Meridian 1

Option 11C

Planning and Installation Guide

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About this guide

The *Planning and Installation Guide (553-3021-210)* is intended for Meridian 1 Option 11C new system planning and installation personnel.

This Northern Telecom Publication (NTP) is a useful reference tool for first-time installations as it provides valuable information for the planning and installation of the Option 11C system. The planning chapters describe the general design, features, limits, and site requirements of the Option 11C system. The installation chapters give complete installation instructions and outlines the process of installing a new Option 11C main cabinet system and expansion cabinets, if required.

IMPORTANT

If performing a new installation of an Option 11C system, follow the procedures described in this guide. If upgrading from an Option 11 or 11E to an Option 11C system, follow the steps outlined in the *Option 11C Upgrade Procedures* guide.

Detailed technical information is contained in the optional *Option 11 Technical Reference Guide*.

Chapter 1 — Overview of the Option 11C

General information

This chapter provides an overview of the Option 11C system for first-time installations. It covers general design and features as well providing unique system information.

Design and architecture

The Option 11C is a small wall- or floor-mounted digital system which can be configured as a system with up to five cabinets.

Up to four expansion cabinets can be connected to the main cabinet using fiber optic cable. The expansion cabinets can be located up to 3 km (1.8 mi) from the main cabinet. Two types of fiber optic cable are used:

- Plastic fiber optic cable for connecting an expansion cabinet up to 10 m (33 ft) from the main cabinet.
- Glass fiber optic cable for connecting an expansion cabinet up to 3 km (1.8 mi) from the main cabinet.

Call processing, serial ports and network traffic are handled by an MC68040 processor located on the Small System Controller (SSC) card in the main cabinet. Processing is significantly increased in comparison with previous Option 11 systems.

The Option 11C uses global software found in other members of the Meridian 1 family. It can be configured as a key system or as a Private Branch Exchange (PBX).

Line cards and trunk cards used in the Option 11C are the same as those used in other Meridian 1 systems. There are some specially designed cards used in the Option 11C system. These are described in “Unique Option 11C elements” on page 4.

The Option 11C can be configured as a non-blocking system as it does not need to be provisioned for speech paths or timeslots.

Easy to install and program

The system is shipped with a Software Daughterboard which is pre-configured with system and customer data.

The Software Installation Program is automatically invoked during first-time installation of the Option 11C system. This is a menu driven program which installs the software and makes the Option 11C operational.

Model telephones

The user has a variety of pre-programmed model telephone layouts from which to choose. Using telephone layouts or templates, technicians can perform a few simple steps at installation to activate multiple telephones.

Administration telephone

If the default model layouts for telephones and trunk routes are used, an administrative telephone is all that is required to make adjustments to such things as the numbering plan and access codes. A TTY input terminal is not required for programming the Option 11C unless a custom layout is used.

The telephone used for administrative functions can be an M2616 or M2008 digital telephone. This phone can also double as a user’s working telephone.

Changing or removing pre-programmed data

If the pre-programmed data is not applicable to users at a particular site, the data can be revised on-site with a TTY, or remotely over a modem connection. If desired, the user can start with the minimal amount of data required for initial software programming which is the configuration record. This step must be performed while the user is in the Software Installation Program.

Set-Based Administration

The Set-Based Administration feature simplifies system installation and administration by enabling a telephone set to perform several administrative and maintenance procedures. Examples such as changing data associated with specific set-related features, or changing Calling Party Name Display on a particular set, can be performed through the Set-Based Administration feature.

For more information about Set-based Administration, refer to the *X11 System Management Application Guide*, NTP 553-3001-303.

Multiple-terminal access

The Option 11C allows a total of five users access to log in, load, and execute overlays simultaneously. For example, if you have expansion cabinets, users can access the system through the Main or Expansion cabinets at the same time.

Three Serial Data Interface (SDI) ports are provided on the Main cabinet's Small System Controller (SSC) card, while each expansion cabinet can be accessed through one SDI port on each Expansion cabinet Fiber Receiver card.

The advantage of multiple-terminal access is that it allows for more efficient programming and maintenance of the Option 11C, especially when system cabinets are located up to 3 km (1.8 mi) apart.

Meridian Mail

The specially designed Meridian Mail comes pre-configured with mailboxes already setup for pre-programmed extensions. If the numbering plan is being modified, then the mailboxes can be changed from any TTY used for Option 11C administration.

Fully featured

Option 11C comes with software for applications such as Automatic Call Distribution, Voice Mail, Automatic Route Selection, Automatic Set Relocation, and Attendant Administration, to name a few.

The Meridian Mail application comes equipped standard with features like Voice Menus, Automated Attendant, and Hospitality Voice Services.

Meridian Mail Networking is available on advanced Meridian Mail systems.

There is a choice of software available offering everything from General Business features to Advanced Applications. First-time installations are performed from the Software Daughterboard that is initially provided with the new system. Upgrades to new software releases are performed using a Software Delivery card (PCMCIA card).

Unique Option 11C elements

The Option 11C system is characterized by the following unique elements:

- Software Delivery card (PCMCIA)
- Flash Drives (primary and backup)
- Software Daughterboard
- Security Device which validates keycodes for features assigned to this system.

Software Delivery card

The Option 11C uses a Software Delivery card (PCMCIA card) to upgrade system software and to provide storage for a backup copy of customer data.

The Software Delivery card is inserted in a specially designed socket in the faceplate of the NTDK20 Small System Controller (SSC) card. Once inserted, software and customer databases can be loaded from the card to the Flash Drive daughterboard on the NTDK20 Small System Controller (SSC) card.

Flash Drive

Meridian software operation and customer data storage is performed by two Flash Drives located on the Small System Controller (SSC) card.

The first Flash device, called the Primary Flash Drive, is located on the Flash Drive daughterboard on the Small System Controller (SSC) card in the main cabinet. It contains Meridian system data and the first copy of customer data required to load and run the switch.

The second Flash Drive, called the Backup Flash Drive, stores user changeable files such as configuration data and the second copy of the customer database. The Backup Flash Drive is in a physically different location on the Small System Controller (SSC) card so that in the unlikely event of a Primary Flash Drive failure, a backup set of customer data can be retrieved and loaded into the system's active database.

Software Daughterboard

The Software Daughterboard is used as a storage area for system and customer data. It is used to deliver and load the system software and customer database in a new Option 11C installation. The Software Daughterboard is pre-programmed with the system software before being shipped to the customer site (this is the method used in most cases).

The Software Daughterboard contains all the components associated with a particular release of software; including software patches, preconfigured customer database, feature sets and other pertinent databases and software. It interfaces with the Option 11C CPU through a connector mounted on the component side of the Small System Controller (SSC) card.

CAUTION

A Software Daughterboard, Security Device and Keycode Data Sheet are required to allow proper installation of the software. A keycode data sheet is needed to complete the installation. Refer to the keycode data sheet when entering the ISM parameters, adding packages or changing the AUX ID.

Security Device

A Security Device is provided with each new Option 11C system. This device is attached to the component side of the NTDK20 Small System Controller (SSC) card at time of initial installation and remains there for the life of the system. The Security Device is used to identify the system and allows the activation of features assigned to the system through the use of a series of key codes which provide validation.

System specifications

The Main cabinet houses a maximum of 10 cards. These can be combined using line and trunk cards as needed. Since each installation varies, depending on the end-user's needs, it is difficult to quote capacities. However, in a moderate to busy work environment, a common ratio of users to trunks usually falls between 4-6 users to each trunk.

Since each line card can interface with up to 16 telephones and each trunk card can interface with up to 8 trunks, then a common configuration might be 7 line cards and 3 trunk cards.

Each Expansion cabinet specifications are as follows:

- Input voltage
  - — 90 V to 240 V, or 208 V to 240 V ac, -52 V dc
- Number of slots
  - — 10 in the main cabinet and 10 in each expansion cabinet for a total of 50 when four expansion cabinets are added
- Software generic
  - — Global X11, release 22 and later software versions for systems equipped with single port fiber expansion daughterboards only (maximum two expansion cabinets)
  - — Global X11, release 24 and later software versions for systems equipped with one or more dual port fiber expansion daughterboards (allowing up to four expansion cabinets)

- Conference channels
  - — 32 channel capability for a one-cabinet system; each additional single port fiber expansion daughterboard provides an additional 16 channels; each additional dual port fiber expansion daughterboard provides an addition 32 channels (16 per port)
- Connection to expansion cabinets
  - — fiber optic cable; 10 m (33 ft) pre-cut, plastic fiber optic cable for short connections (included).
  - — Glass fiber optic cable for longer distances up to 3 km (1.8 mi), must be supplied locally by a facilities provider.

Backup power

Alternative backup power sources available during a power failure include:

- Power Failure Transfer Unit (PFTU)
- Reserve Battery (NTAK75 and NTAK76 battery units).

Power Failure Transfer Unit

Power failure transfer occurs when the main power to the Option 11C is cut-off. When this occurs, the PFTU connects predetermined analog telephones directly to the Central Office trunks. The PFTU is capable of supporting a maximum of five or eight telephones depending on the power failure transfer unit used.

PFTU units can be connected to each expansion cabinet as well as the main cabinet. All the cabinets are equipped with a connector for an Auxiliary (AUX) cable.

Reserve battery

The Option 11C has two types of reserve battery power available in case full call processing is desired for a short period of time:

- the NTAK75 reserve power supply which provides a minimum of two hours of reserve DC power
- the NTAK76 unit which provides a minimum of 15 minutes of reserve DC power.

Note: Battery units other than the NTAK75 and the NTAK76 can be connected to the Option 11C through the use of the NTAK28 Junction box.

Data backup and restore methods

Option 11C provides several methods of backing up customer configured data. These methods can be categorized as either on-site backup, or remote backup over a modem connection.

On-site backup

There are three different types of on-site backup that can be performed using LD 143. Customer data can be backed up from the database in use to:

- the Primary Flash Drive
- the Backup Flash Drive, or
- an external Software Delivery card (PCMCIA).

Remote backup

Remote backup can be performed with LD 143 using the Customer Configuration Backup and Restore (CCBR) feature. The CCBR feature permits the user to backup customer configured data to an external IBM-type PC or a Macintosh computer over a modem connection.

Note: For more information about the remote backup feature, refer to the *Customer Configuration Backup and Restore Guide*, NTP 553-3011-330.

Both the on-site and remote methods of backup can be performed during normal system operation.

Restoring data

In the event data becomes corrupt or inoperable, backup data can be restored to the main database and primary Flash Drives from either:

- the External PCMCIA Drive
- the backup Flash Drive
- or from a computer over a modem connection.

Chapter 2 — Equipment identification

General information

This chapter identifies the major components of the Option 11C that are pertinent to installation. Identification codes are given where appropriate.

Cabinets

The NTAK11 Cabinet is used for both main and expansion cabinets.

The Main cabinet houses the Small System Controller (SSC) card and can be connected to up to four Expansion cabinets to increase the line capacity of the system. Each cabinet provides ten additional Intelligent Peripheral Equipment (IPE) slots to the system.

Cable connectors

Connectors for cables to the cross-connect terminal are found at the bottom of each cabinet.

The AUX, SDI and Ethernet connectors are located at the bottom left-hand side of the cabinets. The AUX port connects auxiliary equipment such as a Power fail transfer unit (PFTU) to the Option 11C in each cabinet. The SDI connector in the main cabinet interfaces three SDI ports using a three-port SDI cable. In expansion cabinets, the SDI connector interfaces with one SDI port. The Ethernet connector in the main cabinet provides a 10 Mbps Ethernet port.

Cooling

The NTAK11 cabinet is designed to permit natural convection cooling.

CAUTION
Make sure ventilation to the cabinets is not obstructed.

Power supplies

Two types of power supply are available for the system:

- The NTAK04 or NTDK78 AC/DC power supply (see Figure 1 on page 10) is used when the cabinet is powered by a commercial AC power source, or by a Uninterruptible Power Supply (UPS). The NTAK04 or NTDK78 can also accommodate a battery back-up unit for DC reserve power.

Figure 1
AC/DC power supply

- The NTAK05 or NTDK72 DC power supply is used when the cabinet is powered by a -52 V dc source.

Reserve power

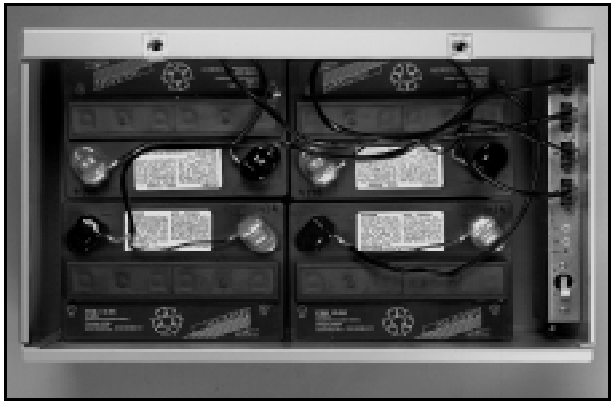
CAUTION

If the NTAK04 or NTDK78 AC/DC power supply is powered down while it is operating on DC reserve power from a battery backup unit, the Option 11C system cannot be powered up again until AC power is restored. Be careful not to open the circuit breaker, either on the battery backup unit or on the NTAK04 or NTDK78, while the system is operating on battery backup.

The types of reserve battery power for the Meridian 1 Option 11C are:

- The NTAK75 battery box (shown in Figure 2 on page 11) which has the following features:
  - — designed to be float-charged by the NTAK04 or NTDK78 AC/DC power supply
  - — provides a minimum of two hours of reserve DC power
  - — mounts on the floor
  - — supports one system cabinet. (One NTAK75 battery box is required for each cabinet in the system.)

