Lucent Technologies
Bell Labs Innovations

DEFINITY
Enterprise Communications Server
Release 6
Installation and Maintenance for
Survivable Remote EPN

Notice
Every effort was made to ensure that the information in this book was complete and accurate at the time of printing. However, information is subject to change.

Your Responsibility for Your System's Security
Toll fraud is the unauthorized use of your telecommunications system by an unauthorized party, for example, persons other than your company's employees, agents, subcontractors, or persons working on your company's behalf. Note that there may be a risk of toll fraud associated with your telecommunications system and, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

You and your system manager are responsible for the security of your system, such as programming and configuring your equipment to prevent unauthorized use. The system manager is also responsible for reading all installation, instruction, and system administration documents provided with this product in order to fully understand the features that can introduce risk of toll fraud and the steps that can be taken to reduce that risk. Lucent Technologies does not warrant that this product is immune from or will prevent unauthorized use of common-carrier telecommunication services or facilities accessed through or connected to it. Lucent Technologies will not be responsible for any charges that result from such unauthorized use.

Lucent Technologies Fraud Intervention
If you *suspect that you are being victimized* by toll fraud and you need technical support or assistance, call Technical Service Center Toll Fraud Intervention Hotline at 1 800 643-2353.

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

Part 68: Network Registration Number. This equipment is registered with the FCC in accordance with Part 68 of the FCC Rules. It is identified by FCC registration number AS593M-13283-MF-E.

Part 68: Answer-Supervision Signaling. Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 Rules. This equipment returns answer-supervision signals to the public switched network when:
- Answered by the called station
- Answered by the attendant
- Routed to a recorded announcement that can be administered by the CPE user

This equipment returns answer-supervision signals on all DID calls forwarded back to the public switched telephone network. Permissible exceptions are:
- A call is unanswered
- A busy tone is received
- A reorder tone is received

Canadian Department of Communications (DOC) Interference Information
This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

Le Présent Appareil Nomérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A préscrites dans le reglement sur le brouillage radioélectrique édicté par le ministére des Communications du Canada.

Trademarks
See the preface of this document.

European Union Declaration of Conformity
The "CE" mark affixed to the DEFINITY® equipment described in this book indicates that the equipment conforms to the following European Union (EU) Directives:
- Electromagnetic Compatibility (89/336/EEC)
- Low Voltage (73/23/EEC)
- Telecommunications Terminal Equipment (TTE) i-CTR3 BRI and i-CTR4 PRI

For more information on standards compliance, contact your local distributor.

Comments
To comment on this document, return the comment card at the front of the document.

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Purpose

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About This Document

Purpose

The Survivable Remote Expansion Port Network (SREPN)

This book provides installation and maintenance procedures for technicians installing and maintaining the Survivable Remote Expansion Port Network (SREPN).

The SREPN provides EPN (either MCC or SCC) service to the customer when the link to the main R6r processor fails or is broken, or when the R6r processor or center stage fails. SREPN is a disaster recovery operation rather than as an additional reliability option.

The Survivable Remote Processor (SRP) is a TN790-based processor complex collocated with the remote EPN cabinet. The SRP and its EPN cabinet are connected with fiber optic cabling.

shows the main connections for the Survivable Remote EPN hardware.

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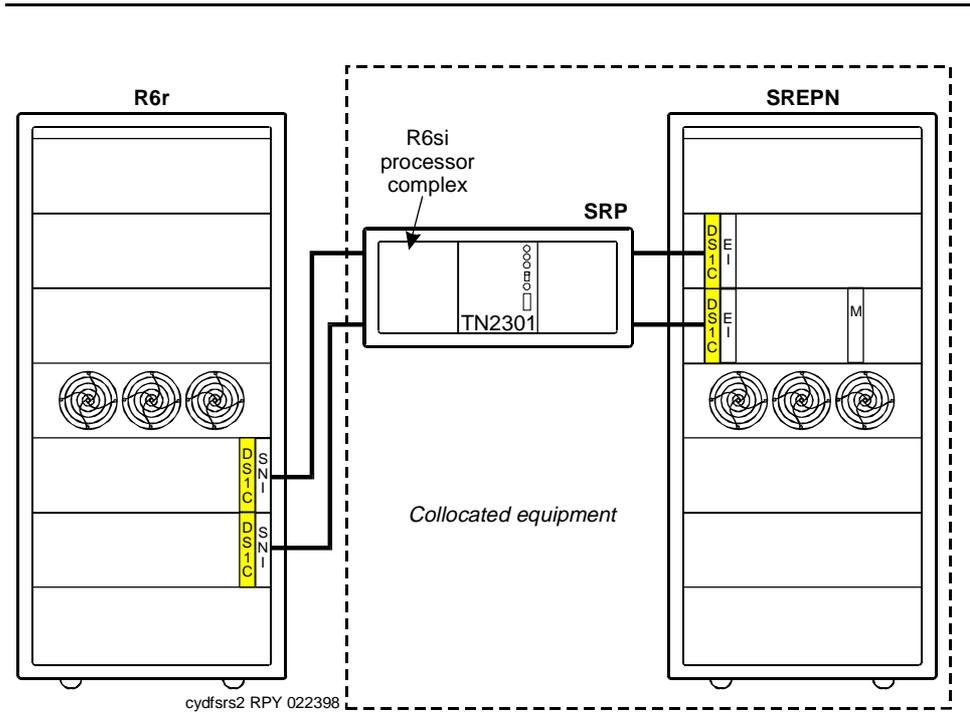
Figure 1.   Typical Survivable Remote EPN hardware connections

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Features not supported

Table 1 lists the features that are not supported by SREPN.

Table 1.   Features not supported by SREPN

AAR	Demand Print
Audible Message Waiting	Digital Multiplexed Interface
Audio Information Exchange (AUDIX) Interface	Distributed Communications System
Call Charge Information	Enhanced DCS
Call Detail Recording	Extension Number Portability
Call Management System	External Device Alarming
CallVisor Adjunct Switch Application Interface	Flexible Billing
Centralized Attendant Service	Inbound Call Management
Customer-Provided-Equipment Alarm	Inter-PBX Attendant Service (IAS)
DCS	Intraflow and Interflow
DCS Alphanumeric Display for Terminals	Look-Ahead Interflow
DCS Attendant Control of Trunk Group Access	Look-Ahead Routing
DCS Attendant Direct Trunk Group Selection	Messaging Server Interface
DCS Attendant Display	Node Number Routing
DCS Automatic Callback	Private Network Access
DCS Automatic Circuit Assurance	Property Management System Interface
DCS Busy Verification of Terminals and Trunks	QSIG
DCS Call Coverage	QSIG Call Forwarding (Diversion)
DCS Call Forwarding	QSIG Call Transfer
DCS Call Waiting	QSIG Name and Number Identification
DCS Distinctive Ringing	QSIG Path Replacement (ANF-PR)
DCS Leave Word Calling	QSIG Transit Counter (ANF-TC)
DCS Multiappearance Conference/Transfer	Reason Codes
DCS Over ISDN-PRI D-channel	Uniform Dial Plan
DCS Trunk Group Busy/Warning Indication	Voice Response Integration

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Intended audience

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Intended audience

The information in this book is intended for use by:

- Installation or maintenance technicians dispatched to a DEFINITY System site to either install the SREPN equipment or in response to a trouble alarm or a user trouble report

- A maintenance technician located at a remote maintenance facility

- The user's assigned maintenance technician. The technician is expected to have a knowledge of telecommunications fundamentals and of the DEFINITY Enterprise Communications Server Release 6 Systems to the extent that the procedures in this book can be performed, in most cases, without assistance.

This book is not intended to solve all levels of troubles. It is limited to troubles that can be solved by using the Alarm Log, Error Log, trouble-clearing procedures, maintenance tests, and traditional troubleshooting methods. If the trouble still has not been resolved, it is the responsibility of the maintenance technician to escalate the problem to a higher level of technical support. Escalation should conform to the procedures in the *Technical and Administration Escalation Plan*.

- Chapter 1, "SREPN Installation" covers the upgrade path and installation instructions for the Survivable Remote EPN equipment.

- Chapter 2, "SREPN Maintenance" covers the trouble isolation, repair, and reset of the Survivable Remote EPN system.

Conventions used

This document uses the following typographic conventions:

- Information you type at the management terminal is shown in the following typeface: **list system-parameters maintenance**

- Information displayed on the management terminal screen is shown in the following typeface: login

- Keyboard keys are shown in the following typeface: Enter.

The following conventions describe the systems referred to in this document.

- The word *system*, is a general term encompassing Release 6 and includes references to the DEFINITY Enterprise Communications Server.

- Systems in this book are called: Release 6, R6r, and R6si.

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■ Circuit pack codes (such as TN790B or TN2182B) are shown with the minimum acceptable alphabetic suffix (like the "B" in the code TN2182B).

The alphabetic suffix of the circuit pack is very important in the Survivable Remote equipment configuration. And, not every *vintage* of either the minimum or a higher suffix code is necessarily acceptable.

⇒ NOTE:
Refer to *Technical Monthly: Reference Guide for Circuit Pack Vintages and Change Notices*, for current information about the usable vintages of specific circuit pack codes (including the suffix) in a Release 6 system.

■ DEFINITY Enterprise Communications Server is abbreviated as DEFINITY ECS.

Admonishments used in this book are as follows:

⚠ CAUTION:
This sign is used to indicate possible harm to software, possible loss of data, or possible service interruptions.

⚠ WARNING:
This sign is used where there is possible harm to hardware or equipment.

⚠ DANGER:
This sign is used to indicate possible harm or injury to people.

Safety precautions

When performing maintenance or translation procedures on the system, users must observe certain precautions. Observe all caution, warning, and danger admonishments to prevent loss of service, possible equipment damage, and possible personal injury. In addition, the following precautions regarding electromagnetic interference (EMI) and static electricity must be observed:

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Security issues

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Electromagnetic interference

This equipment generates, uses, and can radiate radio frequency energy. Electromagnetic fields radiating from the switch may cause noise in the customer's equipment, called electromagnetic interference (EMI). If the equipment is not installed and used in accordance with this installation and maintenance book, radio interference may result.

⚠ WARNING:
To maintain the EMI integrity of the system, maintenance personnel must ensure that all cabinet panels, covers, and so forth, are firmly secured before leaving the customer's premises.

Static electricity

To prevent or reduce electrostatic discharge (ESD), always attach a wrist grounding strap before working on switch components or handling circuit packs.

⚠ CAUTION:
Electrostatic discharge can damage or destroy circuit packs containing integrated circuits (ICs).

The ESD wrist strap, cable assembly, and spare fuses are packed in a plastic bag and placed in the top of the system cabinet. Use the ESD wrist strap when troubleshooting, performing maintenance, or handling any circuit packs.

Security issues

A number of matters concerning maintenance are affected by security issues. For details, be sure to consult the *BCS Products Security Handbook*, 555-025-600.

⚠ CAUTION:
Login security is an attribute of the DEFINITY® Enterprise Communications Server (ECS) Release 6 software.

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Standards compliance

The equipment presented in this document complies with the following (as appropriate):

ITU-T (Formerly CCITT)	ANSI	Australia AS3260
ECMA	FCC Part 15 and Part 68	IEC 825
ETSI	EN55022	IEC950
IPNS	EN50081	UL 1459
DPNSS	EN50082	UL1950
National ISDN-1	CISPR22	CSA C222 Number 225
National ISDN-2	Australia AS3548 (AS/NZ3548)	TS001
ISO-9000		

Electromagnetic compatibility standards

This product complies with and conforms to the following:

- Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment, EN55022 (CISPR22), 1993

- EN50082-1, European Generic Immunity Standard

- FCC Parts 15 and 68

- Australia AS3548

    $\Longrightarrow$ **NOTE:**
    The system conforms to Class A (industrial) equipment; voice terminals meet Class B requirements.

- Electrostatic Discharge (ESD) IEC 1000-4-2

- Radiated radio frequency field IEC 1000-4-3

- Electrical Fast Transient IEC 1000-4-4

- Lightning effects IEC 1000-4-5

- Conducted radio frequency IEC 1000-4-6

- Mains frequency magnetic field IEC 1000-4-8

- Low frequency mains disturbance

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The system conforms to the following:

- Electromagnetic compatibility General Immunity Standard, part 1; residential, commercial, light industry, EN50082-1, CENELEC, 1991

- Issue 1 (1984) and Issue 2 (1992), Electrostatic discharge immunity requirements (EN55024, Part 2) IEC 1000-4-2

- Radiated radio frequency field immunity requirements IEC 1000-4-3

- Electrical fast transient/burst immunity requirements IEC 1000-4-4

European Union standards

Lucent Technologies Business Communications Systems declares that the DEFINITY equipment specified in this document bearing the "CE" mark conforms to the European Union Electromagnetic Compatibility Directives.

The "CE" (Conformité Europeénne) mark indicates conformance to the:

- European Union Electromagnetic Compatibility Directive (89/336/EEC)

- Low Voltage Directive (73/23/EEC)

- Telecommunication Terminal Equipment (TTE) Directive (91/263/EEC)

- i-CTR3 Basic Rate Interface (BRI) and i-CTR4 Primary Rate Interface (PRI) as applicable.

The "CE" mark is applied to the following Release 6 products:

- Global AC powered Multi-Carrier Cabinet (MCC)

- DC powered Multi-Carrier Cabinet (MCC) with 25-Hz ring generator

- AC powered Single-Carrier Cabinet (SCC) with 25-Hz ring generator

- AC powered Compact Single-Carrier Cabinet (CSCC) with 25-Hz ring generator

- Enhanced DC Power System

Trademarks and Service Marks

The following are trademarks or registered trademarks of Lucent Technologies:

- 5ESS™, 4ESS™

- AUDIX®

- Callvisor®

- Callmaster®

- CentreVu™

- CONVERSANT®

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- DEFINITY®
- DIMENSION®
- MERLIN®
- VOICE POWER®

The following are trademarks or registered trademarks of AT&T:

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- DATAPHONE®
- MEGACOM®
- MULTIQUEST®
- TELESEER®

The following are trademarks or registered trademarks of other companies:

- Ascend® (registered trademark of Ascend, Inc.)
- Audichron® (registered trademark of the Audichron Company)
- MS-DOS® (registered trademark of the Microsoft Corporation)
- MicroChannel® (registered trademark of IBM Systems)
- MULTIQUEST® (registered trademark of Telecommunications Service)
- PagePac® (trademark of the Dracon Division of the Harris Corporation)
- UNIX® (trademark of the Novell Corporation)

Related documents

DEFINITY ECS Release 6 — Maintenance for R6r, 555-230-126

Provides details of maintenance architecture, testing and troubleshooting, craft commands, and maintenance objects and interpreting system error codes.

DEFINITY ECS Release 6 — Maintenance for R6vs/si, 555-230-127

Provides details of maintenance architecture, testing and troubleshooting, craft commands, and maintenance objects and interpreting system error codes.

DEFINITY ECS Release 6 — System Description Pocket Reference, 555-230-211

Provides hardware descriptions, system parameters, listing of hardware required to use features, system configurations, and environmental requirements. This compact reference combines and replaces Release 6 *System Description and Specifications* and Release 6 *Pocket Reference*.

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DEFINITY ECS Release 6 — Administration and Feature Description, 555-230-522

Provides descriptions of system features. Also provides step-by-step procedures for preparing the screens that are required to implement the features, functions, and services of the system. Includes the applications and benefits, feature interactions, administration requirements, hardware requirements, and procedures for voice terminal, data module, and trunk group administration.

DEFINITY ECS Release 5 — Installation and Test for Single-Carrier Cabinets, 555-230-894

Provides procedures and information for hardware installation and initial testing of single-carrier cabinets.The Release 5 version of this document applies to Release 6 as well.

This document is available in the following languages: English, German (DE), Dutch (NL), Brazilian Portuguese (PTB), European French (FR), Castillian Spanish (SP), Italian (IT), Russian (RU), and Japanese (JA). To order, append the language suffix to the document number; for example, 555-230-894DE for German. No suffix is needed for the English version.

