

Summa Four

**Generic V3.3 FSR06
Release Notes**

61040300633-OCR

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

NOTICE: Customers connecting this device to the network shall, upon request of the telephone company, inform the telephone company of the particular lines such connections are made, the FCC registration number, and ringer equivalence number of this device. This information is contained on the label located on the rear panel of the system.

If this device causes harm to the network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be notified in advance to give you the opportunity to maintain uninterrupted service.

If you experience trouble with the Summa Four switch, please contact Summa Four, Inc., 25 Sundial Avenue, Manchester, NH 03103-7251, 1-(800)-978-6624 for repair information. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected, or you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

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For further information about this product, contact:

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Printed In U.S.A.



This symbol on the product's nameplate means it has been tested by Electronic Testing Labs, Inc.

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Preface

These release notes provide important information about this release of Generic software, Version 3.3 Field Software Release 06 (V3.3 FSR 06). This document assumes that readers are familiar with SDS features and operation.

These release notes are organized as follows:

Section 1 — Introduces the changes to the generic in V3.3 FSR06, and lists the problems corrected since V3.3 FSR05.

Section 2 — Lists the system requirements for V3.3 FSR06.

Section 3 — Provides incremental installation instructions for V3.3 FSR06.

Section 4 — Lists known design constraints and resolutions, where applicable.

Section 5 — Lists known functional constraints and resolutions, where applicable.

Appendix A — Provides instructions for removing and replacing firmware PROMS and PLDs, if necessary.

Section 1

CONTENTS OF THE RELEASE

1.1 INTRODUCTION

Upgrade kits for V3.3 FSR06 consist of the following components:

- Software Generic V3.3 FSR06 diskettes (4)
- SDS or VCO Documentation Set (may be shipped prior to system shipment)
- CPU Boot Even, CPU Boot Odd Firmware: Version 1.14
- E1-CAS/R2 (No CRC4) V3.42
- E1-PRI Firmware, Odd and Even V1.03
- PRI Firmware, Odd and Even V1.02
- PRI/N Firmware, Odd and Even V1.08
- NET5 Firmware, Odd and Even V1.01

If any of the required floppy diskettes or technical publications are not in this package, contact Summa Four Technical Support at 1-800-9SUMMA4.

New systems shipped with V3.3 FSR06 software have all generic and download files installed on the system hard disk. Users upgrading to V3.3 FSR06 from V3.2 and earlier, should call Technical Support at 1-800-9SUMMA4.

Software installation instructions for loading revised V3.3 software on a system running a previous version of V3.3 are provided in *Section 3* of this document and the *System Administrator's Guide*.

1.2 ENHANCEMENTS IN V3.3 FSR06

Generic Version 3.3 FSR06 contains the following enhancements:

- Drop and Insert card support
- NBC-3 card support
- Host Link Failure detection
- Host Link and Host Control command enhancements
- IP Subnet (Gateway) Routing
- ISDN NET5 Overlap Sending and Receiving
- Updated downloads and boot files

Each of these enhancements is discussed in the following sections.

For the purpose of this document, the term PRI/N is used to refer to both PRI and PRI/N cards, unless stated otherwise.

1.3 DROP AND INSERT CARD SUPPORT

The Drop and Insert (D&I) card provides DS0 access to the SDS/VCO system. This card supports a maximum of eight interfaces per card that operate at either 56 KB or 64 KB. It is configurable as DCE or DTE with normal or reverse bit-packing. This card supports both (user supplied) RS-449 and V.35. The V.35 cable can be ordered from Summa Four (refer to the *Technical Description: Drop and Insert* for more information). The Drop and Insert card can be inserted into the system while the system is active.

Administration of the card is done through the existing System Administration Console. Configuration messages are sent to the card from the Generic through the NBC/NBC-3 interface.

1.3.1 RELATED DOCUMENTS

System Administrator's Guide
Programming Reference

1.3.2 Definitions

Local loopback—PCM time slot from the backplane looped back to the backplane. This loopback is intended for testing the board. It is configured by moving a port to the Diagnostics state.

Remote loopback—Bit stream from customer equipment looped back to the customer. This loopback is for testing the cabling and MDF connections. There is no requirement to test the board circuitry, so the loopback occurs close to the MDF.

1.3.3 Summary of Features

1.3.3.1 Card Characteristics

The Drop and Insert Card has the following characteristics:

- New eight-port card type
- Card maintenance states:
 - Active
 - Maintenance
 - Diagnostics
 - Out-Of-Service

1.3.3.2 Port Characteristics

- Supports DS0 connections and the following port connected states:
DS0_IDLE
DS0_CONN
DS0_MAINT
- Each port has a set of programmable parameters:
56KB or 64KB
DCE or DTE operation
Normal or reverse bit-packing order
Slip threshold for alarming
- Individual port maintenance states:
Active
Diagnostics
Out-Of-Service
Alarm
- Individual port alarms:
Loss of Clock
Slip Threshold Reached

1.3.3.3 Generic Support for the Drop and Insert Card

The above card characteristics are mapped into the generic software V3.3 FSR06 as follows:

- New administration screens, Drop and Insert Card Configuration, and Drop and Insert Port Display
- No impact on ASIST or TeleRouter

The existing administration screen support for the Drop and Insert card are:

- The Card Summary—provides access to the Drop and Insert Card Configuration screen
- The Card Display screen—displays new port maintenance states
- The Card Alarm Display—supports new per-port alarms
- The System Alarm Display—supports new per-port alarms
- The Set Up Paths

Host command and report support:

- \$66 command to set connections
- \$F0 alarm report to support new port alarms
- \$90 command to activate/deactivate ports

New FRM messages:

- FRM342: D&I Slip Limit Reached, RLSP 1,1,11,4
- FRM343: D&I Loss of Clock Failure RLSP 1,1,11,4

1.3.4 Line Card Configuration

The Drop and Insert Card Configuration screen (Figure 1.1) has been added so that users can configure the eight ports on the Drop and Insert card.

| D R O P A N D I N S E R T C A R D C O N F I G U R A T I O N | | | | |
|---|-----------|-------------|-------------------|----------------------|
| PORT | DATA RATE | TERMINATION | BIT PACKING ORDER | SLIP ALARM THRESHOLD |
| 1 | 64KB | DCE | NORMAL | 1 |
| 2 | 64KB | DCE | NORMAL | 1 |
| 3 | 64KB | DCE | NORMAL | 1 |
| 4 | 64KB | DCE | NORMAL | 1 |
| 5 | 64KB | DCE | NORMAL | 1 |
| 6 | 64KB | DCE | NORMAL | 1 |
| 7 | 64KB | DCE | NORMAL | 1 |
| 8 | 64KB | DCE | NORMAL | 1 |

Figure 1.1: Drop and Insert Card Configuration Screen

Table 1.1 outlines the card's configuration parameters for each port.

Table 1.1: Drop and Insert Card Configuration Screen Parameters

| Field | Options | Description |
|--------------------------|--------------|--|
| Data Rate (Selectable) | 64KB 56KB | Each serial port is capable of synchronous operation at either 64Kbits/sec or 56Kbits/sec. When operating at 64 Kbits/second, each 8 bits of data received is placed into a PCM time slot. When operating at 56Kbit/sec, each 7 bits of data received is placed into a PCM time slot in the most significant 7 bits. |
| Termination (Selectable) | DCE DTE | DCE = Data Communication Equipment DTE = Data Terminating Equipment The significant difference is that in DCE operation, the D&I port supplies the clocking. In DTE operation, the customer equipment supplies both transmit and receive clocks. |

Table 1.1: Drop and Insert Card Configuration Screen Parameters (Continued)

| Field | Options | Description |
|--------------------------------------|--------------------------------|---|
| Bit Packing Order (Selectable) | Normal Reverse | The bits may be packed into a PCM byte in normal or reverse order. |
| Slip Alarm Threshold (Numeric Entry) | 0-255 (0 disables alarming) | The slip limit is used to set up a threshold value for slip errors. The slip alarm threshold defines the number of slips that need to occur before an alarm is declared. In DTE mode, when the card detects that a slip threshold has been reached, it sends the slip error report to the generic. The user sees a card alarm for exceeding the threshold in the Port Display screen. |

1.3.4.1 DCE or DTE Operation

DCE Operation

When a port is configured for DCE operation, the port uses the system clock to create the transmit and receive clocks. When configured this way, the transmit and receive data path is not subject to data slips. This is the preferred configuration.

DTE Operation

When a port is configured for DTE operation, the port uses the received clocks to transmit data as well as receive data. Since receive clocks may not be locked to the SDS/VCO system clock, the transmit and receive data paths are subject to data slips.

1.3.4.2 Bit Packing Order

Users may select normal or reverse bit ordering. The bits may be packed into a PCM byte in normal or reverse order as shown in Table 1.2:

**Table 1.2: Bit Mapping at 56K and 64K Bits/Second–
 Transmit and Receive**

| Mode | Bit 7 MSB | Bit 6 | Bit 5 | Bit 4 | Bit 3 | Bit 2 | Bit 1 | Bit 0 LSB |
|-------------------------|--------------|---------|---------|---------|---------|---------|---------|--------------|
| 64 Kbits/ sec Normal | 1st bit | 2nd bit | 3rd bit | 4th bit | 5th bit | 6th bit | 7th bit | 8th bit |
| 56 Kbits/ sec Normal | 1st bit | 2nd bit | 3rd bit | 4th bit | 5th bit | 6th bit | 7th bit | Fixed at 0 |
| 64 Kbits/sec Reverse | 8th bit | 7th bit | 6th bit | 5th bit | 4th bit | 3rd bit | 2nd bit | 1st bit |
| 56 Kbits/sec Reverse | 7th bit | 6th bit | 5th bit | 4th bit | 3rd bit | 2nd bit | 1st bit | Fixed at 0 |

1.3.5 Slip Limit

Administrators use the Slip Limit to define a threshold value for slip errors. When the number of slips is greater than the slip limit, a Slip Error report is sent from the card.

1.3.6 Card Maintenance

The Drop and Insert card appears in the list of cards in the Card Maintenance screen. Select the D&I card from the list to add it to the system. When the card is added, eight ports are added to the database. Each port reserves a time slot on the backplane for transmission onto the PCM bus.

1.3.6.1 Port States

Administrators can activate or deactivate individual ports, or place them in diagnostic mode. To do this, type **P**, for Port Definition, in the Card Maintenance screen's command field, then indicate the location of the card (R,L,S). When the card ports are displayed, one of the following port states can be designated: ACTIVE (**1**), OOS (**0**), or DIAG (**D**). Refer to *Table 1.3* for a definition of the port states and Figure 1.2 for a sample Card Maintenance and port state screen display.

Table 1.3: Drop and Insert Port States

| Char. | State | Description | Notes |
|-------|-------------|--|---|
| 1 | ACTIVE | Ports ready for connection. | None |
| 0 | OOS | Port connection can be made with SET PATH screen. | Users take the port out of service by entering a 0 in the port field. Users are warned if the port has connections and have the option to abort the operation. |
| D | DIAG | <i>This is a new port state.</i> The PCM time slots of the port are looped back to the SDS/VCO backplane. | In this state, SET PATH may be not done. |
| A | ALARM STATE | The port has reached the Slip Threshold. | This port state is designated by the system. The user does not set this state, however, the user does set the Slip Threshold upon which this state is triggered. |

In Figure 1.2, the ports on the D&I card in (R,L,S) 1-1-10 are in the following modes:

- Port 1—active mode
- Port 2—out of service
- Port 3—diagnostic mode
- Port 4—alarm state
- Ports 5 through 8—out of service

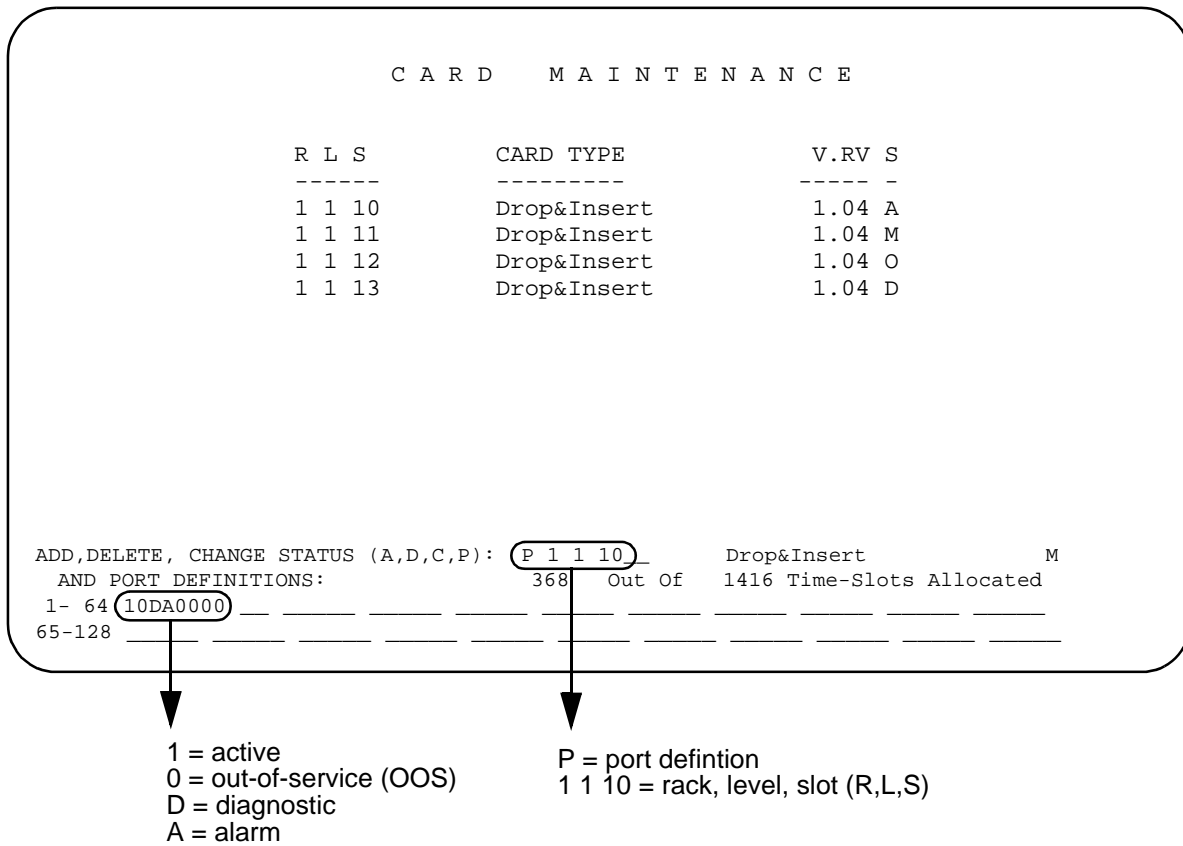


Figure 1.2: Card Maintenance Screen

1.3.6.2 Card States

Possible card states for the Drop and Insert card are: Active (A), Out of Service (O), Maintenance (M), and Diagnostics (D). All card states can be set by the user in the Card Maintenance screen. Refer to the *System Administration Guide* for further details on setting the card states.

Refer to Table 1.4 for an explanation of the card states.

Table 1.4: Drop and Insert Card States

| State | Description | Notes |
|-------------------------|--|---|
| ACTIVE | The card is ready for connections. There are no card alarms. There may, however, be port alarms (all ports could have alarms). Only a card alarm or the user can remove a card from the ACTIVE state. | When changing from OOS to ACTIVE, the card goes into the MAINT state until the card activation process completes. |
| OOS (out of service) | The card is in the database, but out of service. No connections can be made. There is no communication from the system controller to the card. | When the user moves the card to the OOS state, the NBC/NBC-3 resets the card, and communication to the card ends. Users are warned if the card has connections and have the option to abort the operation. If the operation is not aborted, communication is dropped. In addition, if the NBC/NBC-3 detects a card communication failure, the card may go out-of-service (OOS). |
| MAINT (maintenance) | This state change is passed to the host. When the card is placed in a MAINT state, the current connections (communications) are completed, but no new connections are allowed. This is also the temporary state of the card when it goes from OOS to ACTIVE. | Temporary state pass-through during card activation. MAINT mode can be set by the administrator and remains in effect until it is changed. Currently, there are no card alarms that move the card to the MAINT state. The Card Failure alarm moves the card to the OOS state. |
| DIAG (diagnostics) | Enables trunk card diagnostics on the D&I card. | When in the DIAG state, the active ports are placed in (local and remote) loopback state. |

1.3.7 Card Alarm Display

The Card Alarm Display displays alarms present on the Drop and Insert card. Card alarms include:

- Slip Limit Reached (per port)
- Loss of Clock (per port)

The following are examples of the alarm display:

```
RLS  ALARM STATE
114  MI D&I Slip Limit Reached port 1
114  MA D&I Loss of Clock port 2
```

1.3.8 Port Alarms

Each port on the card has the following associated alarms:

- Slip Error
- Loss of Clock

The Drop and Insert card can detect slips on each port. The card keeps track of the number of slips and reports a Slip Limit Reached when the count exceeds the slip threshold specified in the Card Configuration screen.

When a D&I port is selected to operate in DTE mode, the port may lose its transmit and receive clocks. When the system detects a Loss of Clock on a port, a Loss of Clock alarm is reported. There are no Loss of Clock events when the port is configured in DCE mode.

Note: The Drop and Insert card does not differentiate between transmit and receive slips or Loss of Clock.

1.3.8.1 FRM Message Support for Alarms

The following FRM messages are used to declare the per port D&I alarms:

```
FRM342: D&I Slip Limit Reached, RLSP x, x, xx, x
FRM343: D&I Loss of Clock Failure RLSP x, x, xx, x
FRM373: D&I Internal Message Length Error, RLS x, x, xx
```

1.3.9 Diagnostics

Diagnostics are supported from the system administration console. Administrators may define path set ups. Refer to the *System Administration Guide* for information on defining paths.

1.3.9.1 Display Card Data

The Drop and Insert card uses the existing Card Display screen. The Display Card Data option displays the card's:

- Rack, level, and slot information—R,L,S
- First Port Address—1st Port Adr
- Card Type—Card Type
- Firmware Version—FW
- Card Status—Card Status
- Communication Errors—Comm Errors
- Polling Status—Poll Queue

The Card Display screen displays the status of the eight ports on the card. The Port Available section indicates whether the port is Active or Disabled along with a field for alarm information (Alarm States). If a port has reached the Slip Threshold, an A is displayed for that port. Refer to *Table 1.3* for information on the port states.

| C A R D | | | | D I S P L A Y | | | |
|-------------------------|----------|--------------------|----------|---------------|--------------|-----------|-------------|
| R,L,S | 1 1 11__ | Display Port (Y/N) | N | 1st Port Adr | 8 | Card Type | D&I FW 1.00 |
| Card Status (8) | Active | Comm Errors | 0 | Poll Queue | Active | | |
| Alarm Condition Present | | | | | | | |
| | 1 -- 8 | 9 -- 16 | 17 -- 24 | 25 -- 32 | ALARM STATES | | |
| Port Available | 0AD11111 | _____ | _____ | _____ | _____ | | |
| On (0)/Off (1) Hook | 00000000 | _____ | _____ | _____ | _____ | | |
| Diagnostics | _____ | _____ | _____ | _____ | _____ | | |
| Voice Path Trace | 00000000 | _____ | _____ | _____ | _____ | | |
| NBC Msg. Trace | 00000000 | _____ | _____ | _____ | _____ | | |
| Host Msg. Trace | 00000000 | _____ | _____ | _____ | SLIPS | | |
| | | | | | 0 | | |
| | 33 -- 40 | 41 -- 48 | 49 -- 56 | 57 -- 64 | OUT OF FRAME | | |
| Port Available | _____ | _____ | _____ | _____ | _____ | | |
| On (0)/Off (1) Hook | _____ | _____ | _____ | _____ | _____ | | |
| Diagnostics | _____ | _____ | _____ | _____ | _____ | | |
| Voice Path Trace | _____ | _____ | _____ | _____ | _____ | | |
| NBC Msg. Trace | _____ | _____ | _____ | _____ | _____ | | |
| Host Msg. Trace | _____ | _____ | _____ | _____ | _____ | | |

Figure 1.3: Card Display Screen

1.3.9.2 Drop and Insert Port Display Screen

The Drop and Insert Port Display screen displays port connections, port address, current major and supplementary state conditions, the RLSP, and slips. All other information, such as rules, tokens, resource group, and conference and call information, does not apply to the Drop and Insert card. All matrix connections are made through the Voice Path Control command (\$66).

```
      D R O P   A N D   I N S E R T   P O R T   D I S P L A Y
RLSP: 1 1 11 1 PA 8          TRACE: Host 0  NBC 0  Voice 0
CURRENT STATE
Major      DSO_MAINT
Supplementary M_ALARM      Connected To RLSP  _ _ _ _ _ PA 4C0

                                ALARM STATES
                                Loss of Clock
                                Slip Threshold Reached

                                SLIPS
                                120
```

Figure 1.4: Drop and Insert Port Display Screen

When in DTE mode, the following alarms are reported for each port on the card.

- Slip Error
- Loss of Clock

Note that the Drop and Insert card does not differentiate between transmit and receive slips.

Slip Error

In DTE mode, the Drop and Insert card can detect slips on each port. The Drop and Insert card keeps track of the number of slips and reports a Slip Limit Reached when the count exceeds the slip threshold set by the administrator in the Card Configuration screen.

Loss of Clock

When the Drop and Insert port is selected to operate in DTE mode, the port may lose its transmit and receive clocks. When a Loss Of Clock is detected on a port, a Loss of Clock Error is reported. There are no Loss of Clock events when the port is configured in DCE mode.

Major and Supplementary Port States

The Major and Supplementary port states shown in the Drop and Insert Port Display screen are summarized in the following tables. Refer to Figure 1.4.

Table 1.5: D&I Port Major States

| State | Description |
|-----------|---|
| DS0_IDLE | The port is active and idle. |
| DS0_CONN | The port has a DS0 connection. |
| DS0_MAINT | The port has been placed in a maintenance state by the user or is considered OOS due to an alarm. |

Table 1.6: D&I Port Supplementary States

| State | Description |
|---------|--|
| M_OOS | The port has been taken OOS via the Admin screen or the host \$90 Change Port Status command. |
| M_DIAG | The user has placed the port in the local loopback state. The SDS/VCO PCM time slots are looped back to the backplane. |
| M_PATH | The user has placed the port in the diagnostic state and then made a connection with the SET PATH screen. |
| M_ALARM | The port is in an alarm state. |

While the Port Display is active (monitoring a port which is in DTE mode), it queries the card every 30 seconds for the slip count.

