S/390

Maintenance Information for the 9032 Model 5 Director

SY28-1158-01

Note: Before using this information and the product it supports, read the general information under “Notices” on page vii.

Second Edition (August, 1999)

This is the second edition of SY28-1158

This edition applies to the 9032 Model 5 Enterprise Systems Connection Director and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters.

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Safety

For general information concerning safety, refer to *Electrical Safety for IBM Service Representatives*, S229-8124. For a copy of this publication, contact your IBM marketing representative or the IBM branch office serving your locality.

The following notices describe the safety practices you must observe while working on this equipment.

DANGER!

To prevent possible electric shock, always disconnect the machine power cable from the power receptacle before you connect or disconnect any cable that has a conductive outer surface or a conductive connector.

Fare!

For at undgå electrisk stød skal du altid tage maskinens strømforsyningskabel ud af stikkontakten, før du tilslutter eller afbryder kabler med en ledende ydre overflade eller et ledende stik

¡PELIGRO¡

Para prevenir posibles descargas eléctricas, desconecte siempre el cable de alimentación de la máquina antes de conectar o desconectar cualquier otro cable que tenga una superficie exterior conductiva o un contector conductivo.

ACHTUNG

Aus Sicherheitsgründen immer zuerst das Gerätenetzkabel ziehen, bevor andere Kabel gelöst oder angeschlossen werden.

DANGER

Afin d'éviter tout risque de choc électrique, débranchez toujours le cordon d'alimentation du socle de prise de courant avant de manipuler un cordon comportant des éléments non protégés (enveloppe extérieure ou connecteur métallique).

PERICOLO

Per evitare possibili scosse elettriche, prima di collegare o scollegare quaisiasi cavo provvisto di una superficie esterna conduttiva o di un connettore conduttivo, scollegare sempre il cavo di allmentazione della macchina dalla presa elettrica in cui è inserito.

FARE

Det er fare for elektrisk støt, og du må alltid trekke ut maskinens nett-kabel fra stikkontakten før du kobler til eller fra eventuelle kabier som har en strømførende overflate eller kontakt.

PERIGO

Para evitar o risco choque eléctrico, sempre desconecte da tomada o cabo de alimentação da máquina antes de conectar ou desconectar quailsquer cabos que possuam uma superficie externa condutiva ou um conector condutivo.

DANGER

To prevent possible electrical shock, do not reach into non-visible areas of a Director connected to primary power.

Fare!

For at undgå elektrisk stød bør du ikke røre ikke-synlige områder på ledende elementer, der er forbundet med primær strøm.

VAARA

Älä työnnä kättäsi sähköverkkoon kytketyssä laitteessa sellaiseen paikkaan, jonne et kunnolla näe. Muutoin voit saada sähköiskun.

DANGER

Afin d'éviter tout risque de choc électrique, ne tâtonnez pas sans visibilité a l'intérieur d'un contrôleur relié a une source d'alimentation.

Achtung!

Um die Gefahr eines elektrischen Schlages zu vermeiden, nicht in die nichteinsehbaren Bereiche einer ESCON-Verbindungseinheit greifen, wenn dlese an die Primärstromversorgung angeschlossen ist.

PERICOLO

Per evitare possibili scosse elettriche, evitare il contatto con qualunque parte non visibile della macchina quando essa é collegata all'alimentazione primaria.

FARE

Det er fare for elektrisk støt, og du må ikke stikke hånden inn i usynlige områder i en hovedleder som er tilknyttet strømnettet.

PERIGO

Para evitar o risco de choque eléctrico, não tente alcançar as áreas que não estejam visivels de um Diretor conectado à alimentação principal.

PELIGRO

Para prevenir posibles descargas eléctricas, no trate de llegar a partes no visibles de la unidad de control -o otros dispositivosconectados a la fuente de alimentación.

DANGER

This product has a 3-wire power cable with a 3-prong plug. Use this power cable with a correctly grounded power receptacle to prevent possible electric shock.

Pas på!

Produktet er udstyret med en 3-polet netledning og et 3-benet stik. For at undgå elektriske stød skal netledningen tilsluttes et stik med korrekt jordforbindelse.

VAARA

Tämän tuotteen verkkojohto ja pistoke ovat maadoitetut. Kytke verkkojohto vain maadoitettuun pistorasiaan sähköiskun vaaran välttämiseksi.

DANGER

Cette unité est équipee d'un cordon d'alimentation à trois fils et d'une fiche de prise de courant à trois broches. Pour éviter tout risque de choc électrique, branchez ce cordon sur un socle de prise de courant correctement mis à la terre.

VORSICHT

Netzkabel und Nezstecker des Gerätes entsprechen den einschlägigen Sicherheitsanforderungen. Aus Sicherheitsgründen darf das Gerät nur an eine ordnungsgemäβ geerdete Schutzkontaktsteckdose angeschlossen werden.

PERICOLO

Il prodotto è fornito di cavo di alimentazione trifilare e di una spina con spinotto di terra. Per evitare possibili scosse elettriche utilizzare tale cavo con una presa di corrente munita di alveolo correttamente collegato alla terra di sicurezza.

FARE!

Dette produktet er utstyrt med en trelederkabel og en kontakt med tre poler. Sett nettkabelen i en riktig jordet stikkontakt for å unngå elektrisk støt.

PERIGO

Este produto tem um cabo de corrente êlectrica com uma ficha de tres pinos. Ligue este cabo a uma tomada de corrente que esteja correctamente ligada à terra, para evitar choques eléctricos.

PELIGRO

Este producto tiene un cable de alimentación de tres hilos con un enchufe de tres patillas. Utilice este cable de alimentación con un receptáculo de alimentación debdamente conectado a tierra para prevenir posibles descargas electricas.

DANGER

Before you connect the power cable of this product to ac power, verify that the power receptacle is correctly grounded and has the correct voltage.

Pas på!

Før man sætter netledningen i stikket, skal man sikre sig, at stikkontakten har korrekt jord- forbindelse og spænding.

VAARA

Enneli kuin kytket tämän tuotteen verkkojohdon pistorasiaan, tarkista, että pistorasia on maadoitettu ja että siinä on oikea jännite.

DANGER

Avant de brancher le cordon d'alimentation sur le socle de prise de courant, vérifiez que celui-ci est correctement mis à la terre et que la tension est adéquate.

VORSICHT

Maschine nur an eine ordnungsgemäß geerdete Steckdose mit der auf der Maschine angegebenen Netzspannung anschließen.

PERICOLO

Prima di collegare il cavo di alimenaslatazione dl questo prodotto alla corrente ca, assicurarsi che la presa abbia la terra di sicurezza e la giusta tensione.

FARE!

Før du kobler nettkabelen til en stikkontakt med vekselstrøm, må du se etter at stikkontakten er riktig jordet og har riktig spenning.

PERIGO

Antes de ligar o cabo de corrente eléctrica deste produto à tensão CA da rede, verifique se a tomada de corrente está correctamente ligada à terra e tem a voltagem correcta.

PELIGRO

Antes de conectar el cable de alimentación de este producto a la red de alimentación CA, verifique que el receptáculo de alimentación esta debidamente conectado a tierra y tiene el voltaje correcto.

DANGER

During an electrical storm, do not connect or disconnect any cable that has a conductive outer surface or a conductive connector.

Pas på!

Strømførende kabler og stik må ikke tilsluttes eller afmonteres i tordenvejr.

VAARA

Älä kytke äläkä irrota kaapeleita ukonilman aikana.

DANGER

En cas d'orage, évitez de manipuler un câble présentant des risques de contact avec des éléments non protégés.

VORSICHT

Bei Gewitter dürfen keine Kabel angeschlossen oder gelöst werden.

PERICOLO

Durante un temporale non collegare o scollegare nessun cavo che abbia il connettore o la superlicie esterna conduttivi.

FARE!

Når det er tordenvær, må du ikke koble til eller fra kabler som har en strømførende overflate eller kontakt.

PERIGO

Não ligue nem desligue qualquer cabo que tenha um revestimento ou um conector condutor durante uma trovoada.

PELIGRO

Durante una tormenta eléctrica, no conecte ni desconecte ningún cable que tenga una superficie exerior conductora o conector conductor.

DANGER

Switch off power and unplug the machine power cable from the power receptacle before removing or installing any part that is connected to primary power.

Pas pa!

Sluk for strømmen og tag maskinens netledninger ud af kontakten, før du fjerner eller installerer dele, som er tilsluttet elnettet.

VAARA

Katkaise koneesta virta ja irrota sen verkkojohto pistorasiasta, ennen kuin irrotat tai asennat tähän koneeseen kuuluvia laitteita.

DANGER

Avant d'installer ou d'enlever un élément connecté au bloc d'alimentation primaire, mettez l'appareil hors tension et débranchez son cordon d'alimentation du socle de prise de courant.

VORSICHT

Vor dem Ein- oder Ausbau von Teilen, die an die Primärstromversorgung angeschlossen sind, Netzschalter ausschalten und Gerätenetzkabel aus der Netzsteckdose ziehen.

PERICOLO

Spegnere la macchina e togliere il cavo di alimentazione dalla presa di corrente prima di spostare o installare qualsiasi parte che sia collegata all'alimentazione primaria.

FARE!

Før du skal fjerne eller installere deler som har forbindelse med nettspenningen, må du slå av maskinen og dra ut nettkabelen fra stikkontakten.

PERIGO

Desligue o interruptor de corrente e retire o cabo de corrente eléctrica da tomada antes de remover ou instalar qualquer dispositivo que seja ligado a tensão da rede.

PELIGRO

Desconecte la alimentación y desenchufe el cable de alimentación de la máquina del receptáculo de alimentación, antes de desmontar o instalar cualquier parte que este conectada a la alimentación principal.

DANGER

To prevent possible electrical shock during machine installation, relocation, or reconfiguration, connect the primary power cable only after connecting all electrical signal cables.

Pas på!

For at undgå elektrisk stød, når maskinen installeres, flyttes eller tilpasses, må den primære strømforsyning ikke tilsluttes, før alle signalkabler er forbundet.

VAARA

Vältä sähköiskun vaara koneen asennuksen, uudelleen sijoituksen tai uudelleen kokoonpanon aikana kytkemällä verkkojohto vasta kaikkien muiden kaapeleiden kytkennän jalkeen.

DANGER

Pour éviter tout risque de choc électrique lorsque vous installez, déplacez ou reconfigurez l'appareil, connectez tous les câbles d'interface électriques avant de brancher le cordon d'alimentation primaire.

VORSICHT

Um einen elektrischen Schlag während Installation, Standortwechsel oder Rekonfiguration der Maschine zu vermeiden, das Nezanschlußkabel erst nach Anschluß aller Signalkabel anschließen.

PERICOLO

Per evitare possibili scosse elettriche durante l'installazione, lo spostamento o la riconfigurazione della macchina, collegare il cavo dell'alimentazione primaria soltanto dopo aver collegato tutti i cavi di segnale.

FARE!

For å unngå å få elektrisk støt når du installerer, flytter eller konfigurerer maskinen på nytt, må du ikke koble til hovednettkabelen før etter at du har koblet til alle de elektriske signalkablene.

PERIGO

Para evitar um possivel choque eléctrico, durante a instalação, mudança de instalação ou reconfiguração da máquina, ligue o cabo principal de corrente somente depois de ligar todos os cabos eléctricos de sinal.

PELIGRO

Para prevenir posibles descargas eléctricas durante la instalación, reubicación o reconfiguración de la máquina, conecte el cable de alimentación primaria únicamente cuando haya conectado todos los cables de señal.

DANGER

To prevent possible electrical shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to non-redundant FRU removal.

FARE!

For at forhindre at få elektrisk stød skal du altid sikre dig, at strømmen er afbrudt, og at alle netledninger taget ud af kontakterne, før maskinens udskiftelige enheder fjernes.

VAARA

Ennen kuin irrotat asiakkaan tiloissa vaihdettavan yksikön, tarkista, että siitä on katkaistu virta ja että kaikki verkkojohdot on irrotettu pistorasioista. Muutoin voit saada sähköiskun.

DANGER

Pour éviter tout risque de choc électrique, assurez-vous que l'interrupteur d'alimentation est en position hors tension et que tous les cordons d'appareils sont débranchés avant de retirer les FRU non redondants.

VORSICHT

Um die Gefahr eines elektrischen Schlages zu vermeiden, vor dem Entfernen von nichtredundanten austauschbaren Funktionseinheiten (FRUs), sicherstellen, da die Netzspannung abgeschaltet ist und die Netzkabel gelöst sind.

PERICOLO

Per evitare scosse elettriche, prima di effettuare la rimozione di una FRU, accertarsi che l'interruttore di alimentazione ca sia spento e che tutti i cavi di alimentazione della macchina siano scollegati dalle prese elettriche.

FARE!

For å unngå får elektrisk støt, må du slå av hovedstrømmen og trekke ut nettkablene fra stikkontakten før du fjerner en nødendig erstatningsenhet (FRU).

PERIGO

Para evitar a possibilidade de choque eléctrico, assegure-se de que a chave de alimentação de corrente alternada esteja desligada e que quailsquer cabos de alimentação da máquina estejam desconectados de suas tomadas, antes de uma remoção de FRU (Field Replaceable Unit ou Unidade Substituível de Campo) não-redundante.

PELIGRO

Para prevenir una posible descarga eléctrica, asegúrese de que el interruptor de alimentación ca está en posición de apagado (off) y de que todos los cables de alimentación de la máquina están desenchufados antes de cuaiquier desmontaje relevante de la unidad sustituible.

CAUTION:

The FL200 laser ports are designed and certified for use only with single mode optical fiber and connectors having characteristics specified by IBM. The use of any other connectors or fiber can result in emission of laser power levels capable of producing injury to the eye if directly viewed. Use of non-specified connectors or fiber could violate the Class 1 laser classification.

PAS På!

FL200-laserporte er kun fremstillet til brug sammen med “single-mode” lysledere og stik, der svarer til IBM’s krav. Anvendes andre stik eller lysledere kan det give laserstråling, der skader øjet, hvis man ser direkte ind i strålerne. Bruges uautoriserede stik eller lysledere, kan der være risiko for laserstråling ud over klasse 1.

ACHTUNG:

Die IBM FL200 Laseranschlüsse sind nur für die Verwendung mit voder IBM vorgeschriebenen einadrigen Glasfaserkabeln und Steckern ausgelegt. Die Verwendung anderer Stecker oder Glasfaserkabel kann zur Freisetzung von solch starker Laserstrahlung führen, daß das Auge bei direktem Hineinsehen verletzt werden kann. Die Verwendung von Steckern/Glasfaserkabeln, die nicht die von IBM angegebenen Eigenschaften aufweisen, kann die Sicherheitsregeln für Laser der Klasse 1 verletzen.

VAROITUS:

FL200-laserportit on suunniteltu ja luokiteltu vain yksitoimisia valojohdekaapeleita ja liittimiä varten, joiden ominaisuudet IBM on määrittänyt. Muiden valojohdekaapeleiden ja liittimien käyttö saattaa lisätä lasersäteilyä, joka suoraan säteeseen katsottaessa voi aiheuttaa näkövamman. Tällaiset johtimet ja liittimet eivät täytä laserluokan 1 vaatimuksia.

ATTENTION:

Les produits à laser du module de communication FL200 sont conçus et certifiés pour utilisation avec des connecteurs et une fibre optique monomode dont les caractéristiques ont été spécifiées par IBM. L'utilisation de tout autre connecteur ou fibre optique peut entrainer un rayonnement à des niveaux pouvant être dangereux pour l'oeil en cas d'exposition directe. De même, l'utilisation d'autres connecteurs ou fibre optique pourrait signifier que le produit excède les limites de la classe 1.

ATTENZIONE:

Le aperture laser dell'IBM FL200 sono progettate e certificate per essere usate solamente con connettori e fibre ottiche monomodali che abbiano caratteristiche specificate dall'IBM. L'uso di qualsiasi altra fibra 0 connetiore può produrre un'emissione con livelli di potenza laser capace di procurare danni agli occhi se guardata direttamente. L'uso di connettori 0 fibre non specificati può violare la classificazione di laser di Classe 1.

ADVARSEL:

FL200-laserportene er bare utformet og godkjent for bruk sammen med de optiske kablene og kabelkontaktene som oppfyller kravene til IBM. Bruk av andre kontakter eller kabler, kan medføre laserstråling som kan skade øyet hvis du ser rett på laserstrålen, og er et brudd på reglene for laserprodukter i klasse 1.

CUIDADO:

Os produtos a laser do modulo FL2OO foram concebidos e certificados para serem utilizados unicamente com fibras ópticas mono-modo e com conectores cujas caracteristicas sejam as especificadas pela IBM. A utilização de outros conectores ou fibras poderá ocasionar radiações laser a níveis tais que, em caso de exposição directa, poderão ser nocivas para os olhos. Outros conectores ou fibras não especificados poderao violar a classificação de Classe 1 para produtos a laser.

PRECAUCIÓN:

Las bocas láser del módulo FL200 fueron diseñadas y garantizadas para usarse con conectores y fibras ópticas de modalidad única que tengan caracteristicas especificadas por IBM solamente. Al usarse otros conectores o fibras se podrian emitir niveles de energía láser capaces de producir daños en la vista, en caso de contacto visual directo. El uso de conectores o fibras no recomendados puede violar la clasificación Clase 1 para el uso de láser.

CAUTION:

Data processing environments can contain equipment transmitting on system links with laser modules operating at greater than Class 1 power levels. For this reason, it is advised never to look into the end of an optical fiber cable or open receptacle. The inspection or repair of optical fiber cable assemblies and receptacles should be performed by trained service personnel only.

PAS På!

Edb-miljøet kan indeholde udstyr med lasermoduler, der opererer ved højere strålingsniveauer end klasse 1. Af den grund må man aldrig se direkte ind i enden af et lyslederkabel eller i en åben stikkontakt. Eftersyn og reparation af lyslederkabler og stik må kun foretages af serviceteknikere.

ACHTUNG:

ln der Datenverarbeitung können Geräte eingesetzt werden, die auf Systemleitungen mit Lasermodulen übertragen, die die Werte der Klasse 1 uberschreiten. Aus diesem Grund nie in das offene Ende eines Glasfaserkabels oder einer offenen Anschlußbuchse schauen. Die Überprüfung und/oder Reparatur von Glasfaserkabeln darf nur von Fachpersonal durchgeführt werden.

VAROITUS:

Tietojenkäsittely-ympäristöissä saattaa olla lasermoduuleita, jotka toimivat suuremmalla kuin luokan 1 voimakkuudlella. Älä koskaan katso valojohdekaapelin päähän tai kaapelin avoimeen pistokkeeseen. Valojohdekaapelin ja sen pistokkeen huolto sekä korjaus on annettava koulutetulle huoltoedustajalle.

ATTENTION:

Les installations informatiques peuvent inclure des équipements qui utilisent des réseaux communs, et dont des modules à laser peuvent fonctionner avec un niveau énergétique, se situant au-delà des limites prescrites pour la classe 1. Il est donc recommandé de ne pas examiner à l'oeil nu la section d'un câble à fibres ap#iques ou une prise de fibres optiques ouverte. L'inspection ou la réparation des câbles a fibres optiques cu des prises de fibres optiques ne doit être faite que par un personnel qualifié.

ATTENZIONE:

Gli ambienti di elaborazione dati possono contenere apparecchiature che trasmettono sui collegamenti del sistema con moduli laser che operano a livelli di potenza superiori alla Classe 1. Per questa ragione, si raccomanda di non guardare nell'estremità del cavo a fibra ottica 0 in una presa aperta. L'ispezione e/o la riparazione di cavi a fibra ottica e prese deve essere effettuata solo da personale di manutenzione specializzato.

ADVARSEL:

EDB-miljøet kan bestå av lasermoduler som brukes ved høyere strålingsnivå enn klasse 1. Du må derfor aldri se rett inn i enden av en fiberoptiske kablel eller en åpen stikkontakt. lnspeksjon eller reparasjon av fiberoptiske kabler og stikkontakter må bare utføres av kvalifisert personale.

CUIDADO:

Nos ambientes informáticos, pode existir equipamento que utilize redes cujos módulos a laser funcionam em niveis de energia superiores aos prescritos para a Classe 1. Por esta razão, não se deve nunca olhar para a extremidade de um cabo de fibras ópticas nem para uma caixa de ligação de fibras ópticas que esteja aberta. A inspecção e/ou reparação de módulos com cabos de fibras ópticas, e das respectivas caixas dligação, apenas deve ser efectuada por pessoal técnico especializado.

PRECAUCIÓN:

En los entornos de procesamiento de datos se realizan transmisiones entre equipos a través de enlaces de sistemas, en los cuales los módulos láser operan a niveles mayores que la clase 1. Es por esta razón que se recomienda no mirar el extremo de una fibra óptica o de un receptáculo abierto. La inspección y reparación de conjuntos de fibras ópticas y de receptáculos sólo deben ser realizados por personal técnico especializado.

Laser Compliance Statement

The IBM FL200 is certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for Class 1 laser products. Elsewhere, it is certified to be in compliance with IEC 825 (1st edition 1984) and CENELEC HD 482 S1 as a Class 1 laser product. The FL200 has been tested and approved in Sweden as a Class 1 laser product by Statens Provnings anstalt (Swedish National Testing Institute), and assigned the approval number SP LA 1989:118.

Class 1 laser products are not considered to be hazardous. lnternally, the IBM FL200 Module contains a Class 3b laser that is nominally a 5.0 milliwatt lndium Gallium Arsenide Phosphide laser operating in the wavelength region of 1270-1340 nanometers. The FL200 module is designed such that there is never any human access to laser radiation above a Class 1 level during normal operation, user maintenance, or prescribed service conditions.

See Chapter 4 for an illustration of the Class 1 Laser Product label. The label is located inside the front access door.

The instruction manual for the 3M (**) Photodyne optical power source contains the compliance statement for the laser module (3M part number 1720SM1300T; IBM part number 02G6155). The instruction manual and the module are included in lBM's Fiber Optic Field Test Support Kits.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe A d'émlsslon des bruits radioélectriques pour les appareils numériques, telles que prescrites par le Règlement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur á prendre les dispositions nécessaires pour en éliminer les causes. Voir le Guide d'instructions.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class A limits per radio noise emissions for digital apparatus, set out in the Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference. See instruction manual.

Canadian Electromagnetic (EMI) Regulations for Computing Devices

This Class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Japanese Voluntary Control Council for Interference Statement

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- EN55022, ITE-Generic Emission standard for domestic, commercial, and light industrial environments (CISPR 22 Class A).
- EC 1000-4; prEN55024, ITE-Generic Immunity standard for domestic, commercial, and light industrial environments (IEC 801-2 through 801-5). This device meets CE Mark Immunity Performance Criteria “A,” with the exception being IEC 801-2, Electro-Static Discharge Immunity, which meets Performance Criteria “B.” In effect, the software will automatically restore full operation if performance degradation occurs, with no operator intervention required.

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About This Publication

This publication contains the information needed to install and maintain an IBM* 9032 Enterprise Systems Connection Director Model 5 (also referred to as a 9032-005 and a Director) with the Director Console.

Who Should Use This Publication

This publication is intended for the 9032-005 service representative experienced with systems and fiber optic technology.

How This Publication Is Organized

This publication is organized as follows:

- **Chapter 1, "General Information,"** describes the maintenance approach to 9032-005 problem analysis and repair. This chapter provides a general description of the Director and Console, switches and indicators, a list of special tools and test equipment, and an example of a system configuration using 9032-005 Directors.
- **Chapter 2, "Diagnostic Information,"** provides the procedures to perform service tasks for failure diagnosis and fault isolation and a description of tests to verify Director operation. The chapter includes the maintenance analysis procedures (MAPs), a description of maintenance functions available through various Console menus, and general procedures to check light intensity, perform port diagnostics, install or remove fiber optic cable, and block or unblock ports.
- **Chapter 3, "Repair Information,"** contains information to perform Director repair actions after isolating a failure to a field replaceable unit (FRU) or a FRU group.
- **Chapter 4, "Locations,"** shows the physical location of the major Director components.
- **Chapter 5, "Preventive Maintenance,"** states that the Director requires no preventive maintenance.
- **Chapter 6, "Installation, Discontinuance, and Relocation,"** describes procedures to install, discontinue, and relocate a Director and Console. This chapter also contains fiber optic handling information, such as connector keying and strain relief, and procedures to customize operating parameters for the Console support software.

- **Chapter 7, “Maintenance Agreement Inspection Procedure,”** contains information to determine if a Director meets IBM safety standards for a maintenance agreement.
- **Chapter 8, “Grounding Path Diagram,”** contains a diagram showing all grounding points for the Director.
- **Chapter 9, “Parts List,”** contains listings and illustrations of all FRUs, assemblies, subassemblies, and individual parts called out in Chapter 3, “Repair Information.”
- **Chapter 10, “Administration,”** contains administrative information associated with the Director.
- **Appendix A, “Incident Codes and Sense Data Summary,”** contains a summary of sense data bytes reported for hardware and link incident events.
- **Appendix B, “Messages,”** describes messages that appear in Console windows, on the Console Status line, in Console logs, and on the operator panel.
- **Appendix C, “Director Status Codes,”** explains codes that appear on Console matrixes, the *Director Operational Status* dialog box, and the operator panel.
- **Appendix D, “Default Port Address Chart,”** shows the layout of logic cards inside the Director and the default port addresses assigned to ports.
- **Appendix E, “Maintenance Terminal and Terminal Window Commands,”** describes how to connect a maintenance terminal to the Director and use it to enter commands. This appendix also lists and describes all commands available for the separate maintenance terminal and the Console’s *Terminal* window.
- **Appendix F, “Operator Panel Reference Summary,”** reproduces the summary document. This provides information on using the Director’s operator panel.

A **Glossary** and **Index** are also provided at the back of this publication.

Where to Find More Information

The user of this publication should be familiar with the following IBM publications:

S/390 Server-Based Control Products

- *Introducing Enterprise Systems Connection* (GA23-0383)
- *Introducing Enterprise Systems Connection Directors* (GA23-0363)
- *Planning for S/390 Fiber Optic Links - ESCON, FICON, Coupling Links, and Open System Adapters* (GA23-0367)

- *S/390 Fibre Channel Connection (FICON) I/O Interface - Physical Layer* (SA24-7172)
- *S/390 FICON Migration Guide* (SG24-5169)
- *Introduction to IBM S/390 FICON* (SG24-5176)
- *Enterprise Systems Connection: Planning for Migration* (GG66-3181)
- *Programming the Interface for Enterprise Systems Connection Directors: XDF Capable* (SA23-0356)
- *System Automation for OS/390, General Information* (GC28-1541)
- *System Automation for OS/390, Planning and Installation* (GC28-1549)
- *System Automation for OS/390, Technical Referenc*e (GC28-1593)
- *System Automation for OS/390, Operations* (GC28-1550)
- *System Automation for OS/390, Customization* (GC28-1566).

ESCON 9032 Model 5 Director publications

The following publications support the 9032-005 Director:

- *9032 Model 5 ESCON Director Physical Planning Template* (GX22-0046)
- *Operator Panel Reference Summary for the 9032 Model 5 Enterprise Systems Connection Director* (SA22-7297)
- *Using Enterprise Systems Connection Directors: XDF Capable* (GA23-0354).
- *Console Installation and User's Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291)
- *Planning for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7295)
- *Using the 9032 Model 3, 9033 Model 4, 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296)
- *User's Guide Reference Summary for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7298)

ESCON 9032 Model 3 Director publications

- *Maintenance Information for the 9032 Model 3 Enterprise Systems Connection Director* (SY27-3601)
- *9032 Model 3 ESCON Director Physical Planning Template* (GX22-7147)
- *Operator Panel Reference Summary for the 9032 Model 3 Enterprise Systems Connection Director* (SA26-6103).

ESCON 9033 Model 4 Director publications

- *Maintenance Information for the 9033 Model 4 Enterprise Systems Connection Director* (SY27-2638)
- *Operator Panel Reference Summary for the 9033 Model 4 Enterprise Systems Connection Director* (SA22-7211)

ANSI Publications

The following publications related to Fibre Channel are provided by the American National Standards Institute (ANSI):

- *Fiber Channel Physical and Signaling Interface (FC-PH), Revision 4.3, June 1, 1994* (X3.230-1994)
- *Fiber Channel Physical and Signaling Interface - 2 (FC-PH-2), Revision 7.4, September 10, 1996* (X3.297-1997)
- *Fiber Channel Physical and Signaling Interface - 3 (FC-PH-3), Revision 9.1, October 16, 1996* (X3.303-1997).

Other publications

- *Fiber Optic Cleaning Procedures* (SY27-2604-01 or later)
- *Electrical Safety for IBM Service Representatives,* (S229-8124)
- *Maintenance Information for Fiber Optic Channel Links* (SY27-2597)
- *Enterprise Systems Connection Link Fault Isolation* (SY22-9533)
- *Environmental Record Editing and Printing (EREP) Program User's Guide* (GC35-0151-00)
- *Environmental Record Editing and Printing (EREP) Program Reference* (GC35-0152-00)
- *IBM System/360, System/370, 4300, 9370 Processors Input/Output Equipment Installation Manual—Physical Planning* (GC22-7064)
- *Enterprise System/9000 Input/Output Configuration Program Users Guide and ESCON Channel-to-Channel Reference* (GC38-0097, GC38-0455, and GC38-0401)
- 9672/9674 IOCP Users Guide (GC38-0455)
- *Enterprise Systems Connection Link Fault Isolation* (SY22-9533)
- *ESCON Operator Problem Determination in the MVS/ESA Environment* (GG66-3239)
- *S/390 9672 PTS, 9672 PES, and S390 CF Installation Manual - Physical Planning* (GC22-7101)

- *S/390 G3 and G4 Enterprise Servers and Coupling Facility Models C04 and C05: Installation Manual - Physical Planning* (GC22-7102)
- *S/390 G5 Enterprise Server: Installation Manual - Physical Planning* (GC22-7106)
- *System Overview - S/390 G3 Server* (GA22-7150)
- *System Overview - S/390 G4 Server* (GA22-7154)
- *System Overview - S/390 G5 Server* (GA22-7158)
- *Input/Output Configuration Program Users Guide* (GC38-0401)
- *IBM General Information: Installation Manual - Physical Planning* (GC22-7072)
- *ES/9000 and ES/3090 PR/SM Planning Guide* (GA22-7123)
- *S/390 PR/SM Planning Guide* (GA22-7236)
- *Fiber Transport Services (FTS) Direct Attach Physical and Configuration Planning* (GA22-7234).

Chapter 1. General Information

Introduction

This chapter describes the maintenance approach and service strategy an IBM service representative uses to fault isolate and repair the 9032 Model 5 Director (9032-005 Director or Director). The chapter includes a description of the Director, attached Director Console, enhanced availability features (EAFs), service plan, and maintenance procedures. The chapter also provides a system configuration example and describes Director components, tools, and test equipment.

Maintenance Approach

Director fault isolation begins with the examination of messages and error codes transmitted to the Director event log, link incident (LIN) log, and Console error log. Director and link operational status are available at the Director Console through dialog boxes and status line messages on the *Active Matrix* window. Messages and codes also appear at the Director operator panel and attached host processor.

An incident is reported when the Director detects an error associated with Director hardware, Director licensed internal code (LIC), or the Director-to-Console link. Incidents result in status codes and other information appearing at one or several of the following:

- Director operator panel.
- Status line of the *Active Matrix* window.
- *Port Maintenance* window.
- Director event log.
- LIN log.

When incidents are reported that need immediate attention, an event appears on the operator panel and in the Director event log. Separate incidents are reported for each detected error. For example, if two cooling fans fail, a separate incident is reported for each device. In addition, incidents are reported when problems are detected and when problems are fixed. For example, an incident is reported when a cooling fan fails, and an additional incident is reported when the fan is replaced. Incidents can be of three types:

- **Link Incident** - associated with failures in a fiber-optic link connection.
- **Hardware Incident** - associated with hardware failures.
- **Software Incident** - associated with software faults.

An incident event is defined by 22 bytes of sense data that appear at the operator panel and 32 bytes of sense data that appear in the Director event and LIN logs. Incident codes are included in sense bytes 0 through 9 of the logs. For additional information about incident codes and sense bytes, refer to Appendix A, "Incident Codes and Sense Data Summary."

Use maintenance analysis procedures (MAPs) in Chapter 2 isolate errors that appear as events on the Director operator panel or as entries in the Director event log. Director service normally begins with "Start Initial Fault Isolation" on page 2-4.

9032-005 Director Description

The Director dynamically controls data paths between enterprise systems connection (ESCON) or fibre connection (FICON) host channels and ESCON input/output (I/O) control units. The host channels and control units connect to the Director through fiber-optic cables. A Console is required to monitor the Director and perform administrative, operations, and maintenance tasks. The Director and Director Console are shown in Figure 1-1.

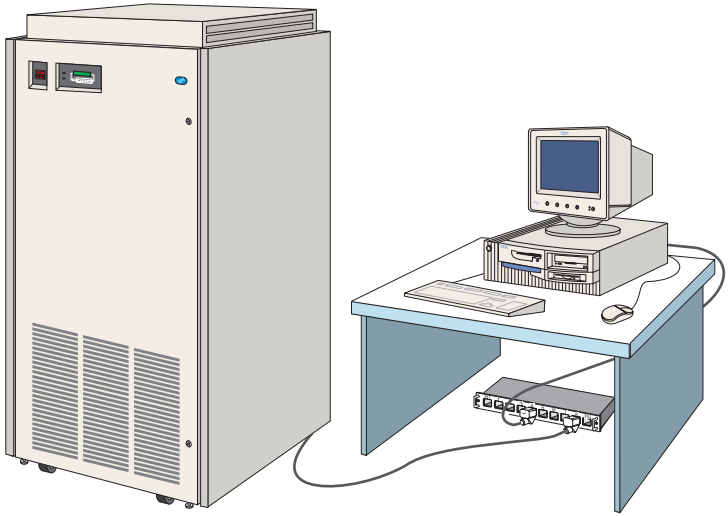


Figure 1-1. 9032-005 Director and Console

The Director is a floor-standing unit that can be configured for ESCON-only operation, or can be configured with a FICON converter feature that connects to FICON channels of an IBM S/390 generation 5 (or later model) parallel enterprise server. The Director also provides static connectivity to support the 9034 ESCON converter and chaining of ESCON Directors.

When a channel or a control unit sends a request, the Director:

- Reads the address header and determines the destination for the information.
- Activates the necessary physical connection.
- Transfers the information (in both directions).
- Reads the trailers, breaks the physical connection (if specified), and waits for the next communication.

ESCON-Only Operation

When configured for ESCON-only operation, the Director contains a minimum of three device port (DVP) cards (24 external ports) and a maximum of 31 DVP cards (248 external ports). Each DVP card provides either eight light-emitting diode (LED) ports or eight extended distance feature (XDF) laser ports. Up to 124 simultaneous internal connections (two ports per connection) are possible when each external port attaches to an ESCON channel or control unit. DVP cards can be ordered and installed as the need for increased port connections arises. DVP cards for the 9032-005 Director are not interchangeable with DVP cards for earlier model Directors. To determine if a port is LED or XDF laser, refer to "Determining Port Type" on page 2-143.

Each LED port allows Director connection to an ESCON channel, control unit, 9034 or 9035 ESCON converter, another ESCON Director. An LED port can also provide a channel-to-channel (CTC) connection.

Each XDF laser port allows Director connection to a second Director or other mode converter at a distance of up to 20 kilometers. Any ESCON-compatible control unit can be attached to the Director or mode converter at a remote site.

FICON Converter Feature

Fibre Channel converter (FCV) port cards can be ordered and installed in the Director as optional FICON converter features. Each FCV port card provides one FICON port connection that provides a link attachment to an IBM S/390 generation 5 (or later model) parallel enterprise server.

The Director supports the installation of one to 16 FCV port cards. The remaining port cards must be ESCON DVP cards (LED or XDF laser). An increase in physical FICON connections results in a corresponding decrease in physical ESCON connections. With the minimum or maximum number of FCV port cards installed, the number of connections are as follows:

- If no FCV port cards and 31 DVP cards are installed, the Director supports 248 external ESCON connections.
- If one FCV port card and 30 DVP cards are installed, the Director supports one external FICON connection and 240 external ESCON connections.
- If 16 FCV port cards and 15 DVP cards are installed, the Director supports 16 external FICON connections and 120 external ESCON connections.

The FCV port card provides a function that multiplexes and converts eight ESCON channels into one FICON channel. Therefore, the single FICON port on the card maps to eight internal ESCON ports on the same card. The FCV port card is a converter between a FICON server and ESCON peripherals.

The Director provides non-blocking switching between the FICON port and enabled ESCON DVP ports. Any internal ESCON port on the FCV port card can dynamically connect to any other ESCON DVP port. A dedicated connection between an internal ESCON port and an ESCON DVP port is not allowed. An internal ESCON port to internal ESCON port connection is also not allowed.

Any valid combination of host and I/O port is supported. Each LED or XDF laser port allows attachment of an ESCON channel, ESCON control unit, 9034 or 9035 ESCON converter, or another Director. Each FCV port allows attachment of a FICON channel. To determine if a port is LED, XDF laser, or FCV, refer to "Determining Port Type" on page 2-143.

Director Ship Group

The following are packaged and shipped with the Director:

- 6.1-meter (20-foot) cable to connect the Director's Token-Ring (TKRG) controller adapter card to a Token-Ring local area network (LAN).
- Torque tool with hex adapter to remove and replace logic cards.
- Service key to open doors.
- Two LED wrap plugs, two XDF laser wrap plugs (if XDF laser port cards are installed), and two FCV port wrap plugs (if FCV port cards are installed).
- Protective plugs for each ordered port.
- Two caster stops.
- Fiber-optic cables shipped according to facility requirements. Refer to *IBM System/360, System/370, 4300, 9370, and ES/9000 Processors Input/Output Equipment Installation Manual - Physical Planning* (GC22-7064) for information.
- Supporting documentation:
  - *Using the 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, and 9032 Model 5 Director* (SA22-7296).
  - *Maintenance Information for the 9032 Model 5 Director* (SY28-1158).
  - *Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).
  - *User's Guide Reference Summary for the 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, and 9032 Model 5 Director* (SA22-7298).
  - *Operator Panel Reference Summary for the 9032 Model 5 Director* (SA22-7297).

- Power cord - One ac power cord is shipped for each Director power supply. Power cords are site-dependent and vary in length and type of outlet plug. The minimum length is 1.8 meters (6 feet). Table 1-1 lists standard power cords available.

  Table 1-1. Director Power Cord Options

Specify Code	Part Number	Description
9986	14F1547	Chicago: NEMA, nonlocking plug, 250V, 6-foot
9801	14F1548	USA, Canada, Taiwan, Thailand: nonlocking plug, 250V, 14-foot
9987	14F1549	Chicago: locking plug, 250V, 6-foot
9800	14F1550	USA, Canada, Mexico: locking plug, 250V, 14-foot
*	14F1553	Argentina, Uruguay, Paraguay, Columbia: 250V, 14-foot
*	14F1554	Iceland, Korea: EMEA, 250V, 14-foot
*	14F1555	Denmark, United Kingdom, Hong Kong, Singapore, Malaysia: water-tight connector, 250V, 14-foot
*	14F1557	South Africa, Bangladesh, Pakistan, Sri Lanka: 250V, 14-foot
*	14F1558	New Zealand: 250V, 14-foot
*	14F1559	Australia: 250V, 14-foot
*	14F1560	Somalia, Italy: 250V, 14-foot
*	14F1561	Israel: 250V, 14-foot
9896	86F2645	Chicago: water-tight connector, 250V, 6-foot
9797	86F2646	USA, Canada: water-tight connector, 250V, 14-foot
*	86F3439	Japan: 250V, 14-foot

  An asterisk (*) indicates that the specific code is determined by the 3-digit DPRM country code

- Software diskettes: Although the Director ships with LIC installed, diskettes containing the current LIC version are shipped in case future installation is required. Console software is shipped for backup or if the Console option is not ordered with the Director. The following software diskettes are included:

  — One Director LIC diskette, labeled *System Version XX.YY.ZZ*, where *XX.YY.ZZ* is the version number.

  — One Director LIC diskette, labeled *System2 Version XX.YY.ZZ* (containing FICON operational code), where *XX.YY.ZZ* is the version number.

— One Director diagnostics diskette, labeled *Diag Version XX.YY.ZZ*, where *XX.YY.ZZ* is the version number.

— One LMA diskette, labeled *LMA Version XX.YY.ZZ*, where *XX.YY.ZZ* is the version number.

— One Console application software diskette, labeled *Console Version XX.YY.ZZ,* where *XX.YY.ZZ* is the version number.

— Four blank diskettes, labeled *Diskette DOS formatted for use by service personnel.*

— Two Data Collection diskettes, labeled *Data Collection Utility Version XX.YY.ZZ*, where *XX.YY.ZZ* is the version number.

Note: Current version numbers appear on diskettes shipped with the Director.

A multistation access unit (Feature Code #5400), Director Console (Feature Code #5900), or instructions to install the Director Console application on a hardware management console (Feature Code #5901) can be ordered with the Director as optional features.

Director Console Description

The Director requires an attached Console (Figure 1-2) to perform operations and maintenance tasks. The Console can simultaneously communicate with up to 16 Directors. The Console is ordered separately or as an optional feature (Feature Code #5900).

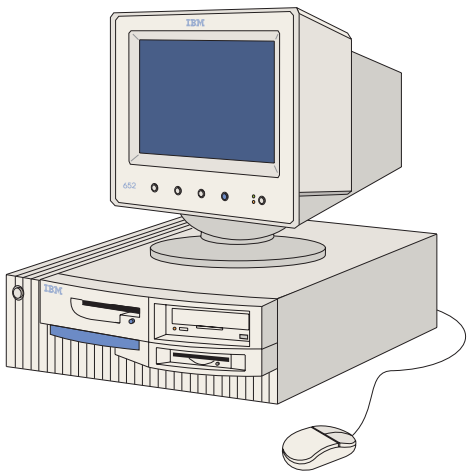


Figure 1-2. Director Console

The Console connects to the Director through a 4/16 Mbps Token-Ring LAN using shielded twisted-pair cable. Through the Token-Ring connection, a Console operator can simultaneously communicate with a cluster of up to 16 attached units comprising of any combination of 9032-003, 9033-004, and 9032-005 Directors and up to two 9037 Model 2 Sysplex Timer networks. Each Sysplex Timer network is considered to be one unit. An example of this type of configuration is shown in Figure 1-3.

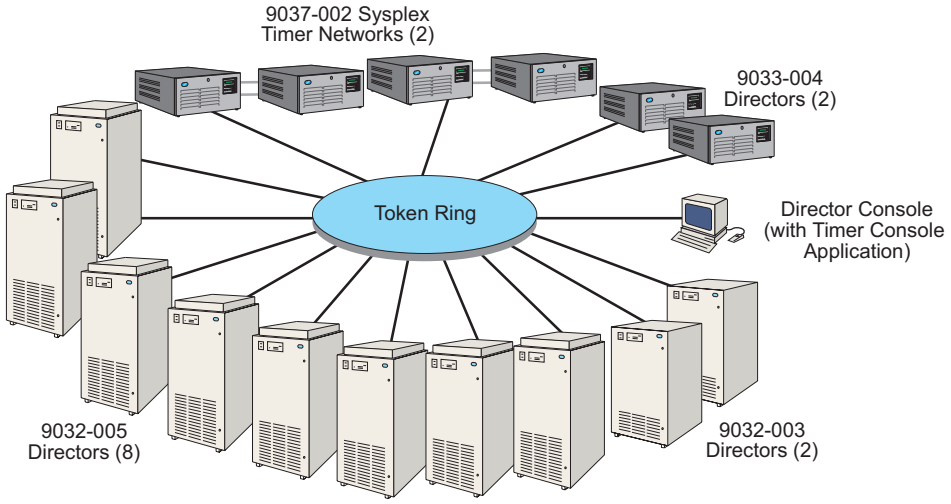


Figure 1-3. Twelve Directors, Two Timer Networks, and Console Installed on LAN

The Console can be installed anywhere up to the limit of the Token-Ring, or can be installed on a remote LAN and communicate with the Director (on a local LAN) through a bridge or router. The LAN can be public or dedicated to the Director cluster. ***It is recommended the Directors and Director Console be installed on a dedicated LAN.***

Attention!

Operation of all Director models (9032-003, 9033-004, or 9032-005) is supported through a bridged LAN. Operation of all Director models (9032-003, 9033-004, or 9032-005) is supported through a routed LAN *only* if LIC Version 4.3 or higher is installed.

The Console described in this publication does not support operation of 9033-001 or 9032-002 Directors. Conversely, Consoles for the 9033-001 and 9032-002 Directors do not support operation of 9032-003, 9033-004 or 9032-005 Directors. Refer to Table 1-2 on page 1-10 for information about operating system and PC model support.

Table 1-2. Director Requirements by PC Model and Operating Systems

PC Model and Operating System	9032-003 Director	9033-004 Director	9032-005 Director
PS/2 with OS/2 Warp Connect 3.0	Yes	Yes	No
PS/2 with OS/2 Warp 4.0	No	No	No
PC-330 (6571/6576) with OS/2 Warp Connect 3.0	Yes	Yes	No
PC-330 (6571/6576) with OS/2 Warp 4.0	No	No	No
PC-365 (6589) with OS/2 Warp Connect 3.0	No	No	No
PC-365 (6589) with OS/2 Warp 4.0	Yes	Yes	Yes
PC 300PL with OS/2 Warp Connect 3.0	No	No	No
PC 300PL with OS/2 Warp 4.0	Yes	Yes	Yes
Hardware Management Console with OS/2 Warp Connect 3.0	Yes	Yes	No
Hardware Management Console with OS/2 Warp 4.0	Yes	Yes	Yes

Console Considerations

Consider the following when using the Director Console and Console application:

- The Director Console can be located at any distance from the Director, up to the limit of the installed Token Ring. The Console can attach to a local LAN containing the Director, or through a remote LAN connected by a bridge or router.
- A Console is required for Director installation and configuration, changing configurations (without SA OS/390), and accessing logs. The Director can be powered on and off without the Console. After the Director is configured and operational, dynamic connectivity tasks are performed without Console intervention.
- A Console failure does not cause an operating Director to fail. However, a Console is required to monitor Director operations, access critical system or application data, and access logs. For maximum Console availability, consider maintaining either a backup or replacement Console for installation on the Token-Ring LAN.
- When the Console manages multiple Directors, and a Director failure occurs, ensure the appropriate Director is selected for service. Ensure the ID that appears on the status display of the Director's operator panel matches the ID that appears on the *Matrix* window of the Console application.

- Selected Directors can be accessed by opening their respective *Active Matrix* windows. However, all defined Directors continue to communicate with the Console while the Director Console application is running (even if their respective *Matrix* windows are not open). For example, defined Directors continue to log incidents and provide status input to the Console.
- The Director Console application can be installed on the following PC platforms. Hardware operational requirements vary for the different Director models. Refer to the *Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer* (GA22–7291) for minimum requirements.

  — A dedicated IBM PC supplied with the Director. This platform provides the hardware and software required to connect the PC to a Token-Ring LAN, perform Win-OS/2 administrative tasks, and operate the Director Console application. This platform configuration is shown in Figure 1-4.

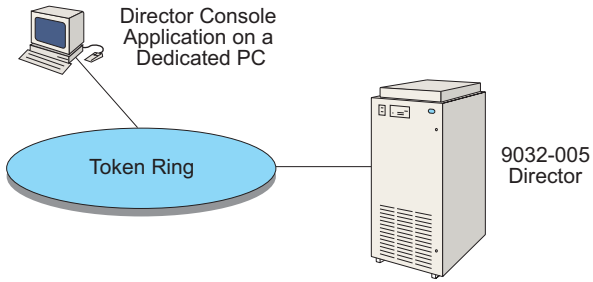


Figure 1-4. Director Console Application on a Dedicated PC

  — The IBM PC supplied with the 9037-002 Sysplex Timer. This platform provides the hardware and software required to connect the PC to a Token-Ring LAN and perform Win-OS/2 administrative tasks. The Director Console application must be installed on the Console. This platform configuration is shown in Figure 1-5.

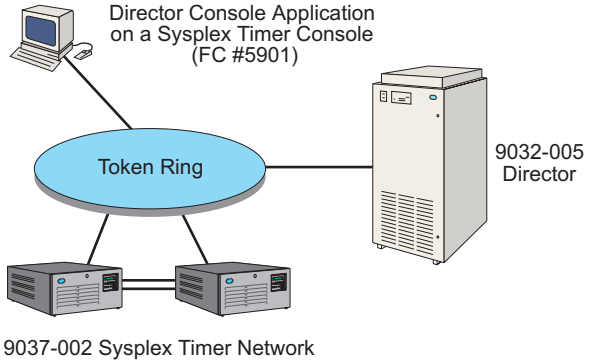


Figure 1-5. Director Console Application on a Sysplex Timer Console

— The S/390 server's hardware management console. This platform provides the hardware and software required to connect the PC to a Token-Ring LAN and perform Win-OS/2 administrative tasks. The Director Console application must be installed on the Console. This platform configuration is shown in Figure 1-6.

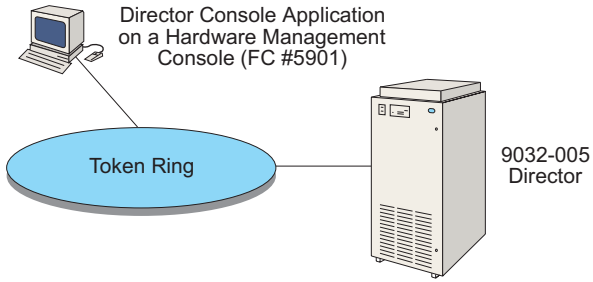


Figure 1-6. Director Console Application on a Hardware Management Console

— A customer-supplied PC. The PC must meet minimum hardware requirements and the Director Console application must be installed. Use of a customer-supplied PC is not recommended.

Automatic Backup of Data Files

Depending on the PC platform, the Console provides software to back up Director system libraries (stored on the Console fixed disk) to a tape cartridge or rewriteable optical cartridge (ROC). If the *Automatic Backup* function is enabled from the Win-OS/2 operating system, configuration files, event logs, error logs, and other critical data are backed up at the specified interval. The default backup interval is daily at midnight. The backup time and interval can be changed or disabled. Refer to the *Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer* (GA22–7291) for instructions.

If the Console is operated with the *Automatic Backup* option enabled:

- Console configuration files can be rebuilt after a primary Console failure, including:
  - — All saved configuration data, including the most recently saved changes.
  - — Accurate and up-to-date event, audit, and error logs.
  - — The correct number and types of Directors managed by the Console.

If the Console is operated with the *Automatic Backup* option disabled:

- Console configuration files might not be accurately recovered if a Console failure occurs and changes were made since the last manual backup. Missing information may include:

  - — Saved configuration changes.
  - — Event, audit, and error log information.
  - — The number and types of Directors managed by the Console.
- Perform regular manual backups to keep backup information as current as possible.

Regardless of the status of the *automatic backup* option (enabled or disabled), manually back up the Director library whenever a Director is added to or removed from the shared Console configuration. In addition, back up the Director system library immediately after installing a Director and configuring its port connections. Refer to "Backing Up the System Library" on page 6-49 for instructions.

Director Console Ship Group

The following are packaged and shipped with the Director (if ordered from IBM):

- IBM PC - Hardware specifications for the PC Console (processor type and speed, memory, fixed disk capacity) change as new PCs become available.
- 4/16 Mbps Token-Ring controller adapter card
- Keyboard and pointing device (mouse) and pad
- 6.1-meter (20-foot) cable to connect the Console's Token-Ring controller adapter card to a Token-Ring LAN
- Ac power cables (for the PC and color monitor) configured for length and plug type according to site requirements. The minimum length is 1.8 meters (6 feet)
- Data backup and restore peripherals - Peripherals used to back up and restore data (rewriteable optical cartridge (ROC) or tape cartridge) change as new PCs and utility software become available. Blank media (ROCs or tape cartridges) are provided with the Console.
- Fixed disk restore peripherals - Peripherals used to restore the Console fixed disk change as new PCs and utility software become available. Restoration software on diskette, tape cartridge, or compact disc read-only memory (CD-ROM) provided with the Console.
- Software loaded on the PC fixed disk - Programs shipped with the PC change as new operating system and associated utility software become available.
- Software diskettes.
  - — One Console application software diskette, labeled *Console Version XX.YY.ZZ*, where *XX.YY.ZZ* is the version number.
  - — One fixed disk restore diskette, labeled *Base Console Restore Version XX.YY.ZZ*, where *XX.YY.ZZ* is the version number.
  - — Three blank diskettes, labeled *Diskette DOS formatted for use by service personnel.*
  - — Four IBM Auto 16/4 Token-Ring industry standard architecture (ISA) adapter diskettes.

- Supporting documentation:
  - — *Using the 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, and 9032 Model 5 Director* (SA22-7296)
  - — *Maintenance Information for the 9032 Model 5 Director* (SY28-1158)
  - — *Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer* (GA22-7291)
  - — *User's Guide Reference Summary for the 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, and 9032 Model 5 Director* (SA22-7298).

Hardware Management Console and Sysplex Timer Console Support

If a Director Console is not ordered and installed, the Director Console application can be installed on the S/390 server's hardware management console by ordering Feature Code #5901. This feature includes the following diskettes and publications:

- One Director Console Tools diskette
- One blank diskette for migrating Director Console definitions to the hardware management console
- The supporting miscellaneous equipment specification (MES) instructions
- *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296)
- *User's Guide Reference Summary for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 ESCON Directors* (SA22-7298)
- *Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer* (GA22-7291)
- *Maintenance Information for the 9032 Model 5 Enterprise Systems Connection Director* (SY28-1158).

The following items packaged with Feature 5901 are used for installing the Director Console application on the Sysplex Timer Console:

- One Director Console Tools diskette
- One blank diskette for migrating Director Console definitions to the Sysplex Timer Console
- The supporting MES instructions
- *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296)
- *User's Guide Reference Summary for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 ESCON Directors* (SA22-7298)

- *Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer* (GA22-7291)
- *Maintenance Information for the 9032 Model 5 Enterprise Systems Connection Director* (SY28-1158).

Remote Access Console

With a remote access Console, an operator assumes functional control of the Director Console application. The *remote access* Console refers to the PC platform installed physically distant from the Director Console. The remote access Console is also called the *controller* Console. The remote Console can be a Director Console, Sysplex Timer Console, or S/390 hardware management console. The *local* Console refers to the PC platform locally running the Director Console application. The local Console is also called the *target* Console.

The remote Console communicates with the local console over a bridged or routed LAN (LIC 5.0 or greater) using a customized version of DCAF software and transmission control protocol/internet protocol (TCP/IP) software. The customized version of DCAF is supported only for the Director or Sysplex Timer Console applications.

Figure 1-7 shows a remote Console attached to a Director Console through a LAN and TCP/IP connection. In this example, the remote Console controls 9032-003, 9033-004, and 9032-005 Directors.

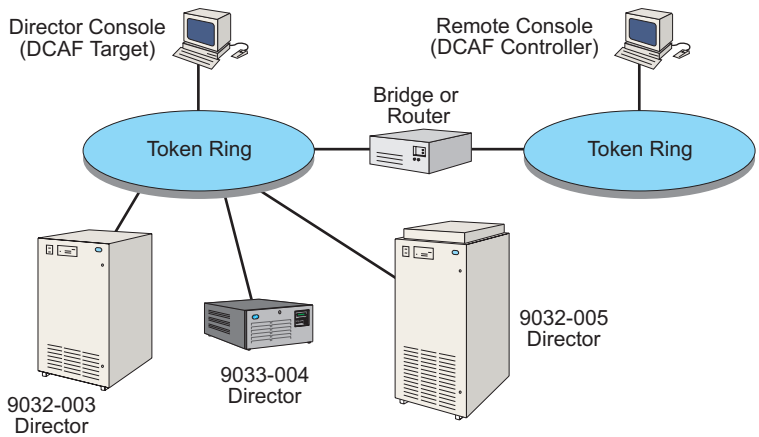


Figure 1-7. Remote Console Connection to the Director Console

Attention!

Operation of all Director models (9032-003, 9033-004, or 9032-005) is supported through a bridged LAN. Operation of all Director models (9032-003, 9033-004, or 9032-005) is supported through a routed LAN *only* if LIC Version 4.3 or higher is installed.

To enable a DCAF session and use a remote access Console, an operator activates the software at both the remote and local Consoles, and starts the Director Console application on the local Console. The session can control up to 16 Directors. For instructions, refer to Chapter 4 of the *Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).

Auto-Discovery Feature

An auto-discovery feature is provided with PC 365 and PC 300PL Consoles (Director and Sysplex Timer) that facilitates configuration and use of a DCAF session with an S/390 hardware management console. When Director or Sysplex Timer Consoles (with the auto-discovery feature) are installed on a Token-Ring LAN with a hardware management Console:

- The hardware management console is automatically configured as a DCAF controller Console
- Director or Sysplex Timer Consoles are automatically configured as a DCAF target Consoles
- Controller Console setup, target Console setup, and session parameter setup is not required.
- The Auto-Discovery feature requires HMC level 1.44 to build an icon under the desktop.

To start a DCAF session from the hardware management console, double-click the *Defined Director/Timer Consoles* icon at the *Hardware Management Console Workplace* window. For additional information, refer to the *Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer* (SA22-7296).

Service Plan

The Director service plan instructs you to perform maintenance procedures to isolate a failure within the Director without decreasing its level of operation, when possible. "Start Initial Fault Isolation" on page 2-4 is the start of Director maintenance in this publication. However, you might be sent directly to "Maintenance Information and Utilities" on page 2-85 to solve problems.

Maintenance information is available through maintenance analysis procedures (MAPs) in Chapter 2. MAPs are a set of step-by-step procedures that prompt you for information or request you to take action. These procedures guide you through collection of status information, fault isolation, and field replaceable unit (FRU) replacement. These procedures either direct you to sections in this publication or to Console menu options to help you isolate problems.

The maintenance procedures provide information to help you isolate a failure to a single FRU. Service procedures vary, depending on the information provided in the operator panel status display and the status display available through the Console.

Make sure that you select the current Director for service when the Console manages multiple Directors. The Director ID that appears on the Director operator panel should match the ID that appears on the Director's active matrix window (Figure 1-8).

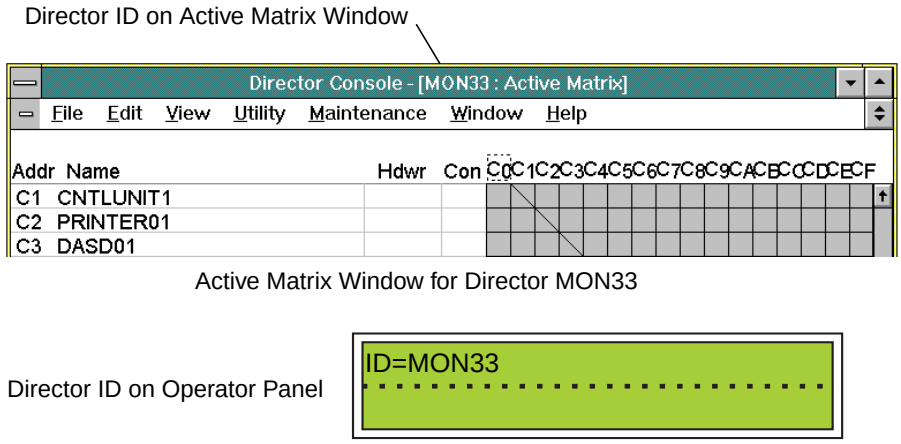


Figure 1-8. Director ID on Active Matrix and Operator Panel

The following illustration provides a summary of Director service information sources in:

- This manual
- The Console's maintenance information and utilities
- The operator panel.

Document

Maintenance Information for the 9032 Model 5 Enterprise Systems Connection Director (Chapter 2):

- Start MAP 9000: initial Fault Isolation
- Maintenance Information and Utilities

Operator Panel

System Information:

- Director ID
- Director IP address
- Token-Ring card MAC address
- LIC version
- CUP name
- Fault codes during startup
- Console IP address

Incident Display:

- Operational errors
- Hardware incident messages and codes
- Software incident messages and codes

Operator Assist Mode:

- Change IP address
- Change MAC address

Console

Console Startup Menus:

- Director matrix selection
- Passwords
- Console audit and error log
- LIC versions
- Help menu

Matrix File and Edit Menus:

- Open active and saved matrix
- Create matrix
- Activate matrix
- Prohibit, dedicate, block, allow connections
- Modify port address and name
- Edit CUP name
- Copy matrix
- Merge saved matrix
- Enable operator
- Command Lists

Console Matrix Help Menu:

- Product information
- Help index
- Keyboard
- Mouse
- Using Help

Console Matrix Utility Menu:

- Director status
- Node descriptor
- Time and date
- Remote offline control
- IPL Director
- Console Audit and Error log
- LIC versions
- Active=Saved
- Set Director offline
- Clear System Error light
- Port Authorization
- Reset Installation Defaults
-

Console

Console Matrix Maintenance Menu:

- Director LIN log
- Director Audit log
- Director Event log
- Hardware configuration
- Hardware Audit log
- Node descriptor list
- Port maintenance
- Advanced (*Terminal* window and LMA versions)
- Console link statistics
- Collect Maintenance Information

Utilities Available through *Terminal* Window:

- Allow, block, prohibit, connect, dedicate, port connections
- Reset Director IP and MAC addresses
- Set ports offline
- Obtain LAN statistics
- Display port information
- Display active matrix
- Upload Director dump file
- Display logical to physical port connections
- Prohibit dynamic communication
- Block and unblock ports
- Display hardware configuration and status
- Online diagnostics control

Selectable Port Card Tests:

- Internal loopback of port
- External loopback with wrap plug
- Internal loopback (includes Matrix Switch)
- Channel-to-port wrap mode *(Maintenance* and *Terminal* windows only)

Figure 1-6. Information Available for Service

System Configuration Using 9032-005 Directors

Fiber optic cables connect to Director device ports (DVPs), providing connectivity to channels, control units, and other devices such as ESCON converters. Refer to *Planning for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7295) for more information on possible configurations and connections.

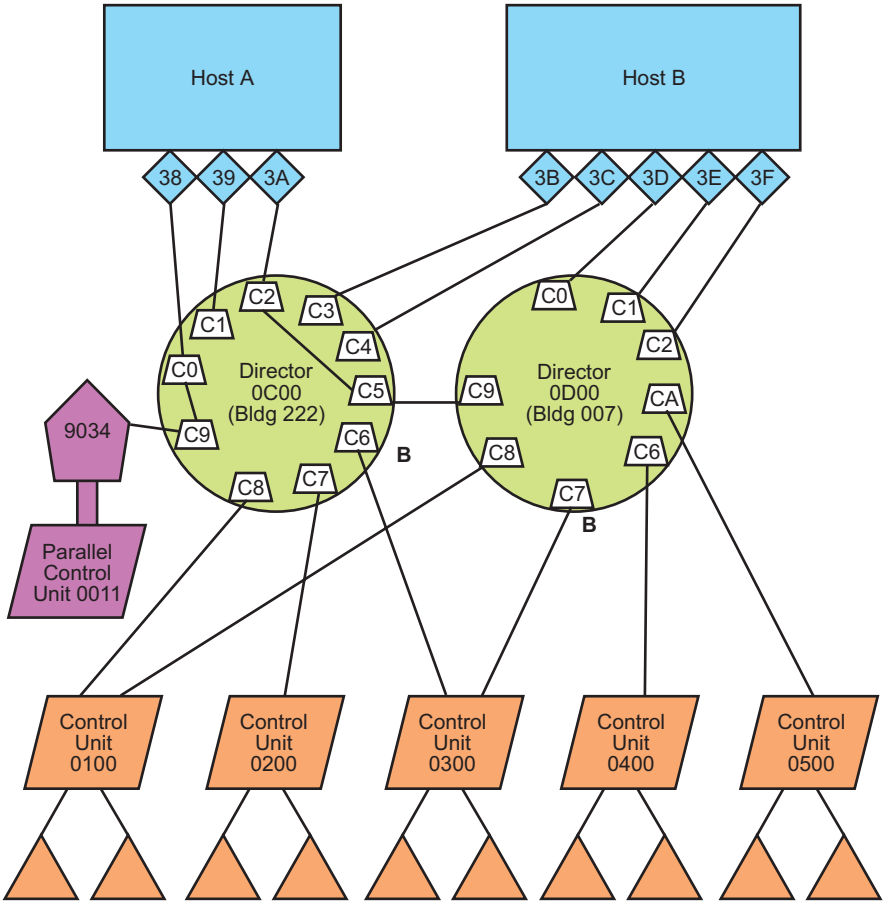


Figure 1-7. A Basic System Configuration Using Two Directors

Storing Active Configuration Matrixes

When changes are made to the Director's active matrix (from the Console application) and saved, the matrix is saved as a file on the Console fixed disk. When the matrix is activated by selecting the *Activate Configuration Matrix* option from the *File* menu, the Director:

- Stores the matrix in dynamic random access memory (DRAM) on the Director's control processor (CTP) card.
- Stores the matrix in the **current** location in nonvolatile memory on the Director's CTP card.

Figure 1-9 illustrates this process.

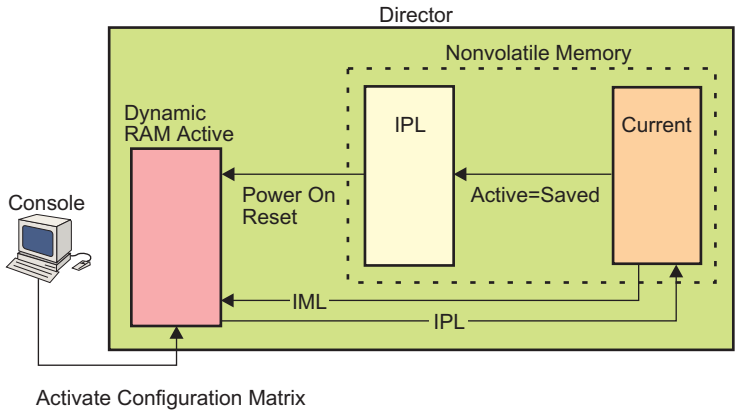


Figure 1-9. Storage of Active Configuration Matrix Data

Selecting the *Active = Saved* option from the *Utility* menu determines if matrix changes are temporary or carried forward to the next Director power-on cycle. If the *Active = Saved* option is set, changes to the current file are also written to the initial program load (IPL) location in nonvolatile memory to be active at the next power-on cycle.

IML and IPL Functions

The initial machine load (IML), initial program load IPL, and power-cycle functions load active matrix information from nonvolatile memory for use in controlling port connections.

IML Function

- *Both* CTP cards (if two are installed) and the active TKRG controller adapter card reset. **Pressing the *IML* button does *not* reset the functional logic of the MXC, MXS, FCV port card, and DVP cards.**
- The LIC loads from control processor FLASH memory to the CPU without powering the Director off and on.
- The Service Required status for all logic cards resets.

An IML forces those components not critical to FICON or ESCON port operation to reset. An IML does not affect connections between channels and control units that are routed through the Director.

After an IML, the Director loads matrix information from the **current** location in non-volatile memory to use as the active matrix for controlling port connections. This information corresponds to the last active matrix downloaded from the Console. The internet protocol (IP) address may appear as *0.0.0.0* on the status display of the operator panel until the actual IP address is calculated and displayed.

Attention!

If an FCV port card is operating in degraded mode (one or more internal ESCON ports not operational), pressing the *IML* button sets the FICON port offline. Prior to pressing the *IML* button during degraded operation, ensure the system operator varies the attached FICON channel offline. It is recommended the *IML* button be used *only* by authorized service personnel.

Note: On a Director with only one CTP card installed, the IPL and IML functions are identical.

IPL Function

Selecting the *IPL Director* option from the *Utility* menu resets a subset of hardware components and reinitializes Director LIC. During an IPL, the following events occur:

- Functional logic on the TKRG Controller Adapter card and CTP card resets. *The MXC/MXS card sets, FCV port cards, and DVP cards do not reset.*
- The **Service Required** status for all logic cards resets.
- Director LIC loads from CTP FLASH memory to the central processing unit (CPU), without cycling power to the Director.

An IPL forces those components not critical to FICON or ESCON port operation to reset. An IPL does not affect connections between channels and control units that are routed through the Director.

After an IPL, the Director loads matrix information from the **current** location in non-volatile memory to use as the active matrix for controlling port connections. This information corresponds to the last active matrix downloaded from the Console. The IP address may appear as *0.0.0.0* on the status display of the operator panel until the actual IP address is calculated and displayed.

Attention!

If an FCV port card is operating in degraded mode (one or more internal ESCON ports not operational), selecting *IPL Director* from the *Utility* menu sets the FICON port offline. Prior to selecting this option during degraded operation, ensure the system operator varies the attached FICON channel offline.

Note: On a Director with only one CTP card installed, the IPL and IML functions are identical.

Powering the Director On and Off

You do not need to switch Director power off to remove certain FRUs, depending on the enhanced availability features installed (refer to "Field Replaceable Units" on page 1-32 for more details). You also do not need to switch off Director power to connect fiber optic cables to and from port cards. You may need to switch off Director power to remove some FRUs when a redundant FRU is not installed and to remove FRUs such as the logic board assembly. You must switch off power to relocate the Director.

Note: Before powering off, make sure that you follow "Powering Procedures" on page 3-5 to power off the Director. These procedures ensure that the Director's active matrix is saved as the IPL matrix and that all channel path identifiers (CHPIDs), devices, and Director ports are placed offline for a controlled shutdown before switching off power.

Note: If powering the unit off to cycle power, wait 30 seconds before switching on power again.

Switch power off and on to the Director by pushing up and down on the ac power switch located to the left of the operator panel at the top of the unit. When switching power on, push firmly to engage the switch. If the switch does not engage properly (because it was not pushed firmly) wait 30 seconds before attempting to switch power on again.

Powering the Director off and on (power cycle) resets all Director hardware components, but interrupts current Director port operation. When the Director powers on, all logic cards are reset, the service-required status for all logic cards resets, and matrix information loads from the "IPL" location in nonvolatile memory to use as the active matrix for controlling port connections. This matrix information corresponds to the last Director matrix downloaded from the Console with the *Active=Saved* option set through the *Utility* menu of the Console's active matrix window. Refer to "Storing Active Configuration Matrixes" on page 1-19.

Logical Partitioning Capability

The logical partitioning capability allows an administrator to create port-level configuration access control that is unique to each defined operator. The Director can be divided into distinct groups or logical regions of port addresses, each with operator-specific management authority. This capability allows operators to access only the ports they are authorized to use, and restricts unauthorized operators from changing the port connectivity configuration of any single device or set of devices under control of the Director. The administrator can also define groups of ports whose configuration access can be shared between operators. A logical partition can be:

- As small as one port to as large as 248 contiguous or non-contiguous ports in any increment or physical location of the Director
- A different size from another logical partition
- Mutually exclusive to one operator or overlapped between operators
- Easily changed or modified.

This feature offers increased security and maximizes the flexibility of system configuration. For more information on how to use these options, refer to *Using the 9032-003, 9033-004, and 9032-005 Enterprise Systems Connection Directors* (SA22-7296).

Enhanced Availability Features

The enhanced availability features (EAFs) reduce the impact to customer operations if a Director hardware component fails. These features include:

- Redundant Token-Ring controller (TKRG) adapter card (FC #5800)
- Redundant control processor (CTP) card (FC #5600)
- Redundant matrix controller/matrix switch **(**MXC/MXS) card set (FC #5500)
- Spare ports card (FC #5245 or FC #5255).

The system automatically switches to the TKRG, CTP and MXC/MXS components (if they are present) in the event of failure. Switching to the spare ports card requires manual intervention if a port or port card fails. Failed components can be replaced and controllers and channels can be connected to ports without disrupting operation of the Director. In addition, when redundant components are purchased as EAFs, they can also be added without disrupting operation.

Note: If a CTP enhanced availability feature is installed, the redundant CTP card monitors the primary CTP card's operation so that it can take over if the primary CTP fails. When the redundant CTP takes over, it loads a synchronized copy of the configuration matrix stored in the "current" location of nonvolatile memory for use as the active matrix to control port connections.

Port Configuration Features

Port configuration features can be installed to simplify the migration of ESCON port connections from an older model Director to the 9032-005 Director. These features include:

- The Director with the 9032-002 port card addressing configuration installed (Feature Code #5902)
- The Director with the 9032-003 port card addressing configuration installed (Feature Code #5903).

Components

Figure 1-10 (below) and Figure 1-11 on page 1-25 illustrate the main components of the 9032 Model 5 Director.

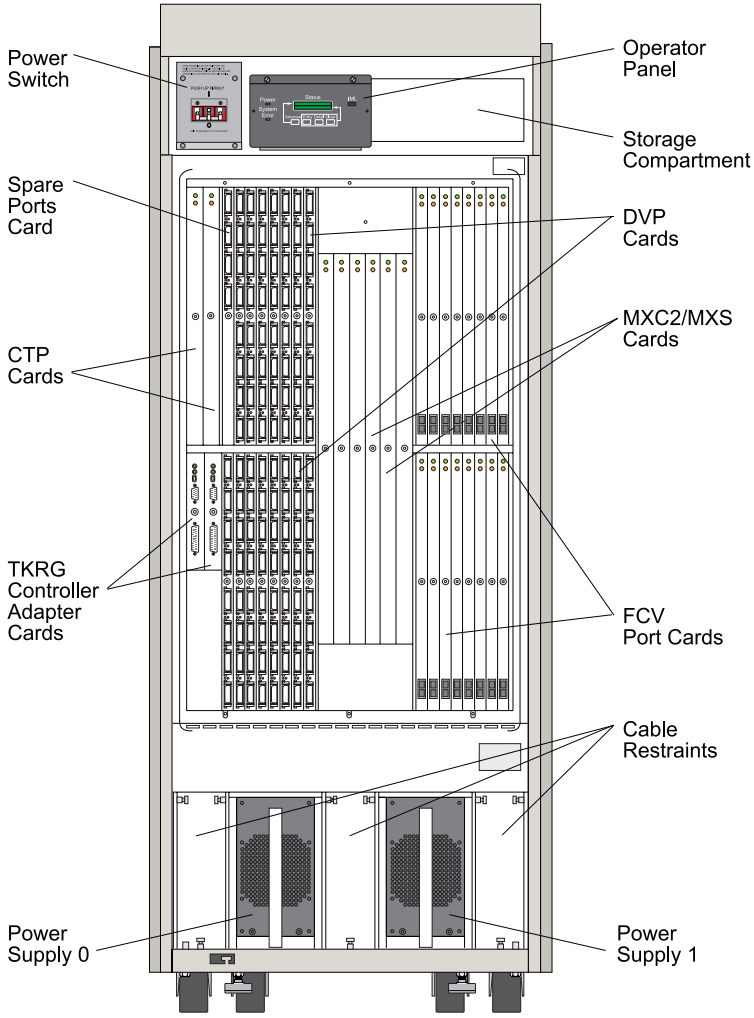


Figure 1-10. 9032 Model 5 Director Components (Front View - Fully Configured)

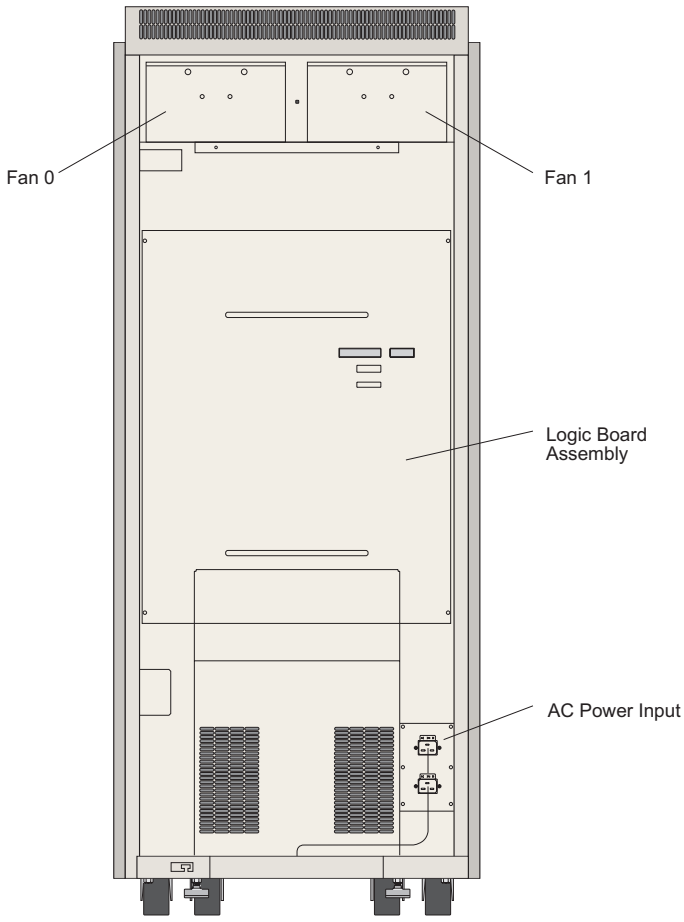


Figure 1-11. 9032 Model 5 Director Components (Rear View)

Logic Cards

The Director includes the following unique logic cards. There are no common logic cards between the 9032 Model 5 and previous Director models.

Note: All cards illustrated in Figure 1-10 on page 1-24 are installed in slots identified with position numbers. Refer to Appendix D, "Default Port Address Charts," for an illustration of slots, component locations, and position numbering in the Director. For a description of LED indicator functions on the logic cards, refer to "Switches and Indicators" on page 1-34.

- **Spare ports Card** - The spare ports card (Figure 1-10) is only used when ESCON ports on a standard DVP card are swapped for spare ports. The card does not increase the total number of active connections available. The spare ports card *cannot* be used to swap a FICON port on an FCV port card. The spare ports card contains either:
  - — Four LED spare port interfaces for ESCON fiber-optic media (Feature Code #5245). Cables attach to the ports through IBM multimode duplex connectors.
  - — Two LED and two XDF laser spare port interfaces for ESCON fiber-optic media (Feature Code #5255). Cables attach to the LED ports through IBM multimode duplex connectors and to XDF ports through singlemode Fibre Channel standard/subscriber connector (FCS/SC) connectors. An XDF adapter kit (part number 46H9223) is required for each port if cables from ESCON devices have IBM multimode duplex connectors.
- **Device port (DVP) cards:** The DVP card (Figure 1-10) is the hardware interface for ESCON fiber-optic media. A minimum of three DVP cards (24 ports) must be installed in the Director. Each DVP card contains either:
  - — Eight LED port interfaces for ESCON fiber-optic media. Cables attach to the ports through IBM multimode duplex connectors.
  - — Eight XDF laser port interfaces for ESCON fiber-optic media. Cables attach to the ports through singlemode FCS/SC duplex connectors. An XDF adapter kit (part number 46H9223) is required for each port if cables from ESCON devices have IBM multimode duplex connectors.

  Note: If the 9032-005 Director is replacing a 9032-002 0r 9032-003 Director with XDF ports (using IBM duplex connectors), an XDF adapter kit (part number 46H9223) is required for each port.
- **Control processor (CTP) card:** The CTP card contains the micro- processor and associated logic that provides overall coordination for the Director. The CTP card (Figure 1-10 on page 1-24) provides overall coordination for the Director by initializing hardware components after power-on or reset. The CTP card also contains the fiber channel controller for handling the I/O requirements of channels. While in operation, the card supports the Director control unit port (CUP), maintenance port, operator panel, port exception handling, and Console and error recovery.
- **Matrix controller/matrix switch (MXC/MXS) card set:** The matrix controller/ matrix switch (MXC/MXS, shown in Figure 1-10) is a three-card set that controls dynamic connection requests and provides connection paths between ports specified by port attributes configured through the Director Console or system automation for OS/390™ (SA OS/390™). There are two MXC card types:
  - — The original card (labelled **MXC**) controls switching only for ESCON DVP cards. ***This card does not support operation of FCV port cards.***
  - — The current card (labelled **MXC2**, Feature Code #5703) controls switching for *both* ESCON DVP cards and FCV port cards. This card is required to support FICON operation.

Note: An older 9032-005 Director must be upgraded to the MXC2 card to support FICON operation. The card is provided automatically when an initial FCV port card is ordered as an upgrade.

Note: ***Ensure that there are primary and backup MXC2 cards.*** In redundant systems, you must have a primary MXC2 and backup MXC2 card to maintain FICON capability

Note: **TKRG Controller Adapter Card** - The Token-Ring (TKRG) controller adapter card (Figure 1-10) provides a:

— **LAN Connection** - This port is a serial connector (9-pin female) that attaches the Director to a 4/16 megabit per second (Mbps) Token-Ring LAN. The LAN connection allows the Director to communicate with a Director Console.

— **Maintenance Port** - This port is an RS-232-D asynchronous serial connector (25-pin male) that attaches the Director to a maintenance terminal. The terminal accesses maintenance utilities and functions through the Director's monitor subsystem, and is intended for use only by a service representative.

- **FCV Port Card** - The FCV port card is a concurrent FRU that can be removed and replaced while the Director is operational. The card is the hardware interface for FICON fiber-optic media (Figure 1-10). Up to 16 FCV port cards can be installed in the Director. The FCV port card provides a multiplexing and conversion function that connects one FICON port to eight internal ESCON ports that connect to the Director's logic board assembly. The card acts a FICON-to-ESCON converter.

  Each card contains one longwave laser port interface for FICON fiber-optic media. The port attaches to a FICON host channel. A singlemode fiber-optic cable attaches to the port through an FCS/SC duplex connector. Multimode cables can attach to an FCV port using a mode conditioning patch cord (part number 21L4175).

  Data arriving at the FICON port is intended for specific logical addresses and is not for specific internal ESCON ports. Data travels through those internal ports that are functional and are not busy. Therefore, if internal ESCON ports fail, data will still transmit to ESCON channels through the remaining functional ports. However, depending on traffic through the FICON channel, performance through these remaining ports may be degraded. If one or more internal ports fail, the card's amber status LED illuminates, indicating that the card is operating in degraded mode, If the FICON port fails, the FCV port card fails.

  The FCV port card can operate in degraded mode. Up to seven internal ESCON ports may be disabled without affecting operation of the remaining ports on the FCV port card. However, performance of the remaining ports is degraded.

Storage Compartment

The storage compartment (Figure 1-10) provides storage for tools and supporting publications.

Operator Panel

The operator panel (Figure 1-10 on page 1-24) is a concurrent FRU that is removed and replaced while the Director is operational. Refer to "Operator Panel and Power Switch" on page 1-34 for details.

Cable Restraints

Fiber-optic jumper cables are routed to the Director through access holes beneath three cable restraints (Figure 1-10). Removable covers restrain the cables after they are routed to port cards. The covers can be adjusted to allow for additional cables when port cards are added.

Power Supplies

Two variable-input power supplies (Figure 1-10) step down and rectify facility input power to provide dc power to Director components. An LED on the power supply illuminates when the supply is operational. Each supply is a concurrent FRU that is removed and replaced while the Director is operational. There are two power supply types:

- PWR - This power supply that provides +5 and +24 Vdc power to Director components only. For identification, the face plate of this power supply is unfinished aluminum (silver) with an appropriate label. ***This power supply does not support operation of FCV port cards.***
- PWR2 - This power supply (Feature Code #5702) provides +3.3, +5, and +24 Vdc power to Director components and supports FCV port card operation. For identification, the face plate of this power supply is anodized (black). This power supply is required to support FICON operation. A +3.3 Vdc power sense cable must also be installed with this option.You can identify this cable by its yellow band.

Note: An older 9032-005 Director must be upgraded to the current power supply to support FICON operation.

Fan Assemblies

Two fan assemblies (four fans), shown in Figure 1-11 on page 1-25, provide cooling for internal components as well as redundancy for continued operation in case a fan fails. The fan assemblies slide into position at the top of the unit.

Fan speed output is monitored, and error messages are generated if the output is not in a specified range.

- For a Director that does not support FCV port card operation, the Director can operate with any two of the four fans functioning. When three or more fans fail, an offline signal is sent through each port and a controlled shutdown of the Director occurs in 5 minutes.
- For a Director that does support FCV port card operation, the Director can operate with any three of the four fans functioning. When two or more fans fail, an offline signal is sent through each port and a controlled shutdown of the Director occurs in 10 minutes.

AC Power Input

The ac power input contains two plug receptacles for 180 to 264 Vac power (Figure 1-11 on page 1-25). Each plug receptacle connects to one power supply. For redundancy, it is recommended each receptacle be connected to a separate facility power source.

Fiber Optic Cabling Devices, Labels, Static Pad, and Storage

Figure 1-12 shows the restraints and guides inside the front door that are used to route fiber cable to port cards. A static pad is available on top of the power supply in slot 0 (left), and a storage compartment for publications, port wrap plugs, and other items is in the upper right area of the Director.

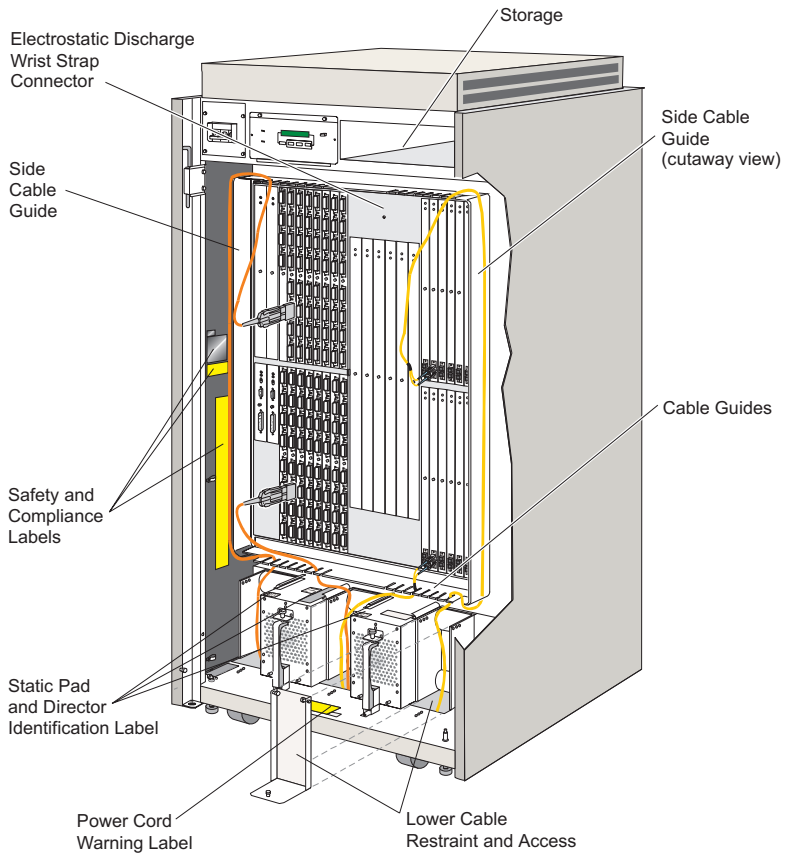


Figure 1-12. Fiber Optic Cabling Devices, Labels, Static Pad, and Storage

Cabling and Labels - Rear Access

Figure 1-13 and Figure 1-14 show the cables and safety label inside the rear access door. The cables illustrated comprise the power sense 0 and 1 cable assemblies

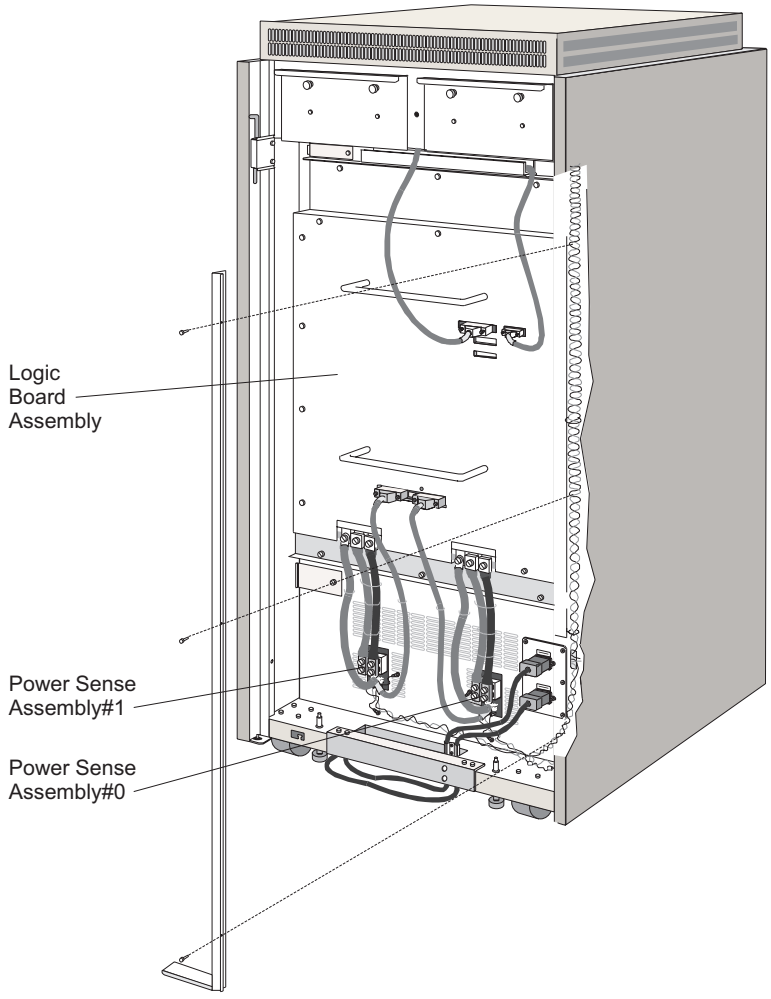


Figure 1-13. Cabling and Components on Rear of Director

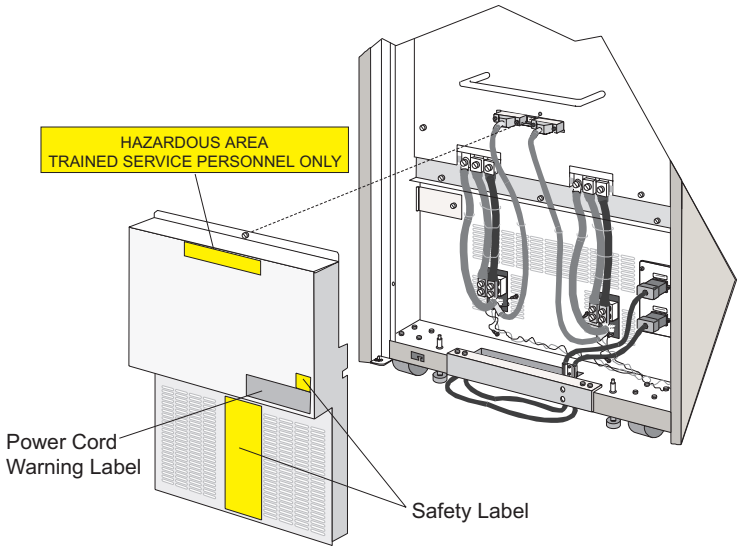


Figure 1-14. Labels on Rear of Director

Power Cables and Line Filters

Each power supply receives ac power through an ac power cord receptacle located inside the rear door (Figure 1-13). Ac power can be 50 or 60 Hz, and 180 to 264 volts. Separate power circuits with line filters provide ac power to the power switch and power supplies.

Logic Board Assembly

The logic board assembly, located on the rear of the unit (Figure 1-13 on page 1-31), provides the power and logic connections for the logic cards. If replacement is necessary, the logic board assembly can be removed from the rear of the unit by its handles after performing the removal procedures in Chapter 3, “Repair Information.”

Console Components

See the items provided with the Console under "Director Console Ship Group" on page 1-13.

Field Replaceable Units

Following is a list of concurrent and nonconcurrent FRUs. With appropriate enhanced availability features (EAFs) installed, you can replace concurrent FRUs without switching off power to the Director and customer operations can continue. Refer to Chapter 4 for FRU locations.

Concurrent FRUs (EAF Not Required)

Fan assembly

Device port (DVP) card

Fibre Channel converter (FCV) port card

Operator panel assembly

Token-Ring (TKRG) controller adapter card

Main power cable

Power supply.

Concurrent FRUs (with EAF)

The following are concurrent FRUs if EAF is installed for that FRU:

Control processor (CTP) card

Matrix controller (MXC) card

Matrix switch (MXS) card

Matrix controller 2 (MXC2) card

TKRG controller adapter card

Spare ports card.

Nonconcurrent FRUs

Main power switch

180 to 264 V ac receptacles and filter assemblies

Cable assembly for the 180 to 264 V ac receptacles

AC cable to main power switch

AC power cable assembly to power supplies

DC power and sense cable assembly from power supply

Operator panel cable

Logic board assembly

Fan cable assembly

Thermal shutdown cable assembly.

Effect of FRU Replacement on Port Operation

Table 1-3 summarizes the effects of FRU removal, replacement, or addition on ESCON and FICON port operation.

Table 1-3. Effects of FRU Replacement on Director Operation

FRU	Remove and Replace (One FRU Installed)	Remove and Replace (Redundant FRU Installed)	Add Redundant or Backup FRU
CTP card	Affects ESCON and FICON port operation	No effect	No effect
TKRG controller adapter Card	No effect	No effect	No effect
MXC/MXS or MXC2/ MXS card set	Affects port operation	No effect	No effect
DVP card	Affects port operation	No effect	No effect
FCV port card	Affects port operation	No effect	No effect
Logic board assem-bly	Affects ESCON and FICON port operation	Not applicable	Not applicable
Operator panel	No effect	Not applicable	Not applicable
Power supply	Not applicable	No effect	Not applicable
Fan assembly	Not applicable	No effect	Not applicable

Switches and Indicators

The Director operator panel has switches, buttons, indicators, and a status display. Some FRUs have LED indicators (visible only when the door is open) that denote failed and active conditions. For a description of LED indicator functions on the FRUs, refer to "Switches and Indicators" on page 1-34.

Operator Panel and Power Switch

Figure 1-15 illustrates the power on/off switch and operator panel.

The operator panel includes:

- **Power Indicator** - The Power indicator is an LED that illuminates when power is supplied to the Director.
- **Status Display** - The status display is a liquid-crystal display (LCD) that shows status and event messages on two 16-character lines.

- **IML Button** - Pressing the initial machine load (*IML*) button reloads licensed internal code (LIC) and resets all hardware, except the matrix controller/matrix switch (MXC/MXS) or matrix controller 2/matrix switch (MXC2/MXS), FCV port cards, and DVP cards. The *IML* button is hidden when the front door is closed.
- **Control Buttons** - Four control buttons (*Advance*, *Entry*, *Detail*, and *Clear*) control information shown on the status display.
- **System Error Indicator** - The System Error indicator is an LED that illuminates when a software or hardware error occurs.

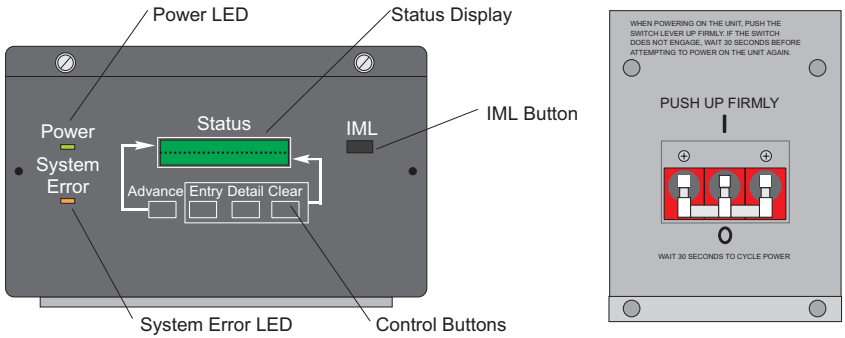


Figure 1-15. Director Operator Panel and Power Switch

Power Switch

Setting the power switch to the on position (**|**) supplies ac power to the dual power supplies and powers on the Director. Setting the power switch to the off position (**O**) powers off the Director. The power switch is a non-concurrent field-replaceable unit (FRU) that is removed and replaced only when the Director is powered off.

When switching power on, push up firmly to engage the switch. If the switch does not engage properly (because it was not pushed up firmly) wait 30 seconds before attempting to switch power on again.

Note: When powering the unit off to cycle power, wait 30 seconds before powering on again.

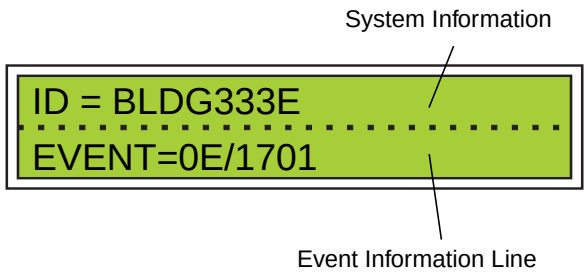
Operator Panel Status Display

This section briefly describes the status display functions. Refer to Appendix F, "Operator Panel Reference Summary" for more detailed information, The operator panel status display is a liquid crystal display containing two 16-character message lines:

- The System information line (top) displays the following:
  - — The Director identification (ID) name

- The Director internet protocol (IP) address
- The media access control (MAC) address
- LIC version
- Director CUP name
- Codes that indicate the power-on self-test (POST) that failed and caused the POSTs to terminate
- A power loss message appears in the event of a catastrophic power system failure.

- The event information line (bottom) displays, in a coded format, the faults, failures, sense data, or events that impact Director operational status. Codes may relate to:
  - FRUs
  - LIC events.



Refer to Appendixes A and C to interpret events.

Operator Panel Buttons

Note: All operator panel buttons must be pressed and held firmly until the display changes.

- **IML Button:** When you press the *IML* button and hold it for five seconds:
  - *Both* CTP cards (if two are installed) and the active TKRG controller adapter card reset. **Pressing the *IML* button does *not* reset the functional logic of the MXC, MXS, and DVP cards.**
  - The LIC loads from control processor FLASH memory to the CPU without powering the Director off and on.
  - The service-required status all logic cards resets.

Note: Only use the *IML* button if directed by your next level of support or by a MAP.

An IML forces those components that are not critical to current port operation to reset. An IML does not affect the connections between channels and control units through the Director. After an IML, the Director loads matrix information from the “current” location in nonvolatile memory to use as the active matrix for controlling port connections. This corresponds to the last active matrix downloaded from the Console. Refer to "Storing Active Configuration Matrixes" on page 1-19.

After an IPL or IML, the IP address may display as 0.0.0.0 on the operator panel for a while until the actual IP address is calculated.

Attention!

If an FCV port card is operating in degraded mode (one or more internal ESCON ports not operational), pressing the *IML* button sets the FICON port offline. Prior to pressing the *IML* button during degraded operation, ensure the system operator varies the attached FICON channel offline. It is recommended the *IML* button be used *only* by authorized service personnel.

- **Advance Button:** The *Advance* button is essentially a “scroll” button which controls the information displayed on the status display system information line.

  Pressing the advance button once causes the currently displayed line of system support information to advance to the next sequential line of system support information. By pressing the *Advance* button, you may “cycle through” the following system support information:

  — Director ID name

  — CUP name

  — Director IP address

  — MAC address

  — LIC version number.

- **Entry Button:** The *Entry* button displays and acknowledges events. When an event displays, press the *Entry* button to acknowledge that event, upgrade status to Active, and display the next event. Each time that you press the button, the next event displays. An asterisk (*) displays after the last event displays. Press the button again to display the first event.

- **Detail Button:** The *Detail* button displays the specific details associated with the event currently displayed on the status display event Information line. Continue pressing the *Detail* button to cycle through the following nine sequential information detail lines:

  — Date of event (line 1)

  — Time of event (line 2)

— Sense byte data 10 through 32 (lines 3 through 9).

- **Clear Button:** The *Clear* button performs two functions:
  - — Pressing the *Clear* button once updates the event information queue from event or active status to history status.
  - — Pressing the *Clear* button twice deletes the history status from the event information queue.

Operator Assist Mode

Pressing the *Advance* and *Entry* buttons simultaneously allows changes to the IP and MAC addresses. For details, see Appendix F, “Operator Panel Reference Summary.”

Console IP Address Function

To display the active Console IP address, press both the *Detail* and *Clear* buttons simultaneously while the Director IP is being displayed. Entering Console IP mode causes the front panel to display the IP address for an attached console. Releasing one or both of the buttons causes the front panel to return to displaying the Director IP.

If there is no active console attached, the active Console IP address displayed is 000.000.000.000. Due to Director timeout requirements, the active Console IP will not be immediately updated when communication with a Console is lost. For details, refer to Appendix F, "Operator Panel Reference Summary"

Operator Panel LED Indicators

- **System Error Indicator:** The System Error indicator lights when an event occurs at operational level 1 or higher. This notifies an operator of an event requiring immediate operator attention, such as a FRU failure or LIC error. The indicator circuitry deactivates after the level 1 condition is cleared, and the indicator LED goes out when the operator moves the incident from the Event or Active status to History status or clears the incident completely from the event information queue. When this indicator is on, the Director System Error indicator on the Console matrix window will also indicate an error.

  With a maintenance authorization password, the Console operator can turn off the indicator using the *Clear System Error* option from the *Utility* menu (all events in the event log are set to History status).

- **Power Indicator:** The Power indicator lights when power is applied to the Director. When the indicator is off, the following may be the cause:
  - — Power to the Director is not switched on.
  - — Both power cords are not plugged in.
  - — Both power supplies are faulty.
  - — The operator panel is faulty. The Director may actually be receiving power.
  - — The Power indicator is faulty. The Director may actually be receiving power.

Indicators on FRUs

LED indicators on FRUs indicate operational or failed status. Refer to Figure 1-10, Figure 1-11, and Figure 1-15 for locations of the following components:

- **Operator panel:** An amber System Error indicator lights when the Director detects an event requiring immediate operator attention, such as a FRU failure. The indicator remains active for as long as an operational level of 1 or higher exists. The indicator deactivates when you delete or designate as History all event and active statuses resident in the event information queue or when no events with operational level 1 or higher exist. Appendix A and Appendix C list the events.
- **Power supply:** A green LED indicator on the power supply lights when the power supply is working and goes out upon failure or loss of ac power.
- **Control processor (CTP) card:** A green LED indicator lights when the card is active and goes out when the card is not active. An amber LED indicator lights when the card fails.
- **Matrix controller (MXC) or matrix controller 2 (MXC2) card:** The matrix controller card contains a green and amber LED indicator. The green indicator lights if the MXC/MXS card set is online and active. The amber indicator lights if the MXC card fails.
- **Matrix switch (MXS) card:** The single amber indicator on the MXS card lights if the card fails.
- **Token-Ring (TKRG) controller adapter card:** A green LED indicator lights when the card is active and goes out when the card is not active. An amber LED lights when the card fails.
- **Device port (DVP) card:** Each card contains eight amber LED indicators, one for each port. The indicator lights to indicate port failure.
- **FCV port card:** Each card has a green and amber status LED.

  The FCV port card has a green status LED that indicates the following conditions:

  — When illuminated, the FICON port is operational.

  — When flashing, the FCV port card is loading code. Note that the amber LED may also be on when the card is loading code.

  — When extinguished, the FICON port or *all* internal ESCON ports failed. Note that card can operate when up to seven internal ESCON ports are disabled. However, performance of the remaining ports may be degraded. The card is not operational if the FICON port is disabled. For more information on degraded operation, see “FCV Port Card” under "Logic Cards" on page 1-25.

  The FCV port card has an amber status LED that indicates the following conditions:

— When illuminated, one or more internal ESCON ports are disabled and the card is operating in degraded mode or card logic has failed. If the green LED is also flashing, the card may be loading code.

— When extinguished, all internal ESCON ports are operational.

— When flashing, the port card may be offline because an MXC card is installed instead of an MXC2 card. An MXC2 card is required to support FICON operation. If this is the case, a “HW-Crosspoint Controller” event will post to the event log with detailed sense byte data.

The amber LED may also flash on the 17th FCV card installed in the Director since only a maximum of 16 FCV cards are allowed.

Refer to Map 9100 in Chapter 2 for detailed troubleshooting.

- **Spare ports card:** Each card contains four amber LED indicators, one for each port. The indicator lights to indicate port failure.
- **Fan assemblies:** Each fan assembly has two green LED indicators (one for each fan). The LED lights when the fan is working and goes out on fan failure.

Thermal Shutdown

The Director is equipped with a thermal shutdown function. This function sends an incident to the host and the Director Console. The Director operator panel senses when a specific number of fans have failed, and the thermal shutdown function starts a timer to allow time to replace a fan assembly or for a fan to restart itself. At the end of a specific time period, an offline sequence is sent to all ports and the switches ac power switch off.

The number of fans that can fail and the time allowed before thermal shutdown is different for Directors that support FCV port card operation and Directors that do not support this operation. A Director supports FCV port card operation if it contains a PWR2 power supply, MXC2 matrix controller card, and one or more FCV port cards.

- For a Director that does not support FCV port card operation, the Director can operate with any two of the four fans functioning. When three or more fans fail, an offline signal is sent through each port and a controlled shutdown of the Director occurs in 5 minutes.
- For a Director that does support FCV port card operation, the Director can operate with any three of the four fans functioning. When two or more fans fail, an offline signal is sent through each port and a controlled shutdown of the Director occurs in 10 minutes.

Note: If both fan assemblies need to be replaced, replace them one at a time. Remember that when you remove a fan assembly this takes two fans out of service. You should have a replacement fan assembly available and install it immediately.

Power Distribution

Both power supplies balance the power load during Director operation. If one power supply fails, the other automatically supplies all power to the Director. The PWR2 power supply, required to support FCV port cards, provides an additional 3.3 V dc to the FCV port cards.

Two ac power cables plug into receptacles on the bottom right of the unit to supply 180 to 264 V ac power. From the receptacles, two separate ac circuits carry power through separate filters to the power on/off switch. Separate ac power source cables provide power to each power supply. The power supplies provide dc power to the Logic Board through power sense cables. Each power supply (Figure 1-10 on page 1-24) slides into position from the front of the Director, plugging into a “hot plug” connector that services ac, dc, and status lines.

The power supply monitors power (+5 and +24 V dc). When power is out of a specified range, error messages display on the operator panel and write to the Director’s Event log.

If malfunctions are severe, the CTP and LIC perform a controlled shutdown of the Director. The Director operator panel displays a power loss message. Refer to Figure 8-1 on page 8-1 for a diagram of the power distribution in the rear of the Director chassis. Also refer to "Cabling and Labels - Rear Access" on page 1-30.

Tools and Test Equipment

Following is a list of tools and test equipment needed to service the Director and the fiber optic cables and connectors.

Director Tools

The following tools are provided to service the Director:

- A **service key** is provided to open the Director front and rear doors.
- A **torque tool** is stored in the storage compartment inside the front access door of the Director. Use the torque tool when removing or replacing the CTP, DVP, FCV port card, TKRG controller adapter, spare ports, MXC or MXC2, and MXS cards.

  Note: Because of unique torque specifications, this is the only tool that should be used for 9032-005 logic cards.

Fiber Optic Tools and Test Equipment

The following tools and test equipment are needed to service and maintain the fiber optic cables and connectors:

- **Two LED fiber optic wrap plugs**. Two plugs, with dust covers, are provided with the Director. Use these plugs to run the external wrap tests on a port. Figure 1-16 shows the LED fiber optic wrap plug.

Note: Do not confuse the LED fiber optic ***wrap*** plug with the LED fiber optic ***protective*** plug.

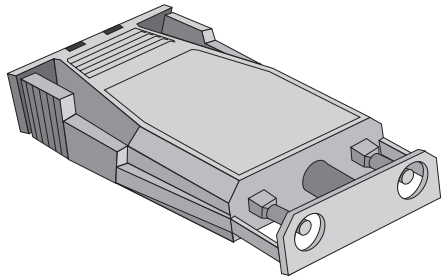


Figure 1-16. LED Fiber Optic Wrap Plug

- **LED fiber optic protective plug**. Use this plug to protect the port card connectors during shipping, when relocating a Director, when returning cards because of a repair action, or whenever a fiber optic cable is not occupying a port. Figure 1-17 shows the LED fiber optic protective plug.

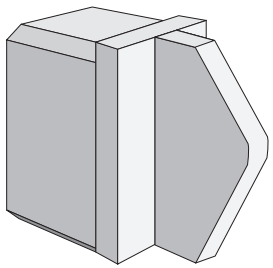


Figure 1-17. LED Fiber Optic Protective Plug

- **Two XDF/FCV laser fiber optic wrap plugs**. Two wrap plugs, with dust covers, are provided if XDF or FCV port cards are ordered. Use these wrap plugs to run the external wrap tests on a port.

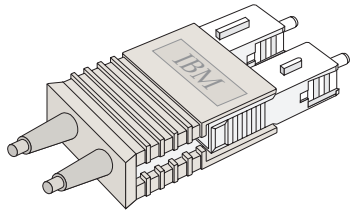


Figure 1-18. XDF/FCV Laser Fiber Optic Wrap Plug (FCS Connector)

- **XDF/FCV laser fiber optic protective plug**. This plug protects the port card connectors during shipping, when relocating a Director, when returning cards because of a repair action, or whenever a fiber optic cable is not occupying a port. The plug has an FCS connector (Figure 1-19) for XDF or FCV port cards.

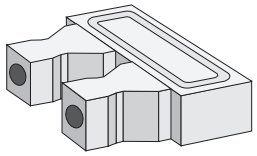


Figure 1-19. XDF/FCV Laser Fiber Optic Protective Plug (FCS Connector)

Note: The following items are not provided with the Director.

- **Fiber optic test support kits:**
  - — Single-mode
  - — Multimode
  - — Combined single-mode and multimode
  - — Upgrade kit multimode to combined.
- **Optical power meter**. Use this meter to measure the light output of the fiber optic cables and the fiber optic subassembly. (Available as part of the fiber optic test support kit.)
- **Laser adapter for the fiber optic power meter**. Use this adapter to measure the laser light output of the fiber optic cables and the fiber optic subassembly. (Available as part of the fiber optic test support kit.)
- **Fiber optic cleaning kit**. This kit contains items and instructions for cleaning the fiber optic connectors, wrap plugs, and protective plugs. (Available as part of the fiber optic test support kit.)

- **ESCON adapter cable**. These cables are required (eight per XDF port card or one per FCV port card) to connect ports with FCS connectors to ESCON fiber optic cable.

Additional tools, test equipment, and part lists are contained in *Maintenance Information for Fiber Optic Channel Links*, SY27-2597.

Fault Isolation Using Maintenance Analysis Procedures

Start all problem determination or fault isolation with "Start Initial Fault Isolation" on page 2-4.

Although offline and online diagnostics are available to help isolate a FRU, MAPs (Chapter 2) are the main strategy for Director FRU problem isolation.

Power-On Self-Tests (POSTs)

When Director power is switched on, a set of POSTs run to ensure correct operation of the Director logic. These tests are resident in FLASH memory on the CTP card. They verify correct operation of the following:

- CTP card
- TKRG controller adapter card
- LED and laser DVP cards, FCV port card
- MXC card
- MXS card
- CUP (a part of the CTP card)
- Spare ports card.

As the POSTs run during power-on, messages display rapidly on the top line of the operator panel status display. These messages indicate the test currently running. After the POSTs complete, the LIC loads to the CPU.

If an error associated with a redundant FRU is detected during POSTs, the Director will continue to power on and load the LIC. An event indicating the problem and the associated FRU will be displayed in the bottom line of the status display when power on is completed.

If a failure occurs in a nonredundant FRU, POSTs are terminated. A test identifier (such as SSP0 P400) appears on the top line, and an error message (such as IOC0 MEM Error) appears on the bottom line of the operator panel status display.

The Director has successfully initialized when the operator panel status display shows ID = XXXXXXXX, where XXXXXXXX is the Director identification, and any previous status messages (Figure 1-20).

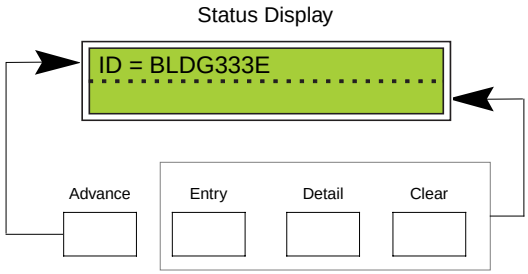


Figure 1-20. Location of Director Identification on the Operator Panel Status Display

Note: If the Director identification was not provided to the *Director Definition* dialog box during installation tasks, only “ID=” will display, with no identification.

If the following occurs after Director power-on, the POSTs may not have completed. Look for errors on the operator panel status display and status line on the matrix window.

- The link status indicator indicates that the link is not operational.
- An operational code does not display when you click on the link status indicator.
- The *Director Operational Status* option is not available from the *Utility* menu.

For more information on tests, operator panel status and error messages that occur during POSTs, refer to Task 2, "Verify Director Operation and Determine LAN Addressing" on page 6-23. For information on problem analysis for POST failures, Refer to Map 9300: “Power-On/IML Initialization Failure” in Chapter 2.

Console Status Line

A status line (Figure 1-21) appears at the bottom of each Console window. For *Matrix* and *Port Maintenance* windows, the status line provides:

- **Link Status Indicator** - Indicates the status of the Token-Ring link between the Director and Director Console.
- **Director Status Indicator** - Indicates the operational status of the Director.
- **System Error Indicator** - Illuminates when a system error occurs.
- **Operator ID Area** - Displays the operator ID for port authorizations.
- **Message Area** - Displays transient status, error, and other informational messages.

For *Terminal* and log windows, the status line provides only a link status indicator and message area. Other log windows provide only a message area.

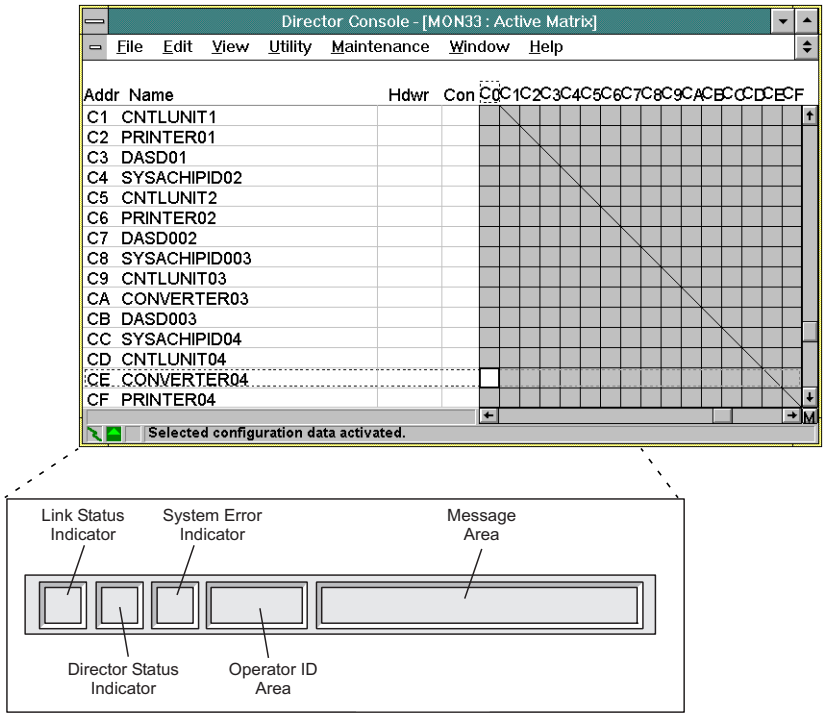


Figure 1-21. Status Line in Active Matrix Window

Link Status Indicator

Three Director-to-Console link operational states are indicated by the link status indicator (Figure 1-22):

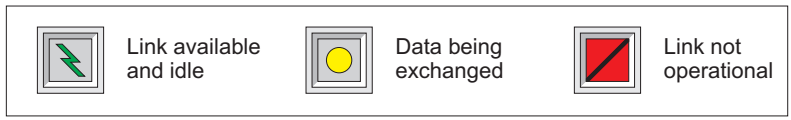


Figure 1-22. Link Status Indicator Operational States

- **Link available and idle** - Indicates the normal link condition (green lightning bolt on a gray background), where the link is up but no traffic is exchanged.
- **Data being exchanged** - Indicates a busy state (yellow circle on a gray background), where data is transmitted to or received from the Director. This is a transient state normally observed after completing a command.
- **Link not operational** - Indicates an unavailable state (black slash on a red background) where the connection cannot be made between the Director and Console.

Director Status Indicator

Four Director operational states are indicated by the Director status indicator (Figure 1-23):

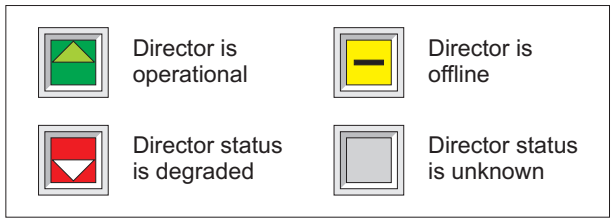


Figure 1-23. Director Status Indicator Operational States

- **Director is operational** - Indicates the Director is fully operational and operational status bytes are all zeros (0000).
- **Director is offline** - Indicates the Director received an offline command from the host system or the Director Console.
- **Director status is degraded** - Indicates the Director is operating, but the operational status bytes are other than all zeros. To display values of Director status bytes, double-click the Director status indicator or select the *Director Operational Status* option from the *Utility* menu.
- **Director status is unknown** - Indicates the Director-to-Console link status is unavailable and the Director operational status cannot be obtained.

System Error Indicator

Two states are indicated by the system error indicator (Figure 1-24):

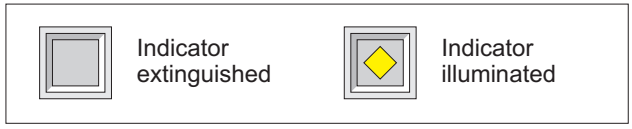


Figure 1-24. System Error Indicator States

- **Indicator extinguished** - No system errors have occurred and the indicator is off. This is the normal operating condition.
- **Indicator illuminated** - A system error occurred and the indicator is on (yellow diamond on a gray background).

Clear System Error Indicator

With a maintenance authorization password, the Console operator can turn off the indicator using the *Clear System Error* option from the *Utility* menu (all events in the operator panel event queue are set to history status).

Message Area

The message area displays transient operator messages such as error conditions or indications that operations are complete. For example, any change to the Director operational status displays a message indicating the change, and alters the contents of the status indicator. Changes that could go unnoticed (such as updates to the hardware status column from the host), are indicated in the status line message area. Certain user operational errors are also indicated in the message area. Colors indicate the priority of the message:

- **Black text** indicates normal status (information message only).
- **Yellow text** indicates transient status (such as a command transmit state) or notification messages (such as notification that the hardware status column was updated).
- **Red text** indicates an error condition (operator command error, Director error, or link error).

A status message is cleared by double-clicking the *Matrix* window (such as on the message area of the status line), or by a keystroke received by the window.

Operator Identification Area

The operator identification area of the status line is only displayed when the port authorization feature is enabled. This operator identification number (L301, L302) of the operator is displayed between the system error indicator and the message area.

Director Operational Levels

Repair procedures vary depending on the Director's level of operation. You can determine the Director's status after POSTs complete using the Console and the operator panel on the Director.

Determining Operational Level Using the Console

To determine status from the Console, select the *Director Operational Status* option from the *Utility* menu of the Director's active matrix window or double-click on the Director status indicator on the bottom left of the active matrix window (Figure 1-21).

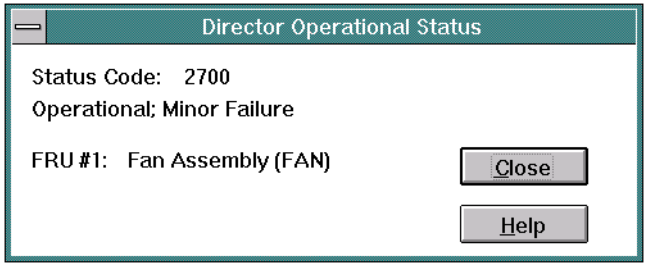


Figure 1-25. Director Operational Status

A four-digit hexadecimal code appears in the *Director Operational Status* dialog box. As shown in Figure 1-25, the code is 0000. This indicates the Director is fully operational. If the Director is less than fully operational, another code may display. For example, a code of 2770 means that two fan assemblies have failed, and the Director is operational.

Reading the code from left to right, the first digit indicates the operational level. Table 1-4 describes operational levels (first digits).

Table 1-4. Operational Status of the Director

Code	Status
0	Fully operational
1	Fully operational; redundant component failure
2	Operational; minor failure
3	Operational; major failure
4	Not operational
5	Cannot determine operational level

The second digit is the FRU code that indicates the FRU type where the problem exists. The third and fourth hexadecimal digits indicate other failed FRUs. The following table defines the FRU codes (0-H).

Table 1-5. FRU Codes in Error Code and Operational Status

Code	FRU Type
0	No additional FRUs
1	MXC card
2	CTP card
3	MXS Card
4	LED port card
5	Laser port card
6	Reserved
7	Fan assembly
8	Power supply

Table 1-5. FRU Codes in Error Code and Operational Status (Continued)

9	Console
A	TKRG controller adapter card
B	Front (operator) panel
C	LED 4-port spare card
D	LED 2-port/laser 2-port spare card
E	Logic board assembly (backplane)
F	FCV port card
G	Power supply (PWR2). supports FICON operation
H	MXC card (MXC2). supports FICON operation

The third and fourth digits indicate FRU types with outstanding events that are not cleared. For example, the code 4770 indicates that both fan assemblies have failed.

Determining Operational Level Using the Operator Panel

The operator panel status display contains two 16-character message lines. If, after power-on, the bottom line of the status display is blank and the top line contains the Director's ID (ID=xxxxxxxx), the POSTs completed and the unit is operating normally.

If the bottom line of the status display shows "Event=ic/xynn," an event has occurred that may indicate a decrease in the operational level and possibly a component failure. Reading from left to right:

- The first two digits, "ic," are the incident code.
- The "x" digit indicates an operational level (0 through 5) as described under "Director Operational Levels."
- The "y" hexadecimal digit (0-F) indicates the FRU type where the event was detected; an amber LED illuminates on the FRU to visually direct you to the failed FRU. Refer to the following table for meanings of the codes 0 through H.
- The "nn" digits indicate the FRU's position, slot number, or port number in the Director's Logic Board Assembly. The following table defines the possible position numbers for the FRUs.

Refer to "Director Operational Status Codes" in Appendix C for more information on reading status codes.

Table 1-6. FRU Position Number in Error Code

(Code) FRU Name	Possible Position Numbers
(1) Matrix controller	00 or 01
(2) Control processor	00 or 01
(3) Matrix switch	00, 01, 02, 03
(4) LED port card	port number
(5) Laser port card	port number
(7) Fan assembly	00 or 01
(8) Power supply	00 or 01
(A) TKRG adapter card	00 or 01
(C) LED spare ports card	port number
(D) LED/laser spare ports card	port number
(F) FCV port card	port number
(G) Power supply (PWR2)	00 or 01
(H) Matrix controller (MXC2)	00 or 01

Refer to Chapter 4, “Locations,” for illustrations of FRU locations inside the Director.