DEFINITY ECS Release 6 — Installation and Test for Multi-Carrier Cabinets, 555-230-112

Provides procedures and information for hardware installation and initial testing of multi-carrier cabinets.

BCS Products Security Handbook, 555-025-600

Provides information about the risks of telecommunications fraud and measures for addressing those risks and preventing unauthorized use of BCS products. This document is intended for telecommunications managers, console operators, and security organizations within companies.

Federal Communications Commission statement

Part 68: Statement

Part 68: Answer-Supervision Signaling. Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 rules. This equipment returns answer-supervision signals to the public-switched network when:

- Answered by the called station
- Answered by the attendant
- Routed to a recorded announcement that can be administered by the CPE user

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This equipment returns answer-supervision signals on all DID calls forwarded back to the public-switched telephone network, with these exceptions:

- A call is unanswered

- A busy tone is received

- A reorder tone is received

This equipment is capable of providing users access to interstate providers of operator services through the use of access codes. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.

This equipment complies with Part 68 of the FCC Rules. On the rear of this equipment is a label that contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company. The REN is used to determine the number of devices connected to the telephone line. Excessive RENs on the telephone line may result in devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed 5.0. To be certain of the number of devices that can be connected to a line, as determined by the total RENs, contact the local telephone company.

NOTE:
REN is not required for some types of analog or digital facilities.

Means of connection

Connection of this equipment to the telephone network is shown in the following table.

Manufacturer's Port Identifier	FIC Code	SOC/REN/ A.S. Code	Network Jacks
Off/On Premises Station	OL13C	9.0F	RJ2GX, RJ21X, RJ11C
DID Trunk	02RV2-T	0.0B	RJ2GX, RJ21X
CO Trunk	02GS2	0.3A	RJ21X
CO Trunk	02LS2	0.3A	RJ21X
Tie Trunk	TL31M	9.0F	RJ2GX
1.544 Digital Interface	04DU9-B, C	6.0P	RJ48C, RJ48M
1.544 Digital Interface	04DU9-BN, KN	6.0P	RJ48C, RJ48M
120A2 Channel Service Unit	04DU9-DN	6.0P	RJ48C

If the terminal equipment (DEFINITY® System) causes harm to the telephone network, the telephone company may notify you in advance that temporary

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discontinuance of service is be required. But if advance notice is not practical, the telephone company may notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice so you can make the necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment or for repair or warranty information, please contact the Technical Service Center at 1-800-248-1234. If the equipment causes harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

It is recommended that repairs be performed by Lucent Technologies-certified technicians.

The equipment cannot be used on public coin phone service provided by the telephone company. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission, or corporation commission for information.

This equipment, if it uses a telephone receiver, is hearing aid compatible.

How to order documentation

In addition to this book, other description, installation and test, maintenance, and administration books are available. A complete list of DEFINITY books can be found in the *Business Communications System Publications Catalog*, 555-000-010.

This document and any other DEFINITY documentation can be ordered directly from the Lucent Technologies Business Communications System Publications Fulfillment Center toll free at 1-800-457-1235 (voice) and 1-800-457-1764 (fax). International customers should use 317-322-6791 (voice) and 317-322-6849 (fax).

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How to comment on this document

Lucent Technologies welcomes your feedback. Please fill out the reader comment card found at the front of this manual and return it. Your comments are of great value and help improve our documentation.

If the reader comment card is missing, FAX your comments to 1-303-538-1741 or to your Lucent Technologies representative, and mention this document's name and number, *DEFINITY Enterprise Communication Server Release 6 Installation and Maintenance for Survivable Remote EPN,* 555-233-102.

Where to call for technical support

Region	Phone Number
Streamlined Implementation (for missing equipment)	1-800-772-5409
Technical Service Center (INADS Database Administration)	1-800-248-1111
Asia/Pacific Regional Support Center	65-872-8686
Western Europe/South Africa/Middle East	441-252-774-800
Eastern/Central Europe	361-345-4334
ITAC	1-303-804-3777
Latin/Central America & Caribbean	1-303-804-3778

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Check customer's order

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SREPN Installation

<div style="text-align: right; font-size: 100px; font-weight: bold;">1</div>

Check customer's order

Check the customer's order and the shipping packing lists to confirm that all equipment is present. If any equipment is missing, report this to your Lucent Technologies representative.

Correcting shipping errors

1. Red-tag all defective equipment and over-shipped equipment and return according to the nearest Material Stocking Location (MSL) instructions. For international customers, contact your order service agent.

2. Direct all short-shipped reports to the nearest MSL. Contact the appropriate location for specific instructions. For Streamlined Implementation in the United States, call 1-800-772-5409.

Unpack and inspect

READ THIS FIRST!

⚠️ CAUTION:
A fully loaded system weighs approximately 48 lbs (22 kg). Use lifting precautions.

1. Verify the equipment received. See Figure 1-1. Actual equipment may vary in appearance and may ship in separate packages.

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2. Refer to Table 1-1 through Table 1-7 for a list of Survivable Remote Processor (SRP) and Expansion Port Network (EPN) parts and comcodes.

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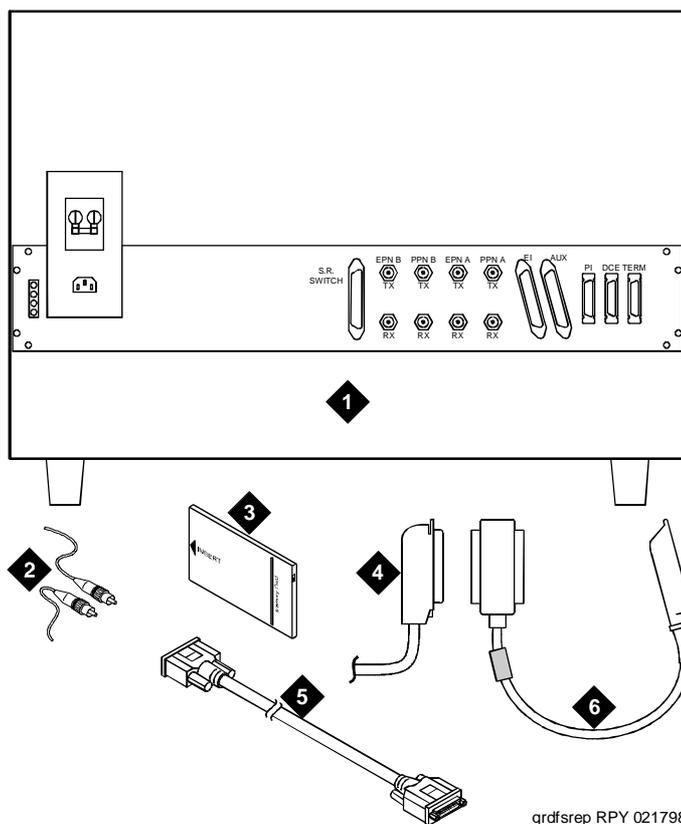
Figure Notes

1. SRP cabinet (rear view)

2. Fiber optic cables (2 sets for standard/high reliability and 4 sets for critical reliability)

3. Translation card

4. B25A 25-pair (Group 300) cable

5. RS-232 cable

6. S.R. switch to EI 14-inch (35.5 cm) Y cable

Figure 1-1.   Equipment packed with the SRP cabinet

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Table 1-1.   Basic SRP parts list

Comcode	Description	Quantity
J58890L-2 List 30	SRP cabinet	1
108136474	TN2301 survivable remote switch circuit pack	1
108230624	TN570C expansion interface circuit pack	1
106577422	TN777B network controller circuit pack	1
103557435	TN790 processor circuit pack	1
107784019	TN2182B tone clock-tone detector and call classifier circuit pack	1
848101440	S.R. switch to EI 14-inch (35.5 cm) Y cable	1
----------------	RS-232 cable - connects between the SRP cabinet and the management terminal	1
105455109	Large retainer clips to hold the transceivers to the rear of the EPN (upgrades only)	2 for standard/high 4 for critical

Table 1-2.   Optional SRP parts list

Comcode	Description	Quantity
103557310	TN778 packet control circuit pack	1
106689516	TN771D maintenance/test circuit pack (used only with the TN778 packet control circuit pack)	1
103557187	TN765 processor interface circuit pack	1

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Table 1-3.   Required EPN parts list

Comcode	Description	Quantity
106696081	TN570C expansion interface circuit pack	1
105533756	TN1654 DS1CONV circuit pack	1
108187170	TN775C maintenance circuit pack (Needed if one is not already there)	1

Table 1-4.   Optional EPN parts list

Comcode	Description	Quantity
107089922	TN750C announcement circuit pack[1]	1

1.   Announcements can only be saved to the TN750C flash memory and announcements should not be saved to the SRP translations.

Table 1-5.   Required Release 6r parts list

Comcode	Description	Quantity
105533756	TN1654 DS1CONV circuit pack[1]	1
107737934	TN573B SNI circuit pack[2]	1
847245750	14-inch (35.5 cm) Y cable	1
847245768	or 70-inch (177.8 cm) Y cable	

1.   Replaces the TN574 circuit pack.
2.   Needed if the TN574 circuit pack is replaced with the TN1654 circuit pack.

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Table 1-6.   Parts list for DS1CONV configurations

Comcode	Description	Quantity
106455348	9823A fiber optic transceiver	2 for standard/high 4 for critical
847245776	DS1CONV Y cable	1 for standard/high 2 for critical
407439975 multi-mode 407598358 single mode	50-foot (15.2 m) fiber optic cable - connects between the SRP cabinet and an EPN	2 for standard/high 4 for critical
846301075	50-foot (15.2 m) B25A 25-pair (Group 300) cable	3

Table 1-7.   Parts list for direct fiber configurations

Comcode	Description	Quantity
106455348	9823A fiber optic transceiver	1 for standard/high 2 for critical
106455363	9823B fiber optic transceiver (if multi-mode fiber is longer than 4900 feet (1493.5 m))	1 for standard/high 2 for critical
107731853	300A fiber optic transceiver (if single mode fiber installation)	1 for standard/high 2 for critical
104266523 multi-mode 407598358 single mode	50-foot (15.2 m) fiber optic cable - connects between the SRP cabinet and an EPN	2 for standard/high 4 for critical
846301075	50-foot (15.2 m) B25A 25-pair (Group 300) cable	3

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Install the SRP cabinet

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Install the SRP cabinet

> **NOTE:**
> The expansion port network (EPN) appears in this document as either a Multi-Carrier Cabinet (MCC) or Single-Carrier Cabinet (SCC).

Connect cabinet ground

For cabinet installation, earthquake protection, power, and ground information, refer to *DEFINITY Enterprise Communications Server Release 6 Installation and Test for Single-Carrier Cabinets*, 555-230-894. The SRP needs a dedicated power source.

Connect cables to the SRP

The TN2301 survivable remote switch circuit pack is located in slot 7 of the SRP cabinet. Fiber optic transceivers are attached to the TN2301 circuit pack. Fiber cables are connected from these transceivers to the TX and RX connectors on the rear of the cabinet.

> **NOTE:**
> Always connect a fiber cable from a TX connector to an RX connector and vice versa.

Do not connect the cables to the EPN until you reach the "Replace EPN circuit packs and make cable connections" section.

Depending on the customer's configuration, refer to one of the following sections for connecting fiber cables to the SRP:

- Connect SRP fiber cables for standard/high reliability
- Connect SRP fiber cables for critical reliability

Connect SRP fiber cables for standard/high reliability

1. Connect the equipment as shown in Figure 1-2.
2. Go to the "Connect the SRP and management terminal" section.

Connect SRP fiber cables for critical reliability

1. Connect the equipment as shown in .
2. Go to the "Connect the SRP and management terminal" section.

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Connect cables to the SRP

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cydfsdsa RPY 030998
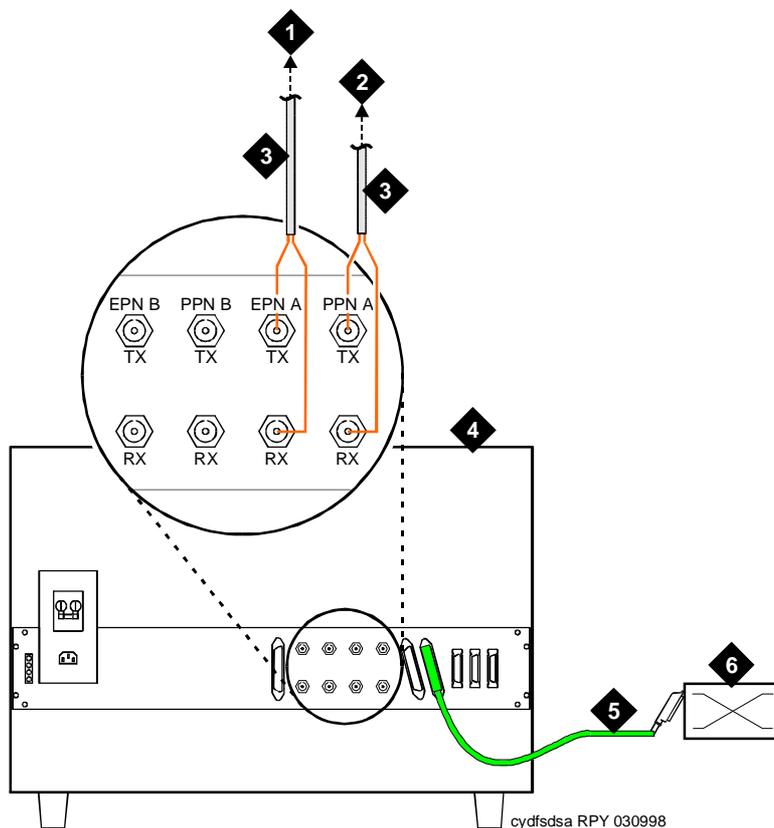
Figure Notes

1. To EPN A

2. To Port Network Connectivity (PNC) A

3. Fiber optic cable

4. SRP cabinet

5. B25A 25-pair cable

6. Main Distribution Frame (MDF)

Figure 1-2.   SRP fiber cables for standard/high reliability

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cydfaepn RPY 030998
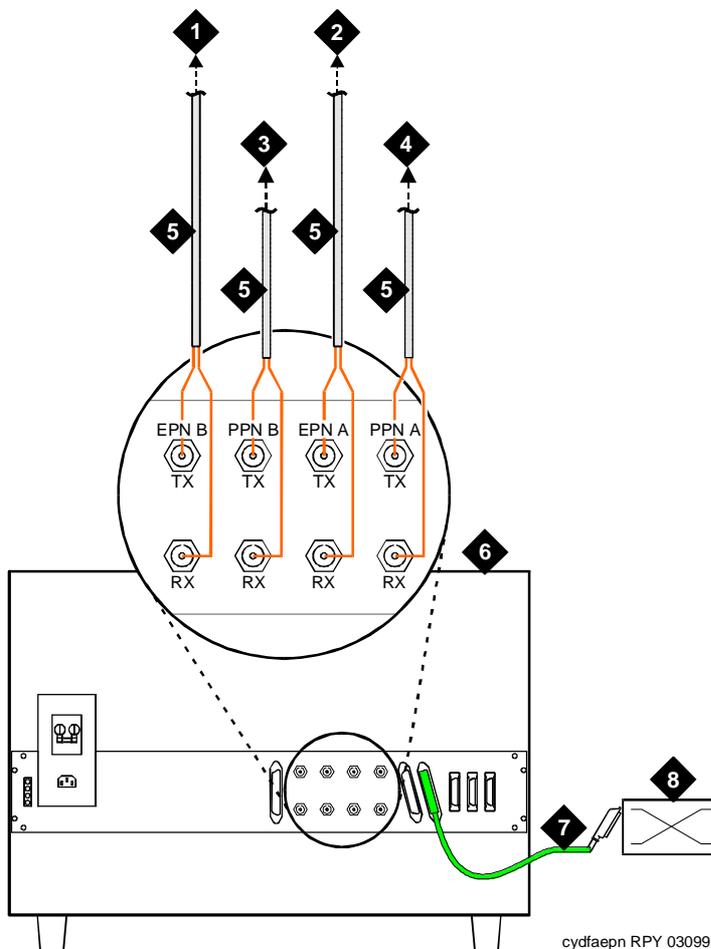
Figure Notes