Figure 2
NTAK75 battery box



- The NTAK76 battery box (shown in Figure 3 on page 12) has the following features:
  - — Designed to be float-charged by the NTAK04 or NTDK78 AC/DC power supply
  - — provides a minimum of 15 minutes of reserve DC power
  - — mounts on the wall
  - — supports one system cabinet. (One NTAK76 battery box is required for each cabinet in the system.)

Figure 3
NTAK76 battery box

- An Uninterruptible Power Supply (UPS) which provides a continuous AC power supply. Install this unit according to the manufacturer's instructions.

  Note: Customer-supplied battery backup units can be connected to the cabinets using an NTAK28 Junction box.

Common equipment circuit cards

The circuit cards described in this section are used in the Option 11C Main cabinet.

NTDK20 Small System Controller (SSC) card

The NTDK20 SSC card includes a Central Processing Unit (CPU) which handles call processing for the system. Also included is an Ethernet controller, storage for system and customer data and system memory. Additionally it provides the following features and functions:

- An MC68040 main processor
- Software Daughterboard interface
- Two connectors for Fiber Expansion interfaces
- Two PCMCIA interface slots
- Three SDI ports
- Conferencing
- Digitone Receiver, Tone generation and tone detection functions
- Security Device socket

Software Daughterboard

The system and customer data is stored on the Software Daughterboard attached to the NTDK20 SSC card, see Figure 4 on page 16. This daughterboard is also used as a software delivery card for new Option 11C installations. Additional memory on the NTDK20 SSC card temporary stores and processes automated routines and user-programmed commands. The SSC card also retains a copy of customer files in the event of data loss, in an area called the Backup flash drive.

Two versions of Software Daughterboard may be used. The NTDK21, which is the original version, provides 32 Mb of memory. The NTDK81, which is the newer version, provides 40 Mb of memory.

Note: The NTDK81 Software Daughterboard requires an NTDK20AB Rlse 11 or higher SSC card and at least X11 Rlse 23.30 software.

Note: X11 Rlse 24 requires an NTDK81 Software Daughterboard and 32Mb program store.

Note: Systems with three or four expansion cabinets require X11 Rlse 24 software and an NTDK20CA or later SSC card.

Security Device

The NTDK20 SSC card is equipped with a socket designed to accommodate the Security Device shipped with each new Option 11C system. The Security Device is normally not attached to the SSC card when it is shipped. It must be attached to the SSC card during initial installation procedures, see Figure 4 on page 16.

PCMCIA interface

The NTDK20 SSC card has a 2-slot PCMCIA interface socket located on its faceplate. The socket can accommodate a Software Delivery card used primarily for software upgrades on existing Option 11C systems. It can also be used for creating an external backup copy of the customer data base.

Fiber Expansion interfaces

The Option 11C Main cabinet can be connected to;

- up to two expansion cabinets using single port Fiber Expansion Daughterboards.
- up to four expansion cabinets using dual port Fiber Expansion Daughterboards.

The Fiber Expansion Daughterboards are mounted on the on the NTDK20 SSC card (see Figure 4 on page 16). Each port on the Fiber Expansion Daughterboard also provides an additional 16 channels of conferencing capabilities.

An NTDK26 Upgrade Daughterboard is used in place of a Fiber Expansion Daughterboard when an Option 11 or Option 11E system is upgraded to Option 11C, but is to remain connected to an existing expansion cabinet using a metal expansion cable (such as an NTAK1204 or NTAK1205 cable). It provides 10 DS-30 loops for the expansion cabinet as well as an additional 16 conference channels.

SDI ports

The NTDK20 SSC card contains three SDI ports used to connect on-site terminals or remote terminals through a modem. The default settings on the ports are as follows:

Table 1
SDI port default settings

TTY Port	Baud rate	Data bits	Stop bits	Parity
0	Set by a DIP switch	8	1	None
1	1200 (Note)	8	1	None
2	1200(Note)	8	1	None

Note: The baud rate shown for ports 1 and 2 is the default rate. Ports 1 and 2 can be configured in software to a maximum baud rate of 19200 bps.

Ethernet interface

The NTDK20 SSC card is equipped with a 10 Mdps ethernet port. External connection to the ethernet port is provided by a 50 pin connector located in the main cabinet. An NTDK27 Ethernet Adaptor Cable adapts this 50 pin connector to the standard 15 pin AUI interface for a MAU.

Conferencing

Thirty conference channels are provided by the NTDK20 SSC card. Conference capability is increased when Fiber Expansion Daughterboards are added to the NTDK20 SSC card to connect to expansion cabinets, see Figure 4 on page 16. Each port on the Fiber Expansion Daughterboard increases the total number of conference channels by 16.

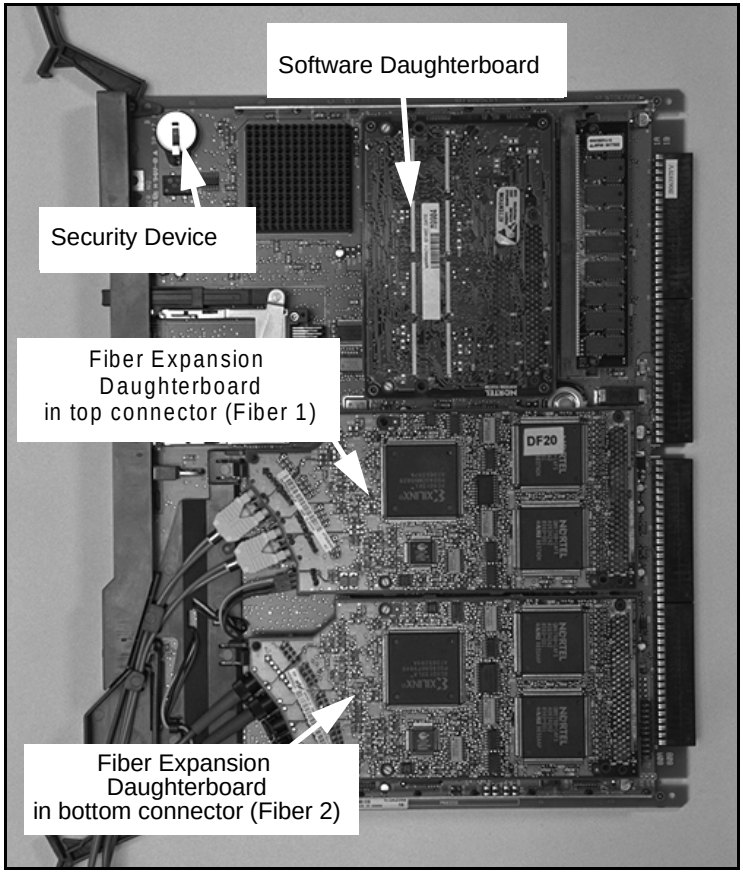
Digitone Receiver, tone generation, tone detection functions

The NTDK20 SSC card provides the following Digitone and other tone related functions:

- 30 channels of tone and digit switch (TDS) and a combination of eight Digitone receivers (DTR) or dial tone detectors (XTD)
- Tone service ports which can be configured as either four units of MFC/MFE/MFK5/MFK6/MFR or eight DTR/XTD units.

An NTAK03 card can be installed in the main cabinet if additional tone receiver and transmission resources are required.

Figure 4
Daughterboards and Security Device on the NTDK20 SSC card



NTAK02 SDI/DCH card

The optional SDI/DCH card provides four SDI ports that can be used for the following:

- D-channel handler interface in ISDN applications
- Enhanced SDI for Meridian Mail applications. However, there is one pre-programmed ESDI port which supports Meridian Mail without the SDI/DCH card.
- SDI applications for additional DTE or DCE devices for applications like Call Detail Reporting or Traffic Studies or ACD MAX Reports.

NTAK03 TDS/DTR card

The functionality of this card is also provided by the NTDK20 SSC card. However, this card is still supported and provides tone transmission and detection plus two SDI ports.

ISDN and Digital Trunk Interface

Network Equipment also includes Digital Trunk Interface (DTI) and Primary Rate Interface (PRI) cards. A Clock Controller is required if connecting to digital trunks. ISDN PRI connections require a D-channel handler interface as well.

For more information about ISDN and network equipment, refer to the following NTPs:

- *Option 11 1.5 DTI/PRI Administration and Maintenance Guide*, NTP 553-3011-310
- *Option 11 2.0 DTI/PRI Administration and Maintenance Guide*, NTP 553-3011-315
- *Option 11 SDN BRI Guide*, NTP 553-3011-311

Peripheral equipment cards

The following Intelligent Peripheral Equipment (IPE) cards can be used in the Option 11C system. Both the Main cabinet and Expansion cabinets can accommodate these IPE cards.

- NT1R20 Off-Premise Station (OPS) Analog line card
- NT8D02 Digital line card: provides an interface to 16 digital integrated voice and data sets for a total of 32 ports.

- NT8D03 Analog line card: provides an interface to 16 analog telephones (500/2500).
- NT8DO9 Analog message waiting line card: provides an interface to 16 analog sets (500/2500) with the Message Waiting lamp feature.
- NT8D14 Universal Trunk card: interfaces eight 600 or 900 ¾ trunks in A-Law or µ-Law application. Each of these eight ports can be individually configured to operate as Central Office (CO), Direct Inward Dialing (DID), 2-way TIE, Dial Repeating (2DR), 2-way TIE, Outgoing Automatic Incoming Dial (OAID), Outgoing Automatic Number Identification (OANI), Recorded Announcement (RAN), Music, or Paging trunk.
- NT8D16 Digitone Receiver card: provides a total of eight channels of Dual Tone Multi Frequency (DTMF) detection.
- NT8D15 E&M Trunk card: provides four analog trunks, each of which can be individually configured to operate as, E&M signaling, two-wire TIE, four-wire TIE, or Paging trunk.
- NT5K02 (International) Analog line card: provides an interface for 16 rotary dial or DTMF telephones with either ground button recall switches, high voltage message waiting lamps, or low voltage message waiting LEDs.
- NT5K18 (International) 8 Port COT/PPM Trunk card: provides an interface to eight central office trunks and can be configured in software for either A- or µ-law operation.
- NT5K17 (International) 8 Port DID Trunk card: provides eight analog trunks, each of which can be individually configured to operate as Direct Dial Inward units (DDI).
- NT5K19 (International) 4 Port 2W/4W E&M, RAN, Paging AC15 trunk card: provides four analog trunks, each of which can be individually configured to operate as 4 wire E&M Type 1 TIE trunk (DC5), 2 wire E&M Type 1 TIE trunk (DC5), 2280 Hz TIE trunk (AC15), Music trunk, Paging trunk and Emergency Recorder trunk.
- NT5K21 (International) Multi Frequency Compelled Sender/Receiver card: provides signaling for four units across a trunk interface with CCITT R2 signaling standard (XMFC). This pack also provides signaling across a trunk interface according to French Socotel standards (XMFE), and operates in either A-law or µ-law companding.

- NT5K36 (International) 4 Port German DID/DOD Trunk card: provides four analog trunk interfaces with three CO types: IKZ1, IKZ2, and IKZ3.
- NT7D16 Data Access card (DAC): provides an interface for up to six data ports, with each port operating in either RS-232C or RS-422 modes.
- NTAG26 Extended Multi-frequency Receiver (XMFR) card: receives MF digits for 911 and Feature Group D applications. It operates only in systems using µ-Law companding.

Fiber Expansion equipment

Fiber Receiver card

Multi-cabinet Option 11C systems require a Fiber Receiver card in each Expansion cabinet. There are three versions of the Fiber Receiver card, the NTDK23, NTDK25 and NTDK80.

The NTDK23 supports a 10 m (33 ft) plastic fiber optic cable, while the NTDK25 and NTDK80 each support a glass fiber optic cable connection of up to 3 km (1.8 mi). Additionally, each Fiber Receiver card provides one SDI port for remote TTY access.

Fiber Expansion Daughterboard

Fiber Expansion Daughterboards must be installed on the NTDK20 SSC card in order to connect to expansion cabinets. There are two kinds of Fiber Expansion Daughterboards, Single Port and Dual Port.

Single Port Fiber Expansion Daughterboard

There are three types of Single Port Fiber Expansion Daughterboards, each of which can interface with one expansion cabinet. Each type must be matched with its appropriate Fiber Receiver counterpart.

- The NTDK22 Fiber Expansion Daughterboard is used with the A0632902 Fiber Optic (multi-mode) cable. Its Fiber Receiver card counterpart is the NTDK23.
- The NTDK24 daughterboard is used with glass fiber optic cable (multi-mode) up to 3 km (1.8 mi) in length. Its Fiber Receiver card counterpart is the NTDK25.
- The NTDK79 daughterboard has the same capabilities as the NTDK24 except that it interfaces with Single Mode fiber optic cable. Its Fiber Receiver card counterpart is the NTDK80.

Dual Port Fiber Expansion Daughterboard

There are two types of Dual Port Fiber Expansion Daughterboards, each of which can interface with two expansion cabinets. Each type must be matched with its appropriate Fiber Receiver counterpart.

- The NTDK84 Dual Port Fiber Expansion Daughterboard is used with the A0632902 Fiber Optic (multi-mode) cable. Its Fiber Receiver card counterpart is the NTDK23.
- The NTDK85 daughterboard is used with glass fiber optic cable (multi-mode) up to 3 km (1.8 mi) in length. Its Fiber Receiver card counterpart is the NTDK25.

Routing Guide

Each cabinet in a multi-cabinet system requires a Routing guide in order to route and manage the fiber optic cable. Only one guide is required in each cabinet.

There are two types of Routing guides used in cabinets equipped with an NTDK20 SSC:

- The P0816832 Fibre Routing guide can be used in main cabinets equipped to support a maximum of two expansion cabinets or in expansion cabinets.
- The P0888475 Cable Routing guide is required to support three or four expansion cabinets is supplied as standard with new systems using X11 Rlse 24 or later software. It is also compatible with systems when one or two expansion cabinets are being used and in expansion cabinets.

