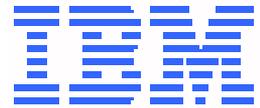


S/390



**Using the 9032 Model 3 ESCON Director,
9033 Model 4 ESCON Director, and 9032
Model 5 Director**

Note

Before using this information and the product it supports, read the general information under "[Notices](#)" on page xiii.

Second Edition (August, 1999)

This is the second edition of SA22-7296. This manual supersedes information about the 9032-005 Director that appears in the previous edition of SA22-7296.

This edition applies to 9032-003 and 9033-004 Enterprise Systems Connection (ESCON) Directors, the 9032-005 Director, and to all subsequent releases and modifications of the Directors until otherwise indicated in new editions or technical newsletters.

For 9032-003 and 9033-004 ESCON Directors, this edition applies to Licensed Internal Code (LIC) Version 4.3, running on the personal computer platform described in the manual, using Operating System/2 (OS/2) Warp 4.0. For the 9032-005 Director, this edition applies to LIC Version 5.0, running on the personal computer platform described in the manual, using OS/2 Warp 4.0.

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Laser Compliance

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

Class 1 laser products are not considered hazardous. The FL200 Module contains a Class 3b, 5.0 milliwatt (nominal) indium gallium arsenide phosphide laser operating in the wavelength region from 1270 to 1340 nanometers. The module is designed such that there is never human access to laser radiation above a Class 1 level during normal operation, user maintenance, or prescribed service conditions.



CAUTION

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



PAS PÅ

FL200-laserporte er kun fremstillet til brug sammen med 'singlemode' 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 von der 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 être utilisés 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 entraîner 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 o connettore può produrre un'emissione con livelli di potenza laser capace di procurare danni agli occhi se guardata direttamente. L'uso di connettori o 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 FL200 foram concebidos e certificados para serem utilizados unicamente com fibras ópticas mono-modo e com conectores cujas características 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.



VARNING - RISK för PERSONSKADA

Portarna på lasermodulen FL200 är konstruerade och godkända endast för optokablar och kontakter enligt IBMs specifikationer. Andra kablar eller kontakter medför risk för laserstrålning som kan skada gonen och kan göra att utrustningen inte uppfyller kraven för laserprodukter i klass 1.



CAUTION

Data processing environments can contain equipment transmitting data on system links with laser modules operating at greater than Class 1 power levels. For this reason, it is advised to never look into the end of an optical fiber cable or open receptacle. 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

In der Datenverarbeitung können Geräte eingesetzt werden, die auf Systemleitungen mit Lasermodulen übertragen, die die Werte der Klasse 1 überschreiten. 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 voimakkuudella. 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, tels que des modules à laser. Ces derniers peuvent fonctionner avec un niveau énergétique, supérieur aux 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 optiques ou une prise de fibres optiques ouverte. L'inspection ou la réparation des câbles à fibres optiques ou des prises de fibres optiques ne doit être faite que par une personne qualifiée.



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 o 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 kabel eller en åpen stikkontakt. Inspeksjon 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 níveis 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 de ligação, apenas deve ser efectuada por pessoal técnico especializado.



VARNING - RISK för PERSONSKADA

Datorutrustning kan innehålla lasermoduler som arbetar med högre effektnivåer än de som gäller för laserklass 1. Därför ska du aldrig titta in i en optokabel eller i ett uttag för en sådan. Inspektion och reparation av optokablar och uttag ska utföras av utbildad servicepersonal.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

Note: This equipment is tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. The limits are designed to provide reasonable protection against harmful interference when the equipment operates in a commercial environment. The 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 the equipment in a residential area is likely to cause harmful interference, in which case the user is required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used 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 can 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 conditions: (1) the device may not cause harmful interference, and (2) the 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'émission 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 à 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 television reception, requiring the owner or operator to take steps necessary to correct the interference. Refer to the instruction manual.

Japanese Voluntary Control Council for Interference Statement

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United Kingdom Telecommunications Safety Requirements Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunications systems in the United Kingdom.

European Community for Information Technology Equipment (ITE) Statement

This device meets the following regulatory requirements set forth by the European community for Information Technology Equipment (ITE).

- EN55022, ITE-Generic Emission standard for domestic, commercial, and light industrial environments (CISPR 22 Class A).

- EN55082-1, ITE-Generic Immunity standard for domestic, commercial, and light industrial environments (IEC 801-2 through 801-6). The device meets European Community Mark Immunity Performance Criteria **A**, with the exception being IEC 801-2, *Electrostatic Discharge Immunity*, which meets Performance Criteria **B**. The software automatically restores the device to full operation if performance degradation occurs, with no operator intervention required.

Attention!

This is a Class A device. In a domestic environment the product may cause radio interference, in which case the user may be required to take adequate corrective measures.

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About This Publication

This publication provides information required to operate the IBM 9032-003 and 9033-004 Enterprise Systems Connection (ESCON®) Directors running Licensed Internal Code (LIC) version 4.3 (or later), and the IBM 9032-005 Director running LIC version 5.0 (or later), with or without the Fibre Connection (FICON™) converter feature. You should be familiar with:

- The Director and its operation.
- Messages and status codes that may appear at the Director Console.
- Navigating in the Windows®-Operating System/2® (Win-OS/2®) environment.

Who Should Use This Publication

This publication should be used by personnel required to operate the Director Console or being introduced to the Director Console's user interface.

How To Use This Publication

This publication is used both as a tutorial (for those trained but requiring a refresher before resuming work with a Director), and as a manual for those who operate the Director Console.

What Is Included in This Publication

This publication includes five chapters and one appendix organized as follows:

- **Chapter 1 - Introduction.** This chapter introduces the 9032-003, 9033-004, and 9032-005 Directors and Director Console, and compares characteristics of the different Director models (including a comparison of 9032-002 and 9033-001 Directors). The chapter describes system configurations, dynamic connectivity, the FICON converter feature (9032-005 Director only), port cards, logical partitioning capability, and Director components.
- **Chapter 2 - The Director Console.** This chapter describes the Director Console, Console platforms, and Console operation and navigation in the OS/2 environment. The chapter describes the windows (*Startup*, *Matrix*, *log*, *Terminal*, and *Port Maintenance*) available through the Console application, and describes *Startup* window menu options.
- **Chapter 3 - Matrix Window Operations.** This chapter describes the *Matrix* window, *Matrix* window components, and *Matrix* window menu options. Tasks described in the chapter do not directly relate to configuring port connections within a configuration matrix.

- **Chapter 4 - Configuring Port Connections.** This chapter describes configuration matrices, including port attribute symbols and connectivity hierarchy. The chapter also provides instructions to configure, save, and activate a matrix.
- **Chapter 5 - Console Administrative Functions.** This chapter describes Console administrative functions, including installing LIC and Loader/Monitor Area (LMA) code, administering passwords, creating logical partitions, changing Director local area network (LAN) addresses, migrating a Director database, and maintaining and using a backup or replacement Console.
- **Appendix A - Console Messages.** This appendix provides a list of error messages, informational messages, and alert dialog messages with error codes that appear at the Director Console.

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

Related Publications

The following publication applies to all Director models:

- *Programming the Interface for Enterprise Systems Connection Directors* (SA23-0356).

The following publications provide information required to plan for, use, and maintain 9032-003, 9033-004, and 9032-005 Directors:

- *Planning for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Directors* (SA22-7295).
- *Planning for the 9032 Model 5 Director with FICON Converter Feature* (SA22-7415).
- *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 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 3 Enterprise Systems Connection Director* (SA26-6103).

- *Operator Panel Reference Summary for the 9033 Model 4 Enterprise Systems Connection Director (SA22-7211).*
- *Operator Panel Reference Summary for the 9032 Model 5 Director (SA22-7297).*
- *Up and Running OS/2 Warp V4 (S84H-3090).*

Notational Conventions

The following table lists notational conventions used in this publication.

Function	How Shown	Example
Menu options	Italics	<i>Passwords</i> menu option
Keys and key combinations	Bold	Enter or Alt+H keys
Menu names	Italics	<i>Help</i> menu
Dialog boxes	Italics	<i>Select Timer Network</i> dialog box
Buttons on dialog boxes	Italics	<i>OK</i> button on the <i>Select Timer Network</i> dialog box
Console input or output	Courier Font	Type <code>c:\prtdrv</code> s and click the <i>OK</i> button
Operator panel indicators	Bold	Set the event to HISTORY status

Chapter 1. Introduction

This manual applies to Console Application Version 5.0 (or later), supporting IBM 9032-003 and 9033-004 Enterprise Systems Connection (ESCON) Directors running Licensed Internal Code (LIC) version 4.3 (or later), IBM 9032-005 Directors running LIC version 5.0 (or later), and Director Consoles using Operating System 2 (OS/2®) Warp 4 and the personal computer (PC) platform described in the manual.

Enterprise Systems Connection Directors

The Director dynamically controls data paths between 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. Directors and the Director Console described in this publication are shown in [Figure 1](#).

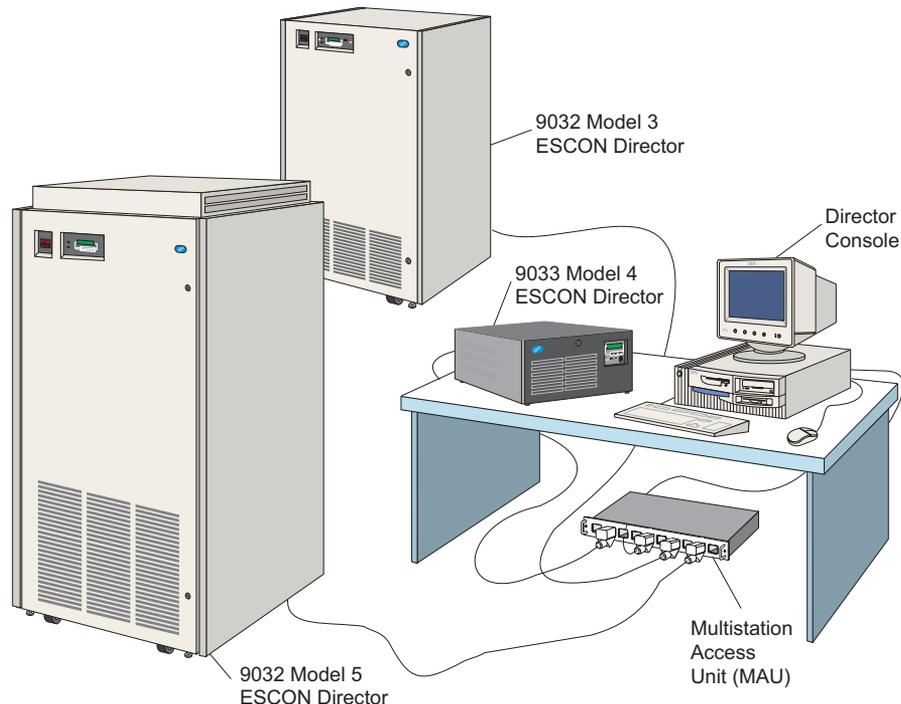


Figure 1. Directors and the Director Console

The Console connects to multiple Directors through a 4/16 megabit per second (Mbps) Token Ring local area network (LAN). The Console is attached to the same (or bridged or routed) LAN as the Directors, and can be located anywhere within the physical limitations of the LAN.

Director models described in this publication are:

- A 9032 Model 3 (9032-003) Director that provides a minimum of seven ESCON Device Port (DVP) cards (28 external connections) and a maximum of 31 DVP cards (124 external connections). Additional DVP cards provide connections in four-port increments.
- A 9033 Model 4 (9033-004) Director that provides a minimum of two ESCON DVP cards (eight external connections) and a maximum of four DVP cards (16 external connections). Additional DVP cards provide connections in four-port increments.
- A 9032 Model 5 (9032-005) Director that provides both ESCON and Fibre Connection (FICON) capability. DVP cards provide ESCON connections. Fibre Channel Converter (FCV) port cards provide a converter feature that connects to FICON channels of an IBM System/390® (S/390®) Generation 5 (or later model) Parallel Enterprise Server™. Additional DVP cards provide ESCON connections in eight-port increments, while additional FCV Port cards provide FICON connections in one-port increments.
 - The Director provides a minimum of three ESCON DVP cards (24 external connections). There is no minimum requirement for FCV port cards. An increase in physical FICON connections results in a corresponding decrease in physical ESCON connections.
 - If no FCV port cards are installed, the Director supports a maximum of 31 DVP cards (248 ESCON connections).
 - If one FCV port card and 30 DVP cards are installed, the Director supports one FICON connection and 240 ESCON connections.
 - The Director supports a maximum of 16 FCV port cards (16 FICON connections). If 16 FCV port cards are installed, the Director supports 15 DVP cards (120 ESCON connections).

Purpose of the Director

All Director models provide dynamic connections between switch ports that attach to ESCON servers and ESCON control units. The 9032-005 Director also provides dynamic connections between FICON servers and attached ESCON control units. All Director models also provide dedicated ESCON-to-ESCON connections (for example, to a 9034 ESCON Converter). Establishing a connection from one port to another to transfer commands and data is functionally equivalent for all Director models. Director port connections are qualified by the following attributes:

- **Blocked** - All communication is blocked through a port. How the blocking is done is a function of the connection type.
- **Dedicated** - A static connection between two ports is dedicated and restricts two ports from communicating with any other ports. Dedicated connections are required to support communication through a Director to a 9034 ESCON Converter and to support chained Directors.

Note: Dedicated connections between a FICON port and an ESCON port *are not* allowed.

- **Prohibited** - A prohibited connection means two specific ports cannot be dynamically connected. However, this attribute does not affect a port's ability to connect dynamically with other ports on the Director. A port can be prohibited from communicating with only one other port, with several ports, or with all ports on a Director.
- **Allowed** - A dynamic connection is allowed through a port. If blocked, dedicated, or prohibited attributes are not assigned to a port, the port is open for a connection to another port.

Comparing 9032-003, 9033-004, and 9032-005 Directors

The similarities and differences in the functional characteristics of the 9032-003, 9033-004, and 9032-005 Directors are listed in [Table 1](#).

Table 1. Comparing 9032-003, 9033-004, and 9032-005 Directors

Functional Characteristic	9032-003	9033-004	9032-005
Maximum number of ESCON ports	124 ports (up to 62 simultaneous connections)	16 ports (up to eight simultaneous connections)	248 ports (up to 124 simultaneous connections)
Number of ports per DVP card	Four ports	Four ports	Eight ports
Maximum number of FICON ports	Not applicable	Not applicable	16 ports
Number of ports per FCV port card	Not applicable	Not applicable	One port
Spare ports card feature (ESCON only)	No	No	Yes
Standard dual power supplies	No	No	Yes (standard power supply or FICON upgrade feature with +3.3 Vdc output)
Enhanced availability features	Yes	No	Yes
Size	Floor-standing	Desktop	Floor-standing
Matrix Controller/Matrix Switch (MXC/MXS) card set	Two cards	One card	Three cards (standard MXC card or FICON MXC2 card upgrade feature)

Enhanced Availability Features

The 9032-003 and 9032-005 Directors can have enhanced availability features (EAFs) installed. EAFs are backup field-replaceable units (FRUs) that can be ordered and installed to provide redundancy and reduce operational disruption in case of failure. The Director automatically switches over to the backup FRU if the primary FRU fails. The 9033-004 Director does not support EAFs.

Spare Ports Card Feature

The 9032-005 Director supports an optional spare ports card feature that provides four dedicated spare ESCON ports. The feature provides either four light-emitting diode (LED) ports, or two LED ports and two Extended Distance feature (XDF) ports. The spare ports do not increase the number of active Director connections, but allow port swapping between a failed port and a spare port. *This feature does not provide spare FICON ports.*

FICON Upgrade Features

FICON compatibility is required to attach the 9032-005 Director to FICON channels of an IBM S/390 Generation 5 (or later model) Parallel Enterprise Server. If the Director is not delivered with this capability, a FICON upgrade feature must be installed. ***The FICON upgrade feature is not available for the 9032-003 and 9033-004 Directors.*** The upgrade feature includes one or more FCV port cards that provide hardware interfaces for FICON fiber-optic media, an MXC2 card that provides switching control for both ESCON DVP cards and FCV port cards, and redundant power supplies that provide additional +3.3 Vdc outputs to support FICON operation.

Comparing 9033-001 and 9033-004 Directors

The differences in functional characteristics between the 9033-001 and 9033-004 ESCON Directors are:

- An enhanced Console user interface for the 9033-004
- Concurrent (hot swappable) Token Ring (TKRG) Controller card for the 9033-004.

The 9033-001 Director supports two to four DVP cards (eight to 16 ports in four-port increments), beginning with logical port address *C0* and ending with logical port address *CF*. The 9033-004 Director also supports two to four DVP cards (eight to 16 ports in four-port increments), beginning with logical port address *C0* and ending with logical port address *CF*.

The Console for the 9033-001 Director has a character-based, menu-driven user interface. The Console for the 9033-004 Director has a graphical user interface that uses a mouse and Windows-Operating System/2 (Win-OS/2). The 9033-004 Director uses the same Console as the 9032-003 Director.

Comparing 9032-002 and 9032-003 Directors

The differences in functional characteristics between the 9032-002 and 9032-003 ESCON Directors are:

- An enhanced Console user interface for the 9032-003
- An enhanced-availability hardware feature for the 9032-003
- An increase in the number of physical port connections (up to 124) for the 9032-003.

The 9032-002 Director supports seven to 15 DVP cards (28 to 60 ports in four-port increments), beginning with logical port address *C0* and ending with logical port address *FB*. The 9032-003 Director supports seven to 31 DVP cards (28 to 124 ports in four-port increments), beginning with logical port address *80* and ending with logical port address *FB*.

The 9032-003 Director can have EAFs installed to provide redundancy and reduce operational disruption in case of failure. EAFs include power supplies, DVP cards, and TKRG Controller cards. Redundant power supplies and TKRG Controller cards can be removed and replaced without powering off the Director and disrupting operation. Redundant DVP cards allow an operator to logically reroute a connection for a failed port (or DVP card) to a spare port. The 9032-002 Director does not support EAFs.

The Console for the 9032-002 Director has a character-based, menu-driven user interface. Options for categories such as *Utilities* and *Maintenance* are provided through full-screen menus. The Console for the 9032-003 Director has a graphical user interface that uses a mouse and Win-OS/2. Options for categories such as *Utilities* and *Maintenance* are provided through pull-down menus at the top of the *Matrix* window.

System Configuration and ESCON Directors

Host systems can have multiple fiber-optic channels connected to one or more Directors. System configurations also includes I/O control units connected to one or more Directors by fiber-optic cables. [Figure 2](#) illustrates a typical Director configuration.

- Directors can be controlled from a host connectivity management program such as a System Automation for Operating System/390™ (SA OS/390™). Changes are processed more safely through integration with the host operating system across multiple system images.

Note: The Director Console application must be active for changes made by SA OS/390 to reflect on Director Console windows.

- Up to 16 Directors (any combination of 9032-003, 9033-004, or 9032-005 Models), and up to two 9037-002 Sysplex Timer® networks (up to two Timers per network) can be controlled from the Director Console. The Timer Console application must be installed on the Director Console to support Sysplex Timer operation.

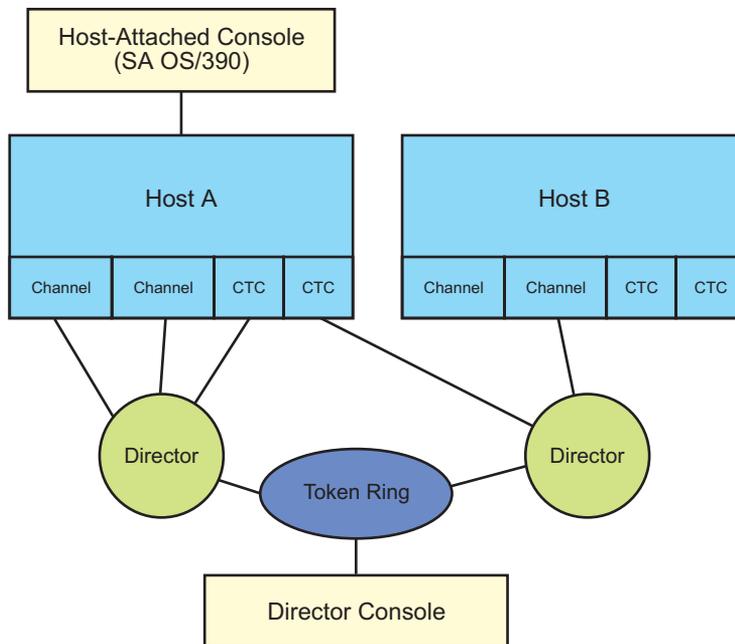


Figure 2. Typical Director Configuration

This publication describes the Director (9032-003, 9033-004, and 9032-005 Models) and Director Console. This publication also provides the instructions required to control, monitor, and operate the Director, and to perform certain Director Console administration functions. To perform Director console functions associated with the OS/2 operating system, 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)*.

Dynamic Connectivity and Directors

The task of a Director is to enable dynamic connections between external ports for the purpose of transferring commands and data between host systems (ESCON or FICON) and ESCON control units. When the command and data transfers are complete, the Director disables the connection (unless the connection is dedicated, rather than dynamic). When a FICON channel, ESCON channel, or control unit sends a request to the Director:

- The Director reads the address header of the request and determines the destination for the information
- Activates the necessary physical connection

- Transfers the information (in both directions)
- Reads the trailer, breaks the physical connection (if specified), and waits for the next request.

Although each Director port is connected to only one other Director port at a time, multiple port pairs (up to 124 on a fully-populated 9032-005 Director) are connected simultaneously. Directors can enable and disable multiple connections millions of times per second. Director operation (enabling port connections, disabling port connections, and transferring data) is transparent to other application programs. [Figure 3](#) shows multiple connection paths through a pair of Directors.

The Director also provides dedicated (static) connectivity to support 9034 ESCON Converters and chained ESCON Directors.

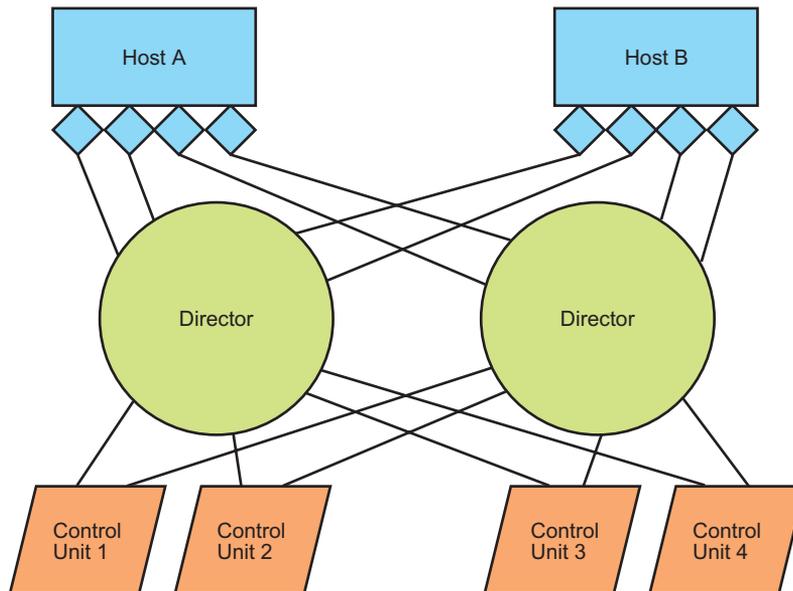


Figure 3. Director Dynamic Connectivity

Dynamic Connectivity

[Figure 4](#) shows how Director functions are performed. Host 1 is connected to a Director and illustrates the concept of dynamic connectivity. Host 2 is connected to the same Director and illustrates the concept of a dedicated connection and chained Directors.

Channel B of Host 1 is attached to port *94* of the Director. The Director enables a dynamic connection to port *B6*, which is attached to an external device. As data transmission to port *B6* terminates, the Director disables the connection and enables a new dynamic connection to port *F8* (attached to a separate external device).

Channel B of Host 2 is attached to port *D8* of the Director. A second Director (chained Director) is attached to port *D5*. A dedicated connection is enabled between ports *D8* and *D5* to establish the Director chain.

Note: Ports *D8* and *D5* can only communicate with each other, and not with any other ports in the Director.

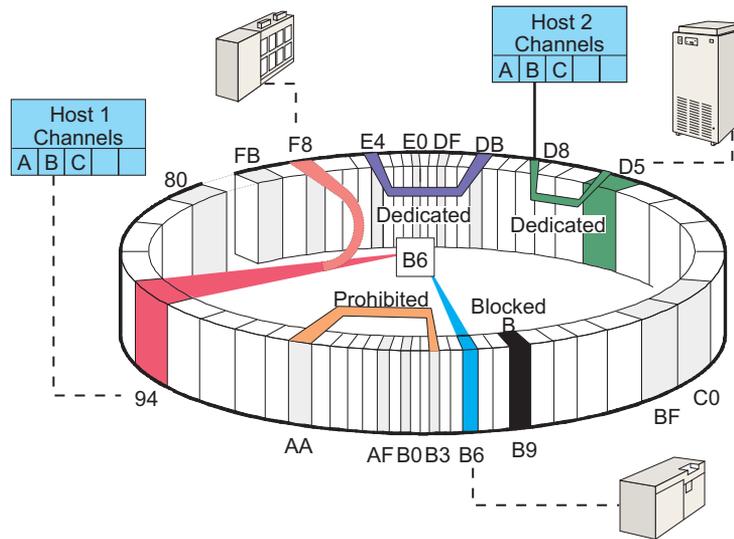


Figure 4. Performing Director Functions

Change Dynamic Connectivity

Changes to the Director's dynamic connectivity capability are controlled from the host (through SA OS/390) or the Director Console application. An operator can change, customize, or limit the capability of each port to dynamically connect to other ports through:

- **Blocking** a port so that no communication takes place with the device externally connected to the port. In Figure 4, port *B9* is blocked. The port cannot communicate with any other Director port, and no other port (or connected device) can communicate with it.
- Establishing a **dedicated** connection between two Director ports so the ports communicate only with each other. Figure 4 shows a dedicated connection between ports *E4* and *DB*. These ports can communicate *only* with each other.
- **Prohibiting** a dynamic connection between two ports. In Figure 4, a connection between ports *AA* and *B3* is prohibited. Port *AA* can connect to any port except *B3*, and port *B3* can connect to any port except *AA*.

Dynamic Connectivity Hierarchy

Assigning more than one connectivity attribute to a port (ESCON or FICON) creates the following hierarchy.

1. The **Blocked** attribute has the highest precedence and overrides all other attributes (dedicated, prohibited, allowed) assigned to a port.
2. The **Dedicated** attribute has second precedence and overrides the prohibited and allowed attributes.
3. The **Prohibited** attribute has third precedence and overrides only the allowed attribute.
4. The **Allowed** attribute has the lowest precedence and does not override any other attributes.

ESCON Director Description

The following paragraphs describe and illustrate 9032-003, 9033-004, and 9032-005 ESCON Directors.

9032-003 Director

The 9032-003 Director and Director Console are shown in [Figure 5](#). The Director is a floor-standing unit that contains a minimum of seven ESCON DVP cards (28 external ports) and a maximum of 31 DVP cards (124 external ports). Each DVP card provides either four LED ports or four XDF laser ports. Up to 62 simultaneous internal connections (two ports per connection) are possible when each external port attaches to an ESCON channel or control unit. For a description of LED and XDF laser ports, refer to "[Port Cards](#)" on page 17.

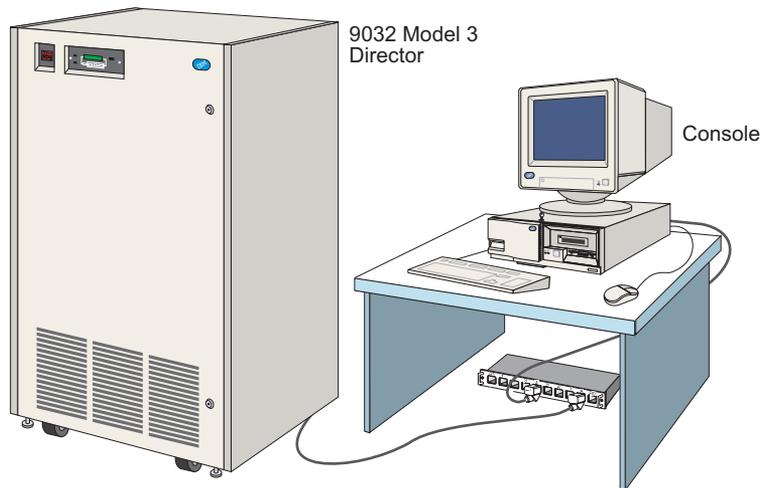


Figure 5. 9032-003 Director and Console

Any valid combination of host and I/O port is supported. Each port allows attachment of an ESCON channel, ESCON control unit, 9034 or 9035 ESCON Converter, or another Director.

Note: The 9032-003 Director *does not* support FICON operation.

9033-004 Director

The 9033-004 Director and Director Console are shown in [Figure 6](#). The Director is a desktop unit that contains a minimum of two ESCON DVP cards (eight external ports) and a maximum of four DVP cards (16 external ports). Each DVP card provides either four LED ports or four XDF laser ports. Up to eight simultaneous internal connections (two ports per connection) are possible when each external port attaches to an ESCON channel or control unit. For a description of LED and XDF laser ports, refer to "[Port Cards](#)" on page 17.

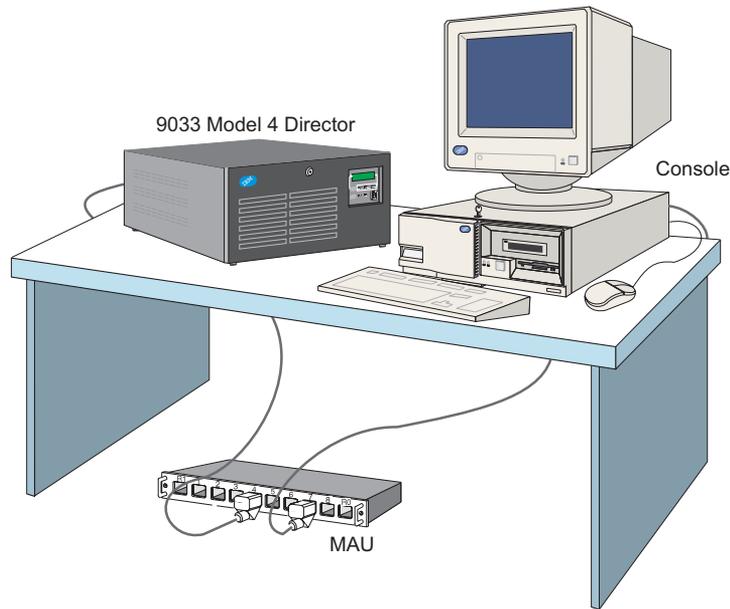


Figure 6. 9033-004 Director and Console

Any valid combination of host and I/O port is supported. Each port allows attachment of an ESCON channel, ESCON control unit, 9034 or 9035 ESCON Converter, or another Director.

Note: The 9033-004 Director *does not* support FICON operation.

9032-005 Director

The 9032-005 Director and Director Console are shown in [Figure 7](#). 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.

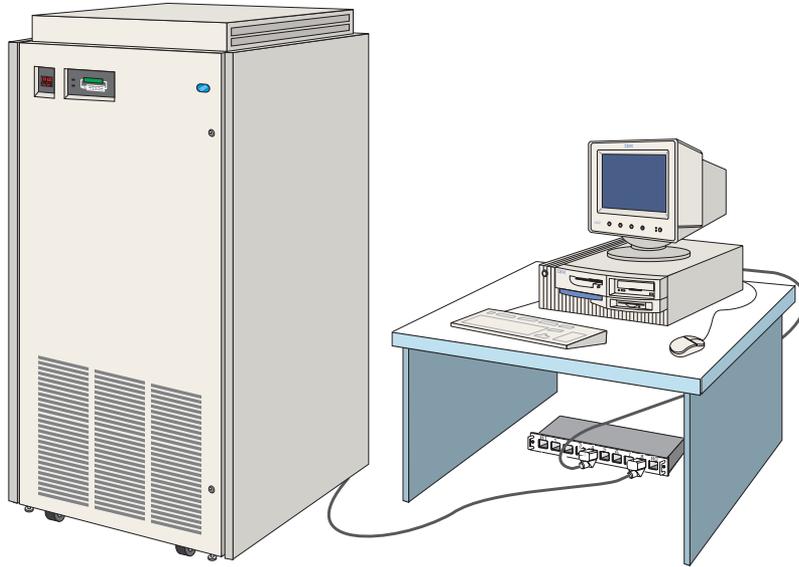


Figure 7. 9032-005 Director and Console

ESCON-Only Operation

When configured for ESCON-only operation, the 9032-005 Director contains a minimum of three DVP cards (24 external ports) and a maximum of 31 DVP cards (248 external ports). Each DVP card provides either eight LED ports or eight 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. For a description of LED and XDF laser ports, refer to "[Port Cards](#)" on page 17.

FICON Converter Feature

FCV port cards can be ordered and installed in the 9032-005 Director only 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 device 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 device port and enabled ESCON DVP ports. Any internal ESCON port on the FCV port card can be dynamically connected 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. For a description of FCV, LED, and XDF laser ports, refer to "[Port Cards](#)" on page 17.

Director Console

All Director models require an attached Console (shown in [Figure 8](#)) to perform operations and maintenance tasks. The Console is ordered separately or as an optional feature. The Console is optional *only* if the customer has a PC platform that meets the minimum specifications listed in 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)*.

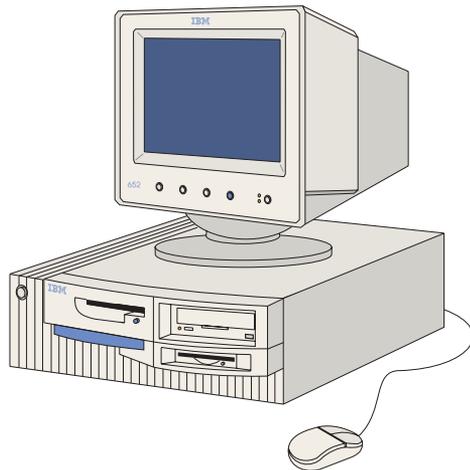


Figure 8. Director Console

The Console communicates with the Director through a 4/16 Mbps Token Ring LAN using shielded, twisted-pair cable. The default LAN data rate is 16 Mbps, but can be changed to 4 Mbps. The Console is installed anywhere up to the limit of the Token Ring, or on a remote LAN that communicates with the Director (on a local LAN) through a bridge or router. As shown in Figure 9, up to 16 Directors (any combination of 9032-003, 9033-004, or 9032-005 Models), and up to two 9037-002 Sysplex Timer networks (up to two Timers per network) can be controlled from the Director Console.

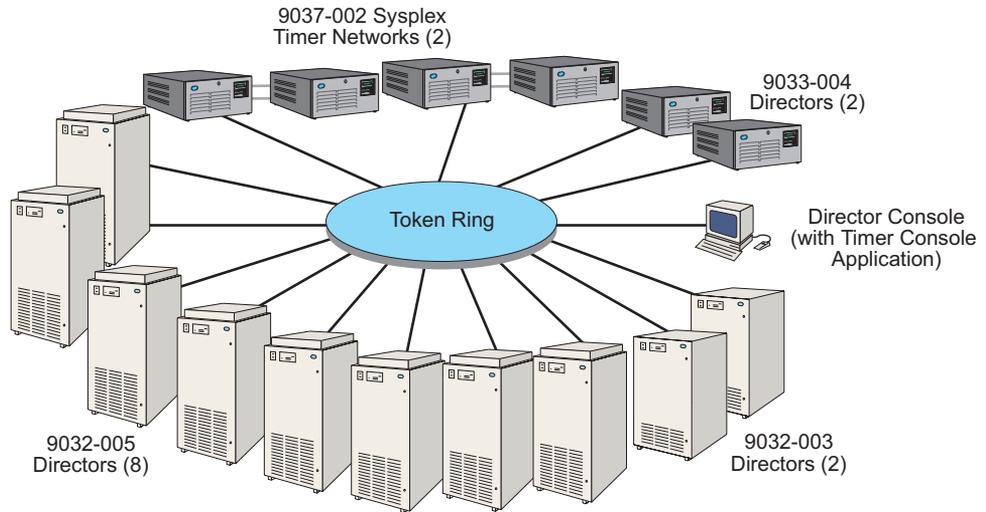


Figure 9. Twelve Directors, Two Timer Networks, and Console Installed on LAN

A Console is required to configure the Director, change configurations (without the system integrated change control of SA OS/390), and access logs. After a Director is configured and operational, it performs connection tasks without Console intervention. A Console failure does not cause an operating Director to fail.

Although a single Console can control multiple Directors, two or more Consoles cannot share control of a Director simultaneously. For maximum availability, a backup Console should be maintained on the LAN in case the primary Console fails. The backup Console is maintained with current Director configuration matrices, critical system or application data, and other Director information for immediate access.

Through a customized version of Distributed Console Access Facility (DCAF™) software, an operator on a remote PC can access the Director Console application to perform administration and operator tasks.

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 the 9032-003, 9033-004 or 9032-005 Director. For additional information about which Consoles support Director operation, 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)*.

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 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.
 - 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.
 - 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.
 - 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 used, 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 Win-OS/2, 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 Console fixed disk when a Director is added to or removed from the shared Console configuration. In addition, back up the Console fixed disk immediately after installing a Director and configuring port connections, or if the Director name is changed.

Storing Active Configuration Matrices

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 10](#) illustrates this process.

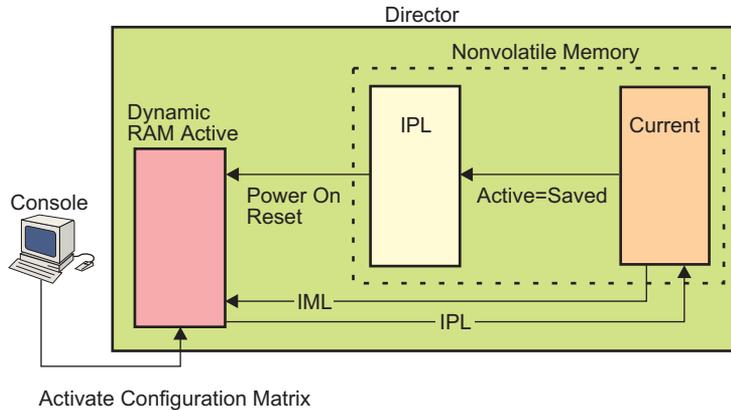


Figure 10. Storing Active Configuration Matrix Data

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), IPL, and power-cycle functions load active matrix information from nonvolatile memory for use in controlling port connections.

IML Function

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.

Attention!

It is recommended the *IML* button be used *only* by authorized service personnel.

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 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.

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 set, FCV port cards, and DVP cards do not reset.*
- The **Service Required** status for FCV port cards and DVP 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 IML, the Director loads matrix information from the **current** location in nonvolatile 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.

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

Port Cards

Port cards support FICON or ESCON port connections. FICON connections are provided by FCV port cards, and ESCON connections are provided by DVP cards (LED or XDF laser).

FCV Port Cards

FICON compatibility is required to attach the 9032-005 Director to a FICON channel of an IBM S/390 Generation 5 (or later model) Parallel Enterprise Server. If the Director is not delivered with this capability, a FICON upgrade feature must be ordered and installed. FCV ports provide FICON channel connections only. Chained Directors, ESCON converters, and FICON-to-FICON connections are not supported.

Note: An FCV port card *cannot* be installed in the 9032-003 or 9033-004 Director. These Director models *are not* FICON capable.

An FCV port card provides one FICON port connection. The Director supports the installation of one to 16 FCV port cards. There is no minimum card installation requirement. An increase in FCV port cards results in a corresponding decrease in card cage slots for ESCON DVP cards.

Because each FCV port card contains only one port connection, one or more additional cards must be installed (up to 16 total) if spare FICON ports are a requirement. The spare ports card does not provide spare FICON ports.

Either a Fibre Channel Standard or subscriber connector (FCS/SC) duplex connector is required to attach optical fiber to an FCV port. Either singlemode or multimode fiber-optic cable is used. The exterior jacket of singlemode cable is typically yellow, and the exterior jacket of multimode cable is typically orange.

LED Port Cards

Depending on the Director model, an LED port card provides either four or eight ESCON port connections. Each port provides a link attachment to an ESCON-compatible server, ESCON-compatible control unit, 9034 or 9035 ESCON Converter, or another Director. All Director models support installation of LED port cards.

A multimode duplex connector is required to attach optical fiber to an LED port, and only multimode fiber-optic cable is used. The exterior jacket of multimode cable is typically orange.

For the 9032-003 ESCON Director, each LED port card provides four ESCON port connections. A minimum of seven port cards (28 ports) must be installed, and at least four cards (16 ports) must be LED port cards. A maximum of 31 LED port cards (124 ports) can be installed.

For the 9033-004 ESCON Director, each LED port card provides four ESCON port connections. A minimum of two port cards (eight ports) of any combination (LED or XDF laser) must be installed. A maximum of four LED port cards (16 ports) can be installed.

For the 9032-005 Director, each LED port card provides eight ESCON port connections. A minimum of three ESCON port cards (24 ports) of any combination (LED or XDF laser) must be installed. A maximum of 31 XDF laser port cards (248 ports) can be installed.

XDF Laser Port Cards

Depending on the Director model, an XDF laser port card provides either four or eight ESCON port connections. Each port provides a link attachment to an ESCON-compatible server, ESCON-compatible control unit, 9034 or 9035 ESCON Converter, or another Director. All Director models support installation of XDF laser port cards.

An FCS/SC duplex connector is required to attach optical fiber to an XDF laser port. Only singlemode fiber-optic cable is used. The exterior jacket of singlemode cable is typically yellow. XDF laser ports have FCS duplex connectors. If cables from control units have multimode connectors, an XDF adapter kit (part number 46H9223) is required for each cable.

XDF ports allow the Director to be connected to a second Director or mode converter at a distance of up to 20 kilometers. Any ESCON-capable control unit can then be attached to the remote Director or mode converter.

For the 9032-003 Director, each XDF laser port card provides four ESCON port connections. There is no minimum requirement for installation of XDF laser port cards. However, a minimum of seven port cards (LED or XDF laser) must be installed, and at least four cards must be LED port cards. A maximum of 27 LED port cards (108 ports) can be installed. The remaining four card slots must be populated with LED port cards.

For the 9033-004 Director, each XDF laser port card provides four ESCON port connections. A minimum of two port cards (eight ports) of any combination (LED or XDF laser) must be installed. A maximum of four XDF laser port cards (16 ports) can be installed.

For the 9032-005 Director, each XDF laser port card provides eight ESCON port connections. A minimum of three ESCON port cards (24 ports) of any combination (LED or XDF laser) must be installed. A maximum of 31 XDF laser port cards (248 ports) can be installed.

Spare Ports Card

The spare ports card is a feature *for the 9032-005 Director only* that provides four spare ESCON ports. These ports function only as spare ports and do not increase the number of external connections available for the Director. Depending on the feature number, the spare ports card provides either four LED ports or two LED ports and two XDF laser ports.

Note: The spare ports card feature does not provide spare FICON ports.

Determine 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](#) describes the physical characteristics of and differences between port cards.

Table 2. Physical Characteristics of FCV, LED, and XDF Laser Port Cards

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)	Yellow (singlemode)
Color of cable connector	Light gray or blue	Black	Light gray or blue

- Do not insert a singlemode cable connector, XDF laser wrap plug, or XDF laser protective plug into an LED port.
- 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 ports on a spare ports card (9032-005 Director only) are either all LED ports or two LED ports and two XDF laser ports. The spare ports card *does not* provide FCV ports.

Logical Partition Capability

The Director has a logical partition (LPAR) capability that allows an administrator to create port-level configuration access control unique to each defined operator. Director port addresses are divided into distinct groups or logical regions with operator-specific management authority. This LPAR capability allows operators to access only authorized ports, and restricts unauthorized operators from changing the port connectivity configuration of any device or set of devices under control of the Director. The administrator can also define groups of ports whose configuration access is shared between operators. The LPAR feature offers increased security and maximizes the flexibility of system configuration. An LPAR can be:

- One port up to the maximum number of ports (FICON and ESCON) available on the Director.
- A set of contiguous or non-contiguous ports (any increment or location).
- A different size from another LPAR.
- Mutually exclusive to one operator or common to multiple operators.
- Easily changed or modified.

Logical partitioning is enabled by selecting the *Port Authorization* option from the *Utility* pull-down menu. By default, port authorization is not enabled and all operators have connectivity management authority for all ports. For additional information about creating logical partitions and granting port authorization, refer to "[Creating Logical Partitions](#)" on page 178, and "[Enable Operator](#)" on page 91. The following examples illustrate uses for logical partitions.

Example 1:

A test group and production group share use of a mainframe computer. With the Director, each group can access the mainframe through a set of ports allocated only to that group. This allows the test group to complete its tests without interfering with the production group's computer access.

Example 2:

A service bureau owns a mainframe computer that processes data for many businesses. Each business uses the mainframe only when required. During peak periods for one business, the service bureau can allocate more port connectivity management to that business and remove port connectivity management from the other businesses.

Example 3:

A disaster recovery site controls several tape storage devices that manage data for many businesses. Each device is allocated to a different business. Through the Director, access to each device is restricted so that only the operator in charge of a specific business's data can control port connectivity to that device. For example, one business may have authority to manage connectivity to ports 24, 64, A4, and E4; and another business may have authority to manage connectivity to ports 25, 65, A5, and E5.

Example 4:

The Information Systems (IS) department is responsible for a Director shared among three departments. The IS department wants to grant port connectivity control to a person in each department but retain overall control of the Director. In addition, the Director is configured with more ports than are required. Using the logical partitioning capabilities of the Director, the IS department dedicates 44 ports to software engineering, 72 ports to business systems, and 52 ports to manufacturing. The remaining 80 ports are dedicated to the IS department for future use by other departments. Ports are reallocated to these departments as their needs increase.

Example 5:

In a manufacturing company, all operators require access to the printer, but the remaining devices need to be restricted only to authorized personnel. Through the Director, authority to manage connectivity to all ports except those attached to the printer can be restricted.

Example 6:

A large bank recently acquired two small banks. The data centers for the small banks are consolidated into the large bank's data center, and the small banks' workload is added to the current set of Directors. The workloads are segregated during this process. The IS department uses logical partitioning to allocate 42 unused ports to the workload of one small bank, and 30 ports to the workload of the other small bank. After workload consolidation, the IS department can change the logical partition's port authorization matrix as required.

9032-003 Director Components

The following paragraphs and supporting illustrations describe 9032-003 Director components.

Power Switch

Setting the Director's power switch to the on position (**I**) 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 FRU that is removed and replaced only when the Director is powered off.

Operator Panel

The 9032-003 operator panel ([Figure 11](#)) includes a:

- **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 *IML* button reloads LIC and resets all hardware, except the MXC/MXS 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.

The operator panel is a concurrent FRU that can be removed and replaced while the Director is operational.

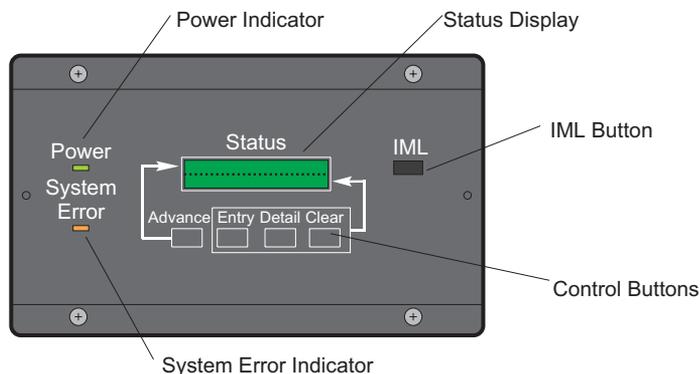


Figure 11. 9032-003 Operator Panel

Power Supply and Fan Assemblies

As shown in [Figure 12](#), the Director contains two power supply assemblies and three fan assemblies. Power supplies are concurrent FRUs that slide into position at the bottom front of the Director. Each 90 to 264 Vac variable-input power supply rectifies and steps down the input power and provides +5 and +24 Vdc power to the Director.

Fan assemblies are concurrent FRUs that slide into position at the top front of the Director. Fans provide cooling for internal components and redundancy for continued operation if a fan fails. The Director can operate with any two of the three fans functioning. Fan speeds and power supply outputs are monitored, and error messages are generated if outputs deviate from a specified range. If a failure is severe, an offline signal is transmitted to each ESCON port and a controlled shutdown of the Director occurs.

Logic Cards

The following paragraphs describe 9032-003 Director logic cards. The cards are illustrated in [Figure 12](#). All cards are installed in slots identified with position numbers engraved in the Director chassis.

- **CTP Card** - The CTP card contains a microprocessor and associated logic that provides overall coordination for the Director. The card also initializes system hardware components after power on or reset. During Director operation, the CTP card controls the operator panel, ESCON port exception handling, error recovery, maintenance port operation, and control unit port (CUP) operation.

It is recommended a backup CTP card (Feature Code #4600) be installed to operate the Director if the primary CTP card fails. The backup CTP card is installed concurrently while the Director is operational. With two CTP cards, Loader/Monitor Area (LMA) code and LIC can be upgraded concurrently. A CTP card can also be removed and replaced concurrently.

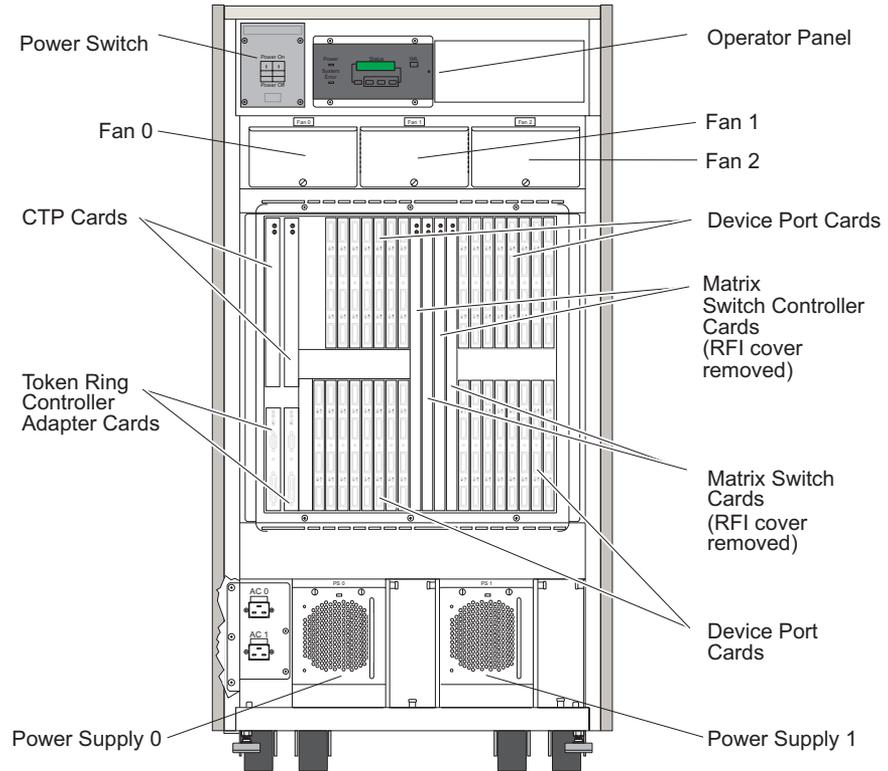


Figure 12. 9032-003 Director Components (Fully-Configured Director)

- **TKRG Controller Adapter Card** - The TKRG Controller Adapter card provides a serial connector (9-pin female, labeled **CONS**) 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.

The card also provides an RS-232-D asynchronous serial port (25-pin male, labeled **MAINTENANCE**) 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.

Note: Always connect the maintenance terminal to the card installed in the left-most slot (slot **0**). Connect a terminal to the card in slot **1** only if it is the only card installed, or if the card in slot **0** failed.

It is recommended a backup TKRG Controller Adapter card (Feature Code #4800) be installed for redundancy in case the primary card fails. The card can be installed while the Director is operational. With two cards installed, each card is a concurrent FRU that can be removed and replaced while the Director is operational.

- **DVP Card** - The DVP card is the hardware interface for ESCON fiber optic media. Each port contains an optical transmitter and receiver that convert signals from electrical to optical and vice versa. A minimum of seven DVP cards (28 ports) must be installed, and a maximum of 31 DVP cards (124 ports) can be installed. DVP cards can be removed and replaced concurrently. Each DVP card contains either:
 - Four LED port interfaces. Cables attach to the ports through multimode duplex connectors. At least four DVP cards installed in the Director (16 ports) must be LED port cards.
 - Four XDF laser port interfaces. Cables attach to the ports through singlemode FCS/SC duplex connectors.

Note: New and replacement XDF port cards and those shipped with the 9032-003 Director since December 1995 have FCS receptacles. An XDF adapter kit (part number 46H9223) is required for each port if jumper cables from ESCON devices have IBM duplex connectors.

- **MXC/MXS Card Set** - The MXC/MXS card is a two-card set that controls dynamic connection requests and provides connection paths between ports specified by port attributes configured through the Director Console or SA OS/390. The card pair responds to connect and disconnect requests from all ports and provides nonblocking, any-to-any connections for up to 124 ports (full duplex).

It is recommended a backup MXC/MXS card set (Feature Code #4500) be installed for redundancy in case the primary card set fails. The card set can be installed while the Director is operational. With two card sets installed, each set is a concurrent FRU that can be removed and replaced while the Director is operational.

Power Cables and Line Filters

Each power supply assembly receives facility ac power through a power cord receptacle at the bottom front of the Director ([Figure 12](#)). The ac power input can range from 90 to 264 volts, an includes 110 and 208 Vac inputs (U.S.). Two separate power circuits with line filters provide ac power to the power switch and the two power supplies.

Fiber-Optic Cable Routing, Labels, Static Pad, and Storage

[Figure 13](#) shows the cable restraints and guides inside the Director's front door that route fiber-optic cables to DVP cards. To comply with electrostatic discharge (ESD) precautions, a static pad is provided on top of the left power supply (slot 0). A storage compartment for publications, port wrap plugs, torque tool (for removing logic cards), and other tools is provided at the upper right area of the Director.

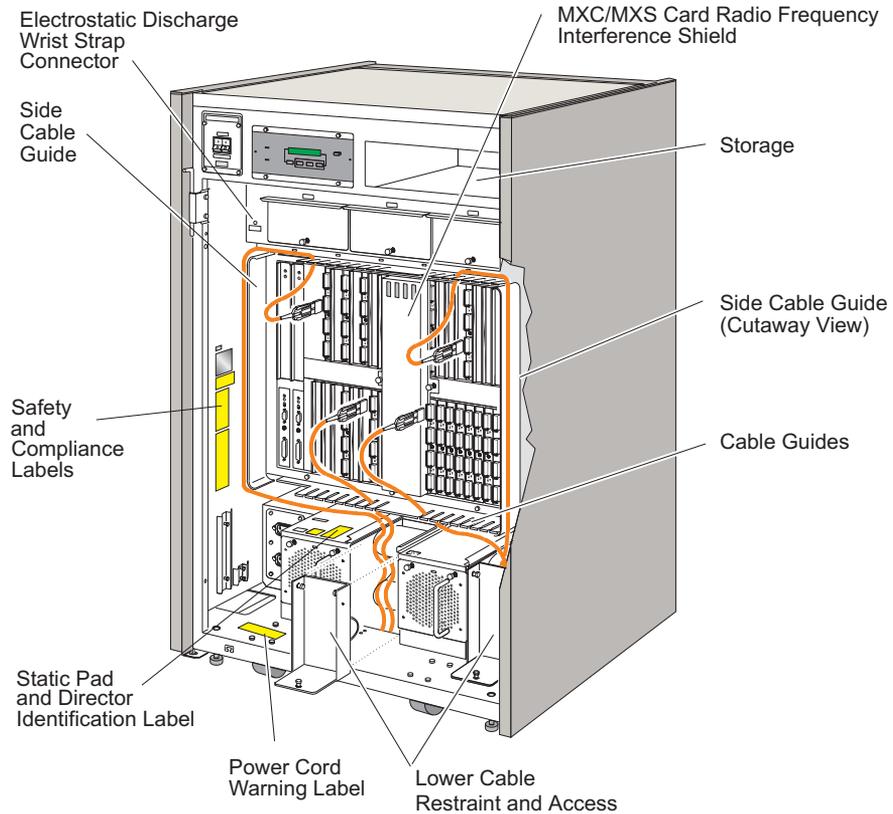


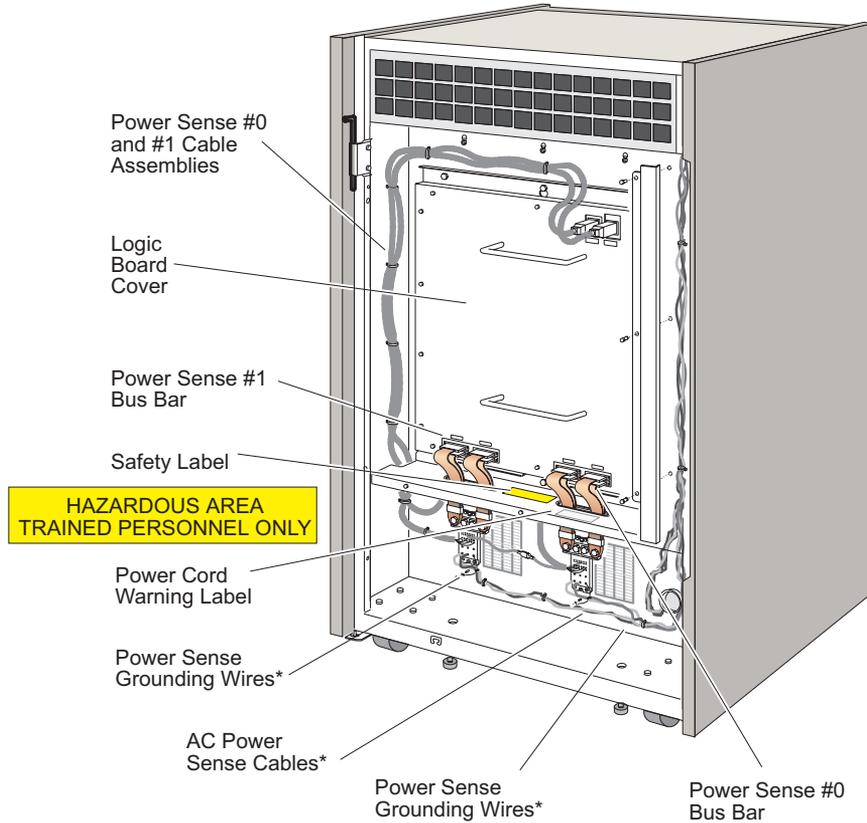
Figure 13. 9032-003 Cable Routing, Labels, Static Pad, and Storage

Cabling and Labels - Rear Access

Figure 14 shows cables and safety labels that are accessed through the rear door of the Director. The cables illustrated include the power sense 0 and power sense 1 cable assemblies, power sense grounding wires, power sense bus bars, and power cords.

