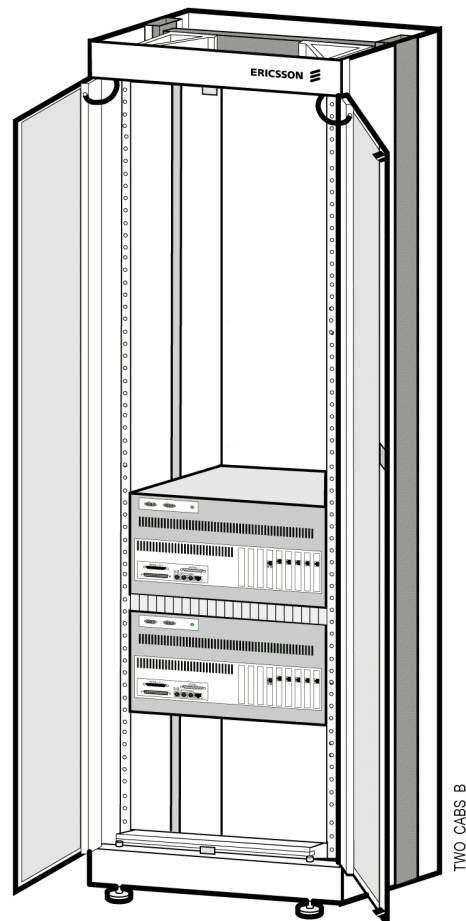
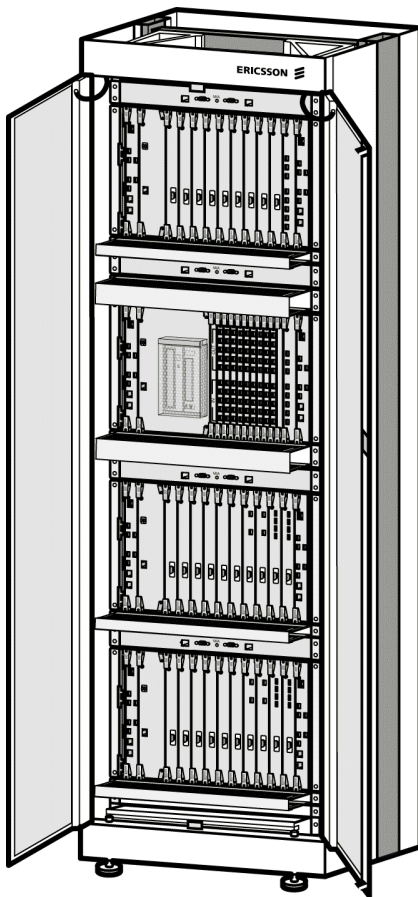




Hardware Installation Instruction

NSP 3.2 with SS7 Server



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1 Overview

1.1 General

This instruction describes the installation of a node based on the JAP 3 server platform including NSP 3.2 HW using the Base Cabinet BFE 306 055 and the SS7 Cabinet BFE 306 026.

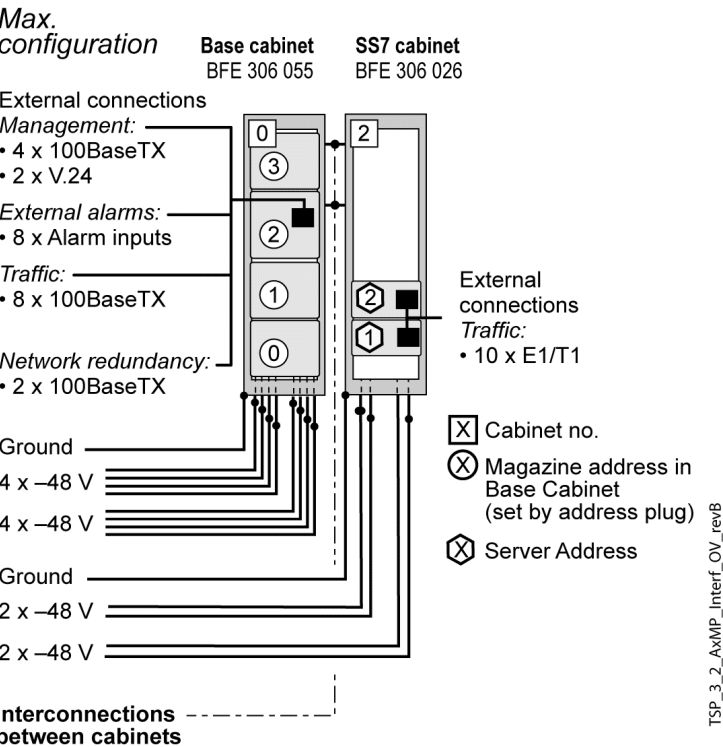


Figure 1 Overview of External Connections

1.2 Installation instruction overview

Safety issues and environmental issues are described in the document *Safety and Environmental Issues*, 1/124 46-APR 901 189/1 Uen.

An overview of the installation is available as a 2 page A3 drawing 2/1531-APR 901 189/1. This drawing can be used as a checklist of the installation to be made.

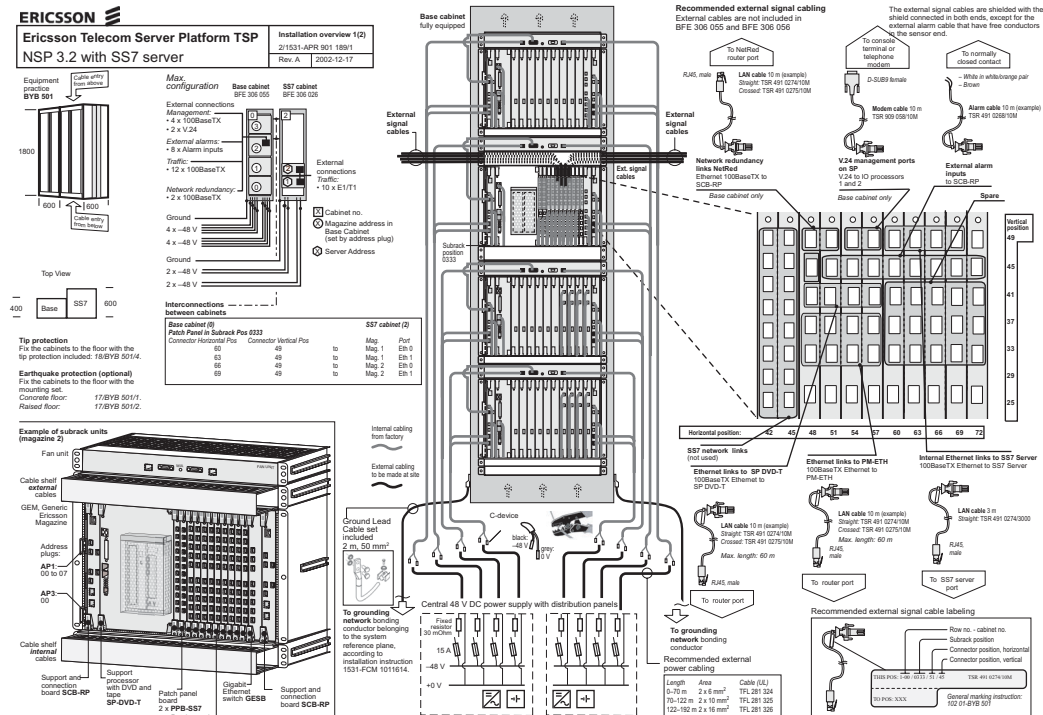


Figure 2 Installation instruction overview 2/1531-APR 901 189/1.