The card only resets the slip count if a user changes the maintenance threshold or if the slip threshold is reached and the generic resets the count.

1.3.10 Host Commands and Reports

The generic uses the following existing host commands and reports to support the Drop and Insert Card.

- \$66 Voice Path Control Command—to connect a PCM time slot to a DS0 port.
- \$90 Change Port Command—to activate/deactivate ports.
- \$81 Hardware Allocation Report—a bit map report that allows the host to match the logical port addresses used in the SDS/VCO commands to their corresponding physical Rack-Level-Slot hardware addresses.
- \$D9 Card Status Report—informs the host of a change in the status of the Drop and Insert Card.
- \$D3 Port Status Report—informs the host of a change in the port status on the Drop and Insert Card.
- \$F0 Alarm Condition Report—indicates the presence of clearance of a system alarm.

The \$66 command and \$F0 reports are discussed in greater detail in the following subsections.

1.3.10.1 \$66 Voice Path Control Command

All matrix connections are made through the Voice Path Control Command (\$66). Call processing does not track the calls or the port states. Impulse and output rules do not apply.

An NSB of \$54 indicates that the port specified is busy.

Matrix connections are not changed during a switchover, so the path setups made with the \$66 command are kept during a switchover.

After a reboot, the host must re-establish all the matrix connections.

1.3.10.2 \$F0 Alarm Condition Report

The \$F0 Alarm Condition Report is used to indicate the presence or clearance of alarms on the Drop and Insert Card. The three types of alarms reported are: Card Failure, Slip Maintenance Threshold Reached, and Loss of Clock.

The Loss of Clock definition has been added to the Alarm Code identification byte. The Additional Data Bytes identify the port originating the alarm.

1.3.11 Drop and Insert I/O Module

Each port is individually capable of operating as either a DCE or DTE as selected by the system administrator. Each port has the following signals:

- Receive clock — INPUT (DTE)/OUTPUT (DCE)
- Receive data —INPUT
- Transmit clock — INPUT (DTE)/OUTPUT (DCE)
- Transmit data — OUTPUT

Note: The Drop and Insert card cannot be used as a system clock reference source.

The Drop and Insert I/O Module has eight female DB9 connectors that provide the necessary signals for RS-449/V.35 connection. The DB9 pinout is as follows:

| | | |
|-------|---------|------------------|
| Pin 1 | GND | Ground |
| Pin 2 | TXCLKA | Transmit Clock A |
| Pin 6 | TXCLKB | Transmit Clock B |
| Pin 3 | TXDATAA | Transmit Data A |
| Pin 7 | TXDATAB | Transmit Data B |
| Pin 5 | RXCLKA | Receive Clock A |
| Pin 9 | RXCLKB | Receive Clock B |
| Pin 4 | RXDATAA | Receive Data A |
| Pin 8 | RXDATAB | Receive Data B |

1.4 NBC-3 CARD SUPPORT

Support for the NBC-3 card is now available. NBC cards can be replaced with NBC-3 cards.

The Network Bus Controller 3 (NBC-3) is a special control circuit card that drives the communication bus and time slot address bus, and generates the system clocks. The NBC-3 also provides the data communication path between other control circuit cards and the rest of the system.

The NBC-3's intelligence comes from an on-board 68360 microprocessor. The 68360 microprocessor's memory includes 4 MB RAM (selectable) and 256KB of EPROM.

The 68360 processor allows the NBC-3 to serve as communications bus (Combus) master. The Switch Interface (SWI) functions as a direct memory access (DMA) interface to the NBC-3 for communication with the other control circuit cards. Redundant NBC-3 cards operate in active or standby mode, depending on which controller is selected as master through the Alarm Arbiter Card (AAC).

The NBC-3 uses dynamic random access memory (DRAM) for program storage. The program/application is downloaded from the CPU card to the NBC-3 through the SWI.

The NBC-3 implements special Phase Locked Loop (PLL) circuitry that allows for system synchronization to the network via incoming T1/E1 facilities, or to the Central Office (CO) composite clock from a Building Integrated Timing Source (BITS) signal, or to the internal clock.

The card is equipped with a Stratum 4 clock. The Stratum 3 clock is optional.

1.4.1 RELATED DOCUMENTS

Technical Description—Control Subsystem Network Bus Controller 3 (NBC-3) Card
(61050200433)

1.4.2 Summary of Features

The NBC-3 card differs from the older NBC card in the following respects:

- SWI buffer — Checksum includes header (header not included for NBC card)
- Deterministic download — NBC-3 passes the Download Continue (\$09) to the generic
- Message table download — Downloaded to the NBC-3 immediately after the code
- Clock synchronization — Reports absence of clock rather than default to internal clock

1.4.3 Generic Support for the NBC-3 Card

The card characteristics are mapped into the generic software V3.3 FSR06 as follows:

- The NBC-3s are “plug-and-play” in the sense that the system recognizes the card type.

The existing administration screen support for the NBC cards are:

- Downloads for both NBC card types (nbc.dwn and nbc3.dwn) appear on the Software/Firmware configuration screen. This screen is accessed via the Administration main menu and the System Configuration menu. Make the appropriate selection.

1.4.4 DTG-2 Mezzanine Card

The NBC-3 has connections for a DTG-2 mezzanine card. V3.3 systems do not support the DTG-2.

1.4.5 Combust

As the master of the Combust, the NBC-3 performs the following communication functions:

- Communicates with other boards on the backplane through the Combust.
- Initiates all data transfers on the Combust.
- Sends messages to just one card or broadcasts messages to many other cards (except a redundant NBC-3) at the same time.

The Combust is a one byte wide half-duplex interface. This interface facilitates the transfer of messages between the port cards and the NBC-3.

1.4.6 Clock Synchronization

The NBC-3 includes phase-locked-loop (PLL) circuitry that lets you synchronize system clocks from an internal or external source. Internally, the NBC-3 generates the time slot reference quadrature (Stratum 4) clock.

Externally, the NBC-3 synchronizes the system with a 64 KHz BITS clock input or with any incoming T1 (1.544 MHz clock) stream or E1 (2.048 MHz clock) stream. It can synchronize to an internal 1.544 MHz Stratum 3 or 4 clock.

1.4.7 SWI Interface

The NBC-3 communicates with the control circuit cards through a 16-bit, DMA-controlled, bi-directional data bus between the NBC-3 and the SWI card. (The data bus is a ribbon cable in SDS-1000 and VCO/80 Systems.) The NBC-3 translates information from control circuit cards into a serial or 8-bit parallel stream.

The interface is connected internally via one of the serial communications controllers within the CPU, which is controlled by the NBC-3 application. The input channel transfers data from the control circuit cards to the NBC-3. The output channel transfers data from the NBC-3 to the control circuit cards.

Data is transferred to and from the NBC-3 memory by the DMA controllers on the SWI that are directionally dedicated.

In SDS-1000 or VCO/80 Systems, the NBC-3 extends the half-duplex messaging path from the control circuit cards to all cards in the master subrack, and all cards (to a maximum of 6) in extension subracks, through BRCs configured in a star arrangement.

1.4.7.1 Control Circuit Cards To NBC-3 Messaging

The NBC-3 receives command messages from the control circuit cards through the two SWI DMA channels. Received messages are placed into one of the receive buffers on the NBC-3. Individual messages are extracted from the receive buffer(s) and placed in the appropriate card output buffer. There is an output buffer for each of the cards in the system.

The NBC-3 sends messages to the control circuit cards through the SWI DMA channels. Messages are received from the cards during the card polling cycle, aggregated in one of NBC-3 transmit buffers, and when the buffer is full, sends the messages to the control circuit cards.

1.4.7.2 Control Circuit Cards To NBC-3 Time Slot Base Address Information

The time slot address information stream shares the cable on the SWI to the NBC-3 with the normal messaging. The NBC-3 receives the information from the control circuit cards, after which the information is translated into serial or parallel data. The data is then sent to the cards equipped to receive and interpret translated information through either the high speed serial interface or the communications bus on the backplane. Other cards receive path setup commands as part of the messages from the control circuit cards through the NBC-3.

1.4.8 External Interfaces

Table 1.7 lists the external interfaces for the NBC-3 cards.

Table 1.7: NBC-3 External Interfaces

| Connections | SDS-1000 and VC0/80 |
|--------------------|--|
| NBC-3 to SWI | Ribbon cable connection from back panel of the SWI in the control subrack to back panel of the NBC-3 in master port subrack. |
| BITS Clock | DB-9 connection on NBC-3 card front panel |
| Debugging | RS-232 connection on the NBC-3 front panel. This is not for customer use. |

1.4.9 NBC-3 Card Population Rules

*Note: You must replace cards in pairs in redundant systems (a mix of NBC and NBC-3 cards is **not** supported).*

The following card population rules apply to the NBC-3:

- In non-redundant SDS-1000 and VCO/80 Systems, the NBC-3 must reside in slot 1 of the master port subrack.
- In redundant SDS-1000 and VCO/80 Systems, the NBC-3s must reside in slots 1 and 2 of the master port subrack.

1.4.10 Removal/Replacement Procedures

This subsection describe how to remove and replace the NBC-3 card.

CAUTION: The NBC-3 card can be removed and inserted while the system is powered on. However, if you are replacing an NBC card, shut off the system power before removing the older NBC card.

Observe antistatic precautions whenever handling the NBC-3 to avoid damage to sensitive CMOS devices. Wear a ground strap connected to the system's equipment frame.

1.4.10.1 Removal Procedures

Perform the following steps to remove an NBC-3.

1. If you have a redundant system, verify that the NBC-3 you want to remove is on the Standby side. If the card is not in the Standby side, run the Switch Active Side to Standby Utility as described in the *System Administrator's Guide*.

If the utility does not switch the system over, flip the **SELECT** toggle on the AAC to force the system to switchover. (Refer to the *Alarm Arbiter Card (AAC) Technical Description* or *Alarm Arbiter Card (AAC) With Alarm Interface Card (AIC) Technical Description* for more information.)
2. If you have a non-redundant system, shut down the system. If you have a redundant system, shut down the Standby side.
3. Disable the external alarm system to which the AAC might be connected.
4. Disconnect all cables that are attached to the card (for example, BITS clock cable.)
5. Use your thumbs to pull the upper and lower extractors away from the card front panel. This action extracts the card from the backplane connectors.
6. Pull the NBC-3 free of the card slot.
7. After you remove the card from the system, place it on an antistatic mat or an antistatic envelope.

1.4.10.2 Replacement Procedures

To replace an NBC-3, perform these steps.

1. Place the replacement NBC-3 card next to the removed card on the antistatic mat or envelope.
2. Refer to your release notes and verify that the revision levels of the PROMs match the requirements of the generic software currently loaded in the system.
3. Verify that the switch and jumper settings on the replacement NBC-3 are the same as those on the removed card.
4. Grasp the replacement NBC-3 by the top handle and the bottom edge and align it with the top and bottom card guides of the subrack.
5. Be sure the extractor levers are perpendicular to the front panel. Push the NBC-3 in until it makes contact with the master port subrack backplane. The hooks on the extractors must be behind the front rail of the subrack. Use your thumbs to push the extractors toward the front panel.
6. If you are using the BITS clock option, reconnect the clock source to the DB-9 connector on the NBC-3 front panel.
7. Enable the external alarm system connected to the AAC terminals.
8. If you have a nonredundant system, reboot the system. If you have a redundant system, reboot the Standby side. (Refer to the *System Maintenance Manual* for more information.)
9. If you have a redundant system, flip the **SELECT** toggle switch on the AAC to the **AUTO** position.

1.4.11 User Interface

The only user interface change introduced with the NBC-3 card support is the existence of downloads for both appearing on the SW/Firmware Configuration screen. This screen is accessed via the Administration main menu and the System Configuration menu. Make the appropriate selection.

1.5 HOST FAILURE DETECTION

Prior to this release, if there were an Ethernet link failure and the host did not close the socket properly, the time frame for detection could be 2 to 3 minutes for two or more hosts configured for cyclic call distribution. This time frame was unacceptable.

The detection of Ethernet link failure is now done in a reasonable time frame, 6 to 15 seconds, and failure handling can be configured on a host by host basis. The user can configure the system to do nothing, to tear down calls on a link, or to clear the controlling host. (Refer to the *System Administration Guide* for these existing features.)

1.5.1 Summary of Features

The major functionality in this release includes:

- detection of lost-of-host connection via a probing packet (ping) from the switch over each link
- user-defined time between probes, and number of consecutive failed probes to determine a broken link, on a per-link basis
- automatic closing of the connection, and the generation of alarms when there is a lost connection
- support for the previous one-minute ping frequency scheme

If the consecutive failure count reaches the limit specified by the user, the connection is considered to be broken. The switch will close the connection by freeing up all sockets tied to the local ports, and it will generate alarm messages.

Note: The ping mechanism is mandatory for all network devices supporting the Internet suite of protocol. It detects any link failure but does not give much information about the state of the host application software. However, the current Generic contains a feature that deals with host application problems, such as shortage of processing time, host application bug or network congestion. There is a Host Timer option in the System Configuration screen that a user can enable and specify a time-out period for a call setup. If the host does not respond within the defined period of time, the Generic tears down the call, logs the error condition, but performs no necessary steps to restore the service.

1.5.2 User Interface

When the host is configured with *Ethernet* from the Host Configuration Screen, the user enters the probe frequency and number of failed probes to facilitate this feature. There are two new fields in the Host Configuration Screen. Refer to *Figure 1.5* and note the new fields which are illustrated in bold type.

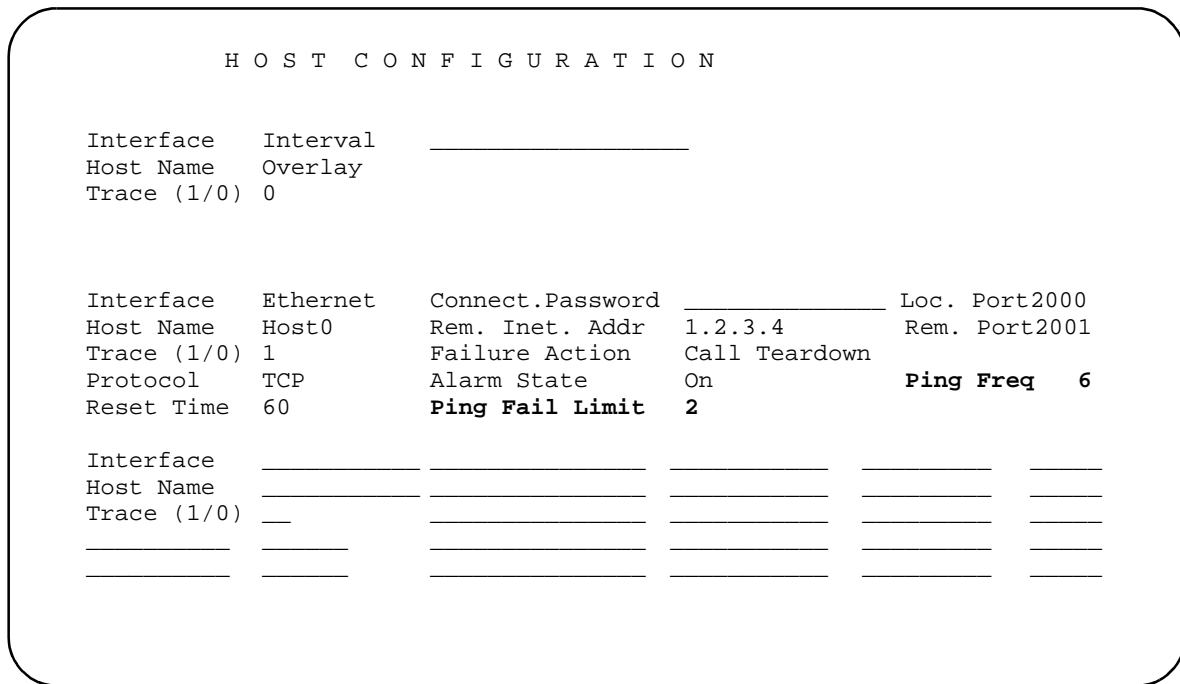


Figure 1.5: Host Configuration Screen

The **Ping Frequency** field defines the time in seconds between probes. The range for this field is 0 to 60. The default for this field is zero (0), which indicates that probing will occur as it did prior to this enhancement—once every minute.

The **Ping Fail Limit** defines the number of consecutive failed probes to determine that a connection is lost. The range for this field is 0 to 10.

The **Ping Fail Limit** default is one (1), if the Ping Frequency is non-zero. (The default of one can be overridden with any value other than zero.) The default is zero (0) if the Ping Frequency is zero. (The default of zero cannot be overridden.) This is the previous once-a-minute probing. Any missing probe will be declared a lost connection.

In the sample screen in *Figure 1.5*, the probe frequency is set to 6 seconds and the number of failed probes is set to 2. This means that the system will probe the remote host every 6 seconds and the switch will determine that a connection is lost when there is no response from 2 consecutive probes. This configuration defines a 12 second time frame for failure detection.

To disable the feature, set the **Ping Frequency** to zero. To disable all pinging set the Remote Internet Address to INADDR_ANY.

1.6 HOST LINK AND HOST CONTROL EXTENSIONS

The behavior of Host Link Failure is extended to include conference calls. The Host Assume/Relinquish Port Control command (\$C0 05) is extended to include conference calls.

1.6.1 Summary of Features

The Host Link and Host Control extension changes result in the following new characteristics.

- A new System Feature Flag, “Include Conference Calls in the Host Link Failure Processing,” is provided. The SDS/VCO host link failure processing is extended to conference calls, based on this feature flag setting.
- When a conference is set up, or ports are added to the conference by a host through the \$6D command, the controlling host for all the associated ports is updated.
- The \$C0 05 command processing is modified to bring the conference calls into its purview, in addition to the existing port control.
- A port involved in a conference is not relinquished by a host which is controlling that port and the conference, as this would lead to inconsistency of the controlling host maintenance for the conference.

1.6.2 User Interface—Host Link Failure Processing for Conference Calls

The following subsections provide the details for the host link failure processing extension to conference calls.

1.6.2.1 New Feature Flag: Conference Calls in Host Link Failure Processing

A new feature, Conference Calls in the Host Link Failure Processing, is added to the System Host Configuration screen. Since the flag name display is limited to 32 characters maximum, the flag name is truncated as “Conf Calls in Host Failure Proc” (Figure 1.6). Users set this flag to either INCLUDED or EXCLUDED by pressing the **Select** or **Reverse Select** keys. The flag setting is stored in the database syscnfg.tbl table file.

The initial setting after installation is EXCLUDED.

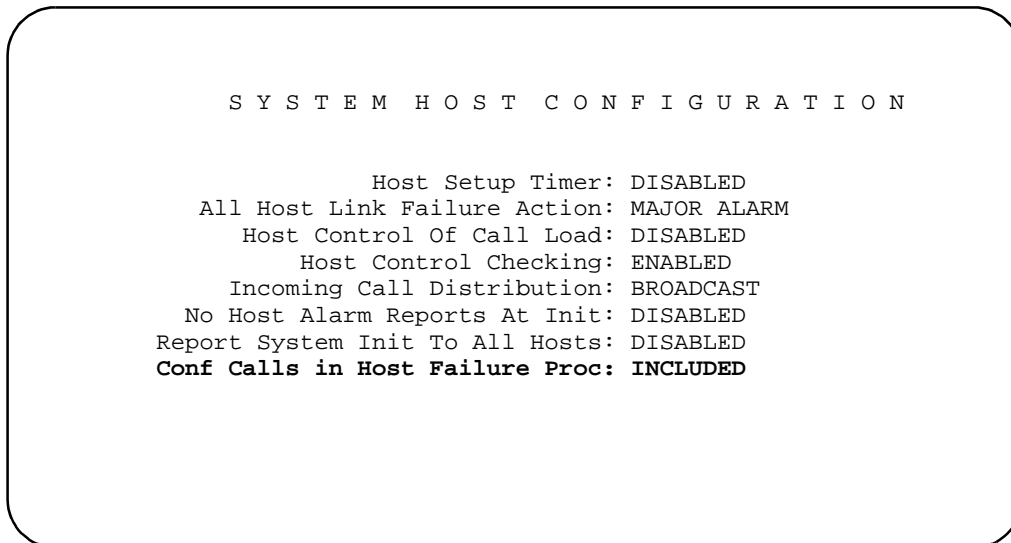


Figure 1.6: System Host Configuration Menu.

When the Conference Calls in Host Link Failure Processing flag is set to INCLUDED, the conference calls are handled on par with other calls, and one of the following occurs:

- The controlling host of the conference call and its associated ports is set to no controlling host
- The call is cleared
- No action is taken based on the Failure Action field setting of Clear Cntrl Host or Call Teardown or None in the Host Configuration screen against the failed host.

When this flag is set to EXCLUDED, the conference calls are *not* considered for the host failure processing and all the conference calls' status are maintained as they are.

On Redundant systems, the standby side is kept in sync with the active side, via messages sent from the active side.

1.6.3 \$6D Command Changes

1.6.3.1 Update Controlling Host for Ports

Prior to this release, the controlling host maintained the conference structure only for conference calls. This maintenance did not extend to the ports involved in the conference. While initiating or adding ports to the conference, the system checked only to verify that the controlling host was set to no controlling host. This meant that the port involved in the conference was not under the sole control of the host controlling the conference. (See U605070001 in *Section 1.9*.)

1.6.3.2 Port Count Processing

Prior to this release, adding a one-way port to a conference call which already had seven two-way and a one-way port would result in a \$03 Syntax Error returned in the status byte. The command now supports port assignments as described in the *Programming Reference*. (See U511130010 in *Section 1.9*.)