Logic Board Assembly

The logic board assembly is located on the rear of the Director (Figure 14). The assembly provides power and logic connections for all logic cards installed in the Director. The logic board assembly is a non-concurrent FRU that is removed and replaced only when the Director is powered off.



* Lower Rear Power Supply Cover Removed

Figure 14. 9032-003 Cable Routing and Labels (Rear of Director)

9033-004 Director Components

The following paragraphs and supporting illustrations describe 9033-004 Director components.

Operator Panel

The 9033-004 operator panel (Figure 15) is integrated with a power supply and cooling fans as a single FRU. The entire assembly slides in and out of the Director chassis. The operator panel includes a:

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

- **IML Button** - Pressing the *IML* button reloads LIC and resets all hardware, except the MXC/MXS and DVP cards.
- **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.
- **Power Switch** - Setting the Director's power switch to the on position (**I**) supplies ac power to the power supply and powers on the Director. Setting the power switch to the off position (**O**) powers off the Director.

The operator panel is a non-concurrent FRU that is removed and replaced only when the Director is powered off.

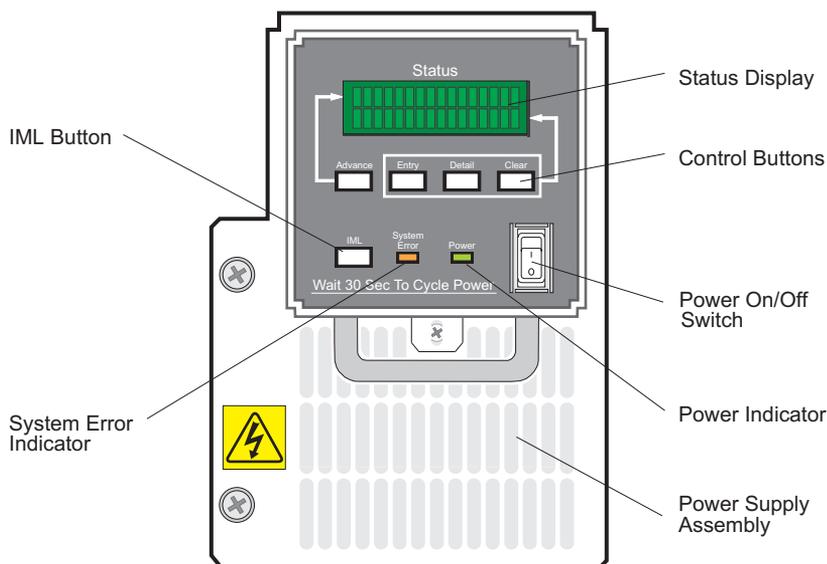


Figure 15. 9033-004 Operator Panel

Power Supply and Fan Assemblies

As shown in [Figure 16](#), the power supply, fans, and operator panel are integrated into one non-concurrent FRU that is removed and replaced only when the Director is powered off. The 90 to 264 Vac variable-input power supply rectifies and steps down the input power and provides +5 and +24 Vdc power to the Director.

Two fans provide cooling for internal components. If one fan malfunctions, the other fan provides adequate cooling until the FRU is replaced. Fan speeds and power supply outputs are monitored, and error messages are generated if outputs deviate from a specified range. If a failure is severe, an offline signal is transmitted to each ESCON port and a controlled shutdown of the Director occurs.

Logic Cards

The following paragraphs describe 9033-004 Director logic cards. The cards are illustrated in [Figure 16](#). All cards are installed in slots identified with position numbers engraved in the Director chassis.

- CTP Card** - The CTP card contains a microprocessor and associated logic that provides overall coordination for the Director. The card also initializes system hardware components after power on or reset. During Director operation, the CTP card controls the operator panel, ESCON port exception handling, error recovery, maintenance port operation, and CUP operation. The CTP card is a non-concurrent FRU that is removed and replaced only when the Director is powered off.

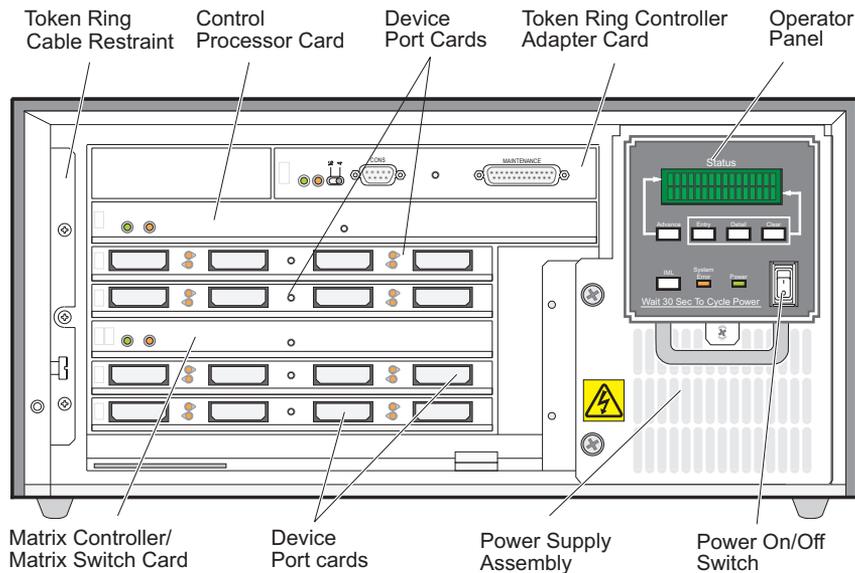


Figure 16. 9033-004 Director Components (Fully-Configured Director)

- TKRG Controller Adapter Card** - The TKRG Controller Adapter card provides a serial connector (9-pin female, labeled **CONS**) 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. The Token Ring adapter cable routes through a radio frequency interference (RFI) shield and through an access hole in the bottom or side of the chassis.

The card also provides an RS-232-D asynchronous serial port (25-pin male, labeled **MAINTENANCE**) 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. The card is a concurrent FRU that can be removed and replaced while the Director is operational.

- **DVP Card** - The DVP card is the hardware interface for ESCON fiber optic media. Each port contains an optical transmitter and receiver that convert signals from electrical to optical and vice versa. A minimum of two DVP cards (eight ports) must be installed, and a maximum of four DVP cards (16 ports) can be installed. DVP cards can be removed and replaced concurrently. Each DVP card contains either:
 - Four LED port interfaces. Cables attach to the ports through multimode duplex connectors.
 - Four XDF laser port interfaces. Cables attach to the ports through singlemode FCS/SC duplex connectors.

Note: New and replacement XDF port cards and those shipped with the 9033-004 Director have FCS receptacles. An XDF adapter kit (part number 46H9223) is required for each port if jumper cables from ESCON devices have IBM duplex connectors.
- **MXC/MXS Card** - The MXC/MXS card controls dynamic connection requests and provides connection paths between ports specified by port attributes configured through the Director Console or SA OS/390. The card responds to connect and disconnect requests from all ports and provides nonblocking, any-to-any connections for up to 16 ports (full duplex). The MXC/MXS card is a non-concurrent FRU that is removed and replaced only when the Director is powered off.

Logic Board Assembly

The logic board assembly is located on the rear of the Director ([Figure 17](#)). The assembly provides power and logic connections for all logic cards installed in the Director. The logic board assembly is a non-concurrent FRU that is removed and replaced only when the Director is powered off.

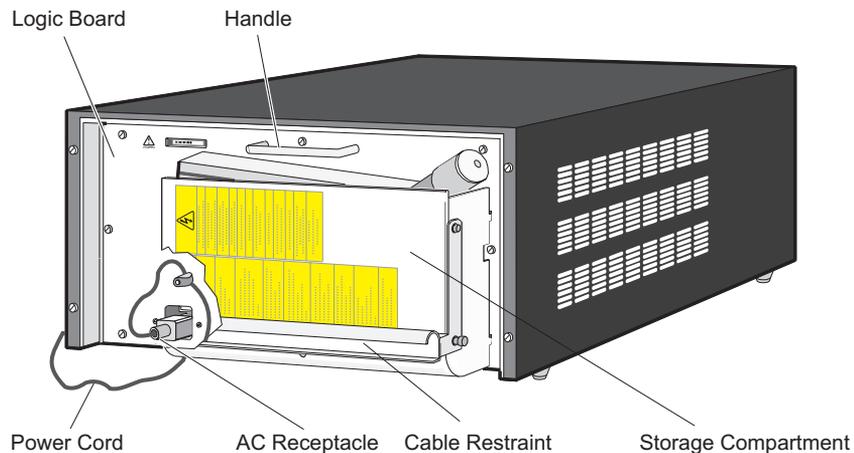


Figure 17. 9033-004 Rear View

Note: Do not use the handle attached to the logic board assembly to lift the Director. Use the handle only to remove and replace the logic board assembly.

Storage Compartment

A storage compartment (Figure 17) for publications, port wrap plugs, torque tool (for removing logic cards), and other tools is provided at the rear of the Director.

Power Cord and Line Filter

The power supply assembly receives facility ac power through a power cord receptacle at the rear of the Director (Figure 17). The ac power input can range from 90 to 264 volts, and includes 110 and 208 Vac inputs (U.S.).

Cable Routing, ESD Ground Point, and Safety Label

Figure 18 illustrates LAN and fiber-optic cable routing inside the Director. Also shown is the grounding point for connecting an ESD wrist strap and a safety label. The grounding point (marked GND) is on the front left edge of the chassis. The safety label is on the front of the operator panel.

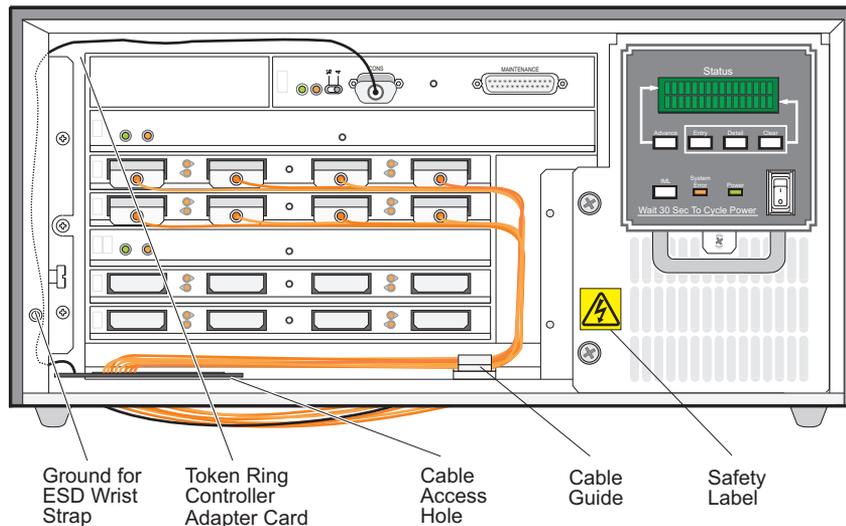


Figure 18. 9033-004 Cable Routing, ESD Ground, and Safety Labels

9032-005 Director Components

The following paragraphs and supporting illustrations describe 9032-005 Director components.

Power Switch

Setting the Director's power switch to the on position (**I**) 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 FRU that is removed and replaced only when the Director is powered off.

Operator Panel

The 9032-005 operator panel (Figure 19) includes a:

- **Power Indicator** - The Power indicator is an LED that illuminates when power is supplied to the Director.
- **Status Display** - The status display is an LCD that shows status and event messages on two 16-character lines.
- **IML Button** - Pressing the *IML* button reloads LIC and resets all hardware, except the MXC/MXS 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.

The operator panel is a concurrent FRU that can be removed and replaced while the Director is operational.

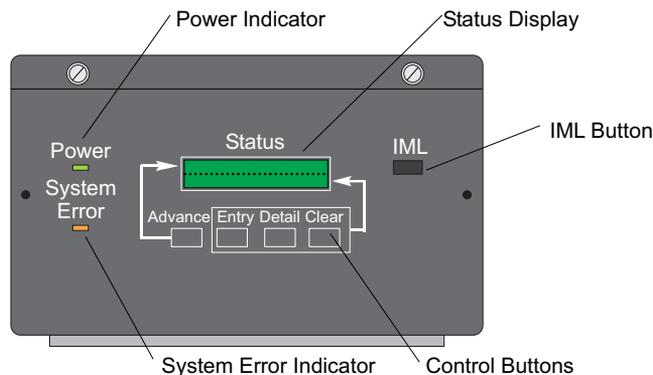


Figure 19. 9032-005 Operator Panel

Power Supply and Fan Assemblies

As shown in Figure 20, the Director contains two power supply assemblies. Power supplies are concurrent FRUs that slide into position at the bottom front of the Director. Each 90 to 264 Vac variable-input power supply rectifies and steps down the input power and provides dc power to the Director. There are two power supply types:

- The original power supply provides +5 and +24 Vdc power to Director components. 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.***
- The current 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.

Power supply outputs are monitored, and error messages are generated if outputs deviate from a specified range. If a failure is severe, an offline signal is transmitted to each ESCON and FICON port, and a controlled shutdown of the Director occurs.

As shown in [Figure 21](#), the Director contains two fan assemblies. Fan assemblies are concurrent FRUs that slide into position at the top rear of the unit. Four fans (two fans in each assembly) provide cooling for internal components and redundancy for continued operation if a fan fails. With no FCV port cards installed, the Director can operate with any two of the four fans operational. With FCV port cards installed, the Director can operate with any three of the four fans operational. Fan speeds are monitored, and error messages are generated if outputs deviate from a specified range. If a failure is severe, an offline signal is transmitted to each ESCON and FICON port, and a controlled shutdown of the Director occurs.

Logic Cards

The following paragraphs describe 9032-005 Director logic cards. The cards are illustrated in [Figure 20](#). All cards are installed in slots identified with position numbers engraved in the Director chassis.

- **CTP Card** - The CTP card contains a microprocessor and associated logic that provides overall coordination for the Director. The card also initializes system hardware components after power on or reset. During Director operation, the CTP card controls the operator panel, port exception handling, error recovery, thermal protection mechanisms, maintenance port operation, and CUP operation.

It is recommended a backup CTP card (Feature Code #5600) be installed to operate the Director if the primary CTP card fails. The card can be installed while the Director is operational. With two cards installed, each card is a concurrent FRU that can be removed and replaced while the Director is operational.

- **TKRG Controller Adapter card** - The TKRG Controller Adapter card provides a serial connector (9-pin female, labeled **CONS**) 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. The card also provides an RS-232-D asynchronous serial port (25-pin male, labeled **MAINTENANCE**) 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.

Note: Always connect the maintenance terminal to the card installed in the left-most slot (slot **0**). Connect a terminal to the card in slot **1** only if it is the only card installed, or if the card in slot **0** failed.

It is recommended a backup TKRG Controller Adapter card (Feature Code #5800) be installed for redundancy in case the primary card fails. The card can be installed while the Director is operational. With two cards installed, each card is a concurrent FRU that can be removed and replaced while the Director is operational.

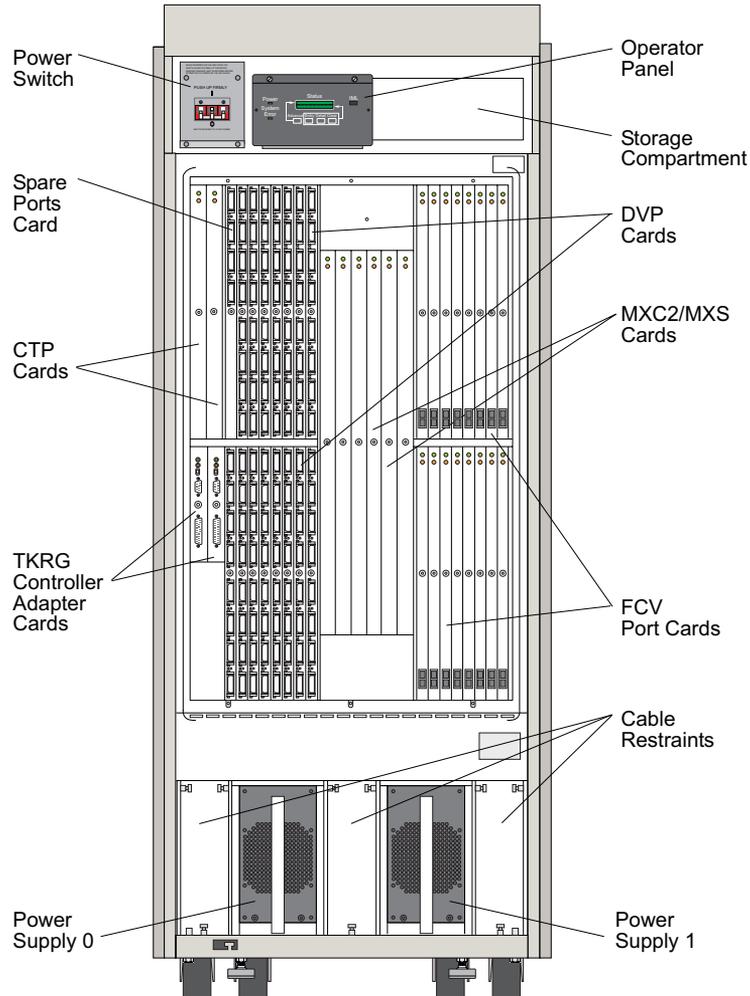


Figure 20. 9032-005 Director Components (Fully-Configured Director)

- DVP Card** - The DVP card is the hardware interface for ESCON fiber optic media. Each port contains an optical transmitter and receiver that convert signals from electrical to optical and vice versa. A minimum of three DVP cards (24 ports) must be installed, and a maximum of 31 DVP cards (248 ports) can be installed. DVP cards can be removed and replaced concurrently. Each DVP card contains either:

- Eight LED port interfaces (Feature Code #5240). Cables attach to the ports through multimode duplex connectors.
- Eight XDF laser port interfaces (Feature Code #5250). Cables attach to the ports through singlemode FCS/SC duplex connectors.

Note: XDF port cards shipped with the 9032-005 Director have FCS receptacles. An XDF adapter kit (part number 46H9223) is required for each port if jumper cables from ESCON devices have IBM duplex connectors.

- **FCV Port Card** – The FCV port card (Feature Code #5260) is the hardware interface for FICON fiber optic media. Up to 16 FCV port cards can be installed in the Director. Each card contains one longwave laser port interface for FICON fiber optic media. The port attaches to a FICON host channel (defined as FCV). A singlemode or multimode fiber-optic cable attaches to the port through an FCS/SC duplex connector.

The card provides a multiplexing and conversion function that maps one FICON port to eight internal ESCON ports on the same card. The card is a FICON-to-ESCON converter.

- **Spare Ports Card** – The spare ports card 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 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 multimode duplex connectors and to XDF 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 multimode duplex connectors.
- **MXC/MXS Card Set** - The MXC/MXS card 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 SA OS/390. The card pair responds to connect and disconnect requests from all ports and provides nonblocking, any-to-any connections for up to 248 ports (full duplex). 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.

It is recommended a backup MXC/MXS card set (Feature Code #5500) be installed for redundancy in case the primary card set fails. The card set can be installed while the Director is operational. With two card sets installed, each set is a concurrent FRU that can be removed and replaced while the Director is operational.

Power Cables and Line Filters

Each power supply assembly receives facility ac power through a power cord receptacle at the bottom rear of the Director (Figure 21). The ac power input can range from 180 to 264 volts, and includes 208 Vac input (U.S.). Two separate power circuits with line filters provide ac power to the power switch and power supplies.

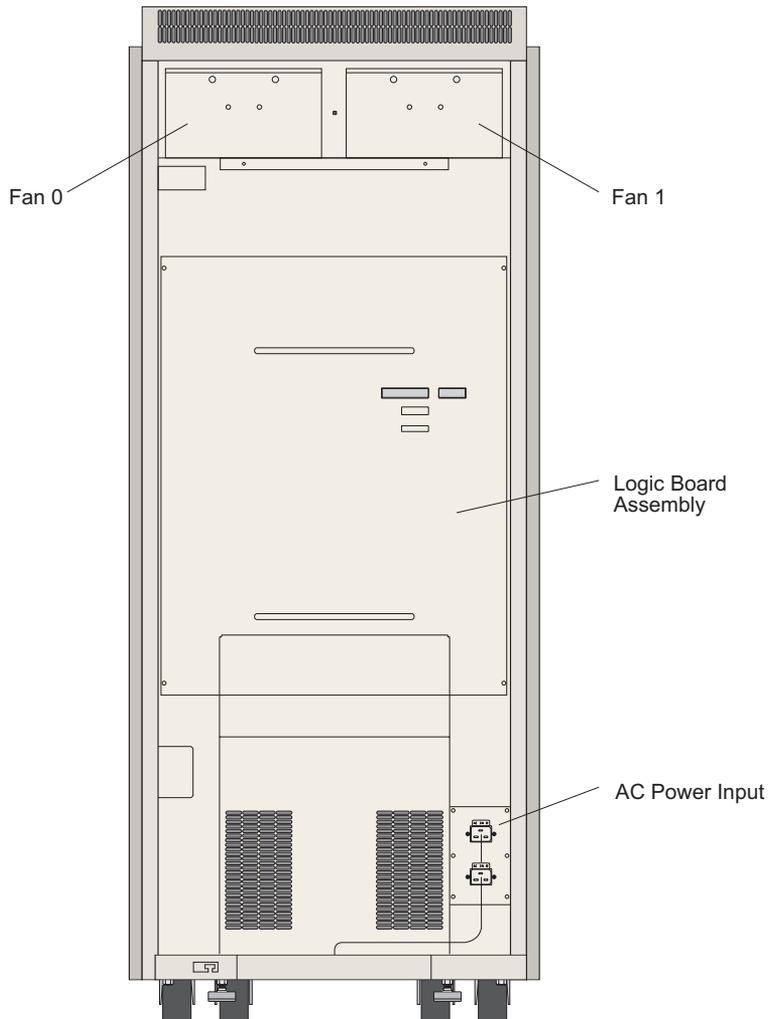


Figure 21. 9032-005 Rear View

Logic Board Assembly

The logic board assembly is located on the rear of the Director (Figure 21). The assembly provides power and logic connections for all logic cards installed in the Director. The logic board assembly is a non-concurrent FRU that is removed and replaced only when the Director is powered off.

Fiber-Optic Cable Routing, Labels, Static Pad, and Storage

Figure 22 shows the cable restraints and guides inside the Director's front door that route fiber-optic cables to DVP and FCV cards. To comply with ESD precautions, a static pad is provided on top of the left power supply (slot 0). A storage compartment for publications, port wrap plugs, torque tool (for removing logic cards), and other tools is provided at the upper right area of the Director.

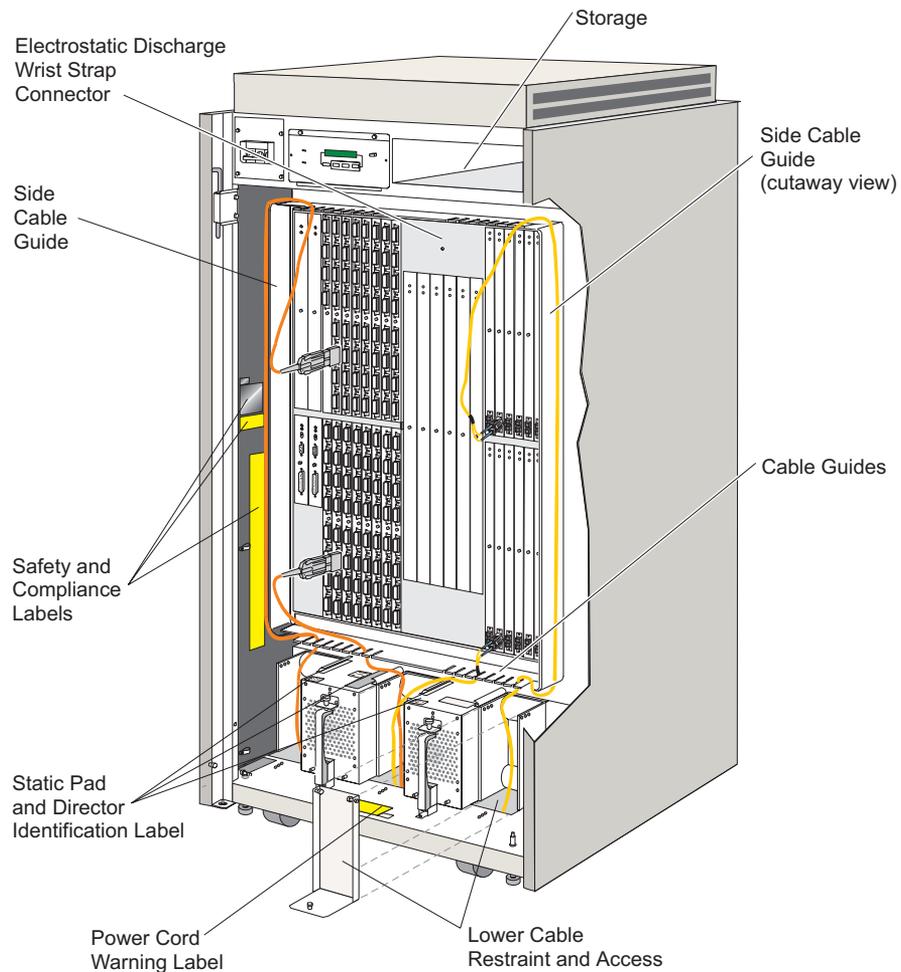


Figure 22. 9032-005 Cable Routing, Labels, Static Pad, and Storage

Cabling and Labels - Rear Access

Figure 23 shows cables and safety labels that are accessed through the rear door of the Director. The cables illustrated include the power sense cable assemblies and power cords.

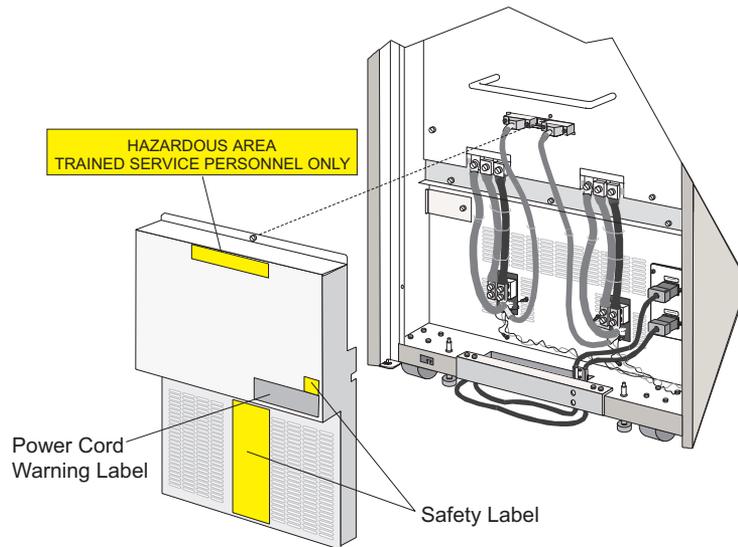


Figure 23. 9032-005 Cable Routing and Labels (Rear of Director)

Chapter 2. The Director Console

This chapter describes the Director Console, the Console application *Startup* window, and *Startup* window menu options. The chapter also describes how to navigate within the Console application (using a mouse and navigation keys to move within a window and select items). The chapter specifically describes how to:

- Move between application menus and select menu options using a mouse, keyboard, or navigation keys
- Identify window and menu types
- Use the *Startup* window, associated menu options, and dialog boxes
- Open a new configuration matrix.

The chapter does not discuss Windows-Operating System/2 (Win-OS/2). For information about the Win-OS/2 environment, 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)*.

Console Platforms

The Win-OS/2-based Director Console application is installed on a PC platform that communicates with the Director through a 4/16 megabit per second (Mbps) Token Ring local area network (LAN). The application can be installed on three different platforms:

1. The recommended platform is a dedicated IBM PC with appropriate hardware and software (Figure 24).

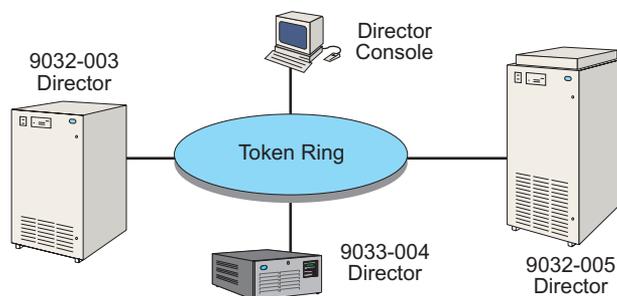


Figure 24. Director Console Application on a Dedicated PC

2. The IBM PC Console used with a 9037 Model 2 Sysplex Timer network (Figure 25).

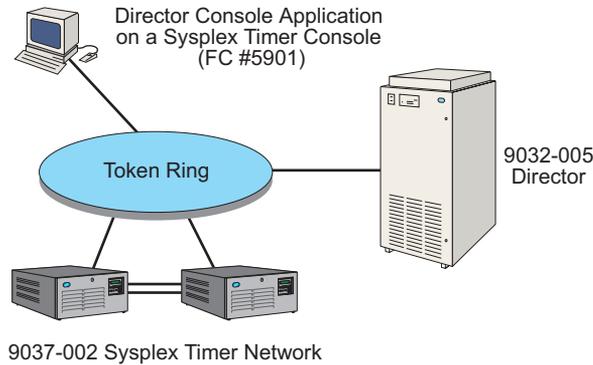


Figure 25. Director Console Application on a Sysplex Timer Console

3. The System/390 (S/390) Server's Hardware Management Console (Figure 26). The S/390 Hardware Management Console must have a Token Ring adapter card installed to support this configuration.

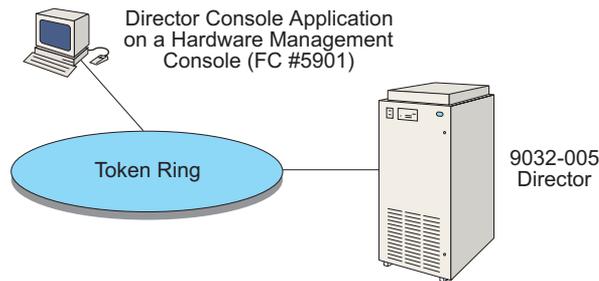


Figure 26. Director Console Application on a Hardware Management Console

An operator can also use a remote Console to assume functional control of the Director Console application. The remote Console can be a Director Console, Sysplex Timer Console, or S/390 Hardware Management Console.

The remote Console communicates with the Director console through a bridged or routed LAN, using a customized version of Distributed Console Access Facility (DCAF) software and Transmission Control Protocol/Internet Protocol (TCP/IP) software. The customized version of DCAF is supported only for the Director and Sysplex Timer Console applications.

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 Licensed Internal Code (LIC) Version 4.3 or higher is installed.

Figure 27 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.

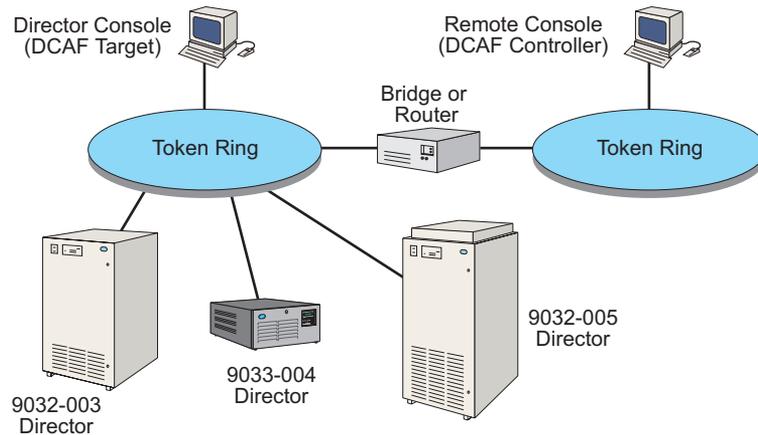


Figure 27. Remote Console Connection to the Director Console

For additional information on planning an installation for Director Console support, refer to *Planning for the 9032 Model 3, 9033 Model 4, and 9032 Model 5 Enterprise Systems Connection Director (SA22-7295)* or *Planning for the 9032 Model 5 Director with FICON Converter Feature (SA22-7415)*.

Console Operations

The Director Console application operates in a Win-OS/2 environment where menus, dialog boxes, and function keys operate as standard objects. This publication describes operation of the Director Console application and does not provide specific information about Win-OS/2 operation. For information about Win-OS/2, refer to

- Operating system-specific publications delivered with the PC platform
- *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)*.

Only one instance of the Director Console application can be open and operating on a PC platform at any time. In addition, only one instance of a defined Director can exist for an open Console application, and only one *Matrix* window can be open per Director. However, multiple *Matrix* windows can be open within the Console application, allowing monitoring and operation of multiple Directors.

It is recommended a backup or replacement Console be maintained in case the primary Director Console fails.

- A replacement Console remains disconnected from the Token Ring LAN on which the Director Console is attached. However, the Director and replacement Consoles are maintained with *identical* Internet Protocol (IP) addresses.

- A backup Console remains connected to the same Token Ring LAN on which the Director Console is attached, but the Consoles are maintained with *different* IP addresses.

Attention!

Operate the Director Console application on *one Console only*. Operating the application on more than one Console at a time can result in loss of event data or other critical data. Refer to "[Maintaining and Using a Replacement or Backup Console](#)" on page 190 for additional information.

Mouse

Within the Director Console application, use the mouse to navigate quickly through windows, dialog boxes, and menus, or to select or modify data in windows and dialog boxes. The following operations are mouse supported:

- Scrolling through data in windows with horizontal and vertical scroll bars (where scroll bars appear)
- Pulling down menu lists from the *Startup*, *Terminal*, *Port Maintenance*, *Log*, and *Matrix* windows by clicking the menu title
- Selecting menu options by clicking the desired option
- Clicking radio buttons, check boxes, or push buttons, to enable, disable, or select options that appear in dialog boxes
- Clicking (to position the cursor for editing) or selecting text that appears in dialog boxes.

Keyboard

Although a mouse is used for most Director Console operations, the mouse is not required. The keyboard is fully supported through navigation keys and accelerator keys. The following key descriptions apply to all windows and menus in the Console application.

Navigation Keys

- **PgUp / PgDn** - Scrolls the displayed window up or down one page (the amount of data displayed). The key is not available for the *Port Maintenance* or *Terminal* windows.
- **Ctrl+PgUp / Ctrl+PgDn** - Scrolls the displayed window left or right one page. The key is not available for the *Port Maintenance* or *Terminal* windows.
- **Home / End** - Moves the display to the leftmost (home) or the rightmost (end) position without scrolling. The key is not available for the *Port Maintenance* or *Terminal* windows.
- **Ctrl+Home / Ctrl+End** - Moves to the top or bottom of the displayed data. The key is not available for the *Port Maintenance* or *Terminal* windows.

- **Ctrl+Shift+Home / Ctrl+Shift+End** - Scrolls to the beginning or end of the data. The key is not available for the *Port Maintenance* or *Terminal* windows.
- **Arrow Keys** - Each arrow key moves the highlight (selection indicator) in the direction of the arrow, one position at a time. The key is not available for the *Port Maintenance* or *Terminal* windows.
- **Ctrl+F6** - Cycles through the display of other open Console windows. The next window in sequence is brought fully into view.
- **Alt+F6** - Selects an alternate dialog box (if multiple dialog boxes are open). For example, if the *Director Information* dialog box is selected from the *Select Active Director* dialog box; **Alt+F6** alternates selection of the two dialog boxes, allowing interaction.
- **F10 or Alt** - Selects the menu bar for the displayed window. To select menu options:
 - Use the appropriate arrow key and the **Enter** key
 - Use the underlined letter mnemonic.
- **F1** - Activates online help for the selected window. The key is not available for the *Port Maintenance* or *Terminal* windows.
- **F4** - At list boxes within dialog boxes, displays a list of all defined options. At windows with no open dialog boxes, refreshes or rereads the display data.

Accelerator Keys

To assist experienced Console operators, accelerator keys are available to perform frequently used operations without using menus. To learn the keystrokes, available accelerators (usually a control or alternate key, like **Ctrl+D**) are listed on pull-down menus to the right of the associated menu option. The option's function is performed with the accelerator keystroke from the window without pulling down the menu.

To pull down a menu and select an option without the mouse, press and hold the **Alt** key, then press the underlined letter for the menu option displayed. When a menu is displayed, press the underlined character for the menu option to perform the selection.

Most dialog boxes contain letter mnemonics (underlined letters) displayed for buttons, controls, and entry fields. Press the underlined letter to perform the function of the selected option. When the cursor is in a data entry field, use **Alt** with the letter key as the accelerator to select the desired control. Use the **Enter** key to accept the current selection in a dialog box. The default selection is always highlighted with a heavy border around the button.

Menu and Window Types

Multiple *Matrix* windows (for such tasks as monitoring multiple Directors) can be kept open at the Director Console, along with other windows like a *Log* or *Terminal* window. Windows can be sized, moved, or minimized to icons on the Console application window. However, all windows are retained within the application window to avoid confusion with windows from other PC applications.

To monitor multiple Directors at the same screen, an *Active Matrix* window can be opened for each Director and the windows can be tiled or cascaded to avoid confusion. Refer to "[Window Menu](#)" on page 67 for additional information.

Menu bar selections at the top of a window change depending on the window type. Each type of window has a different set of menu options. The window types (*Startup*, *Matrix*, *Log*, *Terminal*, and *Port Maintenance*) can be displayed when working in the Console application.

Startup Window Menu Bar

When the Director Console application is opened or when all other windows within the application are closed, the *Startup* window appears ([Figure 28](#)). The *Startup* window menu bar provides options to access to local Console functions not directly related to a Director, such as adding a new software release or changing password access.



Figure 28. Startup Window

Matrix Window Menu Bar

When a Director configuration is selected from the *Startup* window *File* menu, the *Matrix* window for that Director appears ([Figure 29](#)). Menu bar options expand to include Director-specific operations, including commands to configure and maintain the Director. Depending on the Director status and configuration, certain menu options may be disabled (grayed out) and not available.

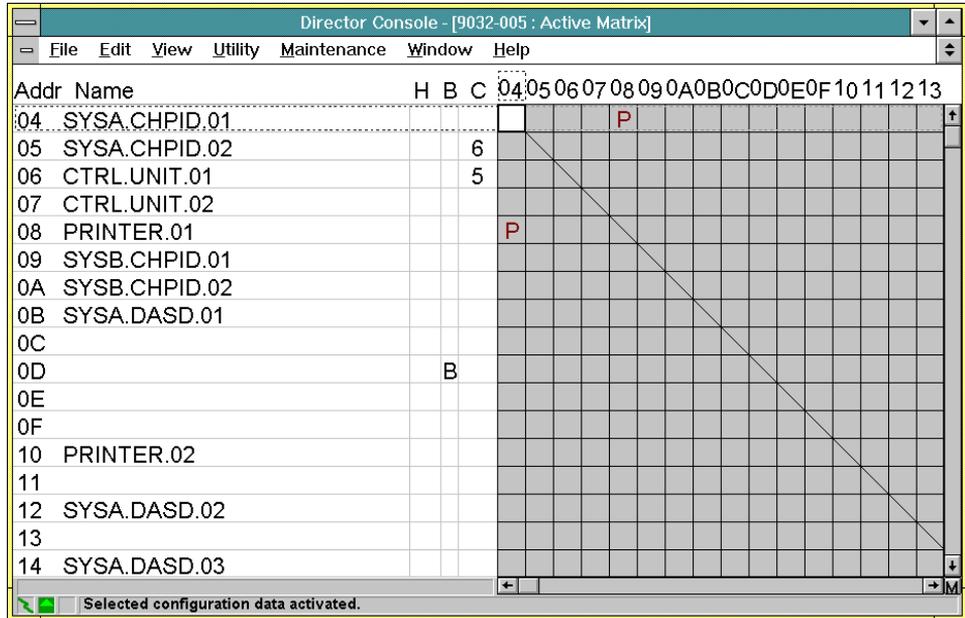


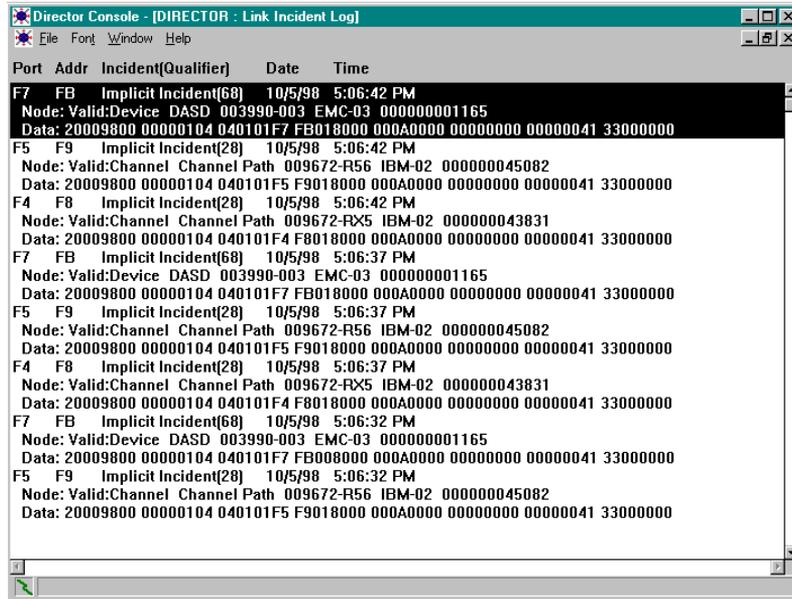
Figure 29. Matrix Window

Note: The appearance of the matrix may vary due to size variations in the working window, number of logical port addresses shown, and type of Director. In addition, the 16-port 9033-004 Director matrix may appear with a gap between the menu bar and matrix.

Log Windows

When a log or data display window is selected (*Director Link Incident* log in [Figure 30](#)), menu bar options change to include operations specific to the open window. The log contents can be cleared, refreshed, copied to a disk file, and printed, or can be displayed in a different font or character size. Log and data display windows include the:

- Console Audit log
- Console Error log
- Director Link Incident (LIN) log
- Director Audit log
- Director Event log
- Hardware Configuration window
- Hardware Audit log
- Node Descriptor list.



Port Maintenance Window

The *Port Maintenance* window displays a visual representation of the hardware configuration and port address mapping of the selected Director. Menu bar options expand to include Director-specific monitoring and diagnostic operations. The *Utility* and *Maintenance* menus contain the options used to monitor functions of the selected Director.

Window options allow the operator to swap logical port addresses, access *Log* windows and associated functions, initial program load (IPL) the Director, set the Director offline, access options such as the *Terminal* window and *Loader/Monitor Area (LMA) Versions*, and collect maintenance information.

Figure 32 shows the *Port Maintenance* window for the 9032-003 Director (124 ports). The illustration shows that Device Port (DVP) cards in card slots 1, 5, and 17 require service, and DVP cards are not installed in card slots 21 and 23 through 30.

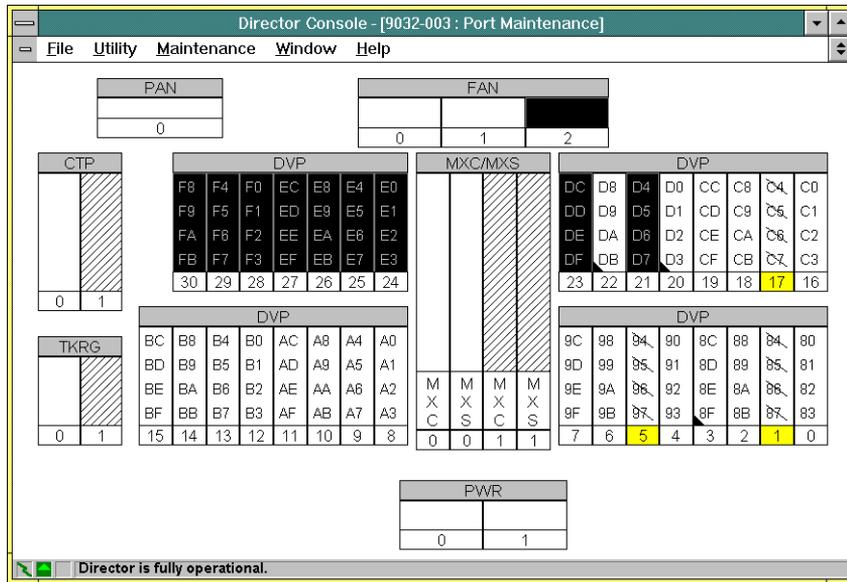


Figure 32. Port Maintenance Window (9032-003 Director)

Figure 33 shows the *Port Maintenance* window for the 9033-004 Director (16 ports). The illustration shows the DVP card in card slot 1 requires service, and a DVP card is not installed in card slot 2.

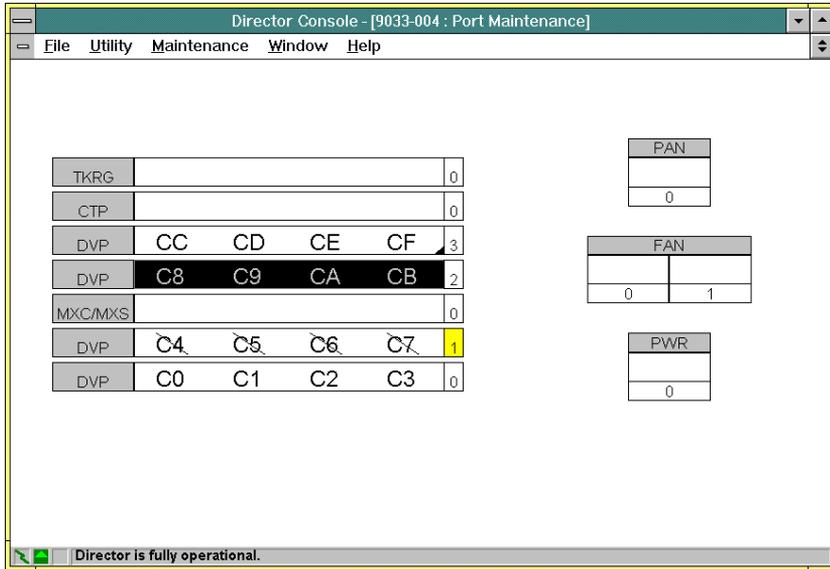


Figure 33. Port Maintenance Window (9033-004 Director)

Figure 34 shows the Port Maintenance window for the 9032-005 Director (248 ports). The illustration shows that DVP cards in card slots 5 and 17 require service, and a DVP card is not installed in card slot 21. Fibre Channel Converter (FCV) Port cards are installed in card slots 0, 1, and 2.

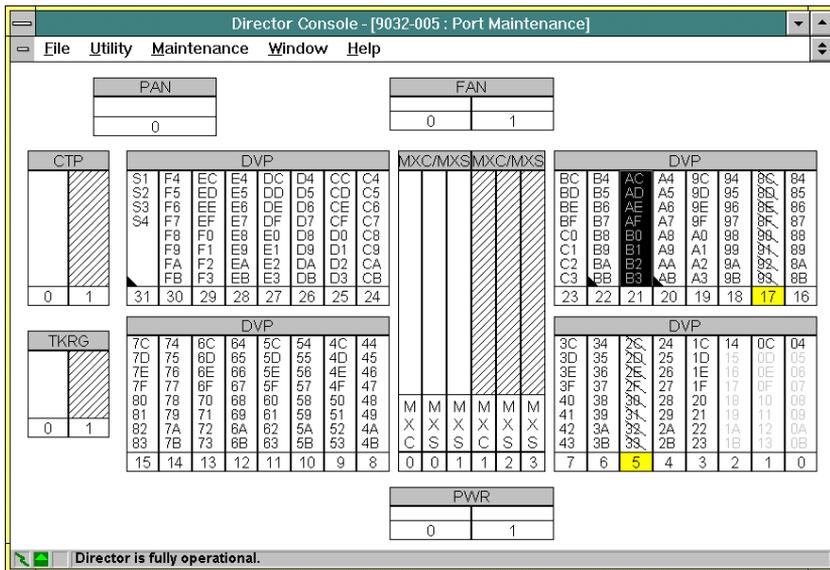


Figure 34. Port Maintenance Window (9032-005 Director)

Startup Window Menu Options

To start the Director Console application from the OS/2 desktop, double-click the *Director Console* icon (Figure 35).

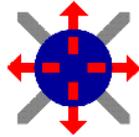


Figure 35. *Director Console* Icon

The *Startup* window (Figure 36) appears. It may take up to 30 seconds for the Console application to open.



Figure 36. *Startup* Window

Note: It is assumed the Director Console application is properly installed on the PC platform, the platform is powered on, and the OS/2 desktop is displayed prior to double-clicking the *Director Console* icon. During installation, ensure the Director Console icon is not placed in the OS/2 system's *Startup* folder.

Startup window pull-down menus and associated menu options are listed in Table 3.

Table 3. Startup Window Menu Options

File	Utility	Window	Help
New Configuration Matrix	LIC Versions	Tile	Contents
Open Saved Configuration Matrix	Passwords	Cascade	Keyboard
Open Active Configuration Matrix	Console Audit Log	Arrange Icons	Mouse
Exit	Console Error Log		Using Help
			Product Information

The menu commands allow an operator to:

- Create a new Director configuration matrix (*File* menu)
- Open a saved or active configuration matrix (*File* menu)
- Exit the Console application and return to the OS/2 desktop (*File* menu)
- Maintain up to three Licensed Internal Code (LIC) versions (*Utility* menu)
- Maintain Console application passwords (*Utility* menu)
- View and print Console Audit and Error logs (*Utility* menu)
- Perform window management (*Window* menu)
- Access the online help facility (*Help* menu).

Startup File Menu

The *Startup* window *File* menu (Figure 37) provides operator entry to Directors and associated configuration matrices. The same menu options also appear at the *Matrix* window's *File* menu (refer to "Matrix File Menu" on page 77 for information). *File* menu options are:

- **New Configuration Matrix** - Opens a new Director definition or a new matrix for a previously-defined Director (requires a maintenance-level password).
- **Open Saved Configuration Matrix** - Provides access to a library of previously-configured matrices for each Director supported by the Console.
- **Open Active Configuration Matrix** - Opens the current settings (*Active Matrix* window) for a selected Director.
- **Exit** - Closes all windows and exits the Director Console application.

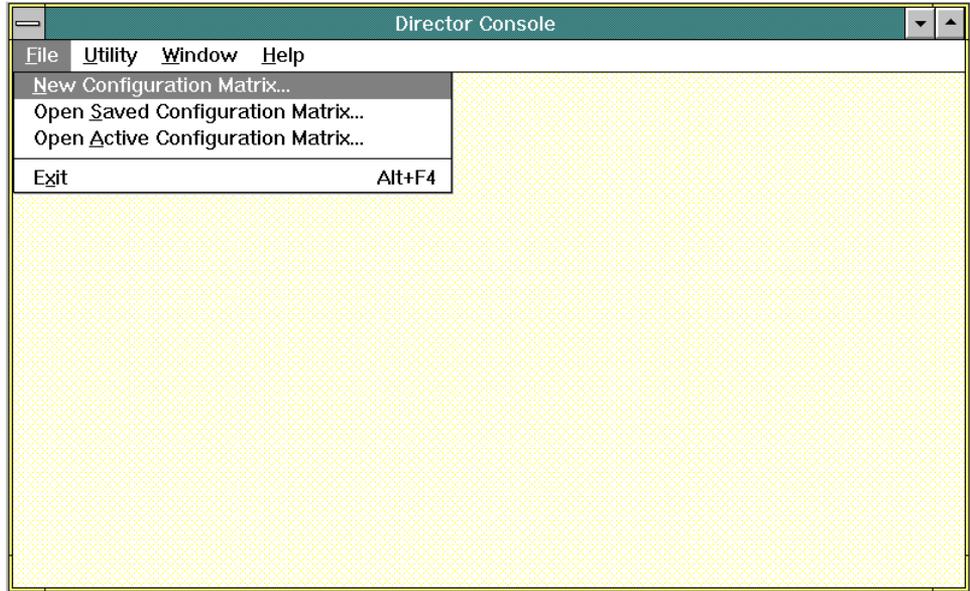


Figure 37. File Menu (Startup Window)

New Configuration Matrix

When the *New Configuration Matrix* option is selected from the *File* menu, the *Select Director for New Matrix* dialog box appears (Figure 38).



Figure 38. Select Director for New Matrix Dialog Box

To open a Director, select (double-click) the Director name in the list box, or highlight the Director name with the up or down arrow keys and click the *OK* button. If a *Matrix* window is already open for the selected Director, the window closes and a new (blank) *Matrix* box appears. The following options are available at the dialog box.

- **New Director** - This option allows an operator to add a new Director. Information is entered through the *Director Definition* dialog box. A maintenance authorization password is required.
- **Modify Definition** - This option allows an operator to modify the definition of an existing Director. Information is changed through the *Director Definition* dialog box. A maintenance authorization password is required.
- **Delete Definition** - This option allows an operator to delete a Director definition from the Console fixed disk. A maintenance authorization password is required.
- **Director Info** - This option displays definition parameters at the *Director Information* dialog box.

Director Definition Dialog Box

Select the *New Director* or *Modify Definition* option to open a blank *Director Definition* dialog box (Figure 39). The dialog box provides fields for the Director ID, Director Model, default Control Unit Port (CUP) name (optional), Internet Protocol (IP) address, and code page (for port address names). Up to 16 Director definitions can be created and maintained in the Console library.

The image shows a dialog box titled "Director Definition". It has a standard Windows-style title bar with a close button on the left. The dialog contains the following elements:

- Director ID:** A text input field.
- Model:** A dropdown menu currently displaying "24-248 port Director".
- Default CUP Name:** A text input field.
- IP Address:** A text input field.
- Code Page:** A dropdown menu currently displaying "037 - US/Canada/Brazil New".
- Buttons:** "OK", "Cancel", and "Help" buttons are located on the right side.
- Checkbox:** An unchecked checkbox labeled "Open active window on Console start-up" is located at the bottom left.

Figure 39. Director Definition Dialog Box

Complete dialog box fields as follows:

- **Director ID** - Enter an ID (from one to eight characters) that uniquely identifies the Director to the Console. Valid characters are A through Z, 0 through 9, underscore (_), and hyphen (-). The ID appears in Console window titles and on the *Window* menu. Characters typed in the field are automatically converted to upper case. IDs cannot be duplicated, and disk operating system (DOS) device names are invalid.

- **Model** - This entry identifies the Director model to the Console. Click the arrow button (adjacent to the list box) or press **F4** to display a list of valid selections.
 - The 9032-003 Director is defined to the Console as the 28 to 124 port Director.
 - The 9033-004 Director is defined to the Console as the 8 to 16 port Director.
 - The 9032-005 Director is defined to the Console as the 24 to 248 port Director.

Attention!

The default value for this field is the 24 to 248 port Director. The selection can only be changed when a new Director is defined. The field cannot be modified for an existing Director definition.

- **Default CUP Name** - This entry is optional and can be used to assign the same CUP name to multiple configuration matrices for a Director. If a name is entered, it appears in the *CUP Name* field at the bottom of the *Matrix* window. When the matrix is saved, the name becomes the default for future matrix definitions for that Director. The name can be changed by modifying the Director definition or using the *CUP Name* option from the *Matrix* window's *Edit* menu.
- **IP Address** - The entry is the IP address for the Director on the Token Ring LAN. Each IP address must be unique for devices on the LAN. The address is in the form *nnn.nnn.nnn.nnn*, where *nnn* is a decimal byte in the range zero through 255. The address may not be all zeros or all 255s.
- **Code Page** - This entry selects the code page used for port address names. Click the arrow button (adjacent to the list box) or press **F4** to display a list of valid selections. The default value is US/Canada.
- **Open active window on Console start-up** - Enable this check box to open the *Active Matrix* window for this Director each time the Console application is started. If the box is checked for only one Director, that Director is the default displayed when the Console application opens. If the box is checked for multiple Directors, multiple active windows open (one for each Director with the box enabled).

The Console application validates field length, IP address, and Director ID for uniqueness when the *OK* button is clicked. Any error in these fields is indicated by an error message with the invalid field highlighted.

Delete Definition

Select the *Delete Definition* option to open the dialog box shown in [Figure 40](#). Select the *Delete* button. The *Maintenance Authorization* dialog box appears. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The selected Director definition is deleted from the Console.

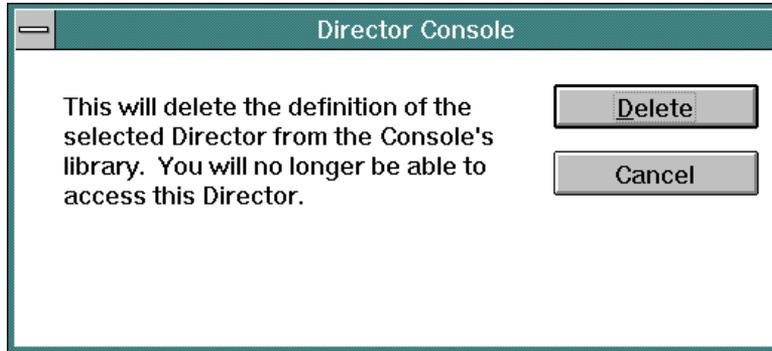


Figure 40. Delete Director Definition Dialog Box

Director Information Dialog Box

Select the *Director Info* button to open the *Director Information* dialog box (Figure 41). Basic information for the selected Director appears. The dialog box can remain open to display information about each Director as a Director is selected from the list box.