Startup Window Menu Options

Start online information from the Console’s *Startup* window (Figure 1-26).

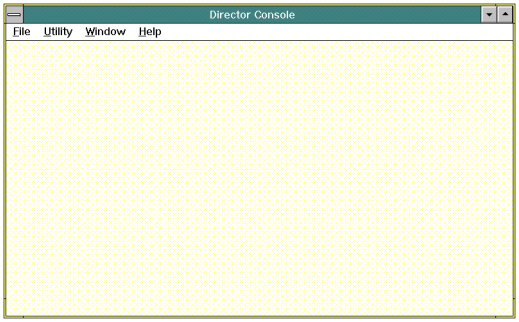


Figure 1-26. Startup Window

The *Startup* window menus include command options that are used for Console-related functions. Menus and their command options include:

- **File:** The four options under the *Startup* window *File* menu are identical in function to the *File* menu options with same names in the matrix window.

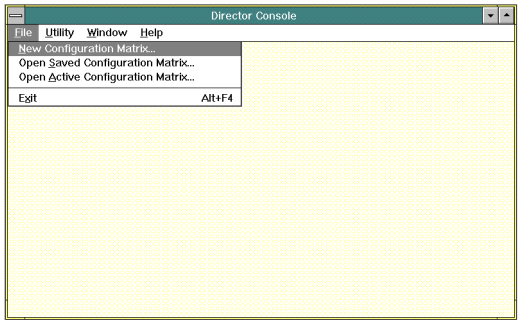


Figure 1-27. File Menu (Startup Window)

  - — **New Configuration Matrix:** Selecting this option displays a dialog box where a new Director may be defined, an existing definition modified or deleted, or a new matrix created for an existing Director. Matrixes can also be opened from this dialog box.
  - — **Open Saved Configuration Matrix:** Selecting this option displays a list of active Directors. Selecting a Director displays a list of saved matrixes for that Director. The saved matrix displays when selected from the list. Display information about both the Director and the saved configuration by selecting buttons.
  - — **Open Active Configuration Matrix:** Selecting this option displays a dialog box similar to the dialog box displayed when you select the *New Configuration Matrix* option. However, this dialog box only displays a list of active Directors. Selecting the Director displays its active matrix.

  For details on using these options to configure port connections in a Director matrix refer to *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296-00).

- **Utility:** This menu provides four options:

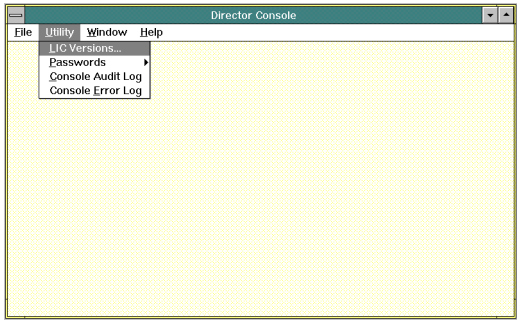


Figure 1-28. Utility Menu (Startup Window)

— **LIC Versions:** This displays a list of all Director LIC versions (three versions maximum) currently stored on the Console's fixed disk. From this window, you can install new versions in the library, edit existing version descriptions, and delete unused versions. The *Install* option transmits the selected LIC to a selected Director for the next Director IML, IPL, or power-on reset (POR).

— **Passwords:** This displays all of the users who have been assigned a password for a selected password level. The password administrator uses this option to assign a new password or change an existing password. Three levels of passwords protect the system from unauthorized or inadvertent changes at the Console and to Director port configurations (if port authorization is enabled). The service representative uses a maintenance authorization password to access maintenance procedures and diagnostic functions. The default password for maintenance is LEVEL002.

Refer to Chapter 10 for more information on passwords.

— **Console Audit Log:** This automatically tracks and records Console operator activities that are not specific to a Director, including changing passwords, installing or deleting LIC versions from the database, adding or deleting a Director definition, or entering or exiting the Console application. The log contains the ID of the Console operator who performed the action, a brief description of the action, a password ID for actions requiring passwords, a Director ID for Director definition actions, a LIC version for LIC release actions, and the time and date the action was performed.

— **Console Error Log:** Records error conditions that are not severe enough to bring down the Console, such as insufficient memory, subsystem internal errors, and printing errors. The time, date, and code identifying the problem subsystem are recorded in the log.

- **Window:** This menu contains options that allow you to perform window manipulation tasks such as tiling and cascading windows, or arranging icons (minimized windows).

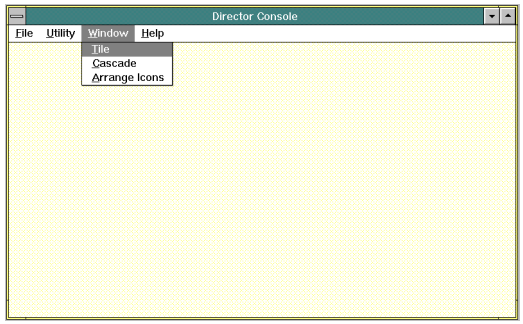


Figure 1-29. Window Menu (Startup Window)

- **Help**: This menu provides help for Console topics and features and for navigating through the Console with the keyboard and mouse.

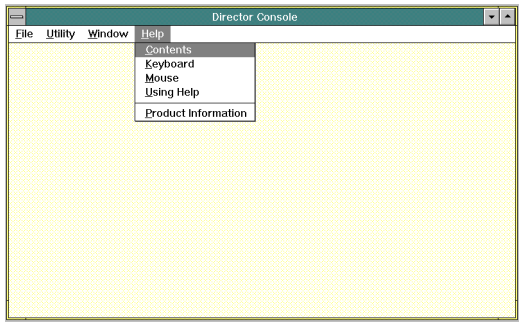


Figure 1-30. Help Menu (Startup Window)

Active Matrix Window Menu Options

To view and work in an active matrix window for a Director, select the *Open Active Configuration Matrix* option from the *File* menu on the *Startup* window.

The active matrix window contains menus and options for the active matrix. The active matrix is the matrix currently operating on an attached Director to control port connections. Information in this matrix is obtained from the selected Director (Figure 1-31).

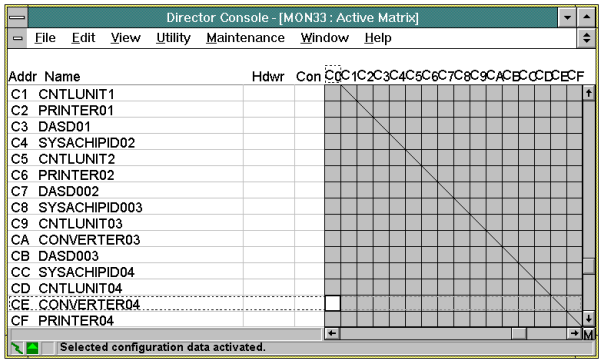


Figure 1-31. Active Matrix Window Menu Options

Active matrix window menus and their command options include:

- **File:** This menu (Figure 1-32) provides options to create a new matrix, open a saved matrix, open the active matrix, merge a saved matrix onto the active matrix, activate a matrix, save a matrix, save a matrix under a new name, and print a matrix to a text file. This menu also provides an option to copy a matrix to a diskette, the Console's fixed disk, or another Director's library.

  For details on using these options to configure port connections in a Director matrix, refer to *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296-00).

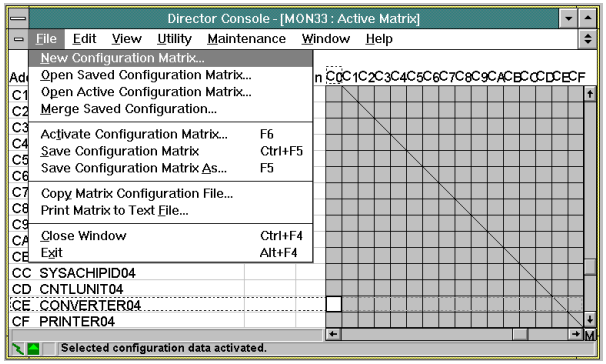


Figure 1-32. File Menu (Active Matrix Window)

- **Edit:** This menu provides options for modifying the port connections and other items on the matrix. For details on using these options, refer to *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296-00).

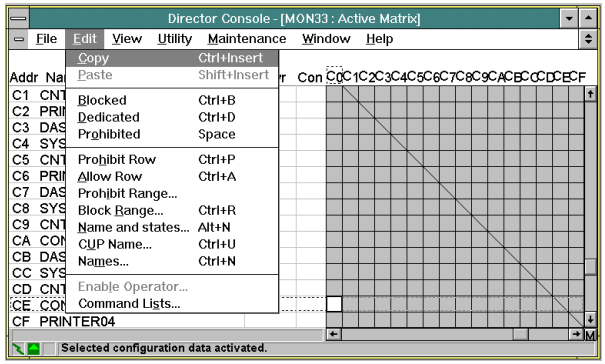


Figure 1-33. Edit Menu (Active Matrix Window)

Edit menu options allow you to:

- Duplicate all the allow and prohibit attributes from a selected address line to another address line in the matrix using the *Copy* and *Paste* options
- Set blocked, dedicated, and prohibited attributes for ports in the matrix
- Prohibit and allow connections for rows of ports
- Prohibit or allow a range of port addresses
- Block a range of ports from connections
- Set multiple connection attributes for a selected address and intersection address cell
- Modify the CUP name for the Director
- Name a port on the matrix
- Enable a operator to configure a port
- Define a list of connection attributes to apply to an active matrix through a command list.

- **View:** This menu provides options for displaying the active and saved matrix windows, including viewing the matrix in graphic or nongraphic display mode, displaying a matrix map, and entering a port address to define the display of address columns/rows. For details on using these options, refer to *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296-00).

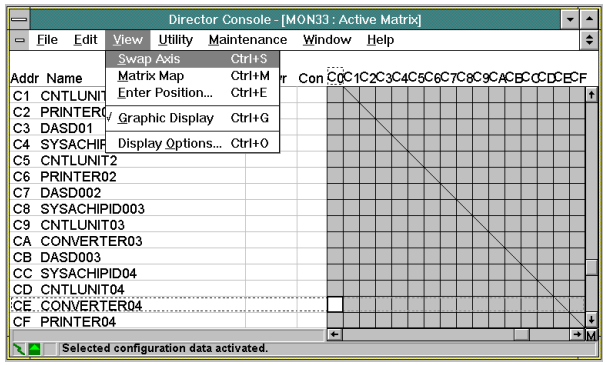


Figure 1-34. View Menu (Active Matrix Window)

- **Utility:** This menu provides diagnostic and maintenance options for the attached Director. Many of the items in this menu require a maintenance authorization password.

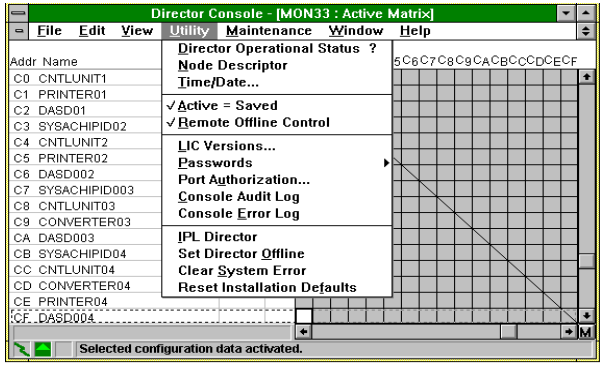


Figure 1-35. Utility Menu (Active Matrix Window)

The following provides an overview of these options. For more detail on their use, refer to “Utility Menu Options” in Chapter 2.

— **Director Operational Status:** Displays current operational status code and status messages for the Director.

— **Node Descriptor:** Provides information about the hosts and control units currently connected to a selected port in the matrix.

— **Time / Date:** Allows you to display and set the current time and date for the Director and synchronize the time and date with the Console.

— **Active=Saved:** When *Active=Saved* is set and the *Activate Configuration* option is selected, the configuration that is active on the Director is saved to the Director's nonvolatile memory as the IPL matrix.

— **Remote Offline Control:** When set, System Automation for OS/390 (SA OS/390) can set the Director offline. If not set, the SA OS/390 cannot set the Director offline.

— **LIC Versions:** Same as in the *Utility* menu of the *Startup* window.

— **Passwords:** Same as in the *Utility* menu of the *Startup* window (Figure 1-28 on page 1-53); refer to "Startup Window Menu Options" on page 1-51 for description).

— **Port Authorization:** Provides a means for authorizing or prohibiting specific operators from configuring specific ports.

— **Console Audit Log:** Same as in the *Utility* menu of the *Startup* window (Figure 1-28 on page 1-53); refer to "Startup Window Menu Options" on page 1-51 for description).

— **Console Error Log:** Same as in the *Utility* menu of the *Startup* window (Figure 1-28 on page 1-53); refer to "Startup Window Menu Options" on page 1-51 for description).

— **IPL Director:** Causes the current active CTP card to initiate an IPL. During the IPL, the current LIC reloads from memory. The active CTP card (including the CUP) and TKRG Controller Adapter card reset. The MXC, MXS, FCV port cards, and DVP cards do not reset. After an IPL, the Director uses the current active matrix to control port connections

Attention!

If an FCV port card is operating in degraded mode (one or more internal ESCON ports not operational), selecting *IPL Director* from the *Utility* menu sets the FICON port offline. Prior to selecting this option during degraded operation, ensure the system operator varies the attached FICON channel offline.

— **Set Director Offline**: Sets all ports offline, placing the Director in an offline state. To restore normal operation, select the *IPL Director* option, push the *IML* button on the Director's operator panel, or switch the Director power off and on. The Director should be set offline before switching power off to perform maintenance.

Note: If switching Director power off, refer to "Power Off" in Chapter 3. After powering off, make sure that you wait at least 30 seconds before switching on the power again.

— **Clear System Error:** Turns off the System Error indicator on the Director's operator panel. All events in the operator panel event queue are set to history status.

— **Reset Installation Defaults:** Resets non-volatile information maintained in the Director to the default values that were valid at installation. Upon receiving the reset installation defaults command, the Director clears host data, resets the key counter to zero, and resets the IPL file to the default state. These values remain reset until an IPL or IML occurs or until the Director cycles power.

The Director must be offline before you can reset the defaults.

For details on these options, refer to "Utility Menu Options" in Chapter 2.

- **Maintenance:** This menu provides diagnostic and maintenance options for the attached Director. Many of the items in this menu require a maintenance authorization password.

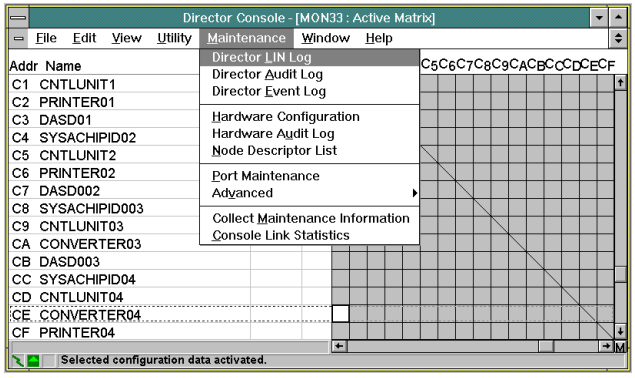


Figure 1-36. Maintenance Menu (Active Matrix Window)

The following provides an overview of these options; for more detail on their use, refer to "Maintenance Menu Options" in Chapter 2.

— **Director LIN Log:** Contains LIN (link incident) records for specific ports as reported to the Console by the Director. Information in the Director LIN log is typically useful only to those qualified to troubleshoot a fiber optic link problem.

— **Director Audit Log:** Contains a record of all changes to the Director that have occurred through SA OS/390, through the maintenance port, and through Console operator activities that relate to a Director, including changing the Director's active matrix or the active=saved state, changing the remote offline control state, changing Director time or date, performing a remote IML or power off, and transmitting new LIC to the Director.

— **Director Event Log:** Contains Director hardware and software event entries reported to the Console by the Director. This log also records

changes to the state of the Token-Ring link between the Director and the Console.

— **Hardware Configuration:** Displays information on the hardware installed on the Director, including logic card serial numbers and revisions, and the current operational status of the hardware (including failed components).

— **Hardware Audit Log:** Contains a record of all Director hardware removal and replacements.

— **Node Descriptor List:** Provides information about the hosts and control units currently connected to ports in the matrix.

— **Port Maintenance:** Displays a physical layout of the current hardware configuration for the selected Director. This includes the relative location and presence of logic cards, fans, Power Supply, and operator panel.

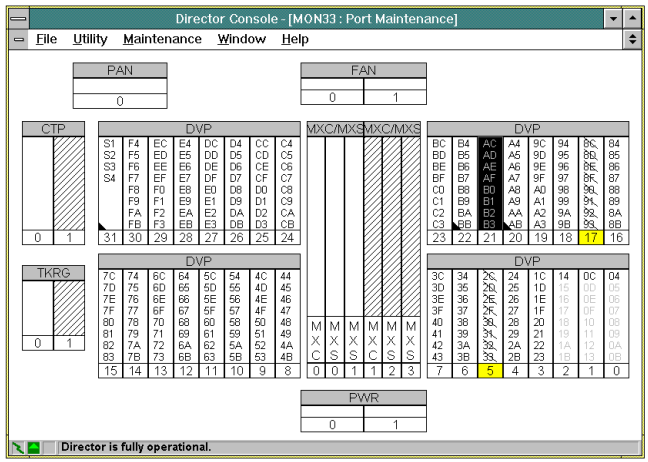


Figure 1-37. Port Maintenance Window

The *Port Maintenance* window includes *File*, *Utility*, *Maintenance*, *Window*, and *Help* menus. You can access most of the options from these menus that you can from the active matrix window for the selected Director.

The *Maintenance* menu of the *Port Maintenance* window contains these additional menu options (refer to Figure 1-38 on page 1-61).

Swap Ports: This option allows the user to modify the mapping of physical ports on the Director to logical addresses used on the host and on the matrix windows.

Note: The FICON port on an FCV port card can only be swapped with a FICON port on another FCV port card. The unaddressable internal ESCON ports on the FCV port card cannot be swapped

with any port. ESCON ports on any card cannot be swapped for the FICON port on an FCV port card.

Collect Maintenance Information: This option transfers information to the Console's fixed disk, such as the current Director time and date, log information, Director definitions, dump files, ESCD and hardware configuration data, LIC level, and port address/number mapping. This option is used to help diagnose system operation when a FRU is replaced.

Port Diagnostics: This option allows you to initiate, monitor, and stop internal loopback, external loopback, and matrix tests for one or all ports on a port card. You can also initiate, monitor, and stop tests for an FCV port card.

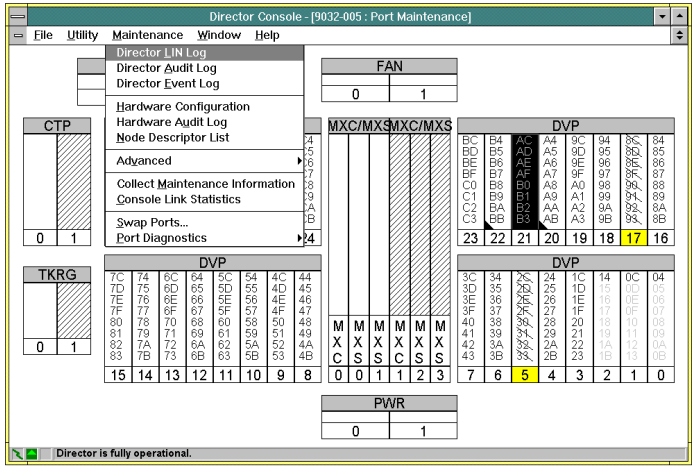


Figure 1-38. Port Maintenance Window Maintenance Menu

For more information on port maintenance functions, refer to "Port Maintenance" in Chapter 2.

— Advanced Options

Terminal: This *Advanced* option opens a special window for performing maintenance and service functions. This window lets you enter commands along the *Edit* field at the bottom of the screen and displays results in a main scrolling window (Figure 1-39 on page 1-62).

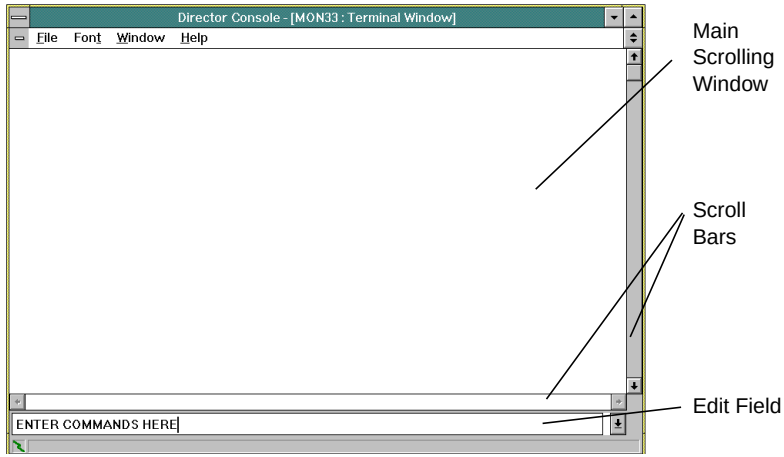


Figure 1-39. Terminal Window

Terminal commands transmit directly to the Director without being interpreted by the Console. Results display directly from the Director. Previously entered commands can be recalled to the *Edit* field. You can also enter terminal commands through a maintenance terminal attached to the RS-232 maintenance port on the Director's TKRG controller adapter card. For a list and explanation of terminal commands, refer to "Maintenance Terminal and Maintenance Terminal Window" on page 1-64.

The *File* menu in the *Terminal* and matrix windows contains the same options to establish a new matrix or open a saved or active matrix. The menu provides other options to return to the Director matrix, clear data, capture window commands and responses to a file, or print window contents. Through the *Font* menu, you can display text in various fonts or character sizes.

LMA Versions: Displays a dialog box similar in form and function to the *LIC Versions* dialog box. The dialog box displays a list of loader/monitor area (LMA) code versions stored on the Console's fixed disk. Among other functions, LMA code provides the input/output functions available through the maintenance port, operator panel, and Console interface, *Terminal* window, power on diagnostics, FRU power-on hours update, and data read/write control, and LMA code/LIC download functions.

Use the *LMA Versions* option to add a new LMA version to the fixed disk, edit existing LMA version descriptions, and delete unused LMA versions from the disk. An *Install* option transmits the selected LMA code on the fixed disk to the currently selected Director. This option is for use by trained service personnel only. A *Set Offline* option on the *LMA Versions* dialog box allows you to set the Director offline without returning to the *Utility* menu on the matrix window. You must set a nonre-

dundant Director (one CTP card installed) offline before installing an LMA or LIC version to the Director.

— **Collect Maintenance Information:** Transfers information to the Console's fixed disk, such as the current Director time and date, log information, Director definitions, dump files, ESCD and hardware configuration data, LIC level, and port address/number mapping. This option is used to help diagnose system problems or whenever a FRU is replaced.

— **Console Link Statistics:** Displays the *Console Link Statistics* dialog box to show current status and statistics for the Token-Ring link between the Director and the Console. This is the same information provided when you double-click the link status indicator in the bottom left corner of the matrix window (Figure 1-21 on page 1-46).

- **Window:** Options in this menu let you tile, cascade, or arrange items.

Saved Matrix Window Menu Options

This window contains the same menus and options as the active matrix window (refer to "Active Matrix Window Menu Options" on page 1-55). However, certain options under the *File*, *Edit*, *Utility*, and *Maintenance* menus require a link to an active Director. Therefore, on the saved matrix window menus, these options are not active.

Help Menu

The *Help* menu options are the same in the active and saved matrix windows, the *Startup* window, and the *Terminal* window. Options provide help for the Console, matrix window topics and features as well as for navigating through the Console with the keyboard and mouse. This menu also includes Console software product information. Help is available from all windows and many dialog boxes. The same general help topics are available under the *Help* menu of the *Startup* window and all matrix windows.

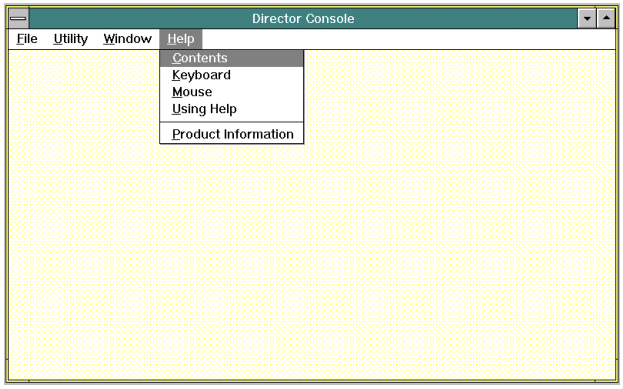


Figure 1-40. Help Menu (Startup Window)

- **Contents.** Organized by topic to provide help on the Console application.

- **Keyboard.** Describes navigating through the Console using the keyboard.
- **Mouse.** General help for using the mouse in the Console application.
- **Using Help.** Standard information for using the help system.
- **Product Information.** Dialog box that displays information about the Console, including version number and copyright notice.

Maintenance Terminal and Maintenance Terminal Window

The maintenance terminal and maintenance *Terminal* window are for use by experienced maintenance personnel. Most of the functions available through the maintenance terminal and *Terminal* window are also available through menu options of the active matrix window.

Through the maintenance terminal, you can input commands to perform port connection and other functions. An ASCII terminal or PC with appropriate emulation software can be directly attached to the Director's maintenance port on the TKRG controller adapter card. The maintenance terminal commands are also available through the maintenance *Terminal* window on the Console by selecting the *Advanced* option from the *Maintenance* menu and then selecting *Terminal*. Terminal commands transmit directly to the Director without being interpreted by the Console.

Refer to "Maintenance Utilities and Procedures" in Chapter 2 for more information on commands and utilities. Obtain an ANSI terminal that uses the ASCII character set or a PC with communications software that can emulate such a terminal. You can connect a remote terminal through a modem to the maintenance port.

Use a null modem cable with a 25-pin DSUB female connector for the maintenance port. For a modem, use a RS-232 adapter cable. The maintenance port is a male RS-232 connector (labeled MAINTENANCE) located on the TKRG controller adapter card. Configure the terminal or PC communications program for no parity, eight data bits, one stop bit, and a baud rate of 2400 bps, 9600 bps, or 19200 bps.

Note: The maintenance port operates at a default speed of 19.2 Kbps. You can change the baud rate to match your terminal baud rate by pressing **Break** when you access the Director, Refer to "Connecting a Maintenance Terminal" in Appendix E, for instructions.

Commands available through the maintenance terminal include the following. For details on these commands, refer to Appendix E under "Terminal Commands."

- **AIC:** Displays the current asynchronous inter-SSP communications environment.
- **Allow:** Allows dynamic connection between specified ports.
- **Baud:** Changes the default baud rate available through the maintenance port when the Director powers on.
- **Block:** Blocks a specified port from connection to any other port.

- **CPS:** Displays the control block for the SSP common protocol services subsystem that is resident on the SSP processor.
- **Dedicate:** Establishes a dedicated connection between specified ports.
- **Dir:** Displays an alphabetical list of files in FLASH memory including filename, size, and creation date.
- **Dmps:** Displays current status of the dump file.
- **Frux:** Allows display and editing of product data in operator panel memory when replacing an operator panel.
- **Help:** Displays a list of commands. Entering **Help** followed by a specific command provides a description and command syntax.
- **Hw_cnfg:** Displays a table of information on all logic cards, power supplies, and fans installed in the Director. Information includes active/backup status, serial number, power on hours, and fail code/date.
- **ID:** Displays a specific port's node identifier. This identifies the channel or device attached to the port.
- **LAN:** Used with a series of parameters to debug the LAN interface.

  Note: This command is password protected and intended for engineering use only.
- **Lanip:** Displays or changes the IP address on the Director's TKRG Controller Adapter card.
- **Lanmac:** Displays or changes the MAC address on the Director's TKRG Controller Adapter card.
- **Lan_stat:** Displays statistics about the Token-Ring LAN's physical, IP, and actual block processor (ABP) layers.
- **LC:** Controls how entries are recorded to the Director's log file.
- **LD:** Controls how entries are displayed from the Director's log file.
- **Matrix:** Displays the active port connection matrix for the Director.
- **More:** Sets the scroll state of the display screen. The screen will either stop when a full screen of data displays or display all screens of data.
- **Name:** Displays or changes a port's name.
- **Offline:** Takes all ports offline except the CUP. Offline sequences (OLSs) through each port notify attached channels that ports are going offline.
- **Onldiag:** Initiates and controls online diagnostics. Available diagnostics include:

  Internal loopback of a port (no wrap plug required). This function is not available on specific LED DVP cards. Refer to Appendix E under "Terminal Commands" for more information.

- External loopback of a port (wrap plug required).
- Matrix wrap test. This tests transmission between a port card and the MXC/MXS card set.
- Channel-to-port wrap mode. This test allows the channel to test transmission to the Director in conjunction with host diagnostics.

- **Pib:** Displays the port's port information block (PIB). The PIB includes the following:
  - Port number and address
  - Blocked, prohibited, and dedicated connection status
  - Port type (LED or laser)
  - Installed status
  - Link failure status
  - Spare port status
  - Offline status
  - Control unit port status
  - Maintenance mode
  - Service required status.
- **Plog:** Displays the contents of the power-on status log.
- **PM:** Establishes or removes privileged mode for maintenance terminal commands.

  Note: This command is password protected and intended for engineering use only.

- **Portmap:** Displays a table showing the logical addresses currently assigned to physical ports in the Director.
- **Portswap:** Swaps port addresses between pairs of ports or ranges of ports. Not available through the *Terminal* window on the Console.
- **Prohibit:** Prohibits dynamic connection between two specified ports.
- **Pswd:** Changes the password for the current command access mode (nonprivileged or privileged). A password can be any character string up to eight characters.
- **Ps:** Provides a set of options for gathering information about Director software and hardware failures.
- **S:** Selects a processor (SSP1 or FCC) where terminal window commands will apply.

- **Sz:** Invokes the ZMODEM send handler for the current I/O devices. This command is primarily used to upload the system dump file (system.dmp) from memory.

  Note: You cannot enter this command from the *Terminal* window on the Console. Enter it from a separate maintenance terminal only.

- **Unblock:** Unblocks a port. After issuing this command, you can configure the port to connect with any other port.
- **Undedicate:** Allows connections for specified ports that are dedicated.
- **Ver:** Displays the current LIC version on the Director as well as the date and time of the LIC build.
- **Xpmdbg:** Controls the operation of the XPMLOG.

Director Logs

There are four logs for the Director: the Director link incident (LIN) log, the Director Audit log, the Director Event log, and the Hardware Audit log. Select these logs from the *Maintenance* menu of the Console's active matrix window or *Port Maintenance* window.

- **Director LIN Log:** Contains LIN records for specific ports as reported to the Console by the Director. Information in the Director LIN log is typically useful to engineering personnel or qualified service technicians troubleshooting a fiber link problem. The LIN log also includes results of online diagnostic tests. Access these diagnostics through the *Maintenance* menu of the *Port Maintenance* window. Refer to "Port Diagnostics" on page 2-103.
- **Director Audit Log:** Contains a record of all Console operator activities that concern a Director. This includes changes to the Director's active matrix or its Active=Saved state, changes to remote offline control status, changes to the Director's time and date, remote IML or power-off events, and LIC updates. Refer to "Director Audit Log" on page 2-92 for additional information.
- **Director Event Log:** Contains Director hardware incident (HIN) and software incident (SIN) information reported to the Console by the Director. This log also records changes to the state of the Token-Ring link between the Director and the Console. Refer to "Director Event Log" on page 2-93 for additional information. Refer to Appendix A for details on sense data bytes.
- **Hardware Audit Log:** The hardware audit log contains hardware configuration change history. The Console reevaluates hardware configuration information when a FRU is added or removed. Changes that occur while the link between the Director and the Console is unavailable will be detected only when the link is reestablished. The Director cannot determine the removal or installation of a fan or the removal of the operator panel. Consequently, any changes made to the fan assembly or the operator panel will not appear in the hardware audit log. Refer to "Hardware Audit Log" on page 2-95 for more information.

Refer to Appendix A, "Incident Codes and Sense Data Summary" and Appendix C, "Director Status Codes" for more information on incidents detected by the Director.

Chapter 2. Diagnostic Information

Start Initial Fault Isolation

Begin troubleshooting the cause of error conditions or faulty system operation at this point. The large bold numbers in the maintenance analysis procedures (MAPs) indicate the steps you should follow to identify the source of the problem and direct you to the appropriate section of the manual for instructions on further tests or repairs.

These MAPs direct you to "Maintenance Information and Utilities" and to Chapter 3, "Repair Information" for further procedures to help isolate problems or make repairs.

The following procedures reference errors that display on the Director's operator panel status display. Refer to Appendix F, "Operator Panel Reference Summary," for instructions on using the operator panel.

Note: Follow correct electrostatic discharge (ESD) procedures when performing all procedures in this chapter.

MAP 9000: Director Initial Fault Isolation

1

Do you suspect a power problem in the Director or in the customer's power distribution to the Director?

NO	YES
↓	Go to MAP 9400

2

Has the Director posted a failure indication on the operator panel at power on/IML (including an Event=20/xynn)?

YES	NO
↓	Go to step 6.

3

Did the Director finish power-on/IML (is "ID=" displayed)?

YES	NO
↓	Go to MAP 9300.

4

Is there an Event=20/xynn on the front panel or a 20/xynn entry in the event log?

NO	YES
↓	Go to MAP 9800.

5

Is there an Event=1E/20nn displayed on the operator panel or a 1E/20nn entry in the event log?

NO	YES
Go to step 6.	Go to MAP 9900.

6

Is there an event, error, or fault displayed, with the date and time of the customer's complaint, on the Director's operator panel or in the event log of the active matrix?

NO **YES**

↓ Go to MAP 9100.

7

Is there a reported or detected loss of Console communication with the active Director?

NO **YES**

↓ Go to MAP 9200.

8

Do link incidents, with the date and time of the customer's complaint, appear in the Director LIN log on the Console?

NO **YES**

↓ Go to MAP 9600.

9

Do you suspect an individual port fault or failure?

NO **YES**

↓ Go to MAP 9500.

10

Do you suspect fiber optic link or external device problems?

NO **YES**

↓ Go to MAP 9600.

11

Do you suspect a problem with Console hardware or Console applications?

NO	YES
↓	Go to MAP 9700

12

No known condition has been determined as a result of performing this MAP, or a pre-existing condition has been repaired. Call your next level of support if the customer has reported problems other than those listed above. Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through events in the event log.

Exit MAP.

MAP 9100: Event, Error or Fault Displayed on Operator Panel or in the Event Log of the Active Matrix

Optional Enhanced Availability feature

The optional enhanced availability feature reduces operational disruptions if specific hardware FRUs should fail. Enhanced availability provides:

- Additional Token-Ring (TKRG) controller adapter card.
- Additional control processor (CTP) card.
- Additional matrix controller/matrix switch (MXC/MXS) three-card set.
- Spare device port (DVP) ports card.

The system automatically switches over to these redundant FRUs in the event of a failure, although the ports on the spare port card require cabling to be switched to the spare port and the spare port configured to the correct address. Any redundant FRU can be added, and most failed FRUs can be replaced without disrupting Director operation. In addition, I/O controller devices and channels can be connected to ports without disrupting operation of the Director.

Also inherent in the Director is the ability to “hot plug” many of the FRUs without powering off the unit. This enables the FRUs to be exchanged without disruption to users.

Note: The Director allows operational ports to function normally, even though individual ports may have failed. This gives the user an option to logically swap the failing ports with spare ports on the optional spare port card or with unused ports on installed port cards, thus enabling the user to actually swap out the failing device port (DVP) card at a more convenient time.

Error Recognition and Recording

Note: The type of information available in an incident record and the various event-recording formats are summarized in the following section. Continue reading for a format refresher, or go to step 1 if already thoroughly familiar with event-recording formats.

When an event occurs within the Director, an incident record is created. Depending on several factors and who needs to see them, the Director will send them to these possible locations: the host, the operator panel, and the Console. In some cases, the Console logs are the only location that the event is reported. For example, link events are not sent to the operator panel. Be sure to check all Console logs for the suspected failing Director when beginning any event analysis.

Note: The Director’s operator panel status display is divided into two information fields: top and bottom. The top is used for display of information used in the installation, initialization, operation, and service of the unit. The bottom is used to display events, which include error conditions, software events, power-on initialization errors, and fault condition data. The four buttons located below the status display are used to control the

action or display of information. Refer to Chapter 1 for a complete description of the operator panel, the status display, and use of the buttons.

Within the Console, the incident record is displayed in two formats. The difference is in the last two digits of the coded displayed data.

For example, If an event condition occurred for the TKRG card, ic/xynn would appear on the Director's operator panel status display:

ic	indicates the incident code
x	designates the severity code
y	indicates the FRU type (In this example, the "y" designates the TKRG card.)
nn	indicates the slot number of the FRU that detected or caused the event, except for DVP failures, where it indicates the physical port number.

The same format of ic/xynn will be seen at the Console in that Director's event log, which is displayed from the matrix *Maintenance* menu. It will appear under the "Op Panel" heading of the log.

Also at the Console, it will appear in the Director's *Operational Status* dialog box as a four-digit code displayed as xfff:

x	Indicates the operational status of the Director
fff	indicates accumulated FRUs that have outstanding errors or events and have NOT been cleared or acknowledged.

You will notice that for all the various formats of event, error, and fault codes, the FRU will always be called out in the same digit position. In this example, A is the constant identifier for the TKRG card.

Code Format	***Where Found***
ic/xynn	At the Director's operator panel
ic/xynn	At the Console in that Director's event log
xfff	At the Console in that Director's status

Incident Codes

Refer to Appendix A, "Incident Reporting" for the meaning of all incident codes (ic).

Severity and Operational Status Codes

0	fully operational
1	fully operational, redundant component failure
2	operational, minor failure
3	operational, major failure
4	not operational
5	cannot determine operational level

FRU Codes

0	no additional FRUs
1	matrix controller (MXC) card
2	control processor (CTP) card
3	matrix switch (MXS) card
4	LED device port (DVP) card
5	laser device port (DVP) card
6	reserved
7	fan assembly (FAN)
8	power supply (PWR)
9	ESCD Director Console (CON)
A	Token-Ring (TKRG) controller adapter card
B	operator panel (PAN)
C	spare DVP (SDVP) card - 4 LED ports
D	spare DVP2 (SDV2) card - 2 LED and 2 laser ports
E	logic board assembly (LBA)
F	FICON converter (FCV) port card
G	3.3 and 5.0-volt, FICON-capable power supply (PWR2)
H	FICON-capable matrix controller (MXC2) card
I – V	reserved

Note: During LIC recovery sequences or physical insertion of logic cards, the amber and green LEDs on each logic card may blink or flash. This is considered normal and should not be mistaken for a hard failure indication. A solidly illuminated amber LED is considered a failed status indicator. Under some circumstances, the amber LED may be illuminated for up to one minute, even though there is no solid (permanent) failure.

1

If this is your second time at this step, call your next level of support.

If you are at the Director, write down the code displayed for Event= or other codes that appear on the operator panel status display, with the date and time of the customer's complaint. If you are at the Console, observe the Director event log from the active matrix. The following list of possible codes directs you to the appropriate MAP 9100 step (or appropriate MAP, if not MAP 9100) where you can begin troubleshooting.

Is the event code:

ic/x0nn (no additional FRUs)?	Go to step 2.
ic/x1nn (MXC)?	Go to step 35.
ic/x2nn (CTP)?	Go to step 3.
ic/x3nn (MXS)?	Go to step 9.
ic/x4nn (LED DVP)?	Go to step 15.
ic/x5nn (laser DVP)?	Go to step 15.
ic/x7nn (fan)?	Go to step 24.
ic/x8nn (PWR)	Go to step 34.
ic/x9nn (ESCD Console)?	Go to step 26.
ic/xAnn (TKRG)?	Go to step 27.
ic/xBnn (front panel)?	Go to step 32.
ic/xCnn (LED spare)?	Go to step 18.
ic/xDnn (LED / laser spare)?	Go to step 18.
ic/xEnn (LBA)?	Go to step 33.
ic/xFnn (FCV)?	Go to step 15.
ic/xGnn (PWR2)?	Go to step 34.
ic/xHnn (MXC2)?	Go to step 35.
20/xynn (power-on error)?	Go to MAP 9800.
other event code?	Call you next level of support.

2

ic/x0nn (no additional FRUs)

If this is your second time at this step, call your next level of support.

A recoverable logical failure has occurred. It is displayed and logged for troubleshooting assistance should further analysis be needed. No further action is required.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Exit MAP.

3

ic/x2nn (CTP)

Open the front door of the Director.

Is a CTP card installed in slot nn of the Director?

YES	NO
↓	Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.
↓	Call your next level of support.

4

Is an amber LED illuminated on the CTP card in slot nn?

YES	NO
↓	Go to step 6.

5

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through events in the event log.

If this is your second time at this step, call your next level of support.

Replace the failed card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Control Processor Card, Nonredundant” on page 3-18 or “Control Processor Card, Redundant” on page 3-25.

Use the button on the operator panel to clear the event codes that cause you to enter this section of the map. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

6

At the Console, select the *Hardware Audit Log* option from the *Maintenance* menu.

Does the CTP card indicate ”Removed” in the hardware audit log?

NO	YES
↓	This indicates a possible blown fuse on the CTP logic card. Go to step 8.

7

At the Console, select the *Port Maintenance* option from the *Maintenance* menu.

Is the slot number for the CTP card in slot nn shaded yellow, indicating failure?

YES	NO
↓	Do not replace the CTP card at this time. A recoverable logical failure may have occurred. Perform the data collection procedure listed on page 2-114. Mail the diskette to IBM Poughkeepsie Product Engineering. Be sure to include the Director serial number and the date and time of the error. Call your next level of support.
↓	Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through events in the event log.
↓	Exit MAP.

8

If this is your second time at this step, call your next level of support.

Replace the CTP card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Control Processor Card, Nonredundant” on page 3-18 or for “Control Processor Card, Redundant” on page 3-25.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to **"Clearing Events" on page F-13**.

Go to MAP 9000.

9

ic/x3nn (MXS)

Open the front door of the Director.

Is an MXS card installed in slot nn of the Director?

YES	NO
↓	Call your next level of support.

10

Is an amber LED illuminated on the MXS card in slot nn?

YES	NO
↓	Go to step 12.

11

If this is your second time at this step, call your next level of support.

Replace the MXS card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Matrix Controller or Matrix Switch Cards, Nonredundant” on page 3-29 or for “Matrix Controller or Matrix Switch Cards, Redundant” on page 3-31.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

12

At the Console, select the *Hardware Audit Log* option from the *Maintenance* menu.

Does the MXS card indicate “Removed” in the *Hardware Audit Log*?

NO	YES
↓	This indicates a possible blown fuse on the MXS logic card. Go to step 14.

13

At the Console, select the *Port Maintenance* option from the *Maintenance* menu.

Is the slot number for the MXS card in slot nn shaded yellow, indicating failure?

YES	NO
↓	Do not replace the MXS card at this time. A recoverable logical failure may have occurred. Call your next level of support.
↓	Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.
↓	Exit MAP.

14

If this is your second time at this step, call your next level of support.

Replace the failed card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Matrix Controller or Matrix Switch Cards, Nonredundant” on page 3-29 or “Matrix Controller or Matrix Switch Cards, Redundant” on page 3-31.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

15

ic/x4nn (LED DVP) or ic/x5nn (Laser DVP) or ic/xFnn (FCV)

Select the *Hardware Audit Log* option from the *Maintenance* menu.

Does the port card indicate “Removed” in the *Hardware Audit Log*?

YES	NO
↓	Go to step 17.

16

If the port card is still installed, a board failure makes it appear as it is not installed.

If this is your second time at this step, call your next level of support.

Replace the port card that is indicated as removed but is still installed, and return here. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Port Cards” on page 3-37.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

17

The Director may have an optional feature called “enhanced availability.” This feature allows operational ESCON ports to function normally, even though individual ESCON ports may have failed. This gives the user an option to logically swap the failing ports with ports on the optional spare ports card. If no ports are available on the spare ports card, swap with unused ports on installed port cards.

This enables the user to physically swap out the failing port card at a more convenient time. Also inherent in this unit is the ability to “hot plug” many of the FRUs without powering off the unit. This enables the cards to be exchanged without disruption to users.

Each FCV port card has an amber LED that illuminates when the Director detects a failure on the FRU port card or when online diagnostics detect an error. The LED flashes while diagnostics are running.

Each of the eight ports on an ESCON port card is equipped with an amber LED. This LED is illuminated when the Director detects a failure within the individual port, or when online diagnostics has detected an error. The LED will flash while diagnostics are executing.

Go to MAP 9500 and then return here.

Use the buttons on the operator panel to clear the events that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

18

ic/xCnn (LED SDVP) or ic/xDnn (LED/Laser SDV2)

Open the front door of the Director.

Is a spare ports card installed in slot 31 of the Director?

YES **NO**

↓ Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

↓ Call your next level of support.

19

Is an amber LED illuminated on the spare ports card for port nn?

YES **NO**

↓ Go to step 21.

20

If this is your second time at this step, call your next level of support.

Note: If any cables are attached to the spare ports card, swap those cables back to their original locations before replacing the spare ports card. If the card in the original location is defective, replace that card before replacing the spare ports card.

Go to Chapter 3 for removal and replacement procedures for a spare ports card, and replace the failed card.

After replacement, use the buttons on the operator panel to clear the events that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

21

At the Console, select the *Hardware Audit Log* option from the *Maintenance* menu.

Does the port card indicate “Removed” in the *Hardware Audit Log*?

NO **YES**

↓ This indicates a possible blown fuse on the spare DVP logic card. Go to step 23.

22

At the Console, select the *Port Maintenance* option from the *Maintenance* menu.

Is the slot number for the card in slot 31 shaded yellow, indicating failure?

YES	NO
↓	Do not replace the spare ports card at this time. A recoverable logical failure may have occurred. Call your next level of support.
↓	Exit MAP.

23

If this is your second time at this step, call your next level of support.

Replace the failed card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Spare Ports Card, LED and LED/XDF Laser” on page 3-34.

Use the buttons on the operator panel to clear the events that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

24

ic/x7nn (Fan)

Observe the last two digits of the event code. These two digits indicate which fan assembly to remove and replace.

At the Console, select the *Hardware Configuration* option from the *Maintenance* menu.

Does the status for the fan assembly indicate “Failed”?

YES	NO
↓	Do not replace the fan assembly at this time. A recoverable logical failure may have occurred. Call your next level of support.
↓	Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.
↓	Exit MAP.

25

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Use the buttons on the operator panel to clear the events that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

There are a total of four fans in two fan assemblies. If the Director supports FCV port cards, in other words it contains an MXC2 card, PWR2 power supply, and FCV port cards, failure of two fans will cause the Director to shut down in 5 minutes. If the Director does not support FCV port cards, the Director continues to run if two fans fail with events reported for the failed fans. If three fans fail, the Director shuts down in 10 minutes.

Attention!

For Directors that do not support FCV port cards. If a total of two fans fail in the same or different fan assemblies, pulling and replacing an assembly will cause a temporary failure of a third fan. With three fans failed, shutdown will occur in 10 minutes. Therefore, once you start to replace a failed fan assembly, you should complete the procedure promptly.

Attention!

For Directors that do support FCV port cards. If a total of two fans fail in the same or different fan assemblies, the Director will shut down in 5 minutes. Therefore, when pulling and replacing an assembly, whether it contains one or two failed fans, you have 5 minutes to complete the procedure.

Replace the indicated fan assembly. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Fan Assembly” on page 3-59.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Using the operator panel, clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

26

ic/x9nn (console connection failure)

If this is your second time at this step, call your next level of support.

This code indicates a problem with communications between the Director and the Console program.

Go to MAP 9200 and return here.

Go to MAP 9000.

27

ic/xAnn (TKRG)

Open the front door of the Director.

Is a TKRG card installed in slot nn of the Director?

YES	NO
↓	Call your next level of support.

28

Is an amber LED illuminated on one or more of the TKRG cards?

NO	YES
↓	Go to step 31.

29

From the Console's *Matrix* window or *Port Maintenance* window, select the *Hardware Audit Log* option from the *Maintenance* menu.

Does the TKRG card indicate "Removed" in the *Hardware Audit Log*?

NO	YES
↓	This indicates a possible blown fuse on the Token-Ring logic card. Go to step 31.

30

This condition may be caused by Token-Ring link errors or a problem with communications between the Director and the Console program.

Go to MAP 9200 and return here.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

31

If this is your second time at this step, call your next level of support.

Using the operator panel, clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Replace the failed card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Token-Ring Controller Adapter Card, Nonredundant” on page 3-48 or “Token-Ring Controller Adapter Card, Redundant” on page 3-51.

Go to MAP 9000.

32

ic/xBnn (front panel assembly)

If this is your second time at this step, call your next level of support.

Replace the front panel assembly. For instructions, refer to the removal and replacement procedures in Chapter 3 for the “Front Panel” on page 3-63.

Go to MAP 9000.

33

ic/xEnn (logic board assembly)

This condition indicates a failure within the circuitry used to store maintenance data on the logic board assembly (LBA) and in no way indicates a failure of the LBA’s ability to perform its interconnecting functions.

Call your next level of support for assistance in correcting this problem. After you have talked to your next level of support, use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

34

ic/x8nn (PWR) or ic/xGnn (PWR2)

Go to MAP 9400 and return here.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

35

ic/x1nn (MXC) or ic/xHnn (MXC2)

Open the front door of the Director.

Is an MXC or MXC2 card installed in slot nn of the Director?

YES	NO
↓	Call your next level of support.

36

Is an amber LED illuminated on an MXC or MXC2 cards?

BOTH	ONE	NONE
↓	Go to step 47.	Go to step 42.

37

If this is your second time at this step, call your next level of support.

The MXC/S/S, one or more DVP ports, or the logic board assembly may be the cause of the indicated MXC or MXC2 failure.

At the Director operator panel or from the event log at the Director Console, examine sense bytes 17 and 18 of the MXC entry for”x’40” and “x’04” respectively. An entry of “x’4004” for sense bytes 17 and 18 of the MXC entry indicates a DVP-detected parity error on the 5-bit data bus.

To examine the sense bytes:

1. Press the *Entry* button on the operator panel to scroll through events in the event information queue.
2. When an active event appears (for example Active=ic/xynn), press the *Detail* button to display the nine lines of event detail (one line each time that you press the button). Pressing the button once displays the event's date. Keep pressing the button until the following appears:

   SB14=xx xx xx xx, where xx represents data in sense bytes 14, 15, 16, and 17
3. Press the *Detail* button again to display the following:

   SB18=xx xx xx xx, where xx represents data in sense bytes 18, 19, 20, and 21

Do sense bytes 17 and 18 indicate "x'40" and "x'04" respectively?

YES **NO**

↓ Go to step 49.

38

An "x'4004" in sense bytes 17 and 18 normally indicates an error on the MXC/S/S, but it is possible for a DVP port (or multiple DVP ports on the same logic card) or the logic board assembly to cause this error.

From the Director Console Active Matrix, select *Director LIN Log* from the *Maintenance* pull-down menu. There will be multiple implicit events logged in the 24 hour period prior to the MXC failures. Examine sense byte 11 (source port number) and sense byte 19 (connected port number) for all implicit event entries. If the port number for either the source port or the connected port is the same for all of the implicit entries logged in the Director LIN log, then suspect a port card problem.

To examine the sense bytes:

1. Press the *Entry* button on the operator panel to scroll through events in the event information queue.
2. When an active event appears (for example Active=ic/xynn), press the *Detail* button to display the nine lines of event detail (one line each time that you press the button). Pressing the button once displays the event's date. Keep pressing the button until the following appears:

   SB10=xx xx xx xx, where xx represents data in sense bytes 10, 11, 12, and 13
3. Press the *Detail* button twice more to display the following:

   SB18=xx xx xx xx, where xx represents data in sense bytes 18, 19, 20, and 21.

Are the port numbers for the source port number or connected port number (sense byte 10 and 19) the same for all implicit event?

YES **NO**

↓ Go to step 49.

39

Note: The Director may have an optional feature called enhanced availability. This feature allows operational ports to function normally, even though individual ports may have failed. This gives the user an option to logically swap the failing ports with ports on the optional spare ports card, or if no ports are available on the spare ports card, with unused ports on installed port cards. This enables the user to physically swap out the failing port card at a more convenient time. Also inherent in this unit is the ability to “hot plug” many of the FRUs without powering off the unit. This enables the cards to be exchanged without disrupting users.

Is a port available for a port swap?

Note: The extreme left port card slot in the upper left quadrant of port cards is designated as a spare ports card slot. If installed, it will only contain four ports on that card. If that spare ports card is not installed, or if it is installed but all ports are connected, any other unused port on installed port cards of the same technology type can be used as a spare.

YES **NO**

↓ Go to step 41.

40

Using the *Port Maintenance* window, select the *Swap Port* option from the *Maintenance* menu to swap the port identified in step 38 with an available port. Select the *Unblock After Swap* option. Swap to a port on the spare ports card if it is available. After you swap the ports, verify that the original failing port address (now associated with a new physical port) is unblocked and that the unit is online.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

IML the Director by pressing and holding the *IML* button on the Director operator panel. This will clear the MXC faults.

Observe the Director LIN log for additional implicit events. Do additional implicit events occur?

NO **YES**

↓ An abnormal condition exists. Contact your next level of support.

41

Replace the port card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Port Cards” on page 3-37.

Note that other ports on this port card will be affected. Take appropriate precautions.

Go to MAP 9000

42

At the Console, select the *Hardware Audit Log* option from the *Maintenance* menu.

Does the MXC card indicate “Removed” in the *Hardware Audit Log*?

NO **YES**

↓ This indicates a possible blown fuse on the MXC logic card. Go to step 49.

43

At the Console, select the *Port Maintenance* option from the *Maintenance* menu.

Is the slot number for the MXC card in slot nn shaded yellow, indicating failure?

NO **YES**

↓ Go to step 49.

44

Note: It is possible that the MXC logic card failed or posted an error because of an invalid configuration. Follow the procedure in this step to determine if the MXC is part of an invalid configuration.

From the active matrix window, select *Director Event Log* from the *Maintenance* pull-down menu.

Locate the event titled, “H/W - Crosspoint Controller” with the format of "0A/xHnn.” Examine sense byte 24 for an entry of "07" or "0E.” For example:

H/W - Crosspoint Controller 0A/1H01 4/1/99 12:40:31 PM
1000E000 00000A04 0501123D 140000FF 010000FF 00000000 **07**FF0011 00481000

or

H/W - Crosspoint Controller 0A/2H01 4/1/99 12:41:32 PM
1000E000 00000A04 0501224A 00000090 010000FF 00000000 **0E**FF0000 00081000

Does sense byte 24 indicate “07” or “0E”?

YES **NO**

↓ Go to step 46.

45

The MXC logic card is part of an invalid configuration. Depending on which card was recognized first, either the MXC or the FCV logic card will be held offline. To correct the problem, remove the MXC in slot nn (0A/xHnn where nn is the slot number) and replace it with an MXC2 logic card (IBM part number 07H5972; feature code #5700).

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Exit MAP.

46

Do not replace the MXC or MXC2 logic card at this time. A recoverable logical failure may have occurred. Call your next level of support.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Exit MAP.

47

Note: It is possible that the MXC logic card is failed or posted an error because of an invalid configuration. Follow the procedure in this step to determine if the MXC is part of an invalid configuration.

From the active matrix window, select *Director Event Log* from the *Maintenance* pull-down menu.

Locate the entry titled “H/W - Crosspoint Controller” with the format of “0A/xHnn.” Examine sense byte 24 for an entry of “07” or “0E”. For example:

H/W - Crosspoint Controller 0A/1H01 4/1/99 12:40:31 PM
1000E000 00000A04 0501123D 140000FF 010000FF 00000000 **07**FF0011 00481000

or

H/W - Crosspoint Controller 0A/2H01 4/1/99 12:41:32 PM
1000E000 00000A04 0501224A 00000090 010000FF 00000000 **0E**FF0000 00081000

Does sense byte 24 indicate “07” or “0E”?

YES **NO**

↓ Go to step 49.

48

The MXC logic card is part of an invalid configuration. Depending on which card was recognized first, either the MXC or the FCV logic card will be held offline. To correct the problem, remove the MXC in slot nn (0A/xHnn where nn is the slot number) and replace it with an MXC2 logic card (IBM part number 07H5972; feature code #5700).

Exit MAP.

49

If this is your second time at this step, call your next level of support.

Replace the failed card(s). For instructions, refer to the removal and replacement procedures in Chapter 3 for “Matrix Controller or Matrix Switch Cards, Nonredundant” on page 3-29 or for “Matrix Controller or Matrix Switch Cards, Redundant” on page 3-31.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Go to MAP 9000.

MAP 9200: Loss of Console Communication with Active Director

The Director is configured and controlled using a PC running the Console program. The PC may be a dedicated PC or it may be a PC running the HMC application and/or a Model 2 Timer application. The Console connects to the Director through a 4/16 Mbps Token-Ring LAN. The link-level protocols physically used are Token-Ring IEEE 802.5 and a TCP/IP stack. The Console initiates the logical link connection to all defined Directors when either the Console or the Director initializes. The link is maintained in a background manner until the Console program is exited or the Director powers off. Graphic link status indicators in the lower left corner of any active matrix window indicate link status. Refer to "Status Line" on page C-2 of Appendix C to interpret the status line.

The defined states for the link are:

- The link between the Director and Console is available and idle (green lightning bolt).
- Data is being transmitted/received (yellow circle).
- The link between the Director and Console is currently not operational (red square with a black slash).

1

Suspected loss of communication with the currently active Director.

Is the Console's active matrix window for the suspected Director currently displaying a red square with a black slash symbol in the lower left corner of its matrix window?

NO	YES
↓	Go to step 9.

2

Is there a yellow circle symbol in the lower left corner of the matrix?

YES	NO
↓	Go to step 4.

3

Data is being transmitted/received via the link level between the Console and the Director. This is a normal condition that requires no further action. However, the Console is timing response activity and if, after ten seconds, no response is received from the Director, it will display an operation error message or transition to the loss of communication state.

Exit MAP; no further action is required.

4

Is there a green lightning bolt in the lower left corner of the matrix?

YES	NO
↓	Go to step 7.

5

The link-level connection between the Console and the Director is operating normally.

Do all mouse and keyboard functions work properly for the displayed matrix?

NO	YES
↓	Exit MAP; no further action is required.

6

If this is your second time at this step, call your next level of support.

The Console may be configured as a “target” for a distributed console access facility (DCAF) connection with that connection established. Verify with the customer if another PC is connected as a DCAF controller and is in control of the PC/Director operations. If it is, exit the MAP, since this is a normal operation.

If a DCAF session exists, and it is necessary to break that connection to perform maintenance on this Console, use “Alt+T” on the target Console to regain local control.

If no DCAF operation is in place the Console application appears to be hung. The PC needs to be rebooted to see if Console operations return to normal. For instructions, refer to the procedure in Chapter 3 for Power-On on page 9.

If Console operations do not return to normal with reboot, go to MAP 9700.

Exit MAP.

7

This situation could be caused by a duplicate MAC address on the LAN.

Go to the Director in question and observe the operator panel event entries.

Is there an incident code of “0C” in the event (Event=0C/xynn) and an entry of “A9” in sense byte position 20?

YES	NO
↓	An abnormal condition exists. Contact your next level of support.

8

It appears that a duplicate MAC address has been detected on the LAN.

Contact the local LAN administrator and ensure that a duplicate MAC address has not been configured within the Token-Ring network. If a duplicate MAC address is found, remove the duplicate and reconfigure it with a unique MAC address.

Refer to "Verify Director Operation and Determine LAN Addressing" on page 6-23 for details on the MAC address.

Return to step 1.

9

At the Console:

Double-click on the link status indicator within the active matrix window itself, or select the *Maintenance* menu and then select the *Console Link Statistics* option.

With the dialog box opened, the IP address, link statistics, and a button to reset link appear.

Select or click on the *Reset Link button.* This will force the link-level software to attempt a disconnect/reconnect sequence.

Did the link-level communications successfully reset and reactivate (does the green lightning bolt link status indicator appear)?

NO	YES
↓	Exit MAP; operations have returned to normal.

10

If this is your second time at this step, contact your next level of support.

The Console has detected loss of link-level communications.

Note: The Console that indicates a link failure may do so because:

- Another Console in the network has control of the Director

or

- This Console should have control but does not because of a problem in the network.

To find out why this Console cannot take control:

a. On the active matrix for the Director in question, select or double-click on the Console link status indicator.

b. The dialog box will appear with the *Current State* field, which shows a message other than "Available."

   A further reason code may be listed below it. This will show the current state of the Console-to-Director connection.

   A link error may also be listed in the dialog box. If so, refer to the section "Error and Information Messages" on page B-2 of Appendix B for a further description of these errors.

c. If you are at the Director, the currently connected or last connected Console IP address can be displayed on the operator panel. Use the operator panel to display the IP address of the currently connected Console.

d. At the Console, display the IP address of the Console Token-Ring adapter.

e. If the Console IP address displayed matches the IP address displayed on the Director operator panel, you are at the currently connected or your Console was the last Console connected.

   If the IP address displayed is 0.0.0.0, there is no Console currently connected to the Director.

Is this the only Console program running on the Director/Console network?

NO **YES**

↓ Go to step 12.

11

Locate the other PC running the Console program. Observe its link status indicator in the active matrix window for the suspected Director.

If the second Console also indicates loss of communication with the suspected Director, then go to step 10 and assume that only one Console is attached.

If the second Console program has acquired the Director and its link status indicator appears to be normal, then use the second Console for continuing service and control of the desired Director. If this is the customer's desired configuration, no further action is required.

Exit MAP; no further action is required.

If this is not the desired customer configuration, all other Console programs other than the one on the desired Console must be taken down, and only the one on the desired Console should be left active. After other Console programs are closed, return to step 1.

12

Is the IP address for the Director correctly configured in the matrix definition in the Console application?

NO or Don't Know	**YES**
↓	Go to step 17.

13

Ensure that the IP address configured in the Director matches the IP address in the Console.

Note: The first octet of the IP address MUST be the same in both the Director and the Console addresses. For example, for the IP address 125.xxx.xxx.xxx, the "125" is the portion of the address which must be the same for both the Director and the Console.

To view the Director's IP address, press the *Advance* button on the Director's operator panel until the text message on the top line of the status display is "Ixxx.xxx.xxx.xxx" (I=IP address). If you are unable to display the IP address or if all zeros display, call your next level of support.

To display the IP address of the Token-Ring adapter in the Console, refer to "Change Director's LAN Addresses (Optional)" on page 6-26.

To display the configured IP address of the selected Director in the Console application, double-click on the Console link status indicator in the matrix window. Refer to "Console Status Line" on page 1-45 and "Console Link Statistics" on page 2-117 for examples.

Does the first octet of the IP address displayed on the Director operator panel match the first octet of the IP address of the Console PC?

NO	YES
↓	Go to step 15.

14

At this point you have a choice of either configuring an IP address in the Director or in the Console PC.

For instructions on changing the Director's IP address, refer to "Change Director's LAN Addresses (Optional)" on page 6-26.

Configure one address or the other so the first octet matches. (It is recommended that the IP address in the Director be changed.)

Return to step 1.

15

Does the IP address displayed on the Director operator panel match the IP address of the Director displayed in the Console link statistics screen?

NO	YES
↓	Go to step 17.

16

At this point you have a choice of either configuring an IP address in the Director or in the Console program.

For instructions on changing the Director's IP address, refer to "Changing the Director's LAN Addresses through the Operator Panel" on page 10-14 of Chapter 10. For details on configuring an IP address for a Director on the Console program, refer to Installing Directors on page 17 of Chapter 6.

Configure one address or the other (the IP address in the Director is recommended) so that both addresses match.

Return to step 1.

17

If this is your second time at this step, contact your next level of support.

Is this Console able to communicate with other Directors in the Director/Console network (in other words, no loss of communications link status is indicated for other Directors that the Console is communicating with)?

NO (or there is only one Director)	**YES**
↓	Go to step 20.

18

The suspected trouble is with this Console.

Check the cables from the PC to the MAU for loose connections, or reset the MAU port using the manufacturer's supplied reset or initialization tool, if applicable.

Contact the local LAN administrator and ensure that the Token-Ring LAN is operating properly.

From the Director's active matrix window, pull down the *Maintenance menu.*

Select the *Console Link Statistics* option.

Click on or execute a *Reset Link* to force a disconnect/reconnect function at the link level.

Be sure that the Console application is at the same or a higher level than the attached Directors.

Are communications reestablished between the Director and this Console (does the green lightning bolt appear)?

NO	**YES**
↓	Exit MAP; operations have returned to normal.

19

Possible Token-Ring problem.

If this is your second time at this step, contact your next level of support.

Be sure other applications on the PC (such as Timer Console or HMC applications) are not interfering with the Console Token-Ring use.

Possible MAU port problem. Move the Token-Ring cable to another spare port, if available, or replace the MAU to confirm that the MAU port is operational.

Verify normal ring operation by observing other traffic on the ring.

If other ring traffic is experiencing problems, use normal Token-Ring troubleshooting techniques. See the appropriate problem determination manual.

Are communications reestablished between the Director and this Console (does the green lightning bolt appear)?

NO **YES**

↓ Exit MAP; operations have returned to normal.

20

The suspected trouble is with the Director's ability to communicate with the Console.

From the Console, perform the following:

- Pull up the suspected Director's active matrix window.
- Select the *Director Event Log* option from the *Maintenance* menu. Observe the most current entries.
- Verify the Console application is at the same or a higher level than the attached Directors. Use the *Help* menu to display the Console's application level.

At the Director, perform the following:

- Check the cable connection from the TKRG card to the MAU to eliminate the cable as a source of the problem.
- Contact the local LAN administrator and ensure that the Token-Ring LAN is operating properly.

Note: The switch on the TKRG controller adapter card signals the Token-Ring controller adapter logic which LAN speed is desired. This occurs during Director initialization ONLY. Although the switch can be physically changed during normal operations, this WILL NOT change the current LAN speed. If a change to the LAN speed is required, change the switch position and then push the *IML* button on the operator panel. This procedure requires coordination with the customer for traffic outages.

- Ensure that the Token-Ring speed switch on the TKRG controller adapter card is set to the correct LAN speed. This switch sets the Director's LAN speed to either 4 or 16 Mbps.

Are communications reestablished between the Director and this Console (does the green lightning bolt appear)?

NO **YES**

↓ Exit MAP; operations have returned to normal.

21

Go to MAP 9700, and then return to the beginning of this MAP.

MAP 9300: Power-On/IML Initialization Failure

During the initial power-on sequence or upon pressing the *IML* button, the normal sequence is interrupted or does not complete without errors. During this sequence, the top line of the status display is used to display the progress of initialization. If an error occurs during this time, the bottom line of the status display will be used to display any errors.

If the Director has the enhanced availability feature installed (that is, redundant CTP, MXC/MXS, or TKRG cards), then it will attempt to continue to operate. Event/error fault codes will then be displayed on the bottom line of the status display, and an event/error will be sent to the Console for entry into the Director event log.

1

Observe the Director's operator panel status display.

Is the bottom line of the status display blank?

NO **YES**

↓ Go to step 5.

2

Is a numeric or intelligible text message displayed on the bottom line?

YES **NO**

↓ Call your next level of support.

3

Is the first character of the displayed value an "L"?

NO **YES**

↓ Go to step 13.

4

Is the message "SSP0 or SSP1 DRAM Failure"?

YES **NO**

↓ | Go to step 7.

5

Open the front door of the Director.

Is an amber LED illuminated on one or more of the CTP cards?

YES **NO**

↓ Call your next level of support.

6

If this is your second time at this step, contact your next level of support.

Replace the CTP card which has its amber LED illuminated. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Control Processor Card, Nonredundant” on page 3-18 and for “Control Processor Card, Redundant” on page 3-25.

Return to step 1.

7

Is the message “SSP0 or SSP1 SRAM Failure”?

YES **NO**

↓ Go to step 10.

8

Open the front door of the Director.

Is an amber LED illuminated on one or more of the CTP cards?

YES **NO**

↓ Call your next level of support.

9

If this is your second time at this step, contact your next level of support.

Replace the CTP card which has its amber LED illuminated. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Control Processor Card, Nonredundant” on page 3-18 and for “Control Processor Card, Redundant” on page 3-25.

Return to step 1.

10

Is the message “SSP0 or SSP1 Err, CS:EL0”?

NO	YES
↓	Call your next level of support.

11

If this is your second time at this step, call your next level of support.

Is there a Event=20/xynn displayed on the operator panel?

Note: A system error may display momentarily prior to completion of the 20/xynn event to the display.

NO	YES
↓	Go to MAP 9800.

12

Is an event displayed that occurred at the power-on sequence?

YES	NO
↓	Go to step 14.

Go to MAP 9100.

13

The Load process of the LIC has failed.

Perform an IML of the Director.

Does an IML error still appear on the operator panel status display?

NO **YES**

↓ Call your next level of support.

14

Is the message “POWER LOSS”?

NO **YES**

↓ Go to MAP 9400.

15

Is the message on the top line of the display “ID=xxxxxxxx” ?

NO **YES**

↓ The Director has successfully completed its power-on or IML initialization. The unit is operating normally.

↓ If this is your second time at this step for the same operator panel event or event log entry, call your next level of support. Otherwise, Go to MAP 9000.

16

Open the front door of the Director.

Note: Remember, amber LEDs may blink very slowly to indicate some conditions that are not failures.

Are any of the card’s amber colored LEDs solidly illuminated?

NO **YES**

↓ Go to step 20.

17

Feel for airflow at the front of the power supplies.

Are the fans running?

YES **NO**

↓ Go to MAP 9400.

18

Is the Power indicator on the operator panel lit?

NO **YES**

↓ Call your next level of support.

19

If this is your second time at this step, call your next level of support.

Refer to the removal and replacement procedures in Chapter 3 for “Front Panel” on page 3-63.

Return to step 1.

20

If this is the second time at this step, contact your next level of support.

Go to Chapter 3 for instructions on replacing any cards with amber LEDs that are not illuminated.

After removal and replacement of the suspected card has been completed, press and hold the *IML* button for at least six seconds to initiate the IML sequence.

Return to step 1.

MAP 9400: Power Distribution Analysis

The Director is configured with two power supplies. Both power supplies share the load between them. If one supply becomes defective, the other supply picks up the load without disruption.

Note: A single main power on/off switch is located on the operator panel and controls the ac power inputs; both are controlled from this single switch.

1

Observe the Director's operator panel.

Is the main power on/off switch in the "on" position?

NO	YES
↓	Go to step 3.

2

Toggle the power on/off switch to the "on" position. The switch should stay on and the Director should power on.

The Director can power the switch off through software control if the Director detects multiple fan failures. Go To MAP 9100 to inspect the operator panel events and the Director event log entries at the Console for fan failures. Return here if there are **no** fan failures.

Multiple power supply failures could also cause an indication of this type. Go To MAP 9100 to inspect the operator panel events and the Director event log entries at the Console for power supply failures. In the event of power supply failure, refer to "Power Supply" on page 3-55 for replacement procedures. Return here if there are no power supply failures.

If the Director was not purposely powered off, and there were no fan or power supply failures that caused software power shutdown, the switch may be defective, and should be replaced. Refer to the removal and replacement procedures in Chapter 3 for "AC Power Switch" on page 3-76.

Return to step 1.

3

The main power on/off switch is “on” and the Director should be powered on.

Observe the Director’s operator panel.

Is there a “POWER LOSS” message on the bottom line of the status display?

YES **NO**

↓ Go to step 9.

4

Open the front door of the Director.

Observe the green LED on the front of each power supply.

Is the green LED illuminated on either power supply?

YES **NO**

↓ Go to step 8.

5

Input power may have “glitched” and caused the indication that the Director failed.

Toggle the main ac switch off and, after 30 seconds, back on.

At the operator panel, or in the Console in the Director event log, check if there is an event with an x4 in byte 10 and an 06 in byte 24.

To examine the sense bytes:

1. Press the *Entry* button on the operator panel to scroll through events in the event information queue.
2. When an active event appears (for example Active=ic/xynn), press the *Detail* button to display the nine lines of event detail (one line each time that you press the button). Pressing the button once displays the event’s date. Keep pressing the button until the following appears:

   SB10=xx xx xx xx, where xx represents data in sense bytes 10, 11, 12, and 13
3. Press the *Detail* button three more times to display the following:

   SB22=xx xx xx xx, where xx represents data in sense bytes 22, 23, 24, and 25

Is there an entry with an x4 in byte 10 and an 06 in byte 24 of the event log?

YES	NO
↓	Go to step 7.

6

A false power fail event was logged. Notify the customer that a problem may exist with the input power. Monitor the input power to the Director for fallout glitches of a relatively short duration.

If this is your second time at this step, call your next level of support. Assuming no input glitches were found, replace the following in the order listed using the procedures in Chapter 3, and return to step 1 after each component replacement.

1. Power Supplies
2. Power Cords
3. Power Switch
4. Input Filter
5. Internal Distribution Cables (cables from the input filter to the switch and from the switch to the power supply).

Return to step 1.

7

Call your next level of support. An unusual condition has occurred. With at least one power supply indicating proper operation, this condition should not occur.

8

One or both power supplies in the Director may have failed.

Toggle the main ac switch off. After 30 seconds, toggle it back on.

If this is your second time at this step, call your next level of support, otherwise

Return to Step 1.

9

Observe the Director's operator panel.

Is the Power indicator illuminated?

NO **YES**

↓ Go to step 14.

10

The +5 volt output from the dc power system drives the LED. The "off" state of the LED indicates no +5 volt output from the power supply(ies).

Open the Director front door and observe the LEDs on the power supplies.

Is a green LED indicator illuminated on either power supply?

NO **YES**

↓ Go to step 12.

11

This is an indication that ac power is not present at the power supply inputs, or if present, went away momentarily and came back before the 30 second power cycle restriction.

Toggle the power-on/off switch off. After 30 seconds, toggle the switch back on.

Return to step 1.

If this is your second time at this step, check to be sure that the customer is supplying input power at the power receptacle at the correct voltage and frequency (refer to "Power Supplies" on page 1-28 for power requirements). If not, have the customer resolve this.

If power is correct at the outlets, the problem is with one of the following:

1. power supplies
2. power cords
3. power switch
4. input filter
5. internal distribution cables (cables from input filter to switch and from switch to power supply).

Replace these in the order listed, using procedures in Chapter 3. Return to step 1 after each component replacement.

12

Call your next level of support. An unusual condition has occurred. With at least one power supply indicating proper operation this condition should not occur.

There is an indication that at least one power supply is working properly. The Director may be online and operating properly, with only a defective or disconnected operator panel.

Go to MAP 9300, determine if the Director is communicating with the Console, determine its operational status, and proceed to the proper MAP to resolve the problem.

If the Director is operational, and the operator panel is defective, be aware that the operator panel cannot be replaced with power applied. Schedule a time to power the Director off, and refer to the removal and replacement procedures in Chapter 3 for “Front Panel” on page 3-63.

If the Director is not operational, call your next level of support to resolve the problem.

13

Open the Director front door. Are both power supplies installed?

YES	NO
↓	The basic configuration for the 9032-005 requires two power supplies. Install the second power supply. For instructions, refer to removal and replacement procedures in Chapter 3 for “Power Supply” on page 3-55.

Exit MAP.

14

Open the Director front door. Observe the green LED on both installed power supplies.

Are green LED indicators illuminated on both power supplies?

YES	NO
↓	The redundant power supply has failed or has no ac input to the supply or front panel. Examine sense byte 26 of the 0D/xGnn or 0D/x8nn event that reported the power supply failure:
↓	If sense byte 26 is not ‘01,’ replace the power supply using steps under “Power Supply” on page 3-55.
↓	If sense byte 26 is ‘01,’ go to step 15.
↓	To examine the sense bytes:

1. Press the *Entry* button on the operator panel to scroll through events in the event information queue.
2. When an active event appears (for example Active=ic/xynn), press the *Detail* button to display the nine lines of event detail (one line each time that you press the button). Pressing the button once displays the event's date. Keep pressing the button until the following appears:

   SB26=xx xx xx xx, where xx represents data in sense bytes 26, 27, 28, and 29

Exit MAP.

15

There is no indication that a power problem now exists. You may be at this MAP because a temporary ac problem to one supply occurred.

At the operator panel, or in the Console event log for this Director, see if there are any 0D/xGnn events logged.

For all events of that type, inspect sense byte 26 for contents "01".

1. Press the *Entry* button on the operator panel to scroll through events in the event information queue.
2. When an active event appears (for example Active=ic/xynn), press the *Detail* button to display the nine lines of event detail (one line each time that you press the button). Pressing the button once displays the event's date. Keep pressing the button until the following appears:

   SB22=xx xx xx xx, where xx represents data in sense bytes 22, 23, 24, and 25
3. Press the *Detail* button again to display the following:

   SB26=xx xx xx xx, where xx represents data in sense bytes 26, 27, 28, and 29

For all 0D/xGnn or 0D/x8nn events with sense byte 26=01, inspect sense byte 24 for contents "01" or "05."

Order in a time-ascending order all events that match the above criteria.

Is there a sequence observed where 0D/x8nn or 0D/xGnn events with sense byte 24=01 and sense byte 26=01 are followed by event 0D/xGnn with sense byte 24=05 and sense byte 26=01?

YES	**NO**
↓	Go to step 17.

16

An ac failure is occurring on power supply nn where nn is the unit number following the “G” or the “8” in Event=0D/xGnn or Event=0D/x8nn. Have the customer inspect the ac input power to be sure uninterrupted ac is being furnished to that power supply.

If incoming power is continuous, inspect the power cord, the ac switch, the input filter and the internal cables for intermittent connections.

If power distribution to the supply is correct, and the problem continues, replace the supply. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Power Supply” on page 3-55.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Exit MAP.

17

An intermittent ac failure has occurred, but has recovered.

Investigate and resolve any other 0D/x8nn or 0D/xGnn events that might be in the logs or operator panel, keeping in mind that they may have been addressed in the course of executing this MAP.

Return to MAP 9000.

MAP 9500: Port Fault / Link Incidents (LIN) Analysis

An event occurring at the fiber link or physical port level will generate error/status data in the format of a link incident (LIN) Record. This record is sent to the attached host in response to a link-level request incident record (LIR) frame. It is also sent to, and stored in, the currently attached Console Director LIN log.

LINs can occur because of a Director port, fiber cable, or connected device port problem. This MAP will confirm the reliability of the Director's port cards only. If no trouble is found, attention should be directed to the device connected to the other end of the fiber or to the fiber itself.

1

At the Console, select the active matrix for the suspected Director.

Obtain the suspected port address from the customer. Once known, determine the correct port card of the suspected port by correlating the port address to the port number. This will be the port card slot location used and referenced during the execution of this MAP.

Note: An ESCON port card has eight physical ESCON fiber ports. If fiber cables are currently attached to any of the eight ports, ensure that the customer's operations will not be affected by the complete removal and replacement or reseating of the port card, which you may be directed to perform during this MAP. Ports may be temporarily swapped to allow maintenance to be rescheduled to allow non-disruptive maintenance operations and MAP continuation. See the port card map inside the Director's door for a list of port numbers, addresses, and slot numbers.

Note: An FCV port card has one physical FICON fiber port. Ports on FCV port cards may be temporarily swapped to other unused FCV ports to allow maintenance to be rescheduled to allow non-disruptive maintenance operations and MAP continuation.

View the hardware status column of the active matrix for the suspected port.

Is an "N" or "NotInst" (not installed) displayed?	Go to step 2.
Is an "M" or "Maint" (maintenance) displayed?	Go to step 5.
Is an "A" or "Invalid" (invalid attachment) displayed?	Go to step 7.
Is an "O" or "Offline" (offline) displayed?	Go to step 8.
Is an "L" or "LnkFail" (link failure) displayed?	Go to step 14.
Is an "I" or "Inactive" (inactive) displayed?	Go to step 17.
Is an "S" or "Service" (service required) displayed?	Go to step 23.

Is a “D” or “Degrad” (degraded mode) displayed?	Go to step 36.
Is a “U” or “Unaddr” (unaddressable server port) displayed?	Go to step 37.
Is a “T” or “Thrshld” (device error threshold exceeded) displayed?	Go to step 38.
Is a “G” or “Logout” (explicit logout by host) displayed?	Go to step 39.
Is the status column blank (nothing displayed)?	Go to step 40.

2

“N” or “NotInst” displayed.

Is a port card physically installed in this port location?

YES	NO
↓	Exit MAP. This is a normal condition.

3

An FCV logic card can take up to five minutes to completely load. If the subject port is a FICON port, wait five minutes and then review the status of the port again. If it still indicates “Not Installed,” then continue. Otherwise, exit MAP.

An FCV logic card may indicate “Not Installed” if incorrect power supplies are installed. Verify that the color of the faceplate of the power supply is black. If one or both supplies are silver colored, upgrade the supplies to IBM part number 07H5973 (MES feature code 5701). Otherwise, continue.

Select *Maintenance* from the active matrix window.

Select *Port Maintenance.*

Does it indicate the physical presence of a port card in the suspected port/slot location?

NO	YES
↓	Call your next level of support.

4

If this is the first time at this step, and current system configuration/port card usage allows it, physically remove the port card from the Director. Wait at least 45 seconds and then reinsert the card.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

If this is your second time at this step, refer to the procedures in Chapter 3 for removal and replacement of “Port Cards” on page 3-37.

If this is your third time at this step, call the next level of support.

Return to step 1.

5

“M” or “Maint” displayed.

Select *Port Maintenance* from the *Maintenance* menu.

Select *Port Diagnostics* from the *Maintenance* menu.

Select either *ESCON or FICON* (depending on the type of port that is in Maintenance Mode).

Enter a maintenance authorization password when prompted.

Does a message box appear stating that ports were found running diagnostics and asking if you want to shut down the tests and continue?

YES	**NO**
↓	The *Online Diagnostics* dialog box appears. Call your next level of support.

6

Select the *Yes* button on the message box. When the *Online Diagnostics* dialog box appears, close the box by clicking the *Close* button.

Return to step 1.

7

“A” or “Invalid” displayed

Note: For the ports not specified as having a dedicated connection, the link attachment of certain node element classes is not valid. These invalid attachments can cause a link error condition when communication over the path is attempted.

To identify an invalid attachment as the cause of the link error condition, the Director tests each port that does not have a dedicated connection and identifies the ports with invalid attachments. The test is performed as soon as possible after the port is operational. A port is operational when it is not offline or when it no longer has a link failure.

The Director tests for the following invalid attachments:

- A port connected to a port on another Director (not a dedicated connection).

- A port connected to another port on the same Director (not a dedicated connection).
- A port has its own transmitter and receiver connected (possible wrap plug installed).

Investigate the connection to any port that indicates an “A” status and resolve the connection problem.

This invalid attachment status is reset when the condition is removed.

Note: Incorrect cabling usually causes link incidents, as well as invalid attachment tasks.

↓

Return to step 1.

8

“O” or “Offline” displayed

View the active matrix.

Is this port blocked?

YES **NO**

↓ Go to step 10.

9

Consult with the customer as this may be normal and desired condition of the port.

Return to step 1.

10

Open the front door of the Director.

Is a fiber cable connected to the port?

YES **NO**

↓ Go to step 9.

11

View the active matrix window.

Is this port dedicated?

YES **NO**

↓ Go to step 13.

12

Check the other port of the dedicated connection.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

If this is your second time at this step, call your next level of support.

13

If this is your second time at this step, call your next level of support.

The port is not dedicated.

Refer to the *Enterprise Systems Connection Link Fault Isolation Manual (SY22-9533)* for further analysis. Return here when completed.

Return to step 1.

14

"L" or "LnkFail" displayed

Note: A link failure "L" in the hardware status column is set when the Director detects a link failure and reset when a failure is no longer valid or present.

Open the active matrix window.

Select the *Maintenance* option.

Select *LIN Log.*

Is there a current LIN entry for the suspected port?

YES **NO**

↓ Go to step 16.

15

Refer to the *Enterprise Systems Connection Link Fault Isolation Manual (SY22-9533)* for further analysis. Return here when completed.

Return to step 1.

16

Go to MAP 9600, then return here when completed.

Return to step 1.

17

“I” or “Inactive” displayed

FCV Logic Cards Only

A FCV logic card converter port address may indicate “I” or “Inactive” for a number of different reasons. All of these reasons indicate an invalid configuration for the FCV logic card.

While viewing the active matrix for the suspect Director, double-click the *Hardware Status* column for the inactive FCV port address.

A *Name and States* dialog box for the FCV port appears. View the *Hardware Status* section of the dialog box.

If the Hardware Status section indicates:

- Awaiting LIC — Go to step 18
- Invalid Configuration - Dedicate — Go to step 19
- Invalid Configuration - Swap — Go to step 20
- Port exceeds converter card limit — Go to step 21
- FICON-incompatible MXC hardware — Go to step 22
- Other — Call next level of support

18

A LIC update for the FCV logic card is in progress. The FCV port cannot be activated until this is complete.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Wait until the LIC update is complete and then recheck the converter port hardware status column. Exit MAP.

19

The IPL configuration file that has been activated specifies a dedicated connection with the FCV port address or one of the unaddressable port addresses associated with the FCV logic card. This is an invalid configuration and must be corrected before the FCV port can be activated. Refer to "Configuring Port Connections" in *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors (SA22-7296).*

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Exit MAP.

20

The IPL configuration file that has been activated specifies a swapped connection with the FCV port address or one of the unaddressable port addresses associated with the FCV logic card. This is an invalid configuration and must be corrected before the FCV port can be activated. Refer to Chapter 3, "Port Swap Procedure" on page 3-45. Exit MAP.

21

The FCV logic card is being held offline because the number of FCV logic cards supported by the 9032 Model 5 has been exceeded. A maximum of sixteen (16) FCV logic cards may be installed at any one time. Remove the extra FCV logic card(s) to correct this problem.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Exit MAP.

22

The FCV logic card is being held offline because one or more MXC logic cards are not of the correct type. IBM part number 07H5972 or later MXC2(s) must be installed in one (non-redundant) or both (redundant) MXC slots. Remove the MXC that is not at the correct level and install the correct MXC2 (MES feature code 5700). Exit MAP.

23

"S" or "Service" displayed

Note: As a special case, *all* of the service required (SR) lights may be on for a port card, or all of the SR lights may be on for a pair of two adjacent port cards. This condition indicates that a "Stuck Interrupt" exists for one of the cards in the pair. If this condition exists, call your next level of support.

From the active matrix window, select *Director Event Log* from the *Maintenance* pull-down menu.

Locate the event titled "Port Error" with the format "1B/x4nn", "1B/x5nn", "1B/xFnn", "1B/xCnn", or "1B/xDnn" where "nn" is the port number showing service required or degraded mode.

Note: The time and date of the entry should match or closely match the time and date of the customer's problem.

Examine the Director event log for an additional "port error" entry occurring at approximately the same date and time. For example:

Port error 1B/24**BE** 4/1/99 12:39:31 PM
1000E000 00001B04 0501224C 4A3F01BE 004004FF 00000000 0094 8E24 40004000

Port error 1B/24**94** 4/1/99 12:39:30 PM

1000E000 00001B04 0501224C 4A3F0194 004004FF 00000000 00BE 0E24 40004000
Are there port errors logged for more than one port in the Director event log at the same time?

YES	**NO**
↓	Go to step 30.

24

For both port error entries in the Director event log, examine sense byte 25 for the connected port number.

To examine the sense bytes:

1. Press the *Entry* button on the operator panel to scroll through events in the event information queue.
2. When the active event appears (for example Active=ic/xynn), press the *Detail* button to display the nine lines of event detail (one line each time that you press the button). Pressing the button once displays the event's date. Keep pressing the button until the following appears:

   SB22=xx xx xx xx, where xx represents data in sense bytes 22, 23, 24, and 25

Note: Port number "FF" indicates an embedded port. If sense byte 25 equals FF, go on to step 29.

Is the connected port number equal to the port number of the other port error event?

YES **NO**

↓ Go to step 29.

25

There is a problem in the path between the two ports currently in service required or degraded mode. This problem could reside on the MXC/S/S, the DVP or FCV logic card, or the logic board assembly. Further troubleshooting is necessary.

Are there two ports available for a port swap?

Note: For ESCON ports, the extreme left port card slot in the upper left quadrant of port cards is designated as a spare ports card slot. IA spare ports card only contains four ports. If a spare ports card is not installed, or if installed but all ports are connected, you can use any other unused ports on installed port cards of the same technology type as spares.

Note: An FCV port card has one physical FICON fiber port. Ports on FCV port cards may be temporarily swapped to other unused FCV ports to allow maintenance to be rescheduled to allow non-disruptive maintenance operations and MAP continuation.

YES **NO**

↓ Go to step 28.

26

Using the *Port Maintenance* window, select the *Swap Port* option from the *Maintenance* menu to swap the ports in service required (S) mode with available ports. Do **not** select the *Unblock After Swap* option. When swapping ESCON ports, swap to a port on the spare ports card if it is available. Unblock each of the two ports after you swap **both** ports. Verify that the original failing port addresses (now associated with new physical ports) are unblocked and that the unit is online.

Did the problem move with the cable? Does the physical port that the port address was swapped to now indicate service (S)?

YES	**NO**
↓	Go to step 28.

27

Note: The amber indicators on port cards illuminate on a per port basis each time the Director determines a problem exists that requires a port to be placed in service required (S) mode. The hardware status column indicator for that port in the Console active matrix window also indicates ”S” to let the Console operator determine the mode of that port. The purpose of this indicator is to notify an observer, customer, or CE that a problem has been detected by the Director and the continued operation of the specific port has been stopped. Intervention by a CE is required. The most common intervention is to replace the port card.

Use the *Swap Port* option to swap back to the original port.

Clear the service required (S) mode on both the original and swapped ports, using the xpmdbg command. See Appendix E for commands and procedures.

Perform MAP 9600 and return here.

If MAP 9600 DID NOT find the problem, refer to the *Enterprise Systems Connection Link Fault Isolation Manual* (SY22-9533) for further analysis. Then return here when completed.

If the port is no longer in service required (S) mode, go to step 1.

If the port still indicates it is in service required (S) mode, call your next level of support.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

28

Run online diagnostics for both ports in service required.

Select *Port Maintenance* from the *Maintenance* menu.

Select *Port Diagnostics* from the *Maintenance* menu.

Select *ESCON* or *FICON*.

Enter a maintenance authorization password when prompted.

If diagnostics are being run against ESCON ports, execute the online diagnostic test *Matrix* for the ports in question. If the diagnostics are being run against a FICON port, insert a loop back plug into the port and then run diagnostics. Refer to “Port Diagnostics” on page 2-103 for further information.

Do the Online Diagnostics pass?

NO	YES
↓	An abnormal fault condition exists. Call next level of support.

29

Remove and replace the port card containing the suspected port. For removal and replacement procedures refer to Chapter 3, “Port Cards” on page 3-37. Note that other ports on this port card will be affected. Take appropriate precautions.

Return to step 1 of this map.

30

Is this the second time at this step for this port number?

YES	NO
↓	Go to step 32.

31

Has the port card for this port been replaced recently for this service action?

NO	YES
↓	Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.
↓	Call your next level of support for further action and analysis.

32

Is a port available for a port swap?

Note: For ESCON ports, the extreme left port card slot in the upper left quadrant of port cards is designated as a spare ports card slot. If installed, it will only contain four ports on that card. If that spare ports card is not installed, or if installed but all ports are connected, any other unused port on installed port cards of the same technology type can be used as a spare.

YES **NO**

↓ Go to step 35.

33

Using the *Port Maintenance* window, select the *Swap Port* option from the *Maintenance* menu to swap the port in service required (S) mode with an available port. Select the *Unblock After Swap* option. Swap to a port on the spare ports card if it is available. After you swap the ports, verify that the original failing port address (now associated with a new physical port) is unblocked and that the unit is online.

Did the problem move with the cable? Does the physical port that the port address was swapped to now indicate service required (S) or degraded (D) mode?

YES **NO**

↓ Go to step 35.

34

Note: The amber indicators on port cards illuminate on a per port basis each time the Director determines a problem exists that requires a port to be placed in service required (S) mode. The hardware status column indicator for that port in the Console active matrix window also indicates ”S” to let the Console operator determine the mode of that port. The purpose of this indicator is to notify an observer, customer, or CE that a problem has been detected by the Director and the continued operation of the specific port has been stopped. Intervention by a CE is required. The most common intervention is to replace the port card.

Use the *Swap Port* option to swap back to the original port.

Clear the service required (S) mode on both the original and swapped ports, using the xpmdbg command. Refer to Appendix E for commands and procedures.

Perform MAP 9600 and return here.

If MAP 9600 DID NOT find the problem, refer to the *Enterprise Systems Connection Link Fault Isolation Manual (SY22-9533)* for further analysis. Then return here when completed.

If the port is no longer in service required (S) mode, go to step 1.

If the port still indicates it is in service required (S) mode, call your next level of support.

35

Remove and replace the port card containing the suspected port. For removal and replacement procedures refer to Chapter 3, “Port Cards” on page 3-37. Note that other ports on this port card will be affected. Take appropriate precautions.

Return to step 1 of this map.

36

“D” or “Degrad” displayed.

FCV logic cards only

If a degraded status occurs, the FCV port card may be operating at a level where performance (such as data transfer rates) is reduced. Performance may reduce still further in the future. Schedule a time with the customer to replace the card as soon as possible.

Refer to Chapter 3, “Port Cards” on page 3-37 for replacement instructions.

Exit MAP.

37

“U” or “Unaddr” displayed

FCV logic cards only

An FCV logic card takes the place of one ESCON port logic card. The ESCON port logic card contains eight addressable ports.

When an FCV logic card is inserted into the 9032 Model 5 Director, only one of the eight ports is addressable. The remaining seven ports display “Unaddr” or “U” in the hardware status column of the active matrix. This is a normal condition.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Exit MAP.

38

“T” or “Thrshld” displayed

Under some circumstances, externally produced link and device level errors on a port may cause the ESCON Director to allocate excessive control device resources for servicing the port. In order to protect resources required for other functions, the control device will count the number of link and device level errors which occur in a given time interval. If the count exceeds a prescribed threshold, the port will be taken offline creating an error threshold exceeded condition.

In most cases, correction will require a repair action on the device attached to the other end of the link. In these cases, action should be taken at the local Console to cause the error threshold exceeded bit to be reset. The bit may also be reset by issuing a *Unblock* command requesting that the port be unblocked. The error threshold exceeded bit will also be reset whenever a power-on of the ESCON Director takes place. If the condition is not corrected before the bit is reset, the detection mechanism will set the bit again when the threshold has been exceeded.

The entry that is posted to the event log and event displayed on the Director operator panel, "1E/20nn" (where nn is the port number), may be posted twice. When the error threshold exceeded event occurs, the port is taken offline and then is immediately brought back online. This verifies that the errors were not caused by a transient disturbance. If the error threshold exceeded event occurs again, the port is blocked and a second event is posted to the Director operator panel and the event log. User intervention is required to clear this state.

Clear the events from the Director operator panel and correct the error at the device end. When you believe the errors have been corrected, unblock the port and monitor for further errors. For instructions, refer to the section later in this chapter “Unblock Port Procedure” on page 2-130. If the error returns, contact your next level of support. Exit MAP.

39

“G” or “Logout” displayed.

FCV Logic Cards Only

This is not a card fault. The associated S/390 server has performed an explicit logout, and all internal ESCON ports on the FCV port card are set offline. Ask the system operator to perform an explicit login at the server.

Exit MAP.

40

Status is blank in the hardware status column of the active matrix.

Note that there may have previously been an “S” in this column, but it was cleared by a customer IML or power-on reset, including an IPL from the Console.

At the Console, select the *Director Event Log* option from the *Maintenance* menu.

Between the time the customer opened the call and the current time, search the event log for entries with hexadecimal x4 in byte 10 and a hexadecimal x0E or x0F in byte 11.

Have any IMLs (Byte 11= x0E) or power resets (Byte 11=x0F) occurred since the customer reported the problem on the suspected port?

YES	NO
↓	Go to step 42.

41

View the LIN log and the Director event log. Analyze port reported errors and matrix reported errors before the time the customer reported the problem. Identify problems that may have illuminated the “service required” LED for a port.

The “S” light was on at one time but is off now, and has not come back on after an IML or power-on reset. This may indicate a transitory problem that was external to the Director and is now cleared. If multiple occurrences are observed on a port or the “S” light on and the problem is not due to external causes, replace the port card.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Exit MAP.

42

Are you here because you cleared a previous status condition in the hardware status column?

NO	YES
↓	Go to step 54.

43

View the active matrix window.

Select *Director Event Log* from the *Maintenance* pull-down menu.

Examine the event log for an entry of “1B/2Fnn” where “nn” is the port number you suspect as having a problem.

Does the log contain an entry of “1B/2Fnn”?

YES **NO**

↓ Go to step 45.

44

A recoverable logic failure has occurred. Perform the data collection procedures later in this chapter (refer to “Collect Maintenance Information” on page 2-102) and mail the data collection diskette to Poughkeepsie Product Engineering for analysis. Be sure to include the Director serial number and the date and time of the error.

If this is your second time at this step, replace the FCV logic card. For instructions, refer to Chapter 3, “Port Cards” on page 3-37. Note that other ports on this port card will be affected. Take appropriate precautions.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Exit MAP.

45

View the active matrix window.

Select the *Maintenance* option.

Select *LIN Log*. Does the log indicate an implicit event at the time the customer reported the problem?

YES **NO**

↓ Go to step 49.

46

Go to MAP 9600 then return here when completed.

If performing MAP 9600 found or fixed the problem, return to step 1.

If the problem is unsolved, continue this MAP.

Note: In the following action you are instructed to execute the matrix test for the port in question. It is important to understand that you **must** execute the test for only one port at a time. Do not start the test on one port, then start another and so on. If you desire to test multiple ports, start the test for one port, then stop that execution before starting the next.

Run the matrix test from the *Port Diagnostics* dialog box on the Console. Refer to "Port Diagnostics" on page 2-103 for procedures.

Does the matrix test pass?

YES	NO
↓	Go to step 48.

47

Call your next level of support.

Return to step 1.

48

Remove and replace the card containing the failing port. For instructions, refer to the removal and replacement procedures in Chapter 3 for "Port Cards" on page 3-37.

Return to step 1.

49

Does the log indicate one of the following? (See Appendix A, "Incident Codes and Sense Data Summary" for details.)

- 03 Loss of signal (LOS) or Synchronization
- 04 Not operational sequence (NOS) received
- 05 Sequence time-out
- 06 Invalid sequence

NO **YES**

↓ Go to MAP 9600, then return here when completed.

Return to step 1.

50

Does the incident code in the LIN log refer to bit error rate threshold exceeded?

YES **NO**

↓ Go to step 54.

51

Look for sub-threshold bit errors (BER) in the event log at the Console. To do this, select *Director Event Log* from the *Maintenance* menu on the active matrix window for the Director. An example of a sub-threshold BER from the event log follows:

```
Sub-threshold bit error (BER) ID/0033    11/26/98    4:22:15 PM
20009800 00001D04 05010909 80310033 37010005 00050001 00000000 00000000
```

If this is your second time at this step, contact your next level of support.

Go to MAP 9600; return here when completed.

Any BERs reported?

YES **NO**

↓ Go to step 54.

52

Refer to the *Enterprise Systems Connection Link Fault Isolation Manual (SY22-9533)* for further analysis. Return here when completed.

Has the problem been isolated?

YES **NO**

↓ Go to step 54.

53

Go to step 42.

54

If this is your second time at this step, contact your next level of support.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Exit MAP; operations have returned to normal.

MAP 9600: Link Checkout Procedure

Note: This MAP is designed to analyze and verify the fiber links and hardware interfaces of the Director. Usually other MAPs will direct you here, but it can also be used during installation or general link analysis.

1

Verify the transmit and receive signal levels.

Refer to “Transmitter and Receiver Power Measurements for LED Ports” on page 2-144 or “Transmitter and Receiver Power Measurements for Laser (XDF) and FICON Ports” on page 2-147 for procedures.“

Is the transmitter power signal level within specification?

YES	NO
↓	Go to step 8.

2

Is the receiver power signal level within specification?

NO	YES
↓	Go to step 4.

3

If this is your second time at this step, refer to the *Enterprise Systems Connection Link Fault Isolation Manual (SY22-9533)* for further analysis. Return here when completed.

If this is your first time at this step, clean the fiber optic cables and ports on the port card according to prescribed procedures.

Run FCV or DVP diagnostics on the card. Refer to steps in “Port Diagnostics” on page 2-103 for procedures.

Return to step 1.

4

View the active matrix window.

Select *Maintenance.*

Select *Port Maintenance.*

Select *Port Diagnostics* under the *Maintenance* menu.

Select *ESCON or FICON.*

Execute the online diagnostic test external loopback (EXT) for ports in question. Refer to “Port Diagnostics” on page 2-103.

Do the tests pass?

NO	YES
↓	Go to step 6

5

For instructions on how to remove and replace the port card with the failing port, refer to “Port Cards” on page 3-37.

Return to step 1.

6

Clean the fiber optic cables and ports on the port card before reinstalling the fiber cables.

Is there an “S” in the hardware status column of the active matrix for the port under test?

YES	NO
↓	Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.
↓	Exit MAP or return to the MAP that directed you here.

7

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Select *Maintenance.*

Select *Advanced.*

Select *Terminal* from the *Advanced* menu.

Clear the service required (S) mode on the port using xpmdbg 6 nn, where “nn” is the port number in question. Refer to Appendix E for information on the ’xpmdbg’ command options and procedures.

Exit MAP or return to the MAP that directed you here.

8

If this is your second time at this step, refer to Chapter 3 under “Port Cards” on page 3-37 for removal and replacement procedures of the port card under test. Follow the usual precautions for removing a DVP or FCV port card with possible traffic through any of the ports.

If this is your first time at this step, clean the fiber optic cables and ports on the port card according to prescribed procedures.

Return to step 1.

MAP 9700: Console Application or Hardware Problem

This MAP is designed to assist in determining a possible 9032 Model 5 Console application problem or hardware problem. It is divided into four sections: application messages, application lockup, user interface problem, and hardware problem.

1

Did you receive a message from the application that an error or problem occurred?

YES	NO
↓	Go to step 7.

2

Write down the messages.

Collect maintenance information. (Refer to "Collect Maintenance Information" on page 2-114 for the procedure.) Return here when completed.

At the OS/2 desktop, restart the application by clicking on the *Console Application* icon.

Retry the operation that gave you the error or message.

Does the message still appear?

NO	YES
↓	Go to step 4.

3

Operations appear to have returned to normal.

If this is your second time at this step, contact your next level of support.

Go to MAP 9000.

4

The problem still exists. If possible, close the application, power the PC off and on again, and retry the operation.

If powering off is not possible, contact your next level of support.

Did the problem still appear after powering the PC off and on?

YES **NO**

↓ Go to step 6

5

If this is your second time at this step, contact your next level of support.

Go to step 17 and eliminate hardware as the problem.

6

Operations appear to have returned to normal.

If this is your second time at this step, contact your next level of support.

Go to MAP 9000.

7

Did the Console application lock up?

YES **NO**

↓ Go to step 11.

8

Record any available information, including steps leading up to the lockup.

Collect maintenance information. (Refer to “Collect Maintenance Information” on page 2-114 for the procedure.) Return here when completed.

At the OS/2 desktop, restart the application by clicking on the *Console Application* icon.

Did the application restart?

YES **NO**

↓ Go to step 10.

9

The application restarted. Conditions returned to operational.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

If this is your second time at this step, contact your next level of support.

Go to MAP 9000.

10

Possible Console PC hardware problem.

Go to step 17.

11

Did the user report a problem with the user interface functions?

For example:

A configuration parameter not taking effect.

A selection on a menu item not executing.

YES **NO**

↓ Go to step 17.

12

Record any available information, including the exact steps necessary to recreate the problem.

Collect maintenance information (“Collect Maintenance Information” on page 2-114 for the procedure). Return here when completed.

At the OS/2 desktop, restart the application by clicking on the *Console Application* icon.

Retry the operation that gave you the error or message.

Does operation still fail?

NO **YES**

↓ Go to step 14.

13

The application restarted. Conditions returned to operational.

If this is your second time at this step, contact your next level of support.

Go to MAP 9000.

14

The problem still exists. If possible, close the application, power the PC off and on again, and retry the operation.

If powering off is not possible, contact your next level of support.

Did the problem still appear after powering the PC off and on?

YES **NO**

↓ Go to step 16.

15

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

If this is your second time at this step, contact your next level of support.

Go to step 17 and eliminate hardware as the problem.

16

Operations appear to have returned to normal.

If this is your second time at this step, contact your next level of support.

Go to MAP 9000.

17

If you suspect a PC or hardware problem, it is recommended that you contact the manufacturer of the equipment as they are the best resource for problem determination and resolution.

You can use these problem determination actions to eliminate hardware as the problem:

1. Close any applications that are not immediately required.
2. Re-boot the PC (only if not previously rebooted).
3. Ensure that enough free memory exists to run the Console application. Refer to Chapter 1 for memory requirements and Chapter 6 for procedures for displaying the memory size on the PCs furnished as a part of Director orders. If you are not running IBM PCs, refer to the appropriate documents for displaying memory size on OEM PCs.
4. Execute the PC's standalone diagnostics (if any). Refer to the appropriate PC manual for instructions on running diagnostics.

Did the diagnostics indicate a problem with the PC?

NO **YES**

↓ Refer to the documentation for the PC to resolve the problem.

18

Perform the following steps:

1. Reload OS/2 from CD-ROM. For instructions, refer to the backup and restore procedures for your console type in *S/390 Console Installation and User Guide (GA22-7291)*.
2. Reload the *Console application* program from diskette (see Chapter 6).

If the problem is not resolved, contact your next level of support.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Go to MAP 9000.

MAP 9800: Power-On Error Events

This MAP is designed to assist you in determining which power-on faults are significant and which ones mirror a previously repaired failure condition.

Each CTP card contains an area of memory that logs events that occur during the power-on sequence. When an event or error is detected, an error code is stored in the PLOG. PLOG entries and the associated events displayed on the operator panel are caused by a power-on diagnostic failure only.

The operator panel displays these events with an incident code of 20 in Event=20/xynn. These events may be catastrophic (requiring immediate intervention), minor (requiring flagging and the scheduling of repair time), or informational (recoverable error occurred, requiring no further action).

These events are detected and reported by the execution of the power-on diagnostics, as well as the initial loading of the LIC. The LIC will analyze the entries in the PLOG and create individual entries for each FRU identified as failing during the power-on diagnostic testing.

Once the LIC is initialized and comes online, it may also detect the same failure in the system. This means that you may observe two separate events that point to the same failure.

1

Is there an Event=20/5ynn displayed on the operator panel? (Refer to the “Error Recognition and Recording” section of MAP 9100 for an explanation of the code.)

YES	NO
↓	Go to step 28.

2

Is there an Event=20/51nn?

YES	NO
↓	Go to step 4.

3

The event code indicates the matrix controller had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance menu.*

On the *Maintenance menu,* select the *Port Maintenance* option. View the status of the MXC card. The MXC may indicate “Failed” if the LIC also determined that the MXC failed.

Replace the failing MXC card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Matrix Controller or Matrix Switch Cards, Nonredundant” on page 3-29 or “Matrix Controller or Matrix Switch Cards, Redundant” on page 3-31.

4

Is an Event=20/52nn displayed on the operator panel?

YES	NO
↓	Go to step 6.

5

The event indicates the control processor (CTP) had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the CTP card. The CTP may indicate “Failed” if the LIC also determined the CTP failed.

Replace the failing MXC card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Matrix Controller or Matrix Switch Cards, Nonredundant” on page 3-29 or “Matrix Controller or Matrix Switch Cards, Redundant” on page 3-31.

6

Is there an Event=20/53nn?

YES	NO
↓	Go to step 8.

7

The event indicates a matrix switch (MXS) had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the MXS card. The MXS may indicate “failed” if the LIC also determined the MXS failed.

Replace the failing MXS card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Matrix Controller or Matrix Switch Cards, Nonredundant” on page 3-29 or “Matrix Controller or Matrix Switch Cards, Redundant” on page 3-31.

8

Is there an Event=20/54nn displayed on the operator panel?

YES	NO
↓	Go to step 10.

9

The event code indicates a LED device port (DVP) card had an error at power-on. If there are multiple 20/54nn events, another card may be responsible. Call your next level of support.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the port card. The port card may indicate “Failed” if the LIC also determined the port card failed.

Replace the failing port card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Port Cards” on page 3-37. Note that other ports on this port card will be affected. Take appropriate precautions.

10

Is there Event=20/55nn displayed on the operator panel or an 20/55nn posted in the event log?

YES	NO
↓	Go to step 12.

11

The event code indicates a that a laser device port (LDVP) card had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the LDVP card. The LDVP may indicate “Failed” if the LIC also determined the DVP failed.

Replace the failing LDVP card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Port Cards” on page 3-37. Note that other ports on this port card will be affected. Take appropriate precautions.

12

Is the event 20/57nn?

YES	NO
↓	Go to step 1.

13

The event code indicates a fan assembly failed at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the fan Assembly. The fan may indicate “failed” if the LIC also determined that the fan failed.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Replace the failing fan assembly. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Fan Assembly” on page 3-59.

14

Is there an Event 20/58nn displayed on the operator panel?

YES	NO
↓	Go to step 16.

15

The event code indicates a power supply assembly failed at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the power supply. The power supply may indicate “failed” if the LIC also determined the power supply failed.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Replace the failing power supply. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Power Supply” on page 3-55.

16

Is there an Event=20/59nn displayed on the operator panel an 20/59nn posted in the event log?

YES **NO**

↓ Go to step 18.

17

The event code indicates the Director detected a problem with the Console link at power-on.

At the Console, view the active matrix window for the suspected Director.

If a green lightening bolt is on the bottom left of the screen, the Console connection is working properly.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Use the buttons on the operator panel to clear the event codes that caused you to enter this section of this MAP. For help, refer to "Clearing Events" on page F-13.

Exit MAP.

If the Console is not connected to the Director, go to MAP 9200.

18

Is there an Event=20/5Ann displayed on the operator panel?

YES **NO**

↓ Go to step 20

19

The event code indicates that the Token-Ring adapter had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the TKRG card. The TKRG may indicate “Failed” if the LIC also determined the TKRG failed.

Replace the failing TKRG card. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Token-Ring Controller Adapter Card, Nonredundant” on page 3-48 or “Token-Ring Controller Adapter Card, Redundant” on page 3-51.

20

Is there an Event=20/5Bnn displayed on the operator panel or an 20/5Bnn posted in the event log?

YES	**NO**
↓	Go to step 22.

21

The event code indicates the operator panel had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the operator panel (PAN) card identified by the yy entry in the event code (yellow = Failed). The PAN may indicate “Failed” if the LIC also determined the PAN failed.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Replace the failing operator panel. For instructions, refer to the removal and replacement procedures in Chapter 3 for “Front Panel” on page 3-63.

22

Is there an Event=20/5Cnn displayed on the operator panel or an 20/5Cnn posted in the event log?

YES	NO
↓	Go to step 24.

23

The event code indicates the LED spare port card (SDVP) had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the LED spare port card (SDVP). The SDVP may indicate “failed” if the LIC also determined the SDVP failed.

Go to MAP 9500 to determine current port status, swap to a spare port if possible, and replace the SDVP in that MAP if necessary.

24

Is there an Event=20/5Dyy displayed on the operator panel or an 20/5Dnn posted in the event log?

YES	NO
↓	Go to step 26.

25

The event code indicates the LED/laser spare port card (SDV2) had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the LED/Laser spare port card (SDV2). The SDV2 may indicate “failed” if the LIC also determined the SDV2 failed.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Go to MAP 9500 to determine current port status, swap to a spare port if possible, and replace the DVP card if that MAP requires replacement.

26

Is there an Event=20/5Eyy displayed on the operator panel or an 20/5Enn posted in the event log?

YES	NO
↓	Go to step 28.

27

The event code indicates the logic board had an error at power-on.

At the Console, view the active matrix window for the suspected Director.

Pull down the *Maintenance* menu.

On the *Maintenance* menu, select the *Port Maintenance* option. View the status of the logic board. The logic board assembly (LBA) may indicate “failed” if the LIC also determined that the LBA failed.

Do not replace the logic board assembly! Call your next level of support to assist in analyzing the extent of the problem.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

28

If this is your second time at this step, call your next level of support, as further analysis is required.

Check for other events displayed on the front panel and write them down. Use the *Entry* button to scroll through entries in the event log.

Return to the MAP 9100 or MAP 9300 (whichever of the two MAPs directed you to this procedure).

MAP 9900: Link and Device-Level Errors

Under some circumstances, external link and device level may cause the ESCON Director to allocate excessive control resources for servicing the port. In order to protect resources required for other functions, the Director will count the number of link and device-level errors which occur in a given time interval. If the count exceeds a prescribed threshold, the port will be taken offline, creating an error threshold exceeded condition.

In most cases, correction will require a repair action on the device attached to the other end of the link. In some cases, action taken at the local console may cause the error threshold exceeded bit to be reset. The bit may also be reset by issuing an *Unblock* command requesting that the port be unblocked. The error threshold exceeded bit may also be reset whenever a power-on of the ESCON Director takes place. If the condition is not corrected before the bit is reset, the detection mechanism will set the bit again when the threshold has been exceeded. This results in the posting of another event.

The event that is posted to the event log and also to the director operator panel, "1E/20nn" (where nn is the port number), may be posted twice. When the error threshold exceeded event occurs, the port is taken offline and then is immediately brought back online, this verifies that the errors were not caused by a transient disturbance. If the error threshold exceeded event occurs again, the port is blocked and a second event is posted to the Director operator panel and the event log. User intervention is required to clear this state.

Perform the following steps:

1. Correct the error at the device end of the link.
2. Clear the events from the Director operator panel and correct the error at the device end.
3. Unblock the port and monitor for further errors. Refer to page "Block Port Procedure" on page 2-128 and "Unblock Port Procedure" on page 2-130 for instructions.
4. If the error returns, contact your next level of support.

Exit MAP.

Maintenance Information and Utilities

Maintenance procedures, information to aid in troubleshooting, and utilities for a specific Director are available through menus in the active matrix window on the Console. Utilities and information are available through commands you enter through the *Terminal* window. Access the *Terminal* window through the *Maintenance* menu in the Director's active matrix window.

On the Console, select all maintenance procedures, utilities, and information from the following menus:

- Maintenance.
- Utility.
- Help.

Figure 2-1 through Figure 2-3 show these menus for the active matrix window.

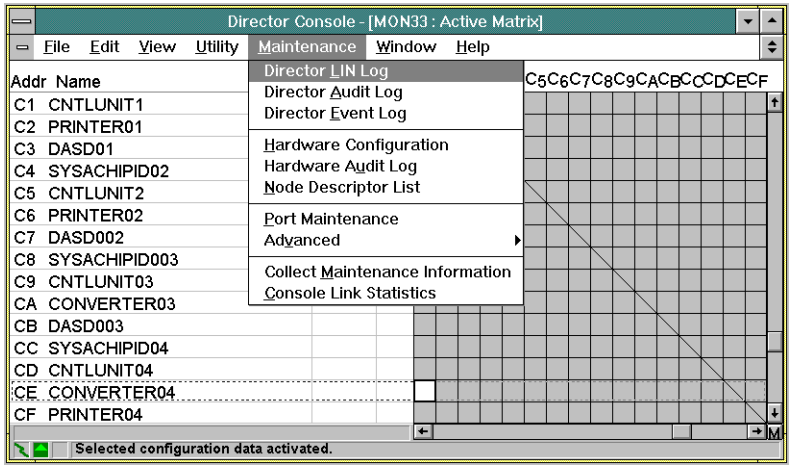


Figure 2-1. Maintenance Menu from Active Matrix Window

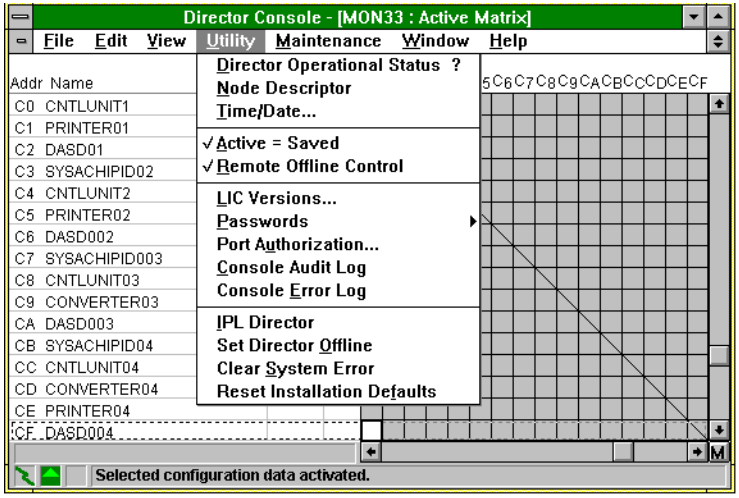


Figure 2-2. Utility Menu from Active Matrix Window

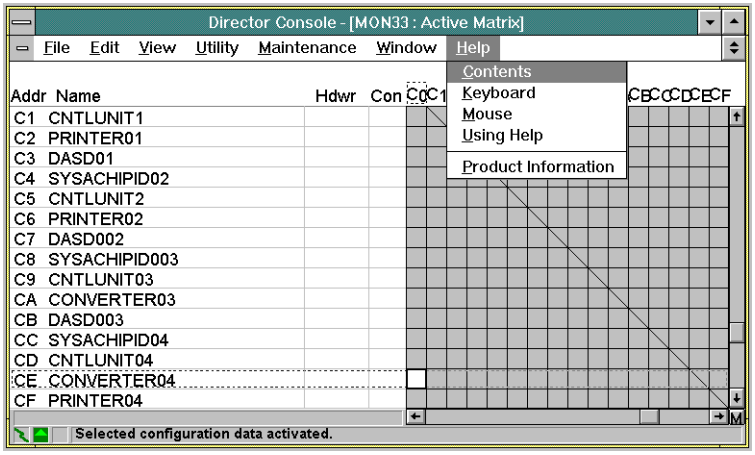


Figure 2-3. Help Menu from Active Matrix Window

Maintenance Authorization

Access to the following menu options requires a maintenance authorization password (the default is LEVEL002):

- *New Director*, *Modify Definition*, and *Delete Definition* options accessed through buttons on the *Select Director for New Matrix* and *Select Director for Active Matrix* dialog boxes.
- *LIC Versions* option from the *Utility* menu of the new, active, and saved matrix windows and the *Port Maintenance* window.
- *Director Event Log* option from the *Maintenance* menu of the active matrix and *Port Maintenance* windows.
- *Swap Ports* option of the *Maintenance* menu of the *Port Maintenance* window.
- *Terminal* option of the *Advanced* option from the *Maintenance* menu of the active matrix and *Port Maintenance* windows.
- *LMA Versions* option of the *Advanced* option from the *Maintenance* menu of the active matrix and *Port Maintenance* windows.
- *Port Diagnostics* option from the *Maintenance* menu of the *Port Maintenance* window.
- *Clear System Error* option from the *Utility* menu of the active matrix window.
- *Clear option* from the *File* menu of the *Director Audit, Event, and LIN Log* windows.
- Reset Installation *Defaults* option from the *Utility* menu of the active matrix window.

Selecting a Director

To select a Director and its active matrix window:

- Pull down the *File* menu from the Console's *Startup* window or a matrix window, and select *Open Active Configuration Matrix*.

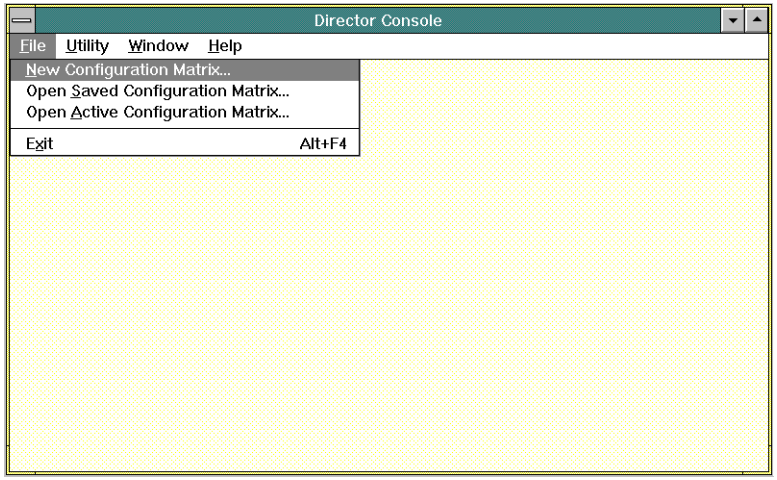


Figure 2-4. File Menu from Startup Window

- Select a Director from the list in the *Select Active Director* dialog box by double-clicking the Director name or by highlighting the appropriate Director and clicking the *OK* button.

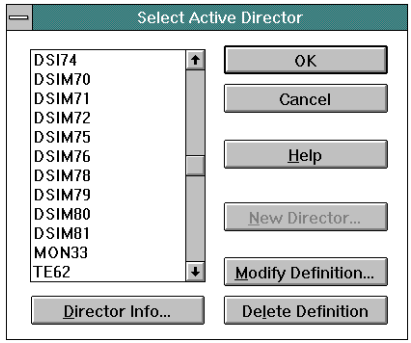


Figure 2-5. Select Active Director Dialog Box

The active matrix window appears for the Director.

Note: If port authorization is enabled, the matrix is displayed as dark gray. It remains dark gray until a operator logs in (enters a valid operator level password) using the *Enable Operator* option of the *Edit* menu.

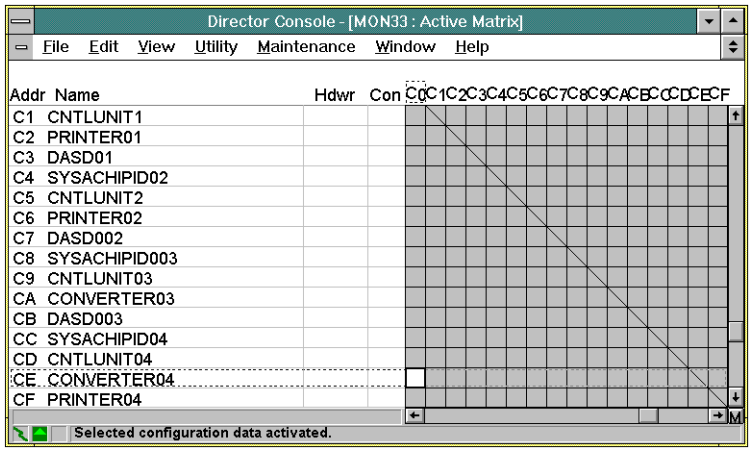


Figure 2-6. Active Matrix Window

The active matrix is the matrix currently controlling port connections on an attached Director. Attributes that control port connection appear in the columns and shaded grid on the right side of the window. Refer to *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296) for more information about configuring port connections.

