

Maintenance Information for the 9037 Sysplex Timer

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Note

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Safety

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

DANGER

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

Pas på!

For at undgå stød skal netledningen altid tages ud af stikkontakten, før man tilslutter eller afmonterer strømførende kabler.

VAARA

Välttääksesi mahdollisen sähköiskun vaaran irrota koneen verkkojohto pistorasiasta, ennen kuin kytket tai irrotat muita kaapeleita.

DANGER

Afin d'éviter tout risque de choc électrique, débranchez toujours le cordon d'alimentation du socle de prise de courant avant de manipuler un câble présentant des risques de contact avec des éléments non protégés.

VORSICHT

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

PERICOLO

Per evitare possibili scosse elettriche, scollegare sempre il cavo di alimentazione dalla presa di corrente prima di collegare o scollegare qualsiasi cavo che abbia il connettore o la superficie esterna conduttivi.

FARE!

Det er fare for elektrisk støt, og du bør alltid trekke ut maskinens nettkabel fra stikkontakten før du kobler til eller fra eventuelle kabler som har en strømførende overflate eller kontakt.

PERIGO

Para evitar choques eléctricos, desligue sempre o cabo de corrente eléctrica da máquina da tomada antes de ligar ou desligar qualquer cabo que tenha um revestimento ou um conector condutor.

PELIGRO

Para prevenir posibles descargas eléctricas, desconecte siempre el cable de alimentación del receptáculo de alimentación antes de conectar o desconectar cualquier cable que tenga una superficie exterior conductora o conector conductor.

Varning — livsfara

Undvik risk för elstötar genom att alltid koppla ur maskinens nätkabel innan du ansluter eller kopplar ur någon kabel som har ett elektriskt ledande hölje eller har en kontakt med utsida av elektriskt ledande material.

DANGER

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

Pas på!

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

VAARA

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

DANGER

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

VORSICHT

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

PERICOLO

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

FARE!

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

PERIGO

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

PELIGRO

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

Varning — livsfara

Den här produkten är försedd med jordad nätkabel och kontakt. Får endast anslutas till jordat eluttag.

DANGER

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

Pas på!

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

VAARA

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

DANGER

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

VORSICHT

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

PERICOLO

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

FARE!

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

PERIGO

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

PELIGRO

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

Varning — livsfara

Kontrollera att eluttaget är jordat innan du ansluter den här produktens nätkabel till uttaget.

DANGER

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

Pas på!

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

VAARA

Älä kytke äläkä irrota kaapeleita ukonilman aikana.

DANGER

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

VORSICHT

Bei Gewitter dürfen keine Kabel angeschlossen oder gelöst werden.

PERICOLO

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

FARE!

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

PERIGO

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

PELIGRO

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

Varning — livsfara

Vid åskväder ska du inte ansluta eller koppla ur någon kabel som har ett elektriskt ledande hölje eller har en kontakt med utsida av elektriskt ledande material.

DANGER

Power supply unit removal and replacement procedures must be performed with power switched off and with the power cable disconnected.

Pas på!

Når strømforsyningsdelen fjernes eller udskiftes, skal strømmen være afbrudt og netledningen taget ud.

VAARA

Virtalähteen poiston ja vaihdon ajaksi tulee koneesta katkaista virta ja irrottaa verkkojohto.

DANGER

Mettez l'appareil hors tension et débranchez le cordon d'alimentation avant d'effectuer les opérations de dépose ou de remplacement des unités d'alimentation.

VORSICHT

Ausbau und Austausch des Netzgerätes nur bei ausgeschaltetem Gerät und gezogenem Netzkabel.

PERICOLO

Le procedure di rimozione e sostituzione dell'alimentatore devono essere effettuate con l'alimentazione spenta e il cavo di alimentazione scollegato.

FARE!

Når du skal fjerne eller skifte ut en strømforsyningsenhet, må du passe på at enheten er slått av, og at nettkabelen er koblet fra.

PERIGO

Os procedimentos para retirar ou substituir a unidade da fonte de alimentação têm que ser executados com a corrente desligada e com o cabo de corrente eléctrica retirado da tomada.

PELIGRO

Los procedimientos de desmontaje o sustitución en la unidad suministradora de alimentación deben realizarse con el interruptor de alimentación en posición apagada y el cable de alimentación desconectado.

Varning — livsfara

Installation eller demontering av kraftaggregat måste utföras med strömmen till maskinen frånslagen och nätkabeln urkopplad.

CAUTION:

To verify the continuity of a fiber optic cable, use an optical light source and a power meter. Although looking into a disconnected optical fiber at distances more than a few centimeters may not injure the eye, this procedure can result in a possibly dangerous habit. Therefore, verifying the continuity of optical fibers by shining light into one end and looking into the other end is not recommended.

NB!:

Brug en optisk lyskilde og en effektmåler for at kontrollere gennemgangen i et lyslederkabel. Selvom det ikke skader øjet at kigge ind i et lyslederkabel på en afstand af nogle få centimeter, kan denne fremgangsmåde være farlig, hvis den anvendes gentagne gange. Det frarådes derfor at kontrollere lyslederkabler ved at lyse ind i den ene ende og kigge ind i den anden.

Varoitus:

Käytä välolähdettä ja mittaria, kun tarkastat valokaapelin kunnon. Vaikka irrotettuun valokaapeliin katsominen muutamien senttimetrien päästä ei vahingoittaisikaan silmää, tästä menettelystä saattaa muodostua mahdollinen vahinkoa aiheuttava tapa. Tämän vuoksi ei suositella sellaista valokaapelin tarkastamista, jossa valoa johdetaan kaapeliin ja yritetään katsoa sen läpi.

ATTENTION:

Pour vérifier la continuité d'un câble à fibres optiques, utilisez une source lumineuse et un appareil de mesure. Bien que l'examen de l'extrémité des fibres optiques à une distance de quelques centimètres présente peu de danger pour les yeux, il est déconseillé de le faire trop souvent. Évitez donc, pour vérifier la continuité des fibres optiques, d'appliquer une source lumineuse à une extrémité et d'approcher l'autre extrémité de vos yeux.

ACHTUNG:

Zur Prüfung der Leitfähigkeit eines Glasfaserkabels eine optische Lichtquelle und ein Luxmeter verwenden. Von der Prüfung der Leitfähigkeit des Glasfaserkabels durch Hineinleuchten auf einer und durch Hineinschauen auf der anderen Seite wird abgeraten.

ATTENZIONE:

Per verificare la continuità di un cavo a fibra ottica, usare una fonte di luce ottica e un tester. Sebbene guardare in una fibra ottica scollegata ad una distanza superiore ad alcuni centimetri potrebbe non danneggiare gli occhi, questa procedura può risultare un'abitudine dannosa. Quindi, non è consigliabile verificare la continuità di fibre ottiche immettendo luce da un'estremità e guardando dentro quella opposta.

ADVARSEL:

For å måle kontinuiteten til en fiberoptisk kabel må du bruke optisk lys og et elektrisk måleapparat. Det vil ikke skade øynene hvis du fra en avstand på mer enn fem centimeter ser inn i en optisk fiber. Det kan allikevel ha andre skadevirkninger, og vi anbefaler ikke at du måler kontinuiteten til optiske fibere ved å lyse inn i den ene enden og se inn i den andre.

CUIDADO:

Para verificar a continuidade de um cabo de fibras ópticas utilize uma fonte luminosa e um instrumento para medir potência. Muito embora possa olhar através de um cabo de fibras ópticas desligado, a distâncias de poucos centímetros, sem daí resultarem lesões oculares, este procedimento pode criar um hábito potencialmente perigoso. Assim, não é recomendado verificar a continuidade de fibras ópticas colocando uma fonte luminosa num dos lados e olhando pelo outro lado.

PRECAUCION:

Para verificar la continuidad de un cable de fibra óptica, utilice una fuente de luz óptica y un medidor de potencia. Aunque mirar el interior de una fibra óptica desconectada a distancia mayores de unos pocos centímetros no daña los ojos, este proceder es un hábito peligroso. Por lo tanto no se recomienda que para verificar la continuidad de la fibra óptica, se utilice luz en un extremo y mirar por el otro extremo.

Varning — risk för personskada:

Använd en optisk ljuskälla och ett mätinstrument (optisk effektmätare) när du ska kontrollera om en optisk fiberkabel är hel. Visserligen är risken för ögonskada liten om du på några centimeters håll tittar in i kabeländan, men att på detta sätt kontrollera fiberkablar kan i vissa fall vara farligt och är inte att rekommendera.

CAUTION:

An optical transmitter emits optical radiation that is probably not visible. Do not look into the end of a fiber optic cable or into a fiber optic receptacle. Eye injury can result.

NB!:

En optisk kilde afgiver optisk stråling, der sandsynligvis ikke kan ses. Kig ikke ind i enden af et lyslederkabel eller i en stikdåse til et lyslederkabel. Det kan resultere i øjenskader.

Varoitus:

Valolähde lähettää säteilyä, joka todennäköisesti ei ole nähtävissä. Älä katso valokaapelin päähän tai valokuitupistorasiaan.

ATTENTION:

Un émetteur optique émet un rayonnement qui n'est pas forcément visible. Par conséquent, n'examinez pas l'extrémité d'un câble à fibres optiques ou une prise de fibres optiques, au risque de vous blesser les yeux.

ACHTUNG:

Ein optischer Sender gibt Lichtwellen ab, die möglicherweise nicht sichtbar sind. Nicht in das Ende eines Glasfaserkabels oder in eine Glasfasersteckdose schauen. Gefahr von Augenverletzungen.

ATTENZIONE:

Un trasmettitore ottico emette una radiazione ottica probabilmente non visibile. Non guardare l'estremità del cavo o dentro l'alloggiamento della fibra ottica. Può danneggiare gli occhi.

ADVARSEL:

En optisk sender avgir optiske stråler som vanligvis ikke er synlige. Du må ikke se inn i en fiberoptisk kabel eller en fiberoptisk kontakt. Det kan føre til øyenskader.

CUIDADO:

Um transmissor óptico emite radiações ópticas que, possivelmente, não são visíveis. Não olhe directamente para o final de um cabo de fibras ópticas ou para um receptáculo de fibras ópticas. Podem ocorrer lesões oculares.

PRECAUCION:

Un transmisor óptico emite radiación que probablemente no es visible. No mire el extremo del cable de fibra óptica o el interior del receptáculo de la fibra óptica. Se pueden dañar los ojos.

Varning — risk för personskada:

En optisk sändare avger optisk strålning som kan vara osynlig. Ögonen kan ta skada om du tittar in i änden av en optisk fiberkabel eller i ett uttag för en sådan kabel.

CAUTION:

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

NB!:

Der er fare for eksplosion, hvis batteriet ikke udskiftes korrekt. Ved udskiftning må der kun anvendes batteri af samme fabrikat og type. Levér det brugte batteri tilbage til forhandleren.

Varoitus:

Pariston väärä sijoitus saattaa aiheuttaa räjähdysvaaran. Korvaa paristo vain samanlaisella tai valmistajan suositamalla vastaavanlaisella paristolla. Hävitä käytetyt paristot niiden hävittämisestä annettujen ohjeiden mukaan.

ATTENTION:

Il y a danger d'explosion si la batterie n'est pas remplacée selon les instructions du fabricant qui en définit les équivalences. Conformez-vous aux instructions du fabricant pour vous débarrasser d'une batterie usagée.

ACHTUNG:

Die Batterie kann bei unsachgemäßem Austausch explodieren. Es darf nur die vom Hersteller empfohlene oder eine gleichwertige Batterie verwendet werden. Die Batterie muß nach Gebrauch als Sondermüll entsorgt werden.

ATTENZIONE:

Pericolo di esplosione se la batteria non è sostituita correttamente. Sostituirla con una dello stesso o di tipo equivalente raccomandata dal costruttore. Eliminare le batterie usate in accordo alle istruzioni del costruttore.

ADVARSEL:

Det kan oppstå eksplosjonsfare hvis du ikke erstatter et batteri med et annet batteri av samme type. Følg retningslinjene fra produsenten når du skal kaste brukte batterier.

CUIDADO:

Existe o perigo de explosão se a pilha for substituída incorrectamente. Só substitua a pilha por outra igual ou de tipo equivalente recomendado pelo fabricante. Destrua as pilhas usadas de acordo com as instruções do fabricante.

PRECAUCION:

Si se sustituye incorrectamente la batería existe el peligro explosión. Sustituyala sólo con el mismo tipo o equivalente recomendado por el fabricante. instructions.

Varning — risk för personskada:

Batteriet kan explodera om det monteras fel. Byt endast till batteri av samma typ eller till likvärdigt batteri som rekommenderas av tillverkaren.

Electronic Emission Notices

Federal Communications Commission (FCC) Statement

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

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

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

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- PS/2
- Sysplex Timer

About This Publication

This publication contains information needed to install and maintain the 9037 Sysplex Timer* unit.

Who Should Use This Publication

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

How This Publication Is Organized

This publication is organized as follows:

- **Chapter 1, “General Information,”** describes the maintenance approach to 9037 problem determination and repair. This chapter provides a general description of the 9037, examples of possible 9037 configurations, environmental restrictions, and a list of special tools and test equipment.
- **Chapter 2, “Problem Determination,”** provides problem determination procedures used for the 9037.
- **Chapter 3, “Repair Information and Verification Testing,”** contains the information needed to perform all 9037 repair actions and to verify that the repair action corrected the problem.
- **Chapter 4, “Locations,”** shows the physical location of each 9037 part.
- **Chapter 5, “Preventive Maintenance,”** states that the 9037 requires no preventive maintenance.
- **Chapter 6, “Installation, Discontinuance, and Relocation,”** describes the procedures used to install, discontinue, and relocate a 9037.
- **Chapter 7, “Maintenance Agreement Inspection Procedure,”** contains information used to determine

if a 9037 meets IBM* safety standards for a maintenance agreement.

- **Chapter 8, “Grounding Path Diagram,”** shows all the 9037 grounding points.
- **Chapter 9, “Parts List,”** contains listings and diagrams of replaceable assemblies and subassemblies for the 9037.
- **Chapter 10, “Administration,”** states that the 9037 requires no unique, maintenance-related administrative information.

Where to Find More Information

The user of this publication should be familiar with these publications:

Planning for Enterprise Systems Connection Links, GA23-0367

Maintenance Information for Enterprise Systems Connection Links, SY27-2597

Planning for the 9037 Sysplex Timer, GA23-0365

Enterprise Systems Connection Link Fault Isolation, SY22-9533

Enterprise Systems Connection: Planning for Migration, GG66-3181

Fiber Optic Cleaning Procedures, SY27-2604-01 or later

Electrical Safety for IBM Customer Engineers, S229-8124

Chapter 1. General Information

Maintenance Approach

The customer performs the initial system problem determination using the host console messages and facilities.

For a 9037 failure, problem determination starts at the beginning of Chapter 2.

The service strategy is to isolate a 9037 failure to one of these field-replaceable units (FRUs):

- Base card
- Port card
- Control link card
- Logic board
- Power supply
- Battery-Clock module (pluggable)
- Control link cable
- Console adapter card
- Console adapter cable
- Fan assembly

System Configuration

The 9037 attaches a maximum of 16 processors using fiber optic cables and has 2 system configurations: Basic and Expanded Availability.

Basic Configuration

In this configuration, each processor attaches to only one 9037 (see Figure 1-1 on page 1-3). The 9037 console is required to initialize the 9037 during installation and to monitor and control the 9037s after installation. After initialization, if a power outage occurs, the 9037 stops transmitting to all attached processors; an internal battery-clock module automatically maintains critical configuration

information and continues to update the date and the time within the 9037. When power is restored to the 9037, it resumes transmitting data without customer intervention, even if the console power has not been restored. Also, if a 9037 console outage occurs after initialization, the 9037 operation is not affected.

With this configuration, any single failure, such as the link, a critical 9037 component, or a power outage causes loss of time synchronization to one or more processors, thereby preventing them from operating in a coupled environment.

Note: The connection of both port 0 and port 1 of the adapter card in the processor to the same 9037 is a supported configuration. However, this configuration only provides link redundancy and not 9037 availability as with the Expanded Availability configuration. With this configuration, when the processor is IPLed, a console message results indicating both port 0 and port 1 are connected to the same 9037. This is not an error, but a notification that some action might be required by the customer. See Appendix A for examples of system console messages and their meanings.

Figure 1-1. Basic Configuration

Expanded Availability Configuration

This configuration increases the 9037 availability when each processor in the configuration is linked to two 9037s (see Figure 1-2). The two 9037s are synchronized with each other using redundant duplex copper control links between units.

With this configuration, any single failure or a power outage affecting only one 9037 still allows data transmission to the processors, thereby making synchronized time information continuously available.

Both 9037s are attached to a single console. If a 9037 console outage occurs after initialization, the 9037 operation is not affected.

Note: In the Expanded Availability configuration, port 0 and port 1 of the adapter card in each processor **must** be connected to different 9037s.

Figure 1-2. Expanded Availability Configuration

General Product Description

The 9037 provides synchronization for the time-of-day (TOD) clocks of multiple processors. The 9037 has 4, 8, 12, or 16 ports, which allows for the attachment of a maximum of 16 processors or processor sides.

Data is transmitted using a fiber optic link at a maximum distance of 3000 meters (9843 feet). For more cable information, see *Planning for Enterprise Systems Connection Links*, GA23-0367, and *Maintenance Information for Enterprise Systems Connection Links*, SY27-2597.

The 9037 console is required to configure and service the 9037 and to display, set, and adjust the time and date. This console must be an IBM PS/2* computer Model 25 286 or equivalent. The PS/2 Model 30 286 and Models 50, 60, 70 (except A21), or 80 can also be used. The console adapter cable between the console and the 9037 is a maximum of 3 meters (9.84 feet). Each console can support a maximum of two 9037s.

The 9037 console has its own operational diskette, which contains the 9037 Licensed Internal Code and the 9037 error log. This diskette must remain in the console diskette drive.

When the 9037 console is powered on or when it is IPLed, console diagnostics run. The 9037 Main Menu screen is displayed after successful completion of diagnostics. See page 2-107 for examples of the 9037 console screens.

Switches and Indicators

Following are the 9037 switches and indicators. For component locations, see Figure 4-1 on page 4-1 and Figure 4-5 on page 4-5.

- **Power On/Power Off Switch**

This switch is located on the front of the 9037 and switches power on or off to the 9037.

- **Power Supply Status Indicator**

- Off when ac power is not detected
- Blinking when only ac power is detected
- On when dc voltages are within tolerance

This indicator is located next to the Power On/Off switch.

- **Base Card Indicator**

- On if an error is detected that requires service.
- Off when the 9037 is operating correctly or if an error is detected but service can possibly be deferred.
- Blinks on and off during self-tests. Remains on if an error is detected.