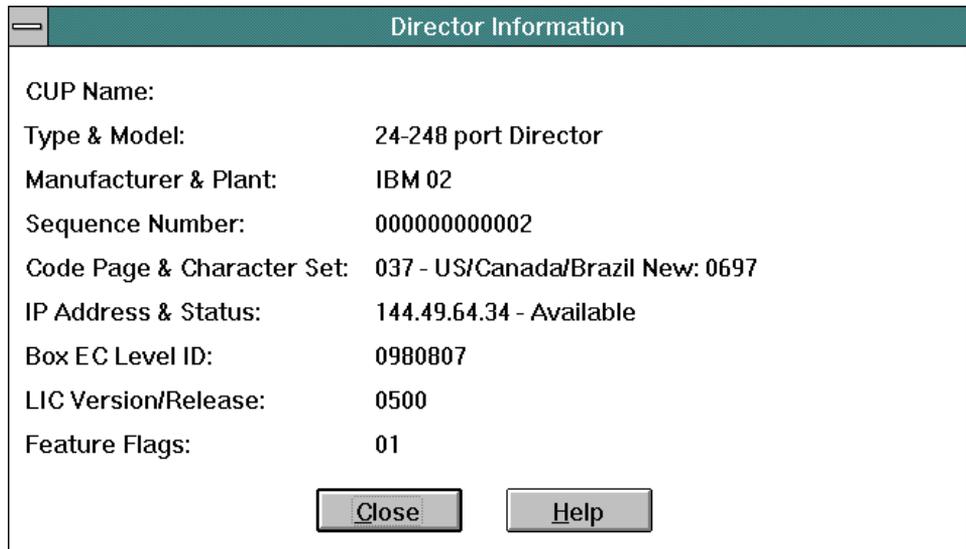


Figure 41. Director Information Dialog Box

Information in this dialog box is generated from the Director definition (CUP name, type and model, code page, and IP address) and from Director information supplied to the Console (all other fields).

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. 9032-003 and 9033-004 Directors always have a feature flag of **00**. 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**.

Open Saved Configuration Matrix

When the *Open Saved Configuration Matrix* option is selected from the *File* menu, the *Select Saved Configuration Matrix* dialog box appears (Figure 42). To open a saved matrix, select (double-click) a Director name from the *Director* list box, then select a matrix name from the *Matrix* list box (or highlight the selections with the up or down arrow keys and click the *OK* button). Use the **Tab** key to change between the *Director* and *Matrix* list boxes.

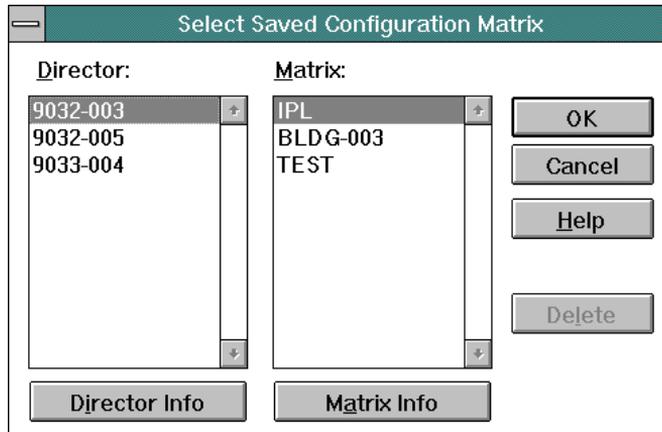


Figure 42. *Select Saved Configuration Matrix* Dialog Box

The following options are available at the dialog box.

- **Delete** - This option allows an operator to delete a configuration matrix from the Console fixed disk. An operator authorization password is required.
- **Matrix Info** - This option displays matrix information at the *Saved Matrix Information* dialog box.
- **Director Info** - This option displays definition parameters at the *Director Information* dialog box.

Delete

Select the *Delete* option to open the dialog box shown in Figure 43. Select the *Delete* button. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The selected configuration matrix is deleted from the Console.

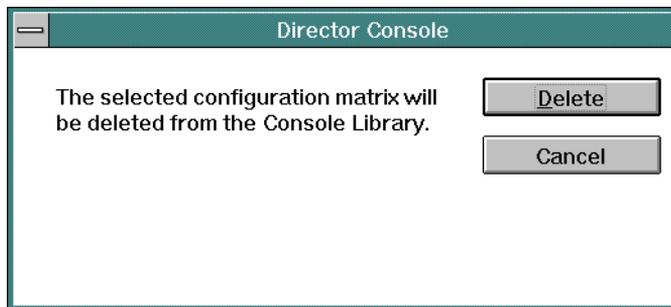


Figure 43. Delete Configuration Matrix Dialog Box

Saved Matrix Information Dialog Box

Select the *Matrix Info* button to open the *Saved Matrix Information* dialog box (Figure 44). The dialog box displays information about the selected configuration matrix. Selecting a different configuration matrix from the list box displays information about that saved matrix.

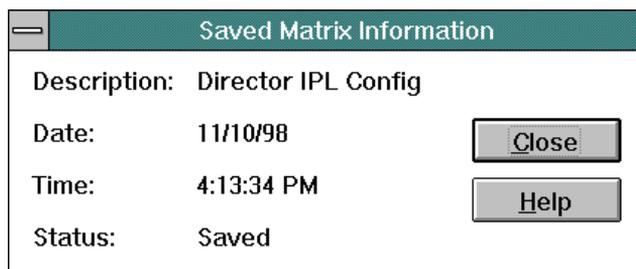


Figure 44. Saved Matrix Information Dialog Box

The following information appears in the dialog box.

- **Description** - A description of the configuration matrix specified when saved using the *Save Configuration Matrix As* option from the *Matrix* window's *File* menu. Refer to "[Save Configuration Matrix As](#)" on page 81 for more information.
- **Date and Time** - The date and time the configuration file was last saved or updated.
- **Status** - The status for all files is **Saved**, because the dialog box displays only saved files. Other status conditions may also be displayed next to the **Saved** indicator. However, the file may be **Locked** if a host system is using the file or if *Active = Saved* is set for the IPL file. An IPL file may also be **Unavailable** if the Token Ring link to the Director is unavailable.

Director Information Dialog Box

Select the *Director Info* button to open the *Director Information* dialog box (Figure 41 on page 54). Basic information for the selected Director appears. Refer to "Director Information Dialog Box" on page 54 for additional information.

Open Active Configuration Matrix

Changes made to a configuration matrix are not implemented for a Director until the matrix is activated. Matrix activation transmits a copy of the current (new or saved) matrix to the Director and enables changes to the active matrix for the Director.

When the *Open Active Configuration Matrix* option is selected from the *File* menu, the *Select Active Director* dialog box appears (Figure 45). To open a Director (display an active matrix), select (double-click) the Director name in the list box, or highlight the Director name with the up or down arrow keys and click the *OK* button.

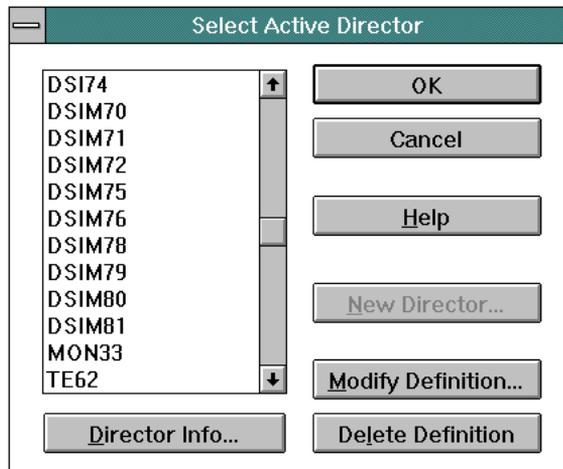


Figure 45. Select Active Director Dialog Box

Options available at the dialog box are identical to those available at the *Select Director for New Matrix* dialog box (Figure 38 on page 51). If the *Open active window on Console start-up* check box at the *Director Definition* dialog box (Figure 39 on page 52) is enabled, the *Active Matrix* window for each enabled Director appears when the Console application opens.

When a *Matrix* window (new, saved, or active matrix) is selected and displayed, the menu bar expands to include operations available only from the *Matrix* window. This includes commands for configuring and maintaining the Director. In addition, expanded *File* and *Utility* menus with more options are available. Refer to "[Matrix File Menu](#)" on page 77 and "[Matrix Utility Menu](#)" on page 104 for information.

Exit

Select the *Exit* option from the *File* menu to close all windows and exit the Director Console application.

Startup Utility Menu

The *Startup* window *Utility* menu (Figure 46) provides tools required to monitor and report on Console-level functions. The same menu options also appear at the *Matrix* window's *Utility* menu (refer to "Matrix Utility Menu" on page 104 for information).

Utility menu options are:

- **LIC Versions** - Lists all Director LIC versions (up to three versions) stored on the Console fixed disk.
- **Passwords** - Allows an administrator to view or modify password identifications and associated descriptions (requires password-level authorization).
- **Console Audit Log** - Displays a list of recent Console operator activities. The activities are not specific to a Director.
- **Console Error Log** - Displays a list of recent Console errors or exception conditions.

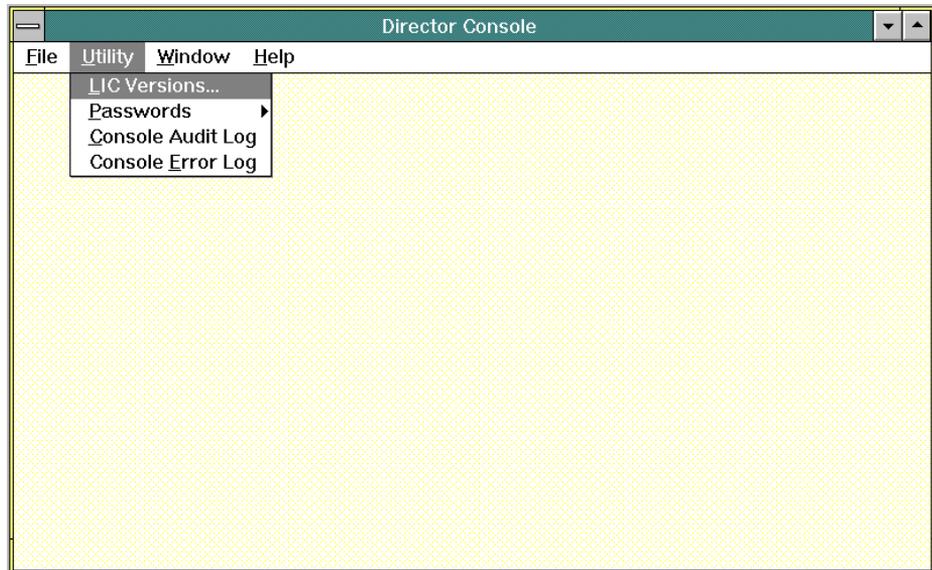


Figure 46. Utility Menu (Startup Window)

LIC Versions

The *LIC Versions* dialog box (Figure 47) displays a list of LIC versions stored on the Console fixed disk. Up to three LIC versions can be maintained. From this dialog box, new LIC versions are installed on the fixed disk, existing version descriptions are edited, and unused versions are deleted.

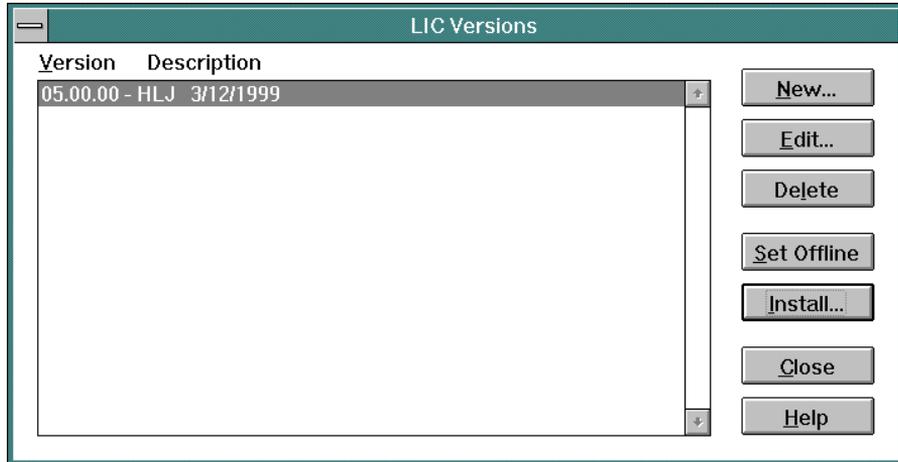


Figure 47. LIC Versions Dialog Box

Dialog box buttons and functions are:

- **New** - Provides the ability to load a new LIC version from diskettes to the Director Console fixed disk.
 - **Edit** - Allows the description (for a selected LIC version) to be edited.
 - **Delete** - Deletes the selected LIC version from the Console fixed disk.
 - **Set Offline** - Allows the operator to set the Director offline.
- Note:** When installing a LIC version to a Director without a redundant Control Processor (CTP) card, ensure the Director is set offline prior to installing the LIC version.
- **Install** - Installs the selected LIC version to the Director.
 - **Close** - Closes the dialog box.

The six-digit LIC version number (XX.YY.ZZ) represents the following:

- XX - LIC version level
- YY - LIC release level
- ZZ - LIC patch level.

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.

Passwords

When the *Passwords* option is selected from the *Utility* menu, the *View IDs* and *Modify* options are displayed. The *View IDs* option opens the *Passwords* dialog box shown in [Figure 48](#).

The dialog box contains three radio buttons to select a password authorization level for view. The levels of password authorization are:

- **Level 1 - Password (Administrative) Authorization** - This level of authorization allows administrators to display, 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.

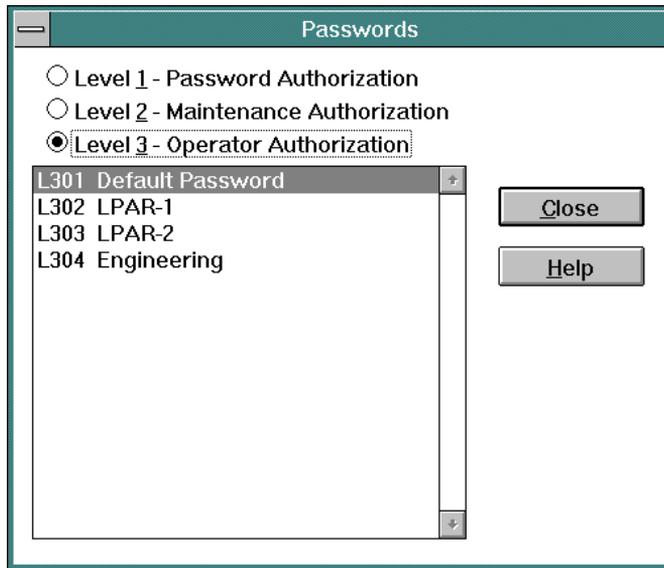


Figure 48. Passwords Dialog Box (View IDs Option)

For each authorization level, the dialog box displays password identifications (such as **L101**, **L102**, **L201**, and **L301**) and associated descriptions. The actual passwords are *not* displayed. A password description can be up to 24 characters long. This option provides access to password IDs and descriptions for review only. Entry to the dialog box does not require a password, and no modification to a password, password ID, or description is allowed.

The *Modify* option opens the *Passwords* dialog box shown in [Figure 49](#). This option requires **a valid administrative authorization password** to add or modify a password, and the task is usually performed by a system administrator. Refer to "[Adding, Modifying, and Deleting Passwords](#)" on page 174 for instructions.

Passwords are required to access or save changes to most *Matrix* window options. Up to 30 passwords can be defined for each authorization level. Error checking ensures duplicate passwords are not entered. All activities requiring password access are logged (with the associated password ID) in the *Console Audit* log.

Password IDs are used in audit log files to identify who performed an operation. The IDs appear in the leftmost column of the *Director Audit* and *Console Audit* logs. Password IDs appear as follows:

- If a password is not defined for an authorization level, the password ID is blank.
- If the change occurred at the Director, the password ID is **Dixx**.
- If the change occurred from a host-based application such as System Automation for Operating System/390 (SA OS/390) the Password ID is **H** with a host identifier.

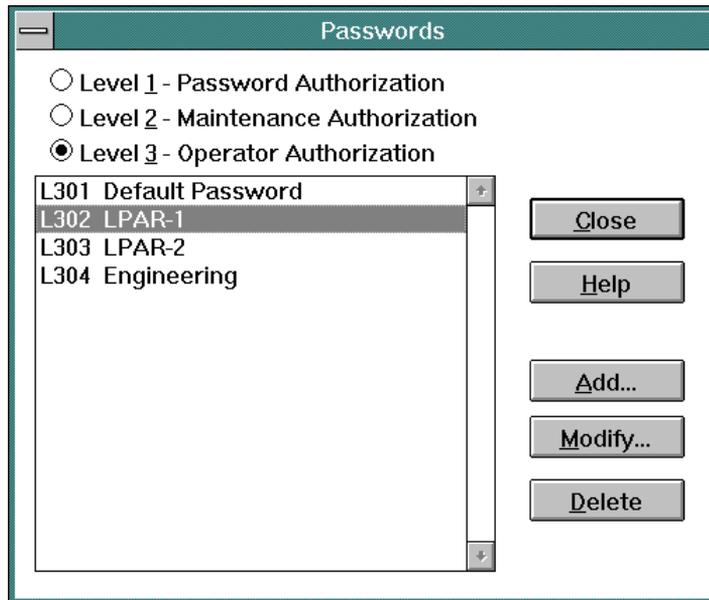


Figure 49. Passwords Dialog Box (Modify Option)

Password-protected Console features are listed below, arranged by the required authorization level. Menu option or button names are separated by an arrow to indicate the command location in the user interface. For example, the *Password* option from the *Utility* menu is indicated by *Utility > Passwords*. A slash (/) separates multiple items that use the password. All changes made with password access are logged to the *Director Audit* log, except those indicated as logged to the *Console Audit* log.

Password (Administrative) Authorization

The following menu items require password (administrative) authorization. The default password is **LEVEL001**.

- *Utility > Passwords* - Define and maintain passwords (*Console Audit* log)
- *Utility > Port Authorization* - Authorize operators to configure ports.

Maintenance Authorization

The following menu items require maintenance authorization. The default password is **LEVEL002**.

- *File > New Configuration Matrix / New / Modify / Delete* - Perform Director definition operations (*Console Audit* log)
- *File > Open Active Configuration Matrix / New / Modify / Delete* - Perform Director definition operations (*Console Audit* log)
- *Utility > LIC Versions* - Add or delete LIC versions (*Console Audit* log)
- *Utility > Clear System Error* - Clear the System Error indicator
- *Utility > Reset Installation Defaults* - Reset non-volatile information to installation default values
- *Maintenance > Director Event Log* - Log hardware and software incidents
- *Maintenance > Swap Ports* - Modify physical port mapping (accessed from the *Port Maintenance* window)
- *Maintenance > Port Diagnostics / ESCON* - Perform port diagnostics for an ESCON device port (accessed from the *Port Maintenance* window)
- *Maintenance > Port Diagnostics / FICON* - Perform port diagnostics for an FCV port (accessed from the *Port Maintenance* window)
- *Maintenance > Advanced / Terminal* - Opens a *Terminal* window
- *Maintenance > Advanced / LMA Versions* - Install Loader/Monitor Area (LMA) versions.

Operator Authorization

The following menu items require operator authorization. The default password is **LEVEL003**.

- *File > Open Saved Configuration Matrix / Delete* - Delete a saved configuration file
- *File > Activate Configuration Matrix* - Activate a Director configuration
- *File > Save Configuration Matrix* - Save a Director configuration
- *File > Save Configuration Matrix As* - Save a Director configuration under a new name
- *Edit > Enable Operator* - Use the enable operator function

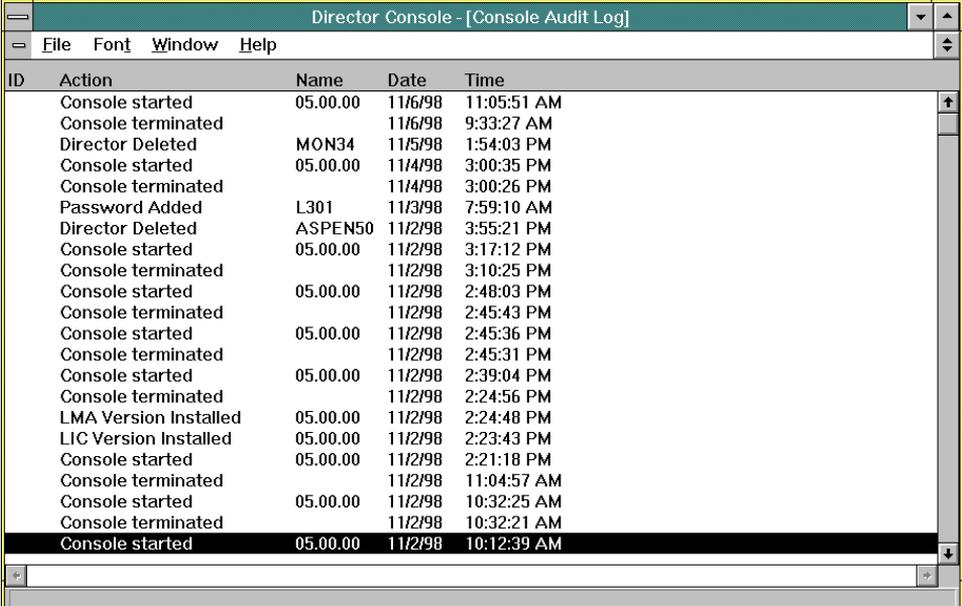
- *Edit > Command Lists* - Use the command list function
- *Utility > Time/Date / Console Sync / OK* - Modify the Director time and date
- *Utility > Active = Saved* - Toggle the Active = Saved state
- *Utility > Remote Offline Control* - Toggle the Remote Offline Control state
- *Utility > IPL Director* - Reload Director software from the last configuration
- *Utility > Set Director Offline* - Set the Director offline (must be manually powered on).

Console Audit Log

The *Console Audit* log (Figure 50) automatically tracks and records Console operator activities not specific to a Director, including:

- Changing passwords
- Installing or deleting LIC versions
- Adding or deleting a Director definition
- Entering or exiting the Console application.

Note: The *Director Audit* log is identical in format to the *Console Audit* log, but records only Console operator activities specific to a Director.



ID	Action	Name	Date	Time
	Console started	05.00.00	11/6/98	11:05:51 AM
	Console terminated		11/6/98	9:33:27 AM
	Director Deleted	MON34	11/5/98	1:54:03 PM
	Console started	05.00.00	11/4/98	3:00:35 PM
	Console terminated		11/4/98	3:00:26 PM
	Password Added	L301	11/3/98	7:59:10 AM
	Director Deleted	ASPEN50	11/2/98	3:55:21 PM
	Console started	05.00.00	11/2/98	3:17:12 PM
	Console terminated		11/2/98	3:10:25 PM
	Console started	05.00.00	11/2/98	2:48:03 PM
	Console terminated		11/2/98	2:45:43 PM
	Console started	05.00.00	11/2/98	2:45:36 PM
	Console terminated		11/2/98	2:45:31 PM
	Console started	05.00.00	11/2/98	2:39:04 PM
	Console terminated		11/2/98	2:24:56 PM
	LMA Version Installed	05.00.00	11/2/98	2:24:48 PM
	LIC Version Installed	05.00.00	11/2/98	2:23:43 PM
	Console started	05.00.00	11/2/98	2:21:18 PM
	Console terminated		11/2/98	11:04:57 AM
	Console started	05.00.00	11/2/98	10:32:25 AM
	Console terminated		11/2/98	10:32:21 AM
	Console started	05.00.00	11/2/98	10:12:39 AM

Figure 50. Console Audit Log

When a log window (*Console Audit*, *Console Error*, *Director LIN*, *Director Audit* or *Director Event* log) is selected, the menu bar changes to provide commands unique to the log window. The logs can be refreshed (re-read), saved to a file, or printed. The log text can also be displayed in different fonts and character sizes. Refer to "[Console Log Operation](#)" on page 65 for additional information. The log contains the following columns of information:

- **ID** - The Password ID of the Console operator performing the action. If no password is defined or applicable (Console start or exit), the field is blank.
- **Action** - A brief description of the performed action.
- **Name** - An identifier whose content depends on the action. For example, a password ID for password actions, a Director ID for Director definition actions, or a LIC version for microcode actions.
- **Date** - The date the action was performed.
- **Time** - The time the action was performed.

Console Error Log

The *Console Error* log ([Figure 51](#)) automatically tracks and records Console exception conditions. Exception conditions are errors that are potentially severe enough to affect Console operations, such as:

- Insufficient memory or memory corruption
- File read/write errors
- Subsystem internal errors
- Inability to access a resource.

When a log window (*Console Audit*, *Console Error*, *Director LIN*, *Director Audit* or *Director Event* log) is selected, the menu bar changes to provide commands unique to the log window. The logs can be refreshed (re-read), saved to a file, or printed. The log text can also be displayed in different fonts and character sizes. Refer to "[Console Log Operation](#)" on page 65 for additional information. The log contains the following columns of information:

- **Error Message** - A brief error message describing the exception condition
- **Qualifier** - An internal code identifying the failed component
- **Date** - The date the exception condition occurred
- **Time** - The time the exception condition occurred.

Information in the *Console Error* log is typically of use only to qualified service technicians fault isolating a Console problem.

The screenshot shows a window titled "Director Console - [Console Error Log]". The window has a menu bar with "File", "Font", "Window", and "Help". Below the menu bar is a table with four columns: "Error Message", "Qualifier", "Date", and "Time". The table contains 20 rows of error messages, all of which are "Could not establish link to Director." with a qualifier of "06:00000041" and a date of "11/2/98". The times range from 2:40:34 PM to 2:45:36 PM. The last row is highlighted in black.

Error Message	Qualifier	Date	Time
Could not establish link to Director.	06:00000041	11/2/98	2:45:36 PM
Could not establish link to Director.	06:00000041	11/2/98	2:45:36 PM
Could not establish link to Director.	06:00000041	11/2/98	2:45:10 PM
Could not establish link to Director.	06:00000041	11/2/98	2:45:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:45:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:44:34 PM
Could not establish link to Director.	06:00000041	11/2/98	2:44:34 PM
Could not establish link to Director.	06:00000041	11/2/98	2:44:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:44:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:43:34 PM
Could not establish link to Director.	06:00000041	11/2/98	2:43:34 PM
Could not establish link to Director.	06:00000041	11/2/98	2:43:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:43:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:42:34 PM
Could not establish link to Director.	06:00000041	11/2/98	2:42:34 PM
Could not establish link to Director.	06:00000041	11/2/98	2:42:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:42:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:41:34 PM
Could not establish link to Director.	06:00000041	11/2/98	2:41:34 PM
Could not establish link to Director.	06:00000041	11/2/98	2:41:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:41:04 PM
Could not establish link to Director.	06:00000041	11/2/98	2:40:34 PM

Figure 51. Console Error Log

Console Log Operation

The *Console Error* and *Console Audit* logs store up to 128 entries. After the maximum number of entries has been stored, new entries overwrite the oldest entries.

When a log window is first opened, the entire contents of the log file are available for display (scrolling may be required). New log events that occur while the window is open are not displayed until the *Refresh* option is selected from the *File* menu.

Menu options specific to log windows are available from the *File* and *Font* menus. Options available from the *Window* and *Help* menus are identical to those options available from the *Startup* window. Refer to "[Window Menu](#)" on page 67 and "[Help Menu](#)" on page 69 for information.

Console Log Window File Menu

File menu options ([Figure 52](#)) available from the *Console Error* and *Console Audit* logs are:

- **New Configuration Matrix** - This option is identical to the same option at the *Startup* window *File* menu. Refer to "[New Configuration Matrix](#)" on page 51 for information.
- **Open Saved Configuration Matrix** - This option is identical to the same option at the *Startup* window *File* menu. Refer to "[Open Saved Configuration Matrix](#)" on page 55 for information.

- **Open Active Configuration Matrix** - This option is identical to the same option at the *Startup* window *File* menu. Refer to "Open Active Configuration Matrix" on page 57 for information.
- **Refresh** - Select this option to write the latest information to the log window and refresh the display.
- **Save to File** - Select this option to open the *Save As* dialog box and save log data to a user-specified file on diskette or the Console fixed disk.
- **Print** - Select this option to print the log window contents to a file or printer.
- **Print Setup** - Select this option to open the *Print Setup* dialog box and assign print and printer parameters. Printer selection must be complete (from the *Print Setup* dialog box) before using the *Print* option to print a log file.
- **Close Window** - Select this option to close the log window and return to the *Startup* window.
- **Exit** - Select this option to close all windows and exit the Director Console application.

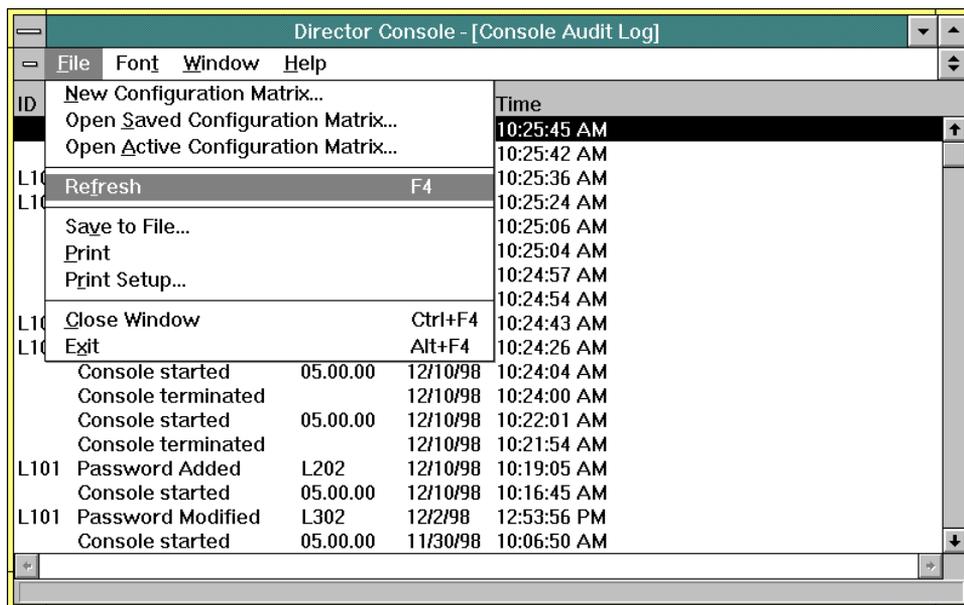


Figure 52. File Menu (Console Error and Audit Logs)

Console Log Window Font Menu

The *Font* menu available from the *Console Error* and *Console Audit* logs provides only a *Select* option. Selecting this option opens the *Font* dialog box, where the font, font style, and font size for the log window text are changed and saved.

Window Menu

The *Startup* window *Window* menu (Figure 53) provides the ability to simultaneously arrange and manipulate open windows.

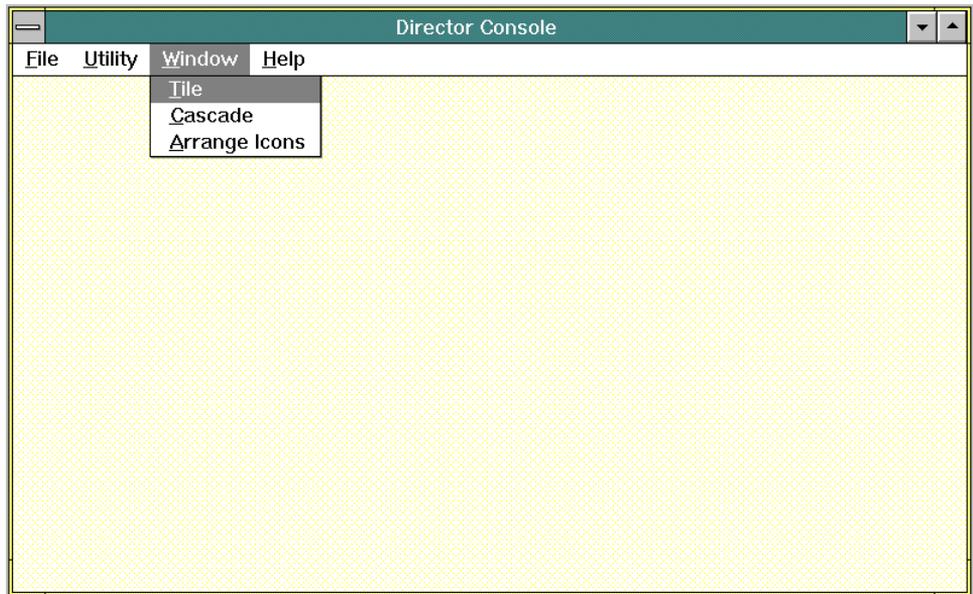


Figure 53. Window Menu (Startup Window)

The *Tile*, *Cascade*, and *Arrange Icons* options appear in all instances of the *Window* menu and are described as follows:

- **Tile** - This option arranges all windows (that are open and visible) to a size small enough to simultaneously fit in the application window without overlapping (Figure 54). The size and position of the tiles is a function of the number of open windows.

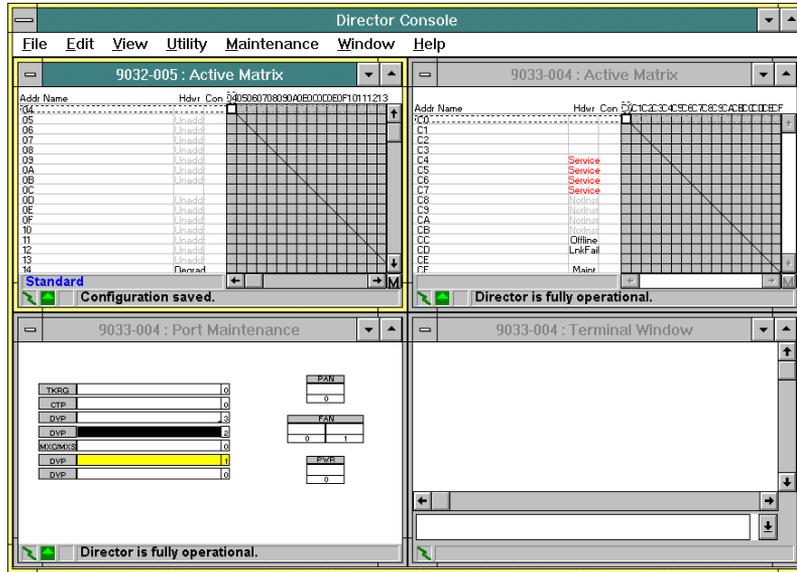


Figure 54. Tiled Windows

- **Cascade** - This option sizes all document windows to the same size and overlaps the windows (Figure 55). Link Status indicators and title bars for the eight most recently viewed windows are visible.

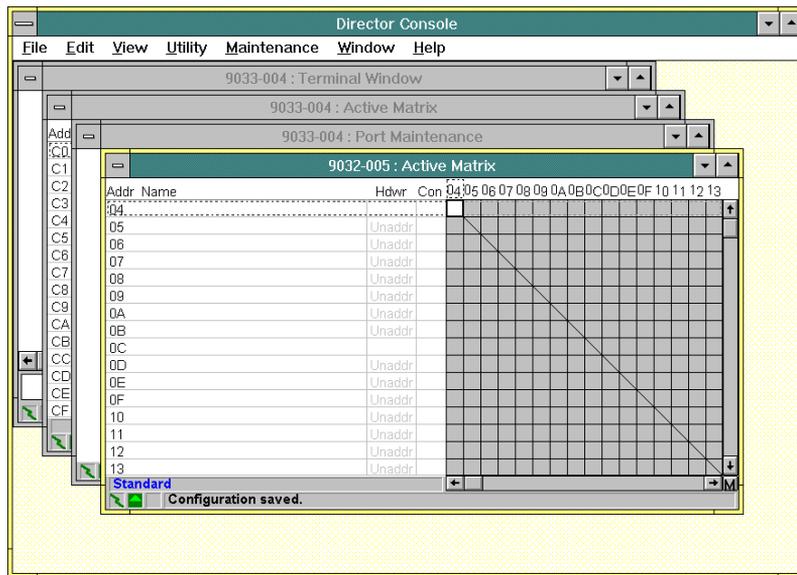


Figure 55. Cascaded Windows

- **Arrange Icons** - This option organizes all windows that are minimized (shown as icons) along the bottom of the application window (Figure 56).

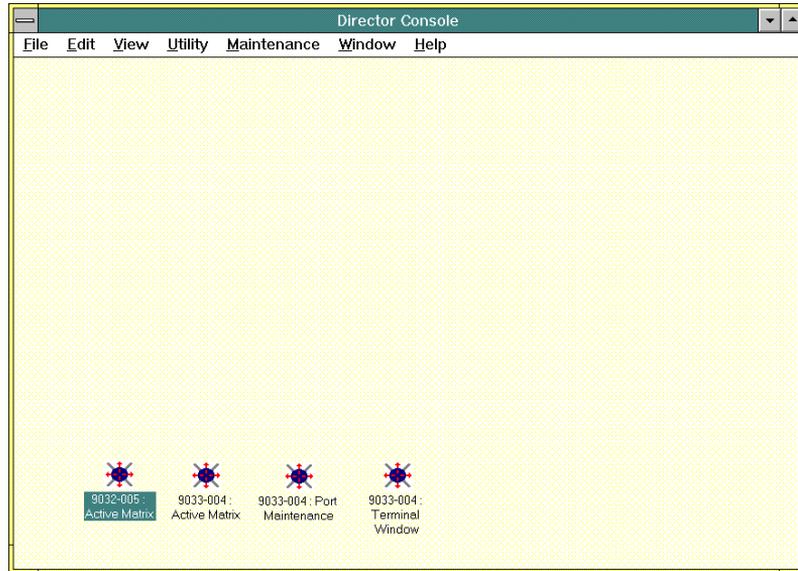


Figure 56. Arranged Icons

Each open window is listed in the list portion of the *Window* menu (not shown). An operator can select an open window to be brought to the front by selecting the window from this menu.

Help Menu

General help topics are available for all windows from the *Help* menu. *Help* menu options are:

- **Contents** - This option provides a list of high-level Console topics for which help is available. Details are available by double-clicking the topic name with the mouse, or by selecting the topic with the **Tab** key, then pressing the **Enter** key. Displayed contents are contingent on the Director type open. If no Director is open, a dialog box appears that allows an operator to select the Director contents to display.
- **Keyboard** - This option describes how to navigate in the Console application using the keyboard.
- **Mouse** - This option describes how to navigate in the Console application using the mouse.
- **Using Help** - This option describes how to use Help topics.

- **Product Information** - The Product Information dialog box (Figure 57) displays information about the Console application, including version number and copyright notice. When contacting support personnel about problems with the Console application, provide this version number.



Figure 57. Product Information Dialog Box

Help buttons are available for most application dialog boxes. Alternatively, press the **F1** key from any window or the **Alt+H** from any dialog box to access *Help* topics for the window or dialog box. Related topics of interest are underlined. Double-click any underlined word or phrase to transfer to another window (or pop-up box) that explains the selected topic.

Chapter 3. Matrix Window Operations

This chapter describes operation of the Director *Matrix* window. *Matrix* window navigation and operation, pull-down menus, menu item operation, and commands are discussed. All operations apply *only* to a currently selected Director.

Matrix Window

The graphic display of the configuration matrix (Figure 58) provides a user with an easy-to-recognize visual interface that displays configuration attributes of the selected Director.

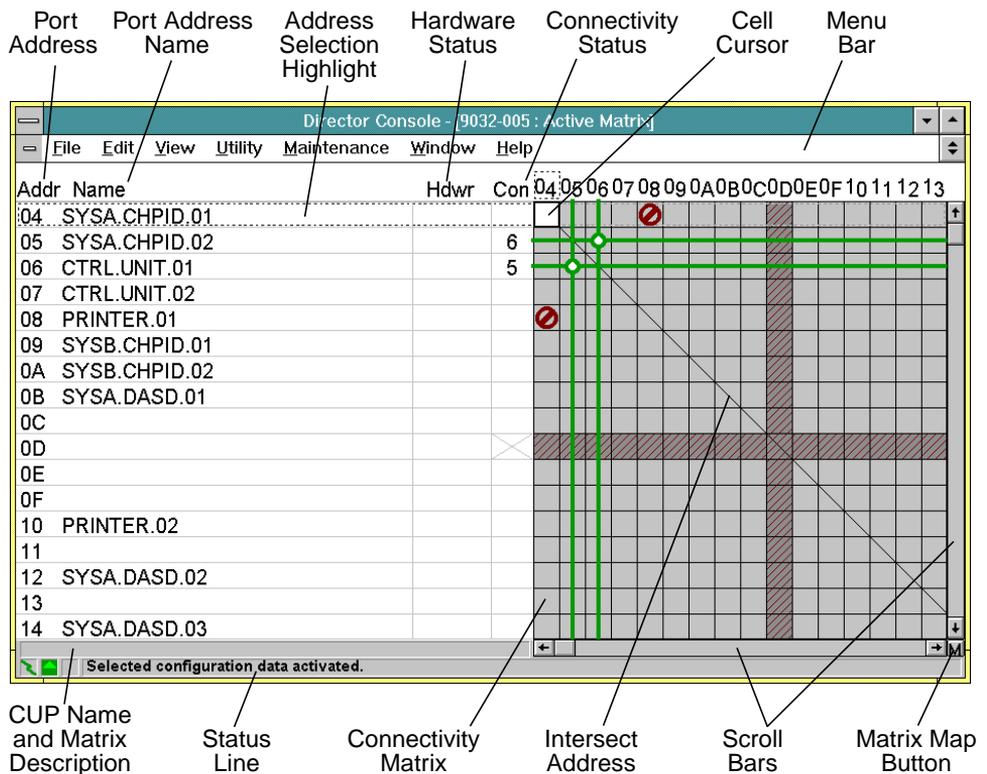


Figure 58. Matrix Window and Components

Port Addresses and Names

Logical port addresses and associated user-defined port names are listed in rows at the left side of the window. Display and configuration operations in the window relate to these addresses. By clicking a port address or name, the address selection highlight (dashed box around a matrix row) moves to and selects that address line.

Menu operations and port attribute changes affect the selected port. For example, to modify a selected port address name and associated attributes, select the *Name and States* option from the *Edit* menu (or use the **Alt+N** accelerator keys). If an asterisk appears between the port address and associated name, the port address mapping is changed from the default value for the port. Refer to "[Port Maintenance](#)" on page 127 for additional information.

Status Columns

To the right of the address names are two columns in graphic display mode (**Hdwr** and **Con**) or three columns in nongraphic display mode (**H**, **B**, and **C**), indicating hardware status and connection status for each port address. These columns and the connection matrix cells to the right relate to port address rows. Refer to "[Graphic Display](#)" on page 102 for additional information.

The first column to the right of the port address name is the hardware column. In graphic display mode the column is titled **Hdwr**, and in nongraphic display mode the column is titled **H**. This column displays the hardware status of the port for an active Director link, and cannot be modified by a user. For a new or saved matrix, only the **NotInst** or **N** indicator appears (when appropriate). [Table 4](#) lists active matrix hardware status indicators.

Table 4. Hardware Status Indicators

Graphic Display Mode	Nongraphic Display Mode	Status
(Blank)	(Blank)	Port is installed and operational.
NotInst	N	Port is not installed.
Maint	M	Port is set to maintenance mode.
Service	S	Service is required. Call a service representative to clear the error.
Thrshld	T	Device error threshold was exceeded and the port attached to the disruptive device was set offline.
Invalid	A	An attached device is invalid (sending unexpected responses), or a wrap plug is installed in the port.
LnkFail	L	A link failure occurred.
Offline	O	Port is offline.
Degrad	D	Port card is degraded or not operating at peak capacity (FCV Port card only).
Inactive	I	Port card is inactive or will not come online (FCV Port card only).
Logout	G	Attached host system performed an explicit logout from the port card (FCV Port card only).
Unaddr	U	Port is unaddressable (FCV Port card only).

In graphic display mode, the **Con** column displays a connectivity indicator that represents blocked and dedicated connections for the associated port address. If the column contains an **X**, the port address is blocked. If the column contains a port address, a dedicated connection to that port is indicated. Refer to [Figure 92](#) on page 102 for an example of graphic display mode.

In nongraphic display mode, two columns appear to the right of the hardware status column. The **B** column displays a blocked status indicator. If the column contains a **B**, the port address is blocked. The **C** column displays a connectivity indicator. If the column contains a port address, a dedicated connection to that port is indicated. Refer to [Figure 93](#) on page 103 for an example of nongraphic display mode.

Connectivity Matrix

In graphic display mode, the gray connectivity matrix graphically indicates all connectivity attributes, including blocked, dedicated, and prohibited connections. Refer to "[Matrix Highlights and Symbols](#)" on page 139 for information about the display of connectivity attributes. These visual indicators appear in addition to the contents of the connectivity column (**Con**).

In nongraphic display mode, a red **P** appears in a intersecting matrix cell to indicate a prohibited connection (between the row port address at the left of the window and the column port address at the top of the window). No other connectivity indicators appear in nongraphic display mode.

Scrolling and Matrix Map

By default, 9032-003 and 9032-005 Director matrices displays 32 port addresses horizontally and vertically. However, the 9032-003 Director can support up to 124 ports and the 9032-005 Director can support up to 248 ports and a scrolling function is provided to display connectivity attributes for remaining port addresses. Scroll bars and page keys are used to scroll up or down (**PgUp** or **PgDn**) and left or right (**Ctrl+PgUp** or **Ctrl+PgDn**).

Use a matrix map to view a designated section of the matrix (depending on display options chosen). To use a matrix map, select the *Matrix Map* option from the *View* menu, or click the matrix map (**M**) button at the lower right corner of the *Matrix* window. The matrix map button is disabled for 9033-004 *Matrix* windows. For additional information, refer to "[Matrix Map](#)" on page 101.

Status Line

A status line ([Figure 59](#)) 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.

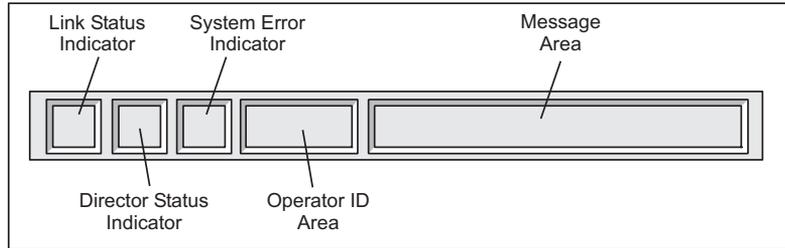


Figure 59. Status Line

Link Status Indicator

Three Director-to-Console link operational states are indicated by the Link Status indicator (Figure 60):

- **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.

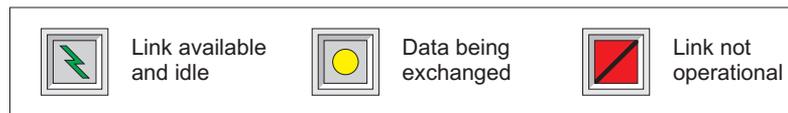


Figure 60. Link Status Indicator Operational States

Director Status Indicator

Four Director operational states are indicated by the Director Status indicator (Figure 61):

- **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.

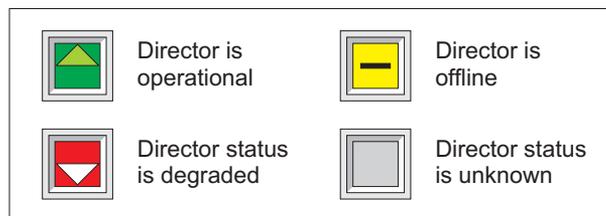


Figure 61. Director Status Indicator Operational States

System Error Indicator

Two states are indicated by the System Error indicator (Figure 62):

- **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).



Figure 62. System Error Indicator States

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.

Matrix Window Menu Options

Matrix window pull-down menus and associated menu options are listed in [Table 5](#). The *Window* and *Help* menus are identical to those menus for the *Startup* window and are not discussed in this chapter. Refer to "[Window Menu](#)" on page 67 for an explanation of *Window* menu options. Refer to "[Help Menu](#)" on page 69 for an explanation of *Help* menu options.

Table 5. Matrix Window Menu Options

File	Edit	View	Utility	Maintenance
New Configuration Matrix	Copy	Swap Axis	Director Operational Status	Director LIN Log
Open Saved Configuration Matrix	Paste	Matrix Map	Node Descriptor	Director Audit Log
Open Active Configuration Matrix	Blocked	Enter Position	Time/Date	Director Event Log
Merge Saved Configuration Matrix	Dedicated	Graphic Display	Active = Saved	Hardware Configuration
Activate Configuration Matrix	Prohibited	Display Options	Remote Offline Control	Hardware Audit Log
Save Configuration Matrix	Prohibit Row		LIC Versions	Node Descriptor List
Save Configuration Matrix As	Allow Row		Passwords	Port Maintenance
Copy Matrix Configuration File	Prohibit Range		Port Authorization	Advanced
Print Matrix to Text File	Block Range		Console Audit Log	Collect Maintenance Information
Close Window	Name and states		Console Error Log	Console Link Statistics
Exit	CUP Name		IPL Director	
	Names		Set Director Offline	
	Enable Operator		Clear System Error	
	Command Lists		Reset Installation Defaults	

Monitoring Multiple Directors

A user can visually monitor all Directors attached to the Console by opening *Matrix* windows for the Directors and tiling them (*Tile* option from the *Window* menu) on a full screen. Indicators on the status lines of all *Matrix* windows appear. Status messages and color and shape changes quickly indicate conditions that require actions by operations or service personnel.

Matrix File Menu

The *Matrix* window *File* menu (Figure 63) provides operator entry to Directors and associated configuration matrices. The menu contains the same options to create and open saved or active configuration matrices as the *Startup* window *File* menu. These options function identically and are not discussed in this chapter. However, the *Matrix* window *File* menu is expanded to include additional functions that are unavailable at the *Startup* window *File* menu. *File* menu options are:

- **New Configuration Matrix** - Identical to the same option at the *Startup* window *File* menu. Refer to "[New Configuration Matrix](#)" on page 51 for information.
- **Open Saved Configuration Matrix** - Identical to the same option at the *Startup* window *File* menu. Refer to "[Open Saved Configuration Matrix](#)" on page 55 for information.
- **Open Active Configuration Matrix** - Identical to the same option at the *Startup* window *File* menu. Refer to "[Open Active Configuration Matrix](#)" on page 57 for information.
- **Merge Saved Configuration** - Allows a user to merge a saved configuration matrix with the active configuration matrix. If there are conflicting port address attributes, active port address attributes prevail. This option is valid only for an attached Director (active matrix). The menu option is grayed out in *Saved Matrix* or *New Matrix* windows.
- **Activate Configuration Matrix** - Overlays the current (active) set of Director port attributes with a new configuration matrix.
- **Save Configuration Matrix** - Saves the displayed saved matrix with the same file name.
- **Save Configuration Matrix As** - Allows a user to save the displayed new, saved, or active matrix under a different file name.
- **Copy Matrix Configuration File** - Allows a user to copy a selected configuration matrix file to and from a diskette (in the disk drive of the Director Console), or to and from a Director library (on the Director Console fixed disk).

- **Print Matrix to Text File** - Saves (prints) the matrix to a specified American National Standard Code for Information Interchange (ASCII) text file.
- **Close Window** - Closes the open *Matrix* window.
- **Exit** - Closes all windows and exits the Director Console application.

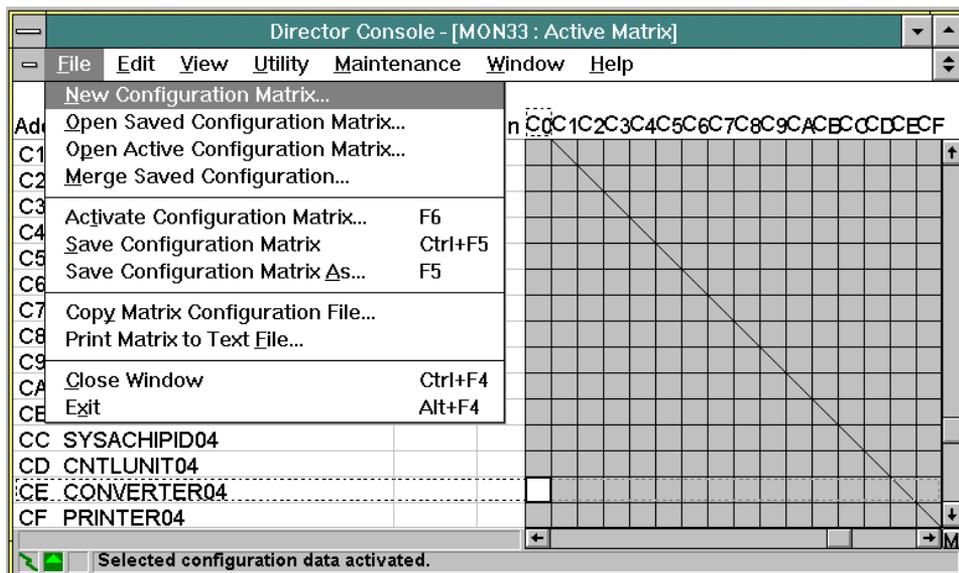


Figure 63. File Menu (Matrix Window)

Matrix Types

The Director uses two separate and distinct types of matrices. The first type is the active matrix. The active matrix is resident on the Director and displays the operating set of Director port assignments. Each Director has only *one* active matrix.

The second type is the saved matrix. Multiple saved matrices comprise a set of specific configuration attributes (stored on the Console fixed disk) that can be copied to the working matrix image (activated). Saved matrices act as templates to store configuration options for the Director. When a saved matrix is activated, the configuration attributes of the saved matrix are copied to the working matrix image and become the current configuration attributes. A saved matrix is not affected when activated.

Note: When changes are made to a *Matrix* window but not saved or activated, an attempt to close the window or exit causes the Console to display the following verification dialog box (Figure 64).

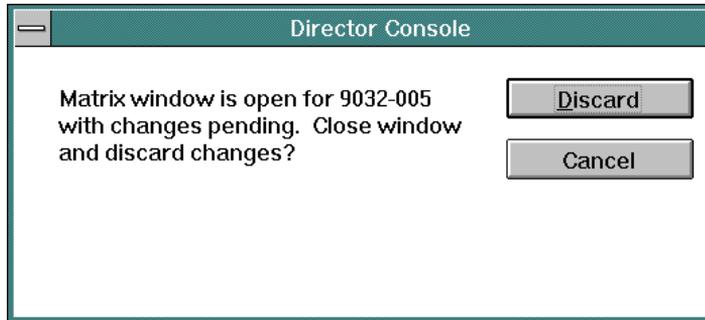


Figure 64. Changes Pending Dialog Box

Merge Saved Configuration

Select the *Merge Saved Configuration* option from the *File* menu. The *Merge Saved Configuration Matrix* dialog box appears (Figure 65). This option allows an operator to select a saved configuration matrix and merge it onto the active matrix.

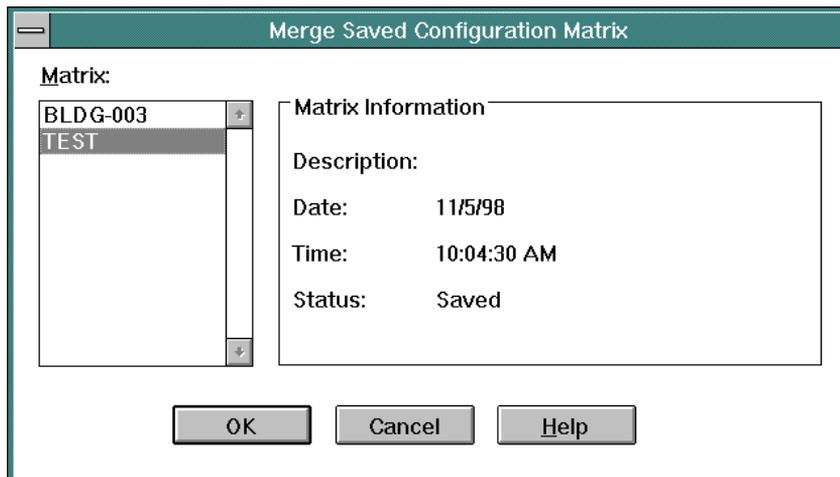


Figure 65. Merge Saved Configuration Matrix Dialog Box

The dialog box prompts the user to select a saved matrix from the *Matrix* list box. The **IPL** (initial program load) configuration is not included in the list because it is a special saved matrix. The **IPL** matrix is stored in non-volatile memory at the Director, not on the Console fixed disk. To merge configuration matrices, double-click the desired configuration name from the list of saved configurations, or select the desired configuration name and click the *OK* button.

When a saved matrix is merged onto the active matrix, the active matrix highlights the changes between the matrices in the same manner as if the operator had entered the changes. When port authorization is enabled, the merge function adheres to the port address authorization restrictions. Refer to "Port Authorization" on page 109 for additional information.

Activate Configuration Matrix

Changes made to a configuration matrix do not take effect for a Director until the matrix is activated. Activation transmits the contents of the matrix to the selected Director, enabling the changes. Select the *Activate Configuration Matrix* option from the *File* menu. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Activate Configuration Matrix* dialog box appears (Figure 66).

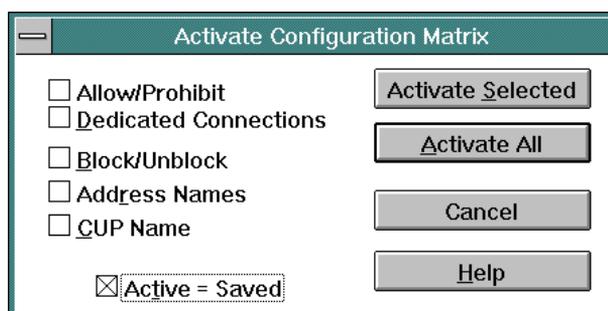


Figure 66. *Activate Configuration Matrix* Dialog Box

The dialog box provides check boxes associated with attributes for the current configuration matrix. These attributes specify port connection types (blocked, dedicated, prohibited), port address names, and the Control Unit Port (CUP) name that are to be changed upon activation of the configuration matrix. Changes to the matrix are indicated as checked (enabled) items in the attribute list. The *Activate All* button (default) activates all attributes. The *Activate Selected* button transmits only the checked (enabled) attributes to the active matrix.