Link status, Director status, and Director system error status also display along the Status line at the bottom of the window. Refer to "Console Status Line" on page 1-45 for more information.

You can access utilities and procedures for maintaining and servicing a specific Director through the Director's active matrix window.

Maintenance Menu Options

Figure 2-7 shows the options available from the *Maintenance* menu.

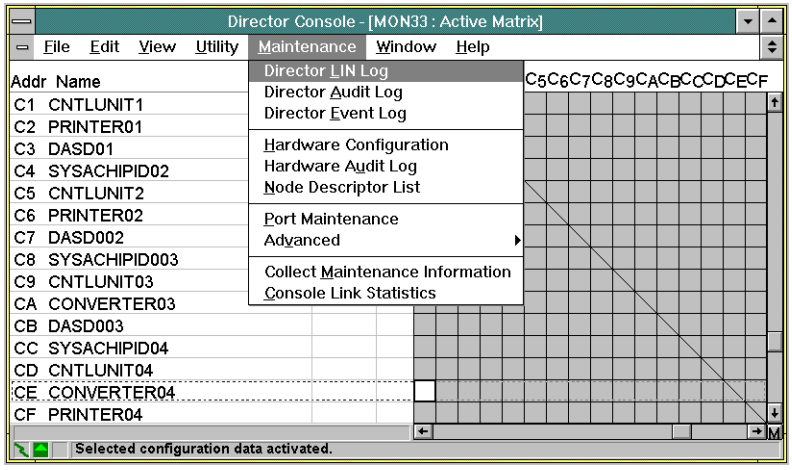


Figure 2-7. Maintenance Menu from Active Matrix Window

Director LIN Log

The Director LIN log contains link incident notification (LIN) records reported to the Console by the Director (Figure 2-8).

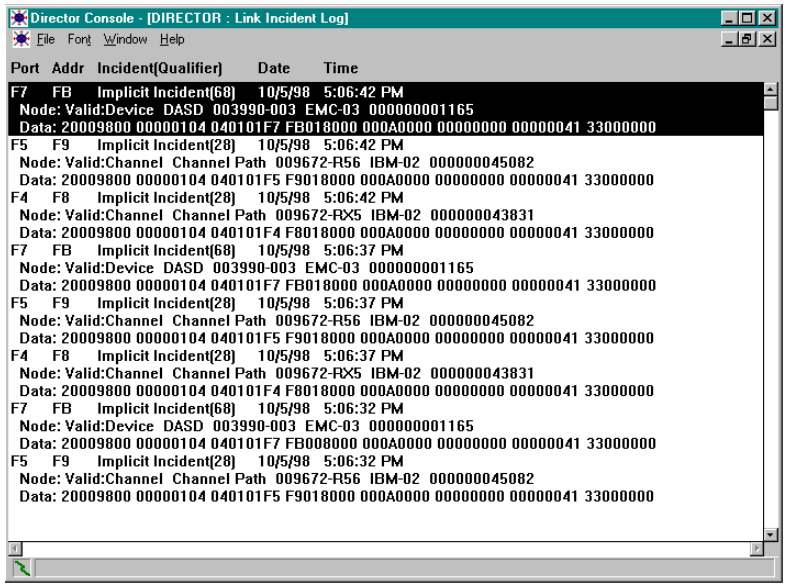


Figure 2-8. Director Link Incident Notification (LIN) Log

The first line of the three-line LIN log entry contains the following columns of information:

- **Port** - The number of the port reporting the incident
- **Addr** - The address of the port reporting the incident
- **Incident (Qualifier)** - Incident information reported by the port (used by engineering)
- **Date** - The date the incident was logged
- **Time** - The timestamp is based on when the Director sends the incident to the Console.

Note: The LIN log time is set to the Director time. If no link was established between the Console and the Director (such as at power on), the *Time* field is blank.

“Node” identifies the hardware attached to the port. The hardware is described in the same format as in the node descriptor list.

“Data” is the raw sense byte information. All 32 sense bytes are displayed. For details about sense data (including link incident codes), refer to Appendix A, “Incident Codes and Sense Data Summary.”

For a list of log messages and their meanings, refer to Appendix B, “Messages.”

Note: Information in the Director LIN Log is typically useful only to qualified service technicians troubleshooting a fiber optic link problem.

To save or print the data, refer to "Printing, Filing, and Clearing Logs" on page 2-97".

Director Audit Log

The Director Audit log (Figure 2-9) tracks and records Console operator activities specific to a Director.

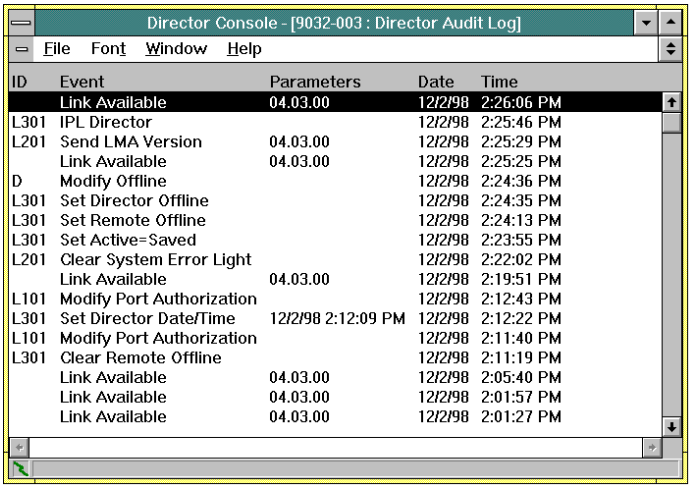


Figure 2-9. Director Audit Log

The following are examples of possible operator activities that are logged:

- Changing the active matrix or the “Active=Saved” state
- Changing the “Remote Offline Control” state
- Changing the Director date and time
- Performing a remote initial program load (IPL) of a Director
- Transmitting a new licensed internal code (LIC) version to a Director
- Modifying port authorizations.

The Director audit log contains the following columns of information:

- **ID** - The contents of this field depend on where the change was made:
  - Console - The password ID of the Console operator who performed the action.
  - ESCM - Image ID and port address.

– Front panel or monitor port - the letter 'D.'

- **Event** - A brief description of the action performed.
- **Parameters** - Any parameters, such as port number or matrix name associated with the action.
- **Date** - The date the action was logged.
- **Time** - The time the action was logged. The audit log *Time* field is set to Director time.

Note: If no link was established between the Console and the Director (such as at power-on), the *Time* field is blank.

To save or print the data, refer to "Printing, Filing, and Clearing Logs" on page 2-97".

Director Event Log

The Director event log (Figure 2-10) contains Director hardware and software events reported to the Console by the Director. This log also records changes to the state of the Token-Ring link between the Director and Console. Refer to Appendix A, "Sense Data Summary," for more information.

Before being given access to this function, you must enter a maintenance authorization password.

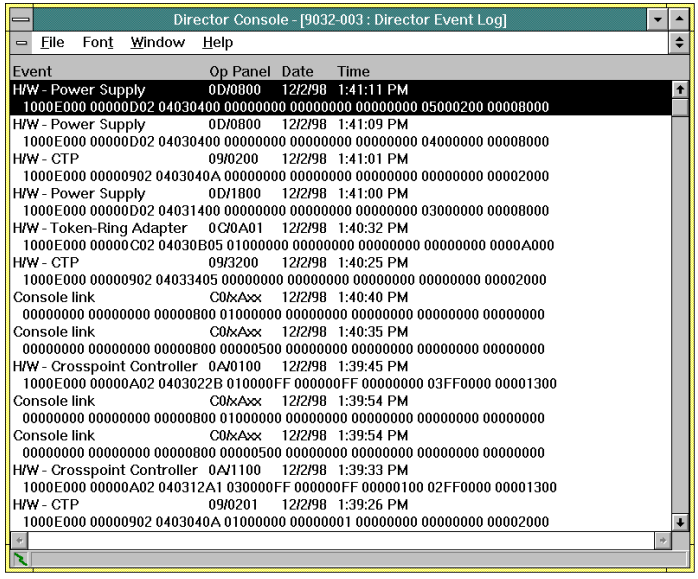


Figure 2-10. Director Event Log

The first line of the log entry contains the following columns of information:

- **Event** - A brief message describing the event. This response reflects the contents of the event code.
- **OP Panel** - This column mirrors the contents of the Director operator panel Status display.
- **Date** - The date the event was logged.
- **Time** - The time the event was logged.

The second line of the log entry contains the 32 bytes of raw sense byte information.

Note: Information in the Director event log is typically useful only to qualified service technicians troubleshooting a Director problem. For details, refer to Appendix A “Incident Codes and Sense Data Summary.”

To save or print the data, refer to refer to "Printing, Filing, and Clearing Logs" on page 2-97“.

Hardware Configuration

This window displays information on the hardware installed on the Director, including serial numbers, revision levels, IBM part numbers, and current operational (failure/active/backup) status of the hardware.

If a second control processor (CTP) card is installed as an Enhanced Availability feature, the status column for the backup CTP card may sometimes be blank or indicate “0” or “none.” This is normal and occurs after a Director initial machine load (IML) or IPL when the software resets. After the reset completes, the backup CTP card will not provide status data to the *Hardware Configuration* window for about five minutes. For more information on IPL and IML functions, refer to"IML and IPL Functions" on page 1-20.

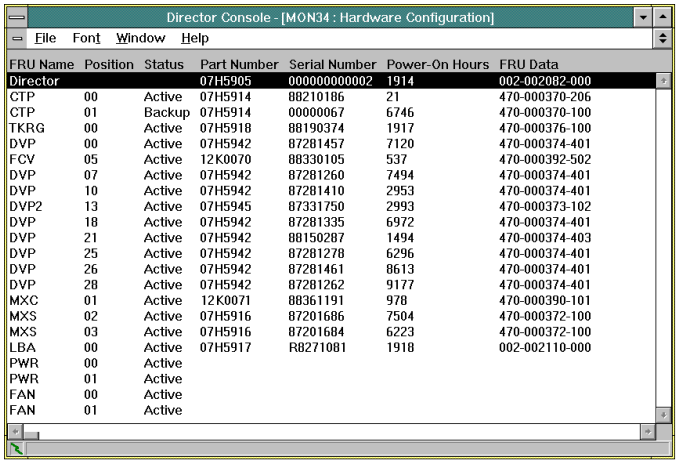


Figure 2-11. Hardware Configuration Window

The status column can contain the following entries that indicate the operational state of a field replaceable unit (FRU):

- **Active** - FRU is operational and active.
- **Backup** - FRU is operational and in a ready state, but is inactive.
- **Failure** - FRU has failed.

To save or print the data, refer to "Printing, Filing, and Clearing Logs" on page 2-97".

Hardware Audit Log

The hardware audit log (Figure 2-12) contains hardware configuration change history. The Console reevaluates hardware configuration information any time a FRU is added or removed. Changes that occur while the link between the Director and the Console is unavailable will be detected only when the link is reestablished. The Director cannot determine the difference between the removal or failure of a fan assembly or the removal of the operator panel. Consequently any changes made to the fan assembly will not appear in the hardware audit log. Changes made to the operator panel will appear in the hardware audit log after power-on or IML.

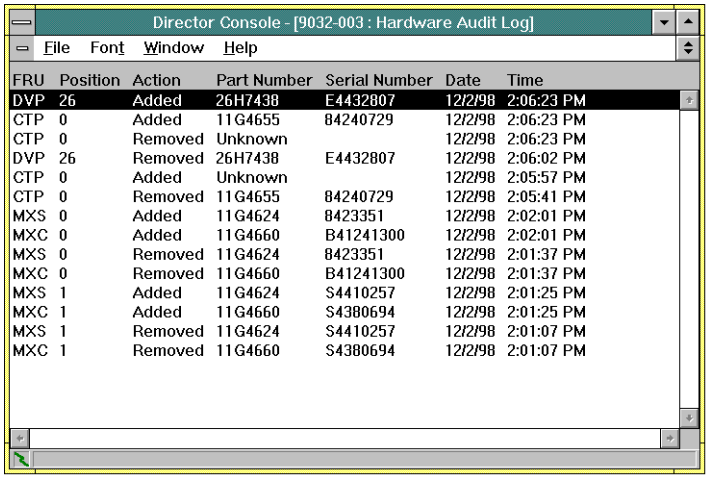


Figure 2-12. Hardware Audit Log

The hardware audit log includes the following columns of information:

- **FRU** - The designated name of the FRU that changed
- **Position** - The FRU's slot number
- **Action** - This indicates whether the FRU was added or removed
- **Part Number** - The part number for the FRU
- **Serial Number** - The serial number for the FRU
- **Date** - The date the change was detected
- **Time -** The time the change was detected.

Node Descriptor List

To display a list of descriptors of nodes connected to all Director ports, select *Node Descriptor List* from the *Maintenance* menu of the Director's active matrix window. Refer to "Displaying Node Descriptor" on page 2-137 later in this chapter for a description of the data displayed and procedures for displaying the node descriptor for individual ports. To save or print the list, refer to "Printing, Filing, and Clearing Logs" on page 2-97.

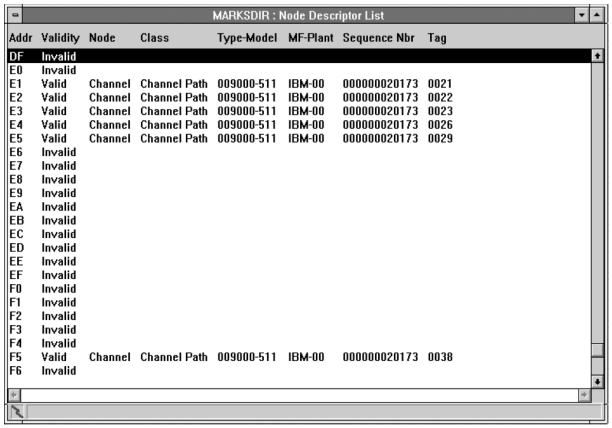


Figure 2-13. Node Descriptor List

Printing, Filing, and Clearing Logs

You can create a data file, print data, and clear data for the following options located under the *Maintenance* menu:

- Director LIN log
- Director audit log
- Director event log.

You can only create a data file and print data (you *cannot* clear data) while using the following options located under the active matrix and *Port Maintenance* windows:

- Hardware configuration
- Node descriptor list.

Use the following procedures to manipulate data from the displayed log window option:

To clear the log window of all data, select *Clear* from the window's *File* menu and enter the maintenance password when prompted. An entry is made in the Console audit log indicating the log was cleared.

To save a log to a file, use the following steps.

1. Select the *Save to File* option from the window's *File* menu. The *Save As* dialog box appears.

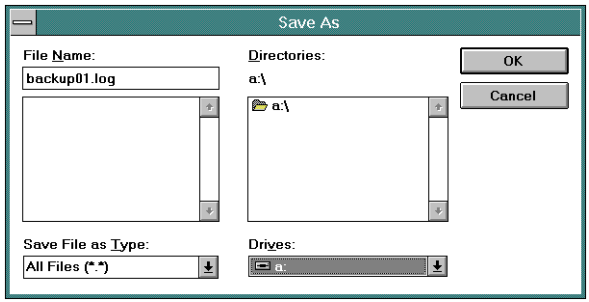


Figure 2-14. Save (Log) As Dialog Box

2. Click the scrolling arrow in the *Drives:* field to display all network drives. The *c:* drive is the hard drive and the *a:* drive is the diskette drive of the Console. If selecting the *a:* drive, make sure a formatted diskette is in the drive.
3. Click the drive to which the log file is to be saved. The directory structure of the selected drive is displayed in the *Directories:* field. The contents of the open directory are displayed in the window below the *File Name:* field.
4. Type in a file name and extension for the log file in the *File Name:* field.

   In Figure 2-14, an empty diskette is in drive a: The file name of the log file to be saved is "backup01.log."
5. Click the *OK* button. The *Save As* dialog box closes.

   Note: The log file is saved in the selected location (drive and directory) as an ASCII text file.

To print a log to a printer, use the following steps:

1. Select the *Print Setup* option from the window's *File* menu. The *Print Setup* dialog box appears.

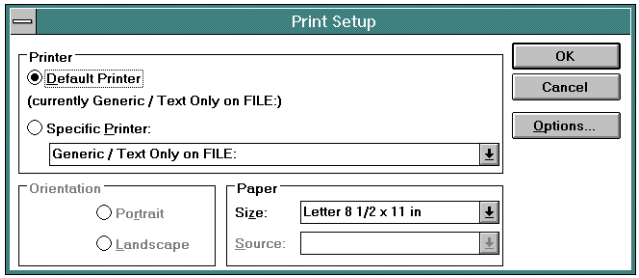


Figure 2-15. Print Setup Dialog Box for Maintenance Menu Logs/Windows

2. Select a printer on LPT1.OS2 by clicking the *Default Printer:* button or the *Specific Printer:* button. Select specific printers by clicking the arrow opposite the *Specific Printer:* field, and then clicking a listed printer.
3. Select *Landscape* or *Portrait* orientation by clicking the appropriate radio button in the bottom left corner of the dialog box.
4. Select a paper size (if supported by your printer) by clicking the arrow opposite *Size:*, and then clicking the appropriate page size.
5. Click the *OK* button to exit the *Print Setup* dialog box.
6. Select *Print* from the *File* menu.

Port Maintenance

The *Port Maintenance* window (Figure 2-16) visually represents current hardware configuration and port address mapping of the selected Director. The *Utility* and *Maintenance* menus on this window contain most of the menu options used to monitor the functions of the selected Director. The *Port Maintenance* menu options allow the user to swap logical port addresses, access all of the log windows and their options, IPL and set the Director offline, and access *Advanced* options such as *Terminal* window and *LMA Versions*.

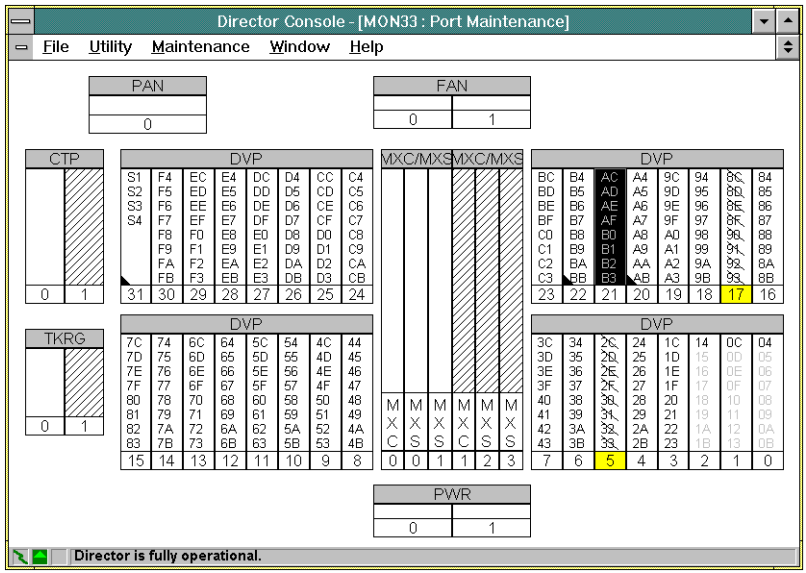


Figure 2-16. 9032 Model 5 Port Maintenance Window

You can distinguish the type of port cards by the following characteristics:

- FCV Port Card: The port card display shows the top logical port address as normal text, with the remaining seven port addresses grayed out (indicating the ports are unaddressable). FCV port cards are installed *only* in the 9032-005 Director.
- XDF Laser Port Card: The port card display has a black triangle in a lower left corner.
- LED Port Card: The port card display shows no distinguishing characteristics.

The following defines the shading and symbols that appear on all hardware components to indicate status:

- Component is black: Hardware is not currently installed. If this occurs and the hardware is installed, it may require service or it is installed incorrectly.
- Component is shaded (yellow on color monitors): The component requires service.
- Component contains all diagonal lines: The component is a redundant component.
- Port card contains a black triangle in lower corner: port card is a laser type.

- Spare ports card contains a black triangle in lower corner: spare ports card is half laser, half LED.
- Port address is underlined: Port address is blocked.
- Port address has a slash through it: Port address requires service.
- Port address is followed by asterisk (*): The logical port address has been swapped.

If any component requires service, replace the failed component before continuing with installation. For more detail on installed hardware, select *Hardware Configuration* from the *Maintenance* menu.

The *Maintenance* menu from the *Port Maintenance* window (Figure 2-17) contains three unique menu options: *Swap Ports*, *Collect Maintenance Information*, and *Port Diagnostics*.

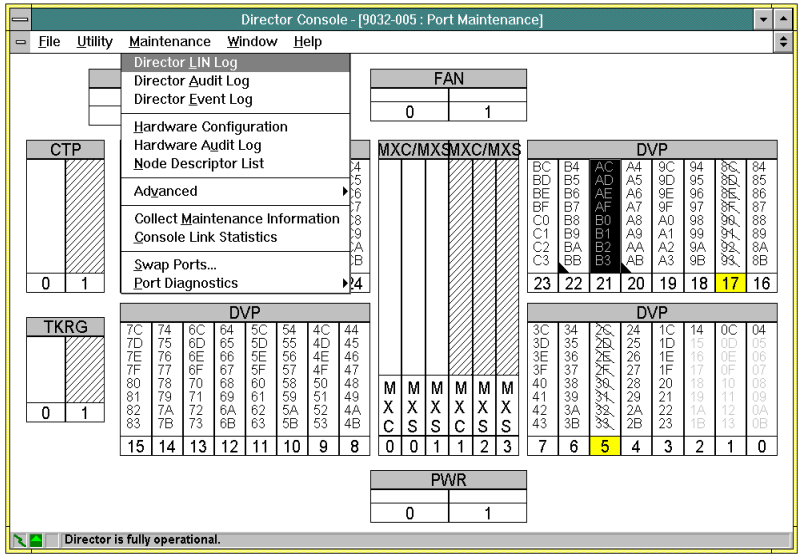


Figure 2-17. Maintenance Menu from the Port Maintenance Window

Swap Ports

Note: Verify the availability of ports before performing the port swap procedure. If a spare ports card is installed in the Director, the card is available as the first target option for a port swap.

Using the *Port Swapping* dialog box (page 2-102), you can modify the mapping of physical ports on the Director to logical addresses used on the host and on the matrix windows. You can also use this option to move an installed address to an installed port.

If mapping is changed from the default, an asterisk (*) appears near the port address number on the displayed *Port Maintenance* window, and the port address numbers change places. Detailed procedures to use this option are located under “Port Swap Procedure” in Chapter 3.

Note: An LED port can only be swapped with another LED port, an XDF Laser port can only be swapped with another XDF Laser port, and an FCV FICON port can only be swapped with another FCV FICON port. In addition, the unaddressable, internal ESCON ports on an FCV port card cannot be swapped with any other port.

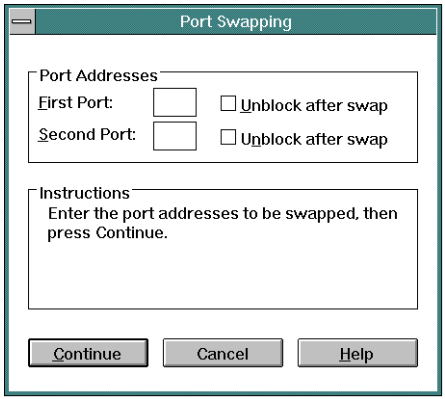


Figure 2-18. Port Swapping Dialog Box

Note: If an FCV port card is inserted into a slot originally occupied by an ESCON DVP card with swapped ports, the FCV port card will be held offline. Ports must be unswapped to bring the card online.

Collect Maintenance Information

This option transfers information to the Console’s fixed disk, such as the current Director time and date, log information, Director definitions, dump files, ESCD and hardware configuration data, LIC level, and port address/number mapping. Use this option to collect information to diagnose system problems or when replacing a FRU.

To use this option:

- With an active link to the Director, select *Collect Maintenance Information* from the *Maintenance* menu. A screen displays briefly showing the status of the data transfer to the fixed disk.

- When a dialog box appears confirming that the maintenance information was saved to the hard disk, click the *OK* button.
- Transfer the collected data from the Console's fixed disk using the procedure packaged with the data collection diskette or procedures described later in this chapter.

For detailed procedures, refer to the "Collect Maintenance Information" section on page 2-114 later in this chapter.

Port Diagnostics

Note: Verify the availability of ports before performing port diagnostics.

To perform port diagnostics, select *Port Diagnostics* from the *Maintenance* menu. A second menu appears with the *ESCON* and *FICON* options.

Note: The *ESCON* option performs diagnostics only for LED or XDF Laser ports and does not perform diagnostics for FCV ports. The *FICON* option performs diagnostics only for FCV ports, and does not perform diagnostics for LED or XDF Laser ports. Procedures are provided for ESCON, as well as FICON ports.

ESCON

This option allows you to initiate, monitor, and stop internal loopback, external loopback, and matrix tests for one or all ports on a port card.

1. Open the active matrix for the Director containing the port card that you want to test.
2. Select *Port Maintenance* from the *Maintenance* menu. The *Port Maintenance* window appears
3. Select the *Port Diagnostics* and *ESCON* options from the *Port Maintenance* window's *Maintenance* menu.

   The *Maintenance Authorization* dialog box appears.
4. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button.

   The *Online ESCON Port Diagnostics* dialog box appears (Figure 2-19)

   If a message box appears stating that ports were found running diagnostics, you must shut down the tests at this point to run any additional diagnostics. Perform one of the following steps:

   – Click the *No* button to not distribute current tests, and return to the *Port Maintenance* window.

   – Click the *Yes* button to shut down the tests. The *Online Port Diagnostics* dialog box appears (Figure 2-19).

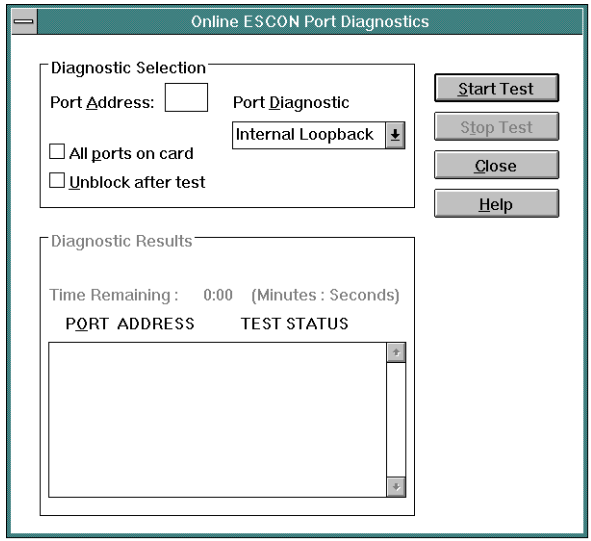


Figure 2-19. Online Port Diagnostics Dialog Box

5. Enter a port address from the graphic display of the *Port Maintenance* window. To select all ports on the card containing that port address, click *All ports on a card* check box.

   Note: The *ESCON* option performs diagnostics only for LED or XDF Laser ports. If an attempt is made to perform FCV port diagnostics using the *ESCON* option, the following message box appears (Figure 2-20).

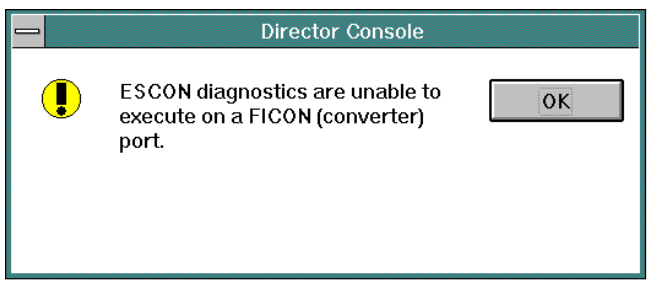


Figure 2-20. ESCON Diagnostics Message Box

6. Click the *Unblock after test* check box to unblock all ports tested after the test terminates. If you do not select this check box, all ports tested will stay blocked after the test. Blocking and unblocking requests on a spare port is

prohibited and therefore ignored when executing a diagnostic test on a spare port.

7. Select the type of test by scrolling on the *Port Diagnostic* list box.

   – *Internal loopback*. This places the port in internal loopback mode and wraps signals internally through the port transmitter and receiver. This tests the interface between the matrix switch and port as well as most of the port's transmit/receiver circuits.

   – *External loopback*. This test requires that you insert a wrap plug (supplied with the Director) into the port being tested or all eight ports on a card if *All ports on card* is selected. This test is similar to the internal loopback test, except the port is not placed in a special test mode. The signal is wrapped at the wrap plug to fully test the port's receiver and transmitter.

   After you start, a notice appears to verify that wrap plugs are installed in all ports running the external loopback tests.

   – *Matrix*. In this test, data is sent from the port through the Matrix Switch and Matrix Controller, and then back through the port card. This verifies the path through the matrix controller /matrix switch (MXC/MXS) card set, port card where the port is located, logic board assembly, and the interfaces between these components and the CTP card.

8. Start the test by clicking the *Start Test* button.

   The *Diagnostic Results* area of the dialog box displays the current state of the diagnostic test request. Possible states are **Diagnostic stop Port: nn**, **Diagnostic start Port: nn**, **Unblocking Port: XX**, **Blocking Port: nn**, and **Diagnostic Running**, where nn is a port number.

   The area also displays the status of all ports that are currently executing diagnostics or have just terminated a diagnostic test. Status can be **Running**, **Stopped:Passed**, **Stopped:Failed**, or **Stopped: Invalid**. The status area clears each time that you start a new test.

   Note that **Stopped: Invalid** means there is a problem with the diagnostics, not necessarily the port card. For example, the link to the Director may have dropped after the test started.

   The *Time Remaining:* field displays the time remaining for the current test in minutes and seconds.

9. Stop the current test by clicking the *Stop Test* button.

   If you attempt to close the *Online Diagnostic* dialog box while a test is executing, a message box appears informing you to stop the test before closing the dialog box. Click the *OK* button on the message box and stop the tests by clicking the *Stop Test* button on the *Online Diagnostic* dialog box.

FICON

This option allows you to initiate, monitor, and stop a sequence of diagnostic tests, including an external wrap test, for the FCV port card.

Note: Verify the availability of ports before performing port diagnostics.

Note: The *FICON* option performs diagnostics only for the FCV port card and does not perform diagnostics for LED or XDF laser DVP cards.

1. Open the active matrix for the Director containing the FCV port card that you want to test.

   For FCV port cards, the FICON port should be named according to its end connection and will have the first port (lowest number) on the card. The remaining seven ports are unaddressable or *Unaddr* or “U”. See ports O4 through OB in Figure 2-21).

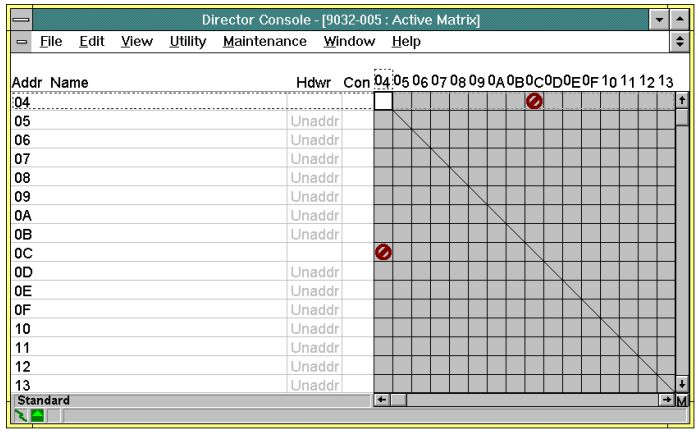


Figure 2-21. Active Matrix

2. Remove the protective plug from the port connector on the port card.
3. At the Director, install the wrap plug in the port receptacle of the FCV port card.

   Note: Use only the proper wrap plug type. Wrap plugs are keyed to allow insertion only in the correct type of port receptacle.

4. Select *Port Maintenance* from the *Maintenance* menu. The *Port Maintenance* window appears.
5. Select *Port Diagnostics* and then *FICON* from the *Maintenance* menu.

6. Enter a maintenance authorization password when prompted (**LEVEL002** is the default).

   The *Online FICON Port Diagnostics* dialog box appears.

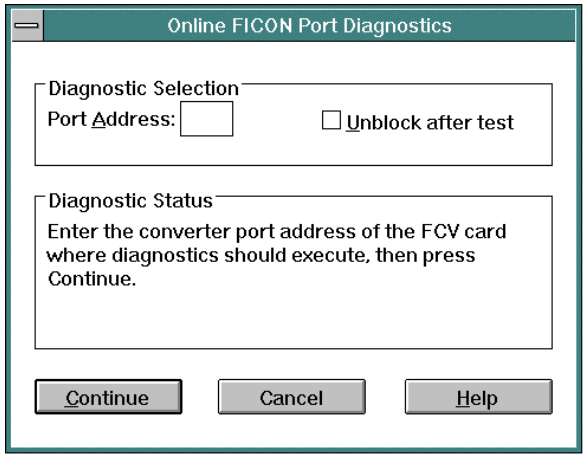


Figure 2-22. Online FICON Port Diagnostics Dialog Box

7. Enter the address for the external FICON port into the *Port Address* box. Select the *Unblock after test* option.
8. Press the *Continue* button.

   A dialog box appears asking for verification that the FCV port card is fitted with a wrap plug.

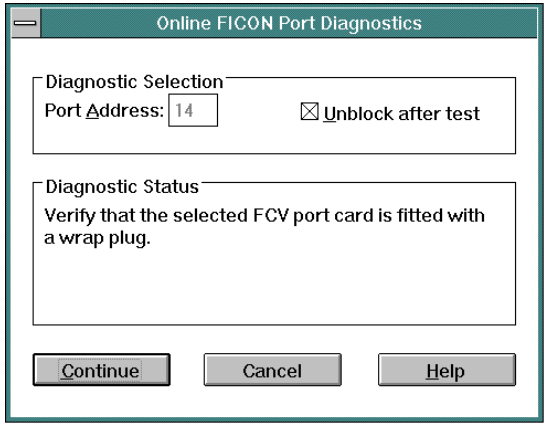


Figure 2-23. Online FICON Port Diagnostics "Verify Wrap Plug" DIalog Box

9. Press the *Continue* button.

   A dialog box may appear stating that the FCV port card will be set offline (if the port is not already blocked).

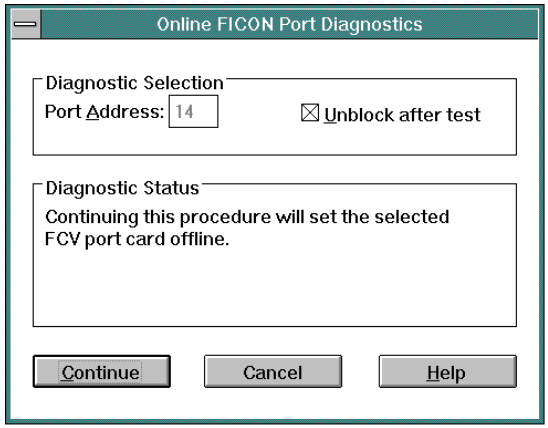


Figure 2-24. Online FICON Port Diagnostics "Set FCV Card Offline" DIalog Box

10. Press the *Continue* button.

    The online FICON port diagnostics will start. These can take up to 5 minutes to complete.

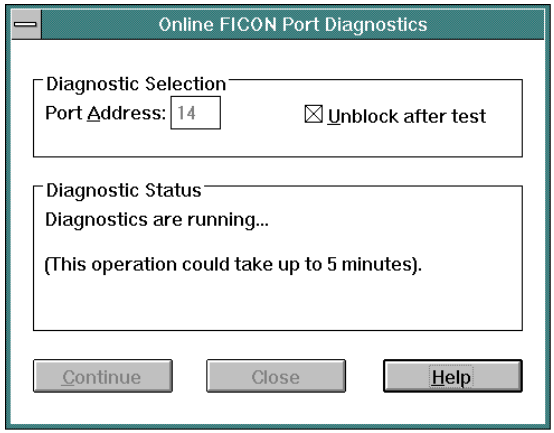


Figure 2-25. Online FICON Port Diagnostics "Diagnostics are Running" DIalog Box

Note: Unlike ESCON diagnostics, you cannot select specific tests to execute. All tests execute automatically in sequence.

The results of the Online Diagnostics will appear in the *Diagnostic Status* region of the *Online FICON Port Diagnostics* dialog box. The following are possible diagnostic results:

- Passed
- Redundant Component Failure
- Required Component Failure
- Failed External Wrap Sequence Only.

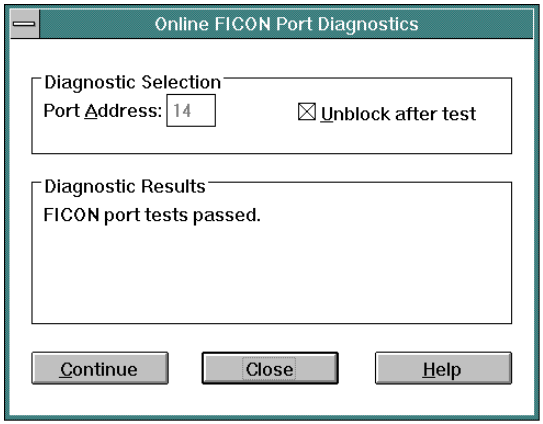


Figure 2-26. Online FICON Port Diagnostics "Tests Passed" Dialog Box

A diagnostic error may occur that is not caused by the FCV logic card. In these cases, the following message appears: "FICON port diagnostics is unable to complete. An error has occurred processing a diagnostic request."

Situations that would cause these errors include the following:

- The FCV port card is removed while in maintenance mode.
- The link between the Director and Console is lost while a FICON diagnostic is running (including IPL).
- The Console fails repeated attempts to poll the Director for diagnostic results.

If anything other than "passed" appears in the diagnostic status region, remove and replace the FCV port card.

Advanced Options

When the *Advanced* option is selected from the *Maintenance* menu, a cascading menu appears, containing the two additional *Advanced* options, *Terminal* and *LMA Versions*.

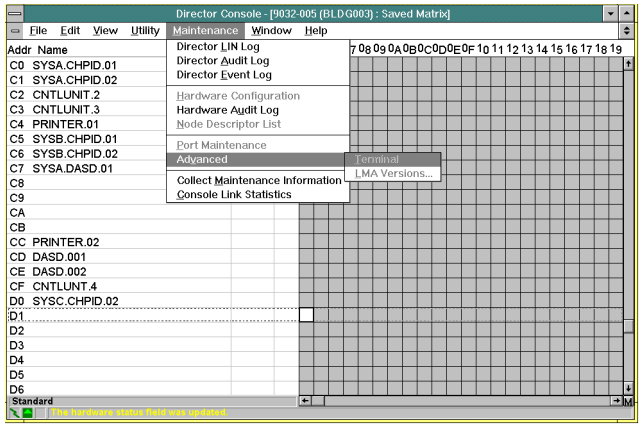


Figure 2-27. Advanced Options

Terminal Window

Selecting *Terminal* from the *Advanced* option of the *Maintenance* menu opens the *Terminal* window as shown in Figure 2-28. Enter commands described under “Terminal Commands” in Appendix E in the *Edit* field at the bottom of the screen. Terminal commands transmit directly to the Director without interpretation by the Console. Results display in the main scrolling window.

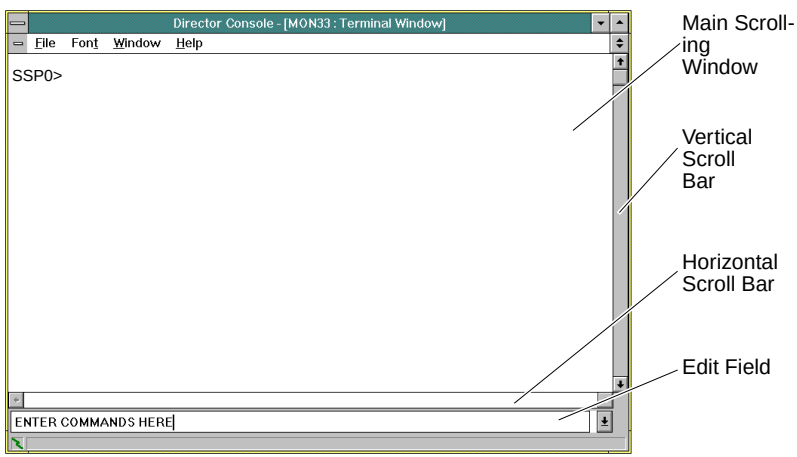


Figure 2-28. Terminal Window

Menus: The *File* menu on the *Terminal* window and matrix window contain the same options to establish a new matrix or open a saved or active matrix. The menu also provides options to clear, capture text to a file, or print window contents. Through the *Font* menu, you can display text in various fonts or sizes.

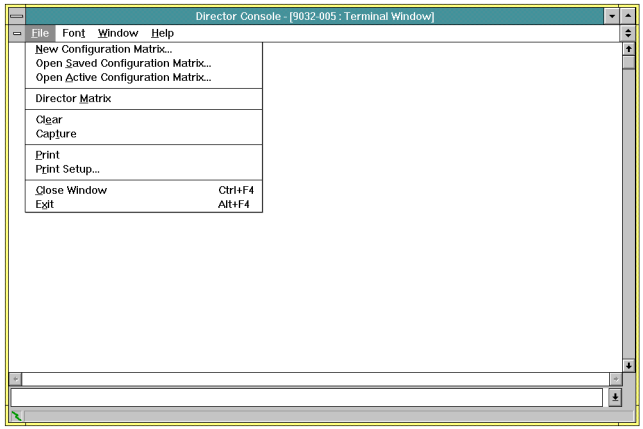


Figure 2-29. Terminal Window File Menu

Using the *Edit* Field: Type commands in the *Edit* field at the bottom of the window. Control input in this window using the following:

1. Press **Enter** to accept and process the command.
2. Enter **help,** type a terminal command, and press **Enter** to obtain help for terminal commands. For example, enter **help hw_cnfg** and press **Enter**. For more information on terminal commands, refer to Appendix E.
3. Select the scroll arrow to display and scroll through previously entered commands.

Using the Main Scrolling Window: Results of commands display in the main window.

1. Click the arrow button to scroll through previously displayed results.
2. Select *Capture* from the *File* menu to print all subsequent keystrokes and their results in the main scrolling window to a file. A checkmark by the *Capture* option indicates when capture mode is on. Selecting *Capture* again turns capture mode off.
3. Select *Print Setup* from the *File* menu and select the *Options* button on the displayed dialog box to save information in the window to a file. Print to a printer by selecting a printer from the main *Print Setup* dialog box, and then select *Print* from the *File* menu.

4. Select *Clear* from the *File* menu to clear data in the main window. This does not affect commands in the *Edit* field.
5. Select the *Director Matrix* option from the *File* menu to return to the active matrix window without closing the *Terminal* window.

Opening Matrixes from the Terminal: Open and edit new, saved, or active matrixes from options on the *File* menu.

Change Display Type: Through the *Font* menu, you can display text in the main window in various fonts or character sizes.

Printing, Filing, and Clearing the Terminal Window

You can capture a session (or part of a session) of keystrokes to a data file, print data, and clear data using the options located in the *File* menu of the *Terminal* window.

Use the following procedures to perform the indicated actions in the *Terminal* window:

To clear the window of all data, select *Clear* from the window's *File* menu.

To capture a session to a file, use the following steps.

1. Select the *Capture* option from the window's *File* menu. The *Enter Filename* dialog box appears.

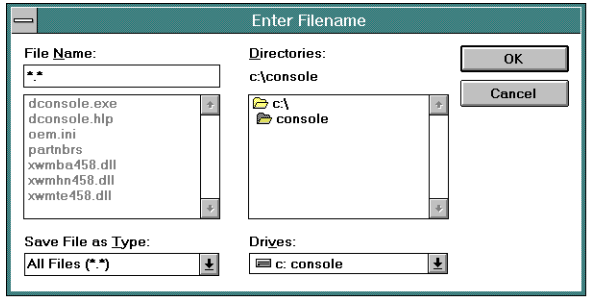


Figure 2-30. Enter Filename Dialog Box from the Capture Command

2. Click the scrolling arrow in the *Drives:* field to display all network drives. The *c:* drive is the hard drive and the *a:* drive is the diskette drive of the Console.
3. Click the drive to which the file is to be saved. The directory structure of the selected drive is displayed in the *Directories* field. The contents of the open directory are displayed in the area below the *File Name:* field.

Note: If saving the file to drive *a:,* make sure a formatted diskette is installed in the drive.

4. Type a file name and extension for the file in the *File Name:* field.
5. Click the *OK* button. The *Enter Filename* dialog box closes.

Note: The log file is saved in the selected location (drive and directory) as an ASCII text file.

The file will continue to collect data until either the *Terminal* window is exited or the capture command is terminated by selecting the *Capture* option from the *File* menu again.

To print to a printer, use the following steps:

1. Select the *Print Setup* option from the window's *File* menu. The *Print Setup* dialog box appears.

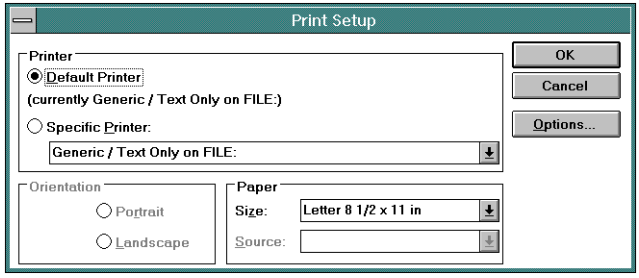


Figure 2-31. Print Setup Dialog Box for Maintenance Menu Logs/Windows

2. Select a printer on LPT1 by clicking the *Default Printer:* button or the *Specific Printer:* button. Select specific printers by clicking the arrow to the right of the *Specific Printer:* field, and then clicking a listed printer.
3. Select *Landscape* or *Portrait* orientation by clicking the appropriate radio button in the bottom left corner of the dialog box.
4. Select a paper size (if supported by your printer) by clicking the arrow opposite *Size*:, and then clicking the appropriate page size.
5. Click the *OK* button to exit the *Print Setup* dialog box.
6. Select *Print* from the *File* menu.

LMA Versions

The *LMA Versions* option on the *Maintenance* menu displays a dialog box similar in form and function to the *LIC Versions* dialog box.

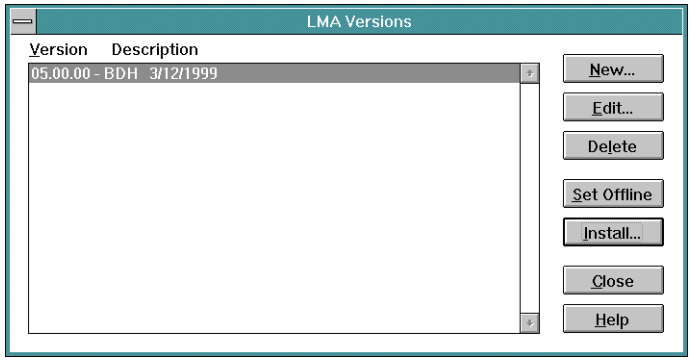


Figure 2-32. LMA Versions Dialog Box

The *LMA Versions* dialog box displays a list of all currently installed LMA versions stored on the Console's fixed disk and several control buttons for manipulating the LMA versions. This option requires a maintenance authorization password to enter the window.

Buttons are provided to install *New* LMA versions to the fixed disk, *Edit* existing LMA version descriptions, and *Delete* unused LMA versions from the fixed disk (Figure 2-32).

The *Install* button transmits the selected LMA code to the current Director. This function is primarily for use by trained service personnel. For detailed information on using LMA Versions, refer to "Installing LMA Code on a Director" on page 6-72 and "Loading the LMA Code to the Console Fixed Disk (not normally required)" on page 6-40.

The *Set Offline* button performs the same function as the *Set Director Offline* option on the *Utility* menu. It takes all ports, except the control unit port (CUP), offline. Refer to "Set Director Offline" on page 2-125 for more information.

Collect Maintenance Information

This option transfers information to the Console's fixed disk for retrieval to a diskette through the data collection procedure. Information transferred includes the following. Note that the type of information transferred may change in future releases.

- Current time and date
- All logs
- Director definitions
- ESCD and hardware configuration data
- LIC level
- Port address/number mapping

- Dump files (error and status information)
- Port node descriptions
- Link status
- Console software level.

This information is collected when a system problem occurs or when replacing a FRU.

Note: Some of the data is not available for collection without an active link to the Director.

1. Select the *Collect Maintenance Information* option from the *Maintenance* menu on the Director's active matrix window.

   The *Collect Maintenance Information* dialog box appears. This dialog box displays files currently being transferred and the status of the transfer.

   When all files have transferred, the following dialog box appears informing you that maintenance information was saved and that you must perform data collection procedures to retrieve the information.

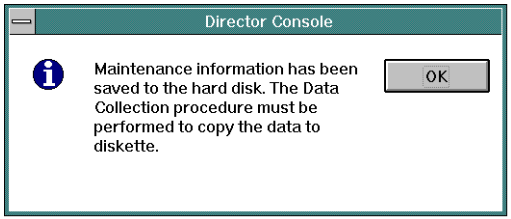


Figure 2-33. Transfer Completed Dialog Box

2. Click the *OK* button to close the dialog box.
3. Perform one of the following steps to retrieve collected information onto a "Data Collection Utility" diskette:

1. If you are replacing a FRU using procedures in Chapter 3, "Repair Information," use procedures packaged with the "Data Collection Utility" diskette to collect data onto the diskette.
2. If you are collecting data for another purpose, such as to isolate Director software problems, use the "Data Collection Utility Version" diskettes packaged with the Director. Use the following steps to collect data onto these diskettes.

   a. Insert a "Data Collection Utility Version" diskette into Drive A:.

   b. Double-click the *ESCON Director Tools* icon at the OS/2 desktop on the Console. The *ESCON Director Tools - Icon View* window appears (Figure 2-34).

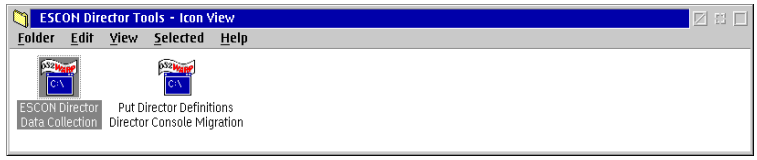


Figure 2-34. ESCON Director Tools - Icon View Window

c. Double-click the *ESCON Director Data Collection* icon. The *ESCON Director Data Collection* window appears (Figure 2-35).

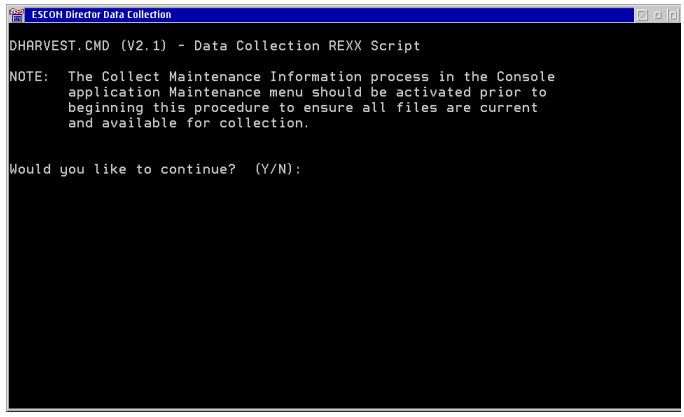


Figure 2-35. ESCON Director Data Collection Window

d. Type **Y** and press **Enter** to start the collection process.

e. When prompted, enter the name of the Director from which you want to collect data and press **Enter**.

   There are three places where you can locate this name:

   - The title bar at the top of the active matrix window for the Director.
   - The list box in the *Select Active Director* dialog box. Access this dialog box by selecting the *Open Active Configuration Matrix* option from the *File* menu.
   - After ID= on the top line of the Director operator panel status display.

   After you enter a valid Director name and press **Enter**, messages appear in the window showing the files loading to the diskette from the Console. The process is complete when a prompt appears asking you to press **Enter** to continue.

f. Press **Enter**. The *Data Collection* window closes.

g. Close the *ESCON Director Tools - Icon View* window by double-clicking the upper left corner of the window.

h. Remove the data collection diskette from the diskette drive.

3. Write the following information on the label of each diskette that you used to collect data. Note that you may be required to insert another diskette to collect all of the data. You may use a blank DOS-formatted diskette if necessary.
   - Director serial number
   - Quality service activity reporting (QSAR) number
   - Problem management - hardware (PMH) number
   - Date.
4. If you have a pre-addressed envelope for shipping the diskettes, insert the diskettes in the envelope, then seal and mail the envelope.
5. If you were sent here from another procedure, return to that procedure now.

Console Link Statistics

Select the *Console Link Statistics* option (Figure 2-36) from the *Maintenance* menu of the Director's active matrix window to review the status of the Token-Ring link between the Director and the Console. Statistics include the Internet protocol (IP) address for the Director, the link's current state, transmit/receive packets sent, transmit/receive errors, link resets, link errors, and frame errors. If the current state of the link is "unavailable," select the *Reset Link* button to deactivate and then activate the link in an attempt to restore a lost link.

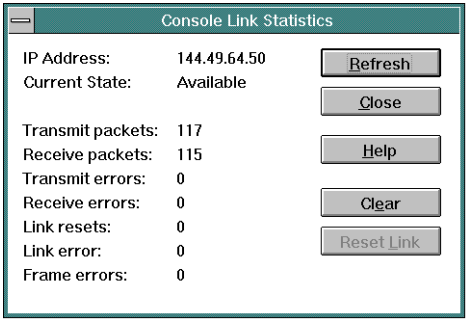


Figure 2-36. Console Link Statistics Dialog Box

You can also check link status through the status line and icons located at the bottom left corner of the active matrix window. For details, refer to"Console Status Line" on page 1-45.

Utility Menu Options

Figure 2-37 shows the *Utility* menu available from the active matrix window.

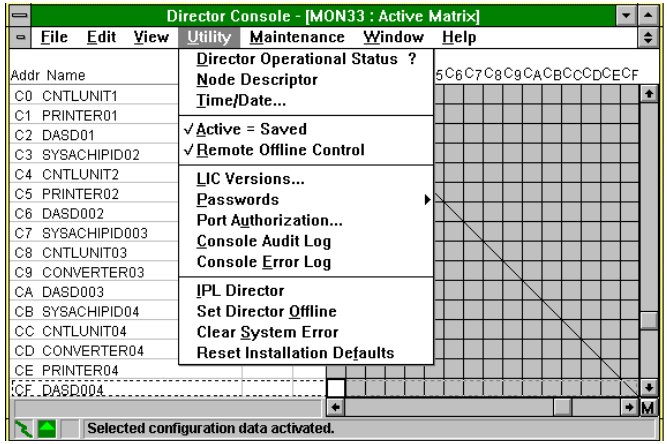


Figure 2-37. Utility Menu from Active Matrix Window

Director Operational Status

Select *Director Operational Status?* from the *Utility* menu to display a four-digit hexadecimal status code and message. The four-digit code indicates the operational level after power-on initialization (POI) completes. Refer to “Director Operational Levels” in Chapter 1 for more information.

Note: You can obtain the same status information by double-clicking the Director status indicator on the bottom left of the active matrix window.

Node Descriptor for a Port

To display a descriptor for a node connected to a specific port, click a port address cell in the matrix region of the active matrix window. Then select the *Node Descriptor* option from the *Utility* menu of the Director’s active matrix window. Refer to "Displaying Node Descriptor" on page 2-137 for more information.

Time/Date

The *Time/Date* option displays a dialog box for entering the current time and date for the Director. These fields can be synchronized with the Console PC’s time/date fields. Acceptance of this dialog box sets the time and date on the attached Director. You must enter an operator authorization password to save this option.

Active=Saved

This option is used by Director administrators for saving an active matrix as the IPL file. Set this option to On (default) by clicking the *Active=Saved* check box on the *Activate Configuration Matrix* dialog box. Access the dialog box by selecting the *Activate Configuration Matrix* option from the *Edit* menu. When *Active=Saved* is set (X in check box), the active matrix is stored in the "IPL" location in nonvolatile memory. Changes made to the matrix through System Automation for OS/390 (SA OS/390) will also be saved to this location.

Remote Offline Control

This option controls whether the Director accepts an SA OS/390 command to set the Director offline. If the option is set, SA OS/390 can set the Director offline. If the option is not set, the Director rejects the SA OS/390 command.

LIC Versions

This option displays a list of all Director LIC versions currently stored on the Console's fixed disk. From this window, you can install new versions, edit existing release descriptions, and delete unused LIC versions. The *Install* option transmits the selected LIC to the Director for the next Director IML. Refer to "Installing LIC on a Director" in Chapter 6 for procedures to use this function.

Port Authorization

The *Port Authorization* menu option requires an administrative level password to enable any changes. On proper authorization, the port authorization data is presented in the form of a matrix with operator IDs shown horizontally across the top of the display area and port addresses shown vertically down the left side of the display area. The administrator authorizes operators to configure specific ports by using the *Range* dialog box. Once the ranges have been set, a check mark in a cell of the *Port Authorization* matrix indicates that the operator ID associated with the matrix column is authorized to configure the port associated with the matrix row. If the operator ID is not authorized to configure a port, the corresponding cell is blank. For more information on port authorization, refer to *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise System Connection Directors* (SA22-7295).

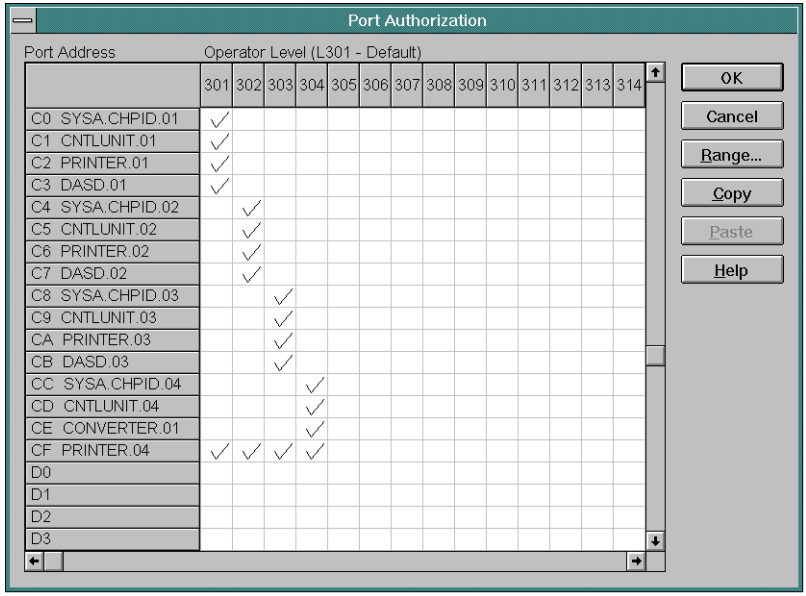


Figure 2-38. Port Authorization Matrix

Passwords

The *Passwords* option provides two secondary options: *View IDs* and *Modify*.

- *View IDs*. Select this option to display a *Passwords* dialog box that allows you to only view the defined IDs for the three password authorization levels.
- *Modify*. This option requires an password authorization password (level 1). The *Modify* option displays a *Passwords* dialog box that allows you to view, modify, add, and delete existing passwords and the descriptions associated with the password IDs.

Refer to Chapter 10. for more information about passwords.

Console Audit Log

The Console audit log (Figure 2-39) automatically tracks and records Console operator activities that are not specific to a Director, including changing passwords, installing or deleting LIC versions from the database, adding or deleting a Director definition, or entering or exiting the Console application. The log contains the following information:

- ID of the Console operator that performed the action
- Brief description of the action

- Password ID for actions requiring passwords
- Director ID for Director definition actions
- LIC version for LIC release actions
- Time and date the action was performed.

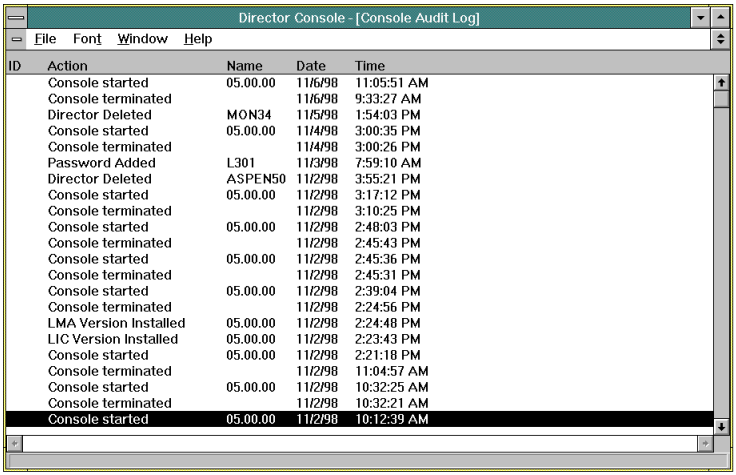


Figure 2-39. Console Audit Log

To save or print the log, refer to "Saving and Printing Console Logs" on page 2-122.

Console Error Log

The Console error log (Figure 2-40) records Console exception conditions. Exception conditions are errors that are not severe enough to shut down the Console, such as insufficient memory or memory corruption, file read/write errors, subsystem internal errors, printing errors, and inability to access a resource. The time and date the exception occurred and a qualifying code identifying the failing subsystem are included in the record.

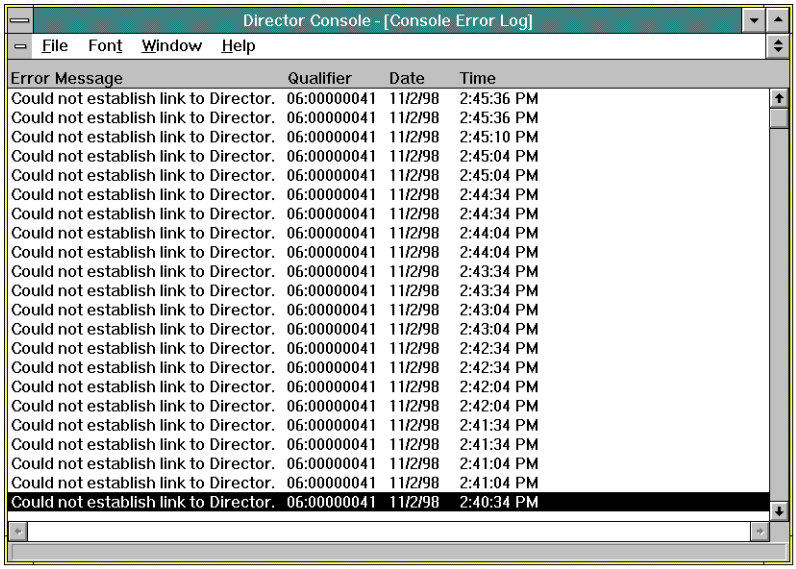


Figure 2-40. Console Error Log

To save or print the log, refer to “Saving and Printing Console Logs” following.

Saving and Printing Console Logs

You can save data to a file and print data for the *Console Audit Log* and *Console Error Log* options located under the *Utility* menu of the active matrix or *Port Maintenance* window.

Use the following procedures from the Console log window.

To save a log to a file, use the following steps.

1. Select the *Save to File* option from the window’s *File* menu. The *Save As* dialog box appears.

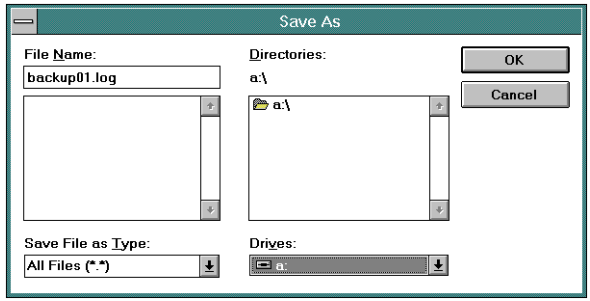


Figure 2-41. Save (Log) As Dialog Box

2. Click the scrolling arrow in the *Drives:* field to display all network drives. The *c:* drive is the hard drive and the *a:* drive is the diskette drive of the Console. If selecting drive *a:*, ensure a formatted diskette is in the drive.
3. Click the drive to which the log file is to be saved. The directory structure of the selected drive is displayed in the *Directories:* field. The contents of the open directory are displayed in the area below the *File Name:* field.
4. Type a file name and extension for the log file in the *File Name:* field.
5. In Figure 2-41, an empty diskette is in drive *a:*. The file name of the log file to be saved is “backup001.log.”
6. Click the *OK* button. The *Save As* dialog box closes.

Note: The log file is saved in the selected location (drive and directory) as an ASCII text file.

To print the log to a printer:

1. Select the *Print Setup* option from the window’s *File* menu. The *Print Setup* dialog box appears.

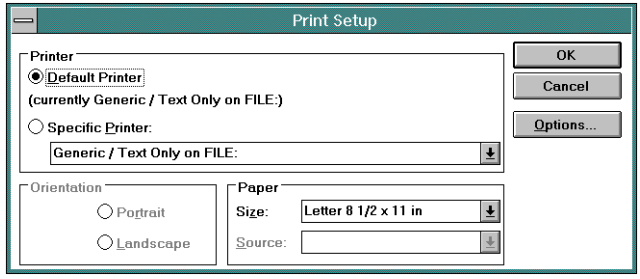


Figure 2-42. Print Setup Dialog Box for Utility Menu Logs

2. Select a printer on LPT1.OS2 by clicking the *Default Printer:* or the *Specific Printer:* radio button. Select specific printers by clicking the arrow opposite the *Specific Printer:* field, and then clicking a listed printer.
3. Select landscape or portrait orientation by clicking the appropriate radio button in the bottom left corner of the dialog box.
4. Select a paper size (if supported by your printer) by clicking the arrow opposite *Size:*, and then clicking the appropriate page size.
5. Click the *OK* button to exit the *Print Setup* dialog box.
6. Select *Print* from the *File* menu.

IPL the Director

This option causes the current active CTP card to initiate an IPL. During an IPL, the current LIC reloads from memory. The active CTP card (including the CUP) and TKRG controller adapter card reset. The MXC, MXS, and DVP cards do not reset, but the System Error indicator is cleared. After an IPL, the Director uses the active matrix information stored in the “current” location of nonvolatile memory to control port connections. If *Active=Saved* is selected from the *Utility* menu, this information corresponds to the last configuration matrix activated through the *Activate Configuration Matrix* option on the Console’s active matrix window. Refer to "IPL Function" on page 1-21 for more information.

Attention!

If an FCV port card is operating in degraded mode (one or more internal ESCON ports not operational), selecting *IPL Director* from the *Utility* menu sets the FICON port offline. Prior to selecting this option during degraded operation, ensure the system operator varies the attached FICON channel offline.

Note: After an IPL or IML, the IP address may display as 0.0.0.0 on the operator panel until the actual IP address displays.

Clear System Error

Select this option from the *Utility* menu of the Director’s active matrix window. This option turns off the system error indicator on the operator panel. The indicator lights when an event occurs at operational level 1 or higher. When you clear the indicator, events in the event log are set to history status.

CAUTION

The indicator illuminates when the Director detects events requiring immediate operator attention, such as a FRU failure. Before clearing the System Error indicator, resolve any problem that may have activated the indicator. Scroll through the events displayed on the operator panel using the *Entry* button, and refer to MAP 9100 "Event, Error or Fault Displayed on Operator Panel or in the event log of the Active Matrix" earlier in this chapter to resolve any problems.

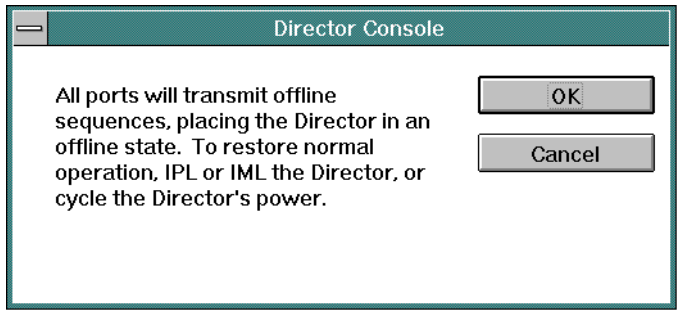
Set Director Offline

Note: Verify that you have selected the correct Director prior to performing the set Director offline procedure.

To set the Director offline:

1. Perform one of the following actions:
   - If the Director is not supported by SA OS/390, ensure that the system operator configures all channel paths and control unit interface to the Director offline.
   - If the Director is supported by SA OS/390, ensure that the host operator uses the Remove Switch command to prevent unanticipated problems with customer equipment. This command varies all channels and sub-channels offline.
2. Make sure that the *Remote Offline Control* option on the *Utility* menu is enabled (checkmark by option). If not, click the option to enable it.

   The *Set Director Offline* option is not available if *Remote Offline Control* is not enabled.
3. Select the *Set Director Offline* option from the *Utility* menu on the active matrix window for the Director. The following dialog box appears:



4. Click the *OK* button to set the Director offline.
5. Provide an operator authorization password when prompted (the default is LEVEL003).

To return the Director to an online state and restore normal operation, select the *IPL Director* option or push the *IML* button on the Director's operator panel, or switch the Director power off and on.

Note: If switching Director power off, refer to "Powering the Director On and Off" on page 1-22. After switching off the power, make sure that you wait at least 30 seconds before switching on power again.

Reset Installation Defaults

Use these procedures to reset non-volatile information in the Director to installation-default values.The following information is reset when you perform these steps:

- Host Data. This is data stored on the Director for the host. It can only be programmed by the host software.
- Key Counter. This counter is used by the Director and host used to synchronize multiple enterprise system connection managers (ESCMs).
- IPL data. This includes the matrix information stored in the IPL location in nonvolatile memory. This information is used when the Director is powered on to control port connections. The default IPL data allows all ports to connect with each other.

Note: After performing these steps, you must perform an IPL, IML, or cycle power off/on to reset the installation defaults.

To reset installation defaults, follow these steps:

1. Set the Director offline by following steps under "Set Director Offline" on page 2-125.
2. Select *Reset Installation Defaults* from the *Utility* menu of the active matrix.

This option is disabled (grayed out) on the *Utility* menu if:

- The Director-Console link is active or busy.
- The matrix window is locked.
- The installed LIC version does not support the option (version lower than 4.3).

3. If the Director is offline, a message box appears stating that nonvolatile information will be reset to the installation default values.
4. Click the OK button.

   The *Maintenance Authorization* dialog box appears.
5. Type a maintenance authorization password (default is LEVEL002) and click the *OK* button.

   The dialog box closes.

6. Perform an IPL, IML, or cycle power off/on to reset the installation defaults.

Maintenance and Diagnostic Procedures

These procedures require the use of matrix window menu options or maintenance terminal commands covered in detail in the previous sections of this chapter.

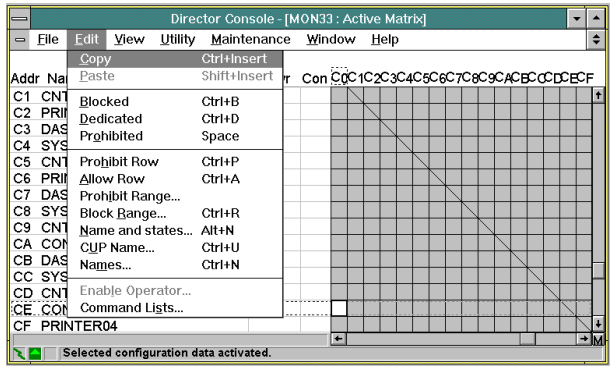
Block Port Procedure

You can use three methods to block a port: through the Console active matrix window, through the Console *Terminal* window, or through a separate maintenance terminal.

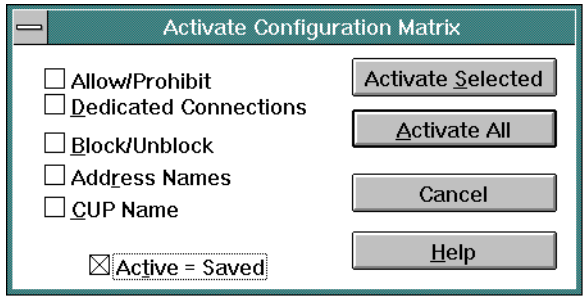
Note: Blocking or unblocking a FICON port on an FCV port card blocks or unblocks all unaddressable ESCON ports as well. Blocking or unblocking an unaddrssable ESCON port has no effect on port operation.

From the Console Active Matrix Window

1. Have the customer take the channel and/or control unit connected through the port offline.
2. Select the *Open Active Configuration Matrix* option for the Director from the Console's *File* menu.
3. Select the appropriate Director from the *Select Active Director* dialog box.
4. Click the active matrix cell that corresponds to the port you wish to block.
5. Select the *Blocked* option from the *Edit* menu. The blocked status for a port appears differently in the graphic display and nongraphic display matrix window and in the *Port Maintenance* window:
   - Matrix window (graphic display mode): The port's column and row highlight to reflect the connections to other ports that are blocked. In addition, an X appears under the *Con* column by the blocked port.
   - Matrix window (nongraphic display mode): By the blocked port, a B appears under the *B* column.
   - *Port Maintenance* window: The port address is underlined.



6. Repeat Steps 4 and 5 of this procedure for each additional port you wish to block for a Director.
7. From the *File* menu, select the *Activate Configuration Matrix* option. The *Operator Authorization* dialog box displays, prompting you for your password.
8. Enter an operator authorization password (the default is LEVEL003), and click the *OK* button. The *Activate Configuration Matrix* dialog box displays.



9. Click on the *Activate Selected* button. The “Selected Configuration Data Activated” message appears on the status line to confirm the completion of this operation.

From a Maintenance Terminal

1. Have the customer take the channel and/or control unit connected through the port offline.
2. Issue the following command from a separate maintenance terminal connected to the maintenance port on the TKRG controller adapter card.

   block [port address]

To use the maintenance terminal, refer to "Using the Maintenance Terminal" on page E-4.

To use the **block** command, refer to"Terminal Commands" on page E-5.

From the Console Terminal Window

1. Have the customer take the channel and/or control unit connected through the port offline.
2. Select the *Open Active Configuration Matrix* window for the Director from the Console's *File* menu.
3. Select the appropriate Director from the *Select Active Director* dialog box.
4. Select *Terminal* from the *Advanced* option of the *Maintenance* menu and issue the following command in the Console's *Terminal* window:

   block [port address]

To use the *Terminal* window, refer to "Terminal Window" on page 2-110.

To use the **block** command, refer to "Terminal Commands" on page E-5.

Unblock Port Procedure

Note: Blocking or unblocking a FICON port on an FCV port card blocks or unblocks all unaddressable ESCON ports as well. Blocking or unblocking an unaddrssable ESCON port has no effect on port operation.

From the Console Active Matrix Window

1. Have the customer take the channel and/or control unit connected through the port offline.
2. Select the active matrix window for the Director from the Console's *File* menu.
3. Click on a blocked matrix cell that corresponds to the port you wish to unblock.
4. Select the *Blocked* option from the *Edit* menu.
   - Matrix window (graphic display mode): The highlighted portions of the port's column and row change color and the X disappears under the *Con* column by the port.
   - Matrix window (nongraphics mode): The B disappears under the *B* column.
   - Port Maintenance window: The underline under the port address disappears.

   (Refer to "Block Port Procedure" on page 2-128 for an illustration of the *Blocked* condition.)
5. Repeat Steps 3 and 4 of this procedure for each additional port you wish to unblock.
6. From the *File* menu, select the *Activate Configuration Matrix* option.

The *Operator Authorization* dialog box displays, prompting you for your password.

7. Enter an operator authorization password (the default is LEVEL003), and click the *OK* button.

   The *Activate Configuration Matrix* dialog box displays. Refer to the “Block Port Procedure” on page 2-128 for an illustration of the *Activate Configuration Matrix* dialog box.

8. Select the *Activate Selected* button. The “Selected Configuration Data Activated” message appears on the status line to confirm completion of this operation.

   The X under the port’s *Con* column and the highlighted areas in the port’s column and row disappear.

9. Have the customer place the channel and/or control unit connected through the port back online.

From the Maintenance Terminal

To use the maintenance terminal, refer to "Using the Maintenance Terminal" on page E-4.

To use the **pib** command, refer to ""Terminal Commands" on page E-5.

1. Issue the following command for the port that you wish to unblock to determine the port’s status.

   pib [port address]

   If the port is blocked, “Blocked” will indicate “Yes.”

2. Issue the following command to unblock the port:

   unblock [port address]

3. Enter the following command to determine that service is no longer required.

   pib [port address]

   If service is no longer required, “Service Required” will indicate “No.”

4. Have the customer place the channel and/or control unit connected through the port back online.

From the Console Terminal Window

1. Confirm that the customer has taken the channel and/or control unit connected through the port offline.
2. Select the *Open Active Configuration Matrix* option from the Console’s *File* menu.
3. Select the appropriate Director from the *Select Active Director* dialog box.
4. Select *Terminal* from the *Advanced* option of the *Maintenance* menu and issue the following command in the Console’s *Terminal* window:

unblock [port address]

To use the *Terminal* window refer to “Terminal Window” on page 2-110 earlier in this chapter.

To use the **unblock** command, refer to "Terminal Commands" on page E-5.

5. Make sure the ports are no longer flagged as B (blocked) as indicated on the active matrix.
6. Have the customer place the channel and/or control unit connected through the port back online.

Determining Bit Error Rates (BER)

Incidents where the bit error rate (BER) has exceeded the threshold are generated and reported to the Director Event and LIN logs and to the status line message display on the Director’s active matrix window and reported to the host.

The bit error rate thresholds for the Director, attached control units, and attached channels are:

- Director: 12 errors every five minutes
- Control Units: 15 errors every five minutes
- Channels: 15 errors every five minutes.

When the BER exceeds the threshold limit, a link event is recorded in the Director event log and a link incident in the LIN log. Following is an example of a BER incident in the LIN log showing the first 11 bytes of the sense data (sense bytes 0 through 10) that define the incident.

```
Port   Addr   Incident (Qualifier)          Date       Time
3B     BB     Bit-Error-Rate Exceeded(30)   7/11/94    1:54:22 PM
Node:
Data:   20009800 00000205 70FF013B BB...
```

The incident code for bit error rate exceeded is hexadecimal 02, contained in sense byte 6 of the sense data. Sense byte 11 displays 3B, which is the physical port number where the incident occurred. Sense byte 12 displays BB, which is the port’s address. Sense bytes 11 and 12 display at the beginning of the second line of the log entry.

When the bit error rate does not exceed the threshold, the link incident is recorded only in the Console event log and not to the host. The following example of this type

of BER event in the event log shows the first 11 bytes of the sense data (sense bytes 0 through 10) that define the event.

```
Port   Addr   Incident (Qualifier)          Date       Time
3B     BB     Sub-threshold bit error (BER) 7/11/94    1:54:22 PM
Node:
Data:  20009800 00001D05 04010989 80...
```

You can also display the last BER and current BER total for a port through option 2 of the **xpmlog** command. Following is an example of an xpmlog (option 2) for port 3B showing a count of 15 errors for a five minute period. These are enough errors to generate a link incident report to the log.

```
{P} SSP0>xpmlog 2 3B

PCB at 06D640 pn: 00  intr_grp: 0  slot: 3B  port: A tech: 02
rx_seq: Idle event: rcv_seq_IDL  seq_st: inactive  pdf:
seq_tmr: 00009F  LOSL_tmr: FFFFFF  last_ber: 00  curr_ber: 15  inact: 00
oper: 1  fail: 0  FIFO_bsy: 0  static_pend: 0  static_pn: none
MXC pa[00]: 80  pn[80]: 00  cp: 7F  bsy: 0  HIB:
```

Refer to “Xpmlog,” Option 2, in Appendix E for more information on using this command.

Checking Light Intensity

To check light intensity from a specific port, issue a **block** command for the port from the Console’s active matrix window from the *Terminal* window, or from a separate maintenance terminal. Although blocked from connection to another port, the appropriate offline sequence (OLS) signal still transmits through the port so that you can check the light level. Refer to “Verifying the Director Transmit and Receive Levels” on page 2-141 for procedures to check light intensity.

Removing/Installing Fiber Optic Cables

Removing:

1. Issue a **block** command from the Console’s active matrix window, from the *Terminal* window, or from a separate maintenance terminal. Refer to the “Block Port Procedure” on page 2-128 for details.
2. Carefully remove the cable connector from the port receptacle of the port card.
3. Label the location of the removed cable.
4. Clean the cable connector and port connector using procedures in *Fiber Optics Cleaning Procedures* (SY27-2604-01 or later).

5. Insert a protective cap over the fiber optic connector and insert a protective plug into the port receptacle on the port card.

Installing:

1. Remove the protective plug from the port receptacle on the port card.
2. Clean the port connector where you will install the cable using procedures supplied with the fiber optic cleaning kit.
3. Clean the fiber optic cable connector.
4. Carefully insert the cable connector into the port receptacle of the port card.
5. Unblock the port using the “Unblock Port Procedures.”

Configuration Verification Tools

Two tools are available on the Console that help verify the system configuration:

- Port hardware status for column *H* (nongraphic display mode) or *Hdwr* (graphic display mode).
- Display node descriptor.

Hardware Status Column

To access the active matrix window for a Director, refer to instructions under “Selecting a Director” on page 2-87. The hardware status column *(Hdwr)* in the following illustration, displays the hardware status of each port.

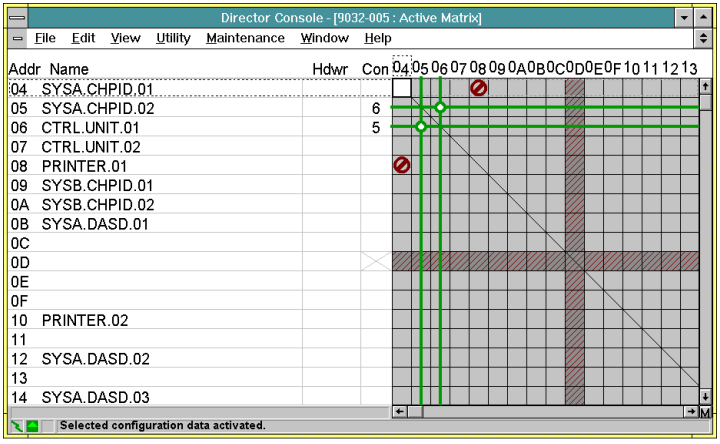


Figure 2-43. Hardware Status of Director Active Matrix Window - Graphic Display

You cannot change the content of the *Hardware Status* column because it is controlled by the Director. The characters in the *Hardware Status* column are set and reset as follows:

Table 2-1. Hardware Status Column Content - Graphic vs. Nongraphic Mode

Graphic Display Mode On	Graphic Display Mode Off	Definition
(Blank)	(Blank)	Port is installed and fully operational
Degrad	D	Port is degraded or not operating at peak capacity (FCV port card only). A degraded status occurs when a FCV port card is operating at a level where performance may be impacted.
Inactive	I	Port is inactive or will not come online (FCV Port card only). See" I or Inactive" paragraph following this table for more information.
Invalid	A	An attached device is invalid (sending unexpected responses), or a wrap plug is installed in the port.
Logout	G	The associated S/390 server has performed an explicit logout.
LnkFail	L	Link failure has occurred.
Maint	M	Port is in maintenance mode.
NotInst	N	Port is not installed.
Offline	O	Port is offline.
Service	S	Call your service representative
Thrshld	T	A device error threshold was exceeded and the port attached to the disruptive device was set offline.
Unaddr	U	Port is unaddressable (FCV Port card only)

- **Blank.** The port has received the proper ESCON protocols from the other end of the fiber optic link.
- **D or Degrad.** Set for FCV port card when the card is operating at a level where performance may be impacted. For example, the port card is in

degraded mode if from one to seven ESCON ports on the card are not functioning.

- **I or Inactive.** Set for the FCV port card when the card has an illegal configuration and cannot come online. The following invalid port configurations cause an FCV port to have inactive status.
  - An FCV port is swapped with another port that is not an FCV port.
  - An unaddressable ESCON port on the FCV port card is swapped with any other port.
  - A dedicated connection exists for a port on the FCV port card.

  The following conditions require that an FCV port be held offline. When these occur, the port status is set to *Inactive*:
  - The FCV port card is placed offline by the user to perform a nonconcurrent LIC install.
  - The maximum number of FCV port cards supported by the Director has been exceeded.
  - The hardware upgrades (MXC2 card) required to successfully operate an FCV port card were not detected.

  Note: If an FCV port card is inserted into a slot originally occupied by an ESCON port card that had swapped ports, the FCV port card will be held offline until the ports are unswapped.

  The *Names and States* dialog box displays a more detailed description of the hardware status, including an offline reason code. Display this dialog box by double-clicking the *Hardware Status* column on the active matrix.
- **A or Invalid.** Set when the Director detects any of the following conditions:
  - A fiber optic cable from a dynamically configured port (not dedicated) is connected to another dynamically configured port on a different Director.
  - A fiber optic cable from a dynamically configured port (not dedicated) is connected to another dynamically configured port on the same Director.

  A wrap plug is installed in a Director port, and the port is not in a diagnostic or maintenance activity.
- **G or Logout.** The associated S/390 server has performed an explicit logout, and all internal ESCON ports on the FCV port card are set offline. Ask the system operator to perform an explicit login at the server.
- **L or LnkFail.** Set when the Director detects a link failure and reset when the failure is no longer detected.
- **M or Maint.** Set when online diagnostics are run.

- **N or NotInst.** Set when the port is not installed.
- **O or Offline**. ESCON protocol is not being received on the fiber optic link for any of the following reasons:
  - The product on the fiber optic link sent an OLS (channel or control unit offline) after the proper link protocols were established.
  - A fiber optic cable was not connected to a port when the Director initialized.
  - A fiber optic protective plug was installed in a port when the Director initialized.
  - The device at the other end of the fiber optic link was not switched on when the Director initialized.

  The column resets to blank (installed port) when the proper ESCON protocols are sensed at the ESCON Director. There are no SA OS/390 commands or Director functions to reset this condition.

  Note: A fiber optic cable that is coupled to a port in the O or offline state might cause an erroneous link failure report.
- **S or Service Required**. Set when the Director detects a port failure. It is reset when the port failure is corrected or after Director power is switched off and on and the failure is no longer detected. An IML or IPL also resets it.
- **T or Thrshld.** The error threshold for an attached device was exceeded and the port attached to the device was set offline.
- **U or Unaddr.** The unaddressable ESCON ports on an FCV port card.

Displaying Node Descriptor

The *Node Descriptor* option displays identification information about the attached device (channel or control unit). During the operating system initialization, all devices that follow the ESCON architecture exchange identification information about themselves with the device to which they attach. The Console displays this information to verify the existing configuration.

Note: Devices that do not follow the ESCON architecture, such as the 9034 Converter, display “Not valid” in the *Validity* field, and all other fields are blank. “Not valid” also displays when a port is not installed.

Use one of the following methods to display node descriptor information:

- Click to highlight a port address cell in the matrix region of the active matrix window. Click on *Node Descriptor* in the *Utility* menu of the Director’s active matrix window to display a *Node Descriptor* dialog box for the physical port associated with the address. Click on the *Previous* or *Next* buttons to display descriptors for lower or higher numbered ports.

The *Node Descriptor* dialog box displays descriptor fields for the node, provides the port number, and describes the port hardware (LED, laser, spare). The node descriptor fields are the same as displayed in the node descriptor List. The following is a node descriptor for port address 36 and port number 32.

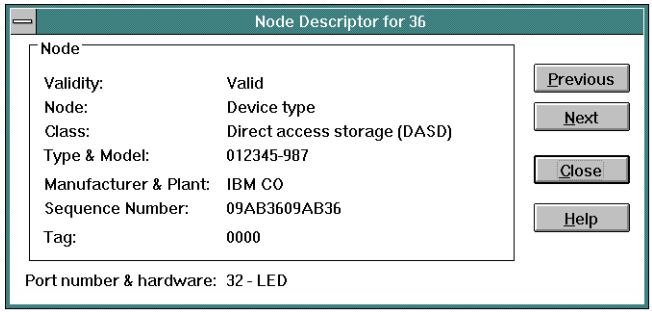
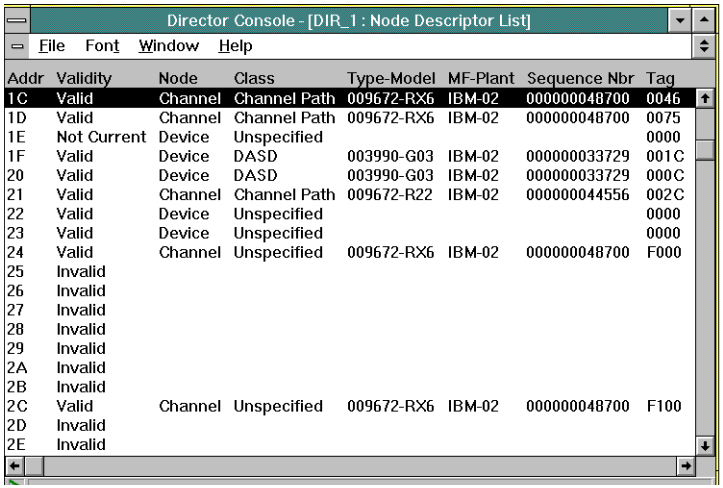


Figure 2-44. Node Descriptor Dialog Box for Port

- Double-click on the port address of the desired port to display the same *Node Descriptor* dialog box for the physical port as shown in Figure 2-44. Click on the *Previous* or *Next* buttons to display descriptors for lower or higher numbered ports.
- Select *Node Descriptor List* from the *Maintenance* menu of the Director's active matrix window to display a table of descriptor fields for each port address. Scroll to display descriptors for all port addresses from 04 through FB. The CUP descriptor also displays following address FB. The physical port number for each port address displays under the *Tag* column (refer to Figure 2-45).



Addr	Validity	Node	Class	Type-Model	MF-Plant	Sequence Nbr	Tag
1C	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0046
1D	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0075
1E	Not Current	Device	Unspecified				0000
1F	Valid	Device	DASD	003990-G03	IBM-02	000000033729	001C
20	Valid	Device	DASD	003990-G03	IBM-02	000000033729	000C
21	Valid	Channel	Channel Path	009672-R22	IBM-02	000000044556	002C
22	Valid	Device	Unspecified				0000
23	Valid	Device	Unspecified				0000
24	Valid	Channel	Unspecified	009672-RX6	IBM-02	000000048700	F000
25	Invalid						
26	Invalid						
27	Invalid						
28	Invalid						
29	Invalid						
2A	Invalid						
2B	Invalid						
2C	Valid	Channel	Unspecified	009672-RX6	IBM-02	000000048700	F100
2D	Invalid						
2E	Invalid						

Figure 2-45. Node Descriptor List

Changes in port status (such as changes in port type or changes in the device type connected to the port) are not dynamically displayed in either the *Node Descriptor* dialog box for an individual port or the *Node Descriptor List* window for all ports. To display any status changes that may occur while you access these features, perform one of the following steps:

- **Node Descriptor dialog box**. Exit the dialog box and then access the *Node Descriptor* dialog box again through the *Utility* menu.
- **Node Descriptor List window.** Select the *Refresh* option from the *File* menu while in the *Node Descriptor List* window or press the **F4** key.

Node Descriptor Fields

The following fields display for both the *Node Descriptor* dialog box for the individual ports and the *Node Descriptor List* window.

- **Addr.** Applies to the *Node Descriptor List* window only. A logical address is assigned to each port. To determine physical port numbers for logical addresses, use the **portmap** command from the *Terminal* window. Refer to Appendix E for information on the **portmap** command.
- **Validity.** The node descriptor reported by the device may be one of the following:
  - Valid - A node descriptor, flagged as valid, was received from the node.
  - Not Current - Response was not received from the node for a descriptor. The last valid descriptor is used, but is flagged as Not Current.

  - Invalid - A flag was received with the node descriptor that identifies the information received as invalid.

    Note: A valid node followed by seven invalid nodes at contiguous addresses indicates attachments to an FCV port card.

- **Node.** The *Class:* field depends on this node type. The type may be one of the following:
  - Central processing complex type
  - Device type
- **Class.** If the node is a device type, the class describes the general device, such as a direct access storage device (DASD). If the node is a channel subsystem type, the class, if specified, is either a channel path or a channel-to-channel adapter (CTCA). The class may be one of the following:
  - Unspecified
  - DASD
  - Magnetic tape
  - Unit record (input)
  - Unit record (output)
  - Printer
  - Communications controller
  - When the node contains a central processing complex value, the class may be one of the following:

    Unspecified

    Channel path

    Stand-alone CTCA.
- **Type.** A six-character type number of an attached unit that corresponds to the type number indicated on the machine serial number plate.
- **Model.** A three-character model number of an attached unit that corresponds to the model number indicated on the machine serial number plate.
- **MF (manufacturer).** A three-character code that identifies the manufacturer of an attached unit.
- **Plant.** A two-character code that identifies the plant of manufacture for the device.
- **Sequence Nbr (number).** A 12-character sequence (serial) number that corresponds to the device's serial number.

- **Tag.** The tag contains the interface ID of the port providing the node descriptor information. This could be the channel path identifier (CHPID) if originating through a channel, or the part number of an attached device.

Verifying the Director Transmit and Receive Levels

Use these procedures to verify that the port transmitter is operating properly and to measure the *receive level* input. Use these procedures only in conjunction with link fault isolation and the MAPs procedures.

CAUTION

The FL200 laser ports are designed and certified for use only with single-mode optical fiber and connectors having characteristics specified by IBM. The use of any other connectors or fiber may result in emission of laser power levels capable of producing injury to the eye if directly viewed. Use of nonspecified connectors or fiber could violate the Class 1 laser classification.

CAUTION

Data processing environments can contain equipment transmitting on system links with laser modules operating at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. The inspection or repair of optical fiber cable assemblies and receptacles should be performed by trained service personnel only.

All transmit and receive power levels must be recorded as instructed. If it is determined the Director is not the cause of the problem, you might be directed to another service publication where you will need to know the recorded power levels from these procedures.

For a list of the items needed for the following procedures, refer to “Tools and Materials” following. To identify the type of port card, refer to "Determining Port Type" on page 2-143.

The procedure you use to measure the transmitter and receiver levels is determined by the type of port you are testing.

Table 2-2. Power Measurement Procedures for Director Ports

Port Type	Procedure
LED ports	"Transmitter and Receiver Power Measurements for LED Ports" on page 2-144.
XDF Laser ports	"Transmitter and Receiver Power Measurements for Laser (XDF) and FICON Ports" on page 2-147.
FCV ports	"Transmitter and Receiver Power Measurements for Laser (XDF) and FICON Ports" on page 2-147.

Tools and Materials

The following items are needed for the LED verification procedures:

- **Optical power meter** (part number 12G8814)
- **Fiber optic cleaning kit** (part number 46G6844)
- **Duplex-to-duplex coupler** either metal (part number 42F2132) or plastic (part number 42F8604) supplied with the fiber optic test support kit
- **Duplex-to-biconic test cable, 3.0 meters** (part number 18F6948) supplied with the fiber optic test support kit

The following items are needed for the laser verification procedures:

- **Optical power meter** (part number 12G8814)
- **Fiber optic cleaning kit** (part number 46G6844)
- **Brush cleaning tool** (part number 46F2481)
- **Air cleaning tool** (part number 46F2485)
- Cables and adapters for cable with ESCON connectors:
  - **Duplex jumper cable** (part number 02G4982) supplied with the fiber optic test support kit
  - **Duplex-to-ST adaptor** (part number 73F5419) supplied with the fiber optic test support kit
  - **ST-to-BIC test cable** (part number 58F1043) supplied with the fiber optic test support kit
- Cables and adapters for cable with Fiber Channel Standard (FCS) Connectors:
  - **Duplex jumper cable** (part number 54G3409) supplied with the fiber optic test support FCS upgrade kit

– **Duplex-to-ST adaptor** (part number 54G3424) supplied with the fiber optic test support FCS upgrade kit

– **ST-to-BIC test cable** (part number 58F1043) supplied with the fiber optic test support kit.

Determining Port Type

To determine if a port card is an FCV port card, LED port card, or XDF Laser port card, open the Director door and examine the card. Table 2-3 describes the physical characteristics of and differences between port cards.

Table 2-3. Determining Port Type

Physical Characteristic	FCV	LED	XDF Laser
Director model compatibility	9032-005 only	All models	All models
Number of external port connections	One	Four or eight	Four or eight
Type of port connector	FCS/SC duplex	Multimode duplex	FCS/SC duplex
Color of fiber-optic cable attached to port	Yellow (singlemode) Orange (multimode)* See Notes following.	Orange (multimode)	Yellow (singlemode)
Color of cable connector	Light gray or blue. Black if multimode.	Black	Light gray or blue

Notes:

- Do not insert a singlemode cable connector XDF/FCV laser wrap plug, or XDF/FCV laser protective plug into an LED port.
- You can only connect multimode cable to the FCV port card's FCS/SC connector using a mode conditioning patchcord (part number 21L4175).
- Do not insert a multimode cable connector, LED wrap plug, or LED protective plug into an FCV or XDF laser port.
- The ports on a DVP card are either all LED ports or all XDF laser ports (if one port is LED, all ports are LED). The single port on an FCV port card is a laser port.

- The ports on a spare ports card are either all LED ports or two LED ports and two XDF laser ports. The spare ports card *does not* provide FCV ports.

You can also determine if a port is LED or laser by displaying the node descriptor for the port address. Refer to “Displaying Node Descriptor” on page 2-137.

Transmitter and Receiver Power Measurements for LED Ports

Use the following procedures to measure optical power through LED ports.

Note: After finishing these procedures, unblock the port using procedures under "Unblock Port Procedure" on page 2-130.

LED Transmitter Power Level Verification

Use Figure 2-46 with this procedure.

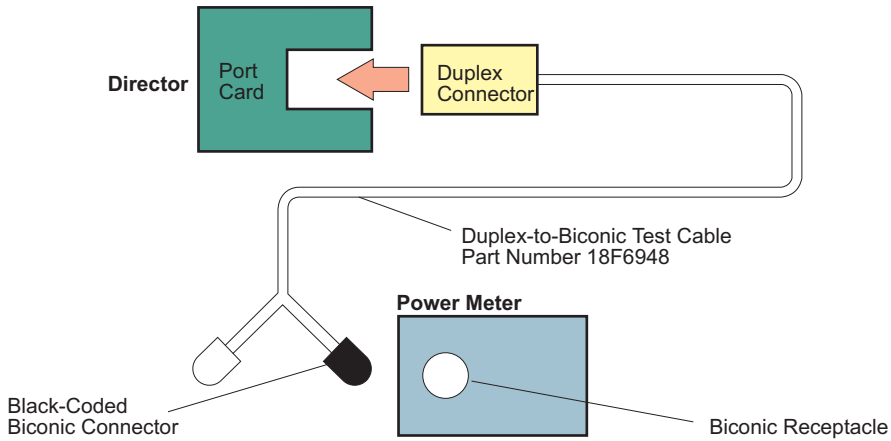


Figure 2-46. LED Transmitter Power Level Verification

1. Verify that the port is blocked. If not, block the port using procedures under "Block Port Procedure" on page 2-128.
2. Clean the duplex-to-biconic test cable connectors as directed in *Fiber Optic Cleaning Procedures* (SY27-2604-01 or later) supplied with the fiber optic cleaning kit.

   Attach the duplex-to-biconic test cable duplex connector to the Director fiber optic cable receptacle.
3. Attach the duplex-to-biconic test cable’s black-coded biconic connector to the power meter biconic receptacle.

4. Set the power meter to the 1300-nm range and move the power switch to the On position. Before continuing this procedure, let the meter warm up for about five minutes.
5. Record the power level displayed on the power meter. If the power level is less than -21.0 dBm (for example, -23 dBm), clean the fiber optic port as directed in the cleaning procedure supplied with the fiber optic cleaning kit. Then measure and record the power level again. For correct power levels, refer to *Enterprise Systems Connection Link Fault Isolation* (SY22-9533) and *Maintenance Information for Fiber Optic Channel Links* (SY27-2597).
6. Remove the test cable duplex connector from the Director. Do not remove the duplex-to-biconic test cable's black-coded biconic connector from the power meter biconic receptacle.
7. Go to "LED Receive Power Level Verification."

LED Receive Power Level Verification

Use Figure 2-47 with this procedure.

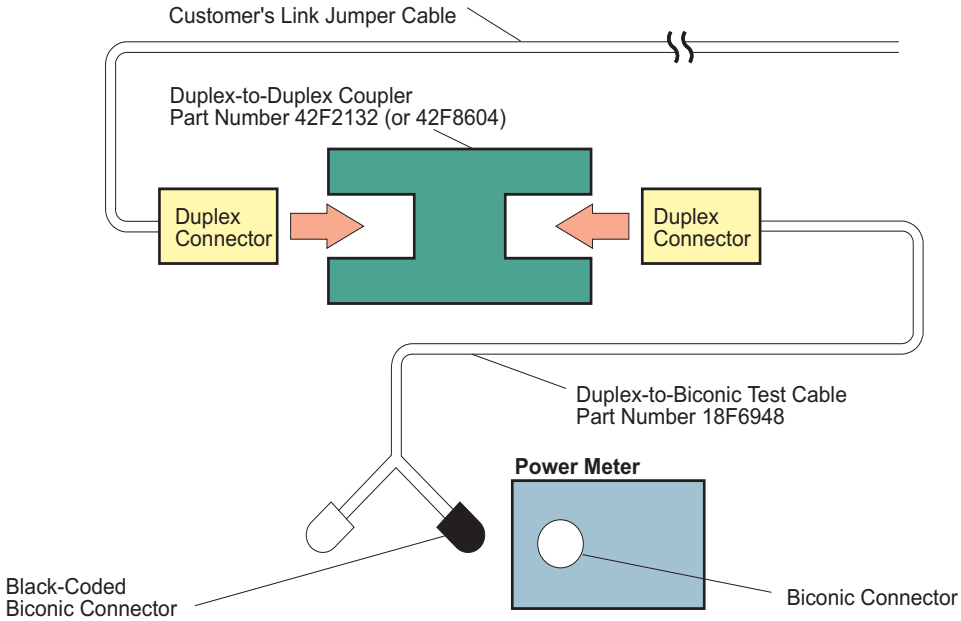


Figure 2-47. LED Receive Power Level Verification

1. Verify that the port is blocked. If not, block the port using procedures under "Block Port Procedure" on page 2-128.
2. Clean the duplex-to-biconic test cable connector as directed in *Fiber Optic Cleaning Procedures* (SY27-2604-01 or later) supplied with the fiber optic cleaning kit.
3. Attach the duplex-to-biconic test cable's black-coded biconic connector to the power meter biconic receptacle.
4. Set the power meter to the 1300-nm range and move the power switch to the On position. Before continuing this procedure, let the meter warm up for about five minutes.

   Attach the test cable duplex connector and the customer's link jumper cable to the duplex-to-duplex coupler.
5. Record the power level displayed on the power meter. For correct power levels, refer to *Enterprise Systems Connection Link Fault Isolation,* (SY22-9533). For additional information, refer to *Maintenance Information for Fiber Optic Channel Links* (SY27-2597).
6. Remove all test equipment from the Director.
7. Clean and reconnect all fiber optic cabling. Refer to *Fiber Optic Cleaning Procedures* (SY27-2604-01 or later) supplied with the fiber optic cleaning kit.
8. Unblock the port using procedures under "Unblock Port Procedure" on page 2-130.
9. If you were directed here from a MAP in Chapter 2, return to the same step in the MAP.

Refer to the following publications for additional information.

- *Maintenance Information for Fiber Optic Channel Links* (SY27-2597)
- *Enterprise Systems Connection Link Fault Isolation* (SY22-9533).

Transmitter and Receiver Power Measurements for Laser (XDF) and FICON Ports

Use the following procedures to measure optical power through laser ports on XDF laser port cards and the FICON port on FCV port cards. The XDF and the FCV port cards have fiber channel standard (FCS) cable connectors. Use the cable and cable adapter for the FCS connector.

Note: After finishing these procedures, unblock the port using procedures under "Unblock Port Procedure" on page 2-130.

XDF and FICON Transmitter Power Level Verification (FCS Connectors)

Use Figure 2-48 with this procedure.

1. Verify that the port is blocked. If not, block the port using procedures under "Block Port Procedure" on page 2-128.
2. Clean all test cable connectors. Refer to *Fiber Optic Cleaning Procedures* (SY27-2604-01 or later) packaged with the fiber optic cleaning kit.
3. Attach one end of the duplex jumper test cable to the Director fiber optic port. Attach the other end to the appropriate duplex-to-ST single-mode adapter.
4. Attach the single ST connector on the ST-to-BIC test cable to the “A” connector on the duplex-to-ST single-mode adapter.
5. Set the power meter to the 1300 nm range and move the power switch to the On position. Let the meter warm up for about five minutes before continuing this procedure.
6. Record the power level displayed on the power meter. If the power level is less than -10.0 dBm (for example, -11 dBm) for ports with FCS connectors, clean the fiber optic port as directed in the cleaning procedure supplied with the fiber optic cleaning kit. Then measure and record the power level again.
7. For correct power levels, refer to the following publications:
   - *ESCON I/O Physical Layer (SA23-0394)*. This contains link optical specifications for multi-mode TRS and single-mode XDF 200 Mbps links.
   - *FICON I/O Physical Layer (SA24-7172).* This contains link optical specifications for multimode and single-mode FICON 1062 Mbps links.
8. For other information on link power measurements, refer to the following publications:
   - *Enterprise Systems Connection Link Fault Isolation* (SY22-9533). This contains procedures for calculating total link loss.
   - *Maintenance Information for Fiber Optic Channel Links* (SY27-2597). This contains procedures for calculating total link loss.

- *Planning for Fiber Optic Links (GA23-0367)*. This contains link loss specifications, measurement techniques, cable specifications and planning information for cables and coupler connections.

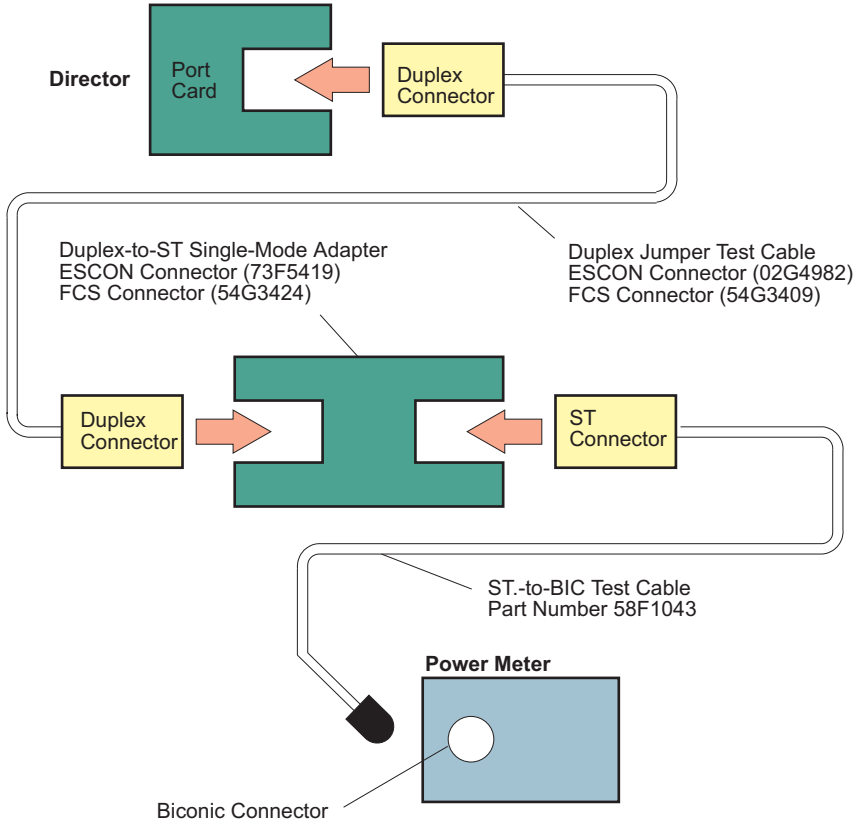


Figure 2-48. Laser XDF and FICON Transmitter Power Level Verification

9. Remove the duplex jumper test cable from the Director and the duplex-to-ST single-mode adapter. Do not remove the ST-to-BIC test cable from the power meter or the duplex-to-ST single-mode adapter.
10. Go to “XDF and FICON Receive Power Level Verification.”

XDF and FICON Receive Power Level Verification (FCS Connectors)

Use Figure 2-49 with this procedure.

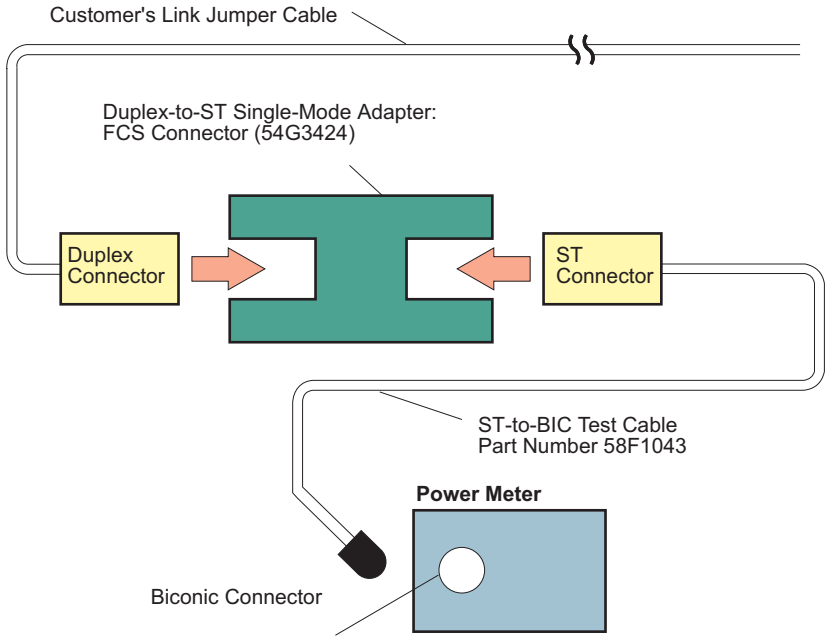


Figure 2-49. XDF and FICON Port Receive Power Level Verification

1. Verify that the port is blocked. If not, block the port using procedures under "Block Port Procedure" on page 2-128.
2. Attach the customer's link jumper cable to the appropriate connector on the duplex-to-ST single-mode adapter.
3. Attach the single ST connector on the ST-to-BIC test cable to the "A" connector on the duplex-to-ST single-mode adapter.
4. Set the power meter to the 1300-nm range and move the power switch to the On position. Let the meter warm up for about five minutes before continuing this procedure.
5. Record the power level displayed on the power meter.
6. For correct power levels, refer to the following publications:
   - *ESCON I/O Physical Layer (SA23-0394)*. This contains link optical specifications for multi-mode TRS and single-mode XDF 200 Mbps links.
   - *FICON I/O Physical Layer (SA24-7172).* This contains link optical specifications for multimode and single-mode FICON 1062 Mbps links.

7. For other information on link power measurements, refer to the following publications:
   - *Enterprise Systems Connection Link Fault Isolation* (SY22-9533). This contains procedures for calculating total link loss.
   - *Maintenance Information for Fiber Optic Channel Links* (SY27-2597). This contains procedures for calculating total link loss.
   - *Planning for Fiber Optic Links (GA23-0367)*. This contains link loss specifications, measurement techniques, cable specifications and planning information for cables and coupler connections.
8. Remove all test equipment from the Director.
9. Clean and reconnect all fiber optic cabling as directed in *Fiber Optic Cleaning Procedures* (SY27-2604-01 or later) supplied with the fiber optic cleaning kit.
10. Unblock the port using procedures under "Unblock Port Procedure" on page 2-130.
11. If you were directed here from a MAP, return to the same step in the MAP.

Diagrams

The following are reference diagrams for using the diagnostic information in this chapter.

Maintenance Port Cabling

Figure 2-50 illustrates pinout assignments for a null modem cable to attach a maintenance terminal to the Director maintenance port. You can also use a 25-pin to 25-pin RS-232 cable and null modem adapter (part number 83X9280).

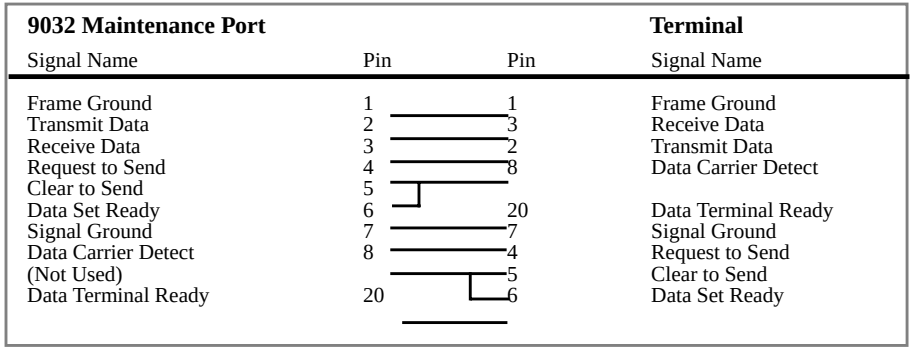


Figure 2-50. Null Modem Pinout Assignments for RS-232 25-Pin Female Maintenance Port

Electrical Cabling and Connections

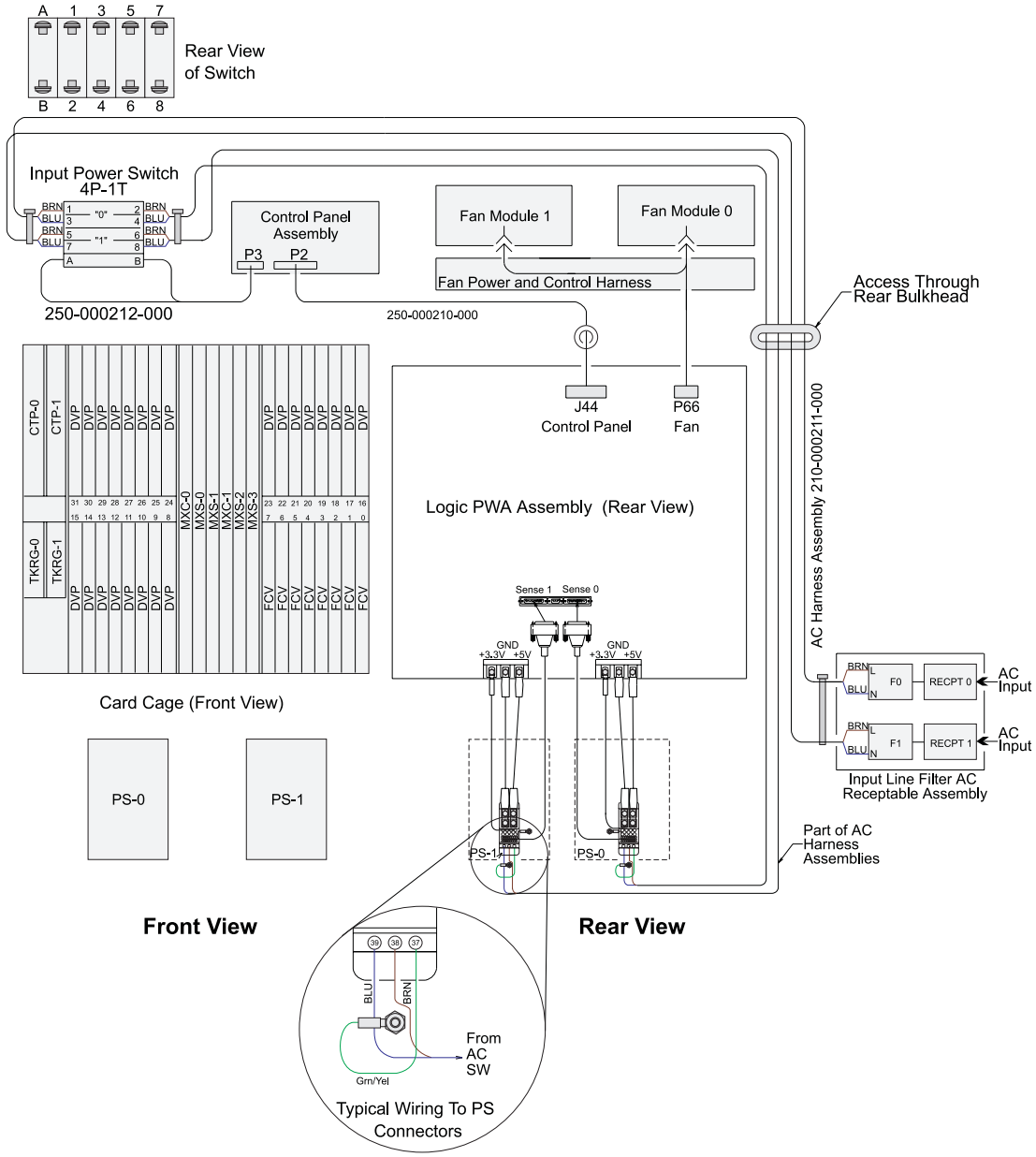


Figure 2-51. Director Electrical System and Ground Connections

Chapter 3. Repair Information

Introduction

This chapter contains removal and replacement procedures used by IBM service representatives for all field replaceable units (FRUs) comprising the 9032 Model 5 Enterprise Systems Connection (ESCON) Director.

Note: Do not perform Director repairs until you have isolated the failure to a FRU. If you have not performed fault isolation, refer to "Start Initial Fault Isolation" on page 2-4.

Before initiating repair on a FRU, read the removal and replacement procedures for that FRU carefully and thoroughly in order to familiarize yourself with its operations and reduce the possibility of problems.

To determine the urgency of a repair, determine the operational level of the Director using either the six-digit hexadecimal code displayed on the front panel status display event information line (and in the Director's event log on the Console), or the four-digit hex code displayed on the Console after executing the Director *Operational Status* option.

For detailed information on the Console, refer to the publication *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296-00).

The Console's Director Operational Status Command

From the *Utility* menu of the active matrix window, select the *Director Operational Status* option.

The *Director Operational Status* dialog box displays the four-digit status code and a statement of the Director's operational level. For information on interpreting these codes, refer to "Console Operational Status Codes" on page C-5.

Adjustments

The 9032 Model 5 Director requires no adjustments.

Procedural Notes

The following notes are referenced from applicable procedures. They do not apply to all procedures in this chapter.

1. In all procedures that refer to detailed steps in another procedure, complete the required steps, return to the initial procedure, and continue to the next step.
2. Observe the front panel status display during a replacement procedure. An event will be generated with a severity code of zero (0) when the failure is corrected. Check sense bytes 27 and 28 of the front panel's event record to

determine if the Director has additional events currently degrading its operational status.

To examine the sense bytes:

a. Press the *Entry* button on the operator panel to scroll through events in the event information queue.

b. When an active event appears (for example Active=ic/xynn), press the *Detail* button to display the nine lines of event detail (one line each time that you press the button). Pressing the button once displays the event's date. Keep pressing the button until the following appears:

   SB26=xx xx xx xx, where xx represents data in sense bytes 26, 27, 28, and 29.

c. To interpret sense byte data, refer to the section on sense bytes 27 and 28 under "Common Sense Bytes" on page A-9.

3. After completing the replacement procedure, clear the event reporting the failure and the event reporting the recovery from the front panel status display after completing the replacement procedure. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.

Powering Procedures

Switch power on and off to the Director with the ac power switch to the left of the front panel using the following procedures. For specific locations regarding Director components or Console features, refer to "Repair Information" on page 3-1

Power-Off

Note: Before powering the unit off to cycle power, wait 30 seconds before powering on again.

When the Console Is Available:

1. Ask the customer to configure all attached channels and control units offline.
2. Save the current active matrix configuration data:
   a. Are you replacing a control processor (CTP) card in a nonredundant CTP card unit?
      - **Yes:** Continue to step c.
      - **No:** Continue to step b.
   b. On the *Utility* menu of the active matrix window, is the *Active=Saved* option selected next to menu option)? Refer to Figure 3-1 on page 3-6.

- **Yes:** Continue to step 3c. The active matrix configuration is already saved to the initial program load (IPL) area in nonvolatile memory.
- **No:** Select the *Active=Saved* option. Continue to step c.

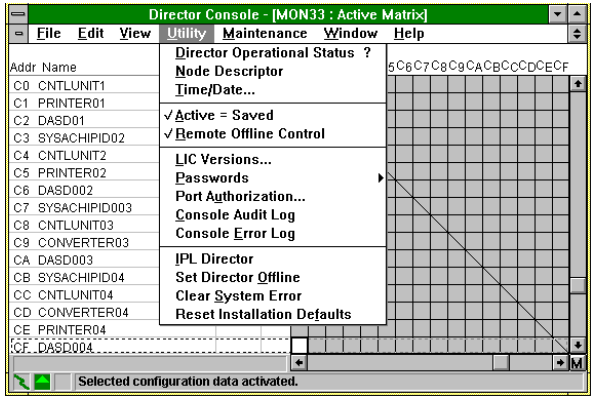


Figure 3-1. Active = Saved Option

c. Save the configuration to a file on the Console's fixed disk by selecting the *Save Configuration Matrix As* option from the *File* menu of the active matrix window.

   Note: Use a name for the saved configuration other than "IPL."

   The *Operator Authorization* dialog box displays, prompting you for an operator authorization password.

d. Type an operator authorization password (the default is LEVEL003), and select the *OK* button.

   The *Save Configuration Matrix As* dialog box (Figure 3-2 on page 3-7) displays, prompting you for the name of the matrix which you wish to save. Go to step 2e.

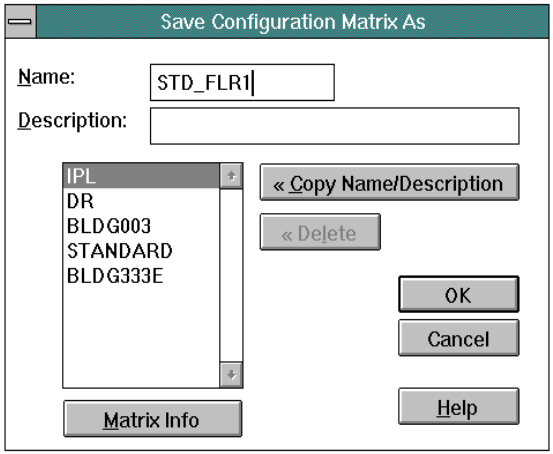


Figure 3-2. Save Configuration Matrix As... Dialog Box

e. Select (highlight) the matrix you wish to save (or create a new matrix by typing a matrix name into the *Name:* field), and select the *OK* button.

   The "Configuration saved" message displays on the status line to confirm this operation's completion. Continue to step 3.