Telephones and attendant console

The following is a list of the telephones supported by Option 11C:

- Analog (500/2500 type) Telephones with or without message waiting lamps
- Meridian Digital Telephones (M2006, M2008, M2009, M2018, M2112, M2216, M2616 and M3000)
- M2616 or M2216 Central Answering Position (CAP). This telephone must be equipped with an ACD LCD display in order to function as a CAP telephone.
- Meridian 2250 (TCM) attendant consoles.

Cables and wires

Table 2
Cable and wire specifications

Cables and wires	Purpose/description
A0317094 power cord	Connects a system cabinet to a 110 V ac commercial power source Length: 9 ft 10 in. (3000 mm).
A0391685 power cord	Connects a system cabinet to a 220 V ac commercial power source Length: 9 ft 10 in. (3000 mm).
NTDK27 Ethernet adaptor cable	Provides a 15-pin AUI ethernet interface.
A0632902 Fiber Optic cable (multi-mode plastic)	Connects a Main and Expansion cabinet by interfacing with an expansion daughterboard and a Fiber Receiver card. Length: 10 m (33 ft)
Glass Fiber Optic (multi-mode or single mode, depending on interface) cable up to 3 km (1.8 mi)	Must be supplied locally by a facilities provider. Length up to 3 km (1.8 mi)
NTAK0420 power cable	Connects a system cabinet to a reserve battery power supply, or to a DC power source in conjunction with an NTAK28 Junction box.
- table continued -	

Table 2 (Continued)
Cable and wire specifications

Cables and wires	Purpose/description
NTAK1104 AUX cable	Connects a PFTU to a system cabinet, and provides power to an M2250 attendant console.
NTBK48 three-port SDI cable	Connects TTYs, modems, and so on, to Option 11C. It is used in conjunction with the NTDK20 card.
NTAK1118 one-port SDI cable	Connects TTYs, modems, and so on, to Fiber Receiver card supported SDI ports in the expansion cabinets. The cable provides a 9-pin to 25-pin converter connection.
NTAK19EC cable	Two-port SDI cable used with the NTAK03 circuit card.
NTAK19FB cable	Four-port SDI cable used with the NTAK02 circuit card.
A0601397 F-F DCE to DTE converter, or A0601396 F-M DCE to DTE converter	May be required when connecting SDI ports to TTYs, modems, etc.
NTBK04 1.5 Mb DTI/PRI carrier cable (A0394216)	Connects the NTAK09 1.5 Mb DTI/PRI card to the Channel Service Unit (CSU). Brings Tx and Rx pairs to a standard 5 pin connector.
NTBK05CA coax cable NTBK05DA twisted pair cable NTAK10 2.0 Mb DTI cable NTAK79 2.0 Mb PRI cable NTAK50 2.0 Mb PRI cable	Provides DTI/PRI connections. Brings Tx and Rx pairs to a standard 5 pin connector.
NE-A25B 25-pair cable	Connects peripheral equipment cards to cross-connection terminals. NE-A25B connector slots are located on the bottom of each cabinet.
#6 AWG (#40 Metric Wire Gauge) insulated ground wire	Connects a system cabinet to a building ground source.
Cross-connecting wire	Makes cross-connections at the cross-connect terminal.

Glass fiber optic cable requirements

The Option 11C fiber optic link for distances up to 3 km (1.8 mi) uses the industry standard 62.5/125 µm glass multi-mode duplex cable or 9/125 µm glass Single Mode duplex cable with ST-type connectors.

The type of cable used depends on the type of installation and any local building codes.

Table 3 on page 23 lists the optical requirements for glass fiber optic cable used with the Option 11C.

Table 3
Multi and Single Mode glass optical cable requirements for distances up to 3 km (1.8 mi)

Parameter	Minimum	Typical	Maximum	Units
Glass Fiber Cable Length			3.0	km
Cable Attenuation @1300 nm		1.5 (multi-mode) 0.5 (Single Mode)	2.0 (multi-mode) 0.7 (Single Mode)	dB/km
Modal Bandwidth @1300 nm	200	500		MHz * km
Chromatic Dispersion @1300 nm		6		ps / nm * km
Typical 3dB Optical Bandwidth		180		MHz * km

Note: The fiber link is limited to a maximum length of 3 km. To guarantee reliable operation a bandwidth of 150% should be maintained. If the link is increased beyond the 3 km length the 150% margin is deteriorated possibly resulting in link malfunction under some conditions.

Miscellaneous items

The following is a list of typical miscellaneous items that can be used as part of the system installation. Quantities needed depend on the site and customer requirements:

- QUA6 Power fail transfer units (PFTU) to transfer lines during a power or system failure
- modems or Data Communication Equipment (DCE) for remote access to the system
- on-site Data Terminating Equipment (DTE) or teletypewriter (TTY) terminal for accessing the system
- connecting blocks for the cross-connect terminal
- transformers and centralized power supplies for items such as digit displays on telephones
- optional equipment such as music sources, RAN machines, paging equipment and CDR devices
- NTAK92 Off-Premise Protection module for connecting up to four off-premise analog telephones
- additional Modem Eliminator (NULL Modem without hardware handshaking) A0601397 converter may be required to interface the DTE to the system.

Chapter 3 — System and site requirements

General information

Before installing the Option 11C system, take some time to plan the installation to ensure the system performs correctly.

Make sure that the site meets all of the following environmental, grounding, power, and cross-connect terminal requirements before proceeding with the installation.

Environmental requirements

The Meridian 1 Option 11C system is designed to operate in an office environment that meets the following general conditions:

- The room is clean and well ventilated. Each cabinet can dissipate up to 500 Watts of power in the form of heat (1700 BTU [1800 kJ] per hour). Equipment room ventilation must be sufficient to maintain the temperature at an acceptable level.
- The temperature is maintained between:
  - 0° and 45° C (32° and 113° F) when the cabinets are mounted side-by-side.
  - 0° and 35° C (32° and 95° F) when the cabinets are mounted one above the other.
- The humidity is maintained between 5% and 95% non-condensing.
- The location selected to mount the equipment is not subject to constant vibration.

- The equipment is located at least 12 ft (3660 mm) away from sources of electrostatic, electromagnetic or radio frequency interference. These sources may include:
  - — power tools
  - — appliances (such as vacuum cleaners)
  - — office business machines (such as copying machines)
  - — all electric motors
  - — electrical transformers.

Earthquake bracing requirements

IMPORTANT

The following earthquake bracing guidelines conform to the requirements for the state of California specifications in the U.S.A.

The guidelines recommend that the installer mount the cabinets on a wall using a sheet of 3/4 in. (20 mm) plywood as a backboard. The plywood should be secured to the wall with a minimum of six fasteners. (Refer to Table 5 on page 27 for a description of appropriate fasteners.)

Table 4 identifies the maximum allowable wall height in earthquake prone areas for various types of stud wall construction.

Table 4
Minimum wall requirements – stud construction

Wall Studs	Spacing off center	Maximum Height of Wall
2 in. x 4 in. wooden studs	16 in. or 24 in.	10 ft
2 in. x 6 in. wooden studs	16 in. or 24 in.	16 ft
3 5/8 in. 20 gauge metal studs	16 in. or 24 in.	12 ft
3 5/8 in. 18 gauge metal studs	16 in. or 24 in.	16 ft

Table 5
Minimum fastener requirements

Type of wall	Fasteners	
Wooden studs	#10 wood screws	Minimum 1 in. embedment in wood studs
Metal studs	# 14 sheet metal screws	Minimum 1 in. embedment in metal studs
Concrete (2000 PSI)	1/4 in. HILTI KB-II	Minimum 1 1/8 in. embedment
Masonry	1/4 in. Ramset Redhead Dynabolt sleeve anchor	

The mounting bracket for each cabinet should be fastened to the sheet of plywood with the five, 1 in. #14 screws supplied with the bracket.

A detailed procedure for earthquake bracing is included in "Chapter 6 – Bracing cabinets against earthquakes" on page 79 of this handbook.

Grounding requirements

WARNING

Failure to follow grounding recommendations may result in an installation that is:

- unsafe for personnel working on, or using the equipment
- not properly protected from lightning or power transients
- subject to service interruptions

Grounding requirements

Before installing an Option 11C and applying AC power, measure the impedance of the building ground reference. (An ECOS 1023 POW-R-MATE or similar meter is suitable for this purpose.) If the ground path connected to the Option 11C has an impedance of 5 Ohms or more, better grounding arrangements should be made. Any improvements to the grounding system should be made before the Option 11C is installed.

Other grounding requirements are as follows:

- The impedance of the link between the ground post of the system cabinets and the Single Point Ground (SPG) to which it is connected must be less than 0.25 Ohms.
- Never connect the single point ground conductor from the Option 11C system to structural steel members or electrical conduit. In particular, never tie this conductor to a ground source or grounded electrode that is not hard-wired to the building reference conductor.
- Ground conductors for the Option 11C system:
  - must not be smaller than #6 AWG (#40 metric) at any point
  - must be routed through the same conduit as the phase conductors serving the system
  - must not be smaller than any phase conductor in the same conduit
  - do not carry current under normal operating circumstances.
- All ground conductors in the building:
  - must be isolated from the neutral bus except at the service entrance to the building
  - must be hardwired to the main ground reference.
- Avoid spliced conductors. Continuous conductors have lower impedance and are more reliable than spliced ones.

- All conductors must be terminated in a permanent manner. Ensure all terminations are easily visible and accessible for maintenance purposes.
- Tag ground connections clearly with a message such as “CRITICAL CONNECTION: DO NOT REMOVE OR DISCONNECT”.

CAUTION

Once the Option 11C is installed, the impedance of the link between the ground post of the main cabinet and the single point ground to which it is connected must be less than 0.25 Ohms.

CAUTION

Reliable Option 11C operation depends on high-precision internal circuitry, which can be damaged by transients in its supply conductors and ground system. Damage to sensitive devices due to transients may not be immediately apparent: degradation may occur over longer periods of time.

Ground bus isolation

It is permitted in the USA under the exception to article 384-20 in the NEC to isolate a panel’s ground bus from the housing, provided the panel concerned is not at the main service entrance. This is also permitted in some Canadian locations. For more information on ground bus isolation, refer to local electrical codes.

CAUTION

Do not isolate the ground bus from the housing unless it is specifically permitted by local electrical codes. Work inside electrical panels should only be performed by qualified electricians. Do not attempt to remove bonding conductors without approval from qualified personnel.

CAUTION
Ground conductors between supply panels must be routed through the same conduit as the supply conductors. This is a safety requirement of both the NEC and CEC.

Grounding method

CAUTION
In order to prevent ground loops, it is recommended that cabinets be powered from the same dedicated power panel, and that all cabinets are grounded to the power panel through the grounding bar.

The method of grounding used for the Option 11C depends on whether all cabinets are powered by the same service panel.

Three grounding scenarios are possible:

1 A single-cabinet system

2 A two- to five-cabinet system powered by the same service panel

3 A two- to five-cabinet system powered by different service panels.

Single-cabinet system or cabinets powered by one service panel

For each system cabinet, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to the NTBK80 ground bar provided. The ground bar, in turn, is connected to a ground source (the ground bus in the AC power service panel) and the expansion cabinets.

Cabinets powered by different service panels

For each system cabinet, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to the NTBK80 ground bar provided. If any cabinet cannot be powered from the same service panel, then it must be grounded separate from the others back to the service panel that supplies it.

Note: A separately grounded cabinet is grounded the same as a single-cabinet system.

Conduit requirements

Conductive conduit linking panels and equipment are legal for use as a grounding network in most countries. It is recommended that properly sized, insulated copper conductors routed inside conduit for all Option 11C system ground paths be used whenever possible. A ground link dependent on conduit may compromise or defeat the improvements made by installing dedicated panels and transformers. Here are the reasons why:

- Conduit links may be separated by personnel servicing unrelated equipment. If such a separation occurs anywhere between the Option 11C system and the building ground reference, the conduit is incapable of providing a ground path. This is a hazardous situation.
- Metallic conduit is liable to corrode over time, particularly at threaded connections. Such corrosion will increase resistance significantly. This problem is compounded when multiple links are involved. Application(s) of paint over the conduit may accelerate the corrosion process.
- Conduit is required to be anchored to secure surfaces. Often, it is bolted to structural steel members, which may function as ground conductors to very noisy equipment, such as compressors, motors, and so on. The coupling of these noisy signals into the Option 11C grounding system may seriously impair its performance. The resulting intermittent malfunctions can be difficult to trace.

Commercial power requirements

The Option 11C system is available in both AC-powered and DC-powered versions.

AC-powered version

The AC-powered version is presented in two separate sections in this Chapter:

- Optimal AC-powered installation
- Alternative AC-powered installation

The optimal installation of an AC-powered Option 11C system consists of a direct connection to the electrical system in the building, provided certain requirements are met. Refer to AC-powered installation later in this chapter for detailed information.

Alternatively, an approved isolation transformer may be used for AC-powered systems, where meeting the optimum requirements may be too expensive or may not be achievable. See "Alternative AC-powered installation" on page 34.

DC-powered version

With the DC-powered version of Option 11C, each cabinet is powered solely from a DC power source. See DC-powered version later in this chapter for detailed information.

AC-powered installation

It is recommended that a dedicated AC service panel be used with the Option 11C system. Equipment unrelated to the Option 11C must not be connected to this panel. Keep all lighting, fans, motors, air conditioning equipment, and the like, as "electrically separate" from the Option 11C system as possible.

Power from each outlet must meet the input requirements of at least one Option 11C power supply as itemized in Table 6 on page 32. Please check power requirements for other system equipment and install additional outlets if required.