1.6.4 \$C0 05 Command Processing Extensions for Conference Calls

The \$C0 05 command is enhanced in this release to support the following:

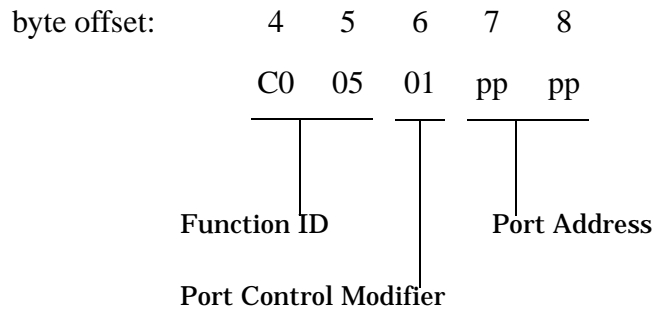
- Assume/Relinquish host control is extended to include conference calls
- By issuing a single \$C0 05 command, a new host can assume control of all conference calls that were being controlled by a particular host id.
- By issuing a single \$C0 05 command, a controlling host can relinquish control of all conference calls that were being controlled by it.
- Assuming control of a port by a new host is not allowed if the port is involved in a conference that is controlled by another host, unless the entire conference is taken over by that new host.

See U605070001 in *Section 1.9* for more details.

1.6.4.1 Functional Description

Prior to this release, the \$CO 05 command operated as shown in Figure 1.7.

(SC0 05) **Host Assume/Relinquish Port Control**



Function ID (byte offset 4 & 5) - Bytes immediately following the Network Header; uniquely identifies the command to the system.

Port Control Modifier (byte offset 6) - Determines the type of action to be taken. Specify this byte according to the following list:

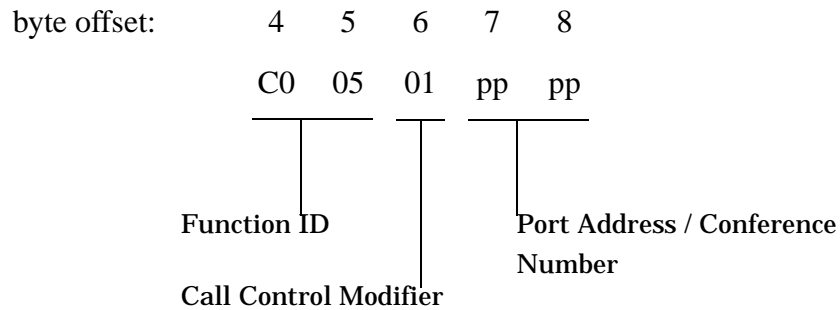
- 00 = Relinquish Control
- 01 = Assume Control

Port Address (byte offset 7 & 8) - Port address for which control is being seized or relinquished.

Figure 1.7: SC0 05 Command Format Prior to V3.3 FSR06

The new command format is shown in Figure 1.8.

(\$C0 05) **Host Assume/Relinquish Port and Conference Control**



Function ID (byte offset 4 & 5) - Bytes immediately following the Network Header; uniquely identifies the command to the system.

Call Control Modifier (byte offset 6) - Determines the type of action to be taken. Specify this byte according to the following list:

- 00 = Relinquish Port Control
- 01 = Assume Port Control
- 02 = Relinquish Conference Control by Conference Number
- 03 = Assume Conference Control by Conference Number

Port Address/Conference Number (byte offset 7 & 8) - Port Address or Conference ID for which control is being seized or relinquished. A '0000' will be invalid.

If Call Control Modifier is 00/01: byte offset 7 & 8 represent Port Address

If Call Control Modifier is 02/03: byte offset 7 & 8 represent Conference Number

Figure 1.8: New \$C0 05 Command Format

A Call Control Modifier value of 00 (Relinquish Port Control) causes the switch to set the controlling host indicator to "no host" for the specified port and any other associated port. An alternate host can subsequently take control of that port (and any/all associated ports) by sending a command which affects that port.

A Call Control Modifier value of 01 (Assume Port Control) causes the switch to override any existing controlling host indicator for the specified port and any associated ports. The controlling host identifier for these ports is set to the host issuing the command. Assumption of control over a port is therefore equivalent to the aggregate behavior provided by a “relinquish control” command followed by “normal” host command processing which affects that port.

A Call Control Modifier value of 02 (Relinquish Conference Control by Conference Number) causes the switch to set the controlling host indicator to ‘no host’ for the specified Conference Number. The controlling host identifier for the conference call as well as for all individual interface ports involved in that conference will also be set to ‘no host’. An alternate host can subsequently take control of that conference call (and all associated ports) by sending a command which affects that conference call.

A Call Control Modifier value of 03 (Assume Conference Control by Conference Number) causes the switch to override any existing controlling host indicator for the specified Conference Number. The controlling host identifier for the conference call as well as for all individual interface ports involved in that conference will also be set to the host issuing the command. This command mode helps in load sharing among controlling hosts.

The following table shows the return codes associated with the enhanced \$C0 05 command.

Table 1.8: \$C0 05 Command Error Return Codes

| Return Code | Description |
|-------------|---|
| \$03 | Syntax error. |
| \$0C | No active conference with conference number specified in command. Indicates the conference number specified in the command does not correspond to any currently active conferences. |
| \$0F | Call or conference is not controlled by this host. Indicates the host port from which this command was received does not correspond to the port controlling the call. This return code is possible only when relinquishing a port or conference call (Call Control Modifier value 00 or 02). |
| \$11 | Port in command is idle but should not be. Indicates the circuit identified by the port address specified in the command (usually a controlling port or incoming port) is in the CP_IDLE MState and the command cannot be processed. |
| \$12 | Port address in command is not a line or trunk. Indicates the circuit identified by the port address specified in the command is not a network interface circuit. |
| \$1C | Line/trunk port in conference. Indicates the circuit identified by the port address is participating in a conference. |

Table 1.8: \$C0 05 Command Error Return Codes (Continued)

| Return Code | Description |
|-------------|---|
| \$23 | Invalid Port Address or Conference Number specified in command. Indicates that either the port address byte values do not fall within the range \$00 00 through \$07 FF, or the conference number is not in the range \$0001 to \$00FF. |
| \$29 | Internal Error - command can not be completed. Indicates an SDS/VCO processing error. |

1.6.5 Port Relinquishing Not Allowed While in Conference

Prior to this release, it was possible for an inconsistency to occur between the controlling host of a conference call and the individual ports participating in the conference. This happened when the host relinquished a port while the port was involved in a conference.

Initially, when a conference was controlled by a host, all the ports involved in that conference would also be controlled by the same host. It was possible for the host to issue a \$C0 05 command, relinquishing a port, even though the port was still in a conference, provided that the conference was controlled by the same host. The relinquished port's controlling host would then be set to "no controlling host" allowing another host to assume control of that port. At the same time the port was allowed to remain in the conference. The result was a port participating in a conference while being controlled by a host other than the host controlling the conference.

The processing of the \$C0 05 command has been modified in this release so a port cannot be relinquished by a host when that port is involved in a conference. An attempt to do so will result in rejection of the command with a returned NSB of \$1C.

The \$C0 05 command now functions as follows:

- A port involved in a conference controlled by one host cannot be taken away by another host with the \$C005 command.
- A port involved in a conference controlled by a host cannot be relinquished even by the same host, because this permits the same loss of control.

The \$C0 05 command is now automatically rejected if it is issued to a port which is in conference. This rejection includes the case where a host that is already controlling a port issues a \$C0 05 command to assume control of the same port. In this case there is no logical point in processing that command because the port is already under control of the host. An NSB of \$1C is also returned in this case.

If a port in conference has to be relinquished by the host, delete the port with a \$6D command and then relinquish it with the \$C0 05 command.

1.7 IP SUBNET (GATEWAY) ROUTING

The IP Subnet (Gateway) Routing feature allows TCP connection to other systems through the network gateway. A new routing table provides for up to four gateway addresses. The Gateway Routing table is configured at the time of installation through the Ethernet Install Utility, or configured on-line through the Gateway Routing Configuration screen.

The new IP Routing table takes effect only after a reboot of the system.

The new features provided are:

- Online Gateway Routing table configuration
- Configuration of Gateway Routing table with Ethernet installation
- Access to screen controlled through the Screen Access Configuration screen

Once you have installed the Gateway Routing feature, you have access to two new screens, Ethernet/NFS Configuration and Gateway Routing Configuration, and their associated prompts. In addition, there are minor changes to existing screens. These are all described in the following subsections.

1.7.1 User Interface

1.7.1.1 Gateway Routing

The Ethernet Configuration menu has been modified as shown in Figure 1.9 to add Gateway Routing.

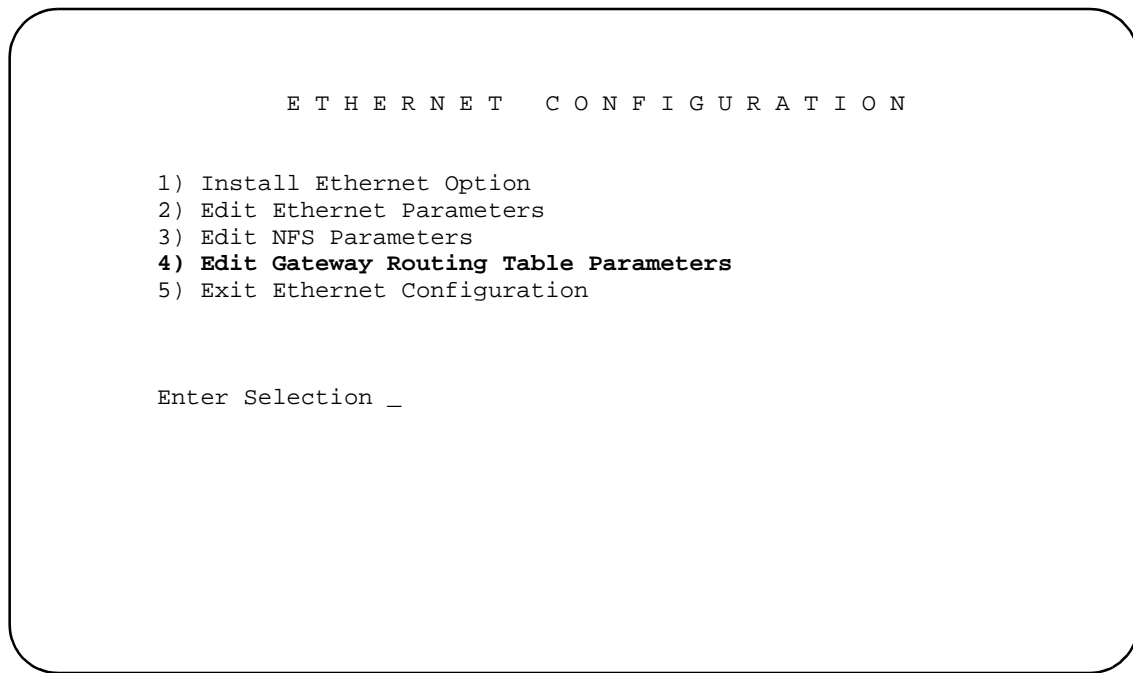


Figure 1.9: Ethernet Configuration Screen with Gateway Menu Option

Follow the procedure below to add an IP Subnet address and Gateway address to your installed Ethernet option.

1. Re-install the Ethernet option with the provided diskette as described in Section 2.3.1 of the *Ethernet Supplement*. If you do not wish to review or edit existing Ethernet or NFS parameters, it is not necessary to perform steps 7 through 19 of the procedure in the *Ethernet Supplement*.
2. In the Ethernet Configuration screen, type 4. The following prompts appear, line by line:
Route No. n
Destination Subnet Address: 000. 000. 000. 000 ?
Gateway System Internet Address: 000. 000. 000. 000 ?
3. Enter the Destination Subnet and Gateway System Internet addresses. When you have finished entering the information for this prompt, additional prompts appear for routes 2, 3, and 4. If you are not using a particular route, leave the address fields as is, with all zeros.
4. When you have completed the routing table entries, you will be prompted for confirmation:
Update Gateway Routing Table Configuration With Above Data (Y/N) = Y
5. If you enter Y, the parameters you entered are stored and the following message is displayed:
Gateway Routing Table Configuration Updated
6. If you enter N, the Gateway Routing Table configuration is aborted, as indicated in an on-screen message, and you are returned to the Ethernet Configuration screen. Perform steps 2 through 4 again.
7. When you have successfully completed Gateway routing configuration, you are automatically returned to the Ethernet Configuration screen. Press 5 to exit.
8. Reboot your system.

1.7.1.2 Ethernet/NFS Configuration

The System Configuration Menu has been extended to include a new option, K, for Ethernet/NFS configuration. Refer to Figure 1.10.

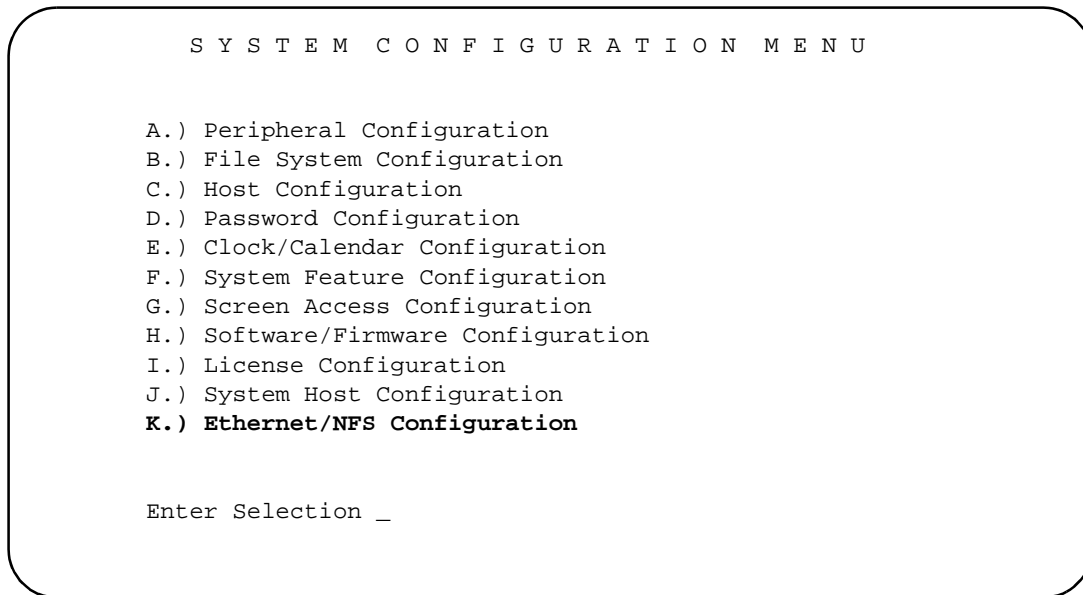


Figure 1.10: System Configuration Menu

After a user chooses K from the System Configuration Menu, the Ethernet/NFS Configuration screen appears. This screen has been modified to include an option for Gateway Routing Configuration. It appears with data similar to that shown in Figure 1.11.

```

                                ETHERNET/NFS CONFIGURATION

Current System Internet Address      = 204.160.248.127__
New System Internet Address on Reboot = 204.160.248.128__
Enable NFS File Access              = Y
NFS Server Internet Address         = 204.160.248.81__
NFS Server Name                     = jupiter_____
NFS Mount Directory Point           =
    /home/server/xxxx_____
Target System Name                   = smith_____
Target System User Id                = 125_____
Target System Group Id               = 12_____
Target System Umask                  = 0____
Gateway Routing Configuration     = __

```

Figure 1.11: Ethernet/NFS Configuration Screen

1.7.1.3 Gateway Routing Configuration

To bring up the Gateway Routing Configuration screen, place the cursor at the data entry field for Gateway Routing Configuration in the Ethernet/NFS Configuration screen, enter a non-null character, and press **Enter**.

The Gateway Routing Configuration screen has one display-only field, the Current System Internet Address field (copied down from the parent Ethernet/NFS Configuration screen), and eight variable fields for Internet address entries. The variable fields correspond to four supported gateways. Refer to Figure 1.12.

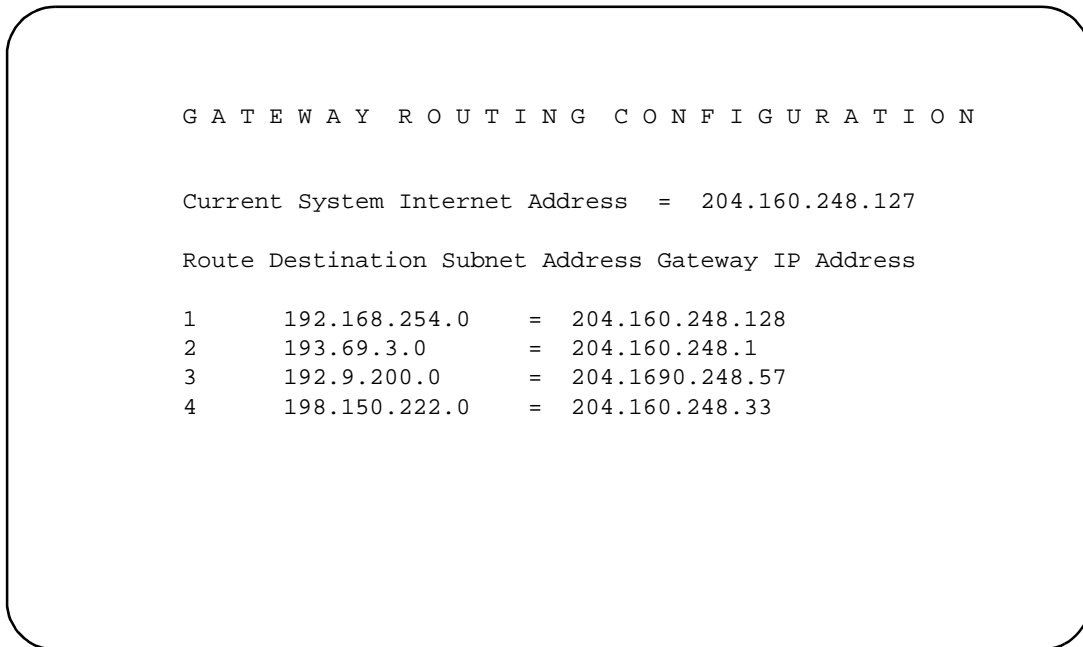


Figure 1.12: Gateway Routing Configuration Screen

The following table shows format requirements and recommended values for the Gateway Routing Configuration screen's input fields.

Table 1.9: Gateway Routing Configuration Screen Options

| Parameter | Definition | Options | Recommend Value |
|----------------------------|--|---|--|
| Destination Subnet Address | Internet address of the destination host or the destination network. | Valid Internet address in standard notation (12.13.14.15) | Value must be supplied by Ethernet administrator |
| Gateway IP Address | Internet address assigned to the Gateway through which the destination host can be accessed. | Valid Internet address in standard notation (12.13.14.15) | Value must be supplied by Ethernet administrator |

The Internet addresses you entered are validated when the cursor moves out of each of the respective fields. If you enter invalid data, the cursor is repositioned on the same field and you will see one of the following error messages:

Invalid Internet Address

The Internet address is again validated against the system IP Address. If the validation fails, the following messages appear:

Destination Subnet Address Must Not Be On Local Network

Gateway IP Address Must Be On Local Network

1.7.1.4 Updating Ethernet/NFS Configuration

Use the **NEXT FIELD** and **PREV FIELD** keys to navigate between the input fields of the Gateway Routing Configuration screen. Use the **EXIT** and **PREV MENU** keys to abort an operation and go back to the Ethernet/NFS Configuration screen. Use the **MAIN MENU** key to abort the operation and return to the Main Menu. Depress the **ENTER** key when you are done.

1. Type the changes to the Subnet and Gateway IP addresses into the screen. Press **Enter**. You are prompted to confirm the entries with the following prompt:

Update Gateway Routing Configuration (Y/N)?

2. Upon positive confirmation, the Ethernet/NFS parameters you entered are stored in NVRAM. The following message is logged, sent to the printer, and shown on screen:

PRM053: Gateway Routing Parameters Updated.

The new parameters take effect only after you reboot the system.

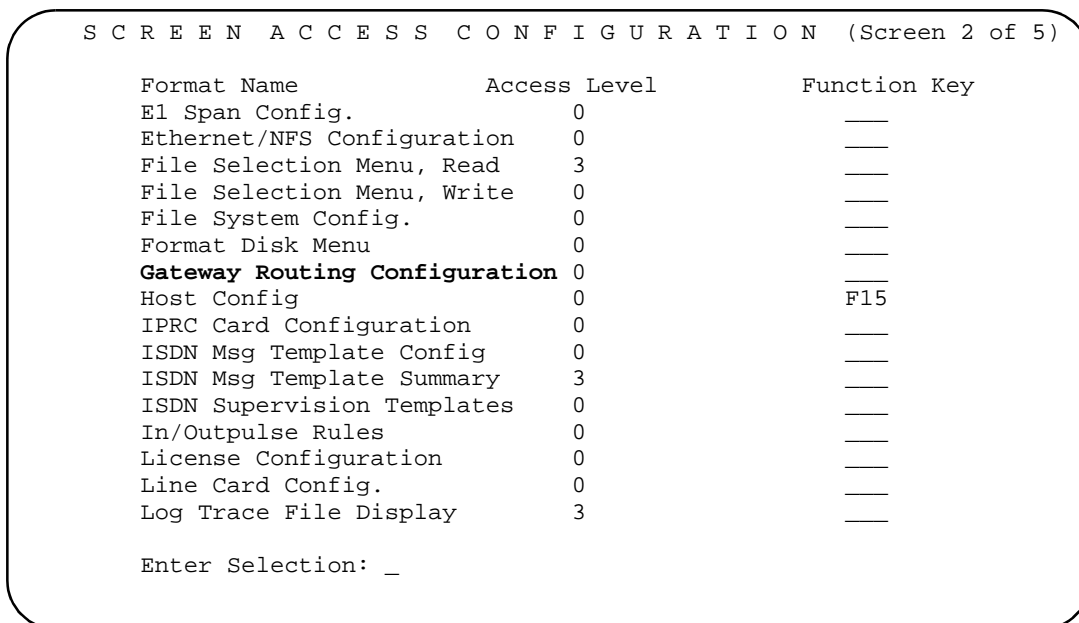
3. If you receive negative confirmation, the following message appears:

Gateway Routing Configuration Aborted.

If you enter the Gateway Routing Configuration screen again before rebooting, the new parameters are shown, and can be edited if required.