This indicator is located on the base card and is viewed with the rear cover removed.

Connectors and Receptacles

For component locations, see Figure 4-4 on page 4-4 and Figure 4-5 on page 4-5.

- The power cable receptacle is located in the front of the 9037 behind the power cable cover.
- The console adapter cable receptacle is located on the base card in card location 0.
- The control link cable receptacles are located on the control link card in card location 1.
- The port card cable connectors are located behind the rear cover of the 9037 in card locations 2, 3, 4, and 5.

Environmental Restrictions and Physical Characteristics

- The 9037 operates at 50 Hz, 200-240 V ac or 60 Hz, 200-240 V ac. There are several types of power cables available to meet local electrical requirements.
- The 9037 does not provide power for the console.
- The 9037 is 483 mm (19.0 in.) wide, 225 mm (8.9 in.) high, 713 mm (28.1 in.) deep, and weighs 29.5 kg (65 lbs.).
- The 9037 is cooled by 3 dc fans.
- The power consumption is 40-A maximum inrush of 1/4 cycle duration and 1.2-A maximum RMS steady state.
- The acoustical level is Class 1.
- The 9037 operates in a Class C environment.
- The EMC level is FCC Class A and CISPR Class A.
- The 9037 can be located on a table.

For more information about environmental restrictions and physical characteristics, refer to *Planning for the 9037 Sysplex Timer*, GA23-0365.

Tools and Test Equipment

The tools and test equipment used to maintain the 9037 are the:

- Duplex-to-Duplex Coupler, part number 42F8604 (supplied with the Fiber Optic Test Support Kit, part number 46G6836)
- Duplex-to-Biconic Test Cable, 3.0 m, part number 18F6948 (supplied with the Fiber Optic Test Support Kit, part number 46G6836)
- Fiber Optic Wrap Plug, part number 5605670 (supplied with the 9037)

Note: Do not confuse the fiber optic wrap plug with the fiber optic protective plug. Figure 1-3 shows the fiber optic wrap plug.

- Optical Power Meter, part number 12G8814
- Fiber Optic Cleaning Kit, part number 46G6844

Figure 1-3. Wrap Plug

Chapter 2. Problem Determination

START

Before performing any of these procedures, read all the statements in the section titled “Safety” on page vi.

Important! Please read this before continuing:

1. Powering off an online 9037 or disconnecting the fiber optic cables stops the transmission of time-synchronization data to the attached processors and could severely impact the customer's operation.
2. Powering off the 9037 console or disconnecting the console from an online 9037 results in either the loss of external time source data to the 9037 console or prevents the 9037 from tracking to the external time source.
3. The 9037 console (an IBM PS/2 computer Model 25 286 or equivalent) must be attached to the 9037 to record, analyze, and retrieve error log information, and to service the 9037.
4. Before installing interface cables, press the contacts firmly against the electrostatic discharge (ESD) pad to remove static charge. When viewed from the rear of the 9037, the pad is located to the left of the logic cards.
5. Before attaching fiber optic cable connectors to the 9037, always use the fiber optic cleaning kit, part number 46G6844, to clean the connectors.
6. Before inserting the fiber optic cable connector into the 9037, make sure the fiber optic cable connector bevels are correctly aligned with the bevels of the 9037 fiber optic cable receptacle.
7. If the MAPs do not correct the problem, contact your next level of support.

Go to “MAP 0000: Start” on page 2-2.

MAP 0000: Start

001

Note: Before you start problem determination, it is **recommended** that you ask the customer to remove the 9037 console password protection if it has been installed. Otherwise, you might **not** be able to complete certain MAPs and the verification procedure in “Verify 9037 Operation” on page 3-15.

Perform the following procedure to determine if the 9037 console is operational:

Note: For examples of the 9037 console screens, see page 2-107.

At the 9037 console:

- a. At the Main Menu, select **Maintenance**.
- b. Select **Display Configuration**.

Depending on the 9037 configuration, Basic or Expanded Availability, one of the following 9037 configurations **must** be displayed. For configuration descriptions, see “Basic Configuration” on page 1-1 and “Expanded Availability Configuration” on page 1-4.

- For a Basic configuration, the **Network Address**, **Unit Address**, **Unit Status**, and all **Cards installed** in the 9037 must be displayed.
- For Expanded Availability configuration, the **Network Address**, **2 Unit Address** entries, **2 Unit Status** entries, and all **Cards Installed** in both 9037s must be displayed.

(Continued on the next page.)

Is the correct information displayed as described above?

Yes No

002

The console is *not* operational.

Press **ESC** to return to the Main Menu.

Go to “Event Log Reason Codes, Symptoms, and Actions” on page 2-12 and follow the action for the symptom “Console not operational.”

003

The 9037 console is operational and is communicating with the 9037s.

Press **ESC** to return to the Main Menu.

Proceed as follows:

- If you are here for a system control program (SCP) message that was displayed on the SCP operating system console, or for a EREP entry, go to Step 004 on page 2-4.
 - If you are here for a 9037 reason code, go to Step 014 on page 2-6.
 - If you are here for a customer-reported symptom, go to Step 015 on page 2-6.
 - If you are here for a processor-generated action queue entry (AQE), go to the corresponding processor maintenance publication to continue problem determination.
-

004

Note: See Appendix A for examples of SCP messages the customer might have received at the operating system console.

From the SCP console message or EREP report, record the day and time the message occurred.

Was the SCP message reported to you similar to, or the same as, the following?

MESSAGE ID - ETR SERVICE IS REQUESTED. RC = XXX

Yes No

005

Go to Step 026 on page 2-9.

006

Is the reported reason code (RC) 038?

Yes No

007

Is the reported reason code (RC) 039?

Yes No

008

Go to Step 013 on page 2-5.

009

Go to Step 011 on page 2-5.

010

Go to Step 012 on page 2-5.

011

Maintenance Mode cleared. No action is required.

The 9037 is operating correctly. Record all time against the unit that required service; for example, the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.

012

Maintenance Mode set.

Proceed as follows:

- a. At the Main Menu, select ***Maintenance***.
- b. Press **F7**.
- c. Select ***Maintenance Mode Cleared***.
- d. Press **ESC** to return to the Main Menu.

Note: All SCP operating system consoles will display a message similar to the following:

```
MESSAGE ID - ETR SERVICE IS REQUESTED. RC = 039
```

No action is required.

The 9037 is operating correctly. Record all time against the unit that required service; for example, the link, another unit in the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.

013

Record the reason code (RC) from the SCP message that you received. Go to Table 2-1 on page 2-13 and follow the action for that RC.

014

- a. At the Main Menu, select **Log**.
 - b. Select **Display Event Log**.
 - c. Locate the reason code (RC) entry for the problem reported to you.
 - d. Record the RC (RCxxx) and the time of the entry.
 - e. Go to Table 2-1 on page 2-13 and follow the action for that RC.
-

015

Is the reported symptom a port-related symptom?

Yes No

016

Go to Table 2-1 on page 2-13 and try to locate the symptom that describes the customer's reported symptom.

Were you able to locate any entry for the symptom reported to you?

Yes No

017

Go to Step 020 on page 2-7.

018

Perform the action shown in Table 2-1 on page 2-13 for the RC listed.

019

Go to Step 026 on page 2-9.

020

The message or symptom is either informational, cannot be determined, or is intermittent. Gather as much additional information as possible. For example:

- Look for RC entries in the 9037 event log that occurred around the time of the customer's reported symptom. If any entries are found, this might indicate an intermittent or permanent problem.
- Look for configuration errors, such as SCP messages IEA263I and IEA264I. If configuration errors are found, inform the customer. Advise the customer that *Planning for the 9037 Sysplex Timer*, GA23-0365, can be used for 9037 fiber optic cable configuration information.
- Observe all SCP messages and EREP reports for additional information.

Go to Step 021 on page 2-8.

021

Is there an RC that indicates a permanent problem?

Yes No

022

Is there an RC that indicates an informational problem with no service required?

Yes No

023

The 9037 appears operational. The problem is either intermittent or the problem cause is undetermined.

Record the time the customer reported this event and contact your next level of support.

024

The 9037 is operating correctly. Record all time against the unit that required service; for example, the link, another unit in the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.

025

Record the reason code (RCxxx). Go to Table 2-1 on page 2-13 and follow the action for that RC.

026

Proceed as follows:

- a. At the Main Menu, select **Ports**.
- b. Select **Display Port Status**.
- c. Observe the **Status** line.

Is there an L or an E displayed for any port?
L indicates loss of light. E indicates nonvalid light.

Yes No



027

Is there an X displayed for any port?
An X indicates an internal 9037 error was detected for this port.

Yes No

028

Is there a dash (—) displayed for any port?

Yes No

029

Go to Step 020 on page 2-7.

030

Go to Step 035 on page 2-11.

031

Record the 9037 unit address and the port number displaying an **X**; then go to Step 034 on page 2-10.

032

- a. Record the 9037 unit address and the port number displaying an **L** or an **E**.

(Step **032** continues)

032 (continued)

- b. Go to Step 033.

033

Use the following table to match the recorded port number with the corresponding RC. For example, port 2 corresponds with RC050.

Port Number	Reason Code (RC)
0, 1, 2, 3	RC048, 049, 050, 051
4, 5, 6, 7	RC052, 053, 054, 055
8, 9, 10, 11	RC056, 057, 058, 059
12, 13, 14, 15	RC060, 061, 062, 063

Record the 9037 unit address, the port number, and the RC for the suspected failing port. Go to Table 2-1 on page 2-13 and follow the action for that RC.

034

Use the following table to match the port number with the corresponding RC.

Port Number	Reason Code (RC)
0, 1, 2, 3	RC066
4, 5, 6, 7	RC067
8, 9, 10, 11	RC068
12, 13, 14, 15	RC069

Record the RC for the suspected failing port. Go to Table 2-1 on page 2-13 and follow the action for that RC.

035

- a. Obtain the customer's fiber optic port configuration information.
 - b. Compare the customer's configuration with the actual fiber optic cables installed in the 9037.
 - c. If required, correct any configuration errors with the customer and have the customer change the 9037 configuration using the **Change Port Status** option. If no configuration errors exist, go to Step 020 on page 2-7.
-

Event Log Reason Codes, Symptoms, and Actions

Use Table 2-1 on page 2-13 to find the reason code (RC) or symptom, and perform the action indicated.

Note: All messages appearing in the event log or displayed at the 9037 console are preceded by a number, referred to as a reason code (RC). In the event log, each message number has an RC prefix.

The event log identifies all the events that occur on the network, such as operator console activity and error conditions. It also logs the unit address of the 9037 **reporting** the failure, and the date and time the failure was detected. The most recent log entry is displayed at the **bottom** of the display. For more information about the event log, press **F1**.

Table 2-1 (Page 1 of 9). Reason Codes or Symptoms, and Action	
Reason Code or Symptom	Action
Console not operational	Go to "MAP 1000" on page 2-74
External time source not operational	Go to "MAP 1200" on page 2-88
RC002 Operation failed. Modem not responding	Go to "MAP 1200" on page 2-88
RC003 Time out waiting for phone line connection	Go to "MAP 1200" on page 2-88
RC004 Phone line data transfer failed	Go to "MAP 1200" on page 2-88
RC008 Communication established with console	Go to "MAP 1600" on page 2-102
RC012 NOTE: Base Cards are at different internal code levels.	Go to "MAP 1300" on page 2-97
RC013 NOTE: Control Link Cards are at different internal code levels.	Go to "MAP 1300" on page 2-97
RC014 ERROR! Base Cards are at incompatible internal code levels.	Go to "MAP 1300" on page 2-97
RC015 ERROR! Control Link Cards are at incompatible internal code levels.	Go to "MAP 1300" on page 2-97
RC016 Port 0 receiving valid data	Go to "MAP 1600" on page 2-102
RC017 Port 1 receiving valid data	Go to "MAP 1600" on page 2-102

Table 2-1 (Page 2 of 9). Reason Codes or Symptoms, and Action	
Reason Code or Symptom	Action
RC018 Port 2 receiving valid data	Go to "MAP 1600" on page 2-102
RC019 Port 3 receiving valid data	Go to "MAP 1600" on page 2-102
RC020 Port 4 receiving valid data	Go to "MAP 1600" on page 2-102
RC021 Port 5 receiving valid data	Go to "MAP 1600" on page 2-102
RC022 Port 6 receiving valid data	Go to "MAP 1600" on page 2-102
RC023 Port 7 receiving valid data	Go to "MAP 1600" on page 2-102
RC024 Port 8 receiving valid data	Go to "MAP 1600" on page 2-102
RC025 Port 9 receiving valid data	Go to "MAP 1600" on page 2-102
RC026 Port 10 receiving valid data	Go to "MAP 1600" on page 2-102
RC027 Port 11 receiving valid data	Go to "MAP 1600" on page 2-102
RC028 Port 12 receiving valid data	Go to "MAP 1600" on page 2-102
RC029 Port 13 receiving valid data	Go to "MAP 1600" on page 2-102

Table 2-1 (Page 3 of 9). Reason Codes or Symptoms, and Action	
Reason Code or Symptom	Action
RC030 Port 14 receiving valid data	Go to "MAP 1600" on page 2-102
RC031 Port 15 receiving valid data	Go to "MAP 1600" on page 2-102
RC036 Control links wrapped	Go to "MAP 1600" on page 2-102
RC037 Non-severe fan failure detected	Go to "MAP 0300" on page 2-44
RC038 Maintenance Mode Set	Go to "MAP 1600" on page 2-102
RC039 Maintenance Mode Cleared	Go to "MAP 1600" on page 2-102
RC040 Communication lost with console	Go to "MAP 0700" on page 2-51
RC042 The 9037 is tracking the external time source.	Go to "MAP 1600" on page 2-102
RC044 The external time source is out of tracking range	Go to "MAP 1200" on page 2-88
RC045 The external time source is not responding	Go to "MAP 1200" on page 2-88
RC048 Port 0 receiver detected errors	Go to "MAP 0100" on page 2-33
RC049 Port 1 receiver detected errors	Go to "MAP 0100" on page 2-33

Table 2-1 (Page 4 of 9). Reason Codes or Symptoms, and Action	
Reason Code or Symptom	Action
RC050 Port 2 receiver detected errors	Go to "MAP 0100" on page 2-33
RC051 Port 3 receiver detected errors	Go to "MAP 0100" on page 2-33
RC052 Port 4 receiver detected errors	Go to "MAP 0100" on page 2-33
RC053 Port 5 receiver detected errors	Go to "MAP 0100" on page 2-33
RC054 Port 6 receiver detected errors	Go to "MAP 0100" on page 2-33
RC055 Port 7 receiver detected errors	Go to "MAP 0100" on page 2-33
RC056 Port 8 receiver detected errors	Go to "MAP 0100" on page 2-33
RC057 Port 9 receiver detected errors	Go to "MAP 0100" on page 2-33
RC058 Port 10 receiver detected errors	Go to "MAP 0100" on page 2-33
RC059 Port 11 receiver detected errors	Go to "MAP 0100" on page 2-33
RC060 Port 12 receiver detected errors	Go to "MAP 0100" on page 2-33
RC061 Port 13 receiver detected errors	Go to "MAP 0100" on page 2-33

Table 2-1 (Page 5 of 9). Reason Codes or Symptoms, and Action	
Reason Code or Symptom	Action
RC062 Port 14 receiver detected errors	Go to "MAP 0100" on page 2-33
RC063 Port 15 receiver detected errors	Go to "MAP 0100" on page 2-33
RC065 Base card failed	Go to "MAP 0600" on page 2-50
RC066 Port card in card location 2 failed	Go to "MAP 0600" on page 2-50
RC067 Port card in card location 3 failed	Go to "MAP 0600" on page 2-50
RC068 Port card in card location 4 failed	Go to "MAP 0600" on page 2-50
RC069 Port card in card location 5 failed	Go to "MAP 0600" on page 2-50
RC074 Control link card failed	Go to "MAP 0600" on page 2-50
RC075 Severe fan failure detected	Go to "MAP 0300" on page 2-44
RC076 Other 9037 unit failed	Go to "MAP 0200" on page 2-41
RC077 Control link A failed	Go to "MAP 0400" on page 2-45
RC078 Control link B failed	Go to "MAP 0400" on page 2-45

Table 2-1 (Page 6 of 9). Reason Codes or Symptoms, and Action	
Reason Code or Symptom	Action
RC079 Internal bus failed	Go to "MAP 0800" on page 2-67
RC080 Battery clock module failed	Go to "MAP 0500" on page 2-49
RC081 Wrong card in card location XX	Go to "MAP 1100" on page 2-85
RC082 Backup data invalid	Go to "MAP 0500" on page 2-49
RC084 Identical Unit Addresses on the Base cards	Go to "MAP 1100" on page 2-85
RC085 ERROR! Invalid configuration. The 2 9037 units are not linked.	Go to "MAP 1500" on page 2-100
RC096 Diagnostic data (8 bytes)	May be used if assistance is requested
RC104 Port 0 failed	Go to "MAP 1400" on page 2-98
RC105 Port 1 failed	Go to "MAP 1400" on page 2-98
RC106 Port 2 failed	Go to "MAP 1400" on page 2-98
RC107 Port 3 failed	Go to "MAP 1400" on page 2-98
RC108 Port 4 failed	Go to "MAP 1400" on page 2-98

Table 2-1 (Page 7 of 9). Reason Codes or Symptoms, and Action	
Reason Code or Symptom	Action
RC109 Port 5 failed	Go to "MAP 1400" on page 2-98
RC110 Port 6 failed	Go to "MAP 1400" on page 2-98
RC111 Port 7 failed	Go to "MAP 1400" on page 2-98
RC112 Port 8 failed	Go to "MAP 1400" on page 2-98
RC113 Port 9 failed	Go to "MAP 1400" on page 2-98
RC114 Port 10 failed	Go to "MAP 1400" on page 2-98
RC115 Port 11 failed	Go to "MAP 1400" on page 2-98
RC116 Port 12 failed	Go to "MAP 1400" on page 2-98
RC117 Port 13 failed	Go to "MAP 1400" on page 2-98
RC118 Port 14 failed	Go to "MAP 1400" on page 2-98
RC119 Port 15 failed	Go to "MAP 1400" on page 2-98
RC260 9037 Console cannot establish communication with the 9037 units	Go to "MAP 0700" on page 2-51

Table 2-1 (Page 8 of 9). Reason Codes or Symptoms, and Action

Reason Code or Symptom	Action
RC268 9037 not initialized	Go to "MAP 0500" on page 2-49

Service Impact Analysis Procedure

This procedure is used to determine if the 9037 can be serviced now without disrupting the customer's operation or if deferred service must be scheduled.