2 Installation Procedure

2.1 Overview

The installation of the cabinet includes the following steps:

- Site preparation.
- Installation of the cabinet.
- Assembly of the mechanics.
- Power and grounding.
- External cabling and wiring.
- Checking magazine addressing.

2.2 Site Preparation

Follow the BYB 501 instructions, see Section 6.1



Figure 3 Example of site preparation.

A single Base Cabinet requires 600 x 400 mm of floor space. The SS7 Cabinet requires 600 x 600 mm of floor space. The cabinets are designed for a minimum aisle width of 750 mm.

Cable entry can be from below, when using raised floor, or from a cable ladder above.

The heat dissipation of the base cabinet is typically 1250 W. The power dissipation of the SS7 cabinet is typically 700 W. The power dissipation of the equipment must be considered when designing the installation floor plan.

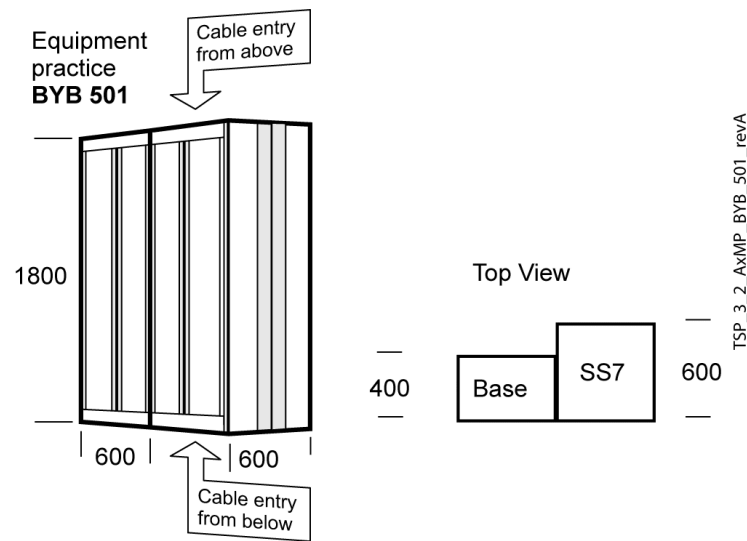


Figure 4 Cabinet dimensions and cable entry.

2.3 Installation of Cabinets

2.3.1 Delivery package

The delivery package for one base cabinet consists of one single plywood case of size 196 x 106 x 73 cm, weight 55 kg. The weight of the base cabinet including delivery package is approximately 260 kg.

The delivery package for one SS7 cabinet consists of one single plywood case of size 194 x 73 x 73 cm, weight 51 kg. The weight of the SS7 cabinet including delivery package is 230 kg.

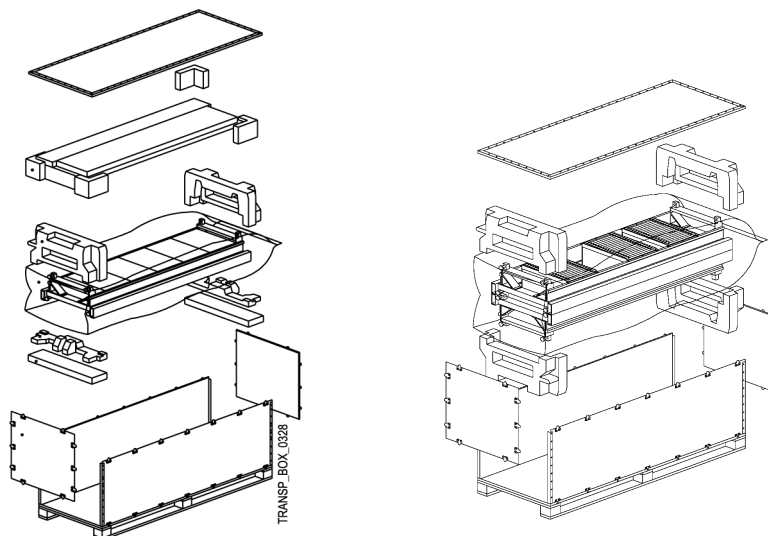


Figure 5 Delivery Packages

The cabinets are supplied complete with all internal units in place, such as subracks with boards, fan units and all internal cabling. The cabinet side panels and back panel are delivered unmounted.

2.3.2 On-site service cable kit

A cable kit, containing cables used for on-site service, is included in the package.

2.3.3 Fixing the cabinet

See Section 6.1 for details

Caution!

The cabinet must be fixed to the floor as tip protection.

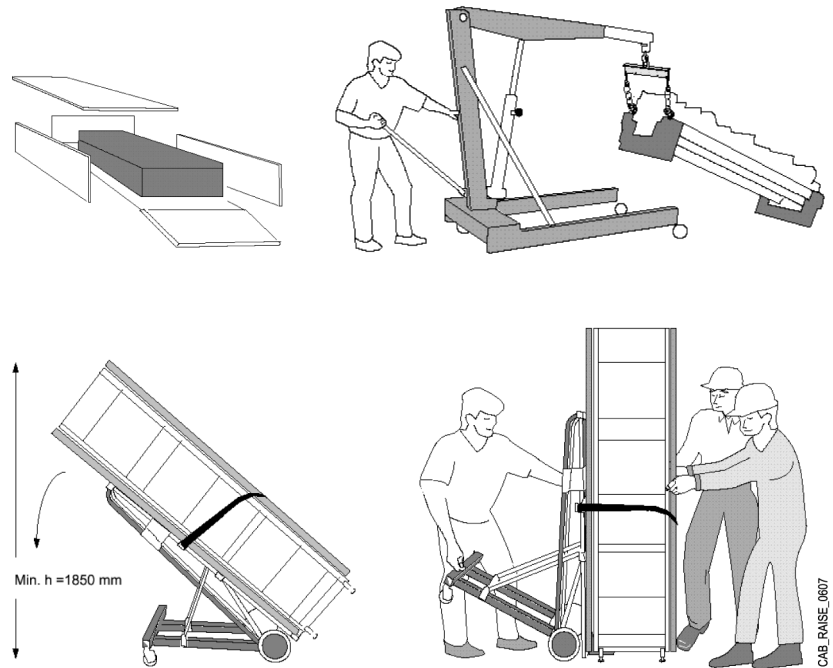


Figure 6 Example of tasks related to unpacking and raising the cabinet.

2.4 Assembly of Mechanics

2.4.1 General inspection

No special assembly of mechanics (except for side panels and back panel) is required. You are recommended to carry out a visual inspection of the cabinet.

Follow the BYB 501 instructions, see Section 6.1

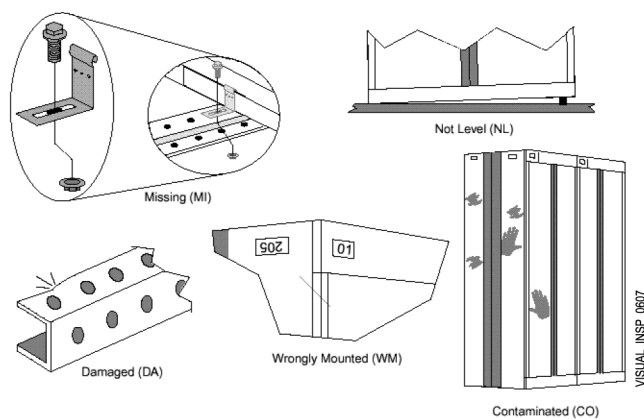


Figure 7 Example of tasks related to visual inspection of the cabinet.