1. To EPN B

2. To EPN A

3. To Port Network Connectivity (PNC) B

4. To Port Network Connectivity (PNC) A

5. Fiber optic cable

6. SRP cabinet

7. B25A 25-pair cable

8. Main Distribution Frame (MDF)

Figure 1-3.   SRP fiber cables for critical reliability

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Connect the SRP and management terminal

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Connect the SRP and management terminal

1. See Figure 1-4 for SRP and management terminal connections.

scdfsre2 RPY 030398
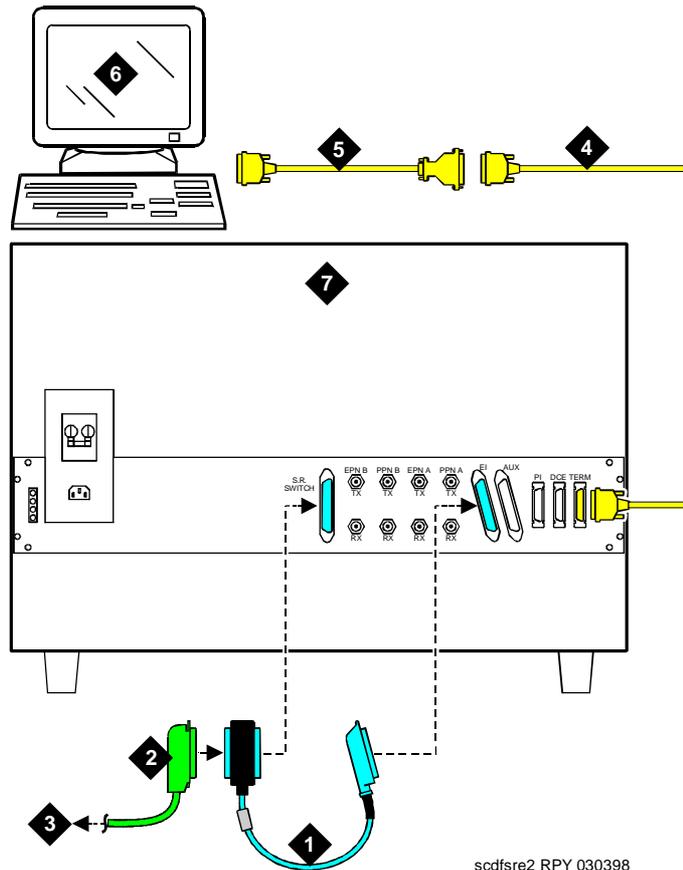
Figure Notes

1. 14-inch (35.5 cm) Y cable

2. B25A 25-pair cable

3. To Main Distribution Frame (MDF)

4. RS-232 cable

5. RS-232 null modem cable (to COM2 connector)

6. 715 BCS-2 management terminal

7. SRP cabinet

Figure 1-4.   SRP and management terminal connections

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MDF connections

1. Punch down the following wires at the MDF. See Table 1-8.

Table 1-8.   110 block cross-connect pins

SRP Aux			EPN Aux		
Color[1]	Cross-Connect Pin Number		Cross-Connect Pin Number	Color	
G-V	46		3	W-O	

SPR Aux			SRP Switch		
Color	Cross-Connect Pin Number		Cross-Connect Pin Number	Color	
W-O	3		46	G-V	
V-G	45		23	BK-O	

EPN Aux			SRP Switch		
Color	Cross-Connect Pin Number		Cross-Connect Pin Number	Color	
O-W	4		24	O-BK	
W-G	5		47	V-BR	
W-BR	7		48	BR-V	
V-BL	41		41	V-BL	
BL-V	42		42	BL-V	
V-G	45		43	V-O	
G-V	46		44	O-V	

1.   The following wire colors apply to this table:

   W = White, BL = Blue, O = Orange, G = Green,
   BR = Brown, BK = Black, V = Violet

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Power up the SRP

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Power up the SRP

1. At the rear of the SRP, set the circuit breaker to **ON**. This starts the system initialization and test.

Administer the Release 6r and SRP

> **NOTE:**
> This documentation assumes that the Release 6r management terminal and the SRP management terminal are located in the same room. If this is not the case, make the appropriate provisions.

> **NOTE:**
> An "init" login is required to perform the following. Contact the regional CSA (Customer Software Associate) to assign the Offer Category option. Maintenance capabilities to initialize the system and access to either an internal or external modem are the only command options available until the Offer Category option is set.

1. Set the customer options to match the Release 6r options.

> **NOTE:**
> Administering the SRP may take several hours.

> ⚠ **CAUTION:**
> *Do not save announcements to the SRP translation card.*

> **NOTE:**
> Not all administration should be copied directly (Example: coverage paths, abbreviated dial lists, and bridged appearances). These administration items may not be valid if the SRP goes into survival mode.

> **NOTE:**
> The following are examples of the types of administration that need to be added to the SRP. Since configurations and administration varies for every switch, it is not possible to list all of the administration that is needed for your SRP.

2. Set the TN2301 switch to the Restore (RSTR) position during the administration to prevent the cabinet from going into the survive mode.

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Administer the Release 6r and SRP   Page 1-12

Administration of the Release 6r

1. Choose an option and enter the command on the Release 6r management terminal:

   - If changing an existing EPN to an SREPN, enter **change cabinet <number>** (number is the cabinet number of the SREPN).

   - If adding a new EPN as an SREPN, enter **add cabinet <next>** (next gives you the next available number).

2. In the `Survivable Remote EPN?` field, enter **y** and press Enter.

3. In the `Survivable Remote Processor ID` field, add the processor ID of the SRP. The processor ID is located on the display system-parameters maintenance screen on the SRP management terminal.

4. Press Enter.

Administration of the SRP

The first step is to administer the hardware. The next step is to administer the software. Finally, administer any individual features.

Administering the hardware

1. On the Release 6r management terminal, enter **list cabinet** and identify the port network of the SREPN. See Figure 1-5.

```
list cabinet                                                    SPE B

                           CABINET REPORT

No. Type Layout Room     Floor      Building   A     B     C     D     E
1    PPN 5-car  CS_1      1         ABC_DE   PN 01 PN 01 PN 01 SN 01 SN 01
2    EPN 5-car  CS_1      1         ABC_DE   PN 04 PN 04 PN 04 PN 16 PN 16
3    sEPN 5-car CS_1      1         ABC_DE   PN 05 PN 05 PN 05 SN 44 SN 44
4    EPN 5-car  B-32      B         VWX_YZ   PN 06 PN 06 PN 06 SN 07 SN 07
5    EPN 5-car  2-12      2         MNO_PQ   PN 08 PN 08 PN 08 SN 09 SN 09
6    EPN 5-car  E-51      1         VWX_YZ   PN 10 PN 10 PN 10 SN 11 SN 11
```

Figure 1-**5.**   **List cabinet screen**

2. Display the hardware in the SREPN by entering **display circuit-packs <number>** (the port network number of the SREPN).

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3. On the SRP management terminal, enter **change circuit-packs 2**. All the circuit packs displayed on the Release 6r management terminal that are not Release 6r specific (such as packet gateways or DS1CONV) must be added to the SRP. Be sure to add circuit packs to all necessary carriers.

   > **NOTE:**
   > Save often the information you add to the SRP management terminal.

4. Press Enter.

Administering the software

Administration for each of the circuit packs in the SREPN needs to be added to the SRP. For every trunk circuit pack, the trunk administration must be added and for every port on every line circuit pack, the station administration must be added.

Identify and add trunk information

1. On the Release 6r management terminal, enter **list configuration port-network** <**number**> (number of the SREPN port network). Identify the slot numbers of the trunk circuit packs.

2. For each trunk circuit pack on the Release 6r management terminal, enter **display port** <**CCSS01**> (where CCSS01 is the circuit pack and port location of the first port on the trunk circuit pack). The Port Information screen appears. The Identification: field shows the trunk group and member information for that port. (For example, 98/1 means that this port is member 1 of trunk group 98.)

3. Enter **display trunk-group** <**number**> (number is the trunk group member).

4. On the SRP management terminal, enter **add trunk-group** <**number**> (number is the same trunk group number as above).

5. Add all of the trunk group information (displayed on the Release 6r management terminal) to the SRP management terminal.

   > **NOTE:**
   > Remember that the port network numbers differ between the Release 6r and the SRP. On the Release 6r management terminal, the port network that you may be displaying is 5; whereas, on the SRP management terminal, the port network that you are adding circuit packs to is always 2.

6. The Member Assignments screen on the Release 6r management terminal appears. Note the number of the members in the trunk group.

   Are all the ports for that trunk circuit pack members of that trunk?

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- If yes, add the members, press Enter and repeat steps 2-6 for the next trunk circuit pack.

- If no, repeat step 2 for all the ports on the trunk circuit pack that are not accounted for in that trunk group. (For example, if trunk group 98 has only 4 members, which correspond to ports 1 - 4, return to step 2 and enter **display port** <**CCSS05**> to determine the trunk group for port 5.) Then follow steps 3 and 4 with the new trunk group information.

NOTE:

For more information about administering trunks, refer to *DEFINITY Enterprise Communications Server Release 6 Administration and Feature Description*.

Identify and add station information

1. On the Release 6r management terminal, enter **list configuration port-network** <**number**> (number of the SREPN port network). Identify the slot numbers of the line circuit packs.

2. For each line circuit pack on the Release 6r management terminal, enter **display port** <**CCSS01**> (where CCSS01 is the circuit pack and port location of the first port on the line circuit pack). The Port Information screen appears. The Identification: field shows the type of station and its extension for that port.

3. Enter **display station** <**extension**> (extension of the station).

NOTE:

The display command depends on the administration of that port - **display station** for stations, **display data** for data terminals, and so forth.

4. On the SRP management terminal, enter **add station** <**extension**> (extension is the same station extension as above).

5. Add all of the station information displayed on the Release 6r management terminal to the SRP management terminal.

NOTE:

Remember to add any additional system administration that may be needed. (For example, if the station has a coverage path, you need to administer the coverage path.) Some of the administration for the station may not apply if the SREPN goes into survive mode (such as coverage paths, abbreviated dial lists, and bridged appearances).

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6. Repeat steps 2 - 5 for every port on every line circuit pack in the SREPN.

➡ NOTE:

For more information about administering stations, refer to *DEFINITY Enterprise Communications Server Release 6 Administration and Feature Description.*

Identify and add other circuit packs

For circuit packs other than trunk and line, follow the same guidelines.

1. Display each port on the circuit pack and the equipment type displayed on the port information screen.

2. Display the equipment on the Release 6r management teminal and add the information to the SRP management terminal.

Administering the system features

➡ NOTE:

Customer options available to the SRP are the same as those available on the existing Release 6r. These are administered by the regional CSA.

Any differences in features from the Release 6r to Release 6si are experienced in the survivable mode. Refer to the Release 6r and Release 6si feature administration descriptions for further details.

System administration needs to be added to the SREPN including dialplan, system features, system maintenance, system security, feature-access-codes, and so forth. Administer in the same manner as listed above.

1. Display the information on the Release 6r management terminal. (For example, enter **display dialplan**.)

2. Add the information to the SRP management terminal. (For example, enter **change dialplan**.)

Administering the maintenance parameters

Page 1 of the system-parameters maintenance form contains 2 fields that must be administered for the abbreviated alarm report. Figure 1-6 shows the screen with the First OSS Telephone Number: and Second OSS Telephone Number: fields that are administered with offsite notification numbers. The Abbrev Alarm Report? fields associated with these numbers must be set to avoid unnecessary notification calls.