- For a Basic configuration (one 9037), go to “Service Analysis for a Basic Configuration” on page 2-22. For a description of a Basic configuration, see page 1-1.
- For an Expanded Availability configuration (two 9037s attached to each other), go to “Service Analysis for an Expanded Availability Configuration” on page 2-23. For a description of an Expanded Availability configuration, see page 1-4.

Service Analysis for a Basic Configuration

1. At the Main Menu, select **Maintenance**.
2. Select **Display Configuration**.

The line below the **Unit Address** line is the 9037 unit status. This line can display the following 9037 status entries:

- **Online**, indicates the fiber optic ports are enabled and are transmitting.
 - **Offline**, indicates no fiber optic ports are enabled or transmitting.
 - **Service Required**, indicates a severe problem has been detected and any enabled fiber optic ports are not transmitting.
3. If **Offline** or **Service Required** is displayed, the 9037 **can** be serviced now.

Go to “Service Procedure for FRU Replacement” on page 2-31.

(Continued on the next page.)

4. If **Online** is displayed, the 9037 **cannot** be serviced now. Proceed as follows:
 - a. Schedule time for deferred service with the customer.

Note: Advise the customer that when power to the 9037 is switched off:

 - The 9037 stops transmitting the time-of-day information to all attached processors.
 - No sysplex applications can be performed.
 - The time-of-day clock will be provided by each processor.
 - b. Record the unit address and the serial number of the 9037 to be serviced.
 - c. Record the part number of the FRUs to be ordered.
 - d. When you return to continue service, go to “Service Procedure for FRU Replacement” on page 2-31.

Service Analysis for an Expanded Availability Configuration

1. At the Main Menu, select **Maintenance**.
2. Select **Display Configuration**.

The line below the **Unit Address** line is the 9037 unit status. This line can display the following 9037 status entries for each 9037 unit address:

- **Online**, indicates the fiber optic ports are enabled and are transmitting.
- **Offline**, indicates no fiber optic ports are enabled or transmitting.
- **Service Required**, indicates a severe problem has been detected and any enabled fiber optic ports are not transmitting.

(Continued on the next page.)

3. If **Offline** or **Service Required** is displayed, the 9037 **can** be serviced now. Go to step 5 on page 2-24.
4. If **Online** is displayed, go to step 9 on page 2-24.
5. **Offline** or **Service Required** is displayed. Record the unit address of the 9037 that displays the **Offline** or **Service Required** entry.
6. Compare the unit address recorded with the unit address switch setting on the base card in card position 0 (see Figure 4-5 on page 4-5) to be sure you are at the correct 9037 to be serviced.

Note: The switches are labeled **1 2 3 4** (left to right) and are read with a binary value of **8 4 2 1** (left to right). The 9037 address is a decimal value and can range from 0 to 15. For example, a unit address of 03 will have these switch settings: 1=off, 2=off, 3=on, and 4=on.

Note: The unit address on the front cover of the 9037 might be wrong. Check the switch settings on the base card in location 0.

7. This 9037 **can** be serviced now.
8. Go to “Service Procedure for FRU Replacement” on page 2-31.
9. **Online** is displayed; read the following:
Both 9037s are **online**. If the 9037's are configured correctly as an Expanded Availability configuration, then switching off power to one of the 9037's for service would not impact the customer. For more information, see “Expanded Availability Configuration” on page 1-4.
If the 9037s are not configured correctly for an Expanded Availability configuration, the customer could be severely impacted if power to a 9037 is switched off for service. To determine if service can be performed now, the following procedure **must** be used.

(Continued on the next page.)

Additional information will be required and might only be available from the customer. Any deviations from this procedure could be catastrophic to the customer's operation. ***You must be sure about all circumstances in this procedure before you perform service.*** Otherwise, schedule deferred service.

The following procedure is to be used to determine if the suspected failing 9037 can be serviced now (concurrent) or later (deferred service).

1. Count and record the number of fiber optic cables in each 9037.

The number of fiber optic cables installed in each 9037 ***must*** be equal.

Note: If available, compare the 9037 and processors fiber optic cable configuration diagram with the 9037s.

- If the number of fiber optic cables in each 9037 ***are*** equal, continue with the next step.
- If the total number of fiber optic cables in each 9037 ***are not*** equal, proceed as follows:
 - a. Schedule time for deferred service with the customer.
 - b. Record the unit address and the serial number of the 9037 to be serviced.
 - c. Record the part number of the FRUs to be ordered.
 - d. When you return to continue service, go to "Service Procedure for FRU Replacement" on page 2-31.

(Continued on the next page.)

2. The following action requires that you and the customer analyze the SCP to determine if each Sysplex Timer attachment feature adapter card installed in the processor has valid fiber optic connections to a 9037. Enter a `D ETR,DATA` command or equivalent at the operating system console.

The operator will see an ETR Status screen similar to the following:

```
IEA282I 03.41.38 ETR STATUS
SYNCHRONIZATION MODE = ETR      CPC SIDE = 0
  CPC PORT 0  <== ACTIVE      CPC PORT 1
OPERATIONAL                                OPERATIONAL
ENABLED                                    ENABLED
ETR NET ID=16                            ETR NET ID=16
ETR PORT=06                               ETR PORT=06
ETR ID=07                                 ETR ID=04
```

Observe the ETR Status screen at the operating system console. Compare the CPC port 0 information with the CPC port 1 information as follows:

- a. Are the ETR NET IDs ***the same***?
- b. Are the ETR IDs ***different***?
 - If **Yes** for both questions, go to step 3 on page 2-27.
 - If **No** for one or both questions, proceed as follows:
 - a. Schedule time for deferred service with the customer.
 - b. Record the unit address and the serial number of the 9037 to be serviced.
 - c. Record the part number of the FRUs to be ordered.
 - d. When you return to continue service, go to “Service Procedure for FRU Replacement” on page 2-31.

(Continued on the next page.)

3. When power is removed from the suspected failing 9037, the other 9037 will be in control of all ports. The other 9037 must be in an **operational** status when a `D ETR,DATA` command or equivalent is entered at the system console.

Observe the ETR Status screen at the operating system console.

Is the CPC port that is **NOT** the **active** CPC port displayed as **operational**?

- If **Yes**, the port for the other 9037 (the 9037 not being serviced) **is operational** for each system console installed. The power to the suspected 9037 (to be serviced) can be switched off. Go to “Service Procedure for FRU Replacement” on page 2-31.
- If **No**, the port for the other 9037 (the 9037 not being serviced) **is not operational** for each system console installed and the 9037 power **cannot** be switched off. Proceed as follows:
 - a. Schedule time for deferred service with the customer.
 - b. Record the unit address and the serial number of the 9037 to be serviced.
 - c. Record the part number of the FRUs to be ordered.
 - d. When you return to continue service, go to “Service Procedure for FRU Replacement” on page 2-31.

Preparing to Service the 9037

Warning: Powering off an online 9037 or disconnecting the fiber optic cables stops the transmission of time-synchronization data to the attached processors and could severely impact the customer's operation.

Warning: Powering off the 9037 console or disconnecting the console from an online 9037 results in either the loss of external time source data to the 9037 console or prevents the 9037 from tracking to the external time source.

Follow this procedure to isolate the **9037 to be serviced** from the attached processors and the other 9037 (if present).

IMPORTANT: The following procedure notifies all attached processors that maintenance at the 9037 is starting. This notification has no affect on the operation of the 9037 or the attached processors. Once the 9037 is in maintenance mode and 9037 power has been removed, be aware that additional service calls might be placed by the customer because the SCP operating system console will have messages displayed indicating a **Loss of Light** and **ETR Service Requested** for each attached processor.

1. At the Main Menu:
 - a. Select **Maintenance**.
 - b. Select **Access Maintenance Functions**.
 - c. Press **F7, Maintenance Mode**.
 - d. Select **Set Maintenance Mode**.
 - e. Press **ESC** to return to the Main Menu. The Main Menu must indicate a **Maintenance Mode Set** condition.
2. At the Main Menu:
 - a. Select **Ports**.
 - b. Select **Display Port Status**.

- c. Record the information displayed on the **Control** line for the failing 9037 unit address. This information will be used later.

Note: A letter o indicates the port is not enabled for transmission. An upward arrow () indicates the port is enabled for transmission.

3. At the **9037 being serviced**, move the power switch to Off and unplug the power cable from the ac source.
4. Remove the rear cover of the **9037 being serviced**.
5. If not already done, label all of the fiber optic port cables with their 9037 port assignments. See Figure 4-5 on page 4-5 for port assignment information.
6. Disconnect all port cables from the **9037 being serviced**.
7. Select one:
 - If this 9037 is a Basic configuration, (not attached to another 9037):
 - The 9037 is ready to be serviced.
 - Return to the step that directed you here.
 - If this 9037 is in an Expanded Availability configuration (two 9037s attached to each other), continue with step 8 on page 2-29.
8. **Note:** When you have completed step 11 on page 2-29, the two 9037s will look like the two 9037s in Figure 2-1 on page 2-30.

Remove the control link cables from the **operating** 9037 at the control link card in card location 1. See Figure 4-5 on page 4-5.
9. Connect the 2 ends of the control link cables just removed together.
10. Remove the console adapter cables from the console.
11. Reconnect the console adapter cable from the **9037 being serviced** to the console.

12. Verify that the 9037s look like the 9037s in Figure 2-1 on page 2-30.
13. The 9037 is now ready to be serviced. Return to the step that directed you here.

Figure 2-1. Expanded Availability Configuration Isolation Diagram

Service Procedure for FRU Replacement

Note: Before continuing with this procedure, you must know:

- The 9037 that is to be serviced
- The FRU to be replaced or the FRU to be replaced was recorded as **Not Determined** and more problem determination must be done

Proceed as follows:

1. Go to “Preparing to Service the 9037” on page 2-28; then return here and continue with the following step.
2. If you know the FRU to be replaced, go to step 3 on page 2-31.
If you have recorded the FRU to be replaced as **Not Determined**, return to the MAP step that directed you here and continue with that MAP.
3. Go to “Removal and Replacement Procedures” on page 3-2 and replace the recorded FRU; then return here and continue with the next step.
4. Go to “Verify 9037 Operation” on page 3-15; then return here and continue with the next step.
5. Go to “Verify Network Operation” on page 3-36; then return here and continue with the next step.
6. Have the customer enter an **ETR PORT STATUS** (**D ETR,DATA** command or equivalent) at the SCP operating system console to verify that the link is operational.

The operator will see an ETR Status screen similar to the following:

```
IEA282I 03.41.38 ETR STATUS
SYNCHRONIZATION MODE = ETR      CPC SIDE = 0
  CPC PORT 0  <== ACTIVE        CPC PORT 1
  OPERATIONAL                    OPERATIONAL
  ENABLED                        ENABLED
  ETR NET ID=16                  ETR NET ID=16
  ETR PORT=06                   ETR PORT=06
  ETR ID=07                     ETR ID=04
```

7. Record all time against the unit that required service; for example, the link, another unit in the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.

MAP 0100

This MAP requires assistance from the system control program (SCP) operating system console operator. See Appendix A for examples of 9037-related SCP console messages.

You were directed to this MAP for one of these reason codes: RC048, 049, 050, 051, 052, 053, 054, 055, 056, 057, 058, 059, 060, 061, 062, or 063.

001

Using the 9037 unit address recorded earlier, the port number, and the corresponding reason code (RC), proceed as follows:

- a. Use customer-provided information to determine which processor is attached to the recorded failing port.
- b. Ask the SCP console operator at the attached processor that is reporting the problem to enter a `D ETR,DATA` command.

The operator will see an ETR Status screen similar to the following:

```
IEA282I 03.41.38 ETR STATUS
SYNCHRONIZATION MODE = ETR      CPC SIDE = 0
  CPC PORT 0  <== ACTIVE      CPC PORT 1
  OPERATIONAL                                OPERATIONAL
  ENABLED                                    ENABLED
  ETR NET ID=16                            ETR NET ID=16
  ETR PORT=06                              ETR PORT=06
  ETR ID=07                                ETR ID=04
```

- c. Ask the system console operator to observe the ETR Status screen at the operating system console to determine if the 9037 unit address and port number recorded earlier are on CPC port 0 or CPC port 1 as follows:
 - 1) Inform the console operator of the 9037 unit address and the port number recorded earlier.

(Step **001** continues)

001 (continued)

- 2) Ask the operator to locate the 9037 unit address, which is the same as the ETR ID number, and the port number, which is the same as the ETR PORT number.
 - 3) Once the CPC port has been determined (CPC port 0 or CPC port 1) ask the operator if this CPC Port is the **active** port.
 - 4) Go to Step 002 on page 2-35.
-

002

Is the suspected failing port the *active* CPC port?

Yes No

003

Go to Step 005 on page 2-36.

004

- a. Record the 9037 unit address, the suspected failing port number, and the corresponding reason code (RC).
 - b. Record the CPC port (0 or 1) of the active CPC port.
 - c. Inform the customer that you need the processor in order to perform link problem determination for the failing port.
 - d. Schedule deferred service with the customer.
 - e. When service can be performed, continue with Step 005 on page 2-36.
-

005

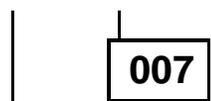
At the 9037 console:

- a. At the Main Menu, select **Ports**.
 - b. Select **Display Port Status**.
 - c. Remove the fiber optic cable from the suspected failing port of the 9037.
Note: As a result of removing the fiber optic cable, the customer will get a SCP console message on that system, indicating a port-not-operational condition.
 - d. Clean the fiber optic wrap plug using the fiber optic cleaning kit.
 - e. Insert the wrap plug into the suspected failing port.
 - f. Allow approximately 30 seconds for an upward arrow () to display on the **Status** line.
 - g. Go to Step 006 on page 2-36.
-

006

Does the **Status** line for the failing port display an upward arrow () ?

Yes No



Go to Step 019 on page 2-39.

008

- a. Remove the wrap plug from the 9037 port.
 - b. Go to “Verifying the 9037 Transmit and Receive Levels” on page 2-104; then continue with Step 009 on page 2-37.
-

009

Is the transmit power level at -21.0 dBm or more (for example, -18 dBm) ?

Yes No

010

If this is your first time at this step:

- a. Clean the failing 9037 fiber optic port (transmitter and receiver subassembly), using the fiber optic cleaning kit as directed in the *Fiber Optic Cleaning Procedures*, SY27-2604-01 or later.
- b. Go to “Verifying the 9037 Transmit and Receive Levels” on page 2-104; then return to Step 009 on page 2-37.

- or -

If this is your second time at this step, go to Step 019 on page 2-39.

011

If not already done, clean the fiber optic cable and reinstall it into the 9037.

Does the *Status* line for the failing port display an upward arrow () ?

Yes No

012

Go to Step 014 on page 2-38.

013

The port is operating correctly. Mark the event log for possible future use, and advise the customer that the 9037 is operational.

014

Is the receive power level at -29.0 dBm or more (for example, -27 dBm)?

Yes No

015

Additional problem determination is needed. With the transmit and receive level values that you recorded, go to the maintenance publication for the attached processor and continue link problem determination.

016

If this is your first time at this step:

- a. Clean the failing 9037 fiber optic port (transmitter and receiver subassembly), using the fiber optic cleaning kit as directed in the *Fiber Optic Cleaning Procedures*, SY27-2604-01 or later.
- b. Go to “Verifying the 9037 Transmit and Receive Levels” on page 2-104; then return to Step 009.

- or -

If this is your second time at this step, the suspected failing port in the 9037 is defective.

Is there a spare, unused port available in the 9037?

Yes No

017

Go to Step 020 on page 2-40.

018

Go to Step 019 on page 2-39.

019

- a. At the Main Menu, select **Ports**.
 - b. Select **Change Port Control**.
 - c. Position the cursor on the unused port position and press the space bar.
 - d. Press **Enter** to send the control information to the 9037.
 - e. Insert a cleaned fiber optic wrap plug into this unused port.
 - f. Allow approximately 30 seconds for the upward arrow () to display on the **Status** line. The upward arrow **must** display.
 - g. Advise the customer that the fiber optic cable can be moved from the failing port to the spare port tested above, without disrupting the 9037 operation.
 - h. System actions might have to be performed before the spare port is completely usable.
 - i. Update all configuration sheets to show the fiber optic cable change.
 - j. Continue with Step 020 on page 2-40.
-

020

- a. Record the FRU to be replaced as the ***port card***.
- b. Record the 9037 unit address and use the following table to match the failing port number with the corresponding RC.

Port Number	Reason Code (RC)
0, 1, 2, 3	RC066
4, 5, 6, 7	RC067
8, 9, 10, 11	RC068
12, 13, 14, 15	RC069

- c. Go to the “Service Impact Analysis Procedure” on page 2-22.
-

MAP 0200

You were directed to this MAP for reason code (RC) 076.

001

At the 9037 console:

- a. At the Main Menu, select ***Maintenance***.
- b. Select ***Display Configuration***.
- c. Locate the ***Unit Address*** line.
- d. Record each 9037 unit address displayed.
- e. Locate the ***Unit Status*** line (below the ***Unit Address*** line).

Does the ***Status*** line indicate ***Online*** for each 9037?

Yes No

002

Go to Step 004 on page 2-42.

003

Go to Step 005 on page 2-43.

- a. At the Main Menu, select **Log**.
- b. Select **Display Event Log**.
- c. Observe the event log to locate the RC076 entry reported to you.
- d. Record the unit address of the 9037 associated with the RC076.

The **other** 9037 is the 9037 that caused the RC076.

- e. Using the RC076 as a starting point, look at the previously recorded entries in the event log and look for an entry associated with the other (failing) 9037 that caused the **Service Required** status. When the entry is found:
 - Record the 9037 unit address and the RC associated with that entry.
 - Go to Table 2-1 on page 2-13 and follow the action for that RC.
-

005

The problem was most likely caused by a loss of power to the 9037. Proceed as follows:

- a. At the Main Menu, select **Log**.
- b. Select **Display Event Log**.
- c. Observe the event log to locate the RC076 entry reported to you.
- d. Record the unit address of the 9037 associated with the RC076.

The **other** 9037 is the 9037 that caused the RC076.

- e. Using the RC076 as a starting point, look at the previously recorded entries in the event log and look for an entry associated with the other (failing) 9037 that caused the **Service Required** status.

Were any log entries located indicating a permanent problem in the 9037?

Yes No

006

The 9037 is operating correctly. Record all time against the unit that required service; for example, the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.

007

- a. Record the 9037 unit address and the RC associated with that entry.
 - b. Go to Table 2-1 on page 2-13 and follow the action for that RC.
-

MAP 0300

You were directed to this MAP for either reason code (RC) 037 or 075.