Table 6
AC input requirements for each NTAK04 or NTDK78 power supply

Voltage	Maximum rated input voltage 100-240 Volts RMS, single phase, 50-60 Hz.
Power (I/P max)	750 VA minimum
Outlet Type	NEMA IG5-15R for 120 Volt, 15 Amp supply NEMA IG6-15R for 208/240 Volt, 15 Amp supply

Site requirements

The following is a list of required site features for an optimal Option 11C AC-powered system installation.

If the conditions below cannot be provided with a dedicated panel, the use of an Isolation Transformer is recommended, as described under the heading “Alternative AC-powered installation” on page 34 of this chapter.

- **Dedicated circuit breaker panel**

  Provides power solely to the Option 11C system and its associated hardware, such as TTYs, printers, and so on.

  Note: It may not always be possible to power a complete system from a single circuit-breaker panel. For example, an expansion cabinet may be remotely located.

- **Insulated copper ground conductor**

  Connects the ground bus in the dedicated panel to the main service panel ground or building ground reference. It must always be routed through the same conduit as the supply conductors feeding the panel.

- **Isolated-ground receptacles**

  All outlets connected to the dedicated panel must be of the isolated ground type. A separate circuit is to be used for each device connected to the panel. Outlets serving the cabinets must be close enough so that the power cord can reach the cabinet power supply.

  For systems equipped with one or two expansion cabinets, a separate outlet for each cabinet must be provided. Each outlet must be from separate circuits in the same panel.

- **Isolated ground bus in the electrical panel, where permitted by local codes.**

Location of power outlets

The maximum distance between a power outlet and the system cabinet depends on the length of the power cord. In North America, the power cord is 9 ft 10 in. (3000 mm). In countries outside North America, the power cord is 8 ft 2 in. (2490 mm).

Alternative AC-powered installation

If optimal conditions cannot be provided with a dedicated panel, the use of an Isolation Transformer with the following characteristics it is recommended:

- 120/208/240 V input, over-current protected at primary
- 120/208/240 V available at secondary outputs, each circuit breaker-protected
- Primary and secondary windings must be fully isolated from one another
- Certified for use locally as a stand alone user product (CSA, UL, or other locally recognized markings apparent)
- Capable of providing power to all Option 11C system equipment operating simultaneously at full load
- Equipment unrelated to the Option 11C system must not be powered from a transformer serving the Option 11C system.

Isolation transformer ground

It is recommended that the transformer ground have the following characteristics:

- Separate grounds for primary and secondary windings rather than common ground
- A “clean” and permanent SPG reference at the transformer secondary for the Option 11C system.

In addition, verify the ground conductors inside the transformer to ensure they are sized appropriately.

> ***Note:*** Do not ground the transformer or Option 11C system to structural steel or water pipes. Connect them to a known building ground reference.

Receptacles

Receptacle requirements are as follows:

- When mounted on the wall, they must be installed within reach of the cabinet power cords
- All receptacles served by the secondary must be of the isolated ground type
- The ground prong of each outlet must be connected by an insulated conductor to the system SPG.

If the transformer has an isolated secondary ground lug, use it as the SPG. If it doesn't, use the chassis ground of the transformer as the Single Point Ground.

Installing an Isolation Transformer

Transformers with pluggable power cords:

1 Connect the power cords of all Option 11C system equipment to the outlets on the transformer secondary.

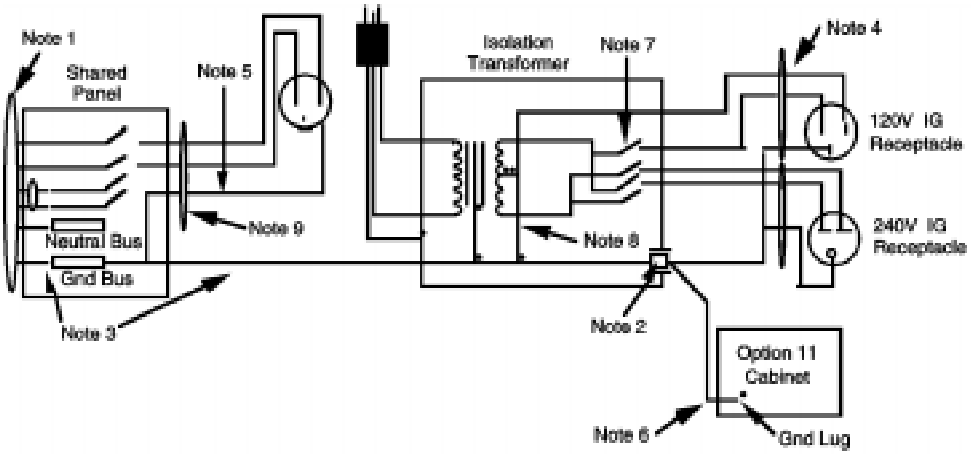
2 Secure an insulated conductor between the ground lug on the main cabinet of the Option 11C and the SPG lug on the transformer. Place a "DO NOT DISCONNECT" tag on it.

Do not fasten or tie this conductor to the power cable feeding the NTAK04 or NTDK78 power supply.

Note: All equipment associated with the Option 11C must be powered exclusively from the secondary of the transformer, and must be grounded to the secondary isolated ground lug. Do not connect equipment unrelated to the Option 11C system to an isolation transformer powering it.

The transformer primary must be powered through a dedicated circuit. If the primary has a pluggable cord, ensure an additional ground connection is made between the Option 11C SPG and a known building ground reference. This connection is vital for safe and reliable operation. Do not connect any Option 11C system ground lines to structural steel or water pipes, or any other unreliable ground path. Use a ground point known to be "clean" and permanent. Place a "DO NOT DISCONNECT" tag on it. Figure 5 on page 36 shows the pluggable cord connections.

Figure 5
Typical pluggable cord Isolation Transformer wiring plan



Notes:

1 Power source is site dependent. It may be from a shared panel or transformer. Wiring may vary accordingly. Wiring to panel must be housed in conduit.

2 Make SPG at the transformer secondary. If the transformer secondary has no isolated secondary ground lug, make SPG by tieing all system ground lines to the chassis lug on the transformer case. An insulated ground connection must be made between the SPG and a known building ground reference, as per Note 3.

3 Terminate the option 11 SPG insulated ground conductor as near as possible to the main building ground reference. Isolate the ground bus from panel housing if permitted by local codes. Conductor should be minimum AWG #6 (metric #40) at all points.

4 Wiring to receptacles must be in conduit unless they are mounted on the transformer case.

5 Connection may be made by metallic conduit. Additional copper conductor recommended.

6 Minimum AWG #6 (metric #40) insulated copper conductor connected to FGND lug on the Option 11 cabinet. Route separately from AC power cable.

7 Separate breaker required for each Option 11 cabinet. Breakers must be mounted on transformer if the receptacles are. If they are in a panel served by the transformer secondary, all connections between the receptacles and transformer must be in conduit.

8 Connect secondary neutral (X0) to system SPG.

9 Conduit required.

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Transformers without pluggable power cords

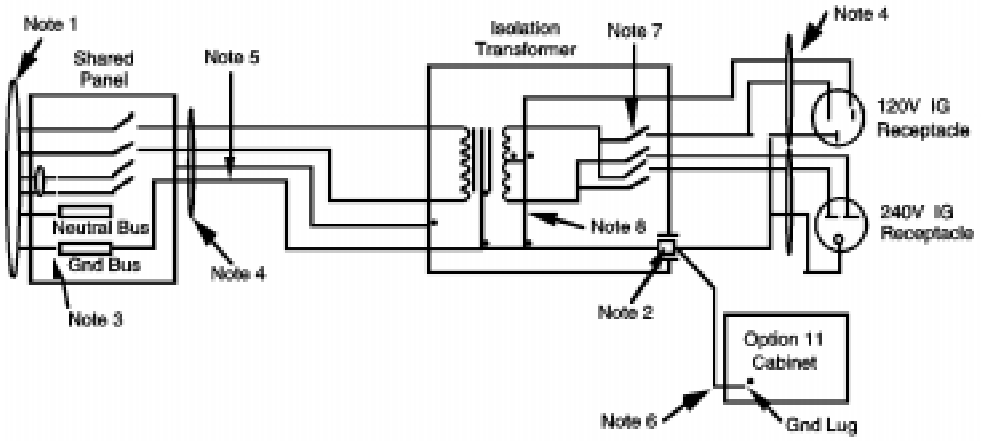
If the transformer does not have a pluggable cord, it must be hardwired to an electrical panel, and all wires (including grounds) must be routed through a single conduit.

Some electrical codes permit the use of conduit as the sole ground conductor between pieces of equipment.

It is recommended that you run a separate insulated ground conductor through the conduit to bond chassis grounds together. Such a conductor will maintain the safety ground connection in the event that the conduit becomes corroded or disconnected.

All ground lines must be run through the same conduit as the phase conductors serving the equipment. Figure 6 on page 38 shows the Isolation transformer connections.

Figure 6
Typical hardwired Isolation Transformer wiring plan



Notes:

1 Power source is site dependent. It may be from a shared panel or transformer. Wiring may vary accordingly. Wiring to panel must be housed in conduit.

2 Make SPG at the transformer secondary. If the transformer secondary has no isolated secondary ground lug, make SPG by tieing all system ground lines to the chassis lug on the transformer case. An insulated ground connection must be made between the SPG and a known building ground reference, as per Note 3.

3 Terminate the option 11 SPG insulated ground conductor as near as possible to the main building ground reference. Isolate the ground bus from panel housing if permitted by local codes. Conductor should be minimum AWG #6 (metric #40) at all points.

4 Transformer primary wires must be in conduit. Wiring to receptacles must be in conduit unless they are mounted on the transformer case.

5 Connection may be made by metallic conduit. Additional copper conductor recommended.

6 Minimum AWG #6 (metric #40) insulated copper conductor connected to FGND lug on the Option 11 cabinet. Route separately from AC power cable.

7 Separate breaker required for each Option 11 cabinet. Breakers must be mounted on transformer if the receptacles are. If they are in a panel served by the transformer secondary, all connections between the receptacles and transformer must be in conduit.

8 Connect secondary neutral (X0) to system SPG.

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DC-powered version

Each Option 11C cabinet may be powered solely from a DC source if it is equipped with the following:

- NTAK05 or NTDK72 DC power supply
- NTAK28 Junction box.

Table 7
DC power requirements for each NTAK05 or NTDK72 DC power supply

	Minimum	Nominal	Maximum
Input Range	-44 V dc	-52 V dc	-54 V dc
Noise (CMESS)	—	—	25 dBrnc
Current	—	—	12 Amps
AC Ripple	—	—	100 mv RMS

Note: The NTAK05 or NTDK72 has a built-in circuit breaker that will trip if the voltage difference at its input terminals drops below -42.5 V dc +/- 1.0 V dc.

CAUTION
Do not allow the voltage difference between the input terminals of the NTAK05 or NTDK72 to exceed 57 V dc. Doing so may result in damage to the equipment and a safety hazard to personnel.

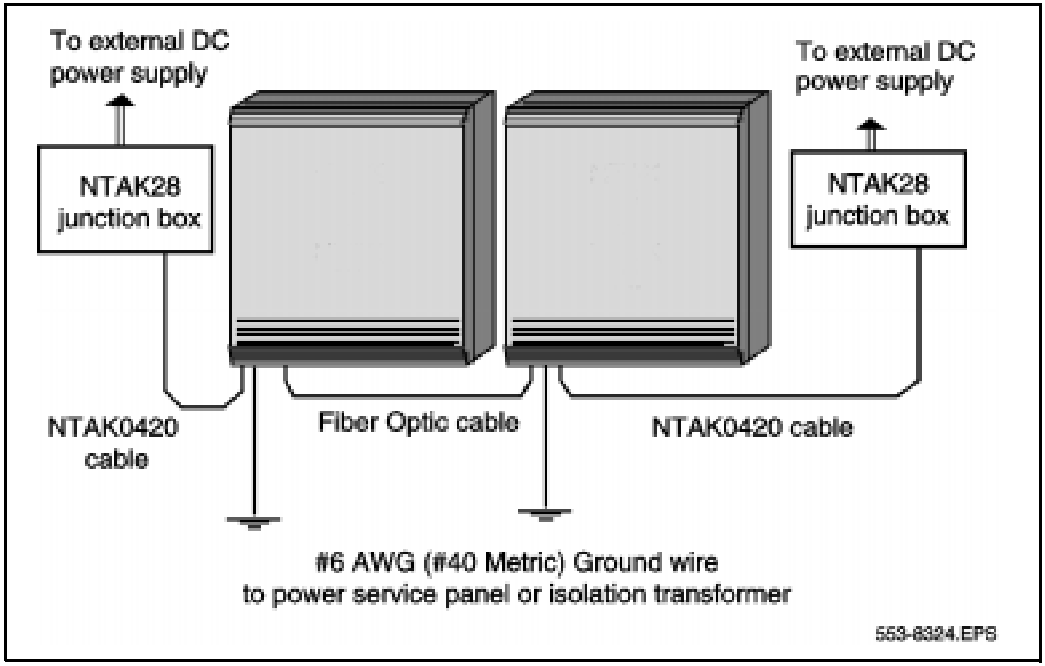
The minimum size of the conductors required between the DC source and the Junction box is shown in Figure 8 on page 39.

Table 8
Recommended wire size

Size (AWG)	Size (Metric)	Maximum Length (one way)
6	#40	50 ft (15 m)
8	#35	30 ft (9 m)
10	#25	20 ft (6 m)

Connect these components together as shown in Figure 7. Make sure the Option 11C main cabinet ground post is connected to the building ground reference by a minimum AWG #6 (metric #40) insulated conductor. Connect the input terminals of the NTAK28 Junction box to a clean DC power source meeting the requirements shown in Table 7 on page 39.