If the *Active = Saved* option is enabled, the activated matrix is also stored as the IPL configuration for the Director. The *Active = Saved* option is enabled by this dialog box (immediately prior to sending the activation command) or by the *Active = Saved* option from the *Utility* menu. Refer to "Active = Saved" on page 109 for additional information.

Attention!

The default is *Active = Saved* enabled. It is recommended to leave the option enabled.

Save Configuration Matrix

Select the *Save Configuration Matrix* option from the *File* menu. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The displayed configuration is saved with the same name as currently defined configuration (overwrites the existing file on the Console fixed disk) with no additional prompting.

Save Configuration Matrix As

Select the *Save Configuration Matrix As* option from the *File* menu. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Save Configuration Matrix As* dialog box (Figure 67) appears. This dialog box also appears when a new or active matrix is saved using the *Save Configuration Matrix* option. New and active matrices require a file name to be saved.

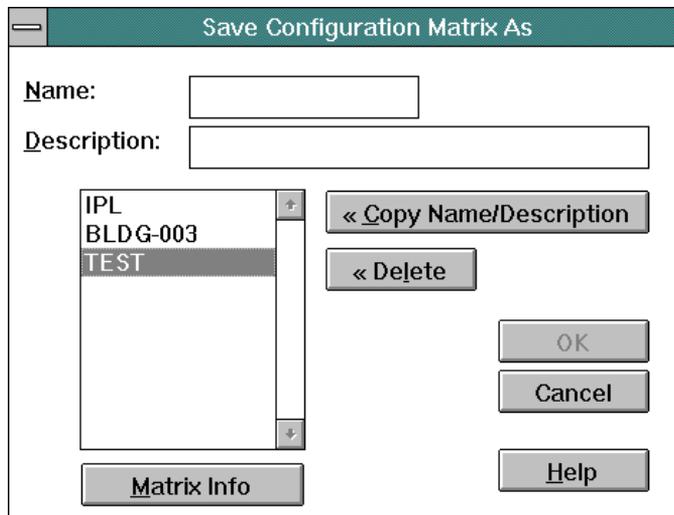


Figure 67. Save Configuration Matrix As Dialog Box

The dialog box prompts for a new name and description of the matrix to be saved. Up to 32 configurations (including the **IPL** matrix file) can be defined for each Director. The **IPL** file comprises the set of configuration attributes loaded to the Director's active matrix after an IPL or power cycle. This file is saved to nonvolatile memory on the Director's Control Processor (CTP) card, not to the Director Console fixed disk. To preserve configuration attributes, the **IPL** file is overwritten with the Director's current active matrix when the *Active = Saved* option is set on during activation.

To save the configuration to the Console fixed disk, double-click the desired configuration name from the list box (or use the *Copy Name/Description* button) to copy information to the *Name* and *Description* entry fields, make any desired changes, and click the *OK* button. Available dialog box fields and options are:

- **Name** - The name under which the configuration matrix is stored. Up to eight alphanumeric characters are allowed, including letters (A through Z), numbers (0 through 9), underscores, and hyphens. If the entered name is the same as an existing matrix name, a prompt appears warning that the previous matrix will be overwritten.
- **Description** - The matrix description can be up to 24 alphanumeric characters in length (same character rules as the name), and is stored with the matrix file for reference. The matrix description appears in *Saved Matrix* windows only (in parentheses), and on the same message line as the CUP name.
- **Matrix Info** - Highlight a desired matrix name and click the *Matrix Info* button to open the *Saved Matrix Information* dialog box (Figure 68). The dialog box displays information about the selected configuration matrix, and can be retained for viewing information on other matrix files by clicking the desired name in the list box at the *Save Configuration Matrix As* dialog box.

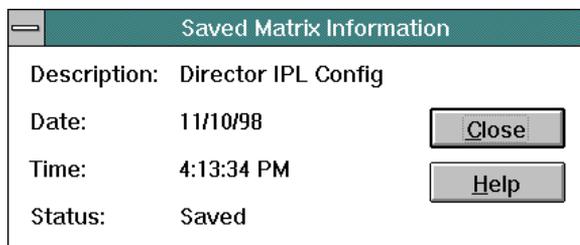


Figure 68. Saved Matrix information Dialog Box

- **Copy Name/Description** - Highlight a matrix name in the list box and click the *Copy Name/Description* button (or double-click the matrix name) to copy the matrix name and description into the *Name* and *Description* fields at the top of the dialog box. This provides a quick method to replace an existing matrix, or to save a new matrix with a name and description similar to an existing matrix.
- **Delete** - To delete a configuration, highlight a desired matrix name and click the *Delete* button. The following dialog box appears (Figure 69).

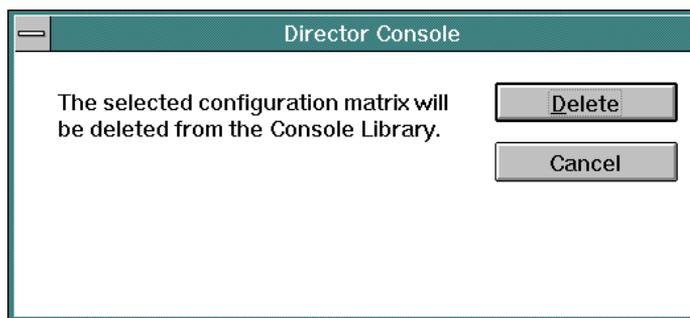


Figure 69. Delete Configuration Matrix Dialog Box

Note: The **IPL** file cannot be deleted. The *Delete* button is disabled when the *IPL* file is highlighted.

Click the *Delete* button to close the dialog box and remove the selected configuration matrix from the Console fixed disk.

Copy Matrix Configuration File

Select the *Copy Matrix Configuration File* option from the *File* menu. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Copy Matrix Configuration File* dialog box appears (Figure 70).

The dialog box titled "Copy Matrix Configuration File" contains two main sections: "Source" and "Destination".

Source Section:

- Library:** This option is selected. It includes a **Director** dropdown menu with the value "9032-005" and a **Matrix** dropdown menu with the value "IPL".
- Path/File Name:** This option is unselected. It includes an empty text input field and a **Browse** button.

Destination Section:

- Library:** This option is unselected. It includes a **Director** dropdown menu with the value "9032-005" and an empty **Matrix** dropdown menu.
- Path/File Name:** This option is selected. It includes an empty text input field and a **Browse** button.

At the bottom of the dialog box are three buttons: **Copy**, **Cancel**, and **Help**.

Figure 70. Copy Matrix Configuration File Dialog Box

This option enables an operator to:

- Copy matrices from Director to Director
- Copy matrices from Director to diskette
- Copy matrices from diskette to Director.

Copied matrix files are saved with the current name or assigned a new configuration name. The *Source* section of the dialog box prompts for source Director and file names, or a path to the source file. The *Destination* section of the dialog box prompts for a destination Director and file names, or a path to the source file.

Print Matrix to Text File

Select the *Print Matrix to Text File* option from the *File* menu to open a standard *Save As* dialog box. The dialog box prompts for a valid file name. After verifying the user-selected file name, click the *Save* button to write the configuration matrix data to a file in American National Standard Code for Information Interchange (ASCII) format.

Close Window

Select the *Close* option from the *File* menu to close the active window. This function closes only the active window, and does not exit the Console application. If other windows are open, the most recently active window appears.

Exit

Select the *Exit* option from the *File* menu to close all windows and exit the Director Console application. If any open matrix windows have modified data, a prompt appears asking if the modifications should be saved to the Console library.

Matrix Edit Menu

The *Matrix* window *Edit* menu (Figure 71) provides options to modify configuration attributes and port names at the *Matrix* window. Some menu options are disabled (grayed out), depending on the cell cursor position. Check marks adjacent to certain options indicate an attribute is currently set for the port or port intersection. *Edit* menu options are:

- **Copy** - Copies attributes from a port address.
- **Paste** - Pastes previously copied attributes to a port address.
- **Blocked** - Toggles the blocked attribute for a selected port address and cell.
- **Dedicated** - Toggles the dedicated attribute for a selected port address and cell.
- **Prohibited** - Toggles the prohibited attribute for a selected port address and cell.
- **Prohibit Row** - Sets the prohibited attribute for all port intersections in a selected port address row.
- **Allow Row** - Sets the allowed attribute for all port intersections in a selected port address row.
- **Prohibit Range** - Sets the prohibited or allowed attribute for a selected range of port addresses.
- **Block Range** - Sets the blocked or unblocked attribute for a selected range of port addresses.
- **Name and States** - Allows a user to select multiple attributes for a selected port address and intersection cell.
- **CUP name** - Allows a user to modify the control unit port name.

- **Names** - Allows the user to assign a name or description to a port address. The name or description appears on the *Matrix* window.
- **Enable Operator** - Selected when a user requires port authorization privileges to edit a configuration matrix. This option is used after the *Port Authorization* option from the *Utility* menu is enabled.
- **Command Lists** - Allows a user to compile a series of frequently-used attribute commands into a file for batch execution.

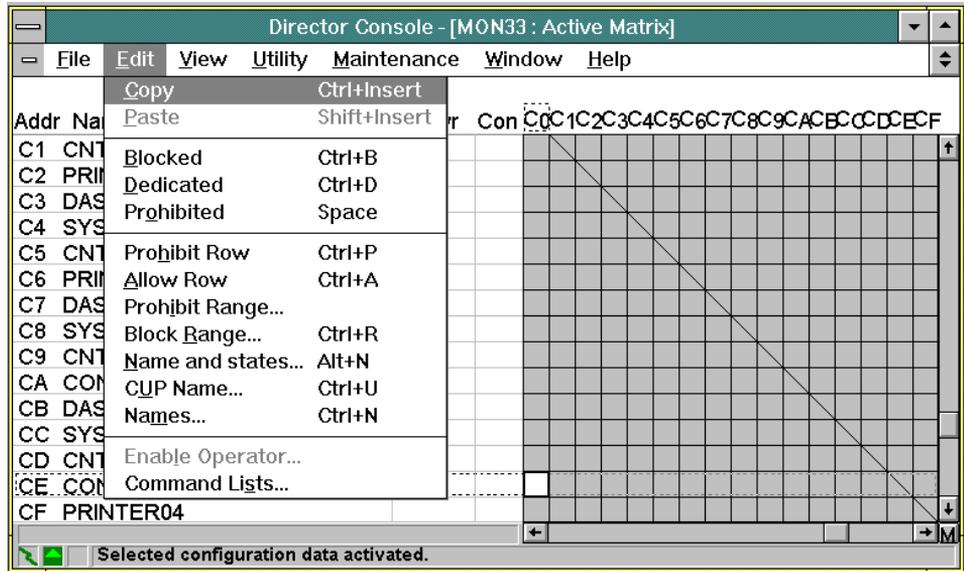


Figure 71. Edit Menu (Matrix Window)

Copy and Paste

The *Copy* and *Paste* options provide the ability to duplicate the allow and prohibit attributes from a selected port address to another port address in the same *Matrix* window, or to a port address in another *Matrix* window. To copy attributes from a source port address, select (highlight) the address and click the *Copy* option. To paste the selection to another address, select (highlight) the destination address and click the *Paste* option.

Note: This procedure copies and pastes allowed and prohibited attributes only. Self-intersection values (the intersection of a port with itself) are undefined and the procedure is invalid for the intersection.

The copy operation fills a buffer whose contents can be pasted to one or more locations until the buffer is overwritten by the next copy operation. Data in the buffer can be pasted to another port address in the same *Matrix* window, or to a port address in any other *Matrix* window for any Director defined to the Console. Because allowed and prohibited data are not pertinent to applications other than the Console, copied data is not available to other applications.

The **Ctrl+Insert** and **C** accelerator keys are available for the copy operation. The **Shift+Insert** and **T** accelerator keys are available for the paste operation. The **C** and **T** accelerator keys operate only in the *Matrix* window.

Text in dialog box fields can be copied and pasted within the Console application or to and from other applications. Highlight text in a dialog box using the **Shift** and the arrow keys (or drag the mouse cursor over the desired text), and copy the text to the clipboard by pressing the **Ctrl+Insert** keys. Pasted the data into another dialog box field (or another Win-OS/2 application) by pressing the **Shift+Insert** keys.

Text copied to the clipboard from another application can also be pasted to Console application dialog box fields. However, the clipboard operation must occur in the same Win-OS/2 session for inter-application copy and paste functions to work.

Blocked, Dedicated, and Prohibited

The *Blocked*, *Dedicated*, and *Prohibited* options toggle the associated port attribute on or off for the selected (highlighted) port address and cell. The state of the selected cell (attribute on or off) is indicated by a check mark to the left of the *Blocked*, *Dedicated*, or *Prohibited* menu option. If a check mark appears, the attribute is set (on), and the appropriate port attribute symbol appears in the cell at the *Matrix* window (refer to "[Port Attribute Symbols](#)" on page 140 for an explanation of the symbols). If a check mark does not appear, the attribute is not set (off) for the cell.

Prohibit Row and Allow Row

The *Prohibit Row* and *Allow Row* options toggle the associated port attribute on or off for the selected (highlighted) port address row (including cells that do not appear on the *Matrix* window). When the prohibit attribute is set, the prohibit port attribute symbol appears in each cell of the selected row at the *Matrix* window (refer to "[Port Attribute Symbols](#)" on page 140 for an explanation of the symbol).

Prohibit Range

Select the *Prohibit Range* option from the *Edit* menu to display the *Prohibit Address Range* dialog box ([Figure 72](#)). The dialog box is used to either allow or prohibit connections to all Director ports or a selected range of Director ports.

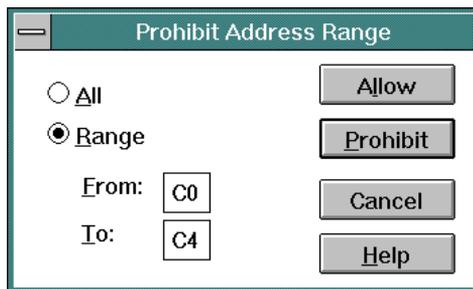


Figure 72. *Prohibit Address Range* Dialog Box

Click the *Allow* button to enable the allow attribute for all Director port addresses or a specified range of port addresses.

Click the *Prohibit* button to enable the prohibit attribute for all Director port addresses or a specified range of port addresses. When the prohibit attribute is set, the prohibit port attribute symbol appears in each selected cell (all or a specified range) at the *Matrix* window (refer to "[Port Attribute Symbols](#)" on page 140 for an explanation of the symbol).

Block Range

Select the *Block Range* option from the *Edit* menu to display the *Block Address Range* dialog box ([Figure 73](#)). The dialog box is used to either block or unblock all Director ports or a selected range of Director ports.

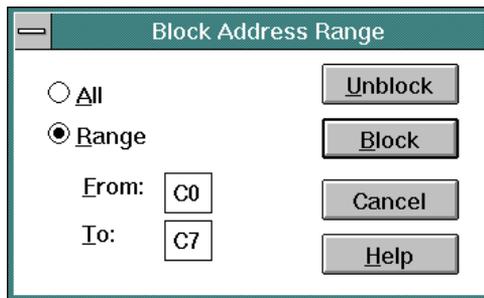


Figure 73. Block Address Range Dialog Box

Click the *Unblock* button to unblock all Director port addresses or a specified range of port addresses.

Click the *Block* button to block all Director port addresses or a specified range of port addresses. When the block attribute is set, the block port attribute symbol appears in each selected cell (all or a specified range) at the *Matrix* window (refer to "[Port Attribute Symbols](#)" on page 140 for an explanation of the symbol).

Name and States

Select the *Name and States* option from the *Edit* menu to display the *Name and States* dialog box ([Figure 74](#)).

The dialog box is used to select multiple attributes for the selected port address and intersection address cell. The dialog box title indicates the selected port address. Attributes for the selected address and intersection appear in the dialog box. Complete dialog box fields as follows:

- **Name** - The port name can be up to 24 alphanumeric characters in length, and must be unique to a Director (the same name can be used on separate Directors). However, it is recommended unique port names be used for all Directors. Any format for a name is acceptable, as long as 24 or fewer characters are used and the name is not preceded by a space.

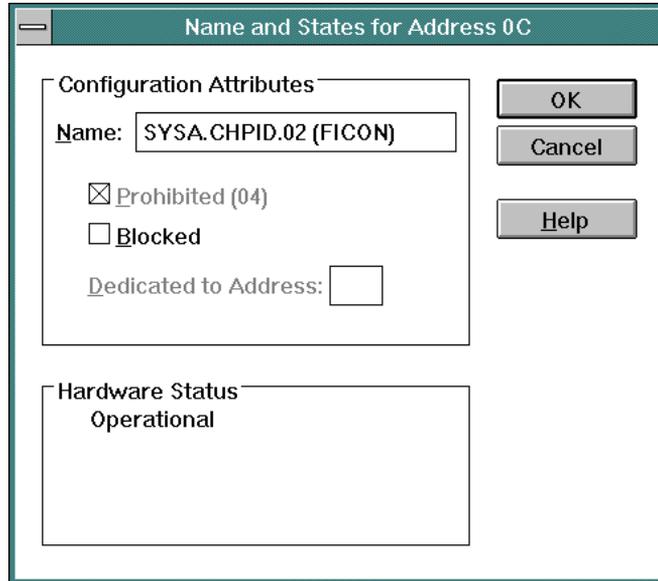


Figure 74. Name and States Dialog Box

If a System Automation for Multiple Virtual Storage (SA/MVS™), System Automation for Operating System/390 (SA OS/390), or ESCON Manager™ Hardware Configuration Definition (HCD) controls the Director, port address names should contain only:

- Upper and lower case characters (A through Z)
- Numbers (0 through 9)
- Periods (.), hyphens (-), and underscores (_).

Port address names *should not* contain:

- Parenthesis at the start or end of the name
- Leading or embedded blanks
- Asterisks (*) or commas (,).

Any format for a name is acceptable (subject to the listed restrictions), as long as 24 or fewer characters are used and the name is not preceded by a space. For additional information, refer to *Planning for the Enterprise Systems Connection Manager (GC23-0423)* or *System Automation for OS/390, Planning and Installation (GC28-1549)*.

Note: ESCON Manager supports ESCON operation only. SA OS/390 is required to support FICON operation.

- **Prohibited** - This check box displays and allows modification of the *Prohibited* attribute for the selected intersection cell. The address adjacent to the check box indicates the intersection address shown in the dialog box title. The check box is disabled if the cell cursor is on an invalid cell.
- **Blocked** - This check box displays and allows modification of the *Blocked* attribute for the selected intersection cell.
- **Dedicated to Address** - This edit field allows a single address to be dedicated to the selected port address (only a valid intersection port address can be entered). Deleting an address from the field clears the dedicated attribute. The field is disabled on an active matrix if the selected port address is not installed.
- **Hardware Status** - This field displays the hardware status of the selected port address. For inactive FCV ports, an offline reason code is appended to the hardware status. The reason codes are listed in [Table 6](#), and provide additional information about the inactive status. If several reason codes affect an FCV port, the highest priority code appears in the *Hardware Status* field.

Table 6. Offline Reason Codes for Inactive FCV Ports

FCV Port Card Offline Reason Codes (High to Low Priority)
FICON-Incompatible MXC Hardware
Port Exceeds FCV Card Limit
Invalid Configuration - Swap
Invalid Configuration - Dedicate
Awaiting Licensed Internal Code (LIC)

CUP Name

To modify the control unit port name, select the *CUP Name* option from the *Edit* menu, or double-click the CUP Name area at the *Matrix* window (gray box below the port address names). Either option opens the *Name for CUP* dialog box ([Figure 75](#)).

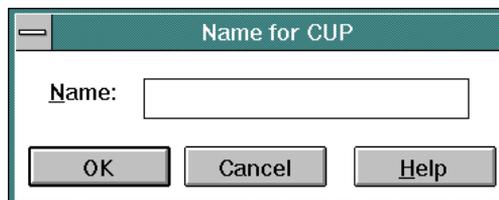


Figure 75. Name for CUP Dialog Box

The CUP name can be up to 24 alphanumeric characters in length, and can contain only upper and lower case characters (A through Z), numbers (0 through 9), periods, hyphens, and underscores. CUP names *cannot* contain leading or embedded blanks, asterisks, or commas.

Editing the CUP name modifies the name for the current configuration matrix (new, active, or saved). The CUP name cannot be the same as any previously entered port address name.

Default CUP Name

To keep CUP names the same for all configurations for a Director, a default CUP name can be defined. This name is entered in the *Director Definition* dialog box (Figure 39 on page 52), which is displayed by selecting the *New Director* or *Modify Definition* button from the *New Configuration Matrix* or *Open Active Configuration Matrix* options at the *File* menu. A name entered in the *Default CUP Name* field is automatically entered for configurations loaded into the Console for that Director. This process is usually performed when the *New Configuration Matrix* option is chosen for a Director, or if an active configuration is chosen for a Director that is not configured.

The changed CUP name must be activated or saved to preserve it with the configuration. To indicate the CUP name is modified (from a blank name), the name appears in blue on the matrix (below the port address names). Use of the default CUP name does not affect CUP names that are not blank, or are defined. To prevent the automatic completion of blank CUP names for a Director, leave the *Default CUP Name* field blank at the *Director Definition* dialog box.

Names

To enter a port address name, select the *Names* option from the *Edit* menu or double-click the selection in the *Name* column (adjacent to the port address). Either option opens the *Name for Address* dialog box (Figure 76).

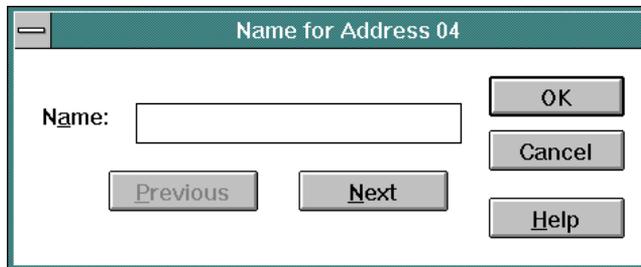


Figure 76. Name for Address Dialog Box

Port address names can be up to 24 alphanumeric characters in length. The port address name usually describes the device attached to the associated port. The *Name for Address* dialog box contains five buttons:

- **OK** - Accepts the entered address name and closes the dialog box.
- **Cancel** - Closes the dialog box without taking action.

- **Help** - Opens a window to access online help for the dialog box.
- **Previous** - Moves to the address name one port address back (up) in sequence. If the previous port is named, the name appears in the dialog box, and appears at the *Matrix* window in blue letters. Activating or saving the matrix changes the name to black letters.
- **Next** - Moves to the address name one port address forward (down) in sequence, and operates like the *Previous* button.

Enable Operator

Select the *Enable Operator* option from the *Edit* menu to edit port authorization privileges for a configuration matrix. The option is typically associated with creating a logical partition (LPAR), and can be used only when the *Port Authorization* option from the *Utility* menu is enabled (refer to "[Port Authorization](#)" on page 109).

When the *Enable Operator* option is selected, the *Operator Authorization* dialog box appears. Type the appropriate operator authorization password and click the *OK* button. The operator is granted port authorization privileges assigned to the operator ID associated with the password. A *Matrix* window with port authorization enabled is shown in [Figure 77](#).

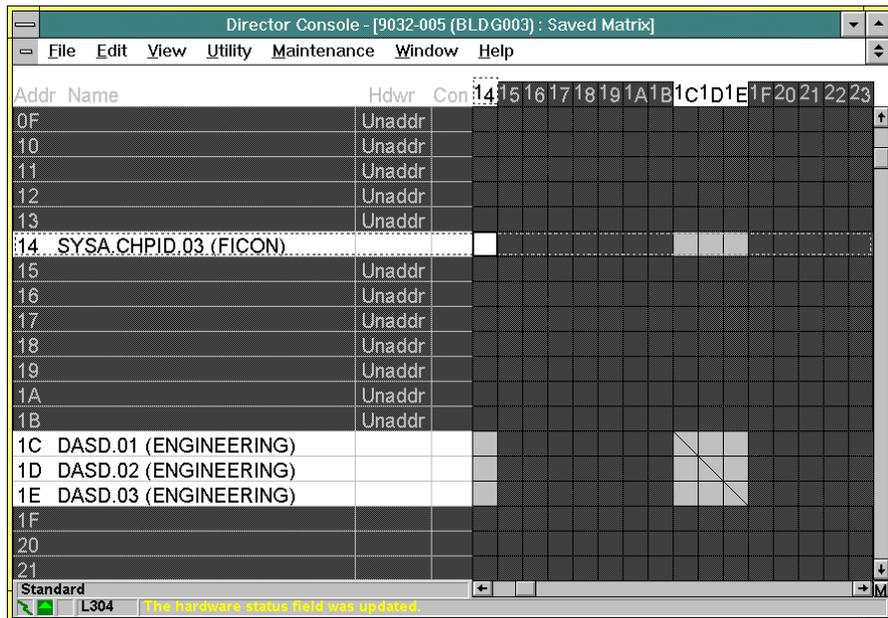


Figure 77. Matrix Window with Port Authorization Enabled

Until the option is selected, 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. Operators not authorized to configure all ports in the matrix can only activate an active matrix or save a saved matrix. The *Activate Configuration Matrix* and *Save Configuration Matrix As* options (from the *File* menu) are not available. Operators defined for an LPAR typically do not have authorization to configure all ports and are not allowed to:

- Activate a new matrix
- Activate a saved matrix
- Save an active matrix
- Edit a new matrix
- Copy a saved matrix
- Delete a saved matrix
- Save a saved matrix using a different name.

If an operator changes a configuration matrix and leaves the Console before activating the matrix, and another operator attempts to activate or save the matrix, the password supplied with the activate request is evaluated and rejected if it does not authorize the operator to configure all matrix ports.

The *Matrix* window appears with a shading scheme that indicates ports for which the operator is not authorized to modify attributes. Unauthorized port rows and columns appear in a dark gray color. The operator can view the state of unauthorized ports, but cannot change port attributes. When port authorization is enabled, an identifier (**L304** in the example) appears in the operator ID area (adjacent to the System Error indicator).

To enable a different port authorization operator ID (i.e. another LPAR), select the *Enable Operator* option again and enter the password assigned to that operator ID. Pending changes for the previous operator ID are discarded (after a warning) before the new operator ID is accepted.

Command Lists

The command list function allows an operator to compile a series of frequently-used commands (block, dedicate, prohibit) into a file for batch execution. The batch file runs and assigns port connectivity attributes, rather than the operator assigning attributes on an individual port basis. The list is developed independently of defined Directors, but is associated with a desired set of Directors during execution. Up to 32 command lists can be saved to the Console fixed disk. Each command list can provide up to 128 commands. The 128-command limit can be exceeded by using embedded (recursive) command lists.

During execution, a Director's active matrix is opened and commands are applied to that active matrix. The matrix can be automatically activated after all commands are applied. Commands are performed according to port authorization definitions for each Director, as defined for the operator initiating execution of the command list. The following configuration commands can be defined in a list:

- **Prohibit or Allow** - Port connections can be prohibited or allowed as port address pairs or as a port address range.
- **Block or Unblock** - Ports can be blocked or unblocked by port address or port address range.
- **Dedicate or Undedicate** - Ports can be dedicated or undedicated by port address pairs.
- **Merge** - A saved matrix can be merged into the active matrix according to port authorizations for the operator.
- **Port Name** - A port name can be specified.
- **Command List** - An embedded (recursive) command list can be executed as part of a current command list.

Command lists can be defined and executed at any time. However, command list activation fails if the link between the Console and selected Directors is unavailable. In addition, all commands are filtered against port authorization levels defined for the Directors (for the operator executing the command list).

Because command list operations are applied to the active matrix for each selected Director, an operator must have authorization to change ports for the Directors or the operations are not applied. If an error occurs (during matrix activation), command list execution terminates for the current Director, an error appears in the *Command List - Operational Status* dialog box (Figure 80 on page 95), and the process continues to the next selected Director.

Select the *Command Lists* option from the *Edit* menu. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Command Lists* dialog box appears (Figure 78).



Figure 78. *Command Lists Dialog Box*

The dialog box provides the following options:

- **Execute List** - When a list item is selected (highlighted) and the *Execute List* button is clicked, the *Command List - Execute* dialog box appears (Figure 79). The selected command list definition is part of the dialog box title.

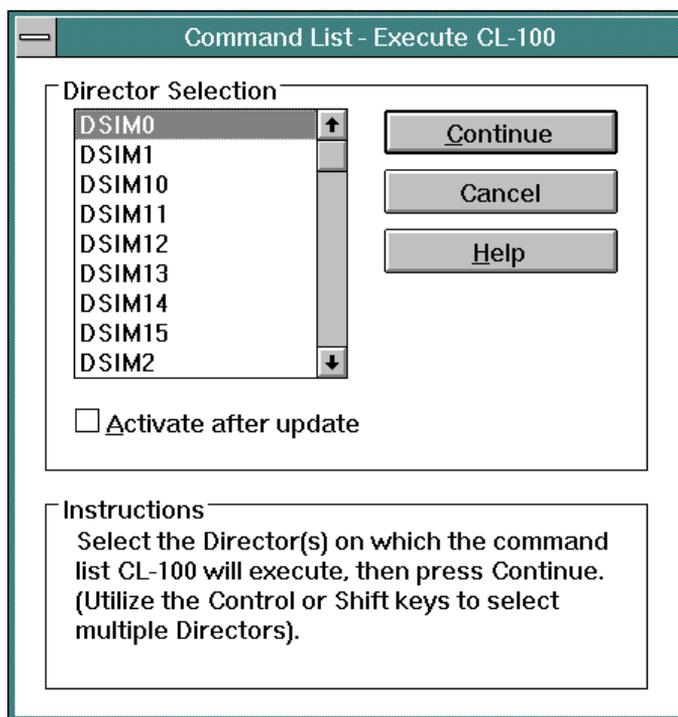


Figure 79. *Command List - Execute Dialog Box*

Select (highlight) the Director (or multiple Directors using the **Ctrl+Shift** keys) for which the command list definition is to be applied. To automatically activate the matrix after all commands are applied, click (enable) the *Activate after update* check box. When the *Continue* button is clicked, the command list definition is applied and the following process occurs:

- The active matrix opens. The *Instructions* section of the dialog box updates to reflect this action. Click the *Continue* button to proceed.
- Port attributes are updated and activated. The *Instructions* section of the dialog box updates to reflect this action. Click the *Continue* button to proceed.
- The command list executes and the *Command List - Operational Status* dialog box appears (Figure 80). Port attribute changes resulting from application of the command list definition appear at the *Active Matrix* window (if the *Activate after update* check box is enabled), and an entry indicating command list execution is added to the *Console Audit* log.

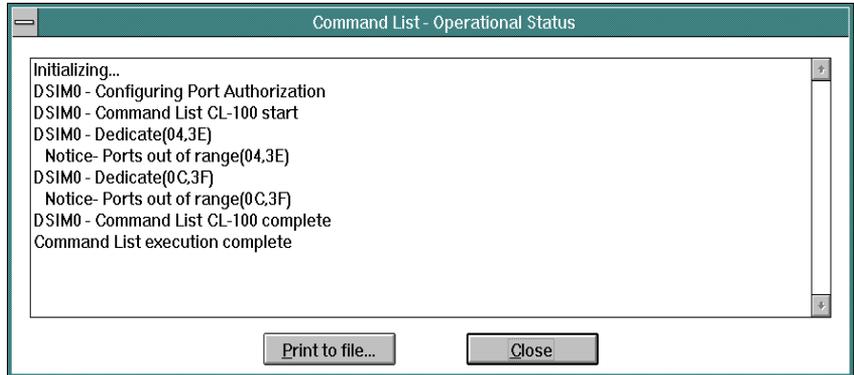


Figure 80. Command List - Operational Status Dialog Box

- If a problem occurs during command list execution and the command list does not complete, the message box shown in [Figure 81](#) appears.

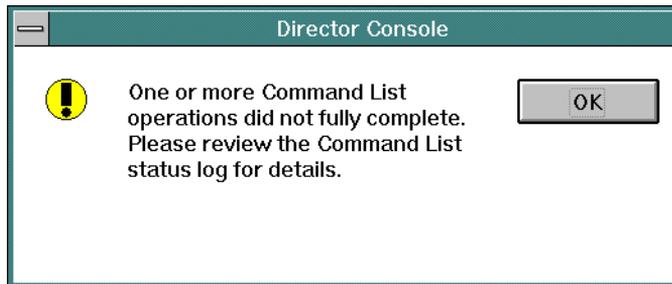


Figure 81. Command List Incomplete Message Box

Click the *OK* button to close the message box, then review the error messages that appear in the *Command List - Operational Status* dialog box. For a list of error messages and their explanations, refer to "[Command List Error Messages](#)" in Appendix A.

- If required, click the *Print to file* button at the *Command List - Operational Status* dialog box to save the status of the command list execution to a file. The *Save As* dialog box appears ([Figure 82](#)). The dialog box allows the operator to specify the file name, file type, and location (diskette or Console fixed disk) under which to save the command list status.

Note: The *Print to file* button is disabled (grayed out) during command list execution.

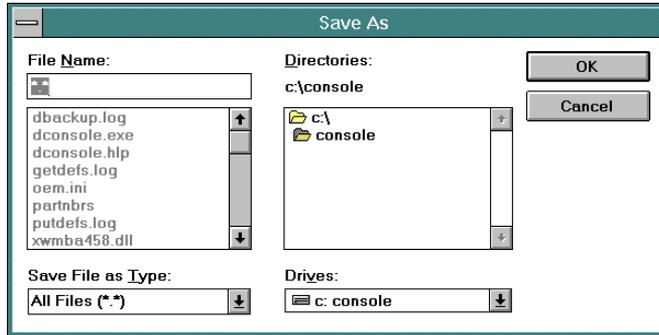


Figure 82. Save As Dialog Box

- At the *Command List - Operational Status* dialog box, click the *Close* button to complete the command list process and return to the *Command Lists* dialog box.

Note: The *Close* button is disabled (grayed out) during command list execution.

- **Close** - Closes the dialog box.
- **New List** - When the *New List* button is clicked, the *Command List - View/Modify* dialog box opens (Figure 83).

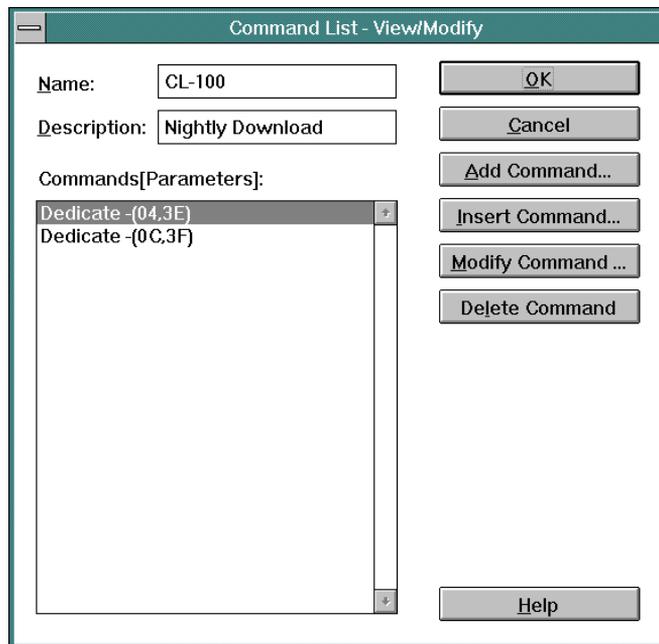


Figure 83. Command List - View/Modify Dialog Box

The dialog box provides the following options:

- **OK** - After command parameters are entered, click the *OK* button to save the new or modified command list. The dialog box closes and the command list name appears in the *Command Lists* dialog box (Figure 78).
- **Cancel** - Cancels the operation and closes the dialog box.
- **Add Command** - When the *Add Command* button is clicked, the *Command List - Edit* dialog box appears (Figure 84).

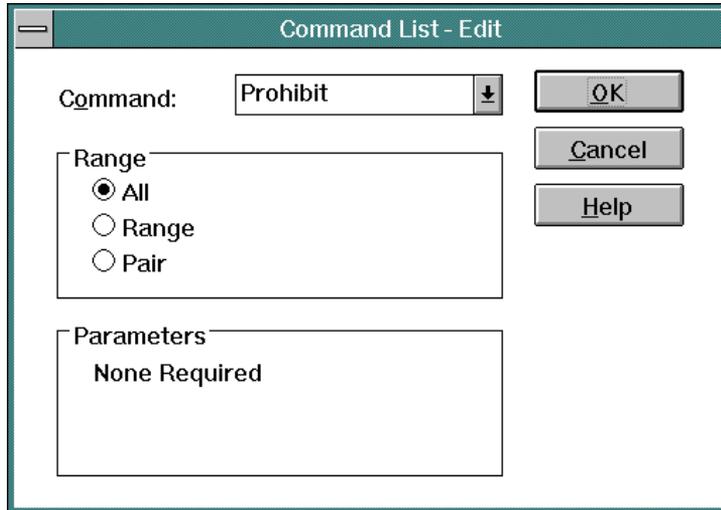


Figure 84. *Command List - Edit* Dialog Box

Click the arrow adjacent to the *Command* list box. A list of valid port attributes (for command list creation) appears. Select (click) the attribute to be added to the command list and complete parameters as required.

Note: Data entry fields change in the *Command List - Edit* dialog box to reflect parameter inputs associated with the selected attribute.

Click the *OK* button to save the command and return to the *Command List - View/Modify* dialog box. If a list item was selected at that dialog box, the new command is inserted *after* the selected list item.

- **Insert Command** - When a list item is selected (highlighted) and the *Insert Command* button is clicked, the *Command List - Edit* dialog box opens (Figure 84). Dialog box functions are identical to functions described for the *Add Command* button. However, the new command is inserted *before* the selected list item.

- **Modify Command** - When a list item is selected (highlighted) and the *Modify Command* button is clicked, the *Command List - Edit* dialog box opens (Figure 84). Dialog box functions are identical to functions described for the *Add Command* button.
- **Delete Command** - When a list item is selected (highlighted) and the *Delete Command* button is clicked, the following dialog box appears (Figure 85).

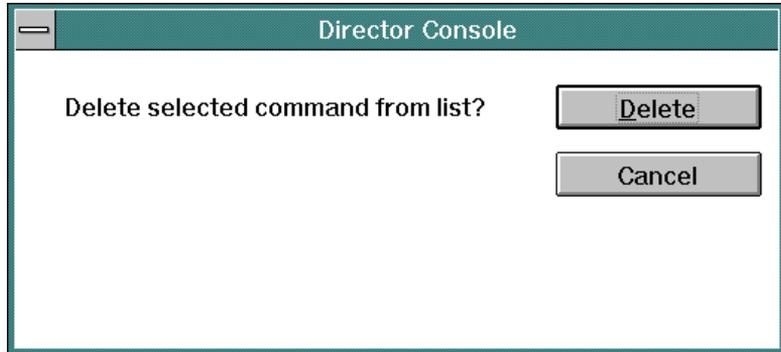


Figure 85. Delete Command Dialog Box

Click the *Delete* button to delete the selected command and return to the *Command List - View/Modify* dialog box.

- **Help** - Opens a window to access online help for the dialog box.
- **Modify List** - When a list item is selected (highlighted) and the *Modify List* button is clicked, the *Command List - View/Modify* dialog box opens (Figure 83). Dialog box functions are identical to functions described for the *New List* button.
- **Delete List** - When a list item is selected (highlighted) and the *Delete List* button is clicked, the following dialog box appears (Figure 86).

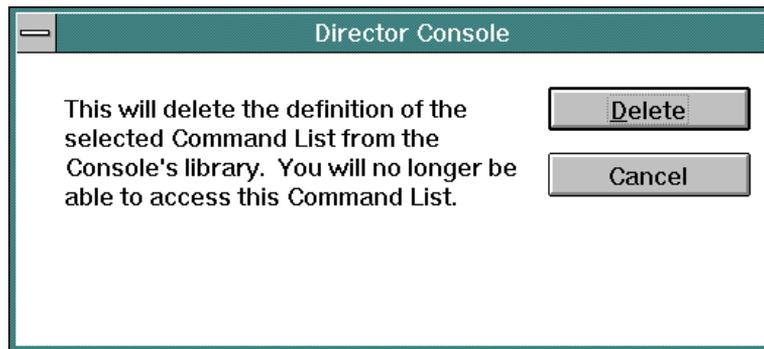


Figure 86. Delete Command List Dialog Box

Click the *Delete* button to delete the selected command list definition from the Console fixed disk and return to the *Command Lists* dialog box.

- **Copy List** - When a list item is selected (highlighted) and the *Copy List* button is clicked, the *Command List - Copy* dialog box appears (Figure 87).



Figure 87. *Command List - Copy Dialog Box*

Enter a file name in the *Copy To* field. Click the *OK* button to copy (duplicate) the selected command list, create a new command list with the specified name (and identical commands), and return to the *Command Lists* dialog box.

- **Help** - Opens a window to access online help for the dialog box.
- **List Info** - When a list item is selected (highlighted) and the *List Info* button is clicked, the *Command List - Information* dialog box appears (Figure 88).



Figure 88. *Command List - Information Dialog Box*

The dialog box provides a description of the selected command list, with the date and time the command list was created. Click the *Close* button to close the box and return to the *Command Lists* dialog box.

Matrix View Menu

The *Matrix* window *View* menu (Figure 89) provides options to modify the visual display of the *Matrix* window. *View* menu options are:

- **Swap Axis** - Orients the matrix so that port addresses along the left side of the matrix appear at the top of the matrix.
- **Matrix Map** - Allows a user to display and select a range of port addresses for viewing. The option is not available for the 9033-004 Director.

- **Enter Position** - Allows a user to specify a port intersection cell (pair of port addresses). The cell cursor moves to the cell location specified by the addresses entered.
- **Graphic Display** - Toggles between graphic display mode and nongraphic display mode.
- **Display Options** - Allows a user to set preference options for viewing the *Matrix* window.

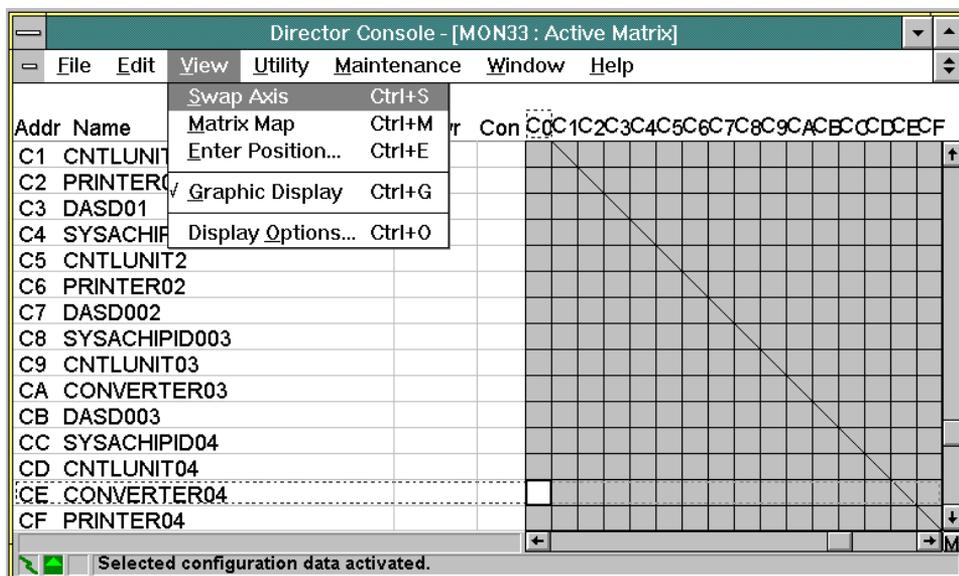


Figure 89. View Menu (Matrix Window)

Swap Axis

Select the *Swap Axis* option from the *View* menu to change the matrix orientation so that:

- Logical port addresses displayed along the left side of the matrix now appear at the top of the matrix.
- Logical port addresses displayed along the top of the matrix now appear at left side of the matrix.

The swap axis function is also performed by double-clicking any port address above the matrix area. This option is useful to select port addresses and view or modify port address names that formerly appeared at the top of the matrix (with the port address name hidden).

Matrix Map

The *Matrix Map* option allows an operator to quickly display and select a range of port addresses for viewing. Select the *Matrix Map* option from the *View* menu or click the *M* button at the lower right corner of the matrix. The *Matrix Map* dialog box appears (Figure 90). The dialog box contains 64 buttons, each representing an address block for the Director matrix. The address block that appears at the *Matrix Map* window is indicated by a thick border on the corresponding button (2, A on Figure 90).

Note: This menu option is not available for a 9033-004 Director. The menu option and the *M* button at the lower right corner of the matrix are grayed out.

When a button is selected, the portion of the matrix starting with addresses in the address block range appears. The size of the displayed matrix depends on display options chosen and the size of the monitor. The default is a 32-by-32 port matrix.

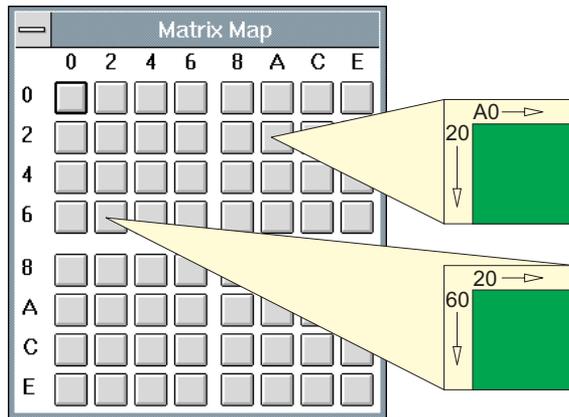


Figure 90. *Matrix Map* Dialog Box (9032-005 Director)

Only the first hexadecimal digit of the range (button) to be selected appears on the axis of the *Matrix Map* dialog box. Selection of a *Matrix Map* button displays the matrix starting with the row and column of the button selected. For example, when displaying 16 ports (vertically and horizontally), select row 6 and column 2 of the *Matrix Map* of a 9032-005 Director to display a matrix with a row range of 60 through 6F (left side) and column range 20 through 2F (top).

Each button on the *Matrix Map* for a 9032-003 Director represents a port address block of the matrix beginning with a 16-port address boundary. Each button on the *Matrix Map* for a 9032-005 Director represents a port address block of the matrix beginning with a 32-port address boundary.

Enter Position

Select the *Enter Position* option from the *View* menu to open the *Enter Address Position* dialog box (Figure 91).

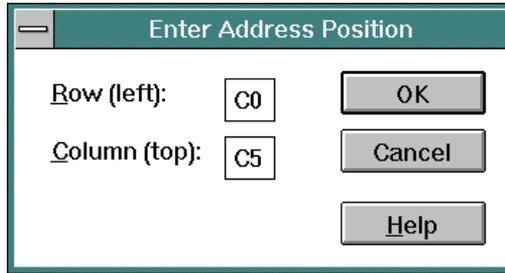


Figure 91. Enter Address Position Dialog Box

Enter row and column port addresses and click the *OK* button, and the cell cursor moves to the cell location specified by the two addresses. If necessary, the matrix scrolls to display the new location (scrolling conforms to matrix map settings). For example, if [B7, 95] is entered, the cell cursor moves to that cell intersection and the upper left cell intersection of the displayed matrix is [B0, 90].

Note: For a 9033-004 Director, the cell cursor moves to the specified cell location, but the matrix does not change display coordinates.

Graphic Display

The *Graphic Display* option is a toggle that enables or disables graphic display mode for the *Matrix* window. In graphic display mode, all attributes (prohibited, allowed, dedicated, and blocked) appear graphically on the configuration matrix. [Figure 92](#) displays the matrix in graphic display mode.

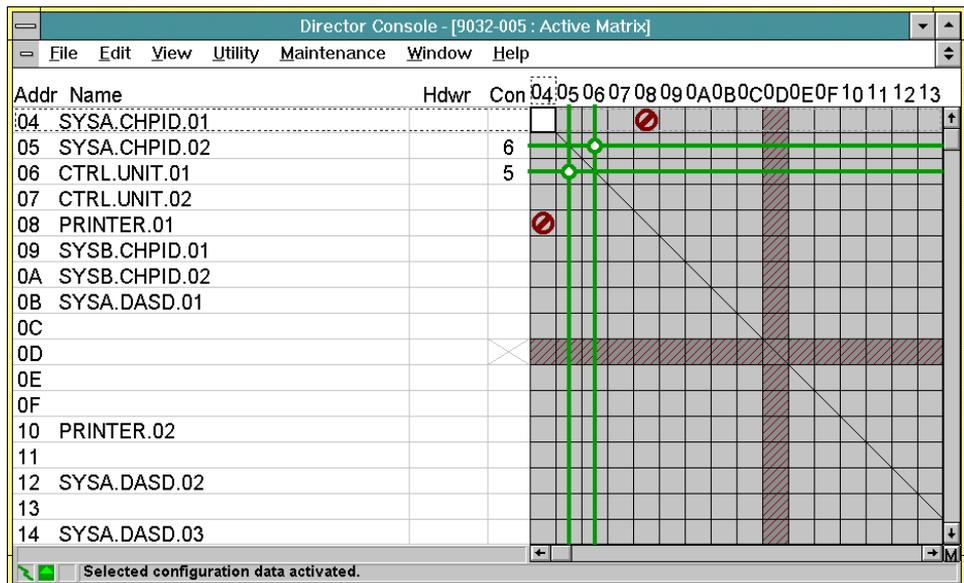


Figure 92. Graphic Display Mode

Nongraphic display mode provides continuity for users of the 9033-001 Console, 9032-002 Console, and host applications (SA OS/390). In nongraphic display mode, a separate blocked column (**B**) appears, and the matrix section displays only prohibited connections in matrix cells (**P**). The lined graphic display of the matrix appears the same in either mode, but display of attributes is different. Figure 93 displays the matrix in nongraphic display mode.

Note: In nongraphic display mode, the *Matrix* window display reacts in all ways as a 9032-002 or a 9033-001 Director Console.

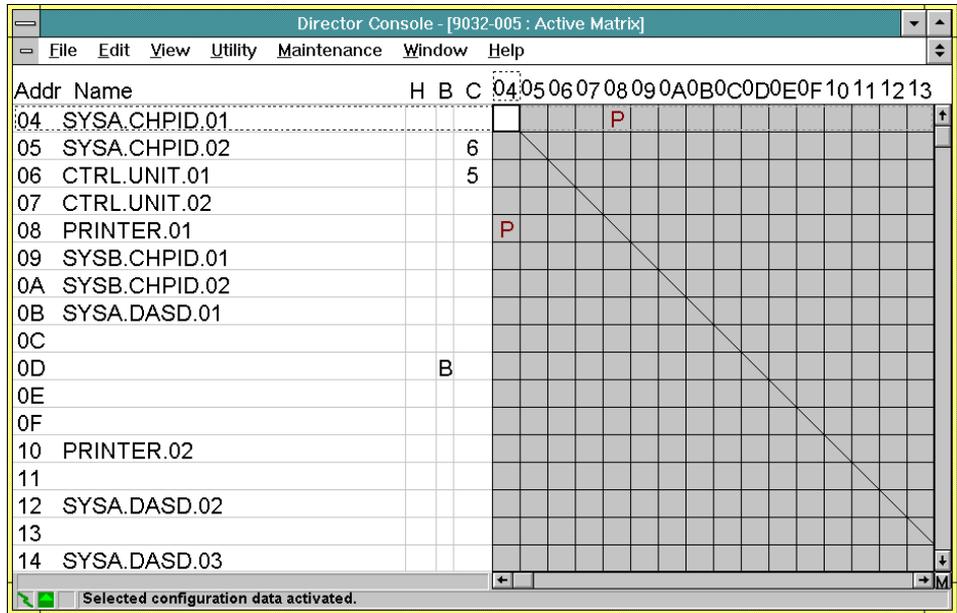


Figure 93. Nongraphic Display Mode

Display Options

Select the *Display Options* selection from the *View* menu to open the *Display Options* dialog box (Figure 94). The dialog box provides preference options for viewing the *Matrix* window. Options can be set separately for each *Matrix* window. The dialog box provides the following options:

- **Number of addresses across** - This entry is the number of port addresses that appear horizontally across the matrix. When sizing a *Matrix* window, the number of horizontal addresses stays consistent, and the size of the cells and matrix features change. The default setting is 32 addresses. The maximum setting is 124 addresses.
- **Percentage of names displayed** - This entry is the percentage of the *Name* field that appears at the left of the matrix. One hundred percent displays all 24 characters of a name at the widest possible setting (usually excessive for most names).

Zero percent displays no names at all, saving screen space to allow for larger matrix cells. The default is 65 percent, which displays most 24-character names.

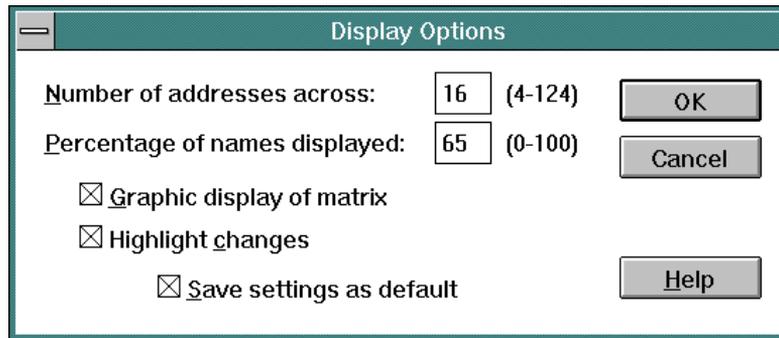


Figure 94. Display Options Dialog Box

- **Graphic display of matrix** - This check box performs the same function as the *Graphic Display* menu option at the *View* menu. With graphic display on (box checked), the matrix appears in graphic display mode, providing the greatest amount of visual feedback about the configuration of the Director. With graphic display mode off, attributes appear similar to the 9032-002 and 9033-001 Console display.
- **Highlight changes** - If this box is checked, changes to attributes made since the configuration was last read appear in a brighter color or intensity. Cleared attributes appear in a more subdued color or intensity. Changed text or port address numbers appear in blue. Highlighted changes revert to normal after the changes are saved or activated. The *Highlight* option is toggled from the matrix display by the **Ctrl+H** keys.
- **Save settings as default** - Parameters set at the *Display Options* dialog box are saved to a Console initialization file as defaults for Console startup. If this box is checked, display settings are saved when the *OK* button is selected. The options become the defaults the next time the Console application is opened.

Matrix Utility Menu

The *Matrix* window *Utility* menu (Figure 95) provides tools required to monitor and report on Console and Director-level functions. Some options are valid only for an attached Director (active matrix). Unavailable menu options are grayed out in *Saved Matrix* or *New Matrix* windows. *Utility* menu options are:

- **Director Operational Status** - Displays the status of the selected Director.
- **Node Descriptor** - Displays information about the hardware and attached device for a selected Director port.
- **Time/Date** - Allows a user to specify the date and time for an attached Director.

- **Active = Saved** - Sets Active = Saved as the default condition for subsequent activate configuration matrix commands.
- **Remote Offline Control** - Toggles an attribute that determines if an attached host system can set the Director offline.
- **LIC Versions** - Identical to the same option at the *Startup* window *Utility* menu. Refer to "[LIC Versions](#)" on page 58 for information.
- **Passwords** - Identical to the same option at the *Startup* window *Utility* menu. Refer to "[Passwords](#)" on page 60 for information.
- **Port Authorization** - Allows an administrator to selectively authorize or deny port access for operators.
- **Console Audit Log** - Identical to the same option at the *Startup* window *Utility* menu. Refer to "[Console Audit Log](#)" on page 63 for information.
- **Console Error Log** - Identical to the same option at the *Startup* window *Utility* menu. Refer to "[Console Error Log](#)" on page 64 for information.
- **IPL Director** - Allows an operator to IPL a selected Director.
- **Set Director Offline** - Allows an operator to set the Director offline. The option is available only if the *Remote Offline Control* option is enabled.
- **Clear System Error** - Extinguishes the System Error indicator at the *Matrix* window and associated Director operator panel.
- **Reset Installation Defaults** - Allows a user to reset non-volatile information to installation default values.

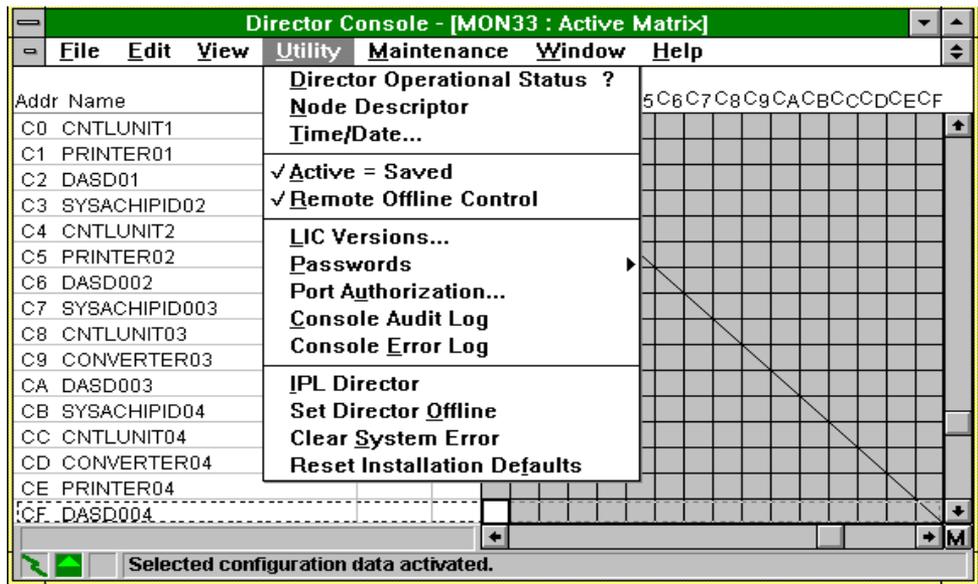


Figure 95. Utility Menu (Matrix Window)

Director Operational Status

Select the *Director Operational Status* option from the *Utility* menu or double-click the Director Status Indicator (on the status line at the bottom of the *Matrix* window). The *Director Operational Status* dialog box (Figure 96) appears.