1. Set the two Abbreviated Alarm Report fields to **y** and press Enter.

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```
change system-parameters maintenance                  Page  1 of  3  SPE A
                 MAINTENANCE-RELATED SYSTEM PARAMETERS
OPERATIONS SUPPORT PARAMETERS
          Product Identification: 1010101010
      First OSS Telephone Number: 9~p5380532     Abbrev Alarm Report? y
     Second OSS Telephone Number: 9~p5380533     Abbrev Alarm Report? y
  Alarm Origination to OSS Numbers: both
       Cleared Alarm Notification? y              Suspension Threshold: 5
             Restart Notification? y
           Test Remote Access Port? y
        CPE Alarm Activation Level: none
     Customer Access to INADS Port? y
       Repeat Dial Interval (mins): 7
SCHEDULED MAINTENANCE
                   Start Time: 23 : 00                   Stop Time: 06 : 00
          Daily Maintenance: daily           Save Translation: daily
 Control Channel Interchange: daily   System Clocks Interchange: daily
             SPE Interchange: daily
```

Figure 1-6.   Maintenance-related system parameters screen

Administering the sync source

⇛ NOTE:
Do not administer a trunk on the SREPN as the synchronization source for the Release 6r. If the system goes into the survive mode, the Release 6r loses its sync source.

To administer the sync source for the SRP:

1. On the SRP management terminal, enter **change synchronization**.

2. Enter a trunk on the SRP as the primary sync source.

3. Press Enter.

   #### ⇛ NOTE:
   When the system is in the survive mode, the synchronization of the SRP comes from the trunk. When the system is in the normal mode, the synchronization of the SRP reverts back to the tone clock and causes a sync alarm in the alarm logs of the SRP.

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Replace Release 6r circuit packs

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Saving the administration

1. After entering all the translations on the SRP, enter **save translation**.

2. Return the TN2301 switch to the AUTO position.

Replace Release 6r circuit packs

If the Release 6r has the TN574 DS1CONV circuit pack:

1. Power down the Release 6r.

2. Replace the TN574 DS1CONV circuit pack with the TN1654 DS1CONV circuit pack.

3. Add the TN573B SNI circuit pack.

4. Power up the Release 6r.

Replace EPN circuit packs and make cable connections

1. Power down the EPN.

2. If this is a previously installed EPN, then remove the DS1CONV to EI cable.

3. Install the TN775C maintenance circuit pack.

4. Install the TN570C expansion interface circuit pack.

5. Replace the TN574 circuit pack with the TN1654 DS1CONV circuit pack.

6. Depending on the customer's configuration, refer to one of the following sections:

   - "Connect DS1CONV cables for standard/high reliability"

   - "Connect DS1CONV cables for critical reliability"

   - "Connect direct fiber cables for standard/high reliability"

   - "Connect direct fiber cables for critical reliability"

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Connect DS1CONV cables for standard/high reliability

1. Connect the equipment as shown in Figure 1-7.

2. Power up the EPN.

3. Go to the "Test the SRP" section.

Connect DS1CONV cables for critical reliability

1. Connect the equipment as shown in Figure 1-8.

2. Power up the EPN.

3. Go to the "Test the SRP" section.

Connect direct fiber cables for standard/high reliability

1. Connect the equipment as shown in Figure 1-9.

2. Power up the EPN.

3. Go to the "Test the SRP" section.

Connect direct fiber cables for critical reliability

1. Connect the equipment as shown in Figure 1-10.

2. Power up the EPN.

3. Go to the "Test the SRP" section.

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Figure Notes

1. MCC cabinet

2. EPN carrier A

3. DS1 cable from Port Network Connectivity (PNC) A link

4. DS1CONV 2-foot (60.96 cm) Y cable (Tie wrap the cable to the cabinet.)

5. 9823A transceiver

6. 9823A transceiver on the EI connector

7. B25A 25-pair cable

8. Main Distribution Frame (MDF)

9. Fiber optic cables

10. From the EPN A TX and RX connectors on the rear of the SRP

11. From the PPN A TX and RX connectors on the rear of the SRP

Figure 1-7.   EPN DS1CONV standard/high reliability cable connections

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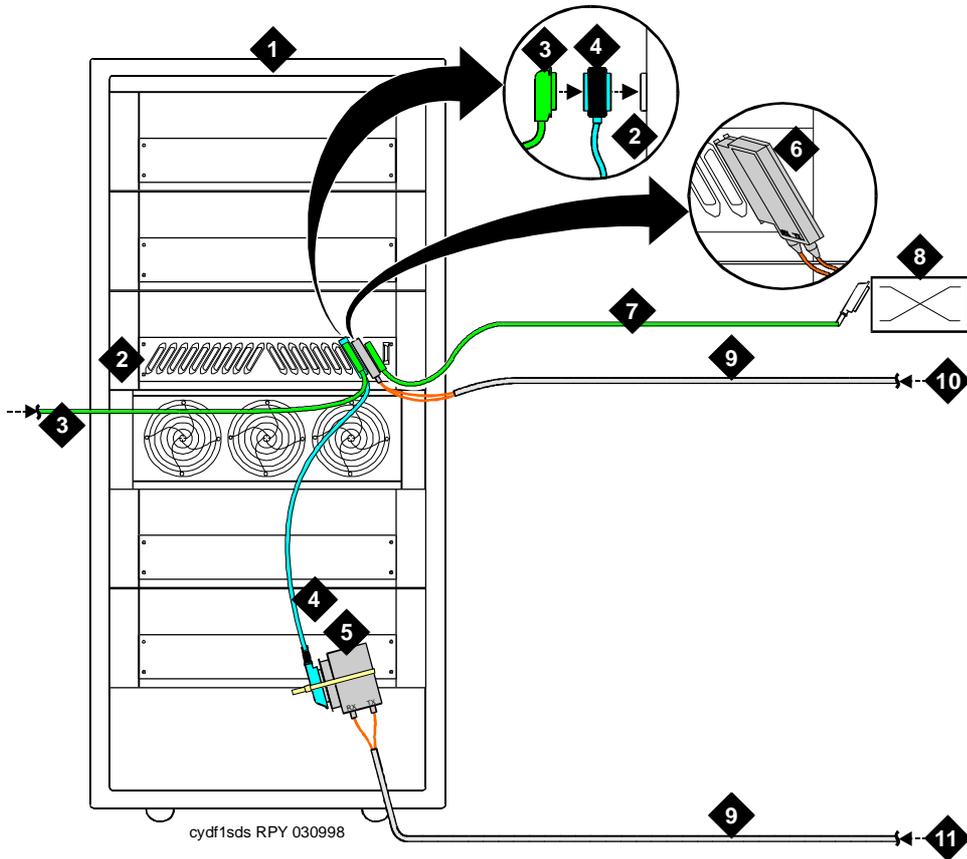
cydfhdsa RPY 030698

Figure Notes

1. MCC cabinet

2. EPN carrier B

3. EPN carrier A

4. DS1 cables from Port Network Connectivity (PNC) A and B links

5. DS1CONV 2-foot (60.96 cm) Y cable (Tie wrap the cable to the cabinet.)

6. 9823A transceiver

7. 9823A transceiver on the EI connector

8. B25A 25-pair cable

9. Fiber optic cables

10. From the EPN B TX and RX connectors on the rear of the SRP

11. Main Distribution Frame (MDF)

12. From the EPN A TX and RX connectors on the rear of the SRP

13. From the PPN A TX and RX connectors on the rear of the SRP

14. From the PPN B TX and RX connectors on the rear of the SRP

Figure 1-8. EPN DS1CONV critical reliability cable connections

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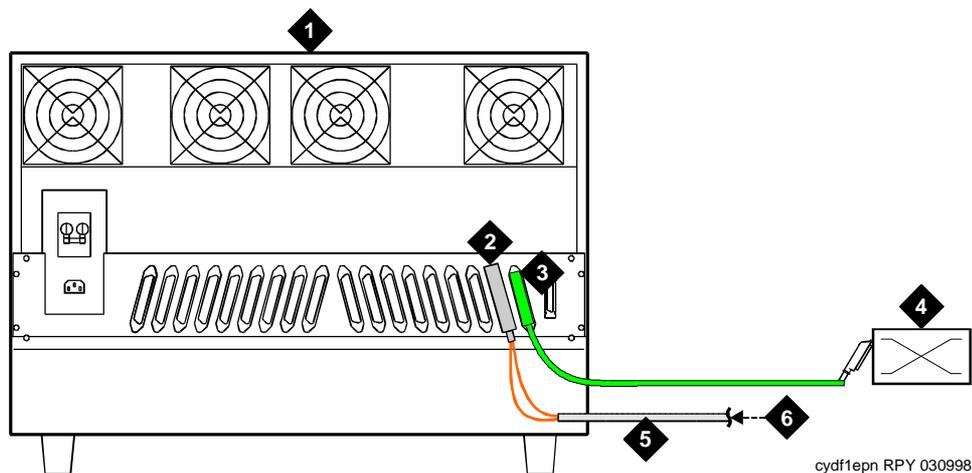
Figure Notes

1. SCC cabinet

2. 9823A transceiver on the EI connector

3. B25A 25-pair cable

4. Main Distribution Frame (MDF)

5. Fiber optic cable

6. From the EPN A TX and RX connectors on the rear of the SRP cabinet

Figure 1-9. EPN Direct fiber standard/high reliability cable connections

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cydfhep2 RPY 030998

Figure Notes

1. MCC cabinet

2. EPN carrier B

3. EPN carrier A

4. 9823A transceiver on the EI connector

5. Fiber optic cables

6. From the EPN B TX and RX connectors on the rear of the SRP

7. Main Distribution Frame (MDF)

8. B25A 25-pair cable

9. From the EPN A TX and RX connectors on the rear of the SRP

Figure 1-10.   EPN Direct fiber critical reliability cable connections

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1 SREPN Installation
Test the SRP

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Test the SRP

After the SRP is fully administered and the TN2301 switch (Figure 1-11) is in the AUTO position, you are ready to test the SRP.
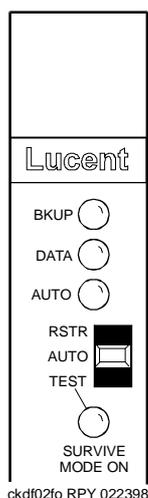
Figure 1-**11.** **TN2301 faceplate switch and LEDs**

Test the survive mode function

1. Type the **list cabinet** command from the R6r management terminal. Determine which EPN is "watched" by Survivable Remote equipment by looking for the lower-case 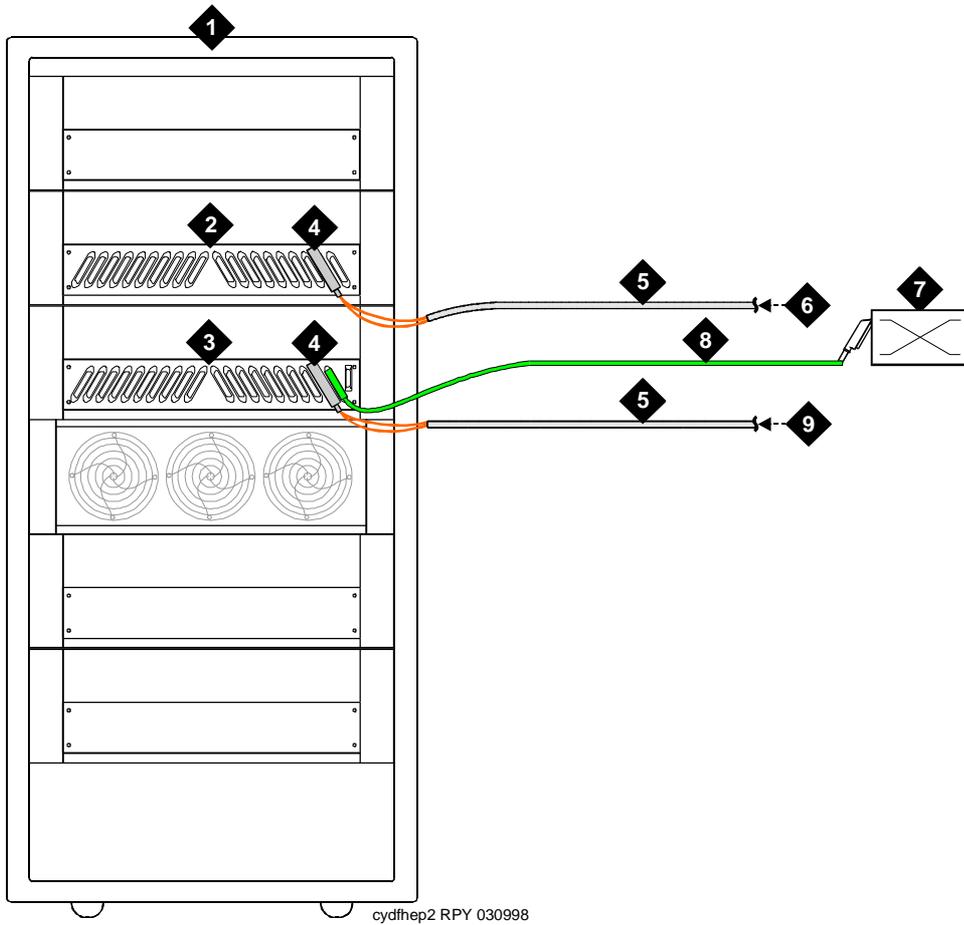"**s**" before the letters "EPN" in the Type field as shown in Figure 1-12. There may be more than 1 EPN designated as Survivable.

2. Enter **status health** on the Release 6r management terminal. The status of the SREPN should be "up."

3. Enter **status health** on the SRP management terminal. The status of the SREPN should be "down."

4. Place a voice call from a telephone on the Release 6r PPN to a telephone on the SREPN and verify the talk path.

5. Physically disconnect all PNC A and B fiber cables from the connectors on the rear of the SRP cabinet. Take care not to mix up or contaminate the fibers. After about a minute, the red emergency transfer LED on TN775C maintenance circuit pack turns on.

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```
  list cabinet                                                    SPE B

                            CABINET REPORT

  No. Type Layout Room      Floor       Building   A     B     C     D     E
  1    PPN 5-car  CS_1       1          ABC_DE     PN 01 PN 01 PN 01 SN 01 SN 01
  2    EPN 5-car  CS_1       1          ABC_DE     PN 04 PN 04 PN 04 PN 16 PN 16
  3    sEPN 5-car CS_1       1          ABC_DE     PN 05 PN 05 PN 05 SN 44 SN 44
  4    EPN 5-car  B-32       B          VWX_YZ     PN 06 PN 06 PN 06 SN 07 SN 07
  5    EPN 5-car  2-12       2          MNO_PQ     PN 08 PN 08 PN 08 SN 09 SN 09
  6    EPN 5-car  E-51       1          VWX_YZ     PN 10 PN 10 PN 10 SN 11 SN 11
```

Figure 1-12.   List cabinet screen

6. Verify that the SURVIVE MODE ON LED on the TN2301 turns on in approximately 2 minutes. Two minutes later, the SREPN performs a cold reset and functions again under the control of the SRP, although it may take longer for some facilities (such as trunks) to be fully restored.

7. Enter **status health** on the Release 6r management terminal. The status of the SREPN should be "dn" or "fe" (far end).

8. Enter **status health** on the SRP management terminal. The status of the SRP should be "up."

9. Place a voice call between two telephones on the SREPN and verify the talk path.

10. Reconnect all PNC A and B fiber cables to the rear of the SRP cabinet.

11. Move the TN2301 switch to the restore (RSTR) position. The SURVIVE MODE ON LED immediately turns off.

12. Verify that the SREPN is back in service on the Release 6r within 1-2 minutes.

13. Move the TN2301 switch to the AUTO position.

14. Enter **status health** on the Release 6r management terminal. The status of the SREPN should be "up."

15. Enter **status health** on the SRP management terminal. The status of the SREPN should be "down."

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Test the SRP

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Verify test switch operation

1. Enter **display alarms category pnc** on the R6r management terminal while in the normal mode. Check for errors associated with the SREPN or its connections.

2. Place the TN2301 switch to the TEST position.

3. Verify that the SURVIVE MODE ON LED on TN2301 turns on immediately. Within 2 minutes, the SREPN performs a cold reset and functions again under the control of the SRP, although it may take longer for some facilities (such as trunks) to be fully restored.

4. Enter **status health** on the Release 6r management terminal. The status of the SREPN should be "dn" or "fe" (far end).

5. Enter **status health** on the SRP management terminal. The status of the SRP should be "up."

6. Enter **display errors category pnc** on the R6r management terminal. Note the errors associated with the SREPN or its connections. These errors appear when the link to the SREPN is good and you are in the survive mode.

7. Place a voice call between two telephones on the SREPN and verify the talk path.

8. Place the TN2301 switch to the AUTO position. The SURVIVE MODE ON LED immediately turns off.

9. Verify that the SREPN is back in service on the Release 6r within 1-2 minutes.

10. Enter **status health** on the Release 6r management terminal. The status of the SREPN should be "up."

11. Enter **status health** on the SRP management terminal. The status of the SREPN should be "down."

SRP checklist

1. Verify that the TN2301 switch is in the AUTO position and the green AUTO LED is on.

2. Verify that the red BKUP LED on the TN2301 is off.

3. Verify that the red SURVIVE MODE ON LED is off.

4. Verify that the yellow DATA LED is on.

5. Verify that the green LED on the EPN TN775C maintenance circuit pack is double flashing. This indicates that EPN can go into the survive mode if needed.

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2 SREPN Maintenance
Before starting to troubleshoot

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SREPN Maintenance

2

Before starting to troubleshoot

Servicing the Survivable Remote EPN (SREPN) equipment involves both the Release 6r and the R6si processors. Therefore, you may need to to refer to these maintenance manuals:

- *DEFINITY ECS Release 6 — Maintenance for R6r*, 555-230-126

- *DEFINITY ECS Release 6 — Maintenance for R6vs/si*, 555-230-127

SREPN connections

Figure 2-1 shows the SREPN hardware connections.

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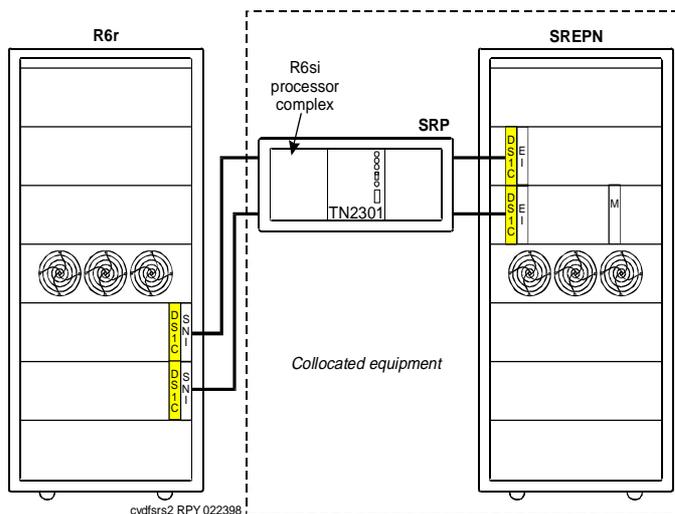**Figure 2-1.   Survivable Remote EPN hardware connections**

⚠ CAUTION:

Only the TN1654 DS1 CONV circuit pack can be used for SREPN systems.

The "M" in Figure 2-1 indicates the TN775C Maintenance circuit pack that monitors the status of the fiber link between the Release 6r and the SREPN.

Figure 2-2 shows the front of the SRP cabinet and the position of the TN2301 SRSwitch circuit pack.