2.4.2 Fixing cabinets to each other

If two cabinets are used, for example a Base Cabinet and an SS7 Cabinet, they should be fixed to each other using the 3 mounting plates included (14/BYB 501).

2.4.3 Inspection of internal cabling and subracks

Check that all mechanical units are positioned in accordance with the site-specific information. The power cabling of the Base Cabinet is shown in figure 8.

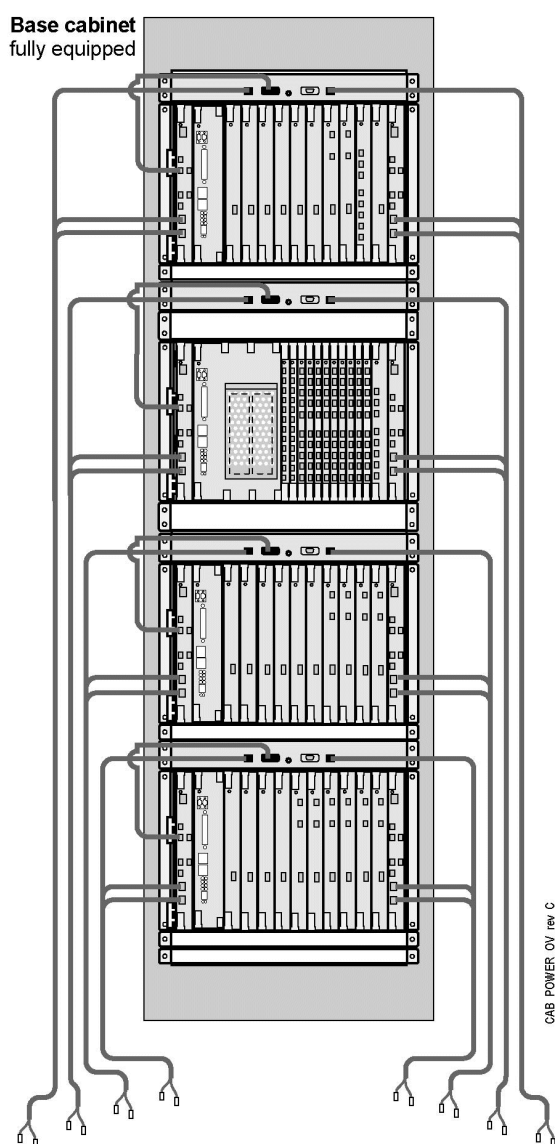


Figure 8 Overview of Base Cabinet Internal Power and Fan Supervision Cabling.

The internal cabling, for each subrack, consists of:

Fan supervision cable. The cable connects the fan unit with the left SCP-RP board.

A fan unit is mounted directly above each Generic Ericsson Magazine (GEM) subrack. The fan unit interface is handled by the V.24 port on the left SCB-RP board.

Note: There is no redundancy of the fan supervision cable, since it is connected to the left SCB-RP board only.

Power cables -48 V_{DC}. There is redundancy of power supply cabling. The first set connects the left side of the fan unit to the left SCB-RP board. The second set connects the right side of the fan unit to the right SCB-RP board.

The power connections of the SS7 cabinet BFE 306 026 are shown in figure 9.