001

Proceed as follows:

- a. At the Main Menu, select **Log**.
- b. Select **Display Event Log**.
- c. Observe the event log to locate the RC037 or RC075 entry reported to you.
- d. Record the unit address of the 9037 associated with the RC037 or RC075 entry.
- e. Record the FRU to be replaced as the fan assembly.

Are you here for a RC037?

Yes No

002

You are here for a RC075.

Note: This RC causes the 9037 to power off.

Go to "Service Procedure for FRU Replacement" on page 2-31.

003

Go to the "Service Impact Analysis Procedure" on page 2-22.

MAP 0400

You were directed to this MAP for either reason code (RC) 077 or 078.

001

At the console:

- a. At the Main Menu, select ***Maintenance***.
- b. Select ***Display Configuration***.
- c. The status of each 9037 is displayed below the unit address.

Does the status for each 9037 indicate *Online*?

Yes No

002

- a. Record the unit address of the 9037 with the following status: ***Service Required***. This is the 9037 to be serviced.
- b. Go to “Preparing to Service the 9037” on page 2-28; then return here.
- c. Go to “Verify 9037 Operation” on page 3-15, then return to Step 004 on page 2-46.

003

Go to Step 008 on page 2-48.

004

Did you replace one of the following FRUs?

- Control link card
- Either control link cable

Yes No

005

Note: The 9037 with **Service Required** is working correctly and the **online** 9037 needs to be verified. Do **not** reconnect the two 9037s to each other. The following steps direct you to reattach the **online** 9037 to the console and to schedule deferred maintenance with the customer for the **online** 9037 to be verified.

Go to Step 007 on page 2-46 to reconnect the **online** 9037 to the console.

006

Go to “Verify Network Operation” on page 3-36.

007

- At the 9037 selected for service in Step 001, move the power switch to Off.
 - Select **Display Event Log**.
 - Press **F5** to mark the log and make a note of the mark log entry number.
 - At the console, disconnect the console adapter cable from the 9037 that was just verified (the 9037 that indicated **Service Required**).
 - Attach the console adapter cable from the **online** 9037 to the console.
 - Press **F4** to refresh the log.
- (Continued on the next page.)

- g. Starting from the noted mark log entry number recorded in Step c above, the following reason code should be displayed:

RC008 Communication established with console

Note: The unit address for the above reason code should be for the **online** 9037.

- h. Disconnect the control link cables from the control link card in the 9037 that was selected for service and connect them together.

- i. Disconnect the opposite ends that were connected together earlier and leave them disconnected.

Note: The **Service Required** 9037 must remain disconnected from the **online** 9037 until the control link card in the **online** 9037 is replaced.

- j. Proceed as follows:
 - 1) Schedule time for deferred service with the customer.
 - 2) Record the unit address and the serial number of the **online** 9037 to be serviced.
 - 3) Record the FRU to be replaced as the control link card.
 - 4) When you return to continue service, go to "Service Procedure for FRU Replacement" on page 2-31.
-

008

The problem might have been a RS-232C cable problem between the two 9037s and was possibly corrected by the customer. Proceed as follows:

- a. At the Main Menu, select **Log**.
- b. Select **Display Event Log**.
- c. Locate the RC077 or RC078 entry and record the unit address displayed in the log entry.
- d. Use that entry as a starting point; go forward in the log and review all log entries to see if the 9037 was restarted with a power-on reset that would clear the condition.

Are there any log entries that indicate a permanent problem in the 9037?

Yes No

009

The 9037 is operating correctly. Record all time against the unit that required service; for example, the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.

010

Go to Table 2-1 on page 2-13 and follow the action plan for that event log reason code.

MAP 0500

You were directed to this MAP for one of these reason codes: RC080, 082, or 268.

The failing FRU is the battery-clock module located on the base card in card location 0. The 9037 will continue to operate correctly until the power is switched off. When the 9037 power is switched off, the battery-clock module must be replaced before power is switched on.

001

Notes:

- If this is a Basic configuration, the customer must set the 9037 time after the battery-clock replacement.
- If this is an Expanded Availability configuration, the time will be automatically set to the time of the other 9037. No customer action is required.

Proceed as follows:

- a. Record the FRU to be replaced as the ***battery-clock module***.
 - b. Record the 9037 unit address.
 - c. Go to the "Service Impact Analysis Procedure" on page 2-22.
-

MAP 0600

You were directed to this MAP for one of these reason codes: RC065, 066, 067, 068, 069, or 074.

001

- a. At the Main Menu, select **Log**.
- b. Select **Display Event Log**.
- c. Locate the reason code (RC) reported to you.
- d. Record the RC and the 9037 unit address.
- e. Use the following table to match the RC with the FRU to be replaced. For example, for RC065 the FRU to be replaced is the base card in card location 0.

Reason Code (RC)	Record the FRU to Be Replaced As
RC065	Base card, card location 0
RC066	Port card, card location 2
RC067	Port card, card location 3
RC068	Port card, card location 4
RC069	Port card, card location 5
RC074	Control link card, card location 1

- f. With the recorded RC, 9037 unit address, and the FRU to be replaced, go to the “Service Impact Analysis Procedure” on page 2-22.
-

MAP 0700

You were directed to this MAP for either reason code (RC) 040 or 260 or from another MAP.

001

Is this an Expanded Availability configuration?

Yes No

002

Go to Step 007 on page 2-53.

003

Go to Step 004 on page 2-52.

004

Are the unit address switches (located on the base card) for the two 9037s set to different values?

Yes No

005

- a. Change the unit address switches for one of the 9037s.

Note: If a service action was performed and the base card was replaced, make sure the address switches on the new card are set to the same address as the old card.

- b. At the 9037 console Main Menu:
 - 1) Select **Maintenance**.
 - 2) Select **Access Maintenance Functions**.
 - 3) Press **F7, Maintenance Mode**.
 - 4) Select **Set Maintenance Mode**.
 - 5) When complete, enter the 9037 unit address at the **Restart Unit Address** line; then press **Enter**.

Note: As a result of the 9037 restart, messages are sent to all operating system consoles. These messages should be ignored.
 - 6) When the 9037 restart is complete, press **F7** and select **Clear Maintenance Mode**; then press **Enter**.
 - 7) Press **F3** to return to the Main Menu.
 - 8) Go to Step 007 on page 2-53.

006

(Step 006 continues)

006 (continued)

Go to Step 007 on page 2-53.

007

Perform this procedure using the 9037 console:

- a. At the Main Menu, select ***Maintenance***.
- b. Select ***Display Configuration***.
- c. Press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed for each 9037 in the configuration?

Yes No

008

Go to Step 010 on page 2-54.

009

- a. The 9037 is operating correctly.
 - b. Analyze the event log for intermittent problems.
 - c. Locate the time stamps of the messages:
Communication lost with console
Communication established with console
and investigate the possible causes (console powered off, 9037 powered off, power failures, and so on).
 - d. Advise the customer that the 9037 is operational.
-

010

For the 9037 that does not have the correct unit address displayed, is the power supply status indicator on and not blinking? (See Figure 4-1 on page 4-1 for the indicator location.)

Yes No

011

You are at this step because the power supply status indicator is off or blinking. This could indicate a defective fan assembly.

Check the event log for:

RC075 Severe fan failure detected.

Is a RC075 displayed?

Yes No

012

Go to Step 016 on page 2-56.

013

Go to Step 015 on page 2-55.

014

Go to Step 023 on page 2-58.

015

- a. Record the FRUs to be replaced as:
 - 1) Fan assembly
 - 2) Base card
 - 3) Logic board
 - b. Go to the “Service Impact Analysis Procedure” on page 2-22. When the 9037 can be serviced, replace 1 FRU at a time, ***in the order shown***, until the problem is resolved.
-

016

Is the power supply status indicator blinking?

Yes No

017

Verify that the 9037 is plugged into an active ac source.

Is the ac source correct?

Yes No

018

- a. Record the 9037 unit address.
- b. Record the FRU to be replaced as ***Not Determined***.
- c. Unplug the 9037 power cable from the ac source.
- d. Ask the customer to correct the ac source problem.
- e. When the ac source problem has been corrected, plug the 9037 power cable into the ac source.
- f. Go to "Service Procedure for FRU Replacement" on page 2-31 and start with step 5 on page 2-31 to verify network operation; continue with that procedure as directed.

019

Go to Step 021 on page 2-57.

020

Go to Step 022 on page 2-57.

021

- a. Record the 9037 unit address.
 - b. Record the FRUs to be replaced as:
 - 1) Power cable, if it is determined to be defective
 - 2) Power supply
 - 3) Base card
 - c. Go to the “Service Impact Analysis Procedure” on page 2-22 and when the 9037 can be serviced, replace the above FRUs one at a time, in the order shown, until the problem is resolved.
-

022

You are at this step because the power supply status indicator is blinking.

- a. Record the 9037 unit address.
 - b. Record the FRUs to be replaced as:
 - 1) Power supply
 - 2) Base card
 - 3) Logic board
 - c. Go to the “Service Impact Analysis Procedure” on page 2-22 and when the 9037 can be serviced, replace the above FRUs one at a time, in the order shown, until the problem is resolved.
-

023

For the 9037 that does not have the correct unit address displayed, is the base card indicator on?

(See Figure 4-5 on page 4-5 for the indicator location.)

Yes No

024

- If this is a Basic configuration, go to Step 026 on page 2-59.
- If this is an Expanded Availability configuration and only one of the 9037s has an incorrect unit address, go to Step 026 on page 2-59.
- If this is an Expanded Availability configuration and both 9037s have an incorrect unit address, go to Step 037 on page 2-62.

025

- a. Record the 9037 unit address.
 - b. Record the FRU to be replaced as base card.
 - c. Go to the “Service Impact Analysis Procedure” on page 2-22.
-

026

Verify that the console adapter cable associated with the 9037 with the incorrect unit address is attached correctly at both ends.

At the console, press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed?

Yes No

027

Go to Step 029 on page 2-60.

028

Go to Step 051 on page 2-66 to verify the repair.

029

Replace the console adapter cable.

Note: If this is an Expanded Availability configuration, the console adapter cable from the other 9037 can be used for problem determination before ordering a new cable. This causes the other 9037 to lose communication with the console. Ignore the resulting reason code.

At the console, press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed?

Yes No

030

Go to Step 032 on page 2-61.

031

Go to Step 051 on page 2-66 to verify the repair.

Note: If this is an Expanded Availability configuration, make sure the console adapter cables have been reconnected to both 9037s.

032**Is this an Expanded Availability configuration?****Yes No****033**

Replace the console adapter card in the console.

At the console, press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed?**Yes No****034**

- a. Record the 9037 unit address.
- b. Record the FRU to be replaced as base card.

Note: Advise the customer that 9037 functions, such as setting the time, scheduling offsets, and varying port control on and off, cannot be performed until this FRU is replaced.

- c. Go to “Service Impact Analysis Procedure” on page 2-22.

035

Go to Step 051 on page 2-66 to verify the repair.

036

- a. Record the unit address of the 9037 that has the incorrect unit address.
 - b. Record the FRU to be replaced as base card.
 - c. Go to the “Service Impact Analysis Procedure” on page 2-22.
-

037

- a. At the console, disconnect the console adapter cable from **either** 9037 and label this cable **A**.
- b. Without disconnecting the **other** console adapter cable, label it cable **B**.
- c. At the console, press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed for the 9037 attached to the console with cable B?

Yes No

038

- a. At the console, disconnect console adapter cable **B**.
- b. Reconnect cable **A**.
- c. At the console, press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed for the 9037 attached to the console with cable A?

Yes No

039

Go to Step 042 on page 2-63.

040

Go to Step 045 on page 2-64.

041

Go to Step 048 on page 2-65.

042

- a. Replace the console adapter card in the console.
- b. Reconnect console adapter cable **A**.
- c. At the console, press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed for the 9037 attached to the console?

Yes No

043

Reconnect console adapter cable **B**; then contact your next level of support.

044

Reconnect console adapter cable **B**; then go to Step 051 on page 2-66 to verify the repair.

045

Console adapter cable **A** and the 9037 are **working correctly**.

To verify that console adapter cable **B** is operating correctly, do this:

- a. Disconnect cable **A** from the 9037 and the console.
- b. Attach cable **B** to the **working** 9037 and the console.

At the console, press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed for the 9037 now attached to the console with cable B?

Yes No

046

- a. Replace console adapter cable **B**.
- b. Reconnect console adapter cable **A**.
- c. Go to Step 051 on page 2-66 to verify the repair.

047

- a. Record the unit address of the 9037 that is **now disconnected** from the console.
 - b. Record the FRU to be replaced as base card.
 - c. Go to the "Service Impact Analysis Procedure" on page 2-22.
-

048

Console adapter cable **B** and the 9037 are *working correctly*.

To verify that console adapter cable **A** is operating correctly, do this:

- a. Disconnect cable **B** from the 9037 and the console.
- b. Attach cable **A** to the *working* 9037 and the console.

At the console, press **F4** to refresh the Display Configuration screen.

Is the correct unit address displayed for the 9037 now attached to the console with cable A?

Yes No

049

- a. Replace console adapter cable **A**.
- b. Reconnect console adapter cable **B**.
- c. Go to Step 051 on page 2-66 to verify the repair.

050

- a. Record the unit address of the 9037 that is *now disconnected* from the console.
 - b. Record the FRU to be replaced as base card.
 - c. Go to the "Service Impact Analysis Procedure" on page 2-22.
-

- a. At the Main Menu, select **Log**.
- b. Select **Display Event Log**.
- c. Press **F4** to refresh the log.
- d. Expect to see:

RC008 Communication established with
console

Note: The unit addresses associated with RC008 should match the unit address switches of the attached 9037s.

If any other log entries are displayed, go to the beginning of Chapter 2 to correct the problem.

- e. The 9037 is operating correctly. Record all time against the unit that required service; for example, the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.
-

MAP 0800

You were directed to this MAP for reason code (RC) 079.

001

Perform the following procedure using the 9037 console:

- a. At the Main Menu, select **Log**.
 - b. Select **Display Event Log**.
 - c. Locate the RC079 entry in the log.
 - d. Record the 9037 unit address associated with the RC079 entry.
 - e. Record the FRU to be replaced as **Not Determined**.
 - f. Press **ESC** to return to the Main Menu.
 - g. Go to the "Service Impact Analysis Procedure" on page 2-22 and return here to Step 002 on page 2-67 when directed by the "Service Procedure for FRU Replacement" on page 2-31.
-

002

Go to "MAP 0900" on page 2-68 to continue problem determination for the RC079.

MAP 0900

You were directed to this MAP either from MAP 0800 or from “Verify 9037 Operation” on page 3-15 for reason code (RC) 079.

001

Note: Either one of the logic cards is causing a problem on the internal bus common to all cards and needs to be replaced, or the logic board has a problem and needs to be replaced. This MAP isolates the problem to the failing FRU (card or logic board) by process of elimination.

- a. At the Main Menu, select **Log**.
 - b. Select **Display Event Log**.
 - c. With the log still displayed, press **F5** to mark the log. Record the mark log entry number appearing on the right side of the screen.
 - d. Remove all logic cards installed in card locations 0-7, using the procedures outlined in “Removal and Replacement Procedures” on page 3-2.
 - e. Go to Step 002 on page 2-69.
-

002

- a. Reinstall the base card in card location 0.
- b. Plug the 9037 power cable into its ac source.
- c. Move the 9037 power switch to On and wait approximately 1 minute for power-on to complete.
- d. With the log still displayed, press **F4** to refresh the log.

Is RC079 displayed since the last mark log entry?

Yes No

003

Go to Step 008 on page 2-71.

004

Go to "Removal and Replacement Procedures" on page 3-2 to replace the base card in card location 0; then return to Step 005 on page 2-70.

005

- a. At the Main Menu, select ***Display Event Log***.
- b. With the log still displayed, press **F5** to mark the log. Record the mark log entry number appearing on the right side of the screen.
- c. Plug the 9037 power cable into its ac source.
- d. Move the 9037 power switch to On and wait approximately 1 minute for power-on to complete.
- e. With the log still displayed, press **F4** to refresh the log.

Is RC079 displayed since the last mark log entry?

Yes No

006

- a. Reinstall all remaining cards previously removed, according to “Removal and Replacement Procedures” on page 3-2.
- b. Go to “Service Procedure for FRU Replacement” on page 2-31 and start with step 4 on page 2-31 to verify 9037 operation and continue with that procedure.

007

- a. Go to “Removal and Replacement Procedures” on page 3-2 to replace the logic board.
 - b. Reinstall the original base card.
 - c. Go to Step 014 on page 2-73.
-

008

Perform the following procedure for each remaining logic card to be reinstalled.

- a. Move the 9037 power switch to Off and unplug the power cable from its ac source.
- b. Reinstall one of the logic cards previously removed.

Note: Before you reseal the cards, check for bent connector pins. Start reseating the cards in a top-to-bottom sequence.
- c. Plug the 9037 power cable into its ac source.
- d. At the Main Menu, select ***Display Event Log***.
- e. With the log still displayed, press **F5** to mark the log. Record the mark log entry number appearing on the right side of the screen.
- f. Move the 9037 power switch to On and wait approximately 1 minute for power-on to complete.
- g. With the log still displayed, press **F4** to refresh the log.

Is RC079 displayed since the last mark log entry?

Yes No

009

Go to Step 011 on page 2-72.

010

Go to "Removal and Replacement Procedures" on page 3-2 to replace the adapter card that was last reseated in Step 008 on page 2-71; then return to Step 014 on page 2-73.

011

Have all previously removed cards been reseated?

Yes No

012

Return to Step 008.

013

- a. The problem has probably been corrected by reseating all the logic cards.
 - b. Go to "Service Procedure for FRU Replacement" on page 2-31 and start with step 4 on page 2-31 to verify 9037 operation and continue with that procedure as directed.
-

014

- a. At the Main Menu, select ***Display Event Log.***
- b. With the log still displayed, press **F5** to mark the log. Record the mark log entry number appearing on the right side of the screen.
- c. Plug the 9037 power cable into its ac source.
- d. Move the 9037 power switch to On and wait approximately 1 minute for power-on to complete.
- e. With the log still displayed, press **F4** to refresh the log.

Is RC079 displayed since the last mark log entry?

Yes No

015

- a. Reseat all remaining cards previously removed, according to “Removal and Replacement Procedures” on page 3-2.
- b. Go to “Service Procedure for FRU Replacement” on page 2-31 and start with step 5 on page 2-31 to verify 9037 operation and continue with that procedure.

016

Contact your next level of support.

MAP 1000

You were directed to this MAP for the symptom
“Console not operational.”