3. Set the Director offline:

   a. On the *Utility* menu of the active matrix window, is the *Remote Offline Control* option enabled (check mark)?

      - **Yes:** Continue to step c.
      - **No:** Continue to step b.

   b. Execute a remote offline control command:

      From the *Utility* menu of the active matrix window, select the *Remote Offline Control* option.

      The *Operator Authorization* dialog box displays, prompting you for an operator authorization password.

      Type an operator authorization password and select the *OK* button.

   c. From the *Utility* menu of the active matrix window, select the *Set Director Offline* option.

      The *Director Console* dialog box displays. Refer to Figure 3-3 on page 3-8.

Note: This operation transmits an offline sequence (OLS). The *Set Director Offline* option is not available if *Remote Offline Control* is not enabled.

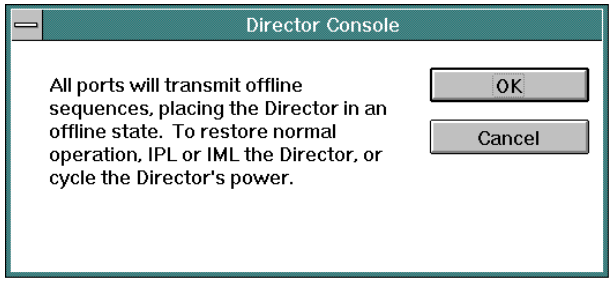


Figure 3-3. Set Director Offline

d. Select the *OK* button.

   The *Operator Authorization* dialog box displays, prompting you for an operator authorization password.

e. Type an operator authorization password and select the *OK* button.

   The “Director is offline” message displays on the status line to confirm this operation’s completion and the offline icon displays

4. From the Director front panel, set the ac power switch to the off position.
5. From the electrical outlet, unplug the Director power cords.

Note: Power off is now complete. Return to the procedure that directed you to this procedure.

When the Console Is Not Available:

Perform this power-off procedure if the failure renders the *Save Active Matrix* and *Set Director Offline* as nonfunctional options on the Console:

1. Is this Director supported by an System Automation for OS/390 (SA OS/390?)
   - **Yes**: Continue to step 2.
   - **No**: Continue to step 3.
2. From the SA OS/390’s terminal, save the current active matrix using appropriate ESCON manger commands, and then execute the *Remove Switch* command for the appropriate Director.

   Note: Unless you save the current active matrix, the last saved active matrix will be reactivated as the active matrix if the Director is powered off then back on.

3. Set the ac power switch to the off position.
4. From the electrical outlet, unplug the Director power cords.
5. If you were sent here from another procedure, return to that procedure at this time.

Power-On

1. At the electrical outlet, plug in the Director power cords.
2. From the Director front panel, set the ac power switch to the On position.

   Note: Push firmly to engage the switch. If the switch does not engage properly because it was not pushed firmly, wait 30 seconds before attempting to switch power on again. If powering the unit off to cycle power, wait 30 seconds before powering on again.

   Note: The IPL matrix automatically configures the Director port connections.
3. Observe that the Director power-on self-tests (posts) have completed (the front panel's event information line displays the Director ID number). This may take from two to five minutes.

   Note: If the POSTs do not complete, refer to maintenance analysis procedure (MAP) 9300: "Power On/IML Initialization Failure" in Chapter 2.
4. Observe that no new events are generated (event Information line is blank).

   Note: **I**f an event occurs (other than what you expect):

   a. Note the event code displayed on the event Information line.

   b. Refer to Appendix C to interpret the code.

   c. Proceed to the applicable MAP in Chapter 2.
5. If you were sent here from another procedure, return to that procedure at this time.

IPL the Director

Attention!

If an FCV port card is operating in degraded mode (one or more internal ESCON ports not operational), selecting *IPL Director* from the *Utility* menu sets the FICON port offline. Prior to selecting this option during degraded operation, ensure the system operator varies the attached FICON channel offline.

1. From the *Utility* menu of the active matrix window, select the *IPL Director* option.

   The *Director Console* dialog box displays. Refer to Figure 3-4.

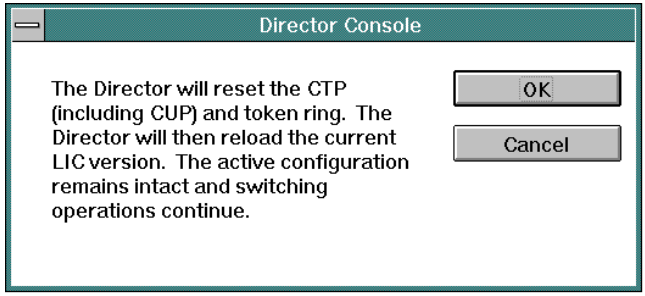


Figure 3-4. IPL the Director

   Note: This operation resets the CTP card, control unit port (CUP), and Token-Ring (TKRG) controller adapter card; reloads the current licensed internal code (LIC) version; and loads the current configuration matrix to the active matrix.

2. Select the *OK* button.

   The *Operator Authorization* dialog box displays, prompting you for an operator authorization password.

3. Type an operator authorization password (default is LEVEL003) and select the *OK* button.

   The “Director is performing an IPL” message displays on the status line to confirm this operation is in progress.

   Note: After an IPL or initial machine load (IML), the internet protocol (IP) address may display as 0.0.0.0 on the front panel until the actual IP address is calculated.

Cleaning Fiber Optics

Perform this procedure when removing or replacing fiber optic connectors. For instructions, refer to *Fiber Optic Cleaning Procedure* (SY27-2604 -01 or later). Procedures are provided with the fiber optic cleaning kit.

Before You Clean Fiber Optics:

1. Determine the ports from which you intend to disconnect the fiber optic cables.
2. Ask the customer to configure all channels and/or control units attached to those ports offline.
3. Block the ports. Refer to "Block Port Procedure" on page 2-128.

After You Clean Fiber Optics:

Unblock the ports. Refer to "Unblock Port Procedure" on page 2-130.

Removals and Replacements

For specific FRU locations, refer to Chapter 4.

Before performing any of the following repair procedures, read all statements listed in “Safety” at the beginning of this manual.

Attention!

To avoid causing machine errors while working in the card cage area of a Director, follow proper electrostatic discharge (ESD) procedures by connecting the grounding cable to either grounding point on the Director chassis and wearing the wrist strap. The grounding point at the front of the chassis is located above the matrix controller (MXC) and matrix switch (MXS) cards. The grounding point at the rear of the chassis is located between the two fans. Additionally, touch the electrostatic discharge pad (located on top of the front of the #0 power supply) before performing maintenance and once each minute while performing maintenance in the card cage area. Refer to Figure 3-5 on page 3-12 and Figure 3-6 on page 3-13 for locations of the ESD components.

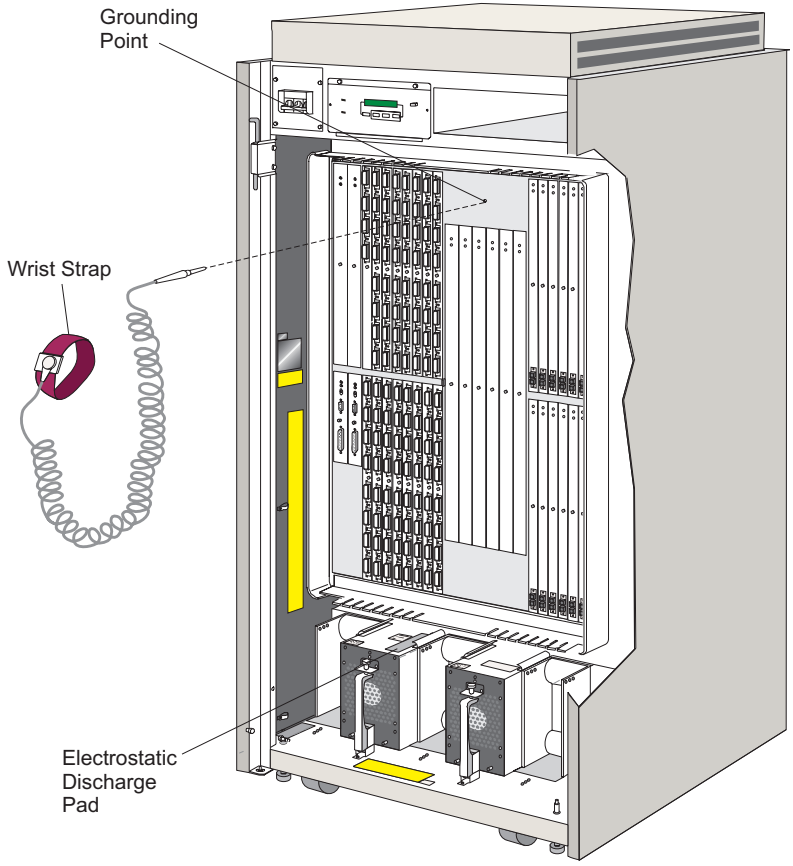


Figure 3-5. ESD Components (Chassis Front)

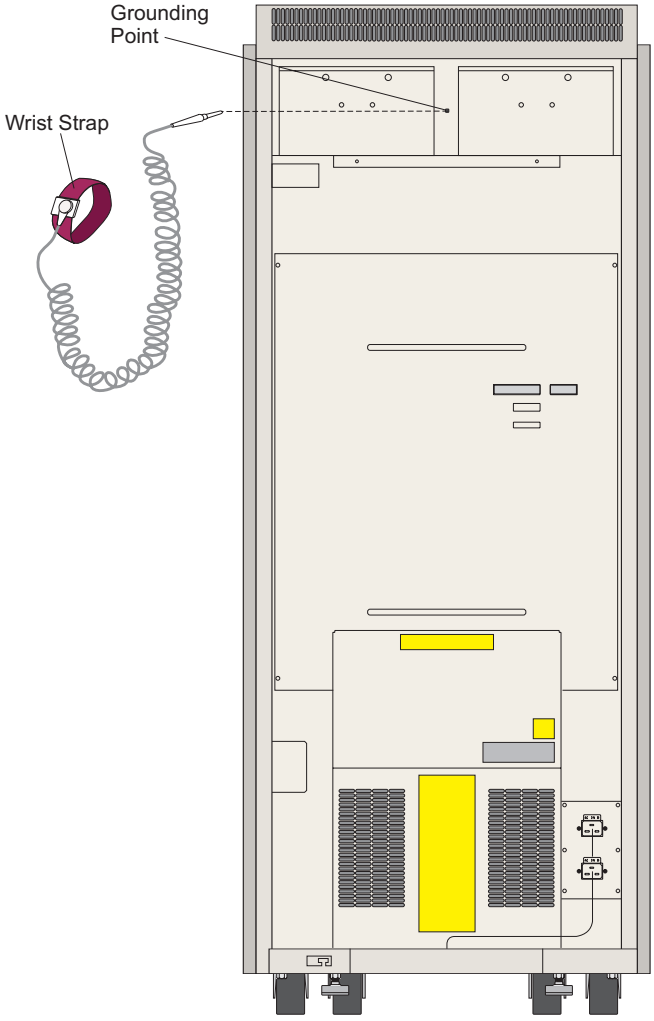


Figure 3-6. ESD Components (Chassis Rear)

Backup Components

Backup FRUs provide redundancy for continuous availability and allow concurrent maintenance for the Director. The following paragraphs provide important considerations when removing and replacing these components.

Logic Cards

- **CTP Card -** A backup CTP card can be installed or replaced while the Director is operational. If the primary card fails, the Director automatically switches operation to the backup card.
- **TKRG Controller Adapter Card** - A backup TKRG controller adapter card can be installed or replaced while the Director is operational. If the primary card fails, the Director automatically switches operation to the backup card.

  Note: Both TKRG controller adapter cards have the same internet protocol (IP) address.
- **MXC/MXS Card Set** - The matrix controller/matrix switch (MXC/MXS) is a three-card set. A backup MXC/MXS card set can be installed or replaced while the Director is operational. If the primary card set fails, the Director automatically switches operation to the backup card set.

  Note: Although the MXC and two MXS cards operate as a set, do not replace them as a set; replace only failed cards.

  Note: A newer model MXC card (labelled **MXC2)** controls switching for *both* ESCON DVP cards and FCV Port cards. This card is required to support FICON operation. For full redundancy in Directors with FICON connections, two MXC2 card sets must be installed. If a Director contains an MXC card with a backup MXC2 card, FICON capability is not enabled.If a director contains an MXC2 card and an MXC card is added while power is on, the MXC card will fail. If an MXC card is added while power is off, then the Director is powered on, the FCV port cards will be held offline.

  Note: **DVP Cards -** A backup LED or XDF Laser DVP card can be installed or replaced while the Director is operational. Device connections on up to eight failed ESCON ports can be manually swapped to ports on the backup card (LED-to-LED or XDF Laser-to-XDF Laser).

  Note: To avoid interrupting port operations when replacing a DVP card, all connections on the failed card can be swapped to unused ports on a spare ports card or spare ports on other DVP cards before replacement. A failed FICON port ***cannot*** be swapped to a port on a DVP card, but it can be swapped to another FICON port.
- **Spare DVP Cards** - An LED spare ports card or an LED/XDF spare ports card can be installed or replaced while the Director is operational. Up to four failed ESCON ports can be manually swapped to ports on the card. A failed FICON port on an FCV port card ***cannot*** be swapped to the spare ports card.

Note: To minimize interrupting port operation when replacing a spare DVP card, swap connections to the spare ports on other DVP cards or spare ports cards before replacement.

- **FCV Port Card** - A backup FCV port card can be installed or replaced while the Director is operational. One failed FICON port can be manually swapped to the backup card.

  Note: A failed FICON port can be swapped with a FICON port on another FCV port card, but not with any ESCON port.

Power Supplies

Two input power supplies provide redundancy in case a power supply fails. If either of the active power supplies fail, the other unit continues to provide adequate power to support Director operation. You can replace the failed power supply while the Director is operating.

A newer model power supply (PWR2, Feature Code #5701) supports FCV port card operation. For identification, the face plate of this power supply is anodized (black). This power supply is required to support FICON operation.

When installing or replacing a redundant power supply in a unit supporting FICON connections, the redundant and primary power supply must be the PWR2 model that supports FCV port cards.

Note: To support FICON operation, earlier Director models may have a 3.3-volt load-sharing jumper cable (250-000220-000) installed between the power sense cable assemblies. Refer to engineering change D98133 for additional information and the serial numbers of affected Directors.

FRUs that Require Power Off During Repair

Completely power off the Director before performing repairs on any of the following FRUs:

Note: **Before switching off or cycling Director power**, ensure that you perform a controlled shutdown of port connections. Refer to "Powering Procedures" on page 3-5.

- AC filter assembly
- AC filter cable assembly
- AC power switch
- CTP card (nonredundant card)
- DC fan cable assembly
- Logic board assembly

- Matrix controller and matrix switch card (nonredundant card set)
- Operator panel cable
- Sense #0 cable assembly
- Sense #1 cable assembly
- Thermal shutdown cable assembly
- Top cover.

Doors, Front and Rear

For orientation and FRU location, refer to Figure 4-1 and Figure 4-2 in Chapter 4

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove either a front or a rear door. Refer to Figure 3-7.

1. Identify which door requires removal.
2. Unlock the top and bottom door latches and open the door.

   Note: Do not open the door fully. In order to perform steps 3 through 5, the door must not be opened beyond a 45˚ angle.
3. Detach the cable stay from the cable stay mounting point.
4. Remove the hinge pin that secures the door hinge to the upper hinge mounting bracket and close the door almost all of the way.

   Note: When removing the hinge pin and door, be careful not to hit the power switch to the off position or damage any internal parts. Hold the door securely while the upper portion is unattached.
5. Remove the door from the Director chassis while following the proper bending and lifting procedures (refer to the publication *Electrical Safety for IBM Service Representatives*).

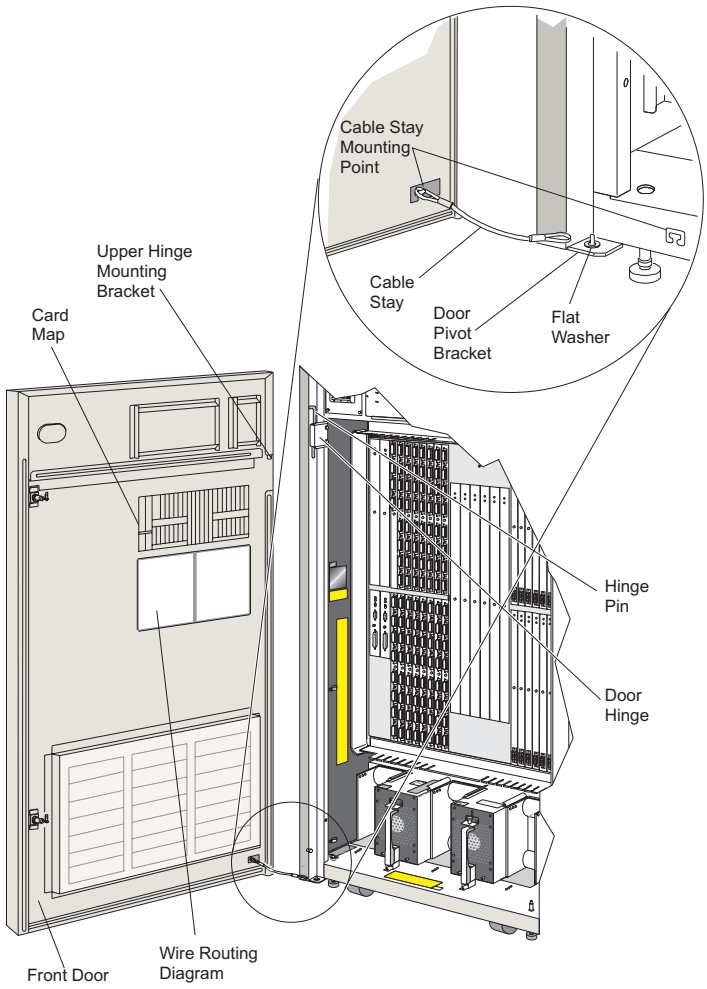


Figure 3-7. Front Door

Replacement:

Use the following procedure to replace either a front or rear door (the preceding figure pertains to these steps).

1. Ensure that the flat washer is positioned over the door pivot bracket.
2. Carefully place the hole on the bottom of the door over the door pivot bracket and flat washer while following the proper bending and lifting procedures (refer to the publication *Electrical Safety for IBM Service Representatives*).

Note: Hold the door securely while the upper portion is unattached.

3. Vertically align the door hinge with the upper hinge mounting bracket and insert the hinge pin.

   Note: When replacing the hinge pin and door, be careful not to hit the power switch to the off position or damage any internal parts.

   Note: Perform step 4 while holding the door at a 45˚ angle.

4. Attach the cable stay to the cable stay mounting point (refer to Figure 3-7).
5. Close the door.
6. Inform the customer that the procedure is complete.

Control Processor Card, Nonredundant

You must use this procedure if replacing a nonredundant card or if replacing both CTP cards in a redundant system. These instructions include powering down the Director and reconfiguring local area network (LAN) addresses. If a fully operational redundant CTP card is installed, use the steps under “Control Processor Card, Redundant.”

Attention!

You cannot remove and replace a CTP card in a nonredundant situation while the power is on. If you do, the configuration data, IP address, and other operating information for the Director will be lost.

You cannot add a redundant CTP card to an empty CTP slot while power is on if the original CTP card has failed. If you do, the configuration data, IP address, and other operating information for the Director will be lost.

For orientation and FRU location, refer to Figure 4-4 in Chapter 4. During this procedure observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove a CTP card from a **nonredundant** CTP card unit. Refer to Figure 3-9 on page 3-21.

1. Record the Director IP address and media access control (MAC) address:

   Note: After replacing the CTP card, you need the Director IP and MAC addresses to reestablish Director/Console communications on a locally administered LAN. If the Director is installed on a dedicated LAN, you can use the default addresses available on the new CTP card to reestablish Director/Console communications. Instructions to determine and reestablish these addresses are as follows:

   a. Is the Director power on?

      - **No:** Continue with step 1b.
      - **Yes:** Press the front panel *Advance* button twice to display the Director IP address. Press the front panel *Advance* button again to display the Director MAC address. Go to step 2.

      Note: The 15-character IP address is preceded by a capital "`I`" to indicate the displayed field on the front panel. The capital "`I`" is not part of the IP address and should not be included when recording or entering the IP address. Record the IP and MAC addresses.

   b. Is the Console operational?

      - **No:** Continue with step 1c.
      - **Yes:** You can determine the IP address, but not the MAC address. From the *File* menu of the active matrix window:

      To determine the IP address:

      - Open the *File* menu from the active matrix window.
      - Select *Open Active Configuration Matrix*.
      - Select (highlight) the required Director name.
      - Select the *Director Info* button. The *Director Information* dialog box displays. The IP *Address & Status* field displays the Director IP address. Record the IP address.

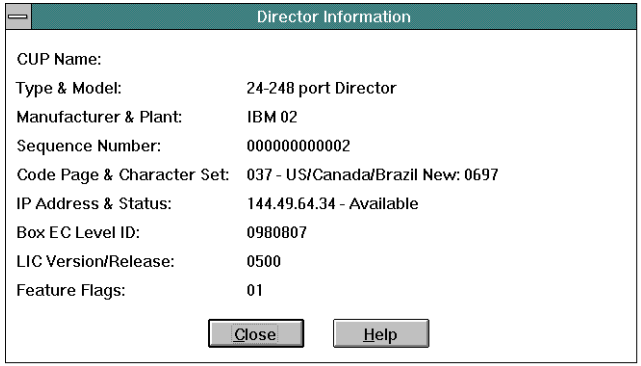


Figure 3-8. Director Information Dialog Box

c. If you cannot determine the IP and MAC addresses, and the Director is on a locally administered LAN, you must get the addresses from the network administrator, then go on to step 2. If the Director is on a dedicated LAN, you can use the default addresses available on the new CTP card.

2. Open (or remove) the Director front door. Refer to steps 2 through 5 of the removal procedure for "Doors, Front and Rear" on page 3-16.
3. Identify the CTP card (refer to Figure 3-9 on page 3-21).

   Note: Step 4 is extremely important. Be sure to perform it before going on to step 5.

4. Perform the “Power Off” procedure on page 3-5. This provides steps to take the channels and control units connected to ports offline, save the current active matrix configuration data to a file on the Console fixed disk, and set the Director ports offline before switching the power off.
5. Remove the torque tool (part number 11G4642 with tip 07H5932) from the storage compartment.
6. Carefully insert the torque tool into the hex socket drive and turn counterclockwise until the tool turns freely.
7. Hold the CTP card by its stiffener while pulling it straight out of its card track.
8. Repeat steps 6 and 7 for the other CTP card if replacing both CTP cards in a redundant system where both CTP cards are not fully operational.

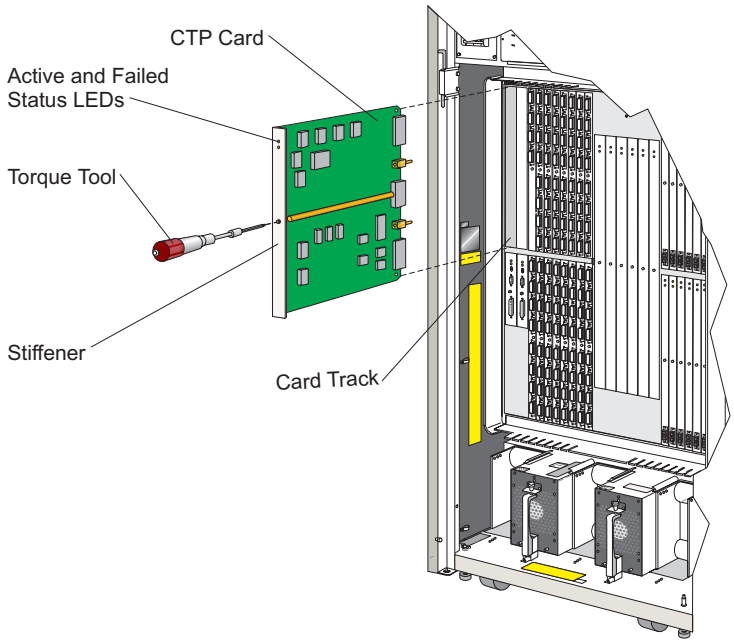


Figure 3-9. Control Processor (CTP) Card, Nonredundant

Replacement:

Use the following procedure to replace a CTP card within a **nonredundant** CTP card unit. Refer to Figure 3-9.

1. Holding the CTP card by its stiffener, carefully insert it straight into its card track (refer to Figure 3-9). Note that the label identifying the CTP card should be at the top and the component side of the card should face to the right.

   Note: For correct card location, refer to the card map inside the front door.

2. Verify that the card is aligned correctly in the upper and lower card track, and then slowly slide it forward along the track until it makes contact with the logic board assembly.
3. Tighten the screw that secures the card to the logic board assembly using these steps:
   a. Insert the tip of the torque tool into the hex socket drive.
   b. Turn t he torque tool clockwise until you hear a clicking sound. As the screw turns clockwise, the card should pull into its connector on the logic board assembly.

c. Verify that the card stiffener is flush with the front of the card cage assembly and is even with the other cards installed in the unit.

4. Repeat steps 1 through 3 for the other CTP card if replacing both CTP cards in a redundant system where both CTP cards are not fully operational.
5. Store the torque tool in the storage compartment.
6. Perform the power-on procedure. Refer to “Power-On” on page 3-9.
7. Reestablish the Director IP address using one of the following procedures. The procedure that you use depends on whether the Director is installed on a dedicated or locally administered LAN.

   - If the Director is on a dedicated LAN, you do not have to use the same IP and MAC address from the old CTP card that you recorded in step 1 of the removal procedures. You can use the default IP and MAC address on the new CTP card. Perform the following steps:

     a. Find the IP address of the new CTP card by pressing the front panel *Advance* button twice.

        Note: The 15-character IP address is preceded by a capital “I” to indicate the displayed field on the front panel. The capital “I” is NOT part of the IP address and should not be included when recording or entering the IP address.

     b. Identify the IP address to the Console by performing steps 6 through 13 under “Changing the IP Address” in Chapter 10.

   - If the Director is on a locally administered LAN, you must reestablish the IP and MAC address that you recorded in step 1 of the removal procedures.

     If you did not record the MAC and IP address or cannot determine the addresses, ask the network administrator for them.

     Perform the following steps:

     a. From the Director’s front panel, press the *Advance* button and the *Entry* button at the same time.

     This places the panel in operator assist mode and the following appears:

     b. Press the *Clear* button once and a blinking cursor appears over the rightmost portion of the IP address.

c. Press the *Detail* button to scroll the number forward. Holding the *Detail* button down for more than three seconds causes it to scroll forward quickly. The IP address scrolls a three-digit range from 000 to 255. The displayed number scrolls back to 000 after 255. When the correct value of this portion of the IP address is reached, press the *Clear* button once. The next three-digit portion to the left of the IP address begins to flash.

d. Repeat step c for each remaining portion of the IP address. When the complete IP address is entered, press the *Entry* button to save and load the new IP address.

e. If the MAC address is administered locally, press the *Advance* button (while still in operator assist mode) and the following appears:

f. To edit the address, press the *Clear* button once. A blinking cursor appears over the rightmost portion (two digits) of the MAC address.

g. Press the *Detail* button to scroll the number forward. Holding the *Detail* button down for more than three seconds causes it to scroll forward quickly. The MAC address only scrolls a two-digit hexadecimal range from 00 to FF. The displayed number scrolls back to 00 after FF. When the correct value of this portion of the MAC address has been reached, press the *Clear* button once. The next two-digit portion to the left of the MAC address begins to flash.

Note: Setting the MAC address to all zeros causes the burned-in MAC address (BIA) on the TKRG controller card to be used after the next IML.

h. Repeat step g for each remaining portion of the MAC address that you want to change. When the complete MAC address is entered, press the *Entry* button to save and load the new MAC address. An asterisk (*) displays at the end of the address.

i. To exit the operator assist mode on the Director's front panel, press the *Advance* button until EXIT appears on the top line of the status display, then press the *Entry* button.

8. Press the *IML* button on the front panel to initiate the address. Note that the IP address may display with all 0's until the address is calculated.

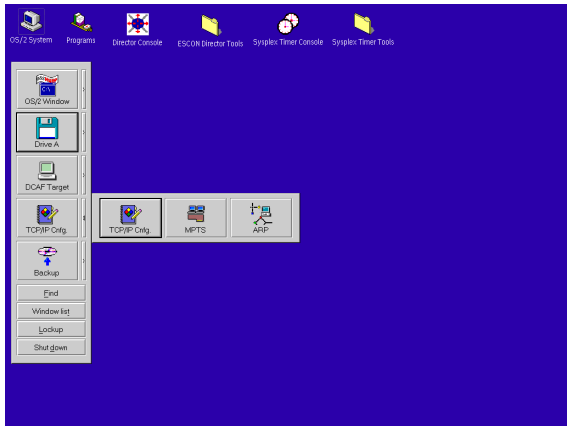
9. If you changed the IP or MAC address, go to the active matrix window on the Console to verify that the Token-Ring link between the Director and Console is active (green lightning bolt in the link status indicator at the lower left corner).
10. If the link is active, go to step 11.

    If the link is showing a failed state, refer to Chapter 2, Map 9000.

    If the link is not active, clear the address resolution protocol (ARP) table using the following steps.

    a. Go to the OS/2 desktop using steps under “Move between the Console Windows and the OS/2 Desktop” in Chapter 6.

    b. Open the *TCP/IP Cnfg.* drawer by clicking on the drawer’s arrow.



    c. Click on the *ARP* icon. This clears the network ARP table, allowing it to accept the new MAC address.

    d. Close the *TCP/IP Cnfg.* drawer by clicking on the drawer’s arrow.
11. Close (or replace) the Director front door. Refer to steps 1 through 5 of the replacement procedure for “Doors, Front and Rear” on page 3-16.
12. From the Console, reload the Director LIC. Refer to the section"Installing LIC on a Director with One CTP Card" on page 6-79.
13. Perform the procedures listed under “Collect Maintenance Information” in Chapter 2.
14. Inform the customer that the Director is now available.
15. Reestablish the active matrix that was saved during the power-off procedure.

    Ask the customer to reload the saved active matrix or to load the saved matrix of their choice.

16. Verify the CTP card installation and status from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director's active matrix window.
17. A table displays, providing hardware information for installed power supplies, port cards, and other logic cards.
18. Verify that the serial number, active status, and other information displays for the CTP card and that no failure codes exist. If CTP card information doesn't display, the card may not be installed correctly.
19. Clear the event reporting the card's failure and the event reporting the recovery from the front panel status display after completing the replacement procedure. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.

Control Processor Card, Redundant

Use this procedure to remove and replace a CTP card when a fully operational redundant CTP card is installed. If two CTP cards are installed but both are not fully operational and you want to replace one or both cards, follow instructions under "Control Processor Card, Nonredundant."

For important information on removing and replacing redundant components, such as port cards, refer to "Backup Components" on page 3-13.

You must use the procedure entitled "Control Processor Card, Nonredundant" if replacing a nonredundant card or if replacing both CTP cards in a redundant system. These instructions include powering down the Director and reconfiguring LAN addresses.

Attention!

You cannot remove and replace a redundant CTP card while power is on and the other CTP card is not fully operational. If you do, the configuration data, IP address, and other operating information for the Director will be lost. You must use the procedure entitled "Control Processor Card, Nonredundant" to replace the card.

For orientation and FRU location, refer to Figure 4-4 in Chapter 4. During this procedure observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove a CTP card from a **redundant** CTP card unit. Refer to Figure 3-10 on page 3-27.

1. Open (or remove) the Director front door. Refer to steps 2 through 5 of the removal procedure for “Doors, Front and Rear” page 3-16.
2. Identify the defective CTP card (amber light-emitting diode (LED) illuminated).
3. Remove the torque tool (part number 11G4642 with tip 07H5932) from the storage compartment.
4. Carefully insert the torque tool into the hex socket drive and turn counterclockwise until the tool turns freely.
5. Holding the CTP card by its stiffener, pull it straight out of its card track.
6. On the status display event information line, observe Event=`09/1200` or Event=`09/1201`, indicating redundant CTP card removal.

Attention!

Do not begin CTP card replacement until at least 20 seconds have passed since you removed the defective CTP card.

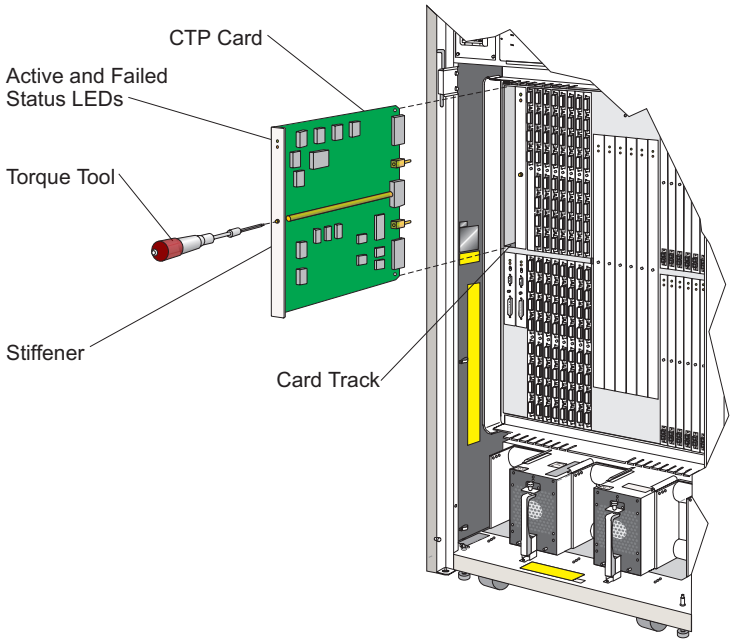


Figure 3-10. Control Processor (CTP) Card, Redundant

Replacement:

Use the following procedure to replace a CTP card within a **redundant** CTP card unit. Refer to Figure 3-10.

1. Holding the CTP card by its stiffener, carefully insert it straight into its card track (refer to Figure 3-10). Note that the label identifying the CTP card should be at the top and the component side of the card should face to the right.

   Note: For correct card location, refer to the card map inside the front door.

2. Verify that the card is aligned correctly in the upper and lower card track, and then slowly slide it forward along the track until it makes contact with the logic board assembly.
3. Tighten the captive screw that secures the card to the logic board assembly using these steps:
   a. Insert the tip of the torque tool into the hex socket drive.
   b. Turn the torque tool clockwise until you hear a clicking sound. As the screw turns clockwise, the card should pull into its connector on the logic board assembly.

c. Verify that the card stiffener is flush with the front of the card cage assembly and is even with the other cards installed in the unit.

4. Store the torque tool in the storage compartment.
5. At the Console active matrix window, select the *Hardware Configuration* option of the *Maintenance* menu. Verify that the new CTP card appears in this log.
6. Observe the bottom line of the front panel status display for Event=`09/0201` or Event=`09/0200` event code, indicating that the CTP card is installed and fully operational.
7. If the 09/0201 or 09/0200 code displays, proceed to the next step. If another code displays, refer to Appendix C to interpret the displayed code. If necessary, proceed to "Start Initial Fault Isolation" on page 2-4 to troubleshoot the problem.
8. The amber LED on the new CTP card will illuminate until the LIC has synchronized with the LIC on the active CTP. This can take up to eight minutes. The amber LED shuts off when this process completes.

   Note: The elapsed time for the LED to go out depends on Director activity.
9. Verify the CTP card installation and status from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director's active matrix window.
10. A table displays providing hardware information for installed power supplies, port cards, and other logic cards.
11. Verify that the serial number, active status, and other information displays for the card and that no failure codes exist. If card information doesn't display, the card may not be installed correctly.
12. Close (or replace) the Director front door. Refer to steps 1 through 5 of the replacement procedure for "Doors, Front and Rear" on page 3-16.
13. Perform the procedures listed under "Collect Maintenance Information" in Chapter 2.
14. Clear the event reporting the card's failure and the event reporting the recovery from the front panel status display. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.
15. Inform the customer that the replacement procedure is complete.

Matrix Controller or Matrix Switch Cards, Nonredundant

For orientation and FRU location, refer to Figure 4-4 in Chapter 4. During this procedure observe the practices described in "Procedural Notes" on page 3-4.

Note: Although the MXC and two MXS cards operate as a set, do not replace them as a set; replace only failed cards.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove an MXC or MXS card from a **nonredundant** logic card unit. Refer to Figure 3-11.

1. Open (or remove) the Director front door. Refer to steps under the removal procedure for “Doors, Front and Rear” on page 3-16.
2. Identify the defective logic card (amber LED illuminated). Remove only a card that has failed.
3. Perform the power-off procedure. Refer to “Power-Off” on page 3-5.
4. Remove the torque tool (part number 11G4642 with tip 07H5932) from the storage compartment.
5. Carefully insert the torque tool into the hex socket drive and turn it counterclockwise until the tool turns freely.
6. Hold the logic card at the top and bottom and pull it straight out of its card track.

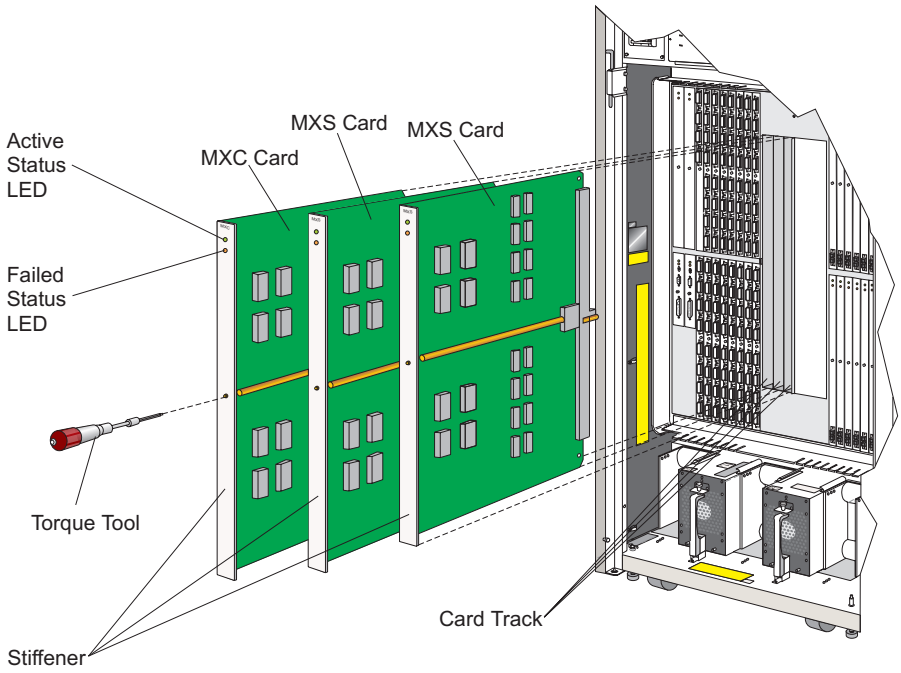


Figure 3-11. Matrix Controller (MXC) and Matrix Switch (MXS) Cards, Nonredundant

Replacement:

Use the following procedure to replace an MXC or MXS card within a **nonredundant** logic card unit. Refer to Figure 3-11.

1. Holding the MXC or MXS card by the top and bottom of its stiffener, carefully insert it straight into its card track (refer to Figure 3-11). Note that the label identifying the MXC or MXS card should be at the top and the component side of the card should face to the right.

   Note: For correct card location, refer to the card map inside the front door.

2. Verify that the card is aligned correctly in the upper and lower card track. Then slowly slide it forward along the track using equal pressure at both the top and bottom until it makes contact with the logic board assembly.
3. Tighten the captive screw that secures the card to the logic board assembly using these steps:

   a. Insert the tip of the torque tool into the hex socket drive.

b. Turn the torque tool clockwise until you hear a clicking sound. As the screw turns clockwise, the card should pull into its connector on the logic board assembly.

c. Verify that the card stiffener is flush with the front of the card cage assembly and is even with the other cards installed in the unit.

4. Store the torque tool in the storage compartment.
5. Perform the power-on procedure. Refer to “Power-On” on page 3-9.
6. Verify the card installation and status from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director’s active matrix window.
7. A table displays providing hardware information for installed power supplies, port cards, and other logic cards.
8. Verify that the serial number, active status, and other information displays for each card. If card information doesn’t display, the card may not be installed correctly.
9. Clear the event reporting the card’s failure and the event reporting the recovery from the front panel status display. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.
10. Close (or replace) the Director front door. Refer to steps 1 through 5 of the replacement procedure for “Doors, Front and Rear” on page page 3-16.
11. Perform the procedures listed under “Collect Maintenance Information” in Chapter 2.
12. Inform the customer that the Director is now available.

Matrix Controller or Matrix Switch Cards, Redundant

For orientation and FRU location, refer to Figure 4-4 on page 4-6. During this procedure observe the practices described in "Procedural Notes" on page 3-4. For information on redundant components, such as port cards, refer to "Backup Components" on page 3-13.

Note: Although the MXC and two MXS cards operate as a set, do not replace them as a set; replace only failed cards.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove an MXC or MXS card from a **redundant** logic card unit. Refer to Figure 3-12.

1. Open (or remove) the Director front door. Refer to steps 2 through 5 of the removal procedure for “Doors, Front and Rear” on page 3-16.
2. Identify the defective logic card (amber LED illuminated).
3. Remove the torque tool (part number 11G4642 with tip 07H5932) from the storage compartment.

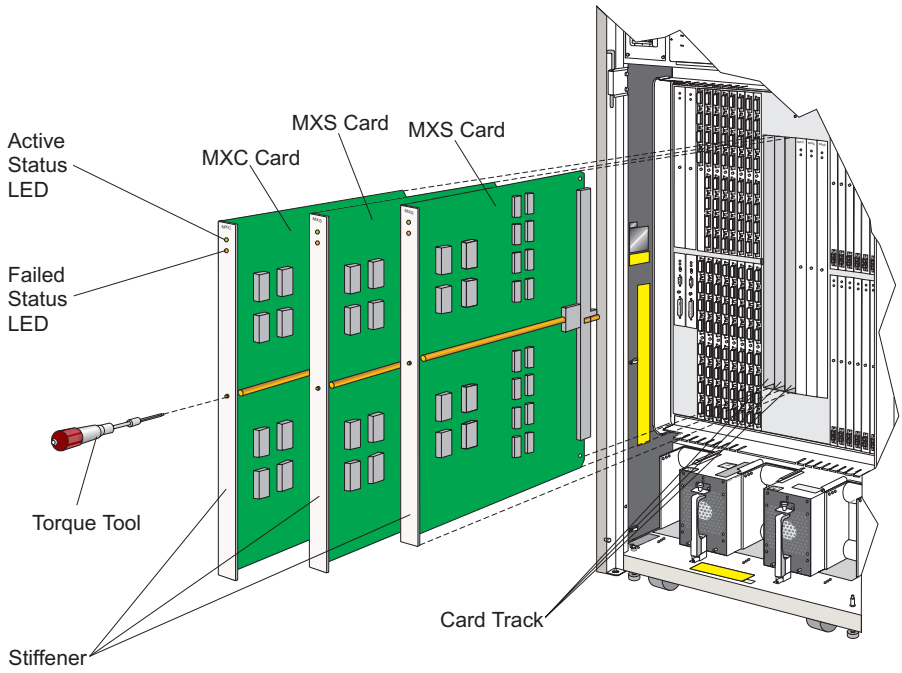


Figure 3-12. Matrix Controller (MXC) and Matrix Switch (MXS) Cards, Redundant

4. Carefully insert the torque tool into the hex socket drive and turn counterclockwise until the tool turns freely.
5. Remove the logic card by pulling it straight out of its card track.
6. On the status display event information line, observe an Event=`0A/1H00` or Event=`0A/1H01`, indicating a redundant card removal.

   A code of 0A/1100 or 0A/1101 will appear if LIC-level 4.xx or earlier is installed.

Attention!

Do not begin logic card replacement until at least 20 seconds have passed since you removed the defective logic card.

Replacement:

Use the following procedure to replace an MXC or MXS card within a **redundant** logic card unit. Refer to Figure 3-12.

1. Holding the MXC or MXS card by the top and bottom of its stiffener, carefully insert it straight into its card track (refer to Figure 3-12). Note that the label identifying the MXC or MXS card should be at the top and the component side of the card should face to the right.

   Note: For correct card location, refer to the card map inside the front door.
2. Verify that each card is aligned correctly in the upper and lower card track, and then slowly slide it forward along the track using equal pressure at both the top and bottom until it makes contact with the logic board assembly.
3. Tighten the captive screw that secures the card to the logic board assembly using these steps:
   a. Insert the tip of the torque tool into the hex socket drive.
   b. Turn the torque tool clockwise until you hear a clicking sound. As the screw turns clockwise, the card should pull into its connector on the logic board assembly.
   c. Verify that the card stiffener is flush with the front of the card cage assembly and is even with the other cards installed in the unit.
4. After installing the MXC and/or MXS card, observe the bottom line of the front panel status display for Event=`0A/0H00` or Event=`0A/0H01`, indicating logic card replacement recognition. A code of 0A/1100 or 0A/1101 will appear if LIC-level 4.xx or earlier is installed.

   Note: All cards in the set must be installed before the event code displays.

5. If any of these codes displays, proceed to the next step. If another code displays, refer to Appendix C to interpret the displayed code. If necessary, proceed to "Start Initial Fault Isolation" on page 2-4 to troubleshoot the problem.
6. Store the torque tool in the storage compartment.
7. At the Console active matrix window, select the *Hardware Audit Log* option of the *Maintenance* menu. Verify that the new MXC/MXS cards appear on this log.
8. Verify the MXC and MXS card installation and status from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director's active matrix window.
9. A table displays providing hardware information for installed power supplies, port cards, and other logic cards.
10. Verify that the serial number, active status, and other information displays for each card. If card information doesn't display, the card may not be installed correctly.
11. Clear the event reporting the card's failure and the event reporting the recovery from the front panel status display. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.
12. Close (or replace) the Director front door. Refer to steps 1 through 5 of the replacement procedure for "Doors, Front and Rear" on page 3-16.
13. Perform the procedures listed under "Collect Maintenance Information" beginning in Chapter 2.
14. Inform the customer that the replacement procedure is complete.

Spare Ports Card, LED and LED/XDF Laser

Each spare ports card contains either four LED port interfaces or two LED and two XDF laser port interfaces. For orientation and FRU location, refer to Figure 4-4 on page 4-6. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove a spare ports card. Refer to Figure 3-45 on page 3-93.

1. Open (or remove) the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
2. Identify the defective port card; determine its type (LED or laser). Refer to "Determining Port Type" on page 2-143.
3. Determine the port number of each port (use the card map inside the front door) on the defective card (a spare port card contains four ports) and label each attached fiber optic cable.

   Note: Be sure that no ports have been swapped to the spare ports card.
4. Remove the fiber optic cable from each port on the defective port card:

   LED Ports

   a. Squeeze together the connector locks on a fiber optic cable connector and pull the cable connector free from the port card.

   b. Place a protective cap over the fiber optic cable connector.

   c. Insert a fiber optic protective plug into the port card connector.

   d. Repeat steps a through c for each port on the defective port card.

   XDF Laser Ports

   a. Pull the keyed adapter cable connector free from the port card. The adapter cable should remain attached to the fiber optic cable.

   b. Place a protective cap over the adapter cable connector.

   c. Insert a fiber optic protective plug into the port card connector.

   d. Repeat steps a through c for each port on the defective port card.

   Note: Place protective plugs in each port to protect the transmitter and receiver from dirt and damage during its return shipment.
5. Remove the torque tool (part number 11G4642 with tip 07H5932) from the storage compartment.

6. Carefully insert the torque tool into the hex socket drive and turn counterclockwise until the tool turns freely.
7. Hold the port card by its stiffener while pulling it straight out of its card track.

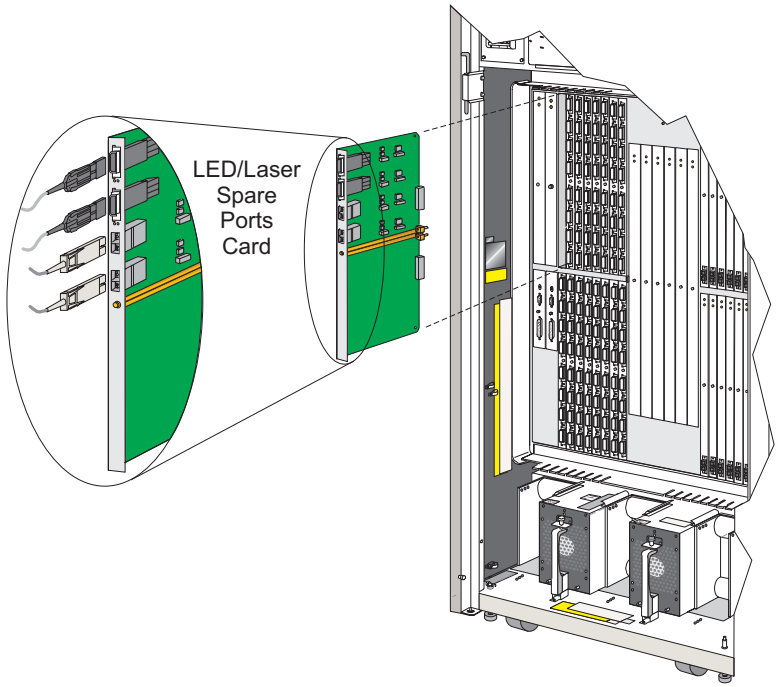


Figure 3-13. LED/Laser Spare Ports Card

Replacement:

Use the following procedure to replace a spare ports card. Refer to Figure 3-13.

Note: Clean fiber optics in accordance with the cleaning procedure provided with the fiber optic cleaning kit.

1. Holding the port card by its stiffener, carefully insert it straight into its card track. The component side of the card should face to the right, as shown.
2. Verify that the card is aligned correctly in the upper and lower card track, and then slowly slide it forward along the track until it makes contact with the logic board assembly.
3. Tighten the captive screw that secures the card to the logic board assembly using these steps:
   a. Insert the tip of the torque tool into the hex socket drive.

b. Turn the torque tool clockwise until you hear a clicking sound. As the screw turns clockwise, the card should pull into its connector on the logic board assembly.

c. Verify that the card stiffener is flush with the front of the card cage assembly and is even with the other cards installed in the unit.

4. Store the torque tool in the storage compartment.
5. Cable the ports on the replacement port card:
   a. Pull the protective cap from a fiber optic cable connector.
   b. Remove the fiber optic protective plug from a port card connector.
   c. Join the fiber optic cable connector with the fiber optic port card connector.
   d. Repeat steps a through c for each port on the replacement port card.
6. Verify card installation from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director's active matrix window.
7. A table displays providing hardware information for installed power supplies, port cards, and other logic cards.
8. Verify that the serial number, active status, and other information displays for each card. If card information doesn't display, the card may not be installed correctly.
9. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
10. Perform the procedures listed under "Collect Maintenance Information" in Chapter 2.
11. Inform the customer that the replacement procedure is complete.

Port Cards

Use steps in this section to replace LED, XDF laser, and FCV port cards.

For orientation and FRU location, refer to Figure 4-4 on page 4-6. During this procedure, observe the practices described in "Procedural Notes" on page 3-4. For important information on redundant components, such as port cards, refer to "Backup Components" on page 3-13.

If a spare ports card (DVP cards only) is not installed, determine if there are any unused ports available for swapping (if feasible). Note that only ESCON ports on DVP cards can be swapped with ports on spare ports cards.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Notes on FCV Port cards:

- Unaddressable ESCON ports cannot be swapped with any port.
- A FICON port can only be swapped with a FICON port on another FCV Port card. FICON ports cannot be swapped with ESCON ports.
- If an FCV port card is inserted into a slot previously occupied by a DVP card with swapped ports, the FCV port card will be held offline. You must unswap these ports to bring the FCV port card online.

Removal:

Use the following procedure to remove either an LED, XDF laser, or FCV port card.

1. Open (or remove) the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
2. Identify the defective port card; determine its type (LED or laser). Refer to "Determining Port Type" on page 2-143.
3. Determine the port number of each port (use the card map inside the front door) on the defective port card (a port card contains eight ports) and label each attached fiber optic cable.
4. Ask the customer to configure offline any channels or control unit paths attached to the ports on the card with defective ports.

   Note: The following step is performed from the Console.

5. Block communication to all ports on the defective port card (refer to the card map inside the front door for port addresses on the card):

   Note: The spare ports card (DVP cards only) has only four ports. Block only those ports that have not been port swapped. Ports must be blocked individually.

   a. From the Console, pull down the *Edit* menu on the Director's active matrix window and select *Block Range*. Refer to Figure 3-14.

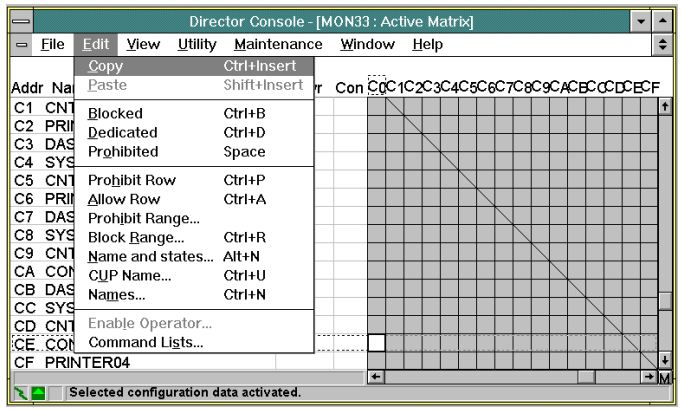


Figure 3-14. Block Address Range

The *Block Address Range* dialog box appears.

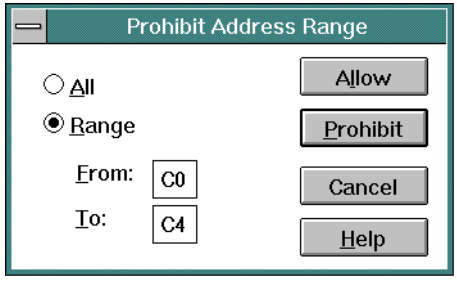


Figure 3-15. Block Address Range Dialog Box

b. Click in the *From* box and enter the address of the first port on the port card. Then click in the *To* box and type in the address of the last port on the card. Figure 3-15 shows ports C0 through C4 blocked.

c. Click on the *Block* button.

In graphic display mode, cells in the matrix area are highlighted and an X appears in the *Con* column for the selected port addresses to indicate that they are blocked. In nongraphic display mode, a blue B appears under the *B* column for the ports.

Note: Blocking or unblocking a FICON port on an FCV port card blocks or unblocks all unaddressable ESCON ports associated with the FCV port card as well. Blocking or unblocking an unaddressable ESCON port has no effect on port operation.

d. From the *File* menu, select the *Activate Configuration Matrix* option.

e. The *Operator Authorization* dialog box displays, prompting you for an operator authorization password.

f. Type an operator authorization password (the default is LEVEL003) and select the *OK* button.

The *Activate Configuration Matrix* dialog box displays. Refer to Figure 3-16.

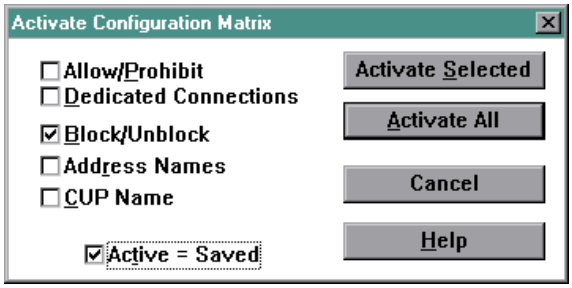


Figure 3-16. Activate Configuration Matrix

g. Be sure the *Block/Unblock* box is selected.

h. Select the *Activate Selected* button.

The "Selected configuration data activated" message displays on the status line to confirm this operation's completion.

Note: Step 6 through step 9 are performed from the Director.

6. Remove the fiber optic cable from each port on the defective port card:

XDF and FCV Laser Ports

a. Pull the keyed adapter cable connector free from the port card. The adapter cable should remain attached to the fiber optic cable.

b. Place a protective cap over the adapter cable connector.

c. Insert a fiber optic protective plug into the port card connector.

d. Repeat steps a through c for each port on the defective port card.

LED Ports

a. Squeeze together the connector locks on a fiber optic cable connector and pull the cable connector free from the port card.

b. Place a protective cap over the fiber optic cable connector.

c. Insert a fiber optic protective plug into the port card connector.

d. Repeat steps a through c for each port on the defective port card.

Note: Place protective plugs in each port to protect the transmitter and receiver from dirt and damage during its return shipment.

7. Remove the torque tool (part number 11G4642 with tip 07H5932) from the storage compartment.
8. Carefully insert the torque tool into the hex socket drive and turn counterclockwise until the tool turns freely.
9. Remove the port card by pulling it straight out of its card track. Figure 3-17 on the following page illustrates LED and laser port cards while Figure 3-18 on page 3-42 illustrates FCV card removal and replacement.

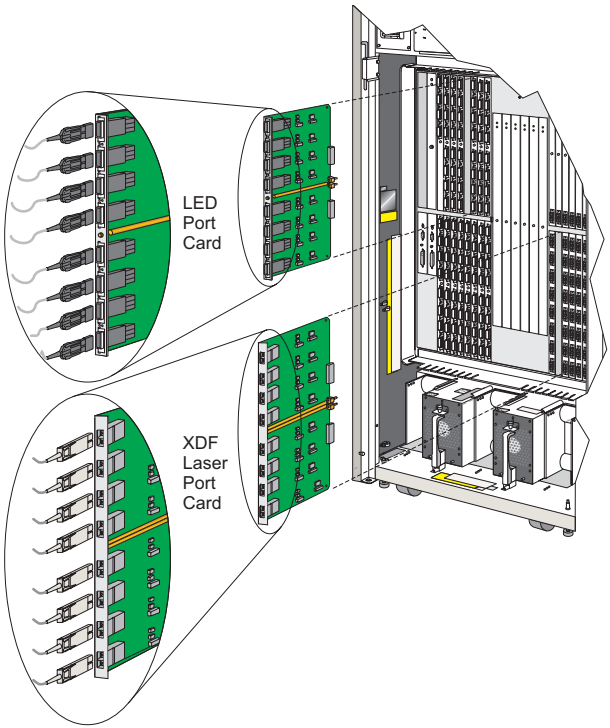


Figure 3-17. LED and XDF Laser Port Cards

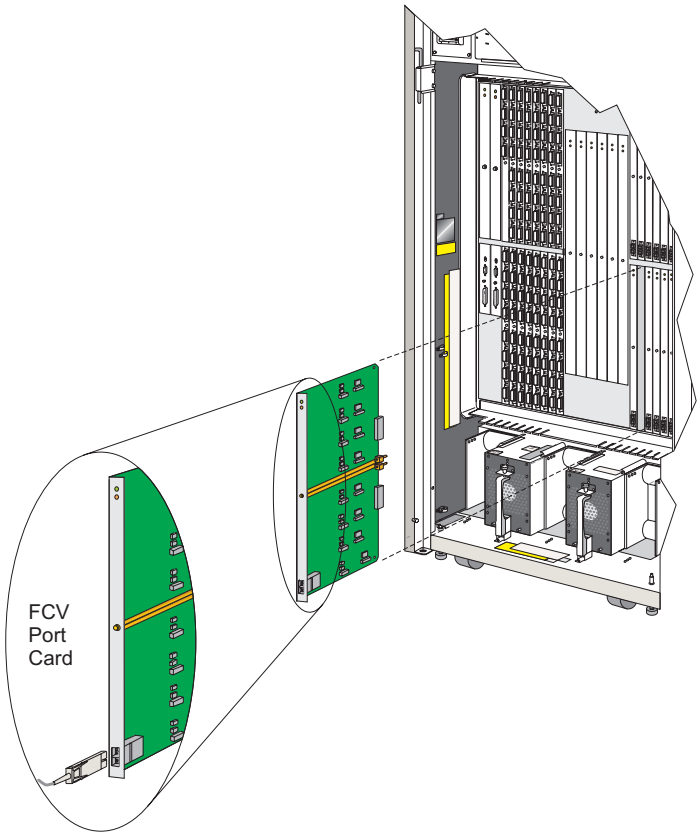


Figure 3-18. FCV Port Card

Replacement:

Use the following procedure to replace either an LED, XDF laser, or FCV port card. Refer to Figure 3-17 (LED and XDF laser) and Figure 3-18 (FCV).

Note: Clean fiber optics in accordance with the cleaning procedure provided with the fiber optic cleaning kit.

1. Holding the port card by its stiffener, carefully insert it straight into its card track (refer to Figure 3-17 and Figure 3-18). The component side of the card should face to the right, as shown.
2. Verify that the card is aligned correctly in the upper and lower card track, and then slowly slide it forward along the track until it makes contact with the logic board assembly.

3. Tighten the captive screw that secures the card to the logic board assembly using these steps:
   a. Insert the tip of the torque tool into the hex socket drive.
   b. Turn the torque tool clockwise until you hear a clicking sound. As the screw turns clockwise, the card should pull into its connector on the logic board assembly.
   c. Verify that the card stiffener is flush with the front of the card cage assembly and is even with the other cards installed in the unit.
4. Store the torque tool in the storage compartment.
5. Cable the ports on the replacement port card:
   a. Pull the protective cap from a fiber optic cable connector.
   b. Remove the fiber optic protective plug from a port card connector.
   c. Join the fiber optic cable connector with the fiber optic port card connector.
   d. Repeat steps a through c for each port on the replacement port card.
6. Verify card installation from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director's active matrix window.

   A table displays providing hardware information for installed power supplies, port cards, and other logic cards.

   Note: Information for the FCV port card will not appear until the card initializes. This may take a short period of time. The card is being initialized when its amber LED stays on solid and its green LEDs flash slowly. When the amber LED is off and the green LED is on solid, initialization is complete.
7. Verify that the serial number, active status, and other information displays for each card. If card information doesn't display, the card may not be installed correctly.
8. Clear the event reporting the card's failure and the event reporting the recovery from the front panel status display. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.
9. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
10. Unblock communication to all ports on the defective port card (refer to the card map inside the front door for port addresses on the card):

Note: Blocking or unblocking a FICON port on an FCV port card blocks or unblocks all unaddressable ESCON ports associated with the FCV port card as well. Blocking or unblocking an unaddrssable ESCON port has no effect on port operation.

Note: The spare ports card has only four ports. Block only those ports that have not been port swapped. Ports must be blocked individually.

a. From the Console, pull down the *Edit* menu on the Director's active matrix window and select *Block Range* (Figure 3-19).

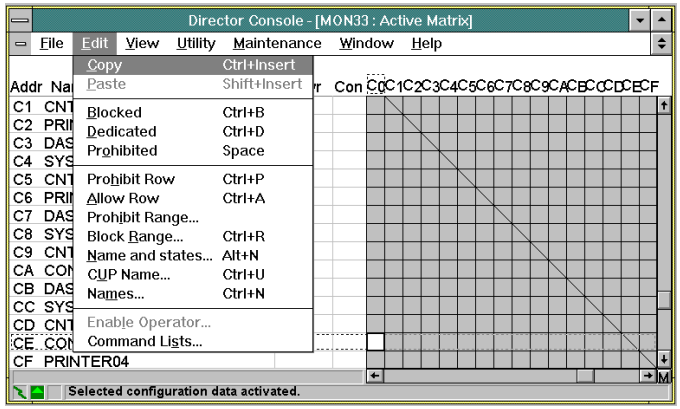


Figure 3-19. Figure Block Address Range

The *Block Address Range* dialog box appears.

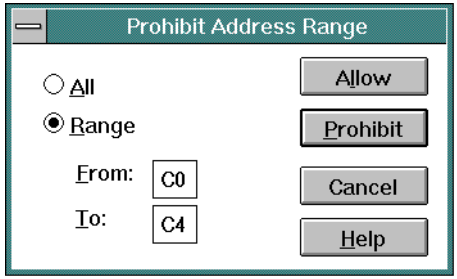


Figure 3-20. Block Address Range Dialog Box

b. Click in the *From* box and enter the address of the first port on the port card. Then click in the *To* box and type in the address of the last port on the card. Figure 3-20 shows ports C0 through C4 blocked.

c. Click on the *Unblock* button.

In graphic display mode, cells in the matrix area are highlighted and an X appears in the *Con* column for the selected port addresses to indicate that they are blocked. In nongraphic display mode, a blue B appears under the *B* column for the ports.

Note: Blocking or unblocking a FICON port on an FCV port card blocks or unblocks all unaddressable ESCON ports associated with the FCV port card as well. Blocking or unblocking an unaddressable ESCON port has no effect on port operation.

d. From the *File* menu, select the *Activate Configuration Matrix* option.

The *Operator Authorization* dialog box displays, prompting you for an operator authorization password.

e. Type an operator authorization password (the default is LEVEL003) and select the *OK* button.

The *Activate Configuration Matrix* dialog box displays.

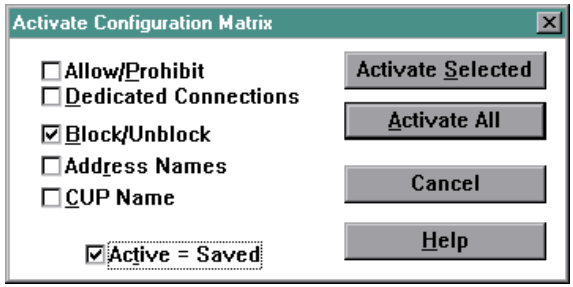


Figure 3-21. Activate Configuration Matrix

f. Be sure the *Block/Unblock* box is selected.

g. Select the *Activate Selected* button.

11. Perform the procedures listed under "Collect Maintenance Information" on page 2-114.
12. Inform the customer that the replacement procedure is complete.

Port Swap Procedure

It is recommended that you use the *Swap Ports* option through the *Port Maintenance* window to swap ports. If the Console is not available, you can also enter the **portswap** command through a maintenance terminal attached to the Director's maintenance port. Appendix E for more information on connecting a maintenance terminal and using commands. If using the **portswap** command, use the **portmap** command first to display port addresses.

Note: A failed FICON port can be swapped with a FICON port on another FCV port card.

Note: If an FCV port card is inserted into a slot originally occupied by an ESCON DVP card with swapped ports, the FCV port card may be held offline. Ports must be unswapped to bring the card online.

Use the following procedure for the *Swap Ports* option from the *Port Maintenance* window.

1. From the *Maintenance* menu of the active matrix window of the Director, select the *Port Maintenance* option. The *Port Maintenance* window is displayed. Refer to Figure 3-22.

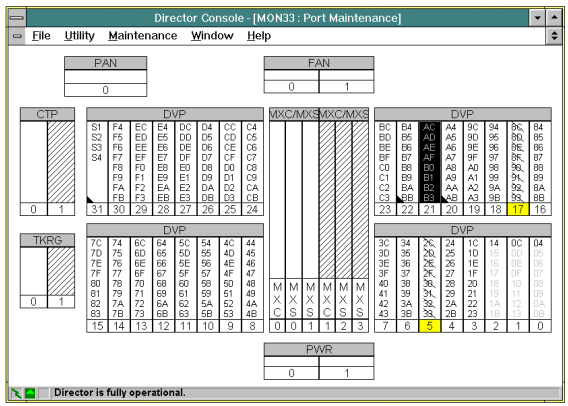


Figure 3-22. The Port Maintenance Window

2. From the *Maintenance* menu, select the *Swap Ports* option. The *Maintenance Authorization* dialog box prompts you for a maintenance authorization password (the default is LEVEL002). When the password is entered and accepted, the *Port Swapping* dialog box (Figure 3-23) displays.

   Note that when a port is swapped, block or unblock is an attribute of the logical address, not the port number.

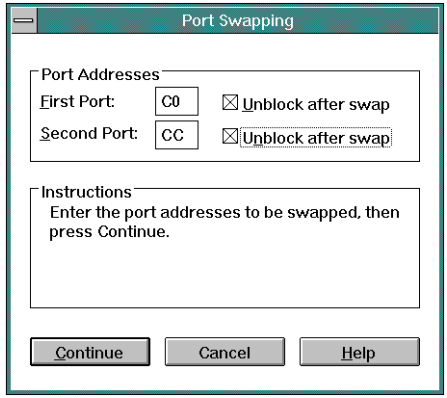


Figure 3-23. The Port Swapping Dialog Box

3. The *Port Swapping* dialog box contains an area with a set of instructions. Following the instructions, enter the ports to be swapped and optionally select the *Unblock after swap* option after each selected port address. Select the *Continue* button.

   Note: The ports to be swapped are blocked automatically during this procedure. If the *Unblock after swap* option is not selected, follow the unblock port procedure (step 10 under the replacement procedure for "Port Cards" on page 3-37).

4. Following the instructions, if you haven't already set selected ports offline, ask the system operator to set the selected ports offline and then select the *Continue* button. The selected ports are automatically blocked.

5. Move the connected port cables to the other selected ports. When the cables are moved, select the *Continue* button.

   Note: If a spare ports card in installed, you cannot swap ports on the spare ports card with each other.

6. The ports are swapped and unblocked (if that option is selected) automatically and a dialog box appears confirming the port swap operation was successfully completed. Select *OK* to complete the operation.

7. The swapped ports are represented on the *Port Maintenance* window in green with an asterisk (*).

   Note: After they are paired, a source and destination port can address and readdress only each other. They are no longer eligible to swap with any other port.

Token-Ring Controller Adapter Card, Nonredundant

For orientation and FRU location, Figure 4-4. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove a TKRG controller adapter card from a **non-redundant** TKRG card unit. Refer to Figure 3-24 on page 3-49.

1. Open (or remove) the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.

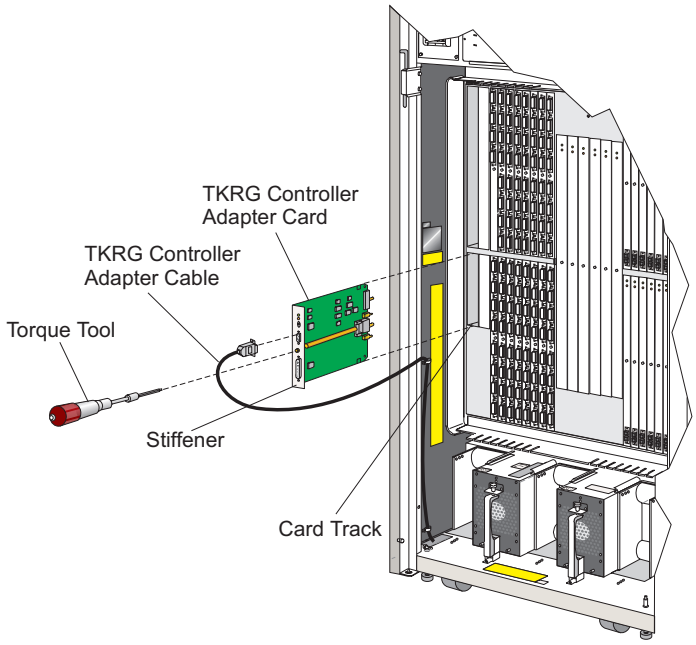


Figure 3-24. Token-Ring (TKRG) Controller Adapter Card, Nonredundant

2. Identify the defective TKRG card (amber LED illuminated).
3. Note the position of the TKRG card LAN speed switch (Up=16 Mbps, Down=4 Mbps). Refer to Figure 3-25 on page 3-52.

   Note: After replacing the TKRG card, the LAN speed may need setting.
4. Identify and remove the TKRG adapter cable (top cable on card):
   a. Loosen the two captive screws.
   b. Pull the cable connector free from the TKRG card.
5. Remove the torque tool (part number 11G4642 with tip 07H5932) from the storage compartment.
6. Carefully insert the torque tool into the hex socket drive and turn counterclockwise until the tool turns freely.
7. Remove the TKRG card by pulling it straight out of its card track.

8. On the status display event information line, observe Event=0C/3A00 or Event=0C/3A01, indicating redundant TKRG card removal.

Attention!

Do not begin TKRG card replacement until at least 20 seconds have passed since you removed the defective TKRG card.

Replacement:

Use the following procedure to replace a TKRG card within a **nonredundant** TKRG card unit. Refer to Figure 3-24.

1. If necessary set the replacement TKRG card LAN speed switch to the speed noted in the removal procedure, step 3 (Up=16 Mbps, Down=4 Mbps).
2. Holding the TKRG card by its stiffener, carefully insert it straight into its card track (Figure 3-24 on page 3-49). Note that the label identifying the TKRG card should be at the top and the component side of the card should face to the right.

   Note: For correct card location, see the card map inside the front door.
3. Verify that the card is aligned correctly in the upper and lower card track, and then slowly slide it forward along the track until it makes contact with the logic board assembly.
4. Tighten the captive screw that secures the card to the logic board assembly using these steps:
   a. Insert the tip of the torque tool into the hex socket drive.
   b. Turn the torque tool clockwise until you hear a clicking sound. As the screw turns clockwise, the card should pull into its connector on the logic board assembly.
   c. Verify that the card stiffener is flush with the front of the card cage assembly and is even with the other cards installed in the unit.
5. Store the torque tool in the storage compartment.
6. Connect the TKRG adapter cable to the TKRG card adapter cable connector and tighten the two captive screws.
7. Observe the bottom line of the front panel status display for Event=0C/0A01 or Event=0C/0A00, indicating that the TKRG card is installed and fully operational.
8. FLASH memory automatically loads all data into the replacement TKRG card.

9. If the `0C/0A00` or `0C/0A01` code displays, proceed to the next step. If another code displays, refer to Appendix C to interpret the displayed code. If necessary, proceed to "Start Initial Fault Isolation" on page 2-4 to troubleshoot the problem.
10. Verify card installation and status from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director's active matrix window.
11. A table displays providing hardware information for installed power supplies, port cards, and other logic cards.
12. Verify that the serial number, active status, and other information displays for the card. If card information doesn't display, the card may not be installed correctly.
13. Clear the event reporting the card's failure and the event reporting the recovery from the front panel status display. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.
14. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
15. Perform the procedures listed under "Collect Maintenance Information" on page 2-114.
16. Inform the customer that the replacement procedure is complete.

Token-Ring Controller Adapter Card, Redundant

For orientation and FRU location, refer to Figure 4-4 on page 4-6. During this procedure, observe the practices described in "Procedural Notes" on page 3-4. For important information on removing and replacing redundant components, such as port cards, refer to "Backup Components" on page 3-13.

Attention!

Do not begin TKRG card replacement until at least 20 seconds have passed since you removed the defective TKRG card.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove a TKRG Controller Adapter card from a **redundant** TKRG card unit. Refer to Figure 3-26 on page 3-53.

1. Open (or remove) the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
2. Identify the defective TKRG card (amber LED illuminated).
3. Note the position of the data rate switch on the defective TKRG card (Up=16Mbps, Down=4Mbps). Refer to Figure 3-26.

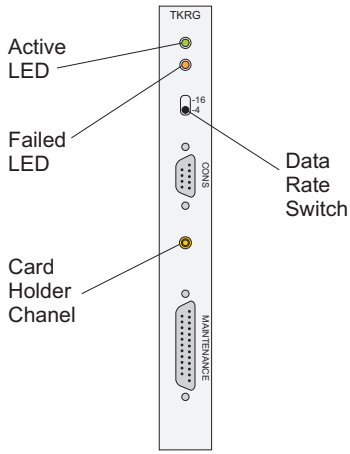


Figure 3-25. Data Rate Switch on Token-Ring Adapter Card

Is the LAN speed (data rate) switch on the redundant TKRG card set to the same LAN speed as on the defective TKRG card?

Yes: Go to step 5.

No: Continue with step 4.

Set the LAN speed switch on the redundant TKRG card (Up=16 Mbps, Down=4 Mbps) to the same LAN speed as the defective TKRG card.

4. Move the TKRG adapter cable from the defective TKRG card to the redundant TKRG card. Refer to Figure 3-26 on page 3-53.
   a. On the defective TKRG card:
   - Loosen the two captive screws on the cable connector.
   - Pull the cable connector free from the TKRG card.
   - On the status display event information line, observe a Event=`0C/1A00` or `Event=0C/1A01,` indicating TKRG card removal.

b. On the redundant TKRG card:

- Join the cable connector with its TKRG adapter connector.
- Tighten the two captive screws on the cable connector.

Note: If an event other than that which you expect displays on the status display event information line, refer to Appendix C to interpret the displayed code, and proceed to “Start Initial Fault Isolation” in Chapter 2.

5. Remove the torque tool (part number 11G4642 with tip 07H5932) from the storage compartment.
6. Carefully insert the torque tool into the hex socket drive and turn counterclockwise until the tool turns freely.
7. Remove the TKRG card by pulling it straight out of its card track.

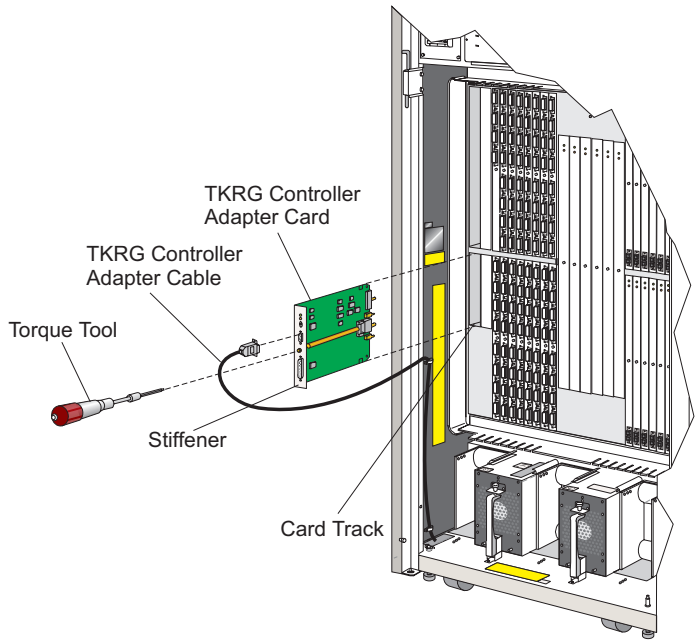


Figure 3-26. Token-Ring (TKRG) Controller Adapter Card, Redundant

CAUTION

Do not begin TKRG card replacement until at least 20 seconds have passed since you removed the defective TKRG card.

Replacement:

Use the following procedure to replace a TKRG card within a **redundant** TKRG card unit. Refer to Figure 3-26 on page 3-53.

1. If necessary, set the replacement TKRG card LAN speed switch to the speed noted in the removal procedure, step 3 (Up=16 Mbps, Down=4 Mbps).
2. Holding the TKRG card by its stiffener, carefully insert it straight into its card track. Note that the label identifying the TKRG card should be at the top, and the component side of the card should face to the right.

   Note: For correct card location, see the card map inside the front door.
3. Verify that the card is aligned correctly in the upper and lower card track, and then slowly slide it forward along the track until it makes contact with the logic board assembly.
4. Tighten the captive screw that secures the card to the logic board assembly using these steps:
   a. Insert the tip of the torque tool into the hex socket drive.
   b. Turn the torque tool clockwise until you hear a clicking sound. As the screw turns clockwise, the card should pull into its connector on the logic board assembly.
   c. Verify that the card stiffener is flush with the front of the card cage assembly and is even with the other cards installed in the unit.
5. Store the torque tool in the storage compartment.
6. Connect the TKRG adapter cable to the TKRG card adapter cable connector and tighten the two captive screws.
7. Observe the bottom line of the front panel status display for Event=`0C/0A01` or Event=`0C/0A00`, indicating that the TKRG card is installed and fully operational.
8. If the `0C/0A01` or `0C/0A00` code displays, proceed to the next step. If another code displays, refer to Appendix C to interpret the displayed code. If necessary, proceed to "Start Initial Fault Isolation" on page 2-4 to troubleshoot the problem.

9. Verify card installation and status from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director's active matrix window.

   A table displays providing hardware information for installed power supplies, port cards, and other logic cards.

10. Clear the event reporting the card's failure and the event reporting the recovery from the front panel status display. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.
11. Verify that the serial number, active status, and other information displays for the card. If card information doesn't display, the card may not be installed correctly.
12. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
13. Perform the procedures listed under "Collect Maintenance Information" in Chapter 2.
14. Inform the customer that the replacement procedure is complete and the Director is now available.

Power Supply

For orientation and FRU location, refer to Figure 4-5 on page 4-7. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

CAUTION

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove a power supply. Refer to Figure 3-27.

1. Open (or remove) the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
2. Identify the defective power supply (LED off).
3. Lift the plunger on top of the power supply handle.

   Note: Some power supplies have a captive screw on top of the handle and a plunger on the side of the handle. For these power supplies, turn the captive screw counter-clockwise until it releases, then release the plunger on the side.

4. Remove the power supply by pulling the vertical lever to the horizontal position to cam the power supply loose, then pull it straight out from its slot.
5. Snap the handle back into place and engage the plunger (to carry the power supply).

CAUTION

The power supply weighs more than 9 kg (20 lbs.). Be careful to support it adequately during removal and replacement.

6. On the status display event information line, observe Event=`0D/1G00` or Event=`0D/1G01`, indicating redundant power supply removal. If LIC 4.xx or earlier is installed, 0D/1800 or 0D/1801 will display.

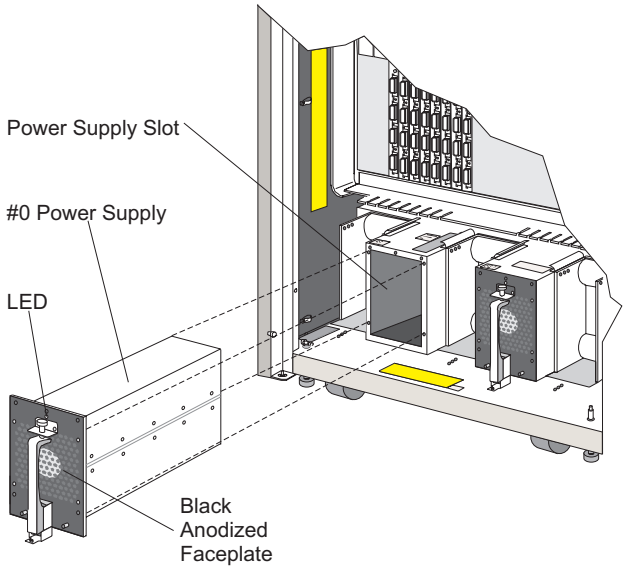


Figure 3-27. Power Supply

Replacement:

Use the following procedure to replace a power supply. Refer to Figure 3-27.

1. Inspect for bent pins on the plug on the rear of the power supply. They may have become damaged during shipping. If any pins are bent, obtain a new Power Supply.

CAUTION

The power supply weighs more than 9 kg (20 lbs.). Be careful to support it adequately during removal and replacement.

2. Orient the power supply as shown in Figure 3-27. Place the handle in the horizontal position. Firmly slide the power supply forward into the slot until it stops, then cam the lever to seat it so that its faceplate is flush with the slot cutout. When the faceplate is flush with the cutout and the plunger is snapped back into place, the power supply should be connected inside the slot.

   Note: Some power supplies have a captive screw on top of the handle and a plunger on the side of the handle. For these power supplies, tighten

the captive screw on top of the power supply handle with a Phillips head screwdriver.

3. Observe the bottom line of the front panel status display for an event code of `0D/0G01` or `0D/0G00`, indicating that the power supply is installed and fully operational. If LIC 4.xx or earlier is installed, OD/1800 or 0D/1801 will display.
4. If the `0D/0G01` or `0D/0G00` codes display, proceed to the next step. If another code displays, refer to Appendix C to interpret the displayed code. If necessary, proceed to “Start Initial Fault Isolation” in Chapter 2, to troubleshoot the problem.
5. Verify power supply installation and status from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director’s active matrix window.

   A table displays providing hardware information for installed power supplies, port cards, and other logic cards.
6. Verify an active status displays for the power supply. If status information doesn’t display, the power supply may not be installed correctly.
7. Clear the event reporting the power supply failure and the event reporting the recovery from the front panel status display. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.
8. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
9. Perform the procedures listed under “Collect Maintenance Information” in Chapter 2.
10. Inform the customer that the replacement procedure is complete.

Fan Assembly

Each fan assembly is comprised of two cooling fans. For orientation and FRU location, refer to Figure 3-28 on page 3-61. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

If you are replacing more than one fan assembly while the Director is operating, replace them one at a time. Remember, if only two of the four fans is operating in a Director that supports FCV port card operation, a thermal shutdown will occur in 5 minutes. If only one of the four fans is operating in a Director that does not support FCV port card operation (ESCON operation only), a thermal shutdown occurs in 10 minutes. A thermal shutdown sets the Director ports offline then turns off the Director by setting the ac power switch to the off position. Remember that removing a fan assembly for replacement effectively takes two fans out of service. If, after removing a assembly, one fan is still operating in a Director that does not support FCV port cards or two fans are operating in a Director with FCV support, thermal shutdown will occur unless you install a new assembly within the required time limits.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Note: When the Director first powers on, the fans will run at full speed. Once power-on is complete, the fans will run at normal speed.

Removal:

Use the following procedure to remove a fan assembly. Refer to Figure 3-28 on page 3-61.

1. Open (or remove) the Director rear door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
2. Identify the defective fan assembly through event codes on the front panel status display or by looking for the fan that is not operating (green LED extinguished). Refer to Appendix C for information on analyzing event codes.

- If two fans have failed in a Director that does not support FCV port card operation, check the LEDs to determine if they are in one or two fan assemblies. If more than one fan assembly has to be replaced while the Director is operating, replace them one at a time. If only one of the four fans is operating, a thermal shutdown will occur in 10 minutes.
- If one fan has failed in a Director that does support FCV port card operation, removing the defective fan assembly for replacement effectively takes two fans out of service. You must install the new fan assembly within 5 minutes or thermal shutdown will occur. Make sure that you have a replacement fan assembly ready for installation when your remove the defective assembly. A Director with support for FCV port card operation will automatically shut down in 5 minutes if only two of the four fans are operating.

  Note: A Director supports FCV port card operation if it contains a PWR2 power supply, an MXC2 matrix controller card, and one or more FCV port cards.

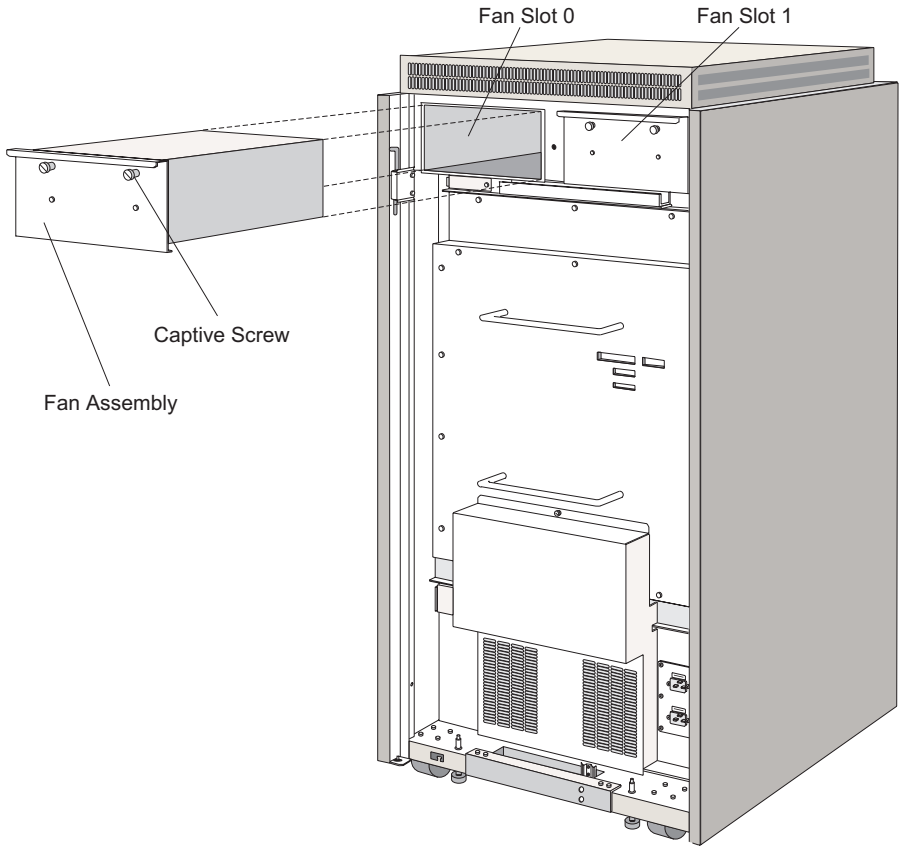


Figure 3-28. Fan Assembly

3. Loosen the captive screws.
4. Remove the fan assembly by pulling it straight out from its slot.
5. On the status display event information line, observe Event=`0E/2700` or `Event=0E/2701`, indicating fan assembly removal.

CAUTION

Do not begin fan assembly replacement until at least 20 seconds have passed since you removed the defective fan assembly.

Replacement:

Use the following procedure to replace a fan assembly. Refer to Figure 3-4.

1. Insert the fan assembly straight into its slot.
2. Tighten the captive screws.
3. On the status display event information line, observe an Event=0E/0700 or Event=0E/0701, indicating fan assembly replacement recognition.

   Note: If an event, other than that which you expect, displays on the status display event information line, refer to Appendix C to interpret the displayed code and proceed to “Start Initial Fault Isolation” in Chapter 2.

Attention!

If you are replacing more than one fan assembly while the Director is operating, replace them one at a time. Remember, if only two of the four fans is operating in a Director that supports FCV port card operation, a thermal shutdown will occur in 5 minutes. If only one of the four fans is operating in a Director that does not support FCV port card operation (ESCON operation only), a thermal shutdown occurs in 10 minutes. A thermal shutdown sets the Director ports offline then turns off the Director by setting the ac power switch to the off position. Remember that removing a fan assembly for replacement effectively takes two fans out of service. If, after removing an assembly, one fan is still operating in a Director that does not support FCV port cards or two fans are operating in a Director with FCV support, thermal shutdown will occur unless you install a new assembly within the required time limits.

4. Verify fan installation and status from the Console by selecting the *Hardware Configuration* option from the *Maintenance* menu of the Director’s active matrix window.

   A table displays providing hardware information for installed power supplies, port cards, and other logic cards.
5. Verify that an active status displays for the fan. If this information doesn’t display, the fan may not be installed correctly.
6. Clear the event reporting the fan failure and the event reporting the recovery from the front panel status display. Cycling power to the Director will not turn off the System Error indicator or clear the front panel status display. For instructions on clearing status codes, refer to "Clearing Events" on page F-13.
7. Close (or replace) the Director rear door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
8. Inform the customer that the replacement procedure is complete.

Front Panel

For orientation and FRU location, refer to Figure 4-5 on page 4-7. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12

CAUTION

Do not inadvertently press the *IML* button when removing and replacing the front panel.

Removal:

Use the following procedure to remove the front panel. Refer to Figure 3-31 on page 3-65.

1. Access the *Terminal* window on the Console by selecting *Terminal* from the *Advanced* option of the *Maintenance* menu (Figure 3-29). Ensure you are using the correct Director's active matrix window.

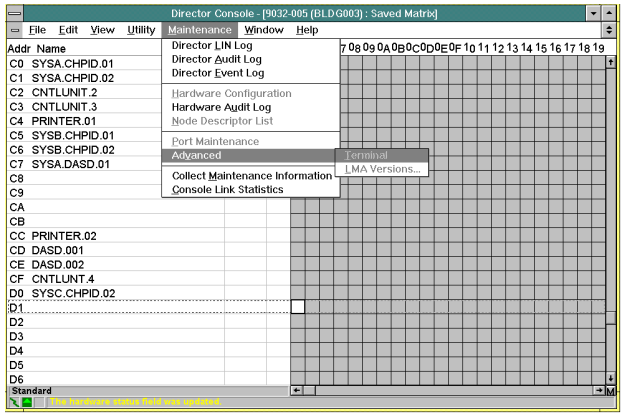


Figure 3-29. Selecting the Terminal Window

1. Enter the following and press **Enter.**

   `FRUX 0`

   For more information on the **FRUX** command, refer to Appendix E .

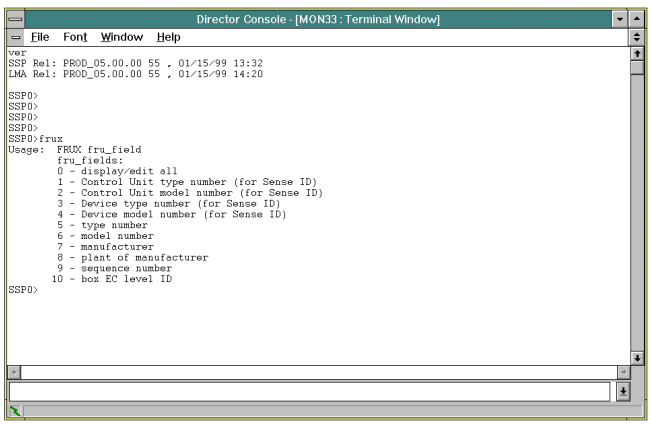


Figure 3-30. FRUX Command - Terminal Window

2. Record all product data that displays.

3. Open (or remove) the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
4. Locate the front panel.
5. Loosen the two captive screws at the top of the front panel.
6. Tilt the front panel forward and away from its compartment.
7. Remove the front panel (Figure 3-31):
   a. Loosen the two captive screws on each of the front panel connectors.
   b. Disconnect the cables and remove the front panel.

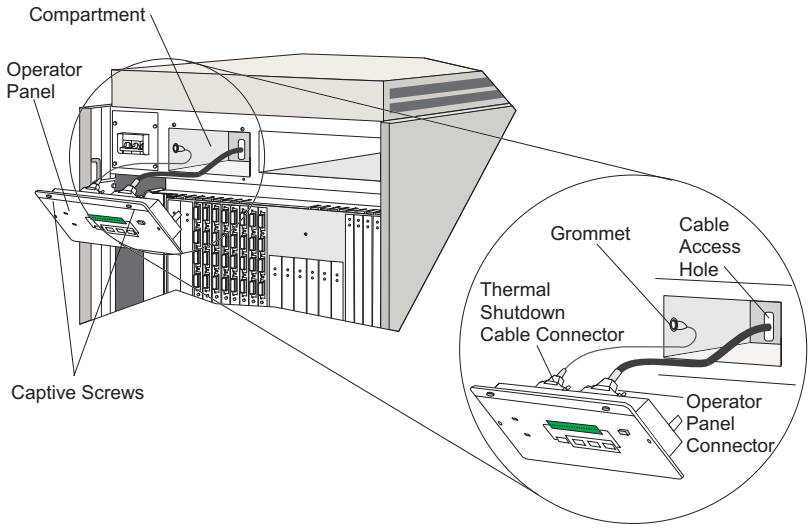


Figure 3-31. Front (Operator) Panel.

Replacement:

Use the following procedure to replace the front panel. Refer to Figure 3-31.

1. Connect the front panel to the front panel cables:
   a. Connect the two front panel cable connectors.
   b. Tighten the two captive screws on each connector.
2. Lift and position the front panel in its compartment, and tilt it forward into place.
3. Tighten the two captive screws at the top of the front panel.
4. Press the *Entry* button to ensure the new front panel is operational.

5. Access the *Terminal* window on the Console by selecting *Terminal* from the *Advanced* option of the *Maintenance* menu (Figure 3-32). Ensure you are using the Director's active matrix window.

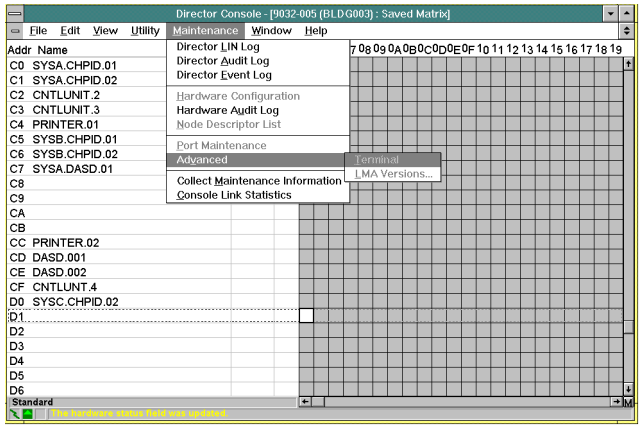


Figure 3-32. Selecting the Terminal Window

6. Enter the following and press **Enter**. Use the serial number that you recorded in step 3 for <serial number>.

   `FRUX 9 <serial number>`

7. Enter the following command in the *Terminal* window's *Edit* field:

   `FRUX 10 <box EC level>`

   Enter the box EC level recorded during step 2 under "Removal." If the box EC level could not be read, due to front panel damage, enter the date that you are replacing the front panel. The box EC level must be entered using the following format:

   `0yymmdd`

8. Enter the following command in the *Terminal* window's *Edit* field to display product data.

   `FRUX 0`

   Ensure the product data matches the data you recorded for the old front panel during step 2 under "Removal."

9. Press the IML button on the front panel and hold for five seconds to initiate an IML. This process will save changes to nonvolatile memory. When the Director successfully initializes, the Director ID number displays on the status display information line.

10. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
11. Inform the customer that the replacement procedure is complete.

Operator Panel Cable

For orientation and FRU location, refer to Figure 3-33. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove the front panel cable. Refer to Figure 3-33 on page 3-68.

1. Perform the power-off procedure. Refer to "Power-Off" on page 3-5.
2. Open (or remove) the Director front and rear doors. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. From the front, remove the two screws from the front panel.
4. Tilt the front panel forward and away from its compartment.
5. Disconnect the front panel cable from the front panel:
   a. Loosen the two captive screws on the front panel connector.
   b. Disconnect the cable.
6. From the rear, remove the fan assembly on the right side by first loosening the captive screws.
7. Remove the fan assembly by pulling it straight out from its slot.
8. Cut the two cable ties inside the fan cabinet that hold the front panel cable to the chassis.

9. Disconnect the front panel cable from the logic board assembly:
    a. Identify the cable and connector.
    b. Loosen the two captive screws on the connector and unplug it.
10. Remove the front panel cable:
    a. Guide the cable assembly back through the fan compartment.
    b. Remove the cable assembly.

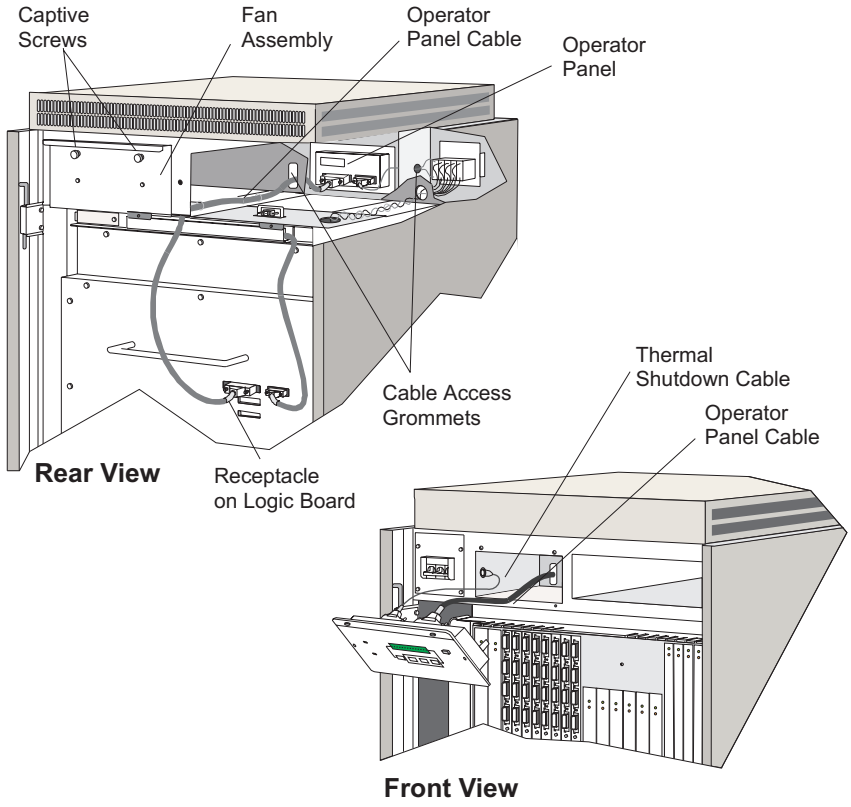


Figure 3-33. Front (Operator) Panel Cable

Replacement:

Use the following procedure to replace the front panel cable. Refer to Figure 3-33.

1. Insert the front panel cable into the rear of the Director chassis through the fan compartment.
2. Connect the front panel cable to the logic board assembly:
   a. Plug in the connector.
   b. Tighten the two captive screws on the connector.
3. Inside the front panel compartment, tie the cable to the eyelet with a cable tie, making sure to leave some slack for its connection to the front panel.
4. Connect the front panel cable to the front panel:
   a. Plug in the connector.
   b. Tighten the two captive screws on the connector.
5. Position the front panel in its compartment and replace the two screws.
6. Inside the fan compartment, tie the cable to the two eyelets with cable ties.
7. Replace the fan assembly by inserting it straight into the slot.
8. Tighten the captive screw for the assembly.
9. Perform the power-on procedure. Refer to "Power-On" on page 3-9.
10. Close (or replace) the Director front and rear doors. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
11. Inform the customer that the Director is now available.

Thermal Shutdown Cable Assembly

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove the thermal shutdown cable assembly. Refer to Figure 3-34 on page 3-70.

1. Perform the power-off procedure. Refer to "Power-Off" on page 3-5.
2. Open (or remove) the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. Identify the ac power switch. Refer to Figure 3-34 on page 3-70.
4. Disconnect the ac power switch.
   a. Remove the four screws.
   b. Tilt the ac power switch forward and away from its compartment.
5. Remove the thermal cable connection by loosening the screws on the ac power switch A and B connections.
6. Remove the two screws from the front panel.
7. Tilt the front panel forward and away from its compartment.

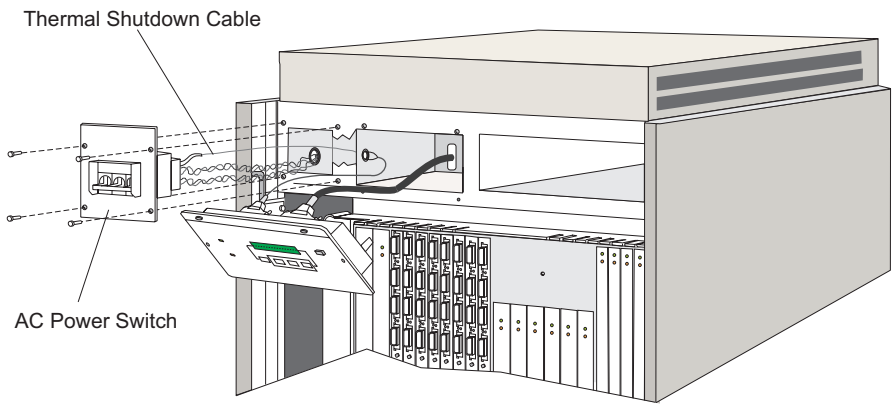


Figure 3-34. Thermal Shutdown Cable Assembly

8. Disconnect the thermal shutdown cable assembly.
    a. Loosen the two captive screws on the thermal cable connector.
    b. Disconnect the cable from the D-sub connector.
    c. Guide the cable through and out of the front panel cavity.

Replacement:

Use the following procedure to replace the thermal shutdown cable assembly. Refer to Figure 3-34.

1. Connect the thermal shutdown cable assembly.
    a. Guide the cable into the front panel cavity and through the access holes, connecting the front panel cavity to the ac power switch cavity.
    b. Tighten the two captive screws on the thermal cable connector.
2. Position the front panel in its compartment, and tilt it forward into place.
3. Insert and tighten the panel's two screws.
4. Reattach the cable terminals to the ac power switch. For each cable terminal (A and B):
    a. Insert the terminal beneath its screw. Refer to the wiring diagram in Figure 3-37 on page 3-78.
    b. Firmly tighten the screw.
5. Replace the ac power switch:
    a. Position the ac power switch in its compartment.
    b. Insert and tighten the four screws.
6. Perform the power-on procedure. Refer to "Power-On" on page 3-9.
7. Close the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
8. Inform the customer that the Director is now available.

Logic Board Assembly

Note: If you are using FTS-III Direct Attach fiber optic trunk cables, refer to *Fiber Transport Services (FTS) Direct Attach Physical and Configuration Planning* (GA22-7234) before continuing this procedure.

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

Follow proper bending and lifting procedures when removing the logic board assembly from the Director (refer to the publication *Electrical Safety for IBM Service Representatives*).

Removal:

Use the following procedure to remove the logic board assembly. Refer to Figure 3-36 on page 3-74.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

1. Perform the power-off procedure. Refer to "Power-Off" on page 3-5.
2. Open (or remove) the Director front and rear doors. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. Disconnect all CTP, DVP, spare DVP, MXC, MXS, and TKRG cards from the logic board assembly. Refer to Figure 3-35 on page 3-73. Complete removal of the logic cards is not necessary; unseat them only. For all DVP, spare DVP, and TKRG cards, removal of cables is not necessary. For all logic cards:
   a. Carefully insert the torque tool into the socket and turn counterclockwise until the tool turns freely.
   b. Carefully pull the logic card loose from the logic board assembly approximately 50.80 mm (2 inches).

      Note: Steps 4 through 10 are performed from the Director rear.

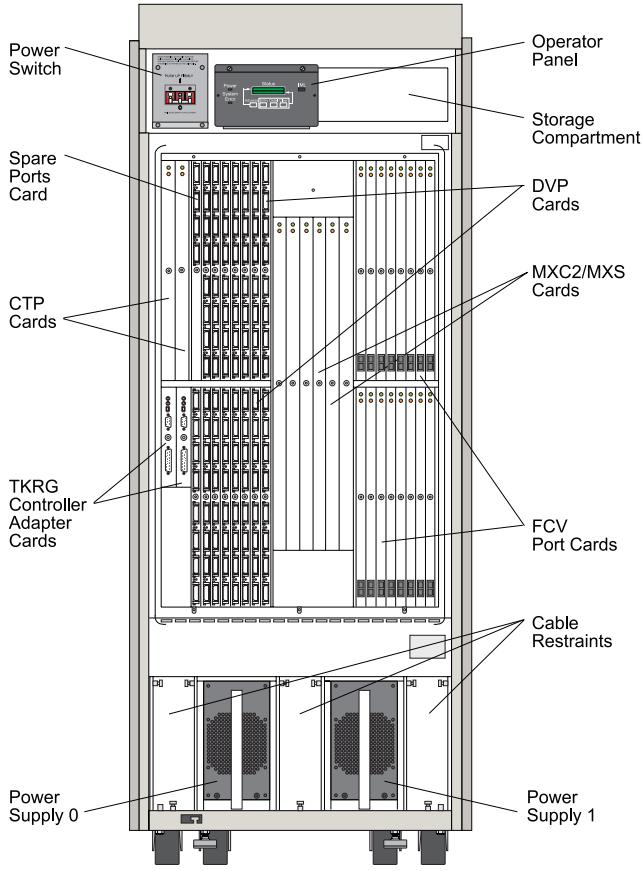


Figure 3-35. Director Front Showing Logic Cards

Note: Power supplies (PWR2) that support FCV port cards are black instead of silver.

4. Disconnect the dc fan cable assembly from the logic board assembly by unplugging it. Do not remove the assembly.
5. Disconnect the front panel cable from the logic board assembly by loosening the two captive screws on the connector and unplugging it. Do not remove the assembly.
6. Remove the power supply cover.
   a. Loosen the captive screw located on the cover top lip.
   b. Pull the power supply cover up and off.

7. Disconnect the power sense cable #0 and #1. Disconnect the +5v, +3.3v, and ground bus bars (6 bus bars total) from the logic board assembly. For each bus bar:

   a. Remove the hex bolt.

   b. Carefully pull the bus bar out of the way.

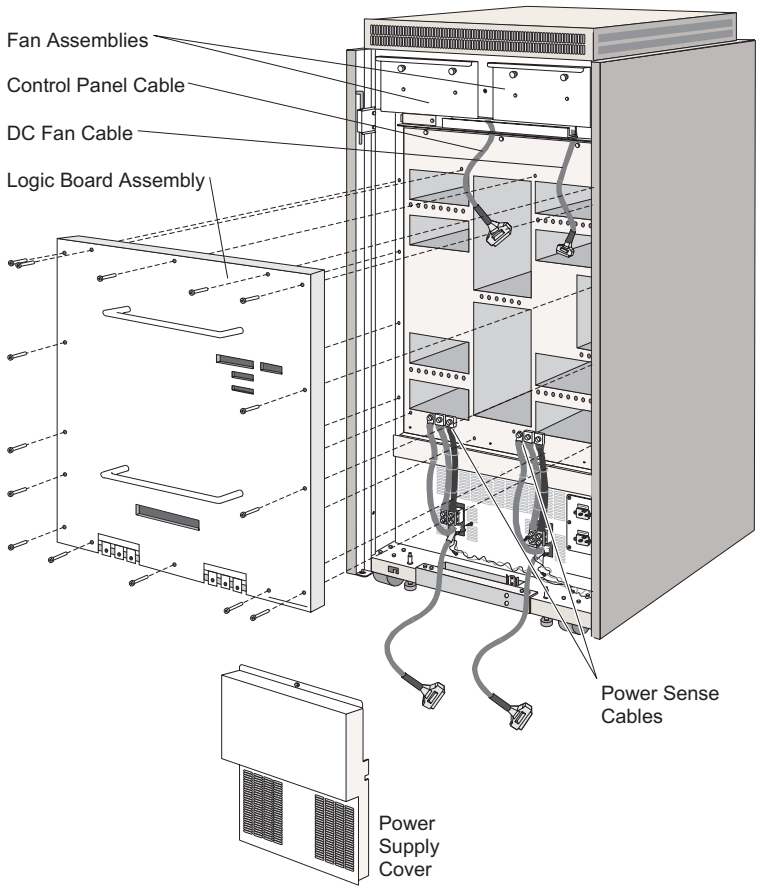


Figure 3-36. Logic Board Assembly

8. Use a 5/32 hex key to remove all screws (except the top screw) that attach the logic board assembly to the card cage. Work from bottom to top, and from side to side.

   Note: Leave the top center screw in place.

CAUTION

The logic board assembly weighs about 17 kg. (38.5 lbs). Be careful that the board does not fall after removing the last captive screw. It is recommended that two people support the assembly.

9. While securely holding both handles of the logic board assembly, remove the top center screw.
10. Lift the logic board assembly away from the chassis. Following proper bending and lifting procedures (refer to the publication *Electrical Safety for IBM Service Representatives*).

Replacement:

Use the following procedure to replace the logic board assembly. Refer to Figure 3-36.

1. While following proper bending and lifting procedures (refer to the publication *Electrical Safety for IBM Service Representatives*), rest the logic board assembly on top of the logic board support.

CAUTION

The logic board assembly weighs about 17 kg. (38.5 lbs). Be careful that the board does not fall after removing the last captive screw. It is recommended that two people support the assembly.

2. Position the logic board assembly flat against the card cage:
   a. Locate the four guide pins on the inside face of the logic board assembly.
   b. Locate the four alignment holes in the Director card cage.
   c. Align the logic board assembly correctly and place it onto the Director card cage.
3. Insert and hand tighten the top center screw.
4. Working from bottom to top, and from side to side, insert and hand tighten the screws.
5. Using a 5/32 hex key, tighten all the screws, working from bottom to top and from side to side.

6. Connect the two power sense cable #0 and #1. Connect the +5v, +3.3v, and ground bus bars into the logic board assembly. For each bus bar cable:
   a. Place the female terminal over the bus bar alignment holes.
   b. Attach and tighten the hex bolts on each of the connections.
7. Replace the power supply cover:
   a. Place the power supply cover into position.
   b. Tighten the captive screw located on the cover top lip.
8. Connect the front panel cable to the logic board assembly by plugging in the connector and tightening the two captive screws.
9. Connect the dc fan cable assembly connector to the logic board assembly.
10. Connect all CTP, DVP, MXC, MXS, and TKRG logic cards to the logic board assembly. For all logic cards:
    a. Carefully push the logic card fully into its card track.
    b. Carefully insert the torque tool into the socket and turn clockwise until you hear a click.
11. Perform the power-on procedure. Refer to “Power-On” on page 3-9.
12. Close (or replace) the Director front and rear doors. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
13. Perform the procedures listed under “Collect Maintenance Information” in Chapter 2.
14. Inform the customer that the Director is now available.

AC Power Switch

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove the ac power switch. Refer to Figure 3-37 on page 3-78.

1. Perform the power-off procedure. Refer to “Power-On” on page 3-9.
2. **Remove** the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. Identify the ac power switch. Refer to Figure 3-37 on page 3-78.
4. Remove the ac power switch:
   a. Remove the four screws.
   b. Tilt the ac power switch forward and away from its compartment.
5. Remove all cable terminals from the ac power switch. Refer to the inset in Figure 3-37. For each cable terminal:
   a. Loosen the screw.
   b. Pull the cable terminal out from beneath the screw.
6. Remove the Director serial number label at the bottom of the ac power switch assembly and place it on the new assembly that you will install in the Director.

   Note: Try to remove the label without touching the adhesive on the back of the label. Otherwise the label may not stick onto the new switch assembly.

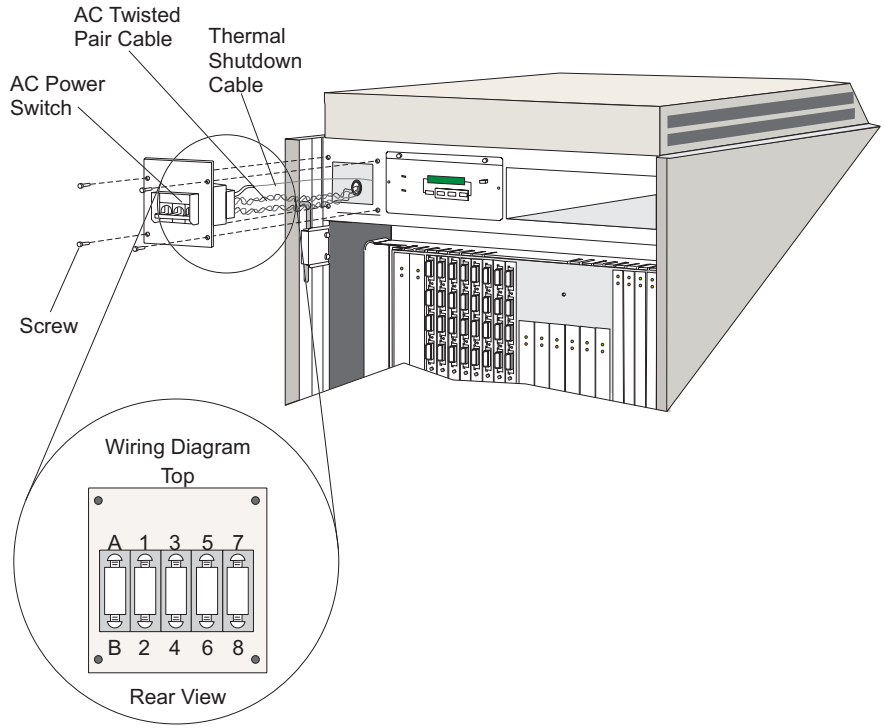


Figure 3-37. AC Power Switch

Replacement:

Use the following procedure to replace the ac power switch. Refer to Figure 3-37.

1. Attach the cable terminals to the ac power switch. For each cable terminal:
   a. Insert the terminal beneath its screw. Refer to the wiring diagram of terminals in Figure 3-37.
   b. Firmly tighten the screw.

      Note: Cable wires are labeled for correct attachment to terminals. Refer to wiring diagram in Figure 3-37 for matching numbers on terminals.
2. Replace the ac power switch:
   a. Position the ac power switch in its compartment.
   b. Insert and tighten the four screws.
3. Make sure that you place the serial number label, removed from the faulty ac power switch assembly, at the bottom of the newly installed assembly.

4. Perform the power-on procedure. Refer to “Power-On” on page 3-9..
5. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
6. Inform the customer that the Director is now available.

AC Filter Assembly

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove the ac filter assembly. Refer to Figure 3-38 on page 3-80.

1. Perform the power-off procedure. Refer to "Power-Off" on page 3-5.
2. Open (or remove) the Director rear door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. Locate the ac filter assembly.
4. Unplug both ac power cords.
5. Disconnect the ac filter assembly.
   a. Remove the six screws.
   b. Pull the ac filter assembly straight away from its compartment.
   c. Identify the ac filter cable terminals exiting the ac filter housing.
6. Remove the ac filter assembly from the Director by removing all wires from the load terminals on both ac filters (four wires total).

Note: Remove the wiring at the load terminals only. Do not loosen or remove the wiring that bridges the receptacles and filters.

For each terminal:

a. Loosen the hex nut and washers.

b. Pull the cable terminal out from between the washers

c. Identify the ac filter cable terminals exiting the ac filter housing.

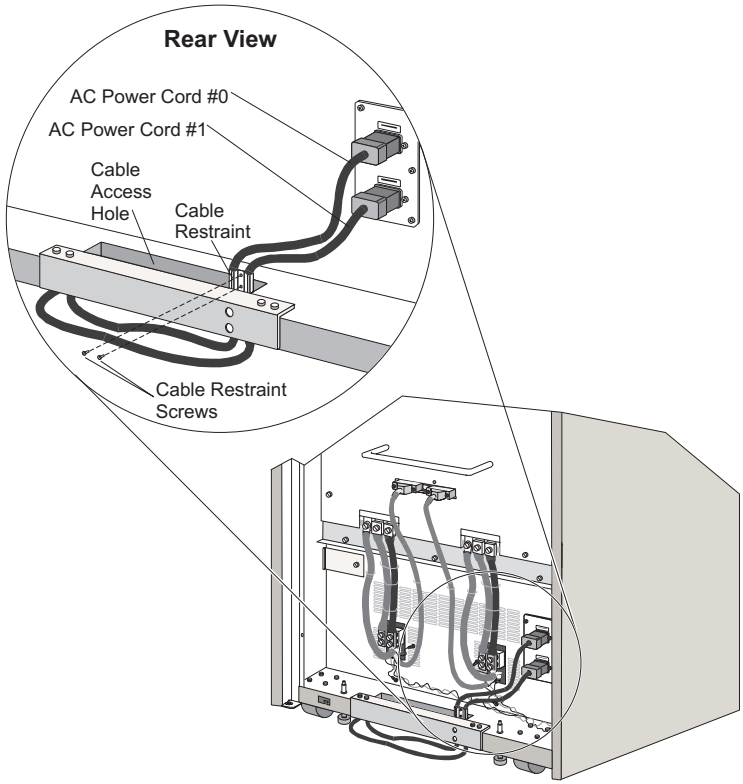


Figure 3-38. AC Power and Cords and Retainer

Replacement:

Use the following procedure to replace the ac filter assembly. Refer to Figure 3-39.

1. Attach the ac filter assembly cable wires to the L and N load terminals on each ac filter assembly. Wires are labeled for correct attachment. Refer to Figure 3-39 on page 3-81. For each cable terminal:

   a. Place the cable terminal beneath the hex nut and between the washers.

b. Firmly tighten the hex nut.

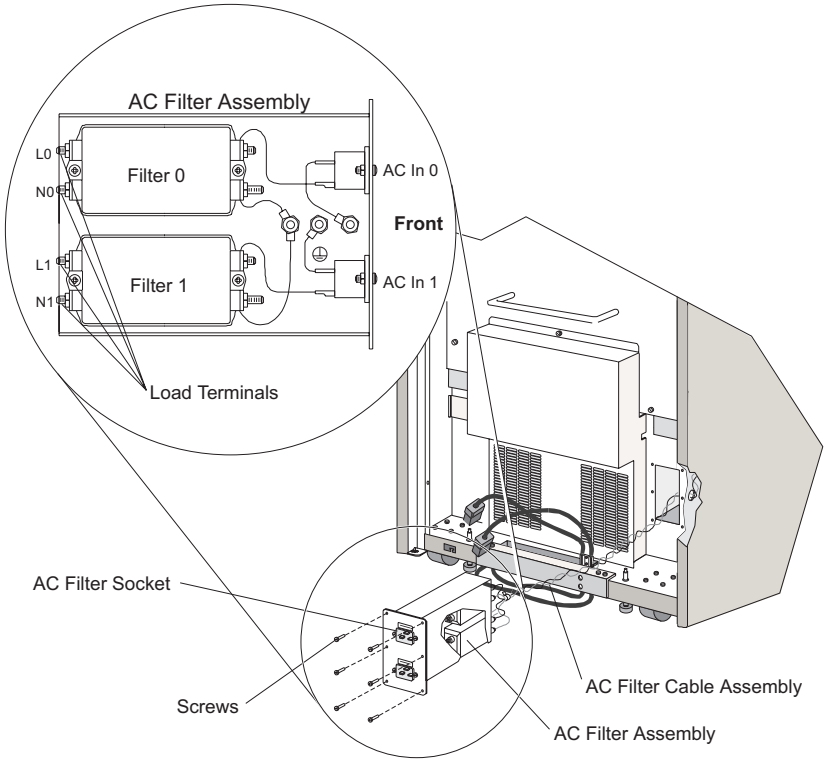


Figure 3-39. AC Filter Assembly

2. Replace the ac filter assembly:
   a. Position the ac filter assembly in its compartment.
   b. Insert and tighten the six screws.
3. Plug in both ac power cords.
4. Perform the power-on procedure. Refer to "Power-On" on page 3-9.
5. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
6. Inform the customer that the Director is now available.

AC Filter Cable Assembly

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove an ac filter cable assembly. Refer to Figure 3-40 on page 3-83.

1. Perform the power-off procedure. Refer to “Power-Off” on page 3-5.
2. Open (or remove) the Director front and rear doors. Perform steps under the removal procedure for "Doors, Front and Rear" on page 3-16.

   Note: Steps 3 through 9 are performed from the Director rear.
3. Remove the ac power switch. Refer to steps 3 through 5 of the removal procedure for the ac power switch.
4. Remove the rear power supply cover.
5. Remove the ac filter assembly. Perform steps 3 through 6 of the removal procedure for the ac filter assembly.
6. Remove the #1 fan assembly (right):
   a. Loosen the captive screws.
   b. Remove the fan assembly by pulling it straight out from its slot.
7. Remove the ac cable shield by removing its three screws.
8. Cut the five tie wraps holding the cable to the cabinet. There are three tie wraps on the side, and two inside the fan cabinet.