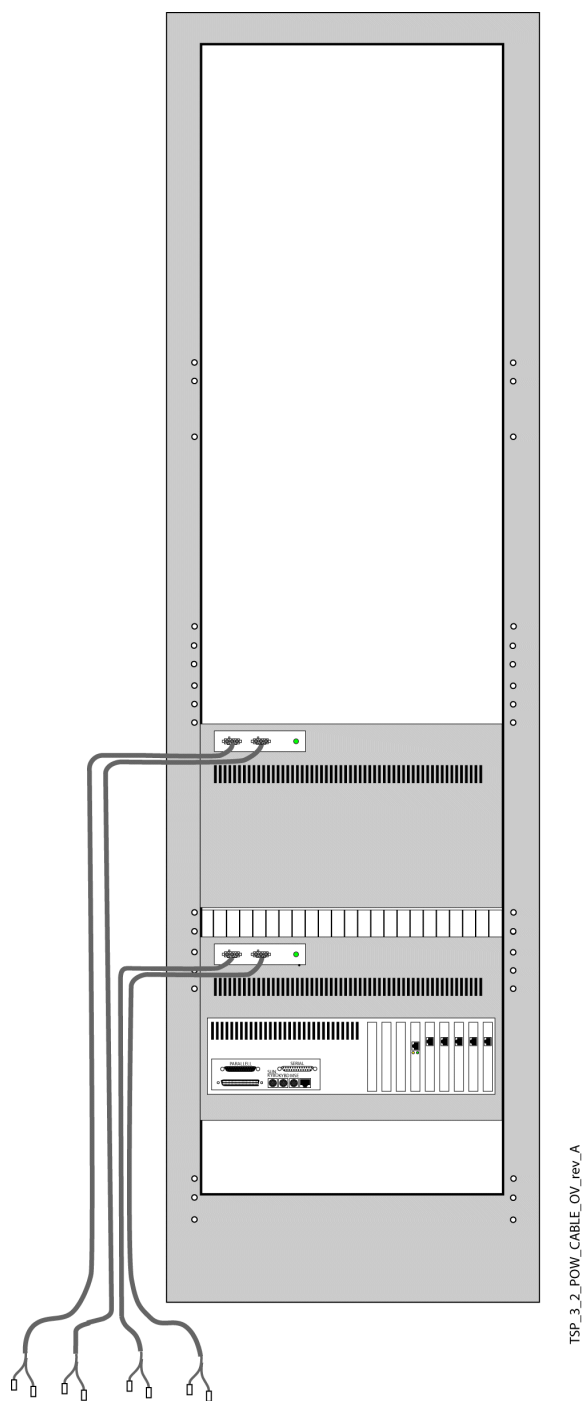


Figure 9 Overview of the SS7 Cabinet Power Cabling

2.5 Power and Grounding

2.5.1 Connection to Telecom Ground

Follow the BYB 501 instructions, see Section 6.1

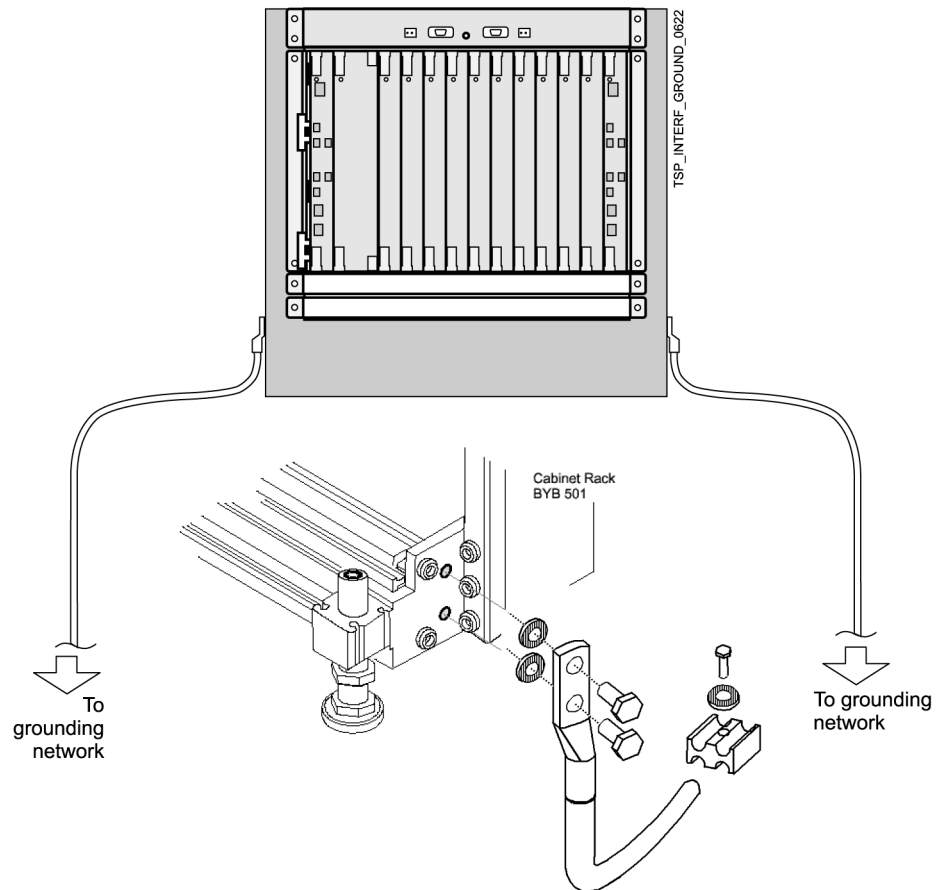


Figure 10 Example of connecting a cabinet to ground using the lower connection point

2.5.2 Connection to Power Supply -48 V_{DC}

Follow the BYB 501 instructions, see Section 6.1

Caution!

Check the polarity carefully. Incorrect polarity may damage the equipment

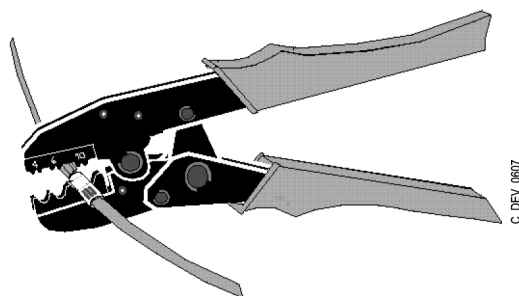


Figure 11 Crimping the external power cables to the C-devices.

The external power supply connections for each cabinet in the node consist of two sets of 2.5 mm² cables. Each cable ends with a C-device about 0.5 m outside the cabinet.

Each cable set is dimensioned for 500 W and shall be fed from a 15 A circuit breaker to protect the system. TS-HOD 500 is a suitable power supply solution (Two-Step High Ohmic Distribution, 500 W per power feeding branch).

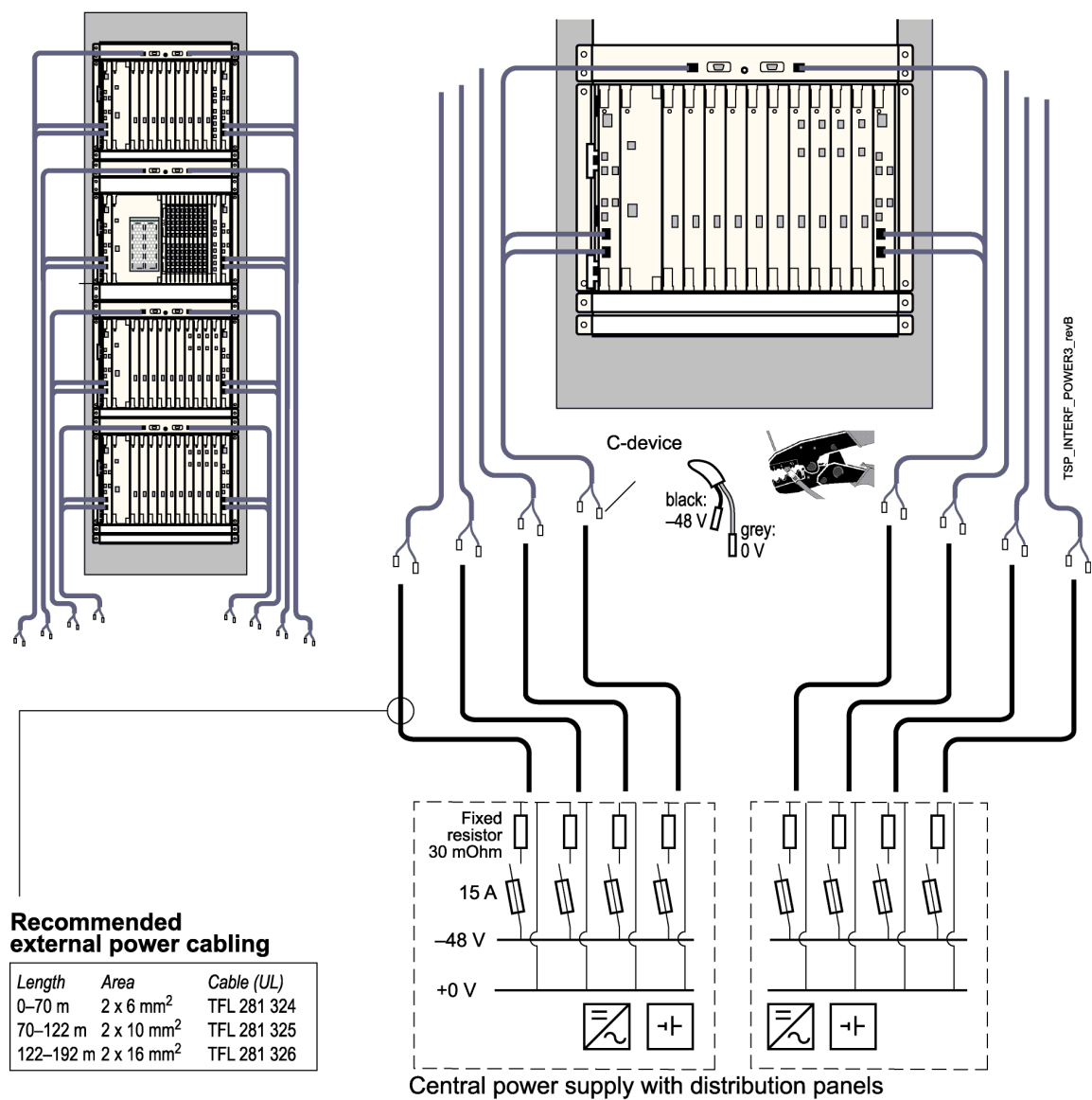


Figure 12 Connection to central power supply with distribution panels, TS-HOD 500.

2.6 External Cabling and Wiring

2.6.1 General

The external interfaces available at the Base Cabinet patch panel are:

- Management IP links
- Remote management V.24 ports
- Network redundancy IP links
- External alarm inputs
- Traffic IP network links.

The positions of the external cables on the patch panel are shown in figure 13.

Follow the BYB 501 instructions, see Section 6.1.

The external interface available at the SS7 Cabinet is:

- Traffic SS7 network links

The external cables are connected directly to the SS7 server, as shown in figure 15.

The maximum permitted cable attenuation between the node and the external equipment for E1 signalling is 6 dB at 1024 kHz, corresponding to a distance of 60 m for commonly used cable types.