1.7.1.5 Ethernet Configuration Access Control

Gateway Routing configuration is under access control. When a user chooses Option G from the System Configuration Menu to bring up the Screen Access Configuration screen, a new line for Gateway Routing Configuration appears on the second of five screens. Valid access level entries are from 0 to 3. The default is 0 (full access). Refer to Figure 1.13.



```
SCREEN ACCESS CONFIGURATION (Screen 2 of 5)

Format Name           Access Level      Function Key
E1 Span Config.       0                ___
Ethernet/NFS Configuration  0                ___
File Selection Menu, Read  3                ___
File Selection Menu, Write  0                ___
File System Config.    0                ___
Format Disk Menu      0                ___
Gateway Routing Configuration  0                ___
Host Config           0                F15
IPRC Card Configuration  0                ___
ISDN Msg Template Config  0                ___
ISDN Msg Template Summary  3                ___
ISDN Supervision Templates  0                ___
In/Outpulse Rules     0                ___
License Configuration  0                ___
Line Card Config.     0                ___
Log Trace File Display  3                ___

Enter Selection: _
```

Figure 1.13: Screen Access Configuration Screen

1.7.2 Related System and Error Messages

Internet addresses you enter are validated when the cursor moves out of the respective fields. If the Internet address you entered for the Destination Subnet is in the same network as that of the SDS/VCO system, validation fails and the following message appears on screen, and the cursor is repositioned in the same field:

Dest IP Address Must Not Be On Local Net

If the Internet address you entered for the Gateway System is not in the same network as that of the SDS/VCO system, validation fails. The following message appears on screen, and the cursor is repositioned in the same field:

Gateway IP Address Must Be On Local Net

When you abort input by using the **EXIT**, **PREV MENU**, or **MAIN MENU** keys, you see the following message:

Gateway Route Configuration Aborted

When you press **ENTER**, the following prompt appears for your confirmation:

Update Gateway Route Configuration (Y/N)?

On positive confirmation, the parameters you entered are stored in NVRAM. The new parameters take effect only after you reboot. The following message is logged, sent to the printer, and shown on the screen, and then the display returns to the System Configuration Menu:

PRM053: Gateway Routing Table Parameters Updated.

If you enter N for the "Update Gateway Route Configuration?" prompt, the following message appears, and then you are returned to the Ethernet/NFS Configuration screen:

Gateway Route Configuration Aborted.

1.8 ISDN NET5 OVERLAP SENDING AND RECEIVING

In the previous version of NET5, the overlap function was implemented at the card level; the card would pass a SETUP with all called digits after it received a message that included information indicating that receiving was complete. In this release, the host has control of digit collection and time-outs for both sending and receiving.

In Overlap Receiving, when a SETUP is received, it is passed to the host. The host responds with the SETUP ACK message. If all digits are not received, the network passes additional digits in INFORMATION messages and the host determines when all the digits have been received. When it is determined that all digits have been received, the host then sends the CALL PROCEEDING message.

In Overlap Sending, the host has control of digit assembly and transmission. When a SETUP is sent, it is passed to the destination. The destination responds with a SETUP_ACK message, and the SDS/VCO enters the Outgoing Call Processing state.

1.8.1 Summary of Features

Generic support of ISDN Overlap Sending and Receiving includes the following:

- ON/OFF selection of Overlap Sending/Receiving feature via console
- SETUP and SETUP_ACK support for Overlap Sending/Receiving
- Multiple INFORMATION message support for Overlap Sending/Receiving
- New ISDN state I_OVRL support for Overlap Receiving and O_OVRL for Overlap Sending
- Host timer expiry support for Overlap Receiving

1.8.2 Features Not Supported

- \$49 command with detach control for call clearing (aborting) on Overlap Receiving

1.8.3 User Interface—Overlap Receiving ON/OFF Control

The feature is configurable from the System Features screen. Selection enables both sending and receiving. See Figure 1.14.

When the feature is enabled (set to Y), the host has control of digit collection and time-outs, and acceptance of variable, unpredictable digit length is supported. The host also has control of digit assembly and time-outs, and transmission of variable, unpredictable digit length is supported. When the feature is disabled (set to N), the card hides the overlap function.

The initial default value of the Overlap Processing feature is N. When the user changes the value, the new value is saved in the database as the new default.

The feature change takes effect only when the NET5 card goes from out-of-service status to active status. Changing the feature value while a NET5 card is active has no effect. The feature flag is sent to the card.

| S Y S T E M F E A T U R E S | | | |
|----------------------------------|---------------|--------------------------------------|---------------|
| FEATURES | ALLOWED (Y,N) | FEATURES | ALLOWED (Y,N) |
| Redundant System | Y | Send All ISDN Connect Reports | N |
| Output Periodic Alarm Reports | N | Enable \$66 Cmd Host Checking | N |
| Card/Alarm Status at Init. | N | Cut Thru For Non-ISDN Alerting | N |
| Manual Intervention For SLIP/OOF | N | Enable 4th Column DTMF | N |
| Enable Grace Timing on Null Rule | N | Enable AllPortsDeactivated Alrm | N |
| Disable Card Error Report/Reset | N | \$EA Reports on DChannel RESTART | N |
| Enable Digit Field Reporting | N | Enable NET5 Overlap Receiving | Y |
| Suppress PSC/Rule Abort Messages | Y | | |
| Enable Host Password Check | N | | |
| Force Bearer/Lap Activation | N | | |
| Enable MFC-R2 Supervised Clear | N | | |
| Enable SLIC Guarded Disconnect | N | | |
| Enable CPA Monitor Disconnect | N | | |
| Revert to Basic Redundancy | N | | |
| Send Reports Before Guard Time | Y | | |
| Enable ISDN Manual Disconnect | N | | |

Figure 1.14: System Features Screen with NET5 Overlap Receiving

1.8.3.1 Overlap Receiving Indication

The new Generic software introduces a new ISDN state of I_OVRL (Incoming, OVerLap receiving) for a call.

According to the standard (European Telecommunications Standards Institute), an Overlap Receiving situation occurs when a received SETUP message contains one of the following:

- no called number IE
- an incomplete called number
- a called number which the user can't determine to be complete

Since the called number IE is *not* mandatory in SETUP, it is not feasible for the Generic to judge whether a "no called number IE" situation is actually an Overlap Receiving case or a normal case. Since Overlap Receiving operates in a situation where there is a variable digit length for a called number, even when some number(s) do appear in the called number IE, it is not possible for the Generic to determine if the called number is complete.

Only the Host Application can determine if information about the called number is complete, and that the call can be routed to its destination. The Generic depends on the Host Application for an indication of Overlap Receiving occurrence. To do this, the Host Application sends SETUP_ACK down to the Generic through the \$49 command with an impulse rule specified. Under the impulse rule, a ISDN Tx template with SETUP_ACK as the message, does the processing. IEs required by the SETUP_ACK are either part of the ISDN template or attached to the \$49 command.

1.8.4 Call State Transition

The Generic maintains two call states for a call: Major state and ISDN state. The ISDN state is affected when the Overlap Receiving feature is enabled.

For Overlap Receiving, a new intermediate state of I_OVRL is introduced into the ISDN state. The state transitions occur as follows:

When a SETUP is received by the Generic,

```
Major state: CP_IDLE    --> CP_SETUP (unchanged)
ISDN state: ISDN_IDLE  --> I_CPRSNT (unchanged)
```

When an outgoing SETUP_ACK is sent,

```
ISDN state: I_CPRSNT   --> I_OVRL
```

When the called number is complete and an outgoing CALL PROCEEDING is sent,

```
Major state: CP_SETUP  --> CP_WANS (unchanged)
ISDN state: I_OVRL    --> I_PRCEED
```

When CONNECT is sent and call goes to stable,

```
Major state: CP_WANS   --> CP_STAB (unchanged)
ISDN state: I_PRCEED  --> I_ACTIVE(unchanged)
```

For Overlap Sending, a new intermediate state of O_OVRL is introduced into the ISDN state. The state transitions occur as follows:

When a SETUP is sent by the Generic,

```
Major state: CP_IDLE    --> CP_SETUP (unchanged)
ISDN state: ISDN_IDLE  --> O_INITED (unchanged)
```

When an outgoing SETUP_ACK is sent,

```
ISDN state: O_INITED   --> O_OVRL
```

When the called number is complete and an outgoing CALL PROCEEDING is received,

```
Major state: CP_SETUP  --> CP_WANS (unchanged)
ISDN state: O_OVRL    --> O_PRCEED
```

When CONNECT is received and call goes to stable,

```
Major state: CP_WANS   --> CP_STAB (unchanged)
ISDN state: O_PRCEED  --> O_ACTIVE(unchanged)
```

The supplemental state, displayed on the Port Display screen, is always 0 because it is not used for any ISDN PRI calls.

1.8.5 Call Establishment

The following describes the data flow of a call establishment with and without Overlap Receiving.

1.8.5.1 Overlap Receiving with Indication from Host Application

The Host Application checks the received SETUP message and judges that the called number is incomplete, then Overlap Receiving occurs.

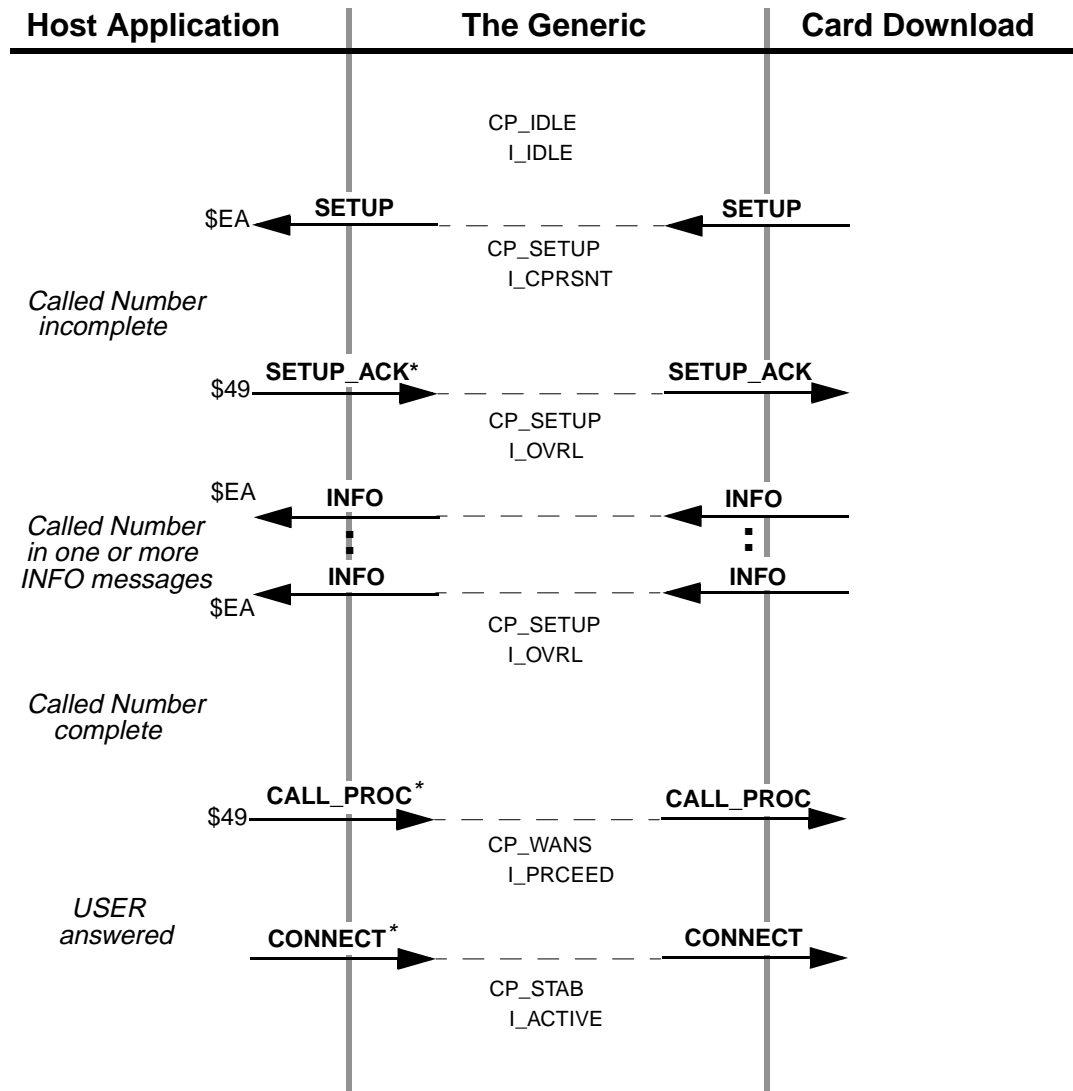
It then tells the Generic to send SETUP_ACK to the PRI card.

The outgoing SETUP_ACK serves as an indicator of Overlap Receiving to the Generic. I_OVRL state is entered.

One or more INFORMATION messages are received and passed to the Host Application until the Host Application considers the called number to be complete.

The Host Application then sends CALL_PROC out via the Generic.

The Generic considers this as an indicator of the end of Overlap Receiving and I_PROCEED state is entered. Refer to Figure 1.15.



* Messages are initiated by the Host Application but actually sent from the Generic

Figure 1.15: Overlap Receiving with Indication (SETUP_ACK) from Host Application

Note that in Figure 1.15, the \$EA report, not the \$ED report, is sent to the Host Application for the SETUP message.

Also note that in those figures, the CONNECT message is sent from the Generic but initiated by the Host Application, and that the \$49 command is not necessarily the one that initiates the receiving.

1.8.5.2 Non-Overlap Receiving in Overlap Receiving Operation

It is possible and allowable in Overlap Receiving for a SETUP message to already include the complete called number, and to not require further INFO messages.

In this case, the Generic does not enter I_OVRL state even if the feature is enabled and SETUP is received. The indicator of Overlap Receiving is never sent from the Host Application to the Generic.

The Host Application checks and determines that the call can proceed and sends out CALL_PROC right away.

1.8.5.3 Timer Expiry on Overlap Receiving

The system uses a timer (T302) when in Overlap Receiving to control call clearing (aborting). Refer to Figure 1.16. The timer resides in, and is controlled by, the card download.

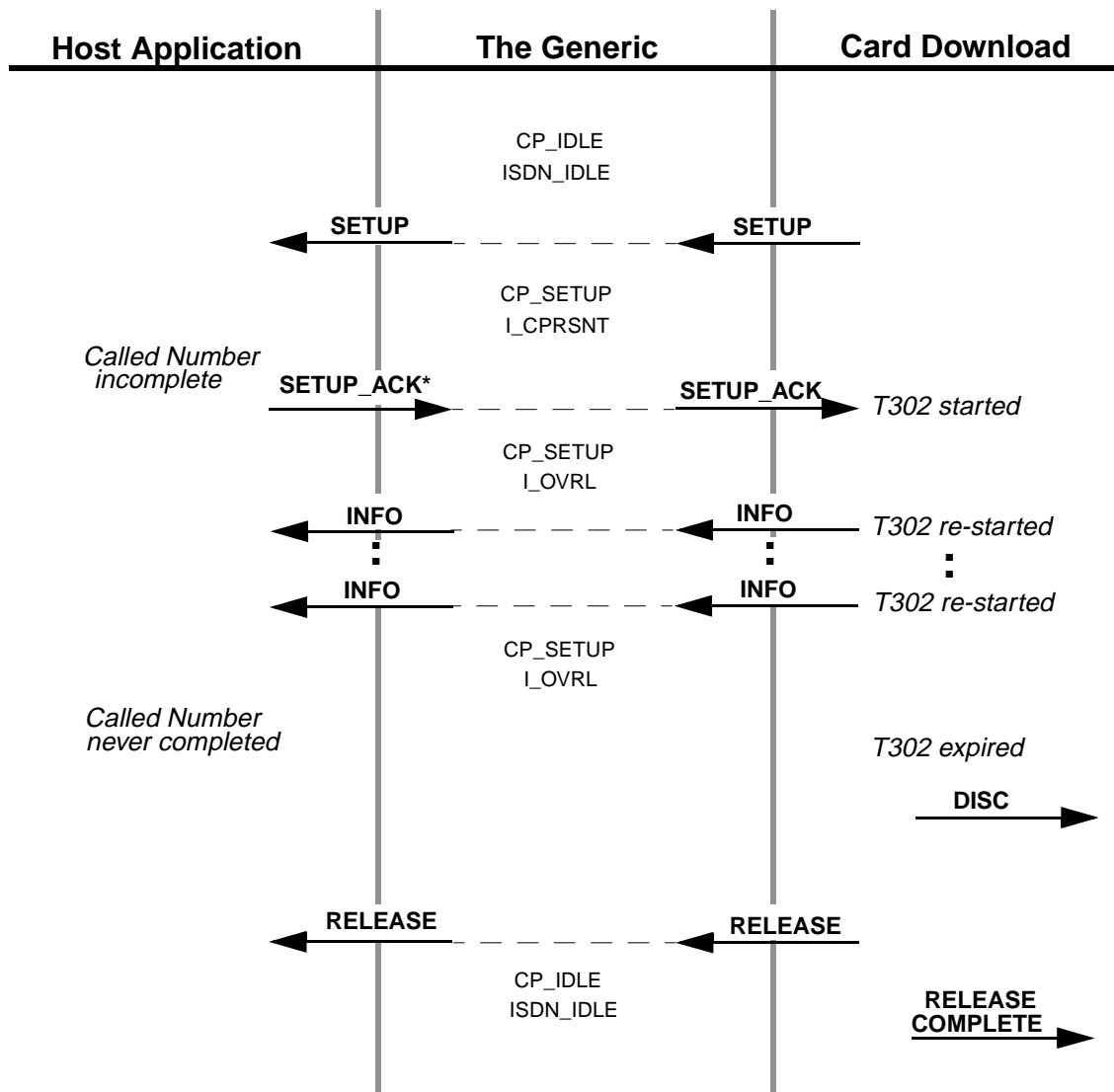
If the Host Application determines that the called number is incomplete, it initiates SETUP_ACK, Overlap Receiving begins, and the timer (T302) is started. The timer is restarted whenever an INFO message is received by the card download.

The timer is stopped when the card download receives CALL_PROC from the Generic. This occurs when the Host Application determines that there is sufficient information about the Call Number, or when Receiving Complete Indication is received. At this point, the Overlap Receiving operation ends.

T302 expires in the Overlap Receiving operation if the card download does not receive CALL_PROC within 10 to 15 seconds (the T302 value), and the Host Application determines that the called number is incomplete.

- Overlap Receiving operation is ended and the card download sends out DISC to the Network. At this point, there is no report of DISC from the card download to the Generic.
- The Network responds to DISC by sending back RELEASE, which is passed to the Generic and the Host Application.
- Call context at the Generic and the Host Application is cleared.
- The card download sends out REL_COMPL to the Network to complete the call clearing.
- The CAUSE IE with outgoing DISC for this call clearing is #28: Invalid Number Format (incomplete number).

Figure 1.16 shows the T302 expiry and call clearing processing initiated by USER. The first call clearing message is RELEASE from NETWORK.



* Messages are initiated by the Host Application but actually sent from the Generic

Figure 1.16: T302 Expiry and Call Clearing from the Card Download

1.8.5.4 Overlap Sending with Indication from Host Application

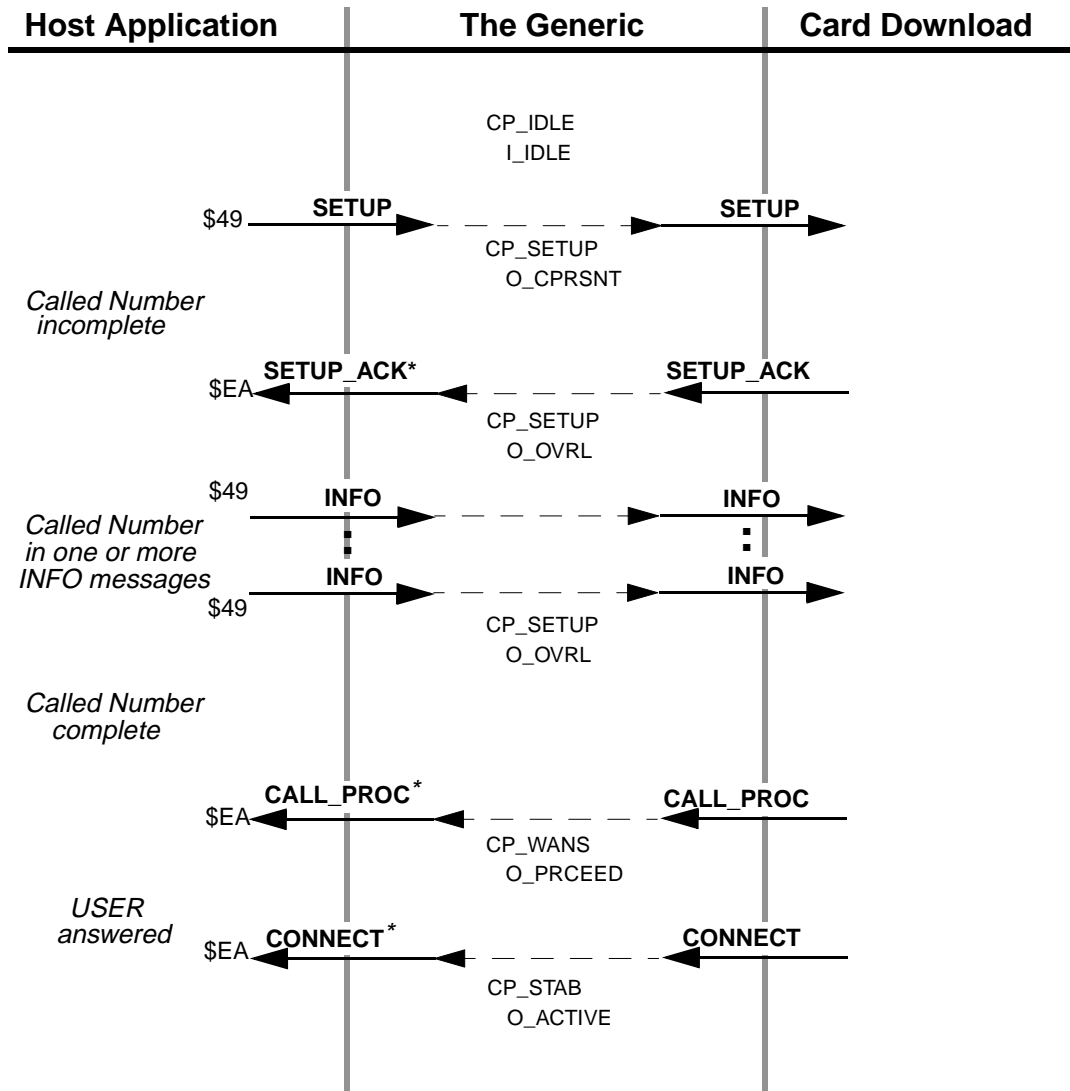
The Host Application initiates the SETUP message and waits for the acknowledgment.