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ckdfsrpn LJK 032398
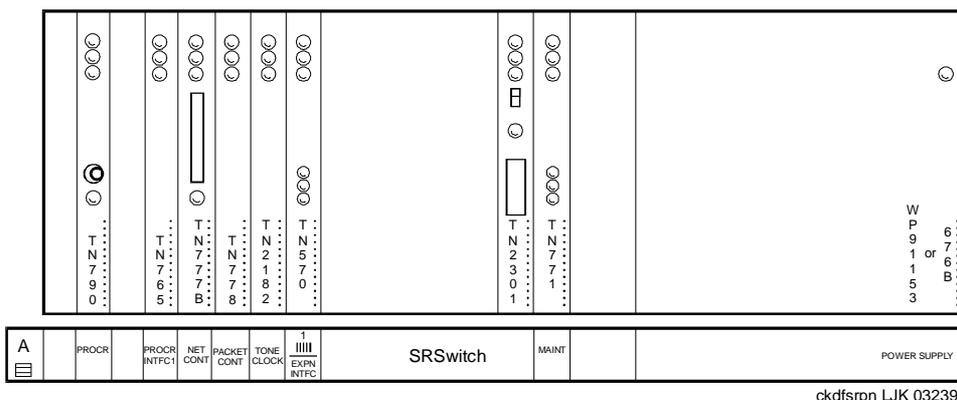
Figure 2-2. **Front view - SRP cabinet**

Required and optional circuit packs

Table 2-1 lists the required and optional circuit packs in the SRP:

Table 2-1. **Required and optional circuit packs - SRP**

Required		Optional		
Circuit pack	Description	Circuit pack	Description	Comments
TN790	Processor	TN778	Packet Control	Used in systems that support packet applications, like BRI or PRI over the Packet Bus
TN777B	Network Control	TN771D	Maintenance/Test	Only used with TN778 Packet Control
TN2182B	Tone/Clock	TN765	Processor Interface	Used for PRI applications
TN2301	SRSwitch	TN570C	Expansion Interface	

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Table 2-2 lists the required and optional circuit packs in the SREPN:

Table 2-2. Required and optional circuit packs - SREPN

Required		Optional		
Circuit pack	**Description**	**Circuit pack**	**Description**	**Comments**
TN775C	Maintenance	TN570C	Expansion Interface	
		TN750C	Announcement	Announcements can only be saved to the TN750C flash memory. Do not save the announcements to the SRP translation card.

Interfacing circuit packs

The Survivable Remote equipment can operate through:

- "Expansion Interface connections"
- "DS1 CONV connections"

Expansion Interface connections

- TN570C Expansion Interface (EI) circuit packs require the 9823(A) multimode transceivers or the 300A single mode transceivers.

   ⇒ **NOTE:**
   A new SREPN system includes the TN570C EI circuit pack. Earlier EI circuit packs (for example, TN570B) are not supported.

DS1 CONV connections

- TN1654 DS1 Converter supports T1/E1 remoting and wideband applications.

- Standard and High Reliability systems use pairs of TN1654, not mixed with the earlier TN574.

- Critical Reliability systems require TN1654 circuit packs on the duplicate pair.

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Transfer sequence to Survive mode

Transfer from Normal to Survive mode is automatic and is controlled by the TN775C Maintenance board. Figure 2-3 shows a schematic of the switching within the TN2301 circuit pack.
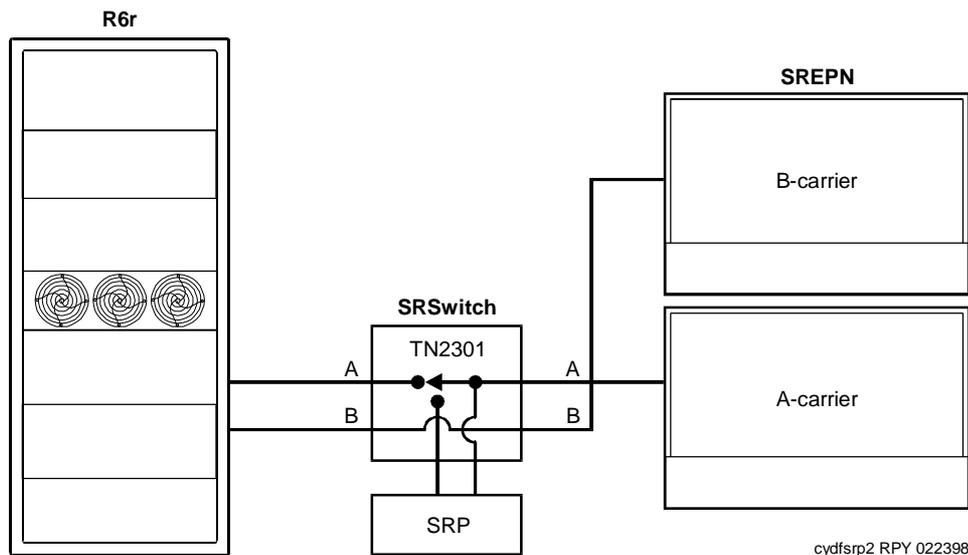
Figure 2-3.   TN2301 switching schematic

The transfer sequence to Survive mode is:

1. Links from the Release 6r PPN to one of its configured SREPNs fail.

2. The SREPN Maintenance circuit pack (A-carrier SREPN) detects the link failure and signals the TN2301 to disconnect its links to the Release 6r and connect the SREPN Expansion Interface.

3. The TN790 Survivable Remote processor takes over control of the EPN in Survive mode.

⬛▷ NOTE:
In Survive mode, the SRSwitch (TN2301) puts the EI/SNI circuit pack in the Release 6r into loopback mode.

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Table 2-3 shows the sequence of events to transfer to the Survive mode, the approximate times for each event, and the service affected at each stage.

Table 2-3. Transfer sequence to Survivable Remote mode

If the link between the Release 6r and an EPN is down for	Then	Service affected
1 minute	Emergency Transfer Mode activated.	Only established calls preserved.[1]
2-3 minutes	System "waits" to determine whether the Release 6r is going through a reset 3.	
3 minutes	Survive mode activated for each SREPN.[2]	Established calls terminated (restart)
5-6 minutes	Transfer sequence completed; EPN service restored.	Intra-EPN calls possible[3]

1. Similar to Emergency Transfer mode, only established, intra-EPN calls are preserved. No new or originating calls can be made.
2. Transfer to Survive mode includes a cold restart of the SREPN.
3. Calls using the link back to the Release 6r are not possible.

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TN2301 (SRSwitch)

The SRSwitch circuit pack (TN2301) occupies 6 slots in the SRP cabinet. Figure 2-4 shows the faceplate switch and LEDs for the TN2301 circuit pack.

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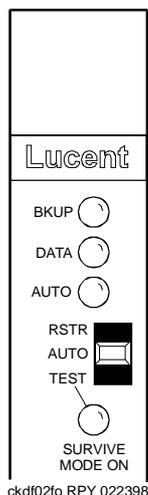
Figure 2-4.   TN2301 faceplate switch and LEDs

TN2301 LED interpretation

Table 2-4 lists the conditions indicated by the LEDs on the TN2301 circuit pack.

Table 2-4.   TN2301 LED interpretation

LED (color)	Condition	Interpretation
BKUP - Backup power (red)	On steady	Backup power (-48v) from the SREPN to the TN2301 has failed.
DATA (yellow)	On steady	Data passing through the TN2301 to/from the A-carrier EI board in the EPN.
	Off	If off and no service-affecting conditions are present, Critical Reliability B-carrier links to the Release 6r are up.
AUTO (green)	On steady	Indicates that the TN2301 faceplate switch is in the AUTO position. This is normal when in-service.
SURVIVE MODE ON (red)	On steady	Survive mode activated either by the Maintenance circuit pack control or the faceplate switch is in the TEST position.

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Faceplate switch

Table 2-5 indicates the 3 positions for the faceplate switch and the use for each.

Table 2-5. Faceplate switch positions and uses

Label	Position	Use
RSTR	Top	Forces control to the Release 6r by switching from Survive mode to Normal mode[1]
AUTO	Middle	Ready to go into Survive mode. The switch should be in this position except during installation, testing, or releasing the SRP from Survive mode.
TEST	Bottom	Forces control to the SRP (Survive mode). Links to the SREPN are through the SRP (TN790 Processor).[1] ⚠️ **CAUTION:** *This is for installation and testing only. Do not leave the switch in this position.*

---

1. This switch position overrides the remote reset **test customer alarm1** command from the SAT terminal. See "Restore from remote location" later in this chapter for more information.

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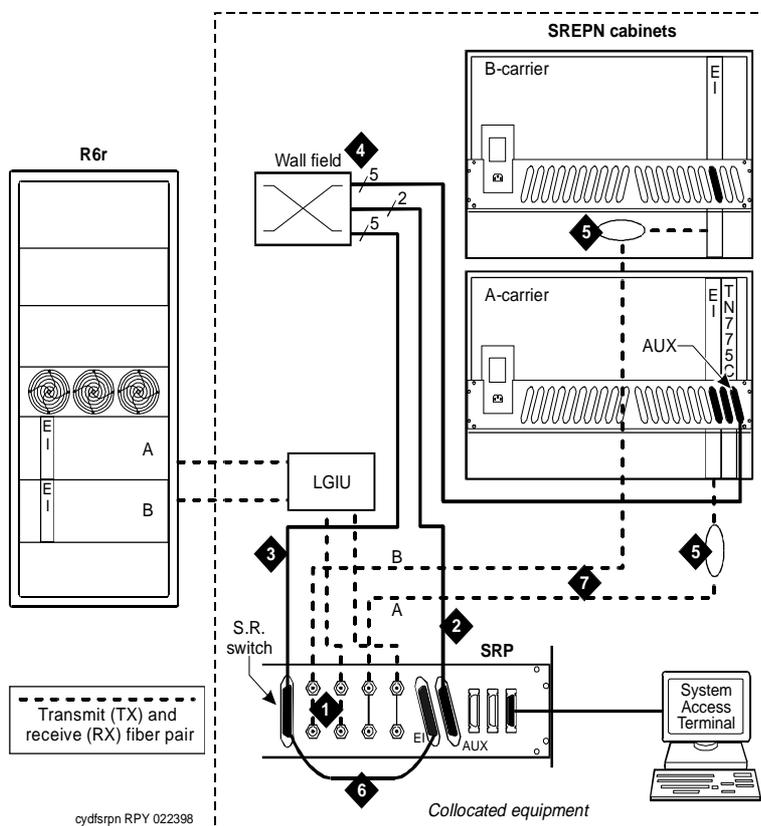
Figure 2-5 shows a detailed view of the rear panel connectors.
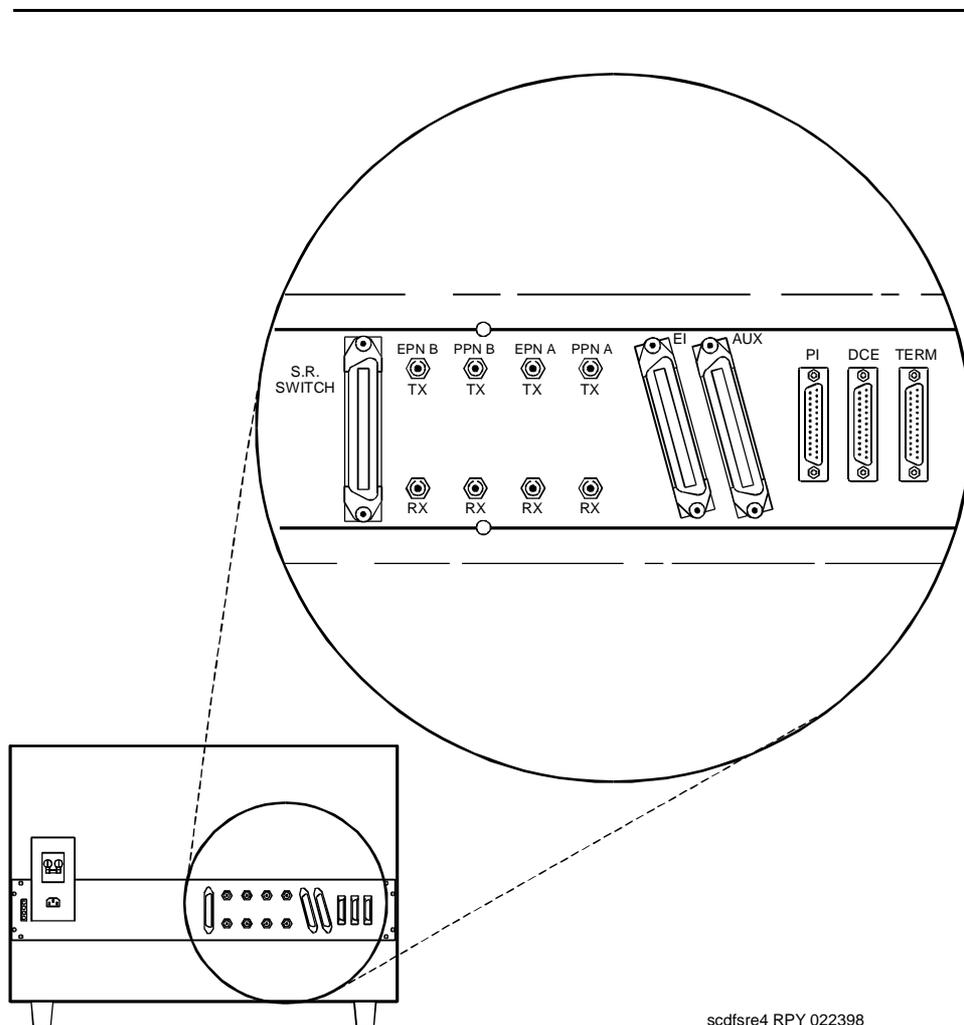
scdfsre4 RPY 022398

Figure 2-5.   SREPN rear panel - detail

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Figure 2-6 shows the hardware connections in the direct fiber system.

cydfsrpn RPY 022398

Figure Notes:

1. Fiber transmit (TX) and receive (RX) pairs for A and B carriers.

2. SRP AUX (B25A 25-pair, Group 300 Cable; max. length = 50'):
   - Major SRP power failure alarm lead
   - -48V secondary power failure signal

3. TN2301 - SRSwitch (B25A 25-pair, Group 300 Cable; max. length = 50'):
   - -48V from wall field
   - Major SRP power failure alarm lead
   - 3 SRSwitch signal leads

4. SREPN AUX connector (B25A 25-pair, Group 300 Cable; max. length = 50'). Refer to the "MDF connections" in Chapter 1:
   - -48V from wall field
   - SRP Alarm
   - 3 SRSwitch signal leads

5. Fiber transceivers (9823A - multimode or 300A - single mode)

6. 14-inch (35.5 cm) Y Cable (Comcode 847245750)

7. Fiber optic cable pairs.

Figure 2-6.   Detailed SRP direct fiber connections

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Figure 2-7 shows the hardware connections in the DS1-CONV system.
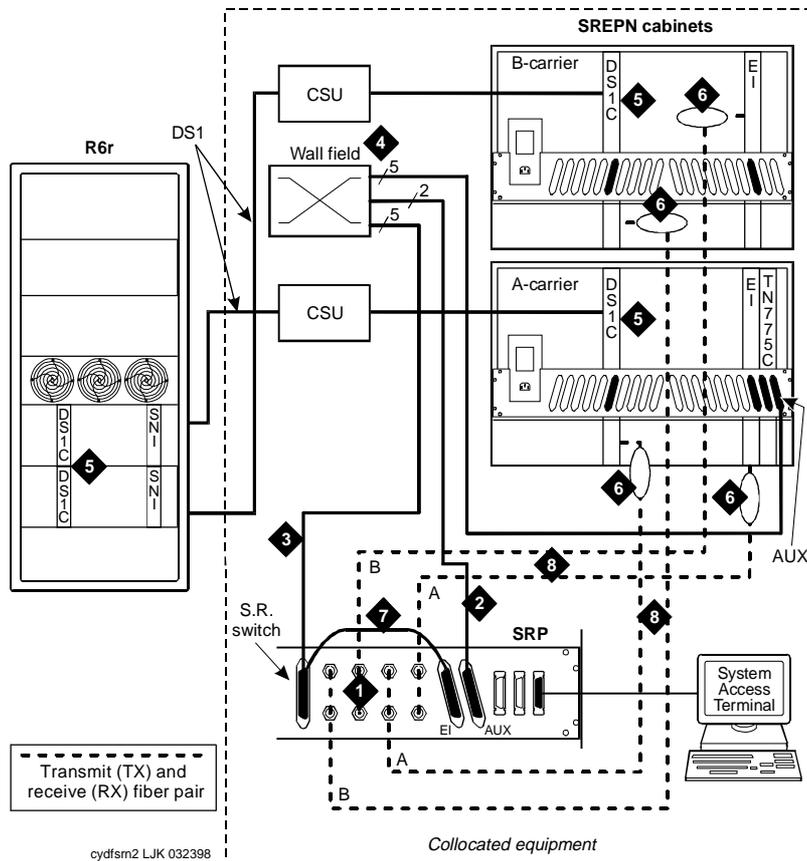
cydfsrn2 LJK 032398