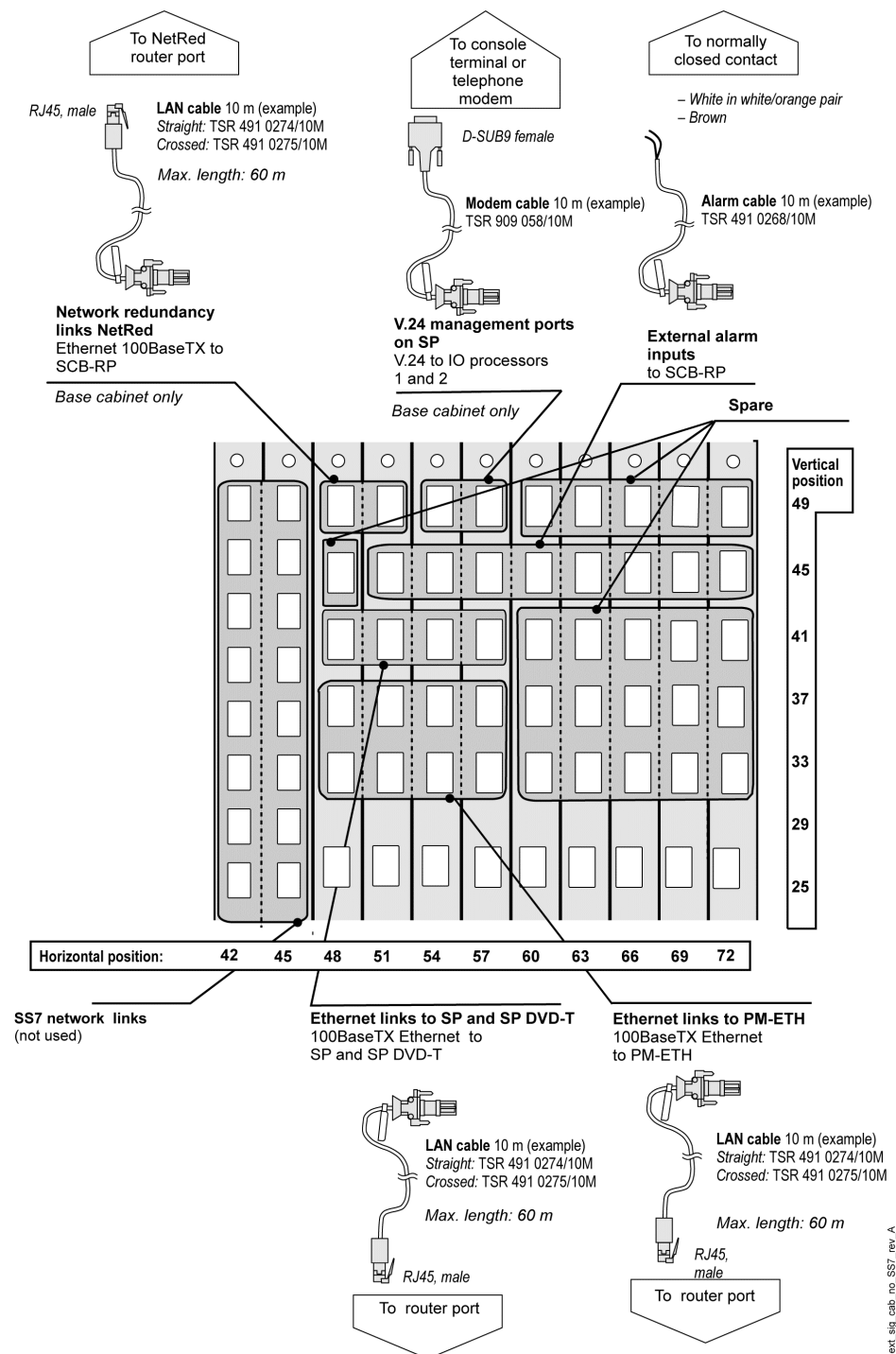


Figure 13 Positions of external cables at the Base Cabinet patch panel

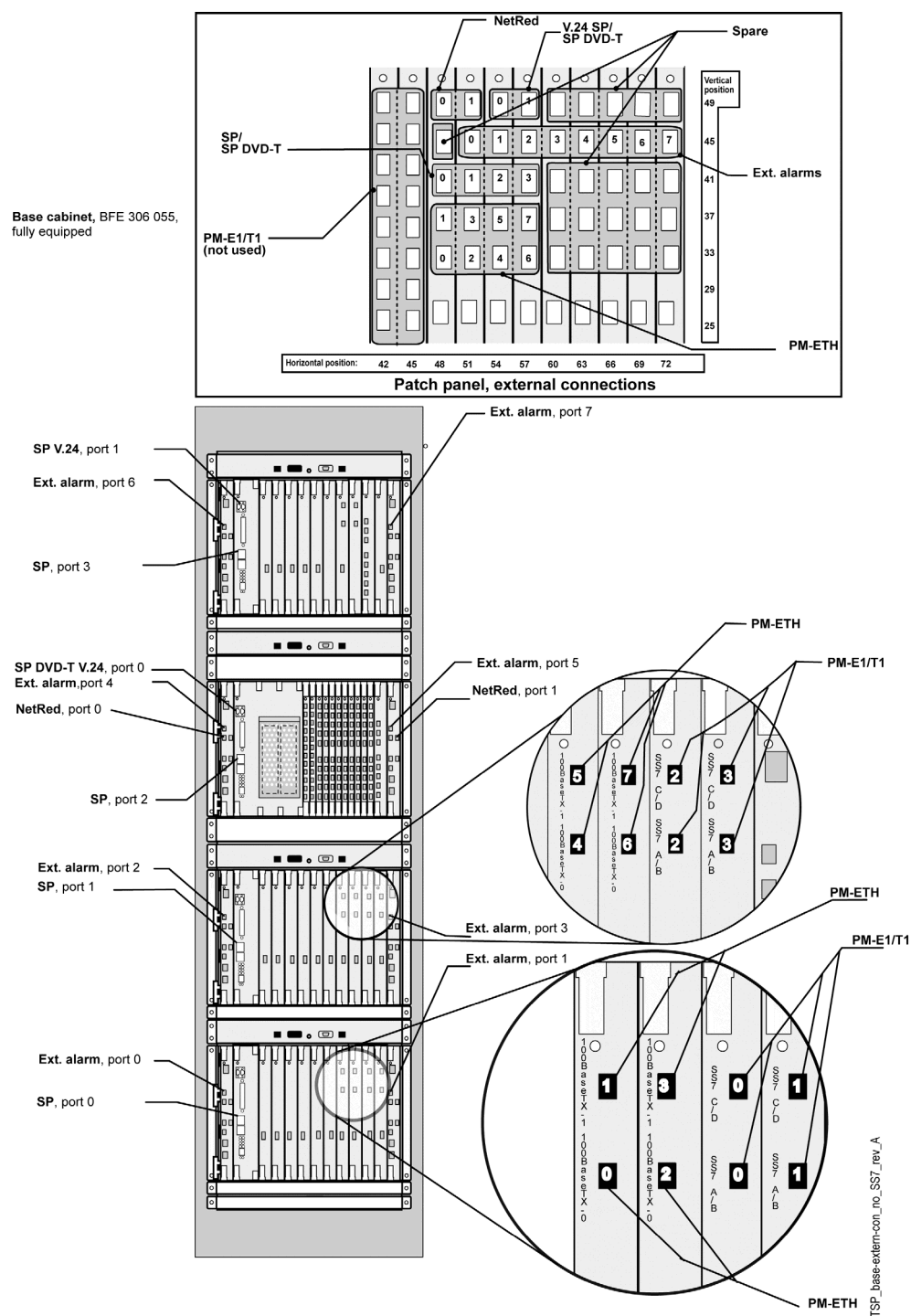


Figure 14 Interconnection between the patch panel and the plug-in units in the Base Cabinet.