The incoming SETUP_ACK serves as an indicator of Overlap Receiving to the Generic. O_OVRL state is entered.

The Host then transmits the Called Number in one or more INFO messages.

The Host Application considers the called number to be complete when a \$EA CALL_PROC message is received.

The Generic considers this as an indicator of the end of Overlap Sending and O_PROCEED state is entered. Refer to Figure 1.17.



* Messages are initiated by the Host Application but actually sent from the Generic

Figure 1.17: Overlap Sending with Indication (SETUP_ACK) to Host Application

Note that in Figure 1.17, the \$49 report, not the \$ED report, is sent to the Host Application for the SETUP message.

Also note that in those figures, the CONNECT message is sent from the Generic but initiated by the Host Application, and that the \$EA command is not necessarily the one that initiates the sending.

1.9 PROBLEMS CORRECTED IN V3.3 FSR06

The following problems have been corrected in V3.3 FSR06.

| TR # | Corrected Problems |
|-------------------|---|
| U508285227/TR5227 | See U602130001. |
| U510180002 | Prior to this release the V3.3 Generic did not support NBC-3 cards. The NBC-3 card is now supported with this fix. This is a change to the Generic only. |
| U510230001 | <p>A problem occurred when a \$69 command had seized a T1 port "A" using a virtual port. Port "A" answered. T1 port B went offhook, and a \$6B command was used to change the virtual port to B.</p> <p>If port A did not answer until after the \$6B was issued, the AB bits remained high, as they should have. However, if port A answered before the \$6B command, RX AB bits on port B remained low, and no \$70 command was sent to the incoming T1port. A \$70 command is now sent.</p> |
| U511130010 | <p>Previously, adding a one-way port to a conference call with seven two-way and one-way ports with the \$6D command, could result in a \$03 Syntax error being returned as the status byte. The possible combination of ports that should be allowed in a conference are: a) maximum of eight two-way ports and no 1-way ports, or b) maximum of seven two-way ports and any number of one-way ports, as limited by the total ports in the system.</p> <p>The system now accepts the port count as per the description of the \$6D command in the Programming Reference. The system will not fail for a \$6D command with a mix of two-way and one-way ports, even though the total number of ports exceeds eight.</p> <p>If the count is invalid, the command is returned with an NSB of \$54. If there are duplicate ports in the command, it is rejected with an NSB of \$55.</p> |
| U511220001 | A system failure occurred when a \$69 command was issued to disconnect an incoming ISDN port attached to a ringing phone (the port was in CP_WANS state). A \$49 command was issued to let the incoming ISDN port execute an outpulse which contained a DISC_T token but no CAUSE_IE token. A CAUSE_IE token is mandatory for disconnecting ports. |

| TR # | Corrected Problems |
|------------|--|
| U511280002 | <p>Previously, the Generic and E1-CAS/R2 (no CRC4) firmware did not support any internal messaging protocol with E1 cards that would allow the E1 card to indicate that one or more ports had been busied-out from the far end.</p> <p>In this release an idle port which has been blocked from the far end cannot be allocated by the System Controller for outgoing seizures until the port has been released by the far end. A port which has been blocked from the far end will continue to transmit idle signalling bits to the far end, as recommended in Q.422.</p> <p>This release now supports this messaging protocol, and a busied-out port is now properly represented on the Port Display screen.</p> |
| U511290001 | <p>Previously, when a card was deleted on the active side, the number of timeslots occupied on the active side were reduced by the number of slots occupied by the card just deleted. However, the timeslots occupied on the standby side remained unchanged. Both sides now report the correct number of timeslots.</p> |
| U601110001 | <p>A problem occurred while editing resource groups. Resource group details showed fewer ports than the port summary. This was caused by a corrupted resource group and presented a variety of other symptoms: more than one resource group corrupted, the COS/IPRULE disappeared, or a port name was changed without having been requested.</p> |
| U601170001 | <p>Following a system switchover, a virtual port was found to be unusable on the new active side. A \$49 command was issued to make an outbound ISDN call from a virtual port., the virtual port was then detached by another \$49 command, and this was followed by the system doing a switchover.</p> |
| U602080001 | <p>Previously, whenever the location of the log file was on "F:" (nfs device), the system running under load was observed to undergo a midnight failure. This would not occur if the log file was located on "C:." The problem was a system call that was needed to allocate the required memory was not being properly invoked. The corrected behavior of the system is that it no longer fails at midnight, when the log file is placed on "F:."</p> |
| U602130001 | <p>Occasionally, during a system watch-dog time-out, the system would dump information into the log file which would show that a call chain got corrupted, causing the watch-dog time-out. Now, calls are properly torn down and the service port is placed back in Idle.</p> |
| U603010001 | <p>Previously, if both primary and back-up D-channels in an NFAS group were lost, it was difficult for them to come up properly. This problem occurred if the switch was connected to a DMS-100 switch.</p> |
| U603040001 | <p>If both primary and back-up D-channels in an NFAS group were lost and then recovered, occasionally all the B-channels on T1/NFAS interfaces stayed in OOS-NE. Now the interfaces return in IN_SERV state. This condition was indicated on the port display screen ISDN state.</p> |

| TR # | Corrected Problems |
|------------|--|
| U603040002 | <p>If both primary and back-up D-channels in an NFAS group were lost and then recovered, all the T1/NFAS interfaces stayed in camp-on. This problem occurred only in V3.3FSR04. Now the interfaces return to IN_SERV. This problem occurred if the switch was connected to a DMS-100 switch.</p> |
| U603040003 | <p>Previously, when a channel RESTART message was received by the primary card in an NFAS group configured without a backup card, the system changed the primary card state to OOS while all the other cards in the group remained in an active state, thus allowing normal calls.</p> <p>Now the system will not change the primary card state with a RESTART.</p> |
| U603070004 | <p>Previously, if the span of a 4xT1 card went into maintenance as a result of reaching a SLIP/OOF limit, or if the span was manually taken into maintenance by the system administrator, or if the port was busied-out with a \$90 command, the AB bits of the port were not raised. The bits could be raised, however, if the ports were manually P'd out from the Maintenance menu. The port's state in this case was CP_MBUSY.</p> <p>The far end equipment connected to this span had no way to determine that the ports were not available for calls. This also applied to T1, E1, and 4xE1 cards.</p> <p>The Generic has been modified to raise the AB bits and place busied-out ports back into service.</p> |
| U603190004 | <p>Network logfiles on the F: drive that were more than 30 days old were not being deleted at midnight. Fixed by U602080002.</p> |
| U603210003 | <p>Prior to this release, spans receiving short hits from the network (less than 2 seconds) would generate an alarm. An alarm should not be generated until a hit has existed for two seconds. This occurred with 4xT1 and 4xE1 cards. The network polling rate is once per second and it is now checked on the third rather than on the second poll.</p> |
| U603220003 | <p>Improper hardware configuration of the 4xT1/E1 cards in earlier versions caused individual ports to be activated with incorrect gain and/or law configuration. Symptoms included noisy voice paths and diagnostic failures. This was more likely on international systems.</p> |
| U603250006 | <p>If there was a system failure, the system often assumed that the system network manager subsystem the cause, and it would dump information for the network manager task. The dump code has been modified to detect which task was the one that failed, and prints dump information for the failed task.</p> <p>In addition, occasionally when the system failed, it would send no dump information. Now it does for the failed task.</p> <p>See U608200002 for changes affecting this TR.</p> |

| TR # | Corrected Problems |
|------------|---|
| U604040001 | <p>This fix backs out TR4717 made in V3.3 FSR05. TR4717 is now listed as a Known Functional Constraint.</p> <p>The unwanted side-effect of the fix for TR4717 occurred when E1-CAS ports or T1 ports with COS A2 had their COS changed from A2 to internal COS (for example AT2) for the incoming call. The internal COS should have gone back to A2 once the call was torn down and the port went back to idle. However, in this case, the ports remained in internal COS even after the call was torn down. The port could then no longer be used for incoming calls.</p> |
| U604170004 | <p>Previously, when the Ethernet Manager option was installed, the Software/Firmware Configuration screen did not display the checksum and version of ethermgr.exe.</p> |
| U604180005 | <p>Previously, if a PRI/N card status was changed from Active to Diagnostic or Remote mode while one of its ports was in Active call state, the call state of this port was changed to Call State DISC_REQ (Disconnect Request). This was indicated on the Port Display screen.</p> <p>The problem has been corrected, and new calls can now be made once the card is returned to active state.</p> |
| U605010006 | <p>This fix backs out TR4105 made in V3.3 FSR05. TR4105 is now listed as a Known Functional Constraint.</p> <p>The unwanted side-effect of the fix for TR4105 is the Card Display showing ports off-hook while the Port Display shows the ports as idle. The Port Display is wrong.</p> |
| U605070001 | <p>Prior to this release, the controlling host maintained the conference structure only for conference calls and not for the ports involved in the conference. While initiating or adding ports to the conference, the system checked only to verify that the controlling host was set to "no controlling host." This meant that the port involved in the conference was not under the sole control of the host controlling the conference.</p> <p>Also prior to this release, the \$C0 05 host processing command (Host Assume/Relinquish Port Control) supported assuming or relinquishing host control to the ports involved in a call only, and not to conference calls. The command supported only two modes of port control for ports not involved in conference calls: 1) Relinquish Control, and 2) Assume Control.</p> <p>In this release, four modes are added which extend control to ports in conference calls. See <i>Section 1.6</i>.</p> |
| U605070003 | <p>Previously, when an E1 port on an E1-CAS/R2 (No CRC4) card was busied-out, it continued to respond to changes in incoming signalling. This behavior is corrected in the new E1-CAS/R2 (No CRC4) firmware, v3.42.</p> |

| TR # | Corrected Problems |
|------------|---|
| U607100003 | Previously, in an outgoing NFAS group, some ports got stuck in CP_GARD, which caused the port to be unusable unless it was P'd out and then P'd back in again. The corrected behavior is that when both phones go off-hook, the two ports go to CP_STAB; when the phones go on-hook, both ports go back to CP_IDLE. |
| U607160001 | A problem occurred in which the \$67 command was issued with voice prompts and delayed first digit timer. If a user entered either clear character or digits followed by clear character while the prompt was playing, the prompt was halted. When the digit collection was restarted, the first digit timer was not enabled. This caused the receiver port to hang while it waited for digits or for a time-out. |
| U607240006 | <p>Previously, Ethernet parameters could not be changed from the standby (SBY) side. The parameters in the Ethernet/NFS Configuration screen, such as Current System Internet Address, are now configurable on the standby side. The following message is shown on the screen:</p> <p>Update Ethernet/NFS Configuration (Y/N)?</p> <p>When the user selects Y, the parameters are stored in NVRAM and a message similar to the following is shown on the screen: PRM052: Ethernet/NFS Params Updated. New Address On Reboot Is XXX.XXX.XXX.XXX.</p> |
| U607260003 | An issue existed in which a port would be stuck in CP_GARD when the call was torn down if the Remote Alarm had been set for an E1-PRI card configured for DPNSS. The Yellow light would turn on, and the card would be in Camp On state, but the call established on this card remained in CP_STAB. |
| U607290002 | Auto make-busy counters should be cleared at midnight, as stated in our documentation. The code that provided this functionality was commented out inadvertently. The system now functions as documented—make-busy counters are reset at midnight. Note: if the card is already in the make-busy state, the counters will not be cleared, and the card will not be brought back into service. |
| U608050001 | In earlier versions, when an Enhanced \$67 command with retained flag set was issued to collect two digits on a DRC8 port, and if more than two digits were entered, the DRC8 port was detached even though the retain flag had been set. The DRC8 port now remains attached. |
| U608080007 | There was an issue in which 4xT1 cards took an excessive amount of time to report an inward seizure. In addition, the 4xT1 port did not report the seizure within a consistent time period. The FXS ground start timer was changed to a "one-phase" counter which is tested against a configurable timer value. An FXS or FXO ground start port on the 4xT1 card will now report an inward seizure after the off-hook timing requirement has been satisfied. |

| TR # | Corrected Problems |
|------------|---|
| U608100001 | Normally when any E1-PRI card is put into Maintenance state from Active state, the ISDN states of all the ports on the card go to MAINT-NE state. A problem occurred when the card was brought back to Active and ports 31 and 32 stayed in MAINT-NE state. This resulted in unusable ports until these two ports were P'd out/in. Now every port goes back into IN_SERV. |
| U608160001 | In earlier versions, the Generic inappropriately issued a command to the DRC8 card between each field of digits collected in a multiple-field DTMF collection. This resulted in the second digit of each field, other than the first field, being dropped. |
| U608200002 | <p>This fix backs out some of the changes U603250006 made in V3.3 FSR05. These are now listed as a Known Functional Constraint.</p> <p>The previous fix for U603250006 could cause problems with systems containing a large number of E1-PRI or 4xE1 cards. Removing and re-inserting a card from a live system following a cold boot would result in CP queue overruns, attempts to retransmit SWI buffers, and a system failure.</p> <p>When a system failure occurred, the system often assumed that the cause was in the main task and would dump information for that task instead of the failed task. The fix in U608200002 corrects this problem.</p> <p>With the changes removed from U603250006 by U608200002, the system now dumps the failed task. Testing confirms that problems do not occur at test loads below the benchmark load limit.</p> |
| U608210003 | There was a problem when a system was configured with any combination of the DPNSS, DASS2, NET5, PRI/N or PRI, cards, or their combination with other downloadable cards. If the download of any of these cards was not completed within 10 minutes from power-on, download was aborted by those cards. Eventually all cards would finish downloading, but it would take more time because of the aborted download. The cards now download properly and the download time is significantly less than before. |
| U608210004 | See U608210003. |
| U608220001 | Prior to this release, the 4xT1 and 4xE1 cards reported erroneous seizures when presented with a random test pattern consisting of a series of seizes and idles. A seize was reported present when a seize condition was found to be present 40 milliseconds after an initial seize. Other signals were ignored during the 40 millisecond period. Thus a seize would be reported even if it were not present for the entire 40 milliseconds. The timer is now reset upon receipt of any signal other than a seize. |
| U608220002 | Previously, the system would occasionally generate the "Start Record Exhausted" message, after which no calls could be established unless the system was rebooted. |

| TR # | Corrected Problems |
|------------|--|
| U608280001 | <p>A problem existed if the following scenario occurred: A user would telnet into the active side of the switch and select Diagnostics from the Main menu. The user would then run Display Card Data and open another telnet session into the active side. If he pressed any key on the system console, after waiting for a period of time, "PRM013: Invalid Field Number Specification" was displayed. A login screen would appear with an erroneous login and password and the screen would lock up. Since the telnet session was not disconnected, the system console was also affected. This problem has been corrected.</p> |
| U608300002 | <p>This problem occurred only on V3.3 FSR05 systems. This problem occurred when an outpulse rule, that included a Wait Sup 1 to listen for dial tone, resulted in an OP field DTMF error. This occurred only with the use of Supervision template #1.</p> <p>The system now performs its operation with final_sup 1.</p> |
| U609090008 | See U608210003. |
| U609090009 | See U608210003. |
| U609200001 | <p>On occasion, when a conference call was being torn down or a port was being deleted from the conference through the \$6D command, the standby side would fail with a bus error exception. Now, after a \$6D command to tear down a conference call or delete a port from a conference is issued, the port goes back to CP_SETUP. Resources are detached on the Active side, and the standby side will not fail.</p> |
| U609230006 | See U602130001. |
| U610010008 | <p>A problem occurred when an incoming ISDN port was used to make an outbound ISDN call with a \$49 command, and the disconnect control byte was set to leave the incoming port in setup upon outgoing disconnect. Another \$49 command was sent to force the outgoing port to IDLE, but the incoming port's major state went from STAB to IDLE instead of to CP_SETUP. The supplementary state remained in I_ACTIVE.</p> <p>The incoming ISDN port now stays in CP_SETUP when the outgoing port is forced to IDLE.</p> |
| U610110001 | <p>Remote Loss of Carrier Alarm (Yellow Alarm) caused ports to be stuck in CP_GARD. When the Generic received the remote carrier alarm, it assumed the port state to be CP_GARD because that is true for single-span T1 cards. The 4xT1 card has been modified to operate like a single-span card in this respect. Now, after the alarm is generated, the call is torn down, the port goes to CP_GARD, the card generates a guard expired message, and the port goes to CP_IDLE. A new diagnostic that permits viewing the previous 20 states of a port has also been added to the download.</p> |

| TR # | Corrected Problems |
|------------|--|
| U610110002 | <p>Previously, if the host setup timer was set when a port with COS A2 went off-hook, and the host did not respond before the setup timer expired, the call was terminated. The port went back to IDLE, and since the port had COS A2, the port status stayed in off-hook. However, the SBY side port status went back to on-hook for the same port.</p> <p>The problem occurred during switchover. The new Active side saw the port as idle and on-hook. This resulted in an unusable port (the far end was already off-hook, because the Summa side appeared to be off-hook). This could be seen from the card display screen.</p> <p>Now both Active and SBY side hook states are consistent.</p> |
| U612200003 | <p>When a \$6D command was issued to bring an ISDN port into a conference, the command was rejected with a status byte \$21 indicating that the port was off-hook. The problem was caused by a failure to either send or receive a CONNECT message on the switch side.</p> <p>The system now adds an ISDN port into conference after responding to the SETUP message. The \$6D command is not rejected.</p> |
| U612230001 | <p>This is a two-part problem.</p> <p>Previously, when a DRC-48 was taken OOS from the card maintenance screen, the subsequent \$D9 report showed an incorrect DRC port address. The port address range should have started with \$4000 or above. Instead the range was \$0000-\$002F. For instance, if the DRC-48 had ports from \$4000 to \$402F, the \$D9 report would show \$0000 to \$002F. The correct range is now shown.</p> <p>Also, when a DRC port was P'd out from the card maintenance screen, the generated \$D3 report showed the same problem discussed above; the range failed to start with \$4000 or above. The correct range is now shown.</p> |
| U701220001 | <p>Occasionally 4xE1 cards did not return to Idle state after being busied-out from the far end. The input rules were executed and resources allocated properly, but when the far end was removed from the busy state the port did not return to Idle state. This problem was similar to U511280002. The 4xE1 now deals correctly with a far-end busy-out condition.</p> |
| U702140002 | <p>Occasionally, all B-channels in an NFAS group would remain in OOS-NE, after both primary and backup D-channels were lost and then returned. Now when both primary and backup D-channels are lost and then return, the B-channels go into IN-SERV state.</p> |

Section 2

SYSTEM REQUIREMENTS

2.1 INTRODUCTION

This section lists the hardware, software, and firmware requirements for running V3.3 FSR06. Contact Summa Four, Inc. Technical Support for any site-specific information at 1-800-9SUMMA4.

2.2 HARDWARE REQUIREMENTS

To operate any release of V3.3, a system must be equipped with the following System Controller components:

- 8 Megabyte (MB) 68030-based central processing unit
- 42 MB or greater small computer system interface (SCSI) hard drive
- 3.5" SCSI Interface Floppy Drive
- Switch Interface Card (P/N 50125050100, Revision A0AR)

Additionally, if you are using an Integrated Prompt/Record Card, you need P/N 50230050200, Revision C0FR, for it to function properly with V3.3 FSR06.

2.3 FIRMWARE REQUIREMENTS

This section lists the firmware required to run V3.3 FSR06. Table 2.1 lists the V3.3 FSR06 firmware requirements that are common to all systems. Firmware locations for specific cards appear in the appropriate technical description.