9. Identify and remove the ac filter cable assembly by pulling it loose from its route through the Director chassis.

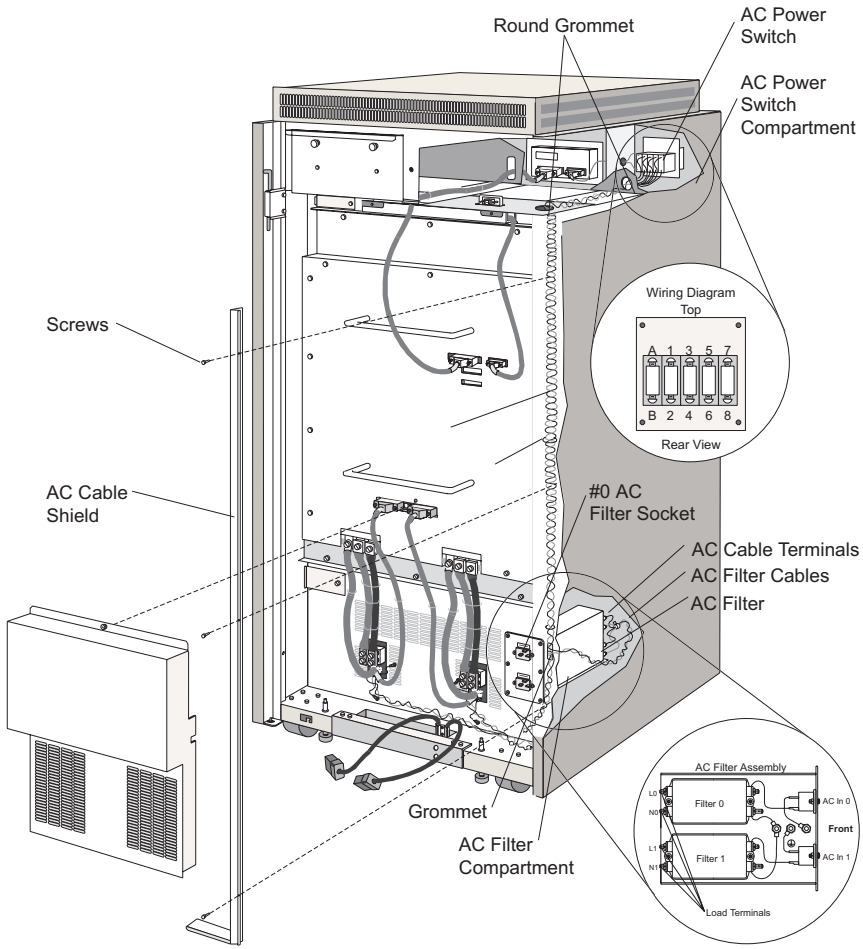


Figure 3-40. AC Filter Cable Assembly

Replacement:

Use the following procedure to replace an ac filter cable assembly. Refer to Figure 3-40.

1. If the fan assembly is not already removed, identify and remove it. Perform steps 3 and 4 of the removal procedure for a fan assembly.

   Note: Step 2 is performed from the Director rear.

2. Insert the ac filter cable assembly into the Director chassis, route the cable through the fan exhaust plenum.

   Note: Steps 3 and 4 are performed from the Director front.

3. Replace the ac power switch:
   a. Position the ac power switch in its compartment.
   b. Insert and tighten the four screws.

   Note: Steps 4 through 9 are performed from the Director rear.

4. Route the ac filter cable assembly down along its path. Refer to Figure 3-40.
5. Cable tie all ac twisted-pair cables to the three eyelets located on the side of the Director chassis and the two inside the fan cabinet (Figure 3-40).
6. Attach the ac cable shield to the Director by aligning the holes in the shield with the holes in the chassis and inserting and tightening the three screws.
7. Replace the fan assembly:
   a. Insert the fan assembly straight into its slot.
   b. Tighten the captive screws.
8. Replace the ac filter assembly. Perform steps 1 through 3 of the replacement procedure for the ac filter assembly.
9. Replace the rear power supply cover:
   a. Position the cover so that it stands freely in place.
   b. Insert and tighten the two screws located on the cover top lip.
10. Perform the power-on procedure. Refer to “Power-On” on page 3-9.
11. Close (or replace) the Director front and rear doors. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
12. Inform the customer that the Director is now available.

DC Fan Cable Assembly

For orientation and FRU location, refer to Figure 3-41 on page 3-85. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove a dc fan cable assembly. Refer to Figure 3-41 on page 3-85.

1. Perform the power-off procedure. Refer to “Power-Off” on page 3-5.
2. Open (or remove) the Director rear door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. Remove the two fan assemblies by loosening the captive screws and pulling the fan assembly straight out from its slot.
4. Unplug the dc fan cable assembly from the logic board assembly.
5. Loosen but do not remove the two screws that connect the dc fan cable assembly to the fan exhaust plenum back plate.
6. Lift the assembly up and out to remove it.

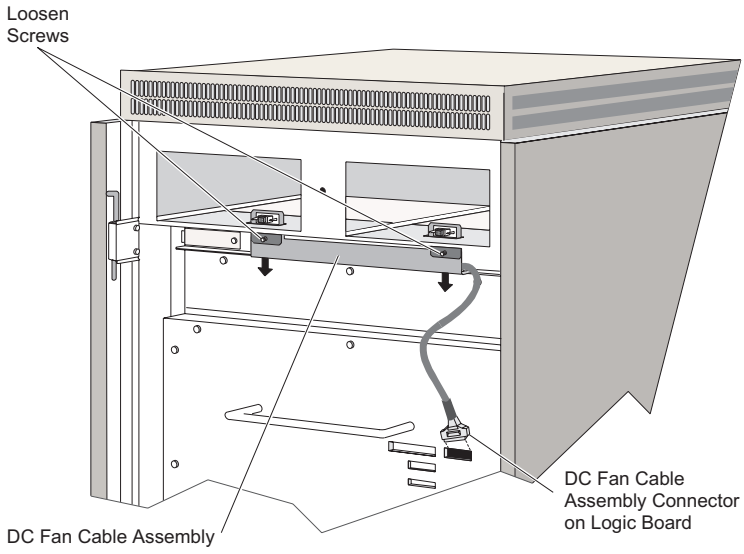


Figure 3-41. DC Fan Cable Assembly

Replacement:

Use the following procedure to replace a dc fan cable assembly. Refer to Figure 3-41.

1. Ensure that the two captive screws that connect the dc fan cable assembly to the fan exhaust plenum back plate are loosely mounted.
2. Position the dc fan cable assembly at the back of the fan exhaust plenum.
3. Firmly tighten the two captive screws.
4. Connect the dc fan cable assembly connector to the logic board assembly.
5. Replace the two fan assemblies. Insert each fan assembly straight into its slot and tighten the captive screws.
6. Perform the power-on procedure. Refer to “Power-On” on page 3-9.
7. Close (or replace) the Director rear door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
8. Inform the customer that the Director is now available.

Power Sense #1 and Power Sense #0 Cable Assemblies

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove a power sense #1 or power sense #0 cable assembly. Refer to Figure 3-44 on page 3-91.

1. Perform the power-off procedure. Refer to “Power-Off” on page 3-5.
2. Open (or remove) the Director front and rear doors. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. Identify the defective power sense cable assembly.

   Note: Facing the Director rear:
   The power sense #1 cable assembly is on the left.
   The power sense #0 cable assembly is on the right.

4. Remove the rear power supply cover (refer to Figure 3-42 on page 3-88).
   a. Loosen the captive screw located on the cover top lip.
   b. Pull the power supply cover up and off.
5. Remove the appropriate two hex nuts and two ground terminals from its threaded ground post.
6. Disconnect the appropriate power sense round cable from the 25-pin D-sub connector on the logic board assembly.
7. Remove the three screws from the ac cable shield on the side of the cabinet, and remove the shield.
8. Remove the #1 fan assembly (right) by loosening the captive screws and pulling the fan assembly straight out from its slot.

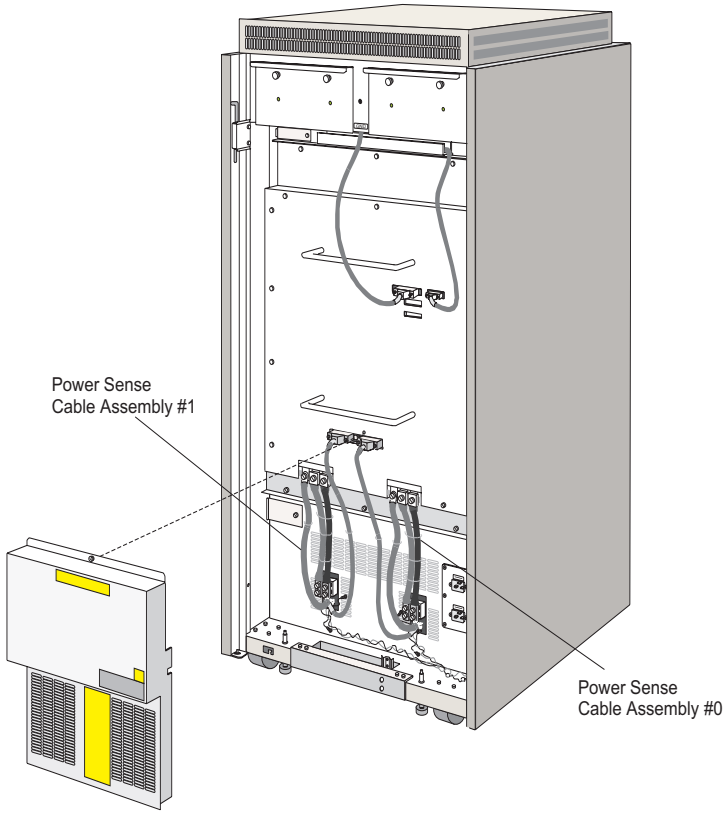


Figure 3-42. Removing Rear Power Supply Cover

9. Cut the five tie wraps holding the cable to the cabinet. There are three tie wraps on the side, and two inside the fan cabinet.

   Note: Steps 10 through 12 are performed from the Director front.

10. Remove the ac power switch assembly:
    a. Remove the four screws securing the switch assembly to the chassis.
    b. Tilt the ac power switch forward and away from its compartment.
11. Remove the appropriate power sense twisted-pair cable terminals from the ac power switch. These are terminals #2 and #4 for sense #0, and terminals #6 and #8 for sense #1. Refer to the wiring diagram in Figure 3-40 on page 3-83. For each cable terminal:
    a. Loosen the screw.
    b. Pull the cable terminal out from beneath the screw.

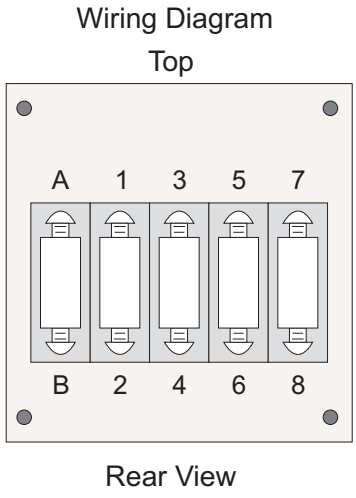


Figure 3-43. AC Power Switch

12. Disconnect the appropriate power supply. This is power supply #0 for sense #0 and power supply #1 for sense #1. Perform steps 2 through 4 of the removal procedure for the power supply.

    Note: Pull the power supply assembly approximately one inch away from their connections with the sense cable assembly.

    Note: Steps 13 through 15 are performed from the Director rear.

13. Disconnect the appropriate bus bar cable +5V, +3.3V and one ground from the logic board assembly. For each bus bar:
    a. Cut the tie wraps.
    b. Remove the three 7/16 hex bolts on each bus bar.
    c. Gently pull the connector straight out.
14. Loosen the top and bottom Phillips screws that secure the power sense connector assembly. The top screw is hidden by the bus bar; you may need to remove the bus bar to gain access to this screw.
15. Lift the power sense cable assembly up and pull it out from the Director.

Replacement:

Use the following procedure to replace a power sense #0 or power sense #1 cable assembly. Refer to Figure 3-44 on page 3-91.

1. Replace each power sense cable assembly onto the logic board assembly. For each assembly:
   a. Seat the power sense cable assembly in the logic board assembly support.
   b. Tighten the top and bottom Phillips screws that secure the power sense connector assembly.
2. Connect each bus bar cable +5V, +3.3V, and single ground into the logic board assembly. For each bus bar cable:
   a. Place the female terminal over the bus bar alignment holes.
   b. Attach and tighten the hex bolts on each of the connections.
   c. Replace the tie wraps.
3. Replace the two screws securing the ground connector to the chassis. Torque to 60 ($5) inch-pounds.
4. Connect the appropriate power sense round cable 25-pin D-sub connector to the logic board assembly.

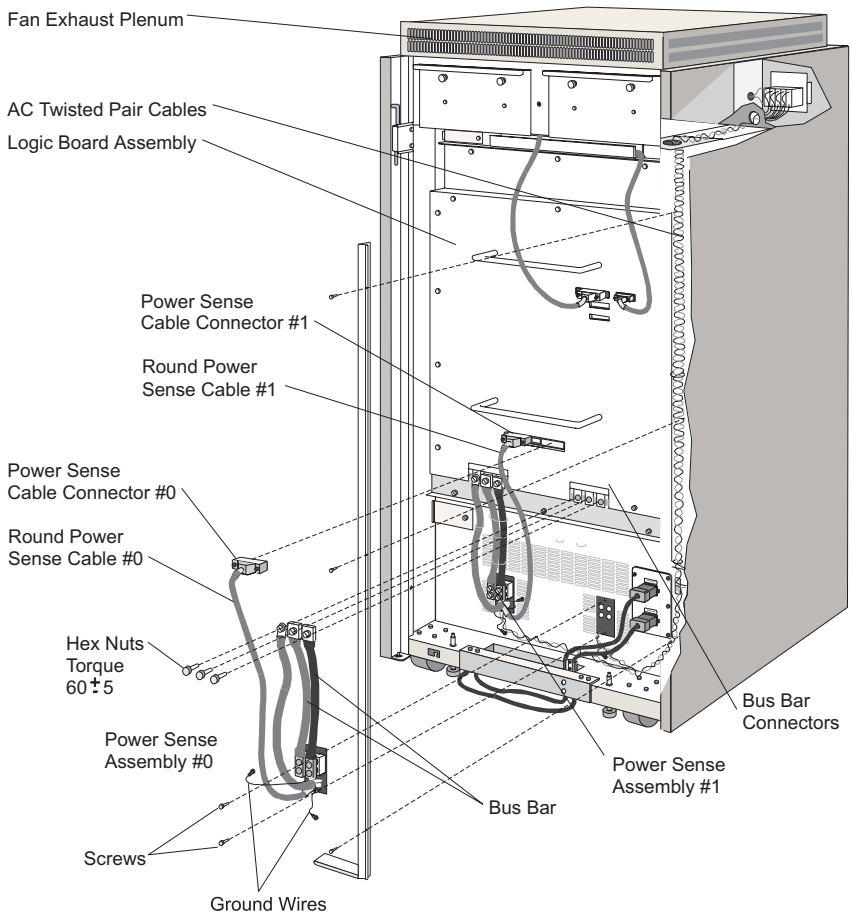


Figure 3-44. Power Sense Cable Assemblies

5. Connect the appropriate power sense cable to the ac power switch. Refer to the wiring diagram in Figure 3-40 on page 3-83:

   a. Route the twisted pair cable up through the grommet and along the right side of the Director chassis.

   b. Guide the cable through the lower round grommet in the fan cabinet and then through the round grommet in the back of the fan cabinet. Refer to the wiring diagram in Figure 3-40 on page 3-83.

   c. From the front of the Director, for each cable terminal, insert the cable terminal beneath the screw. Tighten the screw.

6. Replace the ac power switch. Refer to steps under the replacement procedure for the ac power switch.
7. From the rear, reconnect the power supply. Perform steps 2 and 3 of the replacement procedure for the power supply.
8. Attach two cable ties to the power sense twisted-pair cable to the eyelet that secures the twisted-pair to the Director chassis inside the fan cabinet, and to the three eyelets that secure the twisted-pair to the Director chassis down the side.
9. From the front, replace the fan assembly by inserting the fan assembly straight into its slot. Tighten the captive screws.
10. Replace the ac cable shield and replace the three screws that hold it in place.
11. Replace the rear power supply cover.
    a. Position the cover so that it stands freely in place.
    b. Insert and tighten the two screws located on the cover top lip.
12. Perform the power-on procedure. Refer to “Power-On” on page 3-9.
13. Close (or replace) the Director front and rear doors. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
14. Inform the customer that the Director is now available.

Spacer Cards (CTP/DVP/MXC/MXS/TKRG/Spare Ports)

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

Attention!

Follow proper ESD procedures at all times. Refer to Figure 3-5 on page 3-12.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove any of the spacer cards. Refer to Figure 3-45.

1. Open (or remove) the Director front door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
2. Identify the appropriate spacer card. Refer to Figure 3-45.
3. Remove the spacer card by pulling it straight out from its card track.

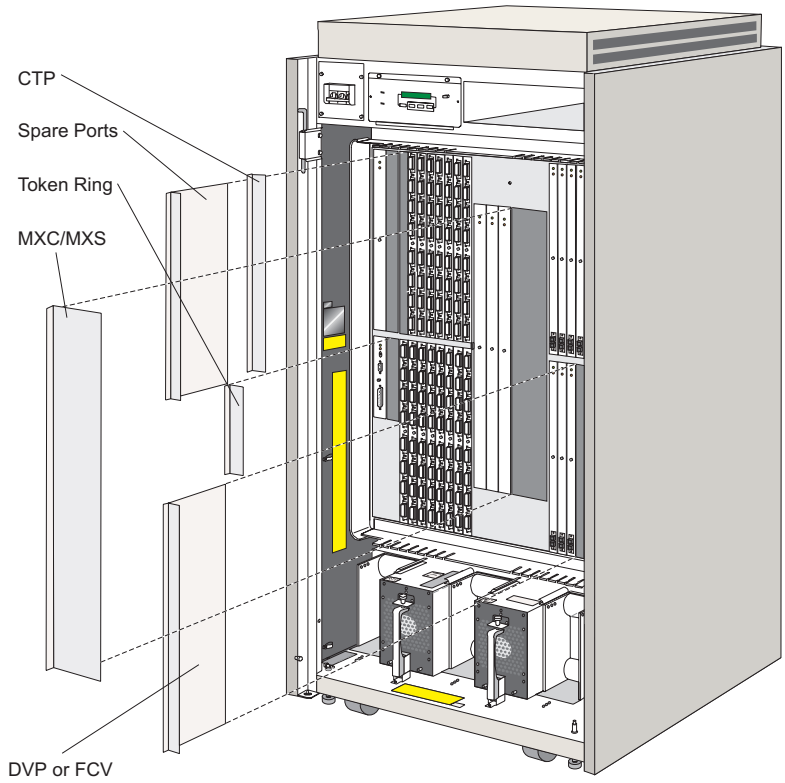


Figure 3-45. Spacer Cards

Replacement:

Use the following procedure to replace any of the spacer cards. Refer to Figure 3-45.

1. Insert the spacer card straight into its card track until you feel it snap into place. The spacer cards are stainless steel, and snap directly into place.
2. Close (or replace) the Director front door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.

3. Inform the customer that the replacement procedure is complete.

Door Latch

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove a door latch. Refer to Figure 3-46.

1. Identify the defective door latch.
2. Unlock the top and bottom door latches (where necessary or possible) and open the appropriate Director door.
3. Remove the mounting nut and its lock washer from the latch body and route over the pawl to remove from the door latch.
4. Route the latch body and attached pawl through the door latch hole (from inside to out) and remove it from the door.

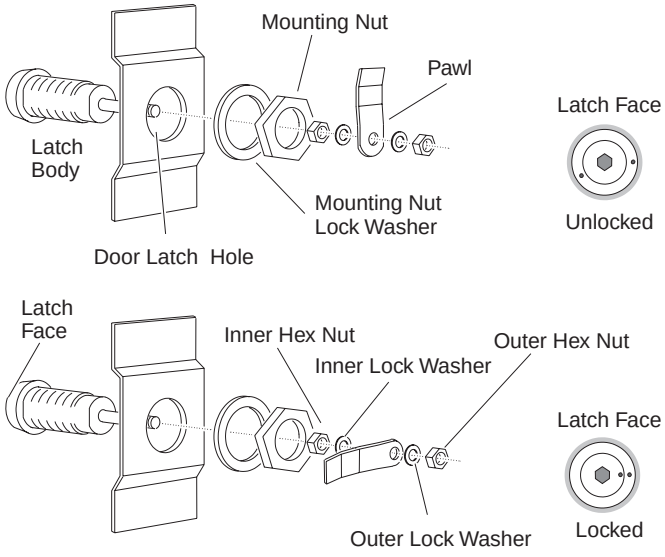


Figure 3-46. Door Latch.

Replacement:

Use the following procedure to replace a door latch. Refer to Figure 3-46 on page 3-94.

1. Is the door latch assembled?

   Yes: Continue to step 3.

   No: Continue to step 2.

2. Assemble the door latch:

   a. Align the dot depressions on the inner and outer diameters of the latch face side by side.

      Note: This action places the latch in a locked position.

   b. Thread the inner hex nut onto the latch core post so that it sits 2/3 to 3/4 of the way down the post.

   c. Place the inner lock washer on the post so that it sits against the inner hex nut.

   d. Place the pawl on the post, resting against the washer, so that it points outward.

   e. Place the outer lock washer on the post so that it sits against the pawl.

   f. Thread the outer hex nut on the post until it sits against the lock washer.

3. Insert the latch body and attached pawl through the door latch hole so that the latch face sits flush with the door face.

4. Thread the mounting nut lock washer over the pawl and latch body until it sits against the inside of the door.

5. Thread the mounting nut over the pawl onto the latch body and tighten until it sits against the lock washer.

6. Insert the key and turn the lock to its unlocked position.

7. Close the door, and lock top and bottom door latches. Check fit.

8. Is the fit satisfactory?

   Yes: Inform the customer that the replacement procedure is complete.

   No: Too loose? Continue to step 9. Too tight? Go to step 10.

9. Tighten fit:

   a. Thread the inner hex nut described in step 2b further down the post away from its lock washer.

   b. Slide the inner lock washer, pawl, and outer lock washer down the post until they rest against the inner hex nut.

c. Firmly tighten the outer hex nut described in step 2f against the outer lock washer and pawl.

10. Loosen fit:
    a. Thread the hex nut described in step 2f further up the post and away from its lock washer.
    b. Shift the inner and outer lock washers and pawl until they rest against the outer hex nut.
    c. Firmly tighten the inner hex nut described in step 2b against its lock washer.
11. Close the door, and lock top and bottom door latches.
12. Inform the customer that the replacement procedure is complete.

Side Cover

For orientation and FRU location, refer to Figure 4-6 on page 4-8. During this procedure, observe the practices described in “Procedural Notes.”

Note: It is not necessary to remove the Director side covers in order to perform any service action.

DANGER

To prevent possible electric shock, do not reach into nonvisible areas of a Director connected to primary power.

Removal:

Use the following procedure to remove a side cover. Refer to Figure 3-47 on page 3-97.

1. Identify the defective side cover.
2. Open (or remove) the Director front and rear doors. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. From the Director front, loosen (only) the two captive screws fastened in the key slots located (upper and lower) just inside the Director chassis.
4. From the Director rear, loosen (only) the two captive screws fastened in the key slots located (upper and lower) just inside the Director chassis.
5. From the side, remove the defective side cover by lifting it up and out of the key slots in the Director chassis.

Figure 3-47. Side Cover

Replacement:

Use the following procedure to replace a side cover. Refer to Figure 3-4.

1. Ensure that the captive screws are loosely mounted to the side cover.
2. From the Director side, position the side cover onto the Director chassis by inserting the captive screws into the key slots.
3. From the Director rear, tighten the two screws.
4. From the Director front, tighten the two screws.
5. Close (or replace) the Director front and rear doors. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
6. Inform the customer that the replacement procedure is complete.

Top Cover

Note: It is not necessary to remove the Director top cover in order to perform any service action.

For orientation and FRU location, refer to Figure 3-48. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

DANGER

To prevent possible electric shock, be certain the ac power switch is off and any machine power cords are disconnected from their power receptacles prior to nonredundant FRU removal.

Removal:

Use the following procedure to remove a top cover. Refer to Figure 3-48.

1. Perform the power-off procedure. Refer to "Power-Off" on page 3-5.
2. Open (or remove) the Director rear door. Refer to steps under the removal procedure for "Doors, Front and Rear" on page 3-16.
3. Remove both fan assemblies.

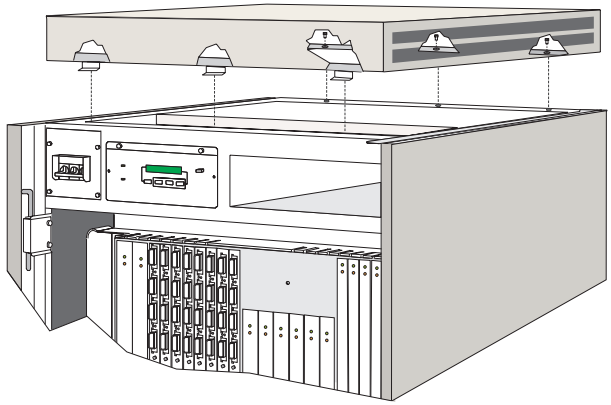


Figure 3-48. Top Cover

4. Inside the Director rear (ceiling), remove the three screws that secure the top cover to the back of the Director chassis. Refer to Figure 3-4.
5. Slide the top cover to the rear to disengage the three front catches.

6. Remove the top cover.

Replacement:

Use the following procedure to replace a top cover. Refer to Figure 3-48 on page 3-98.

1. Carefully place the top cover on top of the Director.
2. Slide the top cover forward to engage the three front catches.
3. Insert and tighten three screws which secure the top cover to the back of the Director chassis. Refer to Figure 3-48.
4. Replace both ac fan assemblies.
5. Close (or replace) the rear door. Refer to steps under the replacement procedure for "Doors, Front and Rear" on page 3-16.
6. Perform the power-on procedure. Refer to "Power-On" on page 3-9.
7. Inform the customer that the Director is now available.

Casters, Fixed and Swivel

For orientation and FRU location, refer to Figure 3-49 on page 3-100. During this procedure, observe the practices described in "Procedural Notes" on page 3-4.

CAUTION

The Director is heavy. Be careful and use all proper safety measures.

Removal:

Use the following procedure to remove a fixed or swivel caster. Refer to Figure 3-49 on page 3-100.

1. Identify the caster in need of repair. Refer to "Assembly 1: Exterior Assemblies" on page 9-8.
2. If necessary, remove the caster stop.
3. Wrench the leveling pad adjacent to caster clockwise until the caster is sufficiently off the floor (up to 1 inch maximum),

   Note: Wrench the caster off of floor.
4. Remove the four hex-nuts and the four washers which secure the caster to the Director chassis.
5. Remove the caster.

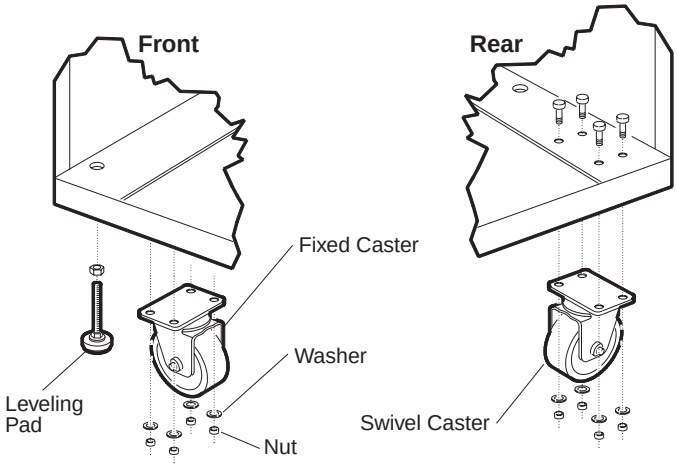


Figure 3-49. Fixed and Swivel Casters

Replacement:

Use the following procedure to replace a fixed or swivel caster. Refer to Figure 3-49.

1. Are any bolts damaged?

   Yes: Replace the bolts.

   No: Continue to step 2.

2. Insert the bolts through the holes in the chassis and then through the holes in the caster. Place a washer and hex nut under each bolt. Firmly tighten the hex nuts.
3. Wrench the leveling pad counterclockwise until the caster is firmly on the floor and supporting the Director's weight.
4. If necessary, replace the caster stop.
5. Inform the customer that the replacement procedure is complete.

Packaging and Handling Procedures

The Director is shipped with two LED fiber optic wrap plugs. Two laser fiber optic wrap plugs are also shipped with the Director if the extended distance feature (XDF) is selected. Fiber optic protective plugs are inserted into all the ports. Port cards ordered from stock also have protective plugs replaced. Leave the protective plugs inserted in any defective card you return to the branch office. This protects the fiber optic transmitter and receiver from dirt and damage.

Note: Save the protective plugs you remove from port cards during a repair for use during problem determination, during a relocation, or when you return defective port cards.

Chapter 4. Locations

Introduction

This chapter shows the physical locations of referenced parts for the 9032 Model 5 Enterprise Systems Connection (ESCON) Director.

Figure 4-1 through Figure 4-8 show:

- Director front (external view)
- Director rear (external view)
- Director operator panel (external view)
- Director front (internal view, logic cards)
- Director front (internal view, power supplies, labels)
- Director rear (internal view, power distribution)
- Director logic card map
- Director safety labels.

Assembly Locations

The following pages display front and rear views of most assemblies contained in the 9032 Model 5 ESCON Director. Each assembly is displayed with its relative position within the Director.

Director Front (External View)

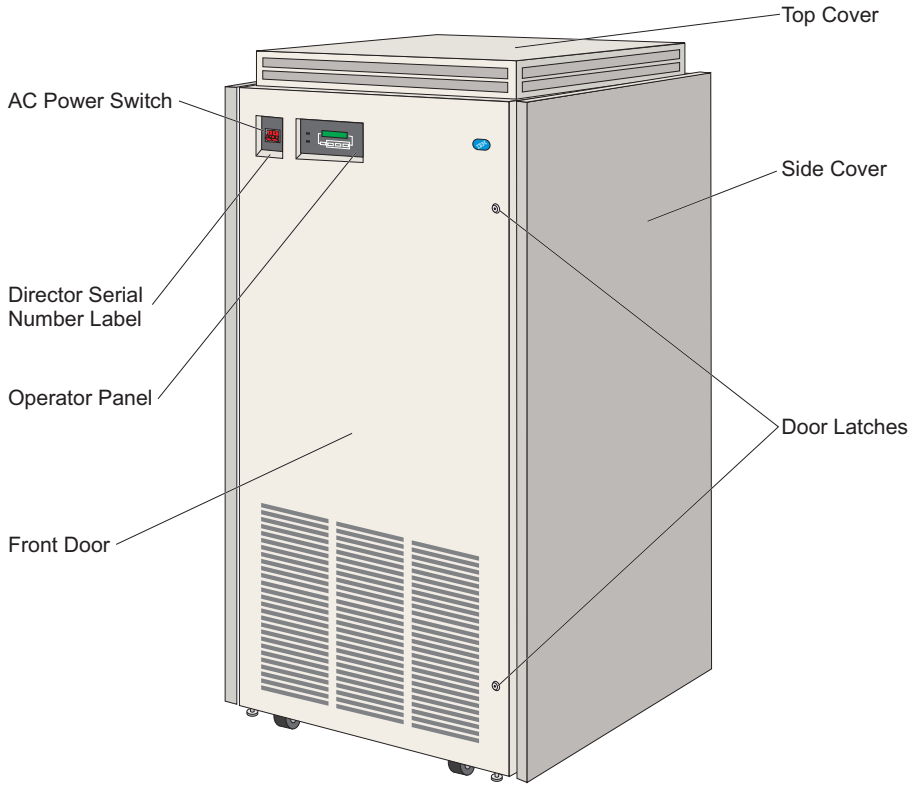


Figure 4-1. Director Front (External View)

Director Rear (External View)

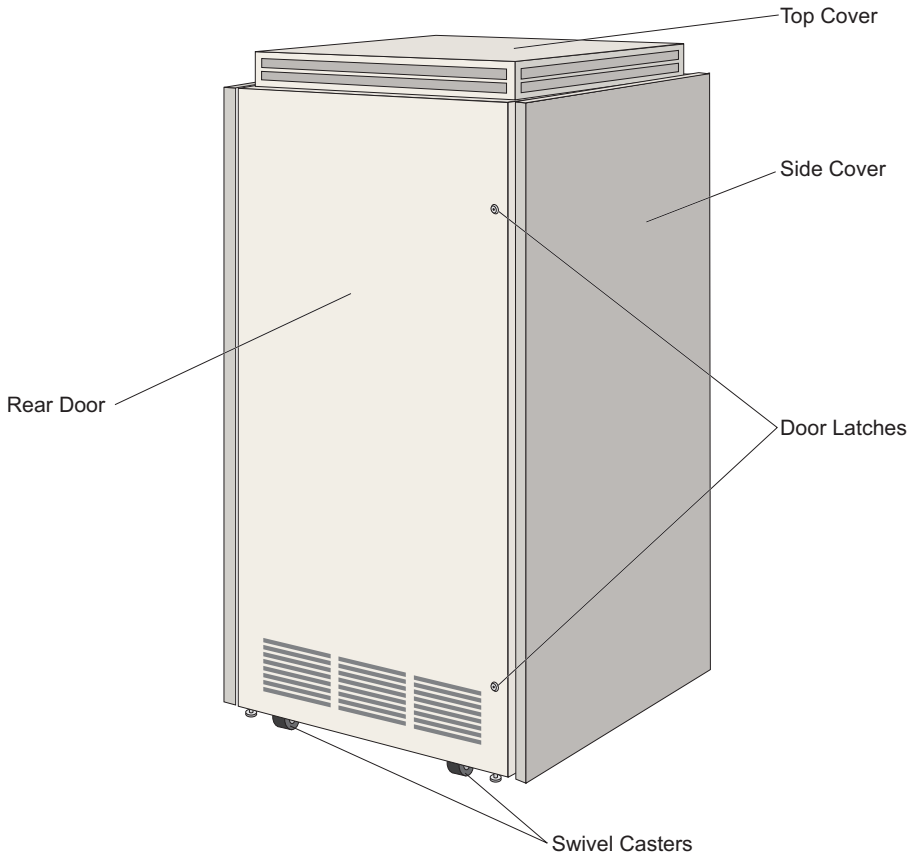


Figure 4-2. Director Rear (External View)

Director Operator Panel (External View)

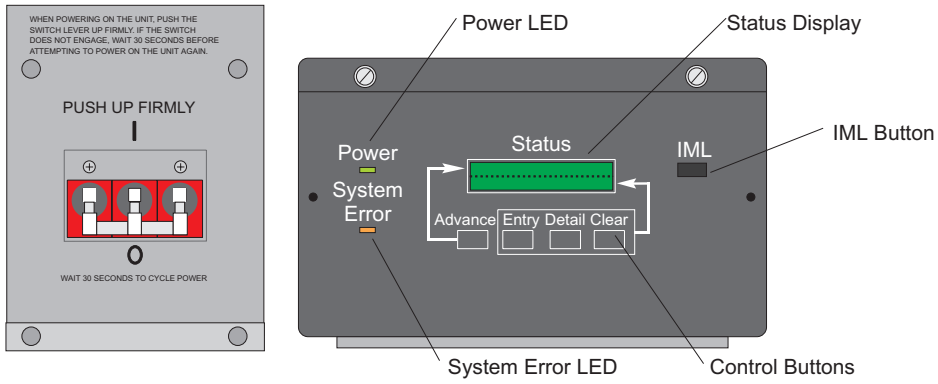


Figure 4-3. Director Power Switch and Operator Panel (External View)

Director Front (Internal View, Logic Cards)

In a Director, any or all of the logic cards (except port cards) may exist in either a redundant or a nonredundant configuration. Refer to "9032-005 Director Description" on page 1-4 for information on the number and types of port cards that can be installed in a Director.

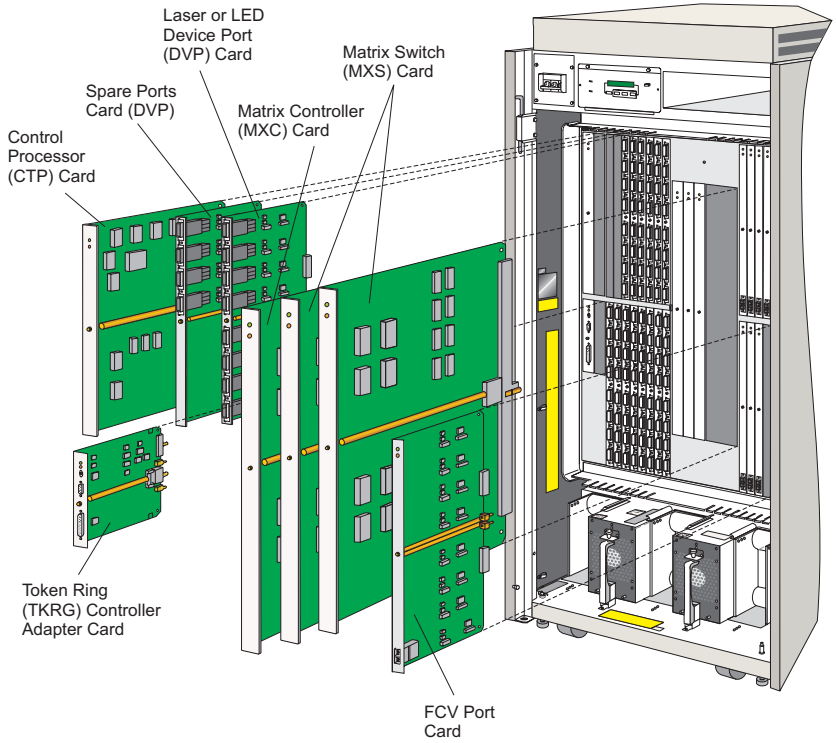


Figure 4-4. Director Front (Internal View, Logic Cards)

Director Front (Internal View, Power Supplies, Labels)

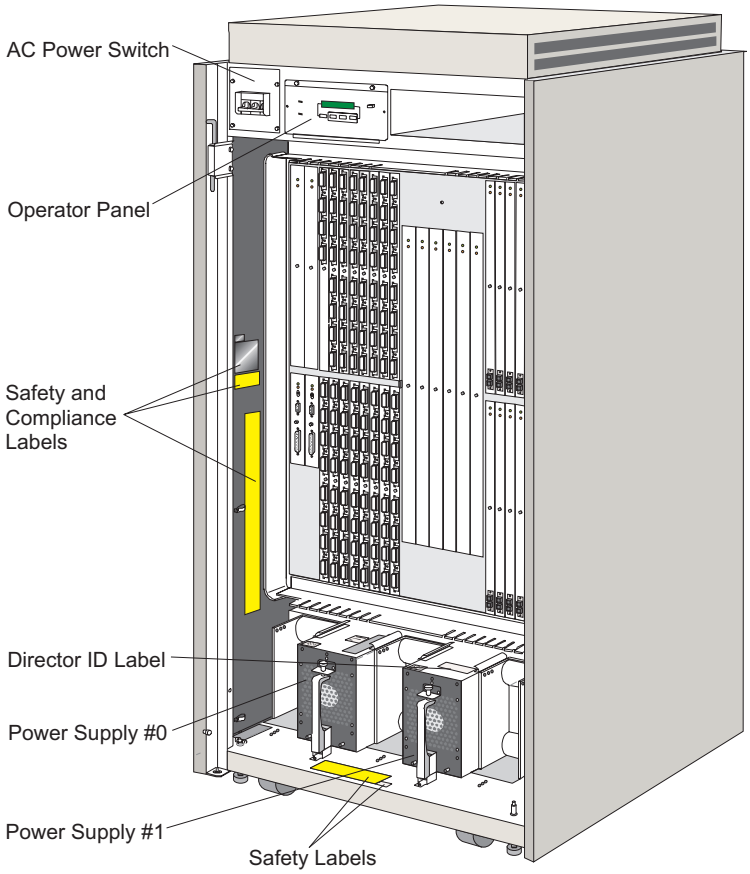


Figure 4-5. Director Front (Internal View, Power Supplies)

Note: Front of power supplies that support the FCV port card are black, anodized metal)

Director Rear (Internal View, Power Distribution)

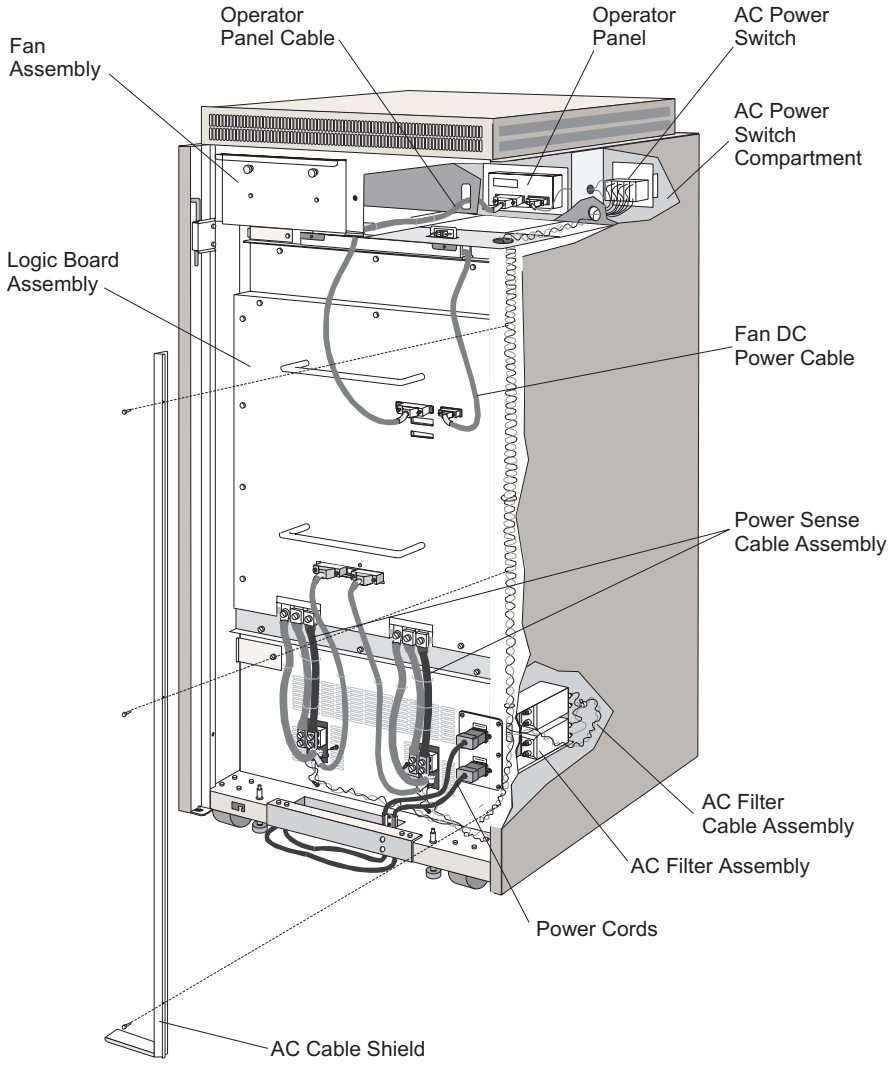


Figure 4-6. Director Rear (Internal View, Power Distribution)

Director Logic Card Map

To verify the location of a logic card, refer to the actual card map located on the inside of the Director front door. This figure maps the port numbers to port logical addresses.

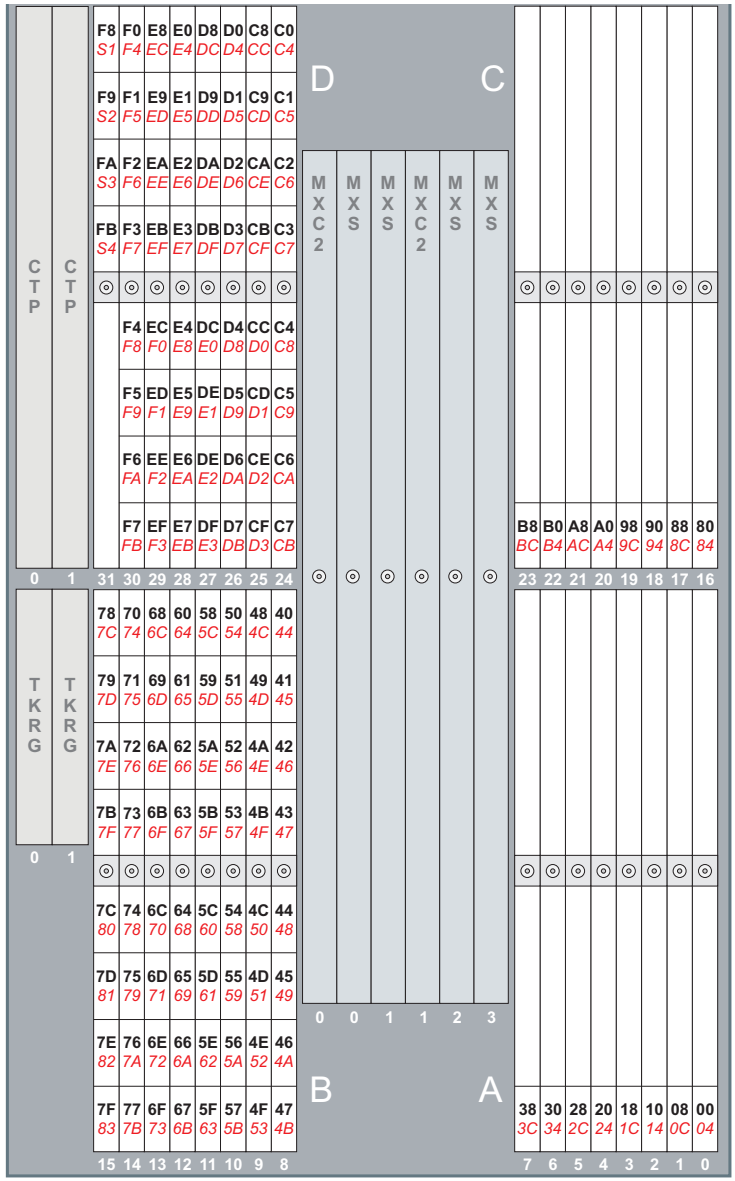


Figure 4-7. Director Logic Card Map

Director Safety Labels

Before performing maintenance, read the safety labels (refer to Figure 4-8). These labels are attached inside the upper left and lower center of the chassis and on the rear power supply cover.

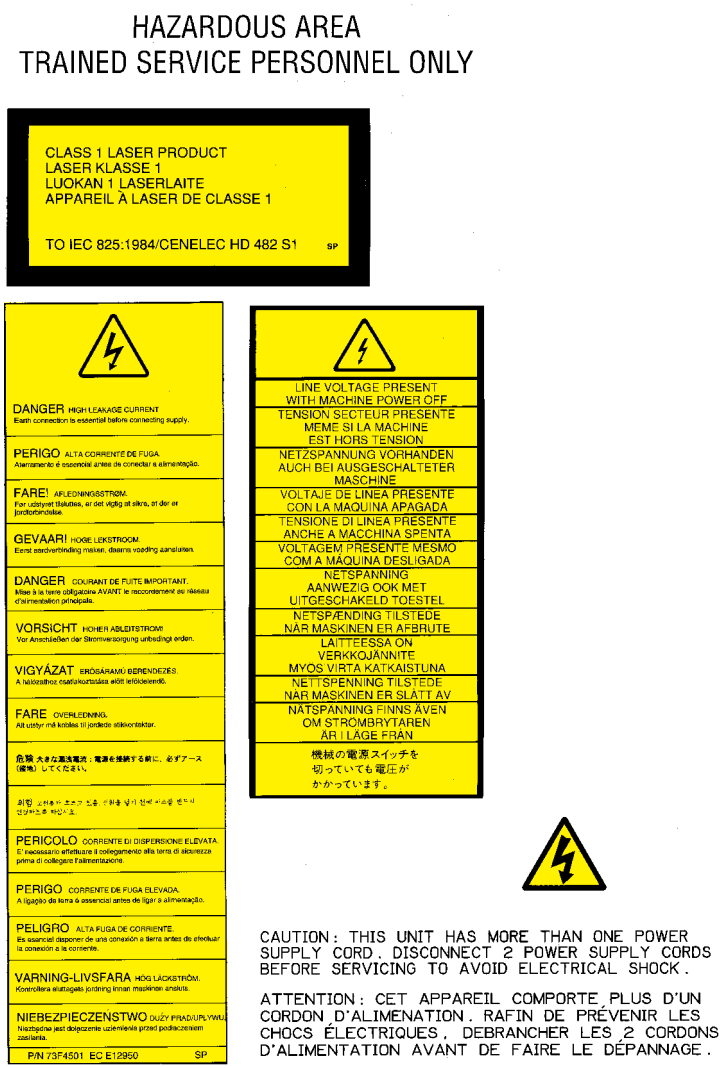


Figure 4-8. Director Safety Labels

Chapter 5. Preventive Maintenance

The Director requires no scheduled preventive maintenance.

Chapter 6. Installation, Discontinuance, and Relocation

Introduction

Use these procedures to install one or more Directors and a Console to a new or to an existing configuration.

The complete installation includes:

- A service code of 20, completion code 1, for:
  - The Console and Director (refer to page 6-10 and page 6-17)
  - Installation cleanup (refer to page 6-50)
- A service code of 20, completion code 6 (post installation) for:
  - Installing and routing fiber optic cables
  - Post-installation cleanup (refer to page 6-60)

Considerations

Consider these requirements before installing a Director or Console:

- The Directors and the Console must connect through a shielded twisted-pair Token-Ring LAN that can operate at 4 or 16 Mbps. You can change the data rate on both the Director and the Console from a default of 16 Mbps to 4 Mbps if required by an existing LAN.
- A Console is required to configure connections. It is also required to change connection configurations and to access logs, utility functions, and maintenance functions during operation. The Director can be powered on and off without the Console and will continue to operate normally if the Console is taken offline.
- One Console can control up to 16 connections. These connections can be any combination of Directors and up to two 9037 Model 2 Sysplex Timer Networks (four Timers maximum) provided the Sysplex Timer Console application is also installed. Although you cannot use more than one Console to share control of these units, consider providing a backup Console somewhere on the LAN in case the primary Console fails. Refer to “Maintaining and Using a Backup or Replacement Console” on page 10-27 for more information.
- The Director Console application version number must be greater or equal to the Director LIC version. The version number appears in the first two digits of the Director LIC or Console application code. For example, Director LIC version 4 is specified as LIC version 04.xx.xx. If any director attached to a Console is at version 04.xx.xx then the Console application must be at 04.xx.xx. Although there may be other Directors attached to the same Console at LIC version 03.xx.xx, because at least one of the Directors is at LIC version 04.xx.xx, the console application must also be at version 04.xx.xx. A Console at version 03.xx.xx attached to a Director at LIC version 04.xx.xx is an unsup-

ported configuration. For details, refer to the *9032 Model 3 Retain Technical Data* (TDR), number H162352.

- Locate the Console anywhere up to the limit of the installed Token Ring. You can also install the Console on a bridged LAN that is remote from the Director's LAN.

  Note: A remote LAN containing a Console can connect to a LAN containing Directors through a router, but the router must employ only its bridging functions.

- Although the Token Ring does not have to be dedicated to a Director or Director cluster, it is recommended that you do not install Directors on a congested LAN.
- Multiple Director clusters, each controlled by a Console, can be installed on a Token-Ring LAN.
- It is strongly recommended that you connect the Console and the Director to an isolated multistation access unit (MAU) as you perform the following installation steps. When you verify that all steps are complete, install the Director on the customer's LAN. Repeat the process, in turn, for each Director that you are installing.

  When you complete the following tasks (covered in detail in this chapter) before you install a DIrector on the customer LAN, you can ensure that all units are functioning normally and that Director and Console LAN addresses will not conflict with other devices already on the LAN.

  – Install the Director on the customer's Token-Ring LAN where all Directors are to be installed
  – Establish Director and Console communications
  – Change LAN addressing for the Token-Ring (TKRG) controller adapter card (if required)
  – Test Director and Console function
  – Customize Console operating environment as necessary.

Setting Up the Token-Ring LAN

LAN Configurations

You must connect the Console and all of the Directors in a cluster managed by the Console through a Token-Ring LAN. Figure 6-1 through Figure 6-4 provide examples of Director and Console configurations on Token-Ring LANs.

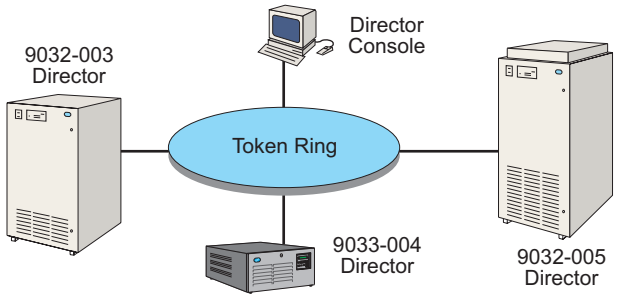


Figure 6-1. Two Directors and Console Configuration

A Console and a cluster of 16 Directors (the maximum capacity of the Console) are shown in Figure 6-2. Note that a Console can control a maximum of 16 connections on the LAN. These connections can be any combination of Directors and up to two Sysplex Timer Networks (provided the Sysplex Timer Console application is also installed).

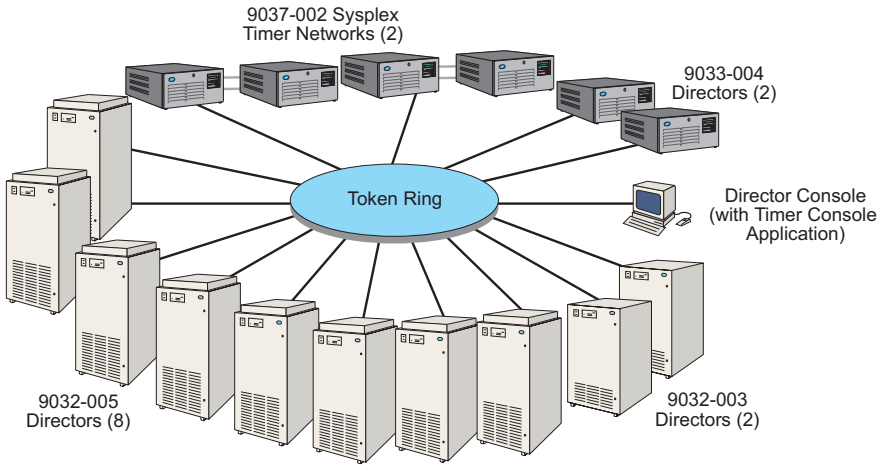


Figure 6-2. Maximum Directors in Cluster with Console

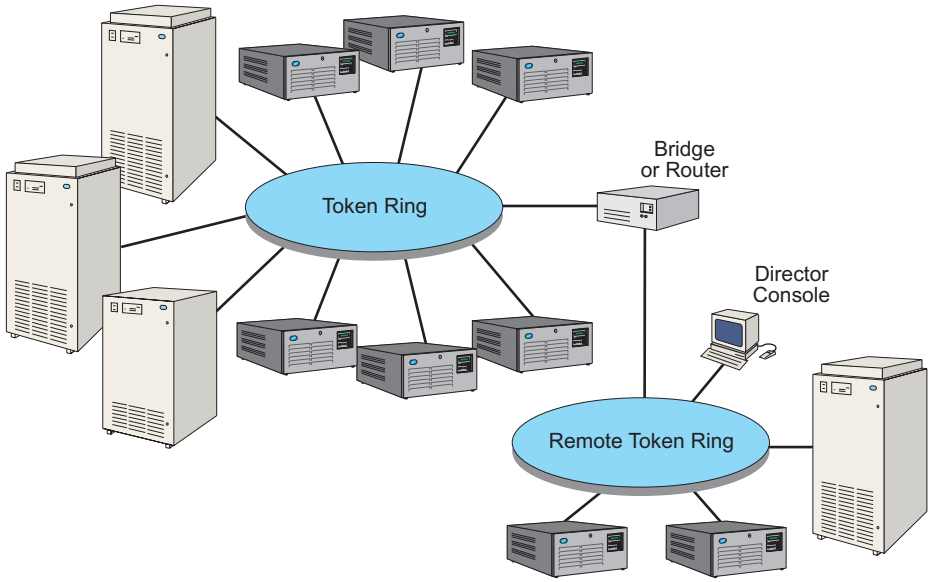


Figure 6-3. Remote Console on Bridged LAN

The Console in Figure 6-3 manages the three Directors on its own LAN and the nine Directors on the remote LAN as a cluster. Note in Figure 6-3 that the Console can be on a remote LAN if connected to the Director LAN through a bridge. A router can be used but it must employ bridging, not routing, functions.

By enabling a Console on the LAN local to the Directors as a distributed console access facility (DCAF) target and another Console on a remote LAN as a DCAF controller, the controller Console can access the Director Console application on the target Console. Refer to Figure 6-4.

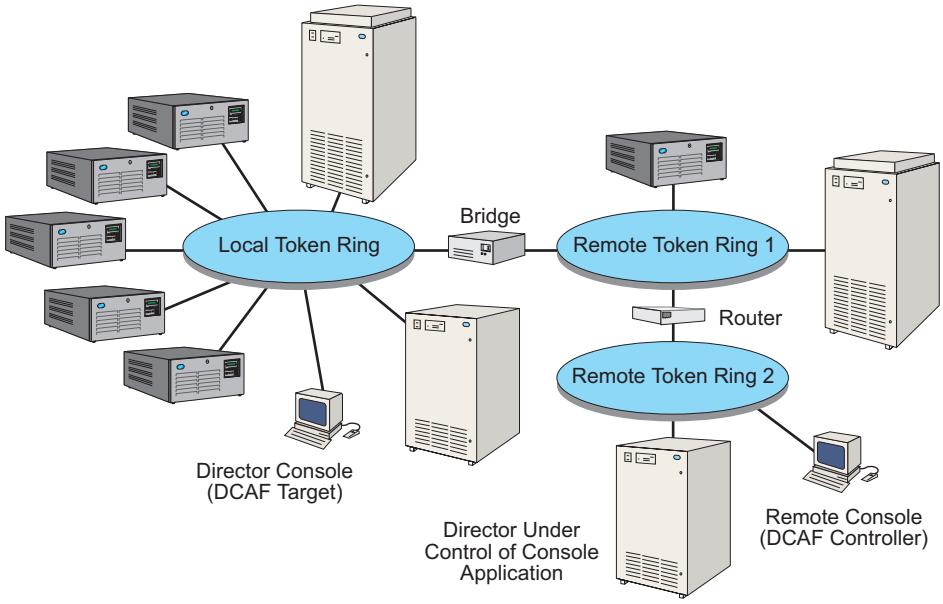


Figure 6-4. Remote Console Using DCAF Across a LAN

MAU Considerations

The Console and all Directors connect into a LAN through MAUs. The MAU can be ordered optionally with the Director.

Figure 6-5 illustrates a simple Token-Ring configuration of the Console and one Director attached to a MAU. The Director contains only one Token-Ring controller adapter card, so only one cable attaches from the card to the MAU.

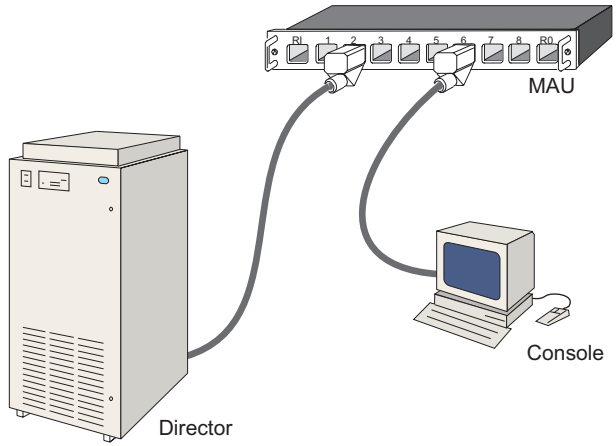


Figure 6-5. Simple LAN Configuration (Nonredundant Token-Ring Controller Adaptor Card)

Figure 6-6 illustrates a Director with a redundant TKRG controller adaptor card installed in a simple Token-Ring configuration. With a redundant card, an additional Token-Ring cable can attach to the MAU (or a different MAU) for backup in case one of the TKRG controller adaptor cards fails.

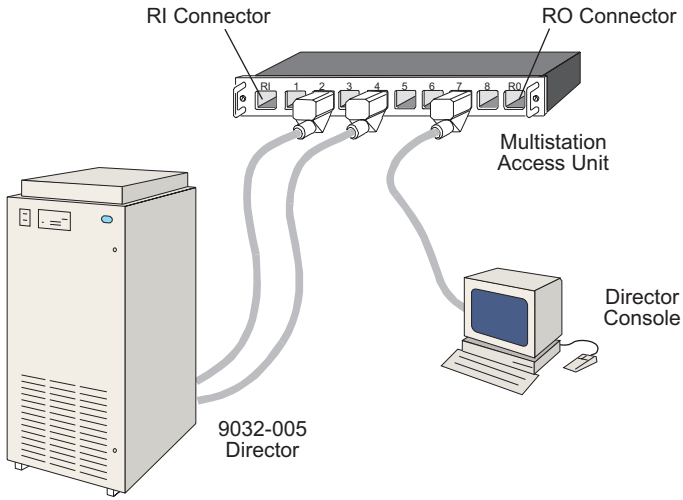


Figure 6-6. Simple LAN Configuration (Redundant Token-Ring Controller Adaptor Card)

Do not connect cables from the Directors and the Console to the ring-in (RI) and ring-out (RO) connectors on each end of the MAU. LAN cables from other MAUs connect to these ports to chain the MAUs and their attached devices into a larger LAN.

During installation, we recommend that you connect the Console and a new Director into an isolated MAU like that shown in Figure 6-5. After you have installed, set up, and tested the Director and Console together, you can move the Director to the main LAN where all Directors and other customer devices are installed. When all new Directors are installed on the main LAN, you can move the Console as well.

A MAU with eight ports allows up to eight devices (including Directors, 9037 Model 2 Sysplex Timers, and a Console) to attach and form a LAN. Two chained MAUs can attach to16 devices (refer to Figure 6-7).

Note: When a Director has a redundant TKRG controller adaptor card (Figure 6-6), two cables can connect the Director to the same MAU or one cable can connect to one MAU and the other cable to a different MAU. Attaching two cables would limit the number of other Directors that can also attach to that MAU.

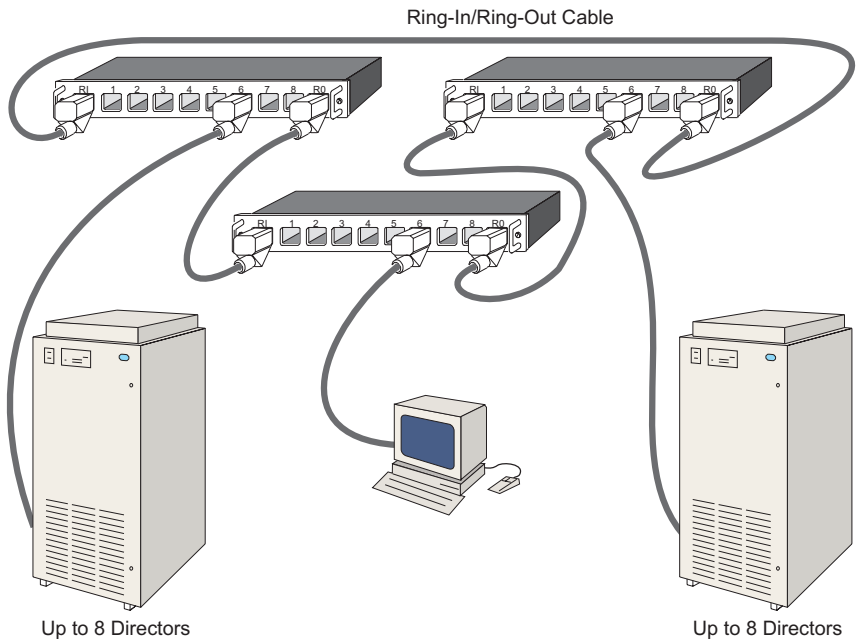


Figure 6-7. Linking MAUs and Attached Devices into Larger Token Ring

- When installing a new Token-Ring LAN, work with the LAN administrator to arrange the location of the Directors and Console, the MAUs, and the LAN cabling. Make sure the location of LAN components allows easy connections and meets LAN requirements for:
  - The Director identification (ID) Name
  - P addressing for the Director and Console
  - Subnet mask for the Director and Console
  - Distance between Directors, Console, and MAU
  - Distance of patch cables between MAUs in the same rack and between MAUs in different racks
  - The number of MAUs on a LAN.
- If integrating the Directors and Console into an existing LAN, arrange the location of the units with the LAN administrator. Make sure enough cabling and MAUs are available to install the new Directors and the Console.
- Follow the installation instructions provided with the MAU.

Installing the Console

Use the following tasks to install a new Console for the 9032 Model 5 Directors.

In the following tasks, you may be prompted for your maintenance authorization password when selecting options from Console application menus. Enter the proper password for your level (the default is LEVEL002). If prompted for an operator authorization password, obtain a password from the Console operator (the default is LEVEL003).

If you are installing an IBM PC console ordered for the Director, the configuration parameters are set at the factory. You do not need to change any of the parameters.

Task 1: Setting Up the Console

If you haven't already done so, set up the PC system using instructions in the system's "Setting Up" instructions and other manuals included in the System Library box shipped with the Console.

1. Unpack the Console and other contents of the Director shipping container. Verify that you have all required items. Refer to "Director Console Ship Group" on page 1-13.
2. Install the Console in a location where you can connect with the Token-Ring LAN to access the Directors that you are installing.

3. Follow instructions in the or PC system manuals to connect the display, system unit, mouse, and keyboard.

   Note: System and monitor power cords are located in the smaller options box containing the software kit.

4. If you have a PC Console unit with a voltage-selection switch, set the switch in the correct position for your country or you may damage the computer. Set the switch at 115 V for ac power in the 90 to 137 V range. Set the switch at 230 V for ac power in the 180 to 265 V range. The switch is located above the PC's plug receptacle.

   To set the voltage-selection switch:

   a. Remove the label (if attached) covering the power connector at the rear of the computer.

   b. Use a ball point pen or your finger to slide the switch to the correct position.

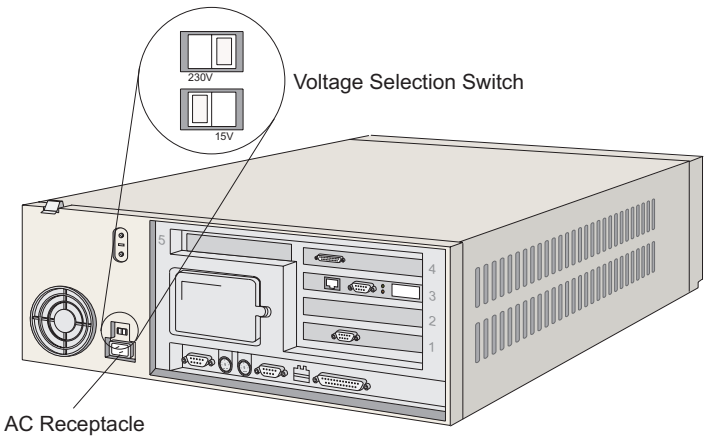


Figure 6-8. Voltage Selection Switch

5. Plug the power cord into the connector on the rear of the computer and into the ac power source.

   Note: Do not connect the Token-Ring adapter cable to the system unit yet. To avoid system problems, you should connect the cable during Task 3.

Task 2: Configuring the Token-Ring Adapter Card

Note: This task is not required if you are installing a new Console ordered with the Director for an isolated LAN.

Refer to following publication for procedures to configure the Token-Ring adapter card for the PC Console. Steps are included to change configuration parameters such as the IP address, and the MAC address.

Console Installation and User's Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer (GA22–7291).

Task 3: Connect the Console to the MAU

1. If you are installing the IBM 8228 MAU, reset the MAU using the *Using the IBM 8228 Setup Aid* instructions packaged with the MAU.
2. If the Console unit is on, shut down the Console application and Console unit using the following steps. If you need help, refer to the "Standard OS/2 Procedures" section in the *Console Installation and User's Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).
   a. Shut down the Console application.
   b. Shut down the OS/2 Operating System.
   c. Switch off power to the Console unit.
3. Connect the Token-Ring adapter cable supplied with the Console unit or customer provided cable to the Token-Ring adapter card at the rear of the Console unit. To connect the Token-Ring adapter cable, plug the cable adapter provided with the PC into the Token-Ring connector.

   Note: If the Token-Ring adapter card in the PC unit has a 9-pin connector, plug the Token-Ring cable into the card as shown in Figure 6-9.

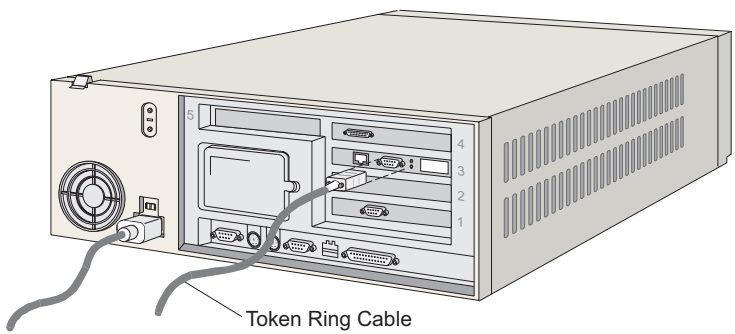


Figure 6-9. Connect Token-Ring Adapter Cable to the PC System Unit

Note: If the Token-Ring adapter card in the PC unit has an RJ45 connector, use the cable adapter shown in Figure 6-10.

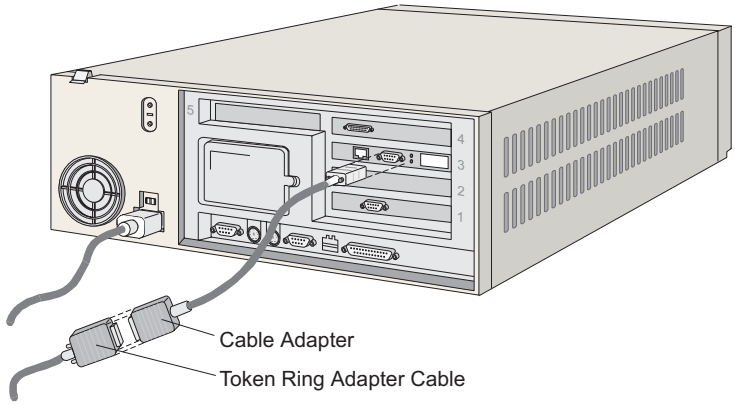


Figure 6-10. Connect Token-Ring Adapter Cable and Cable Adapter to the PC System Unit

4. Attach the other end of the Token-Ring adapter cable to the Token-Ring LAN's MAU.

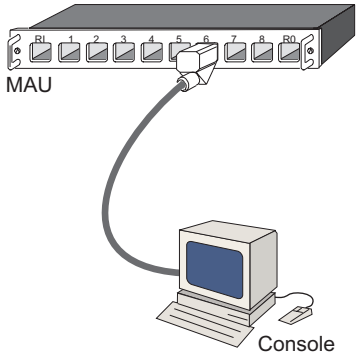


Figure 6-11. Connecting Console to MAU

Note: Do not attach the Director or Console to the ring-in or ring-out connector on the MAU.

5. Switch on the power to the Console display and system unit to verify operation.

- The system performs startup tests and loads software.
- The Console runs through power-on self-tests (POSTs) and loads the OS/2 operating system.
- After the OS/2 operating system loads, the OS/2 Logo Screen appears and then the OS/2 desktop appears. This indicates a successful power on.
- When the OS/2 desktop appears, double-click on the *Director Console* icon. The Console *Startup* window appears as shown in the following illustration, indicating successful operation of the Console application.

  Note: Do not place the Console icon in the system startup folder.

6. If no errors occur, close the Console application by double-clicking on the upper left corner of the *Startup* window. Click on the *OK* button when a dialog box appears to confirm closing the application. Go to the next task.

   Note: The Console application may take up to 30 seconds to open after clicking on the *Director Console* icon.

7. If an error occurs, perform one of the following actions:
   - If a message box appears on the *Startup* window with the following message, the Console's IP address conflicts with the address of another device on the LAN:

     "TCP/IP Kernel is inaccessible. No Links will be Activated. Error Code=06:0049."

     Change the Console's IP address. If you need help, refer to the "Customize Console Operating Environment" section for your Console type in the

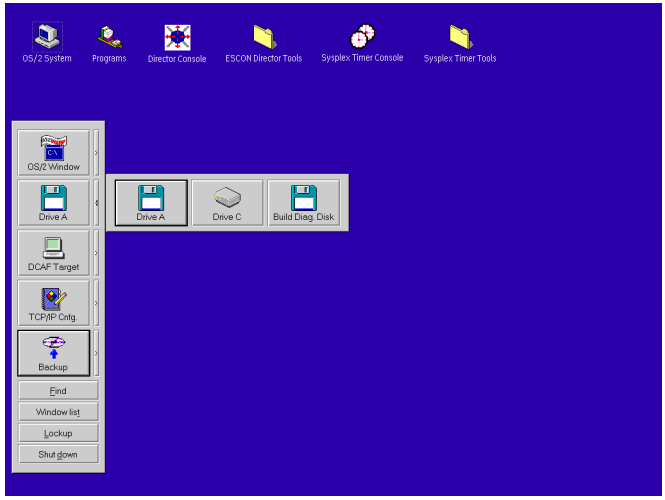
Console Installation and User's Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer (GA22-7291).

- If any other problems occur when you switch on system power, follow instructions in the PC's system manuals to correct them.

Task 4: Create a Diagnostic Diskette

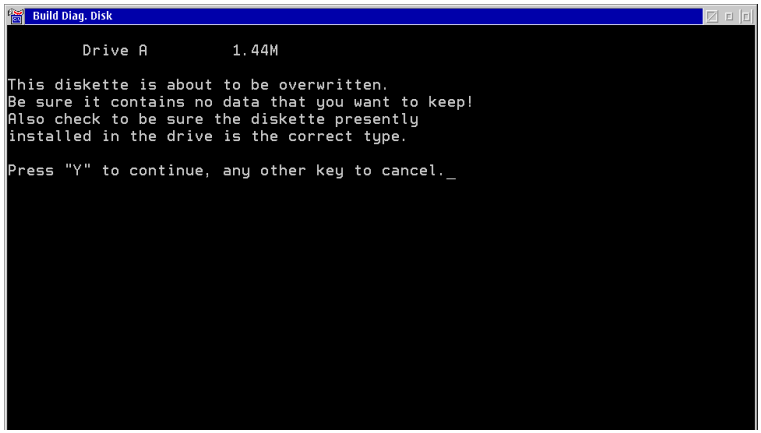
Use the following steps to create diagnostic diskettes for a PC Console. After you create the diskettes, keep them with the Console. Use these diagnostics under direction from your next level of support to help isolate and solve any future problems with the PC.

1. Insert one of the blank, formatted "For Use By Service Personnel" diskettes that you received with the Console unit into a diskette drive.
2. At the OS/2 desktop, open the *Drive A* drawer by clicking on the drawer's arrow.



3. Click on the *Build Diag. Disk* icon.

   The *Build Diagnostic Diskette* window appears:



4. Press the **Y** key to continue.

   A message appears at the bottom of the window showing the percentage of files written to the diskette. Perform the following steps for your Console type:

   When the percentage reaches 100, you will be prompted to insert a second diskette. When the percentage reaches 100 the second time, the OS/2 desktop will reappear. The diagnostic diskette was successfully created. Remove the diskette from the drive.

5. Label the first diskette as “Reference Diskette” and the second one as “SCSI Diagnostic.” Keep the diskettes with the Console. Use these diagnostics under direction from your next level of support to isolate and solve PC problems.

Task 5: Change the Console Operating Environment (Defaults)

At this point you can customize the Console operating environment if necessary by changing default parameters, such as the Console time and date, and TCP/IP, backup, and OS/2 parameters. To do this, follow procedures in the following publication.

Console Installation and User’s Guide: 9032 Model 3 ESCON Director, 9033 Model 4 ESCON Director, 9032 Model 5 Director, and 9037 Model 2 Sysplex Timer (GA22–7291).

Task 6: Collect Definition Data

If you are not migrating from an existing Director Console to a new Director Console, proceed to “Installing Directors” on page 6-17.

Use this procedure to create a diskette containing data for a set of Directors currently being controlled by an existing Director Console to a new Director Console. The data includes the Director IP addresses, identifications, model numbers, and

matrix configuration files. This provides all information needed to define the Director in “Task 5: Install Director Definition Data” on page 6-30.

For complete procedures, refer to the “Create Director Definitions Diskette” section for your Console type in the *Console Installation and User’s Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).

Installing Directors

Use the following procedure to:

- **Install a new configuration of Directors and a Console**

  This includes:

  – Installing the Directors and Console to a new LAN used specifically for the new configuration.

  – Installing the Directors and Console to an existing LAN used for other Director/Console configurations or other devices such as printers and PCs.

- **Add a Director to an existing cluster**

  This includes installing a Director to an established configuration of Directors and a Console on a Token-Ring LAN.

Installation Notes

For a list of items shipped with the Director, refer to “Director Ship Group” on page 1-6. The following procedures reference these items if they are required for installation.

Repeat all of the steps under “Installing Directors,” as well as steps under “Post Installation” (page 6-51) and “Post Installation Cleanup” (page 6-60) for each Director that you are installing.

CAUTION

An insulated earthing conductor that is identical in size, insulation material, and thickness to the earthed and unearthed branch-circuit supply conductors, except that it is green with or without one or more yellow stripes, is to be installed as part of the branch circuit that supplies the unit or system. The earthing conductor described is to be connected to earth at the service equipment or, if supplied by a separately derived system, at the supply transformer or motor-generator set. The attachment-plug receptacles in the vicinity of the unit or system are all to be of an earthing type, and the earthing conductors serving these receptacles are to be connected to earth at the service equipment.

In the following tasks, you may be prompted for your maintenance authorization password when selecting options from Console menus. Enter the proper password for your level (LEVEL002 is the default for maintenance level). If prompted for an operator authorization password, obtain a password from the Console operator (the default is LEVEL003).

If an incident code in the form ic/xynn or a failure message appears on the Director's operator panel status display when you switch Director power on during any of the following tasks, start with "MAP 9300: Power-On/IML Initialization Failure" in Chapter 2 to isolate the problem.

Task 1: Position Director and Route Power Cables

1. Make sure that two ac power receptacles for the Director are available at the installation site and that they are the correct type and voltage. Refer to "Environment, Power and Physical Characteristics" in *Planning for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7295) for information.

   Attention!

   Each receptacle should connect to a different ac circuit

2. Make sure that the power switch to the left of the operator panel on the front of the unit is in the off position (refer to Figure 6-12).

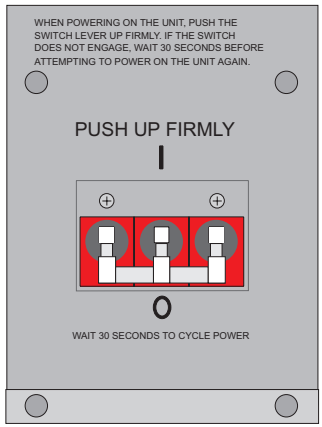


Figure 6-12. Director Power Switch and Operator Panel

3. Open the front door with the service key provided with the Director.
4. Verify that all field replaceable units (FRUs) are installed in the unit as ordered. This includes port cards, the power supply assembly (PSA), and the TKRG controller adapter card.
5. Position the Director on the floor at the desired location. Leveling pads located beneath the Director stabilize the unit and keep it level on uneven flooring. Unscrew a leveling pad at each of the four corners by turning it clockwise until it is snug against the floor. Turn the nut above the pad with a 1/2-inch wrench if you cannot turn the pad with your fingers (refer to Figure 6-13).

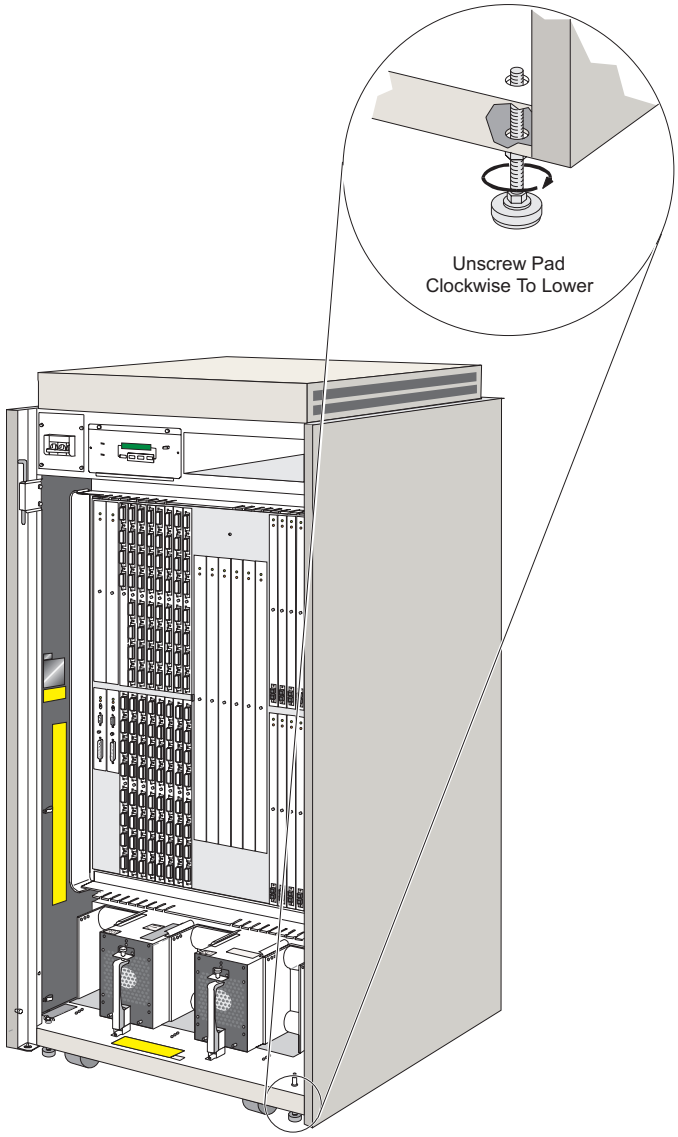


Figure 6-13. Positioning Leveling Pads Under Cabinet

Place a caster stop under each front caster to secure the Director from rolling (refer to Figure 6-14).

Note: The caster stops are located in the smaller shipping container packaged above the Director's large shipping box.

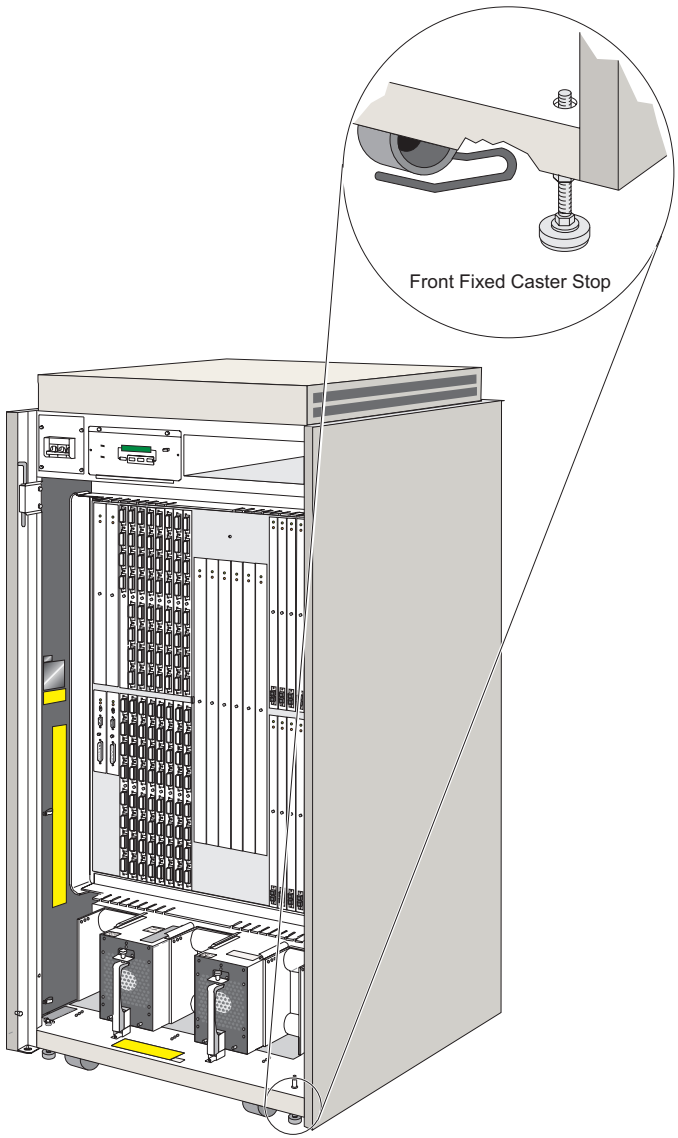


Figure 6-14. Positioning Stops Under Caster Wheels

6. Remove the ac power cables from the Director's shipping container. Route the cables through the rear middle access hole under the cable restraint and plug it into the appropriate ac receptacles at the bottom right corner of the unit (refer to Figure 6-15).

Note: Do not plug the cables into a power source until instructed.

Each power supply requires separate ac input power, preferably from separate ac power sources. The ac receptacle labeled “AC IN 0” supplies power to the power supply labeled “PS0.” The ac receptacle labeled “AC IN 1” supplies power to the power supply labeled “PS1.” Route the other end of the cable to the customer’s ac outlet supplying 180 to 264 V ac current.

Place the two power cables through the empty cable restraints in the rear middle access hole. Tighten the restraint with a Phillips or flat blade screwdriver (refer to Figure 6-15).

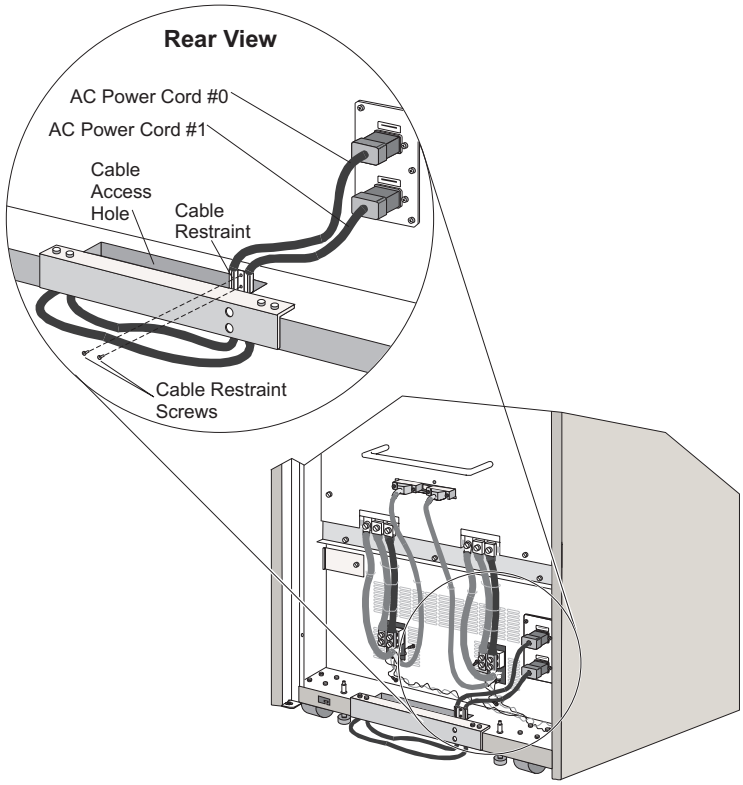


Figure 6-15. Placing Power Cables in Restraints

7. Plug power cables into properly grounded ac outlets supplying 180 to 264 V ac current. Make sure that you plug both power cables into ac outlets or errors will result when the Director is switched on.

   Note: A separate ac circuit is recommended for each ac outlet where you are plugging in a redundant power supply.

8. Attach a label to each power cable describing the ac circuit that it connects to at the installation site.

Task 2: Verify Director Operation and Determine LAN Addressing

1. Switch power on to the Director by setting the power switch to the left of the operator panel to the On position. As the unit powers on, power-on self-tests (POSTs) verify Director memory and operation of other components; then the LIC loader downloads LIC, resident in FLASH memory, to other memory locations.
2. Examine the operator panel status display as the unit powers on.

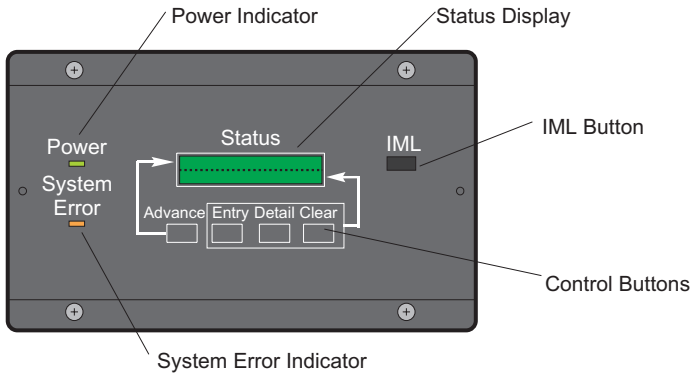
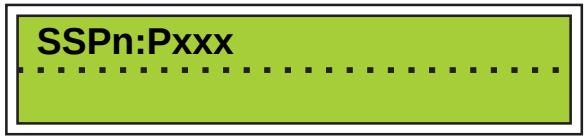
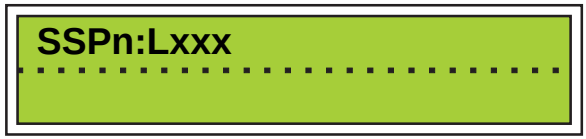


Figure 6-16. Operator Panel Status Display

Power On Messages: Power-on self-test (POST) messages display rapidly in the following sequence on the system information line (top line) of the states display to indicate test progress. This takes up to five minutes.

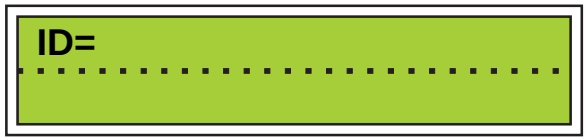




In the actual messages, the SSPn may be **SSP0** if one CTP card is installed. If a second CTP card is installed as an Enhanced Availability feature, **SSP0** and **SSP1** display as tests run on both cards. The SSP, denoting the Systems Services Pro-

cessor, is where the power on diagnostics are processed on the CTP card. Letters, such as P (power on) and L (loader), indicate the type of test being run. The x's indicate the test number.

Power On Complete: When the Director has successfully passed POSTs and is fully operational, the following displays on the top line of the status display. The event information (bottom line) of the status display should be blank, indicating no events.



Note: When you have configured a Director identification through the Console, that identification will display after ID= on the top line of the status display. On a new Director, the identification is blank.

3. If one of the following occurs during or after the POSTs complete, refer to "Start Initial Fault Isolation" on page 2-4 to isolate the problem. If no errors occur, go to step 4.

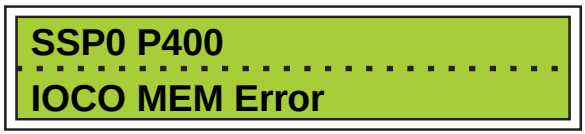
   - ID= does not appear on the status display after the power-on sequence completes.
   - The power indicator on the operator panel does not illuminate.
   - The Director power-on sequence halts and a failure message appears on the status display.

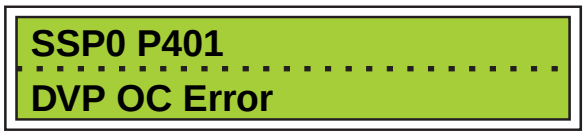
   If a failure occurs during POSTs, a test identifier (such as IOCO MEM Error) appears on the bottom line of the display. In the case of a CTP card failure, a fault code will appear on the top line of the operator panel in the form FAULT-xxxxxxxx.

   Following are some examples of POST failure messages. For more details, refer to Appendix B, "Messages."

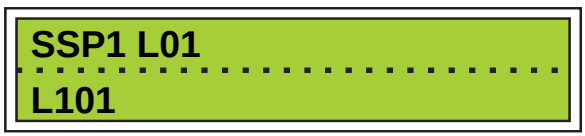
   CTP power on test failure examples:

System Test failure examples:





LIC Loader failure example:



4. When the ID= appears on the top line of the Director's status display and there are no events (the second line of the status display is blank), press the *Advance* button in and out until the Director's default IP address displays in the following form:

Note: It may take 5-10 seconds for the IP address to calculate. The address 0.0.0.0 may display until this occurs. The initial 'I' is a field identification, and not part of the IP address.

The Director has a default IP address of 1.x.x.x, where the value of the first octet is always "1" and the values of the remaining octets (represented by x's) are unique integers derived from the default MAC address of the Token-Ring interface installed in the Director. The first octet of the Console's default IP address (1.1.1.1) also has a value of 1. The first octet of the Director and Console IP address must be identical so that they can communicate across the

Token-Ring LAN. Leading 0's in an IP address do not display on the operator panel. For example, an address of 001.025.155.001 displays as 1.25.155.1. Also, the capital "I" is not part of the address.

Write down the IP address that displays on the panel and give it to the LAN administrator. You will also use this address to define the Director to the Console.

5. Press the *Advance* button until the Director's MAC address displays in the following form:

This is the default hexadecimal MAC address of the TKRG controller adapter card installed in the Director. Copy down the address and give it to the LAN administrator with the IP address.

6. You may need to change the IP or MAC address if:
   - The Director is not on an isolated LAN used specifically for the Director/Console configuration.
   - The Director's addresses do not conform with the LAN's addressing scheme.
   - There is a device on the LAN with the same IP or MAC address as the Director.

   If you need to change the IP and MAC addresses, continue with the next task. Otherwise, go to Task 4.

Task 3: Change Director's LAN Addresses (Optional)

Note: If installing a new Director and Console on an isolated LAN, go on to Task 4.

Find the current IP and MAC address for the Director by using steps in "Task 2: Verify Director Operation and Determine LAN Addressing" on page 6-23. Discuss the addresses with your LAN administrator. You may want to change the MAC or IP address if:

- The Director is not on an isolated LAN used specifically for the Director/Console configuration.
- The Director's addresses do not conform with the LAN's addressing scheme.
- Another device on the LAN has the same IP or MAC address as the Director.

- The LAN uses locally administered MAC addresses.

  Use these steps before installing the Director to an existing LAN containing other devices besides the Director/Console configuration to avoid conflicts with existing LAN addresses. If you do not need to change the Director's IP or MAC address, go to Task 4.

Note: The Director has a default IP address of 1.x.x.x, where the value of the first octet is always "1" and the values of the remaining octets (represented by x's) are unique integers. The first octet of the Console's default IP address (1.1.1.1) also has a value of 1. The first octet of the Director and Console IP address must be identical so that they can communicate across the Token-Ring LAN. Therefore, if you change the Console or Director IP address, make sure that the first octet in each address has the same value.

Note: If you perform these procedures on a Director installed on the LAN, they will temporarily drop the link between the Director and the Console.

Perform the following steps to change the IP and MAC addresses.

1. From the Director's operator panel, press the *Advance* button and the *Entry* button at the same time.
2. This places the panel in operator assist mode and the following appears:

3. To edit the address, press the *Clear* button once and a blinking cursor appears over the rightmost portion of the IP address.
4. Press the *Detail* button to scroll the number forward. Holding the *Detail* button down for more than three seconds causes it to scroll forward quickly. The IP address scrolls a three-digit range from 000 to 255. The displayed number scrolls back to 000 after 255. When the correct value of this portion of the IP address is reached, press the *Clear* button once. A blinking cursor appears over the next three-digit portion of the address.
5. Repeat step 4 for each remaining portion of the IP address that you need to change. When finished, press the *Entry* button to save and load the new IP address.
6. Note that the link to the Director will drop its connection at this time. To re-establish the connection, follow steps 6 through 14 beginning on page 10-15, then return to step 6.

7. If the MAC address is administered locally and you want to change it, press the *Advance* button (while still in operator assist mode) and the following appears

   Note that setting the MAC address to all zeros causes the burned-in address (BIA) on the Token-Ring controller adapter card to be used after the next IML.

8. To edit the address, press the *Clear* button once. A blinking cursor appears over the rightmost portion (two digits) of the MAC address.
9. Press the *Detail* button to scroll the number forward. Holding the *Detail* button down for more than three seconds causes it to scroll forward quickly. The MAC address only scrolls a two-digit hexadecimal range from 00 to FF. The displayed number scrolls back to 00 after FF. When the correct value of this portion of the MAC address has been reached, press the *Clear* button once. A blinking cursor appears over the next two-digit portion to the left of the MAC address.
10. Repeat step 9 for each remaining portion of the MAC address that you need to change. When finished, press the *Entry* button to save and load the new MAC address.

    Note: An asterisk (*) will display at the end of the address. This indicates that than an IML must be performed before the new address takes effect.

11. To exit operator assist mode, press the *Advance* button until “Exit” appears on the top line of the status display, then press the *Entry* button.

Task 4: Connect Director to LAN and Set Adapter’s Data Rate

Perform the following steps for each Token-Ring controller adapter (TKRG) card that you are connecting to the LAN (two cards may be installed in the unit).

1. The data rate for the TKRG card is set at 16 Mbps. You must set the adapter to match the speed of the Console and other Director(s) and devices that will

be attached to the LAN. If you need to set the data rate to 4 Mbps, push the data rate switch on the TKRG card down to the 4 Mbps position (Figure 6-17).

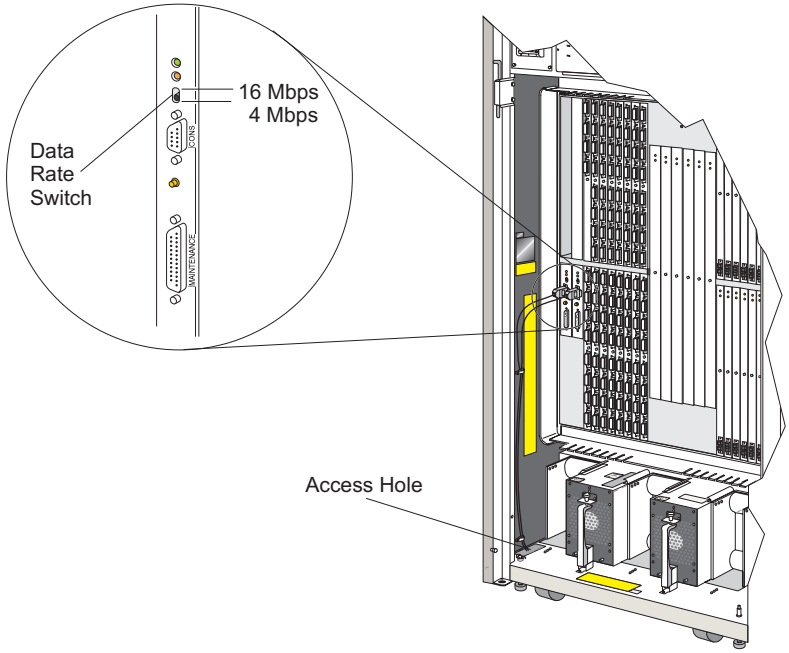


Figure 6-17. Setting Data Rate on Token-Ring Controller Adapter Card

2. Route the end of the Token-Ring cable (attached to the TKRG card) through the access hole in the bottom of the Director (Figure 6-18). If two TKRG cards are installed with connected cables, route the ends of both cables through the access hole. Connect each cable to a MAU on the Token-Ring LAN where you can establish a connection with the Console.

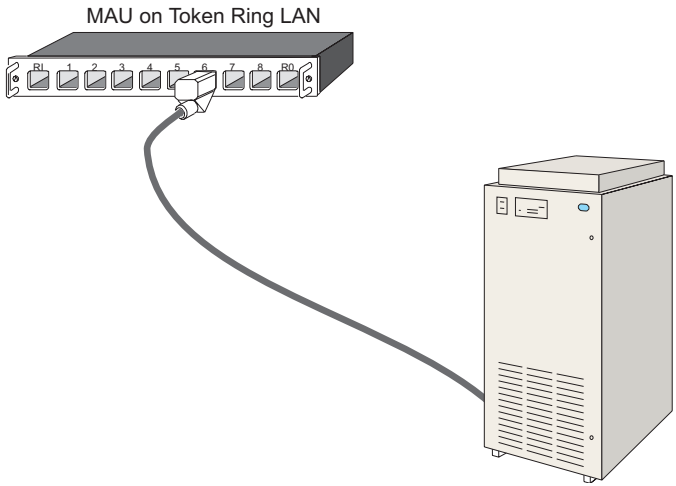


Figure 6-18. Connecting Director to LAN

Notes:

- Although Figure 6-18 illustrates one cable connecting the Director to a MAU, if the Director contains two TKRG cards and two cables, connect both cables to a MAU or each cable to a separate MAU. The TKRG card in slot #0 is the active address on the LAN and will be used to communicate with the Console. If the card in slot #0 should fail, the TKRG card in slot #1 will assume the same active address and allow communications with the Console.
- If you are installing a new IBM 8228 MAU shipped with a Director and have not reset it, reset the MAU with the *Using the IBM Setup Aid* instructions packaged with the MAU.

Task 5: Install Director Definition Data

Use these procedures to install data previously collected from an existing set of Directors in “Task 6: Collect Definition Data” on page 6-16. This data provides all information required to define a Director to the Console. If you are not migrating from an existing Director, proceed to Task 6.

1. Follow steps in the “Migrate Definitions to a Director Console” section for your Console type in the *Console Installation and User’s Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).
2. When you are prompted to insert the migration diskette, make sure to use the diskette created in “Task 6: Collect Definition Data” on page 6-16.

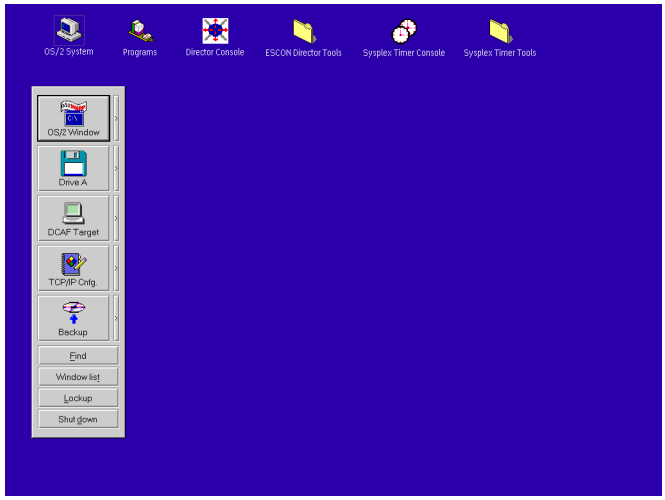
3. Proceed to Task 6.

Task 6: Define the New Director to the Console

1. Close the Director's door.
2. Verify that the Director and Console are powered on.

   Note: If the Director is not powered on, push up firmly to engage the ac power switch. If the switch does not engage properly (because it was not pushed up firmly) wait 30 seconds before attempting to switch power on again. If powering the unit off to cycle power, wait 30 seconds before powering on again.

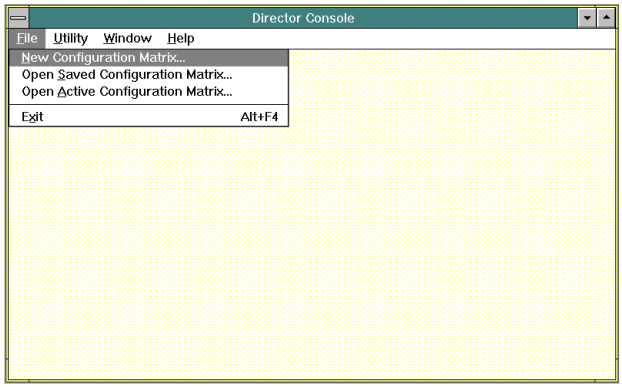
   As the Console powers on, the system runs through POSTs and loads the OS/2 desktop. After the OS/2 operating system loads, the OS/2 desktop appears, indicating a successful power-on.



3. Double-click on the *Director Console* icon. The Console *Startup* window appears, indicating successful Console operation.

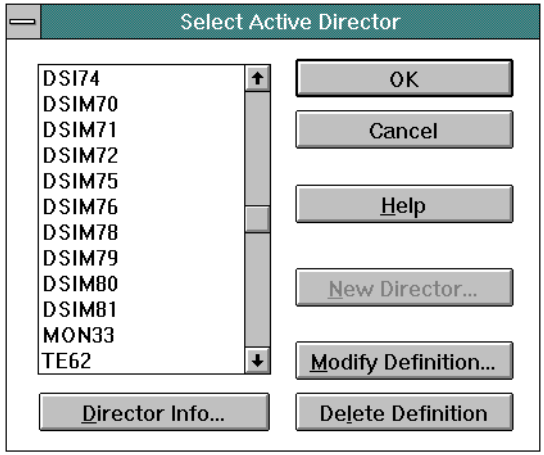
   Note: The *Startup* window may take up to 30 seconds to appear after clicking on the *Director Console* icon. Also, do not place the Console icon in the system's startup folder.

4. Select *Open Active Configuration Matrix* from the *File* menu on the *Startup* window.

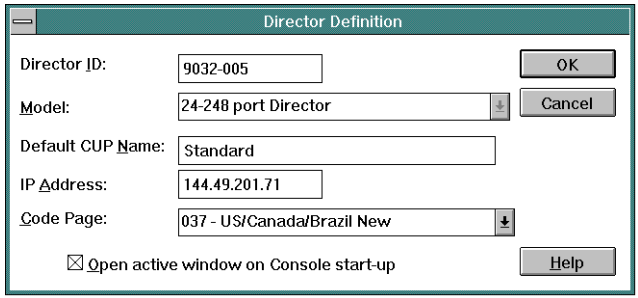


5. The *Select Active Director* dialog box appears. This dialog box contains a list of Directors currently supported by the Console. Select the one you want.
6. If this is the first Director you are defining, the list will be blank.

   If you have migrated an existing Director definition, it will appear in the list.



7. Click the *New Director* button to display the *Director Definition* dialog box.



8. Fill in the *Director Definition* fields as follows, pressing **Tab** to move between the fields:

- *Director ID* (Name). Enter a name from one to eight characters that uniquely identifies the Director to the Console. Valid characters are A-Z, 0-9, underscore (_) and hyphen (-). This name appears in Console window titles and menus.
- *Model*. Use this field to select the Director model that you are defining. The default value is “24-248 port Director” (model 9032-005). Select between 28-124 port Director (model 9032-003), 8-16 port Director (model 9033-004), and 24-248 port Director (9032-005) by using the arrow keys on the keyboard, clicking on the arrow button, or pressing **F4** to display a list of valid selections.
- *Default CUP Name* (optional). Use this option when you want to assign a CUP name for communication with System Automation for OS/390 (SA OS/390). Leave this field blank if you want SA OS/390 to assign a CUP name. Provide a name with 24 or fewer characters. The name appears above the status line in the Director’s matrixes.
- *IP Address*. Find out the Director’s IP address by pressing the *Advance* button on the Director’s operator panel until the address appears in the following form:

Note: It may take 5 to10 seconds for the IP address to calculate. The address 0.0.0.0 may display until this occurs. The initial ‘I’ is a field identification, and not part of the IP address.

The following is an example of an IP address:

144.49.64.60

Leading 0's in the address do not display on the operator panel. For example, an address of 001.025.155.001 displays as 1.25.155.1. Also, the capital "I" is not part of the address.

The Director has a default IP address of 1.x.x.x, where the value of the first octet is always "1" and the values of the remaining octets (represented by x's) are unique integers derived from the default MAC address of the Director's Token-Ring interface. The first octet of the Console's default IP address (1.1.1.1) also has a value of 1. The first octet of the Director and Console IP address must be identical so that they can communicate across the Token-Ring LAN.

Enter the IP address that displays on the Director's operator panel into the IP Address field of the *Director Definition* dialog box. This number must be unique among all devices on the LAN. Enter the address in the form nnn.nnn.nnn.nnn, where nnn is a decimal in the range 0-255. Do not use all zeros or all 255s (for example 255.255.255.255 or 000.000.000.000).

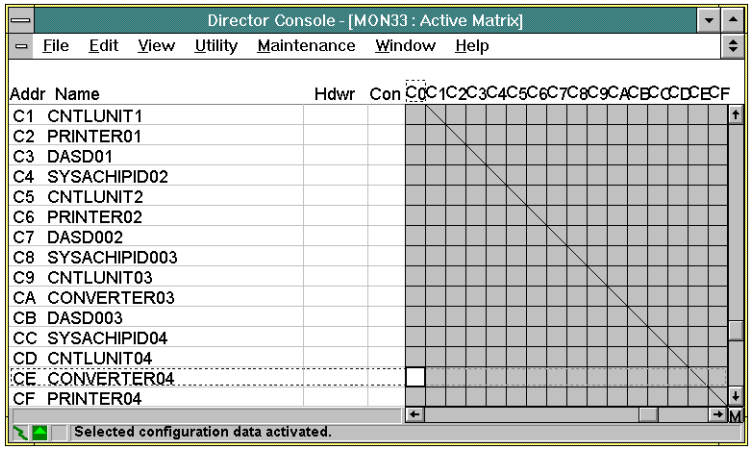
If you need to change the Director's IP address, refer to procedures under "Changing the IP Address" on page 10-15.

- *Code Page*. Select the country code page used to display port names on the Director's matrix (the default is US/Canada/Brazil New). Click on the pull-down arrow by the *Code Page* field to pull down the code page list and use the up and down scroll arrows to find the code page. Select the desired code page by clicking on an option.
- *Open active window on Console start-up*. Click on this check box if you want the active matrix window for this Director to appear each time the Console is powered on.

9. Click the *OK* button when you are done.
10. The *Maintenance Authorization* dialog box appears.
11. Enter the maintenance authorization password (the default is LEVEL002) and click on the *OK* button.

    The *Select Active Director* dialog box appears with the new Director highlighted.
12. Click on the *OK* button.

    The new active matrix window appears.



Task 7: Verifying Director Operation and Console Communication

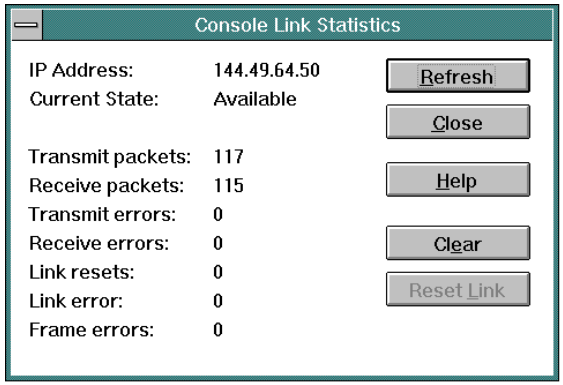
1. Look at the link status indicator at the bottom left corner of the Director's active matrix window. For information and illustrations to help you determine status, refer to "Console Status Line" on page 1-45.

- If the link status indicator indicates that the link is available and idle (green lightning bolt appears in the message area), go to step 2.

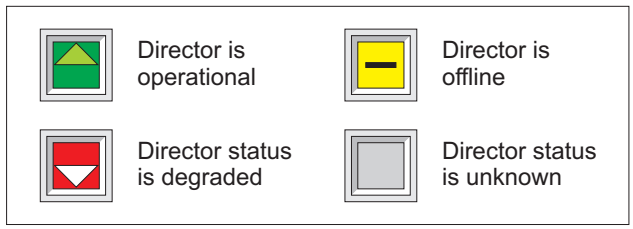
  Note: The message "Director is fully operational" may appear briefly or stay in the message area when the green lightning bolt appears.

- If the link status indicator is a red square with a black slash as shown in the preceding figure, the link between the Director and the Console is not operating.

Click on the indicator twice to display the *Console Link Statistics* dialog box. If the *Current State* shows *Unavailable*, click on the *Reset Link* button. If the *Current State* still does not show *Available*, and the green lightning bolt does not appear on the status line, refer to MAP 9200, "Loss of Console Communication with Active Director," in Chapter 2.



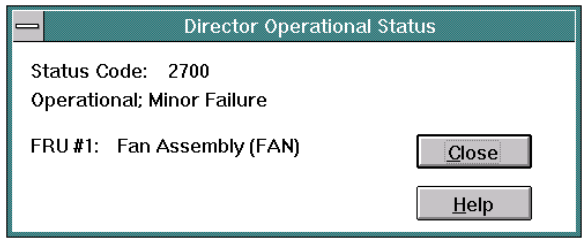
2. Look at the Director status indicator and the message area on the Console status line. For information and illustrations to help you use the Console status line, refer to page 1-45. The following indicators may appear.



- If the Director status is operational, go to step 3.

  If the Director is operational, operational status is 0000.

- If the Director status indicator shows that the status is not fully operational (degraded), the status code is other than 0000. Double-click on the Director status indicator. The Director *Operational Status* dialog box appears.

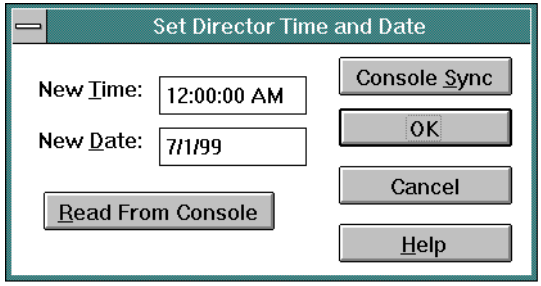


  If 0000 does not display for the status code when the *Director Operational Status* dialog box appears, refer to MAP 9000, “Director Initial Fault Isolation,” in Chapter 2. For example, the code *2700* in the preceding dialog box indicates that a single fan in a fan assembly has failed. The *2* indi-

cates that the Director is operational, but a minor failure occurred (a redundant component failed). The *7* is the FRU code for a fan. Refer To Appendix C, “Director Status Codes,” for additional codes that may appear.

- If the Director status is offline, the all ports are transmitting offline sequences. An IPL or IML must be performed or the Director’s power must be cycled off and on to restore to an online state.
- If status is unknown, status of the link between the Console and Director is unavailable. This normally occurs when the link is not available to the Director.

3. Select *Time/Date* from the *Utility* menu. The *Time/Date* dialog box appears. Use this dialog box to set the time and date on the Director.



To change the time and date of the Director:

- Click on the *Read from Console* button. This sends the current Console time and date to the *New Time:* and *New Date:* fields. Click on the *OK* button to set these as the Director time and date. You will need the operator authorization password to complete this step. The default password is LEVEL003.
- Click on the *Console Sync* button to synchronize the Director time with the Console time. Click the *OK* button. You will need the operator authorization password to complete this step. The default password is LEVEL003.

  Note: The time and date are set on the Director and Console for the location of manufacture. You must set the time and date on the Director and Console to your local time and date. Refer to the “Customize Console Operating Environment” procedures for your Console type in the *Console Installation and User’s Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).

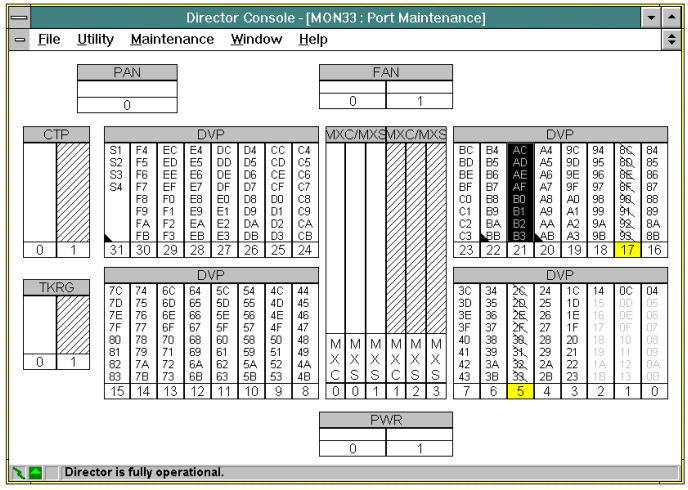
4. Look at the System Error indicator status on the Console status line. For more information on the indicator, refer to page 1-45.

If the Director status indicator, as shown below, indicates that the System Error indicator on the operator panel is on, record any messages and incident codes that display on the operator panel status display. Refer to the “Start Initial Fault Isolation” section of Chapter 2 to isolate any problems.

System Error indicator is on. Indicates that the System Error indicator on the operator panel is on.

5. Select *Port Maintenance* from the *Maintenance* menu.

   The *Port Maintenance* window appears.



This window displays the Director’s current hardware configuration and hardware status. Note that the previous figure shows components not installed (shaded black). In a configuration with all components installed and functioning, no components are shaded black or yellow (yellow requires service). The following defines the shading and symbols that appear on the hardware components to indicate status:

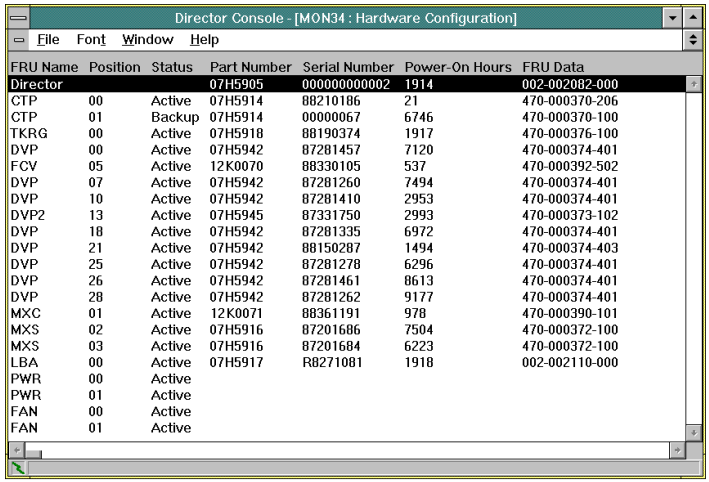
- Component is black: The hardware is not currently installed. If this occurs and the hardware is installed, it may require service or it is installed incorrectly.
- Component is shaded (yellow on color monitors): The component requires service.
- Component contains all diagonal lines: The component is a redundant component.
- Port card contains a black triangle in lower corner: The port card is a laser type.
- Port address is underlined: The port address is blocked.

- Port address has a slash through it: The port address is not useable.
- Port address is followed by asterisk (*): The logical port address has been swapped.

  If any component requires service, replace the failed component before continuing with installation.
- Port is black, followed by seven contiguous grey port addresses. Indicates FCV port card. The black address is the FICON port, and the seven grey addresses are the unaddressable ESCON ports.

6. For more detail on installed hardware, select *Hardware Configuration* from the *Maintenance* menu.

   The *Hardware Configuration* window appears.



   Examine the status column for the FRUs installed in the Director. If any FRU has a failed status, refer to MAP 9100, “Event, Error or Fault Displayed on Operator Panel or in the Event Log of the Active Matrix,” in Chapter 2.

   If a second CTP card is installed as an enhanced availability feature, during an IML or IPL of the Director, the status columns for the backup CTP card may be blank or indicate “0” or “none.” This is normal and occurs as the software reinitializes. After this occurs, the backup CTP card will not provide status data to the *Hardware Configuration* window for about five minutes. Refer to “Initial Machine Load Function” and “Initial Program Load Function” on page 1-22 for more information.

7. You might want to save the configuration information to a file to verify the Director status at the time of installation. To save the configuration to a file, follow instructions to print to a file under “Printing, Filing, and Clearing Logs” on page 2-97.

8. To print the configuration to a printer, follow instructions to “Print to a Printer” under “Printing, Filing, and Clearing Logs” on page 2-97.
9. Double-click on the upper left corner of the *Hardware Configuration* window to close the window and return to the active matrix.

Task 8: Loading the LMA Code to the Console Fixed Disk (not normally required)

Note: The following procedures are optional. Only perform them if you have received a diskette containing a new loader/monitor area (LMA) version and instructions to install the version on a Director. LMA versions are provided on a diskette labeled “LMA Version XX.YY.ZZ,” where XX.YY.ZZ denotes the version and release number. To perform this task, you must also have at least one Director defined in the Console application.

This task provides general instructions to install the Director’s LMA code on the Console’s fixed disk. Storing the code on the Console’s fixed disk provides backup storage and allows you to quickly download code from the Console to the CTP card on a Director when necessary.

Notes:

- Although you can load any LMA version to the Console’s fixed disk, the LMA version that you install to a Director must be compatible with the LIC on the Director. Warning messages will occur if you attempt to install an LMA version containing incompatible LIC. You may need to install the appropriate LIC version before installing the LMA code.
- If warning messages appear as you load LMA code, refer to “LIC/LMA Install Messages” on page B-11 for more information.
- The six-digit LMA version number indicates the exact version level of the software. The six digits XX.YY.ZZ represent the following:
  - XX: The current LMA version level
  - YY: The current LMA release level
  - ZZ: The current LMA patch level.
- If you are installing a new Director, make sure that you install the LMA code and the LIC to the Console’s fixed disk at this time. If the same versions are already on the fixed disk, a warning message will appear when you try to install it.
- If you are upgrading LMA versions stored on the Console, make sure that you follow the installation instructions provided with the new LMA.
- The Console’s fixed disk can contain a maximum of three LMA versions for downloading to Directors. The LMA version that you install to a Director must

be compatible with the LIC version on the Director. If three LMA versions are already installed and you want to add a new one, talk to the customer about which LMA version to delete from the fixed disk (deleting the oldest LMA version is recommended). To delete the LMA, highlight the LMA version you wish to delete by clicking on it, and then click on the *Delete* button.

- Normally, all Directors in the cluster should use the same LMA version.

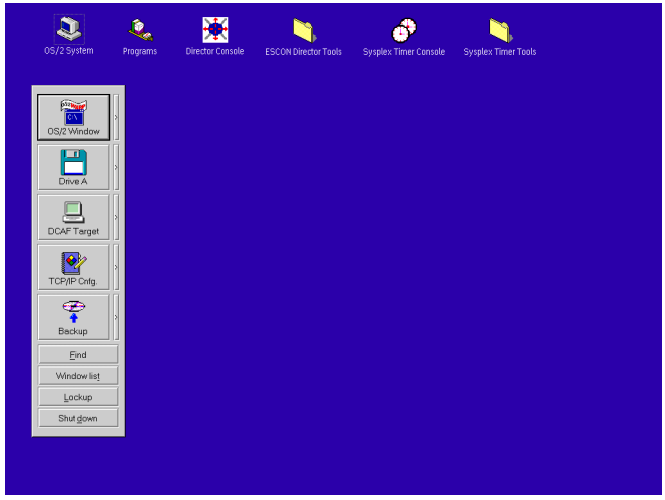
Use the following procedure to load the LMA version on the Console:

1. Obtain the 3.5-inch diskette containing the LMA code:
   - If installing LMA version 4.3 (or a later release level) to the 9032-003, 9033-004, or 9032-005 Director use diskette labeled *LMA Version 04.YY.ZZ*.
   - If installing LMA version 5.0 (or a later release level) to support Fibre connection (FICON) operation for the 9032-005 Director use diskette labeled *LMA Version 05.YY.ZZ*.