001

- a. Verify that the 9037 console is plugged into an active power source and that the power-on indicator is on.
- b. Verify that each 9037 is plugged into an active power source and that the power supply status indicator for each 9037 is on.

Is the power-on indicator on for the 9037 console?

Yes No

002

Go to Step 016 on page 2-77.

003

Is the power supply status indicator on for each 9037?

Yes No

004

- a. Record the unit address of the failing 9037.
- b. Record the FRU to be replaced as the power supply.
- c. Go to “Service Procedure for FRU Replacement” on page 2-31.

005

Is this an Expanded Availability configuration?

Yes No

006

(Step **006** continues)

006 (continued)

Proceed as follows:

- a. Move the 9037 console power switch to the Off position.
- b. At the console, disconnect the console adapter cable.
- c. Verify that the 9037 operational diskette is installed in drive A.
- d. Move the console power switch to the On position.
- e. Allow time for the power-on to complete.

Is the Main Menu displayed on the console?

Yes No

007

- If this is your first time at this step, insert the **backup** operational diskette into drive A and repeat Step 006.
- If this is your second time at this step, go to Step 016 on page 2-77.

008

Go to Step 010 on page 2-76.

009

Go to Step 013 on page 2-76.

010

Replace the console adapter cable.

Does the console appear operational?

Yes No

011

Go to Step 024 on page 2-79.

012

Go to Step 041 on page 2-84 to verify the repair.

013

- a. At the console, disconnect the console adapter cables.
- b. Label one cable **A** and the other cable **B**.

Does the console appear operational?

Yes No

014

Go to Step 016 on page 2-77.

015

Reconnect cable **B**; then go to Step 027 on page 2-80.

016

- a. Perform problem determination for the console, using the maintenance information provided with the console. Return here after the console has been repaired.

Note: To perform a complete checkout of the console, you might require the RS-232C 25-pin D-shell wrap plug, part number 8529280.

- b. Go to Step 017 on page 2-77.
-

017

Proceed as follows:

- a. Move the 9037 console power switch to the Off position.
- b. Verify that the 9037 operational diskette is installed in drive A.
- c. Move the console power switch to the On position.
- d. Allow time for the power-on to complete.

Is the Main Menu displayed on the console?

Yes No

018

Go to Step 020 on page 2-78.

019

Go to Step 023 on page 2-78.

020

Replace the console adapter card in the console.

Proceed as follows:

- a. Move the 9037 console power switch to the Off position.
- b. Verify that the 9037 operational diskette is installed in drive A.
- c. Move the console power switch to the On position.
- d. Allow time for the power-on to complete.

Is the Main Menu displayed on the console?

Yes No

021

Reconnect the console adapter cables; then contact your next level of support.

022

Go to Step 023 on page 2-78.

023

- a. If this is a Basic configuration, attach the console adapter cable at the console.
 - b. If this is an Expanded Availability configuration, attach both console adapter cables to the console.
 - c. The 9037 is operating correctly. Record all time against the unit that required service; for example, the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.
-

024

Replace the console adapter card in the console.

Does the console appear operational?

Yes No

025

- a. Record the unit address of the failing 9037.
- b. Record the FRU to be replaced as the base card.
- c. Go to the “Service Impact Analysis Procedure” on page 2-22.

Notes:

1. Functions, such as setting the time, scheduling offsets, and varying port control on and off, cannot be performed.
2. Information needed to service the 9037 is lost for any future 9037 failures.

026

Go to Step 041 on page 2-84 to verify the repair.

027

Does the console appear operational?

Yes No

|
|
028

- a. At the console, disconnect console adapter cable **B**.
- b. Reconnect cable **A**.

Does the console appear operational?

Yes No

|
|
029

Go to Step 032 on page 2-81.

|
030

Go to Step 035 on page 2-82.

031

Go to Step 038 on page 2-83.

032

- a. Replace the console adapter card in the console.
- b. Reconnect console adapter cable **A**.

Does the console appear operational?

Yes No

033

Reconnect console adapter cable **B**; then contact your next level of support.

034

Reconnect console adapter cable **B**; then go to Step 041 on page 2-84 to verify the repair.

035

Console adapter cable **A** and the 9037 are **working correctly**.

To verify that console adapter cable **B** is operating correctly, do this:

- a. Disconnect cable **A** from the 9037 and the console.
- b. Attach cable **B** to the **working** 9037 and the console.

Does the console appear operational?

Yes No

036

- a. Replace console adapter cable **B**.
- b. Reconnect console adapter cable **A**.
- c. Go to Step 041 on page 2-84 to verify the repair.

037

- a. Record the FRU to be replaced as the base card in the 9037 that is **now disconnected** from the console.
 - b. Go to the “Service Impact Analysis Procedure” on page 2-22.
-

038

Console adapter cable **B** and the 9037 are *working correctly*.

To verify that console adapter cable **A** is operating correctly, do this:

- a. Disconnect cable **B** from the 9037 and the console.
- b. Attach cable **A** to the *working* 9037 and the console.

Does the console appear operational?

Yes No

039

- a. Replace console adapter cable **A**.
- b. Reconnect console adapter cable **B**.
- c. Go to Step 041 on page 2-84 to verify the repair.

040

- a. Record the FRU to be replaced as the base card in the 9037 that is **now disconnected** from the console.
 - b. Go to the "Service Impact Analysis Procedure" on page 2-22.
-

- a. At the Main Menu, select **Log**.
- b. Select **Display Event Log**.
- c. Press **F4** to refresh the log.
- d. Expect to see:

RC008 Communication established with console

Note: The unit addresses associated with RC008 should match the unit address switches of the attached 9037s.

If any unexpected log entries are displayed, go to the beginning of Chapter 2 to correct the problem. Contact your next level of support if assistance is needed.

- e. The 9037 is operating correctly. Record all time against the unit that required service; for example, the link, the 9037 console, or the 9037. Ask the customer to reinstall password protection if the password was removed.
-

MAP 1100

You were directed to this MAP for either reason code (RC) 081 or 084.

001

Are you here for a RC081?

Yes No

002

You are here for a RC084; go to Step 006 on page 2-86.

003

Have any FRUs been replaced for any reason?

Yes No

004

Contact your next level of support.

005

Go to Step 007 on page 2-86.

006

- If you are here for a system control program (SCP) console message containing a reason code (RC) of 084, go to “MAP 0700” on page 2-51.
- If you are here because the 9037 console error log has a RC084, the problem might be resolved. Go to “MAP 0700” on page 2-51.

Note: The only way a RC084 can be written in the 9037 console error log is for the console to communicate with the 9037.

007

At the 9037 console:

- a. At the Main Menu, select ***Maintenance***.
 - b. Select ***Display Configuration***.
 - c. For the 9037 reporting this error, verify that the logic cards shown at the 9037 console are in the correct card location in the 9037 logic board. See Figure 4-5 on page 4-5 for card locations and port assignments.
If any cards are in the wrong card location, go to “Removal and Replacement Procedures” on page 3-2 to put the cards in their correct location.
 - d. Make sure all port card part numbers are the same. Refer to the part number on the upper left corner of the card mounting bracket.
 - e. Go to Step 008 on page 2-87.
-

008

Were any logic cards in the wrong location?

Yes No

009

Do all port cards have the same part number?

Yes No

010

Go to Step 013 on page 2-87.

011

Contact your next level of support.

012

Go to "Service Procedure for FRU Replacement" on page 2-31 and start with step 4 on page 2-31 to verify 9037 operation and continue with that procedure.

013

- a. Contact your next level of support for part number information required for this 9037.
 - b. If any cards must be removed or replaced, go to "Removal and Replacement Procedures" on page 3-2.
 - c. When all of the port cards have the same part number, go to "Service Procedure for FRU Replacement" on page 2-31 and start with step 4 on page 2-31 to verify 9037 operation and continue with that procedure.
-

MAP 1200

You were directed to this MAP either for one of these reason codes: RC002, 003, 004, 044, or 045, or for the symptom “External time source device not operational.”

Note: This background information is provided to help you diagnose and repair the reported problems.

The 9037 external time source function allows the 9037 time to be set to the time provided by an external time source. There are 3 possible external time source configurations:

- An internal modem in the 9037 console
- An external modem attached to the RS-232C port in the 9037 console
- A receiver attached to the RS-232C port in the 9037 console

See Figure 2-2 on page 2-94 for the external time source configuration examples.

For additional information about the external time source function: (1) at the Main Menu, select **Help** and press **Enter**; (2) select **Help Index** and press **Enter**; or (3) review the **External Time Source Protocols** and **External Time Source Options**.

001

Perform this procedure using the 9037 console:

1. At the Main Menu, select **Profile** and press **Enter**.
 2. Select **Change External Time Source Options** and press **Enter**.
 3. Verify that the external time source options selected are correct for the customer's installation.
 4. Go to Step 002 on page 2-89.
-

002

Perform this procedure to verify external time source operation:

1. At the Main Menu, select ***Time*** and press **Enter**.
2. Select ***Adjust the time*** and press **Enter**.
3. Press **F6, Calculate Adjustment**.

Is the message Processing Complete displayed?

Yes No

003

Go to Step 005 on page 2-90 to find the possible condition that could generate the reason code displayed.

004

There is no further action required. Mark the event log for possible future use, and advise the customer that the 9037 and its external time source function are operating correctly.

Table 2-2 on page 2-91 shows the possible conditions that could cause each reason code or message associated with this map. Each condition must be checked. For reason codes (RC) other than 002, 003, 004, 044, or 045, go to “Event Log Reason Codes, Symptoms, and Actions” on page 2-12. After each condition is checked, repeat Step 002 to verify the repair action.

Notes:

1. Certain items might be the customer's responsibility. If necessary, advise the customer to check the appropriate items.
2. If all applicable conditions have been checked for the message:

The external time source is out of tracking range

and the problem is not corrected, inform the customer that the problem can be corrected by setting the 9037 time.

Warning: This is a disruptive corrective action because setting the 9037 time generates a 9037 power-on reset and temporarily stops the ports from transmitting.

3. If all applicable conditions have been checked for all other messages and the problem is not corrected, contact your next level of support.
-

Table 2-2 (Page 1 of 3). Possible Error Conditions for MAP 1200 Reason Codes	
Reason Code or Message	<p>Note: For additional information, select Help Index and refer to the help text for the external time source.</p> <p>Possible Cause</p>
<p>(002) Operation failed. Modem not responding</p>	<ol style="list-style-type: none"> a. The modem is not installed or is improperly installed. b. The modem is not functioning correctly. c. For an external modem: <ul style="list-style-type: none"> • The modem is not plugged into a working ac source or is not powered on. • The RS-232C cable does not conform to the requirements of the modem manufacturer. • The RS-232C cable is connected improperly or is defective. • The RS-232C port in the 9037 console is defective. <p>Note: The RS-232C 25-pin D-shell wrap plug, part number 8529280, might be required to perform a complete checkout of the console.</p>
<p>(003) Time-out waiting for phone line connections</p>	<ol style="list-style-type: none"> a. The Dialing Sequence field on the External Time Source Options panel has not been set up correctly. b. The phone line is not plugged in or there is a phone line problem. c. The modem is not functioning correctly.
<p>(004) Phone line data transfer failed</p>	<ol style="list-style-type: none"> a. The wrong number is being dialed. b. The phone line is noisy. c. The modem is not functioning correctly.

Table 2-2 (Page 1 of 3). Possible Error Conditions for MAP 1200 Reason Codes

Reason Code or Message	<p>Note: For additional information, select Help Index and refer to the help text for the external time source.</p> <p>Possible Cause</p>
<p>(044) External time source is out of tracking range</p>	<p>Note: Review the background information pertaining to time adjustment on page 2-95 before proceeding. If necessary, select the Adjust the time option and press F9, Details, to determine the actual time difference.</p> <p>a. The 9037 time accumulated an error of greater than 4.999 seconds because no adjustments were made to track it to an external time source for at least 5 weeks.</p> <p>Some reasons why adjustments might not have been made are:</p> <ul style="list-style-type: none"> • Adjustment interval is too large. • External time source was powered off or defective. • The phone line was unplugged or had a problem. • Antenna installation was defective. • This installation is a Basic configuration. <p>Note: An adjustment interval of 5 weeks is based on nominal condition. Actual drift might vary with the effects of component aging and the machine environment.</p> <p>b. Jumpers or switch settings, if any, are set incorrectly in the external time source.</p> <p>c. The external time source is not functioning correctly.</p>

Table 2-2 (Page 2 of 3). Possible Error Conditions for MAP 1200 Reason Codes	
Reason Code or Message	<p>Note: For additional information, select Help Index and refer to the help text for the external time source.</p> <p>Possible Cause</p>
(045) External time source is not responding	<ul style="list-style-type: none"> a. The external time source is not plugged into a working ac source or is not powered on. b. The RS-232C cable does not conform to the requirements of the external time source manufacturer. c. The RS-232C cable is connected improperly or is defective. d. Jumpers or switch settings, if any, are set incorrectly in the external time source. e. The external time source is not functioning correctly. f. Antenna installation is defective. g. The RS-232C port in the 9037 console is defective. <p>Note: The RS-232C 25-pin D-shell wrap plug, part number 8529280, might be required to perform a complete checkout of the console.</p>
Other reason codes or messages	Go to "Event Log Reason Codes, Symptoms, and Actions" on page 2-12.

Figure 2-2. Examples of External Time Source Configurations

Time Adjustment Information

Note: The background information below is provided to help you diagnose and repair the reported problems.

Once the 9037 time has been set, adjustments from .001 to 4.999 seconds can be made only for 9037s in the Expanded Availability configuration, using one of these methods:

Do not perform any of these procedures.

- Manual entry:
 - Select ***Adjust the time.***
 - Enter a value from .001 to 4.999 seconds in the ***Adjustment Amount*** field.
 - Press **Enter** to apply the adjustment.
 - Tracking to an external time source-manual operation:
 - Select ***Adjust the time.***
 - Press **F6, Calculate Adjustment.** The 9037 time is compared to the time provided by the external time source. The ***Adjustment Amount*** field is filled in with the adjustment required to synchronize the 9037 with the external time source.
 - Press **Enter** to apply the adjustment.
 - Tracking to an external time source-automatic operation:

The 9037 can periodically calculate the adjustment required to continually track an external time source.

 - Select ***Profile.***
 - Select ***Change External Time Source Options.***
 - Answer Yes to ***Enable automatic adjustment.***
- (Continued on the next page.)

- If a modem has been selected, the adjustment interval can be programmed by entering a value in the ***Adjustment Interval*** field. Selecting a value of once per week keeps the adjustment amount less than 1 second.

Note: The adjustment interval cannot be selected for other external time sources.

Notes:

1. In a Basic configuration, the adjustment is calculated but cannot be applied.
2. When tracking-to-an-external-time-source methods are used, the message:
(044) The external time source is out of tracking range
is displayed when the calculated value is > 4.999 seconds.

For additional information, select ***Help*** on the Main Menu and press **Enter**. Select ***Help Index*** and press **Enter**. Review the ***External Time Source Protocols*** and ***External Time Source Options***.

MAP 1300

You were directed to this MAP for one of these reason codes: RC012, 013, 014, or 015.

If the 9037 is being upgraded, refer to the upgrade instructions to determine the compatibility of the different Licensed Internal Code levels.

Contact your next level of support if you cannot correct this problem.

MAP 1400

You were directed to this MAP for one of these reason codes: RC104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, or 119.

001

At the 9037 console:

- a. At the Main Menu, select **Log**.
 - b. Select **Display Event Log**.
 - c. Locate the reason code that was reported to you.
 - d. Record the 9037 unit address from the log entry.
 - e. Use the reason code reported to you and go to Table 2-3 on page 2-99 to determine which port card must be replaced.
 - f. Record the FRU to be replaced as the port card in card location *x*, where *x* is the actual card location of 2, 3, 4, or 5.
 - g. Go to the "Service Impact Analysis Procedure" on page 2-22.
-

Table 2-3. Reason Codes, Meanings, and Port Cards	
Reason Code and Meaning	Port Card Location
RC104 Port 0 failed RC105 Port 1 failed RC106 Port 2 failed RC107 Port 3 failed	Port card in card location 2
RC108 Port 4 failed RC109 Port 5 failed RC110 Port 6 failed RC111 Port 7 failed	Port card in card location 3
RC112 Port 8 failed RC113 Port 9 failed RC114 Port 10 failed RC115 Port 11 failed	Port card in card location 4
RC116 Port 12 failed RC117 Port 13 failed RC118 Port 14 failed RC119 Port 15 failed	Port card in card location 5

MAP 1500

You were directed to this MAP for reason code (RC) 085.

001

Verify that both control link cables are correctly attached to both of the 9037s.

Perform this procedure using the 9037 console:

- a. At the Main Menu, select **Log**.
- b. Select **Display Event Log**.
- c. Press **F5** to mark the log.
- d. Select the **Maintenance** option.
- e. Select the **Access Maintenance Functions** option.
- f. With the configurations of each 9037 displayed, locate the **Unit Address** line. The line below is the **Unit Status** line for each 9037.
- g. Record the unit address for the 9037s that have a **Service Required** displayed for unit status.
- h. At the **Restart Unit Address** line, located at the bottom of the screen, type the unit addresses recorded above for the 9037 with **Service Required** displayed for the unit status, and press **Enter**.
- i. Wait approximately 60 seconds for the restart to complete; then press **F4** to refresh the display.

Does the displayed configuration show the logic cards actually installed? (See Figure 4-5 on page 4-5.)

Yes No

002

Contact your next level of support.

003

Press **F5** to display the log.

**Are any reason codes displayed after the RC008
Communication established with console for each
9037?**

Yes No

004

Advise the customer that the 9037s are
operating correctly.

005

Go to the beginning of Chapter 2 to correct the
problem.

MAP 1600

You were directed to this MAP for one of these reason codes: RC008, 036,042, 016-031, 038, or 039.

These reason codes are for customer information only. They do not require any service action. A description of each reason code follows:

- **RC008:** Communication established with console. This reason code is 9037-generated and indicates the 9037 is communicating through the console adapter cable to the 9037 console.
- **RC016-RC031:** - Port x receiving valid data. These reason codes are generated when port x (0-15) is receiving valid light. If many of the same RCs seem to be generated, problem determination might be requested for that port.
- **RC036:** Control links wrapped. This reason code is only used when there is a control link card installed in 9037 card location 1. This is generated when the control link cable receptacles of the control link card are connected to each other using the control link cable. This procedure is used during installation, relocation, and verification testing to serially wrap the control link card.
- **RC038:** Maintenance mode set. When service is to be performed at the 9037 and 9037 power is to be removed, or fiber optic cables are to be moved for any reason, the service representative is directed to follow a procedure to set maintenance mode. This reason code is generated by the 9037 and is transmitted to all attached processors.
- **RC039:** Maintenance mode cleared. When service is completed at the 9037, the service representative is directed to follow a procedure to clear maintenance mode. This reason code is generated by the 9037 and is transmitted to all attached processors.