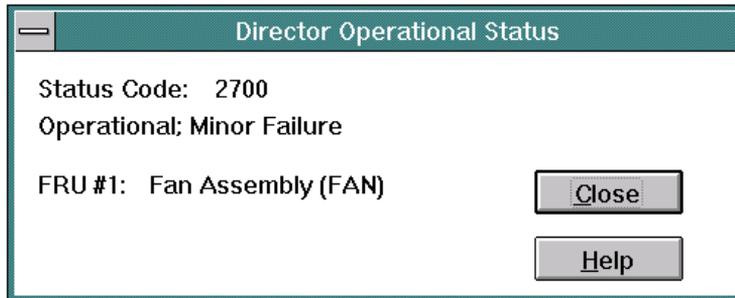


Figure 96. Director Operational Status Dialog Box

A *Status Code* and its meaning are displayed in the dialog box. The first digit of the *Status Code* is the operational condition of the Director, indicating the severity of the failure (if any). The remaining digits indicate a field-replaceable unit (FRU) codes for up to three failed hardware components.

For information about status codes, refer to the Director-specific maintenance publication listed below:

- Maintenance Information for the 9032 Model 3 Enterprise Systems Director (SA27-3601)
- *Maintenance Information for the 9033 Model 4 Enterprise Systems Director* (SA27-2638)
- *Maintenance Information for the 9032 Model 5 Director* (SY28-1158).

Node Descriptor

Select the *Node Descriptor* option from the *Utility* menu to open the *Node Descriptor* dialog box (Figure 97). The dialog box displays information about Director port hardware and the device attached to the highlighted port. The information describes the node descriptor (similar to vital product data) for the attached device, and is provided by the attached device.

Adjacent port address information is viewed by using the *Previous* or *Next* buttons. Fields in the dialog box are described as follows:

- **Validity** - The node descriptor reported by the device can be:
 - **Valid** - A node descriptor (flagged as valid), was received from the node.

- **Not Current** - A response was not received from the node for a descriptor. The last valid descriptor is used, but is flagged as *Not Current*.
- **Invalid** - A node descriptor (flagged as invalid), was received from the node.

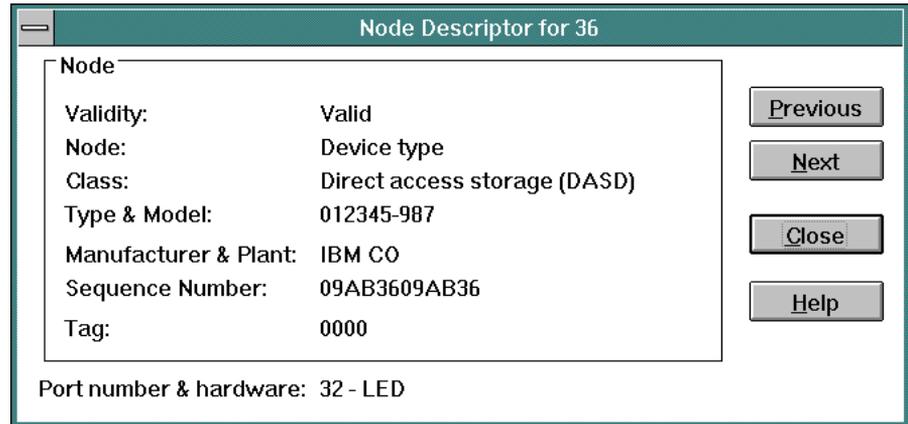


Figure 97. Node Descriptor Dialog Box

- **Node** - The node is either a device type or channel subsystem type. The *Class* field depends on the node type.
- **Class** - If the node is a device type, the class describes the general device, such as direct access storage device (DASD), printer, or magnetic tape drive. If the node is a channel subsystem type, the class (if specified), is either a channel path or integrated channel-to-channel adapter (CTCA).
- **Type & Model** - A six-character type number is followed by a three-character model number. These numbers correspond to the type and model numbers indicated on the machine serial number plate.
- **Manufacturer & Plant** - A three-character manufacturer code is followed by a two-character plant of manufacture code, identifying the manufacturer of the device.
- **Sequence Number** - A 12-character code (usually preceded by the plant code) that corresponds to the device serial number on the machine serial number plate.
- **Tag** - The tag encodes the interface ID of the channel port or control unit port supplying the node descriptor information.
- **Port number & hardware** - This line displays the physical port number mapped to the selected port address, followed by a port type indicator (**LED** for an LED port, **Laser** for an XDF Laser or FCV port).

Time/Date

Select the *Time/Date* option from the *Utility* menu to open the *Set Director Time and Date* dialog box (Figure 98). The option is available *only* from an *Active Matrix* window.

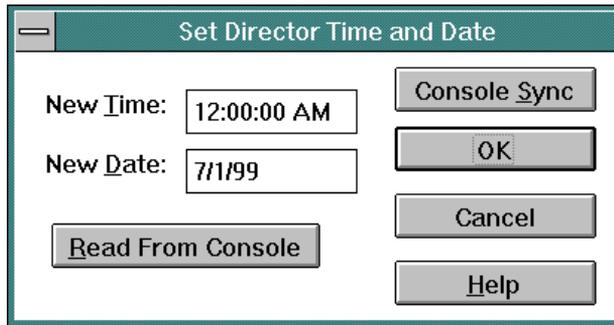


Figure 98. *Set Director Time and Date* Dialog Box

The dialog box provides the following options:

- **New Time** - This field allows input of the current time. Click the *OK* button to set the Director time to the entered time.
- **New Date** - This field allows input of the current date. Click the *OK* button to set the Director date to the entered date.
Note: The *New Date* field accepts only a 2-digit year entry. However, the Director Console application correctly interprets the entry **00** as the year 2000, **01** as the year 2001, etc.
- **Read From Console** - When this button is clicked, the *New Time* and *New Date* fields are updated with the Console PC time and date (set through the operating system). Click the *Console Sync* button to set the Director time and date to the Console time and date.
- **Console Sync** - When this button is clicked, the *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The Director time and date are synchronized with the Console time and date.
- **OK** - After a time and date are entered, click the *OK* button. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The Director time and date are set to the entries typed in the *New Time* and *New Date* fields.
- **Cancel** - Cancels the operation and closes the dialog box.
- **Help** - Opens a window to access online help for the dialog box.

Active = Saved

The *Active = Saved* option from the *Utility* menu sets the default condition (enabled or disabled) for subsequent activate configuration matrix commands. The option is available *only* from an *Active Matrix* window.

When the option is selected, the *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. When the option is enabled, a check mark appears adjacent to the menu item. The default condition can also be set at the *Activate Configuration Matrix* dialog box (Figure 66 on page 80). When the option is enabled, an **X** appears in the *Active = Saved* field at the dialog box.

If *Active = Saved* is enabled and an activate command is transmitted, the active configuration for the Director is copied to the IPL configuration matrix file (saved to the Director's volatile memory), and is used the next time the Director is IPLed.

Attention!

The default is *Active = Saved* enabled. It is recommended to leave the option enabled.

Remote Offline Control

The *Remote Offline Control* option from the *Utility* menu controls whether or not an attached host system can set the Director offline. The option is available *only* from an *Active Matrix* window.

When the option is selected, the *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. When the option is enabled, a check mark appears adjacent to the menu item, and the attached host system is permitted to set the Director offline. When the option is disabled, the check mark disappears and the host system command to set the Director offline is rejected.

LIC Versions

This option is identical to the same option at the *Startup* window *Utility* menu. Refer to "[LIC Versions](#)" on page 58 for information.

Passwords

This option is identical to the same option at the *Startup* window *Utility* menu. Refer to "[Passwords](#)" on page 60 for information.

Port Authorization

Select the *Port Authorization* option from the *Utility* menu to open the *Port Authorization* dialog box (Figure 99). Port authorization changes require an administrative authorization password (default is **LEVEL001**).

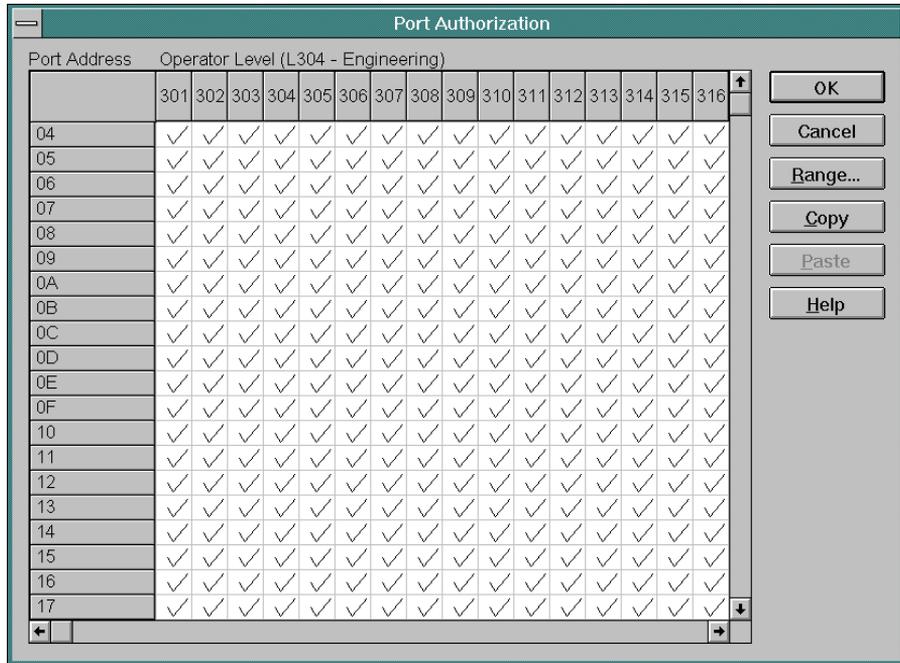


Figure 99. Port Authorization Dialog Box

The port authorization function allows an administrator to create port-level configuration access control unique to defined operators or operator groups, which allows operators to access only authorized ports and restricts unauthorized operators from changing the port connectivity configuration of any device or set of devices under control of the Director. The dialog box provides the following options:

- **OK** - After port authorization changes are made, click the *OK* button to save the changes and return to the *Matrix* window.
- **Cancel** - Cancels the operation and closes the dialog box.
- **Range** - When this button is clicked, the *Authorize Range* dialog box appears (Figure 100). Use the dialog box functions to:
 - Authorize or prohibit operator access to *all* logical port addresses
 - Authorize or prohibit operator access to a specified range of logical port addresses
 - Authorize or prohibit operator access to *all* operator IDs
 - Authorize or prohibit operator access to a specified range of operator IDs.

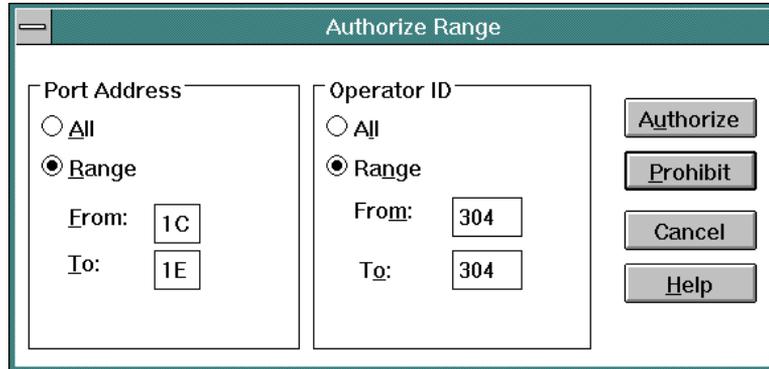


Figure 100. Authorize Range Dialog Box

- **Copy** - Select a intersection cell of a logical port address and operator ID to copy the cell contents (enabled or disabled).
- **Paste** - Select an intersection cell of a logical port address and operator ID to paste previously-copied cell contents (enabled or disabled).
- **Help** - Opens a window to access online help for the dialog box.

After port authorizations are changed, the *Matrix* window is in a read-only state and an operator must select the *Enable Operator* option from the *Edit* menu to enable the changes. For more information about port authorization refer to "[Defining Port Authorizations](#)" on page 180. For more information about the *Enable Operator* option refer to "[Enable Operator](#)" on page 91.

Console Audit Log

This option is identical to the same option at the *Startup* window *Utility* menu. Refer to "[Console Audit Log](#)" on page 63 for information.

Console Error Log

This option is identical to the same option at the *Startup* window *Utility* menu. Refer to "[Console Error Log](#)" on page 64 for information.

IPL Director

When the *IPL Director* option is selected from the *Utility* menu, the dialog box on the following page appears ([Figure 101](#)).

Click the *OK* button. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. An IPL command is Transmitted to the Director to reinitialize Director Licensed Internal Code (LIC) and cause the CTP card to initiate an IPL. The latest LIC version is loaded to the online CTP card, and that card and the Token Ring Controller (TKRG) Adapter card are reset. The active matrix remains online, and no Director functionality is lost during the IPL.

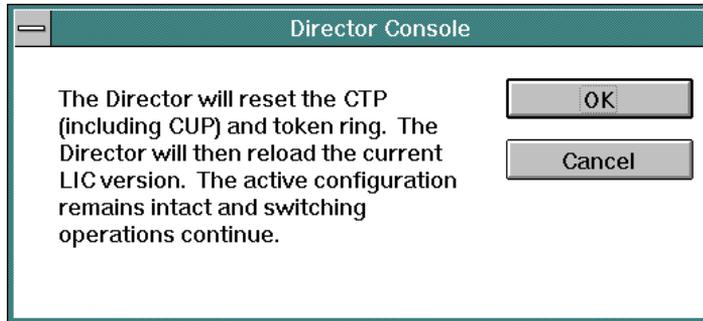


Figure 101. Reset CTP Card Dialog Box

Note: The *IPL Director* menu option is available only from an *Active Matrix* window.

Set Director Offline

Perform the following prior to setting the Director offline:

- If the Director is not supported by 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.

When the *Set Director Offline* option is selected from the *Utility* menu, the following dialog box appears (Figure 102).

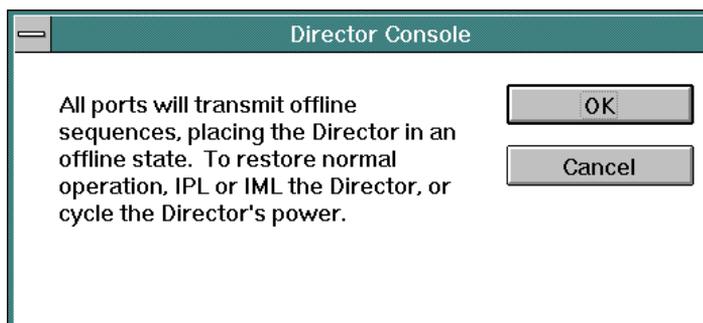


Figure 102. Offline State Dialog Box

Click the *OK* button. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button.

An offline command is transmitted to all Director ports. After the Director is set offline, an IPL, Initial Machine Load (IML) or power cycle is required to clear the offline state. Set the Director offline whenever maintenance is to be performed on a 9033-004 Director or a nonredundant 9032-003 or 9032-005 Director FRU.

Note: The *Set Director Offline* menu option is available only if the *Remote Offline Control* option is enabled.

Clear System Error

When the *Clear System Error* option is selected from the *Utility* menu, the following dialog box appears (Figure 103).

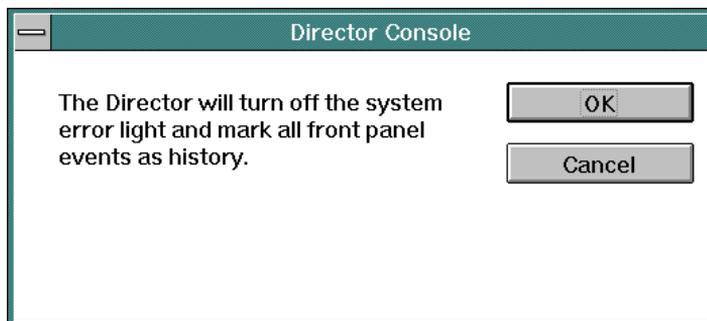


Figure 103. Extinguish System Error Light Dialog Box

Click the *OK* button. The *Maintenance Authorization* dialog box appears. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The System Error indicator is extinguished at the status line of the *Matrix* window and at the Director operator panel. **Active** events at the operator panel Status display are set to **History**.

Note: The *Clear System Error* menu option is disabled (grayed out) if there is no link established between the Director and Console.

Reset Installation Defaults

This option allows a user to reset non-volatile information to installation default values. 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 are not reset until a Director IPL, IML, or power cycle occurs. The *Reset Installation Defaults* menu option is disabled (grayed out) if:

- The Director-Console link is inactive or busy
- The *Matrix* window is locked
- The installed LIC version does not support the option (below Version 4.3).

If the Director is online and the *Reset Installation Defaults* option is selected from the *Utility* menu, the message box on the following page appears (Figure 104).

Click the *OK* button, set the Director offline, and retry the operation. If the Director contains only one CTP card, perform the following prior to setting the Director offline:

- If the Director is not supported by 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.

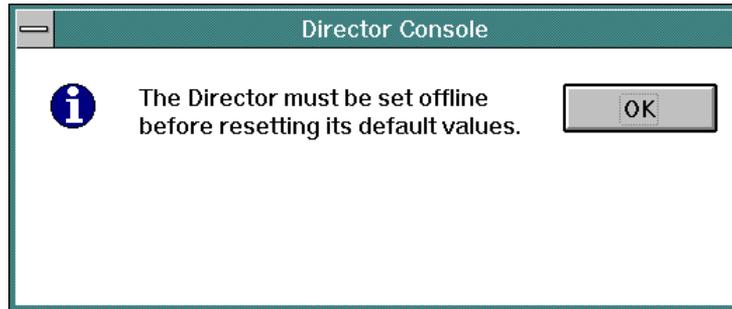


Figure 104. Set Director Offline Message Box

If the Director is offline and the *Reset Installation Defaults* option is selected from the *Utility* menu, the following dialog box appears (Figure 105).

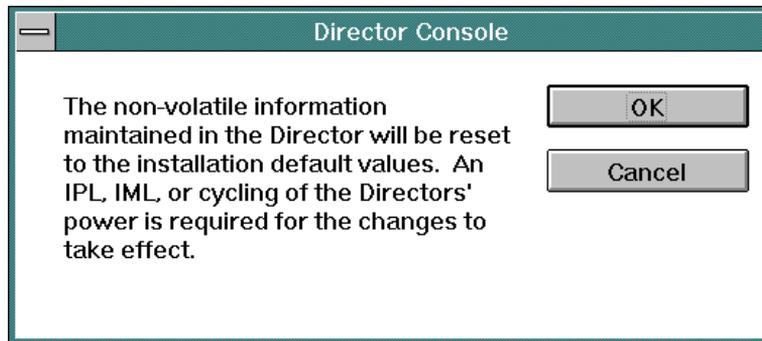


Figure 105. Reset Installation Defaults Dialog Box

Click the *OK* button. The *Maintenance Authorization* dialog box appears. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The dialog box closes, installation default values are reset, and an entry corresponding to the action is added to the *Director Audit* log.

Matrix Maintenance Menu

The *Matrix* window *Maintenance* menu (Figure 106) provides access to diagnostic and maintenance options for an attached Director. Some options are valid only for an attached Director (active matrix). Unavailable menu options are grayed out in *Saved Matrix* or *New Matrix* windows. *Maintenance* menu options are:

Director Log Operation

The *Director LIN* log stores up to 128 entries, the *Director Audit* log stores up to 1,000 entries, and the *Director Event* log stores up to 256 entries. After the maximum number of entries has been stored, new entries overwrite the oldest entries. Information in the *Director LIN* and *Director Event* logs is typically useful only to qualified service technicians who are fault isolating a Director problem.

When a log window is first opened, the entire contents of the log file are available for display (scrolling may be required). New log events that occur while the window is open are not displayed until the *Refresh* option is selected from the *File* menu.

Note: When a log window is selected, the menu bar changes to provide commands unique to the log window. The logs can be refreshed (re-read), saved to a file, or printed. The log text can also be displayed in different fonts and character sizes.

Menu options specific to log windows are available from the *File* and *Font* menus. Options available from the *Window* and *Help* menus are identical to those options available from the *Startup* window. Refer to "[Window Menu](#)" on page 67 and "[Help Menu](#)" on page 69 for information.

Director Log Window File Menu

File menu options ([Figure 107](#)) available from the *Director LIN*, *Director Audit*, and *Director Event* logs are:

- **New Configuration Matrix** - This option is identical to the same option at the *Startup* window *File* menu. Refer to "[New Configuration Matrix](#)" on page 51 for information.
- **Open Saved Configuration Matrix** - This option is identical to the same option at the *Startup* window *File* menu. Refer to "[Open Saved Configuration Matrix](#)" on page 55 for information.
- **Open Active Configuration Matrix** - This option is identical to the same option at the *Startup* window *File* menu. Refer to "[Open Active Configuration Matrix](#)" on page 57 for information.
- **Director Matrix** - Select this option to exit the log window and return to the associated Director matrix.
- **Refresh** - Select this option to write the latest information to the log window and refresh the display.
- **Clear** - Select this option to clear the log file. After prompting for verification, the option clears the screen and log file. This function is available for Director logs only (not Console logs). However, an entry is placed in the *Console Audit* log when a Director log is cleared.
- **Save to File** - Select this option to open the *Save As* dialog box and save log data to a user-specified file on diskette or the Console fixed disk.
- **Print** - Select this option to print the log window contents to a file or printer.

- **Print Setup** - Select this option to open the *Print Setup* dialog box and assign print and printer parameters. Printer selection must be complete (from the *Print Setup* dialog box) before using the *Print* option to print a log file.
- **Close Window** - Select this option to close the log window and return to the *Matrix* window.
- **Exit** - Select this option to close all windows and exit the Director Console application.

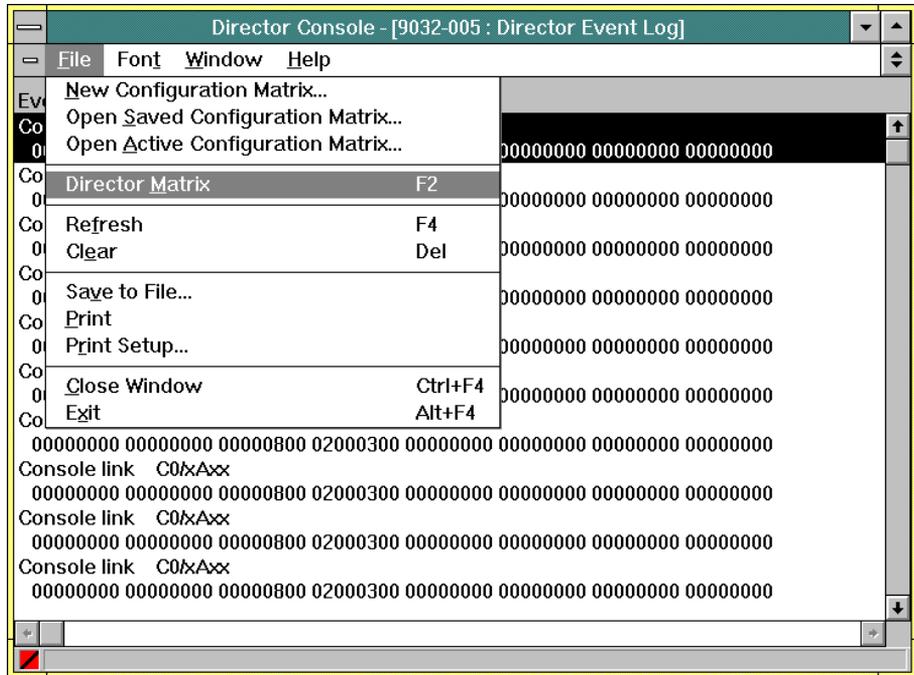


Figure 107. File Menu (Director LIN, Audit, and Event Logs)

Director Log Window Font Menu

The *Font* menu available from the *Director LIN*, *Director Audit*, and *Director Event* logs provides only a *Select* option. Selecting this option opens the *Font* dialog box, where the font, font style, and font size for the log window text are changed and saved.

Director LIN Log

The *Director LIN* log (Figure 108) contains link incident records reported to the Console by the Director. The *Director LIN* log stores up to 128 entries.

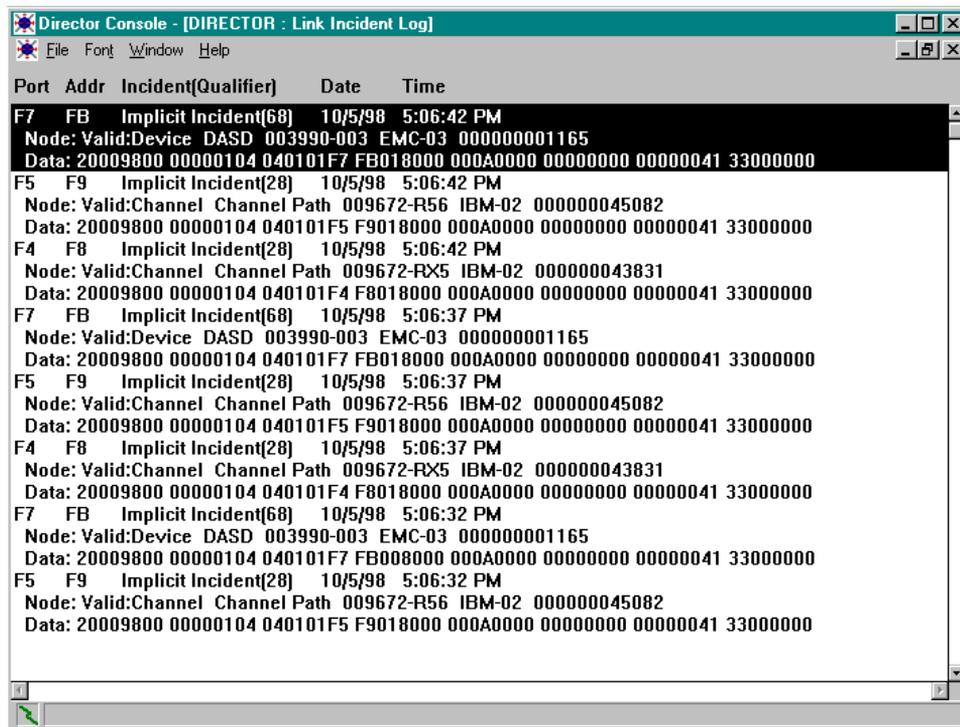


Figure 108. Director LIN Log

The first line of each three-line log entry contains the following columns of information:

- **Port** - The number of the port reporting the incident
- **Addr** - The logical address of the port reporting the incident
- **Incident (Qualifier)** - Incident information reported by the port (used by engineering personnel)
- **Date** - The date the incident was logged
- **Time** - The time the incident was logged.

Note: Entries in the LIN log *Time* field are set to Director time. If a link is not established between the Console and Director (such as at power-on), the *Time* field is blank.

The *Node* entry identifies hardware attached to the port. The hardware is described in the same format as in the Node Descriptor List. The *Data* entry lists raw sense byte information. All 32 sense bytes are displayed.

Director LIN log information is typically useful only to qualified service technicians that are fault isolating a fiber optic link problem. For additional information, refer to Appendix A of the Director-specific maintenance publication listed below:

- *Maintenance Information for the 9032 Model 3 Enterprise Systems Director (SA27-3601)*
- *Maintenance Information for the 9033 Model 4 Enterprise Systems Director (SA27-2638)*
- *Maintenance Information for the 9032 Model 5 Director (SY28-1158).*

Director Audit Log

The *Director Audit* log (Figure 109) tracks and records Console operator activities specific to a Director. The *Director Audit* log stores up to 1,000 entries. The following are examples of 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 IPL of a Director
- Transmitting a new LIC version to a Director.

ID	Event	Parameters	Date	Time
	Link Available	04.03.00	12/2/98	2:26:06 PM
L301	IPL Director		12/2/98	2:25:46 PM
L201	Send LMA Version	04.03.00	12/2/98	2:25:29 PM
	Link Available	04.03.00	12/2/98	2:25:25 PM
D	Modify Offline		12/2/98	2:24:36 PM
L301	Set Director Offline		12/2/98	2:24:35 PM
L301	Set Remote Offline		12/2/98	2:24:13 PM
L301	Set Active=Saved		12/2/98	2:23:55 PM
L201	Clear System Error Light		12/2/98	2:22:02 PM
	Link Available	04.03.00	12/2/98	2:19:51 PM
L101	Modify Port Authorization		12/2/98	2:12:43 PM
L301	Set Director Date/Time	12/2/98 2:12:09 PM	12/2/98	2:12:22 PM
L101	Modify Port Authorization		12/2/98	2:11:40 PM
L301	Clear Remote Offline		12/2/98	2:11:19 PM
	Link Available	04.03.00	12/2/98	2:05:40 PM
	Link Available	04.03.00	12/2/98	2:01:57 PM
	Link Available	04.03.00	12/2/98	2:01:27 PM

Figure 109. Director Audit Log

The *Director Audit* log contains the following columns of information:

- **ID** - The password identification of the Console operator performing the action, or the image identification and port address over which the action was requested by a host application (such as SA/MVS, SA OS/390, or ESCON Manager).
 - **Event** - A brief description of the action performed.
 - **Parameters** - Any identification parameters (such as port address or matrix name) associated with the action.
 - **Date** - The date the action was logged.
 - **Time** - The time the action was logged.
- Note:** Entries in the *Director Audit* log *Time* field are set to Director time. If a link is not established between the Console and Director (such as at power-on), the *Time* field is blank.

Director Event Log

The *Director Event* log (Figure 110) contains Director hardware and software incidents reported to the Console by the Director. The log also records changes to the state of the Token Ring link between the Director and Console. The *Director Event* log stores up to 256 entries.

Event	Op Panel	Date	Time
H/W - Power Supply	0D/0800	12/2/98	1:41:11 PM
1000E000 00000D02 04030400 00000000 00000000 00000000 05000200 00008000			
H/W - Power Supply	0D/0800	12/2/98	1:41:09 PM
1000E000 00000D02 04030400 00000000 00000000 00000000 04000000 00008000			
H/W - CTP	09/0200	12/2/98	1:41:01 PM
1000E000 00000902 0403040A 00000000 00000000 00000000 00000000 00002000			
H/W - Power Supply	0D/1800	12/2/98	1:41:00 PM
1000E000 00000D02 04031400 00000000 00000000 00000000 03000000 00008000			
H/W - Token-Ring Adapter	0C/0A01	12/2/98	1:40:32 PM
1000E000 00000C02 04030B05 01000000 00000000 00000000 00000000 0000A000			
H/W - CTP	09/3200	12/2/98	1:40:25 PM
1000E000 00000902 04033405 00000000 00000000 00000000 00000000 00002000			
Console link	C0xAxx	12/2/98	1:40:40 PM
00000000 00000000 00000800 01000000 00000000 00000000 00000000 00000000			
Console link	C0xAxx	12/2/98	1:40:35 PM
00000000 00000000 00000800 00000500 00000000 00000000 00000000 00000000			
H/W - Crosspoint Controller	0A/1100	12/2/98	1:39:45 PM
1000E000 00000A02 0403022B 010000FF 000000FF 00000000 03FF0000 00001300			
Console link	C0xAxx	12/2/98	1:39:54 PM
00000000 00000000 00000800 01000000 00000000 00000000 00000000 00000000			
Console link	C0xAxx	12/2/98	1:39:54 PM
00000000 00000000 00000800 00000500 00000000 00000000 00000000 00000000			
H/W - Crosspoint Controller	0A/1100	12/2/98	1:39:33 PM
1000E000 00000A02 040312A1 030000FF 000000FF 00000100 02FF0000 00001300			
H/W - CTP	09/0201	12/2/98	1:39:26 PM
1000E000 00000902 0403040A 01000000 00000001 00000000 00000000 00002000			

Figure 110. Director Event Log

Note: A maintenance authorization password (default is **LEVEL002**) is required to open the *Director Event* log.

The first line of each two-line log entry contains the following columns of information:

- **Event** - A brief message that describes the event and reflects the contents of the event code.
- **OP Panel** - Information that mirrors the contents of the corresponding Director's operator panel status display.
- **Date** - The date the incident was logged.
- **Time** - The time the incident was logged. The *Time* field is blank for Console link events.

The second line of the log entry contains lists raw sense byte information. All 32 sense bytes are displayed.

Director Event log information is typically useful only to qualified service technicians that are fault isolating a Director problem. For additional information, refer to Appendix A of the Director-specific maintenance publication listed below:

- *Maintenance Information for the 9032 Model 3 Enterprise Systems Director* (SA27-3601)
- *Maintenance Information for the 9033 Model 4 Enterprise Systems Director* (SA27-2638)
- *Maintenance Information for the 9032 Model 5 Director* (SY28-1158).

Hardware Configuration

Selecting the *Hardware Configuration* option displays a Director-specific log window containing information about hardware installed in the Director. The option is available *only* from an *Active Matrix* or *Port Maintenance* window. The *Hardware Configuration* window contains the following columns of information:

- **FRU Name** - An abbreviation or title that defines the installed FRU.
- **Position** - The number of the Director's chassis slot (starting at 00) where the FRU is installed.
- **Status** - The FRU operational status.
- **Part Number** - The FRU part number.
- **Serial Number** - The FRU serial number.
- **Power-On Hours** - The *total* number of hours the FRU has been powered on. This value is not Director-specific. For example, if a FRU is installed in a Director, then removed and used in another Director, the value reflects the total power-on hours in both Directors.
- **FRU Data** - The supplementary original equipment manufacturer (OEM) part number.

Figure 111 shows the *Hardware Configuration* window for the 9032-003 ESCON Director.

FRU Name	Position	Status	Part Number	Serial Number	Power-On Hours	FRU Data
Director			11G4604	000003009032	13838	002-001202-000
CTP	00	Backup	11G4655	84240729	7413	470-000328-510
CTP	01	Active	11G4655	84240104	2910	470-000328-305
TKRG	00	Active	11G4626	S5100078	11518	470-000329-303
TKRG	01	Backup	11G4653	S4340102	8197	470-000329-305
DVP	01	Active	26H7105	E4475393	16792	470-000341-111
DVP	02	Active	26H7105	E4495648	13200	470-000341-111
DVP	16	Active	26H7105	E4464517	15894	470-000341-111
DVP	20	Active	26H7105	E4475375	16289	470-000341-111
DVP	24	Active	26H7105	E5199934	12816	470-000341-111
DVP	26	Active	26H7438	E4432807	20277	470-000341-110
MXC	00	Backup	11G4660	B41241300	22904	470-000324-502
MXC	01	Active	11G4660	S4380694	18648	470-000324-403
MXS	00	Backup	11G4624	8423351	33591	470-000325-302
MXS	01	Active	11G4624	S4410257	22427	470-000325-302
PWR	00	Active				
PWR	01	Active				
FAN	00	Active				
FAN	01	Active				
FAN	02	Active				

Figure 111. *Hardware Configuration* Window (9032-003 Director)

Figure 112 shows the *Hardware Configuration* window for the 9033-004 ESCON Director.

FRU Name	Position	Status	Part Number	Serial Number	Power-On Hours	FRU Data
Director			11G4604	000000000002	17374	002-001202-000
CTP	00	Active	11G4655	87071281	10865	470-000328-700
TKRG	00	Active	11G4656	S4670335	22599	470-000329-306
DVP	00	Active	26H7438	E4475263	18975	470-000341-110
DVP	01	Active	26H7105	E5190147	14915	470-000341-111
DVP	02	Active	26H7105	E6150917	6504	470-000341-400
MXCMXS	00	Active	11G4689	85280340	6243	470-000342-201
PWR	00	Active				
FAN	00	Active				
FAN	01	Active				

Figure 112. *Hardware Configuration* Window (9033-004 Director)

Figure 113 shows the *Hardware Configuration* window for the 9032-005 Director.

FRU Name	Position	Status	Part Number	Serial Number	Power-On Hours	FRU Data
Director			07H5905	000000000002	1914	002-002082-000
CTP	00	Active	07H5914	88210186	21	470-000370-206
CTP	01	Backup	07H5914	00000067	6746	470-000370-100
TKRG	00	Active	07H5918	88190374	1917	470-000376-100
DVP	00	Active	07H5942	87281457	7120	470-000374-401
FCV	05	Active	12K0070	88330105	537	470-000392-502
DVP	07	Active	07H5942	87281260	7494	470-000374-401
DVP	10	Active	07H5942	87281410	2953	470-000374-401
DVP2	13	Active	07H5945	87331750	2993	470-000373-102
DVP	18	Active	07H5942	87281335	6972	470-000374-401
DVP	21	Active	07H5942	88150287	1494	470-000374-403
DVP	25	Active	07H5942	87281278	6296	470-000374-401
DVP	26	Active	07H5942	87281461	8613	470-000374-401
DVP	28	Active	07H5942	87281262	9177	470-000374-401
MXC	01	Active	12K0071	88361191	978	470-000390-101
MXS	02	Active	07H5916	87201686	7504	470-000372-100
MXS	03	Active	07H5916	87201684	6223	470-000372-100
LBA	00	Active	07H5917	R8271081	1918	002-002110-000
PWR	00	Active				
PWR	01	Active				
FAN	00	Active				
FAN	01	Active				

Figure 113. *Hardware Configuration Window (9032-005 Director)*

Hardware Audit Log

The *Hardware Audit* log (Figure 114) provides a hardware configuration change history. The Director Console reevaluates hardware configuration information when a FRU is removed or replaced. Changes that occur while the link between the Director and Console is unavailable are detected only when the link is reestablished.

The Director cannot determine the difference between removal or failure of a fan assembly, or removal or failure of the operator panel. Changes made to a fan assembly do not appear in the *Hardware Audit* log, and changes made to the operator panel appear in the log only after power-on or IML.

The *Hardware Audit* log contains the following columns of information:

- **FRU** - An abbreviation or title that defines the changed FRU.
- **Position** - The number of the Director's chassis slot (starting at 00) where the FRU is removed or replaced.
- **Action** - Indicates if the FRU is added or removed.
- **Part Number** - The FRU part number.
- **Serial Number** - The FRU serial number.

- **Date** - The date the change is detected.
- **Time** - The time the change is detected.

The screenshot shows a window titled "Director Console - [9032-003 : Hardware Audit Log]". The window has a menu bar with "File", "Font", "Window", and "Help". Below the menu bar is a table with the following columns: FRU, Position, Action, Part Number, Serial Number, Date, and Time. The table contains 15 rows of data, alternating between "Added" and "Removed" actions.

FRU	Position	Action	Part Number	Serial Number	Date	Time
DVP	26	Added	26H7438	E4432807	12/2/98	2:06:23 PM
CTP	0	Added	11G4655	84240729	12/2/98	2:06:23 PM
CTP	0	Removed	Unknown		12/2/98	2:06:23 PM
DVP	26	Removed	26H7438	E4432807	12/2/98	2:06:02 PM
CTP	0	Added	Unknown		12/2/98	2:05:57 PM
CTP	0	Removed	11G4655	84240729	12/2/98	2:05:41 PM
MXS	0	Added	11G4624	8423351	12/2/98	2:02:01 PM
MXC	0	Added	11G4660	B41241300	12/2/98	2:02:01 PM
MXS	0	Removed	11G4624	8423351	12/2/98	2:01:37 PM
MXC	0	Removed	11G4660	B41241300	12/2/98	2:01:37 PM
MXS	1	Added	11G4624	S4410257	12/2/98	2:01:25 PM
MXC	1	Added	11G4660	S4380694	12/2/98	2:01:25 PM
MXS	1	Removed	11G4624	S4410257	12/2/98	2:01:07 PM
MXC	1	Removed	11G4660	S4380694	12/2/98	2:01:07 PM

Figure 114. Hardware Audit Log

Node Descriptor List

Selecting the *Node Descriptor List* option displays a Director-specific log window containing information about devices attached to Director ports. The option is available *only* from an *Active Matrix* window.

The log lists all Director port addresses and associated node descriptions (refer to "[Node Descriptor](#)" on page 106 for an explanation). Log information is provided to the Director by the attached devices.

The *Node Descriptor List* contains the following columns of information:

- **Addr** - The assigned logical port address for the node.
- **Validity** - The node descriptor reported by the attached device has one of the following values:
 - **Valid** - A node descriptor flagged as *Valid* is received from the node.
 - **Not Current** - A response is not received from the node for a descriptor. The last valid descriptor is used, but flagged as *Not Current*.

— **Invalid** - A flag is received with the node descriptor that identifies the information received as *Invalid*.

- **Node** - The node is either a device type or channel subsystem type. The *Class* field is dependent on the node type.
- **Class** - If the node is a device type, the class describes the general device, such as direct access storage device (DASD), printer, or magnetic tape. If the node is a channel subsystem type, the class (if specified) is either a channel path or an integrated channel-to-channel adapter (CTCA).
- **Type - Model** - A six-character type number is followed by a three-character model number. These numbers correspond to the type and model numbers indicated on the machine serial number plate.
- **Manufacturer - Plant** - A three-character manufacturer code is followed by a two-character plant of manufacture code. These numbers identify the manufacturer of the device.
- **Sequence Number** - This 12-character number (usually preceded by the two-character plant code above) corresponds to the device serial number on the machine serial number plate.
- **Tag** - The tag encodes the interface identification of the port originating the node descriptor information.

Figure 115 shows the *Node Descriptor List* for the 9032-003 ESCON Director.

Addr	Validity	Node	Class	Type-Model	MF-Plant	Sequence Nbr	Tag
E8	Valid	Channel	Channel Path	009672-R22	IBM-02	000000044556	002C
E9	Invalid						
EA	Invalid						
EB	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	006D
EC	Invalid						
ED	Valid	Channel	Channel Path	009672-R22	IBM-02	000000044556	000D
EE	Invalid						
EF	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	006F
F0	Invalid						
F1	Invalid						
F2	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	006E
F3	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0043
F4	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0040
F5	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0041
F6	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0042
F7	Invalid						
F8	Not Current	Device	DASD	003990-G03	IBM-02	000000033729	001C
F9	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0046
FA	Valid	Device	Tape	003490-D42	IBM-13	000000010117	0040
FB	Valid	Device	DASD	003990-G03	IBM-02	000000033729	000C

Figure 115. *Node Descriptor List* (9032-003 Director)

Figure 116 shows the *Node Descriptor List* for the 9033-004 ESCON Director.

Addr	Validity	Node	Class	Type-Model	MF-Plant	Sequence Nbr	Tag
C0	Valid	Device	DASD	003990-G03	IBM-02	000000033729	000C
C1	Invalid						
C2	Invalid						
C3	Invalid						
C4	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0046
C5	Invalid						
C6	Valid	Device	DASD	003990-G03	IBM-02	000000033729	001C
C7	Valid	Channel	Channel Path	009672-RX6	IBM-02	000000048700	0041
C8	Invalid						
C9	Invalid						
CA	Invalid						
CB	Invalid						
CC	Invalid						
CD	Invalid						
CE	Invalid						
CF	Invalid						
CUP	Valid	Device	Switch	009033-004	IBM-02	012345678912	0000

Figure 116. Node Descriptor List (9033-004 Director)

Figure 117 shows the Node Descriptor List for the 9032-005 Director.

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 117. Node Descriptor List (9032-005 Director)

Port Maintenance

Selecting the *Port Maintenance* option displays a Director-specific window that displays a visual representation of the hardware configuration and port address mapping of the selected Director.

Components of the *Port Maintenance* window indicate the status of represented FRUs. Indicated states for each FRU are:

- **FRU is shaded black** - The FRU is not installed.
- **FRU contains all diagonal lines** - The FRU is a redundant (backup) component (9032-003 and 9032-005 Directors only).
- **FRU is shaded yellow** - The FRU requires service.

Figure 118 shows the *Port Maintenance* window for the 9032-003 ESCON Director.

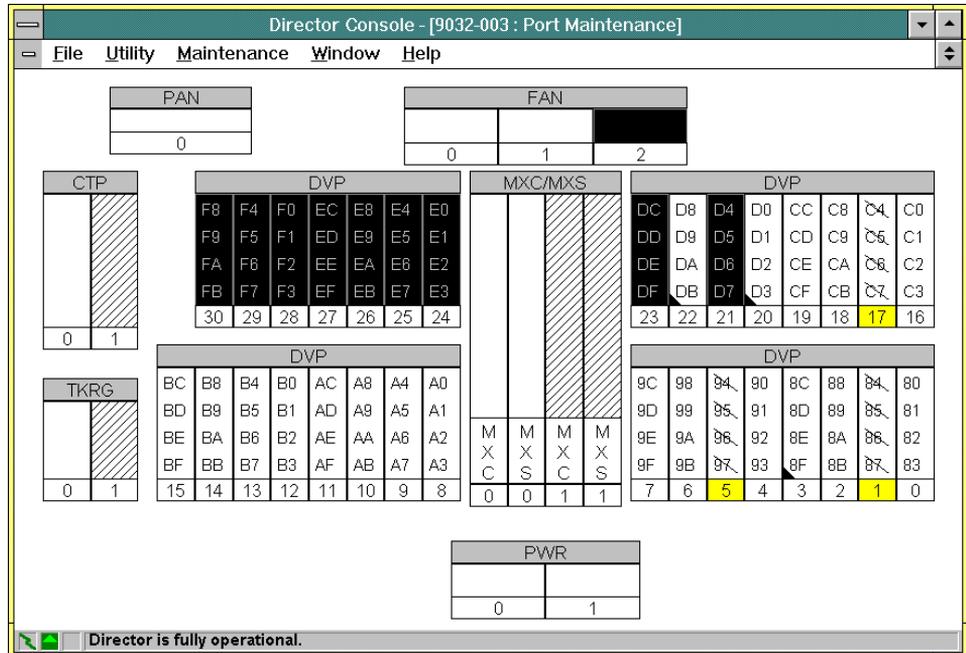


Figure 118. Port Maintenance Window (9032-003 Director)

Figure 119 shows the *Port Maintenance* window for the 9033-004 ESCON Director.

The type of port card (Fibre Channel Converter (FCV), light-emitting diode (LED), or Extended Distance Feature (XDF) Laser) is indicated for each port card installed. Type indicators are:

- **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 corner (lower right corner for the 9033-004 Director, lower left corner for the 9032-003 and 9032-005 Directors).
- **LED Port card** - The port card display shows no distinguishing characteristics.

The status of logical port addresses appears for each Director port. Indicated states for each port address are:

- **Port address is underlined in blue** - The logical port address is blocked
- **Port address is crossed out with a backslash (\)** - The logical port address requires service.
- **Port address is green with a green asterisk** - The logical port address was swapped (physical port mapping was modified). Refer to "[Swap Ports](#)" on page 129 for additional information.

When accessed from the *Port Maintenance* window, the *Maintenance* menu also contains *Swap Ports* and *Port Diagnostics* options. Both options require a maintenance authorization password for access.

Swap Ports

Select the *Swap Ports* option from the *Port Maintenance* window's *Maintenance* menu. The *Maintenance Authorization* dialog box appears. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *Port Swapping* dialog box appears ([Figure 121](#)).

Options at the dialog box allow mapping of physical Director ports to be modified to match logical addresses used on an attached host and on the *Matrix* window. At the *Port Maintenance* window, an asterisk appears adjacent to a logical port address that is swapped. Both the port address and asterisk are shaded green.

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 port can only be swapped with another FCV port. In addition, unaddressable FCV ports cannot be swapped.

Port swapping is typically performed by qualified service technicians that are removing and replacing a port card. For additional information, refer to Chapter 3 of the Director-specific maintenance publication listed on the following page:

- *Maintenance Information for the 9032 Model 3 Enterprise Systems Director (SA27-3601)*
- *Maintenance Information for the 9033 Model 4 Enterprise Systems Director (SA27-2638)*
- *Maintenance Information for the 9032 Model 5 Director (SY28-1158).*

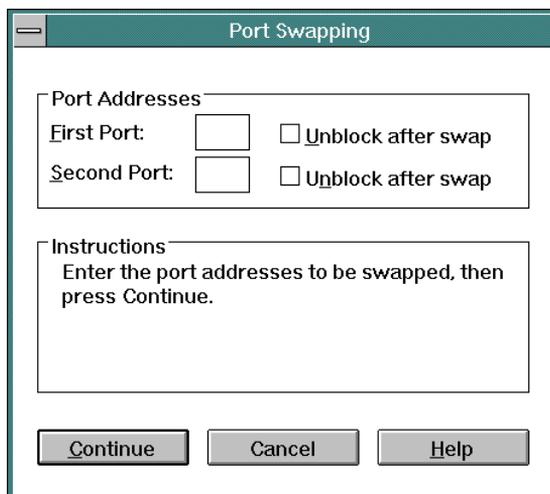


Figure 121. Port Swapping Dialog Box

Port Diagnostics

When the *Port Diagnostics* option is selected 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.

ESCON

Select the *Port Diagnostics* and *ESCON* options from the *Port Maintenance* window's *Maintenance* menu. The *Maintenance Authorization* dialog box appears. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *Online ESCON Port Diagnostics* dialog box appears (Figure 122).

Options at the dialog box allow personnel to perform online ESCON port diagnostic tests from the Director Console. Internal loopback, external loopback, and matrix diagnostic tests are available. Test results appear in the dialog box.

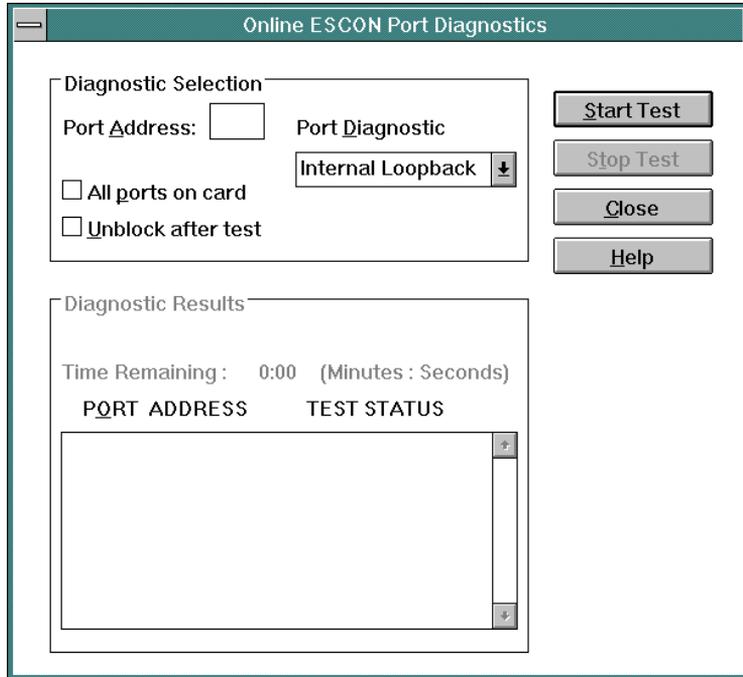


Figure 122. Online ESCON Port Diagnostics Dialog Box

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 123).

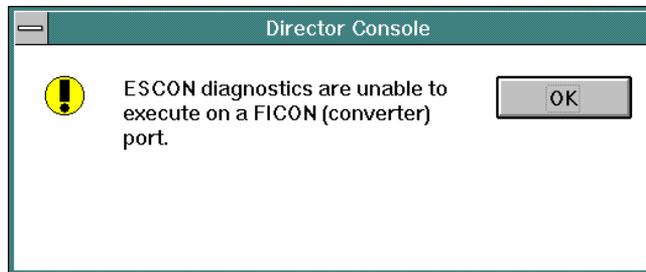


Figure 123. ESCON Diagnostics Message Box

Port diagnostics are typically performed by qualified service technicians who are fault isolating a Director problem. For additional information, refer to Chapter 2 of the Director-specific maintenance publication listed on the following page:

- *Maintenance Information for the 9032 Model 3 Enterprise Systems Director (SA27-3601)*
- *Maintenance Information for the 9033 Model 4 Enterprise Systems Director (SA27-2638)*
- *Maintenance Information for the 9032 Model 5 Director (SY28-1158).*

FICON

Select the *Port Diagnostics* and *FICON* options from the *Port Maintenance* window's *Maintenance* menu. The *Maintenance Authorization* dialog box appears. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *Online FICON Port Diagnostics* dialog box appears (Figure 124).

Figure 124. *Online FICON Port Diagnostics Dialog Box*

Options at the dialog box allow personnel to perform online FCV port diagnostic tests from the Director Console. Test results appear in the dialog box.

Note: The *FICON* option performs diagnostics only for addressable FCV ports. If an attempt is made to perform LED, XDF Laser, or unaddressable FCV port diagnostics using the *FICON* option, the following message box appears (Figure 125).

Port diagnostics are typically performed by qualified service technicians who are fault isolating a Director problem. For additional information, refer to Chapter 2 of *Maintenance Information for the 9032 Model 5 Director (SY28-1158)*.

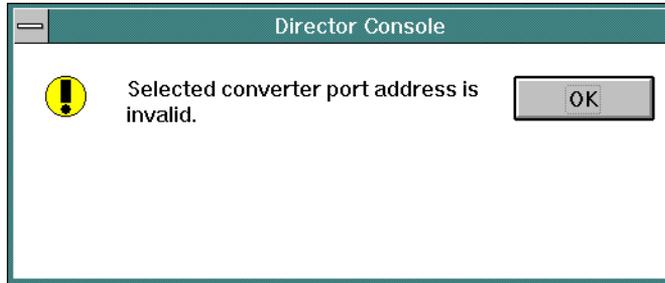


Figure 125. FICON Diagnostics Message Box

Advanced

When the *Advanced* option is selected from the *Maintenance* menu, a second menu appears with the *Terminal* and *LMA Versions* options.

Terminal

Select the *Advanced* and *Terminal* options from the *Maintenance* menu. The *Maintenance Authorization* dialog box appears. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *Terminal* window appears (Figure 126). The option is available *only* from an *Active Matrix* window.

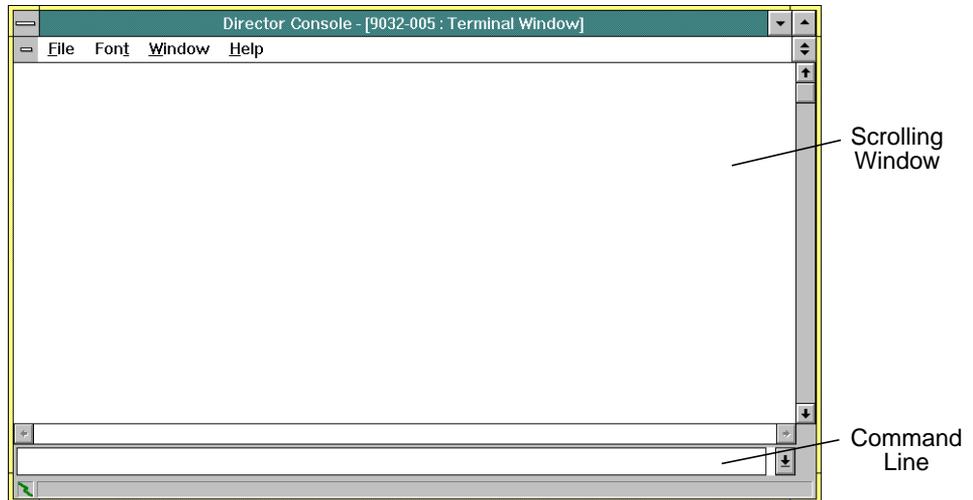


Figure 126. Terminal Window

The scrolling window part of the *Terminal* window displays the results of instructions entered at the command line. Previously entered commands are recalled and displayed by using the up and down arrow keys, clicking the arrow button at the right of the field, or pressing the **F4** key.

Commands entered at the *Terminal* window are transmitted to the selected Director without interpretation by the Console. Corresponding results are transmitted directly to the Console for display.

Unlike other log windows, the *Terminal* window *File* menu provides a *Capture* option. When the option is selected, the *Enter Filename* dialog box appears (Figure 127). At the dialog box, enter a filename and path under which to store all subsequent *Terminal* window commands and responses for the selected Director (as long as the window remains open). Capture mode (enabled) is indicated by a check mark adjacent to the menu option after the file name is specified. Capture mode is disabled by selecting the *Capture* option again.

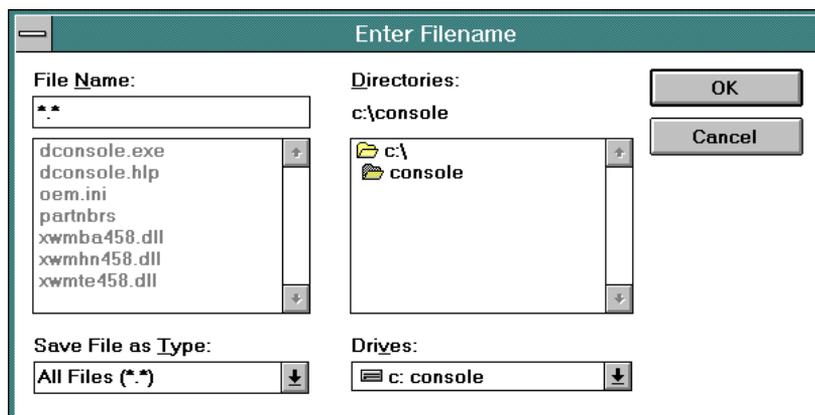


Figure 127. Enter Filename Dialog Box

For additional information about the *Terminal* window and associated commands, refer to Appendix E of the Director-specific maintenance publication listed below:

- *Maintenance Information for the 9032 Model 3 Enterprise Systems Director* (SA27-3601)
- *Maintenance Information for the 9033 Model 4 Enterprise Systems Director* (SA27-2638)
- *Maintenance Information for the 9032 Model 5 Director* (SY28-1158).

LMA Versions

The *LMA Versions* dialog box (Figure 128) displays a list of LMA versions stored on the Console fixed disk. Up to three LMA versions can be maintained. From this dialog box, new LMA versions are installed on the fixed disk, existing version descriptions are edited, and unused versions are deleted.