   Note: LMA version 5.0 (or later) and FICON operation are not supported by 9032-003 or 9033-004 Directors. Attempts to install LMA version 5.0 (or later) to these Director models are prevented by the Director Console.

   Note: XX.YY.ZZ denotes the version and release numbers.
2. Switch on the Console unit's power if it is not already on.

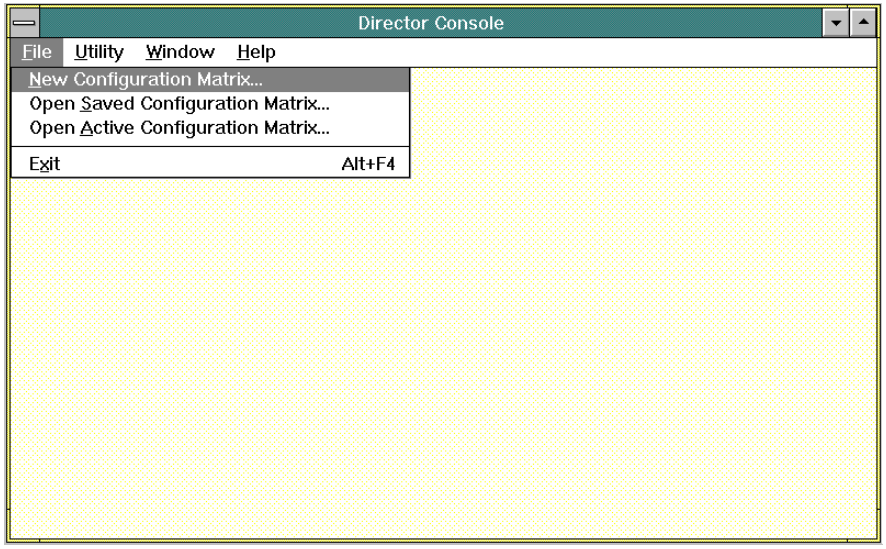
   As the Console runs through POSTs and loads the PC's operating system, various messages will appear on the monitor. The OS/2 desktop appears when the power-on process is complete.



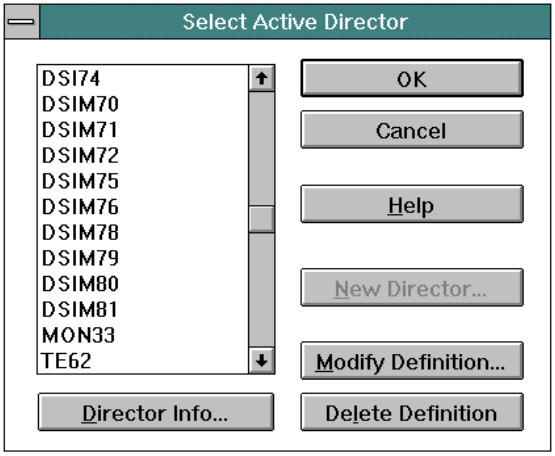
3. Double-click on the Console icon. The Console application's *Startup* window appears.

Note: The *Startup* window may take up to 30 seconds to appear.

4. Select *Open Active Configuration Matrix* from the *File* menu on the *Startup* window.

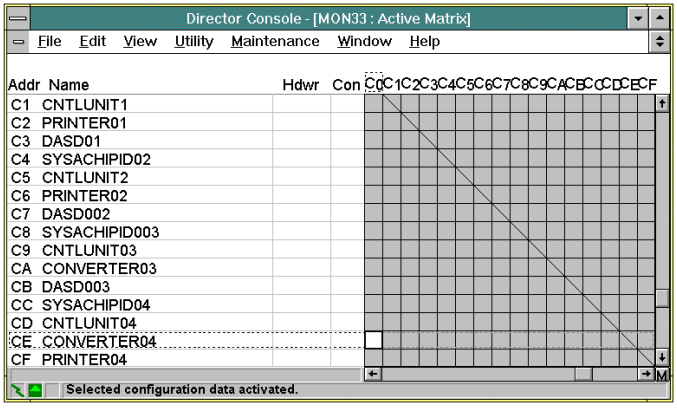


The *Select Active Director* dialog box appears. This box contains a list of Directors currently supported by the Console.

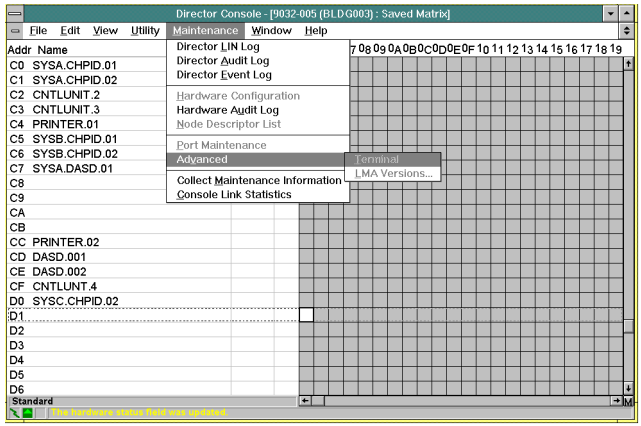


5. Select a Director from the list by highlighting the appropriate Director and clicking the *OK* button.

   The Director's active matrix window appears.

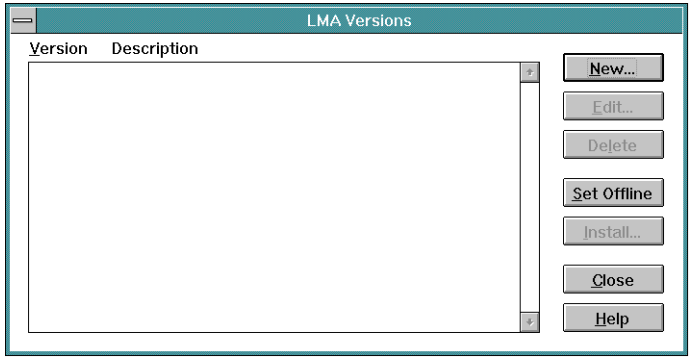


6. Select *Advanced* from the *Maintenance* menu of the active matrix window, then select *LMA Versions*.



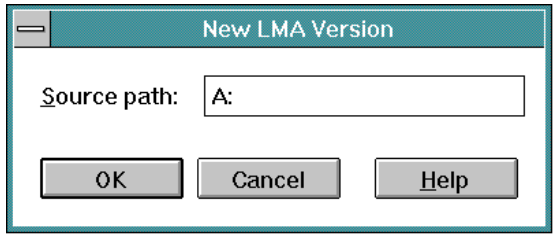
Provide a maintenance authorization password (the default is LEVEL002) when prompted.

The *LMA Versions* dialog box appears.

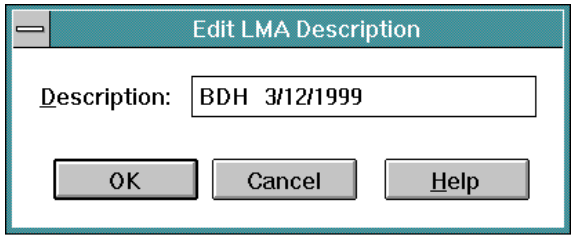


Note: The *LMA Versions* dialog box displays a list of LMA versions installed on the Console fixed disk (up to three versions). The dialog box is blank if no versions are installed, as shown in the previous illustration. If three LMA versions are installed, an old version must be deleted before installing a new version. To delete a version, select it from the *LMA Versions* dialog box and click the *Delete* button.

7. Click the *New* button. The *New LMA Version* dialog box appears with the diskette drive (**A:**) selected as the default.

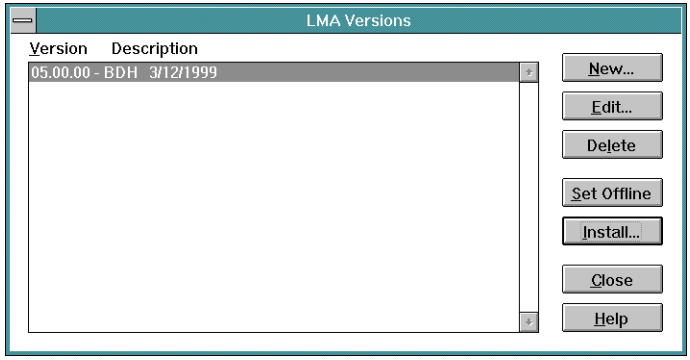


8. Insert the diskette labelled *LMA Version XX.YY.ZZ* in the diskette drive and click the *OK* button. The *Installing New LMA Version* message box appears, indicating installation progress.
9. When the installation is complete, the *Edit LMA Description* dialog box appears. Remove the diskette and store it in a secure location.



10. Type an LMA description (up to 24 alphanumeric characters). The description should contain the name or initials of the installer and the date of installation. When complete, click the *OK* button. The *LMA Versions* dialog box reappears with the new LMA version entered.

    The new LMA version is installed on the Console fixed disk and available for downloading (installation) to any attached Director.



Task 9: Loading the Director LIC to the Console Fixed Disk (Not normally required)

Use steps in this task to install a new licensed internal code (LIC) version.

Note: The following procedures are optional. Only perform them if you have received a diskette containing a new licensed internal code (LIC) version and instructions to install the version on a Director. LIC versions are provided on a diskette labeled "System Version XX.YY.ZZ," where XX.YY.ZZ denotes the version and release number. To perform this task, you must also have at least one Director defined in the Console application. You must have a defined Director on the Console to install LIC code.

This task provides general instructions to install the Director's LIC on the Console unit's fixed disk. Although the LIC is preinstalled on the Director, storing the LIC on the Console unit's fixed disk provides backup storage for the code and allows you to quickly download code to the CTP card on a Director when necessary. After the LIC is installed on the fixed disk, you can load the LIC to the Director at any time using instructions on page 6-77.

Notes:

- The six-digit LIC version number indicates the exact version level of the software. The six digits XX.YY.ZZ represent the following:
  - XX: The current LIC version level
  - YY: The current LIC release level
  - ZZ: The current LIC patch level.
- If warning messages appear as you load the LIC, refer to "LIC/LMA Install Messages" on page B-11 for more information.
- If you are installing a new Director, make sure that you install the LIC to the Console's fixed disk at this time. If the version is already on the fixed disk, a warning message will appear when you try to install it. Go to "Task 8, Loading the LMA Code to the Console Fixed Disk (Optional)" on page 6-40.

  Note: When installing both an LMA version and a LIC version, the LMA version must be installed first.
- If warning messages appear as you load the LIC, refer to "LIC/LMA Install Messages" on page B-11 for more information.
- If you are upgrading LIC versions stored on the Console, make sure that you follow the installation instructions provided with the new LIC. You may need to install the appropriate LMA version before installing the LIC.
- The Console unit's fixed disk can contain a maximum of three LIC versions for downloading to Directors. If three versions are already installed and you want

to add a new one, talk to the customer about which LIC version to delete from the fixed disk (deleting the oldest LIC version is recommended).To delete the LIC, highlight the LIC version you wish to delete by clicking on it, and then click on the *Delete* button.

- Normally, all Directors in the cluster should use the same LIC version.

Use the following procedure to load the LIC version on the fixed disk:

1. Obtain the following diskettes packaged with the Director.
   - Installing LIC version 4.3 (or a later release level) to the 9032-003, 9033-004, or 9032-005 Director requires the following Diskettes:

     One Director LIC diskette, labeled *System Version 04.YY.ZZ.*

     One Director diagnostics diskette, labeled *Diag Version 04.YY.ZZ*.
   - Installing LIC version 5.0 (or a later release level) to support FICON operation for the 9032-005 Director requires the following Diskettes.

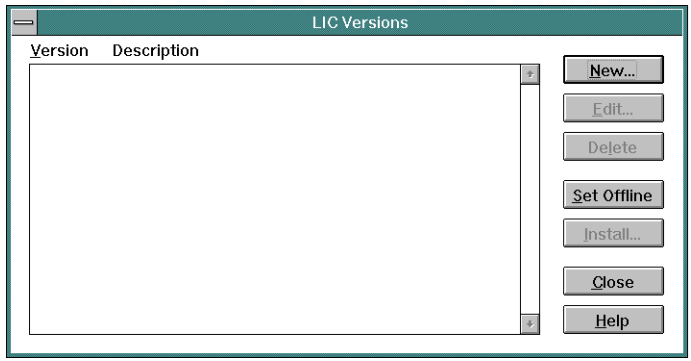
     Two Director LIC diskettes, labeled *System Version 05.YY.ZZ* and *System2 Version 05.YY.ZZ* (containing FICON operational code).

     One Director diagnostics diskette, labeled *Diag Version 05.YY.ZZ*.

Attention!

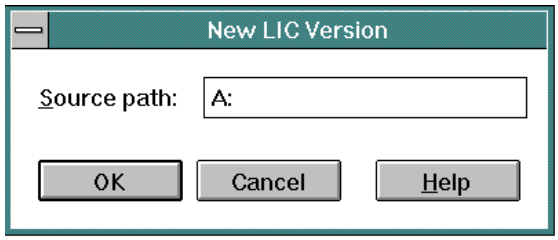
LIC version 5.0 (or later) and FICON operation are not supported by 9032-003 or 9033-004 Directors. Attempts to install LIC version 5.0 (or later) to these Director models are prevented by the Director Console.

2. At the Director Console, ensure the active matrix window is open for the selected Director to which the new LIC version is to be installed.
3. Select the *LIC Versions* option from the *Utility* menu. The *Maintenance Authorization* dialog box appears.
4. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *LIC Versions* dialog box appears.



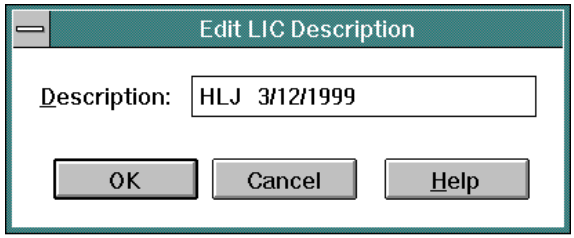
Note: The *LIC Versions* dialog box displays a list of LIC versions installed on the Console fixed disk (up to three versions). The dialog box is blank if no versions are installed. If three LIC versions are installed, an old version must be deleted before installing a new version. To delete a version, select it from the *LIC Versions* dialog box and click the *Delete* button.

5. Click the *New* button. The *New LIC Version* dialog box appears with the diskette drive (**A:**) selected as the default.



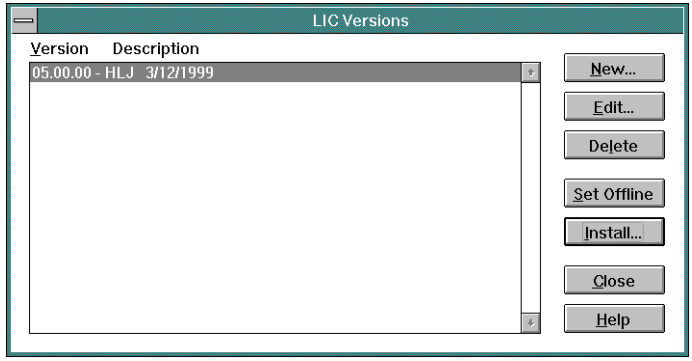
6. Insert the diskette labelled *System Version XX.YY.ZZ* in the diskette drive and click the *OK* button. The *Installing New LIC Version* message box appears, indicating installation progress.
7. When prompted, remove the diskette, insert the diskette labelled *System2 Version 05.YY.ZZ* in the diskette drive, and click the *OK* button. The *Installing New LIC Version* message box indicates installation progress.
8. When prompted, remove the diskette, insert the diskette labelled *Diag Version XX.YY.ZZ* in the diskette drive, and click the *OK* button. The *Installing New LIC Version* message box indicates installation progress.
   - If installing LIC version 4.3 (or a later release level), go to step 9.
   - If installing LIC version 5.0 (or a later release level) to a 9032-005 Director, continue to the next step.

9. When the installation is complete, the *Edit LIC Description* dialog box appears. Remove the diskette and store all LIC installation diskettes in a secure location.



10. Type a LIC description (up to 24 alphanumeric characters). The description should contain the name or initials of the installer and the date of installation. When complete, click the *OK* button. The *LIC Versions* dialog box reappears with the new LIC version entered.

    The new LIC version is installed on the Console fixed disk and available for downloading (installation) to any attached Director.



Task 10: Backing Up the System Library

Note: Perform this task after all Directors and the Console are installed.

1. Back up the system library and perform other Director console functions associated with the OS/2 operating system by using steps in the *Console Installation and User's Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).
2. After backing up the system library, perform steps under "Installation Cleanup" and "Post Installation Cleanup" on page 6-60.

Installation Cleanup

Perform these steps after installing the Console and Directors, but before installing the fiber optic cables.

1. Store the following in the Director's storage compartment, inside the front door, to the right of the operator panel (Figure 6-19).

   - Wrap plugs.
   - Torque tool.
   - Publications:

     This maintenance publication.

     Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors (SA22-7296).

     Operator Panel Reference Summary for the 9032 Model 5 Enterprise Systems Connection Director (SA22-7297).

     User's Guide Reference Summary for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors (SA22-7298).

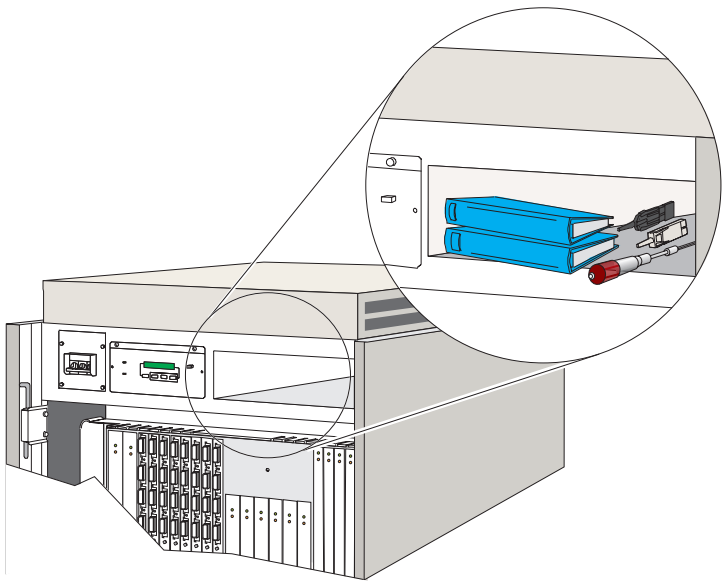


Figure 6-19. Director Storage Compartment

2. After completing installation cleanup, write a service code 20, completion code 1.
3. Place the torque tool inside the right side panel (separate the tool from the handle).
4. If you haven't already done so, continue to "Post-Installation."

Post Installation

Information in this section is organized as follows:

- Fiber optic cable handling precautions
- Installing fiber optic cables
- Fiber optic cabling procedure
- Post-installation cleanup.

Fiber Optic Cable Handling Precautions

When handling fiber optic cable, take the following precautions:

- If you remove a fiber optic cable, wrap plug, or protective plug from the Director, use the procedures in *Fiber Optic Cleaning Procedures* (SY27-2604-01 or later) to clean the cable connector or plug before reinstalling it into its fiber optic housing on the logic card.
- Use the plastic cable connector covers provided with the cables to protect the unused protective plugs.
- Store the unused protective plugs in the storage compartment to the right of the operator panel (Figure 6-19).
- Do not bend the jumper cables to less than a 12 mm (0.5 in.) radius.
- Refer to *Maintenance Information for Fiber Optic Channel Links* (SY27-2597) for fiber optic cable service procedures.
- The fiber optic cable connectors are keyed to the receptacles on the device port (DVP) cards. Before coupling, carefully align the keying bevels on the connector and receptacle. Refer to Figure 6-20 and Figure 6-21 for keying differences between single-mode and multimode cable connectors.

  Note: Keying prevents a multimode cable connector from seating into a laser receptacle, but a single-mode ESCON cable connector is not physically prevented from seating into an ESCON LED receptacle. The following illustrations show keying for ESCON connectors as well as for fiber channel standard (FCS) connectors (laser port cards only).

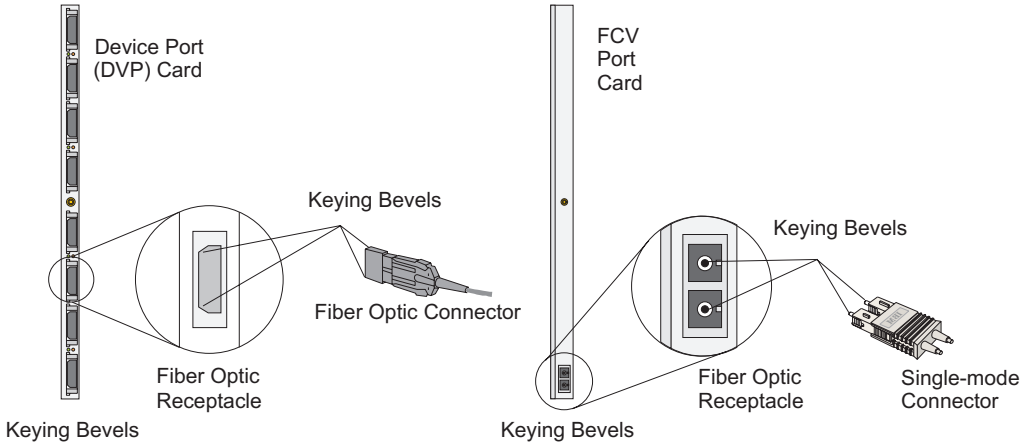


Figure 6-20. Fiber Optic LED (ESCON) and FCV Connector Keying

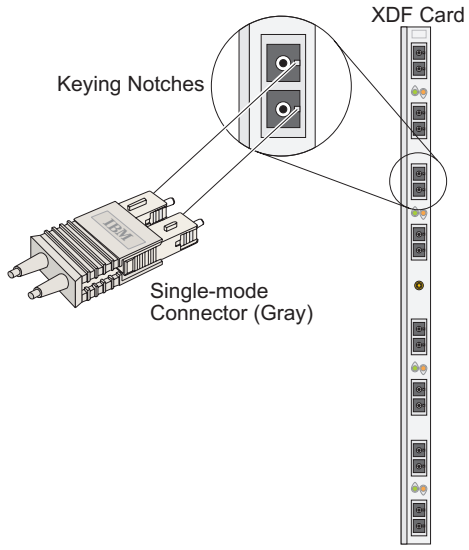


Figure 6-21. Fiber Optic Single-Mode XDF Connector Keying

Attention!

Do not connect FICON cable to XDF laser or LED DVP cards. Also, do not connect ESCON cable to the FCV port card.

Installing and Routing Fiber Optic Cables

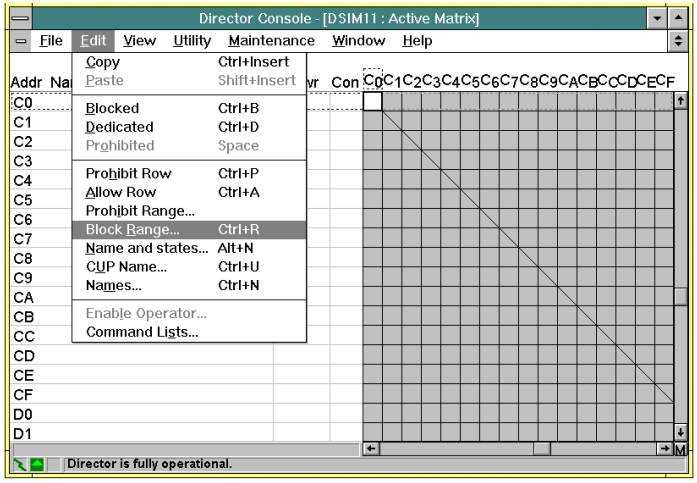
Preparing Director to Install Fiber Optic Cables

Before installing and routing fiber optic cables inside the Director, make sure that:

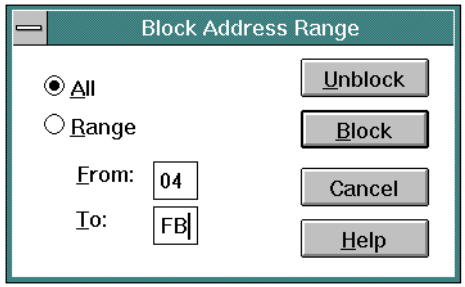
- I/O configurations are defined for the Director and for control units that you are connecting through the Director. Refer to *Planning for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7295) for details.
- All devices and CHPIDs that you are attaching to the Director are offline.
- You obtain the completed *Configuration Planning Worksheet* for the Director. Connect channel and device cables to the correct ports as mapped in the worksheet. Refer to Appendix D, "Default Port Address Charts," for a chart of default addresses assigned to physical ports.

Use the following steps to prepare the Director for cabling.

1. From the Console, pull down the *Edit* menu on the Director's active matrix window and select *Block Range*.



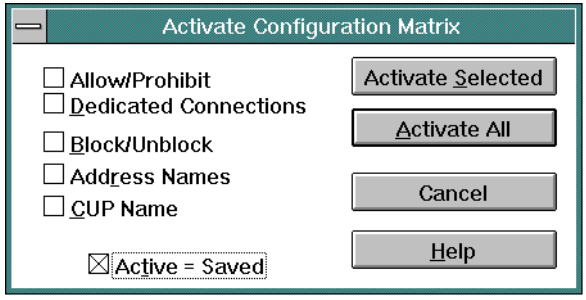
The *Block Address Range* dialog box appears.



2. To block all ports, click on the *All* radio button. This blocks all installed ports so that fiber optic cables can be installed without causing port or link errors.
3. Click on the *Block* button.

   In graphic display mode, all cells in the matrix area are highlighted and an "X" appears in the *Con* column for each port to indicate all ports are blocked. In non-graphic display mode, a blue "B" appears under the *B* column for all ports.

   Note: Blocking or unblocking a FICON port on an FCV port card blocks or unblocks all unaddressable ESCON ports as well. Blocking or unblocking an unaddressable ESCON port has no effect on port operation.
4. From the *File* menu, select the *Activate Configuration Matrix* option. The *Operator Authorization* dialog box appears, prompting you for your password.
5. Enter an operator authorization password (the default is LEVEL003), and select the *OK* button. The *Activate Configuration Matrix* dialog box appears.



6. Select the *Activate All* button. The message "Selected Configuration Data Activated" appears on the status line to confirm the completion of this operation.

   In graphic display mode, the highlighting for all cells in the matrix area changes color and the "X" for each cell in the *Con* column changes to gray. In nongraphic display mode, the blue "B" under the *B* column for each port changes to black.

Note: A message stating that the hardware status column was updated may also appear briefly on the matrix status line after you activate the matrix. This appears when new hardware is installed, such as port cards, or when the status of installed hardware changes.

Installing and Routing Fiber Optic Cables

Notes:

- If you are connecting fiber optic cables with duplex connectors from ESCON units to laser port cards with fiber channel standard (FCS) connectors, use the ESCON XDF adapter cable (62H7246). Make sure that you connect the adapter cable above the lower port card guides, then route the end of the adapter cable with the FCS connector to the desired laser port card.
- You can connect multimode fiber optic cable to the FCV port card's FCS/SC duplex connector using a mode conditioning patchcord (part number 21L4175). Refer to Figure 6-22. Plug the IBM multimode cable's duplex connector into the patchcord's multimode duplex connector and the patchcord's FCS/SC connector into the FCV port card.

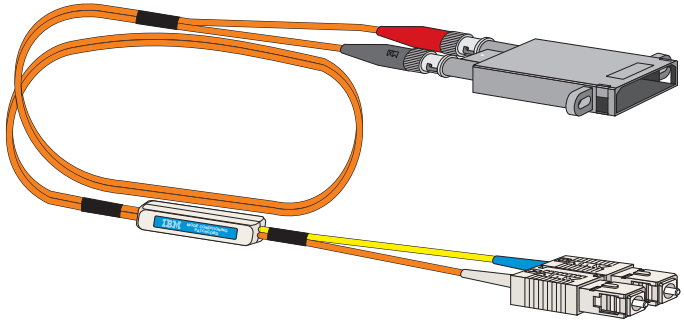


Figure 6-22. Mode Conditioning Patchcord

- Make sure that you have approximately 1.6 meters (65 inches) of jumper or adapter cable inside the unit for rerouting cables to different ports. Also leave an additional 1.0 meter (40 inches) of cable under the floor to provide slack for limited machine movement and inadvertent pulls on the cable. Be sure to position the fiber optic cables for easier migration from an environment with both fiber and copper cables to an environment with only fiber optic cable.

Attention!

Be sure the fiber optic cables do not block air intake for the card cage. Blocking the air intake could result in damage to the logic cards from excessive heat. Use the cable restraints and guides shown in Figure 6-25.

Work with the customer to route and connect jumper cables from external distribution panels to port cards using the following procedures.

As shown in Figure 6-23, the Director contains four areas, or quadrants, for installing DVP cards. Eight port cards can be installed in areas A, B, and C, while seven port cards can be installed in area D. Four fiber optic cables can connect to each port card.

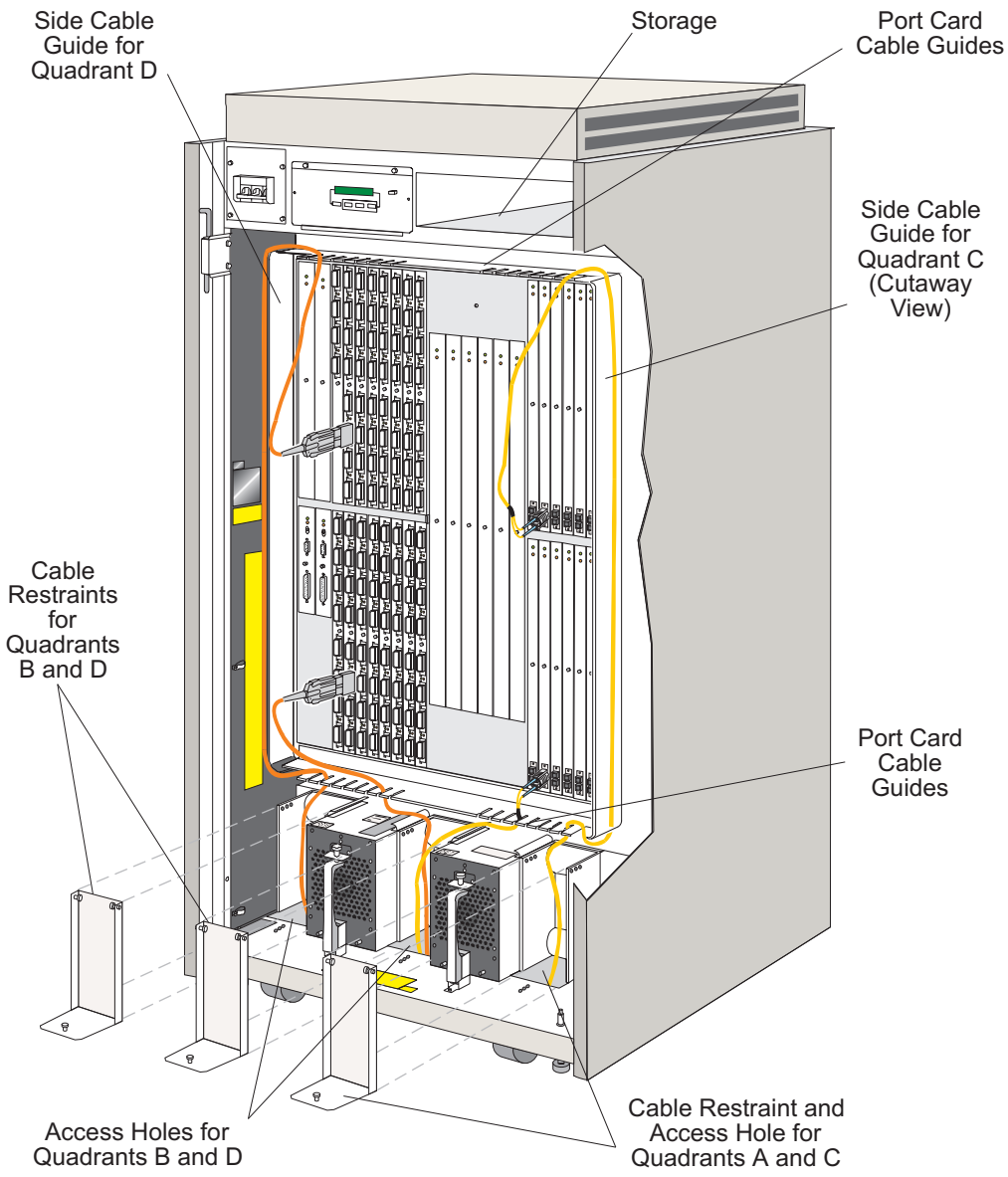


Figure 6-23. Director Cable Routing, Guide, and Restraint Areas

Route fiber optic cables to the Director through the access holes beneath the two cable restraints. The cable then routes directly to the lower port card areas or

behind the long flat guides on either side of the cabinet to the upper port card areas.

1. Remove the lower cable restraint cover for the port card area where you are installing cables (Figure 6-23).
   a. Pull out the top release catches with each hand, and then pull the cover back a short distance until the catches clear their holes.
   b. Pull out the lower release catch as you slide the restraint cover out of the restraint housing.
2. Route jumper cables under the Director and up through the access hole under the restraint housing.
   - Route the cable to the port card area where the desired port is located. Refer to Figure 6-23.
   - *Routing cable to port card quadrant D (top left).* Route the cable from the lower cable restraint, through the lower port card cable guide, around the left side cable guide, and then through the port card cable guide above the card in quadrant D where you will connect the cable.
   - *Routing cable to port cards in quadrant C (top right).* Route the cable from the lower cable restraint, through the lower port card cable guide, around the right side cable guide, and then through the port card cable guide above the card in quadrant C where you will connect the cable.
   - *Routing cable to port card in quadrant B (bottom left).* Route the cable from the lower left or center cable restraint, through the lower port card cable guide, and then up to the port card in quadrant B where you will connect the cable.
   - *Routing cable to port cards in quadrant A (bottom right).* Route the cable from the lower right or center cable restraint, through the lower port card cable guide, and then up to the port card in quadrant A where you will connect the cable.
3. Remove protective covers from port cards where you will connect fiber optic cables. Clean connectors on the ports and cables using the cleaning procedures defined in the *Fiber Optic Cleaning Procedures* (SY27-2604) in the Fiber Optic Cleaning Kit (5453521).
4. Connect cables to port receptacles as illustrated in Figure 6-20.
5. Replace cable restraint covers.
   a. Fan out the cables evenly across the width of the restraint.
   b. Pull out the top two release catches at the top of the restraint cover as you slide the cover into the housing. Make sure each catch locks in the housing holes when the housing is installed.

c. Pull out the lower release catch as you slide the bottom of the cover into the housing and the catch locks in the hole.

Note: If you are routing 32 cables or fewer through the bottom cable restraint, place the release catches on the inner holes as illustrated in Figure 6-24 to provide proper cable restraint. If you are routing more than 32 cables through the restraint, place the release catches in the outer holes to provide proper cable restraint.

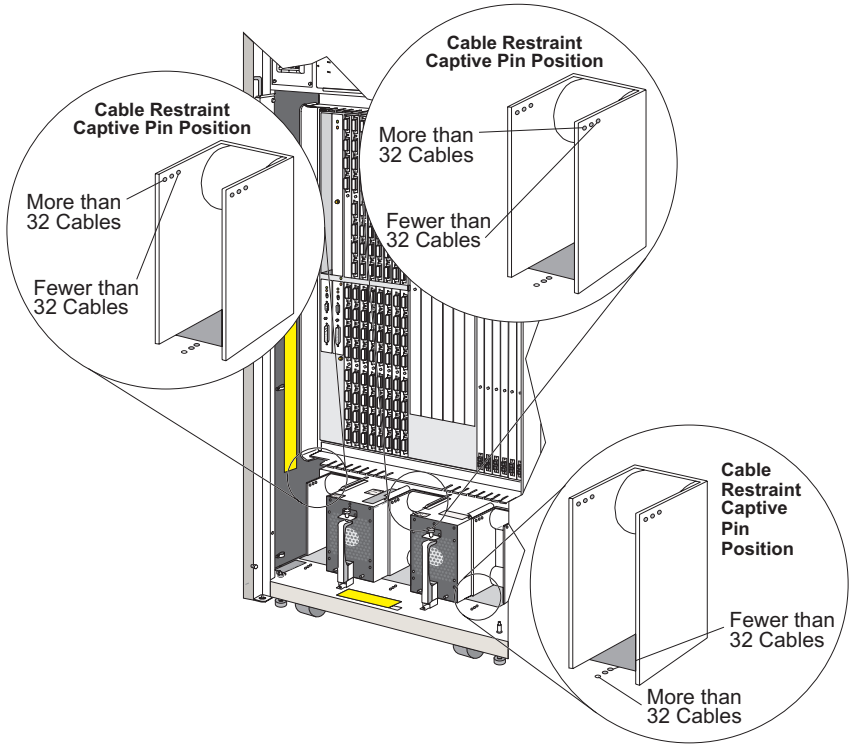


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Figure 6-24. Adjusting Cable Restraint Covers for Cable Thickness

6. Go to “Post Installation Cleanup” on page 6-60.

Fiber Optic Transport Services (FTS) Direct Attach

FTS-III direct attach fiber optic trunk cables can run inside the 9032-003 or 9032-005 and connect to direct attach fiber harnesses. The harnesses plug into the individual fiber optic ports.

Each FTS-III direct attach harness has one multifiber terminated push-on (MTP) connector at one end and six duplex connectors (ESCON or SC-Duplex) at the

other end. Each MTP connector contains twelve fibers and is the equivalent of using six duplex jumper cables. The FTS-III trunk cables also have MTP connectors that enable them to plug directly into the harnesses.

For the 9032-005, the trunk cables enter at the rear of the machine and connect to the harnesses. The harnesses run from the rear to the front of the machine and plug into the individual fiber optic ports. This minimizes cable clutter at the front of the machine. For the 9032-003, the trunk cables enter through the bottom of the front of the cabinet.

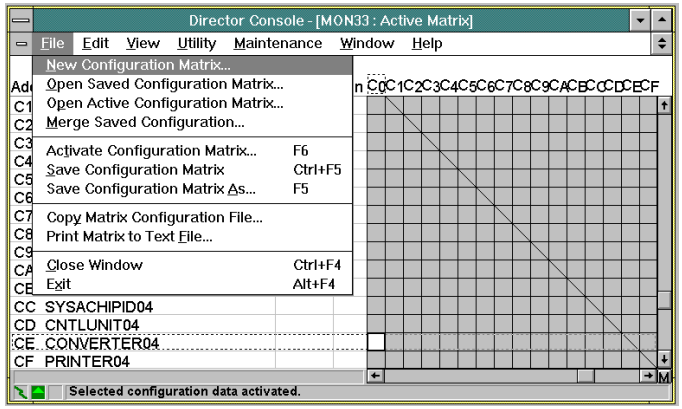
Once the harnesses are installed, all fiber connects and disconnects can be done using the trunk cable MTP connectors. The harnesses remain inside the Director, plugged into the fiber optic ports, while the trunk cables can be quickly removed. If the Director is relocated, the trunk cables can be quickly rerouted to the new location and plugged back into the harnesses. This greatly reduces the time spent unplugging, rerouting, and replugging the individual duplex jumper cables during such a relocation.

The FTS-III direct attach solution enhances the traditional trunking connectivity solution of bringing all ESCON processor and Director ports to main distribution cabinets for central control. The direct attach trunks and harnesses eliminate the need for zone distribution cabinets at the processors and Directors. FTS-III MTP to MTP trunk cables also allow trunk cable from harnesses plugged into ESCON channels in a S/390 processor to connect directly to harnesses plugged into Director ports.

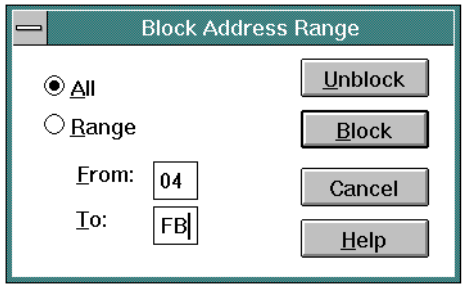
For detailed planning and configuration information, refer to *Fiber Transport Services (FTS) Direct Attach Physical and Configuration Planning* (GA22-7234).

Post Installation Cleanup

1. Have the customer configure port connections through the Console matrix windows.
2. Unblock the Director ports. From the Console, pull down the *Edit* menu on the Director's active matrix window and select *Block Range*.



The *Block Address Range* dialog box appears.



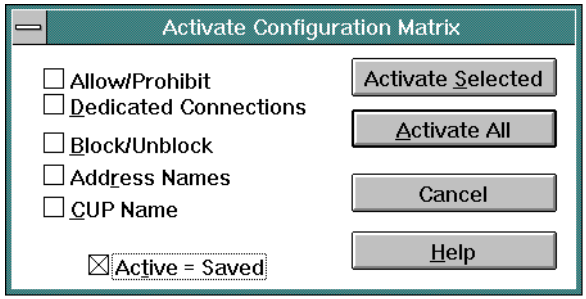
Note: Blocking or unblocking a FICON port on an FCV port card blocks or unblocks all unaddressable ESCON ports as well. Blocking or unblocking an unaddrssable ESCON port has no effect on port operation.

3. Click on the *All* radio button, and then click on the *Unblock* button.

   In graphic display mode, all highlighting for the cells in the matrix area changes color. In nongraphic display mode, an underline appears in place of the black “B” for each port under the B column.

4. From the *File* menu, select the *Activate Configuration Matrix* option. The *Operator Authorization* dialog box displays, prompting you for your password.

5. Enter an operator authorization password (the default is LEVEL003), and select the *OK* button. The *Activate Configuration Matrix* dialog box displays.



6. Select the *Activate All* button.

   In graphic display mode, all highlighting for the cells in the matrix area disappears to indicate unblocked ports. In nongraphic display mode, the underline under the *B* column for each port disappears.

7. Ask the customer to configure all control units and other devices attached to the Director online.
8. Ask the customer to configure all channel paths to the Director online.
9. After completing post installation activities, write a service code 20, completion code 6.
10. Repeat all steps under “Installing Directors” (page 6-17), “Post Installation” (page 6-51), and “Post Installation Cleanup” (page 6-60) for each Director that you are installing.
11. Back up the Director system library. Refer to “Task 10: Backing Up the System Library” on page 6-49.

Removing or Installing Additional Fiber Optic Cables

Attention!

Be sure the fiber optic cables do not block air intake for the card cage. Blocking the air intake could result damage to the logic cards from excessive heat. Use the cable restraints and guides shown in Figure 6-24.

Refer to “Fiber Optic Cable Handling Precautions” on page 6-51 for fiber optic cable plugging and handling information.

Note: Before installing a new fiber optic cable into an unused port, you should run external loopback tests to that port using port diagnostics for the Console. Refer to page 2-103.

Attention!

To prevent fiber optic cable tension created outside the Director from being transferred to the connectors in the Logic Board assembly, use the cable restraints and guides shown in Figure 6-24.

Note: Determine the logical address and physical port position for the port where you want to install or remove cables by using the *Port Maintenance* window on the Console. Refer to page 2-99.

Removing Cables

1. If removing a cable from a port, have the customer take the channel or control unit connected through the port offline.
2. Block the port where you want to remove a cable. Use the “Block Port Procedure” on page 2-128.

   Notes:

   - Use the block port procedure to block a port so that a fiber optic cable can be installed or removed without causing port or link errors.
   - Install the protective plugs to a port whenever a fiber optic cable is removed.
   - Blocking or unblocking a FICON port on an FCV port card blocks or unblocks all unaddressable ESCON ports as well. Blocking or unblocking an unaddrssable ESCON port has no effect on port operation.
3. Disconnect cables from appropriate ports and clean them.

   Note: Clean the fiber optic cable connectors, wrap plugs, or protective plug using the fiber optic cleaning kit (5453521).

Installing Cables

1. When installing cables, clean the cable and port connectors.

   Note: Clean the fiber optic cable connectors, wrap plugs, or protective plug using the fiber optic cleaning kit (5453521) before installing it into its fiber optic receptacle on the port card.
2. Follow instructions under:
   - Installing and Routing Fiber Optic Cables” on page 6-53.
   - “Post Installation Cleanup” on page 6-60.

Discontinuing or Relocating

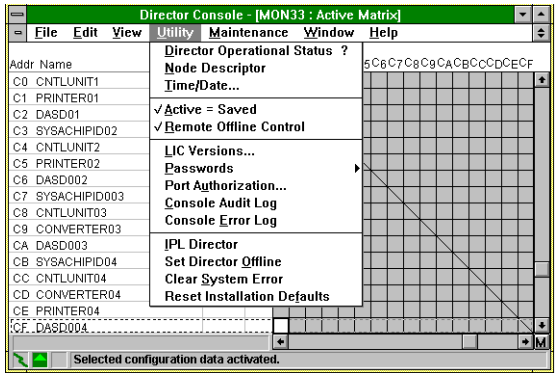
DANGER

To prevent possible electric shock, always disconnect the machine power cable from the power receptacle before you connect or disconnect any cable that has a conductive outer surface or a conductive connector.

Perform the following procedures to discontinue or relocate a Director.

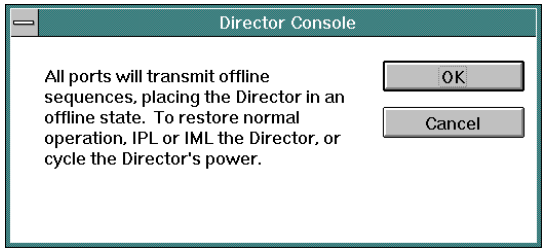
Discontinuing or Relocating the Director

1. Save the active port connection and other customer configuration data associated with the Director to a file on the fixed disk using the *Save Configuration Matrix As* option from the *File* menu in the Director's active matrix window.
2. Make sure the *Active=Saved* option is set through the *Utility* menu of the Director's active matrix window as shown in the following figure. If not, click on the option to set it to on. This saves the configuration to the IPL location in nonvolatile memory.



3. Make sure that the *Remote Offline Control* option is set to On with a checkmark, as shown in the preceding figure. If not, click on the option to set it to on.
4. Enter the operator authorization password (the default is LEVEL003) when the *Operator Authorization* dialog box appears.
5. Select the *Set Director Offline* option from the *Utility* menu.

This command sends an OLS (offline sequence) through all ports so channels are made aware that the ports are going offline. The following message box appears:



6. Click on the *OK* button and enter the operator authorization password (the default is LEVEL003) when prompted.

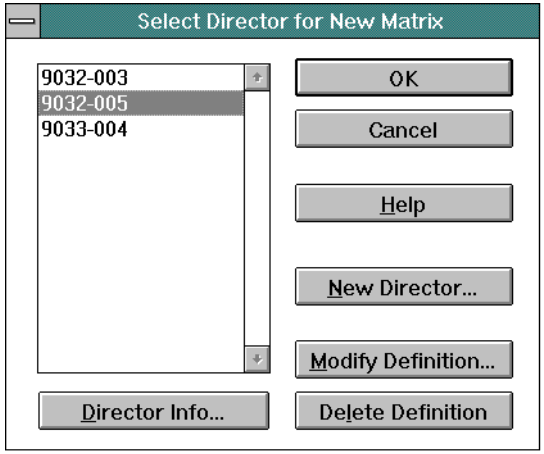
Discontinue Director Definitions

1. Ask the system administrator to configure all channel paths to the Director and all control units offline.

   If the Director is supported by SA OS/390, ensure that the host operator uses the remove switch command to prevent unanticipated problems with customer equipment. This command varies all channels and subchannels offline.

2. Select *New Configuration Matrix* from the *File* menu of any matrix window.

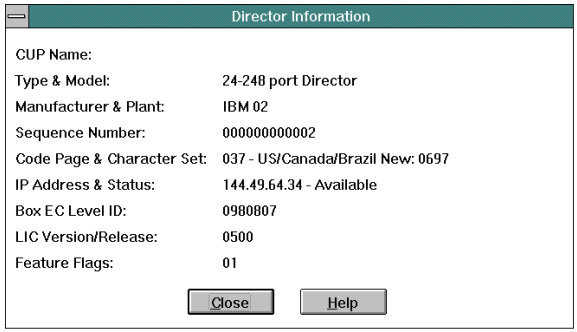
3. The *Select Director for New Matrix* dialog box appears. This box contains a list of Directors currently supported by the Console.



4. Click on the Director name that you want to delete.

5. Click on the *Director Info* button.

The *Director Information* dialog box appears.



6. Record all information from the *Director Information* dialog box.You will need this information when reinstalling the Director using the *Director Definition* dialog box (accessed through the *New Director* button on the *Select Active Director* dialog box).

   Note: The *Feature Flags* field is a 2-digit hexadecimal value that indicates support of Fibre connection (FICON) operation. A feature flag of **00** indicates the Director *does not* support FICON operation. A feature flag of **01** indicates the Director supports FICON operation. A 9032-005 Director with one or more FCV port cards installed has a feature flag of **01**.

7. Click the *Close* button to close the dialog box.
8. Click the *Delete Definition* button on the *Select Active Director* dialog box.

   A *Director Console* dialog box appears.

9. Click the *Delete* button.

   A *Maintenance Authorization* dialog box appears.

10. Enter your maintenance authorization password (the default is LEVEL002).

    The Director name is deleted from the list of Directors on the *Select Director for New Matrix* dialog box.

Disconnect and Remove Cables

1. Set the Director's power switch to the Off position.
2. Disconnect the Director's Token-Ring cable from the LAN. If a cable from a redundant Token-Ring controller adapter card is connected to the LAN, disconnect that cable also.
3. Make sure that all power cables to the Director are disconnected from the customer's electrical outlets.
4. Open the Director's front door with the service key.

Remove fiber optic cables from connectors on LED port cards by pressing the tabs of each connector and pulling the connector from the connector housing.

Remove the cable from fiber channel standard (FCS) connectors (on laser and FCV port cards only) by grasping each connector and pulling it straight out.

5. Obtain each cable's plastic protective cover and attach it to the end of each cable connector to protect the connector from damage and debris.
6. Clean and insert the protective plugs into every port receptacle. Refer to the cleaning procedure supplied with the fiber optic cleaning kit (5453521).
7. To remove the fiber optic cables from the cabinet, refer to Figure 6-25 and complete the following steps:
   a. Pull each cable out of the individual cable guides above or below the port card area.
   b. Pull cables routed to the upper port card areas around the flat routing guides along each side of the Director cabinet.

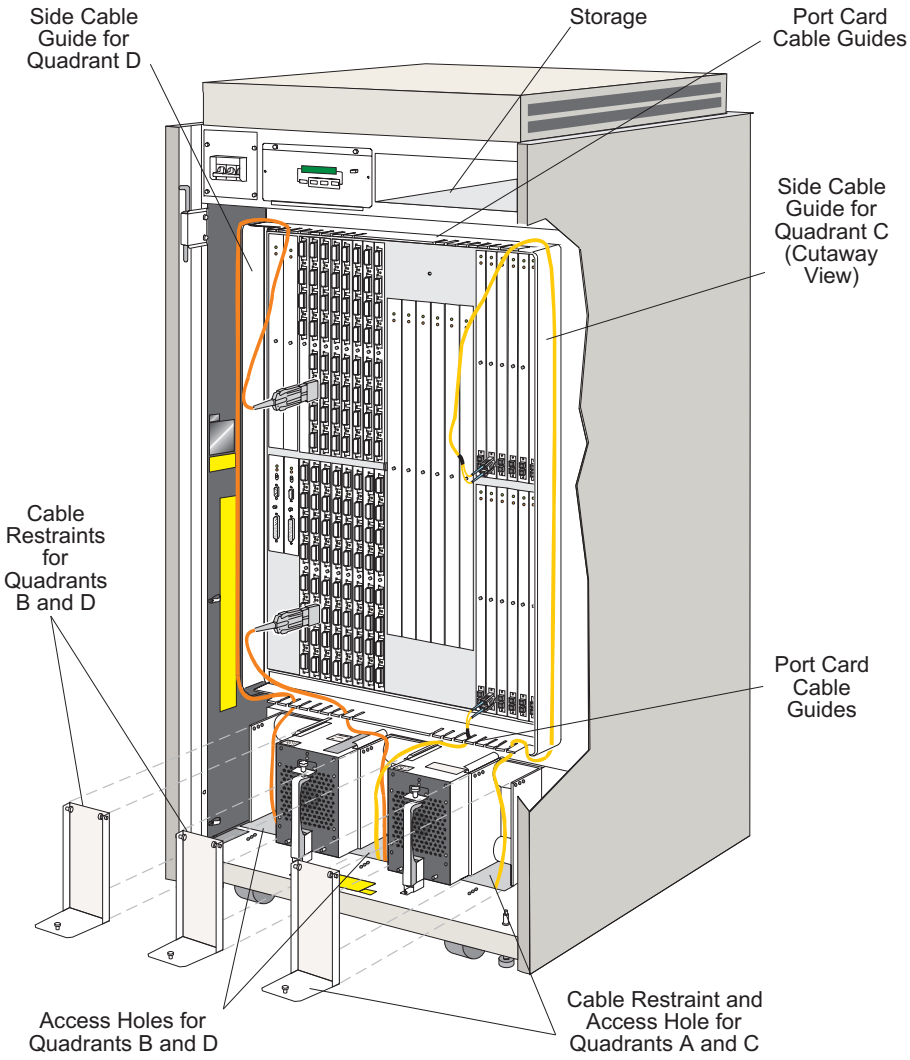


Figure 6-25. Director Cable Routing, Guide, and Restraint Areas

c. Remove the cable restraint covers at the bottom of the Director by pulling on the two release catches at the top of the cover and the single release catch at the bottom of the cover as you pull the cover away from the Director chassis.

d. Push the jumper cables out through the access hole under the cable restraint housing.

8. Place the fiber optic cables in a safe location away from pedestrian traffic.
9. Store any associated 9032 accessories (such as wrap plugs, diskettes, and manuals) in the Director's storage compartment.
10. Disconnect the main power cables from the ac receptacles and cable restraints, push them through the access hole beneath the Director, coil them up, and place them inside the Director.
11. Push the Token-Ring adapter cable up through the access hole beneath the Director, coil it up, and place it inside the Director.
12. Turn all leveling pads counterclockwise to raise them up to the bottom of the Director chassis.
13. Remove any wheel stops under the caster wheels and place them in the Director's storage compartment.
14. Close the Director's front door and lock it with the service key. Make sure that the rear door is also closed and locked.

Discontinuing or Relocating the Console

1. Back up the system library and perform other Director in the *Console Installation and User's Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291). Follow steps for your Console PC model.

   The system library contains all information about the Directors controlled by the Console, such as LIC files, logs, matrixes, and Director profiles.
2. If you are moving the Console, and the Directors that it manages are not moving with it, delete all Director definitions. Use the procedure under "Discontinuing Director" on page 6-64.
3. Shut down the Console application and OS/2 operating system using instructions in the *Console Installation and User's Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).
4. Switch off Console power.
5. Disconnect the Console's Token-Ring adapter cable from the LAN.
6. Disconnect the display, keyboard, and all external options from the Console's system unit.
7. Pack the Console, display, keyboard, cables, diskettes, and related manuals.

Installing the Console Application

Use these procedures to install new versions of the Console application to the Console's fixed disk to operate under OS/2. These procedures do not cover installing new versions of other software required for the Console, such as OS/2, TCP/IP, or DCAF. These procedures also do not cover installing the Console application on PCs used for the 9037 Sysplex Timer or Hardware Management Console applications.

Installation Notes

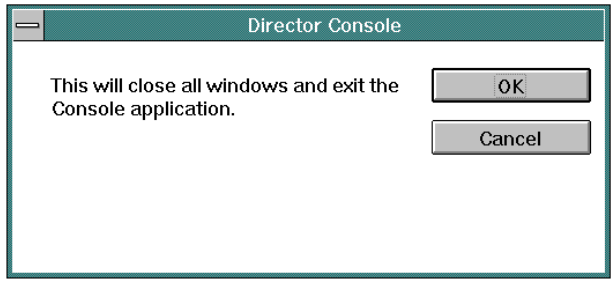
- If you are upgrading the Console application, make sure that you follow any additional installation instructions provided with the new application.
- Make sure that you place the *Director Console* icon on the OS/2 desktop. Do not install the *Director Console* icon in the system's *Startup* folder.
- Unless you elect otherwise when prompted as the application installs, the Console application will reset the WIN-OS/2 session settings to the factory defaults. This includes returning to full screen mode.
- The Director Console application version number must be greater or equal to the Director LIC version. The version number appears in the first two digits of the Director LIC or Console application code. For example, Director LIC version 4 is specified as LIC version 04.xx.xx. If any director attached to a Console is at version 04.xx.xx then the Console application must be at 04.xx.xx. Although there may be other Directors attached to the same Console at LIC version 03.xx.xx, because at least one of the Directors is at LIC version 04.xx.xx, the console application must also be at version 04.xx.xx. A Console at version 03.xx.xx attached to a Director at LIC version 04.xx.xx is an unsupported configuration. For details, refer to the *9032 Model 3 Retain Technical Data* (TDR), number H162352.

Procedure to Install the Console Application

1. Double-click on the upper left corner of the open Director *Console* window to shut down the Console application.

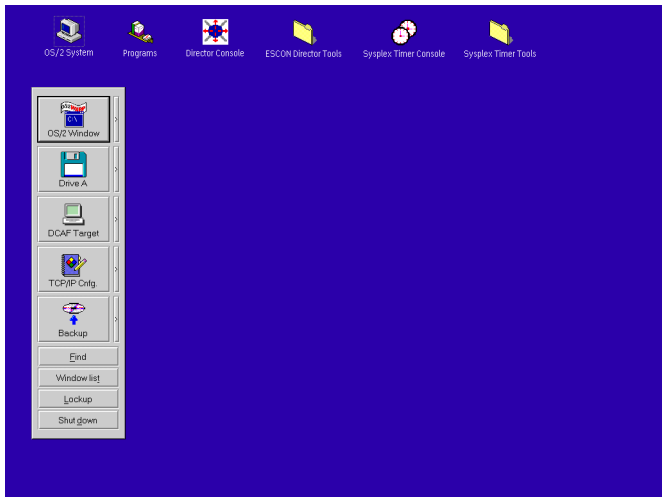
   When the Console shuts down, the Director will continue normal functions.

   A dialog box appears to explain that all windows will close and the application will shut down.



2. Click on the *OK* button.

   The OS/2 desktop appears.

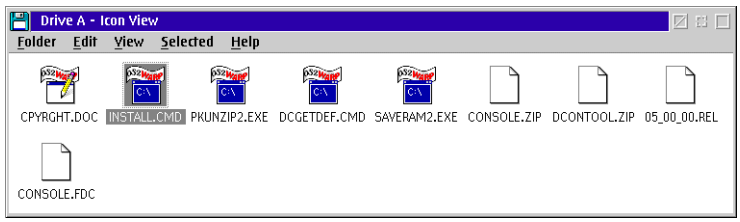


Note: OS/2 screens may look slightly different depending on the level of the operating system installed on your Console.

3. Insert the diskette containing the Console application software (labeled *Console Version XX.YY.ZZ*) into drive A in your system unit.

4. On the launch pad, click on the *Drive A* icon.

   The *Drive A Icon View* window appears.



5. Double-click on the *INSTALL.CMD* icon.

   The *INSTALL.CMD* window appears with Console installation messages.

   Messages appear in the *INSTALL.CMD* window, indicating the progress of files copying from the diskette in drive A.

   - If the Console application is already installed (you are installing a newer version), the following message displays:

     "ESCON Director Console object already exists. Would you like to recreate the ESCON Director Console Object with the suggested IBM default session parameters?"

     If you select *Yes*, the Console object will recreate using default session parameters.

     If you select *No*, the Console object will recreate using the current session parameters.

   - If the Console application is not installed, installation will continue and create a Console desktop object.

6. When the installation is complete, press **Enter** to continue.
7. Close the *Drive A Icon View* window by double-clicking on the top left corner of the window.
8. Click on the arrow on the *Drive A* drawer to close the drawer if it is open.
9. Remove the Console application diskette from the diskette drive.
10. On the OS/2 desktop, double-click on the *Director Console* icon to start the Console application.

    The Console *Startup* window appears when the Console is running again. This may take up to 30 seconds.

Installing LMA Code on a Director

This section provides general instructions to install loader/monitor area (LMA) versions from the Console's fixed disk library to a Director. The Console's fixed disk can contain up to three LMA versions of code for downloading to any installed Director in the Console's cluster.

The following procedures are optional. Only perform them if you have received instructions to install loader/monitor area (LMA) versions from the Console's fixed disk library to a Director.

Note: It is assumed that an LMA version has already been loaded to the Console. If the current LMA code on the Director is at a lower release level and is not compatible with the new LIC that you are installing, you must install

the appropriate LMA code before installing the new LIC. (The LMA code may not be compatible if you are upgrading the current LIC on the Director to a higher level.)

To load LMA versions to the Console's fixed disk, follow instructions under "Task 8: Loading the LMA Code to the Console Fixed Disk" on page 6-40.

Installation Notes

- The LMA version that you are installing must be compatible with the LIC installed on a Director. If it is not, messages will display directing you to install the appropriate LIC before installing the LMA version. If these messages display, follow steps under "Installing LIC on a Director" on page 6-77, and then return to this section.

  If a new LMA version has not been loaded, go to "Task 8: Loading the LMA Code to the Console Fixed Disk" on page 6-40 before performing this procedure.
- If the current LMA code on the Director is at a higher release level and is not compatible with the LIC that you are installing, contact your next level of support for instructions.
- If you are upgrading LIC or LMA versions stored on the Console, make sure that you follow the installation instructions provided with the new LMA or LIC version.
- The load process takes about 20 minutes.

  Note: LMA version 5.0 (or later) and FICON operation are not supported by 9032-003 or 9033-004 Directors. Attempts to install LMA version 5.0 (or later) to these Director models are prevented by the Director Console.

Installing LMA on a Director with Two CTP Cards

When an LMA version installs to a Director with an additional CTP card installed as an Enhanced Availability feature, there is no disruption to Director operations and port connections. The following events occur:

1. The LMA loads to the backup CTP card.
2. The backup CTP card performs an initial program load (IPL).
3. The backup CTP card then becomes the master CTP card, and the old master card becomes the new backup card.
4. The new master card then loads the LIC to the new backup CTP card.

Equipment checks with events displayed on the operator panel that indicate status such as "Link Connection Recovered" and "TKRG Loaded and Activate Successful," are normal when installing or upgrading LMA code on Directors with two CTP

cards installed. These checks occur because the backup CTP card reinitializes during the IPL (refer to event 2 above) and sends a reset to the Token-Ring card. This ultimately causes a temporary loss of link, reconnection, and display of the equipment check messages.

Note: If the backup CTP card is in a failed state, a message records on the Console error log that the request was rejected. Clear the condition before attempting to install again.

Installing LMA on a Director with One CTP Card

When an LMA version is installed on a Director with only one CTP card, you must set the Director offline using the *Set Offline* option on the *LMA Versions* dialog box or the *Set Director Offline* option from the active matrix window on the Console.

Version Numbering

The six-digit LMA version number indicates the exact version level of the software. The six digits XX.YY.ZZ represent the following:

- XX = The current LMA version level
- YY = The current LMA release level
- ZZ = The current LMA patch level.

Procedure to Install LMA Code

1. From the Console, access the active matrix window of the Director where you want to install software.

   Note: Save the active matrix using the *Save Configuration As...* option of the *File* menu before continuing.

2. Make sure that the *Remote Offline Control* option on the *Utility* menu is set to on (checkmark by option). If not, click on the option to set it to on.

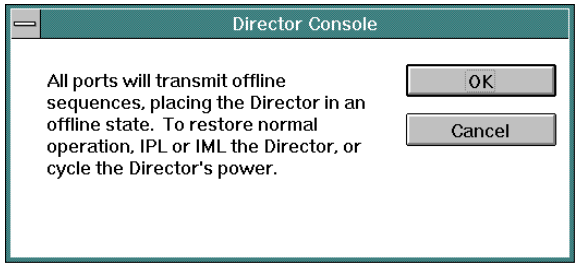
3. If the Director has an additional CTP card installed as an Enhanced Availability feature, go to step 4. If the Director has one CTP card installed, perform the following steps.

   a. Perform one of the following actions:

      - If the Director is not supported by System Automation for Operating System/390 (SA OS/390), ensure the system operator varies all Director-attached channels and control units offline.
      - If the Director is supported by SA OS/390, ensure the system operator applies the remove switch command to vary Director-attached channels and subchannels offline.

b. Select the *Set Director Offline* option from the *Utility* menu on the active matrix window for the Director.

The following dialog box appears:



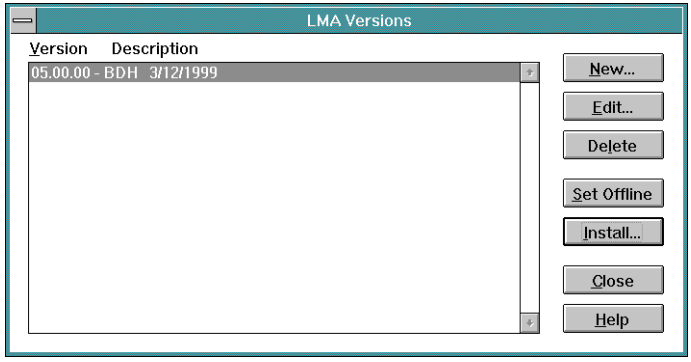
c. Click *OK* to set the Director offline.

The *Operator Authorization* dialog box appears.

d. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. Ensure the message **The Director is offline** appears on the status line at the bottom of the active matrix window.

4. From the active matrix window for the Director where you want to install the LMA code, select the *Advanced* option from the *Maintenance* menu. Select *LMA Versions* and provide a service authorization password when prompted (the default is LEVEL002).

The *LMA Versions* dialog box appears.



5. Click on the LMA version that you want to install (version and description will highlight when selected).
6. Click on the *Install* button and perform one or more of the following steps as required:

- If a dialog box appears with messages similar to the following, contact your next level of support. You may need to install another LMA or LIC version before continuing.

  `“The version requires a specific LIC version or greater.”`

  `“Compatibility between this and a version already installed cannot be determined.”`

  `“The Director LIC version must be downgraded before installing the LMA code.”`

- A dialog box appears stating that the Director must be set offline on a non-redundant system, click the *OK* button and perform the following steps to place the Director offline:

  a. Perform one of the following actions:

  - If the Director is supported by SA OS/390, ensure that the host operator uses the Remove Switch command to prevent unanticipated problems with customer equipment. This command varies all channels and subchannels offline.
  - Ask the system operator to configure all channel paths to the Director and all control units offline.

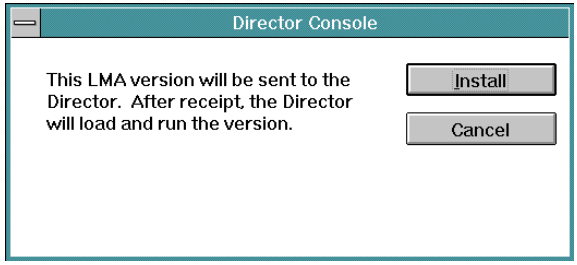
  b. Click on the *Set Offline* button on the *LMA Versions* dialog box.

  c. When the message box appears notifying you that the Director will be placed offline, click on the *OK* button.

  d. Enter an operator authorization password when prompted.

- If the LMA is already installed, make sure you perform this operation from the correct Director matrix, then go to step 9.

- If the following dialog box appears, the Director will accept the LMA version. Proceed to step 7.



7. Click on the *Install* button.

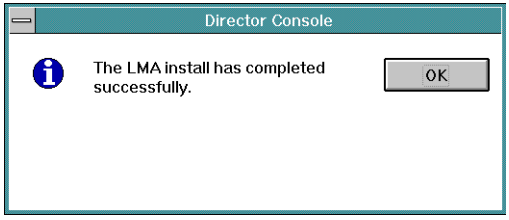
   When file transfer is complete, the *Transferring Files* message box closes and the *LMA Install Status* message box appears, indicating the Director is saving files and synchronizing CTP cards (if applicable). ***Do not click the Close button on this dialog box.***

   Various status messages will display at the bottom of the dialog box as the process continues. The process completes in about 20 minutes. As the process completes, the Console link will drop momentarily as indicated by a red square with black diagonal line at the link status indicator of the active matrix.

   If two CTP cards are installed, the process takes a few more minutes. During this time, the new LMA loads to the backup CTP card, the backup CTP card synchronizes the master CTP card, and then the backup CTP card becomes the master while the master card updates its FLASH memory.

   If ports were taken offline, they return to the online state as the LMA finishes installing.

   The following dialog box appears when the LMA has successfully loaded to the Director.



8. Click on the OK button.
9. Click on the *Close* button of the *LMA Versions* dialog box to close.
10. If you have installed LMA code on a Director with one CTP card installed, place the Director ports back online by selecting *IPL Director* from the *Utility* menu of the Director's active matrix window or pushing the *IML* button on the operator panel.

Installing LIC on a Director

The Console's fixed disk can contain up to three licensed internal code (LIC) versions for downloading to any installed Director in the Console's cluster. This section provides general instructions to install LIC versions from the Console's fixed disk library to a Director.

The LIC load process takes approximately 20 minutes to complete. During this time, the Director remains fully operational.

You may be directed to "Installing LMA Code on a Director" on page 6-72 during a LIC installation:

Installation Notes

- If the current loader/monitor area (LMA)code on the Director is at a lower release level and is not compatible with the new LIC that you are installing, you must install the appropriate LMA code before installing the new LIC. Refer to “Installing LMA code on a Director” on page 6-72 for procedures.
- If the current LMA code on the Director is at a higher release level and is not compatible with the LIC that you are installing, contact your next level of support.
- It is assumed that a new LIC version has already been loaded to the Console. If a new LIC version has not been loaded, go togo to "Task 9: Loading the Director LIC to the Console Fixed Disk (Not normally required)" on page 6-46 before performing this procedure.
- If you are upgrading LIC versions stored on the Console, make sure that you follow the installation instructions provided with the new LIC.
- LIC version 5.0 (or later) and FICON operation are not supported by 9032-003 or 9033-004 Directors. Attempts to install LIC version 5.0 (or later) to these Director models are prevented by the Director Console.
- A LIC install is potentially nonconcurrent *only* when upgrading a FICON-capable 9032-005 Director from version 5.0 to version 5.x. Make sure that you refer to the instructions that accompany the new LIC version for any notification of non-concurrency. When installing LIC version 5.0 (or higher) to a FICON-capable 9032-005 Director, the Console performs a dynamic inspection of the new LIC version and the current LIC version to determine if LIC can be upgraded concurrently. If the LIC cannot be upgraded concurrently, a warning message appears that the converter ports will transmit offline when you elect to continue with the process.

Installing LIC on a Director with Two CTP Cards

When a LIC version installs to a Director with an additional CTP card installed as an Enhanced Availability feature, there is no disruption to Director operations and port connections. The following events occur:

1. The LIC loads to the backup CTP card.
2. The backup CTP card performs an initial program load (IPL).
3. The backup CTP card then becomes the master CTP card, and the old master card becomes the new backup card.
4. The new master card then loads the LIC to the new backup CTP card.

Equipment checks with events displayed on the operator panel, such as “Link Connection Recovered” and “TKRG Loaded and Activate Successful,” are normal when installing or upgrading LIC on Directors with two CTP cards installed. These checks occur because the backup CTP card reinitializes during the IPL (refer to event 2 above) and sends a reset to the Token-Ring card. This ultimately causes a temporary loss of link, reconnection, and display of the equipment check messages.

Note: If the backup CTP card is in a failed state, a message records on the Console error log that the request was rejected. Clear the condition before attempting to install again.

The load process takes about 20 minutes. During the loading and IPL process, all port connections are maintained.

Installing LIC on a Director with One CTP Card

When a LIC version is installed on a Director with only one CTP card, you must set the Director offline using the *Set Offline* option on the *LIC Versions* dialog box or the *Set Director Offline* option from the active matrix window on the Console.

Note: When setting the Director offline, ask the customer to configure channel paths offline and take control units attached through the Director offline. If the Director is supported by SA OS/390, ensure that the host operator uses the Remove Switch command to vary all channels and subchannels offline.

Version Numbering

The six-digit LIC version number indicates the exact version level of the software. The six digits XX.YY.ZZ represent the following:

- XX = The current LIC version level
- YY = The current LIC release level
- ZZ = The current LIC patch level.

Procedure to Install LIC

1. At the Director Console, ensure the active matrix window is open for the selected Director to which the new LIC version is to be installed.

   Note: Save the active matrix using the *Save Configuration As...* option of the *File* menu before continuing.

2. Make sure that the *Remote Offline Control* option on the *Utility* menu is set to on (checkmark by option). If not, click on the option to set it to on.
3. If the Director has an additional CTP card installed as an Enhanced Availability feature, you can install a LIC version without disrupting port connections and Director operation, Go on to step 4.

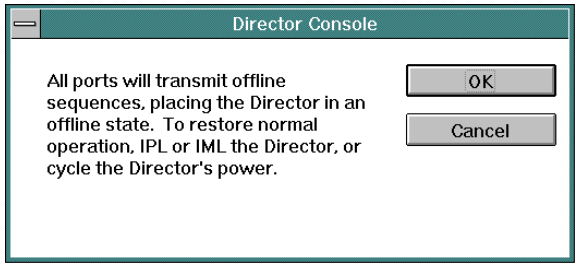
If the Director has one CTP card installed, perform the following steps.

a. Perform one of the following actions:

- If the Director is not supported by system automation for operating system/390 (SA OS/390), ensure the system operator varies all Director-attached channels and control units offline.
- If the Director is supported by SA OS/390, ensure the system operator applies the remove switch command to vary Director-attached channels and subchannels offline.

b. Select the *Set Director Offline* option from the *Utility* menu on the active matrix window for the Director.

The following dialog box appears:



c. Click *OK* to set the Director offline.

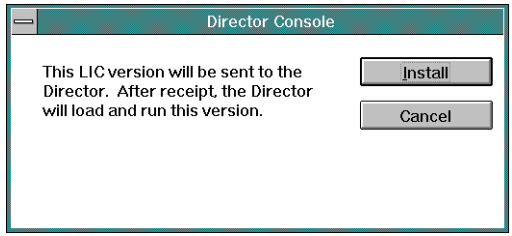
The *Operator Authorization* dialog box appears.

d. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. Ensure the message **The Director is offline** appears on the status line at the bottom of the active matrix window.

4. From the active matrix window of the Director where you want to install the LIC, select the *Utility* option from the *Maintenance* menu. Select *LIC Versions* and provide a service authorization password when prompted (the default is LEVEL002).

   The *LIC Versions* dialog box appears.

5. At the *LIC Versions* dialog box, select (highlight) the LIC version to be installed and click the *Install* button. The following message box appears.



6. Click the *Install* button. If installing LIC version 4.3 (or a later release level), go to step 9. If installing LIC version 5.0 (or a later release level) to a 9032-005 Director, continue to the next step.
7. LIC version 5.0 (or higher) cannot be installed concurrently to a FICON-capable 9032-005 Director if one or more FCV port cards are operating in degraded mode. An FCV port card is degraded if up to seven (but not all eight) internal ESCON ports are not operating. If one or more FCV port cards are degraded, a dialog box appears warning that continuing will cause the degraded card(s) to transmit offline.
   - If an FCV port card is degraded (message box appears), perform one of the following procedures:

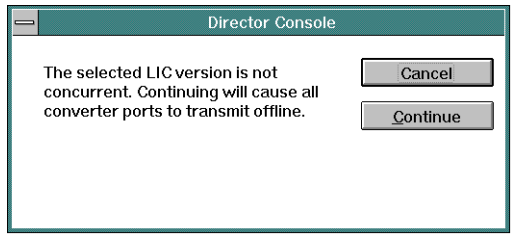
     Click the *Cancel* button to abort the installation, then remove and replace the degraded FCV port card(s). Refer to Chapter 3 in *Maintenance Information for the 9032 Model 5 Enterprise Systems Director* (SY28-1158) for instructions, then repeat the LIC installation procedure.

     Vary all Director-attached channels offline to install LIC nonconcurrently. If the Director is not supported by SA OS/390, ensure the system operator varies the channels offline. If the Director is supported by SA OS/390, ensure the system operator applies the remove switch command to vary the channels offline. Click the *Continue* button to set FCV ports offline and proceed with the LIC installation. The ports remain offline until a Director IML, IPL, or power cycle is performed. Continue to the next step.
   - If an FCV port card is not degraded (message box does not appear), continue to the next step.
8. When installing LIC version 5.0 (or higher) to a FICON-capable 9032-005 Director, the Console performs a dynamic inspection of the new LIC version and the current LIC version to determine if LIC can be upgraded concurrently. If the Director operates at LIC version 5.0 (or higher), LIC installs are preceded by a data exchange between the Director and Console to prepare for installation of nonconcurrent LIC.

   Note: A LIC install is potentially nonconcurrent *only* when upgrading a FICON-capable 9032-005 Director from version 5.0 to version 5.x.

Notification of non-concurrency appears in the instructions that accompany the new LIC version.

- If the LIC versions are *concurrent*, the LIC install proceeds while Fibre channel converter (FCV) ports remain online. Continue to step 9.
- If the LIC versions are *nonconcurrent*, ports must be set offline and the following message box shown appears.



Note: This dialog box does not appear if no FCV port cards are installed in the Director or if the Director is set offline.

Perform one of the following steps:

– If the Director is not supported by SA OS/390, ensure the system operator varies all Director-attached channels offline.

– If the Director is supported by SA OS/390, ensure the system operator applies the remove switch command to vary Director-attached channels offline.

To set the ports offline, click the *Continue* button on the dialog box. All ports are set offline and the LIC install proceeds. The ports remain offline until a Director IML, IPL, or power cycle is performed.

9. The *Transferring Files* message box appears, indicating percent completion of file transfer to the Director. This process takes several minutes.

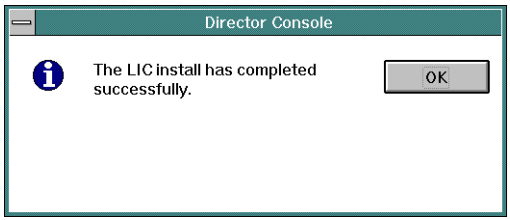
   When file transfer is complete, the *Transferring Files* message box closes and the *LIC Install Status* message box appears, indicating the Director is saving files and synchronizing CTP cards (if applicable).

   Note: If you close this dialog box, you will lose status information.

   As the LIC install proceeds, the link between the Director and Console drops momentarily, then returns to normal. The Director also performs an IML for the new LIC version and sets ports online.

   During this time, the new LIC loads to the backup CTP card, the backup CTP card synchronizes the master CTP card, and then the backup CTP card becomes the master while the master card updates its FLASH memory. If two CTP cards are installed, the process takes a few more minutes.

The following dialog box appears when the LIC has been successfully loaded to the Director.



10. Click the *OK* button to close the message box.
11. At the *LIC Versions* dialog box, click the *Close* button to close the dialog box.

Changing the Console Operating Environment (Defaults)

To change any of the default parameters for the Console operating environment, such as time and date, keyboard layout, IP address, MAC address, subnet mask, country code page, default printer, and automatic backup settings, refer to the "Customize the Console Operating Environment" section for your Console type in the *Console Installation and User's Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).

Chapter 7. Maintenance Agreement Inspection Procedure

Introduction

Note: Contact your maintenance agreement qualification (MAQ) coordinator to determine the tests required to ensure the Director is operational.

This chapter contains information required by the IBM service representative when inspecting a Director for:

- A maintenance agreement qualification
- A service call
- An equipment alteration or attachment review.

This chapter includes a list of preparatory items, a checklist of inspection items, and illustrations of the safety labels.

Preparation

- Before proceeding with a service call or equipment alteration, you must complete the *Electrical Safety Training Course for IBM Customer Engineers* Before you proceed through the checklist, switch off power to the Director and unplug the Director power cables from the electrical outlet.
- Have the following available for reference:
  - Copies of customer engineering memorandums (CEMs), including engineering change announcements (ECAs) and service aids (SAs) for this machine type.
  - *Electrical Safety for IBM Customer Engineers*, (S229-8124).

Note: Although completeness and accuracy are the goals of this publication, not all machine configurations, special features, and requests for price quotation (RPQs) are covered. If you encounter a machine with RPQs or features not described in this publication, use the installation instructions for that RPQ or feature.

General Checklist Guides

The intent of this inspection procedure is to help you identify potentially unsafe conditions on machines being inspected. At the time of manufacture, each machine has required safety items installed to protect the owners, operators, and service personnel from injury.

Before you switch on machine power, perform the following checklist procedure. If any apparent unsafe conditions are present, you must determine how serious the hazard could be and whether to continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical, especially primary power (for example, a “hot” frame can cause serious or fatal electric shock).
- Explosive (for example, bulging capacitors can result in serious injury).
- Use of chemicals, cleaning solutions, or solvents other than those specified by IBM.

Checklist

Check power:

❒ Before starting this procedure, check that the machine power is off and the main power cable has been disconnected.

❒ Check that the power cable is not frayed or damaged.

❒ Check that the power cable is correctly connected to the power supply.

Check inside the machine:

❒ Check for any non-IBM alterations. If there are any, has the *R009, Non-IBM Alteration/Attachment Survey* been completed?

❒ Check for broken or loose parts or assemblies.

❒ Check all fasteners and screws that fasten the power supply assembly, fans, and covers.

Check for machine labels:

❒ Make sure all safety labels are correctly attached. (Refer to Figure 7-1, Figure 7-2 and Figure 7-3.)

Check power plug ground:

❒ Check the continuity between the power plug ground and the machine frame with an ohmmeter. Verify the reading is zero ohms.

Check for the following at installation:

❒ Eleven diskettes with the Director, including two licensed internal code (LIC) diskettes, Console application software diskette, loader monitor area (LMA) code diskette, Director diagnostics diskette, two data collection diskettes, and four blank diskettes for use by the service representative. Refer to "Director Ship Group" on page 1-6 for more information.

❒ Nine diskettes with the Console, including Console application software diskette, diskette to restore the Console fixed disk, three blank diskettes for use by the service representative, and four IBM auto 16/4 Token-Ring ISA adapter diskettes. Refer to "Director Console Ship Group" on page 1-13 for more information.

- ❒ Base Console Restore Version CD-ROM.
- ❒ Two blank rewriteable optical cartridges (ROCs) for Console fixed disk and system library backup.
- ❒ Four IBM Auto 16/4 Token-Ring industry standard architecture (ISA) adapter diskettes.
- ❒ *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7296).
- ❒ *User's Guide Reference Summary for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7298).
- ❒ *Operator Panel Reference Summary for the 9032 Model 5 Enterprise Systems Connection Director* (SA22-7297).
- ❒ *9032 Model 5 ESCON Director Physical Planning Template* (GX22-0046).
- ❒ Torque tool (for card removal).
- ❒ Protective plugs in each port receptacle.
- ❒ Two fiber optic wrap plugs.
- ❒ Spacer card in all unused card positions.

Safety Labels

The safety labels shown in Figure 7-1 are attached to the Director chassis, front internal. For locations of all safety labels, refer to Figure 7-2 and Figure 7-3.

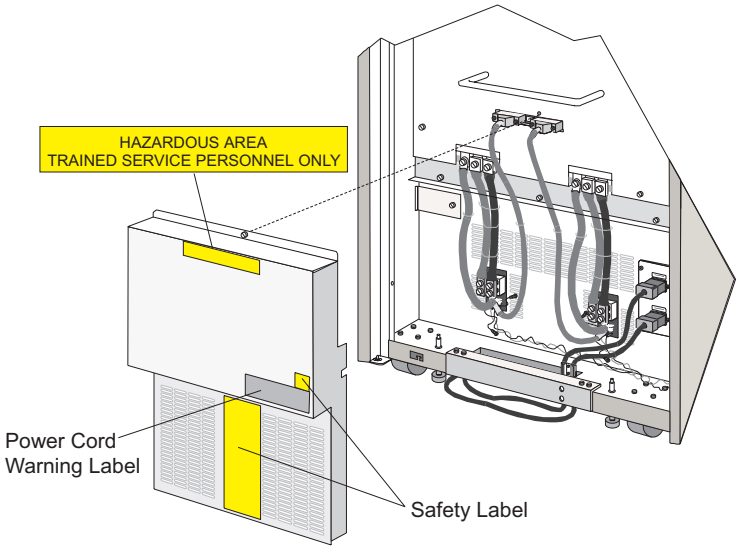


Figure 7-1. Director Safety Labels, Rear

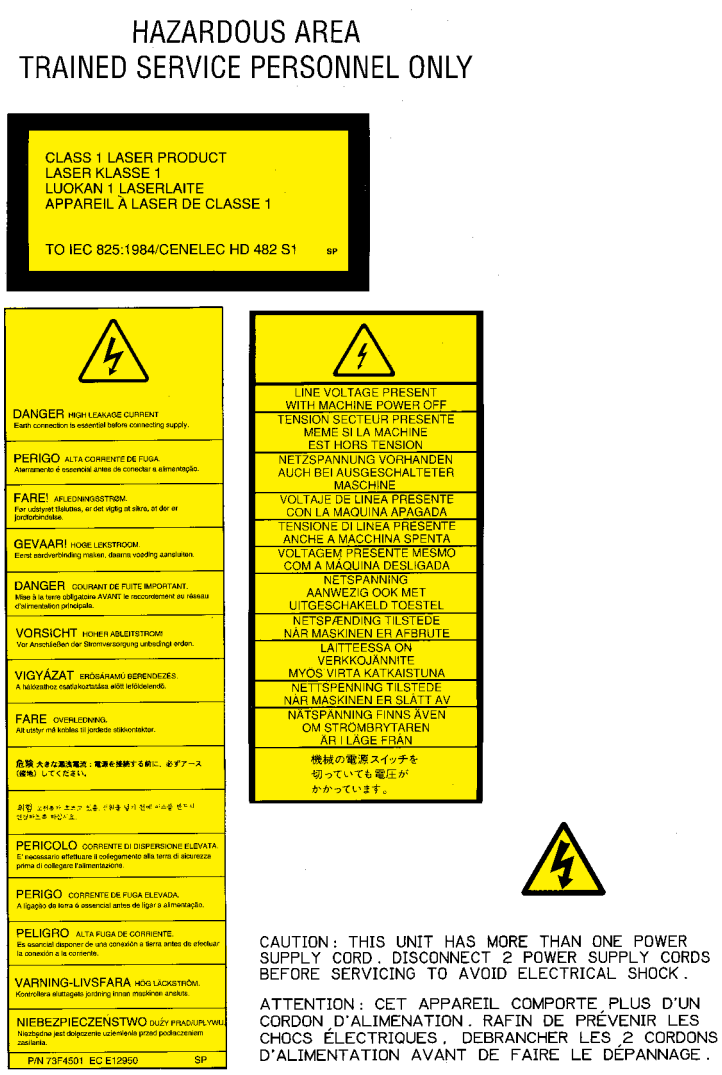


Figure 7-2. Director Safety Labels, Front

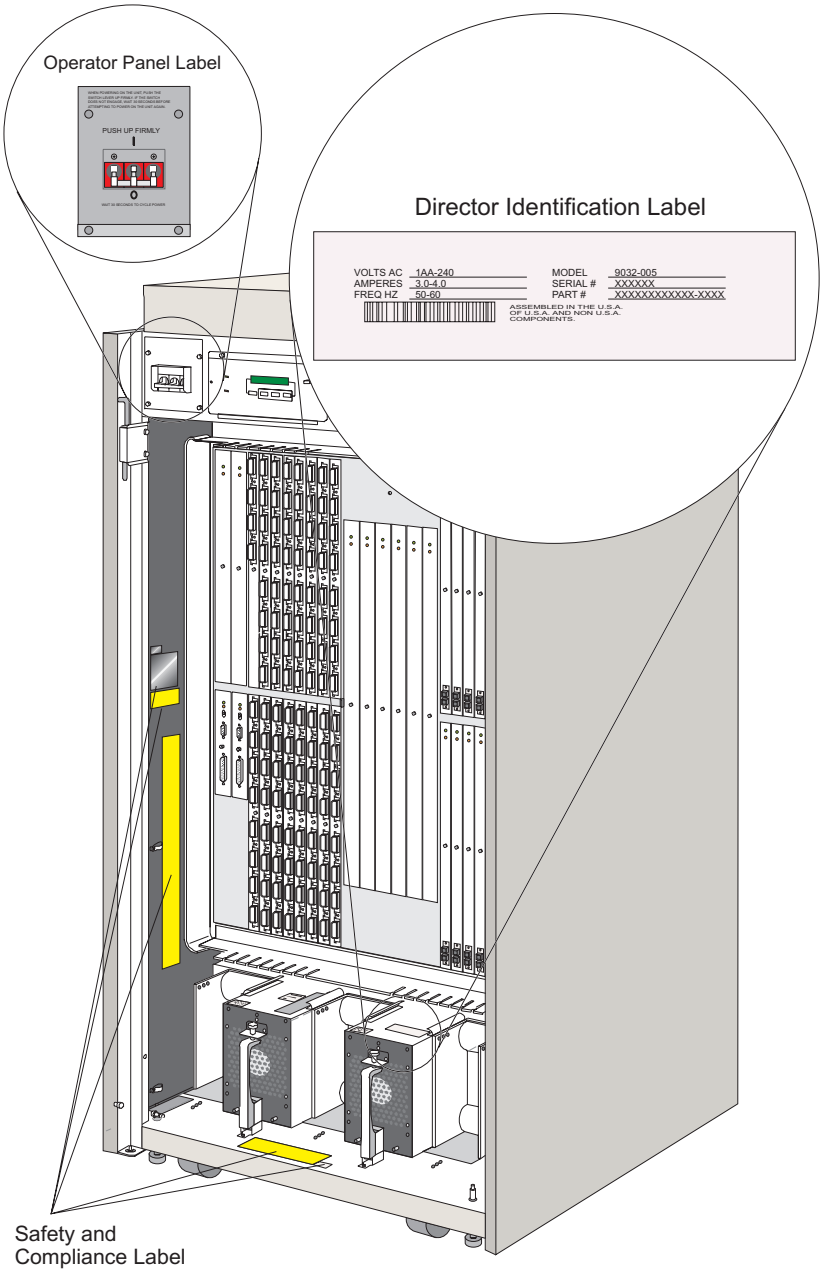


Figure 7-3. Director Safety and ID Labels, Front View

Chapter 8. Grounding Path Diagram

Figure 8-1 shows the ac filter ground connections. Figure 8-2 shows the 9032-005 electrical system, cabling, filter ground connections, and power supply ground connections.

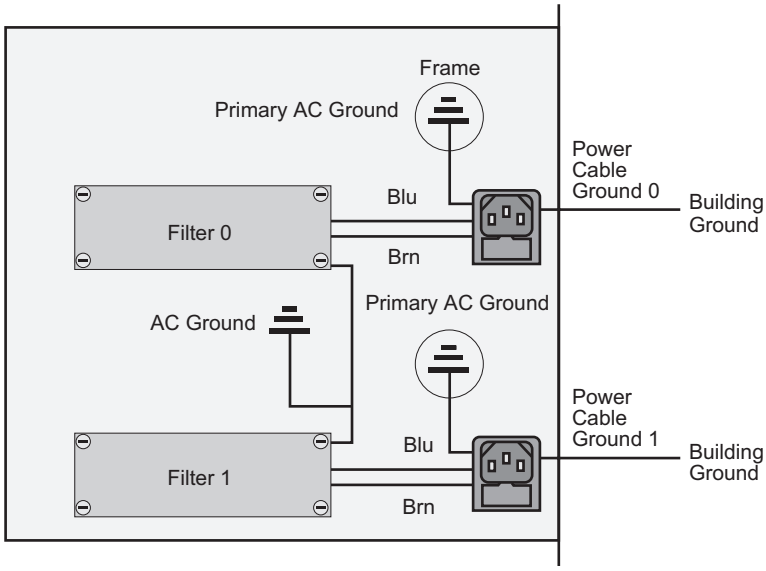


Figure 8-1. Filter Ground Connections

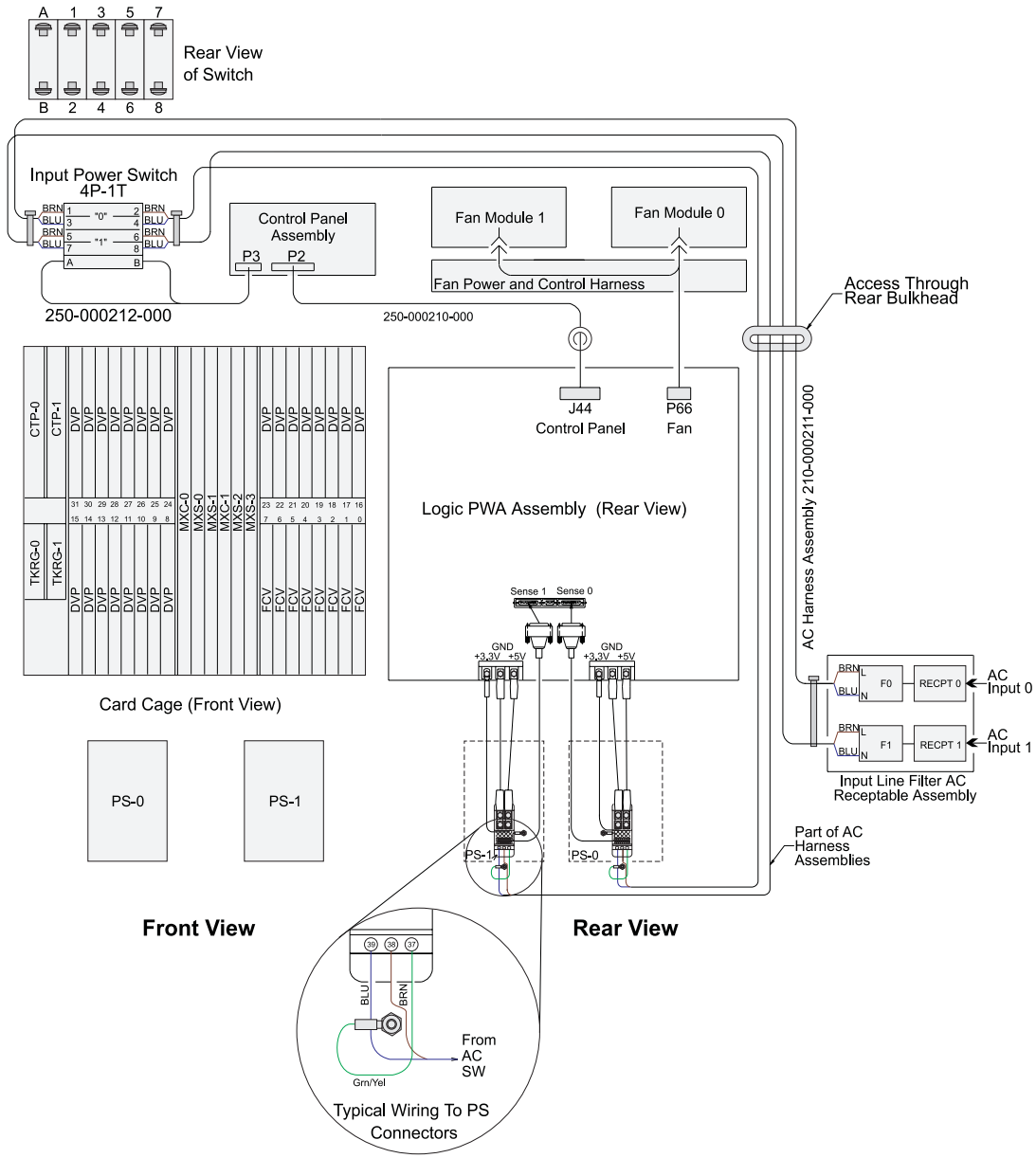


Figure 8-2. Director Electrical Cabling, Connections, and Ground Connections

Chapter 9. Parts List

How To Use This Parts List

Use the part numbers in these lists as a reference when ordering parts through the parts system.

The first parts list, Assemblies, lists the major assemblies for the 9032 Model 5.

Each Visual Index figure is followed by assembly drawings and parts lists for the assemblies and components called out in the drawings. The Index Ref. column is keyed to the associated drawing. For example, in the assembly drawing under "Assembly 2: Logic Card Assemblies" on page 9-12, the circled number 1 indicates the torque tool, and the part number for this is given in the associated parts list.

Table 9-1. Example Parts List: Logic Card Assemblies

Index Ref.	Part No.	Units	Description
2-			
1	11G4642	1	Torque Tool
2	07H5932	1	Torque Tool 3/16-1/4” Hex Adapter
3	07H5914	1	Control Processor Card (CTP)
4	07H5918	1-2	Token-Ring Controller Adapter Card (TKRG)

Similar Assemblies

If two assemblies contain a majority of identical parts, they are broken down on the same list. Common parts are shown by one index number. Parts unique to one or the other of the assemblies are listed separately and identified by description.

Units Column Abbreviations

- AR (as required): indicates that the quantity is not the same for all machines.
- NP (non-procurable): indicates that the part is non-procurable and that the individual parts or the next higher assembly should be ordered.
- NR (not recommended): indicates that the part is procurable but not recommended for field replacement, and that the next higher assembly should be ordered.
- R (restricted): indicates that the part has a restricted availability.

Parts List: 9032 Model 5 Assemblies

Part No.	Units	Description
07H5917	1	Logic Board Assembly
07H5901	1	Fan Assembly
07H5905	1	Operator Panel Assembly, Raven Black
07H5906	1	AC Power Switch
11G4605	1	AC Filter Assembly
07H5973	1	Power Supply 2 (PWR2) - FICON
07H5980	1	Power Supply (PWR)
07H5930	1	Side Cover, Raven Black
07H5931	1	Side Cover, Pearl White
07H5924	1	Top Cover, Graphite Gray
07H5925	1	Top Cover, Pearl White
07H5928	1	Rear Door Assembly, Graphite Gray
07H5929	1	Rear Door Assembly, Pearl White
07H5926	1	Front Door Assembly, Graphite Gray
07H5927	1	Front Door Assembly, Pearl White
11G4645	1	Door Latch, Matte Black
11G4648	1	Door Latch, Satin Silver
54G3120	1	Key, FE (No Logo)
07H5911	1	Cable, Operator Panel
07H5904	1	Cable Assembly, DC Fan
07H5912	1	Cable Assembly, AC Filter
07H5902	1	Cable Assembly, 5V, Sense 0
07H5903	1	Cable Assembly, 5V, Sense 1

Part No.	Units	Description
11G4670	1	Cable Assembly, Token-Ring, 20’
07H5913	1	Thermal Shutdown Cable Assembly
12K0071	1	Matrix Controller Card 2 (MXC2) - FICON
07H5976	1	Matrix Controller Card (MXC)
07H5916	2	Matrix Switch Card (MXS)
07H5914	1	Control Processor Card (CTP)
07H5918		Token-Ring Controller Adapter Card (TKRG)
07H5942	1	LED Device Port Card (DVP)
07H5945	1	Port Card, XDF Laser, with FCS/SC Connectors (ESCON)
12K0070	1	Port Card, FCV, with an FCS/SC Connector (FICON)
07H5944	1	Laser/LED Spare Ports Card
07H5943	1	LED Spare Ports Card
07H5907	1	Spacer Card, DVP (including Spare Ports Card)
07H5908	1	Spacer Card, CTP
07H5910	1	Spacer Card, MXC/MXS
07H5909	1	Spacer Card, TKRG
5605670	1	Plug, Wrap, Fiber Optic, LED
78G9610	1	Plug, Wrap, Fiber Optic, SC
42F8595	1	Plug, Wrap, Fiber Optic, Laser
11G4642	1	Torque Tool
07H5932	1	Torque Tool 3/16 - 1/4 Hex Adapter
11G4643	1	Caster, Swivel
11G4644	1	Caster, Fixed
07H5900	1	Packaging Materials Set

Note: Part numbers for logic cards (MXC, MXC2, MXS, CTP, TKRG, FCV Port card, and DVP cards) and power supply (PWR and PWR2) are current as of June, 1999. Use these numbers as a reference when ordering parts through the parts system.

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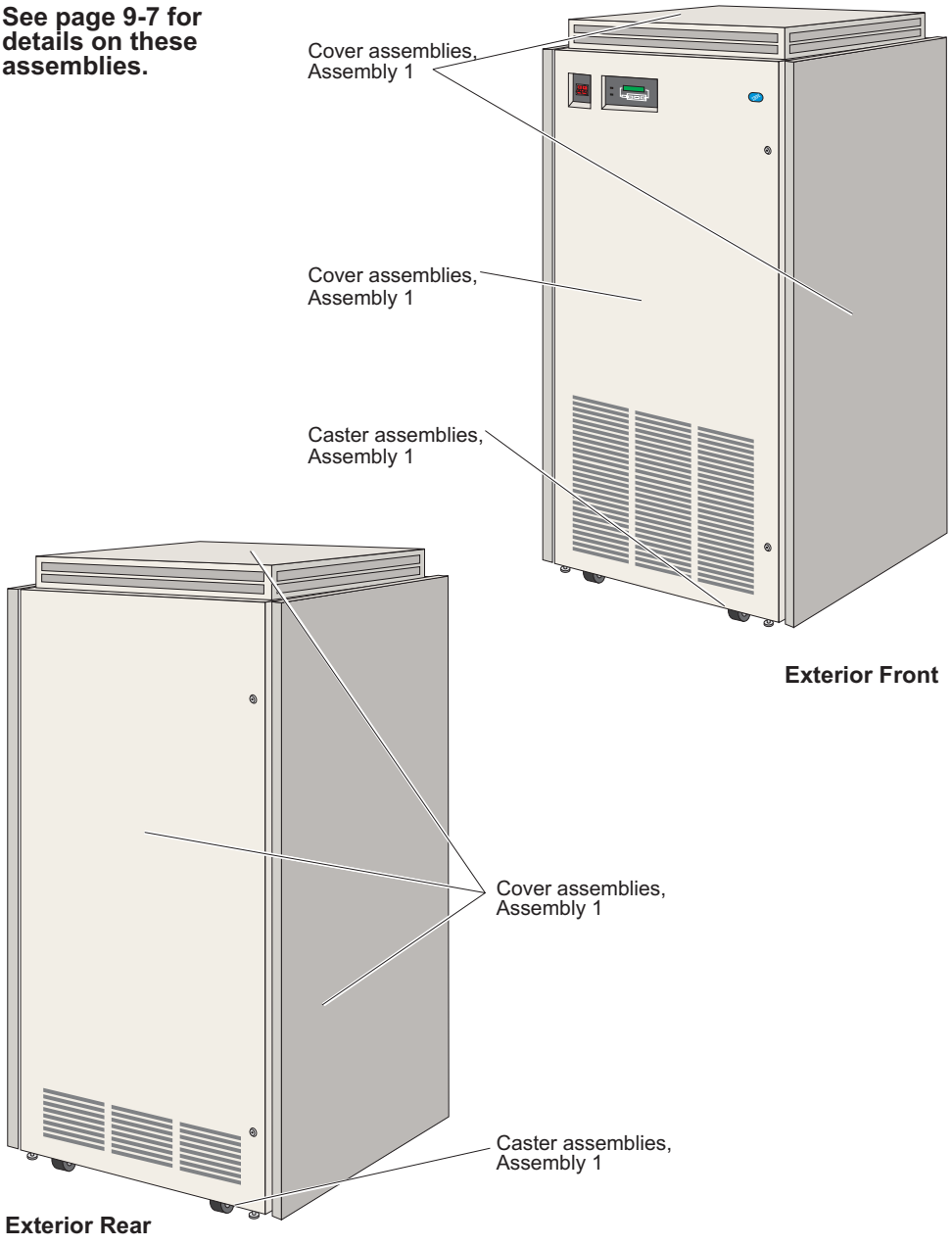
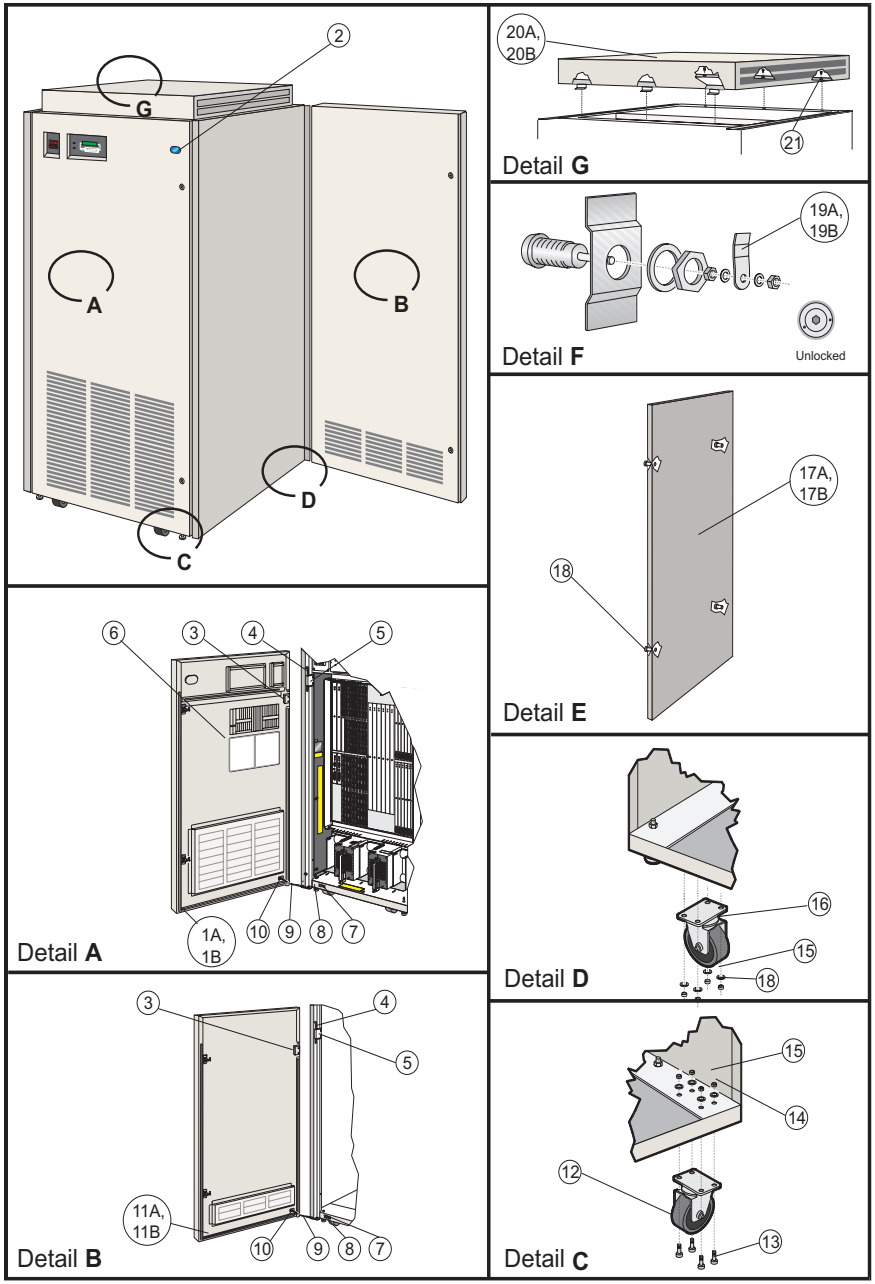
Visual Index 1. Director Exterior

See page 9-7 for details on these assemblies.



Assembly 1: Exterior Assemblies

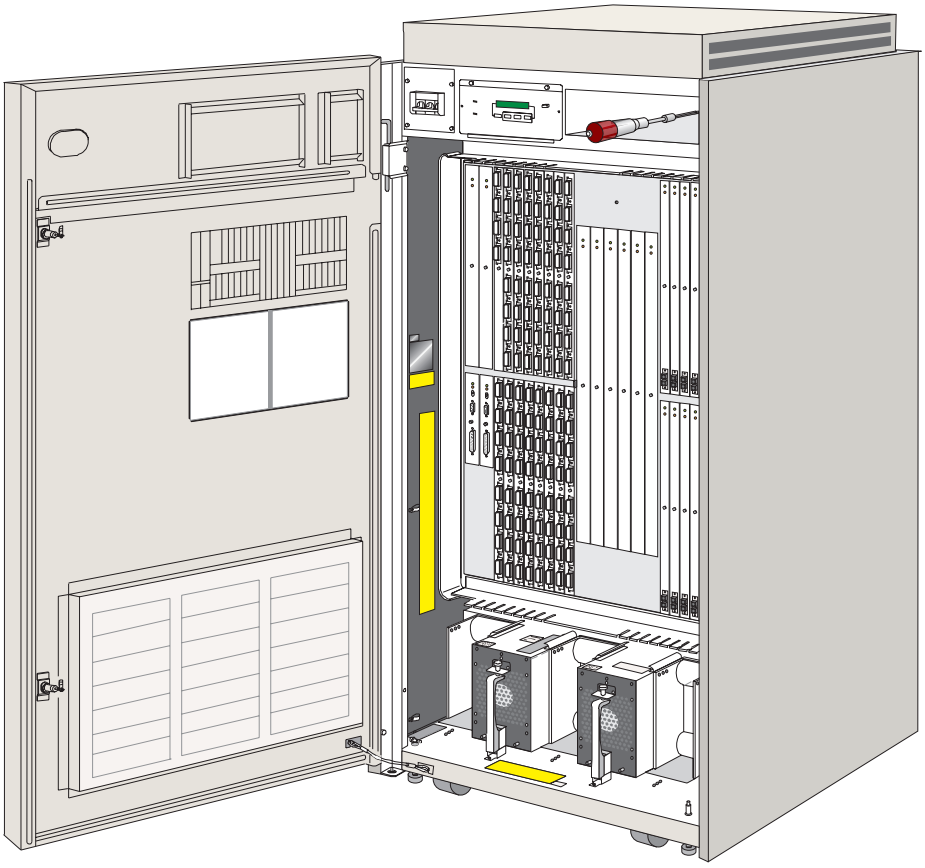


Parts List: Exterior Assemblies

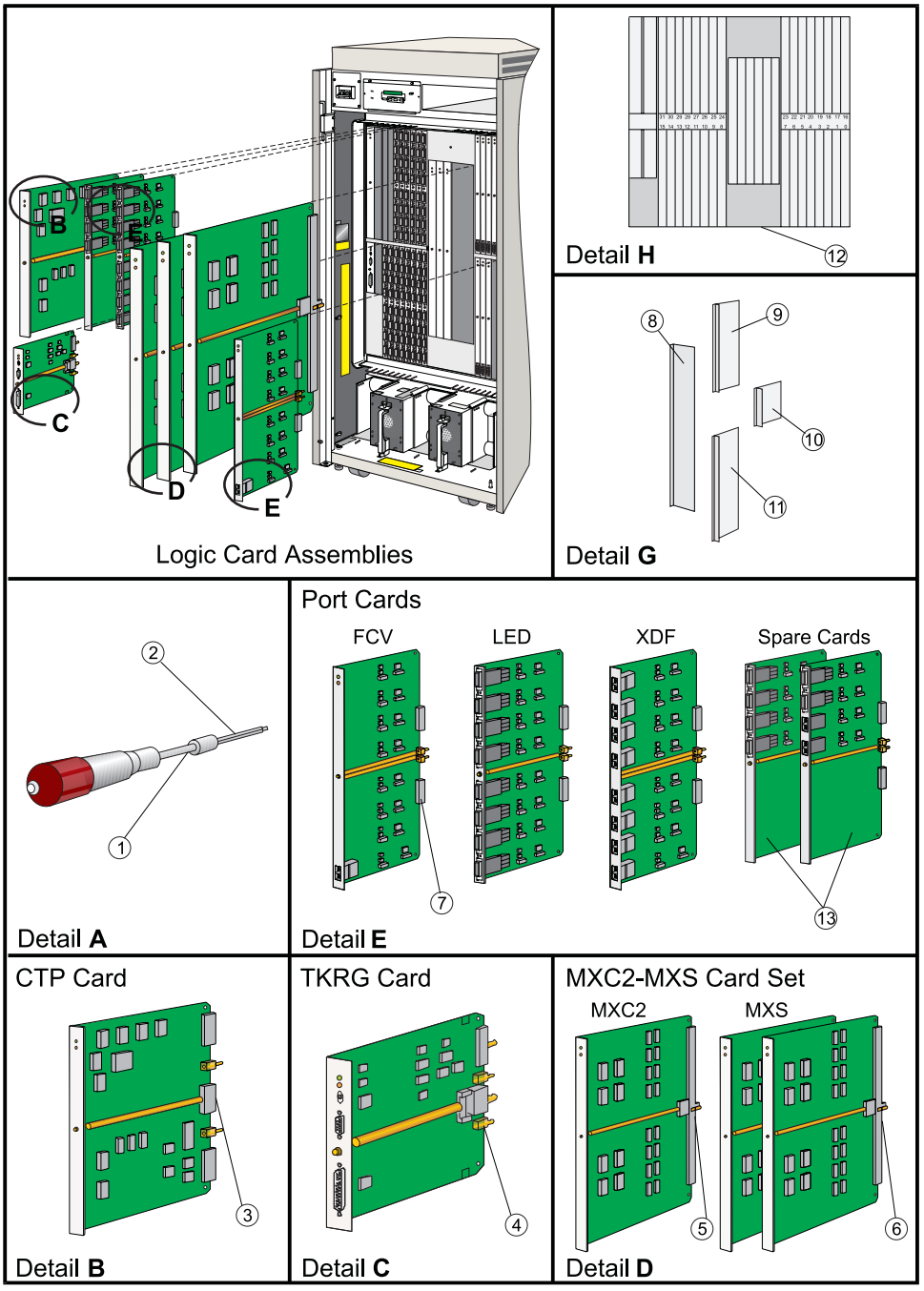
Index Ref.	Part No.	Units	Description
1-			
1A	07H5926	NP	Front Door Assembly, Graphite Gray
1B	07H5927	1	Front Door Assembly, Pearl White
2		NP	IBM Logo
3		NP	Door Hinge
4		NP	Hinge Pin
5		NP	Upper Hinge Mounting Bracket
6		NP	Card Map
7		NP	Flat Washer
8		NP	Door Pivot Bracket
9		NP	Cable Stay
10		NP	Cable Through Bracket
11A	07H5928	1	Rear Door Assembly, Graphite Gray
11B	07H5929	1	Rear Door Assembly, Pearl White
3		NP	Door Hinge
4		NP	Hinge Pin
5		NP	Upper Hinge Mounting Bracket
7		NP	Flat Washer
8		NP	Door Pivot Bracket

Index Ref.	Part No.	Units	Description
9		NP	Cable Stay
10		NP	Cable Through Bracket
12	11G4643	1	Caster, Swivel
14		NP	Washer (4)
15		NP	Hex Nut (4)
16	11G4644	1	Caster, Fixed
13		NP	Bolt (4)
14		NP	Washer (4)
15		NP	Hex Nut (4)
17A	07H5930	1	Side Cover, Raven Black
17B	07H5931	1	Side Cover, Pearl White
18		NP	Captive Screw (4)
19A	11G4645	1	Door Latch, Vice Action, Matte Black
19B	11G4648	1	Door Latch, Vice Action, Satin Silver
20A	07H5924	1	Top Cover, Graphite Gray
20B	07H5925	1	Top Cover, Pearl White
21		NP	Screw (3)

Visual Index 2. Front Interior



Assembly 2: Logic Card Assemblies

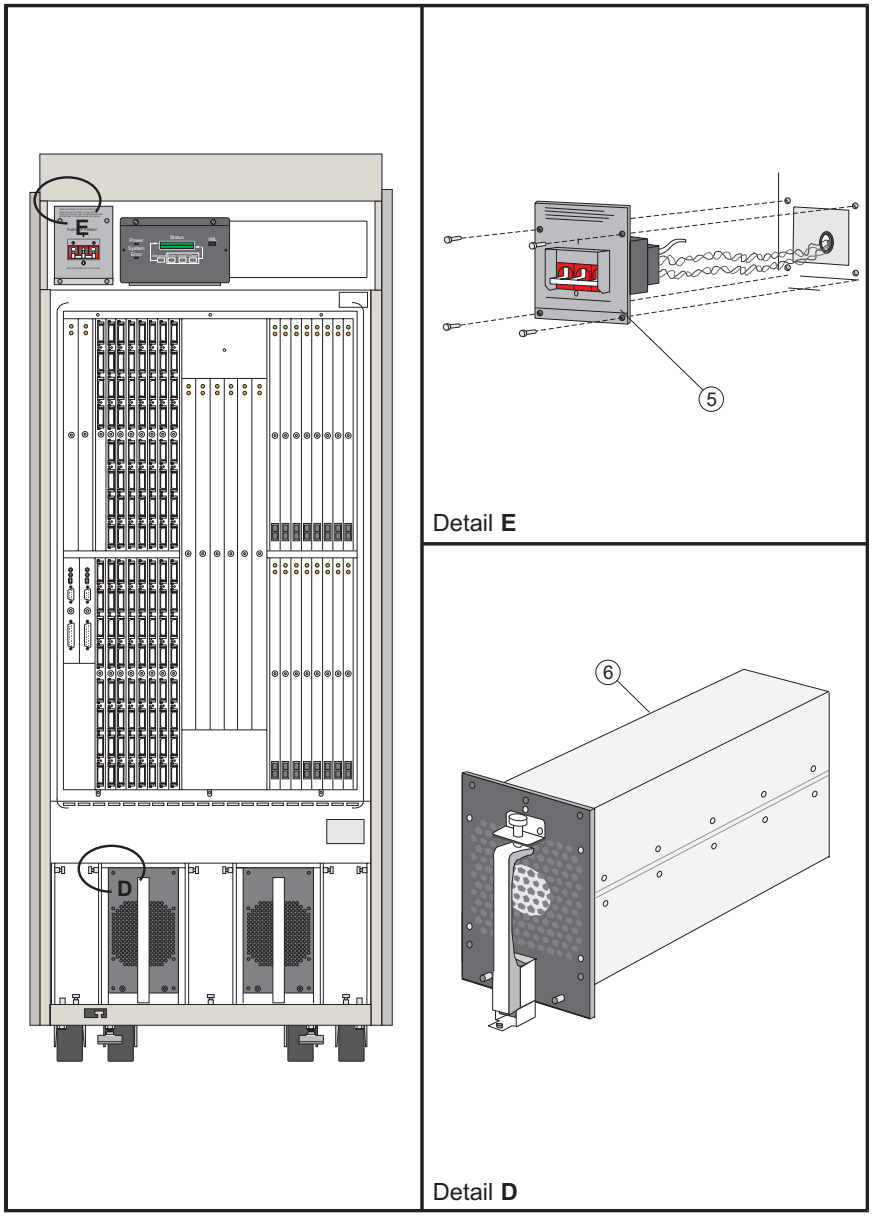


Parts List: Logic Card Assemblies

Note: Part numbers for logic cards (such as MXC, MXC2, MXS, CTP, TKRG, FCV port cards, LED port cards, and laser XDF port cards) are current as of August 1999. Use these numbers as a reference when ordering parts through the parts system.

Index Ref.	Part No.	Units	Description
2-			
1	11G4642	1	Torque Tool
2	07H5932	1	Torque Tool 3/16-1/4” Hex Adapter
3	07H5914	1	Control Processor Card (CTP)
4	07H5918	1-2	Token-Ring Controller Adapter Card (TKRG)
5	12K0071	1	Matrix Controller Card 2 (MXC2) - FICON
5	07H5976	1	Matrix Controller Card (MXC)
6	07H5916	2	Matrix Switch Card (MXS)
7	07H5942	3-31	Port Card, LED
7	07H5945	3-31	Port Card, XDF Laser, with FCS/SC Connectors (ESCON)
7	12K0070	1-16	Port Card, FCV, with an FCS/SC Connector (FICON)
8	07H5910	1	Spacer Card, MXC/MXS
9	07H5908	1	Spacer Card, CTP
10	07H5909	1	Spacer Card, TKRG
11	07H5907	1-28	Spacer Card, DVP (including Spare Ports Card)
12		NP	Card Map Label
13	07H5943	1	LED Spare Ports Card
13	07H5944	1	LED/XDF Laser Spare Ports Card

Assembly 3: Power Distribution Assemblies, Front



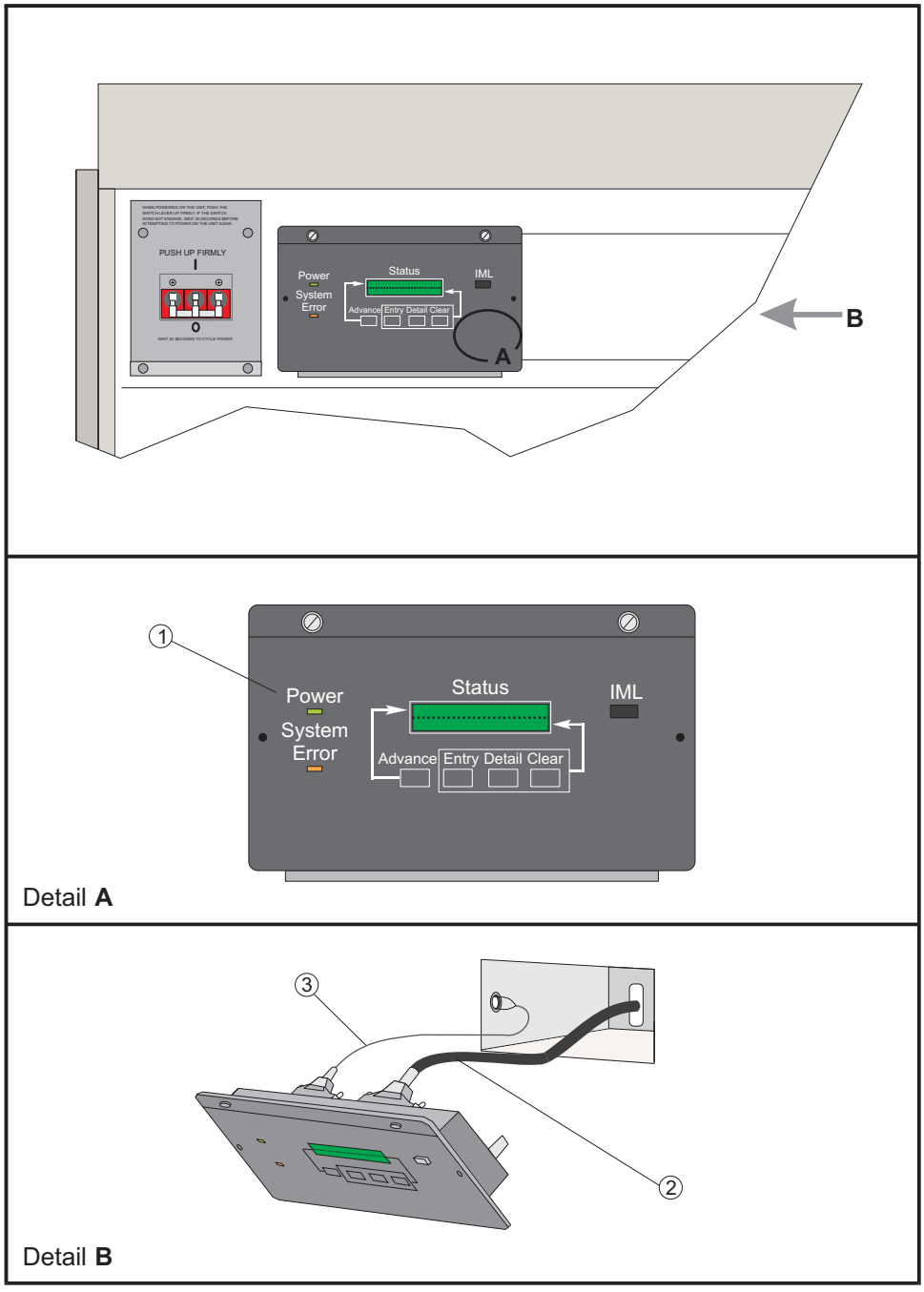
Parts List: Power Distribution Assemblies, Front

Note: Part numbers for the ac power switch and power supply are current as of June 1999. Use these numbers as a reference when ordering parts through the parts system

Index Ref.	Part No.	Units	Description
3-			
5	07H5906	1	AC Power Switch
6	07H5973	2	Power Supply 2 (PWR2) - FICON
6	07H5980	2	Power Supply (PWR)

*PWR2 is required to support FCV port cards.