Table 2.1: Common Firmware Requirements

| Card | Firmware | Checksum | Vers. | Location | Changed Since FSR05? |
|-----------------------------|-----------|----------|-------|----------|----------------------|
| North American Requirements | | | | | |
| CPU | Boot Even | 6910d6 | 1.14 | U1 | Y |
| | Boot Odd | 7e53d4 | 1.14 | U15 | Y |
| | VME147 1 | 28d7 | 2.43 | U30 | N |
| | VME147 2 | d471 | 2.43 | U22 | N |
| DVC | DVC | 95be | 2.07 | U2 | N |
| E+M | E+M | d381 | 2.06 | U2 | N |

Table 2.1: Common Firmware Requirements (Continued)

| Card | Firmware | Checksum | Vers. | Location | Changed Since FSR05? |
|----------------------------|---------------------|----------|--------|----------|----------------------|
| E1-CAS | E1-CAS/MERC | f1c6 | 2.13 | U23 | N |
| | E1-CAS/R2 | 2654 | 2.01 | U23 | N |
| | E1-31B | ef58 | 3.03 | U23 | N |
| | E1-CAS/R2 (No CRC4) | efd3d | 3.42 | U23 | Y |
| | CAS PROC | 1e78 | 1.04 | U85 | N |
| | 32 CHAN SETUP | cdde | 1.00 | U113 | N |
| | GAIN/LAW PROM | 11d2 | 1.02 | U45/53 | N |
| T1 | T1 | 2ba5 | 1.26 | U2 | N |
| | T1 Aux Proc | 7125 | 1.00 | U45 | N |
| NBC | Drive Odd | 27c8 | 3.16 | U16 | N |
| | Drive Even | a66c | 3.16 | U17 | N |
| | Boot Odd | 71ba | 3.16 | U18 | N |
| | Boot Even | 3351 | 3.16 | U19 | N |
| NBC-3 Card | — | — | C0ER | — | New |
| | SWI | 194974 | LP122C | U66 | |
| | Counter | 18e096 | LP123E | U13 | |
| | Chip Select | d7b43 | LP124C | U12 | |
| | CommBus EPLD | 5ced8 | LP126B | U47 | |
| | CommBus FPGA | — | LP125C | U43 | |
| | Mezzanine Address | 6c919 | LP12A | U105 | |
| | Boot PROM | f61855 | 1.00 | U4 | |
| Drop & Insert | | a172fb | 1.04 | U9 | New |
| BRC | BRC | 2412 | 2.01 | U2 | N |
| MRC | MRC | ee80 | 3.08 | U2 | N |
| DRC (8) | DRC | 9625 | 5.23 | U2 | N |
| SRC | SRC | e5c7 | 1.07 | U2 | N |
| CPA | CPA | a7a2 | 1.03 | U2 | N |
| DRC-24 | DRC-2 | 4241 | 3.08 | U2 | N |
| DRC-48 | DRC-2 | 4241 | 3.08 | U2 | N |
| UTC-2 Rev A UTC-2 Rev B | UTC | f91e | 6.00 | U2 | N |
| | UTC | ecf0 | 6.54 | U2 | N |
| DID-2 | DID-2 | 10c3 | 1.41 | U2 | N |

Table 2.1: Common Firmware Requirements (Continued)

| Card | Firmware | Checksum | Vers. | Location | Changed Since FSR05? |
|-----------------------------------|-----------------------|----------|-------|--|----------------------|
| SLIC-2 | SLIC-2 | 10b9 | 1.41 | U2 | N |
| IIRC-8 | IIRC 8-PORT | 220d75 | 1.03 | U2 | N |
| IIRC-64 | IIRC 64-PORT | 220dc1 | 1.03 | U2 | N |
| IIRC-128 | IIRC 128-PORT | 220e0a | 1.03 | U2 | N |
| 4XT1/E1 | 4XT1/E1 68340 VIRT CM | 291041 | 1.08 | U10 | Y |
| | 4XT1 68302 ODD | 277039 | 1.12 | U47, 93, 150, 185 | N |
| | 4XT1 68302 EVEN | 24479b | 1.12 | U48, 94, 151, 186 | N |
| | GAIN/LAW CCITT G.711 | 0fcd68 | 1.03 | U25, 28, 67, 78, 120, 131, 158, 170 | N |
| | PATH SETUP ROM | cdde | 1.00 | U35, 86, 116,178 | N |
| | 4XE1 68302 ODD | 268b57 | 1.01 | U47, 93, 150, 185 | Y |
| | 4XE1 68302 EVEN | 232fcc | 1.01 | U48, 94, 151, 186 | Y |
| International Requirements | | | | | |
| E1-PRI | E1-PRI FW Odd | 105999 | 1.03 | U38 | Y |
| | E1-PRI FW Even | da6c3 | 1.03 | U39 | Y |
| | E1-PRI 32 Chan Setup | cdde | 1.00 | U113 | N |
| | PCM Gain/Law | 11d2 | 1.02 | U45/53 | N |
| NET5 | Net5 Odd | 105997 | 1.01 | U38 | Y |
| | Net5 Even | da683 | 1.01 | U39 | Y |
| PRI | PRI FW Odd | 107ea5 | 1.02 | U38 | Y |
| | PRI FW Even | db30b | 1.02 | U39 | Y |
| | 32 Chan Setup | cdde | 1.00 | U29 | N |
| | PCM GAIN/LAW | 11d2 | 1.02 | U45/53 | N |
| PRI/N | Odd | 116a29 | 1.08 | U38 | Y |
| | Even | deca0 | 1.08 | U39 | Y |
| | 32 Chan Setup | cdde | 1.00 | U29 | N |
| | PCM Gain/Law | 11d2 | 1.02 | U45/53 | N |

Table 2.2: Domestic (U.S.) Firmware Requirements

| Card | Firmware | Checksum | Vers. | Location | Changed Since FSR05? |
|------|---------------|----------|-------|----------|----------------------|
| DTG | DTG | 77ad | 1.23 | U2 | N |
| | Tone Odd | 0078 | 2.04 | U54 | N |
| | Tone Even | 4217 | 2.04 | U53 | N |
| DCC | DCC | a575 | 2.02 | U2 | N |
| | LIN/PCM 0 DB | b9a2 | 1.00 | U43 | N |
| | LIN/PCM -3 DB | ab04 | 1.00 | U44 | N |
| | PCM/LIN Odd | afa2 | 1.00 | U33 | N |
| | PCM/LIN Even | b736 | 1.00 | U34 | N |

2.4 SOFTWARE REQUIREMENTS

The Software/Firmware Configuration utility lets you identify the version/checksum of each software file installed on the system (refer to the *System Administrator's Guide* for more information).

Generic software files are distributed across four floppy diskettes, while each optional software product comes with a single floppy used to install the option.

Table 2.3 lists all the V3.3 FSR06 software requirements including software versions and checksums for the Generic software, as well as optional software products.

Table 2.3: V3.3 FSR06 Software Requirements

| Software Product | S/W Vers. | S/W FSR | Filename | Checksum | File Vers. | Changed since FSR05? |
|------------------|-----------|---------|-------------|----------|------------|----------------------|
| GENERIC | 3.3 | 06 | globals.exe | 257e20f | 3.03 | Y |
| | | | hostmgr.exe | 40c8c6 | 3.03 | Y |
| | | | syswd.exe | 10ae5c | 3.03 | Y |
| | | | redmgr.exe | 1a1a28 | 3.03 | Y |
| | | | permgr.exe | 662bf6c | 3.03 | Y |
| | | | netmgr.exe | 760c9e | 3.03 | Y |
| | | | nbc.dwn | cdab2 | 2.33 | Y |
| | | | nbc3.dwn | 1094cc8 | 1.02 | — |
| | | | src.dwn | 159475b | 1.02 | N |
| | | | cpa.dwn | 3079f3 | 8.09 | N |
| | | | dvc.dwn | 5ada02 | 1.08 | N |
| | | | iprc.dwn | 232a30 | 1.03 | N |
| | | | dtmf.dwn | 53d1a | 2.02 | N |
| | | | 4xt1.dwn | 33be67 | 1.42 | Y |
| | | | 4xe1.dwn | 36b546 | 1.26 | Y |
| | | | install.exe | 6505f7 | 3.03 | Y |
| | | | genkern.exe | 2578d85 | 3.03 | Y |
| | | | VRTX OS | — | 1.08 | N |
| | | | IFX | — | 1.11 | N |
| | | | TNX | — | 1.45 | N |

Table 2.3: V3.3 FSR06 Software Requirements (Continued)

| Software Product | S/W Vers. | S/W FSR | Filename | Checksum | File Vers. | Changed since FSR05? |
|---------------------|-----------|---------|--------------|----------|------------|----------------------|
| Options | | | | | | |
| ETHERNET | 3.3 | 06 | ethermgr.exe | 7b0c | 3.03 | Y |
| TELEROUTER | 3.3 | 06 | telerte.exe | 7ada | 3.02 | N |
| ISDN Options | | | | | | |
| ISDN-NFAS | 3.3 | 06 | nfas.exe | 7b0c | 3.01 | N |
| ISDN-PRI | 3.3 | 06 | pri.dwn | 8612e7 | 5.04 | N |
| ISDN-PRIN | 3.3 | 06 | prin.dwn | 8bde62 | 5.04 | N |
| NTDASS2 | 3.3 | 06 | ntdass2.dwn | 9ed3e9 | 3.03 | Y |
| DPNSS | 3.3 | 06 | dpnss.dwn | ab8906 | 3.06 | Y |
| NET5 | 3.3 | 06 | net5.dwn | 82669d | 1.05 | Y |

Section 3

INCREMENTAL INSTALL OF V3.3 FSR06

3.1 INTRODUCTION

This section describes the procedures for performing an incremental installation of Generic Version 3.3 Field Software Release 06 (V3.3 FSR06). These instructions pertain to systems currently operating V3.3 FSR05.

To upgrade to V3.3 FSR06 from any release of V3.2 (or earlier) or if you are currently running V2.03 or V2.04, Summa Four technical support personnel or users trained and certified by Summa Four must perform the upgrade to V3.3 FSR06.

NOTE: If you are upgrading from V3.1, you must first upgrade to V3.2 FSR03 and then upgrade once more to V3.3 FSR06. For instructions on upgrading to V3.2, follow the instructions in the Generic Release Notes, V3.2 FSR03.

CAUTION: This section provides detailed installation instructions for loading SDS/VCO system software on an active system. Deviating from these instructions can result in lost data and a system reset. Read all the material in this section prior to installing the SDS/VCO software. If you encounter any problems during the installation, contact Summa Four technical support at 1-800-9SUMMA4.

To perform an incremental installation of the system and/or optional software, you must take both redundant and non-redundant systems off line for a brief period. The installation process takes approximately 15 minutes (for non-redundant system) to 30 minutes (for redundant system).

3.1.1 Documentation References

Before installing the software, make sure you read all the material contained in this section. You may also want to reference the following SDS/VCO documents:

- *Installation Manual*
- Product supplements for optional SDS/VCO software, including
 - *TeleRouter Reference Guide*
 - *ISDN Supplement*
 - *ISDN NET5 Supplement*
 - *Ethernet Supplement*
 - *DPNSS Supplement*
 - *DASS2 Supplement*
 - *IPRC Supplement*
 - *Applicable Country Supplements*

3.2 FIRMWARE UPGRADE INSTALLATION

Before installing the software you must first power off your system and perform the following firmware installations. Refer to *Appendix A* if you need instructions for replacing PROMs.

3.2.1 CPU Boot PROMs

Insert the CPU Boot PROMs (V1.14) as follows. Refer to the *Technical Descriptions*, "Central Processing Unit (CPU)", P/N 61050200233, for PROM locations.

- Even: U1 (PROM 1)
- Odd: U15 (PROM 2)

3.2.2 EI-PRI ROMs

Insert the EI-PRI PROMs (V1.03) as follows. Refer to the *International Supplements and Technical Descriptions*, "E1 Primary Rate Interface Card", P/N 61050310831 for PROM locations.

- Even: U39 (PROM 1)
- Odd: U38 (PROM2)

3.3 PRIOR TO SOFTWARE INSTALLATION

Verify that you have four diskettes labeled as follows:

SDS SYSTEMS V3.3 FSR06
GENERIC
DISK x OF 4

The "x" value indicates the sequence in which the floppies must be loaded when you install the generic software. Only Disk 1 contains the installation utilities.

In addition, be sure you have the following:

- A diskette containing the installation utilities for any optional SDS/VCO software packages (TeleRouter, ISDN and/or Ethernet, for example).
- Blank diskettes to backup the system data base.
- License number provided by Summa Four Technical Support.
- ISDN, the PRI and PRI/N downloads.

For redundant systems, be sure

- The SELECT switch, on the front panel of the AAC, is set to Auto.
- An administration console can be connected to both system controllers. Depending on your equipment's arrangement, you can accomplish this by:
 - *Setting up a separate system administration console for each controller (A- and B-side).*

- *Using an A/B transfer switch wired to both system controller CPU-TM front panels to switch access.*
- *Physically removing/connecting the administration console cable from one CPU-TM front panel to the other.*

3.3.1 Determining File Sizes

Because of some variations in existing installations, you may have difficulty converting from your current database to V3.3 FSR06. To determine if this is the case, you need to know the size of several of your files. To determine the file sizes, use the Show Directory option in the Disk Utilities menu to display the files in the c:/dbase directory. The sizes of your files should match the file sizes in Table 3.1.

Table 3.1: File Sizes

| Version Number | File Name | | | | | |
|----------------|-------------|------------|----------|----------|--------------|--------------|
| | syscnfg.tbl | dbvers.tbl | card.tbl | port.tbl | resgroup.tbl | promptlb.tbl |
| V3.2 FSR00 | 1966 | 270 | 20286 | 83968 | 1024 | N/A |
| V3.2 FSR01 | 1966 | 270 | 20286 | 83968 | 1024 | N/A |
| V3.2 FSR02 | 1966 | 270 | 20286 | 83968 | 2016 | N/A |
| V3.3 FSR00 | 2081 | 288 | 32046 | 93184 | 2016 | 1120 |
| V3.3 FSR01 | 2081 | 288 | 32046 | 93184 | 2016 | 1120 |
| V3.3 FSR02 | 2160 | 288 | 32046 | 93184 | 2016 | 1120 |
| V3.3 FSR03 | 2160 | 288 | 32046 | 93184 | 2016 | 1120 |
| V3.3 FSR04 | 2160 | 288 | 32046 | 93184 | 2016 | 1120 |
| V3.3 FSR05 | 2160 | 288 | 32046 | 93184 | 2016 | 1120 |

If the size of any of these files does not match the size listed in Table 3.1, contact Summa Four Technical Support immediately. Failure to have technical support evaluate the file size inconsistency will result in problems converting your current database to the V3.3 FSR06 format.

If you are running a version of software that is not in Table 3.1, you should also contact Summa Four Technical Support. An engineer will determine if the size of your database is correct for the software version numbers that you are running.

3.4 INCREMENTALLY INSTALLING V3.3 FSR06

The following subsections provides instructions to install V3.3 FSR06 on systems currently running V3.3 FSR05. On Disk 1, the Incremental Install of Basic System Software option installs the generic software and download files onto the hard disk. This selection does not format the hard disk.

Although data base tables and screen formats remain intact during the incremental installation, Summa Four recommends that you back-up the system data base as a precautionary measure.

The following subsections assume that the SDS/VCO is running with the A-side controller Active (administration console connected to the A-side CPU-TM).

3.4.1 Software Installation

To install V3.3 FSR06 if your system is currently running V3.3 FSR05, follow these steps.

1. Insert Disk 1 into the A-side floppy drive.
2. Power up the A-side. After the system performs diagnostic tests, the Installation Utilities menu appears (Figure 3.1).

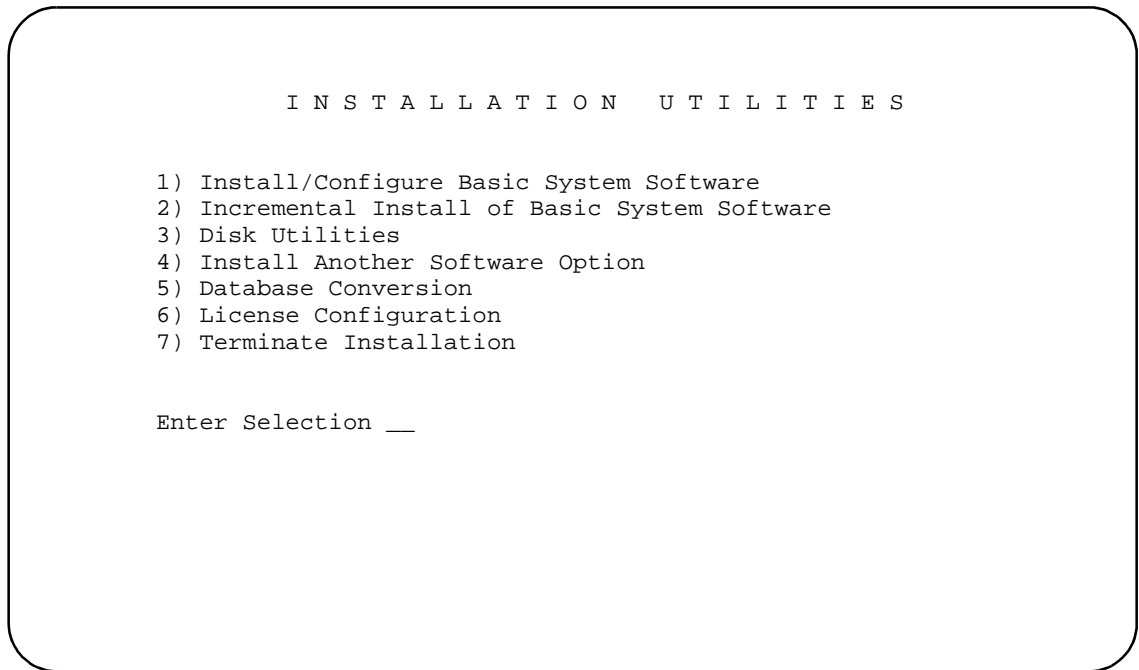


Figure 3.1: Installation Utilities Menu

3. The cursor is located in the Enter Selection data entry field. Type **2** and press **Return**. The following message appears:

Do You Wish To Back-Up The System Data Base? (Y/N) =N?_

NOTE: Summa Four strongly recommends that you perform this backup.

4. a. If you do not wish to back-up the system data base, press **Return** and proceed to Step c.
b. To back-up the system data base, type **Y** and press **Return**. The installation procedure is aborted and you are returned to the Installation Utilities menu. Refer to *Section 3.6.1* for instructions on backing up the system data base.
c. The following message appears:

Insert disk 2 of Installation Set

Press return to continue

Remove the current diskette from the drive, insert Disk 2 and press **Return**. The Disk 2 files are copied to the C:/BOOT/ directory.

5. When all the files are copied, the following message appears:

Insert disk 3 of Installation Set

Press return to continue

Remove the current diskette from the drive, insert Disk 3 and press **Return**. The Disk 3 files are copied to the C:/BOOT/directory.

6. When all the files are copied, the following message appears:

Insert disk 4 of Installation Set

Press return to continue

Remove the current diskette from the drive, insert Disk 4 and press **Return**. When the installation is complete, the Installation Utilities menu appears (Figure 3.1).

7. Remove Disk 4 from the drive.
8. If you are not installing optional software, go to Step 10.
9. To install an optional software package, type **4** and press **Return**. General instructions for installing optional software are provided in *Section 3.5*.
10. If your system is redundant and you have not yet installed the software on the B-side, proceed to Step 14.
11. If your system is non-redundant or you have already installed the software on the B-side, type **7** and press **Return**. Be sure the AAC is in Auto mode and reboot the system. The installation process is now complete.
12. Connect the administration console to the B-side CPU-TM.
13. Power up the B-side.
14. Insert Disk 1 in the B-side drive.
15. After the system performs diagnostic tests, repeat Step 3 through Step 8.

3.5 INSTALLING OPTIONAL SDS/VCO SOFTWARE

You can install optional SDS/VCO software as part of the general software installation or separately, on an active system. The following section provides generalized instructions to install an optional software package. For complete installation instructions, refer to the supplement provided with your optional software.

To install optional software, follow these steps:

1. Power up the A-side.
2. Insert Disk 1 in the A-side drive.
3. After the system performs diagnostic tests, the Installation Utilities menu appears (Figure 3.1).
4. To install a software option, type **4** and press **Return**. The following message appears:

Insert Another Install Disk

Press Return To Continue

5. Remove the current diskette from the drive, insert the optional software diskette and press **Return**. The Installation Utilities menu specific to the software option appears (Figure 3.2).

(You can also boot the option floppies directly.)

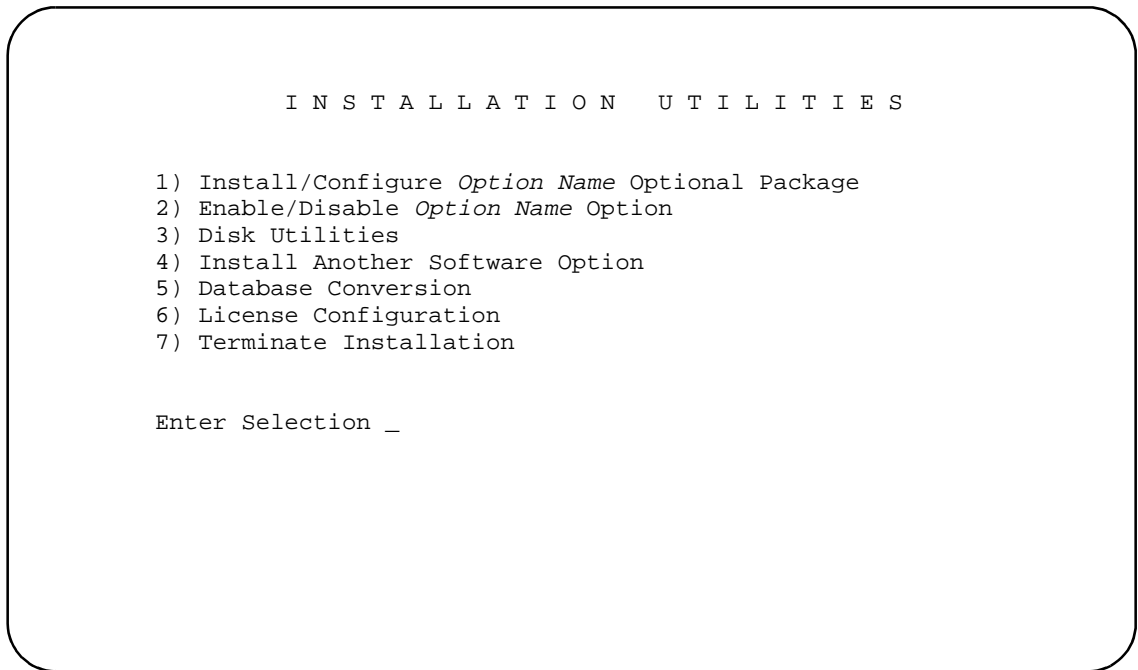


Figure 3.2: Optional Software Installation Utilities Menu

NOTE: The optional software being installed appears in selections 1 and 2 on the Optional Installation Utilities menu in place of Option Name.

6. To load/configure the optional software, type **1** and press **Return**. The following messages appear:

Do You Wish To Back-Up The System Data Base? (Y/N) =N?_

NOTE: Although data base tables and screen formats remain intact during the installation, Summa Four recommends that you back-up the system data base as a precautionary measure.

7. a. If you do not wish to back-up the system data base, press **Return** and proceed to Step 7a (in this section).
- b. To back-up the data base, type **Y** and press **Return**. The installation is aborted and the optional Installation Utilities menu appears (Figure 3.2). Instructions for backing up the system data base are provided in *Section 3.6.1*.

8. a. In most cases, the following messages appear:
Copying A:/Option Filename.EXE...
1 file(s) copied
Option Name Option Enabled
- b. If you are not installing any other optional software, go to Step 8 in *Section 3.4.1*.
- c. To install another optional software package, repeat Step 2 through Step 5 (in this section).
- d. Once all options are loaded, return to Step 8 in *Section 3.4.1*.

The optional software is enabled. Use the Enable/Disable option to deactivate and re-activate the optional software. For more information about activating/deactivating the software, refer to the supplement shipped with the software.

3.6 BACKING UP/RETRIEVING THE SYSTEM DATA BASE

The following sections provide instructions for backing up or retrieving the system data base to/from a diskette. These instructions assume you are currently loading software on the system and have booted the system with an Installation Utility diskette.

NOTE: During normal system operation, you can back-up/retrieve the system data base using the Data Base Store and Data Base Retrieve functions on the Disk Utilities menu. For more information about the Disk Utilities menu, refer to the System Administrator's Guide.