Figure 7
DC power supply connections



Auxiliary equipment power

Terminals, printers, modems, and other data units used in conjunction with the Option 11C require special wiring considerations.

Power for system equipment in the switch room must:

- be powered from the same panel or transformer as the Option 11C
- be grounded to the same panel or transformer as the Option 11C
- be tagged at the panel to prevent unauthorized interruption
- not be controlled by a switch between the breaker and the equipment.

Service receptacles for Option 11C AC systems and associated equipment must be:

- of the isolated ground type, such as NEMA IG5-15
- rated for 120 or 240 V, 15 or 20A, 50-60 Hz, 3-pole, 3-wire, grounded
- grounded to the same location so as to form a Single Point Ground.

Modem requirements

It is recommended that the system be equipped with a modem to allow remote access. Set-up information for modems recommended for use with the Option 11C system is found in “Modem setup requirements” on page 216.

With or without Meridian Mail

The minimum requirement is a 1200 bps auto-answer modem.

If an error-correcting modem is connected to the Meridian 1 Option 11C system, all flow-control and error-correcting functionality of the modem must be disabled to ensure proper operation. Refer to the modem manufacturer’s instructions for information.

Maintenance and administration terminals

Set-up information for Option 11C recommended terminals is found in “Terminal setup” on page 227.

A Modem Eliminator (NULL Modem without hardware handshaking) A0601397 F-F converter or A0601396 M-F converter may be required to interface the TTY to the system.

The following outlines the minimum requirements for a TTY device:

Without Meridian Mail

The minimum requirement is a VT100 compatible device when Meridian Mail is not installed, and will not be installed in the future.

With Meridian Mail

With Meridian Mail, use a VT220 compatible device.

On-site access

Each system should be equipped with an M2616 or M2008 telephone with a display assigned as a maintenance telephone.

A variety of TTY terminals can be used to access the Option 11C. However, a VT220 terminal is recommended as an on-site terminal. It can be used to perform service changes, maintenance and diagnostic functions, as well as Meridian Mail administration activities.

Remote access

Although several types of modems can be used to access the system, a 2400 baud auto-answer modem is the recommended modem and 1200 baud is the minimum. It can be used to perform service change, maintenance and diagnostic functions, as well as Meridian Mail administration activities from a remote location.

> ***Note:*** Additional maintenance functions can be performed through remote access on the Option 11C. For additional information, refer to the *Customer Configuration Backup and Restore Guide*, NTP 553-3011-330.

Cross-connect terminal requirements

Allow for future expansion and equipment changes at the cross-connect terminal.

The cross-connect terminal should have sufficient space for connecting blocks to terminate the following wires:

- ten 25-pair cables from each cabinet (the main cabinet and, if equipped, each expansion cabinet)

- nine conductors comprising the AUX cable from the main cabinet
- one 25-pair cable from each QUA6 PFTU
- wiring from telephone sets and trunks.

The **BIX cross-connect system** is recommended for use with the system. However, use of this system is not mandatory. Other similar cross-connect systems can also be used.

Information about the **BIX cross-connect system** is found in the following Northern Telecom publications (NTPs):

- *BIX In-Building Cross-Connect System Material Description* (NTP 631-4511-100)
- *BIX In-Building Cross-Connect System Planning* (NTP 631-4511-150)
- *BIX In-Building Cross-Connect System Material Installation and Servicing* (NTP 631-4511-200)

Equipment layout plan

Before installing the Option 11C, you need to develop an equipment layout plan to determine where each system component will be positioned.

Consideration should be given to the lengths of the various cables in order to make the best use of space available. Refer to “Cables and wires” on page 21 of this guide for a complete description of Option 11C cable and wire specifications.

Preparation of the site according to the plan is critical. Site preparation consists of making sure the site is ready to accept the equipment and that items such as power outlets and backboards are correctly installed.

General layout guidelines

CAUTION

The mounting surface must be able to support at least 100 lb (45 kg). It is recommended that you secure a backboard consisting of 3/4 in. (20 mm) plywood, or other similar material, to the surface of the wall to hold the equipment.

Follow the guidelines below to assist you in positioning the system equipment. If you plan on installing one or more expansion cabinets, you should read the section called “Additional considerations for multiple-cabinet systems” on page 47.

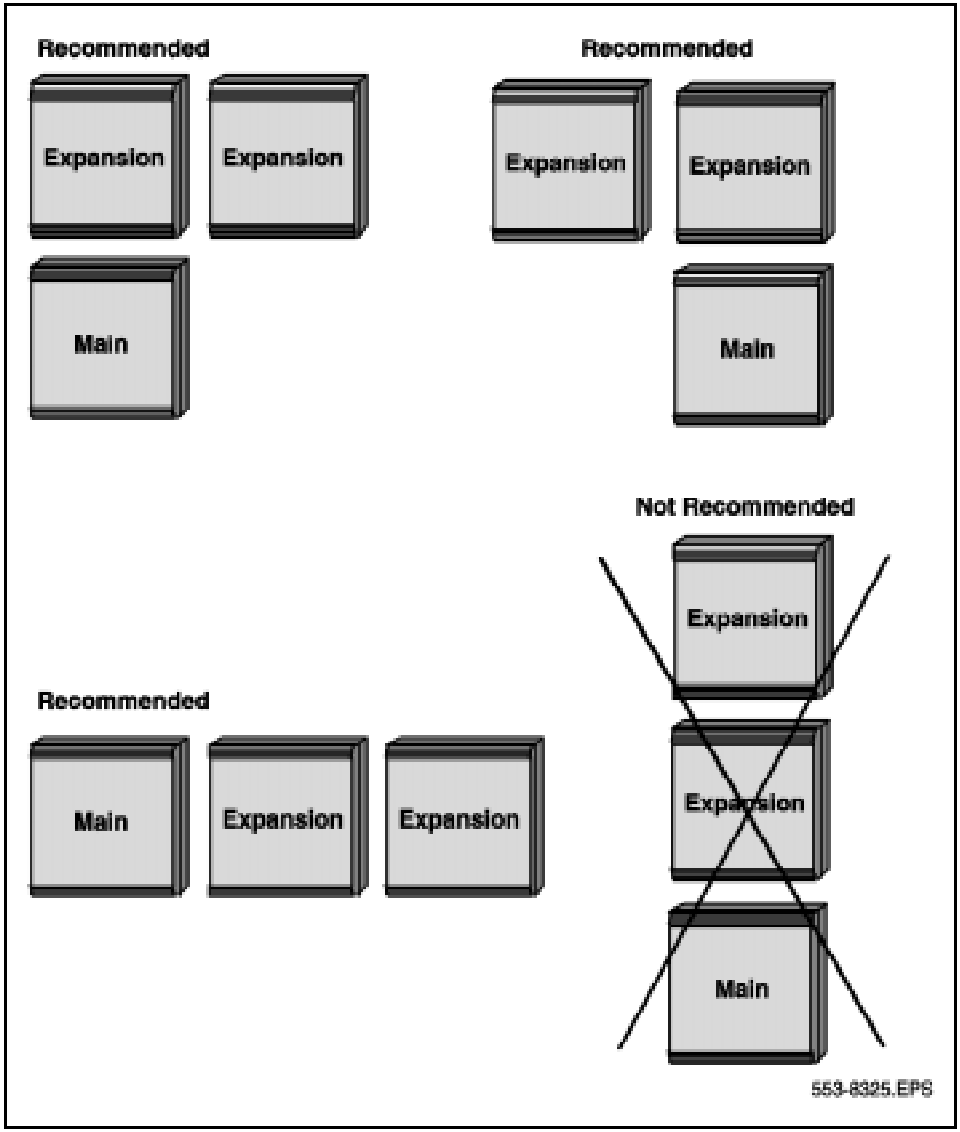
- The recommended method of system cabinet installation is wall-mounting. If you cannot mount the cabinets on the wall (for example, if there is not enough wall space), you can mount each cabinet on an optional pedestal. However, you will still need wall space for installing a cross-connect terminal and other optional equipment.
- Each Option 11C cabinet measures 25 in. (635 mm) high by 22 in. (560 mm) wide by 12 in. (305 mm) deep, or 14 in. (356 mm) deep with the newer Option 11C door.

- Leave adequate space for one or possibly more expansion cabinets. When possible, the expansion cabinets should be mounted next to each other horizontally (horizontal expansion) to ensure proper heat dissipation.
- If horizontal expansion is not possible, vertical expansion is permitted for two cabinets. Make sure the expansion cabinet is mounted above the main cabinet.

  Vertical expansion of three or more cabinets is not recommended. Such a configuration makes reaching the top-most cabinet difficult. Refer to Figure 8 on page 46 for recommended cabinet layout plans.

  Note: Temperature limits are more stringent when expanding vertically. Review the temperature limits stated in the *Environmental requirements* section of this guide before deciding to expand vertically. Do not install an expansion cabinet on top of an existing floor-mounted cabinet.
- When planning for a system that is equipped with DTI/PRI capability, allow space on the backboard for the channel service unit (CSU).
- Leave at least 6 in. (155 mm) above the mounting bracket and any obstruction (such as a pipe or conduit) so that there is room to lift the cabinet on and off the bracket.
- Leave at least 12 in. (305 mm) between the top of a cabinet and the ceiling to ensure proper ventilation.
- Leave 10 in. (255 mm) between the bottom of the lower cabinet and the floor to prevent water damage and to allow for convectional cooling.
- Do not place the cross-connect terminal above a cabinet. Debris from the cross-connect terminal may drop into the cabinet through the top ventilation slots and cause damage.
- Allow adequate space for the battery backup unit, accounting for the cable-length limitation as determined by the choice of a wall-mounted or floor-mounted battery back-up unit.
- If the NTAK92 Off-premises protection module is used, allow for proper installation (according to local practices)
- Ensure power outlets are within reach of each system cabinet. Cable and wire specifications are shown in Table 2, “ Cable and wire specifications,” on page 21.

Figure 8
Recommended layouts for the three-cabinet Option 11C system



Additional considerations for multiple-cabinet systems

For multi-cabinet systems the following guidelines apply for both horizontal and vertical expansion:

- The maximum distance between the main cabinet and each expansion cabinet is 1.8 mi (3 km).
- The minimum distance between cabinets when mounted above one another (vertical expansion) should be 12 in. (305 mm).
- The minimum distance between cabinets when mounted next to each other (horizontal expansion) is defined by an alignment bracket as shown in Figure 11 on page 50. However, this is the minimum distance; the cabinets can be positioned further apart to suit site requirements.

  Note: The equipment layout plans shown in this chapter are applicable to fiber-optic connected cabinets installed within close proximity to each other (such as on the same wall). These layout guidelines are not as stringent if the cabinets are located in separate rooms, on different floors, or in different buildings.

Systems using NTAK75 or NTAK76 reserve power

The mounting location of either the NTAK75 or the NTAK76 backup-up unit is governed by the location of the Option 11C cabinets and the length of the NTAK0410 cable. The NTAK0410 cable is 6 ft (1830 mm) long.

Equipment layout plan for wall mounting

Typical wall layouts using BIX cross-connection equipment are shown in Figure 10 on page 49 and Figure 12 on page 52. Use of other types of terminal blocks and equipment will alter the layout. As a result, you may need to adjust the height at which you place the cabinets in relation to other equipment. You may also need to adjust the distances the power outlets are from the backboard on AC powered systems. The positions for the mounting brackets are shown in Figure 11 on page 50.

Figure 9
Typical minimum distance layout of wall mounted cabinets (horizontal expansion)

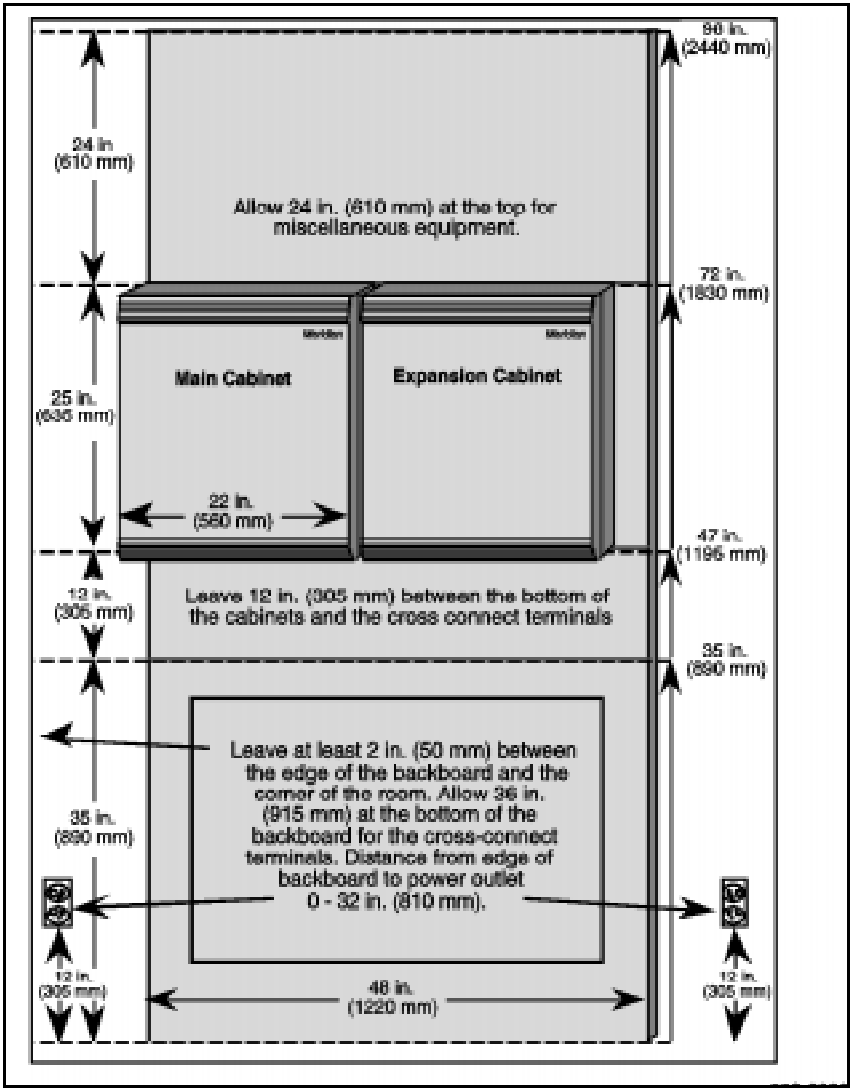


Figure 10
Typical minimum distance layout of wall-mounted cabinets (vertical expansion)