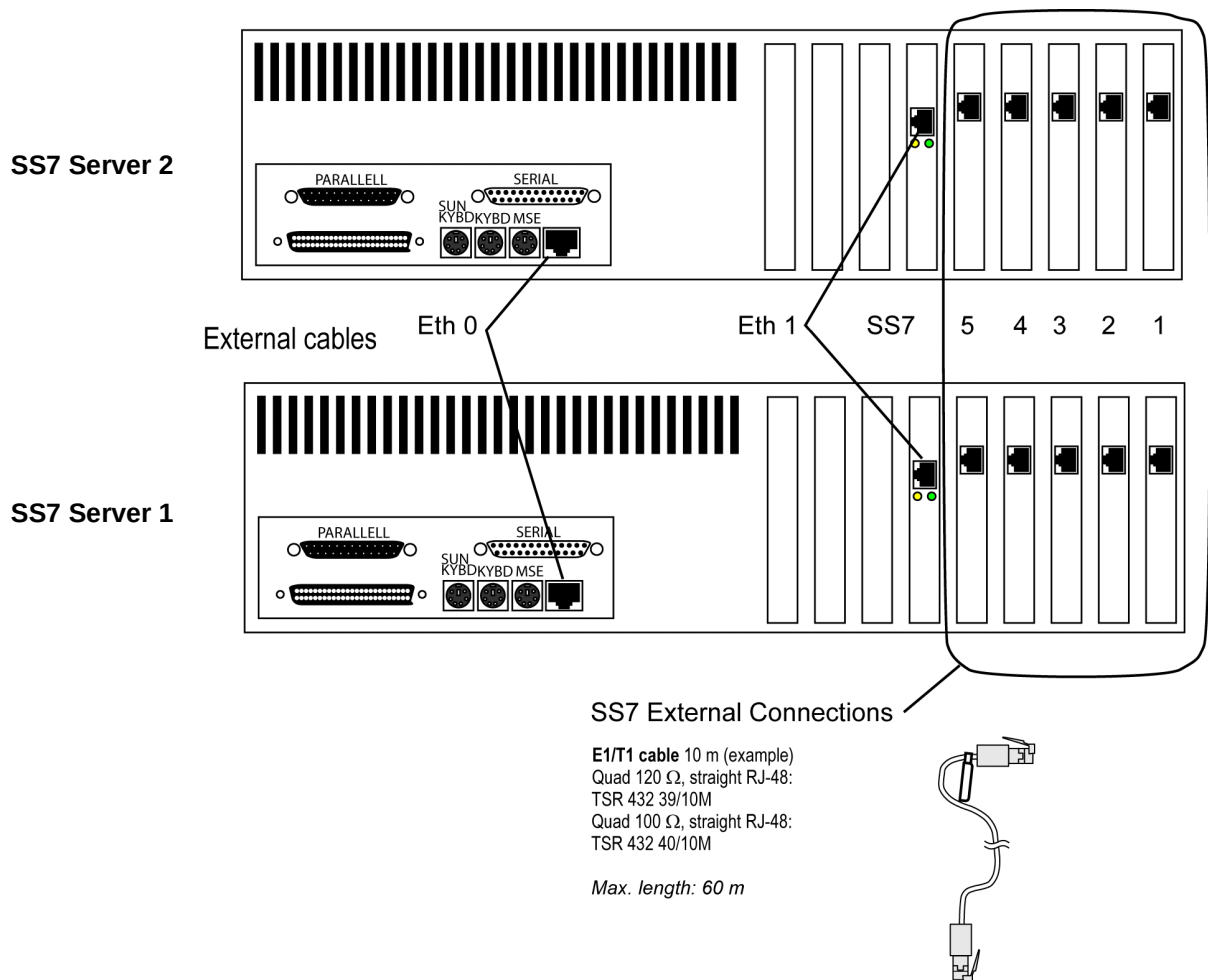


Figure 15 Positions of external cables at the SS7 servers.

2.6.2 Ethernet links to Support Processor (SP) and Support Processor with DVD and Tape (SP DVD-T)

The Ethernet Links to the Support Processor (SP) and Support Processor with DVD and tape station (SP DVD-T) are connected to the patch panel. Two of these processor modules are dedicated to be IO processors, IO1 and IO2 situated in the Base Cabinet.

IO1 is the SP in magazine 3 and IO2 is the SP DVD-T in magazine 2.

Patch panel horizontal position	Patch panel marking	Connected to
pos 48	EXT2	GEM magazine 0, SP pos 08, port SP-Eth 0
pos 51	EXT2	GEM magazine 1, SP pos 08, port SP-Eth 1
pos 54	EXT2	GEM magazine 2, SP DVD-T pos 08, port SP-Eth 2
pos 57	EXT2	GEM magazine 3, SP pos 08, port SP-Eth 3

The interface is of type Ethernet which supports 10BaseT and 100BaseTX in accordance with IEEE 802.3 standard, enabling up to 100 Mbit/s communication.

The following cables can be used for the external connection:

- **TSR 491 0274** is a straight cable with a Sofix shielded connector at one end and an RJ45 male connector at the other end.
- **TSR 491 0275** is a cross-over cable with a Sofix shielded connector at one end and an RJ45 male connector at the other end.

See Section 2.6.10 for guidelines whether to use straight or cross-over cables.

2.6.3 Management V.24 ports

The V.24 management interface of the node is connected to the IO processors IO1 and IO2 in the Base Cabinet.

IO2 is the SP DVD-T in magazine 2 and IO1 is the SP in magazine 3.

Patch panel horizontal position	Patch panel marking	Connected to
pos 54	EXT4	GEM magazine 2, SP DVD-T pos 08, V.24 port 0
pos 57	EXT4	GEM magazine 3, SP pos 08, V.24 port 1

The following cable can be used for the external connection:

- **TSR 909 058** a modem cable with a Sofix shielded connector at one end and an D-SUB9 female connector at the other end.

2.6.4 Network Redundancy IP Links

The network redundancy links on the patch panel are connected to the upper right hand side Support and Connection Boards SCB-RP in the Base Cabinet.

Patch panel horizontal position	Patch panel marking	Connected to
pos 48	EXT4	GEM magazine 2, right SCB-RP, port 100BaseTx
pos 51	EXT4	GEM magazine 2, left SCB-RP, port 100BaseTx

The two network redundancy links are connected via the patch panel to 100BaseTX ports on SCB-RP boards in GEM magazine 2.

The interface is of Ethernet type which supports 10BaseT and 100BaseTX in accordance with IEEE 802.3 standard, enabling up to 100 Mbit/s communication.

The following cables can be used for the external connection:

- **TSR 491 0274** is a straight cable with a Sofix shielded connector at one end and an RJ45 male connector at the other end.
- **TSR 491 0275** is a cross-over cable with a Sofix shielded connector at one end and an RJ45 male connector at the other end.

See Section 2.6.10 for guidelines whether to use straight or cross-over cables.

2.6.5 External Alarm Inputs

The external alarm inputs on the patch panel are connected to the port EXT ALARM on the 8 Support and Connection Boards SCB-RP in the Base Cabinet.

Patch panel horizontal position	Patch panel marking	Connected to
pos 51	EXT3	GEM magazine 0, left SCB-RP, EXT ALARM port 0
pos 54	EXT3	GEM magazine 0, right SCB-RP, EXT ALARM port 1
pos 57	EXT3	GEM magazine 1, left SCB-RP, EXT ALARM port 2
pos 60	EXT3	GEM magazine 1, right SCB-RP, EXT ALARM port 3
pos 63	EXT3	GEM magazine 2, left SCB-RP, EXT ALARM port 4
pos 66	EXT3	GEM magazine 2, right SCB-RP, EXT ALARM port 5
pos 69	EXT3	GEM magazine 3, left SCB-RP, EXT ALARM port 6
pos 72	EXT3	GEM magazine 3, right SCB-RP, EXT ALARM port 7

The interface is a 2-wire balanced interface. The alarm input can be activated in two alternative ways:

- Opening the A and B wires (normally closed contact in the sensor).
- Closing or opening the B wire to the system ground 0 V.