3.6.1 Backing Up the System Data Base

To back-up the system data base, follow these steps.

1. Access the Installation Utilities menu (Figure 3.1).
2. Insert a high-density diskette into the floppy drive.
3. Type **3** and press **Return**. The Disk Utilities menu appears (Figure 3.3)

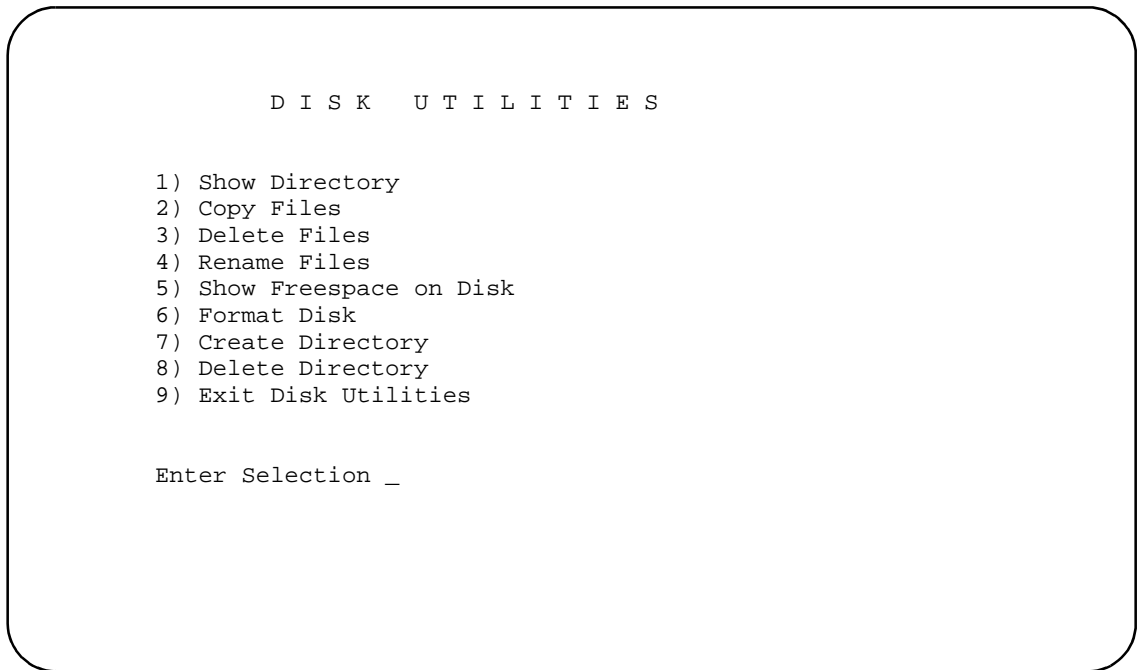


Figure 3.3: Disk Utilities Menu

4. a. If the diskette is already formatted, go to Step 7.
b. To format the diskette, type **6** and press **Return**. The following message appears:
Enter disk device to be formatted: _
5. Type **A:** and press **Return**. The following message appears:
All data will be lost on disk device A:, proceed <Y/N>? _
6. Type **Y** and press **Return**.
7. When the formatting complete, type **2** and press **Return**. The following message appears:
Enter file to be copied:
8. Type **C:/DBASE/*.tbl** and press **Return**. The following message appears:
Enter target file:
9. Type **A:** and press **Return**. When all files are copied, the Disk Utilities menu appears (Figure 3.3).
10. To return to the Installation Utilities menu, type **9** and press **Return**.
11. Remove the diskette, containing the backed up system data base, and refer to *Section 3.4* to incrementally install V3.3 FSR06 or an optional SDS/VCO software package, respectively.

3.6.2 Retrieving the System Data Base

To retrieve the data base from a diskette (A:), follow these steps.

NOTE: To avoid destroying important changes to the data base, make sure that the data contained on the diskette is the most current version available.

1. Access the Installation Utilities menu (Figure 3.1).
2. Insert the diskette containing the backed up data base tables into the floppy drive.
3. Type **3** and press **Return**. The Disk Utilities menu appears (Figure 3.3).
4. Type **2** and press **Return**. The following message appears:

Enter file to be copied:

5. Type **A:/*.tbl** and press **Return**. The following message appears:

Enter target file:

6. Type **C:/DBASE** and press **Return**. When all files are copied, the Disk Utilities menu appears (Figure 3.3).
7. To return to the Installation Utilities menu, type **9** and press **Return**.

NOTE: After retrieving the system data base, you must reboot the SDS/VCO from the hard disk to activate new data base tables. Rebooting the system disrupts in-progress calls and disables the SDS/VCO for several minutes.

Section 4

KNOWN DESIGN CONSTRAINTS

4.1 INTRODUCTION

Summa Four has identified and evaluated design constraints in the Generic V3.3 FSR06 software, firmware and hardware. This section provides explanations and, where applicable, workarounds for design constraints in the areas that follow:

- System Configuration Utilities
- Special Redundant Systems Considerations
- Installation of Software Options
- Cards Asserting DID on Communications Bus
- T1 Trunk Card Support
- Digit Collection
- Inpulse Rule Processing
- Resource Group Processing

4.2 SYSTEM CONFIGURATION UTILITIES

The following information applies to system configuration changes performed via the system administration interface.

4.2.1 Peripheral Configuration Utility

The Peripheral Configuration utility allows users to define the communication parameters of the local and remote system administration interfaces. Users must be careful to match the communication parameters (keyboard type, baud rate, etc.) to the requirements of the equipment arrangement that you are using. If the configuration stored in the data base does not match these equipment or communication characteristics, the system cannot recognize keystrokes from the interface and system administration cannot be performed.

If this type of mismatch occurs, try the following steps:

- Modify the communication parameters at the interface end to match the configuration data stored in the SDS/VCO data base.
- Log into the SDS/VCO through another interface and modify the settings in the Peripheral Configuration screen. For example, if system administration is blocked on the Local TTY interface, log into the SDS/VCO remotely and change the settings.

If system administration access remains blocked on the interface, contact Summa Four Technical Support at 1-800-9SUMMA4.

4.2.2 U609110001 Cannot Blank Out NFS Server Name

It is not currently possible to blank out the NFS Server Name when NFS File access is disabled.

4.3 SPECIAL REDUNDANT SYSTEMS CONSIDERATIONS

The information that follows applies to redundant SDS-1000 systems only.

4.3.1 Software Exceptions on System Controller

In the unlikely event a software exception (such as a bus exception or address exception) occurs on the active system controller, the Alarm Arbiter Card remains unaware of the problem for up to 5 seconds before initiating a system switchover which may cause a loss in the voice path during that time. During that 5 second delay, a system outage occurs before switchover to the standby controller takes place. Stable calls are not torn down during this delay and will be on the Standby side. While this type of event could greatly impair system performance, a software exception on the active controller is an extremely rare occurrence.

4.4 INSTALLATION OF SOFTWARE OPTIONS

When an SDS/VCO software option (i.e. TeleRouter, etc.) is installed on a system, the installation process makes changes to the non-volatile RAM (NVRAM) on the CPU. This characteristic makes operation of software options specific to the CPU on which they were installed. For this reason:

- Software options must be installed on both system controllers in a redundant system
- Software options must be reinstalled if the CPU is replaced; although the data base information resides on the hard disk, a system with a new CPU is unable to access this information

Because of the reliability of the CPU, failures requiring replacement are very rare.

4.5 CARDS ASSERTING DID ON COMMUNICATIONS BUS

A Device Identification (DID) signal is asserted on the Communications Bus by a card to request initialization from the NBC. Under normal conditions, the card is initialized by the NBC and comes into service.

If the card fails to initialize, it continues to assert DID on the Communications Bus and its green LED is lit. This condition occurs when one of the scenarios below is true. The corrective action for each case is also listed below.

- A card in the backplane does not come into service (possible card failure). Remove any Out of Service cards from the backplane.
- A card is inserted into a slot that does not have a card defined for it in the system data base. Remove the card from the backplane or define that card using the system administration Card Maintenance utility.
- A card is inserted into a slot and connected to the backplane, but is defined as an incorrect card type in the data base. Remove the card and replace it with the correct type or update the card definition in the data base in the system administration Card Maintenance utility.
- A card is marked as Out of Service in the Card Maintenance Utility. Change the card status or remove the card.

Note that the normal operating state of NBCs, DTGs, and BRCs in Standby mode is for their green LEDs lit. It is good system practice to remove any Out of Service card from the backplane to optimize system performance and further guard against the conditions above.

For more information on the Card Maintenance utility, refer to the *System Administrator's Guide*. For more information on removing cards from the backplane, refer to the *Maintenance Manual*.

4.6 T1 TRUNK CARD SUPPORT

The information that follows applies to systems equipped with T1 cards.

4.6.1 Slip Conditions in T1-Channel Service Unit (CSU) Connections

T1 slips are known to occur if the T1 port is connected to a Channel Service Unit (CSU) and the current timing source is Internal or Incoming. Slips should be less than 255 in a 24-hour period. If they exceed this threshold, a minor system alarm is set and a FRM114 message is output to the printer and system logfile. The message identifies the location of the T1 card which has exceeded the slip limit. If this condition occurs, contact Summa Four Technical Support. For information on setting the timing source, refer to the *System Administrator's Guide*.

4.6.2 SLIP Counts in Card Display Only Updated After 10 Seconds

SLIP counts for T1 cards are updated every 10 seconds on the Card Display. When a T1 card is displayed, the SLIP count will not be accurate for the first 10 seconds until the information is updated. Once this period is complete, the fields will be updated with the correct count and maintained properly thereafter.

4.7 DIGIT COLLECTION

The following information applies to DTMF/MF digit collection. The type of collection (DTMF or MF) is specified where necessary.

4.7.1 Optimum DTMF Digit Timing (8-Port DTMF Cards Only)

DTMF receivers are optimized to detect digits with a 60ms on/off time (60ms of tone, followed by 60ms of quiet). As the digit on/off times decrease, digits within a collection string may be missed, resulting in erroneous digit collection reports. This condition applies to DTMF Receiver Card (DRC) service circuits, as well as the on-board receivers on SLIC-2, DID-2, and UTC-2 interface cards. Users should contact their network service provider(s) to determine the digit timing on circuits connected to the SDS/VCO.

4.7.2 Digit Collection Using Reenter/Clear Character (8-Port DTMF Cards Only)

When a one- or two-digit Reenter Character is used for DTMF digit collection with the 8-Port DTMF card, the first digit that follows that character must have an on/off time of at least 55ms. If timing of this first digit is less than 55ms it may not be detected by the SDS/VCO.

4.7.3 U412204829/TR 4829 TIM FDIG 15 On DRC-24/48

The DRC-24/48 does not support a first digit timeout of 15 seconds.

4.8 INPULSE RULE PROCESSING

The following information applies to values for Inpulse Rule tokens.

4.8.1 Timer Variations

In V3.3 all timers specified in seconds can vary in length up to $\pm 1/2$ second. This variation affects the Inpulse Rule tokens TIM FIELD, TIM FDIG, TIM INTER, and WAIT TIME in addition to all timers set in the DTMF Digit (\$67) standard/enhanced and Speech Collection Control (\$6E) commands and segments. This behavior is most pronounced when the timer is set to a value of 1 or 2 seconds.

4.9 RESOURCE GROUP PROCESSING

4.9.1 Inserting a Port Into a Resource Group

Changes to resource group configurations during call processing are not recommended. Inserting a port into a group during call processing may temporarily prevent ports from being hunted from that group. Commands that attempt to hunt from the group are returned with a \$1F (no available port in resource group) Network Status byte until the system resets the port data pointers.

Resolution

If ports must be added to a group during call processing, this condition can be avoided by adding the ports to the end of the resource group and changing the group's hunt type setting to "Rotary" while the ports are added.

Section 5

KNOWN FUNCTIONAL CONSTRAINTS

5.1 INTRODUCTION

Summa Four has identified and evaluated functional constraints in the Generic V3.3 FSR06 software, firmware, and hardware. This section provides explanations and, where applicable, workarounds for functional constraints in the areas that follow:

- System Administration (General)
- System Configuration Utilities
- Special Redundant Systems Considerations
- Disk Operations
- T1 Trunk Card Support
- Digit Collection
- Inpulse/Outpulse Rule Processing
- Call Processing
- Command/Report Processing
- ISDN Issues
- Initialization
- Miscellaneous Card Issues
- Timing
- Connecting to Modems
- TeleRouter Issues
- Drop and Insert Card

5.2 SYSTEM ADMINISTRATION (GENERAL)

The following information applies to system administration performed via the System Administration console.

5.2.1 TR 2425 Card Maintenance Screens

The keys **Prev Screen** and **Next Screen** on the system administration keypad let you page back and forth through the card listing on the Card Maintenance screen. However, if the last screen is not filled with card listings and you press **Prev Screen**, only the last twenty cards are displayed.

Resolution

Continue to press **Prev Screen** until all of the cards in the data base are displayed.

5.2.2 U408094642/TR 4642 Printing Detailed Database Causes Console Keyboard To Lock

Printing a detailed database report may cause the Console keyboard to lock up or turn off. This seems to occur while printing the Host Configuration or NFAS Configuration. However, when the problem occurs, the SDS/VCO continues to process calls normally.

5.2.3 U507315154/TR 5154 Trace Files Do Not Close

Trace files do not close at the end of the calendar day. Currently, trace files close only when tracing is disabled. This means that when tracing is enabled, and the data changes, the trace data continues to be added to the previous date's trace file.

5.2.4 U512010004 "Message Too Long" Error Message

With an Ethernet host, if the link goes down during a command being sent to the switch, it can result in an incomplete message transmission. Now after the link is restored and a valid command is sent, it will concatenate with the previous incomplete message and will give the error message "Message Too Long." All subsequent commands will give the same error until you reset the link at the switch side.

5.3 SYSTEM CONFIGURATION UTILITIES

The following information applies to system configuration changes performed via the system administration interface.

5.3.1 U301063881/TR 3881 Selective Tracing Does Not Work Properly

Selective tracing does not work properly in the System Trace Configuration screen. When "Selected" ports is enabled and only one or two ports are specified for that card, trace data is output for all the ports on that card.

5.3.2 U411304788/TR 4788 Viewing Software Configuration On Floppy Disks

Use of the Software/Firmware Configuration screen with floppy diskettes (device A:) does not produce consistent results and should be avoided.

Resolution

To view the contents of a floppy diskette, use the Disk Utilities Show Directory function.

5.3.3 U701150003 New Ethernet Address Reverts to Original

When the Ethernet Network configuration screen is exited after a change and then re-entered, the "New address on boot" is not displayed upon re-entry. Instead, the existing address is displayed.

5.4 REDUNDANT SYSTEMS CONSIDERATIONS

The information that follows applies to redundant SDS/VCO systems only.

5.4.1 U507195130/TR 5130 Side A/B Log File Creation

When either side of an SDS/VCO system operating in redundant mode fails or is reset, that side initially identifies itself as A side STBY. At a certain phase of the reboot initialization, that side determines its true identity (either A or B) and its mode of operation (Standby or Active). The identity of the side determines the name of the log to which logging information is written. Therefore, during the initialization phase of the reboot, logging information will be written to the A log even if the true identity of the reboot side is B.

5.4.2 U507315155/TR 5155 Host File Is Copied With Database

When the system copies a database from a floppy to the standby side and/or to another system, the host file is also copied to the same Ethernet file on all systems. The result is that the side that the database was copied to will have an incorrect IP address.

5.4.3 U512040001 Problem on System Switchover

If a user changes the mode on a 4xT1 card on the active side of a system from Active to Maintenance and then to Out Of Service, the same mode will occur on the standby side. If the user then changes the 4xT1 back to active mode on the active side, the card stays in maintenance mode on the standby side, causing calls to be cut off if the system switches from the active to the standby side.

Resolution

If the user changes the mode of the system on the active side from Out Of Service to Active to Maintenance and then back to Active again, the standby side will change from Maintenance to Active.

5.4.4 U610160004: Standby Side Does Not Detect Loss of Host Connection

Loss of a host connection on the Standby side does not reset the Host Configuration Alarm to ON. However, the loss is recorded in the log file and on the screen.

5.5 DISK OPERATIONS

The information that follows applies to actions involving the Disk Utilities.

5.5.1 U409224673/TR 4673 Database Utility Covers File Access Errors

If an error occurs in the disk operation when a user uses the Data Base Store or Data Base Retrieve commands (under File Utilities), no warning is displayed to indicate that all files may not have been copied correctly.

5.5.2 U505035026/TR 5026 Formatting A Floppy During Reboot

Attempting to format a floppy while a card is being downloaded causes the SDS/VCO to reboot with the error "FRM506: Fatal Processing Error Due To - ALM002: Network Manager Failure (SA)."

Resolution

Wait until all cards have downloaded before using the SDS/VCO to format a floppy.

5.5.3 U507055099/TR 5099 Crash Dump Not Printing To Logfile

During a fatal alarm, the printer gets reset by the AAC, so that the last page of information going to the printer gets lost. A complete dump is available in the logfile.

5.6 T1 TRUNK CARD SUPPORT

The information that follows applies to systems equipped with T1 cards.

5.6.1 TR 2448 T1 Cards In Maintenance Mode Report OOS

Any carrier alarm, OOF or SLIP will cause a T1 card to place itself in Maintenance mode. When this occurs, a Card Status (\$D9) report will be generated containing a byte indicating the card's current mode. If the transition to Maintenance mode was performed automatically by the T1 (and not via the system administration console), the status byte in the report will indicate OOS rather than Maintenance mode. This is done to inform the user the transition was performed automatically and not by system administration (in which case the status byte will indicate Maintenance mode).

Resolution

When the alarm clears, the host will be notified when the card is back in service.

5.6.2 U410064690/TR 4690 DRC48 μ -Law Collection Problems

When a four-span card is set to A-law and then converted to μ -law, the system experiences a noisy voice path and digit collection problems.

5.6.3 U504215003/TR 5003 Noise When Connecting Call on 4xT1

When using a 4xT1, you may observe noise as a new port connects to a call. The problem is more noticeable if SLIC-2 or UTC-2 cards are used for incoming calls and the 4xT1 is used for outgoing calls.

5.7 DIGIT COLLECTION

The following information applies to DTMF/MF digit collection. The type of collection (DTMF or MF) is specified where necessary.

5.7.1 TR 2274 Single Digit Collections (8-Port DTMF Cards Only)

Using single digit end flags while performing DTMF digit collection may result in misplaced or unreported digits. The receiver requires processing time to detect a digit string, report the string to the generic software, and then reset itself for another collection. Collecting single digits as start/end designators between larger strings can result in missed digits because the DTMF receiver does not have sufficient time to reset before the next digit is entered. This situation can be aggravated when the digit timing does not match the optimum timing of 60ms of tone followed by 60ms of quiet. DRC 24/48 port cards function properly.

Resolution

Collect and store incoming DTMF digits as a single digit string. Digit fields 1 through 4 can store up to 40 digits; the ANI field can store up to 20 digits. Digit strings are reported to the host in either a DTMF Digit (\$D1) report or as a segment in an Inpulse Rule Complete (\$DD) report. Using these reports, the host application can parse digit strings into their functional groups, as required.

5.7.2 U307154089/TR 4089 END CHAR Is Not Stored In Field If Only Digit

When only an END CHAR is dialed, it is not displayed in the IFLD. In all other cases, the END CHAR is present at the end of the dialed digits in the IFLD.

5.7.3 U507315157/TR 5157 Garbled MF Digit Reports Not Sent To Host

In V3.3, MF Digit (\$D0) reports indicating garbled digits are not sent to the host when the Inpulse Rule performing the collection contains the reporting control tokens REP EACH or REP NEXT. An Inpulse Rule Complete (\$DD) report is sent informing the host that the Inpulse Rule was aborted, but no subsequent \$D0 report is sent. All other conditions that produce an Inpulse Rule to abort will generate an additional report explaining the cause. If the reporting control token REP END is used in the Inpulse Rule, then the \$DD report will correctly contain a \$D0 segment indicating that the MF digits were garbled.

When an Inpulse Rule using a REP EACH or REP NEXT token performing MF digit collection aborts without generating an additional report, assume that the digit collection was garbled.

5.8 INPULSE/OUTPULSE RULE PROCESSING

The following information applies to values for Inpulse Rule tokens.

5.8.1 U507315158/TR 5158 SPEAK Token Processing

When an Inpulse Rule with a SPEAK token as the last token in the rule is called from an Outpulse Rule, the voice prompt is aborted before it can complete.

Resolution

This problem is easily corrected by adding a WAIT TIME token of any duration immediately after the SPEAK token.

5.9 CALL PROCESSING

5.9.1 U308174105/TR 4105 Seized Ports not Shown as Active and Do Not Clear

Ports that are seized out do not show as active on the Card Display screen until they transfer to stable state.

5.9.2 U407064606/TR 4606 DASS Ports Stuck in MAINT-NE State

DASS ports may become stuck in a MAINT_NE state.

5.9.3 U410264726/TR 4726 After Switchover SLIC OGT Keeps Ringing

If a SLIC ICT is telerouted to SLIC OGT, and the SLIC OGT is ringing during a switchover, the SLIC OGT will not stop ringing when the SLIC ICT goes back on hook.

5.9.4 U412014797/TR 4797 DASS Ports Getting Stuck in CP_GARD

When there are two inbound DASS2 pipes (30 ports each with the first 15 in and the second 15 out), the ports on the second pipe (used when all 15 ports in the first pipe are busy) may become stuck in CP_GARD. If this condition persists and the CO tears down layer 3, the ports become unusable and no inbound calls are sent.

5.9.5 U503284968/TR 4968 Disconnect Fails Unless Port Goes Through Stable

A voice path must be established between incoming and outgoing ports (both ports are CP_STAB) in order for those ports to successfully disconnect.

5.9.6 U505085035/TR 5035 Multiple Ethernet Host and High Load Crashes System

Using an Ethernet SDS/VCO Host interface with up to four hosts and high loads may cause the system to fail. Higher loads may support even fewer host connections.

5.9.7 U505115041/TR 5041 Interval Between Seizure and Wink

One of the fields in Trunk Timing configuration is the Wink Send. For E1, this is the time period of the delayed dial signal. Tests have shown that this is about 60ms as opposed to the 30ms stated in the specifications.