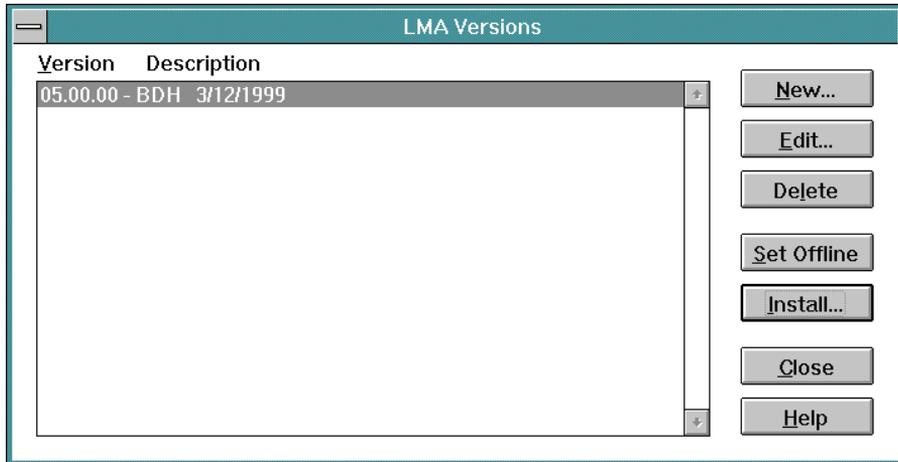


Figure 128. LMA Versions Dialog Box

Dialog box buttons and functions are:

- **New** - Provides the ability to load a new LMA version from diskettes to the Director Console fixed disk.
 - **Edit** - Allows the description (for a selected LMA version) to be edited.
 - **Delete** - Deletes the selected LMA version from the Console fixed disk.
 - **Set Offline** - Allows the operator to set the Director offline.
- Note:** When installing a LMA version to a Director without a redundant CTP card, ensure the Director is set offline prior to installing the LMA version.
- **Install** - Installs the selected LMA version to the Director.
 - **Close** - Closes the dialog box.

The six-digit LMA version number (XX.YY.ZZ) represents the following:

- XX - LMA version level
- YY - LMA release level
- ZZ - LMA patch level.

Attention!

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.

Collect Maintenance Information

The *Collect Maintenance Information* option transfers information to the Console fixed disk for later retrieval to a diskette through the data collection procedure. The information collected is typically used by service personnel.

Select the option from the *Maintenance* menu. The *Collect Maintenance Information* dialog box appears (Figure 129). The option is available *only* from an *Active Matrix* window.

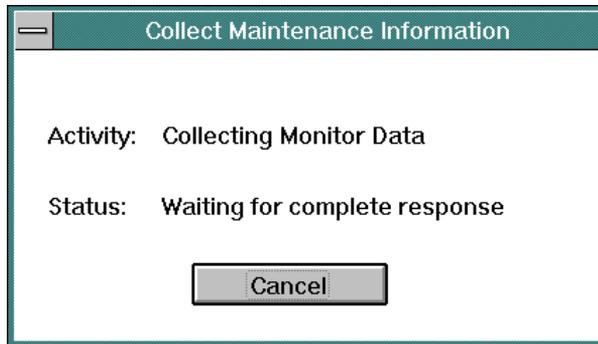


Figure 129. *Collect Maintenance Information Dialog Box*

While maintenance information is collected, the dialog box describes the current activity and the status of that activity. When information collection activities complete, the dialog box closes and the following message box appears (Figure 130).

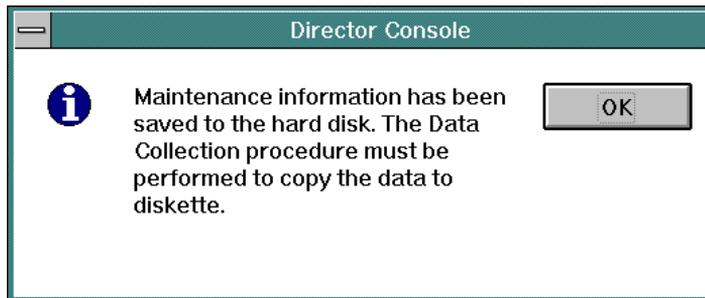


Figure 130. *Maintenance Information Message Box*

To transfer maintenance information to a diskette for later analysis by qualified maintenance personnel, perform the data collection procedure. 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.

Console Link Statistics

Select the *Console Link Statistics* option from the *Maintenance* menu. The *Console Link Statistics* dialog box (Figure 131) appears. The dialog box displays the status of the Token Ring link between a selected Director and the Console, and data and error counts to help diagnose problems associated with the link. The counts are separate for each Director-to-Console link.

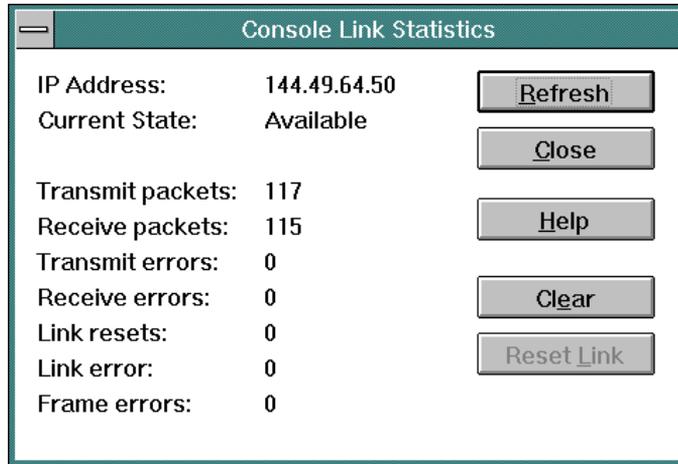


Figure 131. Console Link Statistics Dialog Box

The values displayed are not dynamically updated while the dialog box is open. However, the *Refresh* button can be selected to update and redisplay the contents. The contents of the dialog box can also be cleared (by selecting the *Clear* button) to compare accumulated counts at a later time. When the Director-to-Console link is unavailable, the link can be manually reset (by selecting the *Reset Link* button). If a problem exists, the Director or Console usually resets the link automatically.

The *Console Link Statistics* dialog box provides a link identifier values section, a link statistics data count values section, and control buttons.

Link Identifier Values

Link identifier values include:

- **IP Address** - The Internet Protocol (IP) address of the Director for which the Director-to-Console link statistics apply. The IP address is defined in the *Director Definition* dialog box (Figure 39 on page 52).
- **Current State** - An *Available* state indicates the Director-to-Console link is performing normally. An *Unavailable* state indicates the link is down. Although automatic recovery is normally in process, the link can be manually reset with the *Reset Link* button. When the link is unavailable, the reason for the condition also appears.

Link Statistics Data Count Values

Link statistics data count values include:

- **Transmit and Receive packets** - The displayed values are counts of low-level User Datagram Protocol (UDP) data packets transmitted from the Console to the selected Director, and received from the Director by the Console application.
- **Transmit and Receive errors** - The displayed values are counts of automatically recoverable errors that are normally encountered with heavy traffic on the link. Some errors do not necessarily indicate a problem.
- **Link resets** - The displayed value indicates the number of times the link was brought down (unavailable), due to physical conditions (Director powered off or cable removed) or link errors. When the link becomes unavailable, it automatically performs a recovery process.
- **Link error** - The value indicates the last encountered communications error between the Console application and the Token Ring application interface software (socket error). The value is not an error count.
- **Frame errors** - The displayed value indicates the number of packets sent that were corrupted and resent. In case of multiple errors, several attempts are made to force a retransmission of the data before the link is automatically brought down and restarted.

Control Buttons

The dialog box provides the following control buttons:

- **Refresh** - Reads the latest data and error counts, and refreshes the dialog box with current information. This function is useful because the dialog box does not update dynamically.
- **Close** - Closes the dialog box.
- **Help** - Opens a window to access online help for the dialog box.
- **Clear** - Clears all data and error counts and resets the values to zero. This function is useful when comparing counts over time, and helps to determine which counters continue to increment.
- **Reset Link** - This button is enabled only if the state is *Unavailable*, because the link does not need to be reset otherwise. When the button is selected, the link is reset and a restart is attempted by the Console. This function is not normally required, because link recovery is automatic.

Chapter 4. Configuring Port Connections

This chapter describes how to configure a Director matrix and set port attributes with different states and priorities. Two configuration exercises, from opening a new matrix through saving and activating the matrix, are included in the chapter.

Note: All descriptions of the matrix in this chapter, including Fibre Connection (FICON) or Enterprise Systems Connection (ESCON) port attributes, assume the matrix is in graphic display mode. To enable graphic display mode, enable (check) the *Graphic Display* option from the *View* pull-down menu. For a comparison between graphic display mode and nongraphic display mode, refer to "[Graphic Display](#)" on page 102.

Matrix Highlights and Symbols

The Director matrix window ([Figure 132](#)) provides a visual interface that displays port connection and configuration attributes for a selected Director, and allows an operator to change those attributes. The window illustrates port selection (highlighting) and port attribute symbols (blocked, dedicated, prohibited).

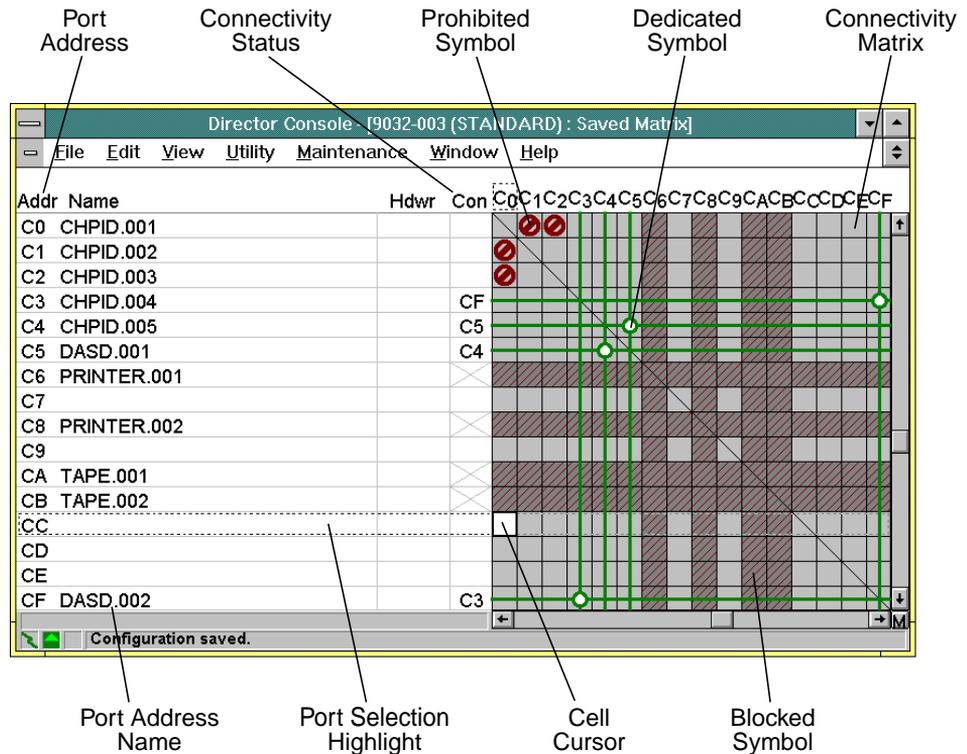


Figure 132. Director Matrix Highlights and Symbols

Address Selection Highlight

Each port address must be individually selected (highlighted) before performing a connection change request. The selected address is highlighted by a dashed box that surrounds the port address, port name, status columns, and matrix cells for the selected address (port address 12 in [Figure 132](#)).

Because prohibited and dedicated connection attributes affect the intersection of two port addresses, a single cell cursor is highlighted (as a white cell) for modification of these attributes for the selected address. Use the keyboard arrow keys or the mouse to move the cell cursor as required. The position of the cell cursor selects the port address within highlight area. [Figure 132](#) illustrates the cell cursor within a port selection highlight area.

Invalid Cell Locations

Certain cell locations in the matrix are invalid for intersection connections (such as allow, block, dedicate, or prohibit). Invalid locations include the intersection of a port address with itself (such as the intersection of port C0 with C0). Self-intersection cells are indicated by a solid diagonal line through the matrix.

Fibre Channel Converter (FCV) Port cards cannot be dynamically connected. An FCV-to-FCV connection is automatically prohibited by the Console application (indicated by a **P** in the cell intersection), and the connectivity attribute cannot be changed.

The white cell cursor may be moved into an invalid cell because other operations are valid for the port address, but connection attribute functions are restricted. The matrix *Edit* menu indicates which operations are invalid for a selected cell. Invalid menu options are grayed out.

Port Attribute Symbols

The matrix window displays symbols for each connectivity attribute. Prohibited connections ([Figure 135](#) on page 142) are displayed at the intersection of the affected port addresses. Blocked connections ([Figure 133](#) on page 141) and dedicated connections ([Figure 134](#) on page 141) are displayed across all affected port addresses, allowing quick visual identification even if an associated connection does not appear in the visible portion of the matrix window.

When a matrix attribute is modified, the attribute is highlighted to identify changes made to the configuration. Attributes changed since the configuration was last read appear in a brighter color or intensity. Attributes changes that are cleared appear in a more subdued color. Changed text (or port address numbers affected by the change) appear in blue. These highlights and color changes revert to normal after the a change is activated (for an active matrix) or saved (for a saved matrix).

Note: Activating a modified (but not saved) attribute for a previously saved matrix sets the attribute for the active matrix but not the saved matrix. For example, if a prohibited port connection is added to a saved matrix and then activated, the active matrix contains the prohibited connection. The saved matrix displays the highlighted port connection attribute (bright red) until the matrix is saved again. Exiting the saved matrix (without saving the attribute change) discards the highlighted attribute, but the change remains in effect in the active matrix.

Examples of attribute highlighting (blocked, dedicated, and prohibited) are shown in the following figures. [Figure 133](#) illustrates blocked symbol highlighting.

Blocked Symbol Highlighting

<p>Currently Blocked: Dark Bar with Red Stripes, Grey X in Connections column. Port address is currently blocked.</p>	
<p>Unblocked to Blocked: Dark Bar with Yellow Stripes, Blue X in Connections column. Port address has been blocked since the configuration was read. The attribute changes to the Currently Blocked appearance after activating or saving.</p>	
<p>Blocked to Unblocked: No Bar with Olive Stripes, Yellow X in Connections column. Port address has been unblocked since the configuration was read. Attribute is cleared from the display after save or activation.</p>	

Figure 133. Blocked Symbol Highlighting

[Figure 134](#) illustrates dedicated symbol highlighting.

Dedicated Symbol Highlighting

<p>Currently Dedicated: Dark Green Indicator bars with Black address. Port address intersection is currently dedicated.</p>	
<p>Not Dedicated to Dedicated: Bright Green Indicator bars with Blue address. Port address intersection has been dedicated since the configuration was read. Attribute changes to the Currently Dedicated (dark green) appearance after activating or saving.</p>	
<p>Dedicated to Not Dedicated: Olive Indicator bars with Olive address. Port address intersection had been dedicated and has been cleared since the configuration was read. Attribute will be cleared from the display after save or activation.</p>	

Figure 134. Dedicated Symbol Highlighting

Figure 135 illustrates prohibited symbol highlighting.

Prohibited Symbol Highlighting

Currently Prohibited: Dark Red symbol. Port address intersection is currently prohibited and has not been modified.	
Allowed to Prohibited: Bright Red symbol. Port address intersection has been prohibited since the configuration was read. Attribute will change to the Prohibited appearance after activating or saving.	
Prohibited to Allowed: Olive symbol. Port address intersection had been prohibited and has been cleared (allowed). Attribute will be cleared from the display after save or activation.	

Figure 135. Prohibited Symbol Highlighting

Connectivity Hierarchy

Multiple connectivity attributes can be assigned to a single port address. With certain exceptions (for example FICON-to-FICON), port addresses can be configured to be simultaneously blocked, dedicated, and prohibited. Assigning more than one connectivity attribute to a port (ESCON or FICON) creates the following hierarchy.

1. The **Blocked** attribute has the highest precedence and overrides all other attributes (dedicated, prohibited, allowed) assigned to a port.
2. The **Dedicated** attribute has second precedence and overrides the prohibited and allowed attributes.
3. The **Prohibited** attribute has third precedence and overrides only the allowed attribute.
4. The **Allowed** attribute has the lowest precedence and does not override any other attributes.

Using the Mouse

Most areas of the matrix window are sensitized for mouse usage. Clicking with the mouse selects a specific position on the matrix grid. Double-clicking in one of the sensitized mouse areas performs a task such as opening a dialog box or placing an attribute symbol. The matrix window can be maximized or minimized as in normal operations, and the matrix window scroll bars perform normal scrolling actions on the matrix.

Actions within the matrix window are initiated with the mouse by positioning the mouse cursor as indicated (refer to [Figure 132](#) on page 139) and performing one of the following operations:

- **Single-click (left button)** - Selects the address under the cursor. The dashed highlight box is moved to the selected address. If the mouse cursor is on a port address, or name, or within the status columns for an address, that address is selected and the intersection cell indicator (white box) is not changed. If the mouse click occurs within the gray matrix area, the intersection cell indicator is positioned under the cursor as well. If the mouse click occurs on the intersection cell addresses (top row numbers above the matrix), only the horizontal position of the intersection cell indicator will be affected.
- **Double-click (left button)** - Performs a default action at the mouse cursor position.
 - **Port Address, left side** - Displays the *Node Descriptor* dialog box, showing information about the device attached to the port.
 - **Port Address, top of matrix grid** - Swaps the axis of the matrix, providing more information (address name, hardware status, connection status) about the port by putting that port address number on the left side of the matrix. Highlights the row with the chosen port address.
 - **Port Address Name** - The *Name for Address* dialog box is displayed to change the selected port address name.
 - **Blocked Column** - Toggles the blocked attribute state of the port (*B* column; graphic display off).
 - **Connections Column** (*Con* or *C* column) - The *Name and States* dialog box is displayed, to enter a dedicated connection intersection port address and/or to modify the prohibited and/or blocked attributes. Hold the **Ctrl** key while double-clicking in the connections column to toggle the blocked state of the port.
 - **Matrix Grid** - Toggles the prohibited state of the intersection cell. Hold the **Ctrl** key while double-clicking to toggle the dedicated attribute for the intersection cell. Single-clicking moves the address selection highlight and cell cursor.
 - **CUP Name Region** - Displays the *Name for CUP* dialog box to modify the Director's Control Unit Port name.
 - **Link Status Indicator** - Displays the *Console Link Statistics* dialog box to show current status and statistics for the Token Ring link between the Director and the Console.
 - **Director Status Indicator** - Displays the *Director Operational Status* dialog box, explaining any errors encountered on the Director.

Double-clicking any other area of the matrix (such as the *Hardware Status* column) does not perform a function. However, double-clicking anywhere on the matrix window clears any existing Status line message in addition to performing the operation.

- **Ctrl + Double-click (left button)** - When the **Ctrl** key on the keyboard is held down while the left mouse button is double-clicked, an extended action is performed at the mouse cursor position. If the mouse cursor is in the *Con* column, the blocked attribute is toggled for the address. If the mouse cursor is in the matrix area, the dedicated attribute is toggled for the intersection addresses in the cell under the cursor. For other areas, the action will be the same as if the **Ctrl** key was not held.
- **Matrix Map button (single-click left button to select)** - This button is in the lower right corner of the matrix, below the vertical scroll bar. It is a fast method of selecting the Matrix Map.

Note: The *Matrix Map* button is grayed out (unavailable) at a 9033-004 matrix window.

Matrix Keyboard Support

This section describes the special keystrokes available for navigation through the matrix windows.

- **PgUp or F7 / PgDn or F8** - Scrolls the matrix up or down one page, respectively (a page is defined as the number of addresses displayed on a single matrix window).
- **Shift+PgUp / Shift+PgDn** - Scrolls the matrix vertically to the minimum (80 for 9032-003, C0 for 9033, 04 for 9032-005) port address (**Shift+PgUp**) or to the maximum (FB for 9032, CF for 9033) port address (**Shift+PgDn**) without changing the horizontal position.
- **Ctrl+PgUp / Ctrl+PgDn** - Scrolls the matrix left (**Ctrl+PgUp**) or right (**Ctrl+PgDn**) one page.
- **Home / End** - Moves the cell cursor horizontally to the left-most displayed cell (**Home**) or to the right-most displayed cell (**End**).
- **Shift+Home / Shift+End** - Scrolls the matrix horizontally to the minimum (80 for 9032-003, C0 for 9033, 04 for 9032-005) port address (**Shift+Home**) or to the maximum (FB for 9032, CF for 9033) port address (**Shift+End**) without changing the vertical position.
- **Ctrl+Home / Ctrl+End** - Moves the cell cursor to the upper left displayed cell (**Ctrl+Home**) or to the lower right displayed cell (**Ctrl+End**).
- **Ctrl+Shift+Home / Ctrl+Shift+End** - Scrolls the matrix both horizontally and vertically to the minimum port address ([80, 80] for 9032-003, [C0, C0] for 9033, [04, 04] for 9032-005) or to the maximum port address ([FB, FB] for 9032, [CF, CF] for 9033).
- **Ctrl+Ins or C** - Copy all allow/prohibit attributes for the selected address row into the clipboard for later paste operations. Equivalent to the *Edit* menu *Copy* option. This function will copy the attributes into the clipboard for use by the matrix paste operation.

- **Shift+Ins or T** - Inserts (pastes) allow/prohibit attributes from the clipboard into the currently selected address row. Equivalent to the *Edit* menu *Paste* command.
- **Arrow keys** - The arrow keys move the cell cursor one cell in the direction of the arrow. When the selected cell is on the edge of the displayed matrix page (top, bottom, right, or left edge), continued use of the direction key scrolls the matrix one cell, until the minimum or maximum (80 or FB for 9032-003, C0 or CF for 9033, 04 or FB for 9032-005) port address is encountered.
- **Tab / Shift+Tab (BackTab)** - Moves the cell cursor one cell to the right or left, respectively. From the edge of the displayed matrix, subsequent use of these keys moves the selected cell (and the row selection indicator) to the next or previous row, respectively, without changing the displayed matrix position. The bottom right cell wraps to the upper left cell on a **Tab**, and the upper left cell wraps to the lower right on a **Shift+Tab**.
- **A/P** - The upper or lower case alpha character **A** (Allow) clears the Prohibit attribute for the currently selected cell (intersection addresses), and **P** (upper or lower case) sets the prohibit attribute for the currently selected cell. The cell cursor is advanced to the next cell after either character. Hold the **Shift** key down while pressing either key to move the cursor to the previous cell after setting the attribute. Scrolling may occur at either end of the displayed matrix grid.
- **B/U** - The alpha character **B** (upper or lower case) sets the Blocked attribute for the currently selected address, and **U** (upper or lower case) clears (unblocks) the Blocked attribute for the currently selected address. The selection row is advanced down after either character. Hold the **Shift** key down while pressing either key to move the selection row up after setting the attribute. Scrolling may occur at the top or bottom of the displayed matrix grid.
- **Space bar** - The space bar toggles the Prohibit attribute for the currently selected intersection cell. The selection cell is not moved.
- **F4** - Use of this key on an active matrix rereads the current active matrix from the Director. This performs a *Revert to last activated* function. The current Director matrix overwrites any non-activated changes made to the active matrix with the Director's current active matrix.

Creating a New Configuration Matrix (ESCON Only)

This section provides a practical exercise that illustrates ESCON-only operation of the Director Console. It is assumed the Console application software is installed on the PC platform, the Operating System/2 (OS/2) desktop is displayed, and at least one ESCON Director is defined to the Console (refer to "[Director Definition Dialog Box](#)" on page 52 for information). The exercise illustrates how to configure a new configuration matrix (including port connections) for a 9032-003 ESCON Director.

1. At the Director Console's OS/2 desktop, double-click the *Director Console* icon. The Console application initializes and the *Startup* window appears. It may take up to 30 seconds for the Console application to open.

2. Select the *New Configuration Matrix* option from the *File* menu. The *Select Director for New Matrix* dialog box appears (Figure 136). The dialog box contains a list of all configured Directors supported by the Console.

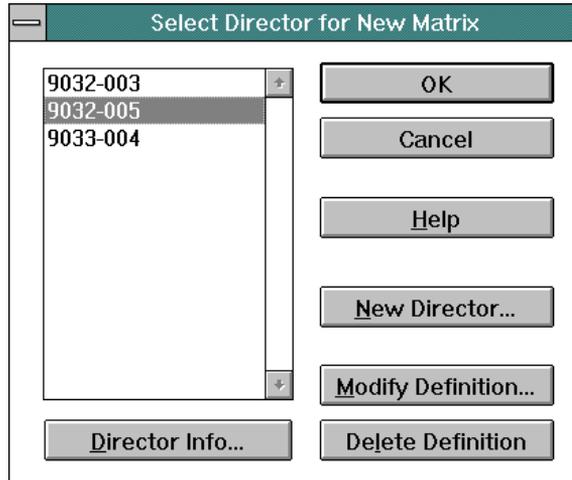


Figure 136. *Select Director for New Matrix* Dialog Box

3. Select the Director for which the new configuration matrix is to be created (**9032-003** in this example) and click the *OK* button. The *New Matrix* window appears (Figure 137).

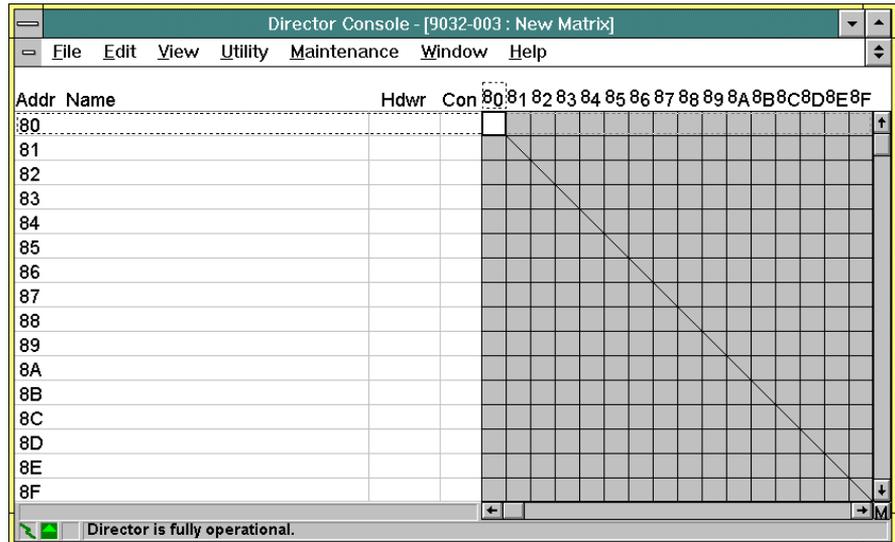


Figure 137. *Matrix* Window (No Attributes Set)

The *Matrix* window appears in graphic display mode with the cell cursor at the first address intersection for the Director type (**80, 80** for a 9032-003, **C0, C0** for a 9033-004, and **04, 04** for a 9032-005). The Director name (**9032-003**) and the type of matrix (**New Matrix**) appear in the title bar at the top of the window. The matrix is ready to have configuration attributes assigned to port addresses.

4. Select the *Matrix Map* option from the *View* menu or click the *M* button at the lower right corner of the matrix. The *Matrix Map* dialog box appears (Figure 90 on page 101). Select the **C, C** intersection. The cell cursor moves to the **C0, C0** address intersection.

Configure Prohibit Attribute - The prohibit attribute is configured first. This attribute only affects a connection between two configured ports.

5. Double-click the white cell cursor (or press the **P** key) and observe the status line at the bottom of the *Matrix* window. The error message **Address self-intersection prohibited or dedicated connections are not allowed.** appears in bright red characters. This is an example of a displayed error condition.
6. Move the mouse cursor to the *Name* column for port address **C0**. Select the *Names* option from the *Edit* menu or double-click the mouse. The *Name for Address* dialog box appears (Figure 138).

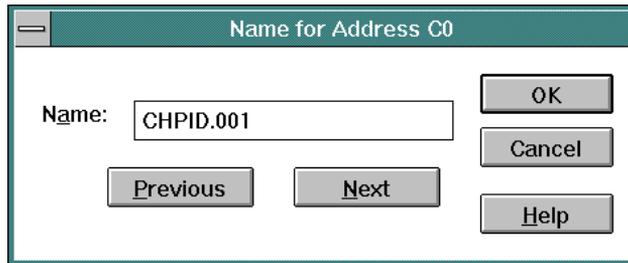


Figure 138. Name for Address Dialog Box

Using facility port naming rules and conventions, enter a name for the port address and click the *OK* button. The port address name (**CHPID.001** in the example) appears in blue characters in the *Name* column.

7. Repeat step 6 for port addresses **C1** and **C2**. Port address names **CHPID.002** and **CHPID.003** are used in the example.
8. Move the white cell cursor one cell (port) to the right. Use the arrow key or click the cell with the mouse cursor. Set the prohibit attribute for the connection between port addresses **C0** and **C1** using one of the following:
 - Select the *Prohibited* option from the *Edit* menu
 - Double-click the cell with the mouse
 - Press the **P** key
 - Press the space bar.

A bright red prohibit symbol appears, overlaying the cell cursor. If the **P** key option was used to prohibit the **C0** to **C1** connection, the cell cursor moves one port address to the right.

9. Move the white cell cursor one cell (port) to the right (to **C0**, **C2**). The cursor is already placed correctly if the **P** key option was used to prohibit the **C0** to **C1** connection. Set the prohibit attribute for the connection between port addresses **C0** and **C2** using one of the options in [step 8](#).

Port address **C0** is now prohibited from a connection with port addresses **C1** and **C2**. Any other address connection for port address **C0** is allowed. [Figure 139](#) shows the *New Matrix* window with the prohibit attribute set.

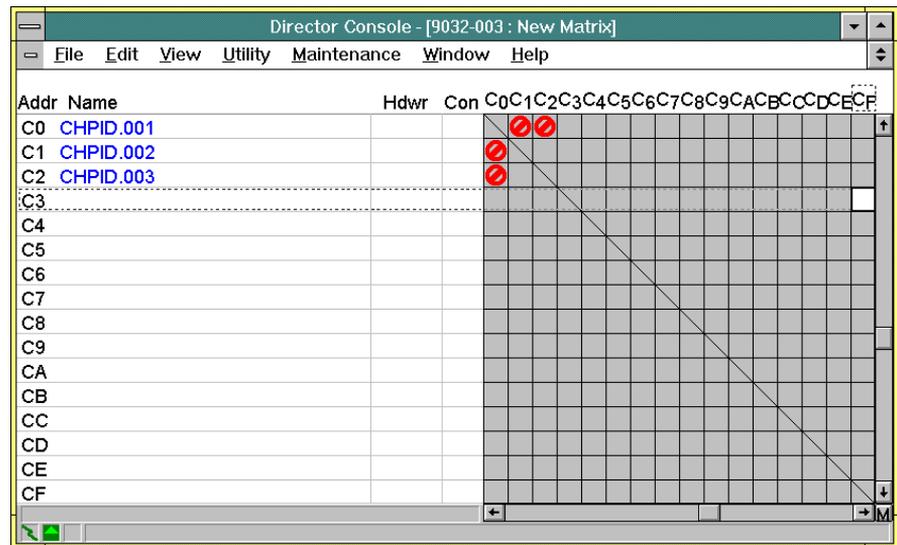


Figure 139. Matrix Window (Prohibit Attribute)

Configure Dedicate Attribute - The dedicate attribute (sometimes referred to as a static connection) is configured next. This attribute disallows all communication, except with the configured port address.

10. Repeat [step 6](#) for port addresses **C3**, **C4**, **C5**, and **CF**. Port address names **CHPID.004**, **CHPID.005**, **DASD.001**, and **DASD.002** are used in the example.
11. Press the **End** key to change the position of the white cell cursor to the **CF** column and move the cursor down to port address **C3** (use the arrow key or click the cell with the mouse cursor).
12. Set the dedicate attribute for the connection between port addresses **C3** and **CF** using one of the following:

- Select the *Dedicated* option from the *Edit* menu
- Simultaneously press the **Ctrl** and **D** keys
- Simultaneously press the **Ctrl** key and double-click the cell cursor (with the cursor in the matrix)
- Set the attribute from the *Name and States* dialog box (Figure 140). Open the dialog box by selecting the *Name and States* option from the *Edit* menu, or by moving the cursor to the *Con* column (for port address **C3**) and double-clicking the mouse. Enter port address **CF** in the *Dedicated to Address* field and click the *OK* button.

Note: Prohibit and block attributes can also be set from the dialog box.

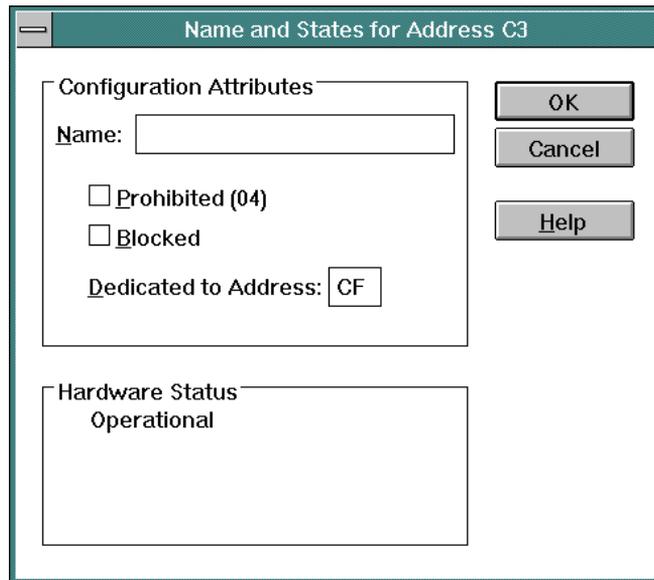


Figure 140. *Name and States* Dialog Box

The dedicated attribute (green bar) appears, and port addresses **CF** and **C3** appear in the *Con* column in blue characters.

13. Set the dedicate attribute for the connection between port addresses **C4** and **C5** using one of the options in [step 12](#).

The dedicated attribute (green bar) appears, and port addresses **C4** and **C5** appear in the *Con* column in blue characters. Any other address connections for port addresses **C3**, **C4**, **C5**, and **CF** are not allowed. [Figure 141](#) shows the *New Matrix* window with both the prohibit and dedicate attributes set.

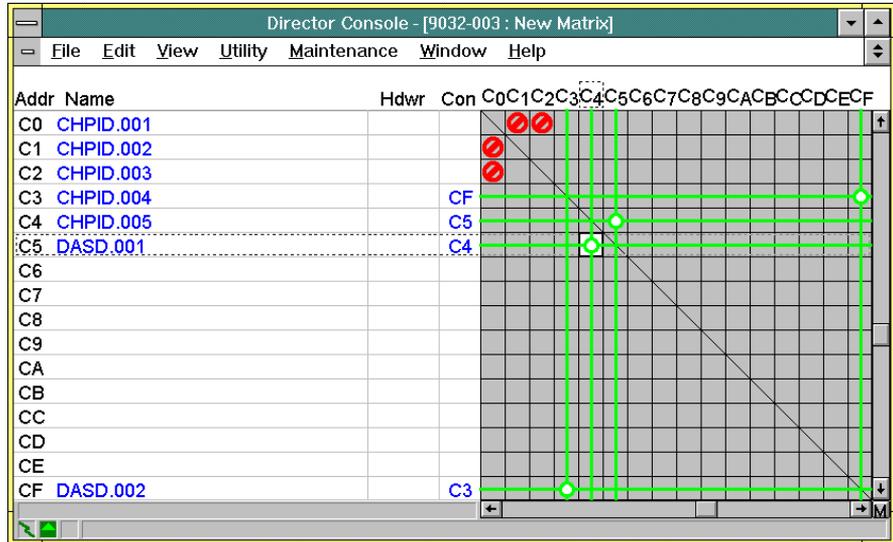


Figure 141. Matrix Window (Prohibit and Dedicate Attributes)

Configure Block Attribute - The block attribute is configured next. This attribute disallows all communication with the blocked port address.

14. Repeat [step 6](#) for port addresses **C6**, **C8**, **CA**, and **CB**. Port address names **PRINTER.001**, **PRINTER.002**, **TAPE.001**, and **TAPE.002** are used in the example.
15. Move the cursor to the *Con* column for port address **C6**. Set the block attribute for port address **C6** using one of the following:
 - Select the *Blocked* option from the *Edit* menu
 - Press the **B** key
 - Simultaneously press the **Ctrl** and **B** keys
 - Simultaneously press the **Ctrl** key and double-click the cell cursor (with the cursor in the *Con* column)
 - Set the attribute from the *Name and States* dialog box ([Figure 140](#)). Open the dialog box by selecting the *Name and States* option from the *Edit* menu or double-clicking the mouse. Enter port address **C6** in the *Blocked* field and click the *OK* button.

Note: Prohibit and dedicate attributes can also be set from the dialog box.

 - Set the attribute for a range of port addresses from the *Block Address Range* dialog box ([Figure 142](#)). Open the dialog box by selecting the *Block Range* option from the *Edit* menu or simultaneously pressing the **Ctrl** and **R** keys. Click the *Range* radio button, enter *From* and *To* port address values, and click the *Block* button.

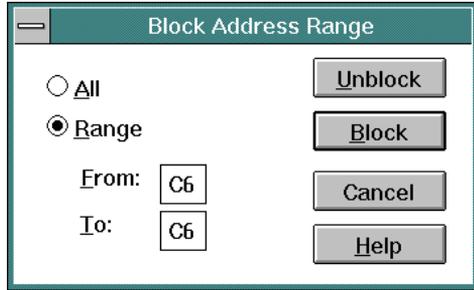


Figure 142. Block Address Range Dialog Box

The cell cursor remains in the *Con* column and port address **C6** is blocked. Both axes for the port address are highlighted and a blue **X** appears in the *Con* column.

16. Set the block attribute for port addresses **C8**, **CA**, and **CB** using one of the options in [step 15](#).
 Port addresses **C6**, **C8**, **CA**, and **CB** are blocked. Both axes for all four port address are highlighted and a blue **X** appears in the *Con* column for each port.
17. Select the *Save Configuration Matrix* option from the *File* menu. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Save Configuration Matrix As* dialog box appears. Enter a name for the new matrix (**STANDARD** is used in the example) and select the *OK* button. [Figure 143](#) displays the matrix as it is now configured.

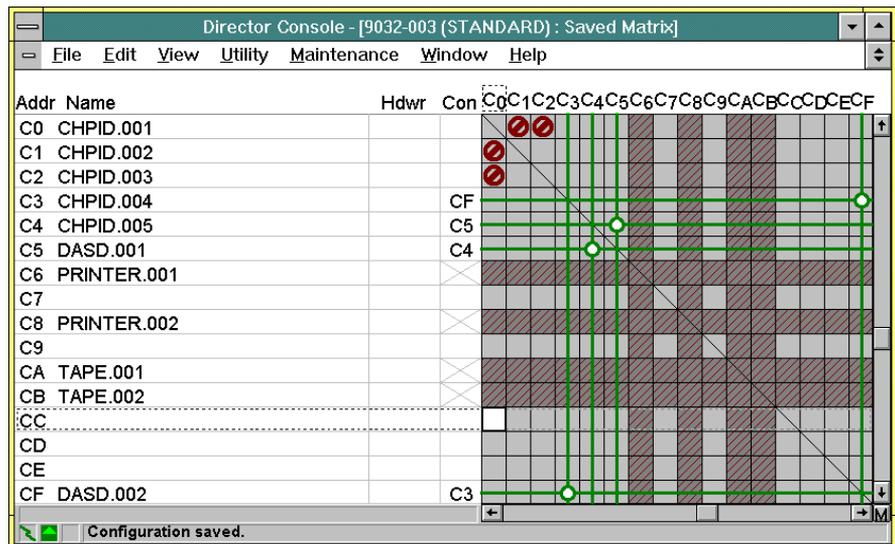


Figure 143. Matrix Window (All Attributes Saved)

The title bar at the top of the window changes to reflect the matrix name (**STANDARD**) and the change of state from a *New Matrix* to a *Saved Matrix*. Port attributes change color as described under "[Port Attribute Symbols](#)" on page 140, and all port names and connections (in the *Con* column) change from blue to black.

18. To install port attributes, select the *Activate Configuration Matrix* option from the *File* menu or press the **F6** key. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Activate Configuration Matrix* dialog box appears ([Figure 144](#)).

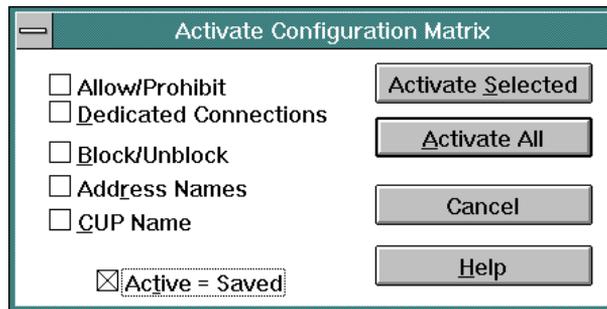


Figure 144. Activate Configuration Matrix Dialog Box

Note: None of the check boxes are selected because the matrix was just saved.

19. Select the *Activate All* button to activate the configuration matrix with the port attributes established in this example.
20. To view the *Active Matrix* for the selected Director:
 - Select the *Open Active Configuration Matrix* option from the *File* menu. The *Select Active Director* dialog box appears.
 - Select (double-click) the 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* for the selected Director appears with the port attributes established in this example (identical to those displayed in [Figure 143](#)).

Opening the *Active Matrix* for the selected Director (there can be only one *Active Matrix* open per Director) automatically closes the *Saved Matrix*, and any unsaved attributes are lost. An operator can close the *Matrix* window and exit the Console application without affecting the selected Director's *Active Matrix*.

Creating a New Configuration Matrix (ESCON and FICON)

This section provides a practical exercise that illustrates ESCON and FICON operation of the Director Console. It is assumed the Console application software is installed on the PC platform, the OS/2 desktop is displayed, and at least one 9032-005 Director (with FCV Port cards installed) is defined to the Console (refer to "Director Definition Dialog Box" on page 52 for information). The exercise illustrates how to configure a new configuration matrix (including ESCON and FICON port connections) for the Director.

Note: FICON operation is supported *only* by a 9032-005 Director with a FICON upgrade feature installed. A FICON port connection provides link attachment *only* to an IBM System/390 (S/390) Generation 5 (or later model) Parallel Enterprise Server.

1. At the Director Console's OS/2 desktop, double-click the *Director Console* icon. The Console application initializes and the *Startup* window appears. It may take up to 30 seconds for the Console application to open.
2. Select the *New Configuration Matrix* option from the *File* menu. The *Select Director for New Matrix* dialog box appears (Figure 145). The dialog box contains a list of all configured Directors supported by the Console.



Figure 145. *Select Director for New Matrix* Dialog Box

3. Select the Director for which the new configuration matrix is to be created (9032-005 in this example) and click the *OK* button. The *Matrix* window appears.

Display More Port Addresses - An insufficient number of port addresses (default is 16) appear at the *Matrix* window to illustrate the configuration. Configure the window so more port addresses appear.

- Select the *Display Options* option from the *View* menu. The *Display Options* dialog box appears (Figure 146).

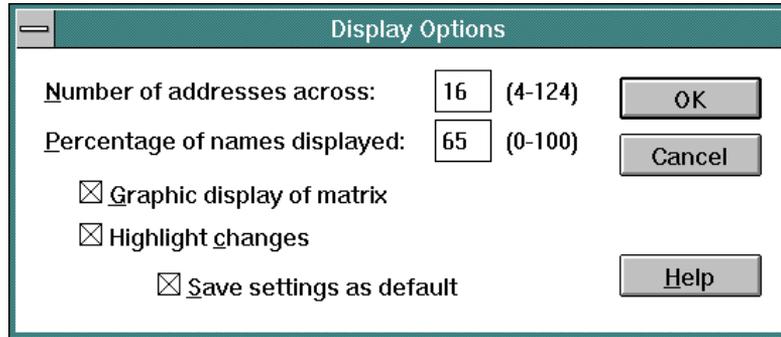


Figure 146. *Display Options Dialog Box*

- Enter a value of **22** in the *Number of addresses across* field and click the OK button. The *New Matrix* window appears (Figure 147) with 22 rows and columns displayed in the matrix.

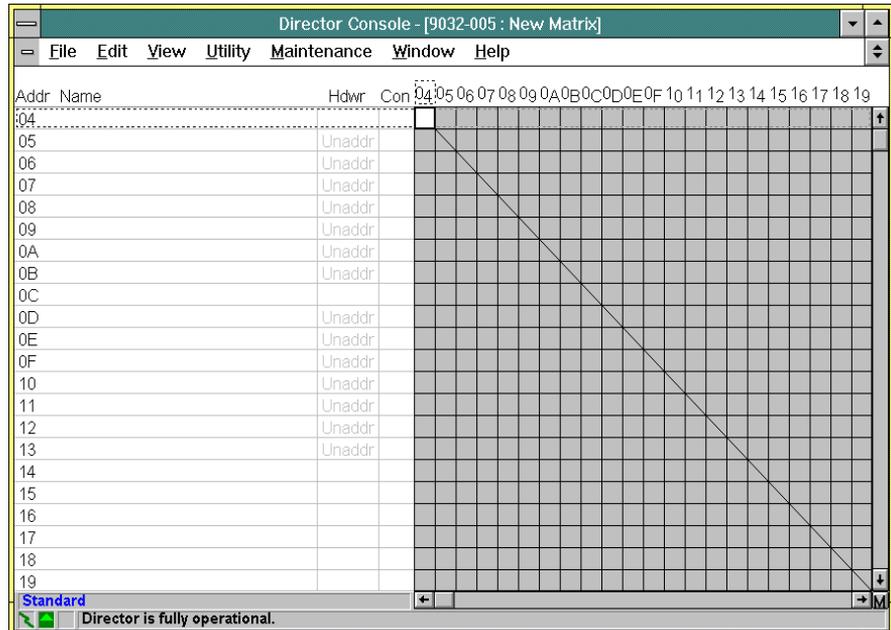


Figure 147. *Matrix Window (FICON, No User-Selected Attributes Set)*

The *Matrix* window appears in graphic display mode with the cell cursor at the first address intersection for the Director type (**80, 80** for a 9032-003, **C0, C0** for a 9033-004, and **04, 04** for a 9032-005). The Director name (**9032-005**) and the type of matrix (**New Matrix**) appear in the title bar at the top of the window. The matrix is ready to have configuration attributes assigned to port addresses.

FCV Port cards are installed in the first two slots of the Director (logical port addresses **04** and **0C**). Setting port attributes for a 9032-005 Director with FCV Port cards installed is subject to the following constraints:

- An FCV Port card uses one logical port address and eight port numbers. For each port card, seven consecutive port addresses are rendered unaddressable, indicated by **Unaddr** (graphic display mode) or **U** (nongraphic display mode) in the *Hdwr* column.
- A dedicated connection to an FCV Port card is invalid.
- A dynamic connection between two FCV Port cards is prohibited. When a matrix is activated, the prohibit attribute is set without user intervention (refer to [step 14](#) of this example).

If an FCV Port card is improperly configured, the Director prevents the card from coming online, and **Inactive** (graphic display mode) or **I** (nongraphic display mode) appears in the *Hdwr* column. The following invalid configurations cause an inactive status for an FCV Port card:

- The maximum number of FCV Port cards (16) supported by the Director is exceeded.
 - Hardware upgrades required for FICON operation are not detected.
 - The FCV Port card is placed offline to perform a nonconcurrent LIC install (refer to "[Installing a LIC Version](#)" on page 167 for information).
 - A dedicated connection is configured for an internal ESCON port.
 - An FCV Port card is swapped with an ESCON port.
 - An unaddressable FCV port is swapped with any other port.
6. Move the mouse cursor to the *Name* column for port address **04**. Select the *Names* option from the *Edit* menu or double-click the mouse. The *Name for Address* dialog box appears ([Figure 148](#)).

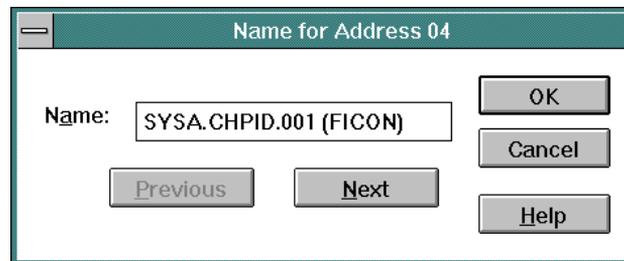


Figure 148. Name for Address Dialog Box

Using facility port naming rules and conventions, enter a name for the port address and click the *OK* button. The port address name (**SYSA.CHPID.001 (FICON)** in the example) appears in blue characters in the *Name* column.

- Repeat [step 6](#) for port addresses **0C**, **14**, **15**, **16**, **17**, **18**, and **19**. Example port address names appear in [Figure 150](#). Unaddressable ports associated with FCV Port cards are typically not named.

Configure Dedicate Attribute - The dedicate attribute (sometimes referred to as a static connection) is configured first. This attribute disallows all communication, except with the configured port address.

- Configure a dedicated connection between **SYSA.CHPID.002 (ESCON)** and **DASD.003**. Move the cursor down to port address **14** and over to matrix column **18** (use the arrow keys or click the cell with the mouse cursor).
- Set the dedicate attribute for the connection between port addresses **14** and **18** using one of the following:
 - Select the *Dedicated* option from the *Edit* menu
 - Simultaneously press the **Ctrl** and **D** keys
 - Simultaneously press the **Ctrl** key and double-click the cell cursor (with the cursor in the matrix)
 - Set the attribute from the *Name and States* dialog box ([Figure 149](#)). Open the dialog box by selecting the *Name and States* option from the *Edit* menu, or by moving the cursor to the *Con* column (for port address **14**) and double-clicking the mouse. Enter port address **18** in the *Dedicated to Address* field and click the *OK* button.

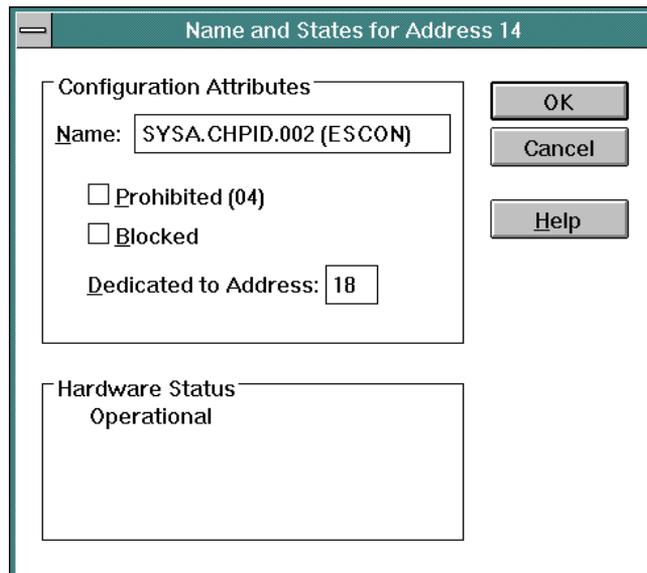


Figure 149. Name and States Dialog Box

Note: Prohibit and block attributes can also be set from the dialog box. The dedicated attribute (green bar) appears, and port addresses **14** and **18** appear in the *Con* column in blue characters. Any other address connections for these port addresses are not allowed. Figure 150 shows the *New Matrix* window with the dedicate attribute set.

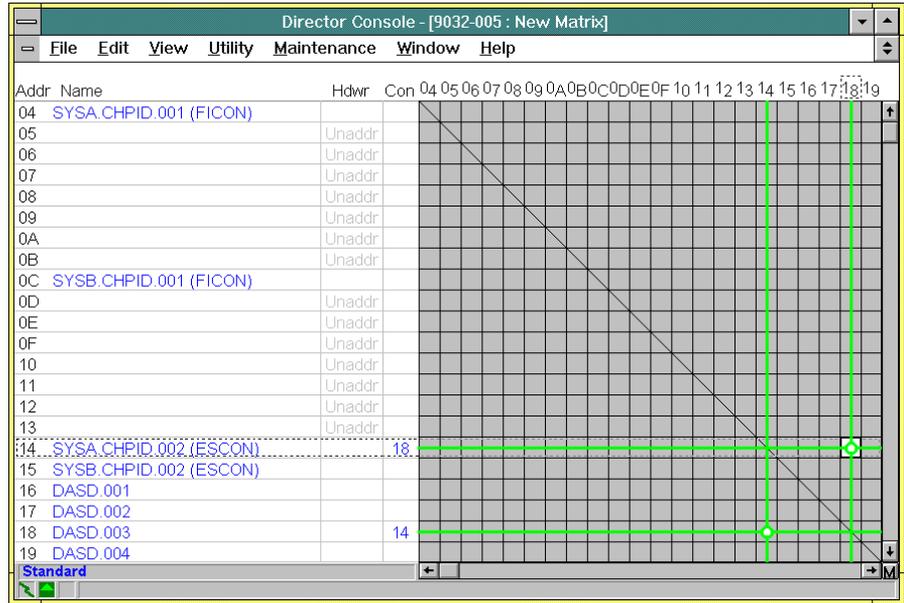


Figure 150. Matrix Window (FICON, Dedicate Attribute)

Configure Block Attribute - The block attribute is configured next. This attribute disallows all communication with the blocked port address.

10. Move the cursor to the *Con* column for port address **16**. Set the block attribute for port address **16** using one of the following:
 - Select the *Blocked* option from the *Edit* menu
 - Press the **B** key
 - Simultaneously press the **Ctrl** and **B** keys
 - Simultaneously press the **Ctrl** key and double-click the cell cursor (with the cursor in the *Con* column)
 - Set the attribute from the *Name and States* dialog box (Figure 149). Open the dialog box by selecting the *Name and States* option from the *Edit* menu or double-clicking the mouse. Enter port address **16** in the *Blocked* field and click the *OK* button.

Note: Prohibit and dedicate attributes can also be set from the dialog box.

- Set the attribute for a range of port addresses from the *Block Address Range* dialog box (Figure 151). Open the dialog box by selecting the *Block Range* option from the *Edit* menu or simultaneously pressing the **Ctrl** and **R** keys. Click the *Range* radio button, enter *From* and *To* port address values, and click the *Block* button.

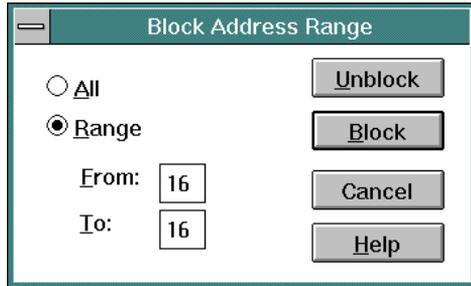


Figure 151. Block Address Range Dialog Box

The cell cursor remains in the *Con* column and port address **16** is blocked. Both axes for the port address are highlighted and a blue **X** appears in the *Con* column. Figure 152 shows the *New Matrix* window with both the dedicate and block attributes set.

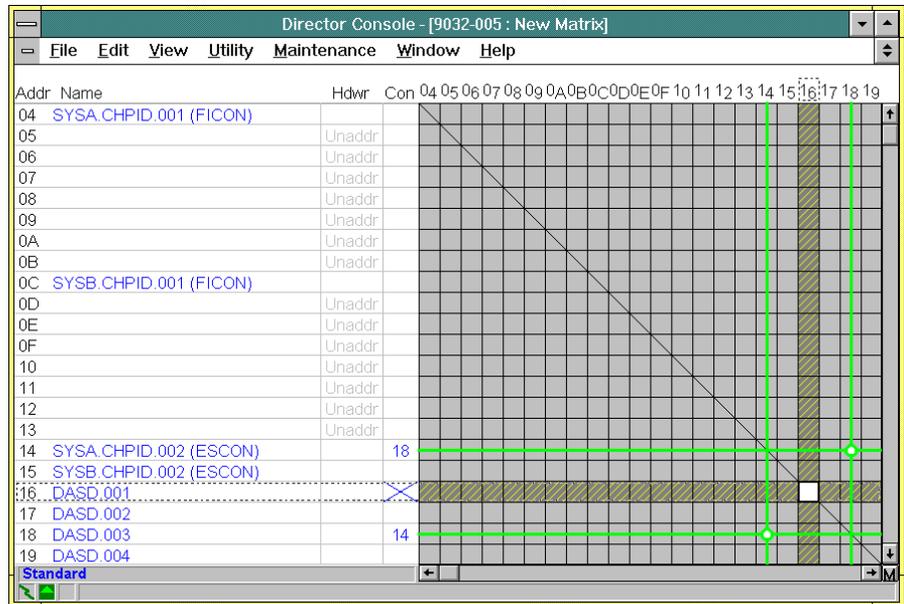


Figure 152. Matrix Window (FICON, Dedicate and Block Attributes)

11. Select the *Save Configuration Matrix* option from the *File* menu. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Save Configuration Matrix As* dialog box appears. Enter a name for the new matrix and select the *OK* button.

The title bar at the top of the window changes to reflect the matrix name and the change of state from a *New Matrix* to a *Saved Matrix*. Port attributes change color as described under "[Port Attribute Symbols](#)" on page 140, and all port names and connections (in the *Con* column) change from blue to black.

12. To install port attributes, select the *Activate Configuration Matrix* option from the *File* menu or press the **F6** key. The *Operator Authorization* dialog box appears. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Activate Configuration Matrix* dialog box appears ([Figure 153](#)).

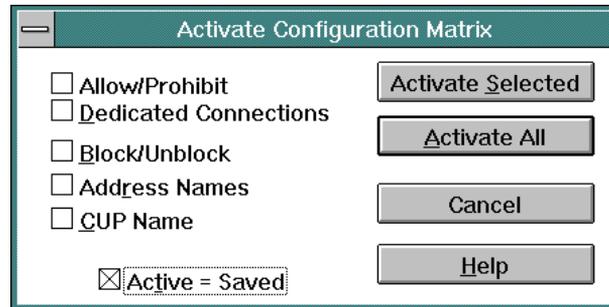


Figure 153. Activate Configuration Matrix Dialog Box

Note: None of the check boxes are selected because the matrix was just saved.

13. Select the *Activate All* button to activate the configuration matrix with the port attributes established in this example.
14. To view the *Active Matrix* for the selected Director:
 - Select the *Open Active Configuration Matrix* option from the *File* menu. The *Select Active Director* dialog box appears.
 - Select (double-click) the 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* for the selected Director appears ([Figure 154](#)) with the port attributes established in this example.

Prohibit symbols appear, indicating a connection between port addresses **04** and **0C** is prohibited. This attribute is set automatically by the Director because a dynamic connection between two FCV Port cards is prohibited.