Figure Notes:

1. Fiber transmit (TX) and receive (RX) pairs for A and B carriers.

2. SRP AUX (B25A 25-pair, Group 300 Cable; max. length = 50'):

   - Major SRP power failure alarm lead
   - -48V secondary power failure signal

3. TN2301 - SRSwitch (B25A 25-pair, Group 300 Cable; max. length = 50'):

   - -48V from wall field
   - Major SRP power failure alarm lead
   - 3 SRSwitch signal leads

4. SREPN AUX connector (B25A 25-pair, Group 300 Cable; max. length = 50'). Refer to the "MDF connections" in Chapter 1:

   - -48V from wall field
   - SRP Alarm
   - 3 SRSwitch signal leads

5. TN1654 (DS1C) can be used only in combination with another TN1654.

6. Fiber transceivers (9823A - multimode)

7. 14-inch (35.5 cm) Y Cable (Comcode 847245750)

8. Fiber optic cable pairs.

Figure 2-7. Detailed SRP DS1-CONV connections

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Maintenance strategy

Since Survive mode is invoked because of a link failure between the Release 6r and an EPN, the maintenance strategy is to:

1. "Check system status"
2. "Repair the link connection"
3. "Reconnect the Release 6r to the EPN"

The final sections of this chapter provide information for resolving

- "Power alarms"
- "System resets"

EI interactions

Although complex to troubleshoot, the following two interactions with EI circuit packs may be present:

- Alarms logged against an EPN that involve an Expansion Interface circuit pack acting as the Expansion Archangel
- EI and Tone/Clock synchronization interactions. Synchronization is involved in the link between two active EI circuit packs or between an active EI circuit pack and an active SNI circuit pack. If the frequency of the clock is out of the specified range ("out of spec"), an EI fiber link can go down.
   — The EI circuit pack reports slip errors if synchronization is not operating properly.
   — Examine the EI circuit packs as a possible cause when diagnosing synchronization problems.

For both topics, refer to the EXP-INTF section in Chapter 9 of *DEFINITY ECS Release 6 — Maintenance for R6r*.

Maintenance procedures

Check system status

Begin the troubleshooting process by gathering information about the system components.

- "Which EPN is survivable?"
- "Health of Port Network Connections (PNC)"
- "Administered links"

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Which EPN is survivable?

1. At the Release 6r terminal, type the **list cabinet** command. Determine which EPN is "watched" by Survivable Remote equipment by looking for the lower-case "s" before the letters "EPN" in the Type field as shown in Figure 2-8.

```
list cabinet                                               SPE B

                         CABINET REPORT

No. Type Layout Room     Floor      Building   A     B     C     D     E
1    PPN 5-car  CS_1      1          ABC_DE   PN 01 PN 01 PN 01 PN 01 SN 01
2   sEPN 5-car  CS_1      1          ABC_DE   PN 02 PN 02 PN 02 PN 02 PN 02
```

Figure 2-8.   List cabinet screen (Release 6r)

2. Once you have located the physical equipment, check to see whether the system is in Survive Mode as indicated by the

   ■ Red SURVIVE MODE ON LED is on steady

Health of Port Network Connections (PNC)

Depending on the conditions present when the system switched from Normal to Survive mode, it may be in either Emergency Transfer or Survive mode.

To determine the mode in which the system is operating:

1. Get on overall report on each cabinet's PNC status with the **status health** command *at both the Release 6r and the SRP terminals*. Figure 2-9 shows the Release 6r screen, and Figure 2-10 shows the SRP screen.

```
status health                                              SPE A

 PNC: A-PNC/auto B-PNC/functional   ALARMS: Maj:   2  Min:   2  Wrn:  104
 Pwr: comm Sync:loc l    Logins:2  BUSYOUT: Trk   0  Stn:   0  Oth:   18
 Cab EmTr  Mj Mn Wn PNC    Cab EmTr  Mj Mn Wn PNC     Cab EmTr  Mj Mn Wn PNC
  1  auto-  0| 0|47 up
  2  auto-  0| 0|12 fe
```

Figure 2-9.   Status health screen (Release 6r)

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```
status health
ALARM SUMMARY                                        CABINET STATUS
       Major:    1                               Emerg  Alarms
       Minor:    0                           Cab Trans Mj Mn Wn PNC
     Warning:   10                            1 auto-  0| 0| 5 up
BUSY-OUT SUMMARY                              2 auto-  1| 0| 0 dn
      Trunks:    0                            3 n.a.   0| 0| 0 dn
    Stations:    0
      Others:    0
PROCESSOR OCCUPANCY STATUS
Static:   1%     SM:    4%
    CP:   0%   Idle:  95%
CRITICAL SYSTEM STATUS
  Active SPE: A/auto
  Duplicated? SPE:n
   SPE Power: commercial
 Time Source: local
    # Logins: 1
```

Figure 2-10.　Status health screen (SRP)

2. Under the `PNC` field column of the status health screen, read whether the link is `up`, `dn` (down), or `fe` (far-end on Release 6r Center Stage systems) on both systems (bold in both examples) and use Table 2-6 to answer these two questions:

    1. Is the link problem on Release 6r or the SREPN side?

    2. Is the system in Emergency Transfer or Survive mode?

Table 2-6.　Release 6r and SRP link status

If the Release 6r link is	And the SRP link is	Then the SRP is in	Where to look for problem
Down	Up	Survive mode	Between Release 6r and SREPN
Down	Down	Emergency Transfer mode	SREPN side (EI circuit pack, transceivers, fibers)
Up	Down	Normal mode	No problem

Administered links

1. To see how the links are administered, use the **list fiber-link** command *at both the Release 6r and the SRP terminals*. Figure 2-11 (Release 6r) and Figure 2-12 (SRP) show examples of both fiber and DS1 CONV links.

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```
list fiber-link                                        Page   1   SPE A
                        FIBER LINK ADMINISTRATION
FIBER -------- ENDPOINT 1 --------  -------- ENDPOINT 2 --------
LINK# TYPE A-PNC DS1  B-PNC DS1     TYPE A-PNC DS1  B-PNC DS1    DS1
           LOC   CONV LOC   CONV         LOC   CONV LOC   CONV   CONV
                 LOC        LOC                LOC        LOC    TYPE
 1    sni  01E03      01D03          ei   02A01      02B02

 2    sni  01E02      01D02          ei   01E01      01D01

 3    sni  01E04      01D04          ei   03A01      03B02

 4    sni  01E19      01D19          ei   03E01      03D02

 5    sni  01E20 01E21 01D20 01D21   ei   04A01 04A02 04B02 04B03 TN574
Primary Facility:            A                              A
 9    sni  01E18 02B16 01D18 02C16   ei   09A01 09A02 09B02 09B03 TN1654
Primary Facility:B           B                    B              B
```

Figure 2-11.   List fiber-link screen (Release 6r)

```
list fiber-link                                        Page 1 SPE A

                    FIBER LINK ADMINISTRATION

FIBER -------- ENDPOINT 1 --------  -------- ENDPOINT 2 --------
LINK# TYPE A-PNC DS1  B-PNC DS1     TYPE A-PNC DS1  B-PNC DS1   DS1
           LOC   CONV LOC   CONV         LOC   CONV LOC   CONV  CONV
                 LOC        LOC                LOC        LOC   TYPE
1     sni  01A17      01B17          ei   10E01 10D02

2     sni  01A18      01B18          ei   06E01 06D02

3     sni  01E20 01E21 01D20 01D21   ei   22A01 22A02 22B02 22B03 TN574
```

Figure 2-12.   List fiber-link screen (SRP)

2. Use the **status sys-link UUCSS** command to obtain status information
    and the current or faulted hardware path (the list of hardware components
    over which the link travels).

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```
status sys-link 01e20                          Page  1 of  2  SPE A

    Location: 01E2001      Type/Chan: INL            Alarms: none
Current Path: present   Faulted Path: none       Last Fault:
       State: up
                              Current Hardware Path
          Maintenance                         Maintenance
Location    Name     Alarms             Location    Name      Alarms
01A1        PKT-INT   none
PN 01       PKT-BUS   none
01E01       EXP-INTF  none
2 A-PNC     FIBER-LK  none
01E02       SNI-BD    none
01E20       SNI-BD    none
```

Figure 2-13.   Status sys-link screen (Release 6r)

Table 2-7 describes when the current or faulted hardware path displays:

Table 2-7.   Current and faulted hardware paths

If link is	Current hardware path displays?	Faulted hardware path displays?	Focus attention on path
up	Y	N	current
down	N	Y	faulted

For more information on system links and hardware paths, refer to:

- SYS-LINK Maintenance Object in Chapter 9 of *DEFINITY ECS Release 6 Maintenance for R6r*

- "System links" on page 2-39

3. Look for alarms on the components listed under the appropriate hardware path. If any alarms are present, follow the maintenance procedures for the alarmed components to clear those alarms first.

4. To help corroborate the information that you have gathered, inspect the Release 6r Alarm and Error logs (Figure 2-14).

   ⇒ **NOTE:**
   Since the system is in Survive mode, the Release 6r thinks it has lost its connections to the EPN. Therefore, alarms may be present, even though the problem has been diagnosed and fixed.

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```
display alarms                                    Page  1 of  2  SPE A
                              ALARM REPORT
Port        Maintenance On   Alt     Alarm   Svc   Ack? Date        Date
            Name        Brd? Name    Type    State 1 2  Alarmed    Resolved
01E02       SNI-PEER    n            MAJOR              03/09/00:21 00/00/00:00
01E20       SNI-CONF    n            MAJOR              03/09/00:26 00/00/00:00
PN02        EXP-PN      n            MAJOR              03/09/00:30 00/00/00:00
PN02        EXP-PN      n            MAJOR              03/09/00:30 00/00/00:00
2 A-PNC     FIBER-LK    n            MAJOR              03/09/00:30 00/00/00:00
2 A-PNC     FIBER-LK    n            MAJOR              03/09/00:30 00/00/00:00
2 A-PNC     FIBER-LK    n            MAJOR              03/09/00:30 00/00/00:00
```

Figure 2-**14.   Display alarms screen (Release 6r)**

Other alarmed Maintenance Objects may include:

DS1 CONV-BD	DS1 CONV circuit packs
EXP-LINK	Expansion Link
EXP-INTF	Expansion Interface
DS1 CONV-BD	DS1 CONV circuit packs
SNI-BD	Switch Node Interface circuit packs

Repair the link connection

After determining on which side (Release 6r or SREPN) the problem lies:

1. Test the fiber connection with the **test fiber-link *number*** [*a-pnc* | *b-pnc*] if duplicated, [*short* | *long*] command. Figure 2-15 shows an example of the test results.

   For this example, the fiber connection on the Release 6r side is bad.

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```
test fiber-link 2 a-pnc                              Page 1 SPE A

                        TEST RESULTS

Port     Maintenance Name  Alt. Name  Test No.  Result       Error Code

2 A-PNC  FIBER-LK                      777       FAIL
2 A-PNC  FIBER-LK                      759       FAIL            135
2 A-PNC  FIBER-LK                      989       FAIL            241
2 A-PNC  FIBER-LK                      237       ABORT          2100
2 A-PNC  FIBER-LK                      238       ABORT          2100
```

Figure 2-15.   **Test fiber-link screen (Release 6r)**

If any of the test results shown in Figure 2-15 fail, isolate the problem:

1. Busyout the suspected fiber connection with the **busyout fiber-link number** [**a-pnc** | **b-pnc**] if duplicated, command.

2. Ensure a reliable fiber connection to the Release 6r. See "Fiber fault isolation procedure" later in this chapter for a flowchart of steps to isolate and test fiber connections.

3. Use the **release fiber-link number** [**a-pnc** | **b-pnc**] if duplicated, command to restore the fiber connections.

4. Test the fiber connection again with the **test fiber-link number** [**a-pnc** | **b-pnc**] if duplicated, [**short** | **long**] command.

5. If all tests on all components PASS, skip to the "Check system status" section.

If necessary, refer to FIBER-LK Maintenance object in Chapter 9 of *DEFINITY ECS Release 6 Maintenance for R6r* for more information.

Reconnect the Release 6r to the EPN

⚠ CAUTION:

Ensure that the links are repaired before proceeding with the next section. See '"Fiber fault isolation procedure" for troubleshooting help.

To reconnect the SREPN to the Release 6r, do the following:

1. Set the switch on the TN2301 circuit pack to the RSTR position for at least 1 second and return the switch to the AUTO position

   OR

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From a remote dial-in connection to the SRP, use the **test customer alarm 1** command to reset the SRP. See the "Restore from remote location" section later in this chapter.

2. Check for the following LED status:

   - Red (SURVIVE MODE ON) is off

   - Green (AUTO) is on steady, meaning that the SREPN is ready to assume processor control for the EPN should another link failure occur.

3. Wait at least 3 minutes while the EPN goes through its cold restart and then check the status of the link connections with the **status health** command *at both the Release 6r and the SRP terminals* to determine whether the link between the Release 6r and the EPN is up (Figure 2-9).

Post-reset checks

Check to see that the following conditions are met before leaving the customer premises:

1. The EI circuit pack in the SRP should be fast flashing. *This is appropriate for Normal mode*, because the links are connected from the SREPN to the Release 6r. Figure 2-16 shows the SREPN EI board test results.