(Continued on the next page.)

- **RC042:** The 9037 is tracking the external time source. This reason code is generated when the time difference between the 9037 and the external time source *is within* the specified range. For additional information, see *Planning for the 9037 Sysplex Timer*, GA23-0365.

Verifying the 9037 Transmit and Receive Levels

Tools and Materials

The tools and materials needed for these procedures are the:

- Optical Power Meter, part number 12G8814
- Fiber Optic Cleaning Kit, part number 46G6844
- Duplex-to-Duplex Coupler, part number 42F8604 (supplied with the Fiber Optic Test Support Kit, part number 46G6836)
- Duplex-to-Biconic Test Cable, 3.0 m, part number 18F6948 (supplied with the Fiber Optic Test Support Kit, part number 46G6836)

Verifying the 9037 Transmit and Receive Operation

Use these procedures to verify that the 9037 transmitter is operating properly, and the receive level input is within tolerance.

All transmit and receive power levels must be recorded as directed. If it is determined that the 9037 is **not** the cause of the problem, you might be directed to another maintenance package, where you will need to know the power levels recorded in these procedures.

Transmitter Verification

The diagrams shown in Figure 2-3 on page 2-106 must be used with this procedure.

1. Clean the duplex-to-biconic test cable connectors 3 and 4, using the fiber optic cleaning kit as directed in the *Fiber Optic Cleaning Procedures*, SY27-2604-01 or later.
2. Attach the duplex-to-biconic test cable duplex connector 3 to the 9037 fiber optic cable receptacle 1.
3. Attach the duplex-to-biconic test cable black-coded biconic connector 4 to the power meter biconic receptacle 6.
4. Set the power meter to the 1300-nm range and move the power switch to On.
5. **Record the power level displayed on the power meter.**
6. Remove the test cable duplex connector 3 from the 9037 1. Do not remove the duplex-to-biconic test cable black-coded biconic connector 4 from the power meter biconic receptacle 6.
7. Go to "Receive Level Verification" on page 2-105.

Receive Level Verification

The diagrams shown in Figure 2-3 on page 2-106 must be used with this procedure.

1. Clean the customer link jumper cable duplex connector 2 and the duplex-to-biconic test cable connector 3, using the fiber optic cleaning kit as directed in the *Fiber Optic Cleaning Procedures*, SY27-2604-01 or later.
2. Attach the test cable duplex connector 3 and the customer's link jumper cable connector 2 to the duplex-to-duplex coupler 7.
3. **Record the power level displayed on the power meter.**

(Continued on the next page.)

4. Remove all test equipment from the 9037.
5. Reconnect all customer cables; then return to Step 009 on page 2-37.

Figure 2-3. Diagrams Used with the Power Meter

Examples of 9037 Console Screens

The console screens shown here are representations only. They are not exact.

Main Menu Screen

```
S0000                IBM 9037 Sysplex Timer Main Menu

-----
| Time      Ports   Profile   Log      Maintenance  Help  |
-----

                                01/08/1992

                                19:03:29  UTC

                                Status changed.  View log for details.

F1=Help
```

Maintenance Screen

S5200

Maintenance

19:04:14 UTC

Network Address : 12

Unit Address : 00 Unit Address : 01

Online

Online

Cards Installed

Cards Installed

0: Base card
1: Control link card
2: Port card
3: Port card
4: Port card
5: Port card
6: Not used
7: Not used

0: Base card
1: Control link card
2: Port card
3: Port card
4: Port card
5: Port card
6: Not used
7: Not used

Restart Unit Address(es) _ _

Enter F1=Help F3=Exit F4=Refresh F5=Display Log

Display Port Status Screen

```
S2100                      Display Port Status          19:03:48 UTC

Changes are not allowed from this screen.
Press F1 for additional information.

Unit Address: 00
  Port:   00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
          -----
  Status:                o o o o o o o o o o o o o o

  Control:                o o o o o o o o o o o o o o o o

                                Port Control Off = o
                                Port Control On  =

Unit Address: 01
  Port:   00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
          -----
  Status:                o o o o o o o o o o o o o o

  Control:                o o o o o o o o o o o o o o

F1=Help  F3=Exit  F4=Refresh
```

Note: If you press **F4**, the screen refreshes with the latest information.

Event Log Screen

S4100

Event Log

19:04:04 UTC

More:

1992/01/08 19:03:26 UTC Audit Trail.

RC129 XXXX Console powered on.

1992/01/08 19:03:26 UTC Unit Address 00.

RC008 Communication established with console.

1992/01/08 19:03:26 UTC Unit Address 01.

RC008 Communication established with console.

1992/01/08 19:59:54 UTC Audit Trail.

RC001 Log Marker. ----- 002

1992/01/08 20:03:26 UTC Unit Address 00.

RC048 Port 0 receiver detected errors.

1992/01/08 21:23:17 UTC Unit Address 00.

RC016 Port 0 receiving valid data.

F1=Help F3=Exit F4=Refresh F5=Mark Log

General Help Screen

General Help

More: &EX.

At the Main Menu:

Use the left and right arrow keys to position the cursor;
then press Enter to select an option.

At any help window:

Use the up and down arrow keys to scroll one line at a time.
Use the PgUp/PgDn keys to scroll one screen at a time.

At a pull-down menu:

Use the up and down arrow keys to position the cursor; then
press Enter to select an option. Use the left and right arrow
keys to move between pull-down menus.

At any data screen:

Follow the instructions for each screen.

Press F1 for additional information.

For most input fields:

Press Alt and v to display the valid alphanumeric characters.

Press Alt and r to display the range of acceptable values.

Esc=Cancel F3=Exit

Chapter 3. Repair Information and Verification Testing

This chapter explains how to perform 9037 repair actions and how to verify that the repair action corrected the problem.

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

Before performing any of these procedures, read all the statements in the section titled "Safety" on page vi.

Notes:

1. When removing or replacing parts, follow correct electrostatic discharge (ESD) handling procedures.
2. Before installing interface cables, press the contacts firmly against the ESD pad to remove static charge. When viewed from the rear of the 9037, the pad is located to the left of the logic cards.
3. Before attaching fiber optic cable connectors to the 9037, always use the cleaning kit to clean the connectors.
4. Before inserting the fiber optic cable connector into the 9037, make sure the connector bevel and the port receptacle keyways are correctly aligned.

To perform 9037 problem determination, go to the beginning of Chapter 2.

Repair Information

Adjustments

The 9037 requires no adjustments.

Removal and Replacement Procedures

For the locations of the 9037 parts, see Chapter 4.

Note: Before removing or replacing any parts, move the 9037 power switch to the Off position, and remove the power cable from its ac source.

From the list below, find the part to be removed or replaced, and go to the page shown. Each removal procedure is immediately followed by the replacement procedure.

Part	Page
External front cover	3-3
Rear cover	3-3
External top cover	3-4
Internal top cover	3-6
Logic and dummy card	3-7
Power supply	3-8
Fan assembly	3-9
Battery-Clock module	3-10
Logic board	3-11
Fiber optic cable strain relief assembly	3-12

External Front Cover Removal

1. Pull the top of the front cover toward you.
2. Disengage the bottom portion of the front cover and lift it up.

External Front Cover Replacement

Place the bottom of the front cover into position and push the top of the cover toward the rear until it latches.

Rear Cover Removal

1. Pull the top of the rear cover toward you.
2. Disengage the bottom portion of the rear cover and lift it up.

Rear Cover Replacement

Place the bottom of the rear cover into position and push the top of the cover toward the front until it latches.

External Top Cover Removal

1. Remove the front cover by pulling the top of the front cover toward you, disengaging the bottom of the front cover, and lifting it.
2. Remove the rear cover by pulling the top of the rear cover toward you, disengaging the bottom of the rear cover, and lifting it.
3. Remove the power supply. See “Power Supply Removal” on page 3-8.
4. Remove the fan assembly. See “Fan Assembly Removal” on page 3-9.
5. Label and remove all cables attached to the logic cards.
6. Remove all logic cards and dummy cards (airflow baffles) from the 9037. See “Logic (Base, Port, and Control Link) and Dummy Card Removal” on page 3-7.
7. Remove the cable guide.
8. Remove the strain relief assembly. See “Fiber Optic Cable Strain Relief Assembly Removal” on page 3-12.
9. From the rear of the 9037, remove the 4 holding screws (2 on each side).
10. **Note:** The top cover supports the 9037 chassis; therefore, when the top cover is removed, the 9037 chassis will drop onto its supporting surface. From the rear of the 9037, push the top cover away from you while holding the chassis.
11. Lift the top cover.

External Top Cover Replacement

1. Place the top cover onto the 9037 and push the 9037 chassis to the front while holding the top cover to prevent it from moving.
2. Replace the 4 cover holding screws.
3. Replace the cable guide.
4. Replace all logic cards and dummy cards (airflow baffles) into their correct card location. See “Logic (Base, Port, and Control Link) and Dummy Card Replacement” on page 3-7.

Note: Route all cables through the appropriate slot in the cable guide. See Figure 4-6 on page 4-6.

5. Replace the strain relief assembly. See “Fiber Optic Cable Strain Relief Assembly Replacement” on page 3-12.
6. Replace the fan assembly. See “Fan Assembly Replacement” on page 3-9.
7. Replace the power supply. See “Power Supply Replacement” on page 3-8.
8. Place the rear cover into position and push it until it latches.
9. Place the front cover into position and push it until it latches.

Internal Top Cover Removal

1. Remove the external top cover. See “External Top Cover Removal” on page 3-4.
2. Remove the 5 internal top cover holding screws.
The internal top cover is hinged and must be opened from the side where the holding screws were removed.
3. Open the internal top cover and lift it.

Internal Top Cover Replacement

1. Place the internal top cover tabs into position in the chassis.
2. Align the 4 locating notches with the 4 chassis locating tabs.
3. Align the 5 screw holes in the cover with the screw holes in the chassis.
4. Replace the 5 internal cover holding screws.
5. Replace the external top cover. See “External Top Cover Replacement” on page 3-5.

Logic (Base, Port, and Control Link) and Dummy Card Removal

Note: Before removing the base card, observe and record the unit address switch settings for use on the new card.

1. Remove the rear cover by pulling the top of the cover toward you, disengaging the bottom of the rear cover, and lifting it.
2. Remove any cables attached to the logic card.
3. Loosen the 2 logic card retaining screws.
4. Pull the logic card straight out toward you.

Logic (Base, Port, and Control Link) and Dummy Card Replacement

Note: Before installing a new base card, make sure the unit address switches are set to the address of the card that was removed.

Note: If this is an Expanded Availability configuration, make sure the two 9037s have the switches set to different values.

1. Hold the logic card by its metal bracket, with the components facing up.
2. Place the logic card into its proper guide rails in the chassis. Push the card evenly until it is completely seated in the board.
3. Turn the retaining screws clockwise, alternately and equally, until the screws are tight.
4. Reconnect any cables that were previously removed.
5. Place the bottom of the rear cover into position and push the top of the cover until it latches.

Power Supply Removal

1. Remove the external front cover by pulling the top of the cover toward you, disengaging the bottom of the front cover, and lifting it.
2. Remove the power cable cover (1 screw) from the internal front cover.
3. Unplug the power cable from the power supply receptacle (J1).
4. Remove the 5 internal front cover holding screws.
5. Unplug the fan assembly power cable connector from the power supply receptacle (J5).
6. Remove the 3 hex screws from the power supply.
7. Pull the power supply toward you.

Power Supply Replacement

1. Position the power supply on the 9037 guide rails.
2. Push the power supply in until it is fully seated.
3. Replace the 3 hex screws.
4. Plug the fan assembly power cable connector into the power supply receptacle (J5).
5. Replace the internal front cover, using the 5 holding screws.
6. Plug the power cable into the power supply receptacle (J1).
7. Replace the power cable cover (1 screw) to the internal front cover.
8. Place the front cover into position and push it until it latches.

Fan Assembly Removal

1. Remove the front cover by pulling the top of the cover toward you, disengaging the bottom of the front cover, and lifting it.
2. Remove the power cable cover (1 screw).
3. Unplug the power cable from the power supply receptacle (J1).
4. Remove the 5 internal front cover holding screws.
5. Unplug the fan assembly power cable connector from the power supply receptacle (J5).
6. Unplug the fan rotation sensor cable connector from the cable connector and bracket assembly.
7. Pull the fan assembly toward you.

Fan Assembly Replacement

1. Position the fan assembly into the 9037.
2. Push the fan assembly until the aligning pins are fully seated.
3. Plug the fan rotation sensor cable connector into the cable connector and bracket assembly.
4. Plug the fan assembly power cable connector into the power supply receptacle (J5).
5. Replace the internal front cover, using the 5 holding screws.
6. Plug the power cable into the 9037 power receptacle (J1).
7. Replace the power cable cover (1 screw).
8. Place the bottom of the front cover into position and push the top of the cover until it latches.

Battery-Clock Module Removal

CAUTION:

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

1. Remove the base card. See “Logic (Base, Port, and Control Link) and Dummy Card Removal” on page 3-7.
2. Remove the pluggable battery-clock module, using the module removal tool.
3. Discard the battery-clock module according to local branch office procedures.

Battery-Clock Module Replacement

1. Replace the pluggable battery-clock module.
2. Replace the base card. See “Logic (Base, Port, and Control Link) and Dummy Card Replacement” on page 3-7.

Logic Board Removal

1. Remove the power supply. See “Power Supply Removal” on page 3-8.
2. Remove the fan rotation sensor cable connector from the rear of the logic board.
3. Remove the external top cover from the 9037. See “External Top Cover Removal” on page 3-4.
4. Remove the internal top cover from the 9037. See “Internal Top Cover Removal” on page 3-6.
5. Locate and remove the 4 board retaining screws from the outer edges of the board.
6. Remove the logic board. To prevent damage to the logic board, place it on a flat surface or into its shipping container.

Logic Board Replacement

1. Place the logic board into the 9037, with the rear of the logic board against the 2 L-shaped brackets located in the center of the 9037.
2. Align the 4 logic board screw holes with the 4 threaded holes in the L-shaped brackets.
3. Insert and tighten the 4 logic board retaining screws through the logic board and into the 4 threaded holes in the L-shaped brackets.
4. Plug the fan rotation sensor cable connector into the rear of the logic board.
5. Replace the internal top cover. See “Internal Top Cover Replacement” on page 3-6.
6. Replace the external top cover. See “External Top Cover Replacement” on page 3-5.

Fiber Optic Cable Strain Relief Assembly Removal

1. Remove the rear cover by pulling the top of the cover toward you, disengaging the bottom of the rear cover, and lifting it.
2. Slide out the strain relief assembly. See Figure 6-1 on page 6-7.
3. Loosen the 4 captive strain relief top cover screws and remove the cover.
4. Carefully remove all the fiber optic cables from the strain relief block. See Figure 6-2 on page 6-8.
5. Pull the excess cable slack through the cable guide, making sure that approximately 50 mm (2.0 in.) of cable slack remains at each of the port connectors.
6. Press down on the 2 strain relief mounting plate retaining latches while pulling the plate toward you.

Fiber Optic Cable Strain Relief Assembly Replacement

1. Loosen the 4 captive strain relief top cover screws and remove the cover.
2. Engage the groove at each end of the strain relief mounting plate with the rails at the bottom of the 9037 chassis.
3. To engage the latches under the chassis, press down on the 2 mounting plate retaining latches and slide the strain relief mounting plate away from you.
4. As viewed from the rear of the 9037 and working from left to right and bottom to top, remove the protective plug from the port card; then clean and plug the fiber optic cable connector into the port.
Note: When installing a fiber optic cable into a port, use the protective cover removed from the cable connector to store the protective plug removed from the port.

5. Press the fiber optic cable into the strain relief groove closest to the logic cards. See Figure 6-2 on page 6-8. **Leave enough slack in the cable to allow for strain relief top cover installation. Also, make sure there is a bend radius of approximately 50 mm (2.0 in.) at all cable bend points.**

Note: Install 2 fiber optic cables in each groove of the strain relief assembly. To allow room for the 2nd cable, push the 1st cable to the bottom of the groove.

6. Position the fiber optic cable in the cable guide.
Note: Install 4 cables in each slot of the cable guide. See Figure 4-6 on page 4-6.
7. Repeat steps 4-6 for each fiber optic cable to be installed.
8. Replace the strain relief top cover, tighten the 4 captive screws, and slide the assembly in place.
9. Align the slots on the bottom of the 9037 rear cover with the tabs on the 9037, lift the cover, and push in at the top.

Packaging and Handling Procedures

The 9037 is shipped with 1 fiber optic wrap plug. Fiber optic protective plugs are inserted into all ports. Port cards ordered from stock also have protective plugs installed. Leave the protective plugs inserted in any defective card you return to the branch office. This protects the fiber optic transmitter and receiver from dirt and damage.

Note: Save the protective plugs you remove from port logic cards during a 9037 installation for use during problem determination, during a relocation, or when you return defective port cards.

Service Procedures

Before attaching the fiber optic cable connector to the 9037, always use the cleaning kit to clean the cable connectors. Refer to the *Fiber Optic Cleaning Procedures*, SY27-2604-01 or later, for the proper cleaning procedures.

Before inserting the fiber optic cable connector into the 9037, make sure the connector bevel and the port receptacle keyways are correctly aligned.

Fiber Optic Cable Information

For more information about fiber optic cables, see:

Planning for Enterprise Systems Connection Links,
GA23-0367

*Maintenance Information for Enterprise Systems
Connection Links*, SY27-2597

Verification Testing Procedures

These procedures are used to verify the correct operation of the 9037 and its console.

Verify 9037 Operation

001

- a. Make sure the power switch for the 9037 being serviced is in the Off position.
 - b. Go to Step 002.
-

002

- a. If not already done, move all console power switches to On.
- b. At the IBM logo screen, press **Enter**.
- c. At the Main Menu, select **Log**.
- d. Select **Display Event Log**.
- e. With the log still displayed, press **F5** to mark the log.

Note: The most recent entry in the log should be:

RC001 Log Marker

A mark log entry number appears on the right side of the screen. Make a note of it. All entries made after this mark relate to this action.

- f. Go to Step 003 on page 3-16.
-

003

Were you able to successfully complete Step 002 on page 3-15?

Yes No

004

Go to Step 061 on page 3-34.

005

- a. Move the 9037 power switch to On.
- b. Wait approximately 1 minute for power-on to complete.
- c. At the Main Menu, select ***Maintenance***.
- d. Select ***Display Configuration***. The left side of this screen shows the unit address and the logic card configuration for the 9037 you are testing.