5.9.8 U508295233/TR 5233 Bus Error Crash with Bad CP_TABLE Index

There have been occurrences of a system reset characterized by a CP_TABLE Index error.

5.9.9 U511130007 Problem with \$91 RLS Address

The rack-level-slot (RLS) address code in the \$91 command does not work. The command is sent out to the system, the SDS/VCO returns a network status byte of 01, but another \$91 report with a network status byte of 4B (\$91 Command Processing Complete), is never returned. The command sent was ddf 0000 91 01 01 14 00 00 00 00 01 00 01.

5.9.10 U601090001: Possible Ethernet Failure in Gateway Connections

Under heavy load conditions, remote host applications connected to the SDS/VCO through a gateway may cause Ethernet subsystem failures. Remote Telnet sessions connected to the administration console will not cause these failures.

Resolution

We recommend placing your host in the same LAN segment of the network as the system.

5.9.11 U608230001: Gateway Routing Does Not Work with Class A or B Networks

The Gateway routing implementation was designed to support Class C type networks, which are more common than Class A and Class B types.

Resolution

Class A and B networks will work if your host and the system are in the same LAN segment of the network.

5.9.12 U612190002 Cyclic Mode Call Distribution Problem

When the switch distributes a call it originates in cyclic mode it is to a different host; in broadcast mode it is sent to all hosts. In both cases the controlling host should be established by the \$6A command that caused to call to be originated.

5.10 COMMAND/REPORT PROCESSING

The following information applies to all host-issued commands and received reports.

5.10.1 U406284589/TR 4589 ADLC Polling Protocol Errors Corrupt Messages

ADLC polling protocol errors are causing messages to be corrupted during poll timeout times and cause messages to not be retransmitted.

5.10.2 U410184717/TR4717 Erroneous \$DA Report for Incoming Call with COS A2

When an incoming call with COS A2 is torn down by a host command and the seized port is on-hook, a \$DA report is generated instead of \$DB report.

5.10.3 U505105037/TR 5037 SIT Tone Detection Failure

The SIT tone for the North American DTG and CPA for V3.3 is not reported correctly. The SIT tone (4C8) is reported as Dial Tone in the \$DA reports.

5.10.4 U507315159/TR 5159 Appending Digits Via The \$67 Command

When appending an odd number of digits to a field which already contains an odd number of digits, the last digit of the first string and the first digit of the last string are lost. Two zeros are added to the end of the string to provide the correct number of digits.

Resolution

To avoid this condition, use two digit fields for digit storage instead of appending digits to an existing field.

5.10.5 U507315160/TR 5160 Number Of Digits To Collect (\$67 Command)

The \$67 command can be used to collect up to 40 digits; the number of digits to collect is specified in the Digit Collection Control (byte offset 9) byte. Command processing does not currently check this value to verify that the number is less than 40. If a number greater than 40 is specified, the SDS/VCO will attempt to collect 40 digits; the command is not rejected with a Network Status byte value of \$2C, as would be expected.

Resolution

Specify 40 or less in the Digit Collection Control byte.

5.10.6 U507315161/TR 5161 Inpulse Rule Complete (\$DD) Report Processing

In V3.3, a \$DD generated when an Inpulse Rule aborts due to a CPA exhaust condition does not correctly specify the cause for the abort. The report indicates that the rule aborted because no Outpulse channels were available (T = 1 in the Inpulse Rule/DVC Port byte offset 10). The CPA exhaust condition is identified, however, by a Resource Allocation (\$D6) report that specifies a resource limitation for the CPA resource group.

5.10.7 U510052001 Second \$67 Command Not Rejected

A second \$67 command is not rejected in the following scenario:

A normal ISDN call is established from a virtual port to an outgoing port which is looped back to an incoming port. The path from the virtual port to the outgoing port is stable and the incoming port is in CP_SETUP.

A \$67 command is sent to attach a DTMF receiver to the incoming port. The \$67 command retains the receiver and sets an eight second first digit timer. When the generic reports that the command was successful (network status byte = 01), a second identical command is sent to the switch. This command also comes back with a network status byte of 01. Since a DTMF receiver is already attached to the incoming port, the second \$67 command should be reported with a failure in the network status byte.

5.10.8 U510270002 \$66 Doesn't Reject Virtual Ports

The \$66 command strips off the high five bits in the 2-byte port address. For example, connecting the virtual port in A address, 80b8 (1000 0000 1011 1000) will turn into address 00b8 (xxxx x000 1011 1000) and connect it if it is a valid port address.

5.10.9 U510270003 Error in \$6a Command with 67e Segment

When a \$6a command with a \$67e segment attached is sent to collect zero digits, the command is sent back from the switch with a network status byte of \$2C which indicates that more than 20 digits were specified for collection. The definition of the \$2C command will be changed to indicate that an invalid number of digits was specified, either too few or too many.

5.10.10 U511130011 \$91 Non-existing Library

When a \$91 command is used to upload a non-existing library, the system responds with a \$91 report with a network status byte of 01, "command successful", and nothing else. There should be another \$91 report with a network status byte of 4C, "\$91 processing error encountered".

5.10.11 U511140003 Inconsistent Network Status

When a short \$C0 02 command is sent to the system, the network status byte that is returned is inconsistent. It is returned as 03, 23, or 01. The command sent is ddfd 0000 c0 02.

5.10.12 U511140004 Error in \$C0 03 Command

If a short \$C0 03 command is sent to the SDS/VCO, the network status byte that is returned is inconsistent. It comes back with a network status byte of "03" and "01". It should come back with a network status byte of "03". The command that was sent to the SDS/VCO was ddfd 0000 c0 03.

5.10.13 U511140005 Error in \$C0 05 Command

Sending a \$C0 05 command to the SDS/VCO with a port address of \$07FF, returns a network status of 23, but according to the documentation, this should be a valid port. Using a port address of \$8100 should be an invalid port, but the command returns with a network status byte of 11, which indicates that the port is idle, but should not be. Also, the documentation says that the valid range of the port address is \$0000 to \$07FF. The first port address of the switch is \$0008, not \$0000.

5.10.14 U511150003 Error in \$61-72 Command

When a \$6A-72 command is sent to the SDS/VCO with a supervision code of 00, the SDS/VCO returns this command with a network status byte of 01, "Command Successful." The SDS/VCO should return this command with a network status byte of 03, "Syntax Error in Command", if the command is built following the *Programming Reference*. A network status byte of 01 is also returned if the supervision code is FF.

5.10.15 U511150004 Error in \$91 Command

If a \$91 command is sent to the SDS/VCO with the RLS address of the DVC, and the system attempts to upload or download prompts, the command is returned with a network status byte of 01. This command should be returned with an error.

5.10.16 U511210001 First Digit Timer Gets Fired

If a \$67 command is sent to collect one digit with the first digit timer set, the digit is collected and is reported by a \$D1 report. If another \$67 is sent to collect 16 digits, the timer from the first \$67 expires soon afterward and generates another \$D1 report. Now if the user enters the digits for the second \$67, none of them will be reported. The first \$67 is followed by a \$D1 which reported a digit. The receiver and all the timers should have been reset at this point. Now, if the digits are entered soon after the second \$67, but before the FDIG timer from the first \$67 gets fired, all the digits are reported.

5.10.17 U611200010 \$6D Does Not Support Full System Port Capability

The \$6D command byte 7 offset specifies the number of ports used in a conference. The system can support up to eight 2-way conferences or up to seven 2-way conferences combined with as many 1-way ports as are available to the system. However, the command supports values only up to 0F for the byte 7 offset.

Resolution

To control more than fifteen ports with a \$6D command, issue subsequent \$6D commands.

5.11 ISDN ISSUES

The following functional constraints apply to PRI and PRI/N ISDN configurations.

5.11.1 U401054297/TR 4297 ISDN Ports Remain in DISC_REQ State

If phantom-to-DASS port calls are set up and torn down periodically for all the ports on a card, the DASS ports may become stuck in a CP_GARD, NORMAL, DISC_REQ state. If this happens to only a few ports on a card (some ports remain idle), incoming call attempts from the PSTN fail such that no indication of the call is received. The caller will eventually hear a "number out of order" message. Outgoing calls from the SLIC connect but the DASS ports remain in a CP_WTSUP, O_INITED state.

5.11.2 U410194718/TR 4718 PRI/N In A NFAS Group

If a PRI/N card in a NFAS group is configured to use the NTI interface, the initial service messages are not sent.

Resolution

Compatibility is not guaranteed when configuring PRI or PRI/N with the NTI interface in an NFAS group.

5.12 INITIALIZATION

5.12.1 U311104202/TR 4202 System Sends \$DC Report Too Early

After a warm start, the system sends a (\$DC) report to start call processing before IPRC prompt downloading is complete.

Resolution

Users can use the feature flag and not start call processing until the SDS/VCO receives a command from the host (\$C0 04) to send that command when the IPRC transitions from "M" to "A".

5.13 MISCELLANEOUS CARD ISSUES

5.13.1 U409124662/TR 4662 UTC Firmware Causing T1 INIT Code F Error

The UTC firmware does not initialize the serial port in order to disable it. This might cause T1 INIT CODE F errors. We recommend that all firmware be checked to make sure that the serial port is disabled.

5.13.2 U507195126/TR 5126 A2 SLIC Stuck in CP_OUTPULSE

A SLIC will permanently go into a CP_OUTPULSE if an A2 SLIC goes onhook even momentarily before a call is routed to it. Subsequently, no hook flashes are reported for the SLIC.

5.13.3 U507195133/TR 5133 Taking BRC OOS Causes DRC-2 Internal Error

Changing the state of a BRC from Active to Out of Service, will cause a DRC-2 internal error (FRM: 200) and the green light on the front panel to turn on.

5.13.4 U508225210/TR 5210 Multiple DRC 24/48s in System Must Use Same Firmware Version

A watchdog failure was observed during a warm CPU reset on a DRC48 running V3.08 firmware, during which a second DRC48 with V3.07 firmware, also reported a watchdog failure. Apparently, the generic responds to the first failure by broadcasting a command which resets the DSP on all DRC24/48 cards in the system, thereby causing all of them to report a watchdog failure. The generic should direct the command only to the card that originally reported the failure.

Resolution

Customers must upgrade all cards in the system to the same firmware version. Those who run DRCs with V3.07 and V3.08 firmware may experience the problem described in TR5210.

5.13.5 U512010001 IPRC PCM Limit Option

The PCM limit option from the IPRC card configuration does not work. The PCM limits works like a volume control—the range is 0-255, 0 being the loudest and 255 being the softest. However, configuring the IPRC within these ranges has no effect on the volume.

5.13.6 U512080001 IPRC Stops Playing Prompts

During periods of heavy traffic, the IPRC stops playing prompts.

5.14 TIMING

5.14.1 U501104865/TR 4865 CODERR When Timing Is Incoming PRI

The SDS/VCO will report a CODERR when alarms are created or cleared on a PRI card with primary timing.

5.15 CONNECTING TO MODEMS

5.15.1 U407124613/TR 4613 Connecting A Modem To The MODEM/TTY

When connecting a modem to the Modem/TTY port on the SDS/VCO serial port 2/TTY01, the modem must be configured for 8 Data Bits/Char. If the modem is configured for 7 Data Bits/Char, the SDS/VCO cannot be accessed remotely.

Also, the configuration of the remote terminal must match the Modem/TTY baud rate, parity, and stop bit parameters displayed on the SDS/VCO Peripheral Configuration screen.

5.16 TELEROUTER ISSUES

5.16.1 U606030001 Access of TeleRouter Routes

When a Routing screen is displayed which shows all of the routes in that table, you cannot access the last two routes. The “D” and “C” commands give an “Invalid Route” error. The “T” command finds “No Match” even though the screen does display the route and pattern.

Resolution

Add the patterns “FFFE” and “FFFF” to the end of the Route Table.

5.16.2 U606120002 A to Hex 41 Conversion

If you use host commands \$6A or \$69 to Output pulse digits when 4th column DTMF is enabled, and the host command outputs “A” digits, ISDN converts “A”s to hex 41 (upper case A) in the ISDN IA5 digit string. TeleRouter translates the 41 as equal to a 1, instead of an “A”. Calls from the line card with “A” digits become 61 in the ISDN called number IE. TeleRouter sees them as “A”s and routes them correctly.

5.16.3 U606120003 Zero to A Conversion

If you use host commands \$6A or \$69 to output pulse digits when 4th column DTMF is enabled, zeros are converted to “A”s and TeleRouter fails to route on zeros as it should. There are no problems with digit strings coming in from the line card through a port.

5.17 INTERNATIONAL ISSUES

5.17.1 U505105038/TR 5038 Reorder Tone is Not Reported/Detected (UK)

The Call Progress Analyzer (CPA) in use in the UK does not detect the Reorder Tone from the Dial Tone Generator (DTG).

5.17.2 U505105048/TR 5048 Chile CPA Does Not Detect Any Tones

The Chile Call Progress Analyzer (CPA 8.51) used with the Dial Tone Generator (DTG 1.02) does not detect Dial, Busy, Ring, and Congestion tones, and reports CPA Internal Errors (Code 44).

5.17.3 U505155052/TR 5052 Finland CPA Does Not Detect Tones

The Finland Feature Package (CPA 8.70 with DTG FW V1.00) does not detect tones. All tones are detected as Voice Detect and Voice Cessation.

5.17.4 U505165056/TR 5056 Colombia DTG Does Not Output Digits

The Colombia Dial Tone Generator (DTG V1.00) used with Call Progress Analyzer (CPA V8.70) does not Output digits.

5.17.5 U505255068/TR 5068 Colombia CPA Does Not Detect Reorder Tone

The Colombia CPA (V19.02) detects the REORDER TONE only 40% of the time. SPECIAL REORDER TONE is not detected at all.

5.17.6 U510200001 Impulse Rule Problem for MFCR2

An MFCR2 call using Impulse and Outpulse rules does not work correctly. When MFCR2 digits are outpulsed, the Impulse rule does not collect the digits correctly. The first field that is outpulsed is collected correctly as BNUM, but when the category is outpulsed, the Impulse rule collects the second digit of the BNUM field, but does not report it correctly. The last field outpulsed is not seen or collected correctly either. The same scenario noted above using HOST messages works. This problem was seen in Mexico and New Zealand.

5.18 DROP AND INSERT CARD ISSUES

5.18.1 U701230003 Internal Message length Error

Occasionally during a switchover from active to standby (or when a card is pulled from the rack), the error message FRM373: D+I Internal Message Length Error, RLS 1 1 14 FRM102: CARD MSG - RLS 1 1 13 04 14 prints.

5.18.2 U704070002 Drop and Insert Card in DTE Mode Can Slip

When a port is configured for DTE operation, the port uses the received clocks to transmit data as well as receive data. Since the received clocks may not be locked to the SDS/VCO system clock, the transmit and receive data paths are subject to data slips.

Resolution

Configure the Drop and Insert Card to DCE mode.

Appendix A

REPLACING PROMS AND PLDs

A.1 INTRODUCTION

This appendix describes the procedures for installing new firmware and programmable logic in circuit cards. Firmware is shipped in the form of programmable read only memory (PROMs), dual in-line packages (DIPs), integrated circuits (ICs) for through-hole mounting, and plastic leaded chip carriers (PLCC) for surface mount.

Programmable logic is shipped in the form of programmable logic devices (PLDs), DIPs for through-hole mounting, and PLCCs for surface mount.

PROMs are labelled with configuration data which should be checked against the firmware requirements contained in Section 2 prior to installation. PLDs are labelled with their LP identification number.

Instructions for removing and replacing through-hole PROMs and PLDs appear in Section A.2.; refer to Section A.3 for instructions on removing and replacing surface mount PROMs and PLDs.

A.2 REMOVING AND REPLACING THROUGH-HOLE PROMS and PLDs

The following sections provide information on removing and replacing through-hole PROMs and PLDs.

NOTE: Refer to the appropriate technical description for the physical locations of the PROMs and PLDs on each circuit card.

A.2.1 Removing Through-Hole PROMs and PLDs

To remove a through-hole PROM or PLD, follow these steps.

1. If the circuit card is currently installed in the system, follow the removal and replacement procedures in the appropriate technical description. Be sure to also locate affected circuit cards kept as spares.

CAUTION: Observe antistatic precautions near system circuit cards. Wear a ground strap connected to the system's equipment frame whenever servicing or cleaning circuit cards (ground points are indicated by labels on the system front).

2. Remove the PROM to be replaced from the circuit card. Use a PROM removal tool to grasp the integrated circuit and pull it straight up and away from the socket.

CAUTION: Avoid using devices such as screwdrivers to remove PROMs. These devices can damage PROM pins and scratch the circuit card.

3. Remove the PROM chip from the shipping package. Refer to Section 2 to verify that the label on the chip matches the software requirements.

A.2.2 Replacing Through-Hole PROMs and PLDs

To replace a through-hole PROM or PLD, follow these steps.

1. Before installing the new chip, verify that its pins are all evenly spaced and vertically aligned. If necessary, align the IC pins properly prior to installation. To align the pins, you can either use a commercially available pin-straightener tool, sized for a 28-pin DIP device, or you can lay the PROM or PLD on its side and gently press the top *edge*, being careful not to press on the pins (Figure A.1). Repeat this procedure for the other row of pins.

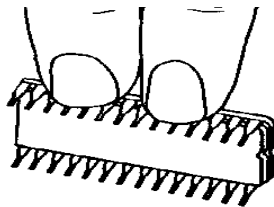


Figure A.1: Aligning PROM or PLD Pins

2. Orient the PROM or PLD chip so that the notch in the chip (Figure A.2) faces the notch on the circuit card.

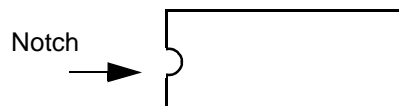


Figure A.2: Notch Orientation for Integrated Circuit

3. Carefully insert the pins on one side of the PROM or PLD chip into holes on the correct side of the socket (see Figure A.3).

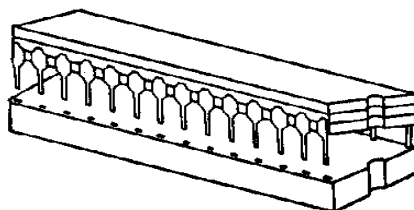


Figure A.3: Inserting Pins in One Side of Socket

4. Insert the pins on the other side of the PROM or PLD chip into holes on that side of the socket (see Figure A.4).

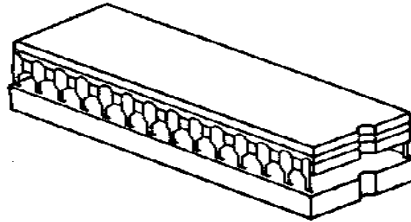


Figure A.4: Inserting Pins in Other Side of Socket

NOTE: If the pins are not aligned with the socket holes, remove the PROM or PLD chip and straighten the pins (see Step 1). After realigning the pins, repeat Step 2 through Step 4.

5. Carefully examine all the pins on the PROM or PLD chip. Be sure that none of the pins are bent or touching one another.
6. With all of the pins inserted into the socket holes, apply gentle and even pressure to the top of the chip until it is fully seated in the socket.
7. Reinstall the circuit card in the system or return the card to spares stock.

A.3 REMOVING AND REPLACING SURFACE-MOUNT PROMs and PLDs

The following sections provide information about removing and replacing surface-mount PROMs and PLDs.

CAUTION: Make sure you use the proper tool to remove surface mount PROMs and PLDs, or you may damage the board.

NOTE: Refer to the appropriate technical description for the physical locations of the PROMs and PLDs on each circuit card.

A.3.1 Removing Surface-Mount PROMs and PLDs

To remove a surface-mount PROM or PLD, follow these steps.

1. If the circuit card is currently installed in the system, follow the removal and replacement procedures contained in the appropriate technical description. Be sure to also locate affected circuit cards kept as spares.

CAUTION: Observe antistatic precautions near system circuit cards. Wear a ground strap connected to the system equipment frame whenever servicing or cleaning circuit cards (ground points are indicated by labels on the system front).

2. Use the surface-mount chip removal tool, provided by Summa Four, to remove the PROM or PLD that is to be replaced on the circuit card. To remove the PROM or PLD chip:
 - a. Spread or compress the tool legs so the tongs fit into the slots of the chip carrier socket.
 - b. Insert the tool tongs into the slots of the socket, and push firmly so that the tool butts on the socket.
 - c. Place the thumb and forefinger on the tool's grip. Squeeze the thumb and forefinger together to remove the chip from the socket.
3. Remove the PROM or PLD chip from the shipping package. Refer to Section 2 to verify that the label on the chip matches the software requirements.

A.3.2 Replacing Surface-Mount PROMs and PLDs

To replace a surface-mount PROM or PLD, follow these steps.

1. Before installing the new PROM or PLD, verify that the pins are all evenly spaced and properly aligned. If necessary, use tweezers to carefully align the IC pins prior to installation.
2. Align the notch or chamfered edge on the PROM or PLD to the silkscreened dot on the circuit card (see Figure A.5).

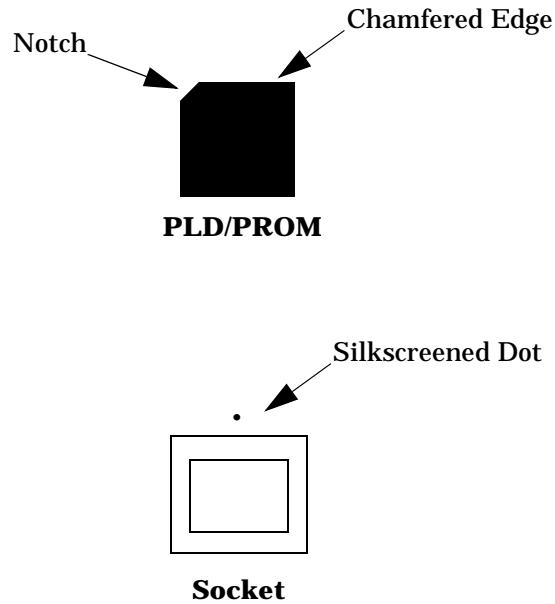


Figure A.5: PLD Alignment

3. With all pins aligned to the pins of the socket, apply gentle, even finger pressure to the top of the chip until it is fully seated in its socket. This completes the installation of the surface mount chip.
4. With all the pins inserted into the socket, apply gentle and even pressure to the top of the chip until it is fully seated in the socket.
5. Reinstall the circuit card in the system or return the card to spares stock.