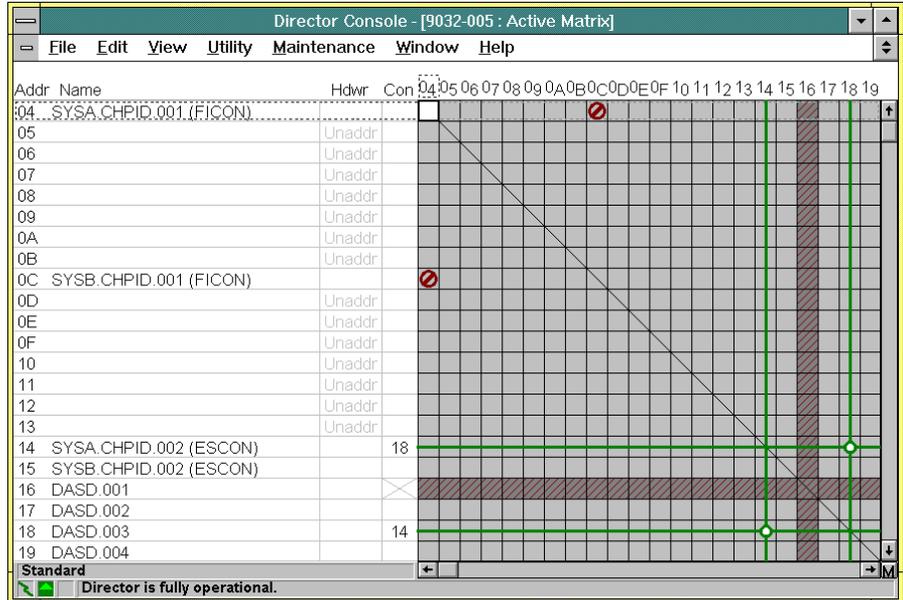


Figure 154. Matrix Window (FICON, All Attributes Saved and Activated)

Opening the *Active Matrix* for the selected Director (there can be only one *Active Matrix* open per Director) automatically closes the *Saved Matrix*, and any unsaved attributes are lost. An operator can close the *Matrix* window and exit the Console application without affecting the selected Director's *Active Matrix*.

Chapter 5. Console Administrative Functions

This chapter describes administrative functions performed from the Director Console application. These functions include:

- Installing or deleting a Loader/Monitor Area (LMA) version or Licensed Internal Code (LIC) version
- Adding a new password or modifying an existing password
- Creating logical partitions
- Changing Director LAN addresses
- Maintaining and using a backup or replacement Console
- Synchronizing the Director time and date with the Console time and date.

Additional administrative functions are performed from Operating System/2 (OS/2). To perform Console administrative functions from the operating system, 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.

Installing or Deleting an LMA Version

The following sections describe installation of an LMA version to the Director Console and Director, and deleting an LMA version from the Director Console.

Note: When installing both an LMA version and a LIC version, the LMA version must be installed first.

Installing an LMA Version

This procedure describes installation of a new LMA version to the Director Console and attached Director. Installation of LMA Version 4.3 (or a later release level) to the 9032-003, 9033-004, or 9032-005 Director requires one diskette, labeled *LMA Version 04.YY.ZZ*.

Installation of LMA Version 5.0 (or a later release level) to support Fibre Connection (FICON) operation for the 9032-005 Director requires one diskette, labeled *LMA Version 05.YY.ZZ*.

Attention!

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.

To install a new LMA version:

Note: When installing both an LMA version and a LIC version, the LMA version must be installed first.

1. At the Director Console, ensure the active matrix window is open for the selected Director to which the new LMA version is to be installed.
2. Select *LMA Versions* from the *Advanced* option from the *Maintenance* menu. The *Maintenance Authorization* dialog box appears.
3. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *LMA Versions* dialog box appears ([Figure 155](#)).

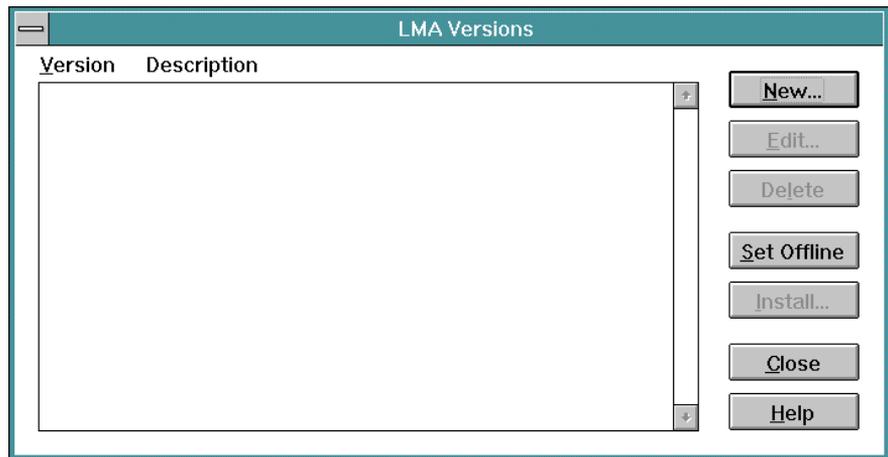


Figure 155. Blank LMA Versions Dialog Box

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. If three LMA versions are installed, an old version must be deleted before installing a new version. Refer to "[Deleting an LMA Version](#)" on page 165 for instructions.

4. Click the *New* button. The *New LMA Version* dialog box appears ([Figure 156](#)) with the diskette drive (**A:**) selected as the default.

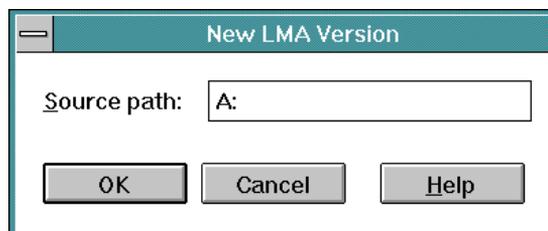


Figure 156. New LMA Version Dialog Box

5. 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.
6. When the installation is complete, the *Edit LMA Description* dialog box appears (Figure 157). Remove the diskette and store it in a secure location.

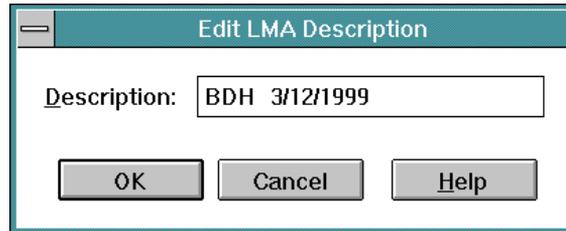


Figure 157. *Edit LMA Description Dialog Box*

7. 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 (Figure 158) 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.

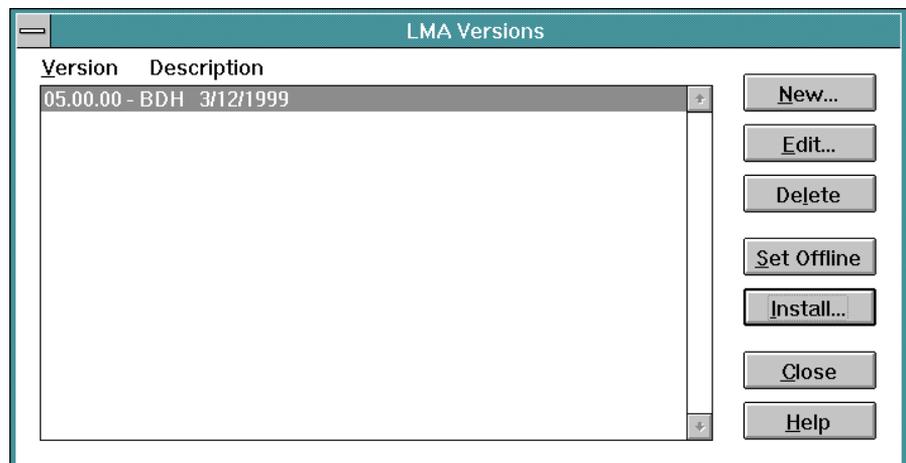


Figure 158. *Completed LMA Versions Dialog Box*

8. The Director must be set offline to install an LMA version if only one CTP card is installed. When a Director contains a redundant CTP card, an LMA version is installed without disrupting port connections and Director operation. If the Director contains two CTP cards, continue to [step 10](#).

9. If the Director contains only one CTP card, perform the following:
 - If the Director is not supported by SA OS/390, ensure the system operator varies all Director-attached FICON channels offline. If the Director is supported by SA OS/390, ensure the system operator applies the **Remove Switch** command to vary Director-attached FICON channels offline.
 - At the *LMA Versions* dialog box, click the *Set Offline* button. The message box shown in [Figure 159](#) appears.

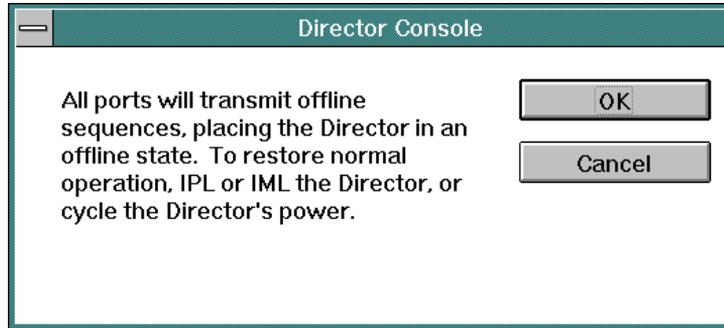


Figure 159. Set Director Offline Message Box

- Click the *OK* button. The *Operator Authorization* dialog box appears.
 - 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.
10. At the *LMA Versions* dialog box, select (highlight) the LMA version to be installed and click the *Install* button. The message box shown in [Figure 160](#) appears.

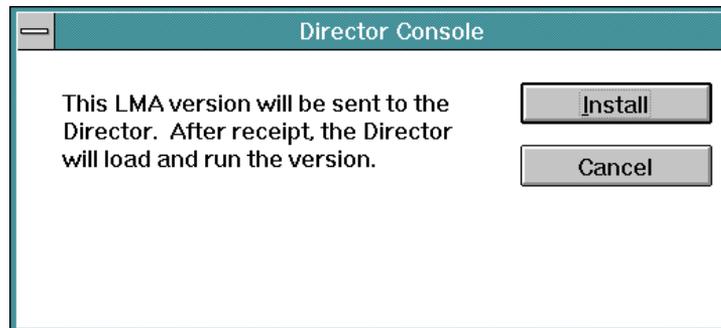


Figure 160. Install LMA Version to Director Message Box

11. Click the *Install* button. 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 *LMA Install Status* message box appears, indicating the Director is saving files and synchronizing CTP cards (if applicable). To view all status messages that appear during file transfer, do not click the *Close* button on the dialog box.

As the LMA install proceeds, the link between the Director and Console drops momentarily, then returns to normal. The Director also performs an initial machine load (IML) for the new LMA version.

12. When the LMA install completes, the *LMA Install Status* message box closes and the message box shown in [Figure 161](#) appears.

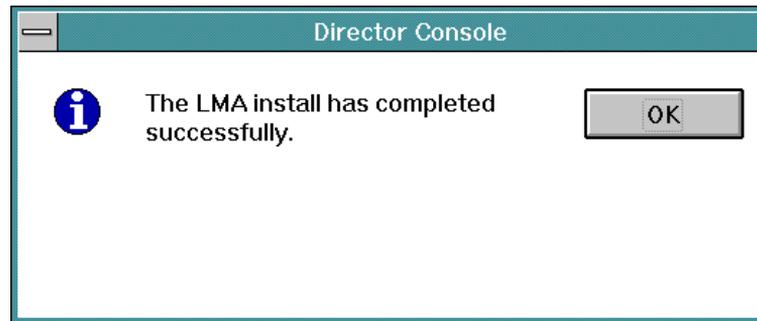


Figure 161. LMA Install Complete Message Box

13. Click the *OK* button to close the message box. At the *LMA Versions* dialog box, click the *Close* button to close the dialog box.

Deleting an LMA Version

This procedure describes how to delete an LMA version from the Director Console. Because only three LMA versions can be installed on the Console, an old version might have to be deleted before a new version is installed. To delete an LMA version:

1. At the Director Console, select *LMA Versions* from the *Advanced* option from the *Maintenance* menu. The *Maintenance Authorization* dialog box appears.
2. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *LMA Versions* dialog box appears ([Figure 162](#)).

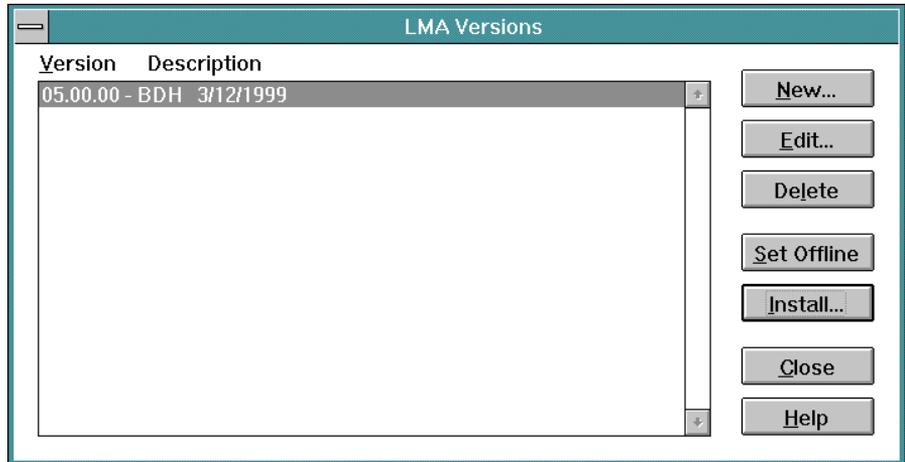


Figure 162. LMA Versions Dialog Box

- At the *LMA Versions* dialog box, select (highlight) the LMA version to delete and click the *Delete* button. The message box shown in [Figure 163](#) appears.

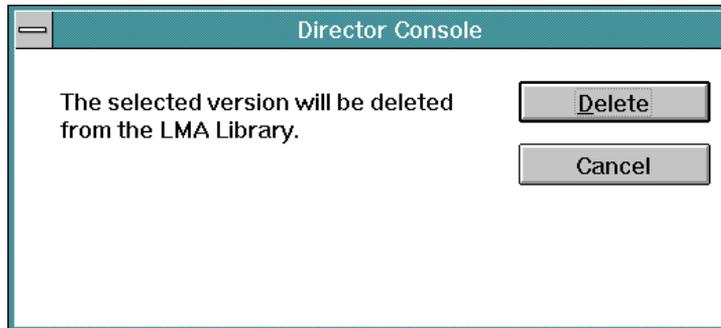


Figure 163. Confirm LMA Deletion Message Box

- Click the *Delete* button. The LMA version is deleted from the Director Console and the *LMA Versions* dialog box reappears with the version deleted.
- At the *LMA Versions* dialog box, click the *Close* button to close the dialog box.

Installing or Deleting a LIC Version

The following sections describe installation of a LIC version to the Director Console and Director, and deleting a LIC version from the Director Console.

Note: When installing both an LMA version and a LIC version, the LMA version must be installed first.

Installing a LIC Version

This procedure describes installation of a new LIC version to the Director Console and attached Director. Installation of 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*.

Installation of 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.

To install a new LIC version:

Note: When installing both an LMA version and a LIC version, the LMA version must be installed first.

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.
2. Select the *LIC Versions* option from the *Utility* menu. The *Maintenance Authorization* dialog box appears.
3. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *LIC Versions* dialog box appears (Figure 164).

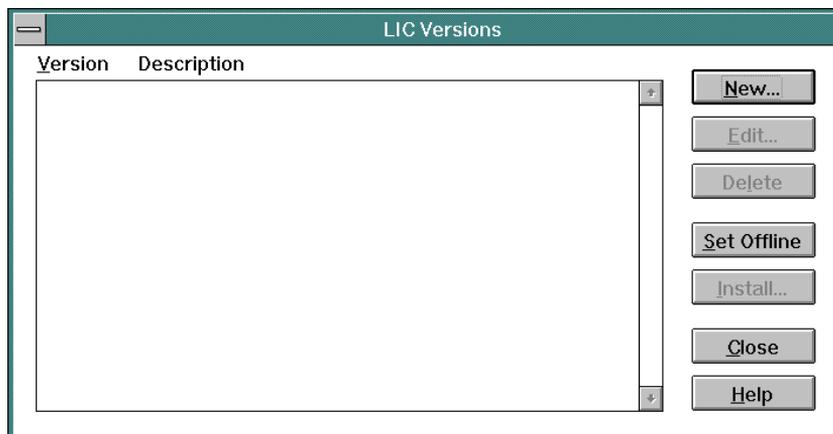


Figure 164. Blank LIC Versions Dialog Box

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. Refer to "[Deleting a LIC Version](#)" on page 173 for instructions.

4. Click the *New* button. The *New LIC Version* dialog box appears ([Figure 165](#)) with the diskette drive (**A:**) selected as the default.

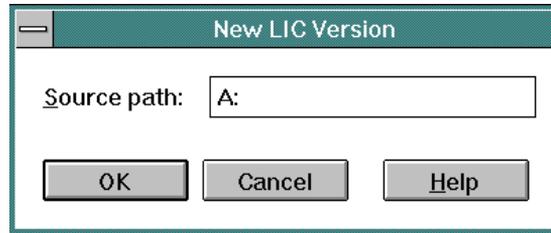


Figure 165. New LIC Version Dialog Box

5. 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.
6. 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 8](#).
 - If installing LIC Version 5.0 (or a later release level) to a 9032-005 Director, continue to the next step.
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 the installation is complete, the *Edit LIC Description* dialog box appears ([Figure 166](#)). Remove the diskette and store all LIC installation diskettes in a secure location.

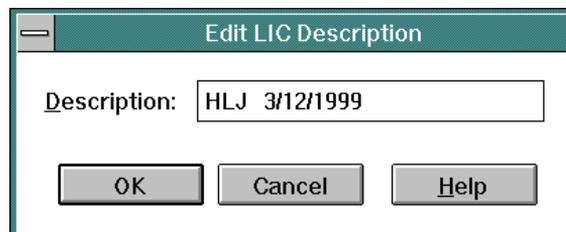


Figure 166. Edit LIC Description Dialog Box

9. 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 (Figure 167) 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.

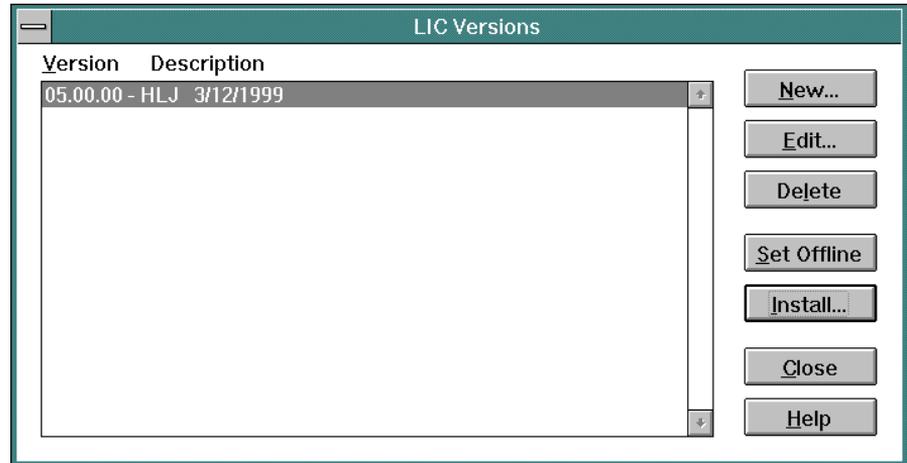


Figure 167. Completed LIC Versions Dialog Box

10. The Director must be set offline to install a LIC version if only one Control Processor (CTP) card is installed.

When a Director contains a redundant CTP card, a LIC version is installed without disrupting port connections and Director operation. If the Director contains two CTP cards, go to [step 12](#).

11. If the Director contains only one CTP card, perform the following:
 - If the Director is not supported by SA OS/390, ensure the system operator varies all Director-attached FICON channels offline. If the Director is supported by SA OS/390, ensure the system operator applies the **Remove Switch** command to vary Director-attached FICON channels offline.
 - At the *LIC Versions* dialog box, click the *Set Offline* button. The message box shown in [Figure 168](#) appears.

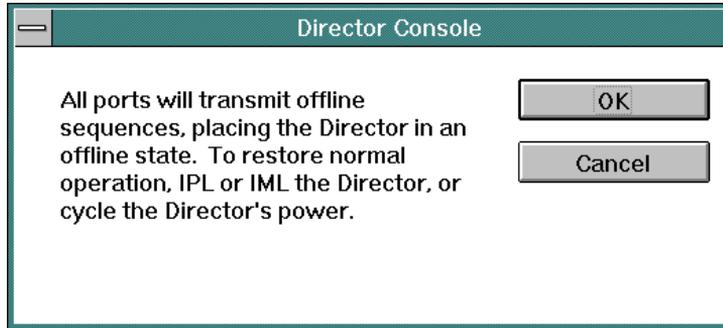


Figure 168. Set Director Offline Message Box

- Click the *OK* button. The *Operator Authorization* dialog box appears.
 - 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.
12. At the *LIC Versions* dialog box, select (highlight) the LIC version to be installed and click the *Install* button. The message box shown in [Figure 169](#) appears.

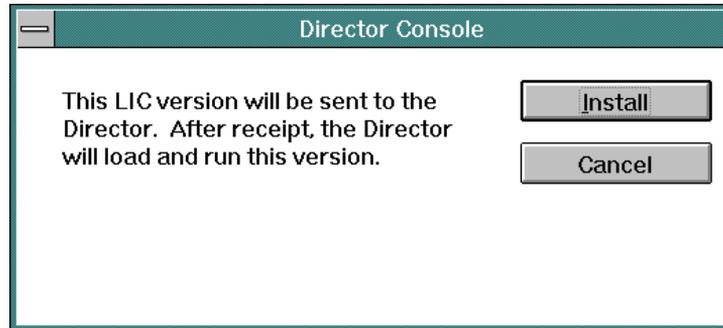


Figure 169. Install LIC Version to Director Message Box

13. Click the *Install* button. If installing LIC Version 4.3 (or a later release level), go to [step 16](#). If installing LIC Version 5.0 (or a later release level) to a 9032-005 Director, continue to the next step.
14. 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 an FCV port card is degraded, the message box shown in [Figure 170](#) appears.

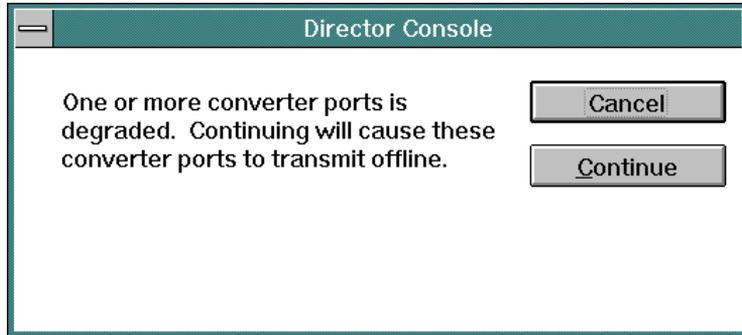


Figure 170. Degraded Converter Port Message Box

- 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. Refer to Chapter 3 in *Maintenance Information for the 9032 Model 5 Director (SY28-1158)* for instructions, then repeat the LIC installation procedure.
 - Vary all Director-attached FICON channels offline to install LIC nonconcurrently. If the Director is not supported by SA OS/390, ensure the system operator varies the FICON channels offline. If the Director is supported by SA OS/390, ensure the system operator applies the **Remove Switch** command to vary the FICON 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.
15. 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 16](#)
- If the LIC versions are *nonconcurrent*, FCV ports must be set offline and the message box shown in [Figure 171](#) appears.

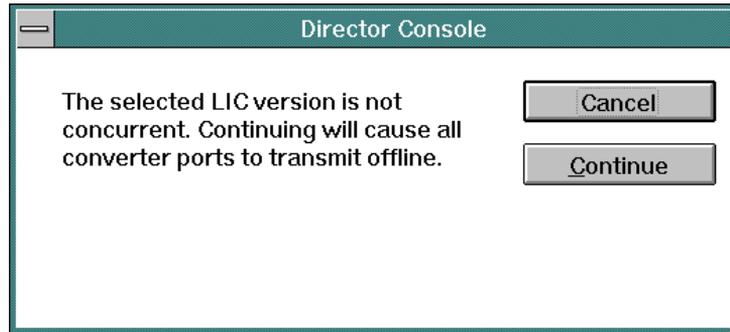


Figure 171. Nonconcurrent LIC Message Box

Note: This dialog box does not appear if no FCV Port cards are installed in the Director or if the Director is set offline.

- If the Director is not supported by SA OS/390, ensure the system operator varies all Director-attached FICON channels offline. If the Director is supported by SA OS/390, ensure the system operator applies the **Remove Switch** command to vary Director-attached FICON channels offline.
 - Click the *Continue* button. FCV ports are set offline and the LIC install proceeds. The ports remain offline until a Director IML, IPL, or power cycle is performed.
16. 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). To view all status messages that appear during file transfer, do not click the *Close* button on the dialog box.
- 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 FCV ports online.
17. When the LIC install completes, the *LIC Install Status* message box closes and the message box shown in [Figure 172](#) appears.

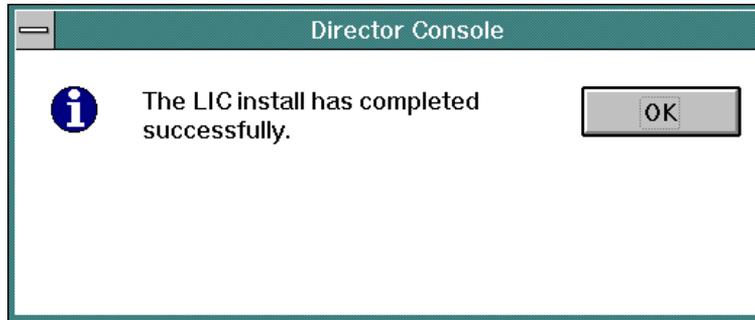


Figure 172. LIC Install Complete Message Box

18. Click the *OK* button to close the message box. At the *LIC Versions* dialog box, click the *Close* button to close the dialog box.

Deleting a LIC Version

This procedure describes how to delete a LIC version from the Director Console. Because only three LIC versions can be installed on the Console, an old version might have to be deleted before a new version is installed. To delete a LIC version:

1. At the Director Console, select the *LIC Versions* option from the *Utility* menu. The *Maintenance Authorization* dialog box appears.
2. Type a maintenance authorization password (default is **LEVEL002**) and click the *OK* button. The *LIC Versions* dialog box appears (Figure 173).

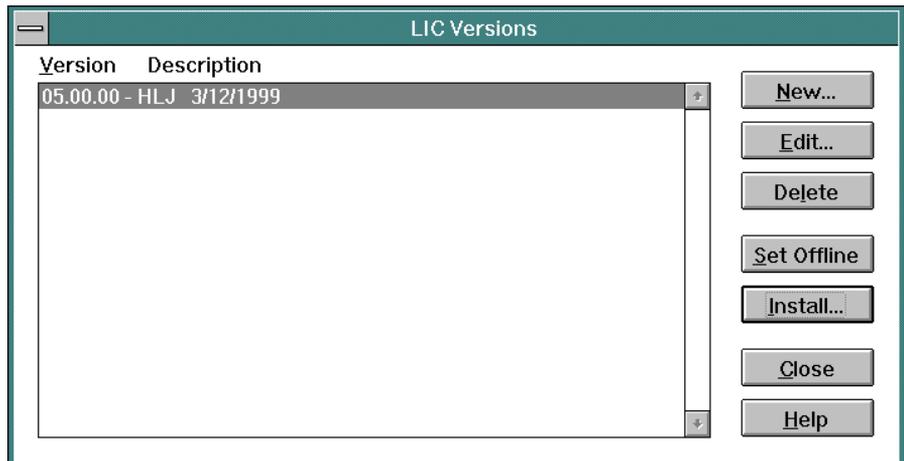


Figure 173. LIC Versions Dialog Box

3. At the *LIC Versions* dialog box, select (highlight) the LIC version to delete and click the *Delete* button. The message box shown in [Figure 174](#) appears.

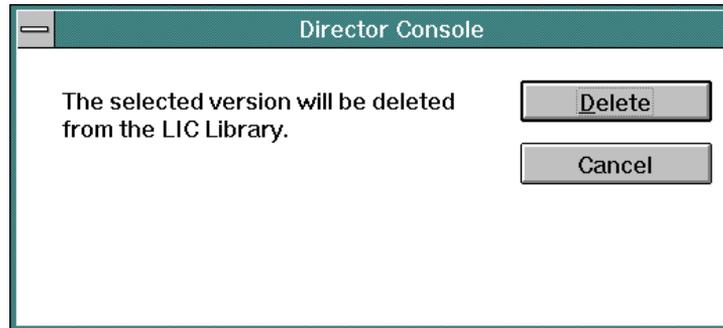


Figure 174. Confirm LIC Deletion Message Box

4. Click the *Delete* button. The LIC version is deleted from the Director Console and the *LIC Versions* dialog box reappears with the version deleted.
5. At the *LIC Versions* dialog box, click the *Close* button to close the dialog box.

Adding, Modifying, and Deleting Passwords

The following sections describe adding, modifying, and deleting passwords. The three levels of password authorization are:

- **Level 1 - Password (Administrative) Authorization** - This level of authorization allows administrators to display, 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.

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 175](#)). The dialog box provides a radio button selection for each password level.

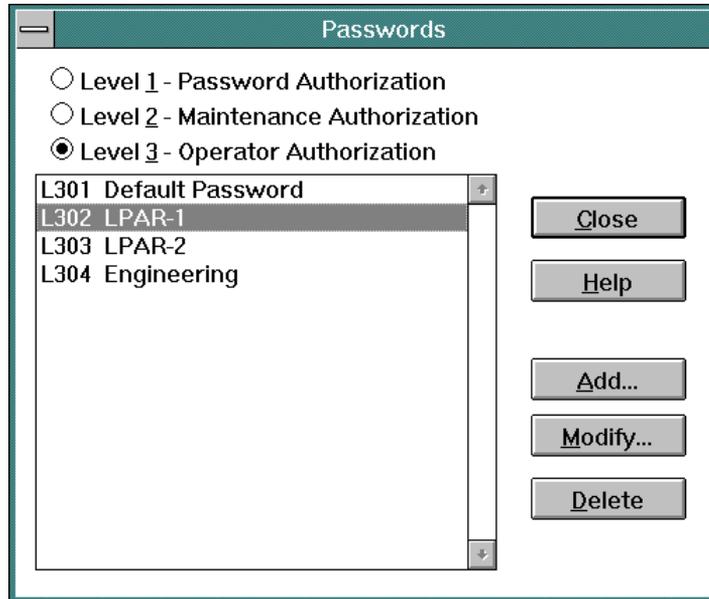


Figure 175. Passwords Dialog Box

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 176).

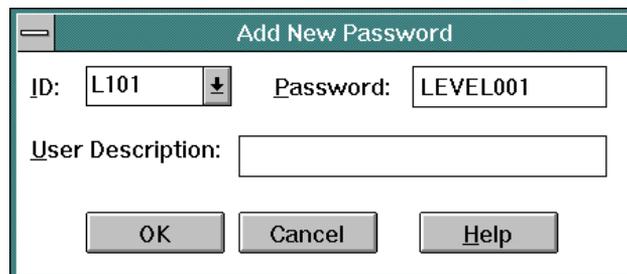


Figure 176. Add New Password Dialog Box

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 175 on page 175](#)). 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 177](#)).

Figure 177. *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 175 on page 175). 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 178).

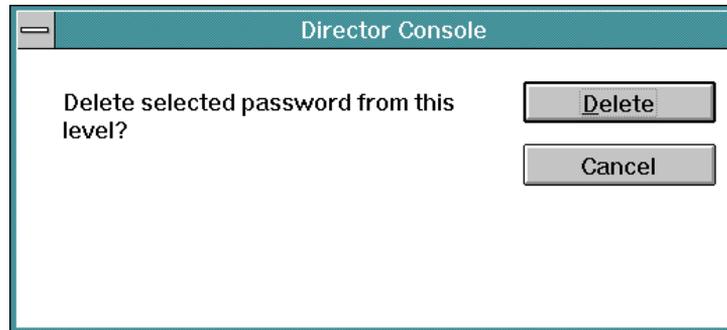


Figure 178. Delete Password Dialog Box

5. Click the *Delete* button. The deleted user description disappears from the appropriate list box at the *Passwords* dialog box.
6. **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 179).

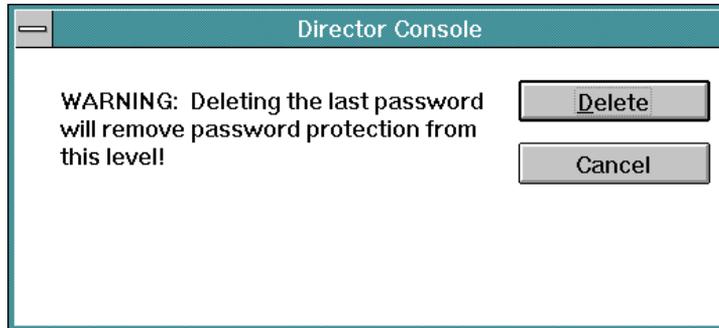


Figure 179. Delete Password Warning Dialog Box

7. Click the *Delete* button. The deleted user description disappears from the appropriate list box at the *Passwords* dialog box.
8. At the *Passwords* dialog box, click the *Close* button.

Creating Logical Partitions

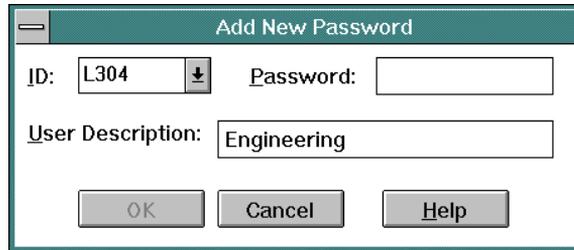
Logical partitions (LPARs) allow an administrator to create port-level configuration access control unique to defined operators or operator groups. LPARs allow operators to access only authorized ports, and restrict unauthorized operators from changing the port connectivity configuration of any device or set of devices under control of the Director. LPARs offer increased security and maximize the flexibility of a system configuration. Three steps are required to create an LPAR:

- **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 following example shows how to create an LPAR for an engineering group. The LPAR includes a FICON host channel attached to Director port *14*, and three direct access storage devices (DASDs) attached to ports *1C*, *1D*, and *1E*.

Defining a Password

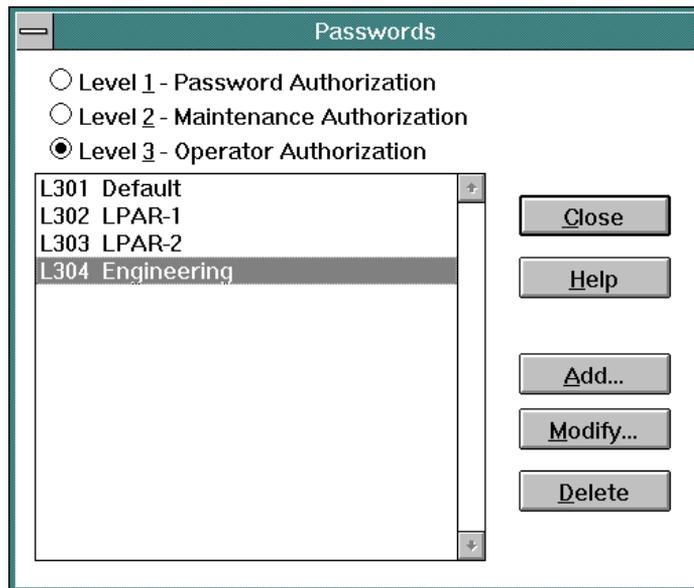
1. At the *Matrix* window, select *Modify* from the *Passwords* option from the *Utility* menu. The *Administrative Authorization* dialog box appears.
2. Type an administrative authorization password (default is **LEVEL001**) and click the *OK* button. The *Passwords* dialog box appears.
3. Select (highlight) the Level 3 radio button and click the *Add* button. The *Add New Password* dialog box appears (Figure 180).



The 'Add New Password' dialog box has a title bar with a minus sign and the text 'Add New Password'. It contains three input fields: 'ID:' with a dropdown menu showing 'L304' and a downward arrow, 'Password:' with an empty text box, and 'User Description:' with a text box containing 'Engineering'. At the bottom, there are three buttons: 'OK', 'Cancel', and 'Help'.

Figure 180. 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 181).



The 'Passwords' dialog box has a title bar with a minus sign and the text 'Passwords'. It features three radio buttons for authorization levels: 'Level 1 - Password Authorization', 'Level 2 - Maintenance Authorization', and 'Level 3 - Operator Authorization', with 'Level 3' selected. Below the radio buttons is a list box containing the following entries: 'L301 Default', 'L302 LPAR-1', 'L303 LPAR-2', and 'L304 Engineering', with 'L304 Engineering' highlighted. To the right of the list box are five buttons: 'Close', 'Help', 'Add...', 'Modify...', and 'Delete'.

Figure 181. Passwords Dialog Box (LPAR Example)

- At the *Passwords* dialog box, click the *Close* button. The *Matrix* window reappears.

Defining Port Authorizations

- Select the *Port Authorization* option from the *Utility* menu. The *Port Authorization* dialog box appears (Figure 182).

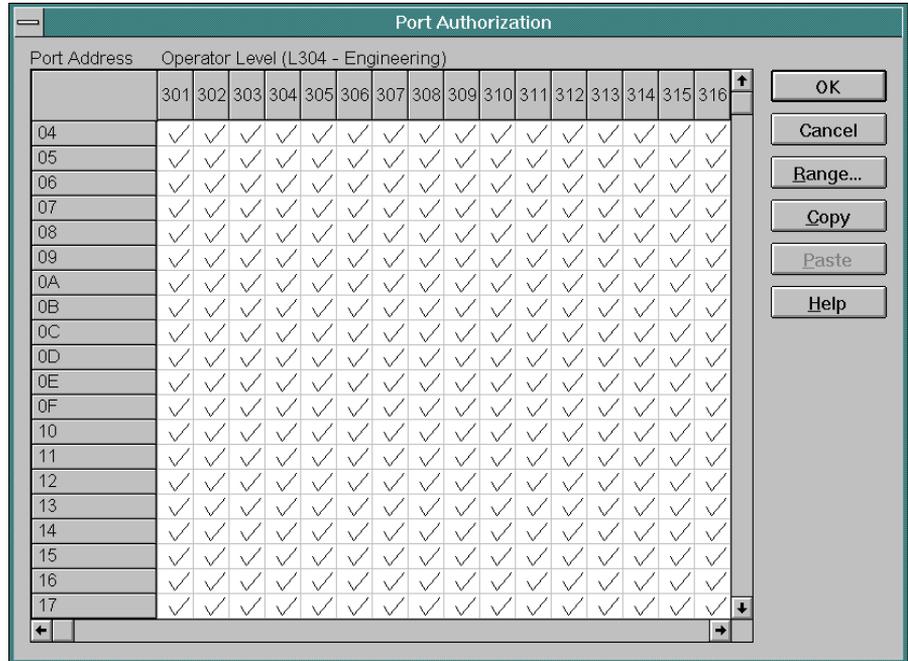


Figure 182. Port Authorization Dialog Box (Unmodified)

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.

- At the *Port Authorization* dialog box, click the *Range* button. The *Authorize Range* dialog box appears (Figure 183).
- At the *Authorize Range* dialog box:
 - At the *Port Address* section, click the *All* radio button.
 - At the *Operator ID* section, click the *All* radio button.

- 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.

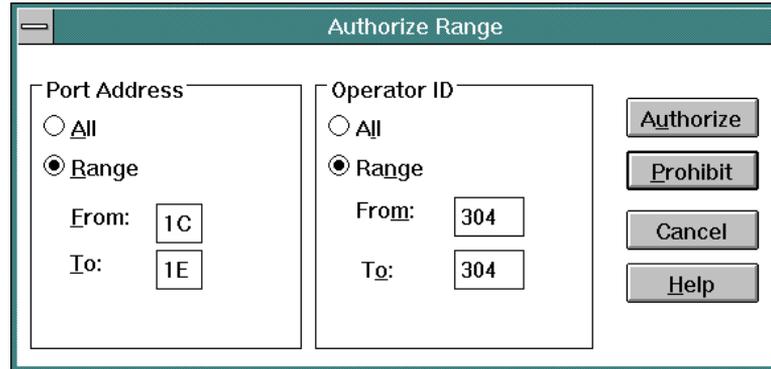


Figure 183. *Authorize Range* Dialog Box (LPAR Example)

- 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.
 - At the *Port Authorization* dialog box, click the *Range* button. The *Authorize Range* dialog box appears again (Figure 183).
 - At the *Authorize Range* dialog box:
 - At the *Port Address* section, click the *Range* radio button. Enter a port address range from 1C to 1E.
 - At the *Operator ID* section, click the *Range* radio button. Enter an operator ID range from 304 to 304.
 - Click the *Authorize* button. The *Port Authorization* dialog box reappears as shown in Figure 184.

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.
 - At the *Port Authorization* dialog box, click the *OK* button. The *Administrative Authorization* dialog box appears.
 - 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.

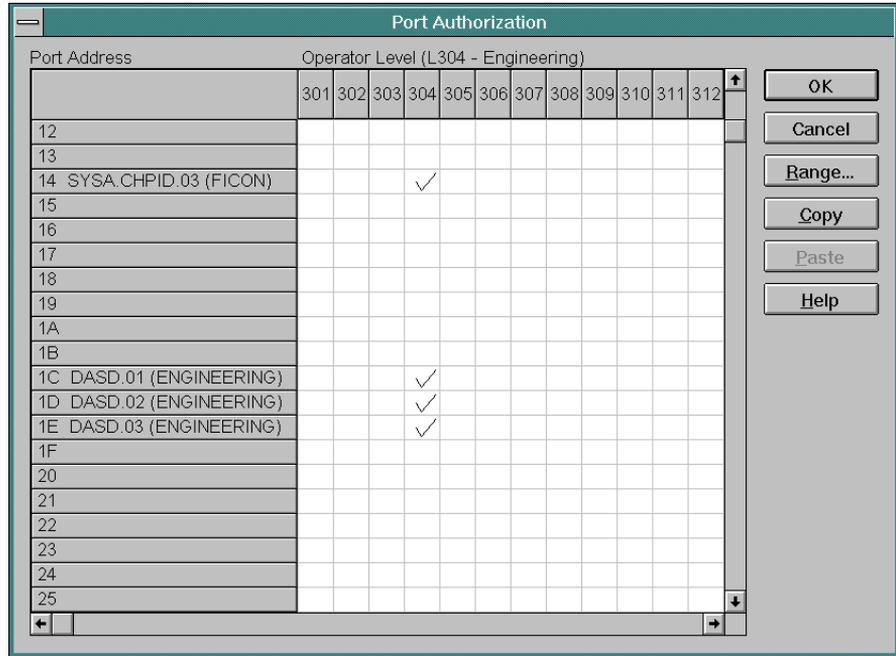


Figure 184. Port Authorization Dialog Box (LPAR Example)

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 185](#).

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 an active matrix or save a saved matrix.* The *Activate Configuration Matrix* and *Save Configuration Matrix As* options (from the *File* menu) can only be used by operators with authorization to configure all ports. 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.

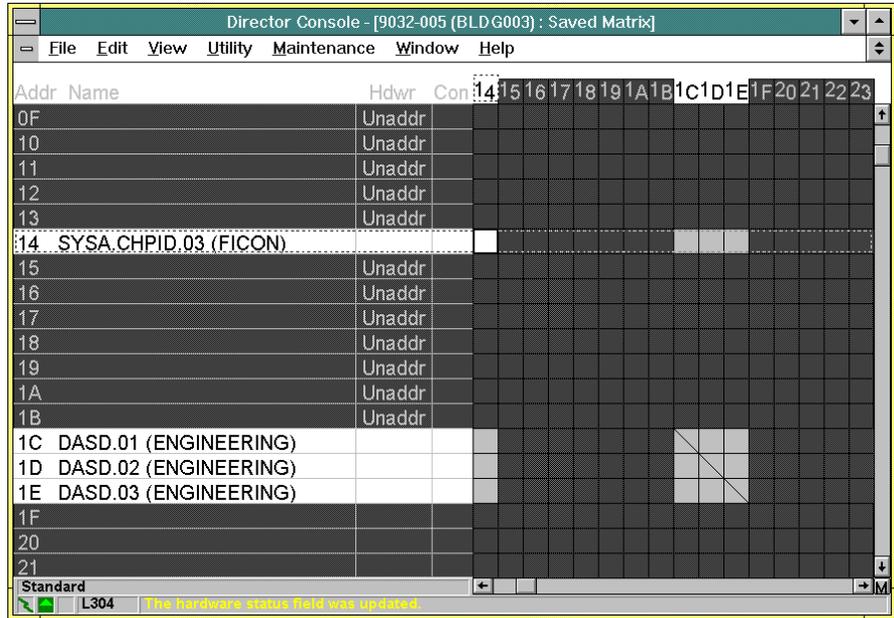


Figure 185. Matrix Window (LPAR Example)

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. Verify any address changes with the customer's LAN administrator. For information about determining a Director's IP and MAC address, or changing the IP and MAC address at the Director's operator panel, refer to Chapter 6 of the one of the following Director-specific maintenance publications:

- *Maintenance Information for the 9032 Model 3 Enterprise Systems Director (SA27-3601)*

- *Maintenance Information for the 9033 Model 4 Enterprise Systems Director (SA27-2638)*
- *Maintenance Information for the 9032 Model 5 Director (SY28-1158).*

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 186](#)).



Figure 186. 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 187](#)).

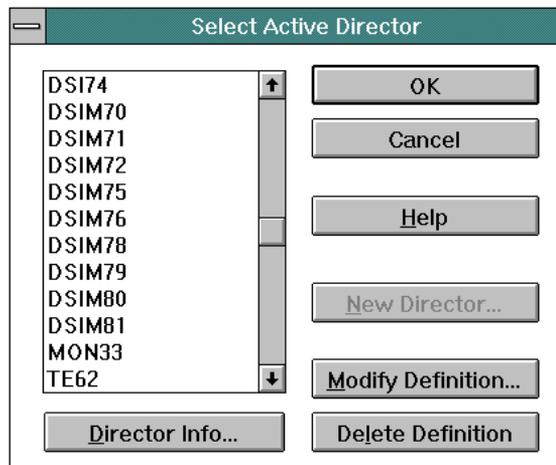


Figure 187. Select Active Director Dialog Box

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 188).

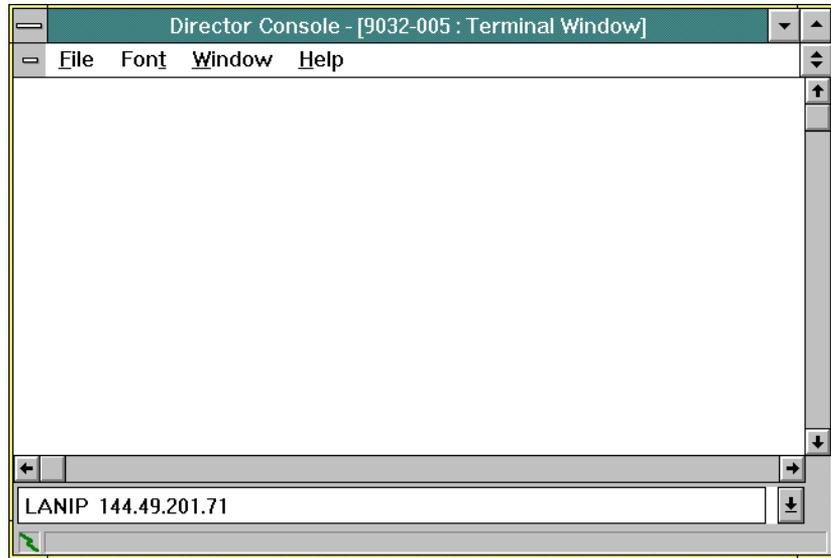


Figure 188. Terminal Window

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 187 on page 184).

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 189](#)).

The screenshot shows a dialog box titled "Director Definition". It contains the following fields and controls:

- Director ID:** A text box containing "9032-005".
- Model:** A dropdown menu showing "24-248 port Director".
- Default CUP Name:** A text box containing "Standard".
- IP Address:** A text box containing "144.49.201.71".
- Code Page:** A dropdown menu showing "037 - US/Canada/Brazil New".
- Buttons:** "OK", "Cancel", and "Help".
- Checkbox:** Open active window on Console start-up.

Figure 189. 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 187](#) on page 184).
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 190](#)).



Figure 190. 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 191).

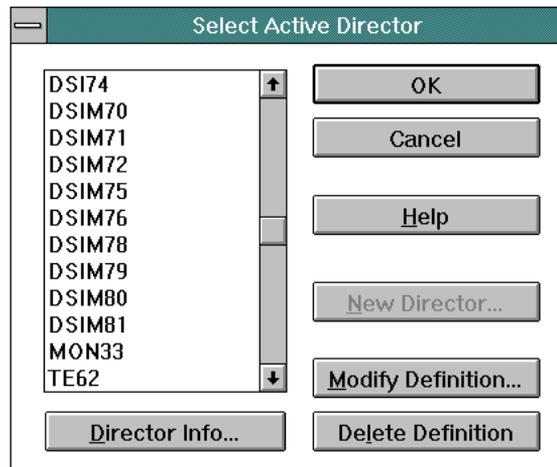


Figure 191. Select Active Director Dialog Box

- 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 192).

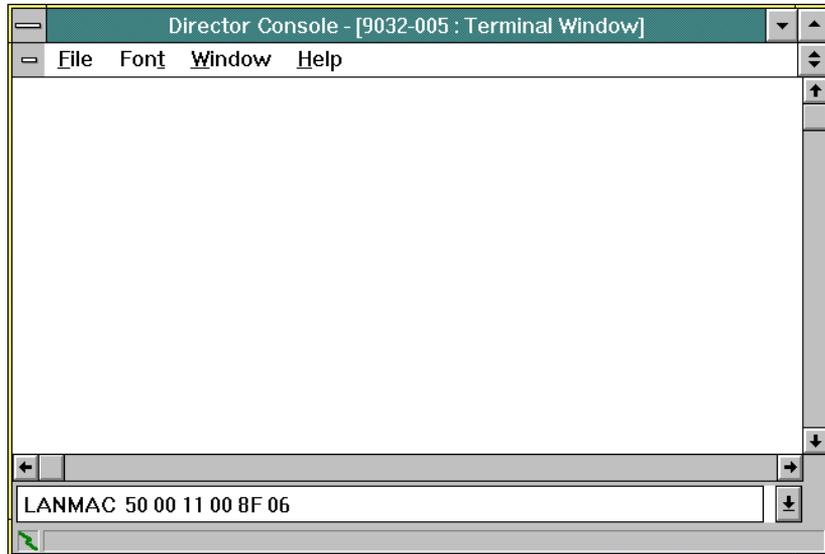


Figure 192. Terminal Window

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 193).

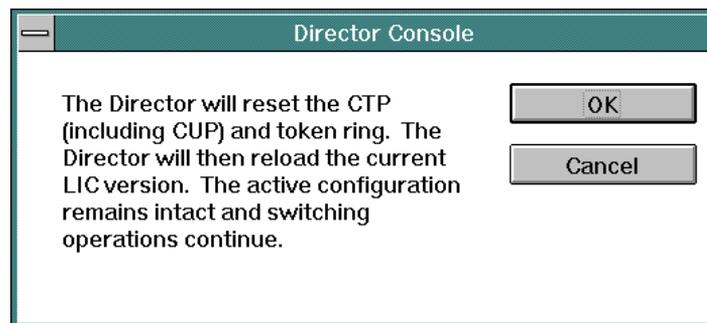


Figure 193. Reset CTP Card Dialog Box

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 194).

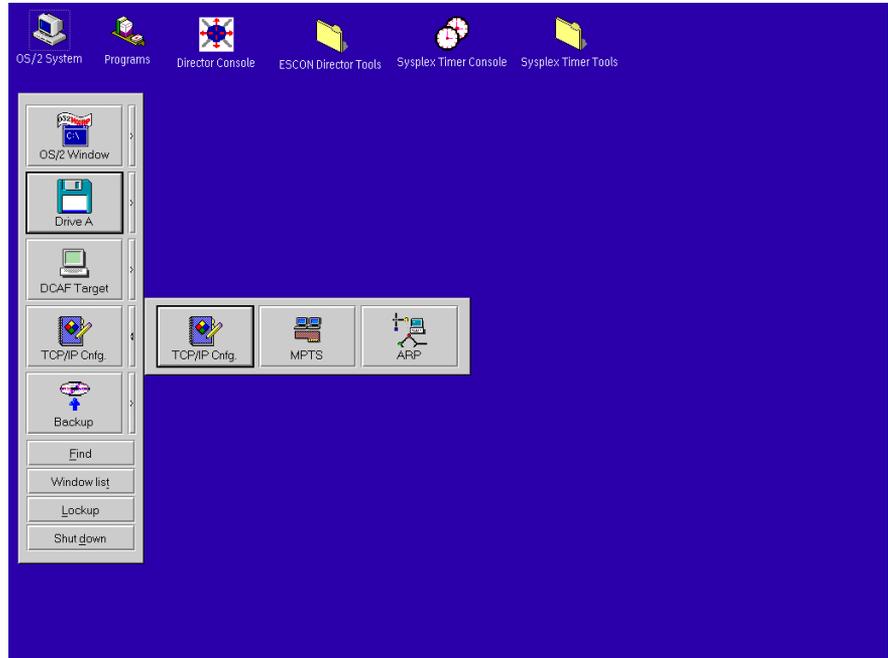


Figure 194. OS/2 Desktop (TCP/IP Cnfg. Drawer Open)

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

It is recommended an additional Console be configured and provided to take over maintenance and operation of Directors if the primary Console fails. Depending on customer requirements, a replacement Console or backup Console should be provided.

Use the following procedures to configure, maintain, and use a replacement or backup Console. Tasks in the procedures are referenced to one of the following Director-specific maintenance publications:

- *Maintenance Information for the 9032 Model 3 Enterprise Systems Director (SA27-3601)*
- *Maintenance Information for the 9033 Model 4 Enterprise Systems Director (SA27-2638)*
- *Maintenance Information for the 9032 Model 5 Director (SY28-1158).*

Replacement Console

This section describes the procedure to configure and use a replacement Console, synchronize Console data with the primary Console, and install the Console on the Token Ring LAN.

A replacement Console *is not* connected to the Token Ring LAN where the primary Console is connected. The replacement Console's system library is periodically updated (from a rewriteable optical cartridge (ROC) or tape) to match the primary Console's system library. If the primary Console fails, it is disconnected from the LAN and the replacement Console is connected.

Attention!

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.

Setting Up the Replacement Console

1. Perform "Task 1: Setting Up the Console" in Chapter 6 of the Director-specific maintenance information manual.
2. If required, change the data rate for the replacement Console's Token Ring adapter card. Refer to Console-specific instructions in 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)*.
3. At the primary Console, perform "Task 10: Backing Up the System Library" in Chapter 6 of the Director-specific maintenance information manual.

4. Restore the system library for the replacement Console to synchronize data with the primary Console. Refer to Console-specific instructions in 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).

Note: If any changes are 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. Refer to Console-specific instructions in 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).

Attention!

Synchronize the system libraries for the replacement and primary Consoles each time a change is made to the primary Console. 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 Token Ring LAN.
2. At the replacement Console, perform "Task 3, Connect the Console to the MAU" in Chapter 6 of the Director-specific maintenance information manual.

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.

A backup Console is similar to a replacement Console, however a backup Console has a different IP address than the primary Console. Therefore, the Console can be connected and maintained on the same Token Ring LAN as the primary Console. A backup Console provides faster replacement of the primary Console. If the primary Console fails, simply shut down the Console and start the Director Console application on the backup Console.

Attention!

The Director Console application does not permit a Director to be simultaneously operated from both a primary and backup Console. Event and other critical data may be lost.

Setting Up the Backup Console

1. Perform “Task 1: Setting Up the Console” in Chapter 6 of the Director-specific maintenance information manual.
2. 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. Refer to Console-specific instructions in 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).
3. Change the IP address of the backup Console so it does not match the IP address of the primary Console. Refer to Console-specific instructions in 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).
4. At the primary Console, perform “Task 10: Backing Up the System Library” in Chapter 6 of the Director-specific maintenance information manual.
5. Restore the system library for the backup Console to synchronize data with the primary Console. Refer to Console-specific instructions in 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).
6. At the backup Console, perform “Task 3, Connect the Console to the MAU” in Chapter 6 of the Director-specific maintenance information manual.

Maintaining the Console

Periodically restore the system library for the backup Console to synchronize data with the primary Console. Refer to Console-specific instructions in 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).

Attention!

Synchronize the system libraries for the backup and primary Consoles each time a change is made to the primary 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 attempt to 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 fails:

1. Switch off the primary Console's power.
2. At the backup Console, double-click the *Director Console* icon located on the OS/2 desktop to start the Console application and to take over operation and maintenance of Directors.

Attention!

Do not simultaneously operate the Director Console application on the primary and backup Console. Event and other critical data may be lost.

Synchronizing Director Time and Date with Console Time and Date

This section describes the procedure to synchronize the Director time and date with the Director Console time and date.

1. At the Director Console, select the *Open Active Configuration Matrix* option from the *File* menu. The *Select Active Director* dialog box appears (Figure 195).

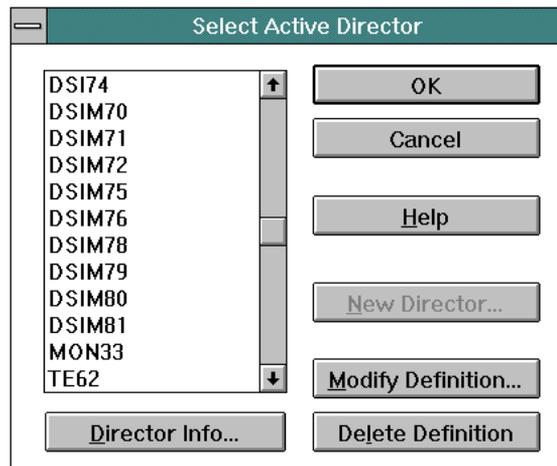


Figure 195. *Select Active Director Dialog Box*

2. 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.
3. Select the *Time/Date* option from the *Utility* menu. The *Set Director Time and Date* dialog box appears (Figure 196).