Assembly 4: Front Panel Assemblies

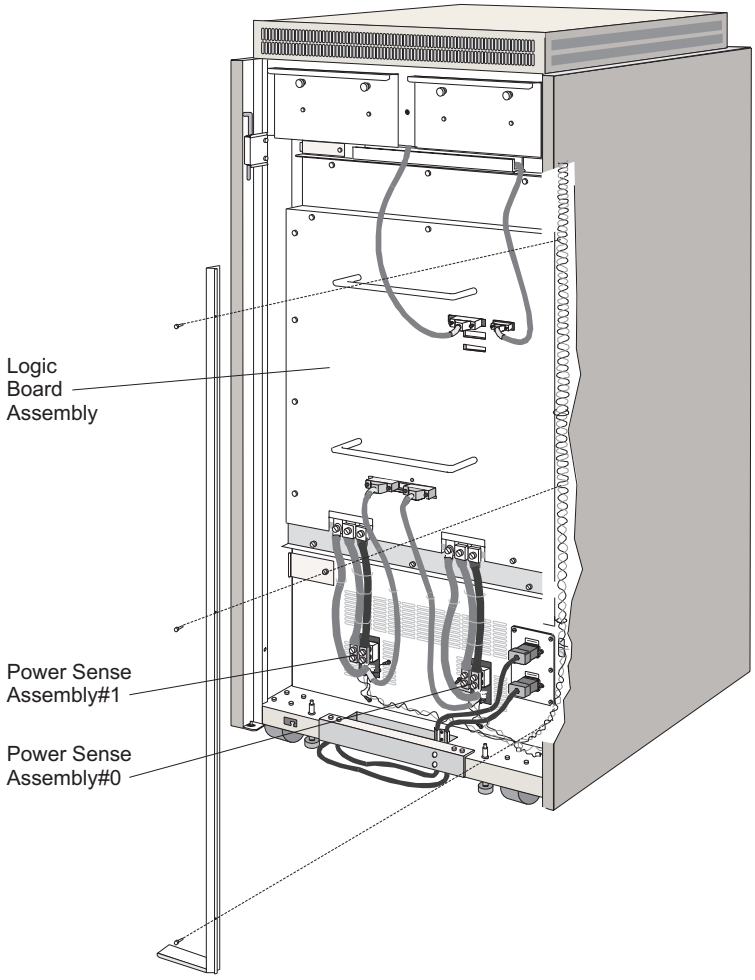


Parts List: Front Panel Assembly

Note: Part numbers for the operator panel assembly, operator panel cable, and thermal shutdown cable assembly are current as of June 1999. Use these numbers as a reference when ordering parts through the parts system.

Index Ref.	Part No.	Units	Description
4-			
1	07H5905	1	Operator Panel Assembly
2	07H5911	1	Operator Panel Cable
3	07A5913	1	Thermal Shutdown Cable Assembly

Visual Index 3. Rear Interior



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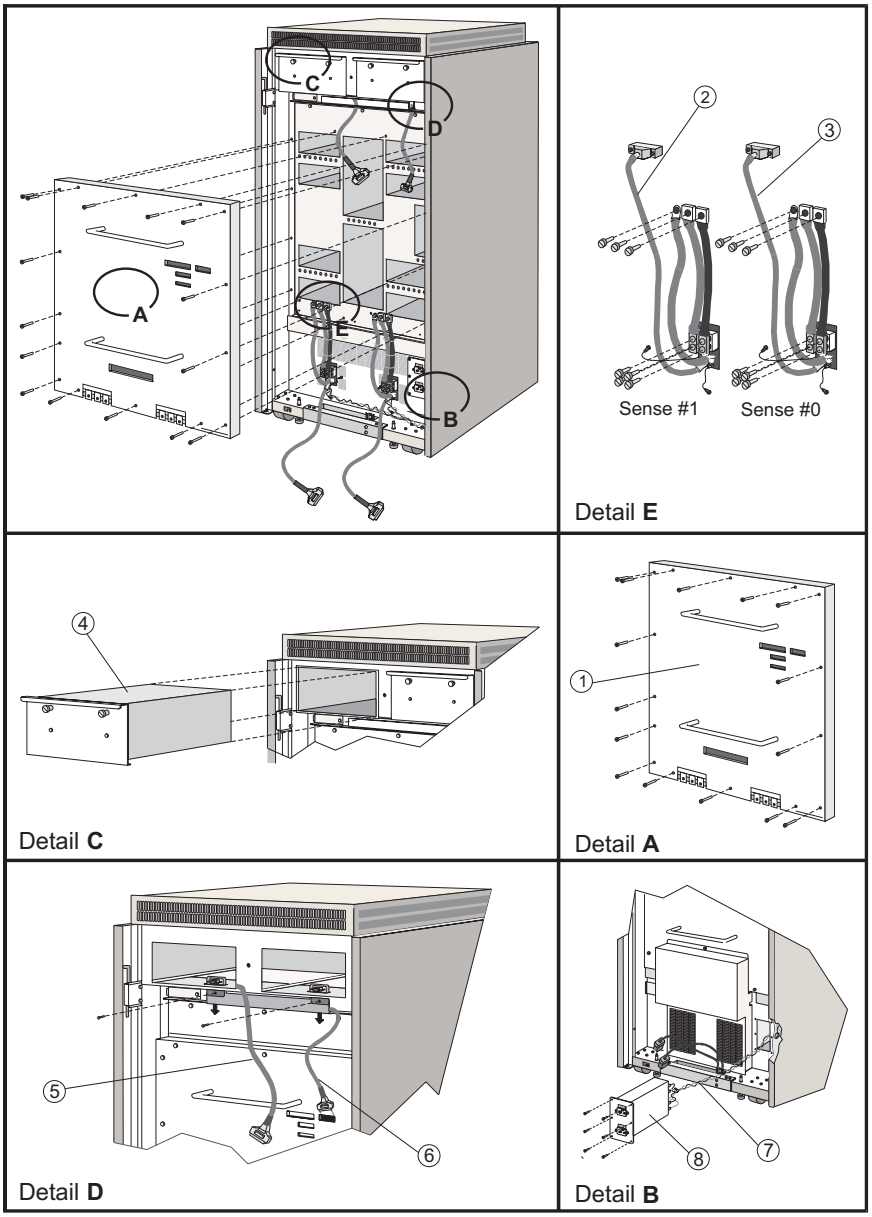
Assembly 5: Power Distribution Assemblies, Rear



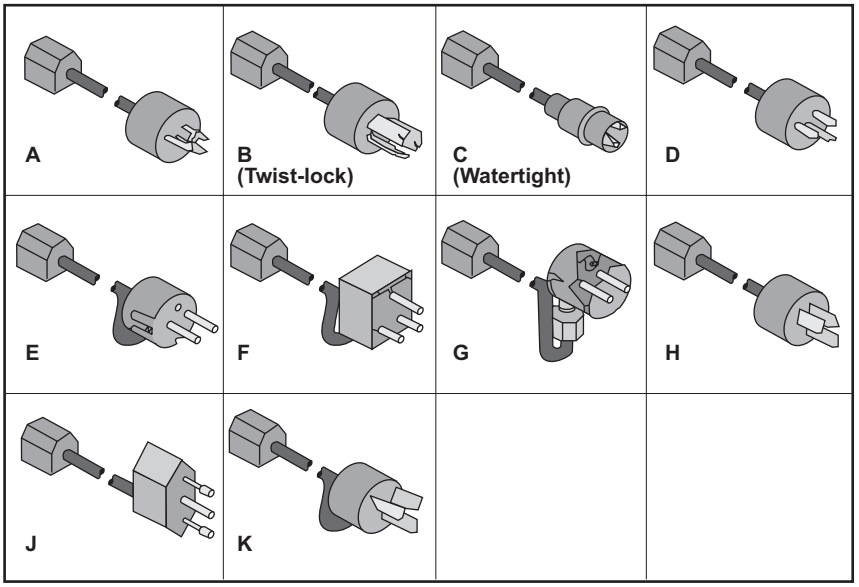
Parts List: Power Distribution Assemblies, Rear

Note: Part numbers for the following assemblies are current as of June 1999. Use these numbers as a reference when ordering parts through the parts system.

Index Ref.	Part No.	Units	Description
5-			
1	07H5917	1	Logic Board Assembly
2	07H5902	1	Cable Assembly, Power Sense 1
3	07H5903	1	Cable Assembly, Power Sense 0
4	07H5901	1-2	Fan Assembly
6	07H5911	1	Cable Assembly, Operator Panel
5	07H5904	1	Cable Assembly, DC Fan
7	07H5912	1	Cable Assembly, AC Filter
8	11G4605	1	AC Filter Assembly

Note: To support FICON operation, earlier Director models may have a 3.3-volt load-sharing jumper cable (250-000220-000) installed between the power sense cable assemblies. Refer to engineering change D98133 for additional information and the serial numbers of affected Directors.

Assembly 6: Power Cord Assemblies



Parts List: Power Cord Assemblies

Note: Part numbers for the following power cords are current as of June 1999. Use these numbers as a reference when ordering parts through the parts system.

Index Ref.	Part No.	Units	Description
6-			
A	14F1547	1	Power Attachment Cord - Chicago, NEMA, Nonlocking Plug, 250V (6 Ft.)
A	14F1548	1	Power Attachment Cord - USA/Canada, Taiwan,Thailand, Nonlocking Plug, 250V (14 Ft.)
B	14F1549	1	Power Attachment Cord - Chicago, Locking Plug, 250V (6 Ft.)
B	14F1550	1	Power Attachment Cord - USA/Canada/Mexico Locking Plug, 250V (14 Ft.)
C	86F2645	1	Power Attachment Cord - Chicago, Water-Tight Connector, 250V (6 Ft.)
C	86F2646	1	Power Attachment Cord - USA/Canada, Water-Tight Connector, 250V (14 Ft.)
C	14F1555	1	Power Attachment Cord - Denmark, United Kingdom, Hong Kong, Singapore, Malaysia, Water-Tight Connector, 250V (14 Ft.)
D	14F1553	1	Power Attachment Cord - Argentina, Uruguay, Paraguay, Columbia, 250V (14 Ft.)
E	14F1554	1	Power Attachment Cord - Iceland, Korea, EMEA, 250V (14 Ft.)
F	14F1557	1	Power Attachment Cord - South Africa, Bangladesh, Pakistan, Sri Lanka, 250V (14 Ft.)
G	14F1558	1	Power Attachment Cord - New Zealand, 250V (14 Ft.)

Index Ref.	Part No.	Units	Description
H	14F1559	1	Power Attachment Cord - Australia, 250V (14 Ft.)
J	14F1560	1	Power Attachment Cord -Somalia, Italy, 250V (14 Ft.)
K	14F1561	1	Power Attachment Cord - Israel 250V (14 Ft.)
	86F3439	1	Power Attachment Cord - Japan, 250V (14 Ft.) (not pictured on previous page)

Chapter 10. Administration

Introduction

This chapter contains unique administrative maintenance information associated with the enterprise systems connection (ESCON) Director.

Passwords

Passwords protect against unauthorized use of Console functions. There are three levels of authorized Director use, and therefore three password levels:

Passwords are controlled by the password administrator (a Level 1 password user).

- **Level 1** - **Password (Administrative) Authorization** - This level of authorization allows administrators to add, modify, and delete passwords for all levels of authorization, and allows access to the port authorization function.
- **Level 2** - **Maintenance Authorization** - This level of authorization allows service personnel to access maintenance and diagnostic functions, and to make changes to a Director definition.
- **Level 3** - **Operator Authorization** - This level of authorization allows users to change, save, and activate Director configuration matrices.

View Password Identifications

To view the identification of users with current passwords:

1. Select *Passwords* from the *Utility* menu in the *Startup* window or any matrix window.
2. Click the arrow by the *Passwords* option and select *View IDs*. The *Passwords* dialog box appears.

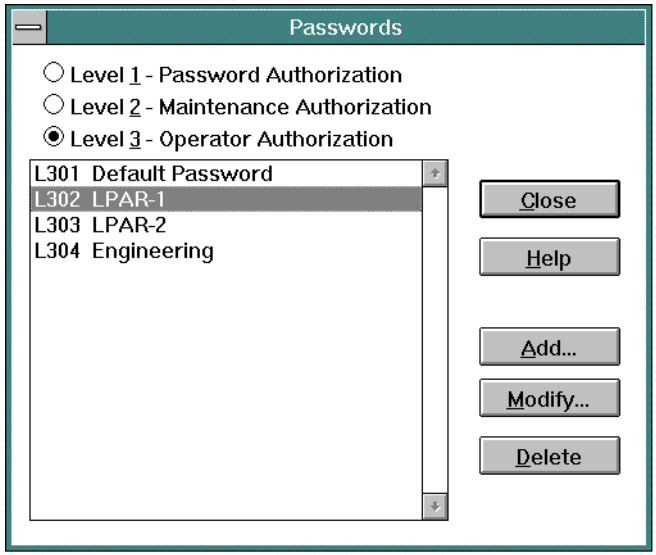


Figure 10-1. Passwords Dialog Box

3. Click on the *Level 1*, *Level 2*, or *Level 3* radio buttons respectively to view the identifications for users with passwords at those levels.

Modify, Add, or Delete Passwords

Use the following procedures to modify, add, or delete passwords.

Adding a Password

To add a password:

1. At the Director Console, select *Modify* from the *Passwords* option from the *Utility* menu. The *Administrative Authorization* dialog box appears.
2. Type an administrative authorization password (default is **LEVEL001**) and click the *OK* button. The *Passwords* dialog box appears (Figure 10-2). The dialog box provides a radio button selection for each password level.

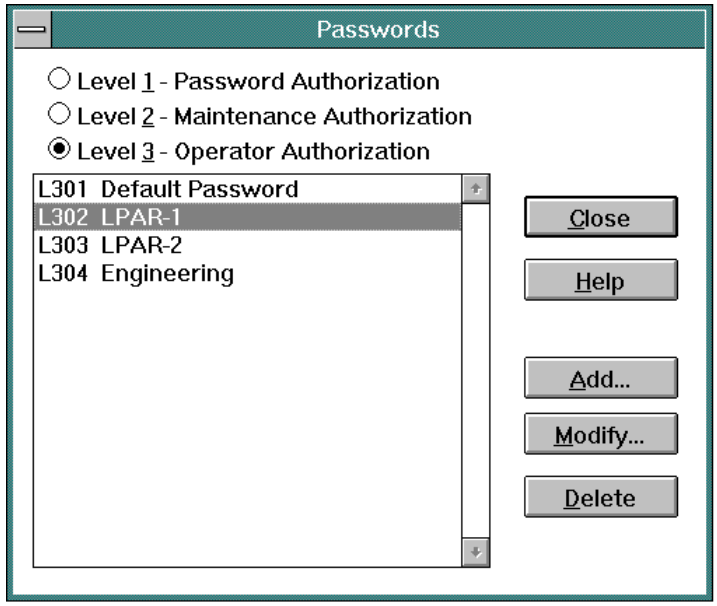


Figure 10-2. Passwords Dialog Box

3. Select (highlight) the radio button that corresponds to the level of password to be added (Level 1, Level 2, or Level 3).
4. Click the *Add* button. The *Add New Password* dialog box appears (Figure 10-3).

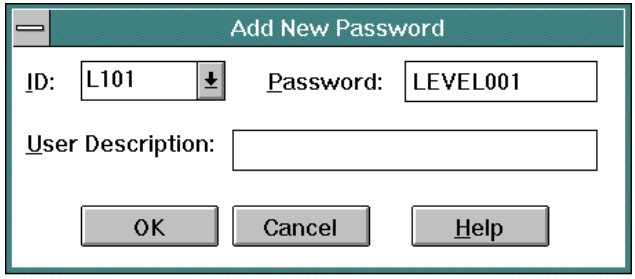


Figure 10-3. Add New Password Dialog Box

5. Type a password in the *Password* field. The password can be up to eight characters in length, and can consist of any alphanumeric characters other than an asterisk (*).

Note: Default passwords are provided when the Console is installed. The passwords are **LEVEL001**, **LEVEL002**, and **LEVEL003** for the three levels.

6. Type a description for the password in the *User Description* field. The description can be up to 24 alphanumeric characters long.
7. Click the *OK* button. The *Add New Password* dialog box closes and the new user description appears in the appropriate list box at the *Passwords* dialog box. Error checking ensures duplicate passwords are not entered at any level.

   Note: Up to 30 passwords can be defined for each password level. After the 30th password is defined for a level, the *Add* button is disabled at the *Passwords* dialog box.

8. At the *Passwords* dialog box, click the *Close* button.

Modifying a Password

To modify a password:

1. At the Director Console, select *Modify* from the *Passwords* option from the *Utility* menu. The *Administrative Authorization* dialog box appears.
2. Type an administrative authorization password (default is **LEVEL001**) and click the *OK* button. The *Passwords* dialog box appears (Figure 10-2 on page 10-4). The dialog box provides a radio button selection for each password level.
3. Select (highlight) the radio button that corresponds to the level of password to be modified (Level 1, Level 2, or Level 3).
4. At the list box, select (highlight) the password and user description to be modified, and click the *Modify* button. The *Modify Password* dialog box appears (Figure 10-4).

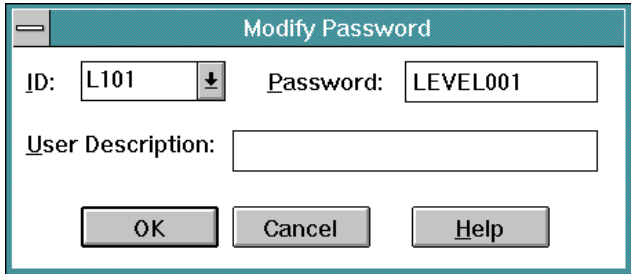


Figure 10-4. Modify Password Dialog Box

5. Edit the password in the *Password* field as required. The password can be up to eight characters in length, and can consist of any alphanumeric characters other than an asterisk (*).
6. Edit the description for the password in the *User Description* field as required. The description can be up to 24 alphanumeric characters long.
7. Click the *OK* button. The *Modify Password* dialog box closes and the modified user description appears in the appropriate list box at the *Passwords* dialog box. Error checking ensures duplicate passwords are not entered at any level.
8. At the *Passwords* dialog box, click the *Close* button.

Deleting a Password

To delete a password:

1. At the Director Console, select *Modify* from the *Passwords* option from the *Utility* menu. The *Administrative Authorization* dialog box appears.
2. Type an administrative authorization password (default is **LEVEL001**) and click the *OK* button. The *Passwords* dialog box appears (Figure 10-2 on page 10-4). The dialog box provides a radio button selection for each password level.
3. Select (highlight) the radio button that corresponds to the level of password to be deleted (Level 1, Level 2, or Level 3).
4. At the list box, select (highlight) the password and user description to be deleted, and click the *Delete* button. The following dialog box appears (Figure 10-5).

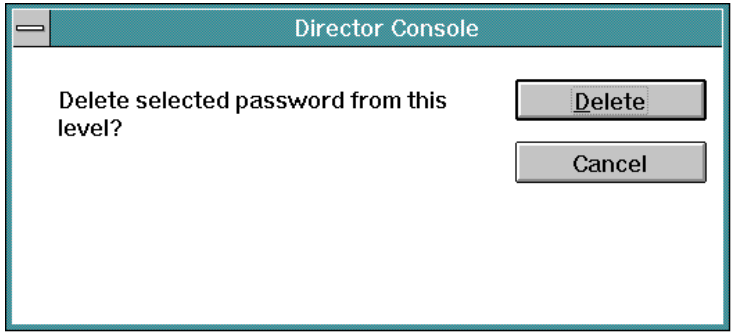


Figure 10-5. Delete Password Dialog Box

5. Click the *Delete* button. The deleted user description disappears from the appropriate list box at the *Passwords* dialog box.

If the password to be deleted is the last password in the list box for the selected level, password protection is disabled for all operations at that level. When the *Delete* button is selected at the *Passwords* dialog box, the following dialog box appears (Figure 10-6).

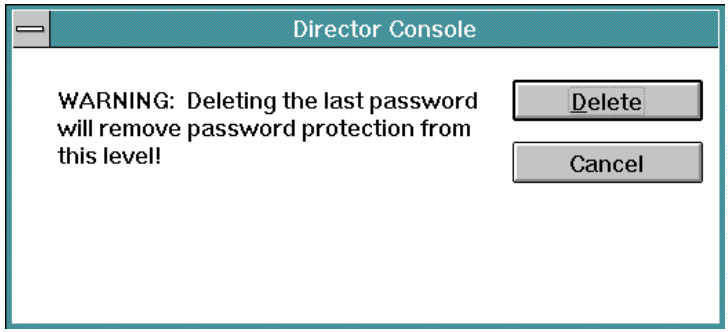


Figure 10-6. Delete Password Warning Dialog Box

6. At the *Passwords* dialog box, click the *Close* button.

Maintenance Terminal Password

A maintenance authorization password is required to access maintenance and diagnostic functions through the Console *Terminal* window.

An additional password is required to access maintenance and diagnostic functions through a separate maintenance terminal attached to the Director's maintenance port. This password is not associated with the maintenance authorization password used for the Console and the Console *Terminal* window.

The default password to access Director maintenance functions for both the Console *Terminal* window and the maintenance terminal is LEVEL002.

After you have used this password to access maintenance and diagnostic functions, you can change the password to a new password of your choice.

- From the maintenance terminal, use the **pswd** command. Refer to Appendix E.
- From the *Terminal* window on the Console, use the **pswd** command. Refer to Appendix E.

Record this new password for future use.

Note: If you are unable to employ a password and access the maintenance terminal, contact your next level of support.

Creating Logical Partitions

Logical partitions (LPARs) allow an administrator to create port-level configuration access control unique to defined operators or operator groups. LPARs allow operators to access only authorized ports and restrict unauthorized operators from changing the port connectivity configuration of any device or set of devices under control of the Director. LPARs offer increased security and maximize the flexibility of a system configuration.

Logical partitions are created using the *Port Authorization* option on the *Utility* menu. Port authorization is disabled for each Director by default. It becomes automatically enabled once an administrator with password authorization removes authorization for one or more ports for any operator ID. Once enabled, operators must select the *Enable Operator* option from the *Edit* menu and enter a password for their ID to change port attributes or operation. For more Information on the Enable Operator option refer to Chapter 3 in *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7298).

Port authorization is enabled using the following steps:

- **Define an operator password** - An administrator assigns a password for access to ports defined by the LPAR. This password applies to the *Enable Operator* option from the *Edit* menu. Separate passwords are required for other Director options (such as *LIC Versions* from the *Utility* menu).
- **Authorize port access for the password** - The administrator defines configuration access for a subset of port addresses by using the *Port Authorization* option from the *Utility* menu. By default, port authorization is not enabled and all operators have connectivity management authority for all ports. By creating an LPAR, the administrator enables operator access to certain Director ports, and disables access to the remaining ports.
- **Enable the LPAR** - After the LPAR is created, operators must use the *Enable Operator* option from the *Edit* menu (with the password defined for the LPAR) to enable access to the defined port configuration.

The password that an operator uses for port authorization only applies to *Enable Operator* option on the *Edit* menu. Authorization for other options, such as *Passwords* (*Utility* menu) and *Activate Configuration Matrix (File* menu), are still required. For the *Activate Configuration Matrix* option, additional checks are performed. If the password entered for the *Activate* request is the same as entered for *Enable Operator*, the *Activate* request initiates immediately. If the password is different, any changes made to ports are evaluated according to authorization rights for that password. If unauthorized changes were made, the *Activate* request is denied.

Defining a Password

1. At the *Matrix* window, select *Modify* from the *Passwords* option from the *Utility* menu. The *Administrative Authorization* dialog box appears.
2. Type an administrative authorization password (default is **LEVEL001**) and click the *OK* button. The *Passwords* dialog box appears.
3. Select (highlight) the Level 3 radio button and click the *Add* button. The *Add New Password* dialog box appears (Figure 10-7).

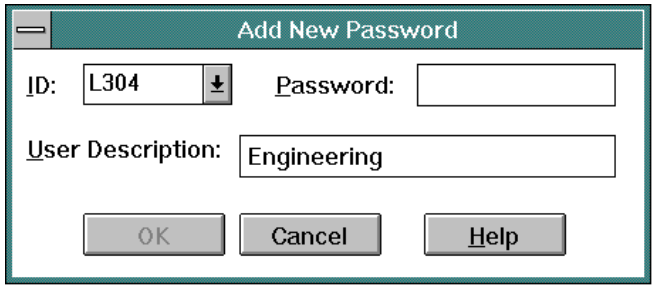


Figure 10-7. Add New Password Dialog Box (LPAR Example)

4. Type a password in the *Password* field. The password can be up to eight characters in length, and can consist of any alphanumeric characters other than an asterisk (*). Type **Engineering** in the *User Description* field.
5. Click the *OK* button. The operator ID (**L304**) and description (**Engineering**) appear in the list box at the *Passwords* dialog box (Figure 10-8).

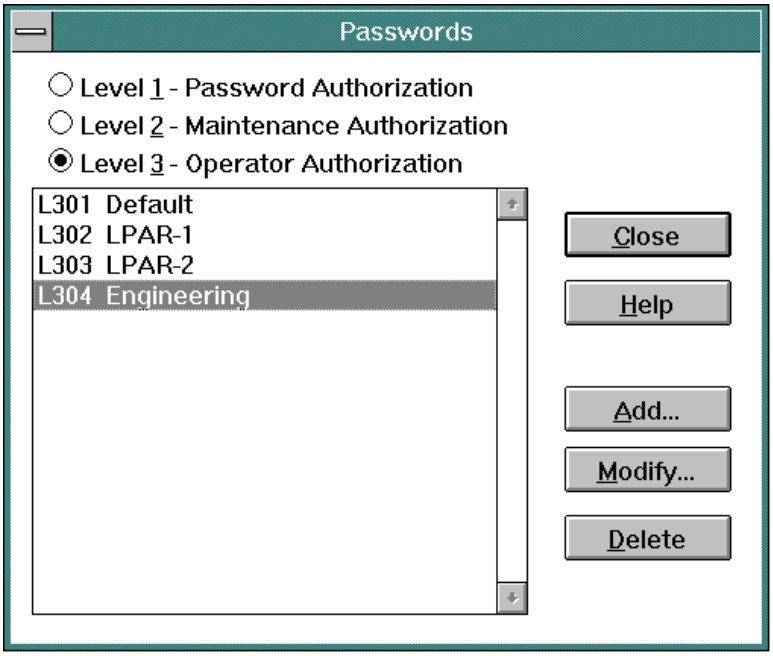


Figure 10-8. Passwords Dialog Box (LPAR Example)

6. At the *Passwords* dialog box, click the *Close* button. The *Matrix* window reappears.

Defining Port Authorizations

7. Select the *Port Authorization* option from the *Utility* menu. The *Port Authorization* dialog box appears (Figure 10-9).

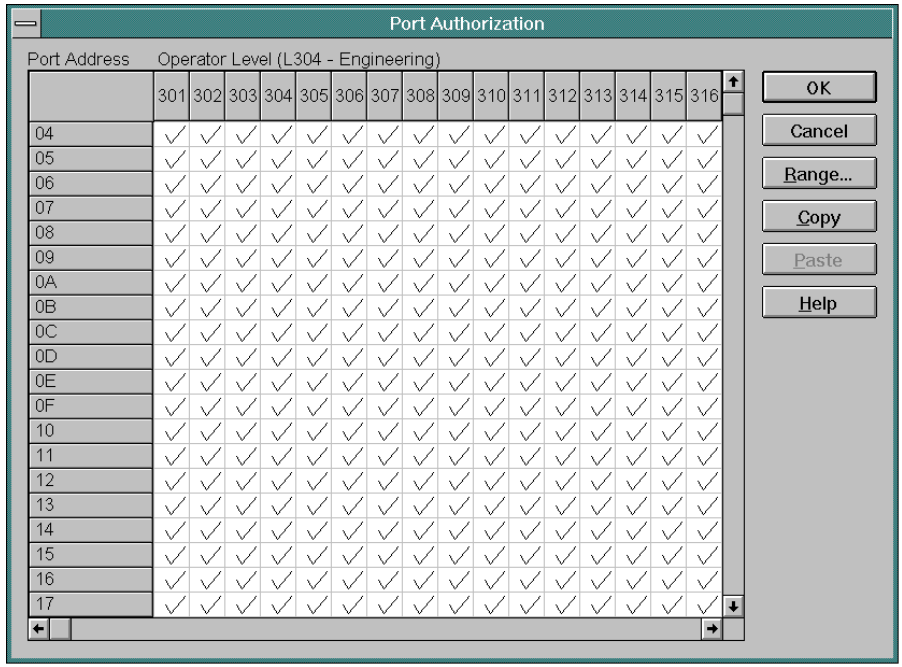


Figure 10-9. Port Authorization Dialog Box (Unmodified)

Port authorization data appears in the form of a matrix, where each cell represents the intersection of an operator ID and a logical port address. Each cell contains a check mark, indicating personnel with any operator ID can change attributes for all Director ports.

8. At the *Port Authorization* dialog box, click the *Range* button. The *Authorize Range* dialog box appears (Figure 10-10).

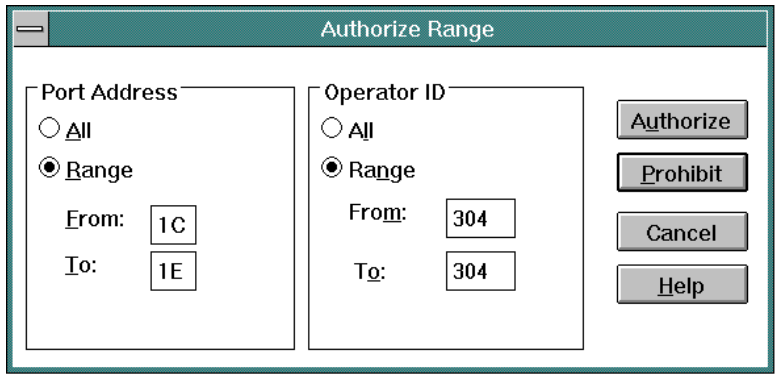


Figure 10-10. Authorize Range Dialog Box (LPAR Example)

9. At the *Authorize Range* dialog box:
   a. At the *Port Address* section, click the *All* radio button.
   b. At the *Operator ID* section, click the *All* radio button.
   c. Click the *Prohibit* button. The *Port Authorization* dialog box reappears with all check marks deleted.

      Note: At this point in the procedure, no operator has authorization to change any port attribute.

10. At the *Port Authorization* dialog box, double-click the matrix cell at the intersection of the Operator ID *304* column and the port address *14* row. A check mark appears in the cell.
11. At the *Port Authorization* dialog box, click the *Range* button. The *Authorize Range* dialog box appears again (Figure 10-10).
12. At the *Authorize Range* dialog box:
    a. At the *Port Address* section, click the *Range* radio button. Enter a port address range from *1C* to *1F*.
    b. At the *Operator ID* section, click the *Range* radio button. Enter an operator
    ID range from *304* to *304*.
    c. Click the *Authorize* button. The *Port Authorization* dialog box reappears as shown in Figure 10-11.

       Note: At this point in the procedure, *only* operator ID **L304** has authorization to change port attributes, and *only* for logical port addresses *14*, *1C*, *1D*, and *1E*.

13. At the *Port Authorization* dialog box, click the *OK* button. The *Administrative Authorization* dialog box appears.
14. Type an administrative authorization password (default is **LEVEL001**) and click the *OK* button. The *Matrix* window reappears with all ports restricted and blacked out.

    Note: The configuration matrix is set to a read-only state. *Edit* menu options (*Blocked*, *Dedicated*, and *Prohibited*) are disabled and cannot be applied, even to ports within the LPAR.

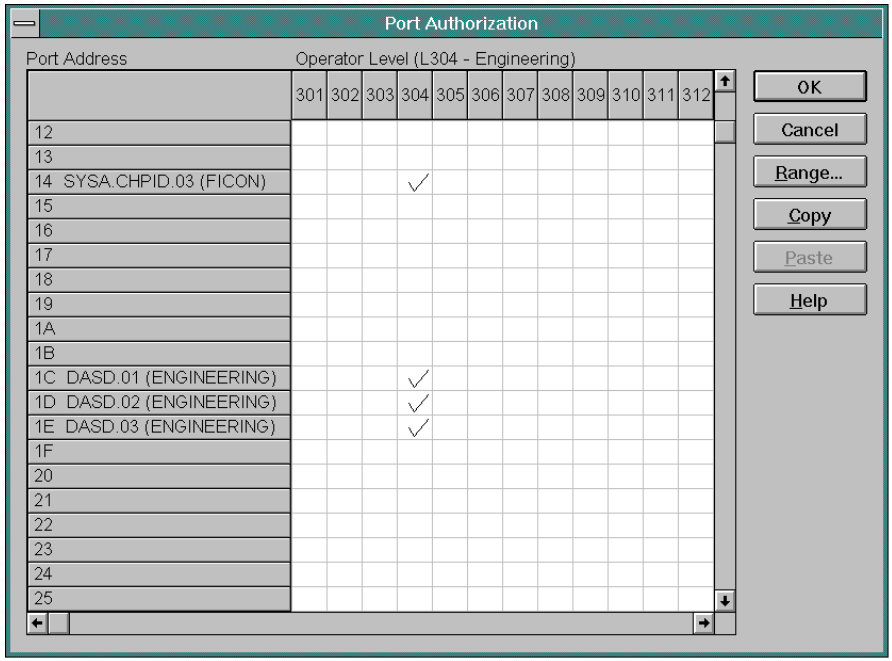


Figure 10-11. Port Authorization Dialog Box (LPAR Example)

Enabling the LPAR

15. Select the *Enable Operator* option from the *Edit* menu. The *Operator Authorization* dialog box appears.
16. Type the operator authorization password assigned in step 4 and click the *OK* button. The *Matrix* window reappears as shown in Figure 10-12 on page 10-14.

    When port authorization for this LPAR is active, **L304** appears in the operator ID area (adjacent to the System Error indicator). If an operator is not identified,**???** appears in the operator ID area.

Note: ***Operators who are not authorized to configure all ports in the matrix can only activate ports they are authorized to configure in an active matrix or save those configurations in a saved matrix.*** The *Activate Configuration Matrix* and *Save Configuration Matrix As* options (from the *File* menu) are not available. Restricted-use operators (defined for the LPAR) typically do not have authorization to configure all ports. However, restricted-use operators can merge authorized port attributes from a *Saved Matrix* to the *Active Matrix*, then activate the result.

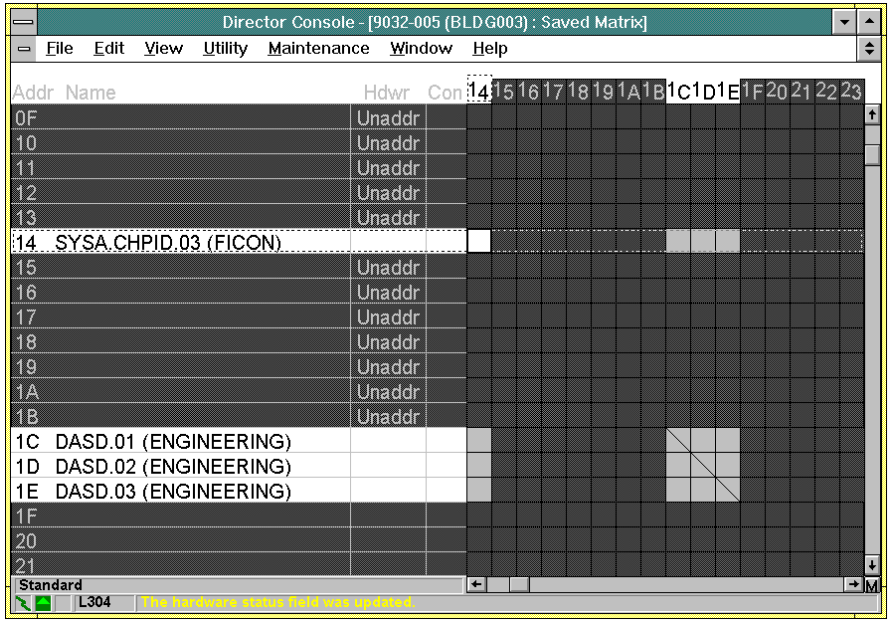


Figure 10-12. Matrix Window (LPAR Example)

Changing the Director's LAN Addresses through the Operator Panel

Perform the following steps at the operator panel of the Director where you want to change addresses. This procedure provides instructions to change both the internet protocol (IP) and media access control (MAC) addresses.

Use this step if you are installing a Director to an existing cluster on a local area network (LAN) and do not care if existing Director-to-Console communications drop temporarily.

You may want to change the MAC or IP address if:

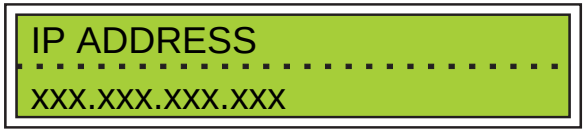
- The Director is not on an isolated LAN used specifically for the Director/Console configuration.

- The Director's addresses do not conform to the LAN's addressing scheme.
- Another device on the LAN has the same IP or MAC address as the Director.
- The LAN uses locally administered MAC addresses.

Find the current IP and MAC address for the Director. "Task 2: Verify Director Operation and Determine LAN Addressing" in Chapter 6. Discuss the addresses with your LAN administrator.

Changing the IP Address

1. From the Director's operator panel, press and hold the *Advance* button and the *Entry* button at the same time.
2. This places the panel in operator assist mode and the following appears:



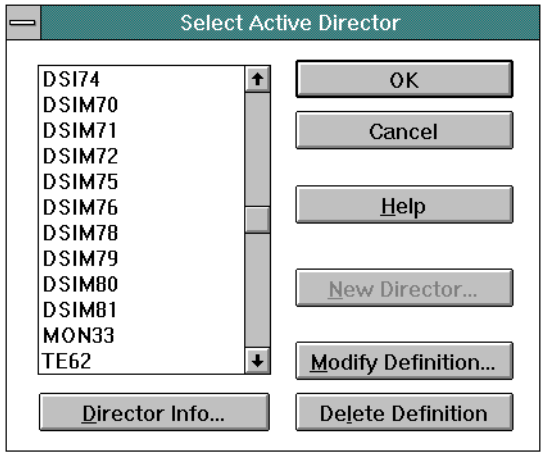
3. Press the *Clear* button once and a blinking cursor appears over the rightmost portion of the IP address.
4. To edit the IP address, press and hold the *Detail* button to scroll the number forward. Holding the *Detail* button down for more than three seconds causes it to scroll forward quickly. The IP address scrolls a three-digit range from 000 to 255. The displayed number scrolls back to 000 after 255. When the correct value of this portion of the IP address is reached, press the *Clear* button once. The cursor appears over the next three-digit portion of the address to the left.
5. Repeat step 4 for each remaining portion of the IP address. When the complete IP address is entered, press the *Entry* button to save and load the new IP Address.

   Note: The link to the Director will drop its connection and the Console Link Status indicator at the bottom left corner of the active matrix window will change to the icon with the red box and black slash (indicating the link is not operational). To re-establish the connection, continue to step 6.
6. Go to the Console. If the OS/2 desktop is displayed, simultaneously press the **Control** and **Esc** keys to switch to the Console program.

   The *Window List* dialog box appears.

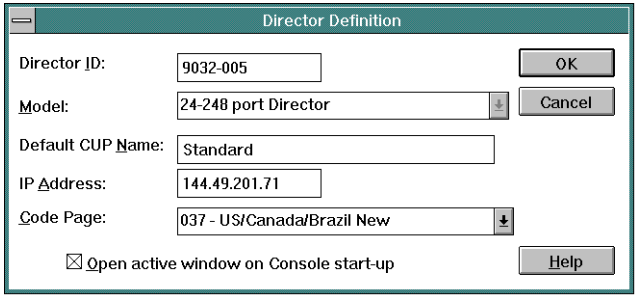
7. Double-click on the *Director Console-Director Console* selection.
   The active Console window appears.

8. Select *Open Active Configuration Matrix* from the *File* menu.
   The *Select Active Director* dialog box appears.



9. Select the Director on which you changed the IP address and click on the *Modify Definition* button.

   The *Director Definition* dialog box appears.



10. Click on the *IP Address* field and change the value to match what you entered for the Director in steps 3 through 5. To change the value, use the arrow or **Backspace** keys to move the cursor, delete the old address, and enter the new address. This identifies the new director address to the Console.
11. Click on the *OK* button.

    A warning box appears, explaining that the modification will temporarily drop the line to the Director and close any open windows for this Director.
12. Click on the *OK* button.
13. The *Maintenance Authorization* dialog box appears.
14. Enter the maintenance authorization password (the default is LEVEL002) and click on the *OK* button.

    The active matrix window for the Director appears.

The link status indicator should return to the icon with a green lightning bolt on a gray background, indicating that the link is now available.

15. To exit the operator assist mode on the Director's operator panel, press the *Advance* button until "EXIT" appears on the top line of the status display, then press the *Entry* button.

Changing the MAC Address

1. If the MAC address is administered locally, press the *Advance* button and the *Entry* button at the same time on the Director's operator panel.
2. This places the panel in operator assist mode and the following appears:
3. Press the *Advance* button again and the following appears:

4. To edit the address, press the *Clear* button once. A blinking cursor appears over the rightmost portion (two digits) of the MAC address.
5. Press and hold the *Detail* button to scroll the number forward. Holding the *Detail* button down for more than three seconds causes it to scroll forward quickly. The MAC address only scrolls a two-digit hexadecimal range from 00 to FF. The displayed number scrolls back to 00 after FF. When the correct value of this portion of the MAC address has been reached, press the *Clear* button once. The cursor appears over the two-digit portion of the MAC address to the left. Setting the MAC address to all zeros causes the burned-in MAC address (BIA) on the Token-Ring controller card to be used after the next IML.
6. Repeat step 5 for each remaining portion of the MAC Address. When the complete MAC Address is entered, press the *Entry* button to save and load the new MAC Address.
7. To exit the operator assist mode on the Director's operator panel, press the *Advance* button until "EXIT" appears on the top line of the status display, then press the *Entry* button.
8. Press the *IML* button on the operator panel to initiate the address. Note that the IP address may display with all 0's until the address is calculated.
9. The link to the Console will drop its connection, and the Console link status indicator at the bottom of the active matrix window will change to the icon with a red box and a black slash (indicating the link is not operational).
10. If the link remains inactive, flush the address resolution protocol (ARP) Table using the following steps.

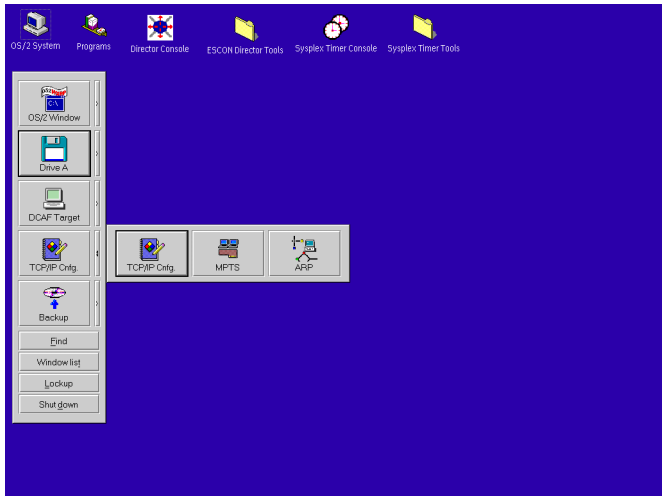
a. Simultaneously press the **Ctrl** and **Esc** keys to switch to the OS/2 desktop.

   The *Window List* dialog box appears.

b. Double-click on the *Desktop-Icon View* selection.

   The OS/2 Desktop appears.

c. Open the *TCP/IP Cnfg.* drawer by clicking on the drawer's arrow.



d. Click on the *ARP* icon. This clears the network ARP table, allowing it to accept the new MAC address.

e. Close the *TCP/IP Cnfg.* drawer by clicking on the drawer's arrow.

Changing Director LAN Addresses through the Console

This section describes the procedures to change a Director's internet protocol (IP) or media access control (MAC) address from the Director Console's *Terminal* window. Each procedure temporarily drops the Director-to-Console communication link.

Director IP and MAC addresses are set by the original equipment manufacturer. However, the addresses may require change if:

- The Director *is not* installed on an isolated LAN used specifically for Directors and the Director Console
- The Director addresses do not conform to the customer's LAN addressing scheme
- Another device on the LAN has the same IP or MAC address as the Director.
- The LAN uses locally-administered addresses.

Prior to changing a Director's LAN addresses, determine the current IP and MAC addresses. Refer to "Task 2: Verify Director Operation and Determine LAN Addressing" in Chapter 6. Verify any address changes with the customer's LAN administrator.

Changing the Director IP Address

1. At the Director Console:
   - If the Director Console application is open (*Startup* or *Matrix* window appears), go to step 2.
   - If the OS/2 desktop is displayed, simultaneously press the **Ctrl** and **Esc** keys. The *Window List* appears (Figure 10-13).

Figure 10-13. Window List

   - Double-click the *Director Console - Director Console* selection. The Director Console application opens and the *Startup* or *Matrix* window appears.
2. Select the *Open Active Configuration Matrix* option from the *File* menu. The *Select Active Director* dialog box appears (Figure 10-15).

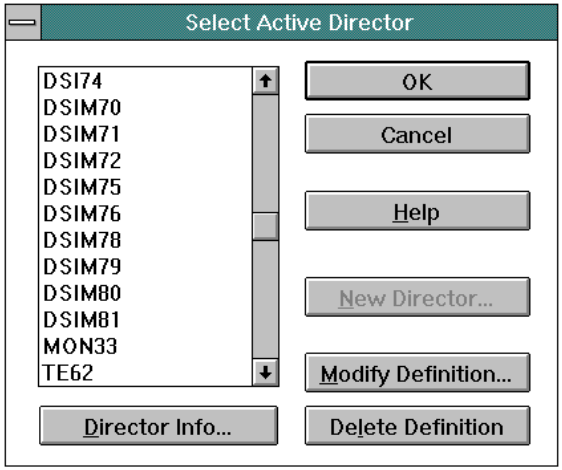


Figure 10-14. Select Active Director Dialog Box

3. Select (double-click) the appropriate Director name in the list box, or highlight the Director name with the up or down arrow keys and click the *OK* button. The *Active Matrix* window for the selected Director appears.
4. Select the *Advanced* option from the *Maintenance* menu, then select the *Terminal* option. The *Maintenance Authorization* dialog box appears.
5. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *Terminal* window appears (Figure 10-15).

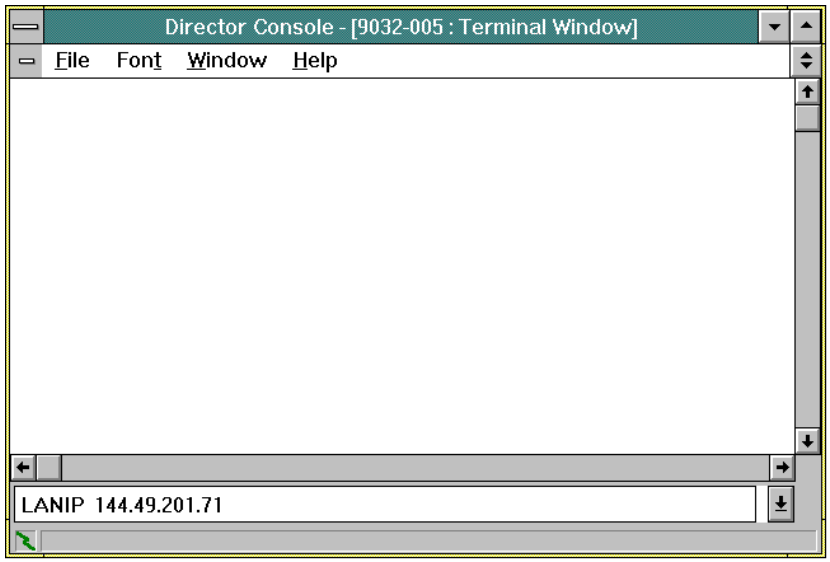


Figure 10-15. Terminal Window

6. To change the IP address, type the following on the command line and press the **Enter** key. The IP address is in the form *nnn.nnn.nnn.nnn*, where *nnn* is a decimal value in the range zero through 255.

   lanip nnn.nnn.nnn.nnn

   Note: Do not use all zeros or all 255s. Leading zeros are not required. The IP address must be unique among all devices in the LAN.

   The Director-to-Console communication link drops and the link status indicator (bottom left corner of the window) changes to a red box with black slash, indicating the link is not operational.

7. Select the *Close Window* option from the *File* menu to close the *Terminal* window and return to the *Active Matrix* window.
8. Select the *Open Active Configuration Matrix* option from the *File* menu. The *Select Active Director* dialog box appears (Figure 10-14 on page 10-21).
9. Highlight the appropriate Director name (the same Director name selected in step 3) with the up or down arrow keys or the mouse, and click the *Modify Definition* button. The *Director Definition* dialog box for the selected Director appears (Figure 10-16).

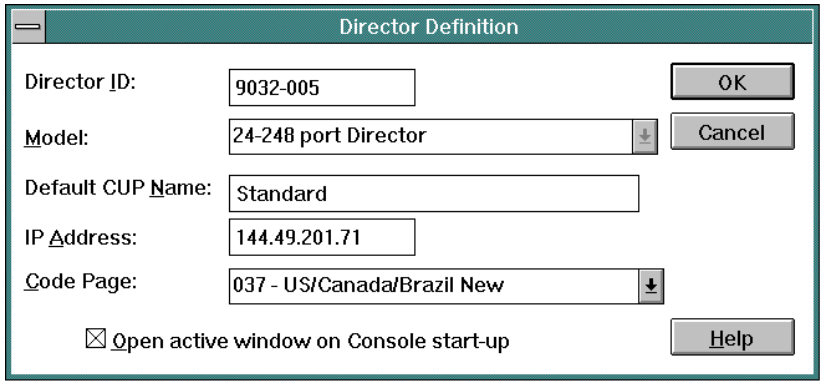


Figure 10-16. Director Definition Dialog Box

10. Select the *IP Address* field and type the new IP address (use the value entered in step 6). This identifies the new IP address to the Director Console.
11. Click the *OK* button. A warning box appears, indicating the modification will temporarily drop the Director-to-Console communication link and close any open windows for the selected Director.
12. Click the *OK* button. The *Maintenance Authorization* dialog box appears.
13. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *Select Active Director* dialog box reappears (Figure 10-14 on page 10-21).
14. Click the *OK* button. The *Active Matrix* window for the selected Director reappears, and the link status indicator returns to a green lightning bolt on a gray background, indicating the Director-to-Console communication link is available.

Changing the Director MAC Address

1. At the Director Console:
   - If the Director Console application is open (*Startup* or *Matrix* window appears), go to step 2.
   - If the OS/2 desktop is displayed, simultaneously press the **Ctrl** and **Esc** keys. The *Window List* appears (Figure 10-17).

Figure 10-17. Window List

- Double-click the *Director Console - Director Console* selection. The Director Console application opens and the *Startup* or *Matrix* window appears.

2. Select the *Open Active Configuration Matrix* option from the *File* menu. The *Select Active Director* dialog box appears (Figure 10-18).

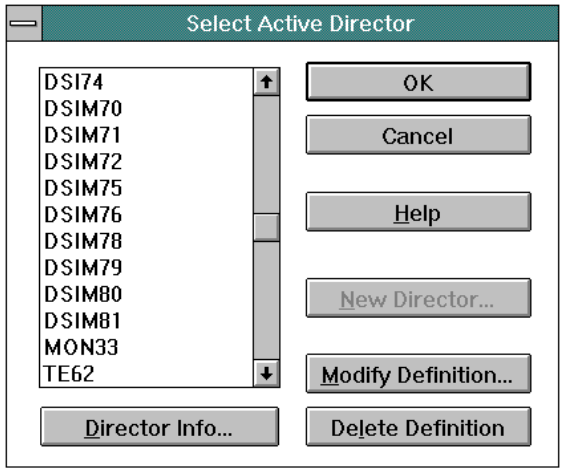


Figure 10-18. Select Active Director Dialog Box

3. Select (double-click) the appropriate Director name in the list box, or highlight the Director name with the up or down arrow keys and click the *OK* button. The *Active Matrix* window for the selected Director appears.
4. Select the *Advanced* option from the *Maintenance* menu, then select the *Terminal* option. The *Maintenance Authorization* dialog box appears.
5. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *Terminal* window appears (Figure 10-19).

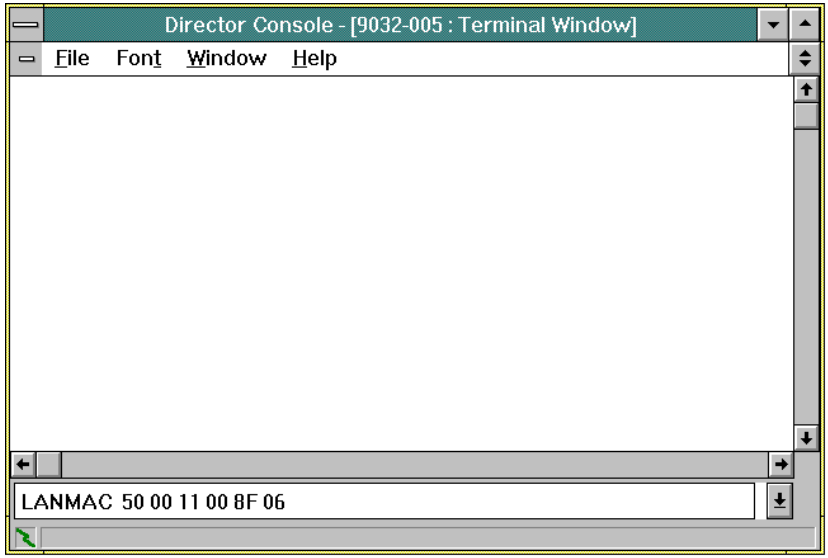


Figure 10-19. Terminal Window

6. To change the MAC address, type the following on the command line and press the **Enter** key. The MAC address is in the form *hh hh hh hh hh hh*, where *h* is a hexadecimal value.

   lanmac hh hh hh hh hh hh

   The Director-to-Console communication link drops and the link status indicator (bottom left corner of the window) changes to a red box with black slash, indicating the link is not operational.

7. Select the *Close Window* option from the *File* menu to close the *Terminal* window and return to the *Active Matrix* window.

8. Select the *IPL Director* option from the *Utility* menu. The following dialog box appears (Figure 10-20).

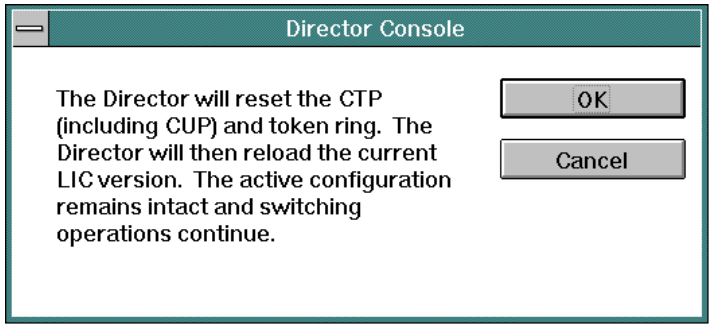


Figure 10-20. Reset CTP Card Dialog Box

9. Click the *OK* button. The *Operator Authorization* dialog box appears.
10. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Active Matrix* window reappears.
11. Simultaneously press the **Ctrl** and **Esc** keys to toggle to the OS/2 desktop.
12. Click the arrow on the *TCP/IP Cnfg.* drawer to open the drawer (Figure 10-21).

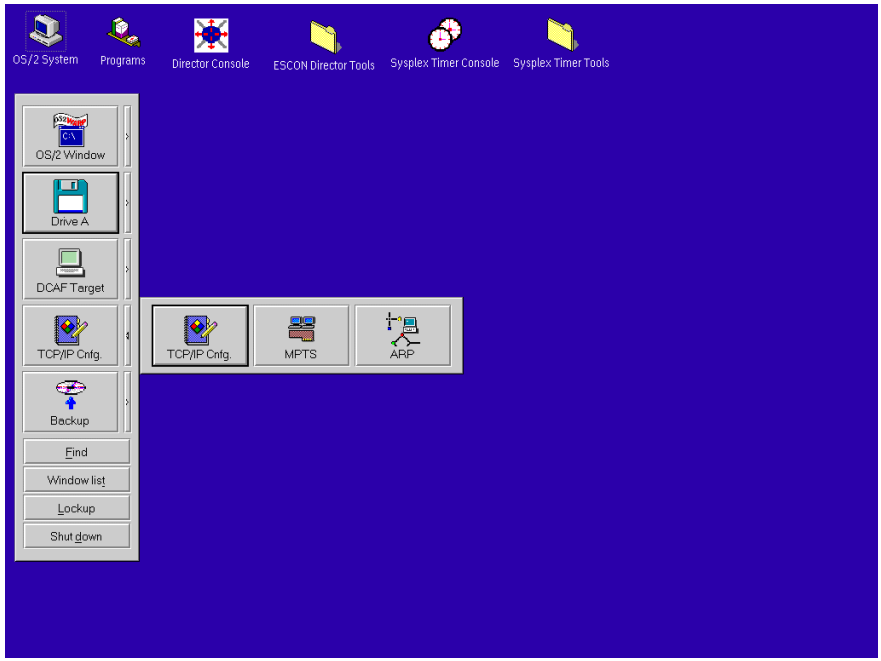


Figure 10-21. OS/2 Desktop (TCP/IP Cnfg. Drawer Open)

13. Click the *ARP* icon. This action clears the address resolution protocol (ARP) table, allowing the network to accept the new MAC address for LAN communications.

    Note: The Director operator panel displays the old MAC address. To display the new MAC address, reboot the Director Console or IML the Director.

14. Click the arrow on the *TCP/IP Cnfg.* drawer to close the drawer.
15. At the OS/2 desktop, double-click the *Director Console* icon. The Director Console application opens and the *Active Matrix* window appears.

Maintaining and Using a Replacement or Backup Console

You can maintain an additional Console to take over maintenance and operation of Directors should the primary Console fail. Depending on your requirements, you can use either a replacement or a backup Console.

Use the following procedures to maintain and use these Consoles.

Replacement Console

This section provides instructions to set up and use a replacement Console, synchronize data with the primary Console, and install the Console on the LAN.

A replacement Console is maintained off the LAN where the primary Console is attached. A system library for the replacement Console can be created to match the library for the primary Console by restoring the data from a backup ROC. “Task 10: Backing Up the System Library” in Chapter 6 for instructions to back up the system library to a ROC. For instructions on restoring data from a ROC, refer to “Restore the Console Fixed Disk from CD-ROM and ROC” in the chapter for your Console (chapter 7 or 8) in the *Console Installation and User’s Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).

Note: Ensure the IP address of the replacement Console is identical to the IP address of the primary Console. Because these addresses are identical, the replacement Console *cannot* be maintained on the same LAN (during normal operations) to which the primary Console is connected.

Set Up the Console

1. Perform “Task 1: Setting Up the Console” in Chapter 6,
2. If required, change the data rate for the replacement Console’s Token-Ring adapter card. Perform “Task 2: Configuring the Token-Ring Adapter Card” in Chapter 6.

3. Perform “Task 10: Backing Up the System Library” in Chapter 6 for the primary Console.
4. To synchronize data with the primary Console, perform steps under “Restore the Console Fixed Disk form CD-ROM and ROC” in the chapter for your Console (chapter 7 or 8) in the *Console Installation and User’s Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).

   Note: If any changes were made to the library on the replacement Console (such as changing matrixes and Director identifications), this process overwrites those changes.

Maintaining the Console

Periodically restore the system library for the replacement Console to synchronize data with the primary Console.

Note: Synchronize data on the replacement Console with the primary Console each time a change is made on the primary Console (perform steps 3 through 5 under “Task 1: Setting Up the Console” in Chapter 6). Establishing a regular schedule for this procedure is recommended to properly maintain the replacement Console.

Using the Console

If the primary Console fails:

1. Disconnect and remove the primary Console from the LAN.
2. Connect the replacement Console to the same MAU where the primary Console was attached using steps under “Task 3: Connect the Console to the MAU” in Chapter 6.
3. Switch on power.

Backup Console

This section describes the procedure to configure and use a backup Console, synchronize Console data with the primary Console, and install the Console on the Token-Ring LAN.

This Console is similar to the replacement Console. The only difference is the backup Console has a different IP address than the primary Console. Therefore, it can be attached and maintained on the same Token-Ring LAN as the primary Console.

This option provides faster replacement of the primary Console, since you only need to shut down the primary Console and start up the Console application on the backup Console if the primary Console fails.

Note: Do not operate the Console application on the primary and backup Console at the same time. Event and other critical data may be lost.

Set Up the Console

1. Perform “Task 1: Setting Up the Console” in Chapter 6“. Ensure the Token-Ring adapter card data rate is identical for the primary and backup Consoles. If required, change the data rate for the backup Console. Perform “Task 2: Configuring the Token-Ring Adapter Card” in Chapter 6.
2. Change the backup Console’s IP address so that it does not match the primary Console’s IP address. For example, the default address for all Consoles is 1.1.1.1. If that is the primary Console address, change the backup Console’s IP address to 1.1.1.2. Refer to procedures for setting the Token-Ring adapter IP address and subnet mask in the chapter for your Console (chapter 7 or 8) in the *Console Installation and User’s Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).
3. Perform “Task 10: Backing Up the System Library” in Chapter 6 for the primary Console.
4. Synchronize data with the primary Console, by performing steps under “Restore the Console Fixed Disk form CD-ROM and ROC” in the chapter for your Console (chapter 7 or 8) in the *Console Installation and User’s Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).
5. Perform “Task 3: Connect the Console to the MAU” in Chapter 6.

Maintaining the Console

Note: Synchronize the system libraries for the backup and primary Consoles each time a change is made to the primary Console by perform steps 3 through 5 under “Set Up the Console” for the replacement Console. Establishing a regular schedule for this procedure is recommended to properly maintain the backup Console.

Using the Console

If maintaining the backup Console as an active node on the LAN, do not start its Console application while the primary Console is operating. This will conflict with the primary Console’s communications with the Directors in its cluster.

If the primary Console should fail:

1. Switch off the primary Console's power.
2. At the backup Console, double-click on the *Director Console* icon located on the OS/2 desktop, to start the Console application and take over operation and maintenance of the Directors.

   Note: Do not place the Console icon in the system's startup folder

Attention!

Do not operate the Console application on the primary and backup Console at the same time. Event and other critical data may be lost.

Installing and Using a Remote Access Console

Using a remote Console, an operator assumes functional control of a local Console running the enterprise systems connection (ESCON) Director Console application or Sysplex Timer Console application. For complete instructions on installing and using a remote access Console, refer to Chapter 4, "Remote Access Console Support," in the *Console Installation and User's Guide: 9032 Models 3 and 5 ESCON Director, 9033 Model 4 ESCON Director, and 9037 Model 2 Sysplex Timer* (GA22-7291).

Appendix A. Incident Codes and Sense Data Summary

Introduction

This appendix provides information about incident codes, and operational and component definitions for the 32 (0 through 31) sense data bytes.

Incident Reporting

The table below lists incident codes (contained in sense byte 6), the incident type, incident description, and the component sense byte format (contained in sense byte 10). The report location column on the table defines the locations where the sense data is reported. These locations vary with the type of incident being reported.

Link, hardware, and software incidents are reported to the host channel. Link incidents (incident codes 01 through 06) are reported through an incident record. This record, 100 bytes in length, contains header information, an incident code descriptor, an attached node descriptor, and 32 bytes of sense data (incident-specific information). Incidents with codes greater than 06 are *not* reported through an incident record, but through 32 bytes of sense data. When incidents other than link incidents are reported to the host, the incident code contained in the sense bytes is 0.

If reported to the host channel, codes in the sense byte data are interpreted by the host application (such as NetView, the host Console, or ESCON manager) and displayed by the application in an appropriate format. This format may include additional text messages about the reported incident.

Link, hardware, and software incidents are reported to the Console through a 100-byte incident record containing a header, incident node descriptor, attached node descriptor, and 32 bytes of sense data. The full 32 bytes of raw sense data display in the Director event log. Also displayed in the log are text messages about the incident, the six-digit code that appears on the operator panel for the incident, and the date/time of the incident.

Only hardware and software incidents are reported to the operator panel as an event. When an event occurs, the incident code, severity code (from byte 10), and the device type and device number from the sense data appear on the second line of the LCD display. By pushing the *Detail* button on the operator panel, you can display the incident time and date and sense bytes 10 through 31.

Incident Codes

The following table lists incident codes (contained in sense byte 6), the incident type and description, the component sense byte format (contained in sense byte 10), and the location where the incident is reported.

Incident Code (Hex)	Incident Type	Incident Description	Sense Byte (11-26) Format	Report Location
01	Link Incident	Implicit incident. A condition which has been caused by an event known to have occurred within the incident node has been recognized by the incident node. The condition affects the attached link in such a way that it may cause a link incident to be recognized by the attached node.	Default LIN format	Console, Host
02	Link Incident	Bit-error-rate threshold exceeded. The number of code violation errors recognized by the incident node has exceeded a threshold.	Default LIN format	Console, Host
03	Link Incident	ESCD link failure, loss of signal or synchronization. A loss of signal or loss of sync condition has been recognized by the incident node, and it persisted for more than the link interval duration.	Default LIN format	Console, Host
04	Link Incident	Not operational sequence (NOS) recognized. The not operational sequence has been recognized by the incident node.	Default LIN format	Console, Host
05	Link Incident	ESCD link failure, sequence time out. The incident node has recognized either a connection recovery timeout or a timeout when timing for the appropriate response while in transmit-OLS state.	Default LIN format	Console, Host
06	Link Incident	ESCD link failure, invalid sequence for link-level_facility-state. Either a UD or UDR sequence was recognized by the incident node while in the wait-for-offline-sequence state.	Default LIN format	Console, Host
07		Reserved		
08		Reserved		

Incident Code (Hex)	Incident Type	Incident Description	Sense Byte (11-26) Format	Report Location
09	Hardware Incident	CTP hardware incident	Co-processor format Sense Byte 10 = x4	Console, Host, Operator Panel
0A	Hardware Incident	Crosspoint controller incident	Matrix Controller format Sense Byte 10 = x2	Console, Host, Operator Panel
0B	Hardware Incident	Online diagnostics incident	Diagnostics Info format Sense Byte 10 = x9	Console, Operator Panel
0C	Hardware Incident	Token-Ring controller adapter incident	Console Interface format Sense Byte 10 = xB	Operator Panel, Host, Console*
0D	Hardware Incident	Power supply incident	Co-proces sor format Sense Byte 10 = x4	Console, Host, Operator Panel
0E	Hardware Incident	Fan incident	Co-proces sor format Sense Byte 10 = x4	Console, Host, Operator Panel
0F	Hardware Incident	Operator panel Incident	Co-processor format Sense Byte 10 = x4	Console, Host, Operator Panel
10	Software Incident	CTP software failure. Unrecoverable software fault. The Director has detected some illogical condition from which it cannot recover. A unique fault code is assigned in the software to each fault condition and/ or point of detection.	Co-processor format Sense Byte 10 = x4	Console, Host, Operator Panel

Incident Code (Hex)	Incident Type	Incident Description	Sense Byte (11-26) Format	Report Location
11	Software Incident	Corrupted configuration file in nonvolatile RAM found during initialization process.	Co-processor format Sense Byte 10 = x4	Console, Host, Operator Panel
12		Reserved		
13	Software Incident	LAN protocol incident	Console Interface format Sense Byte 10 = xB	**
14	Information Only Incident	Link timeout incident. Device-level frame response timeout.	CUP format Sense Byte 10 = x3	**
15	Information Only Incident	CUP initiated connection recovery threshold exceeded	CUP format Sense Byte 10 = x3	**
16	Information Only Incident	Destination address error threshold exceeded	CUP format Sense Byte 10 = x3	**
17	Information Only Incident	Transmission error threshold exceeded	CUP format Sense Byte 10 = x3	**
18	Information Only Incident	Link protocol error threshold exceeded	CUP format Sense Byte 10 = x3	**
19	Information Only Incident	Device protocol error threshold exceeded	CUP format Sense Byte 10 = x3	**
1A	Information Only Incident	Reject limit threshold exceeded	CUP format Sense Byte 10 = x3	**
1B	Port Incident	Port hardware failure	Matrix Controller format Sense Byte 10 = x2	**

Incident Code (Hex)	Incident Type	Incident Description	Sense Byte (11-26) Format	Report Location
1C	Invalid Attachment Incident	Invalid attachment indicator. Sent when the ESCON Director detects that the link connected to a port could be the cause of an invalid attachment.	Port format sense byte 10 = x1	**
1D	Link Incident	Sub-threshold bit error (BER) incident. The number of code violations errors recognized by the incident node is between zero and the thresh old value. If the threshold value is exceeded, an 02 incident code is generated.	Diagnostics info format sense byte 10 = x9	**
1E	Link Incident	Device error threshold detected	Error threshold detection info format sense byte 10=x5	Console, host, operator panel
20	Hardware Incident	Power-on diagnostic failure	Diagnostics info format sense byte 10 = xE	Console, host, operator panel
C0		Director Console DLC error No Director involvement	Director Console format sense byte 10 = x8	**

***** Token-Ring incidents related to the backup are sent to the Console.

****** These incidents are reported to the Console, the host, or the operator panel depending on the severity level of the incident and other circumstances.

The formats for sense bytes 11 through 26 depend on the format code generated in sense byte 10. There are at present eight format definitions:

- Port information format, sense byte 10 = x1
- Matrix controller format, sense byte 10 = x2
- CUP information format, sense byte 10 = x3
- Coprocessors information format, sense byte 10 = x4
- Error threshold detection information format, sense byte 10=x5

- Director Console interface information format, sense byte 10 = x8
- Online diagnostics format, sense byte 10 = x9
- Console LAN Interface information format, sense byte 10 = xB
- Diagnostic power-on log Format, sense byte 10 = xC

For information on further defining these sense bytes for troubleshooting, contact the next level support personnel.

Sense Data Bytes

Sense bytes 0 through 10 and 27 through 31 are common sense bytes. These bytes are common to all attached equipment and not device-dependent. Sense bytes 11 through 26 are device-dependent and called “component” sense bytes. The format for sense bytes 11 through 26 depends on the format code generated in sense byte 10.

When an unusual condition occurs, the sense bytes are recorded to better describe the condition. Depending on the nature of the condition, the record is written to an ESCON Director log file, the host system, the operator panel, or to a combination of these. Refer to "Incident Reporting" on page A-2 for additional information. The Director logs containing sense byte information are:

1. The **Director event log**, which contains Director hardware and software event incidents reported to the Console by the Director.

   The first line of the log entry contains the following columns of information:

   – **OP Panel** - This column mirrors the contents of the event code displayed on the operator panel.

   – **Date** - The date the incident was logged.

   – **Time** - The time the incident was logged.

   The second line of the log contains the 32 bytes of raw sense byte information.

2. The **Director LIN log** (link incident notification), which contains link incident records reported to the Console by the Director. The log contains the following columns of information:

   – **Port** - The number of the port reporting the incident.

   – **Addr** - The address of the port reporting the incident.

   – **Incident** (qualifier) - IBM-specified incident information reported by the port.

   – **Date** - The date the incident was logged.

   – **Time** - The time the incident was logged.

The second line of the LIN log identifies the hardware attached to the port. The hardware is described in the same format as in the node descriptor List. The third line of the LIN entry is the raw sense byte information. All 32 sense bytes are displayed. When a log is selected from the matrix window's *Maintenance* menu, that log's data is displayed as illustrated in Figure A-1 and Figure A-2.

```
Error                                          Op Panel      Date          Time
Incident Code type -description                IC/ptii       Date          Time
Examples:
Error                                          Op Panel      Date          Time
S/W - Backup CTP Failure                       09/4201       5/26/94       09:21:17 PM
00019003 04051007 08090106 860D0E0F 10111213 14151617 18191A1B 1C1D1E1F

H/W - Fan                                      0E/3702       5/27/94       07:11:14 AM
00019003 04050E07 08090104 840D0E0F 10111213 14151617 18191A1B 1C1D1E1F
```

Figure A-1. Director Event Log Sample Format

```
Port      Addr          Incident (Qualifier)                          Date  Time
Port #    Port Address  Error Description                             Date  Time
Examples:
Port    Addr    Incident (Qualifier)                  Date       Time
7B      FA      Loss of Signal/Sync                   06/02/94 1:44:30
 Node: Valid:Device 0B 009035-000 IBM-41 000000001120
Data: 20009800 00000502 0140017B FA000000 00000000 00000000 00000000
00001FB1

7B      FA      Invalid Sequence (00)                 06/02/94 1:59:18
 Node: Valid:Device 0B 009035-000 IBM-41 000000001120
Data: 20009800 00000502 0140017B FA000000 00000000 00000000 00000000
```

Figure A-2. Director LIN Log Sample Format

Common Sense Bytes

Sense bytes 0 through 10 and 27 through 31 are defined as common sense bytes. These bytes are common to all attached equipment and are not device-dependent.

Sense Byte 0	
0	Command reject
1	Reserved
2	Bus-out check
3	Equipment check
4	Reserved
5	Overrun
6 and 7	Reserved

Sense Byte 1 (ESCD Failure)	
0 - 2	Reserved
3	ESCD Console failure
4	Sense data incomplete
5	Reserved
6	Error during recovery
7	Diskette failure

Sense Byte 2 (DSC Action 0)	
0	Maintenance record information
1	Write an ERDS record
2	Write operator message
3	Information only record
4	Incident record indicator
5	Spare port available indicator
6	Asynchronous report to follow
7	Invalid attachment indicator

Sense Byte 3 (DSC Action 1)	
0	Channel initiated unit check
1	Resetting event indicator
2	Reset allegiance indicator
3	Successful test key and increment
4-7	Reserved

Sense Byte 4 (PI Errors)	
0-7	Command code of rejected command

Sense Byte 5 (PI Errors)	
0-7	Command reject error code

Sense Byte 6 (Interface Incident Record)	
0	Alternate reporting mechanism
1-7	Incident codes

Incident Codes for Sense Byte 6	
0x01	Implicit error
0x02	Bit error rate threshold exceeded
0x03	Link failure - loss of signal or synchronization
0x04	Not operational sequence recognized
0x05	Link failure - sequence time-out
0x06	Link failure - illegal sequence for link state

Sense Byte 7 (ESCD Type Identification)	
ESCD Type Codes for Sense Byte 7	
0-3	Reserved
4-7	ESCD type code
0	9032 Model 2
1	9033 Model 1
2	9032 Model 3
3	9033 Model 4
4	9032 Model 5
5-F	Not used

Sense Byte 8 and 9 (LIC Version/Release)	
0-15	LIC version/release

Sense Byte 10 (Error Descriptor)	
0-3	Error severity code
4-7	Information format code (defines format of sense bytes 11-26)

Error Severity Codes, Sense Byte 10, Bits 0-3	
Code	Description
0	Fully operational
1	Fully operational; redundant component failure
2	Operational; minor failure
3	Operational; major failure
4	Not operational
5	Cannot determine operational level
6-F	Reserved

Information Format Codes, Sense Byte 10, Bits 4-7	
Code	Description
0	Not used
1	Port information
2	Matrix controller/ matrix switch port
3	CUP information
4	Co-processor
5	Dev error threshold exceeded
6	Reserved
7	Reserved
8	Shared PC Console
9	Online diagnostics
A	Reserved
B	Console LAN interface
C	Diagnostic power-on log (PLOG)
D	Reserved
E	Power-on diagnostic failure
F	Reserved

Sense Bytes 27-28 (ESCD Overall Operational Status)	
0-3	Operation status code (overall status, based on hardware status)
4-7	FRU code 1
8-11	FRU code 2
12-15	FRU code 3

Operational Status Codes, Bits 0-3, Sense Bytes 27 & 28	
0	Fully operational
1	Fully operational; redundant component failure
2	Operational; minor failure
3	Operational; major failure
4	Not operational
5	Cannot determine operational level
6-F	Reserved

FRU Bytes	
0	No additional FRUs
1	Matrix controller (MXC)
2	Control processor (CTP)
3	Matrix switch (MXS)
4	LED port (DVP)
5	Laser port (DVP2)
6	Reserved
7	Fan assembly (FAN)
8	Power supply (PWR)
9	ESCD Console (CON)
A	Token-Ring (TKRG) controller adapter
B	Front (operator) panel (FP)
C	LED 4 port spare (SDVP)
D	LED 2 port/laser 2 port Spare (SDV2)
E	Logic board assembly (LBA)
F	Fibre Channel converter (FCV) port card (FICON)
G	3.3 and 5.0-volt power supply (PWR2)
H	FICON-capable matrix controller (MXC2) card
I-V	Reserved

Sense Byte 29	
0-7	Reserved

Sense Bytes 30 - 31 (Current failure FRU code)	
0-3	FRU code 1
4-7	FRU code 2
8-11	FRU code 3
12-15	FRU code 4

Component Sense Bytes

Because sense bytes 11 through 26 are device dependent, they are called the component sense bytes. The format for information in sense bytes 11 through 26 depends on the format code generated in sense byte 10. This format code is defined for the various incidents listed in the Incident Codes table.

Port Information Format- Sense Byte 10 = x1

Format x1 is used for port failures and other information.

Sense Byte 11	
0-7	Incident port number

Sense Byte 12	
0-7	Incident port address

Sense Byte 13- Incident Port Status Register	
0-4	Reserved
5	Laser transceiver fault line; undefined if LED device port
6	Engineering use only
7	A frame other than IDLE was received

Sense Byte 14- Incident Port Error Register	
0	Engineering use only
1	Rx or Tx FIFO overflowed
2	Engineering use only
3	Engineering use only
4	Engineering use only
5	CRC error in receive frame
6	Engineering use only
7	Code violation

Sense Byte 15	
0-7	Port RX sequence code

Incident Port RX Sequence Register Codes, Sense Byte 15	
Code	Description
0x00	Received IDLE
0x01	Received unconditional disconnect sequence (UD)
0x02	Received UD response sequence (UDR)
0x03	Received offline sequence (OLS)
0x04	Received not operational sequence (NOS)
0x05	Detected loss of light or signal (COS)
0x06	Reserved, place holder for static passthrough
0x07	Sequence error detected
0x08	Reserved, spare ordered set K28.5 D31.2
0x09	Reserved, spare ordered set K28.5 D01.2
0x0A	Reserved, spare ordered set K28.5 D02.2
0x0B	Reserved, spare ordered set K28.5 D04.2
0x0C	Reserved, spare ordered set K28.5 D08.2
0x10	Sequence change detected

Sense Byte 16 - Incident Port PCB Port Descriptor Field Flags	
0-3	Reserved
4	Offline due to hard failure, service required
5	Held offline by service representative (maintenance mode)
6	Held offline by customer (blocked)
7	Configured as dedicated connection

Sense Byte 17	
0-7	Port TX sequence FSM state codes

Incident Port TX Sequence FSM State codes, Sense Byte 17	
Code	Description
0x00	Power on
0x01	Offline hold, offline transmit substate (Tx: OLS)
0x02	Offline wait (Tx: NOS)
0x03	Offline transmit (Tx: OLS)
0x04	Offline receive (Tx: UD)
0x05	Transmit NOS (Tx: NOS)
0x06	Transmit OLS (Tx: OLS)
0x07	UD transmit (Tx: UD)
0x08	UD receive (Tx: UDR)
0x09	UDR receive (Tx: IDLE)
0x0A	INACTIVE (Tx: IDLE)
0x0B	WORKING
0x0C	STATIC transmit OLS (Tx: OLS)
0x0D	STATIC pass through

Sense Byte 18	
0-7	Number of ESCON server ports (FCV)

Sense Bytes 19-25	
0-7	Connected port information. Refer to bytes 11-18 for format description.

Sense Bytes 26	
0-7	Number of non-operational ESCON server ports (FCV)

Matrix Controller Format- Sense byte 10 = x2

Format x2 is used for the matrix controller, matrix switch, LED port, and laser port hardware failures.

Sense Bytes 11-14	
0-31	Elapsed 25ms ticks since Director started

Sense Byte 15	
0-7	Port Number or 0xFF if N/A

Sense Byte 16	
0-7	Matrix controller/matrix switch device number or 0xFF if N/A

Sense Byte 17	
0-7	Engineering use only

Sense Byte 18	
0-7	Engineering use only

Sense Byte 19	
0-7	Engineering use only

Sense Byte 20 - Bit Flags Representing DVP Detected TX/RCV and Other Misc Errors	
0	MXC was not released by DVP (subject port number not equal 0xFF)
1	Operational port was found spontaneously reset (masked)
2	Laser fault
3	Engineering use only
4	Engineering use only
5	RX or TX FIFO overflowed
6	Engineering use only
7	CRC error in receive frame

Sense Byte 21	
0-7	Engineering use only

Sense Byte 22	
0-7	Engineering use only

Sense Byte 23	
0-7	Engineering use only

Sense Bytes 24	
0-7	Event type qualifier

Event Type Qualifier	
Code	Description
0x00	No event qualification
0x01	No MXC/MXS found
0x02	The second MXC/MXS was removed. The device number is in byte 16.
0x03	An MXC/MXS was installed. The device number is in byte 16.
0x04 - 0x05	Reserved
0x06	User induced switch to backup MXC/MXS
0x07	MXC is not hunt-group capable and the capability is required (FCV recognized)
0x08	An internal port on an FCV port card failed. The port number is in sense byte 15.
0x09	An FCV port card experienced a hardware failure. The affected port number is in sense byte 15. Auxiliary data is available in sense bytes 21, 22, and 23.
0x0A	An FCV port card that exceeds the maximum number supported has been installed. The port number is in sense byte 15.
0x0B	An FCV port card faulted. The port number is in sense byte 15. Sense bytes 21, 22, and 23 contain the six-digit fault code.
0x0C	An FCV port card failed to complete initialization. The port number is in sense byte 15. Sense byte 21 contains a reason code.
0x0D	An FCV port card lost communications with the SSP. The port number is in sense byte 15.
0x0E	An FCV port card (sense byte 15) was installed in a Director with a non-FICON MXC card

Sense Byte 25	
0-7	Connected port when a port-to-port five-bit MXC/MXS data bus parity error was detected (SB[17]. bit[1], 0x40, set) or 0xFF if N/A or unknown. Under rare conditions, the port hardware may detect a parity error but fail to latch the connected port number

Sense Byte 26	
0	Subject port (SB[15]) is the receiving port
1-3	Reserved
4	MXC is suspected failing MXC/MXS card
5	MXS0 is suspected failing MXC/MXS card
6	MXS1 is suspected failing MXC/MXS card
7	Spare port of the same technology available

CUP Information Format - Sense byte 10 = x3

Format x3 is used for control unit port (CUP) information.

Sense Byte 11	
0-7	Port number

Sense Byte 12	
0-7	Port address

Sense Byte 13	
0-7	Path_id

Sense Byte 14 - Status	
0-7	Status code

Status codes from Sense Byte 14	
Code	Description
0x00	Not operational
0x01	Operational

Sense Byte 15 - Exception Class	
0-7	Exception class codes

Exception Class Codes, Sense Byte 15	
Code	Description
0x01	Switch connection recovery
0x02	Destination address error
0x03	Transmission error
0x04	Link protocol error
0x05	Device protocol error
0x06	Rejection limit exceeded

Sense Bytes 16-17	
0-15	Engineering use only

Sense Byte 18-19	
0-15	Engineering use only

Sense Byte 20-26	
0-7	Reserved

Coprocessors Information Format - Sense Byte 10 = x4

Format x4 is used for primary and backup (if installed) control processor (CTP) failures and other information.

Sense Byte 11	
0-7	CTP event type code

CTP Event Type Code From Sense Byte 11	
Code	Description
0x01	Master fault without backup
0x02	Backup self test failure
0x03	Backup failed
0x04	Backup faulted
0x05	Backup not present
0x06	FCC-IOC failed
0x07	Master SCC errors detected
0x08	NV scrubbed on backup CTP
0x09	Reserved
0x0A	Backup became operational
0x0B	IPL after Flash updated on CTP
0x0C	Reserved
0x0D	Reserved
0x0E	Director IML'ed
0x0F	Power On of Director
0x10	During initialization, could not read "current" configuration file. Fall back to IPL configuration file.
0x11	During initialization, could not read IPL configuration file. Fall back to default configuration file.
0x12	User induced switch to backup CTP

Sense Byte 12	
0-7	CTP device number

Sense Byte 13	
0-7	Reserved

Sense Bytes 14-17	
0-7	Engineering use only

Sense Byte 18	
0-7	CTP dump status codes

CTP Dump Status Codes From Sense Byte 18	
Code	Description
0x01	No dump
0x02	Dump good
0x03	Dump failed

Sense Byte 19	
0-7	Device number for dump

Sense Bytes 20	
0-7	Reserved

Sense Byte 21	
0-7	Front panel failure type code

Front Panel Failure Type Code, Sense Byte 21	
Code	Description
0x00	No failure reported
0x01	Front panel failure (EEPROM write failure or device not present)

Sense Byte 22	
0-7	Fan event type code

Fan Event Type Code, sense Byte 22	
Code	Description
0x01	Fan failed, two working assemblies left
0x02	Fan failed, one working assembly left
0x03	Fan failed, none left
0x04	New fan started
0x05	Insufficient fans, power off
0x06	Appears just prior to fan power off

Sense Byte 23	
0-7	Fan device number

Sense Byte 24	
0-7	Power Supply event type code

Power Supply Event Type Code, Sense Byte 24	
Code	Description
0x01	First of two power supplies failed
0x02	Reserved
0x03	Power supply removed
0x04	Power supply replaced
0x05	Redundant power supply recovered from failure
0x06	False power fail indication. Sent when Director is power cycled after a power supply failure is detected and power did not fail. No qualification bits.

Sense Byte 25	
0-7	Failed power supply device number

Sense Byte 26	
0-7	Power supply event qualification

Power Supply Failure Reason, Sense Byte 26	
Code	Description
0x01	AC power
0x02	DC voltage
0x03	Power supply fan

Error Threshold Detection Information Format - Sense Byte 10 = x5

Sense Byte 11	
0-7	Port number

Sense Byte 12	
0-7	Port address

Sense Byte 13	
0-7	path_id

Sense Byte 14	
0-7	Status code

Status Codes	
Code	Description
0x00	Not operational

Sense Byte 15 Exception Class	
0-7	Exception class codes

Exception Class Codes	
Code	Description
0x04	Link protocol error
0x05	Device protocol error

Sense Bytes 16-17	
0-15	Exception Rcode

Sense Bytes 18-19	
0-15	Exception count

Sense Byte 20	
0-7	Affected port number

Sense Byte 21	
0-7	Affected port address

Sense Byte 22	
0-7	Threshold limit (errors per interval)

Sense Byte 23	
0-7	Threshold interval (seconds)

Sense Byte 24	
0-7	Reserved

ESCD Console Interface Information Format - Sense Byte 10 = x8

Format x8 is used for Console error and status information.

Sense Byte 11	
0-7	Console error class code

Console Error Class Codes, Sense Byte 11	
Code	Description
0x00	DLC errors

Sense Byte 12	
0-7	DLC error type codes

DLC Error Type Codes, Sense Byte 12	
Code	Description
0x00	Link down
0x01	Link up
0x02	Link incompatible

Sense Byte 13-14	
0-16	DLC error data (only valid if byte 12 = link incompatible or link down)

DLC Error Type Codes, Sense Byte 13-14	
Code	Description
0x0001	Protocol level mismatch
0x0002	Model number mismatch
0x0003	Director already in session with another Console
0x0004	Link locally reset by user
0x0005	Link timed out
0x0006	Link remotely reset by Director
0x00FF	Undefined error modifier

Sense Bytes 15-26	
	Reserved

Online Diagnostics Format - Sense byte 10 = x9

Format x9 is used for online diagnostic test information, status, results.

Sense Byte 11- CTP General Status Register	
0-2	Three bits defining model description code.
3	A one indicates the CTP has had a read timeout referencing off-board memory or memory mapped I/O
4	A zero indicates that a bus parity error has occurred between the CTP and one of the MXCs, DVPs, or CUP.
5	A one indicates that a write fault occurred on an access to local DRAM memory.
6	A one indicates that the CTP has had a ready timeout when accessing local memory.
7	A zero indicates that a DRAM parity error has been detected.

General Status Register Model Description Code	
Code	Description
0x00	256 port capacity code (reserved)
0x01	124 port capacity code (9032)
0x02	64 port capacity code (reserved)
0x03	32 port capacity code (reserved)
0x04	16 port capacity code (9033)
0x05-0x07	Reserved

Sense Byte 12 - MXC Control register	
0	Always set
1	Reserved
2-7	Engineering use only

Sense Byte 13 - MXC Control register	
0	MXC is online only to support OLS states
1	(9032-005 only) amber LED is on
2	(9032-005 only) green LED is on
3-7	Engineering use only

Sense Byte 14	
0-7	Current test ID code

Current Test ID Codes, Sense Byte 14	
Code	Description
0x00	None
0x01	Internal loopback test
0x02	External loopback test
0x03	Channel wrap test
0x04	Matrix controller data test
0x05	FCV bridge card diagnostic test set
0x06	Reserved

Sense Bytes 15-22	
0-7	EPI port information (refer to format type 01 for port information — bytes 11-18)

Sense Bytes 23	
0-7	Bit error (BER) count (for incident 0x0D only)

Diagnostic Failure Qualifiers, Sense Bytes 24	
0-1	Reserved
2-3	FCV failure severity code
4	MXC failed test
5	MXS0 failed test
6	MXS1 failed test
7	15A pattern test failed

FCV Failure Severity Codes	
Code	Description
0x00	No error
0x01	External wrap test failed; possible operator error
0x02	Redundant component (such as server ports) failed
0x03	Required component (such as FC port ASIC) failed

Sense Byte 25	
0-7	MXC/MXS board set number

Sense Byte 26	
0-7	Reserved

Console LAN Interface Information Format - Sense Byte 10 = xB

Format xB is used for Token-Ring (TKRG) controller adapter failures, status, and other information

Sense Byte 11	
0-7	Event Type Code

Event Type Codes, Sense Byte 11	
Code	Description
0x01	Logical LAN fault (recovered)
0x02	TKRG adapter fault (recovered)
0x03	TKRG adapter failure (unrecoverable)
0x04	TKRG adapter removed
0x05	TKRG adapter replaced (recovered)
0x06	Reserved
0x07	TKRG loaded but activate failed (see bytes 18-21)
0x08	TKRG network management reported IOC error (see bytes 18-21)
0x09	Link connection lost due to some reason other than graceful shutdown of Console application
0x0A	Reserved
0x0B	TKRG that previously failed is being loaded and brought online
0x0C	TKRG IML load failure
0x0D	TKRG debounce insertion error
0x0F	User induced switch to backup TKRG

Sense Byte 12	
0-7	TKRG adapter device number (note that 0xFF indicated device number unknown)

Sense Byte 13-16	
0-7	Engineering use only

Sense Bytes 17	
0-7	Engineering use only

Sense Bytes 18-19	
0-15	NWM error code

NWM Error Code, Sense Bytes 18-19	
Code	Description
0x0000	Network available
0x0101	Network unattached
0x0102	Network reattached
0x0103	Network disabled
0x0104	Physical layer initialization error
0x0105	Physical layer open failure
0x0107	Physical layer beaconing
0x0108	Physical layer counter threshold
0x0201	Link layer counter threshold

Sense Bytes 20	
0-7	NWM flags1 (Valid if non-zero value in NWM error code field (bytes 18-19)

NWM Flags1 Definitions, Sense Bytes 20	
Code	Description
0xA5	Network adapter error
0xA7	Network open error
0xA9	Network duplicate address
0xAD	Counter threshold
0x00 0x20	Error reading TI microcode file in flash memory during network activate sequence

Sense Bytes 21	
0-7	NWM cmd_mod Can have values 0-7 and 58. Used primarily to locate error detection location in code.

Sense Byte 22-26	
0-7	Spare

Diagnostic Power-on Log Format - Sense byte 10 = xC

Format xC is used for PLOG results.

Sense Byte 11	
0-7	PLOG event type code

PLOG Event type code, Sense Byte 11	
Code	Description
0x01-0x0B	Reserved
0x0C	PLOG data available for master CTP
0x0D	PLOG data available for backup CTP

Diagnostic Power-on Log Format - Sense byte 10 = xE

Format xE is used for power-on diagnostic failure information.

Sense Byte 11	
0-7	CTP device number

Sense Byte 12	
0-7	Failing FRU code

Sense Byte 13	
0-7	Failing FRU device or port number

Sense Byte 14	
0-7	PLOG error detail code

Sense Byte 15-18	
0-7	PLOG error data

Sense Byte 19-26	
0-7	Reserved

Appendix B. Messages

Error and Information Messages

Messages may be displayed in message boxes, requiring the selection of an option before any other operation can be completed. Icons in the message box indicate the severity or nature of the message.

(**?**) requires selection of an option before completing the operation.

(**!**) warns of possible undesirable results if the operation is completed. A *Cancel* button is available to abort the operation.

(i) is informational only and is accompanied by an *OK* button to acknowledge the information displayed.

Matrix Window Messages Setting Attributes

These messages (in bold type) appear in message boxes if an invalid operation is attempted while setting attributes in the matrix window. The ***<addr>*** indicated in the messages below is replaced by a port address number in hexadecimal in the displayed error message box. Information following the messages below may help you solve any problems.

Address *<addr>* is already dedicated to address *<addr>*. Replace with new dedicated connection, or delete current dedicated connection? - An attempt was made to set a dedicated connection between two port addresses where one port already has a dedicated connection. Selecting *Replace* will remove the current connection from the one address and replace it with a connection at the intersection of the two selected ports. *Delete* will remove the existing dedicated connection without setting a new one.

An address may not be dedicated to itself! - In setting the dedicated connection intersection address for a port address from the *Names and States* dialog box, the *Dedicated to Address* field may not contain the same address as the one in the dialog box title.

Both addresses are already dedicated to other addresses. Replace BOTH with a single new dedicated connection? - An attempt was made to set a dedicated connection between two port addresses that have both already been assigned dedicated connections to other addresses. Selecting *Replace* will remove both of the previous dedicated connections and make a single dedicated connection between the two selected ports.

Cannot activate configuration with dedicated connection to uninstalled port If a dedicated connection is set with one address assigned to a port that is not installed on the Director, the configuration cannot be activated. Check the hardware status column (refer to status columns) for a **NotInst** condition for any dedicated connections.

Dedicated address must be in the range of *<addr>* through *<addr>* - A dedicated address has been entered that is not valid for the Director.

Port address must be in the range of *<addr>* through *<addr>* - In dialog boxes requiring an address specified in a field, the values must be within the range of those supported by the Director.

Cannot set dedicated connection to uninstalled port - On an active matrix, dedicated connections may not be set for addresses associated with uninstalled ports. Refer to the status columns for determining uninstalled ports.

Cannot activate a configuration containing a dedicated connection to an uninstalled\unaddressable port - You cannot activate an active or saved matrix with an invalid port dedication.

Converter ports must remain prohibited from other converter ports. Continuing will preserve all prohibits between converter ports. - A user is not permitted to alter the prohibit attribute of intersecting converter ports by merging or activating a saved matrix. To continue the desired operation, the user must acknowledge that prohibits between converter ports will be preserved.

This name duplicates an existing name. Enter a unique name. - Two port addresses cannot have the same port address name. This name is already in use on this Director. Enter a new port address name.

Activation failed due to unauthorized changes to Port Name - This message is displayed if there are changes to port names for ports that the activating operator ID does not have authorization to change. This could occur if one operator ID was used to perform editing operations in the matrix window and a different operator ID password was supplied at activation time.

Activation failed due to unauthorized dedicate/undedicate request - This message is displayed if there are changes to the dedicated state for ports that the activating operator ID does not have authorization to change. This could occur if one operator ID was used to perform editing operations in the matrix window and a different operator ID password was supplied at activation time.

Activation failed due to unauthorized block/unblock request - This message is displayed if there are changes to the blocked state for ports that the activation operator ID does not have authorization to change. This could occur if one operator ID was used to perform editing operations in the matrix window and a different operator ID password was supplied at activation time.

Activation failed due to unauthorized prohibit/allow request - This message is displayed if there are changes to the prohibit state for ports that the activation operator ID does not have authorization to change. This could occur if one operator ID was used to perform editing operations in the matrix window and a different operation ID password was supplied at activation time.

Enabled Operator is not authorized to break dedicated connection between ports (port address 1) and (port address 2). - An enabled operator must be authorized for both ports involved in a dedicated connection in order to undedicate those ports.

Status Line Messages

Messages may be displayed on the status line during normal operation of the Console. These messages are often informational only and usually occur without operator action. The messages are transient and are overwritten by subsequent messages. The messages are cleared by normal keystrokes and double-clicking the mouse anywhere on the matrix window. Notification messages do not require any response action.

The following messages (in bold) can be found in the status line of a Director: Information following the messages may help you solve any problems.

Activation of configuration failed - The current configuration could not be activated on the Director. This notification should have been accompanied by an error message indicating the reason for the failure.

Address self-intersection. Prohibited or dedicated connections are not Allowed. - An attempt was made to set a prohibited or dedicated connection on the matrix at the intersection location of an address with itself.

Allow/Prohibit attribute copy complete - Notification that the allowed/prohibited data currently in the copy/paste buffer has been successfully pasted to the currently selected row.

Allow/Prohibit attributes for current address copied to buffer - Notification that the allowed/prohibited data for the currently selected row has been successfully copied to the copy/paste buffer.

Cannot activate configuration with Dedicated connection to uninstalled/unaddressable port - On a saved or a new matrix, dedicated connections may be set for any port address intersection, allowing pre-install configurations. However, if one of the ports is not installed on the selected Director, this message is displayed, warning that the configuration may not be activated with the port uninstalled. Refer to status columns for determining uninstalled ports.

Cannot set Dedicated connection to uninstalled/unaddressable port. - On a saved or a new matrix, dedicated connections may be set for any port address intersection, allowing pre-install configurations. However, if one of the ports is not installed or unaddressable on the selected Director, this message is displayed, warning that the connection can not be made to an uninstalled/unaddressable port.

Cannot set dedicated connection to converter port - You cannot establish a dedicated connection to a converter port in the *Active Matrix Window*.

Cannot activate configuration with dedicated connection to converter port - A warning that setting a dedicated connection to a converter port in the *Saved Matrix Window* will prevent the matrix from being activated.

Configuration saved - Notification that *Save Configuration Matrix* or *Save Configuration Matrix As...* option completed successfully.

Director data has changed. Some pending changes may have been deleted. - Currently displayed active matrix configuration data has been overwritten by changes from ESCON manager. Some changes you had made on the displayed matrix may have been overwritten. Only the categories (allowed/prohibited, dedicated, or blocked) that were changed by ESCON manager were changed on the matrix, so some of your changes may not have been overwritten. Changes not overwritten are still indicated by highlighting.

Director is fully operational - Notification that the Director operational status indicates the Director is fully functional with no errors indicated. This message may be displayed when the Token-Ring link is established between the Director and the Console, and at any time that the Director operational status is checked.

Director status conditions are not current - Director status could not be obtained, usually because the link to the Director is not available or an error has occurred in obtaining the status.

Director status is degraded! - The Director is not fully operational. This may be only because a redundant component has failed, or it may be due to a more serious failure.

Dynamic connections between converter ports are not permitted - You cannot directly alter the prohibit requirement between converter ports in the *Active Matrix Window*.

Dynamic connections between converter ports are not permitted. Operation successful on all other selected cells. - Attempting to alter the prohibit characteristic between converter ports in the *Active Matrix* window indirectly by the *Prohibit Range*, *Prohibit Row* or *Paste* menu item informs the user that all selected prohibits may not have been removed.

Log file contents have changed - While viewing a log file (log window), the log's contents have changed (since the last time the log window was refreshed or first displayed). Use the *Refresh* option on the *File* menu to redisplay the log with the latest information.

No Allow/Prohibit data in buffer for Paste operation - An attempt was made to paste a line of allowed/prohibited data without first copying the data. Refer

to “Copy and Paste” in *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors*.

Port/Address mapping has been changed - The mapping of physical ports to logical addresses has been changed on the Director by another user (usually ESCON manager). The effect of this can usually be seen by the presence of asterisks next to affected addresses in the address column on the left of the matrix window.

Selected configuration data activated. - Notification that the *Activate Configuration Matrix* option completed successfully.

The configuration matrix is not initialized with current Director data. F4 to re-read - A link error between the Director and the Console software has prevented the display of current configuration data for the active matrix window.

The Director is offline - Notification that the Director has been set offline. This message accompanies the change in the Director status indicator on the Status line.

The hardware status field was updated. - Changes to the hardware status column have been made by the Director. You may wish to review the new status for all ports.

The mode register has been changed (Active = Saved, Remote Offline Control, and/or User Alert) - Changes have been made by another user (usually ESCON manager) to the Director mode register. This may be the *Active = Saved*, remote offline control or the user alert modes. The current state of the first two modes is seen by check marks on these options from the *Utility* menu. If the user alert mode is set by the host, attempting to activate a configuration will display a warning message.

Activation in progress - The saved matrix is in the process of becoming the current active matrix for this Director (activated).

Director is performing an IPL - An IPL has been initialized for this Director. The Director is not taken offline during this action.

File Logging Active - *Terminal* window status line message. The *capture* command of the *Terminal* window *File* menu is active. This message remains in the status line until either the session ends or the *capture* command is revoked.

Error Messages During Director/Console Exchange

The messages (in bold type) may appear in abnormal circumstances during execution of a command. They appear in pop-up message boxes if the command exchange between the Director and the Console fails. Information following each message below may help solve any problems.

Could not access matrix configuration file - During a read or write of a saved matrix configuration, the Console could not access the file. A secondary message is displayed indicating the reason for the failure (such as a disk error, or the Director rejected the command to read an IPL file).

The link is busy. Try again later. - The Console is currently busy with too many other commands. Allow traffic to diminish and try the command again.

The Director did not respond in the time allowed - A command was sent to the Director, but no response was received within an acceptable time limit. If the link is available to the Director (the link status indicator is OK), try the command again.

Director is in an allegiance condition. Would you like to reset allegiance? - The Director has not responded to a command possibly because it is in allegiance with a host user. This only occurs if the Director is "stuck" in allegiance with that user. Select the *Reset* button to reset allegiance on the Director, then retry the command.

The Director rejected the command - The command exchange was completed, but parameters in the command were not currently valid. Verify that configuration parameters (matrix attributes) are valid and try the command again. If the command continues to be rejected, record all steps taken that cause the error and contact your support personnel.

Director is not responding - Retry the operation. If it still fails call your next level of support.

Insufficient memory is available to access the Director. - Unable to allocate sufficient memory to complete the Console operation. Close other running applications and reissue the command. If the problem persists, contact your next level of support.

Insufficient buffers are available to access the Director. - The Console is unable to allocate a buffer necessary for communication with the Director. Close other running applications and reissue the command. If the problem persists, contact your next level of support.

The Director is busy. Try again later. - The Director is currently busy with other commands. Reissue the request in a few minutes.

The Director does not support the requested feature - An unknown request has been received by the Director. Contact your next level of support.

The Director is in allegiance - The Director has not responded to a command possibly because it is in allegiance with a host user. This only occurs if the Director is “stuck” in allegiance with that user. Select the *Reset* button to reset allegiance on the Director, then retry the command.

This unit is under host control. Do you really want to activate? - This message is displayed on the Console when trying to activate a configuration when ESCON Manager has set the user alert mode (one of the mode register controls) for the Director. It warns that configuration changes may be pending from an operator on the host-based software. The configuration can still be activated on the Director by selecting the *Activate* button.

The link is unavailable. Try again when the link is restored. - The Director has not responded to a command possibly because it is in allegiance with a host user. Try the command again.

Changes pending. Retrieving the Active Matrix will overwrite changes using the current configuration. - A refresh command has been issued to the Director with unsaved changes in the active matrix. Cancel the refresh command and save the changes to the active matrix and then retry the Refresh command.

Director Definition Messages

The following messages appear in pop-up message boxes only when performing an operation involving modification to the Director definition.

This IP address is already used for Director *<Director name>*. IP addresses must be unique.

Invalid IP address. Address must be in the format “nnn.nnn.nnn.nnn,” where nnn is a decimal byte in the range 0-255. All 0s or all 255s are also not allowed.

Director name *<Director name>* already exists. Delete this Director, or use a different name.

This modification will temporarily drop the link to the Director. Any open windows for this Director will be closed.

This will delete the definition of the selected Director from the Console’s library. You will no longer be able to access this Director.

Port Swapping Messages

During the port swap procedure, the following messages appear in the instructions portion of the *Port Swapping* dialog box. The messages are in the order that they appear in the instructions.

Enter the port addresses to be swapped, then press Continue.

Continuing this procedure requires varying the selected ports offline. Ask the system operator to vary the link(s) offline, then press Continue.

Move the port cable(s), then press Continue

Ports are being blocked.

Port addresses are being swapped.

Ports are being unblocked.

Port swap completed successfully.

The following messages appear in pop-up message boxes only during a port swap operation. Retry the port swap operation with a new destination port.

Cannot swap to uninstalled\unaddressable port.

Cannot swap to a port that is already swapped.

Port *<number>* was unblocked by another operator. The Swap operation cannot proceed.

Cannot swap a port with itself.

Port swapping is not allowed for a port that is already swapped.

Cannot swap two spare ports.

"Converter ports may only be swapped with other converter ports.

Port Authorization Messages

The information in bold type displays on Console dialog boxes when you authorize ports through the *Port Authorization* option on the *Utility* menu. Information following the message below may help you solve any problems.

Operator ID must be between 301 and 330 - This message will be displayed if the user enters an invalid operator ID in the Range field in the *Port Authorization* dialog box.

Changes Pending. Changing the authorized operator will discard the changes in the Active Matrix Window - This message is displayed if the user selects the *Edit-Enable Operator* menu item while there are pending changes in the *Active Matrix* window.

Changes Pending. Changing the Port Authorization will discard the changes in the Active Matrix Window - This message is displayed if the user selects the *Utility-Port Authorization* menu item while there are pending changes in the *Active Matrix* window.

Enabled Operator is not authorized to remove a dedicated connection from port (port address 1) and (port address 2) - Operator must be enabled for both selected ports prior to removing a dedicated connection.

Enabled Operator is not authorized to create a dedicated connection to port (port address 1) and (port address 2) - Operator must be enabled for both selected ports prior to establishing a dedicated connection.

This function may only be performed by an Operator with authorization to all ports - This message is displayed if operator level password supplied for certain operations does not correspond to a fully authorized operator. These operations include activating a save matrix, saving an active matrix, copying a matrix, deleting a matrix, etc.

You are not authorized to remove a dedicated connection from port [port address] - This message is displayed if the user attempts to remove a dedicated connection from an unauthorized port while in the *Name and State* dialog box.

You are not authorized to create a dedicated connection to port [port address] - This message is displayed if the user attempts to add a dedicated connection to an unauthorized port while in the *Name and State* dialog box.

Messages during LIC Install or Dump Retrieval

The following messages (in bold type) appear in pop-up message boxes only when performing an operation involving a LIC installation to the Director or during the retrieval of a dump file. Information following each message below may help you solve any problems.

The selected file was not found or could not be opened - Possible file corruption, call your next level of support.

The Director became unavailable during the file transfer - Link failure, retry later.

Insufficient memory to transfer the file - Try the command again; if the error still occurs, exit the Console and try to free up resources and memory.

Internal memory buffer busy; retry the command later - Try the command again; if the error still occurs, exit the Console and try to free up resources and memory.

“No response received from the Director - Check the Token-Ring connections and retry the operation.

The file transfer was cancelled by the Director - Call your next level of support.

The file transfer path is in use. Please try again in a few minutes - Retry later.

Too many file transfer sessions - Someone is using the monitor port; wait and try again later.

Invalid Parameter. - Check the entry, correct the error, and retry.

The Director has reported a failure on the backup CTP. The operation cannot be performed. - (9032-005 only) Call your next level of support to replace the CTP card.

CTP synchronization in progress. Retry the command later - Informational message; no response required.

File transfer in progress from Director to Console - Informational message; no response required.

File transfer in progress to Director from Console - Informational message; no response required.

The Director reported a checksum failure - Retry; if it still fails, call your next level of support.

Resource failure on the Director - Someone is using the monitor port; wait and try again later.

Flash write failure on the Director - Call your next level of support.

The Director is not offline. The operation cannot be performed. - Set the Director offline and retry the operation.

LIC/LMA Install Messages

The following messages (in bold type) appear in pop-up message boxes only when performing a LIC or LMA installation to the Director from the Console. Information following each message below may help you solve any problems.

Saving Files - Informational message; no response required.

Synchronizing CTPs - Informational message; no response required.

The Director is processing the new version. This could take up to 15 minutes. - Informational message; no response required.

An invalid file was detected. The version cannot be added to the *<library name>* Library - Possible corrupt disk or file; call your next level of support.

An invalid file was detected in the *<library name>* Library. The selected version cannot be installed on the Director." - Possible corrupt disk or file; call your next level of support.

The selected version is not compatible with this Director model - The LIC or LMA is for another model of Director. Obtain the correct LIC or LMA for this Director model and retry the installation.

This version requires LMA version *<version number>* or greater - Obtain the correct LMA for this Director model and retry the installation.

This version requires LIC version *<version number>* or greater - Obtain the correct LIC for this Director model and retry the installation.

The Director LIC must be downgraded before the LMA - Call your next level of support.

This version cannot be installed while the Director is online - Set the Director offline, and retry the installation.

The Director LMA version is unknown. Verify that the LMA is at version *<version number>* or greater - Call your next level of support.

Compatibility between this version and the version installed on the Director cannot be determined - Set the Director offline, and retry the installation.

Version *<version number>* is already installed on the Director - Informational message; no response required.

On a non-redundant system, the Director must be set offline before the install - Set the Director offline, and retry the installation.

The selected version may not be installed while FCV cards are present in the Director - Remove all converter cards and retry LIC/LMA install. Downgrading from 5.x to 4.x with installed FCV cards is not permitted.

The selected version does not support FICON operations. Continuing will result in the loss of Director FICON capabilities. Downgrading from 5.x to 4.x will result in the loss of FICON capable software on the Director.

The selected version cannot be deleted. There are other versions dependent on the selected version. - Delete the dependent (usually software supplements or updates) versions of the LIC or LMA first, and then retry deleting the original LIC or LMA version.

The version already exists in the *<library name>* Library - Informational message; no response required.

The diskette does not contain valid version components - Possible corrupt disk or file; call your next level of support.

This version depends on another version that is not present in the LIC Library Find the correct base LIC version and load it; then retry loading the dependent LIC version.

A file component of the selected version is missing from the *<library name>* Library - Corrupt Library; restore the database from tape and call your next level of support.

Disk or file error. Could not complete operation - Possible corrupt disk or file; call your next level of support.

The Director LIC version does not support reporting download status - Informational message; no response required.

The selected version will be deleted from the *<library name>* Library - Informational message; no response required.

This LIC version will be sent to the Director. After receipt, the Director will load and run this version. - Informational message; no response required.

This LMA version will be sent to the Director. After receipt, the Director will load and run the version. - Informational message; no response required.

One or more FCV port(s) cards are degraded. Continuing will cause the degraded card(s) to transmit offline. - If ports can be set offline, continue with the LIC install. If ports cannot be set offline, defer the LIC install until the degraded FCV port card(s) can be removed and replaced, and notify the customer.

Command List Error Messages

The *Command List - Operational Status* dialog box is created during execution of the *Command List* option from the *Edit* menu, and provides operator feedback as each command is applied to the active matrix for the selected Director. The dialog box displays initialization strings, completion strings, and if applicable, error messages. If a command fails, it appears in the dialog box along with one of the following error messages (shown in bold). Information following each message below may help you solve any problems.

Notice - Port(s) out of range *<port addresses>* - One or more of the port addresses specified in the *Range* parameter for this command do not exist for the Director.

Fail - Port(s) out of range *<port addresses>* - One or more of the port addresses specified for this command do not exist for the Director.

Notice - Operator *<operator ID>* is not authorized - The operator with this identification is not authorized to change port attributes for one or more port addresses specified in the *Range* parameter for this command.

Fail - Operator *<operator ID>* is not authorized - The operator with this identification is not authorized to change port attributes for one or both port addresses specified in this command.

Notice - Unmodifiable converter port attribute - An *Allow Range* attribute is not valid at the intersection of two converter ports.

Fail - Unmodifiable converter port attribute - An *Allow Port* attribute is not valid at the intersection of two converter ports.

Fail - Uninstalled/Unaddressable - A dedicated connection is not allowed to uninstalled or unaddressable ports.

Fail - Operator *<operator ID>* is not authorized to break dedicated connection The operator with this identification is not authorized to change the *Dedicate* attribute for one or more of the port addresses specified in this command.

Notice - Required break of dedicated connection - An existing dedicated connection was replaced during execution of this command.

Fail - Port name *<port name>* not unique - The command was rejected because the specified port name is being used by another port in the Director.

Notice - Partial completion due to port attribute conflicts - A merge of a dedicated connection to an uninstalled port, a merge of a dedicated connection to a converter port, or application of an *Allow* attribute to a converter port intersection was attempted.

Fail - Port attribute violations - A merge of a matrix containing a change to a pair of dedicated (or undedicated) ports was attempted by an operator with an identification that is not authorized to change port attributes for one or more port addresses specified.

Fail - File not found - The indicated file does not exist.

Copy Matrix Messages

The following messages (in bold type) appear in pop-up message boxes only when performing a *Copy* matrix operation. Information following each message below may help you solve any problems.

Copy Matrix Configuration File operation successful - Informational message; no response required.

Unable to copy to the destination path/ file name - Check the path and/or file name, correct it, and retry.

The source path/file name is not valid - Check the path and/or file name, correct it, and retry.

The destination path/file name is not valid - Check the path and/or file name, correct it, and retry.

The destination matrix name is not valid - Check the path and/or file name, correct it, and retry.

Unable to copy to the destination library - Disk error; call your next level of support.

Unable to copy to the destination IPL matrix because the destination Director is not responding - The link to the Director is either down or busy. Check the link and retry the operation.

The FAF service is busy. Try again later - The link to the Director is either down or busy. Check the link and retry the operation.

The destination matrix configuration file is locked - The Host currently has control of the file. Wait and retry the operation.

The matrix configuration file is not compatible with the destination Director model - The matrix being copied is for another model of Director. Copy the file to the correct Director model.

Insufficient memory is available to copy the matrix - Save any open matrixes and close the Console application. Free up resource memory, restart the Console application, and retry the operation.

The content of the file is not a valid matrix configuration - The source file is damaged; call your next level of support.

The maximum number of matrix configuration files already exist for the destination Director - Delete an existing matrix and retry the operation.

The file is not a matrix configuration file - Check the filename and retry.

Unable to copy from the source path/file name - Check the path and/or file name, correct it, and retry. If the problem persists, call your next level of support.

Unable to copy from the source library - Check the path and/or file name, correct it, and retry. If the problem persists, call your next level of support.

Unable to copy from the IPL matrix because the source Director is not responding - The link to the Director is either down or busy. Check the link and retry the operation.

Unable to copy to open destination matrix. Please close destination matrix and try again - Close the destination matrix and retry.

Merge Matrix Messages

The following messages (in bold type) appear in message boxes when you are merging matrixes. Information following each message below may help you solve any problems.

Changes pending. Merging a saved matrix will overwrite the changes in the Active Matrix Window - This message is displayed if the *File.Merge Saved Matrix* menu item is selected when there are changes pending in the *Active Matrix* window.

Cannot merge a configuration containing a dedicated connection to an uninstalled\unaddressable port - This message is displayed if the saved matrix being merged has a dedicated connection to a port that is not installed or not addressable.

Unable to merge all port attributes due to authorization conflicts - This message is displayed if merging the saved matrix would add or remove a dedicated connection where one of the ports is not authorized for the current operator.

Matrix Window File Access Messages

The following messages (in bold type) appear in pop-up message boxes only when performing an operation involving accessing matrix files. Information following each message below may help you solve any problems.

The name cannot be CON, AUX, COMn (where n=1-4), LPTn (where n=1-3), NUL, or PRN - Rename the file.

Changes pending. Retrieving the Saved Matrix will overwrite changes with the last configuration saved." - Informational message; cancel or continue operation.

File key in use from previous command - Call your next level of support.

Could not access Matrix configuration file - Call your next level of support.

Disk error or invalid file data - Call your next level of support.

Internal error - Call your next level of support.

Director rejected IPL file request - Retry the operation; if it fails, call your next level of support.

Maximum number of files already in use. Delete an unused item first." - Delete a matrix file and retry the operation.

File is already locked by another user - Retry the operation later.

No Directors are defined. Add a 'New Director' from the 'New Configuration Matrix' menu item under 'File'. - Define a new Director.

Configuration name *<name>* already exists for this Director. Replace existing configuration?" - Cancel and rename the matrix or continue operation.

The Active = Saved mode is on for this Director. The IPL file cannot be saved in this mode." - Retry the operation with *Active = Saved* mode off.

The link to the Director is busy. Try again later - Cancel the operation and retry later.

The selected configuration matrix will be deleted from the Console Library - Informational message; no response required.

Configuration file has been updated since matrix was displayed. Saving configuration will overwrite changes. - Informational message; no response required.

Alert Message Box with Error Code

An *Alert* message may occur in more severe error conditions on the Console. This message box displays an error code in the form **nn:nnnn** (where n is a decimal digit) and logs the error in the Console error log. If such an error occurs multiple times in the same situation, copy down the error code for use by service personnel. The operation causing the error is retried unless the message indicates a memory error or other major fault condition.

If a memory error is indicated, exit the Console application, try to free up system memory and resources (close other applications, etc.), and open the Console application again. If the error persists, perform the following:

1. Accurately document the following;

   The condition and steps used to cause the error (including previous sequence of steps)

   The error codes that appear

   The full version level of the software (available in the *Product Information* option of the *Help* menu).

2. Print or copy the Console error log and preserve it for use by service personnel.
3. Contact the next level of support.

The available messages are as follows:

Insufficient memory for internal operation!

Insufficient memory for allocation.

Memory corruption detected!

Invalid internal parameter (possible memory corruption).

File read error.

File write error.

Error during print operation.

Could not establish link to Director.

Communications link internal error.

Console Library internal error.

File Access Facility internal error.

User Interface internal error.

Could not initialize item.

Could not create window.

Could not create dialog box.

Could not create list box.

Could not read resource string.

Could not read selected item in list.

Could not select current list item.

Duplicate IP address activated.

Could not read Director data from library. File access or memory error.

Could not create new Director definition to add to library.

Could not rename Director in Library.

Could not delete Director definition from library.

Could not update Director definition data in library.

Could not convert IP address.

Error loading list from resources.

File Transfer internal error.

The LIC Library is corrupted.

Error writing Matrix Option item to DCONSOLE.INI file.

Error writing Load Director item to DCONSOLE.INI file.

File open error.

Invalid pathname.

TCP/IP kernel is inaccessible. No links will be activated.

Director library is unreadable! Partial restore from backup may be required.

LIC library is unreadable! Partial restore from backup may be required.

Passwords are unreadable! Contact your next level of support.

Director library has been corrupted! Restore from backup required. Call your next level of support.

An incident of the console application is already open.

Exchange Service internal error.

Console Library is not compatible with this version of the Console.

The LMA Library is corrupted.

LMA Library is unreadable! Partial restore from backup may be required.

Data Collection internal error.

Miscellaneous Messages

Only *<number>* characters allowed in field.

Could not read selected item in list.

Could not select current list item.

Password not accepted. Try again.

Matrix window is open for *<Director name>* with changes pending. Close window and discard changes?

Password is already in use for *<Director name>*. Enter a different password.

Invalid number of arguments entered!

Link operation in progress. Closing window will abort operation.

Invalid time!

Invalid date!

The part number file is invalid.

Cannot activate a configuration containing a dedicated connection to an uninstalled port.

Please insert the disk labeled *<label>*. If the files on this disk can be found at a different location, for example, on another drive, type a new path below.

All ports will transmit offline sequences before Director power is cycled. Power cycle performs a cold start, resetting all Director cards and activating the IPL configuration when complete.

Delete selected password from this level?

WARNING: Deleting the last password will remove password protection from this level!

All ports will transmit offline sequences, placing the Director in an offline state. To restore normal operation, IPL or IML the Director, or cycle the Director's power.

This will close all windows and exit the Console application.

Existing configuration files will be converted for the new model selected.

The Director will reset the CTP (including CUP) and token ring. The Director will then reload the current LIC version. The active configuration remains intact and switching operations continue.

The number of addresses to display must be in the range of X through Y.

Online Diagnostic Error Messages

The following error messages can appear in pop-up message boxes when performing online diagnostics.

Invalid port selection. Port is out of range.

Hardware does not support the requested diagnostic test.

Invalid port. Port *<port number>* is not installed.

Port *<port number>* is not running a diagnostic test.

Port *<port number>* is not blocked.

Communication with Director has been lost. Shutting down port diagnostics.

All ports running the external loopback diagnostic must be fitted with wrap plugs.

Ports found running diagnostics. Shut down the tests and continue?

Unable to close dialog while diagnostic tests are operating. Stop the test and try again.