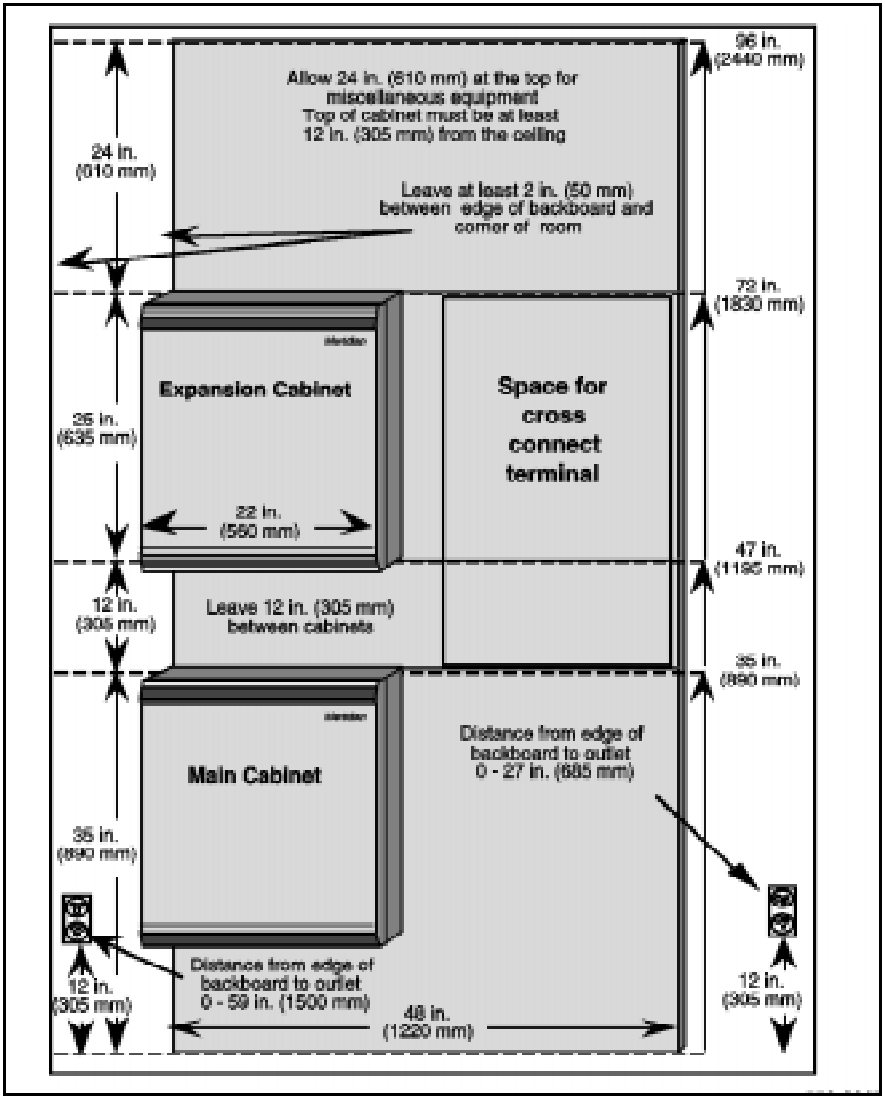
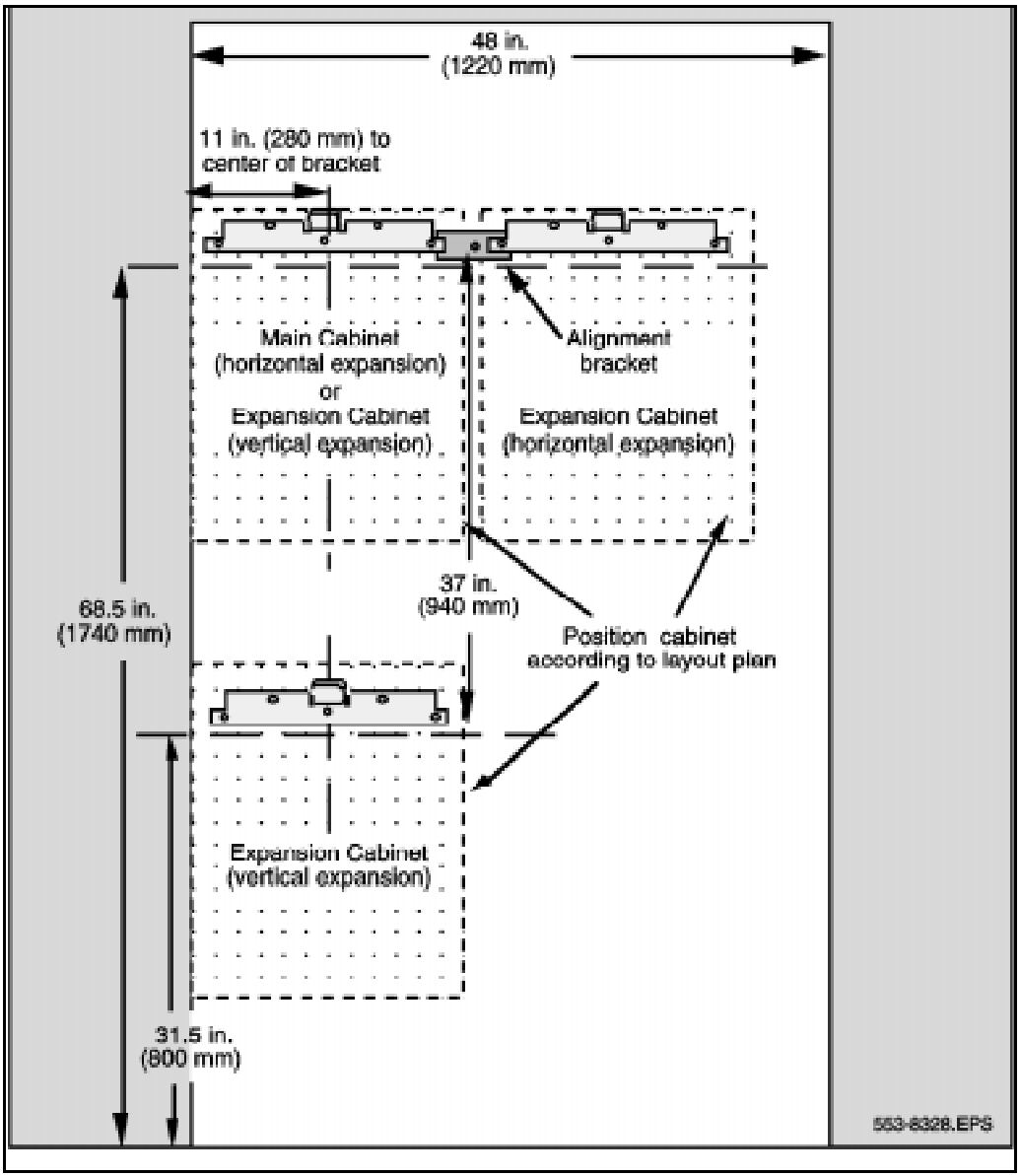


Figure 11
Mounting bracket position



The equipment layout plan for floor mounting

An optional cabinet pedestal is used for floor-mounting when it is not possible to mount the cabinets on a wall.

The available floor space must be large enough to accommodate the main cabinet and one, or more expansion cabinets, as shown in Figure 12 on page 52.

> ***Note:*** Although you may be installing only a main cabinet at this time, leave enough space for expansion cabinets to avoid problems in the future.

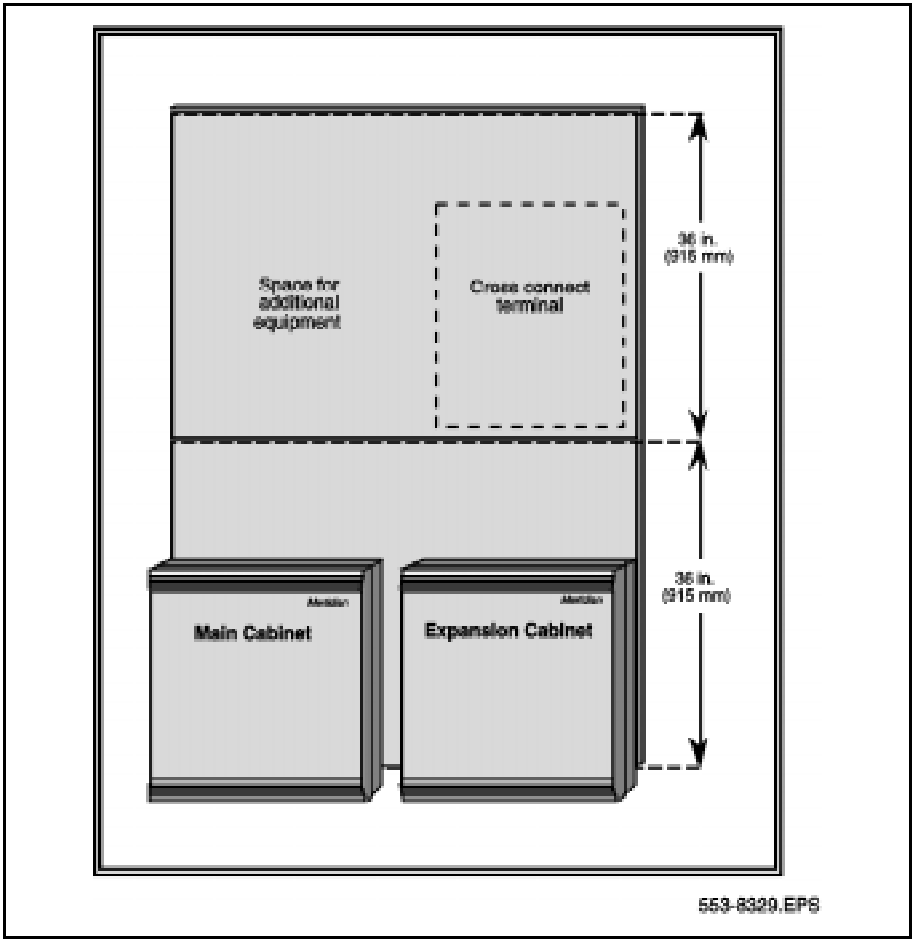
Wall space must be available for the cross connect terminal, the cross-connect cables, the NTAK76 battery unit if required, and any miscellaneous equipment (such as a power supply for digit displays on telephones).

CAUTION

Make sure that cabinet placement does not allow debris from sources such as cross-connect terminal activities to fall into the ventilation slots located at the top of the cabinet.

Leave at least 12 in. (305 mm) of space between the top of the cabinet and any obstruction (such as a shelf) to permit adequate air circulation.

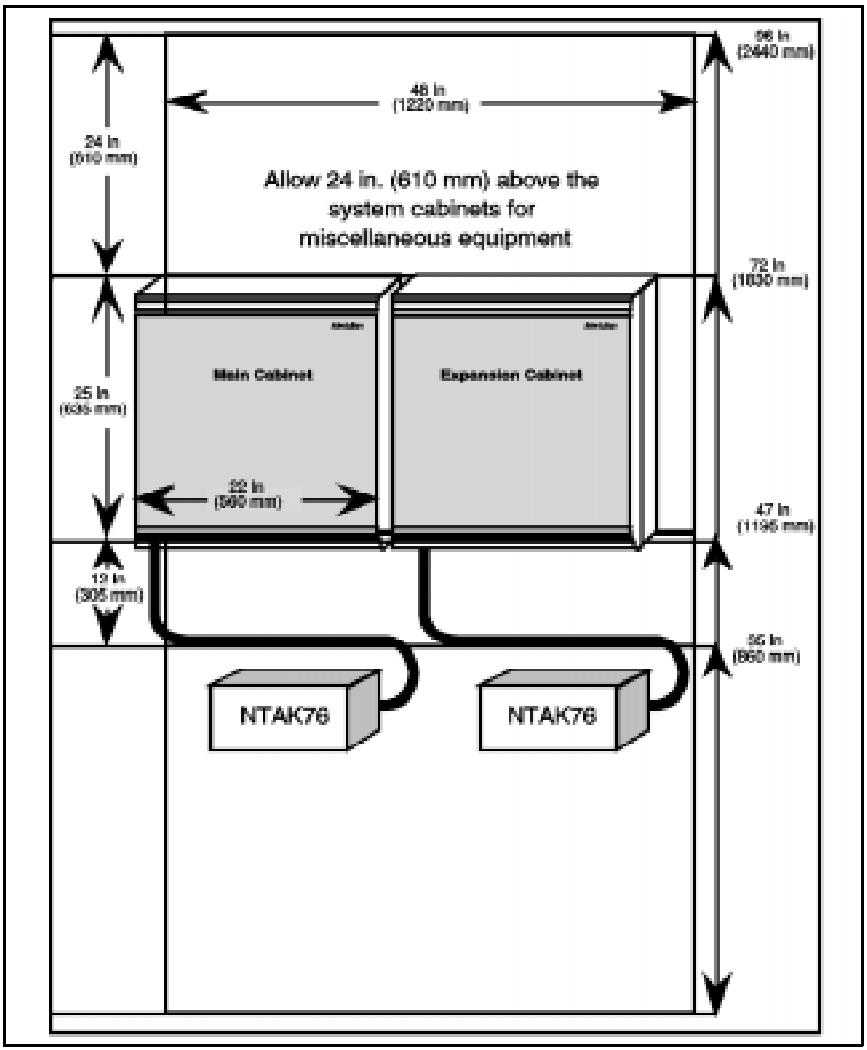
Figure 12
Typical layout of floor mounted cabinets