The following cable can be used for the external connection:

- **TSR 491 0268** is a straight cable with a Sofix shielded connector at one end and free ends at the other end.

2.6.6 Traffic SS7 Network Links

The SS7 network links using E1/T1 are connected to link boards in the SS7 server in the SS7 Cabinet. Each link board has one RJ48C connector.

The following cables can be used for the external connection:

- **TSR 432 39** is a straight quad cable with 120 Ω impedance for E1 transmission. It has 8 Position Modular (“RJ45/RJ48 male”) Connectors at both ends.
- **TSR 432 40** is a straight quad cable with 100 Ω impedance for T1 transmission. It has 8 Position Modular (“RJ45/RJ48 male”) Connectors at both ends.

2.6.7 Ethernet Links to PM-ETH

The Ethernet links to the PM-ETH are connected to the patch panel. Each PM-ETH has 2 interfaces marked 100BaseTx-0 and 100BaseTx-1 on the board front panel.

Base Cabinet

Patch panel horizontal position	Patch panel marking	Connected to
pos 48	EXT0	GEM magazine 0, PM-ETH pos 68, port Tx-0
pos 48	EXT1	GEM magazine 0, PM-ETH pos 68, port Tx-1
pos 51	EXT0	GEM magazine 0, PM-ETH pos 71, port Tx-0
pos 51	EXT1	GEM magazine 0, PM-ETH pos 71, port Tx-1
pos 54	EXT0	GEM magazine 1, PM-ETH pos 68, port Tx-0
pos 54	EXT1	GEM magazine 1, PM-ETH pos 68, port Tx-1
pos 57	EXT0	GEM magazine 1, PM-ETH pos 71, port Tx-0
pos 57	EXT1	GEM magazine 1, PM-ETH pos 71, port Tx-1

The interface is of Ethernet type which supports 10BaseT and 100BaseTX in accordance with IEEE 802.3 standard, enabling up to 100 Mbit/s communication.

The following cables can be used for the external connection:

- **TSR 491 0274** is a straight cable with a Sofix shielded connector at one end and an RJ45 male connector at the other end.
- **TSR 491 0275** is a cross-over cable with a Sofix shielded connector at one end and an RJ45 male connector at the other end.

See Section 2.6.10 for guidelines whether to use straight or cross-over cables.

2.6.8 Fixing the cables

When fixing the connectors of the external cables to the patch panel, use a screwdriver of type Torx TX08. Maximum torque must be 0,3 Nm.

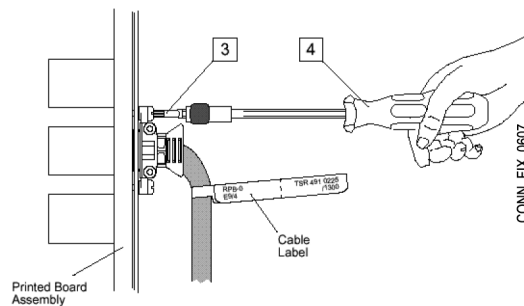


Figure 16 Fixing connectors of external cabling with a Torx screwdriver TX08.

Fix the cables inside the cabinet using the cable straps included (25/BYB 501).

2.6.9 Cable Labelling

Follow the instructions in the general marking instruction 102 01-BYB 501.

Recommended external signal cable labelling

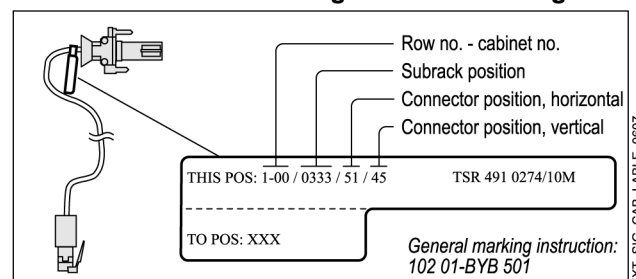


Figure 17 Labelling of external cables.

2.6.10 Connection to LAN

Definition of MDI and MDI-X

There are two types of Ethernet ports. The MDI-X (Media Dependent Interface, cross-over) port is generally used by on switch or hub, and the MDI is generally a workstation or file server. The difference between the two is that the receive and transmit pairs are swapped which means you must use a cross-over cable when connecting devices of the same type (MDI to MDI, or MDI-X to MDI-X).

LAN cables

Connect the external routers/switches via the straight or cross-over LAN cable.

- **TSR 491 0274** is a straight LAN cable, normally used to connect the node to a switch or hub.
- **TSR 491 0275** is a cross-over LAN cable, normally used to connect the node to a router.

NOTE: Layer 3 switches (sometimes denominated routers) shall normally be connected with straight cables. If unsure, please refer to the installation manual of the external equipment.

The cables are shielded, STP, CAT 5E, with the shield connected in both ends.

Caution!

Ensure that the node and the external equipment has the same ground potential. Since the cable shield is connected in both ends of the LAN cable there is a risk of a ground current floating in the shield if the two units connected have different ground potentials.

If there is a difference in ground potential, a bonding network reinforcement should be considered.

2.7 Addressing

2.7.1 Checking subrack addresses

Two address plugs are located to the left in each GEM subrack.

The address plugs are inserted at the factory and need not to be changed at site. The identity can be read on the label without removing the address plug from the magazine.

Caution!

Do not remove the subrack address plug during operation. This will cause an alarm in the Management System.

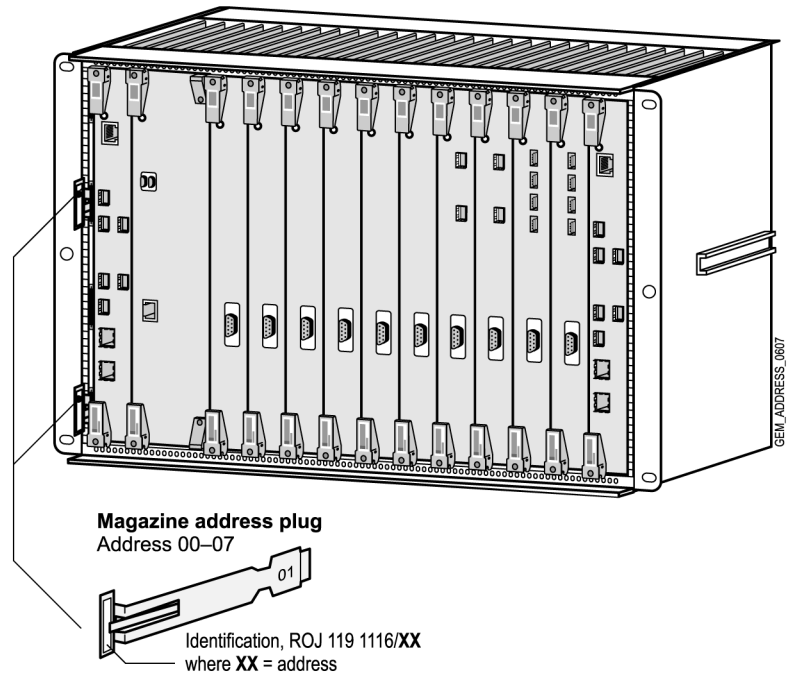


Figure 18 GEM magazine with address plug.