ESCON diagnostics are unable to execute on a FICON (converter) port. It is invalid to attempt to execute ESCON diagnostics on a converter card.

FICON port diagnostics are unable to complete. An error has occurred processing a diagnostic request. Communications between the Console and the FCV card on the Director has been hindered. The diagnostic is unable to complete. If possible attempt to retry the Diagnostic test.

Selected converter port address is invalid.The user has entered an invalid converter port address while attempting to execute an online FICON diagnostic test. The user has entered an invalid converter port address while attempting to execute an online FICON diagnostic test.

FICON port diagnostics are unable to execute on an inactive FCV card. FICON diagnostics are not supported on inactive FCV cards.

FICON port diagnostics are unable to execute on a FCV card requiring service. FICON diagnostics are not supported on a FCV card which in service required mode.

Collect Maintenance Information Messages

The following messages can appear in pop-up message boxes when performing data collection procedures.

Maintenance information has been saved to the hard disk. The Data Collection procedure must be performed to copy the data to diskette.

Maintenance information collection was cancelled.

Maintenance information collection is incomplete because the link to the Director is down.

Error during file transfer on FCV card. Data collection was unable to retrieve file from FCV card.

Power-On Messages

Any detected errors during a power-on reset are logged to the power-on status log (PLOG) and sent to the maintenance terminal and the Director operator panel. The PLOG can contain up to 50 entries, with each entry containing the device type, device number, and error code. The log can be displayed using the **plog** command from the maintenance terminal.

Control Processor Diagnostics

Power-on diagnostics are performed during the Director power-on cycle. The diagnostic routines verify the operations of the control processor (CTP) card in the following areas:

- Master control logic
- DRAM memory
- NV-SRAM memory
- FLASH loader/monitor area checksum.

The master control logic of the CTP is checked. If an error occurs, it is logged to PLOG and the following messages are displayed:

Operator Panel:	"**CTP MC ERR**"
Terminal:	NONE
PLOG:	"**Master Control Circuitry Error - CTP1 unable to establish Mastership**"

DRAM memory is tested by writing to each 16-bit word the least significant 16 bits of the address of the word. Each word is then read back and compared to the value written to the word. If a failure occurs, the following messages are displayed:

Operator Panel:	"**SSPn DRAM Failure**"
Terminal:	NONE
PLOG:	"**SSPn: DRAM failure**"

An 80-byte chunk of nonvolatile SRAM memory is tested by writing to each 16-bit word the least significant 16 bits of the address of the word. Each word is then read back and compared to the value written to the word. If a failure occurs, the following messages are displayed:

Operator Panel:	"**SSPn SRAM Failure**"
Terminal:	NONE
PLOG:	**"SSPn: SRAM Failure**"

The checksum of the loader/monitor area is verified. If a failure occurs, the following messages are displayed:

Operator Panel:	"**SSPn Err, CS:ELO**"
Terminal:	"**SSPn power-on error: LMA checksum error**" "**Download the file LMA.ELO**"
PLOG:	"**SSPn: LMA file error**"

System Diagnostics

The system power-on diagnostics verify the following:

- IOC shared memory
- Port card transmit/receive sequence register loopback
- MXC/port card connection.

The shared memory for each installed IOC is verified by performing a quick address test. The addresses are verified by writing to each address the least signif-

icant 16 bits of the address. Each address is read back and compared to the value written to the address. If a failure occurs, the following messages are displayed:

Operator Panel:	"**IOCn MEM Error**"
Terminal:	"**SSPn Shared Memory Error, IOC slot x (address yyyyy)** "
PLOG:	"**SSPn: Shared memory failure, IOC slot = x**"

This test verifies the data path from the transmit sequence register through the internal loopback path to the receive sequence register and back to the CTP. If a failure occurs, the following messages are displayed:

Operator Panel:	**"DVP xx Error**"
PLOG, Terminal:	**MXCn: Port Number xx TMT/RCV Sequence Register error**"

The DVP card was designed with the ability to generate and detect a diagnostic data pattern. In this test, a connection is established from the CUP to each port in turn of the DVP board under test. The MXS pattern registers are then checked to make sure that the pattern was detected on all ports. If a failure occurs, the following message is displayed:

Operator Panel:	**None**
PLOG, Terminal:	"**MXCn: Connection error with Port Number xx**"

Loader

The FLASH-resident loader performs the following tasks:

- Copies the code resident in FLASH to nonvolatile SRAM
- Downloads and initiates code modules to each input\output controller
- Initiates either LIC or offline diagnostics.

If a failure occurs, the following messages are displayed:

Operator Panel:	**"Loading LXX**" **"L0YY"**
Terminal:	**"XYZ.LXX: "** LOAD FAILURE, SLOT X: file not found"**

PLOG: **"** LOAD FAILURE, SLOT X: file not found"**

Operator Panel: This displays the extension of the file being loaded on the top line (LXX, where XX is the error data) and provides an error code (LYY where Y is the extension of the file being loaded).

Terminal*:* This displays the file and extension being loaded (XYZ.LXX) and a description of the error (LOAD FAILURE, SLOT X: file not found).

PLOG*:* This displays the error description only.

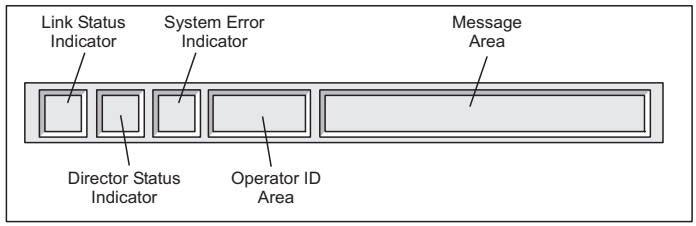
The following table shows the possible error codes, error data, and error descriptions.

Table B-1. Loader Error Codes and Descriptions

Error Code	Error Data	Description
01	Self-test results	IOC self-test failure
02	None	Self-test timeout
03	File type	IOC download timeout
04	File type	Entry point invalid
05	File type	File not found
06	File type	File size not initialized
07	File type	File load address invalid
08	File type	Magic number invalid
09	File type	No entry for file in loader directory
0A	File type	Number of section is invalid
0B	None	Startup timeout
0C	File type	Protected memory violation
0D	File type	Sequence number error
0E	File type	Sector data error
0F	Failed Address	Local memory test failed
13	None	Section too big
14	None	File checksum error

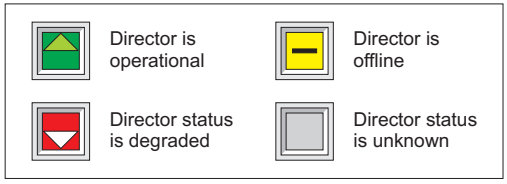
Appendix C. Director Status Codes

Status Line



Link Status Indicator States

Director Status Indicator States



Director System Error Indicator States

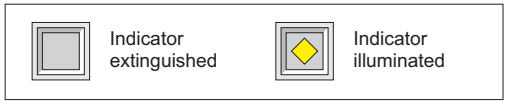


Figure C-1. Status Line Message Area and Indicators

A status/message line is available in each window in the Console. On the matrix and *Port Maintenance* windows, the status line consists of indicators for the current status of the Token-Ring link between the Director and the Console (link status indicator), the current operational status of the Director (Director status indicator), the current status of the Director's system error indicator, and status/error messages. On *Terminal* and log windows updated by the Director, the status line consists of the link status indicator and a message area. Other log windows use the status line only for messages.

The link status indicator is used in the *Terminal* and some log windows. The Director status and System Error indicators are only available in the matrix and *Port*

Maintenance windows. The Operator ID area is only available when port authorization is enabled.

Link Status Indicator

The three states indicated in the link status indicator include:

- **Available and idle.** The normal link “OK” condition where the link is up but no traffic is occurring (green lightning bolt on gray background).
- **Data being exchanged.** The “busy” state where data is being transmitted to or received from the Director. The yellow circle on a gray background indicates a transient state normally seen after completing a command that transmits data to the Director, or when Director alerts are received by the Console.
- **Link not operational.** The “Unavailable” state where the connection cannot be made between the Director and the Console on the Token-Ring (black slash on red background).

Director Status Indicator

The four states of the Director status indicator, representing the Director operational status, are:

- **Director is fully operational.** This state is driven by the operational status of the Director being all zeros (sense bytes 27 and 28 are 0000).
- **Director is offline.** This is displayed when the Console has received an indication of the set ESCD offline command (0xFD) from the Director, issued by the host application.
- **Director status is degraded.** This is displayed any time that the Director operational status (sense bytes 27 and 28) is anything other than all zeros. To display the exact value of the these sense bytes, double-click on the Director status indicator or select *Status* from the *Utility* menu.
- **Status is currently unknown.** This blank gray box is normally only displayed if the link status is unavailable and the current valid Director operational status cannot be obtained.

System Error Indicator

The two states of the Director System Error indicator are as follows:

- **Director System Error indicator is on.** This is displayed when the Director’s system error indicator light is active, indicating a system error (yellow diamond on gray background).
- **Director System Error indicator is off.** The Director’s System Error indicator light is off. This is the normal operating mode for this indicator.

Message Area

The message area displays transient operator messages, such as errors or indications that certain operations have been completed. For example, any change in the state of the Director operational status displays a message indicating the change along with changing the contents of the Director status Indicator on the status line. Changes that could go unnoticed, such as updates to the hardware status column due to System Automation for OS/390 (SA OS/390) changes, are indicated in the status line message area. Certain user operational errors are also indicated in the message area. Colors are used to indicate the priority of the message:

- Black text indicates normal status (informational message only).
- Yellow text indicates transient status (such as a command transmit state) or notification messages (such as notification that the hardware status column has been updated).
- Red text indicates error conditions (operator command error or Director/link error status).

Double click on the matrix window (such as on the message area of the status line) to clear the current status message or enter any keystroke.

Monitoring Multiple Directors

Quick visual monitoring of all Directors attached to the Console can be achieved by opening matrix windows for all Directors, and then tiling them (use *Window, Tile*) on a full screen. The status indicators on the status lines of all matrix windows are displayed full size, and all status indicators for all Directors are displayed at once in tiled mode. Color and shape changes for abnormal conditions, as well as color of status messages, quickly indicate conditions that may need attention by an operator.

Status Codes and Indicators

The Director communicates changes in its operating condition through:

- Director operational status codes
- Console operational status codes
- Logic card and power supply status indicators.

Director Operational Status Codes

These codes display when an event displays on the operator panel status display as Event = ic/xynn.

The “ic” is an incident code. Refer to Appendix A, "Incident Codes and Sense Data Summary," for a list of these codes keyed to incident type (link, hardware, software), related sense bytes, and the location where the incident is reported.

The xynn is a four-digit hexadecimal code that describes the operational status of a particular FRU:

- x: Severity code (operational level)
- y: The FRU where the event occurred
- nn: The location (slot or port number) where the FRU is located in the Director.

Use the following table to interpret these codes.

Table C-1. Director Status Codes on Operator Panel and Director Event Log

Digit x	Definition	Digits y nn	Definition	Action
0 or blank	Fully Operational.	000 or blank		None required
	1. Fully Operational: Redundant coimponent failure.	FRU Slot | || y nn	The FRU Type (y) is: 0=No additional FRUs 1=(MXC) matrix controller 2=(CTP) Control processor 3=(MXS) Matrix switch* 4=(DVP) LED port 5=(DVP) Laser port 6=(Reserved) 7=(FAN) Fan assembly 8=Power supply 9=(CON) Console A=(TKRG) Token-Ring adapter B=(PAN) Operator panel C=(SDVP) LED 4-port spare D=(SDV2) LED 2 port/laser 2-port spare E=(LBA) Logic board assembly F=(FCV) Fibre Channel converter port card G=(PWR2) Power supply, 3.3 and 5.0-volt, H=(MXC2) FICON-capable MXC card I-V=Reserved	Record the failing status code if the 1st digit is 1-5. Replace the failing FRU or see MAPs in Chapter 2 for further diagnoses.
	2. Operational: Minor failure.			
	3. Operational: Major failure.			
	4. Not Operational.			
	5. Cannot determine operational level.			

Note: The FRU code for the matrix switch (MXS) will not display as part of the event on the operator panel status display. A code of 1 will display for both the MXS and the matrix controller (MXC). The MXS code (3) may display when the *Detail* button is pressed to reveal additional sense byte information.

Console Operational Status Codes

To display Director operational status codes/messages on the Director's active matrix window, select *Director Operational Status* from the *Utility* menu or double-

click the Director status indicator on the status line located at the bottom left of the active matrix window. A four-digit status code displays as xyff to describe the operational status of a particular FRU.

- x: A severity code from 0 through 5
- fff: Accumulated FRUs where outstanding events have not been cleared or acknowledged.

Use the following table to interpret these codes:

Table C-2. Director Status Codes on Active Matrix Window on Console

Digit x	Definition	Digits yy nn	Definition	Action
0 or blank	Fully Operational.	000 or blank		None required
	1. Fully Operational: Redundant ocmponent failure.	FRUs | fff	The FRU Type (y) is: 1=(MXC) matrix controller 2=(CTP) control processor 3=(MXS) matrix switch* 4=(DVP) LED Port 5=(DVP) Laser port 6=(Reserved) 7=(FAN) fan assembly 9=(CON) Console A=(TKRG) Token-Ring adapter B=(PAN) operator panel C=(SDVP) LED 4-port spare D=(SDV2) LED 2 port/laser 2-port spare E=(LBA) Logic board assembly F=(FCV) Fibre Channel converter port card G=(PWR2) power supply, 3.3 and 5.0-volt H=(MXC2) FICON-capable MXC card. I-V=Reserved	Record the failing status code if the 1st digit is 1-5. Replace the failing FRU or see MAPs in Chapter 2 for further diagnoses.
	2. Operational: Minor failure.			
	3. Operational: Major failure.			
	4. Not Operational.			
	5. Cannot determine operational level.			

Logic Card and Power Supply Status Indicators

Figure C-2 on page C-7 illustrates the location of FRUs that have status indicators, including logic cards, the operator panel, and the power supply.

- **Operator Panel:** A yellow System Error indicator lights when the Director detects an event requiring immediate operator attention, such as a FRU failure. The indicator remains active for as long as an event status, flagged either event or active, exists with an operational level of 1 or higher. The indicator deactivates when all event and active statuses with an operational level of 1 or higher, resident in the event information queue, have been designated as History.

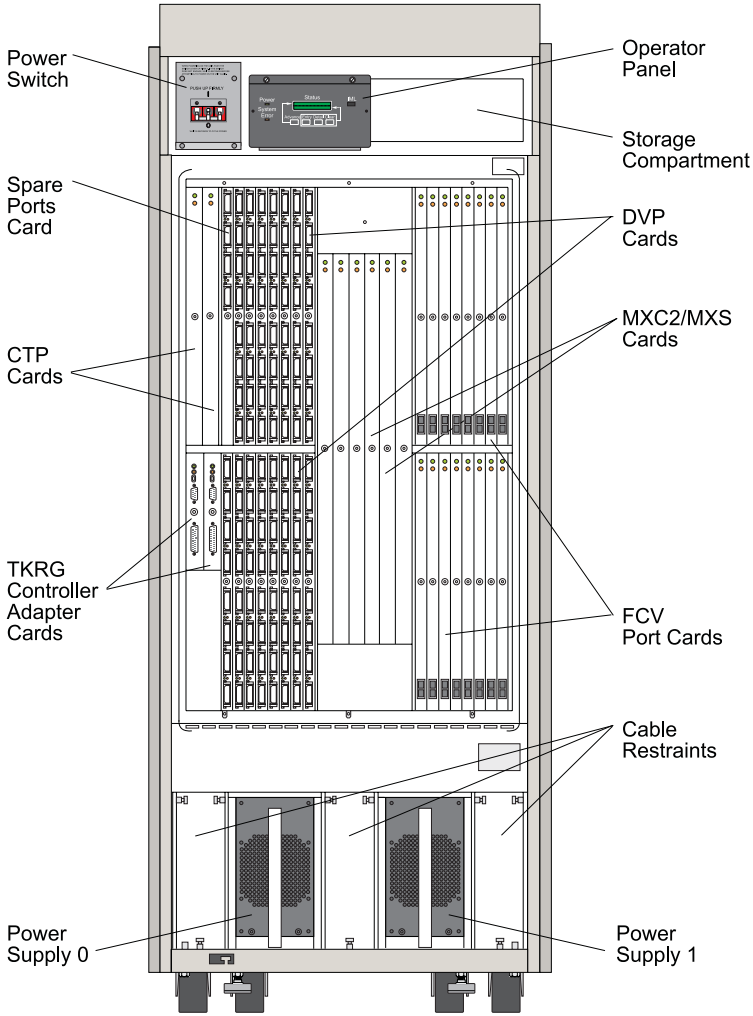


Figure C-2. FRUs with Indicators

- **Spare ports card (SDVP or SDV2):** Each card contains four amber LED indicators, one for each port. The indicator lights to indicate port failure.
- **Device port (DVP) card:** Each card contains eight amber indicator lights, one for each port. An amber indicator lights to indicate that the port is placed in service mode and port operation has halted. Refer to "Service Status" on page C-9.
- **Control processor (CTP) card:** A green status indicator lights when the card is active and goes out when the card is not active. An amber indicator lights and remains on to indicate that the card has failed. The amber indicator also

lights when the LIC is being updated on the card or when the LIC is being synchronized between the primary and backup CTP cards (if two CTP cards are installed.) The light will go out after any of these events occur, however.

- **Matrix controller/matrix switch (MXC2/MXS) card set:** The matrix controller card contains a green and an amber indicator. The green indicator turns on if the MXC/MXS card set is online and active. An amber indicator lights to indicate that a card has failed.
- **Token-Ring (TKRG) controller adapter card:** A green status indicator lights when the card is active. An amber indicator lights to indicate that the card has failed. Refer to "Start Initial Fault Isolation" on page 2-4 to diagnose the problem.
- **FCV port card (FCV):** The FCV port card can operate in degraded mode. Up to seven internal ESCON ports may be disabled without affecting operation of the remaining internal ESCON port or ports. However, performance of the remaining ports is degraded. The card is not operational if the FICON port is disabled.

  The FCV port card has a green status LED that indicates the following conditions:

  – When illuminated, the FICON port is operational

  – When flashing, the FCV port card is loading code. Note that the yellow LED can also be on at the same time.

  – When extinguished, the FICON port or *all* internal ESCON ports failed.

  The FCV Port card has an amber status LED that indicates the following conditions:

  – When illuminated, one or more internal ESCON ports are disabled and the card is operating in degraded mode or card logic has failed

  – When extinguished, all internal ESCON ports are operational.

  – When flashing, the port card may be offline because an MXC card is installed instead of an MXC2 card. An MXC2 card is required to support FICON operation. If this is the case, a “HW-crosspoint controller” event will post to the event log with detailed sense byte data.

    The amber LED may also flash on the 17th FCV port card installed in the Director since only a maximum of 16 FCV port cards are allowed.

    Refer to "MAP 9100" on page 2-8 for detailed troubleshooting.
- **Power Supply (PWR2) :** A green status indicator on the power supply lights when the power supply is working and goes out upon failure.

Port Hardware Status Column (Matrix)

These alpha codes are found on the matrix grid of the Console's matrix window. Codes indicate hardware status and connection status for each port address. The hardware status codes appear in the following columns:

- Hdwr - the hardware column when the matrix is in graphic display mode
- H - the hardware column when the matrix is in nongraphic display mode.

The hardware status column provides the current hardware status of the port for active Director links and cannot be directly modified by the user. Possible contents of the column, with graphic display mode both on and off, are shown with their meanings in Table 2-1 on page 2-135.

Service Status

The matrix indicates that the port is in service status mode when an "S" appears in the hardware status column. Service status means that the Director detected a problem with the port and halted port operation. A port may enter service status if:

- The hardware port has failed
- The attached device presents a high rate of change for ESCON sequences to the port
- A duplex connector is not properly attached and seated
- Fiber optics are dirty, causing a marginal input signal to the port
- The attached device or fiber produces light at an intensity that is just at the port receiver's threshold for synchronizing to the light source.

When a port is placed into service (S) status, an entry is made to the Director event log and operator panel. The incident type reported to the Director event log is "01" (hex), indicating a probable port hardware failure.

If you suspect that the port was placed in service (S) status because of events external to the Director, such as a high rate of change for ESCON sequences or fiber optic cable problems, follow these instructions to clear service status:

1. Access the Director's event log through the *Maintenance* menu of the Director's active matrix window. Write down any incident type "1B" (hex) messages and sense data for the port. This information may be needed by your next level of support for troubleshooting.
2. Enter the following command through the Console's *Terminal* window:

   xpmdbg 6 xx

   The xx is the physical port number. For more information on the xpmdbg command, refer to Appendix E, "Maintenance Terminal and Terminal Window Commands," for more information. Also refer to Appendix D, "Default Port

Address Charts," for an illustration of default port addresses mapped to port numbers.

- If the service status clears and does not recur, the problem was temporary and was related to the cable or attached device.
- If the service status *does not* clear, remove the fiber optic cable attached to the port and attempt to clear the status with the xpmdbg command. If the service status still does not clear, replace the DVP card.

Connection Status Column (Matrix)

The connection status appears in the following column:

- C - the connection column when the matrix is in nongraphic display mode
- Con - the connection column when the matrix is in graphic display mode.

In the graphic display mode, the *Con* column provides an overall connection indicator, representing both blocked and dedicated connections for the address. If the box has an “X” in it, the address is blocked. The presence of a port address indicates a dedicated connection.

With the graphic display mode off, two columns appear: Column *B* (blocked status), and *C* (dedicated connection). When an address is blocked, a “B” will appear in the *B* column. When a port address is displayed in the *C* column, that address is dedicated to the port shown in the corresponding row.

Appendix D. Default Port Address Charts

Figure D-1 and Figure D-2 illustrate the default physical port numbering and logical addresses when the Director is fully populated with ESCON DVP and FCV ports. Each port is assigned a physical port number (shown in bold) and logical address (shown in italics). Note that these are default addresses; actual addresses may differ due to port swapping.

Port numbers help isolate port problems and perform port maintenance. Logical addresses provide dynamic, dedicated, prohibited, and blocked connections that are configured through the Director Console.

The Spare Ports card installed in slot 31 provides four reserved spare ESCON ports. ***The spare ports card does not increase the number of usable ports, nor does it provide spare FICON connections.***

ESCON Ports Only

As shown in Figure D-1 on page D-2, the Director contains 31 DVP card slots, numbered 0 through 30. When fully populated with DVP cards, the Director contains 248 ESCON device ports (eight per card).

DVP card slots are grouped into quadrants. Quadrants A, B, and C contain eight cards each. Quadrant D (upper left) contains seven DVP cards and the optional spare ports card. In general, DVP cards can be installed in any available port card slot.

With FCV Ports Installed

Figure D-2 on page D-3 shows the Director populated with 16 FCV port cards (16 FICON ports) and 15 DVP cards (120 ESCON ports). In general, port cards can be installed in any available port card slot. However, FCV port cards have the following constraints:

- If Feature Code #5902 is ordered, an FCV port card *cannot* be installed in slots 23 through 30. The feature preferentially maps ESCON port connections to those slots.
- If Feature Code #5903 is ordered, an FCV port card *cannot* be installed in slots 15 through 30. The feature preferentially maps ESCON port connections to those slots.

Because one FICON port maps to eight ESCON ports, an FCV port card uses eight consecutive physical port numbers. The first FCV port card (in slot 0) has physical port number **00**, the second card (in slot 1) has physical port number **08**, and the 16th card (in slot 23) has physical port number **B8**. The first ESCON port (in slot 8) has physical port number **40**. The 120th port (in slot 30) has physical port number **F7**. If a spare ports card is installed in slot 31, ports have physical port numbers **F8** through **FB**.

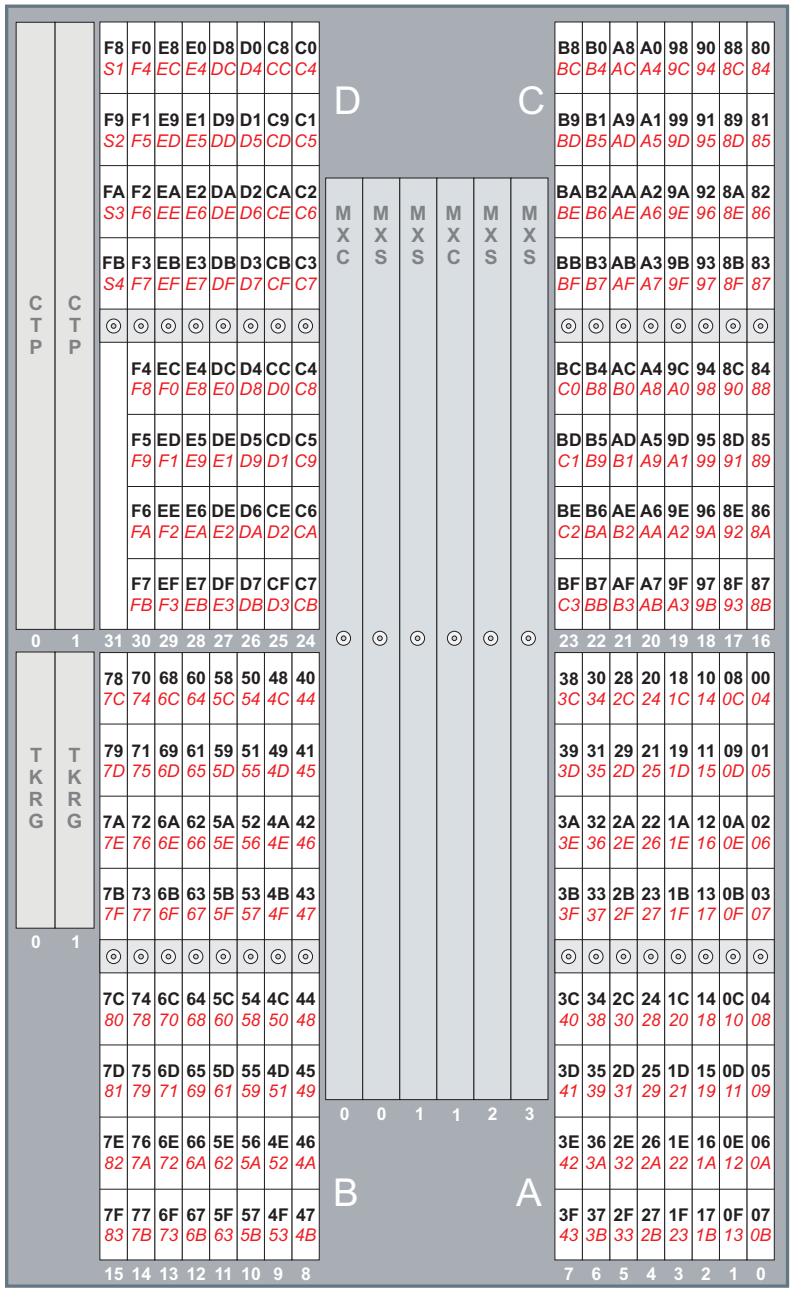


Figure D-1. Director Logic Cards, Physical Port Numbers, and Logical Port Addresses (ESCON Only)

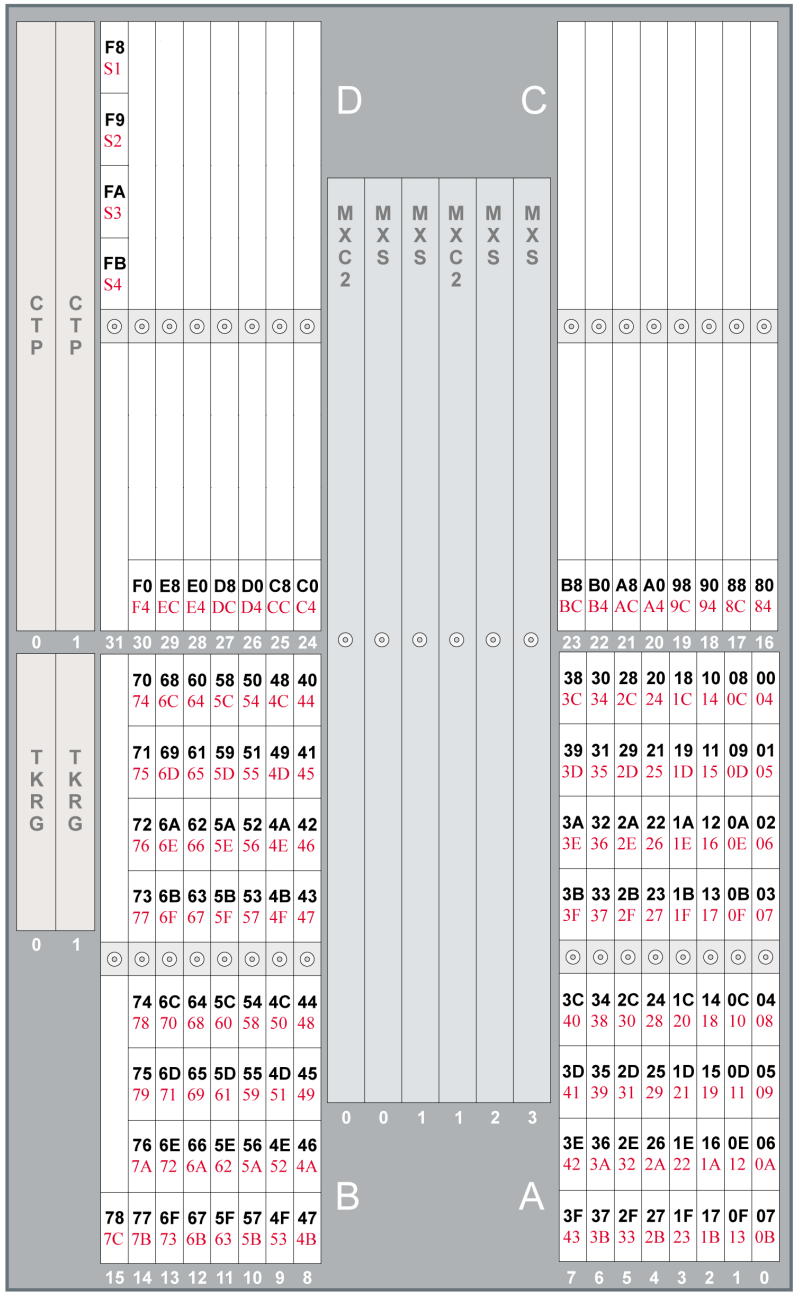


Figure D-2. Director Logic Cards, Physical Port Numbers, and Logical Port Addresses (ESCON and FICON).

Appendix E. Maintenance Terminal and Terminal Window Commands

Connecting a Maintenance Terminal

You can access the same online diagnostics and utilities available through the Console's *Terminal* window through a separate terminal or PC attached to the Director's maintenance port.

1. Obtain an ANSI terminal that uses the ASCII character set or a PC with communications software that emulates such a terminal. Configure the terminal or PC communications program for no parity, 8 data bits, 1 stop bit, and a baud rate of 2400, 9600, or 19200.

   Note: The maintenance port operates at a default baud rate of 19200. You can change the baud rate to match your terminal baud rate by pressing **Break** (or the key combination for your communications software) followed by a **Return** or **Enter** until an SSP0> prompt appears.

2. Connect the terminal or PC to the 25-pin female DSUB connector on the Token-Ring (TKRG) controller adapter card using a 25-pin to 25-pin null modem adapter (P/N 83X9280). Refer to Figure E-1 for the connector location.

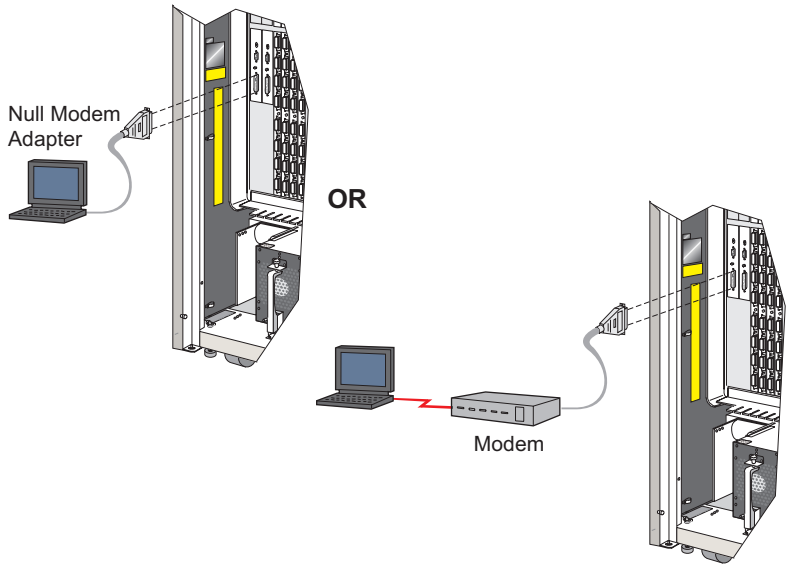


Figure E-1. RS-232 Maintenance Port on Token-Ring Card

Note: If a redundant TKRG controller adapter card is installed, ensure you connect the cable to the TKRG card installed in the left slot (slot 0). If the Monitor does not work through the RS-232 port on the card in slot

0, connect the Monitor to the RS-232 port on the card in slot 1. If the monitor works on the port on the card in port 0, use it regardless of the status of the TKRG card.

If you need to make a cable, refer to “Maintenance Port Cabling” (refer to “Diagrams” in Chapter 2) for the pinout configuration of the RS-232 maintenance port.

3. To log into the Director, use the following steps:

   Note: To cancel out an existing session with the Director and log in under your password, unplug the RS-232 cable from the TKRG card, wait 30 seconds, and then plug the cable back into the card.

   a. Press **Enter** or **Return**.

      The following prompt appears:

      ```
      >
      ```

      If the prompt (>) does not appear, press **Break** followed by **Enter** or **Return**. Repeat the key combination until the > prompt appears. As a note, some PC emulation programs use various key combinations for **Break** such as **Alt** and **B**. Refer To your communication application’s documentation for the correct combinations to send a break sequence.

      Note: If you need to issue a break several times to display the > prompt, the baud rate for the terminal or the PC communications program may not be synchronized with the maintenance port (the port powers on at 19200 bps). Sending a break cycles the port’s baud rate to match the terminal.

   b. Enter your maintenance authorization password and the following prompt appears.

      ```
      SSP0>
      ```

      The default password is LEVEL002. You can change the password using the Password command when you access the SSP0> prompt. The maintenance terminal password does not relate to the maintenance authorization password required for the Console.

      The SSP0> prompt indicates your access to the systems services processor (SSP) on the master CTP card in slot 0. The following prompts may appear instead of SSP0>:

      ```
      MON:SSP0>
      ```

      Indicates that the processor is in a halted state.

      ```
      (BKUP) SSP1>
      ```

      Indicates that the processor is the SSP on the backup CTP card in slot 1.

The SSP0> prompt indicates that you have accessed the CTP card in slot 0 (CTP0).

4. You can now enter commands described under “Terminal Commands” in this appendix. The following section explains terminal prompts and key controls.

CAUTION

Some of these commands can cause unwanted effects. Do not use these commands except under the direction of your next level of support.

Using the Maintenance Terminal

You should be aware of the various prompts that may display on the terminal screen when you access the Director for maintenance tasks. You should also be aware of the key controls available to change the maintenance port baud rate and to enter commands.

Key Controls

Use the following key controls for terminal input:

- **Break** (or **Alt** and **B** depending on your PC’s communications program)
  Toggles between 2400 baud, 9600 baud, and 19200 baud.
- **Backspace** or **Ctrl** and **H**
  Erases the previous character.
- **Ctrl** and **C**
  Halts the SSP and displays a register dump. Use this only under direction of your next level of support.
- **Ctrl** and **X**
  Erases the current input line.
- **Up arrow (↑)**
  Scrolls backward to a previous command in the buffer.
- **Down arrow (↓)**
  Scrolls forward to the oldest command in the buffer.
- **Enter**
  Press to accept the command typed at the SSP0> or SSP1> prompt.

Command Conventions

The following conventions apply to commands described in this section:

- Parameters enclosed in parentheses are required for a command. For example, for the following command you must insert a port address after the command. Do not use parentheses when entering the command.

  block (port address)

- Parameters enclosed in brackets are optional for a command. For example, for the following command you can insert the “free” parameter after the dmps command to mark the dump file as free. Do not use the brackets when entering the command.

  dmps [free]

Terminal Commands

Input the following commands either through the *Terminal* window from the Console or through a separate terminal or PC connected to the maintenance port:

Note: Whenever possible, execute the dedicate, block, and allow port connection functions through the *Edit* menu of the Director’s active matrix window on the Console. Only qualified personnel should execute these functions through the *Terminal* window. Refer To *Using the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA 22 7296 00) for more details on these functions.

- **AIC:** Displays statistics on the asynchronous inter-SSP communications environment. This command is intended for engineering use.
- **Allow:** Allows dynamic connection between specified ports. Use this to override a prohibited attribute set for two ports.

  Command Format:

  allow (port address) (port address)

  Note: Allowing the FICON port on an FCV port card also allows all unaddressable ESCON ports on the card. Allowing an ESCON port that is prohibited, does not affect the port’s operation.

- **Baud:** Use this command to change the power-on default baud rate for the Director’s modem.

  Command Format:

  baud

  Example:

  SSP0>**baud**

  displays the following:

```
Power-up default baud rate = 19200
Establish current baud rate of 9600 as power-up
default? (Y/N)
```

- **Block:** Blocks a specified port or range of ports from connection to any other port.

  Command Format:

  block (port address)

  Example:

  SSP0>**block** E3

  Command Format:

  block (port address - port address)

  Example:

  SSP0>**block** C3-C8

  Note: Blocking or unblocking a FICON port on an FCV port card also blocks or unblocks all unaddressable ESCON ports on the card. Blocking or unblocking an ESCON port on the card does not affect the port's operation.

- **CPS:** Displays the command protocol services sybsystem control block that is resident on the SSP.

  Command Format:

  CPS

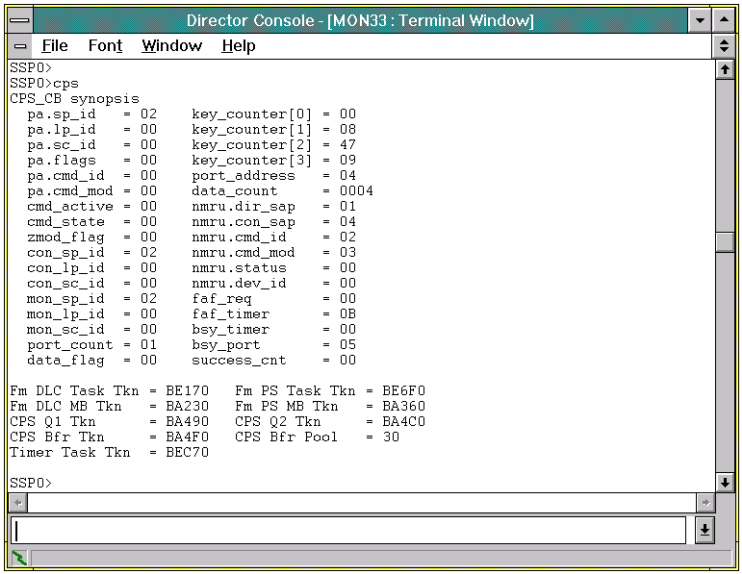
  Parameters:

  None

  Example:

  SSP0>**CPS**

  Displays the following:



- **Dedicate:** Establishes a dedicated connection between specified ESCON ports.

  Note: You cannot dedicate connections to any port on an FCV port card.

  Command Format:

  dedicate (port address) (port address)

  Example:

  SSP0>**dedicate** E3 B9

- **Dir:** Displays an alphabetized directory of the files currently resident in FLASH memory on the Director's master CTP card. The directory includes:

  Command Format:

  `dir` (/v) (/a)

  Parameters:

  none

  Provides a list of all files in the directory, with the file name, size, and creation date.

  /v

  Displays the same directory as with no parameters, except the date associated with each file is the date the file was created at the time the file was built. This date cannot be altered.

/a

Provides a more detailed directory than the /v parameter, including the location in FLASH of each file and the amount of free bytes for the file's allocated portion in FLASH. This directory is sorted by the location of the file in FLASH. The date displayed through this parameter is the date that the file was last modified.

Example:

SSP0>**dir** /a

- **Dmps:** Display or change the current status of the dump file.

  Command Format:
  dmps [free] [busy]

  Parameters:

  None

  Displays the current status of the dump file.

  free

  If "free" is specified, the dump file area is marked as free.

  busy

  If "busy" is specified, the dump file area is marked as busy.

  Example:

  SSP0>**dmps** free

- **Frux:** Use this command after you install a new operator panel to input manufacturing data to the panel's on-board memory.

  Command Format:

  frux [pan] [field 1] [data] [field 2] [data] [field 3] [data]...[field 10] [data]

  Parameters:

pan	Board
field 0	Display/edit all fields. Use when entering data for all fields on one line.
field 1	Control unit type number (9032)
field 2	Control unit model number (05)
field 3	Device type number (9032)
field 4	Device model number (05)
field 5	Type number (00932)

field 6 Model number (005)

field 7 Manufacturer (IBM)

field 8 Plant of manufacture (IBM)

field 9 Sequence or serial number (XXXXXXXXXXXX)

field 10 Box EC level identification (XXXXXXX).

To enter data into a single field at a time

frux pan [field #][data]

Example:

The following enters IBM into field 7 for plant of manufacture.

```
frux pan 7 IBM
```

To enter data into all fields on one line

SSP0>**frux** pan 0 [field 1][data]... [field 10][data]

The following enters data into all fields.

frux pan 0 9032 03 9032 03 009032 003 IBM 02 123456789754 0071394

Note: Data for fields 1 through 8 are always in memory for new operator panels. Obtain the sequence number from the label on top of the power supply in slot 0 (left-most power supply). Data for field 10 is not necessary.

- **Help:** Provides help for terminal commands.

  Command Format:

  help [command]

  Parameters:

  none Provides a list of all available commands.

  command Provides help for the specified command.

  Example:

  SSP0>**help** xpmlog

  Options:

  [ ] = optional

  ( ) = required

  | = or

  + = and/or

  ^ = optional space

... = repetition

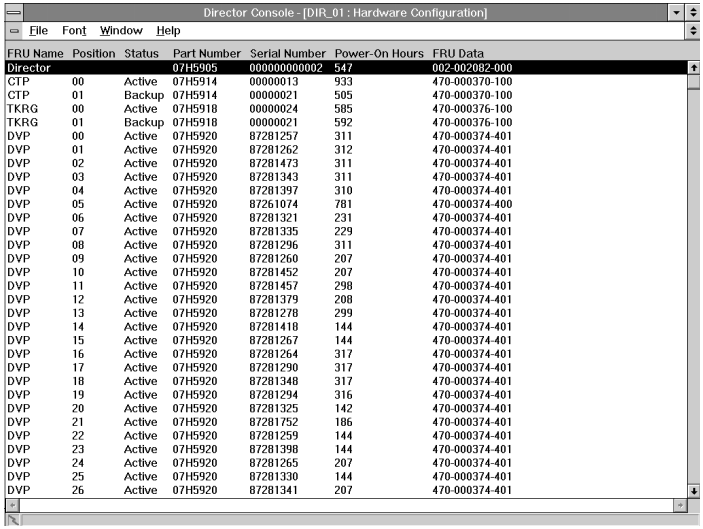
- **Hw_cnfg:** Displays a table of information on all circuit cards, power supplies, and fans (FRUs) installed in the Director. Information includes the component's active, failed, or backup status, serial number, power-on hours, fail error code, and fail date.

  Command Format:

  hw_cnfg

  Example:

  SSP0>**hw_cnfg**



FRU Name	Position	Status	Part Number	Serial Number	Power-On Hours	FRU Data
Director			07H5905	000000000002	547	002-002082-000
CTP	00	Active	07H5914	00000013	933	470-000370-100
CTP	01	Backup	07H5914	00000021	505	470-000370-100
TKRG	00	Active	07H5918	00000024	585	470-000376-100
TKRG	01	Backup	07H5918	00000021	592	470-000376-100
DVP	00	Active	07H5920	87281257	311	470-000374-401
DVP	01	Active	07H5920	87281262	312	470-000374-401
DVP	02	Active	07H5920	87281473	311	470-000374-401
DVP	03	Active	07H5920	87281343	311	470-000374-401
DVP	04	Active	07H5920	87281397	310	470-000374-401
DVP	05	Active	07H5920	87261074	781	470-000374-400
DVP	06	Active	07H5920	87281321	231	470-000374-401
DVP	07	Active	07H5920	87281335	229	470-000374-401
DVP	08	Active	07H5920	87281296	311	470-000374-401
DVP	09	Active	07H5920	87281260	207	470-000374-401
DVP	10	Active	07H5920	87281452	207	470-000374-401
DVP	11	Active	07H5920	87281457	298	470-000374-401
DVP	12	Active	07H5920	87281379	208	470-000374-401
DVP	13	Active	07H5920	87281278	299	470-000374-401
DVP	14	Active	07H5920	87281418	144	470-000374-401
DVP	15	Active	07H5920	87281267	144	470-000374-401
DVP	16	Active	07H5920	87281264	317	470-000374-401
DVP	17	Active	07H5920	87281290	317	470-000374-401
DVP	18	Active	07H5920	87281348	317	470-000374-401
DVP	19	Active	07H5920	87281294	316	470-000374-401
DVP	20	Active	07H5920	87281325	142	470-000374-401
DVP	21	Active	07H5920	87281752	186	470-000374-401
DVP	22	Active	07H5920	87281259	144	470-000374-401
DVP	23	Active	07H5920	87281398	144	470-000374-401
DVP	24	Active	07H5920	87281265	207	470-000374-401
DVP	25	Active	07H5920	87281330	144	470-000374-401
DVP	26	Active	07H5920	87281341	207	470-000374-401

- **id:** Displays a port's node descriptor. This identifies the channel or device attached to the port. Refer to "Displaying Node Descriptor" on page 2-137 for more information on the node descriptor content for a port.

  Command Format:

  id (port)

  id (range)

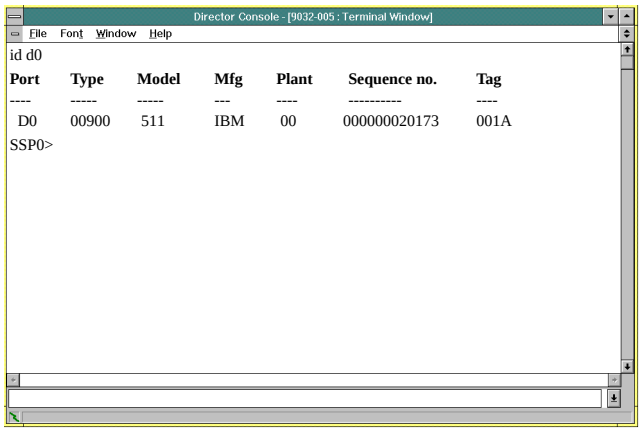
  Parameters:

port	Provides a descriptor for a node connected to a port with the specified address.
range	Provides a descriptor for a node connected to a range of ports with the specified addresses.

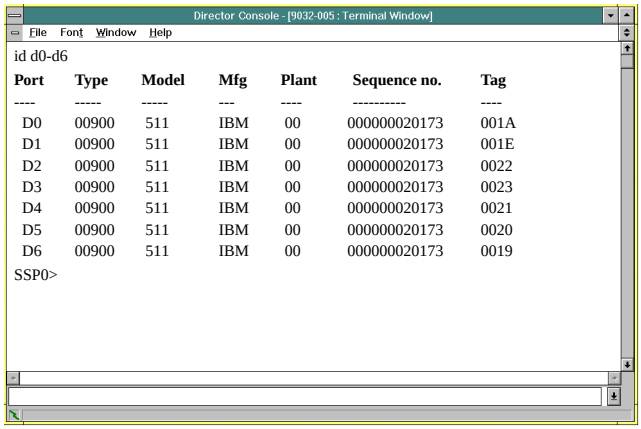
*(Asterisk)	Provides a descriptor for nodes connected to all ports.

Examples:

SSP0>**id** d0



SSP0>**id** d0-d6



- **LC:** Determines if the engineering “log” file is active and how entries are recorded to the log. The log is is intended for engineering use for debugging between subsystems within the director.
- **LD:** Determines which events are displayed in the engineering “log” file and how events are formatted. The log is is intended for engineering use for debugging between subsystems within the Director.
- **LAN:** Used with a series of options for debugging the LAN interface. This requires a password and is intended for engineering use only.

- **Lanip:** Displays or changes the internet protocol (IP) address for Director's Token-Ring controller adapter card. The IP address is not set until network activate completes.

  Note: To maintain Console connection to the Director, you must also change the IP address on the Console through the *Director Definition* dialog box. From the *File* menu of the active matrix window for the Director, select *Open Active Configuration Matrix*, and then select the Director name and the *Modify Definition* button on the *Active Director* dialog box. Change the address in the *IP Address* field to match the new IP address on the Director.

  Command Format:

  lanip (xxx.xxx.xxx.xxx)

  Where x is a decimal digit and leading 0's are not required.

  Parameters:

None	If the IP address is not entered, it will display the current IP address.
IP address	Director's source address in form nnn.nnn.nnn.nnn

  Example:

  SSP0>**lanip** 144.49.64.62

- **Lanmac:** Use to display or change the media access control (MAC) address for Director's Token-Ring controller adapter card. The MAC address is not set until the next Director IML or IPL.

  Command Format:

  lanmac (hh hh hh hh hh hh)

  Where h is a hexadecimal digit.

  Parameters:

None	Displays the current MAC address.
MAC address	Director's six-digit source MAC address in form hh hh hh hh hh hh. Setting the address to all zeros will set the TKRG controller adapter card's default address.

  Example:

  SSP0>**lanmac** 50 00 11 00 8e d3

- **Lan_stat:** Displays statistics from the LAN's physical, IP, and ABP layers.

Command Format:

lan_stat

Parameters:

None

Example:

SSP0>**lan_stat**
Network Stat -- bp = 520E4

- **Matrix:** Displays the active port connection matrix for the Director.

  Command Format:

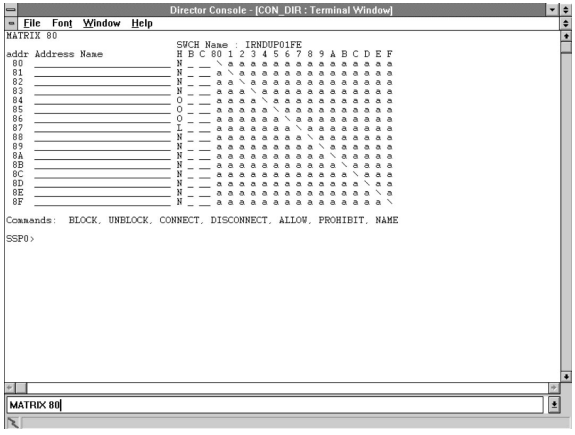
  matrix

  Parameters:

  None

  Example:

  SSP0>**matrix**



- **More:** Sets the screen to either continuously scroll through the data returned after a command is entered or stops scrolling the data when a full screen appears.

  Command Format:

  more (on/off)

  Parameters:

  on
  Sets the screen to stop scrolling after a full screen of data appears.

  off
  Sets the screen to continuously scroll and stop after all data appears.

- **Mps_list**: Displays a list of commands that relate to functions and information available in the Director's active matrix.

  Command Format:

  mps_list

  Parameters:

  None

  Example:

  SSP0>mps_list

  allow

  block

  dedicate

  id

  matrix

  mode reg

  name

  offline

  pib

  portmap

  portswap

  prohibit

  timestamp

  undedicate

  unblock

- **Name:** Displays or changes the port's name that appears in the *Addr Name* column of a matrix window.

  Command Format:

  name (port address) (name)

  Parameters:

  port address
  Address of the port to change.

  name
  24-character text string that identifies the port connection.

  Example:

  SSP0>**name** FB bldg A host1

- **Offline:** Issues a command to take all ports offline. The Director notifies attached channels that ports are going offline for a controlled shutdown of all Director ports.

  Command Format:

  offline

  Parameters:

  none

  Example:

  SSP0>**offline**

- **Onldiag:** Initiates and controls online diagnostics.

  Note: A maximum of four ports can be under test at the same time.

  Available diagnostics include:

  – Internal loopback of a port. This places the port in internal loopback mode and wraps signals internally through the port transmitter and receiver. This tests the interface between the matrix switch and port as well as most of the port's transmit/receiver circuits.

    Note: Internal loopback is not available on LED DVP cards with numbers 470-000341-10X, where X can be any number. To determine if the Director contains these DVP cards, access the Director's active matrix window on the Console and select *Hardware Configuration* from the *Maintenance* Menu. If the DVP card is installed, the number will be listed for the DVP card under the FRU data column of the window.

– External loopback of a port with wrap plug. Similar to the internal loopback test, except the port is not placed in a special test mode. The signal is wrapped at the wrap plug to fully test the port's receiver and transmitter.

– Matrix tests. In this test, data is sent from the port through the matrix switch and matrix controller, and then back through the port card. This verifies the path through the matrix switch (MXS), matrix controller (MXC), port card, logic board, and the interfaces between these components and the CTP card.

– Port-to-channel wrap mode. This sets the Director into a mode for using a host-based diagnostic test to isolate ESCON bit error rate problems. In this test, data sent by the host over the channel can wrap through the port receiver and transmitter and back to the host. This tests the channel's path through the port. Contact your next level of support for using this command and the host-based tests.

Test Sequence:

Before entering the command to start a test, block the port using the block command. Refer to "Block Port Procedure."

Note: Initiate a test using *onldiag (port number) start [ext or int] [channel or matrix].* When you use this command, the specified port is placed in maintenance mode and the diagnostic begins.

Note: If a diagnostic test is already running on the port, the following message displays (xx indicates the port number):

```
Request Rejected - Port xx is already running diagnos-
tics. Enter ONLDIAG xx STOP to terminate the diagnos-
tics on port xx.
```

– Stop diagnostics using *onldiag (port number) stop*. When stopped, test results display.

– Start a new test using onldiag (port number) start [ext or int] [channel or matrix].

– Use *onldiag (port number)* at any time to obtain current test status.

– Messages display in the Console *Terminal* window or on a maintenance terminal or PC screen. Failures for the port number tested display as link incident reports in the Director event log.

Command Format:

onldiag (port number) [start|stop] [int|ext] [channel|matrix]

Parameters:

none	Provides usage information and examples for onldiag command.
port number	Use physical port numbers 00 through 7B. If used without test parameters (such as start, stop, int, ext, channel, matrix), provides the status of diagnostics running on the physical port. If used with test parameters, it initiates the specific test or action for the port.
start, stop	Starts and stops the diagnostic of the specified port and returns completion status.
int, ext	Int initiates an internal loopback of the port. Ext initiates an external loopback of the port. Make sure a wrap plug is installed on the port.
channel	Initiates the channel external wrap test.
matrix	Initiates the internal loopback test through the MXC/MXS.

Examples:

SSP0>**onldiag** 44 start ext
Port C4: External Loopback: RUNNING

SSP0> **onldiag** 44 stop
Port C4: External Loopback: STOPPED and FAILED

SSP0>**onldiag** 44
Port C4: External Loopback: FAILED

SSP0> **onldiag** 44 start int
Port C4: Internal Loopback: RUNNING

SSP0> **onldiag** 44 stop
Port C4: Internal Loopback: STOPPED and PASSED

SSP0>**onldiag** 7B
Port C4: Internal Loopback: PASSED

SSP0>**onldiag** 7B start matrix
Port FB: Matrix Loopback: RUNNING

SSP0>**onldiag** 7B stop
Port FB: Matrix Loopback: STOPPED and PASSED

SSP0>**onldiag** 7B start channel
Port FB: Channel Loopback: RUNNING

SSP0>**onldiag** 7B stop
Port FB: Channel Loopback: STOPPED and PASSED

- **PM:** Establishes or removes privileged mode for *Terminal* window commands.

  Command Format:

  PM [on] [off]

  Parameters:

  on

  An “Enter password:” prompt appears when this parameter is used. After entering the proper password, privileged mode is established, and the *Terminal* window accepts all unprivileged and privileged commands. Please note that privileged commands are for engineering use only. Do not use them unless directed to do so by your second-level support personnel. When in privileged mode, the *Terminal* window prompt will contain a **P** prefix.

  off

  Disables privileged mode.

  Examples:

  SSP0>**PM** on

  SSP0>**PM** off

- **PLOG:** Displays contents of the power-up status log (PLOG). This log contains status information from the last time the Director went through a power-on reset. This log contains 50 entries maximum. Each entry contains the device type, device number, and error code.

  Command Format:

  PLOG

  Parameters:
  None

  Example:

  SSP0>**PLOG**

- **Pib:** Displays a specified port’s port information block (PIB)

  The PIB includes status information for the following:

  – Port number and address
  – Blocked, prohibited, and dedicated connection status
  – Port type (LED or laser)
  – Installed status
  – Link failure status

– Spare port status
– Offline status
– Control unit port status
– Maintenance mode
– Service required status

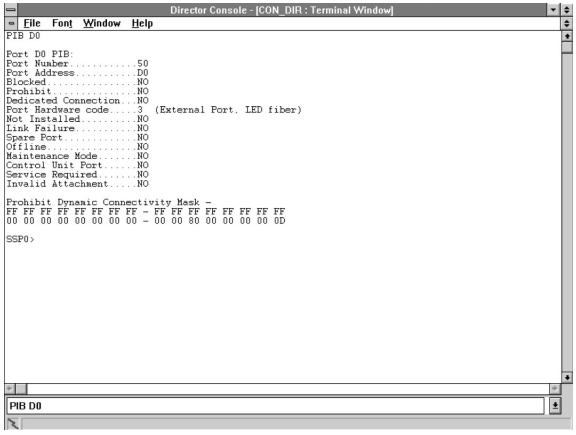
Invalid attachment.

Command Format:

pib (port address)

Example:

SSP0>**pib** D0



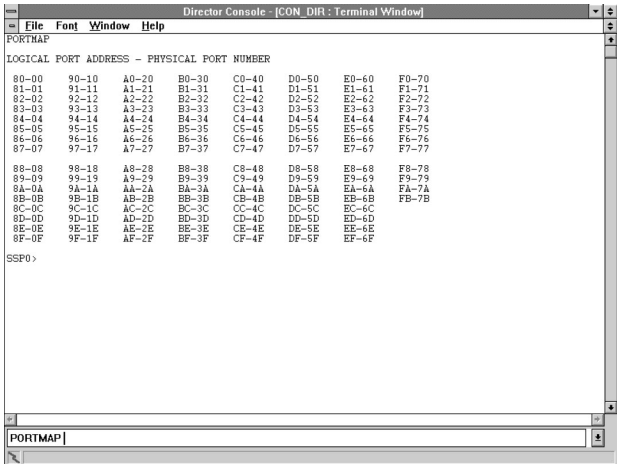
- **Portmap:** Displays a table of physical port numbers and their current addresses.

  Command Format:

  portmap

  Example:

  SSP0>**portmap**



- **Portswap:** This command swaps port addresses between pairs of ports or ranges of ports.

  Note: It is recommended that you use the *Swap Ports* option from the *Maintenance* menu of the Console application's *Port Maintenance* window to swap ports.

  This command is not available through the *Terminal* window in the Console application. Use this command through a terminal or PC attached to the Director's maintenance port.

  Note: When port addresses are swapped, you cannot swap addresses again, except to return the addresses to the original ports. After this, you can swap addresses with another port.

  Command Format:

  portswap (port address, port address)
  portswap (range, range)

  Parameters:

  port address
  Address of the port that you want to swap logical addresses with.

  range
  Range of physical port addresses that you want to swap a range of addresses with.

  Examples:

  SSP0>**portswap** 80,90

The port with address of 80 is assigned address 90, and the port with address 90 is assigned address 80.

portswap 80-8F, 90-9F

Ports with addresses 80 through 8F exchange addresses with ports having addresses 90 through 9F.

portswap 80,90 C0,C1 C2,D2

The port with address 80 exchanges address with the port having address 90. The port with address C0 exchanges address with the port having address C1. The port with address C2 exchanges address with the port that has address D2.

Note: You cannot swap a FICON port on an FCV port card with an ESCON port. You *can* swap a FICON port for a FICON port on another FCV L card. You cannot swap the unaddressable ESCON ports on the FCV port card.

- **Prohibit:** Prohibits dynamic connection between two specified ports.

  Command Format:

  prohibit (port address) (port address)

  Parameters:

  port (address)

  Address of the physical port that you want to prohibit from connecting to another port.

  Example:

  SSP0>**prohibit** 80 B0

  Ports with addresses 80 and B0 are prohibited from connecting with each other.

  Note: Prohibiting a FICON port on an FCV port card also prohibits all unaddressable ESCON ports on the card. Prohibiting an ESCON port on the card does not affect the port's operation.

- **Ps:** This command provides a set of options for gathering information about Director software and hardware failures.

  Command Format:

  ps (option letter) [optional parameter]

  Example:

  SSP0>**ps** i 0

  Displays active incidents in all incident queues.

Options:

ps xx: *Display port Information*. Where xx is a port number. Displays information about the specified port, including port address, port number, port name, port node identification (if it has been identified), and the PIB contents and a description of the values set in the PIB. Use a two-digit port number (for example, 67 or a port address (for example, C3).

ps A: *Display Addresses/Offsets*. Displays the memory addresses of the active file, IPL file, and current file, then offsets the fields containing the files.

ps C: *Display PSCB*. Provides a formatted display of the current presentation services control block (PSCB) contents.

ps E [n]: *Display ESCON Statistics*. Displays the ESCON protocol statistics. Include a number greater than 0 for the optional parameter [n] to clear the statistics (you must enter **ps E** again with no parameters to display the cleared statistics).

ps F: *Display File Structures*. Displays the structures used for File Access Facility (FAF) support. This includes the presentation services (PS) structures for file accountability and file directory as received from the Console.

ps I [x]**:** *Display Incident Queues*. Displays the current entries in the incident queues that are distributed to a host channel path and a Console path. Parameters [x] can be hexadecimal numbers that include the following:

0 - Displays active entries in each queue

1 - Displays active entries in the host queue

2 - Displays active entries in the Console queue

4 - Displays all entries in each queue

5 - Displays all entries in the host queue

6 - Displays all entries in the Console queue

7 - Displays all entries in the operator panel queue

A - Creates nonfailure test incident

B - Creates minor failure test incident

C - Resets the Console incident queue

E - Resets the host incident queue

F - Resets the operator panel incident queue.

ps L: *Display Logical Paths*. Provides a list of the currently available logical paths and the port addresses used by those paths.

ps M [n]: *Display Miscellaneous Statistics*. Provides a list of various link-level activity and some channel statistics maintained by the presentation services (PS) command. Include a number greater than 0 for the optional parameter [n] to clear the statistics. You must enter **ps M** again with no parameters to display the cleared statistics.

ps O: *Display Online Ports*. Provides a list of the current online ports. Information includes port address, port number, port name, and node identification, if available.

ps R: *Display Report Paths*. Displays the primary host reporting path, the secondary host reporting path, and the Console reporting path.

ps S [n]: *Display Sense Statistics*. Displays the number of occurrences of the values in sense byte 5. Only a three-digit field is available for each value. If there are more than 999 occurrences for a value, the field contains three asterisks (***). Include a number greater than 0 for the optional parameter [n] to clear the statistics. You must enter **ps S** again with no parameters to display the cleared statistics.

ps T: *Display Time Queue*. Displays a list of current entries in the idle time queue.

ps V [A]: *Display CCW Values*. Displays CCW values alphabetically or numerically. Include “A” as an optional parameter to display the values alphabetically. Use **ps V** to display values numerically.

ps W [n]: *Display CCW statistics*. Displays the number of occurrences of each CCW. Only a three-digit field is available for each value. If there are more than 999 occurrences for a value, the field contains three asterisks (***). Include a number greater than 0 for the optional parameter [n] to clear the statistics. You must enter **ps W** again with no parameters to display the cleared statistics.

- **Pswd:** Use this command to change the password. If this command is entered, “Enter new password” will be displayed. The new password may be any character string up to eight characters. All alpha characters are translated to upper case.

  Command Format:

  pswd

  Parameters:

  None

  Example:

  SSP0>**pswd**

When “Enter new password” appears, type any character string up to eight characters.

- **S:** Selects the system services processor (SSP) or FCC processor on a specific CTP card or a Token-Ring controller card for processing commands. When you select either the system services processor (SSP), Fibre Channel controller (FCC), or Token-Ring controller IOC (TKRG), the prompt for command input will change to the appropriate processor. All commands entered at the new prompt apply to that processor. You cannot select a processor that is performing physical input/output operations, except the SSP, or processors that do not load successfully.

  Command Format:

  S (processor parameters) [instance]

  Parameters

  SSP - system services processor
  FCC - Fibre Channel controller
  TKRG - Token-Ring controller IOC

  Instance

  For SSP:

  0 - Selects the SSP on the CTP card installed in slot 0.

  1 - Selects the SSP on the CTP card installed in slot 1.

  no instance number - Selects SSP on the current active or master CTP card.

  For FCC:

  0 - Selects the FCC on the CTP card that you are communicating with at the SSP0> or SSP>1 prompt.

  1 - Not a valid number.

  no instance number - Selects the FCC on the CTP card that you are communicating with at the SSP0> or SSP1> prompt.

  For TKRG:

  0 or no instance number - Selects the TKRG processor installed in slot 0. Valid only when you are communicating with the active CTP card at the the *Terminal* window prompt SSP0>.

  1 - Selects the TKRG processor installed in slot 1. Valid only when you are communicating with the active CTP card at the the *Terminal* window prompt SSP0>.

Examples

SSP0>**S SSP1** - Selects the SSP on the CTP card in slot 1 and displays the following prompt:

```
(BKUP)SSP1>
```

(BKUP) SSP1>**S SSP0** - Selects the SSP on the backup CTP card and displays the following prompt:

```
SSP0>
```

SSP0>**S FCC** - Selects the FCC on the active CTP card and displays the following prompt:

```
FCC0>
```

(BKUP) SSP1>**S FCC** - Selects the FCC on the backup CTP card and displays the following prompt.

```
(BKUP)FCC0>
```

SSP0>**S TKRG** - Selects the TKRG processor in slot 0 and displays the following prompt:

```
TKRG0>
```

SSP0>**S TKRG1** selects the TKRG card in slot 1and displays the following prompt:

```
TKRG1>
```

- **Sw_ctp:** This command causes the master CTP to signal the backup CTP to become the master. The command must be entered on a master CTP with an operational backup CTP.

  Command Format:

  sw_ctp (c)

  Parameters:

  c
  Confirmation indicator to preclude accidental command execution.

  Example:

  SSP0>**sw_ctp** c

- **Sz:** Invokes the ZMODEM send handler for the current I/O device. Use this command to upload the system dump file (system.dmp) to the maintenance terminal fixed disk. You can then copy the file to diskette if necessary.

  Note: You cannot enter this command from the *Terminal* window on the Console. Enter it from a separate maintenance terminal only.

Command Format:

sz

- **Tkrg_switch:** This command forces a switch from the primary TKRG to the backup TKRG.

  Command Format:

  tkrg_switch (x)

  Parameters:

x = 1:	If the backup TKRG is available, switch control to the backup and reload the device as the new backup.
x = 2:	Unconditional shutdown (force failure) of primary TKRG and start backup TKRG if available.

  Example:

  SSP0>**tkrg_switch** 1
  Control switched to the backup TKRG using option 1.

- **U:** Unassemble. This command is intended for engineering use. It displays interpreted assembly code commands for use in low-level debugging operations.

- **Unblock:** Unblocks a port or range of ports. After issuing this command, you can configure the port to connect with any other port.

  Command Format:

  unblock (port address)

  Parameters:

  port address
  Address of the port that you want to unblock.

  Example:
  Unblock single port

  SSP0>**unblock** 85
  Port 85 unblocked

  Command Format, unblock a range of ports:
  unblock (port address - port address)

  Parameters:

  port address - port address
  Address range of the ports that you want to unblock.

Example:

Unblock range of ports

```
SSP0>unblock C3-C8
Port C3-C8 unblocked
```

Note: Blocking or unblocking a FICON port on an FCV port card also blocks or unblocks all unaddressable ESCON ports on the card. Blocking or unblocking an ESCON port on the card does not affect the port's operation.

- **Undedicate:** Removes a dedicated connection between specified ports.

  Command Format:

  undedicate (port address) (port address)

- **Ver:** Displays the current version of licensed internal code (LIC) and loader/monitor area (LMA) code running on the Director, as well as the date and time of the software build.

  Command Format:

  ver

  Parameters:

  None

  Example:

  SSP0>**ver**

  SSP Rel: PROD-05.00.00, 4/26/97 07:30

  LMA Rel: PROD-05.00.00, 4/28/97 09:57

- **Xpmdbg:** Use this command to control the xpmlog display and to perform special operations, such as bypassing error checking. When this command is entered without parameters, a list of several options appears:
  - Option 0 removes ports from transmit sequence trace.
  - Option 1 adds ports to transmit sequence trace.
  - Option 2 lists the ports being traced.
  - Option 3 displays the current, previous, or next trace record.
  - Option 6 clears the service required condition for the port. This condition appears in the *Hdwr* or *H* column of the port's active matrix window as displayed on the Console.
  - Option 7 invokes a software-controlled switch from the current master MXC/MXS set to the backup set, if both sets are installed and functional. When using this option, if you cannot switch to the backup MXC/MXS set,

you may need to clear an error condition on the backup MXC/MXS first using option 7 with the zero (0) parameter.

– Option 8 zeros the error counters that are displayed using the xpmlog command with option 8.

Command Format:

xpmdbg <option> <parameter>

where <parameter> is usually a port number.

Parameters:

Note: Parameters are only available for options 0, 1, 3, and 6, and 7.

xpmdbg 0
(port number) Specifies a port number to remove from the transmit sequence trace.

[0xFF]
Removes all port numbers from the trace.

xpmdbg 1
(port number) Specifies a port number to add to the transmit sequence trace.

xpmdbg 3
none: Displays the current transmit sequence trace.

[0] Displays the previous transmit sequence trace.

[1] Causes all current trace records to be too “old” to display, effectively clearing the trace log.

xpmdbg 6
port number) Specifies the port where the service required condition will be removed.

xpmdbg 7
none: Current MXC/MXS set that is primary and secondary.

Note: This command is used for the 9032-005 Director to indicate the primary and secondary MXC/MXS set in a redundant configuration. If only one MXC/MXS set is installed, it will always be the primary set.

[0] Clears the error condition on the secondary MXC/MXS card set if a second MXC/MXS set is installed.

[3] Switches from the current primary to the secondary MXC/MXS set if a second MXC/MXS set is installed.

Example:

SSP0>**xpmdbg** 7

displays the following:

```
Current MXC/MXS occupancy...
Primary MXC/MXS is in slot 0
Secondary MXC/MXS is in slot 1
```

- **Xpmlog:** Displays information about the cross point manager software subsystem (XPM). The xpmdbg command controls what the xpmlog displays.

  Command Format:

  xpmlog (option number) [port number]

  Parameters:

  port number

  When this command is entered without parameters, a list of options appears:

  – Option 0 displays the event FIFO. This is the stimulus that drives the XPM, such as interrupts from ESCON ports and specific timer expirations.

  – Option 1 displays the transmit sequence trace. This is a chronological entry of sequences, such as OLS, NOS, UD, UDR, and IDLE, transmitted to the port(s) being traced. The xpmdbg command controls the ports that are traced.

  – Option 2 displays the port control block for a port. This is useful for checking the current status of a physical port number. The control block contains such information as the port number, address, slot number, interrupt group, last received sequence, current sequence state bit error count for the prior five minutes, the current accumulated bit error count, a count of 30-second inactivity time-outs, and several flags (such as busy/connected and failed).

  – Option 3 displays a snapshot of the current matrix controller (MXC) configuration, including the translation table and connection table. This includes information for all currently configured ports, such as the port number, the port address, the port number that the port is connected to, and the busy bit status. The busy bit is set when another port wants to connect to the port, but can't temporarily.

  – Option 4 displays a combined, compressed, and time-stamped version of device port (DVP) and MXC errors.

  – Option 6 clears the service required condition for the port. This condition appears in the *Hdwr* or *H* column of the port's active matrix window as displayed on the Console.

– Option 8 displays the MXC and DVP raw errors. This is useful to verify hardware error reporting mechanisms and to study patterns of errors occurring on a large number of ports.

Example:

SSP0>**xpmlog** 2 00

```
{P} SSP0>xpmlog 2 00

PCB at 06D640 pn: 00 intr_grp: 0 slot: 00 port: A tech: 02
rx_seq: Idle event: rcv_seq_IDL  seq_st: inactive  pdf:
seq_tmr: 00009F  LOSL_tmr: FFFFFF  last_ber: 00  curr_ber: 00  inact: 00
oper: 1  fail: 0  FIFO_bsy: 0  static_pend: 0  static_pn: none
MXC pa[00]: 80  pn[80]: 00  cp: 7F  bsy: 0  HIB:
```

Figure E-2. Example of Xpmlog Using Option 2.

Example:

SSP0>**xpmlog** 3

```
{P} SSP0>xpmlog 3
Primary MXC - Port Number, Port Address, Connected Port Number, Busy Bit ...
00 80 CC 0   01 81 00 0   02 82 00 0   03 83 FF 0   04 84 FF 0   05 85 00 0
06 86 00 0   07 87 FF 0   08 88 FF 0   09 89 00 0   0A 8A 00 0   0B 8B FF 0
0C 8C FF 0   0D 8D 00 0   0E 8E 00 0   0F 8F FF 0   10 90 FF 0   11 91 00 0
12 92 00 0   13 93 FF 0   14 94 FF 0   15 95 00 0   16 96 00 0   17 97 FF 0
18 98 FF 0   19 99 00 0   1A 9A 00 0   1B 9B FF 0   1C 9C 7F 0   1D 9D 7F 0
1E 9E 7F 0   1F 9F 7F 0   20 A0 FF 0   21 A1 00 0   22 A2 00 0   23 A3 FF 0
24 A4 FF 0   25 A5 00 0   26 A6 00 0   27 A7 FF 0   28 A8 FF 0   29 A9 00 0
2A AA 00 0   2B AB FF 0   2C AC FF 0   2D AD 00 0   2E AE 00 0   2F AF FF 0
```

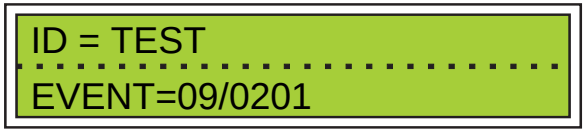
Figure E-3. Example of Xpmlog Using Option 3.

Appendix F. Operator Panel Reference Summary

Operator Panel Status Display

The operator panel status display is a liquid crystal display which contains two message lines:

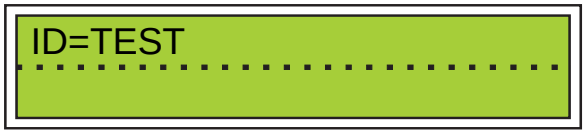
- System information line (top)
- Event information line (bottom)



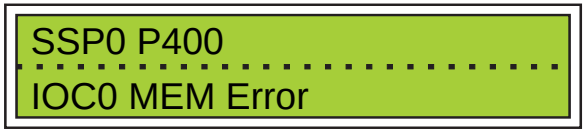
Status Display System Information Line

Following Power-On

When the Director successfully completes its power-on self-tests (POSTs), the system information line displays the Director ID Name:

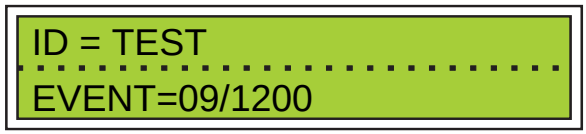


Following power-on, if the Director is unable to successfully complete its POSTs (any nonredundant FRU failure), the system information line displays a code for the event which caused the POSTs to terminate ("Interpreting the Event Code" on page F-5).



Note: Directors with only one CTP card will show the above message if the CTP card fails POSTs. In a redundant Director, the above message format would be displayed only if both CTP cards fail POSTs.

In a redundant Director, following power-on, if the Director is unable to successfully complete its POSTs on the CTP card in slot 0, it will attempt POSTs on the CTP card in slot 1. If it is successful, the event appears as follows:



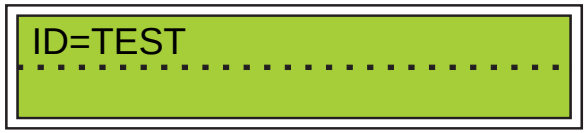
While the Director Is Operating

During normal Director operations, events appear on the event information line.

The system information line displays the Director ID name for the Director. Use the *Advance* button (refer to Figure F-1) to scroll through the following system information displays.

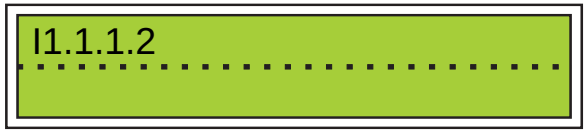
Director Identification (ID) Name

Used by the Console, this name is assigned to a Director to uniquely identify it. Use the Director ID name when discussing Director operations with administrators and service personnel.

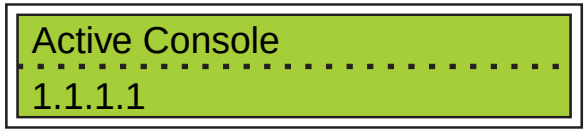


The Director Internet Protocol (IP) Address

This address is used for communications over the Token-Ring LAN to the Console. With each Director using a unique IP address, up to16 Directors may be controlled by the Console.



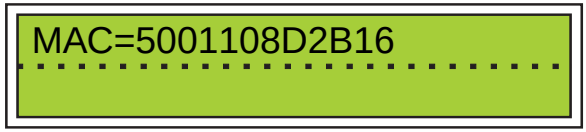
When the Director IP address displays, the Console IP address function is available. Press both the *Detail* and *Clear* buttons simultaneously to refer to the IP address of the active Console displayed on the bottom line of the status display.



Releasing one or both of the buttons causes the status display to return to the Director IP address.

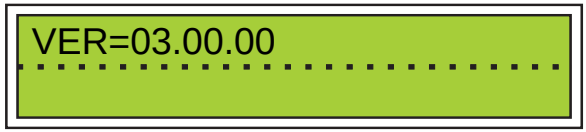
The Media Access Control (MAC) Address

The 12-character hexadecimal MAC address for the Token-Ring (TKRG) controller adapter card in the Director. This address is used for communicating to the Console over the Token-Ring LAN.



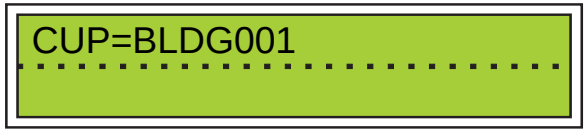
LIC Version

The licensed internal code (LIC) is the particular version of code, housed in Control Processor card memory, which enables the Director. It is important to use the LIC version when speaking with administrators and service personnel about Director operations.



Director CUP Name

The first 12 digits of the control unit port (CUP) name are displayed. The CUP name can be assigned by either the Console or the System Automation for OS/390 (SA OS/390). The SA OS/390 communicates with the Director through the CUP using the CUP name.

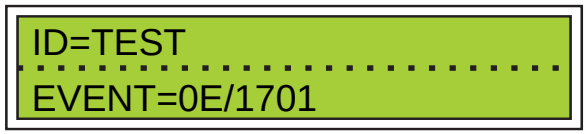


Status Display Event Information Line

The event information line displays, in an encoded format, the faults, failures, or events which impact the Director's operational status. Events may pertain to:

- Link operation
- Field replaceable units (FRUs)
- LIC events.

When an event occurs, the Director reads a set of parameters, specific to that event, and constructs an "event code" to describe it. This event code is what you see on the status display event information line:



Up to ten events may be stored in the event information queue.

Interpreting the Event Code

Event codes display on the operator panel status display as Event = ic/xynn.

ic is an incident code.

xynn is a four-digit hexadecimal code that describes the operational status of a particular FRU:

- x: Director operational level
- y: The FRU where the event occurred
- nn: The location (slot or port number) where the FRU is located in the Director.

Refer to Appendix C, "Director Status Codes," for more information.

Incident Code

The first two digits of the event code display the incident code in hexadecimal format. Interpreting this hex code partially qualifies an event. Three types of event qualifications may be represented:

- Hardware
- Software
- Link.

The following table lists examples of incident hex codes that may appear on the operator panel, the event type they represent, and a description of that event.

Event Code	Event Type	Event Description
09	Hardware	**CTP Incident**
0A	Hardware	**MXC/MXS Incident**
0B	Hardware	**Online Diagnostics Incident**
0C	Hardware	**Token-Ring Adapter Card Incident**
0D	Hardware	**Power Supply Incident**

Event Code	Event Type	Event Description
0E	Hardware	**Fan Incident**
0F	Hardware	**Front Panel Failure**
10	Software	**CTP Software Failure**. Unrecoverable software fault. A unique fault code is assigned in the software to each fault condition and/or point of detection.
11	Software	**CTP Fault**. Corrupted configuration file in nonvolatile RAM found during initialization sequences.
1B	Hardware	**Port Failure**

Refer to Appendix A, "Incident Codes and Sense Data Summary," for a list of these codes keyed to incident type (link, hardware, software), related sense bytes, and the location where the incident is reported.

Severity Code (Event Impact on Operational Level)

The third digit of the event code represents the severity of the event and may be any integer 0 to 5. Each integer represents a level of Director operational capacity:

- 0 = Fully operational
- 1 = Fully operational; redundant component failure
- 2 = Operational; minor failure
- 3 = Operational; major failure
- 4 = Not operational
- 5 = Cannot determine operational level.

The impact code represents the degree to which that particular event degrades the Director functions.

FRU Responsible

The fourth digit of the event code indicates the FRU responsible for the event. The responsible FRU digit may be an integer between 0 and 9, or the alpha characters A through H. Each digit represents a particular FRU:

- 0=No additional FRUs
- 2=(CTP) control processor

- 3=(MXS) matrix switch*
- 4=(DVP) LED port
- 5=(DVP) laser port
- 6=(Reserved)
- 7=(FAN) fan assembly
- 9=(CON) console
- A=(TKRG) Token-Ring adapter
- B=(PAN) operator panel
- C=(SDVP) LED 4-port spare
- D=(SDV2) LED 2 port/laser 2-port spare
- E=(LBA) logic board assembly
- F=FCV port card
- G=3.3 and 5.0-volt power supply (PWR2)
- H=(MXC2) FICON-capable MXC card
- I-V=Reserved

Note: The matrix switch card code (3) will not display as part of the initial event on the status display. A “1” code displays for the matrix controller and matrix switch. A “3” code may display for the matrix switch in sense byte 30 or 31 when the *Detail* button is pressed, revealing additional sense byte information.

Position or Slot Number of Responsible FRU

The position code fully qualifies an event by indicating its precise location in the Director. The last two digits of the event code indicate the FRU.

Position #	Field Replaceable Unit
00 or 01	Matrix controller card (MXC, MXC2)
00 or 01	Control processor card
00, 01, 02, or 03	Matrix switch card
00 through 30	LED port card (port number)
00 through 30	Laser port card (port number)
00 through 30	FCV port card (port number)
00 or 01	Fan
00 or 01	Power supply (PWR, PWR2)

00	Console
00 or 01	TKRG controller adapter card

Operator Panel Buttons

The buttons on the operator panel are listed below. Press and hold a button to perform its respective function.

- IML button (refer to Figure F-1)
- Advance button
- Entry button
- Detail button
- Clear button.

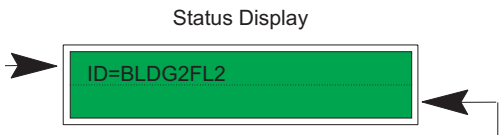


Figure F-1. Operator Panel Buttons

IML Button

When you press the *IML* (initial machine load) button and hold it for five seconds:

- *Both* CTP cards (if two are installed) and the active TKRG controller adapter card reset. **Pressing the *IML* button does *not* reset the functional logic of the MXC, MXS, DVP port cards, and FCV port cards.**
- The LIC loads from control processor FLASH memory to the CPU without powering the Director off and on.
- The service required status for all logic cards resets.
- Connections between channels and control units through the Director are maintained.
- The current active matrix is loaded from the Director's nonvolatile memory.

When the Director successfully initializes (IMLs), the Director ID number displays on the status display system information line.

Attention!

If an FCV port card is operating in degraded mode (one or more internal ESCON ports not operational), pressing the *IML* button sets the FICON port offline. Prior to pressing the *IML* button during degraded operation, ensure the system operator varies the attached FICON channel offline. Only use this button if directed by your next level of support or by a maintenance analysis procedure (MAP).

Note: If the Director does not properly initialize, a component fault or failure or system event may be the cause. In these instances an event code displays on the event information line.

Advance Button

The *Advance* button is essentially a “scroll” button which controls the information resident on the system information line.

Pressing the *Advance* button once causes the currently displayed line of system information to advance to the next sequential line of system information. By pressing the *Advance* button, you may cycle through the following system information:

- Director ID name
- CUP name
- Director IP address
- MAC address
- LIC version number.

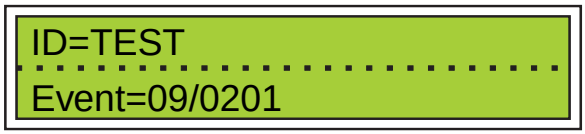
Pressing the *Advance* button while the LIC version number is displayed completes the system information cycle and causes the Director ID name to redisplay.

Entry Button

The *Entry* button, used with the *Detail* and *Clear* buttons, displays and acknowledges event information residing in the event information queue.

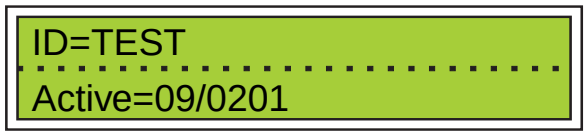
When the Director detects an event (or events), the operator panel alerts you to that event in two ways:

- By turning on the System Error indicator, if the severity code of the event is 1 or greater
- By displaying the event code.



Acknowledge Events

Press the *Entry* button once to acknowledge an event. Acknowledgement changes that event's status from event to active:



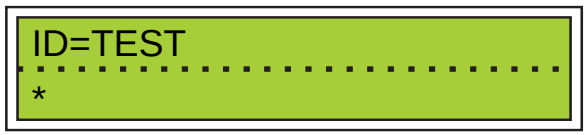
If more than one event exists, pushing the *Entry* button causes the next event to display while changing the first event's status from event to active.

After the event is acknowledged, choose one of the following actions:

- Gather details regarding that event (refer to "Detail Button")
- Report the event
- Resolve the event
- Decode the event code in order to resolve or report that event (refer to "Interpreting the Event Code" on page F-5).

Scroll Through Events

When all events in the queue have been displayed, pressing the *Entry* button causes an asterisk (*) to display:

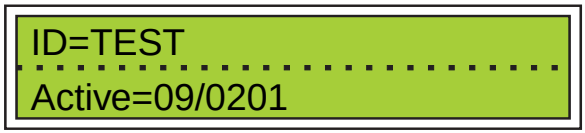


The asterisk signifies the end of the event information queue.

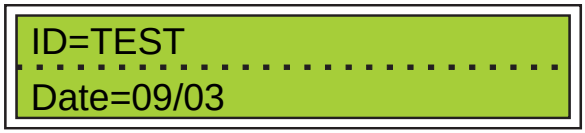
When the asterisk displays, pressing the *Entry* button again causes the first event entry to redisplay, now with active status.

Detail Button

The *Detail* button displays specific details associated with the event currently displayed on the event information line:



Pressing the *Detail* button once results in the display of the currently displayed event's first of nine detail information lines:



Continue pressing the *Detail* button to cycle through the following event information details:

- Date of event (line 1)
- Time of event (line 2)
- Sense byte data 10 through 31 (lines 3 through 9).

When line nine (the last of the sense byte data) displays, the event information detail cycle is complete. Pressing the *Detail* button again causes the date of the event (line1 of the event details) to redisplay.

Interpreting the Sense Byte Data

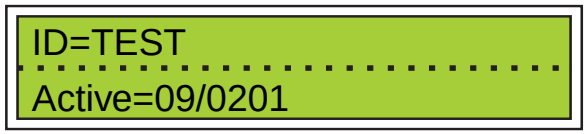
The sense bytes provide detail about the type of error and the location where the error occurred. For more information, refer to Appendix A, "Incident Codes and Sense Data Summary."

Clear Button

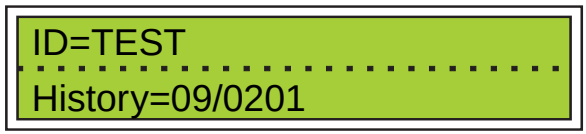
The *Clear* button performs two functions:

- Updates the currently selected active or event status to history status.
- Deletes from the event information queue the currently selected event marked as history.

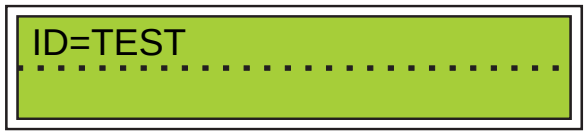
If an event marked as active is currently displayed on the status display:



Pressing the *Clear* button causes the event to be marked as history:



If an event marked as history is currently displayed on the event Information line, pressing the *Clear* button causes the event to be deleted from the queue:



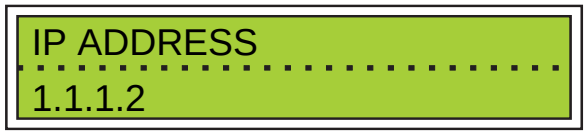
Up to ten events may be stored in the event information queue.

When all Active events of severity code 1 or greater have been designated as History or deleted, the system error indicator deactivates.

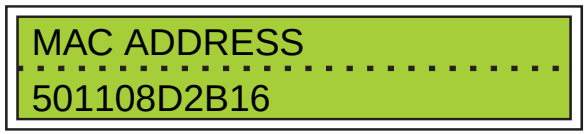
Operator Assist Mode

When you place the operator panel in operator assist mode, you can use the *Clear*, *Detail*, and *Entry* buttons to modify the Director's IP and MAC addresses. The operator assist mode is disabled after an IML until the network activation completes (normally about 15 seconds).

Enter operator assist mode by pressing the *Advance* and *Entry* buttons at the same time. The IP address displays:



Press the *Advance* button to display the MAC address.



Use the buttons as described on the following page to change the displayed address.

Clear Button

Press once to initiate the edit function. A blinking cursor appears over the rightmost character of the rightmost edit field. Press clear again to move the cursor left to the next field. The cursor wraps back to the rightmost field when the leftmost field is passed.

Detail Button

Press to increment the number in the edit field. Hold the button down for more than three seconds to increment the number quickly. Each edit field for the IP address is three digits ranging from 000 to 255. Each edit field for the MAC address is a two-digit hexadecimal number from 00 to FF. The entire number in the edit field increments when you press the *Detail* button.

Entry Button

Use to save an edited IP or MAC address value. Disables the cursor. Exits the operator assist mode when “Exit” displays on the top line of the status display.

Advance Button

Use to abort the current edit and advance to the next menu item in the operator assist mode (either the IP address, MAC address, or exit).

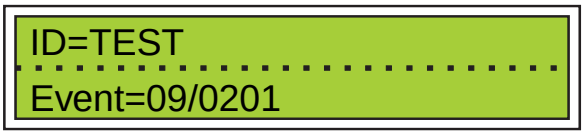
When New Addresses Take Effect

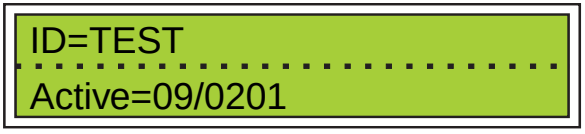
A saved MAC address takes effect only after an IML. An asterisk (*) displays to the right of the address until this occurs. A saved IP address takes effect immediately.

Clearing Events

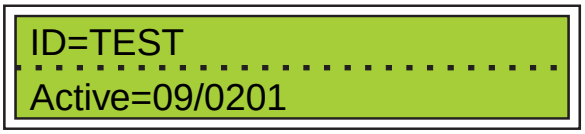
Use the following steps to clear events from the operator panel display and event queue. You should always clear events for resolved problems so that you do not spend time resolving the same problems again. For example, if the maintenance analysis procedures in Chapter 2 direct you to replace a failed FRU because a specific event code appears, you should clear the events (and related events) after replacing the FRU.

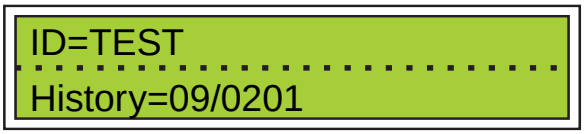
1. Scroll through events in the event queue by pushing the *Entry* button. Events may be marked as “Event,” “Active,” or “History.”
2. If an event appears on the operator panel marked as “Event,” as shown in the following illustration, press the *Entry* button to acknowledge the event and change the status from “Event” to “Active.”



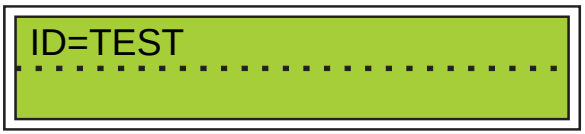


3. To clear an “Active” event, press the *Clear* button to mark the event as “History.”:

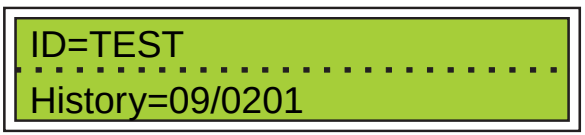


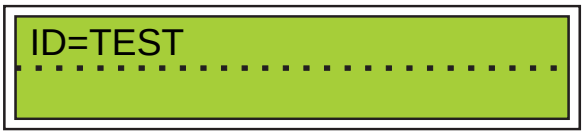


Press the *Clear* button again to delete the event, from the queue:



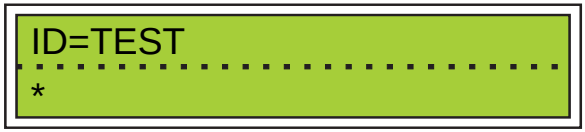
4. To clear a “History” event, press the *Clear* button once to delete the event from the queue.





5. Up to ten events may be stored in the event information queue.

   When all events in the queue have appeared, press the *Entry* button to display an asterisk (*).



   The asterisk signifies the end of the event information queue.

   When the asterisk displays, press the *Entry* button again to display the first event entry that has not been cleared.

Operator Panel LED Indicators

There are two light emitting diode (LED) indicators:

- System Error indicator (amber)
- Power indicator (green).

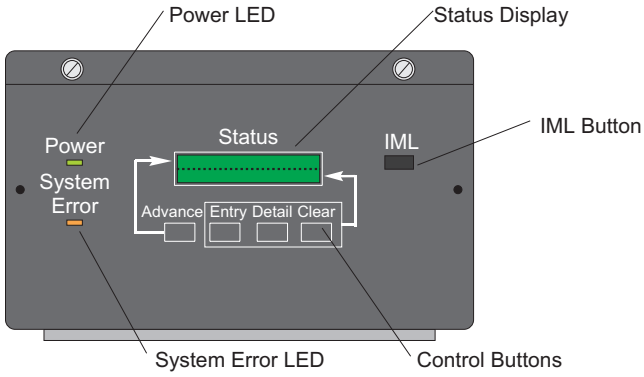


Figure F-2. Operator Panel LED Indicators

System Error Indicator

The System Error indicator lights when an event occurs at operational level 1 or higher. This notifies an operator of an event requiring immediate operator attention, such as a FRU failure or LIC error.

The indicator circuitry deactivates after the level 1 condition is cleared, and the LED indicator goes out when the operator moves the incident from the event or

active status to history status or clears the incident completely from the operator panel.

Note: Even though the System Error indicator is on, indicating operational level 1 or higher, the Director status from the Console will indicate a fully operational status.

Power Indicator

The Power indicator activates when the Director receives 5 V dc power; and remains active for as long as the Director receives 5 V dc power. **An inactive power indicator does not indicate that the Director is not receiving 5 V dc power.**

AC Power Switch

The ac power on/off switch is on the front of the 9032 Model 5 Director. The switch is a 15-Amp, single throw, 4-pole switch which controls the flow of ac power to the power supplies. The power supplies generate the Director's dc voltages. The ac power switch controls both power supplies.

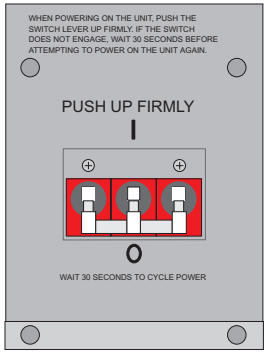


Figure F-3. AC Power Switch

Switch on power to the Director by pressing the ac power switch firmly to fully engage. If the switch does not engage properly (because it was not pushed firmly) wait 30 seconds before attempting to switch power on again.

Note: If powering the unit off to cycle power, wait 30 seconds before powering on again.

Power-On Self-Tests (POSTs) at Power-On

When Director power is switched on, POSTs are automatically run to ensure correct operation of Director logic.

If the Director does not properly initialize, the status display event information line displays an event code.

When the Director successfully initializes, the status display system information line displays the Director ID name.

Glossary

This glossary includes terms and definitions from:

- The *Dictionary of Computing*, ZC20-1699.
- The American *National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright 1990 by the American National Standards Institute (ANSI). Copies can be purchased from the American National Standards Institute, 1430 Broadway, New York, New York 10018. Definitions are identified by the symbol (A) after the definition.
- The *ANSI/EIA Standard - 440A: Fiber Optic Terminology*, copyright 1989 by the Electronic Industries Association (EIA). Copies can be purchased from the Electronic Industries Association, 2001 Pennsylvania Avenue N.W., Washington, D.C. 20006. Definitions are identified by the symbol (E) after the definition.
- The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTCI/SCI). Definitions of published parts of this vocabulary are identified by the symbol (I) after the definition. Definitions taken from draft international standards, committee drafts, and working papers being developed by ISO/IEC JTCI/SCI are identified by the symbol (T) after the definition, indicating that final agreement has not yet been reached among the participating National Bodies of SCI.
- *Maintenance Information for the 9032 Model 3 Enterprise Systems Connection Director,* SY27-3601.
- *Maintenance Information for the 9033 Model 4 Enterprise Systems Connection Director,* SY27-2638.
- *Maintenance Information for the 9032 Model 5 Enterprise Systems Connection Director, SY28-1158*.

The following cross-references are used in this glossary:

Contrast with. This refers to a term that has an opposite or substantively different meaning.

See. This refers the reader to multiple-word terms in which this term appears.

See also. This refers the reader to terms that have a related, but not synonymous, meaning.

Synonym for. This indicates that the term has the same meaning as a preferred term, which is defined in the glossary.

A

active configuration matrix.. In an ESCON environment, the ESCON Director configuration determined by the status of the current set of connectivity attributes. Contrast with *saved configuration*.

adapter. (1) Hardware that provides some transitional functions between two or more devices. (2) In an ESCON environment, link hardware used to join different optical fiber connector types. Contrast with *coupler*.

address. (1) To refer to a device or an item of data by its address. (I) (A) (2) The location in the storage of a computer where data is stored. (3) In data communication, the unique code assigned to each device or workstation connected to a network. (4) The identifier of a location, source, or destination.

address name. See *port name*.

allowed connection. In an ESCON Director, the attribute that, when set, establishes dynamic connectivity capability. Contrast with *prohibited*.

application. (1) The use to which an information processing system is put, for example, payroll application, an airline reservation application, a network application. (2) A collection of software components used to perform specific types of work on a computer.

attribute. An address attribute is the connection status of the address on a configuration matrix; allowed, blocked, dedicated, or prohibited.

B

backup diskette. A diskette that contains information from another diskette. It is used in case the original information is unintentionally changed or destroyed.

blocked. In an ESCON Director, the attribute that, when set, removes the communication capability of a specific port. Contrast with *unblocked*.

C

cascade. Windows may be cascaded to show all windows currently open in a way that allows any one window to be viewed by clicking on its title (it is brought to the front). Cascaded windows are overlapped; tiled windows are not. To cascade windows, use the *Window* menu and *Cascade* option.

CBY. Mnemonic for “channel operations running in byte mode.” This specifies the I/O mode of operation for the channel path under the IOCP CHPID statement’s Type parameter.

cell. On the matrix window’s gray matrix area, a cell is the intersection point between a horizontal port address and a vertical port address. A selected cell is indicated by the cell cursor.

cell cursor. A white square on the matrix window’s gray matrix area indicating the currently selected intersection cell. Attribute modifications that require two port addresses such as prohibit or dedicate are performed on the currently selected cell indicated by the cell cursor.

channel. The system element that controls one channel path, whose mode of operation depends on the type of hardware to which it is attached. In a channel subsystem, each channel controls an I/O interface between the channel control element and the attached control units.

chained. In an ESCON environment, means that two ESCON Directors are physically attached to each other.

channel path (CHP). A single interface between a central processor and one or more control units along which signals and data can be sent to perform I/O requests.

channel path identifier (CHPID). In a channel subsystem, a value assigned to each installed channel path of the system that uniquely identifies that path to the system.

channel subsystem (CSS). A collection of subchannels that directs the flow of information between I/O devices and main storage, relieves the processor of communication tasks, and performs path management functions.

channel-attached. (1) Pertaining to attachment of devices directly by data channels (I/O channels) to a computer. (2) Pertaining to devices attached to a control unit by cables rather than by telecommunication lines.

CHPID. Channel path identifier.

CNC. Mnemonic for an ESCON channel attached to an ESCON-capable device.

column. A vertical arrangement of data. Contrast with *row*.

command. (1) A character string from a source external to a system that represents a request for system action. (2) A request from a terminal for performance of an operation or execution of a program. (3) A value sent on an I/O interface from a channel to a control unit that specifies the operation to be performed.

concurrent maintenance. Ability to perform maintenance tasks, such as removal/replacement of field replaceable units (FRUs) while the Director is operating. Also, fiber cables can be connected/disconnected from Device Port cards while the Director is operating.

component. (1) Hardware or software that is part of a functional unit. (2) A functional part of an operating system; for example, the scheduler or supervisor.

configuration matrix. A configuration matrix details a specific Director's address configuration. The three matrix types are new matrix, saved matrix, and active matrix.

connectivity attribute. In an ESCON Director, the characteristic that determines a particular element of a port's status. See *allowed, blocked, dedicated, prohibited, and unblocked*.

connectivity capability. (1) The capability that allows attachment of a device to a system without requiring physical reconfiguration of the device or its interconnections. (2) In an ESCON Director, the capability that allows logical manipulation of link connections to provide physical device attachment. See also *configuration matrix, connectivity control, and dynamic connection*.

connectivity control. In an ESCON Director, the method used to change a port's connectivity attributes, thereby determining the communication capability of the link attached to that port.

connector. See *optical fiber connector*.

Console. The ESCON Director input/output device used to perform operator and service tasks at the Director.

Console audit log. A log containing summaries of actions taken by the Console operator, recording an audit trail of changes affecting the Console only. For example, adding, modifying, or deleting passwords or LIC versions records the operation, including the date and time, in the audit log.

Console error log. A log of abnormal errors that may have been encountered by the Console software during operations. For example, errors caused by insufficient memory on the PC are logged.

control program. A computer program designed to schedule and to supervise the execution of programs of a computer system. (I) (A)

control processor. Circuit card that provides the processor and associated logic for overall coordination of the Director. This circuit card initializes hardware components of the system after power on or reset. While in operation, the control processor supports the switch control unit port (CUP), maintenance port, control panel, ESCON port exception handling, and error recovery. It also contains the fiber channel controller for handling I/O requirements of ESCON channels. This card is labeled CTP for "control processor."

control unit. A hardware unit that controls the reading, writing, or displaying of data at one or more input/output units.

converter. In an ESCON environment, this device allows attachment of parallel channel (bus and tag) I/O control units to ESCON channels.

coupler. In an ESCON environment, link hardware used to join optical fiber connectors of the same type. Contrast with *adapter*.

CTC. (1) Channel-to-channel. (2) Mnemonic for an ESCON channel attached to another ESCON channel.

CTP. See *control processor.*

CUP. control unit port. An internal Director port on the CTP card numbered FE, that communicates with the channels to report error conditions and link initialization.

CVC. Mnemonic for an ESCON channel attached to an ESCON converter such as a 9034.

D

DASD. Direct access storage device.

DASD subsystem. A storage control and its attached direct access storage devices.

DCAF. Acronym for IBM-licensed distributed console access facility software. Through DCAF, the Director Console can be accessed and controlled by a remote personal computer.

dedicated connection. In an ESCON Director, a connection between two ports that is not affected by information contained in the transmission frames. This connection, which restricts those ports from communicating with any other port, can be established only as a result of actions performed by a host control program or at the Director Console. (The two links having a dedicated connection appear as one continuous link.) Contrast with *dynamic connection*.

default. Pertaining to an attribute, value, or option that is assumed when none is explicitly specified. (I)

destination. Any point or location, such as a node, station, or a particular terminal, to which information is to be sent.

device. A mechanical, electrical, or electronic contrivance with a specific purpose.

device number. In a channel subsystem, four hexadecimal digits that uniquely identify an I/O device.

device port card (DVP). The Director's hardware interface for the ESCON fiber optic media. Each port card contains either eight LED or eight XDF laser port interfaces.

dialog box. A dialog box is a pop-up window containing informational messages or fields to be modified with desired options.

diagnostics. (1) The process of investigating the cause or the nature of a condition or a problem in a product or system. (2) Modules or tests used by computer users and service personnel to diagnose hardware problems.

Director event log. A log of abnormal incidents that may have been encountered by the Director during operations. For example, events caused by insufficient memory on the PC are logged.

Director audit log. A log containing summaries of actions taken by the Console operator or the host-based software, recording an audit trail of changes affecting the Director. For example, prohibiting or dedicating an address intersection records this operation, including the date and time, in the audit log.

disconnected. In an ESCON Director, the attribute, when set, removes a dedicated connection. Contrast with *connected*.

diskette. A thin magnetic disk enclosed in a jacket.

diskette drive. The mechanism used to seek, read, and write data on diskettes.

display device. A device that presents information on a screen.

distribution panel. (1) In an ESCON environment, a panel that provides a central location for the attachment of trunk and jumper cables and that can be mounted in a rack, wiring closet, or on a wall.

duplex. Pertaining to communication in which data can be sent and received at the same time. Contrast with *half duplex.*

duplex connector. In an ESCON environment, an optical fiber component that terminates both jumper cable fibers in one housing and provides physical keying for attachment to a duplex receptacle.

duplex receptacle. In an ESCON environment, a fixed or stationary optical fiber component that provides a keyed attachment method for a duplex connector.

DVP. See *device port*.

dynamic connection. In an ESCON Director, a connection between two ports, established or removed by the Director and that, when active, appears as one continuous link. The duration of the connection depends on the protocol defined for the frames transmitted through the ports and on the state of the ports. Contrast with *dedicated connection*.

dynamic connectivity. In an ESCON Director, the capability that allows connections to be established and removed at any time.

E

EBCDIC. See *extended binary-coded decimal interchange code*.

ELP. See *establish logical path*.

erase. To remove information, leaving the space unoccupied.

error log. A data set or file in a product or system where error information is stored for later access.

error message. An indication that an error has been detected. (A) See also *information message* and *warning message*.

ESCD. Enterprise systems connection (ESCON) Director.

ESCON. Enterprise systems connection.

ESCON channel. A channel having an enterprise systems connection channel-to-control-unit I/O interface that uses optical cables as a transmission medium. Contrast with *parallel channel*.

ESCON Director. A device that provides connectivity capability and control for attaching any two links to each other.

establish logical path (ELP). ESCON protocol command issued from host to establish a connection between host and port or between two ports on a Director. Command frame contains a destination and source address.

extended binary-coded decimal interchange code. A coded character set of 256 8-bit characters.

extended distance feature. Single-mode laser ESCON port.

F

FCC. *See fiber channel controller.*

FCV. Fibre Channel converter. Converts data between ESCON peripherals connected to Director ESCON ports and the FICON server, such as the IBM system/390 (S/390) generation 5 (or later model) parallel enterprise server™ which is attached to the FCV port on the FCV port card.

FCV port card. Fibre Channel converter (FCV). This card includes one external long-

wave FCV laser port for FICON fiber-optic media and eight internal ESCON ports that are connected to the Director's Logic Board Assembly. The card acts as a FICON-to-ESCON converter, multiplexing one FICON port to the eight internal ESCON ports.

feature. A part of an IBM product that may be ordered separately by the customer.

fiber. See *optical fiber*.

Fibre Channel. The general name of an integrated set of standards developed by ANSI that define protocols for flexible information transfer. Logically, a point-to-point serial data channel, structured for high performance.

Fibre Channel controller (FCC). Software and processor on the CTP card. The FCC provides the processing and control logic necessary to handle I/O requirements of the ESCON channel.

Fibre Channel standard (FCS). A standard that describes the point-to-point physical interface, transmission protocol, and signaling protocol of a high-performance fiber optic serial link.

fiber optic cable. See *optical cable*.

fiber optics. The branch of optical technology concerned with the transmission of radiant power through fibers made of transparent materials such as glass, fused silica, and plastic. (E)

- **Note:** Telecommunication applications of fiber optics use optical fibers. Either a single discrete fiber or a nonspatially aligned fiber bundle can be used for each information channel. Such fibers are often called optical fibers to differentiate them from fibers used in noncommunication applications.

Field replaceable unit (FRU). See *FRU*.

FLASH memory. Reusable nonvolatile memory that is organized as segments for writing and as bytes/words for reading. FLASH is faster than PROM, but slower than RAM.

FRU (field replaceable unit). One of the components of a Director, such as a Power Supply assembly or a port card.

G

graphic display. The configuration matrix may be displayed in a graphic mode on the Console. This mode shows all connection types as unique graphic symbols in the matrix region of the window. When graphic display is turned off, only prohibited connections are displayed in the matrix region.

graphical user interface. A graphical user interface (GUI) is a visually-oriented user interface where you interact with representations of real world objects displayed on the computer screen. Interactions with such objects produces actions that are intuitive to you.

H

half duplex. In data communication, pertaining to transmission in only one direction at a time. Contrast with *duplex*.

hexadecimal. Pertaining to a numbering system with base of sixteen; valid numbers use the digits 0-9 and characters A - F, where A represents 10 and F represents 15.

hardware information block (HIB). Status register that defines whether a port is not installed, has a dynamic connection, has a link failure, is blocked, or is offline. The MXC reads the register in response for connection requests to the port.

host processor. (1) A processor that controls all or part of a user application network. (T) (2) ln a network, the processing unit in which resides the access method for the network.

ID. See i*dentifier*.

identifier (ID). (1) One or more characters used to identify or name a data element and possibly to indicate certain properties of that data element. (T) (2) A sequence of bits or characters that identifies a program, device, or system to another program, device, or system. (3) ln an ESCON Director, a user-defined symbolic name of 24 characters or less that identifies a particular Director. See also *password identifier* and *port name*.

information message. A message telling a user that a function is performing normally or has completed normally. User acknowledgement may not be required, depending on the message. See also *error message* and *warning message*.

initial machine load (IML). Loading the operating system and applications software from secondary storage to CPU after power up. Sometimes referred to as booting the machine.

initial program load (IPL). (1) The initialization procedure that causes an operating system to commence operation. (2) The process by which a configuration image is loaded into storage at the beginning of a work day or after a system malfunction. (3) The process of loading system programs and preparing a system to run jobs.

initial program load (IPL) file. Information stored in Director nonvolatile memory that contains default connection configurations. The Director loads this file for operation when powered on. This file can be modified or another file can be specified as the IPL file through the Director Console.

input/output (I/O). (1) Pertaining to a device whose parts can perform an input process and an output process at the same time. (I) (2) Pertaining to a functional unit or channel involved in an input process, output process, or both, concurrently or not, and to the data involved in such a process. (3) Pertaining to input, output, or both.

input/output configuration. The collection of channel paths, control units, and I/O devices that attaches to the processor.

input/output configuration data set (IOCDS). The data set that contains an I/O configuration definition built by the input/output configuration program (IOCP).

input/output configuration program (IOCP). A program that defines to a system all available I/O devices and paths.

interface. (1) A shared boundary between two functional units, defined by functional characteristics, signal characteristics, or other characteristics as appropriate. The concept

includes the specification of the connection of two devices having different functions. (T) (2) Hardware, software, or both, that link systems, programs, or devices.

I/O. See *input/output*.

IOCDS. See *I/O configuration data set*.

IP address. A unique string of numbers that identifies a device on the Internet. The address consists of four groups of numbers delimited by periods (dotted quad). All resources on the Internet must have an IP address.

IPL. See *initial program load*.

J

jumper cable. In an ESCON environment, an optical cable having two conductors that provides physical attachment between two devices or between a device and a distribution panel. Contrast with *trunk cable*.

L

laser. A device that produces optical radiation using a population inversion to provide light amplification by stimulated emission of radiation and (generally) an optical resonant cavity to provide positive feedback. Laser radiation can be highly coherent temporally, or spatially, or both. (E)

licensed Internal code (LIC). Software provided for use on specific IBM machines and licensed to customers under the terms of IBM's customer agreement. Microcode can be licensed Internal code and licensed as such.

link. (1) In an ESCON environment, the physical connection and transmission medium used between an optical transmitter and an optical receiver. A link consists of two conductors, one used for sending and the other for receiving, thereby providing a duplex communication path. (2) In an ESCON I/O interface, the physical connection and transmission medium used between a channel and a control unit, a channel and a Director, a control unit and a Director, or, at times, between two Directors.

link address. In an ESCON environment, an address assigned at initialization that identifies a channel or control unit and allows it to send and receive transmission frames and perform I/O operations. See also *port address*.

local. Synonym for channel-attached.

Loader/Monitor Area code. Code that resides in the loader/monitor area of the CTP card. Among other functions, LMA code provides input/output functions available through the maintenance port, operator panel, and Console interface. It also provides Terminal window command functions, power up diagnostics, FRU power-on hours update and data read/write control, and LMA code/LIC download functions.

log. (1) To record or log all messages on the system printer. (2) A record of events that have occurred.

logical partitioning. A way of creating configuration access control that is unique to each defined operator.

logical switch number. A two-digit number used by the I/O configuration program (IOCP) to identify a specific ESCON Director.

M

MAC Address. The hardware address of a device connected to a shared network.

maintenance analysis procedure (MAP). When a Director hardware fault occurs, these online procedures guide customer engineers step-by-step through initial fault isolation and repair.

matrix controller/matrix switch (MXC/MXS). A set of circuit cards that makes decisions on dynamic connection requests between channels and control units attached to the Director. Provides for connection paths between ports. This card is stamped with MXC/MXS for matrix controller/matrix switch.

megabyte (MB). (1) A unit of measure for storage size. One megabyte equals 1 048 576 bytes. (2) Loosely, one million bytes.

menu bar. The menu bar (or action bar) located across the top of a Console window. From this menu bar, pull-down menus may be displayed by clicking on a menu name with the mouse, or by pressing ***Alt*** with the underlined letter of the name for the menu name.

micrometer. One millionth part of a meter.

ms. Millisecond.

multimode optical fiber. A graded-index or step-index optical fiber that allows more than one bound mode to propagate. (E) Contrast with *singlemode optical fiber*.

MVS/ESA. multiple virtual storage/enterprise systems architecture.

MVS/SP. multiple virtual storage/system product.

MXC/MXS. *See matrix controller/matrix switch.*

N

new matrix. A *New* matrix is a saved matrix that is “blank” (contains default configuration attributes) but does not yet have a saved name. It is used for creating a new saved configuration, and is updated to a Saved Matrix the first time configuration changes are saved.

nondisruptive installation. The physical installation of additional units while normal operations continue without interruption. Contrast with *nondisruptive removal*. See also *concurrent maintenance*.

nondisruptive removal. The physical removal of existing units while normal operations continue without interruption. Contrast with *nondisruptive installation*. See also *concurrent maintenance*.

O

octet. Refers to an 8-bit quantity, often called a byte. Often used to explain specific segments of a LAN address. A LAN address is a 32-bit number in decimal format, normally represented as four 8-bit bytes (octets) with

each byte or octet separated by a decimal point. For example, the address 192.25.8.100 comprises four octets. The value of the first octet from the left is 192, the value of the next octet is 25, and so on.

operating system (OS). Software that controls the execution of programs and that may provide services such as resource allocation, scheduling, input/output control, and data management. Although operating systems are predominantly software, partial hardware implementatlons are possible. (T)

optical cable. A fiber, multiple fibers, or a fiber bundle in a structure built to meet optical, mechanical, and environmental specifications. (E) See also *jumper cable, optical cable assembly,* and *trunk cable*.

optical cable assembly. An optical cable that is connector-terminated. Generally, an optical cable that has been terminated by a manufacturer and is ready for installation. (E) See also *jumper cable* and *optical cable*.

optical fiber connector. A hardware component that transfers optical power between two optical fibers or bundles and is designed to be repeatedly connected and disconnected.

optical waveguide. (1) A structure capable of guiding optical power. (E) (2) ln optical communications, generally a fiber designed to transmit optical signals. See *optical fiber*.

P

parallel channel. A channel having a System/360 and System/370 channel-to-control-unit I/O interface that uses bus and tag cables as a transmission medium. Contrast with *ESCON channel*.

parameter. (1) A variable that is given a constant value for a specified application and that may denote the application. (I) (A) (2) An item in a menu for which the user specifies a value or for which the system provides a value when the menu is interpreted. (3) Data passed between programs or procedures.

password. 1) A value used in authentication or a value used to establish membership in a set of people having specific privileges. (2) A unique string of characters known to the computer system, and to a user who must specify it to gain full or limited access to a system and to the information stored within it.

password identifier. In an ESCON Director, a user-defined symbolic name of 24 characters or less that identifies the password user.

path. In a network, any route between any two nodes. (T)

pdcm. See *port dynamic connect mask*.

port. (1) An access point for data entry or exit. (2) A receptacle on a device to which a cable for another device is attached. (3) See also duplex receptacle.

port address. In an ESCON Director, an address used to specify port connectivity parameters and to assign link addresses for attached channels and control units. See also *link address*.

port authorization. A feature of the password definition function that allows an administrator to extend operator level passwords to

specific port addresses for each Director definition managed by the Console. Port authorization affects only operator level operations for active and saved matrices.

port card. In an ESCON environment, a field replaceable hardware component that provides the optomechanical attachment method fiber cables and performs specific device-dependent logic functions. See *device port card*.

port name. In an ESCON Director, a user-defined symbolic name of 24 characters or less that identifies a particular port.

processor complex. A system configuration that consists of all the machines required for operation; for example, a processor unit, a processor controller, a system display, a service support display, and a power and coolant distribution unit.

prohibited connection. In an ESCON Director, the attribute that, when set, removes dynamic connectivity capability. Contrast with *allowed*.

protocol. (1) A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication. (I) (2) In SNA, the meanings of and the sequencing rules for requests and responses used for managing the network, transferring data, and synchronizing the states of network components. (3) A specification for the format and relative timing of information exchanged between communicating parties.

pull-down menu . A menu that is displayed below, or "pulled down," from a menu bar at the top of a window.

port dynamic connect mask. Controls blocking between two ports. A register that defines the blocked status between two ports. This provides information about blocked status of two ports with a static connection so that requests can be denied for dynamic connections to the ports.

Q

quadrant. One of four areas in the 9032-005 Director where DVP cards are installed. Each quadrant holds eight DVP cards, except quadrant D (holds seven cards). Quadrants are designated A through D counterclockwise, starting with the lower right quadrant.

R

row. A horizontal arrangement of data. Contrast with *column*.

ROC. Rewriteable optical cartridge. The storage medium used in the automatic backup system for the 9032 Model 5.

S

SA/MVS. See system automation for OS/390.

saved configuration. In an ESCON environment, a stored set of connectivity attributes whose values determine a configuration that can be used to replace all or part of the Director's active configuration. Contrast with *active configuration*.

saved matrix. a saved matrix is one that has been modified for a particular purpose, then

saved to the Console's hard disk. Multiple Saved matrixes are maintained in the Console Library for each Director.

spare ports card. The spare ports card features are a spare port card that contains either four LED ports or two LED and two XDF ports.

subsystem. (1) A secondary or subordinate system, or programming support, usually capable of operating independently of or asynchronously with a controlling system. (T)

SWCH. In System Automation for OS/390, the mnemonic used to represent an ESCON Director. Identifies the Director in the I/O UNIT parameter.

switch. In System Automation for OS/390, synonym for ESCON Director. Identifies the Director in the I/O CHPID statement.

System Automation for OS/390 (SA OS/390). A licensed program in which the I/O operations function provides host control and intersystem communication with the ESCON Director connectivity operations.

system configuration. A process that specifies the devices and programs that form a particular data processing system.

T

terminal. In data communication, a device, usually equipped with a keyboard and display device, capable of sending and receiving information.

tile. Windows may be tiled to display all open windows on the screen at the same time in a reduced size. No overlapping of windows occurs; cascaded windows are overlapped. To tile windows, use the *Window* menu and *Tile* option.

TKRG. See *Token-Ring controller adapter card.*

Token-Ring (TKRG) controller adapter card. Circuit card that provides a port to connect the Director to a 4/16 Mbps Token Ring LAN. This card is stamped with TKRG for "Token-Ring controller."

toggle. Changes the state of the feature. If the feature is "On," toggling will turn it "Off," and vice versa.

Token-Ring LAN. Local area network where devices attach to cabling in a closed path or ring. A token (unique sequence of bits) circulates on ring to allow devices to access LAN for transmission.

TPF. Transaction processing facility.

trunk cable. In an ESCON environment, a cable consisting of multiple fiber pairs that do not directly attach to an active device. This cable usually exists between distribution panels and can be located within, or external to, a building. Contrast with *jumper cable*.

U

Unaddressable Port. The internal ESCON ports on an FCV port card. Unaddressable ports have characteristics similar to uninstalled ports.

unblocked. In an ESCON Director, the attribute that, when set, establishes communication capability for a specific port. Contrast with *blocked*.

V

virtual machine (VM). (1) A virtual data processing system that appears to be at the exclusive disposal of a particular user, but whose functions are accomplished by sharing the resources of a real data processing system. (T) (2) A functional simulation of a computer system and its associated devices, multiples of which can be controlled concurrently by one operating system.

virtual storage (VS). (1) The storage space that may be regarded as addressable main storage by the user of a computer system in which virtual addresses are mapped into real addresses. The size of virtual storage is limited by the addressing scheme of the computer system and by the amount of auxiliary storage available, not by the actual number of main storage locations. (I) (A) (2) Addressable space that is apparent to the user as the processor storage space, from which the instructions and the data are mapped into the processor storage locations.

VM. See *virtual machine.*

VSE. Virtual storage extended.

W

warning message. An indication that a possible error has been detected. See also *error message* and *information message*.

window. A view port into a group of data on the Console.

X

XDF. See *extended distance feature*.

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