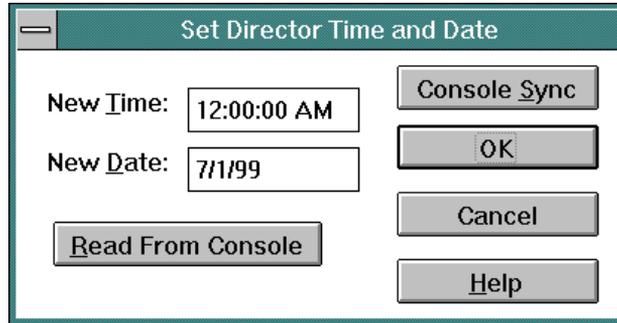


Figure 196. Set Director Time and Date Dialog Box

4. Click the *Read from Console* button. The *New Time* and *New Date* fields are updated with the Console PC time and date (set through the operating system).
5. Click the *Console Sync* button to set the Director time and date to the Console time and date. The *Operator Authorization* dialog box appears.
6. Type an operator authorization password (default is **LEVEL003**) and click the *OK* button. The *Set Director Time and Date* and *Operator Authorization* dialog boxes close, the *Active Matrix* window reappears, and the Director time and date are synchronized with the Console time and date.

Appendix A. Console Messages

Messages may appear in dialog boxes and may require the selection of an option before any other operation is completed. Icons in the dialog box indicate the severity or nature of the message.

(?) requires selection of an option before completing the operation.

(!) are error warning messages. Operations may not be completed in the current state.

(i) are informational only and are accompanied by an *OK* push button to acknowledge the information displayed.

For some messages in this Appendix, the user is directed to **contact your next level of support**. For most Console users, this support is provided by Help Desk or service personnel.

Matrix Window Messages Setting Attributes

The following messages appear in dialog boxes if an invalid operation is attempted while setting attributes in the matrix window. The **<addr>** notation in some messages is replaced by a port address number (in hexadecimal format) in the displayed error dialog box.

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 of the ports already has a dedicated connection. Selecting *Replace* removes the current dedicated connection from the one address and replaces it with a dedicated connection at the intersection of the selected ports. *Delete* removes 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* removes the previous dedicated connections and makes a single dedicated connection between the two selected ports.

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 or unaddressable port. - On an active matrix, dedicated connections cannot be set for addresses associated with uninstalled or unaddressable ports. Refer to status columns to determine uninstalled or unaddressable ports.

This name duplicates an existing name. Enter a unique name. - Two port addresses cannot have the same port address name and 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.

Changes pending. Merging a saved matrix will overwrite the changes in the Active Matrix Window. - This message appears if the *File* menu *Merge Saved Configuration* option is selected when changes are pending in the active matrix window.

Cannot merge a configuration containing a dedicated connection to an uninstalled or unaddressable port. - This message appears if the saved matrix being merged has a dedicated connection to an uninstalled or unaddressable port.

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.

Converter ports must remain prohibited from other converter ports. Continuing will preserve all prohibits between converter ports. - The user cannot alter the prohibit attribute of intersecting FCV Port cards by merging or activating a saved matrix. To continued the desired operation, the user must acknowledge that prohibits between FCV Port cards are preserved.

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 can be found in the Status line of a Director:

Activation of configuration failed. - The current configuration could not be activated on the Director. This notification should have been accompanied by an error dialog box 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 or unaddressable port. - On a saved or a new matrix, dedicated connections can be set for any port address intersection, allowing pre-install configurations. However, if a Director port is uninstalled or unaddressable, this message appears warning that the configuration will not be activated. Refer to status columns to determine uninstalled or unaddressable ports.

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. - The currently displayed active matrix configuration data has been overwritten by changes from the host application. 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 the host application 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.

Log file contents have changed. - While viewing a log file (log window), the log contents have changed (since the last time the log was refreshed or first displayed). Use the *Refresh* option on the *File* menu to display 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](#)" on page 85.

Port/Address mapping has been changed. - The mapping of physical ports to logical addresses has been changed on the Director by another user (usually the host application). 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 *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. - Changes have been made by another user (usually the host application) to the Director mode register. This may be the *Active = Saved*, *Remote Offline Control*, or *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 displays 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 the session ends or the *Capture* command is revoked.

Cannot set dedicated connection to converter port. - A user is not permitted to establish a dedicated connection to a FICON port in the *Active Matrix* window.

Cannot activate configuration with dedicated connection to converter port. - The user is warned that setting a dedicated connection to a FICON port in the *Saved Matrix* window prevents the matrix from being activated.

Dynamic connections between converter ports are not permitted. - A user may not directly alter the prohibit requirement between FICON 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 FICON ports in the *Active Matrix* window (through the *Prohibit Range*, *Prohibit Row* or *Paste* menu items) informs the user that all selected prohibits may not have been removed.

Error Messages During Director and Console Exchange

These messages may appear in abnormal circumstances during execution of a command (such as activating a configuration). They appear in pop-up dialog boxes if the command exchange between the Director and the Console fails.

Cannot activate a configuration containing a dedicated connection to an uninstalled or unaddressable port. - If a dedicated connection is set with one address assigned to a Director port that is uninstalled or unaddressable, the Active or Saved Matrix configuration is not activated. Check the hardware status column for a **NotInst** or **Unaddr** condition for any dedicated connections.

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 (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 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.

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 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 the host application 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 and save the changes to the active matrix and then retry the Refresh command.

Cannot activate a configuration containing a dedicated connection to a converter port. - A user is not allowed to activate an Active or Saved Matrix containing an invalid dedication to a FICON port.

Cannot merge a configuration containing a dedicated connection to a converter port. - A user is not allowed to merge a Saved Matrix containing a dedicated connection to a FICON port.

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 to undedicate the ports.

ESCON diagnostics are unable to execute on a FICON (converter) port. - It is invalid to attempt to execute ESCON diagnostics on an FCV Port card.

FICON port diagnostics are unable to complete. An error has occurred processing a diagnostic request. - Communications between the Console and the FCV Port card on the Director is hindered. The diagnostic is unable to complete. If possible, attempt to retry the diagnostic test.

Selected converter port address is invalid. - The user entered an invalid FCV Port card address while attempting to execute an online diagnostic test.

FICON port diagnostics are unable to execute on an inactive FCV card. - Diagnostics are not supported on inactive FCV Port cards.

FICON port diagnostics are unable to execute on an FCV card requiring service. - Diagnostics are not supported on FCV Port cards that are in service required mode.

Director Definition Dialog Messages

The following messages appear in pop-up dialog boxes 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 through 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.

Copy Matrix Messages

The following messages appear in dialog boxes when performing a copy matrix operation.

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 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 the other model of Director. Copy 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 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 file name 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 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 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 operation.

Unable to copy to open destination matrix. Please close destination matrix and try again. - Close the destination matrix and retry.

Matrix Window File Access Messages

The following messages appear in pop-up dialog boxes when performing an operation involving accessing matrix files.

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 with operation.

File key in use from previous command. - Call next level of support.

Could not access Matrix configuration file. - Call next level of support.

Disk error or invalid file data. - Call next level of support.

Internal error. - Call next level of support.

Director rejected IPL file request. - Retry the operation; if it fails, call 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 matrix or continue with the operation.

The Active = Saved mode is on for this Director. The IPL file cannot be saved in this mode. - Retry 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.

Error during file transfer on FCV card. - The data collection procedure was unable to retrieve a file from the FCV Port card.

Port Authorization Messages

The following messages appear in dialog boxes when performing a port authorization operation.

Operator ID must be between 301 and 330. - This message appears if the user enters an invalid operator ID in the *Range* dialog box in the port authorization matrix.

Changes Pending. Changing the authorized operator will discard the changes in the Active Matrix Window. - This message appears if the user selects the *Edit* menu *Enable Operator* option 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 appears if the user selects the *Utility* menu *Port Authorization* option while there are pending changes in the active matrix window.

This function may only be performed by an Operator with authorization to all ports. - This message appears if the operator level password supplied for certain operations does not correspond to a fully authorized operator. These operations include activating a saved matrix, saving an active matrix, copying a matrix, deleting a matrix, saving a saved matrix to a new name, and editing a new matrix.

Enabled Operator is not authorized to remove a dedicated connection from port <port address>. - This message appears if an operator is not enabled and attempts to remove a dedicated connection between two unauthorized ports at the *Name and States* dialog box.

Enabled Operator is not authorized to create a dedicated connection to port <port address>. - This message appears if an operator is not enabled and attempts to create a dedicated connection between two unauthorized ports at the *Name and States* dialog box.

Cannot swap to uninstalled or unaddressable port. - It is invalid to swap to an uninstalled or unaddressable port.

Converter ports may only be swapped with other converter ports. - It is invalid to attempt to swap a FICON port with an ESCON port.

LIC Install Messages

The following messages appear in pop-up dialog boxes when installing Licensed Internal Code (LIC).

The selected LIC version is not concurrent. Continuing will cause all converter ports to transmit offline. - If converter ports can be set offline, continue with the LIC install. If converter ports cannot be set offline, defer the LIC install and notify the customer.

One or more converter ports are degraded. Continuing will cause all converter ports to transmit offline. - If converter ports can be set offline, continue with the LIC install. If converter ports cannot be set offline, defer the LIC install until the degraded FCV port card can be removed and replaced, and notify the customer.

The selected version may not be installed while FCV cards are present in the Director. Remove all converter cards and retry LIC/LMA install. - It is not permitted to downgrade LIC versions (from 5.x to 4.x) with FCV Port cards installed in the Director.

The selected version does not support FICON operation. Continuing will result in the loss of Director FICON capabilities. - Downgrading LIC versions (from 5.x to 4.x) results in the loss of FICON-capable software for the Director.

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.

Notice - Ports 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.

Alert Dialog with Error Code

An alert dialog box may occur in more severe error conditions on the Console. This dialog 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 try 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 from the *Product Information* option from the *Help* menu).
2. Print or copy the Console error log and preserve it for use by service personnel.
3. Contact your next level of support.

Alert dialog with error code messages are:

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 path name.

TCP/IP kernel is inaccessible. No links will be activated.

Director library is unreadable! Partial restore from backup may be required.

LICA 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

Miscellaneous messages are:

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.

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.

Glossary

This glossary includes terms and definitions from:

- The *IBM 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 from this text are identified by the symbol (A).
- *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 from this text are identified by the symbol (E).
- The *Information Technology Vocabulary*, developed by Subcommittee 1 (SC1), Joint Technical Committee 1 (JTC1), of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). Definitions of published parts of this vocabulary are identified by the symbol (I). Definitions taken from draft international standards, committee drafts, and working papers developed by ISO/IEC SC1/JTC1 are identified by the symbol (T), indicating that final agreement has not been reached among the participating national bodies of SC1.

The following cross references are used in this glossary:

Contrast with - Refers to a term with an opposite or substantively different meaning.

See - Refers the reader to multiple-word terms in which this term appears.

See also - Refers the reader to terms with a related, but not synonymous, meaning.

Synonym for - Indicates the term has the same meaning as a preferred term defined in the glossary.

A

ac. See *alternating current*. Contrast with *dc*.

accelerator. A short-cut keystroke method to perform a menu operation. Menu options may have accelerator keys listed to the right of the menu option. Use the listed accelerator to perform the menu option's function when no menu is selected for the window.

active configuration. In an ESCON or FICON environment, the Director configuration that is determined by the status of the connectivity attributes. Contrast with *saved configuration*.

adapter. (1) Hardware that provides transitional functions between multiple devices. (2) In a fiber-optic environment, the 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 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*.

address resolution protocol (ARP). The protocol by which a host computer maintains a cache of address translations, allowing the physical address of the computer to be derived from the Internet address.

administrative password authorization. The level-one password authorization that allows access to a Director to perform administrative, maintenance, and operator functions. Contrast with *maintenance password authorization* and *operator password authorization*.

allowed connection. In a Director, the attribute that when set, establishes dynamic connectivity capability. Contrast with *prohibited connection*.

alternating current (ac). Electric current that reverses direction at regular sinusoidal intervals. Contrast with *direct current*.

American National Standard Code for Information Interchange (ASCII). A standard character set consisting of 7-bit coded characters (8-bit including parity check) used for information exchange between systems and equipment.

American National Standards Institute (ANSI). A national organization consisting of producers, consumers, and general interest groups that establishes procedures by which accredited organizations create and maintain industry standards in the United States (*A*).

ANSI. See *American National Standards Institute*.

AOC/MVS. See *Automated Operations Control for MVS*.

application. (1) The use to which a data processing system is put, for example, a payroll application, an airline reservation application, or a network application. (2) A collection of software components used to perform specific types of work on a computer.

application-specific integrated circuit (ASIC). A circuit designed for a specific application or purpose, such as implementing the lower-layer Fibre Channel protocol (FC-0). ASICs differ from general-purpose devices such as memory chips or microprocessors.

AR. IBM parts list acronym for *As Required*. AR indicates the parts quantity is not the same for all machines.

ARP. See *address resolution protocol*.

ASCII. See *American National Standard Code for Information Interchange*.

ASIC. See *application-specific integrated circuit*.

attribute. The connection status of the address on a configuration matrix; allowed, blocked, dedicated, or prohibited.

Automated Operations Control for MVS (AOC/MVS). An IBM-licensed program that automates routine processor management tasks, including, shutdown, recovery, startup, and initialization procedures, and automates operator responses to messages. AOC/MVS functions are now integrated into SA OS/390.

B

backup diskette. A diskette that contains duplicate information from an original diskette. The backup diskette is used in case information on the original diskette is unintentionally changed or destroyed.

bit. Acronym for *binary digit*, the smallest unit of data in computing, with a value of zero or one. Abbreviated as lowercase *b*.

blocked. In a Director, the attribute that when set, removes the communication capability of a specific port. Contrast with *unblocked*.

bridge. (1) An attaching device that connects two LAN segments to allow the transfer of information from one LAN segment to the other. A bridge can connect the LAN segments directly by network adapters and software in a single device, or can connect network adapters in two devices through software and use of a telecommunication link between the two adapters.

(2) A functional unit that connects two LANs that use the same logical link control protocol, but may use different media access control protocols (*T*). Contrast with *router*.

British Thermal Unit (BTU). The quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit.

BTU. See *British Thermal Unit*.

button. On a graphical user interface, a virtual display element (a rectangle containing text) that is selected with an input device and programmed to operate as a function key (*T*).

byte. An 8-bit quantity that computers treat as a single unit, often called an octet or word. Abbreviated as uppercase *B*. See also *octet*.

C

cascade. Windows on a console cascade to show all open windows in a way that allows any window to be viewed by clicking its title (window is brought to the front). Cascaded windows are overlapped. To cascade windows, use the *Window* pull-down menu and select *Cascade*. Contrast with *Tile*.

CBY. Acronym for *channel operations running in byte mode* (ESCON channel attached to ESCON converter), and specifies the I/O operation mode for the channel path under the IOCP CHPID statement *Type* parameter. Contrast with *CVC*.

CD-ROM. See *compact disk read-only memory*.

cell. On the Director matrix window, 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 Director's matrix window indicating the selected intersection cell. Attribute modifications that require two port addresses, such as prohibit or dedicate, are performed on the selected cell.

chained. In an ESCON environment, means that two Directors are physically attached.

channel. A system element that controls one channel path, and whose mode of operation depends on the type of hardware attached. Each channel controls an I/O interface between the channel control element and the attached control units.

channel-attached. (1) Pertaining to direct attachment of devices by data I/O channels to a computer. (2) Pertaining to devices attached to a control unit by cables, not telecommunication lines.

channel path (CHP). A single interface between a central processor and one or more control units, along which signals and data is sent to perform I/O requests.

channel path identifier (CHPID). In a channel subsystem, a value assigned to each channel path of the system that uniquely identifies the path.

channel subsystem (CSS). A collection of subchannels that direct the flow of information between I/O devices and main storage, relieve the processor of communication tasks, and perform path management functions.

CHP. See *channel path*.

CHPID. See *channel path identifier*.

Class 3 Fibre Channel service. Class 3 service duplicates the functions of a packet-switched network and allows multiple nodes to share links by multiplexing transmitted data. Class 3 service does not acknowledge data

frame delivery. Class 3 service is supported by the 9032-005 Director.

CNC. Acronym for *ESCON channel-attached to ESCON-capable device*, and specifies the I/O operation mode for the channel path under the IOCP CHPID statement *Type* parameter.

column. Vertical arrangement of data. Contrast with *row*.

command. (1) A character string from an external source to a system that represents a request for system action. (2) A request from a terminal to perform an operation or execute a program. (3) A value sent through an I/O interface from a channel to a control unit that specifies the operation to be performed.

compact disk read-only memory (CD-ROM). High capacity read-only memory in the form of an optically read disk.

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.

concurrent maintenance. The ability to perform maintenance tasks, such as the removal and replacement of FRUs, while the Director is operating. In addition, fiber-optic cables can be connected or disconnected from ports while the Director is operating. See also *hot pluggable* and *nondisruptive installation*.

configuration matrix. A configuration matrix defines a Director's address configuration. The three matrix types are new matrix, saved matrix, and active matrix. Synonym for *matrix*.

connectivity attribute. The characteristic that determines port status for the Director. See *allowed connection*, *dedicated connection*, *prohibited connection*, *blocked*, and *unblocked*.

connectivity capability. (1) The capability that allows attachment of a device to a system without requiring physical reconfiguration of either the device or the interconnections.

(2) The Director 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 a Director, the method used to change port connectivity attributes and determine the communication capability of the link attached to the port.

connector. See *optical fiber connector*.

Console. The Director device used to perform administrative, maintenance, and operations tasks. Synonym for *display device* or *terminal*.

Console Audit log. A log that tracks and records Director Console operator activities, including changing passwords, adding or deleting LIC versions, adding or deleting Director definitions, and entering or exiting the application. Each log entry contains a description of the action, an action identifier, and the date and time the action occurred.

Console Error log. A log of abnormal errors that were encountered by the Director Console software during operations, but did not cause Console failure. For example, errors caused by insufficient PC memory are logged.

Console library. An information database for the Director, maintained by the Console application. The library is stored on the PC platform running the Console application, and contains logs, LIC versions, and saved configurations.

Control Processor (CTP) card. In the Director, the circuit card that provides the processor and associated logic. The card

initializes hardware after power on. While in operation, the card supports the switch CUP, maintenance port, and operator panel, and supports port exception handling and error recovery. It also contains the fiber channel controller for I/O requirements.

control program. A computer program that schedules and supervises execution of programs in a computer system (*I*).

control unit. Hardware that controls the reading, writing, or display of data at one or more I/O units.

Control Unit Port (CUP). An internal Director port (on the CTP card and labelled *FE*) that communicates with channels to report error conditions and link initialization.

converter. In an ESCON environment, a device that allows attachment of parallel channel (bus and tag) I/O control units to ESCON channels.

coupler. In a fiber-optic environment, the link hardware used to join optical fiber connectors of the same type. Contrast with *adapter*.

CSS. See *channel subsystem*.

CTC. Acronym for an ESCON channel attached to another ESCON channel (*channel-to-channel*), and specifies the I/O mode of operation for the channel path under the IOCP CHPID statement *Type* parameter.

CTP. See *Control Processor card*.

CUP. See *Control Unit Port*.

CVC. Acronym for *channel operations running in block mode* (ESCON channel attached to ESCON converter), and specifies the I/O operation mode for the channel path under the IOCP CHPID statement *Type* parameter. Contrast with *CBY*.

D

DASD. See *direct access storage device*.

dB. See *decibel*.

dBm. Decibels referenced to one milliwatt. Zero dBm equals one milliwatt, with a logarithmic relationship as the value increases.

dc. See *direct current*. Contrast with *ac*.

DCAF. Acronym for IBM-licensed *Distributed Console Access Facility* software. Through DCAF, the Director Console is accessed and controlled by a remote PC.

decibel (dB). A standard unit used to express gain or loss of optical power, expressed as the ratio of input power to output power on a logarithmic basis.

dedicated connection. A connection between two Director ports not affected by information in the transmission frames. The connection restricts those ports from communicating with any other port, and can be established only as a result of actions performed by a host control program or at the Director Console. Contrast with *dynamic connection*.

default. Pertaining to an attribute, value, or option assumed by a system when none is specified (*I*).

destination. A point or location, such as a processor, Director, or Console, to which data is transmitted.

device. Mechanical, electrical, or electronic hardware with a specific purpose.

device number. In a channel subsystem, four hexadecimal digits that uniquely identify an I/O device.

device port (DVP) card. The Director's hardware interface for ESCON fiber-optic media. Each port card contains either LED or XDF laser port interfaces. See also *port card*.

dialog box. A pop-up window on a console with information messages or fields to be modified or completed with desired options.

diagnostics. (1) The process of investigating the cause or nature of a problem in a product or system. (2) Modules or tests used by computer users and service personnel to diagnose hardware problems.

direct access storage device (DASD). A storage device that provides direct access to data, and in which access time is independent of data location.

direct current (dc). Electric current that continuously flows in one direction. Contrast with *alternating current*.

Director. A device that provides dynamic switching of fiber-optic connections between ESCON channel paths and control units, and FICON channel paths and ESCON control units. The Director also extends the operational distance between processors (ESCON or FICON) and ESCON control units.

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 is recorded (with the date and time).

Director Event log. A log of abnormal hardware or software incidents that are reported by the Director during operations. For example, a CTP card failure is logged as a hardware incident. A corrupt configuration file is logged as a software incident.

Director LIN log. A log of abnormal link incidents reported by the Director during operations. For example, a loss of synchronization condition or a bit error rate threshold exceeded condition is reported as a link incident.

disconnected. In a Director, the attribute that when set, disables a dedicated connection. Contrast with *connected*.

diskette. A thin magnetic disk enclosed in a plastic jacket, which is removable from a computer and is used to store and transport data.

diskette drive. The hardware mechanism by which a computer reads data from and writes data to removable diskettes.

display device. A computer peripheral that presents information on a screen. A synonym for *Console* or *terminal*.

distribution panel. In an ESCON environment, a panel that provides a central location to attach trunk and jumper cables, and is mounted in a rack, wiring closet, or on a wall.

DRAM. See *dynamic random access memory*. See also *RAM* and contrast with *SRAM*.

duplex. In data communication, pertaining to transmission in which data is sent and received at the same time. Contrast with *half-duplex* and *simplex*.

duplex connector. An optical fiber component that terminates jumper cable fibers in one housing and provides physical keying for attachment to a duplex receptacle. See also *Fibre Channel Standard connector*, *multimode connector*, and *subscriber connector*.

duplex receptacle. A fixed or stationary optical fiber component that provides a keyed attachment method for a duplex connector.

DVP card. See *device port card*.

dynamic connection. In a Director, a connection between two ports established by the Director that appears as one continuous link when active. The duration of the connection depends on the protocol defined for the frames transmitted and on the state of the ports. Contrast with *dedicated connection*.

dynamic connectivity. The Director capability that allows connections to be enabled or disabled at any time.

dynamic random access memory (DRAM). Random access memory that resides in a cell comprised of a capacitor and transistor. DRAM data deteriorates (i.e. is dynamic) unless the capacitor is periodically recharged by the controlling microprocessor. DRAM is slow, but relatively inexpensive. See *random access memory* and contrast with *static random access memory*.

E

EAF. See *enhanced availability feature*.

EBCDIC. See *extended binary-coded decimal interchange code*.

EC. See *engineering change*.

EIA. See *Electronic Industries Association*. See also *TIA*.

electromagnetic interference (EMI). Refers to undesirable electromagnetic emissions generated by solar activity, lightning, and electronic devices. The emissions interfere with or degrade the performance of another electronic device.

Electronic Industries Association (EIA). The governing body that publishes recommended standards for physical devices

and associated interfaces. For example, RS-232 is the EIA standard that defines computer serial port connectivity. See also *TIA*.

electrostatic discharge (ESD). The undesirable discharge of static electricity that can damage or degrade electronic circuitry.

ELP. See *establish logical path*.

EMI. See *electromagnetic interference*.

engineering change (EC). A change to the design, construction, or operation of a hardware or software system that improves the operation, reliability, or serviceability of the system. The EC process involves submission of a formal proposal that is reviewed and authorized. Implementation of an authorized EC is carefully tracked and controlled.

Enhanced Availability Feature (EAF).

Enhanced availability features are backup FRUs that are ordered and installed in the Director to provide redundancy and reduce disruption in case of failure.

Enterprise Systems Architecture (ESA). A computer architecture introduced by IBM in 1988 as ESA/370. The architecture added access registers to improve virtual memory management and increase storage from 2 gigabytes to 16 terabytes. The architecture was enhanced with the introduction of ESA/390 in 1990.

Enterprise Systems Connection (ESCON).

An IBM architecture, technology, and set of products and services introduced in 1990 that provides a dynamically connected environment using fiber-optic cables as the data transmission medium.

erase. To remove electrically or magnetically stored data, leaving the space where the data was stored unoccupied.

EREP. Acronym for IBM's *Environmental Record Editing and Printing* software. Through EREP, data contained in a system recorder file is made available for maintenance analysis.

error message. An indication an error is detected. See also *information message* and *warning message*.

ESA. See *Enterprise Systems Architecture*.

ESCON. See *Enterprise Systems Connection*.

ESCON channel. A data communications channel that uses ESCON technology with fiber-optic cables as the transmission medium, rather than copper bus and tag cables. Contrast with *FICON channel* and *parallel channel*.

ESCON Converter. See *converter*.

ESCON Manager. An IBM-licensed program that provides host control and intersystem communication with the Director connectivity operations. ESCON Manager was discontinued in 1998 and its functions are now integrated into SA OS/390.

ESD. See *electrostatic discharge*.

establish logical path (ELP). An ESCON protocol command issued from host to establish a connection between host and port or between two ports on a Director. The command frame contains a destination and source address.

event code. A multi-digit code that displays at the operator panel or Director Event log. The code is used by maintenance personnel to determine corrective actions to be taken.

extended binary-coded decimal interchange code (EBCDIC). A coded character set comprised of 256 8-bit characters.

Extended Distance Feature (XDF). A means to extend the propagation distance of a fiber-optic signal. Essentially a singlemode laser ESCON port.

F

fabric. A network of one or more switch elements that can transmit, route, and receive data using the Fibre Channel protocol. A fabric can support multiple, concurrent Fibre Channel connections.

fabric port (F_port). A port on a switch to which N_ports are directly connected. Contrast with *node port*. See also *thin fabric port*.

FC-0. The Fibre Channel layer that describes the physical link between two ports, including the transmission media, transmitter and receiver circuitry, and interfaces.

FC-1. The Fibre Channel layer that describes the IBM-patented 8B/10B transmission code that provides DC balance in the transmitted bit stream, separates control bytes from data bytes (for simplification), and detects transmit and receive errors.

FC-2. The Fibre Channel layer that specifies the signaling protocol, rules, and mechanisms required to transfer data blocks. The FC-2 layer is very complex, and provides different classes of service, packetization, sequencing, error detection, segmentation, and reassembly of transmitted data.

FC-3. The Fibre Channel layer that provides a set of services common across multiple N_ports of a Fibre Channel node. The services are not commonly used and are essentially reserved for Fibre Channel architecture expansion.

FC-4. The Fibre Channel layer that provides mapping of Fibre Channel capabilities to upper level protocols, including IP and SCSI.

FC-PH. See *Fibre Channel Physical and Signaling Interface*.

FCS. See *Fibre Channel Standard*.

FCS Connector. See *Fibre Channel Standard connector*.

FCV. (1) Acronym for *Fibre Channel Converter* port card, the Director's hardware interface for FICON fiber-optic media. See also *port card*. (2) Acronym for *FICON channel-attached converted to ESCON-capable* device, and specifies the I/O operation mode for the channel path (using an FCV port card) under the IOCP CHPID statement *Type* parameter.

feature. A part of an IBM-licensed product that may be ordered separately or as an option by the customer.

fiber. See *optical fiber*.

fiber-optic cable. See *optical cable*.

fiber optics. The branch of optical technology concerned with the transmission of radiant power through fibers of transparent materials such as glass, fused silica, or plastic (*E*). Telecommunication applications of fiber optics use optical fibers. A single fiber or a nonspatially aligned fiber bundle is used for each information channel. Such fibers are often called optical fibers to differentiate them from fibers that are used in noncommunication applications.

Fiber Transport Services (FTS). An IBM service that provides installation of fiber-optic cable trunk lines and strategically-located distribution panels in a data center. Optically-connected equipment can then be installed with either short jumper cables, harnesses, or factory-terminated trunk cables.

Fibre Channel Converter (FCV) port card.

The Director's hardware interface for FICON fiber-optic media. See also *port card*.

Fibre Channel Standard (FCS). ANSI standard that provides a common, efficient data transport system that supports multiple protocols. The architecture integrates both channel and network technologies, and provides active, intelligent interconnection among devices. All data transmission is isolated from the control protocol, allowing use of point-to-point, arbitrated loop, or switched fabric topologies to meet the needs of an application.

Fibre Channel Standard (FCS) connector.

A connector that terminates fiber-optic jumper cables in a pair of connected housings (one transmit and one receive), and provides physical keying for attachment to an SC receptacle. An FCS connector is synonymous with an SC connector. An FCS connector can attach to an FCV port card or XDF Laser port card. See also *multimode connector* and *subscriber connector*.

Fibre Channel Physical and Signaling Interface (FC-PH). The ANSI document that specifies the FC-0 (physical signaling), FC-1 (data encoding), and FC-2 (frame construct) layers of the Fibre Channel protocol.

Fibre Connection (FICON). An IBM set of products and services introduced in 1999 that is based on the Fibre Channel Standard. FICON technology uses fiber-optic cables as the data transmission medium, and significantly improves I/O performance (including one Gbps bidirectional data transfer). FICON is designed to coexist with ESCON channels, and FICON-to-ESCON control unit connections are supported.

FICON. See *Fibre Connection*.

FICON channel. A data communications channel that uses FICON technology (rather

than ESCON technology) with fiber-optic cables as the transmission medium. Contrast with *ESCON channel* and *parallel channel*.

Field Replaceable Unit (FRU). An assembly that is removed and replaced in its entirety when any one of its components fails. A logic card is an example of a FRU.

FLASH memory. Reusable nonvolatile memory that is organized as segments for writing, and bytes or words for reading. FLASH memory is faster than read-only memory, but slower than random access memory.

FLOGI. Acronym for the fabric login command. The command establishes the initial operating parameters and topology for a fabric. The command is accepted by an *F_port* or *thin F_port*.

F_port. See *fabric port*. See also *thin F_port*.

FRU. See *Field Replaceable Unit*.

FTS. See *Fiber Transport Services*.

G

GB. See *gigabyte*.

Gbps. Acronym for *gigabits per second*.

GHz. See *gigahertz*.

gigabyte (GB). A unit of measure for data storage, equal to 1,073,741, 824 bytes. Generally approximated as one billion bytes.

gigahertz (GHz). One billion cycles per second (hertz).

GND. Acronym for *ground* (e.g. that portion of a conducting circuit connected to the earth).

graphic display. The Director's 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 mode is disabled, only prohibited connections are displayed.

graphical user interface (GUI). A GUI is a visually oriented interface where the user interacts with representations of real-world objects displayed on the computer screen. Interactions with such objects produce actions that are intuitive to the user.

GUI. See *graphical user interface*.

H

half-duplex. In data communication, pertaining to transmission in only one direction at a time. Contrast with *duplex*, synonym for *simplex*.

hardware. Physical equipment (Director or Console) as opposed to computer programs, procedures, rules, and associated documentation. Contrast with *software*.

Hardware Audit log. A log that records all configuration changes for Director FRUs. Each entry contains a FRU name, position, status, part number, serial number, and date and time a change was detected.

Hardware Configuration Definition (HCD). A program that defines all available I/O devices and channel paths to a processor system and the MVS operating system. This program replaced the Input Output Configuration and MVS Configuration Programs starting with MVS/ESA Version 4.0.

hardware information block (HIB). A Director status register that defines if a port is 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.

HCD. See *Hardware Configuration Definition*.

Hertz (Hz). A unit of frequency equal to one cycle per second.

hexadecimal. A numbering system with base of sixteen; valid numbers use the numbers 0 through 9 and characters A through F, where A represents 10 and F represents 15.

HIB. See *hardware information block*.

host-based software. Pertains to ESCON Manager, the software used in configuring and managing multiple Directors on the network.

host processor. (1) A processor that controls all or part of a user application network (*T*). (2) In a network, the processing unit in which resides the access method for the network.

hot pluggable. Pertains to a FRU that is removed and replaced from a device while the device is powered on and operational. See also *concurrent maintenance* and *nondisruptive installation*.

Hz. See *Hertz*.

I

ID. See *identifier*.

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) A user-defined symbolic name of 24 characters or less that identifies a Director. See also *password identifier* and *port name*.

IEEE. See *Institute of Electrical and Electronics Engineers.*

IML. See *Initial Machine Load.*

information message. A message informing a user that a function is performing normally or has completed normally. User acknowledgment may not be required, depending on the message. See also *error message* and *warning message.*

Initial Machine Load (IML). Process of loading the operating system and applications software from secondary storage to a central processor after machine power-on. Sometimes referred to as booting the machine.

Initial Program Load (IPL). (1) Initialization procedure causing an operating system to commence operation. (2) Process by which a configuration image is loaded into storage at the beginning of a work day or after a system malfunction. (3) Process of loading system programs and preparing a system to run jobs.

Initial Program Load (IPL) file. Information stored in Director's nonvolatile memory that contains default connection configurations. The Director loads the file for operation when powered on. The file can be modified or another file can be specified as the IPL file.

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. A collection of channel paths, control units, and I/O devices that attaches to a processor.

input/output configuration data set (IOCDs). A data set that contains an I/O configuration definition built by the IOCP.

Input/Output Configuration Program (IOCP). A program that defines all available I/O devices and channel paths to a processor system. Replaced by the Hardware Configuration Definition Program starting with MVS/ESA Version 4.0.

input/output controller (IOC). A functional unit in a data processing system that controls one or more devices or units of peripheral equipment.

Institute of Electrical and Electronics Engineers (IEEE). A technical professional society that promotes the development and application of electrotechnology and allied sciences.

interface. (1) A shared boundary between two functional units, defined by functional, signal, or other characteristics. 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.

Internet Protocol (IP). Network layer for the TCP/IP protocol used on Ethernet networks. IP provides packet routing, fragmentation, and reassembly through the data link layer.

I/O. See *input/output.*

IOC. See *input/output controller.*

IOCDs. See *input/output configuration data set.*

IOCP. See *Input/Output Configuration Program.*

IP. See *Internet Protocol.*

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*.

ISA. See *Industry Standard Architecture*.

ITE. Acronym for *Information Technology Equipment*.

J

jack. A hardware-connecting device to which the wire or wires of a circuit are attached, and that is arranged for the insertion of a plug.

jumper cable. In a fiber-optic environment, a cable having two conductors that provide a physical connection between two devices, or between a device and a distribution panel. Contrast with *trunk cable*.

K

kB. See *kilobyte*.

kilobyte (kB). A unit of measure for data storage, equal to 1,024 bytes. Generally approximated as one thousand bytes.

L

LAN. See *Local Area Network*.

LAN Adapter Installation and Diagnostics (LANAID). An IBM-licensed installation tool providing a graphical and command-line interface for manual installation and configuration of a Token Ring LAN or LAN devices.

LAN Adapter and Protocol Support (LAPS). IBM - licensed software that manages and controls network adapter cards in a device, including the device drivers for those cards as well as the protocols that are used to communicate with other devices on the network.

LANAID. See *LAN Adapter Installation and Diagnostics*.

LAPS. See *LAN Adapter and Protocol Support*.

laser. Acronym for *Light Amplification by Stimulated Emission of Radiation*. A device that produces optical radiation using a population inversion to provide amplification and an optical resonant cavity to provide positive feedback. Laser radiation is highly coherent temporally, or spatially, or both (*E*).

LCD. See *liquid crystal display*.

LED. See *light-emitting diode*.

LIC. See *Licensed Internal Code*.

Licensed Internal Code (LIC). Software provided for use on IBM machines and licensed to customers under the terms of IBM's customer agreement.

light-emitting diode (LED). A semiconductor chip that emits visible or infrared light when activated. Often used as an indicator light on computer hardware.

LIN. See *link incident*.

link. In a fiber-optic environment, the physical connection and transmission medium between an optical transmitter and receiver. A link consists of two conductors, one used for sending and the other for receiving, thereby providing a duplex communication path.

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*.

link incident. A failure associated with a link, rather than a hardware or software failure associated with the Director. Examples of link incidents include an invalid sequence, sequence timeout, bit error rate threshold exceeded, loss of signal or synchronization, or a not-operational sequence recognized.

LMA Code. See *Loader/Monitor Area Code*.

Loader/Monitor Area (LMA) Code. Code that resides in the loader/monitor area of the CTP card, and provides input/output functions (through a maintenance port, operator panel, or Console), terminal window command functions, power-on diagnostics, FRU power-on hours, data read/write control, and LMA/LIC download functions.

local. Synonym for channel-attached.

Local Area Network (LAN). A computer network in a localized geographical area (e.g. a building or campus), and whose communications technology provides a high-bandwidth medium to which many nodes are connected.

log. (1) To record or print all messages on a system printer. (2) A record or compilation of system events that have occurred.

logical partition (LPAR). A processor hardware subset defined to support the operation of a system control program, and can be used without affecting any of the applications in another partition.

logical switch number (LSN). A two-digit number used by the IOCP to identify a Director.

LPAR. See *logical partition*.

LSN. See *logical switch number*.

M

MAC. See *Media Access Control*.

MAC Address. The hardware address of a device connected to a shared network.

Maintenance Agreement Qualification (MAQ). After a period of equipment service by another vendor, the MAQ is the verification procedure that ensures the equipment is eligible for maintenance by IBM customer engineers.

Maintenance Analysis Procedure (MAP). A written or online set of procedures that guide maintenance personnel through step-by-step instructions for hardware fault isolation, repair, and verification.

maintenance password authorization. The level-two password authorization that allows access to a Director to perform maintenance and operator functions. Contrast with *administrative password authorization* and *operator password authorization*.

management information system (MIS). (1) management performed using automatic data processing (*I, A*). (2) An information system that aids in performing management functions (*A*).

MAP. See *Maintenance Analysis Procedure*

MAQ. See *Maintenance Agreement Qualification*.

matrix. A matrix defines a Director's address configuration. The three matrix types are new matrix, saved matrix, and active matrix. Synonym for *configuration matrix*.

Matrix Controller-2 (MXC2) card. A Director circuit card that replaces a standard MXC card and upgrades the Director to support FICON operation.

Matrix Controller/Matrix Switch (MXC/MXS) card. A set of Director circuit cards that makes decisions on dynamic connection requests between channels, control units attached to the Director, and provides for connection paths between ports.

MAU. See *Multistation Access Unit*.

MB. See *megabyte*.

Mbps. Acronym for *megabits per second*.

MBps. Acronym for *megabytes per second*.

MCL. See *microcode level*.

Media Access Control (MAC). In LANs, the sublayer of the data link control layer that supports media dependent functions and uses the functions of the physical layer to provide services to the logical link control sublayer. The MAC sublayer includes a method of determining when a device has access to the transmission media.

megabyte (MB). A unit of measure for data storage, equal to 1,048,576 bytes. Generally approximated as one million bytes.

menu. A list of items displayed on the Console from which a user can make a selection. See also *pull-down menu*.

menu bar. The menu bar is located across the top of a Console window. Pull-down menus are displayed by clicking on the menu bar option with the mouse, or by pressing **Alt** with the underlined letter of the name for the menu bar option.

MES. See *miscellaneous equipment specification*.

microcode level (MCL). The release level (1.0, 1.2, 2.0, etc.) of a set of developed and tested microcode instructions that is made public.

micrometer. One millionth of a meter.

MIF. See *Multiple Image Facility*.

MIS. See *management information system*.

miscellaneous equipment specification (MES). A set of stand-alone instructions provided by IBM that supports the installation of a hardware or software replacement or upgrade.

modem. Acronym for *modulator/demodulator*. A device that converts digital computer data to an analog signal that is transmitted over a telecommunication line and converts a received analog signal to digital data for the computer.

mouse. In computer graphics, a hand-held locating, pointing, and selection device. A mouse usually contains a control ball, and is operated by moving it on a flat surface.

MTP. See *multifiber terminated push-on*.

multifiber terminated push-on (MTP). A 12-fiber quick-disconnect push-on connector that provides fast and effective reconnection of processors and devices without disturbing channel hardware configurations.

multimode optical fiber. A graded-index or step-index optical fiber that allows more than one mode (light path) to propagate. Contrast with *singlemode optical fiber*.

Multiple Image Facility (MIF). An IBM-licensed program that allows multiple logical partitions to concurrently share native ESCON or FICON channels. This reduces the number of channel paths required to support a configuration.

Multiple Virtual Storage (MVS). The generic name for an IBM-licensed operating system used on System/370 and later mainframe processors. See also *virtual storage* and *OS/390*.

Multistation Access Unit (MAU). A cabling or wiring attachment device that can connect up to eight nodes to an IBM Token Ring network.

MVS. See *Multiple Virtual Storage*.

MVS Configuration Program (MVSCP). A program that defines all available I/O devices and channel paths to the MVS operating system. Replaced by Hardware Configuration Definition Program starting with MVS/ESA Version 4.0.

MVSCP. See *MVS Configuration Program*.

MVS/ESA. Acronym for Multiple Virtual Storage/Enterprise Systems Architecture. See also *MVS* and *ESA*.

MXC2 card. See *Matrix Controller-2 card*.

MXC/MXS card. See *Matrix Controller/Matrix Switch card*.

N

network. An arrangement of hardware, software, nodes, and connecting branches that comprises a data communication system. The ISO seven-layer specification partitions a computer network into independent modules from the lowest (physical) layer to the highest (application) layer.

new matrix. A Director's saved matrix that is blank (contains default configuration attributes) but does not have a saved name. It is used for creating a new configuration, and updating a saved matrix the first time configuration changes are saved. Contrast with *saved matrix*.

node. (1) In a network, a point at which one or more functional units connect channels or data circuits (*I*). In network topology, the point at an end of a branch (*T*).

node port (N_port). A port on a computer, storage system, or other end device through which the device performs Fibre Channel communication. Contrast with *fabric port*. See also *thin fabric port*.

nondisruptive installation. The installation of units or FRUs while normal equipment operation continues without interruption. Contrast with *nondisruptive removal*. See also *concurrent maintenance* and *hot pluggable*.

nondisruptive removal. The removal of units or FRUs without interrupting normal equipment operation. Contrast with *nondisruptive installation*. See also *concurrent maintenance* and *hot pluggable*.

nonvolatile. A term used to describe a data storage device or memory chip that retains its contents when power is removed or off.

NP. IBM parts list acronym for *Not Procurable*. NP indicates the part is not procurable and the next higher assembly should be ordered.

N_port. See *node port*.

NR. The IBM parts list acronym for *Not Recommended*. NR indicates the part is procurable but is not recommended, and the next higher assembly should be ordered.

O

octet. An 8-bit quantity, often called a byte or word, and 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 octets with each byte or octet separated by a decimal point. See also *byte*.

ohm. A unit of electrical resistance equal to that of a conductor in which a current of one ampere is produced by a potential of one volt across the conductor terminals.

Open Systems Interconnection (OSI). A model that represents a network as a hierarchical structure of functional layers. Each layer provides a set of functions that can be

accessed and used by the layer above. Layers are independent, in that implementation of a layer can be changed without affecting other layers.

operating system (OS). Software that controls execution of applications and provides services such as resource allocation, scheduling, I/O control, and data management. Most operating systems are predominantly software, but partial hardware implementations are possible (*T*).

operator password authorization. The level-three password authorization that allows access to a Director to perform operator functions only. Contrast with *administrative password authorization* and *maintenance password authorization*.

optical cable. A single fiber, multiple fibers, or a fiber bundle in a structure constructed to meet certain optical, mechanical, or environmental specifications (*E*). See also *jumper cable*, *optical cable assembly*, and *trunk cable*.

optical cable assembly. A connector-terminated optical cable. The cable is generally terminated by the manufacturer and is ready for installation (*E*). See also *jumper cable* and *optical cable*.

optical drive backup. A data backup system that uses rewriteable optical cartridges (ROCs) as the storage medium.

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) In optical communications, a fiber designed to transmit optical signals. See also *optical fiber*.

OS. See *operating system*.

OS/2. Acronym for *Operating System 2*, the operating system developed by IBM for personal computers. The OS/2 licensed program can perform multiple tasks at the same time.

OS/390. Acronym for *Operating System 390*, an integrated, open-enterprise server operating system developed by IBM that incorporates a leading-edge and open communications server, distributed data and file services, Parallel Sysplex support, object-oriented programming, distributed computing environment, and open application interfaces.

OSI. See *Open Systems Interconnection*.

P

parallel channel. A data communications channel that uses copper bus and tag cables as a transmission medium, rather than fiber-optic cables. Contrast with *ESCON channel* and *FICON channel*.

parameter. (1) Variable that is given a constant value for a specified application and that may denote the application (*I, A*). (2) 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. A unique string of characters known to a computer system, and to a user who must specify the password to gain full or limited access to the system and the information stored within.

password identifier. In a Director, a user-defined symbolic name of 24 characters or less that identifies the password user.

path. (1) In a network, any route between two nodes (*T*). (2) In systems network architecture, the series of path control network components (path control and data link control) traversed by the information exchanged between two network-addressable units.

PC. See *personal computer*.

PDCM. See *port dynamic connect mask*.

personal computer (PC). A portable computer that consists of a system unit, display, keyboard, mouse, one or more diskette drives, and internal fixed-disk storage. PCs are designed to give independent computing power to a single user.

point-to-point. A Fibre Channel topology that provides a single, direct connection between two communication ports. The Director supports only point-to-point topology.

POR. See *Power-on Reset*.

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.

port address. In a Director, the address used to specify port connectivity parameters and to assign link addresses for attached channels and control units.

port authorization. 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 a Console. Port authorization affects only operator-level actions for active and saved matrices.

port card. In a fiber-optic environment, a FRU that provides an optomechanical attachment method for fiber cables, and performs specific device-dependent logic functions. See also *Device port card* and *FCV port card*.

port dynamic connect mask (PDCM).

Register that controls blocking between two ports and defines the blocked status between the ports. This provides information about blocked status of two ports with a static connection so requests can be denied for dynamic connections.

port name. In a Director, a user-defined symbolic name of 24 characters or less that identifies a port.

POST. See *Power-on Self-Test*.

Power-on Reset (POR). Method by which a device is set to a prescribed or clear state. The device is powered off, then powered on and re-IPLed.

Power-on Self-Test (POST). A series of diagnostic tests that are automatically executed by a device when the power is switched on.

processor. A computer's functional unit that interprets and executes instructions. A processor consists of an instruction control unit and an arithmetic and logic unit. (*I, A*).

prohibited connection. In a Director, the attribute that when set, removes dynamic connectivity capability. Contrast with *allowed connection*.

protective plug. In a fiber-optic environment, a type of duplex connector (or cover) that provides physical protection. Contrast with *wrap plug*.

protocol. (1) Set of semantic and syntactic rules that determines the behavior of functional units in achieving communication (*I*). (2) In systems network architecture, the meanings of and sequencing rules for requests and responses for managing the network, transferring data, and synchronizing network component states. (3) A specification for the format and relative timing of data exchanged between communicating devices.

pull-down menu. A menu that is displayed below, or *pulled down* from a menu bar at the top of a window.

Q

quadrant. One of four areas in a Director where device port cards are installed. The quadrants are designated A through D.

query. (1) The process by which a master device asks a slave device for identification and status (*T*). (2) For interactive systems, an operation at a Console that elicits a response from the system. (3) A request for information from a file based on specific conditions.

queue. (1) A list constructed and maintained so the next data element to be retrieved is the one stored first. This method is characterized as first in-first out (*T*). (2) A line or list of items that is waiting to be processed.

R

R. The IBM parts list acronym for *Restricted*. R indicates the part is procurable but has a restricted availability.

RAM. See *random access memory*. See also *DRAM* and *SRAM*, and contrast with *ROM*.

random access memory (RAM). A group of computer memory locations that is numerically identified to allow high-speed access by the controlling microprocessor. A memory location is randomly accessed by referring to its numerical identifier. See *dynamic random access memory* and *static random access memory*, and contrast with *read-only memory*.

read-only memory (ROM). An information storage chip with permanent memory. Stored information cannot be changed or deleted except under special circumstances. Contrast with *random access memory*.

rewriteable optical cartridge (ROC). A plastic cartridge with a recording medium that uses magneto-optical read/write technology, and is removable from a computer and used to store and transport data.

RI. See *ring-in*. Contrast with *RO*.

ring-in (RI). In an IBM Token Ring network, the receive or input receptacle on a multistation access unit. Contrast with *ring-out*.

ring-out (RO). In an IBM Token Ring network, the transmit or output receptacle on a multistation access unit. Contrast with *ring-in*.

ring topology. A logically circular, unidirectional transmission path without defined ends, in which control is distributed or centralized. See also *Token Ring*.

RO. See *ring-out*. Contrast with *RI*.

ROC. See *rewriteable optical cartridge*.

ROM. See *read-only memory*. Contrast with *RAM*.

router. An attaching device that connects two LAN segments, which use similar or different architectures, at the reference model network layer. Contrast with *bridge*.

row. Horizontal arrangement of data. Contrast with *column*.

RS-232. The EIA-recommended specification for asynchronous serial interfaces between computers and communications equipment. It specifies both the number of pins and type of connection, but does not specify the electrical signals.

S

SA. See *Service Agreement*.

SA OS/390. See *System Automation for OS/390*.

saved configuration. In an ESCON or FICON environment, a stored set of connectivity attributes whose values determine a configuration used to replace all or part of a Director's active configuration matrix. Contrast with *active configuration*.

saved matrix. A matrix modified for a particular purpose, then saved to the Director Console fixed disk. Multiple saved matrices are maintained in the Console library for each Director. Contrast with *new matrix*.

SC Connector. See *subscriber connector*.

SCP. See *System Control Program*.

SCSI. See *small computer system interface*.

Service Agreement (SA). A tailored hardware, software, or combined support contract between IBM and the customer.

simplex. In data communication, pertaining to transmission in only one direction at a time. Contrast with *duplex*, synonym for *half-duplex*.

singlemode optical fiber. An optical fiber that allows one wavelength-dependent mode (light path) to propagate. Contrast with *multimode optical fiber*.

small computer system interface (SCSI). An input and output bus that provides a standard interface between the OS/2 operating system and peripheral devices.

software. Computer programs, procedures, rules, and associated documentation pertaining to the operations of a system. See also *application*, and contrast with *hardware*.

spare ports card. A card feature for the Director that contains either four LED ports (#5245), or two LED and two XDF ports (#5255).

SRAM. See *static random access memory*. See also *RAM* and contrast with *DRAM*.

static random access memory (SRAM). SRAM is microprocessor-cache random access memory. SRAM is built internal to the microprocessor or on external chips. SRAM is fast, but relatively expensive. See *random access memory* and contrast with *dynamic random access memory*.

stop bit. In start-stop transmission, a signal at the end of a character that prepares the receiving device for reception of a subsequent character (*I*).

subnet mask. For internet subnetworking, a 32-bit mask used to identify the subnetwork address bits in the host portion of the IP address.

subscriber connector (SC). A connector that terminates fiber-optic jumper cables in two housings (one transmit and one receive), and provides physical keying for attachment to an SC receptacle. An SC connector is synonymous with an FCS connector. An SC connector can attach to an FCV port card or XDF laser port card. See also *Fibre Channel Standard connector* and *multimode connector*.

subsystem. A secondary or subordinate system, or programming support, usually capable of operating independently of or asynchronously with a controlling system (*T*).

SWCH. The acronym used in ESCON Manager to represent a Director and identify the Director in the *UNIT* parameter.

switch. A synonym used in ESCON Manager for a Director. Identifies the Director in the *CHPID* statement.

Sysplex Timer. An IBM table top unit that provides the synchronization for time-of-day clocks in multiple central processing complexes.

System Automation for OS/390 (SA OS/390). IBM-licensed software that provides System/390 Parallel Sysplex management, automation capabilities, and integrated systems and network management. SA OS/390 manages host, remote processor, and I/O operations. SA OS/390 integrates the functions of Automated Operations Control for MVS, ESCON Manager, and Target System Control Facility.

system configuration. A process that specifies the devices and programs that form a particular data processing system.

System Control Program (SCP). An IBM-supplied program that is fundamental to the operation and maintenance of a mainframe system. The software serves as an interface with licensed programs and other user programs.

T

Target System Control Facility (TSCF). An IBM-licensed program that designates one processor in a Parallel Sysplex as a focal-point system that controls target systems. The focal point system can load, configure, start, control, and monitor applications on target systems. The focal point system can also coordinate processes across systems. TSCF functions are now integrated into SA OS/390.

TCP. See *transmission control protocol*.

TCP/IP. See *transmission control protocol/internet protocol*.

Telecommunications Industry Association (TIA). TIA is a member organization of the Electronic Industries Association, and is the trade group representing the communications and information technology industries. See also *EIA*.

terminal. In data communication, a device, usually equipped with a keyboard and display, capable of transmitting and receiving information. Synonym for *Console* or *display device*.

thin fabric port (thin F_port). The port connection on the FCV port card that behaves externally as an N_port, but has the F_port ability to accept a fabric login (FLOGI) command. Contrast with *node port*. See also *fabric port*.

thin F_port. See *thin fabric port*.

TIA. See *Telecommunications Industry Association*. See also *EIA*.

tile. Windows on a console are tiled to simultaneously display all open windows side-by-side in a reduced-size format. No overlapping of windows occurs. To tile windows, use the *Window* pull-down menu and select *Tile*. Contrast with *Cascade*.

TKRG. See *Token Ring Controller Adapter card*.

toggle. A procedure to change the state of a feature. If the feature is **On**, toggling will turn it **Off**, and vice versa.

token. A sequence of bits passed from one device to another on a Token Ring network that signifies permission to transmit over the network. The token consists of a starting delimiter, access control field, and end delimiter. If a device has data to transmit, it appends the data to the token.

Token Ring. A LAN configuration where devices attach to a network cable in a closed path or ring. A token (unique sequence of bits) circulates on the ring to allow devices to access the LAN for data transmission. See also *ring topology*.

Token Ring Controller Adapter (TKRG) card. The circuit card that provides a port to connect a Director to a 4/16 Mbps Token Ring LAN. The card is labelled *TKRG*.

topology. The physical or logical arrangement of nodes in a computer network.

TPF. See *Transaction Processing Facility*.

Transaction Processing Facility (TPF). IBM-licensed software that supports interactive applications in which requests submitted at terminals are processed upon receipt. TPF provides a message-based, real-time, high-capacity transaction processing environment.

transmission control protocol (TCP). The transport layer for the TCP/IP protocol widely used on Ethernet networks and any network that conforms to U.S. Department of Defense standards for network protocol. TCP provides reliable communication and control through full-duplex connections.

transmission control protocol/internet protocol (TCP/IP). A layered set of protocols (network and transport) that allows sharing of applications among devices on a high-speed LAN communication environment. See also *TCP* and *IP*.

trunk cable. In an fiber-optic environment, a cable consisting of multiple fiber pairs that does not directly attach to an active device. The cable usually exists between distribution panels and can be located within, or external to, a building. Contrast with *jumper cable*.

TSCF. See *Target System Control Facility*.

U

UL. See *Underwriters Laboratories*.

ULP. See *upper level protocol*.

unblocked. In a Director, the attribute that when set, establishes communication capability for a specific port. Contrast with *blocked*.

Underwriters Laboratories (UL). A laboratory organization accredited by the Occupational Safety and Health Administration, and authorized to certify products for use in the home and workplace.

uninterruptable power supply (UPS). A buffer between public utility power or an other power source, and a system that requires precise, uninterrupted power.

URL. Acronym for *Uniform Resource Locator*. A URL is the address of a document or other resource on the internet.

upper level protocol (ULP). Protocols that map to and run on top of Fibre Channel FC-4 layer. Upper level protocols include IP and SCSI.

UPS. See *uninterruptable power supply*.

V

Vac. Acronym for volts alternating current. See *alternating current*.

Vdc. Acronym for volts direct current. See *direct current*.

Virtual Machine (VM). (1) A virtual data processing system that appears to be at the exclusive disposal of a single user, but whose functions are accomplished by sharing the resources of a real data processing system.

(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) Storage space that may be regarded as addressable main storage by the user of a computer system in which virtual addresses are mapped to 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 number of main storage locations. (2) Addressable space that is apparent to the user as processor storage space, from which the instructions and the data are mapped to the processor storage locations.

Virtual Storage Extended (VSE). An IBM-licensed software operating system that controls the execution of programs.

VM. See *Virtual Machine*.

VM/ESA. Acronym for *Virtual Machine/Enterprise Systems Architecture*. See also *VM* and *ESA*.

volt. A measure of the difference in electrical potential between two points in a conductor, equal to one ohm resistance carrying a constant current of one ampere, with a power dissipation of one watt.

VS. See *Virtual Storage*.

VSE. See *Virtual Storage Extended*.

W

watt. A unit of power in the International System equal to one joule (Newton-meter) per second.

warning message. An indication that a system error or other problem has been detected. See also *error message* and *information message*.

window. A portion of the Director Console screen in which one of several concurrent applications or data sets can display information. The user sees what appears to be several sheets of paper, much as the sheets would appear on a desktop. See also *cascade* and *tile*.

Windows. A graphical user interface and windowing system introduced by Microsoft Corporation in 1985. Windows runs on top of the MS-DOS operating system.

Win-OS/2. Win-OS/2 is the Windows component of IBM's OS/2 Version 2.0 operating system. It is based partially on Windows 3.0 and Windows 3.1. Win-OS/2 is the operating system used by the Director Console application.

wrap plug. (1) A connector attached to the plug end of a cable that connects input and output pins together for testing. See *wrap test*. (2) In a fiber-optic environment, a type of duplex connector used to wrap the optical output signal of a device directly to the optical input. Contrast with *protective plug*.

wrap test. A test that checks attachment or control unit circuitry, without checking the mechanism itself, by returning the output of the mechanism as input. A wrap test can transmit a specific character pattern through a system, and compare the pattern received with the pattern transmitted.

X

XDF. See *Extended Distance Feature*.

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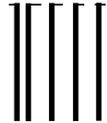


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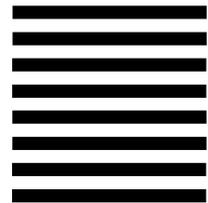
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