Does the unit address (set with the address switches on the base card) match the unit address displayed on the configuration screen? (See Figure 4-5 on page 4-5 for the switch locations.)

Yes No

006

Go to Step 008 on page 3-17.

007

Go to Step 024 on page 3-23.

008

Is any unit address displayed?

Yes No

009

Go to Step 013 on page 3-18.

010

Is this your first time at this step?

Yes No

011

- a. Move the 9037 power switch to Off.
- b. Go to "Removal and Replacement Procedures" on page 3-2 to replace the base card; then go to "Verify 9037 Operation" on page 3-15 to verify the repair.

012

- a. Move the 9037 power switch to Off.
 - b. Reset the address switches on the base card.
 - c. Go to Step 005 on page 3-16 to verify the repair.
-

013

Is the power supply status indicator on and not blinking?

(See Figure 4-1 on page 4-1 for the indicator location.)

Yes No

014

You could have this indication because of a defective fan assembly. Check the event log for:
RC075 Severe fan failure detected.

Is a RC075 displayed?

Yes No

015

Is the power supply status indicator blinking?

Yes No

016

Go to Step 023 on page 3-22.

017

Go to Step 022 on page 3-21.

018

Go to Step 021 on page 3-20.

019

Go to Step 020 on page 3-19.

- a. Move the 9037 power switch to Off.
 - b. Perform these repair actions *in the order shown* until the problem is corrected:
 - 1) Verify that the console adapter cable is plugged in properly at both ends; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 2) Go to “Removal and Replacement Procedures” on page 3-2 to replace the base card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 3) Go to “Removal and Replacement Procedures” on page 3-2 to replace the console adapter card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 4) Replace the console adapter cable; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
-

021

- a. Move the 9037 power switch to Off.
 - b. Perform these repair actions *in the order shown* until the problem is corrected:
 - 1) Go to “Removal and Replacement Procedures” on page 3-2 to replace the fan assembly; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 2) Go to “Removal and Replacement Procedures” on page 3-2 to replace the base card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 3) Go to “Removal and Replacement Procedures” on page 3-2 to replace the logic board; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
-

- a. Move the 9037 power switch to Off.
 - b. Perform these repair actions *in the order shown* until the problem is corrected:
 - 1) Go to “Removal and Replacement Procedures” on page 3-2 to replace the power supply; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 2) Go to “Removal and Replacement Procedures” on page 3-2 to replace the base card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 3) Go to “Removal and Replacement Procedures” on page 3-2 to replace the logic board; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
-

023

- a. Move the 9037 power switch to Off.
 - b. Perform these repair actions ***in the order shown*** until the problem is corrected:
 - 1) Verify that the 9037 is plugged into an active ac source and the power cable is ***not*** defective; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 2) Go to “Removal and Replacement Procedures” on page 3-2 to replace the power supply; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 3) Go to “Removal and Replacement Procedures” on page 3-2 to replace the base card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
-

024

Does the displayed configuration show the logic cards in their correct locations (see Figure 4-5 on page 4-5), and does it show all the logic cards actually installed?

Yes No

025

Is this your first time at this step?

Yes No

026

Go to Step 029 on page 3-24.

027

Go to Step 030 on page 3-25.

028

Go to Step 031 on page 3-25.

029

- a. Move the 9037 power switch to Off.
- b. Go to “Removal and Replacement Procedures” on page 3-2 to replace the card that is installed, but not displayed, in the configuration; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.

If the problem is not corrected:

- a. Move the 9037 power switch to Off.
 - b. Go to “Removal and Replacement Procedures” on page 3-2 to replace the logic board; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
-

030

- a. Move the 9037 power switch to Off.
 - b. Reseat all the logic cards and verify that they are all installed in their correct card location (see Figure 4-5 on page 4-5); then return to Step 005 on page 3-16 to verify the repair.
-

031

Is the message Service Required displayed (below the Unit Address) on the Display Configuration screen?

Yes No

032

Does this 9037 have a control link card installed in card location 1? (See Figure 4-5 on page 4-5 for card locations.)

Yes No

033

Go to Step 044 on page 3-29.

034

Go to Step 036 on page 3-26.

035

Go to Step 043 on page 3-29.

036

Select *Display Event Log*.

Is RC036 displayed since the last mark log entry?

Yes No

037

- If this is an installation, go to Step 041 on page 3-27.
- If this is a service action, go to Step 042 on page 3-28.

038

Is RC077 or RC078 displayed since the last mark log entry?

Yes No

039

Go to Step 044 on page 3-29.

040

- If this is an installation, go to Step 041 on page 3-27.
 - If this is a service action, go to Step 042 on page 3-28.
-

041

- a. Move the 9037 power switch to Off.
 - b. Perform these repair actions *in the order shown* until the problem is corrected:
 - 1) Make sure both ends of the control link cable are correctly seated; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 2) Go to “Removal and Replacement Procedures” on page 3-2 to replace the control link card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 3) Replace the control link cable; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
-

042

- a. Move the 9037 power switch to Off.
 - b. Perform these repair actions ***in the order shown*** until the problem is corrected:
 - 1) Make sure all control link cable connectors are correctly seated; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - 2) Separate the control link cables from each other and remove any one cable from the 9037. Attach both ends of the cable remaining with the 9037 to the control link card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - If the problem is corrected, the unused cable is defective.
 - If the problem is not corrected, continue.
 - 3) Remove the attached cable from the control link card and attach both ends of the unused cable to the control link card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
 - If the problem is corrected, the unused cable is defective.
 - If the problem is not corrected, continue.
 - 4) Go to “Removal and Replacement Procedures” on page 3-2 to replace the control link card; then go to “Verify 9037 Operation” on page 3-15 to verify the repair.
-

043

- a. At the Main Menu, select **Log**.
 - b. Select **Display Event Log**.
 - c. Go to Step 053 on page 3-33.
-

044

- a. At the Main Menu, select **Ports**.
 - b. Select **Change Port Control**. The cursor will be blinking at the port 0 position of the **Control** line.
Note: The letter o on the **Control** line indicates the port is not enabled for transmission. An upward arrow () indicates the port is enabled for transmission.
 - c. Press the space bar for each letter o displayed. Each letter o changes to an upward arrow. When complete, press **Enter**.
 - d. All ports should now display an upward arrow on the **Control** line.
 - e. Obtain the fiber optic wrap plug, part number 5605670, stored in the pocket behind the front cover of the 9037.
 - f. Go to Step 045 on page 3-30.
-

045

As viewed from the rear of the 9037, starting with the top rightmost installed port, remove the protective plug (if installed) and insert the fiber optic wrap plug.

Note: See Figure 4-5 on page 4-5 for port locations.

Wait approximately **30 seconds** after inserting the wrap plug into a port. The status of the port (indicated on the **Status** line) should change from an **L** to an upward arrow (**^**) to indicate the fiber optic port is transmitting normally.

Do both the *Status* and the *Control* lines for the port being wrapped display an upward arrow (**^)?**

Yes No

046

Go to "Removal and Replacement Procedures" on page 3-2 to replace the port card for the failing port; then go to "Verify 9037 Operation" on page 3-15 to verify the repair.

047

Remove the wrap plug and reinstall the protective plug if previously removed.

Note: The port **Status** line should change to **L**, indicating the port is not receiving light. This is normal because the wrap plug has been removed.

Go to Step 048 on page 3-31.

048

Have you performed the port wrap test on all installed ports?

Yes No

049

Perform the wrap test on the next installed port, starting at Step 045 on page 3-30.

050

Go to Step 051.

051

The cursor is blinking on the **Control** line.

- a. Press the space bar for each upward arrow displayed on the **Control** line.
 - b. The upward arrow () changes to the letter o.
 - c. Press **Enter** when complete.
 - d. Store the fiber optic wrap plug in the pocket behind the front cover of the 9037.
 - e. Go to Step 052 on page 3-32.
-

052

- a. At the Main Menu, select the **Log**.
 - b. Select **Display Event Log**.
 - c. With the log still displayed, press **F5** to mark the log. Record the mark log entry number appearing on the right side of the screen.
 - d. At the Main Menu, select **Maintenance**.
 - e. Select **Access Maintenance Functions**.
 - f. At the **Restart Unit Address** line, type the unit address of the 9037 you are servicing and press **Enter** to send the restart command to the 9037.
 - g. Wait approximately 1 minute for the 9037 Restart to complete.
 - h. Select **Display Event Log**.
 - i. Check the event log to ensure that since the last mark log entry there are no error messages after the:

Communication established with console entry.

 - If there are any unexpected messages in the log, go to the beginning of Chapter 2 to correct the problem.
 - If there are no unexpected messages in the log, return to the procedure or step that directed you here.
-

053

You are here for one of these possible reason codes: RC065, 066, 067, 068, 069, 074, 079, 080, or 082.

Are you here for RC079 or RC082?

Yes No

054

You are here for one of these possible reason codes: RC065, 066, 067, 068, 069, 074, or 080.

- a. Go to “Removal and Replacement Procedures” on page 3-2 and replace the failing FRU indicated by the reason code; then return here.
- b. Go to “Verify 9037 Operation” on page 3-15 to verify the repair.

055

Are you here for RC079?

Yes No

056

You are here for RC082. Go to Step 058 on page 3-34.

057

- a. Go to “MAP 0900” on page 2-68; then return here.
 - b. Go to “Verify 9037 Operation” on page 3-15 to verify the repair.
-

058

Has the battery-clock module been replaced as part of this repair action?

Yes No

059

Go to "Removal and Replacement Procedures" on page 3-2 to replace the battery-clock module; then go to "Verify 9037 Operation" on page 3-15 to verify the repair.

060

Note: This is an expected reason code for an uninitialized module. The process of powering off the 9037 and powering it on again will initialize the battery-clock module to default values.

- a. Move the 9037 power switch to Off.
 - b. Go to "Verify 9037 Operation" on page 3-15.
-

061

Use this checklist to make sure the console is set up correctly:

- a. Verify that the console power cables are properly plugged into active ac sources.
- b. Verify that the 9037 operational diskette is properly installed in drive A of the console.
- c. If the 9037 operational diskette is suspected of having a problem, remove it and insert the 2nd copy of the operational diskette shipped with the 9037.
- d. Move the console power switches to Off.
- e. Move the console power switches to On.

(Step **061** continues)

061 (continued)

Does the console appear operational?

Yes No

062

- a. Move the console power switches to Off.
- b. Unplug the console power cables from their ac sources.
- c. Remove the console adapter cable from the console.
- d. Perform problem determination for the console, using the maintenance information provided with the console. Return here after the console has been repaired.
- e. Move the console power switches to Off.
- f. Unplug the console power cables from their ac sources.
- g. Attach the console adapter cable from the console to the 9037.
- h. Go to "Verify 9037 Operation" on page 3-15.

063

Go to "Verify 9037 Operation" on page 3-15.

Verify Network Operation

If this is a Basic configuration (one 9037), go to step 14 on page 3-37.

If this is an Expanded Availability configuration (two 9037s), continue with step 1 to reconnect the repaired 9037 to the operating 9037.

Perform this procedure using the 9037 console:

1. At the Main Menu, select **Log**.
 2. Select **Display Event Log**.
 3. Press **F5** to mark the log.
 4. Move the console power switches to Off.
 5. At the 9037 being serviced, move the power switch to Off.
 6. Attach the console adapter cable from the operating 9037 to the console.
 7. At the 9037 just repaired, disconnect the two ends of the control link cables presently attached to each other, and attach them to the control link card of the operational 9037.
 8. Move the console power switches to On.
 9. Select **Display Event Log** and expect the following reason codes to be displayed:

```
RC129  9037 Console powered on  
RC008  Communication established with console
```

Note: The unit address for RC008 should match the operational 9037.
If any other log entries are displayed, go to the beginning of Chapter 2 to correct the problem.
 10. Press **F5** to mark the log.
 11. Move the 9037 power switch to On and wait approximately 1 minute for power-on to complete.
 12. Press **F4** to refresh the log.
- (Continued on the next page.)

13. Expect to see:
RC008 Communication established with console
Note: The unit address associated with RC008 should match the 9037 just powered on.
If any other log entries are displayed, go to the beginning of Chapter 2 to correct the problem.
14. Attach all the fiber optic cables previously removed. For ports that are not in use, install the fiber optic protective plug.
For fiber optic cable routing information, refer to Figure 6-1 on page 6-7 and Figure 6-2 on page 6-8.
15. At the Main Menu, select **Ports**.
16. Select **Change Port Control** and enter the port control information recorded earlier in “Preparing to Service the 9037” on page 2-28.
17. At the Main Menu, select **Maintenance**.
18. Select **Access Maintenance Functions**.
19. Press **F7, Maintenance Mode**.
20. Select **Clear Maintenance Mode**.
21. At the Main Menu, select **Profile**.
22. Select **Change Authorization Level**.
23. From the Authorization Level screen, change the authorization level to level 1 (display only).
24. Place this publication inside the pocket behind the front cover; then replace the 9037 front and rear covers.
25. Advise the customer that the 9037 is operational.

Notes:

- a. If this is a Basic configuration and the base card or the battery-clock module has been replaced, the customer must initialize the 9037 with the correct time.
- b. If password protection was removed at the start of service, ask the customer to reinstall it at this time.

Chapter 4. Locations

This chapter shows the locations of the 9037 parts.

Figure 4-1. 9037 Front View

Figure 4-2. 9037 Rear View

Figure 4-3. Internal Front Cover

Figure 4-4. Internal View of the 9037

Figure 4-5. Card Locations and Port Assignments

Figure 4-6. Cable Routing Guide

Figure 4-7. Power Supply

Chapter 5. Preventive Maintenance

The 9037 requires no preventive maintenance.

Chapter 6. Installation, Discontinuance, and Relocation

This chapter provides the information necessary to install, discontinue, or relocate a 9037.

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

Before performing any of these procedures, read all the statements in the section titled "Safety" on page vi.

Installation

Notes:

1. If you are installing an Expanded Availability configuration (two 9037s), it is recommended that a separate ac power source be used for each 9037. The console can share the same ac power source with one of the 9037s.
2. If you are installing an Expanded Availability configuration, it does not matter which 9037 you install first.
3. Before installing interface cables, press the contacts firmly against the electrostatic discharge (ESD) pad to remove static charge. When viewed from the rear of the 9037, the pad is located to the left of the logic cards.
4. Before attaching the fiber optic cable connectors to the 9037, always use the cleaning kit to clean the connectors.
5. Before inserting the fiber optic cable connector into the 9037, make sure the connector bevel and the port receptacle keyways are correctly aligned.

Console Installation

1. The 9037 console must be installed and operational before installing the 9037.
 - If the customer is planning to use the external time source function, there are 3 possible configurations (see Figure 2-2 on page 2-94).
 - If the customer is planning to use an internal modem, install the modem prior to installing the 9037 if possible.
 - If the configuration planned requires attachment to the RS-232C port of the 9037 console, the RS-232C 25-pin D-shell wrap plug, part number 8529280, might be required to perform a complete checkout of the console.
2. Determine if the console adapter card has been installed in the console. If the adapter card is installed, go to “9037 Installation” on page 6-3. If the card is not installed, use one of the procedures listed below to install the card.
 - If you received a long (full-length) adapter card in the 9037 ship group, go to “Long Card Installation” on page 6-12. See **Notes** below.
 - If you received a short (half-length) adapter card in the 9037 ship group, go to “Short Card Installation” on page 6-13. See **Notes** below.

Notes:

- a. When installing the console adapter card, follow correct electrostatic discharge (ESD) procedures.
- b. For more general adapter card installation instructions, refer to the documentation provided with the console.

9037 Installation

1. Locate the extender assembly, part number 02G4944, provided with the 9037. If this is an Expanded Availability configuration, only one extender is provided.
2. Insert the extender assembly into the console adapter card cable receptacle of the console controller.
3. Insert the 9037 operational diskette into drive A of the console.
Note: Two copies of the operational diskette are shipped with the 9037. Give 1 copy to the customer to be used as a backup copy.
4. Set up the 9037 using the "Set Up Procedure" on page 6-9; then return to the next step.
5. Go to "Verify 9037 Operation" on page 3-15 to verify the 9037 is operating correctly; then return to the next step.
6. If this is a Basic configuration, go to Step 21 on page 6-4 to complete the installation. If this is an Expanded Availability configuration, continue with the next step.
7. Move the console power switches to Off and unplug the power cables from their ac sources.
8. At the installed 9037, move the power switch to Off and unplug the power cable from its ac source.
9. At the 9037 console, disconnect the console adapter cable from the 9037.
10. Set up the 2nd 9037 using the "Set Up Procedure" on page 6-9; then return to the next step.
11. Go to "Verify 9037 Operation" on page 3-15 to verify the 9037 is operating correctly; then return to the next step.
12. Move the console power switches to Off and unplug the power cables from their ac sources.

(Continued on the next page.)

13. Move the 9037 power switch to Off and unplug the power cable from its ac source.
14. Disconnect the control link cables from both 9037s and reconnect the cables to link the 9037s together.
15. At the console, attach the console adapter cable from each installed 9037 to the console adapter card cable connector.
16. Plug the console power cables into correctly grounded outlets.
17. Move the console power switches to the On position.
18. Plug the power cable for each 9037 into a correctly grounded outlet.
19. For each 9037, move the power switches to the On position.
20. Wait approximately 1 minute for the 9037s to power on.
21. From the event log, use **F5** to mark the log.
Note: If this is an Expanded Availability configuration, a RC076 (other 9037 unit failed) might be displayed if the units were not powered on at the same time. This is *not* a failure.
22. At the Main Menu, select ***Maintenance***.
23. Select ***Access Maintenance Functions***.
24. At the ***Restart Unit Address*** line, type the unit addresses of the 9037s just installed and press **Enter** to send the restart command to the 9037.
25. Wait approximately 1 minute for the 9037s ***restart*** to complete.
26. Select ***Display Event Log***.
27. Check the event log to make sure there are no error messages after the:
Communication established with console
entry for each 9037. If there are any unexpected messages in the log, go to the beginning of Chapter 2 to correct the problem.

28. Place the wrap plug in the pocket behind the front cover.
29. Install all cables (power, console adapter, and control link) in the cable guide as shown in Figure 4-6 on page 4-6.
Provide enough slack for each cable to make sure their connectors are not strained.
30. The 9037 installation is complete. Do one of the following:
 - Go to “Post-Installation” and, if possible, perform the steps listed.
 - If post-installation cannot be performed at this time, place this publication inside the pocket behind the front cover and replace the front and rear covers.