Reserve power supply layout and installation planning

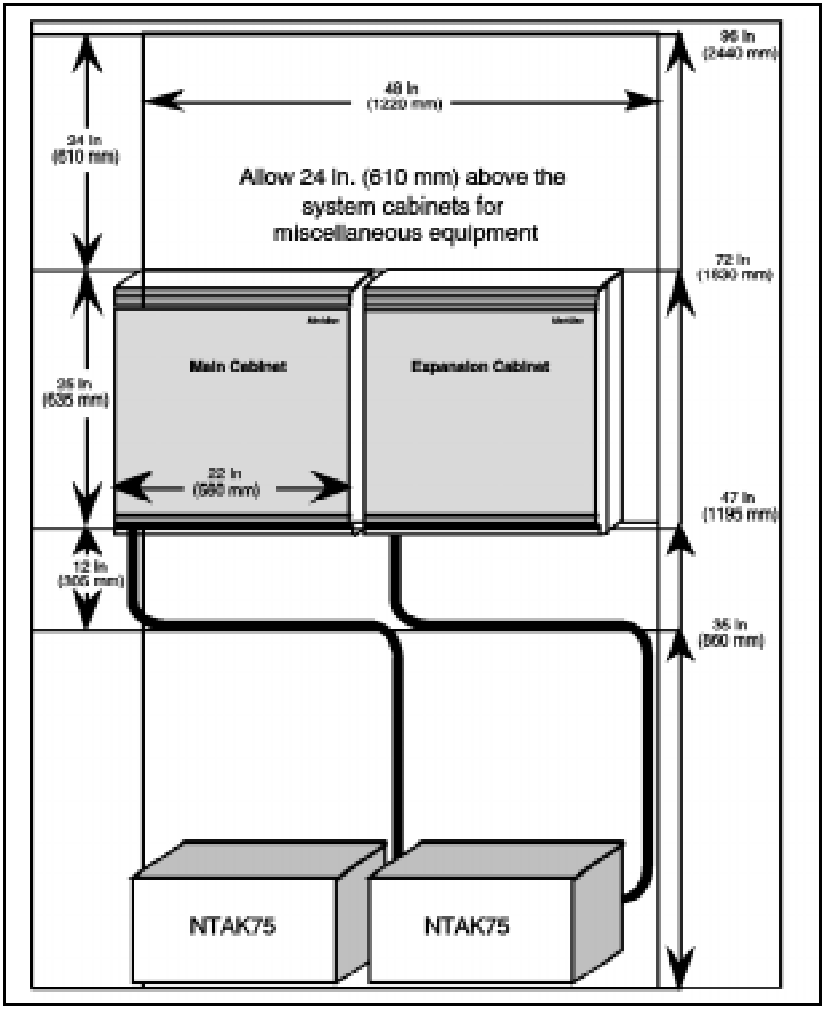
The mounting location of either the NTAK75 or the NTAK76 reserve power unit is governed by the location of the main and expansion cabinets, and the length of the NTAK0410 cable (the NTAK0410 cable is 6 ft [1830 mm] long). Below each of the figures on the following pages, you will find information detailing the maximum distance the center line of the battery unit may be placed from the cabinet center line.

Figure 13
Typical placement of NTAK76 (horizontal cabinet expansion)



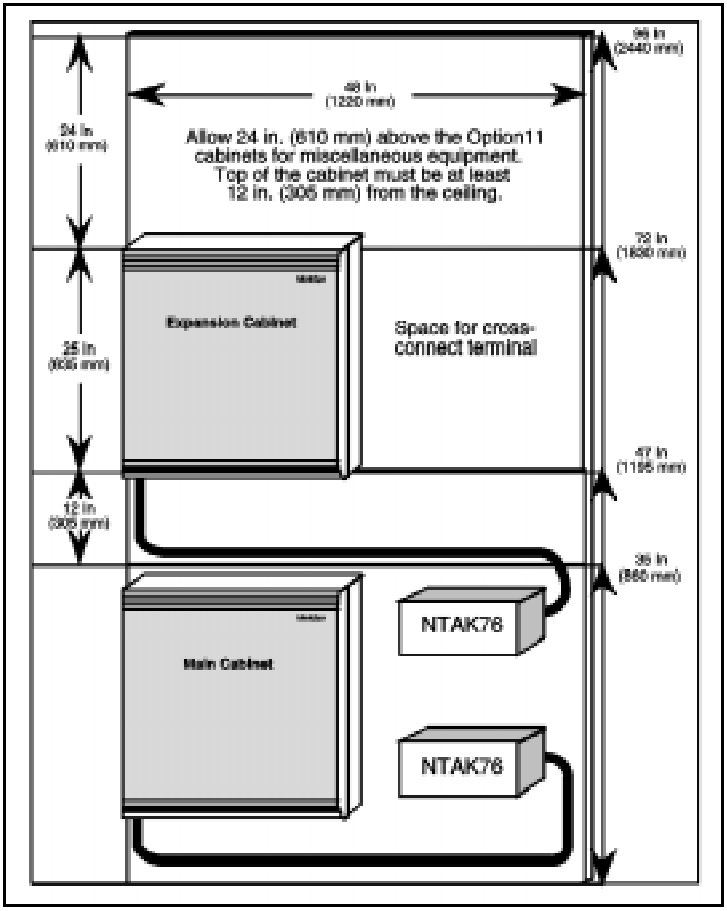
The center line of the NTAK76 may be placed a maximum of 2 ft (610 mm) to the right and 4 ft (1220 mm) to the left of the cabinet center line. These distances are based on the top of the NTAK76 being positioned 1.5 ft (460 mm) below the bottom of the cabinet.

Figure 14
Typical placement of NTAK75 (horizontal cabinet expansion)



The center line of the NTAK75 may be placed a maximum of 0.5 ft (152 mm) to the right and 2.5 ft (760 mm) to the left of the cabinet center line. These distances are based on the cabinets being mounted at the recommended mounting heights, shown in the diagram above, for the horizontal mounting configuration.

Figure 15
Typical placement of NTAK76 (Vertical cabinet expansion)



The center line of the NTAK76 may be placed a maximum of 2 ft (610 mm) to the right and 4 ft (1220 mm) to the left of the cabinet center line. These distances are based on the top the upper NTAK76 being positioned 1.5 ft (460 mm) below the bottom of the Expansion Cabinet, and the bottom of lower NTAK76 being positioned 1.5 ft (460 mm) below the bottom of the Main Cabinet.

Figure 16
Typical placement of NTAK76 (Three-cabinet system)

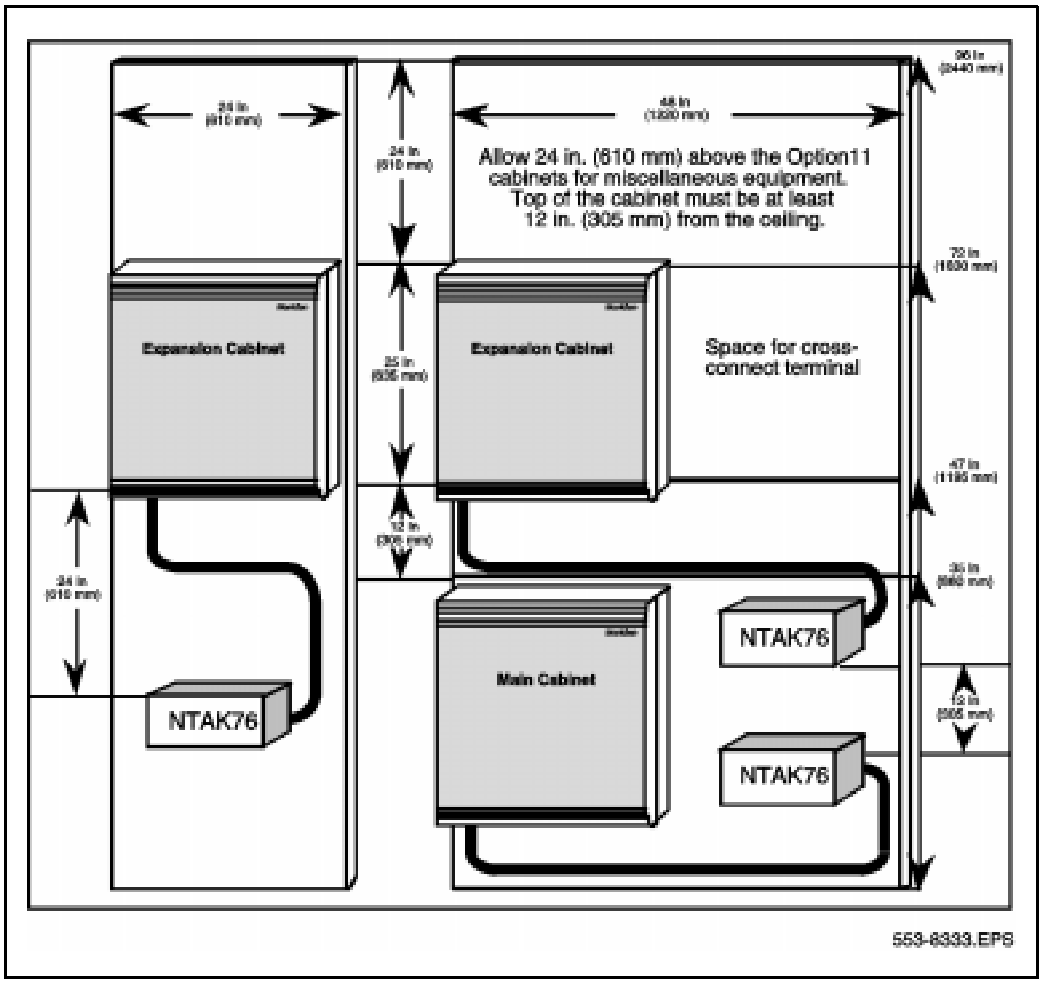
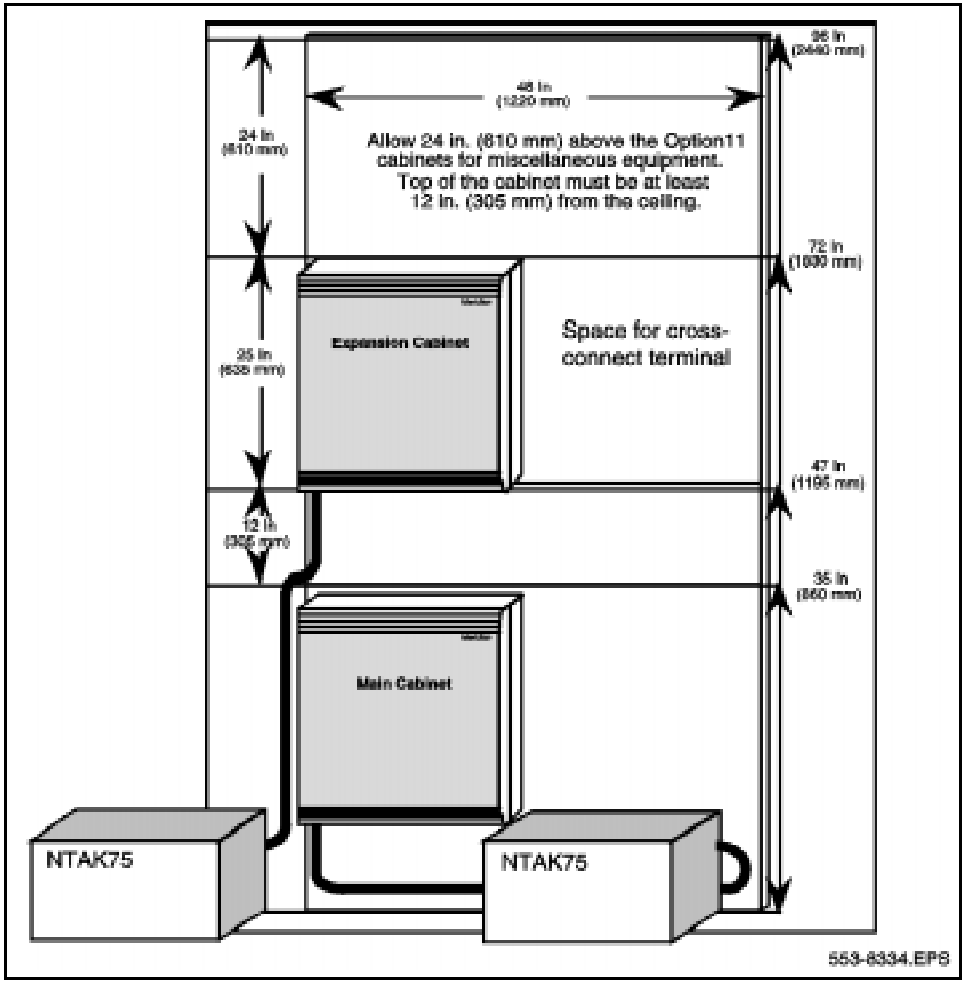
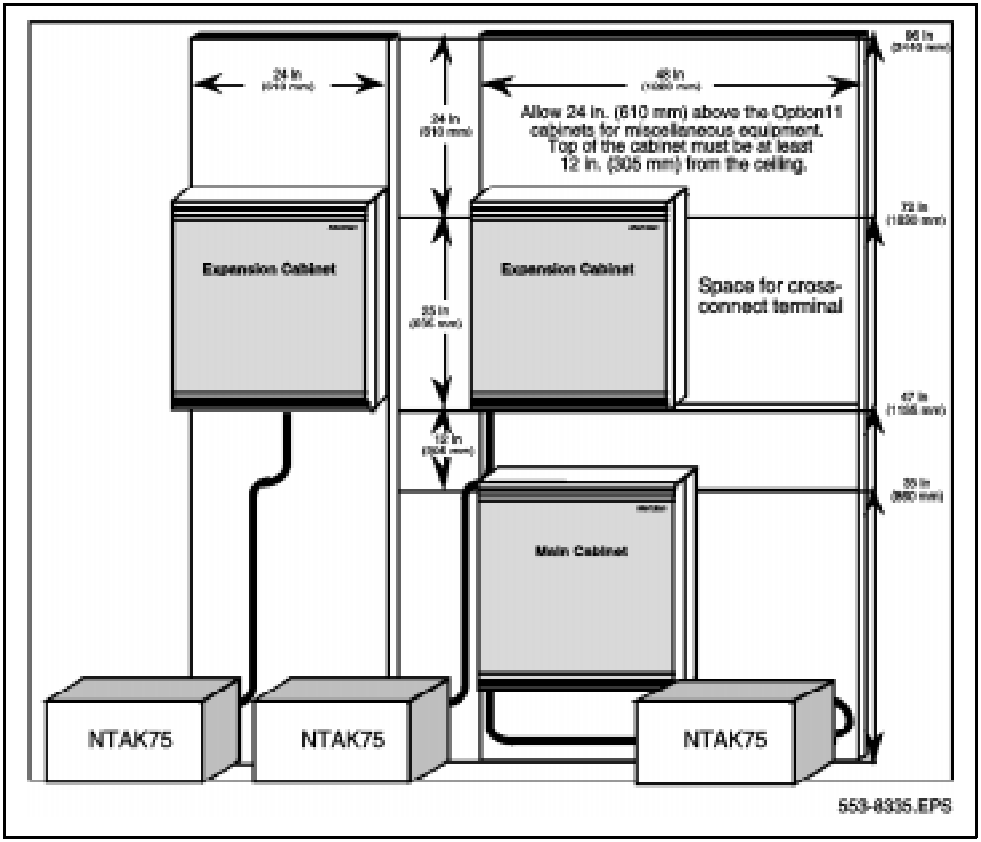