```
test fiber-link                                      Page 1 SPE A

                         TEST RESULTS

Port       Maintenance Name  Alt. Name  Test No.  Result       Error Code

01A01      EXP-INTF                      237       FAIL
01A01      EXP-INTF                      238       FAIL
01A01      EXP-INTF                      240       FAIL           1032
01A01      EXP-INTF                      241       ABORT          1033
01A01      EXP-INTF                      589       ABORT          1033
01A01      EXP-INTF                      316       PASS
```

Figure 2-16.   Test fiber-link screen (SRP)

These Fail and Abort results are appropriate for Normal mode.

2. After normal service is returned to the SREPN, the SRP is in an *alarmed state*. This is *normal* for the SRP and indicates that the TN2301 has disconnected from the SREPN, and the SRP is no longer in control. Connections are re-established between the EI in the SREPN and its EI/SNI counterpart in the Release 6r PPN, and the system is now in its original Release 6r-EI configuration.

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Power alarms

Carrier power failure

A carrier power failure generates a MAJOR alarm against the CARR-POW Maintenance Object. This condition is evident by:

- A CARR-POW alarm in the **display alarms** or **display errors** report at the SRP terminal.

- The LEDs in the SRP cabinet are all dark except for the yellow LED on the TN2301 circuit pack.

1. Refer to the CARR-POW Maintenance Object in Chapter 10 of *DEFINITY ECS Release 6 Maintenance for R6vs/si* for information on resolving this alarm.

NOTE:
When power is restored, the system comes up in Normal mode. If the power outage is longer than the holdover time of the EPN battery but shorter than the holdover time for the SRP battery, the system can come up in Survive mode.

-48V Backup power to the TN2301 circuit pack

Loss of the -48V backup power from the wall field to the TN2301 generates an alarm (major or minor, depending on administration) against the EXT-DEV (External Device) Maintenance Object. Visually, this condition is evident by the TN2301's red BKUP LED on steady. To troubleshoot this alarm:

1. Review the "MDF connections" section in Chapter 1 to familiarize yourself with the cabling and connections both to and from the cross-connect wall field.

2. Check the connections to the cabinet and wall field before replacing the board.

3. If power in all cabinets is good, the -48V connections may be bad. Replace the board using the procedures outlined in the "Replacing the TN2301 circuit pack" section.

System resets

Resetting the Release 6r with either the **reset system 4** or **reset system 5** command breaks down and then re-establishes the PPN-to-EPN links during the reset sequence. Since these links may be down longer than 3 minutes, the SREPN maintenance circuit pack (TN775C) signals the TN2301 circuit pack to begin the transfer sequence to Survivable Remote Mode. This sequence is detailed earlier in Table 2-5.

1. Ensure that the Release 6r reset sequence is complete before proceeding.

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2. Check the status of the link connections with the **status health** command
   at both the Release 6r and the SRP terminals to determine whether the link
   between the Release 6r and the EPN is up (Table 2-6).

3. Test the fiber connections:

   a. Use the **test fiber-link <number> [a-pnc | b-pnc]** if duplicated,
      [short | long] command for fiber/DS1 CONV connections.

   b. If the test fails, continue to troubleshoot the connection problem; if it
      passes, continue with Step 4.

4. Set the switch on the TN2301 circuit pack to the RSTR position for at least
   1 second and return the switch to the AUTO position

   OR

   From a remote dial-in connection to the SRP, use the **test customer
   alarm 1** command to reset the SRP. See the "Restore from remote
   location" section later in this chapter.

   $\Longrightarrow$ **NOTE:**
   After normal service is returned to the SREPN, the SRP is in an
   alarmed state. This is *normal* for the SRP and indicates that the
   TN2301 has disconnected from the SREPN, and the SRP is no
   longer in control. Connections have been re-established between
   the EI in the SREPN and its EI/SNI counterpart in the Release 6r.

Fiber fault isolation procedure

Use the following procedure to isolate faults on a fiber link. This section contains
information on:

- "Fault isolation flowchart"

- "Loopback tests"

- "Expansion Interface LEDs"

Fault isolation flowchart

⚠ CAUTION:
*On systems with duplicated Port Network Connectivity (PNC), first **busyout
pnc-standby** before busying out any of the following standby components:*

- *Fiber-Link (FIBER-LK)*

- *Standby Expansion Interface (EXP-INTF)*

- *Switch Node Interface (SNI)*

- *DS1 Converter (DS1 CONV)*

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⚠ WARNING:

> *Calls are dropped when busying out of any of these components on a simplex PNC.*

⚠ CAUTION:

> *Be sure to release all busied out components after completing the tests.*

Start the fault isolation procedure:

1. Know which fiber span to isolate by using the link information from the status health reports from both the Release 6r and the SREPN and the information in Table 2-6.

1. Enter **display alarms** and press RETURN; type **pnc** in the `Category` field, then choose Enter.

   ➡ NOTE:

   > Since the system is in Survive mode, the Release 6r thinks it has lost its connections to the EPN. Therefore, alarms may be present, even though the problem has been diagnosed and fixed.

   Look for any *on-board* alarms other than the EI circuit pack. If there are any, relace the circuit pack. Do not replace the EI circuit pack unless there are on-board alarms.

   If No, ↓

2. Enter **display errors** for category **pnc**.

   Check for any of the following errors:

Maintenance Object	Error Type
FIBER-LK	Any
SNI-BD	513
EXP-INTF	257 769 770 1281 1537 3073 3074 3075 3076 3585 3841 3842

   If you find *one or more* of the above errors, go to Step 3.

   If you find *none* of the above errors, then look for SNI-PEER errors.

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- If there is one SNI circuit pack with many different SNI-PEER error types, replace the indicated SNI circuit pack

- If there are many SNI-PEER errors of the same error type, replace the indicted SNI circuit pack using the following table.

Error Type	SNI slot
1	2
257	3
513	4
769	5
1025	6
1281	7
1537	8
1793	9
2049	13
2305	14
2561	15
2817	16
3073	17
3329	18
3585	19
3841	20

- After replacing an SNI circuit pack, clear alarms by executing **test board UUCSS long clear** for all alarmed EXP-INTF circuit packs. Wait 5 minutes for any SNI-BD or SNI-PEER alarms to clear.

  You can speed this process with **clear firmware counters** [**a-pnc** | **b-pnc**] for the repaired PNC.

3. Enter **list fiber-link** to get the physical location of the fiber-link endpoints. If a DS1 CONV is administered to the fiber-link (DS1 CONV is y), use the **display fiber-link** command to determine the physical location of the DS1 CONV circuit packs on the fiber-link.

4. Execute **busyout fiber-link** *number* followed by **test fiber-link** *number* **long**.

   If any tests in the sequence fail, proceed with Step 5.

   ➤ **NOTE:**
   Test #759 may fail if SNI circuit packs are present.

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If *all* of the tests pass, clear the alarms by executing **test board UUCSS long clear** for all alarmed EXP-INTF circuit packs. Wait 5 minutes for any SNI-BD, SNI-PEER, FIBER-LK, or DS1C-BD alarms to clear.

⟹ NOTE:
Test attempted on the EI circuit pack in the SREPN do not run.

The **clear firmware counters** [*a-pnc* | *b-pnc*] command for the PNC that was repaired may be quicker than clearing the alarms with the **test board** command.

5. For each endpoint of the fiber link:

Busyout and **test board UUCSS long** and record all test failures. When looking at test results, consult the explanations for Figure 2-17 and Figure 2-18 later in this chapter.

Does Board Not Assigned display for an Expansion Interface in an EPN? If yes, use the **test maintenance long** command to release an Expansion Interface that may be held reset by an EPN Maintenance circuit pack.

⟹ NOTE:
Test attempted on the EI circuit pack in the SREPN do not run.

If No, ↓

Did EXP-INTF Test #242 fail? If yes, replace the EI circuit pack and the lightwave transceiver (if present) and go back to step 4. (EXP-INTF Test #242 runs an on-board looparound if no lightwave transceiver is connected to the EI.)

If No, ↓

Did SNI Test #757 fail? If yes, replace the SNI circuit pack and go back to Step 4 of this procedure.

If No, ↓

Did SNI Test #756 fail? If yes, replace the SNI circuit pack and the lightwave transceiver (if present) and go back to Step 4.

If No, ↓

Did EXP-INTF Test #240 fail? If yes, replace the EI circuit pack and go back to Step 4.

If No, ↓

Did Test #238 (EXP-INTF) or Test #989 (SNI) fail? If yes, replace the lightwave transceivers and fiber-optic cable and go back to Step 4. The faulted component can be further isolated by using information in the ''Loopback tests'' section later in this chapter.

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⇒ **NOTE:**

If a fiber out of frame condition exists and lightwave transceivers are used, check that both lightwave transceivers are of the same type, (9823A or 9823B). If they are not both the same, replace one of the lightwave transceivers so that they match. 9823A is used for distances up to 4900 feet (1493 m) and 9823B is used for distances up to 25,000 feet (7620 m).

If No, ↓

Is a DS1 CONV administered on the fiber-link? If no and the problem is still present, follow normal escalation procedures.

If Yes, ↓

Is there an SNI-BD 513 alarmed error (**display errors** for category **pnc**)? If yes, replace cabling between the SNI circuit pack and the DS1C circuit pack. If the alarm persists, first attempt the manual loopback procedure below, then replace the DS1C and the SNI circuit packs and go back to Step 4.

If No, ↓

If the connected circuit pack is an EXP-INTF, did Test #238 fail? If yes, replace cabling between the EXP-INTF circuit pack and the DS1C circuit pack. If Test #238 continues to fail, replace the DS1C and the EI circuit packs and go back to Step 4.

If No, ↓

Busyout and **test board UUCSS long** for both DS1C circuit packs and note all test failures and aborts.

⇒ **NOTE:**

Test #790 fails with Error Code 1 when in Survive mode.

Did the test return `Board not inserted` for the near-end circuit pack (nearest the SPE), or for the far-end circuit pack in a simplex PNC? If yes, replace the cabling between the DS1C circuit pack and the SNI or EI circuit pack.

Wait 1 minute and retest.

If the board is still not inserted, replace the DS1C circuit pack and the EI or SNI connected to it.

Go back to Step 4.

If No, ↓

Visually check to see if any CSU devices are looped back. **Busyout** and **test ds1-facility UUCSS external-loop** for each DS1 facility.

Many tests pass if the system is in Survive mode.

↓

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Did Test #788 pass and Test #789 fail? If yes, replace the DS1C and lightwave transceiver (if present) at the other end of the DS1C complex. (See)

Go back to Step 4.

If No, ↓

Did Test #788 fail or abort and Test #789 fail or abort? If yes, execute the **test ds1-facility UUCSS long** command for each administered and equipped DS1 facility.

NOTE:
If the Switch Node Interface (SNI) board's yellow LED is fast flashing (.1 sec on/.1 sec off), it can indicate a problem with the fiber from the SNI board to the SREPN. For more detailed information, refer to the SNI-BD Maintenance Object in Chapter 9 of *DEFINITY ECS Release 6 Maintenance for R6r*.

Loopback tests

The following section describes loopback tests for the

- "Fiber direct-connect system"
- "DS1 CONV system"
- "Manual loopback procedure"

Fiber direct-connect system

shows the loopbacks performed on the SNI and EI circuit packs.

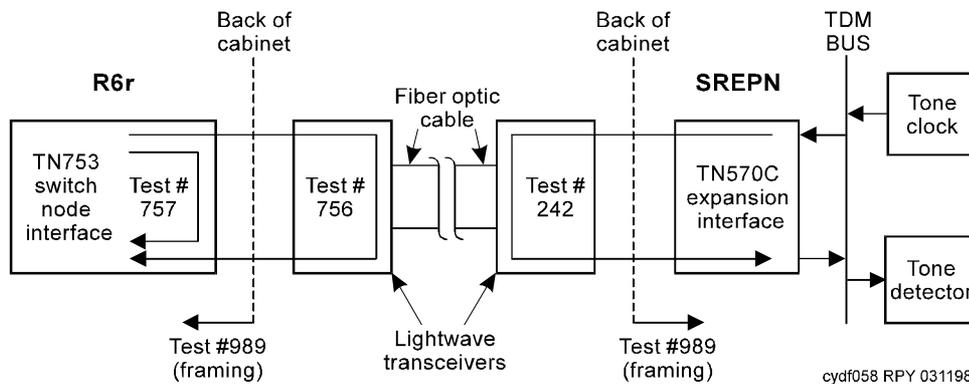**Figure 2-17.   Fiber fault isolation tests for SNI and EI circuit packs**

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- Test #756 reports the result of the off-board loopback

- Test #757 reports the result of the on-board loopback

- Test #756 and Test #757 can run individually or as part of the **test board UUCSS long** command for an SNI circuit pack.

- Test #242 can be run as part of the **test board UUCSS long** command for an Expansion Interface circuit pack. In addition to testing on-board components, this test is helpful for isolating problems *between a circuit pack and the lightwave transceiver*.

  The loopback shown in this diagram shows only part what Test #242 does. If no lightwave transceiver is connected to the Expansion Interface circuit pack, an on-board loopback is performed on the Expansion Interface circuit pack. For more information about Test #242, see the EXP-INTF Maintenance Object in Chapter 9 of *DEFINITY ECS Release 6 Maintenance for R6r*.

DS1 CONV system

Additional DS1-CONV loopback tests are available for DS1 CONV circuit packs and connections to further isolate the problem as shown in <u>Figure 2-18</u>.
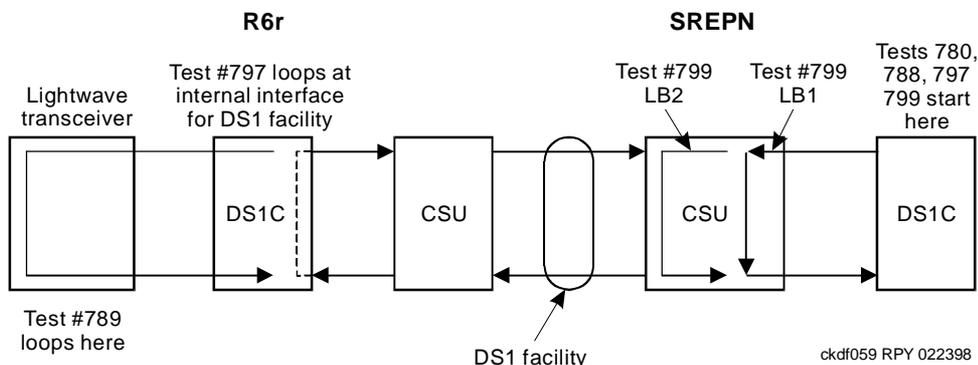

Figure 2-18.   DS1 CONV loopback tests

- If Test #799 fails at LB1, the problem is with DS1C #1, CSU #1, or the connections between them.

- If Test #799 passes at LB1 and fails at LB2, the problem is with CSU #1.

- If Test #799 passes at LB1 and at LB2, the problem is with the DS1 facility, CSU #2, connections to CSU #2, or DS1C #2.

- For more information about loopback Tests #788 and #789 (isolates the lightwave transceiver), see the DS1 CONV-BD section in Chapter 9 of *DEFINITY ECS Release 6 Maintenance for R6r*.

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Manual loopback procedure

This procedure is destructive.

Use this procedure when

- Using DS1 CONV facilities and a 9823A lightwave transceiver.

- An EI/SNI circuit pack cannot be tested by software. For example, an EI circuit pack located in an EPN that is down cannot be tested. This can occur when communication between the switch node carrier and the SPE is down.

Before using this procedure, the configuration audit test (#759) should be run on SNI circuit packs where possible with **test board UUCSS s**. Also, the Processor Route Audit Test (#760) should be run with the **test board UUCSS long** command for the active SNC in the switch node carrier. If the active SNC is not inserted, Test #760 can be run with **test hardware-group pnc P**, where P is **a-pnc** or **b-pnc**.

Before using this procedure, first determine whether more than one SNI is unable to communicate with software. Verify SNI and SNC circuit pack insertion with the **list configuration carrier UUC** command. Check for SNI and SNC insertion for every administered switch node carrier.

If all of the SNIs and SNCs are not inserted (No Board displays for each board) in the entire PNC (either the a-pnc or the b-pnc), then the link between the PPN EI (on the PNC where SNI and SNC circuit packs did not insert) and the connected SNI is not functioning properly.

1. Run the **test board UUCSS** command on the PPN EI and fix any problems found.