Post-Installation

Warning: To prevent fiber optic cable tension created outside the 9037 from being transferred to the port card receptacles, use the strain relief assembly provided in the 9037. See Figure 6-1 on page 6-7 and Figure 6-2 on page 6-8.

1. Remove the 9037 rear cover by pulling the top of the cover toward you, disengaging the bottom portion of the rear cover, and lifting it.
2. Slide out the strain relief assembly. See Figure 6-1 on page 6-7.
3. Loosen the 4 (captive) strain relief top cover screws and remove the cover.
4. As viewed from the rear of the 9037 and working from left to right and bottom to top, remove the protective plug from the port card; then clean the fiber optic cable connector, using the fiber optic cleaning kit as directed in the *Fiber Optic Cleaning Procedures*, SY27-2604-01 or later.

(Continued on the next page.)

5. Plug the fiber optic cable connector into the 9037 port.

Note: When installing a fiber optic cable into a port, use the protective cover removed from the cable connector to store the protective plug removed from the port.

6. Press the fiber optic cable into the strain relief groove closest to the logic cards. ***Leave enough slack in the cable to allow for strain relief top cover installation. Also, make sure there is a bend radius of approximately 50 mm (2.0 in.) at all cable bend points.***

Note: Install 2 fiber optic cables in each groove of the strain relief assembly. To allow room for the 2nd cable, push the 1st cable to the bottom of the groove.

7. Position the fiber optic cable in the cable guide.

Note: Install 4 cables in each slot of the cable guide. See Figure 6-2 on page 6-8.

8. Repeat steps 2-7 for each fiber optic cable to be installed.
9. Replace the strain relief top cover, tighten the 4 captive screws, and slide the assembly in place.
10. Align the slots on the bottom of the 9037 rear cover with the tabs on the 9037, lift the cover, and push in at the top.

This completes post-installation.

Note: Refer to the appropriate processor publication to complete any required system actions.

Figure 6-1. Cable Paths

Figure 6-2. Fiber Optic Cable Strain Relief Assembly

Setup Procedure

1. The 9037 should be at its operating location on a flat, solid surface (for example, a table).
2. If you are installing this machine in Japan, install the power On/Off label over the Power Supply Status indicator on the front of the 9037. See Figure 4-1 on page 4-1.
3. Make sure the 9037 power switch (located in the front of the 9037) is in the Off position and the 9037 power cable is not plugged into a power source.
4. Remove the front and rear covers.
5. Remove the power cable cover located on the interior front cover. See Figure 4-3 on page 4-3.
6. Locate and plug the power cable into the power cable receptacle in the front of the 9037.
7. Arrange the power cable as shown in Figure 6-3 on page 6-11.
8. Secure the power cable to the internal front cover by looping the cable tie (provided with the 9037) around the retaining tab (see Figure 6-3 on page 6-11).
9. Route the power cable underneath and to the rear of the 9037, using the cable track located on the left underside of the 9037.
10. Replace the power cable cover.
11. Attach the console adapter cable, part number 58F0898, to the cable receptacle of the 9037 base card located in card location 0 (see Figure 4-5 on page 4-5).
12. Attach the opposite end of the console adapter cable to the console adapter card in the console.

(Continued on the next page.)

13. Set the address switches to the address of your choice or to the address selected by the customer.

Note: In an Expanded Availability configuration, the two 9037s *must* have different addresses.

The switches are labeled **1 2 3 4** (left to right) and are read with a binary value of **8 4 2 1** (left to right). The 9037 address is a decimal value and can range from 0 to 15. For example, a unit address of 03 will have these switch settings: 1=off, 2=off, 3=on, and 4=on.

14. If there is a control link card installed in card location 1, obtain the control link cable, part number 73F4935, shipped with the 9037, and attach the 2 ends of the same control link cable to the control link card.

15.

DANGER

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

DANGER

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

Plug the 9037 power cable into a correctly grounded outlet.

This completes the setup procedure. Return to the step that directed you here to complete the 9037 installation (step 4 on page 6-3 or step 10 on page 6-3).

Figure 6-3. Power Cable Routing

Long Card Installation

Install the 9037 console adapter card (provided with the 9037) into the console as follows:

1. Move the console (display and controller) power switches to Off.
2. Insert a backup copy of the IBM PS/2 reference diskette (provided with the console) into the console diskette drive A.
3. Move the console power switches to On.
4. Select **copy an option diskette** to copy the configuration files from the 9037 operational diskette. When the console displays the request for the option diskette, insert the 9037 operational diskette into the diskette drive.
5. Move the console power switches to Off.
6. Remove the console cover.
7. Remove the expansion slot cover on the back of the console.
8. Install the console adapter card into an unused slot, with the console adapter cable receptacle through the opening of the console back panel.
9. Fasten the console adapter card mounting bracket to the console back panel.
10. Replace the console cover.
11. Have the customer store the console expansion slot cover for possible future use.
12. Make sure the backup copy of the IBM PS/2 reference diskette is in drive A.
13. Move the console (display and controller) power switches to On.
14. Run the automatic configuration.
15. When the configuration is complete, remove the reference diskette.
16. Move the console power switches to Off and unplug the power cable from its ac source.
17. Go to "9037 Installation." on page 6-3.

Short Card Installation

Install the 9037 console adapter card (provided with the 9037) into the console as follows:

1. Refer to Figure 6-4 on page 6-14 to make sure the switch and jumper settings on the card are set correctly.
2. Move the console power switches to Off.
3. Remove the console top cover.
4. Remove the expansion slot cover on the back of the console.
5. Install the console adapter card into an unused slot, with the console adapter cable receptacle through the opening of the console back panel.
6. Fasten the console adapter card mounting bracket to the console back panel.
7. Replace the console cover.
8. Have the customer store the console expansion slot cover for possible future use.
9. Using the diagnostics provided with the console, verify that the console and the console adapter card are operating correctly.
10. Move the console power switches to Off and unplug the power cable from its ac source.
11. Go to "9037 Installation." on page 6-3.

Notes:

1. Jumpers must be installed across the 17, R1, and A1 pins.

The W2 pin location is used to store a spare jumper on one of the W2 pins. Do **not** install the jumper across the 2 W2 pins.

2. Switches must be set in this manner:
Press down on the Off side of switches 1, 2, and 3.
Press down on the On side of switches 4 and 5.
The red area must be visible as shown above.

Figure 6-4. Console Adapter Card

Discontinuance and Relocation

Perform the following procedure to discontinue or relocate an IBM 9037. For a rear view of the 9037, see Figure 4-2 on page 4-2.

1. At the Main Menu, select ***Maintenance***.
2. Select ***Power Off Console***.
3. When the message displayed indicates the console can be powered off, move the console power switches to Off.
4. Unplug the console power cables from their ac sources.
5. Move the 9037 power switch to the Off position.
6. Unplug the 9037 power cable from its ac source.
7. Disconnect all console adapter cables.
8. Remove the console cover.
9. Remove the console adapter card from the console.
10. Replace the console expansion slot cover if available.
The console adapter card must be packaged with the 9037.
11. Disconnect the fiber optic cables from the 9037 port cards.
12. To prevent connector damage, attach the plastic protective covers to the fiber optic cable connectors.
13. Insert a protective plug into each of the port card receptacles.
14. Slide out the strain relief assembly and remove the strain relief top cover.
15. Remove the fiber optic cables from the strain relief assembly and the cable guide.

(Continued on the next page.)

16. If this is an Expanded Availability configuration, disconnect the two control link cables from the 2 9037s.
17. Pack the 9037 as instructed by existing local procedures.

If this is a relocation, go to the beginning of Chapter 6 to install the 9037.

Fiber Optic Cable Considerations for Installation, Discontinuance, and Relocation

Advise the customer that the fiber optic cable end protectors should be installed if the cables are not attached to a 9037.

For more information about fiber optic cables, see:

Planning for Enterprise Systems Connection Links, GA23-0367

Maintenance Information for Enterprise Systems Connection Links, SY27-2597

Chapter 7. Maintenance Agreement Inspection Procedure

Note: Contact your maintenance agreement qualification (MAQ) coordinator to determine the tests required to make sure the 9037 is operational.

Use this chapter when performing an inspection for a maintenance agreement qualification. It gives a list of preparatory items, a list of inspection items, and a diagram of safety labels.

Before performing any of these procedures, read all the statements in the section titled “Safety” on page vi.

Preparation

- Complete the *Electrical Safety Training Course for IBM Customer Engineers*.
- Make sure the machine power is off and electrical power is removed from the machine before you start the checklist.
- Make sure these reference materials are available:
 - Copies of service memorandums (ECAs and SAs) for this machine type
 - *Electrical Safety for IBM Customer Engineers, S229-8124*

Note: Although completeness and accuracy are the objectives of this procedure, not all machine configurations are covered; for example, special features and requests for price quotations (RPQs). If you have a machine with features or RPQs not described in this procedure, use the installation instructions for that feature or RPQ. Otherwise, use this procedure and good judgment to ensure a safe machine.

General Checklist Instructions

The purpose of this procedure is to help identify conditions that are, or can become, unsafe. When manufactured, all necessary safety items were installed to protect the customer, operators, and service personnel from injury. This checklist includes only those items. Use good judgment to identify conditions not included in this procedure.

The conditions and items you should check before you switch on power to the machine are listed below. If any obviously unsafe conditions are present, you must determine how serious the hazard could be and whether to continue without first correcting the problem.

Considerations

Consider these conditions and the safety hazards they cause:

- Electrical power, especially primary power (for example, a “hot” frame can cause serious or lethal electrical shock)
- Explosive condition (for example, bulging capacitors can cause serious injury)
- Use of chemicals, cleaning fluids, or solvents other than those specified by IBM

Checklist

Power

- Before you start this procedure, check that machine power is off and the ac power cable is disconnected.
- Check that the power cable is not frayed or damaged.

- Check that the power cable is correctly connected to the power supply. Locate the power cable entry behind the power supply.

Inside the Machine

- Check for any non-IBM alterations. If there are any, make sure a *Guide for Inspection of Altered IBM Machines* has been completed.
- Check for broken, loose, or missing parts or assemblies.
- Check all fasteners.

Machine Labels

- Verify that the power supply safety label (shown in Figure 7-1 on page 7-4) is installed correctly.
- Verify that the weight safety label (located behind the front cover on the chassis) is installed correctly. See Figure 7-2 on page 7-5.

Power Plug Ground

- With an ohmmeter set to the R x 1 range, check for continuity between the ground pin on the power plug and the machine frame. The reading should be 0 ohms.

Figure 7-1. Power Supply Safety Label Location

Figure 7-2. Weight Label Locations

Chapter 8. Grounding Path Diagram

Figure 8-1 shows all the 9037 ground connection points.

Figure 8-1. 9037 Ground Connections

Chapter 9. Parts List

This chapter contains diagrams, part numbers, and descriptions of the parts required to maintain an IBM 9037.

Note: For logic card part numbers, refer to the upper left corner of the logic card holder. For example:

XXXXXXXXYYYY, where:

X = Logic card part number

Y = Manufacturing use only

Covers and Strain Relief

Power Supply, Logic Board Assembly, and Fan Assembly

Power Cable Assemblies

Note: The power cable length shown is reduced by 1.0 m to allow for internal cable routing.

External Cables, Extender, and Console Adapter Card

Part

Number	Description
58F0898	Cable, Console Adapter
73F4935	Cable, Control Link
02G4944	Extender, Console Adapter Cable, Console End
73F4136	Card, Console Adapter (Short)
73F4137	Card, Console Adapter (Long)

Chapter 10. Administration

The 9037 requires no unique, maintenance-related administrative information.

Appendix A. System Control Program (SCP) Messages

This appendix contains examples of 9037-related SCP console messages and their meanings. Variables in the message text are shown in *italic*. For more 9037-related SCP messages, see the appropriate SCP messages and codes publication.

IEA259I CLOCK $_{xx}$: ENVIRONMENT NOT VALID FOR SIMETRID.

Explanation: The SIMETRID parameter was incorrectly specified in a CLOCK $_{xx}$ parmlib member. The SIMETRID parameter is only valid when the system is running as a virtual machine (VM) or Processor Resource/Systems Manager* (PR/SM*) guest.

In the message text:

CLOCK $_{xx}$ = The parmlib member, with suffix $_{xx}$

IEA260I THE CPC IS NOW OPERATING IN ETR MODE.

Explanation: The central processing complex (CPC) is now synchronized with the External Time Reference (ETR). ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

IEA261I NO ETR PORTS ARE USABLE. CPC CONTINUES TO RUN IN LOCAL MODE.

Explanation: There is no operational port from the central processing complex (CPC) to the External Time Reference (ETR). ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

IEA262I ETR PORT n IS NOT OPERATIONAL.

Explanation: The specified External Time Reference (ETR) port is not working. ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

n = The port number

**IEA263I BOTH CPC PORTS ARE CONNECTED TO THE
SAME SIDE OF ETR *xx*.**

Explanation: Both central processing complex (CPC) ports are connected to the same side of a coupled External Time Reference (ETR). ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

xx = The ETR identifier

**IEA264I PORT *n* TO ETR *xx* WAS DISABLED BECAUSE
IT IS INCORRECTLY CONNECTED.**

Explanation: The system disabled the specific port to an External Time Reference (ETR). ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent. The port was not connected to the same ETR as the link from the remaining or initial port.

In the message text:

n = The port number
xx = The ETR identifier

**IEA265I UNABLE TO SYNC TOD CLOCKS TO ETR.
CPC CONTINUES IN LOCAL MODE.**

Explanation: The central processing complex (CPC) could not synchronize with the External Time Reference (ETR). This occurred for one of the following reasons:

- A hardware error occurred.
- The time difference between the ETR and time-of-day (TOD) clocks exceeded the ETRDELTA value in a CLOCK*xx* parmlib member.

ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

**IEA266I CLOCK*xx*: {ETRMODE NO AND ETRZONE
YES|OPERATOR PROMPT AND SIMETRID}
ARE MUTUALLY EXCLUSIVE PARMS.**

Explanation: Both ETRMODE NO and ETRZONE YES, or Operator Prompt and SIMETRID, were specified in a CLOCK*xx* parmlib member. The timer synchronization mode must be External Time Reference (ETR) (ETRMODE YES) to obtain the time zone value from the ETR. ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

CLOCK*xx* = The parmlib member, with suffix *xx*

IEA267I ETR PORT *n* IS NOW OPERATIONAL.

Explanation: An External Time Reference (ETR) port is now working. ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

n = The port number

**IEA268I ETR PORT *n* IS DISABLED DUE TO AN
EXCESSIVE NUMBER OF STATE CHANGES.**

Explanation: The system detected an excessive number of availability state changes for an External Time Reference (ETR) port. ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

n = The port number

**IEA269I A SIDE ID CHANGE FROM SIDE *x*: TO SIDE *y*
HAS OCCURRED.**

Explanation: The central processing complex (CPC) switched from using the External Time Reference (ETR) ports on one side to the ports on another side. ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

x,y = The side identifiers

**IEA270I BOTH PORTS TO THE ETR HAVE BEEN
DISABLED. CPC CONTINUES IN LOCAL
MODE.**

Explanation: The system disabled both ports to an External Time Reference (ETR). ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

**IEA271I ETR TIME OFFSET CHANGES HAVE
OCCURRED.**

Explanation: The system encountered a problem with the External Time Reference (ETR). This occurred for one of the following reasons:

- A leap second increment or decrement.
- The local time offset changed because of a change to or from local daylight savings time.

ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

**IEA272I ETR SERVICE IS REQUESTED. REASON
CODE = rcc.**

Explanation: The External Time Reference (ETR) requires service. ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

rcc = The reason code explaining the error

**IEA273I TOD CLOCKS DYNAMICALLY ADVANCED TO
MAINTAIN ETR SYNCHRONISM.**

Explanation: After an External Time Reference (ETR) synchronization check, the system synchronized the time-of-day (TOD) clocks again.

ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

IEA274W THE ONLY ONLINE TOD CLOCK HAS FAILED.

Explanation: The last, or only, online time-of-day (TOD) clock failed.

**IEA276I ETR ATTACHMENT DAMAGE WAS
DETECTED.**

Explanation: The system found that the External Time Reference (ETR) attachment was damaged.

ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

**IEA280I ETR DATA CANNOT BE ACCESSED. CPC
CONTINUES IN LOCAL MODE.**

Explanation: This occurred for one of the following reasons:

- Timer supervision could not obtain the required data words from the External Time Reference (ETR).
- The data words that timer supervision obtained from the ETR are not valid.

ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

**IEA281I ETR SYNC CHECK THRESHOLD EXCEEDED.
 CPC CONTINUES IN LOCAL MODE.**

Explanation: The number of External Time Reference (ETR) synchronization checks exceeded the number allowed by the system.

ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

**IEA282I *hh.mm.ss* ETR STATUS SYNCHRONIZATION
 MODE = *mode* CPC SIDE = *n*
 [PORT 0 [<-] active [->] PORT 1**

op *op*
 enb *enb*]

[PORT 0 [<-] active [->] PORT 1

op *op*
 enb *enb*
 etrnet *etrnet*
 etrport *etrport*
 etrid *etrid*

**[THE ETR Facility IS NOT INSTALLED]
[PORT STATUS CANNOT BE DETERMINED].**

Explanation: In response to the DISPLAY ETR command, the system displays this message. ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

hh.mm.ss = The hour (00-23), minute (00-59), and second (00-59) that the system issued this message.

mode = The current synchronization mode as follows:

- **ETR:** The system time-of-day (TOD) clocks are synchronized to an External Time Reference ETR.
- **Local:** The operator set the system TOD clocks. The system TOD clocks are synchronized to a local oscillator.

<-

-> = An arrow pointing to the active ETR port.

op = The operational status of the ETR port as follows:

- **OPERATIONAL:** The port is working.
- **NONOPERATIONAL:** The port is not working.

enb = One of the following:

- **ENABLED:** The port is enabled.
- **DISABLED:** The port is disabled.

etrnet = The ETR network identifier, in decimal.

etrport = The ETR port number, in decimal.

etrid = The ETR identifier, in decimal.

THE ETR Facility IS NOT INSTALLED

There is no ETR installed on the system.

PORT STATUS CANNOT BE DETERMINED

The system cannot communicate with the ETR.

IEA283I ETR PORT *n*: IS ENABLED.

Explanation: An external time reference (ETR) port is enabled. ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

n = The port number

IEA284I ETR PORT *n*: CANNOT BE ENABLED.

Explanation: The system cannot enable an external time reference (ETR) port for one of the following reasons:

- The installation requested local synchronization mode, indicating that ETR ports must be disabled.
- The ETR facility is not installed.
- The system cannot communicate with the ETR.

ETR is the MVS generic name for the IBM Sysplex Timer unit (9037) or equivalent.

In the message text:

n = The port number