3 Power-on and Check

3.1 General

3.1.1 Normal operating state = no indications

The normal operating state, with power-on is indicated by all front indicators unlit (off), except for the some internal indicators on traffic processor and support processor boards. A lit indicator (MIA, Manual Intervention Allowed) means failure or not normal condition.

Caution!

Do not shut-down the system by disconnecting the -48 V_{DC} . The support processors may get corrupted file systems. Instead use the a proper shutdown command from the O&M system.

3.2 Prerequisites

The following activities are prerequisites to powering up the node.

- All -48 V_{DC} connections must have been made, with correct polarity.
- The external power supply circuit breakers must be switched OFF.
- The doors of the cabinet must be open.

3.3 Power-on and check

- 1 Inspect the distribution panel in the central power supply. The Base Cabinet must have 8 circuit-breakers for the power feeding, 4 for the left -48 V_{DC} and 4 for the right -48 V_{DC} . The SS7 Cabinet requires 4 circuit-breakers.
- 2 Switch ON all external circuit breakers, starting with the circuit breakers for the bottom magazine and then the circuit breakers for the SS7 Servers.
- 3 Check the air flow above the top of the cabinet to ensure that the fans are blowing.
- 4 If the installation has proceeded without problems, you are recommended to leave the power switched ON and continue with the software installation.
- 5 If you have encountered problems: see Section 3.5

3.4 Installation of Software

3.4.1 General

Follow the instructions in *TelORB Installation*, 6/1553-ANA 901 02/1.

3.5 Troubleshooting

Before contacting the help desk, check the following items.

3.5.1 The units have no power

- Check that the distribution panel circuit breakers at the central power supply are switched ON.
- Remove the -48 V_{DC} connectors at the front of the subrack. Measure the voltage at the cable connector. The voltage must be in the range $-40.5\text{ V}_{\text{DC}}$ to -57 V_{DC} .

3.5.2 The fan unit is not running

- Remove the -48 V_{DC} connectors at the front of the fan unit. Measure the voltage at the cable connector. The voltage must be in the range $-40.5\text{ V}_{\text{DC}}$ to -57 V_{DC} .

3.5.3 No connection with external router

- Check that the correct cable is used.
Two types of LAN cables are available:
 - Straight: TSR 491 0274.
 - Cross-over: TSR 491 0275.

4 Installation of Additional Base Cabinet Processor Modules

A partly equipped base cabinet can be extended with additional Processor Modules. The document *Allocation Drawing Equipped Base cabinet*, 1951-BFE 306 055 Uen specifies what type of board each slot position may be equipped with.

4.1 ESD wrist strap

When working with plug-in units, use an ESD wrist strap to avoid ESD damage. The strap can be connected to the ESD socket in the upper part of the cabinet.

4.2 Product handling and inspection

An extension unit should always be kept in its ESD protective bag and original cardboard box until it is ready to be installed in the cabinet.

When handling the unit, do not touch any components or connector pins.

If the packing material is damaged, inspect the unit immediately. If the unit appears to be damaged, return it to the service center for repair or replacement.

4.2.1 Expansion procedure

- 1 Locate the slot in which the new Processor Module shall be inserted to.
- 2 Attach the ESD strap to the wrist and connect the free end of the strap cable to the ground socket in the upper part of the cabinet.
- 3 Loosen the screws holding the dummy unit in the magazine. Use a screwdriver of type Torx TX08.
- 4 Slide the dummy unit forward from the magazine and remove it.
- 5 Remove the new unit from its ESD bag and carefully slide the new unit into the magazine. Tighten the mounting screws in the in the levers to a torque of 0,5-0,7 Nm.
- 6 If the new module has front connectors for external signalling (SS7 or Ethernet links) connect and fix the pre-installed cables according to the instructions on page 23.
- 7 Remove the ESD wrist strap.

Enable the new Processor Module according to the instructions in *TelORB Manager*, 12/1553-ANA 901 02/1.

5 Installation of Additional SS7 Cabinet Link Board

A partly equipped SS7 cabinet server can be extended with additional Link Boards.

5.1 ESD wrist strap

When working with plug-in units, use an ESD wrist strap to avoid ESD damage. The strap can be connected to the ESD socket in the upper part of the cabinet.

5.2 Product handling and inspection

An extension unit should always be kept in its ESD protective bag and original cardboard box until it is ready to be installed in the cabinet.

When handling the unit, do not touch any components or connector pins.

If the packing material is damaged, inspect the unit immediately. If the unit appears to be damaged, return it to the service center for repair or replacement.

5.2.1 Expansion Procedure

The expansion procedure is described in detail in the document *Implementation Procedure for Adding/Replacing SS7 Signalling Link Card or Stack Processor in an Operational JAMBALA System*, 17/1541-ANA 901 01/1 Uen.

6 Additional Information

6.1 Cabinet Installation Instructions

This section gives an overview of the documents that can be used when installing the BYB 501 cabinet.

6.1.1 Preparation

Floor Layout - Marking:	<i>1531-FCM 101 1202</i>
Floor Levelling Technique:	<i>1531-FCM 101 1203</i>
Drilling of Anchoring Holes for Cabinet BYB 501:	<i>1531-FCM 101 1205</i>

6.1.2 Installation of the cabinet

Handling of Equipped Cabinet BYB 501:	<i>1531-FCM 101 1305</i>
Installation of Equipped Cabinet BYB 501:	<i>1531-FCM 101 1317</i>
Anchoring Patterns for BYB 501 Cabinets:	<i>1/1531-FCMU 101 1317</i>

6.1.3 Assembly of the mechanics

Installation of Overhead Mechanics BAY 615:	<i>1531-FCM 101 1405</i>
Installation of Floor System BAY 614 - Cabinet BYB 501:	<i>1531-FCM 101 1406</i>
Visual Inspection of Mechanics - Cabinet BYB 501:	<i>1531-FCM 101 1407</i>
Installation of Cable Chute BAY 615:	<i>1531-FCM 101 1408</i>
Installation of Cable Chute BAY 614:	<i>1531-FCM 101 1409</i>

6.1.4 Power and grounding

Installation of AXE Grounding Network (Single Point):	1531-FCM 101 1609
Installation of Grounding (Earthing) for Cabinet BYB 501:	1531-FCM 101 1614
Foreign Object Ground Installation:	1531-FCMU 102 601
Clarification of FOG Requirements:	1/1531-FCMU 102 601
Power and Ground:	2/1531-FCMU 102 601
Insulation Test:	1531-FCMU 102 602
Installation of AXE Grounding Network (Multipoint):	1531-FCM 101 1603

6.1.5 Cabling and wiring

Installation of Internal Cables in Cabinet BYB 501:	1531-FCM 101 1705
Installation of External Cables in Cabinet BYB 501:	1531-FCM 101 1706
Crimping:	1531-FCM 101 1709
Crimping of Ferrule Lug:	1/1531-FCM 101 1709
Installing Cables on Vertical Runs:	1531-FCM 101 1712
Continuity Test - Installation Technique Cabling and Wiring:	1531-FCM 101 1721
Wiring:	1531-FCM 101 1704
Visual Inspection of Wiring:	1531-FCM 101 1720

6.1.6 Equipping

Handling of Printed Board Assemblies ROJ:	1531-FCM 101 1804
Extension Procedures for Cabinet BYB 501:	1531-FCM 101 1806

6.1.7 Final details

Installation of Final Covering - Cabinet BYB 501:	1531-FCM 101 1902
Firestopping Cable Holes:	1/1531-FCM 101 1905
Markings and Designations - BYB 501:	1531-FCM 101 1910

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