2. Perform the manual loopback procedure for the PPN EI.

3. Perform the manual loopback procedure for the SNI connected to the PPN EI.

4. Replace the active SNC.

If the system has a two-level switch node carrier configuration, that is (*all* must apply)

- SNI-SNI fiber links exist

- The SNIs and SNCs in the second switch node carrier only (the switch node carrier that has no SNI connected to the PPN EI) are not inserted

- At least two SNI-SNI fiber links exist

Then perform the following steps:

1. Run the **test board UUCSS long** command on the SNIs in the first switch node carrier that are connected to SNIs in the second switch node carrier and fix any problems found.

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2. Replace the active SNC.

3. Perform the manual loopback procedure for the SNIs in the second switch node carrier that are connected to SNIs in the first switch node carrier.

If software is unable to communicate with an EPN EI, but can communicate with the connected SNI:

1. Run the **test board UUCSS long** command on the connected SNI and fix any problems found.

2. Busyout the EI or SNI circuit pack (**busyout board UUCSS**).

3. Disconnect the transmit and receive fiber pair from the fiber connectors on the back of the cabinet.

   ### ⇒ NOTE:
   Note which is the transmit and which is the receive side for proper re-connection at the end of this procedure.

4. Connect the transmit and receive cables together using the fiber optic coupler (Comcode 407643014, provided in Maintenance Kit #30) to create a loop as shown in Figure 2-19.
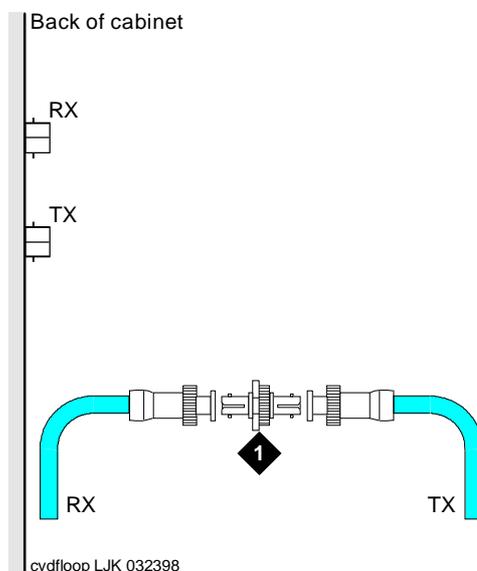

Back of cabinet

RX

TX

RX   TX

1

cydfloop LJK 032398

Figure Notes

1. Fiber optic coupling (Comcode 407643014)

Figure 2-19.   Manual loopback with fiber optic coupling

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5. Go to the front of the cabinet and inspect the yellow LED.

   ■ If the yellow LED flashes on at a rate of once per second, the (Expansion Interface or Switch Node Interface) circuit pack or transceiver should be replaced.

   ■ If the yellow LED flashes on at a rate of five times per second, the circuit pack (Expansion Interface or Switch Node Interface) or the lightwave transceiver may need replacement. This condition may also be due to a faulty system clock on the network containing the Expansion Interface circuit pack or in the switch node carrier containing the SNI.

   ■ If the yellow LED was blinking before starting this procedure and the yellow LED is not blinking now, this circuit pack (Expansion Interface or Switch Node Interface) and the lightwave transceiver are functioning properly.

6. Replace faulty component(s) and reconnect the original fiber. Be sure to reconnect the fibers properly as noted in Step 3.

7. Release Expansion Interface circuit pack or Switch Node Interface circuit pack with the **release board UUCSS** command.

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DS1 interface cable pinout

Table 2-8 shows the pin assignments for the cable used to connect the TN1654
DS1 CONV circuit pack to DS1 facilities.

Table 2-8. DS1 Interface Cable Connectors

Lead	Desig.	50-Pin Connector Pin #	15-Pin Connector Color	Pin	Color
Plug 04					
Facility D Line In	LID	38	W-BL	11	W-BL
Facility D Line In	LID*	13	BL-W	03	BL-W
Facility D Line Out	LOD	39	W-O	09	W-O
Facility D Line Out	LOD*	14	O-W	01	O-W
Plug 03					
Facility C Line In	LIC	41	W-G	11	W-G
Facility C Line In	LIC*	16	G-W	03	G-W
Facility C Line Out	LOC	42	W-BR	09	W-BR
Facility C Line Out	LOC*	17	BR-W	01	BR-W
Plug 02					
Facility B Line In	LIB	44	W-S	11	W-S
Facility B Line In	LIB*	19	S-W	03	S-W
Facility B Line Out	LOB	45	R-BL	09	R-BL
Facility B Line Out	LOB*	20	BL-R	01	BL-R
Plug 01					
Facility A Line In	LIA	47	R-O	11	R-O
Facility A Line In	LIA*	22	O-R	03	O-R
Facility A Line Out	LOA	48	R-G	09	R-G
Facility A Line Out	LOA*	23	G-R	01	G-R

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110 block cross-connect pins

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110 block cross-connect pins

Table 2-9.   110 block cross-connect pins

SRP Aux				EPN Aux		
AmphenolP in Number	Color	Cross-Connect Pin Number	Lead Designation[1]	Cross-Connect Pin Number	Color	Amphenol Pin Number
23	G-V	46	Cust Rtn	3	W-O	27

SRP Aux				SRP Switch		
AmphenolP in Number	Color	Cross-Connect Pin Number	Lead Designation	Cross-Connect Pin Number	Color	Amphenol Pin Number
27	W-O	3	Pwr Fail (-48V)	46	G-V	23
48	V-G	45	Cust A	23	BK-O	37

EPN Aux				SRP Switch		
AmphenolP in Number	Color	Cross-Connect Pin Number	Lead Designation	Cross-Connect Pin Number	Color	Amphenol Pin Number
02	O-W	4	Cust Rtn	24	O-BK	12
28	W-G	5	SRPresent	47	V-BR	49
29	W-BR	7	SRActive	48	BR-V	24
46	V-BL	41	-48V Rtn	41	V-BL	46
21	BL-V	42	-48V In	42	BL-V	21
48	V-G	45	SR Cntrl	43	V-O	47
23	G-V	46	SR Cntrl Rtn	44	O-V	22

1. When the loop between Cust A (alarm) and Cust Rt (return) closes, the SRSwitch configures the SRP into Restore mode, overriding the faceplate switch setting. Closure of the customer alarm relay is controlled by an SRP SAT command which closes the customer alarm relay on the SRP processor.

    Pwr Fail (-48V) is grounded when the TN2301 detects that its -48V redundant power is bad.

    Cust A (alarm) - see above.

    SRPresent is always grounded, indicating to the TN775C (Maint.) that it is connected in a SREPN.

    SRActive is generated by TN775C (Maint.) to disconnect links from Release 6r to SRP in Survive mode.

    -48V In/Rtn is input and return used by DC/DC converter for supplying redundant power to the optical transceivers.

    SR Cntrl/Rtn, when active, connects to the SR Cntrl Rtn signal on the TN775C (Maint.). Loop closed - TN2301 goes into Survive mode; loop open - TN2301 cannnot come out of Survive mode without manual or remote reset.

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Expansion Interface LEDs

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Expansion Interface LEDs

The Expansion Interface circuit pack has red, green, and yellow LEDs. The red and green LEDs show the standard conditions:

- Red indicates an alarm condition

- Green indicates maintenance testing in progress

The yellow LED is used to provide useful visual status information:

- Active EI circuit packs:

    — Have their yellow LED on solid (for an inter-EPN EI in a direct connect system)

    — Blink a pattern of 2 seconds on and 200 ms off.

- The standby PNC EI circuit packs should have their yellow LEDs off.

➡ NOTE:

Another way to determine which PNC (and therefore, which EI in a port network) is active and which is standby, use the **status port-network** and **status PNC** commands.

See for the possible EI yellow LED states.

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**Table 2-10.   Expansion Interface circuit pack
                Yellow LED Flashing States**

Condition	LED On	LED Off
Fiber Out-of-Frame[1]	0.1 second	0.1 second
In Frame-No Neighbor[2]	0.5 second	0.5 second
Expansion Interface Active[3]	2 seconds	0.2 second
Expansion Interface Active[4]	Solid on	Never off
Expansion Interface Standby[5]	Never on	Solid off

1. This flashing state corresponds to Error Codes 769 and 770 from the Hardware Error Log and indicates a failure of Test #238. These error codes are usually accompanied by error code 1281 (no Expansion Interface or Switch Node Interface detected on opposite end of fiber). This condition may be caused by the absence of the neighbor Expansion Interface or Switch Node Interface circuit pack, a broken or missing fiber, or a missing lightwave transceiver on either endpoint (Expansion Interface or Switch Node Interface circuit packs).

   When the SRP is in Survive mode, this flash rate at the Release 6r EI/SNI circuit pack is normal (the TN2301 puts the fiber into looparound back to the Release 6r).

2. This corresponds to Error Code 1281 from the Hardware Error Log and indicates a failure of Test #237. This condition is usually due to the failure of this Expansion Interface circuit pack or a failed Expansion Interface or Switch Node Interface circuit pack counterpart.

3. This is the normal state for an Active EPN Expansion Interface circuit pack that is also the bus master (Expansion Archangel) in the EPN.

4. This is the normal state for an Active Expansion Interface circuit pack that is not the bus master (Expansion Archangel) for an EPN. This applies only in direct-connect configurations where the Expansion Interface circuit pack in an EPN is connected through a fiber link to an Expansion Interface circuit pack in the other EPN. This state also applies for an active Expansion Interface circuit pack located in the PPN.

5. This is the normal state for a standby Expansion Interface circuit pack in the PPN and EPN.

$\Longrightarrow$ **NOTE:**

In an EPN the TN775C EPN Maintenance circuit pack monitors the sanity of the Expansion Interface circuit pack. If the EI circuit pack should cycle

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between sane and insane several times, the Maintenance circuit pack holds the EI circuit pack reset.

- If a new Expansion Interface circuit pack is installed in the EPN and the red LED stays on, remove the EPN Maintenance circuit pack because it may be holding the new EI circuit pack reset.

   This condition could present itself if there is a link problem to the EPN, and the EPN experiences several EPN restarts.

- The Maintenance circuit pack may be reinstalled after the Expansion Interface circuit pack has been physically inserted and the EI circuit pack's red LED is off.

Replacing the TN2301 circuit pack

⚠ CAUTION:
EPN service is interrupted until a replacement TN2301 is installed, powered up, and the EI links restored.

Unseat the circuit pack

1. Power down the cabinet by turning the power switch off.
2. Attach an ESD strap to your wrist.
3. Push the latch pin upward to unlock the locking lever.
4. Pull down on the locking lever until the circuit pack disconnects from its socket.
5. Pull the circuit pack just enough to break contact with the backplane connector, but do not remove it from the cabinet.

⚠ CAUTION:
Ensure that there is enough slack drawn from the extra fiber optic cabling from the bottom pan of the cabinet to clear the circuit pack from the cabinet (approximately 18 inches or 45.7 cm).

Replace the circuit pack

⇒ NOTE:
If the same optical transceivers can be reused, then the optical connections to the transceivers do not have to be removed. Just remove the transceivers from the old circuit pack and reconnect them to the corresponding connector positions on the replacement circuit pack.

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1. Using Figure 2-20 remove the fiber connections from each transceiver, *taking care to note to which transceiver the cables go and which is the transmit (TX) and receive (RX) connections for each transceiver.*
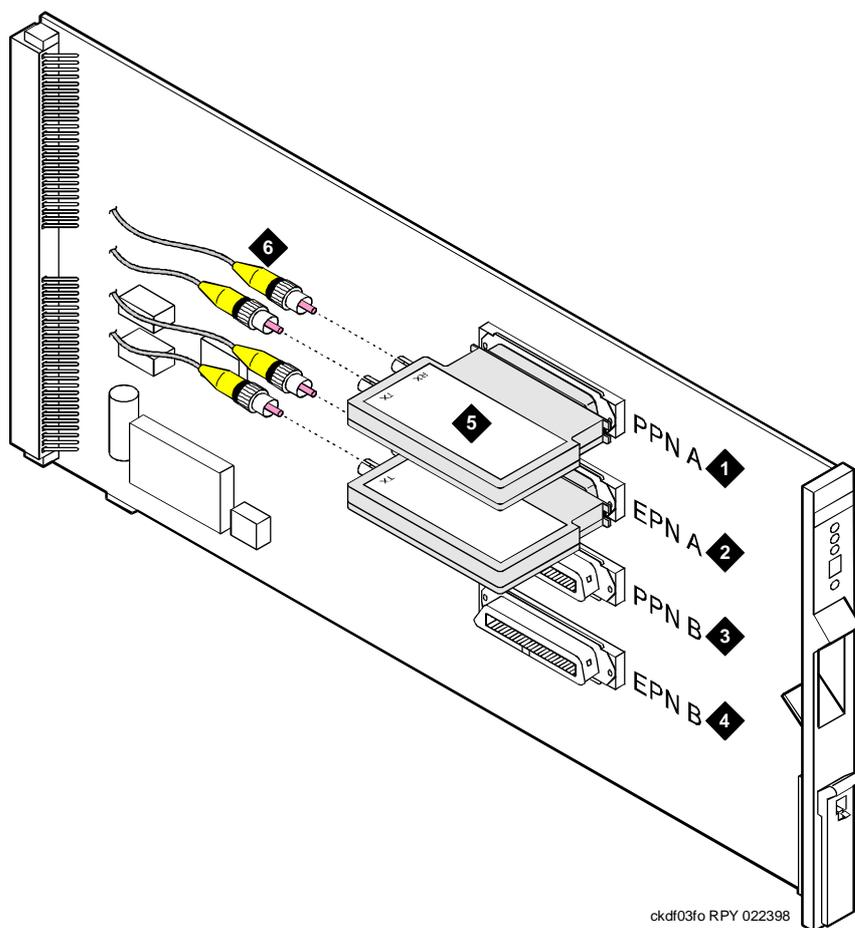

Figure Notes

1. Connections from PPN A

2. Connections to EPN A

3. Connections from PPN B

4. Connections to EPN B

5. Lightwave transceiver (9823A is always in this position)

6. Fiber optic cable pairs from the rear panel of the SRP cabinet

Figure 2-20. **Transceivers attached to the TN2301 circuit pack**

2. Remove the bracket and then the transceivers from the old circuit pack and replace them *in the identical positions* on the new TN2301 circuit pack.

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3. Replace the bracket over the transceivers to secure them to the board.

4. Feed the fiber cables through the slot in the back of the circuit pack and replace the fiber connections on each of the transceivers.

5. Insert the new pack, feeding the fiber patch cords to the bottom pan of the cabinet.

Reseat the circuit pack

1. Reseat the circuit pack into the backplane connector.

⚠ WARNING:
Ensure that the fiber cables are not bent or pinched between the back of the circuit pack and the backplane of the cabinet.

2. Lift the locking lever until the pin engages.

3. Power up the cabinet.

Restore from remote location

The **test customer alarm 1** command reconfigures the EI link connections to the Release 6r PPN just as if the faceplate switch was manually set to the RSTR (Restore) position.

⇒ NOTE:
The TN2301 faceplate switch position overrides the **test customer alarm 1** command, should the two conflict.

Once the connection to the Release 6r is repaired:

1. Dial in and log onto the SRP processor.

2. Type the **test customer alarm 1** command, which closes the relay on the Processor circuit pack.

3. Wait at least 3 minutes while the EPN goes through its cold restart and then check the status of the link connections with the **status health** command for *both the Release 6r and the SRP systems* to determine whether the link between the Release 6r and the EPN is up (Figure 2-9).

   When the connections are up on both sides (EPN and Release 6r), the system is successfully reconnected.

The Table 2-11 describes the conditions in which the restore from a remote location is possible:

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Table 2-11. **TN2301 switch configuration based on input**

Inputs to Control Logic				Modes
Remote Restore	**Survive Mode Requested[1]**	**Switch Position**	**SRP power**	**State of SREPN**
Not active	Not active	AUTO	Good	Normal mode: EPN connected with Release 6r PPN
Not active	Active	AUTO	Good	Survive mode: EPN connected to SRP
Not active	Don't care	TEST	Good	Survive mode: EPN connected to SRP
Active	Don't care	TEST	Good	Service mode: EPN connected to SRP
Not active	Don't care	RSTR	Good	Normal mode: EPN connected to Release 6r PPN
Not active	Don't care	RSTR	Bad	Normal mode: EPN connected with Release 6r PPN
active	Don't care	Don't care	Good	Normal mode: EPN connected to Release 6r PPN

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1. The EPN Maintenance (TN775C) circuit pack requests switching to Survive mode.

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System links

The state of a system link is dependent on the state of the various hardware components that it travels over. The switch maintains a list of hardware components over which the link travels, called the hardware path. For each system link there is a current and a faulted hardware path as shown in Table 2-12.

Table 2-12. Hardware path data for link repair

Hardware path	Link status	Hardware path data present?	Errors cleared at recovery?
Current	Up	Yes	Yes
	Down	No	Yes
Faulted[1]	Up		Yes
	Down	Yes[2]	No

1. Path that the link traversed when it last went down.
2. The time at which the faulted path was last recorded is preserved and is accessible through the **status sys-link *location***, which shows the state of both the hardware paths (current and faulted) and the state of each of the components in that path, and the **list sys-link** commands.

The focus of attention for problems that do not involve a link that is down is the current hardware path. If the link is down, faulted hardware path is the focus of attention. When analyzing any system link problem, look for alarms on the components listed under desired hardware path. If any alarms are present, then follow the maintenance procedures for the alarmed components to clear those alarms first.

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