Figure 17
Typical placement of NTAK75 (Vertical cabinet expansion)



The center line of the NTAK75 for the Expansion Cabinet may be placed a maximum of 2.5 ft (760 mm) to the left of the center line of the cabinet. The center line of the NTAK75 for the Main Cabinet may be placed a maximum of 2 ft (610 mm) to the right of the center line of the cabinet. These distances are based on the cabinets being mounted at the recommended heights, as shown in the diagram above, for the vertical mounting configuration.

Figure 18
Typical placement of NTAK75 (Three-cabinet system)



Card slot assignments

A card slot allocation plan showing circuit card to slot assignments should be prepared in advance for each cabinet. See the most current Option 11C product bulletins for minimum vintage requirements.

The NTDK20 Small System Controller (SSC) card must be installed in the main cabinet in the SSC slot (slot 0). It supports the following optional daughterboards:

- the NTDK22 10 m Single Port Fiber Expansion Daughterboard
- the NTDK24 3 km Single Port Fiber Expansion Daughterboard (Multimode)
- the NTDK79 3 km Single Port Fiber Expansion Daughterboard (Single Mode)
- the NTDK84 10 m Dual Port Fiber Expansion Daughterboard
- the NTDK85 3 km Dual Port Fiber Expansion Daughterboard (Multimode)

  Note: Dual Port Fiber Expansion Daughterboards require NTDK20CA or later versions of SSC card.

- the NTDK26 Upgrade Daughterboard.

The following cards MUST be installed in the main cabinet slots 1-9:

- NTAK09
- NTBK22
- NT6D70 when used as a clock controller.

The NTAK09 supports three optional daughterboards,

- the NTAK20 Clock Controller
- the NTAK93 D-channel Interface
- the NTBK51 DDCH Daughterboard.

To prepare the plan, list the total number of the following circuit cards required for the installation:

Used only in the main cabinet

NTDK20 SSC ____1___

NTAK02 SDI/DCH _____

NTAK03 TDS/DTR _____

NTAK09 1.5 Mb DTI/PRI _____

NTBK22 MISP _____

NT6D70 SILC _____ (if clock controller is active)

Meridian Mail _____

Used only in expansion cabinets

NTDK23 10 m Fiber receiver _____

NTDK25 or NTDK80
3 km Fiber receiver _____

Used in the main and expansion cabinets

NT8D02 Digital line card _____

NT8D03 Analog line card _____

NT8D09 Message waiting _____

NT8D14 Universal Trunk _____

NT8D16 Digitone Receiver _____

NT8D15 E&M Trunk _____

NT7D16 Data Access _____

NT6D70 SILC (see Note 1) _____

NT6D71 UILC _____

NT5K02 XFALC _____

NT5K18 XFCOT _____

NT5K17 XDDI _____

NT5K19 XFEM _____

NT5K36 XDID/DOD _____

NT5K21 XMFC/MFE _____

NTAG26 XMFR _____

Note 1: The NT6D70 SILC card must be installed in the main cabinet (slots 1 through 9) if it is used as a clock controller.

Note 2: Each expansion cabinet must have either an NTDK23, NTDK25 or NTDK80 Fiber-receiver card positioned in slot 0.

If NE-A25B cables are used instead of NTAK19AA and NTAK19BA cables with the NTAK02 and NTAK03 cards, proceed with care. NE-A25B cables are not wired out to station equipment or trunk circuits. They may only be wired out to SDI circuits.

Be sure to allocate the cards to the main cabinet which must reside there first. Fill in the remaining card slots as required.

If you plan on using the pre-assigned numbering plan with consecutive numbers, it is important to assign all line cards in consecutive card slots.

Figure 19
Option 11C main cabinet

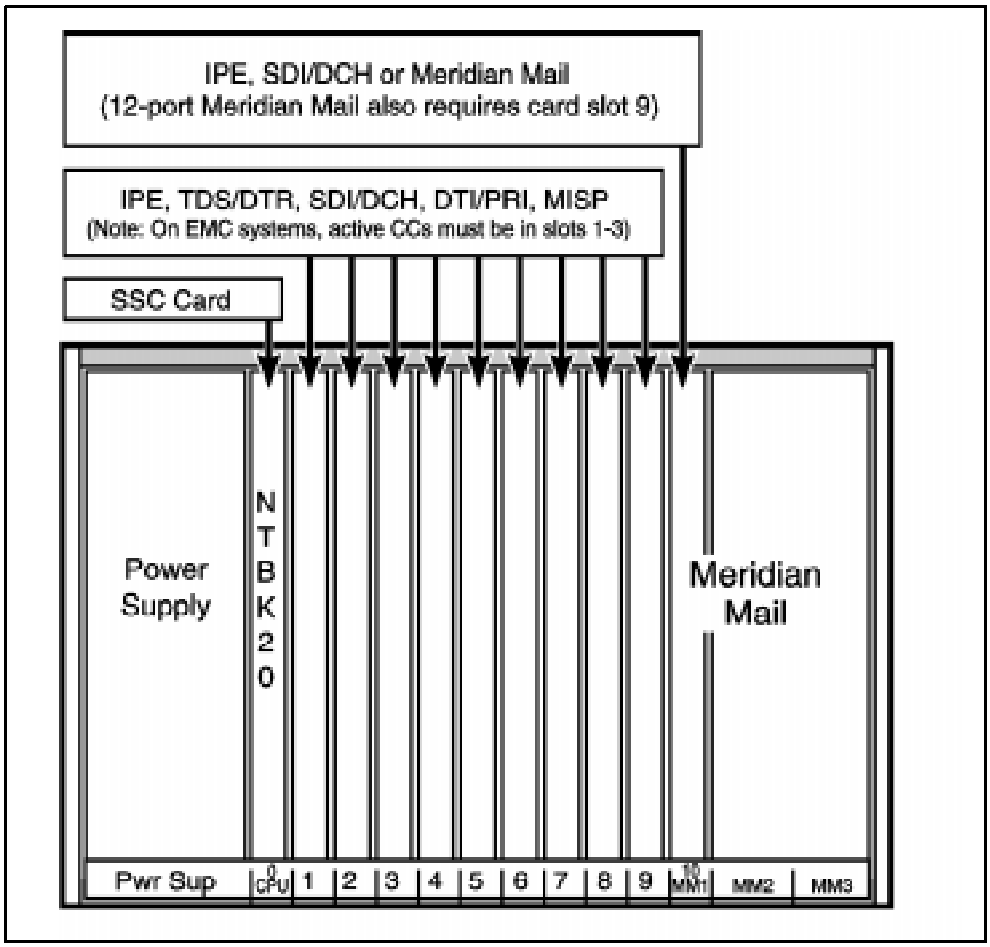
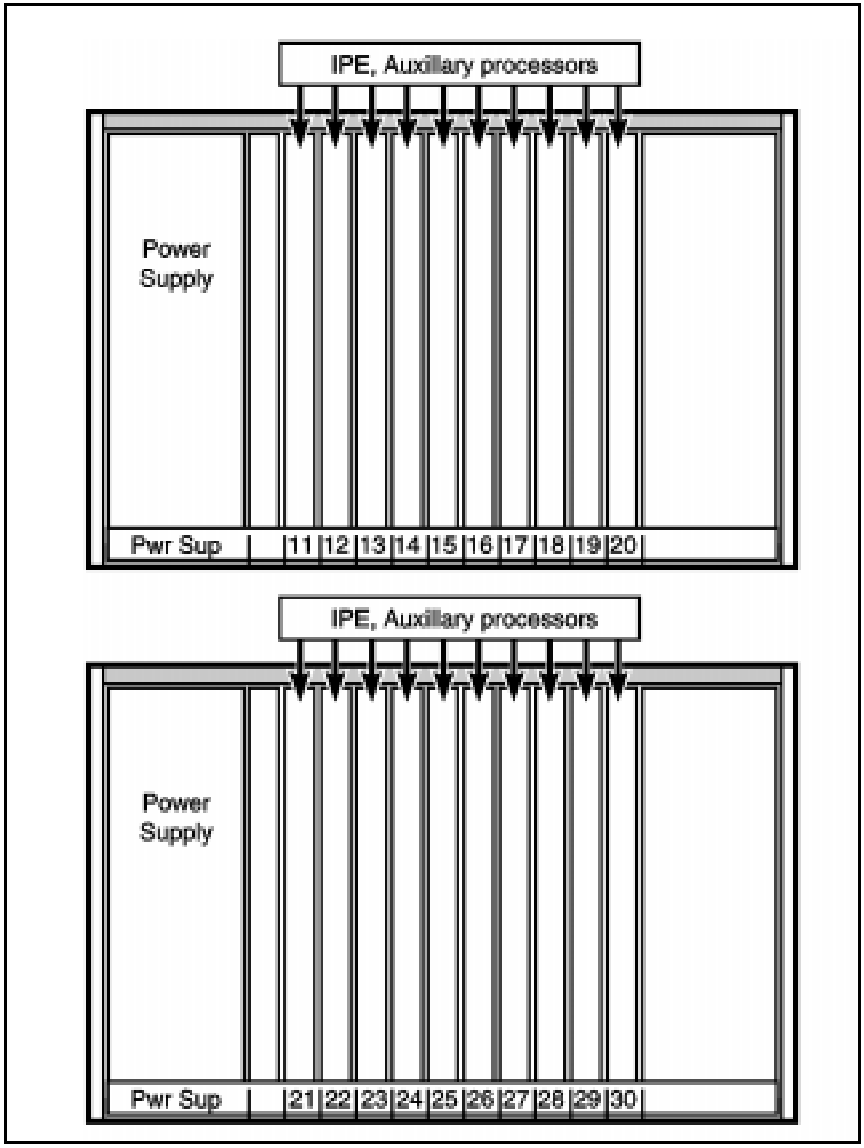


Figure 20
Option 11C Expansion cabinets



Chapter 4 — Regulatory and other information

General information

This chapter includes regulatory information for Canadian and United States installations. It also provides other information pertinent to the Option 11C system installation.

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable.

Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

Notice for United States installations

The Meridian 1 Option 11C system complies with Part 68 of the FCC rules. On the lower left corner of each system cabinet 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.

Meridian 1 Option 11C regulatory labels include:

- FCC registration: AB6982-14234-MF-E
- FCC registration: AB6982-62937-PF-E
- FCC registration: AB6CAN-61117-MF-E
- FCC registration: AB6CAN-61116-PF-E
- FCC registration: AB6USA-18923-KF-E
- FCC registration: AB6CAN-18924-KF-E
- Service code: 9.0F, 6.0P.

Importance of Ringer Equivalence Number

The FCC regulation label includes the Ringer Equivalence Number (REN). This number is a representation of the electrical load that will be applied to your telephone line once the PBX is plugged into the wall jack. The telephone line serving your premises will not operate properly if the total ringer load exceeds the capability of the telephone company central office equipment. That is, if too many ringers are connected to the line, there may be insufficient energy to ring your system. If the ringer load is excessive, you may also have difficulty dialing telephone numbers.

For more information about the total REN permitted for your telephone line, contact your local telephone company. However, as a guideline, a total REN of five should allow normal operation of your equipment.

If your Meridian 1 Option 11C equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. The telephone company may ask you to disconnect the equipment from the network until the problem has been corrected, or you are sure that the equipment is not malfunctioning. If it is possible, they will notify you in advance of the pending disconnection. You will also be advised of your right to file a complaint with the FCC.

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

If you experience trouble with your Meridian 1 Option 11C equipment, contact your authorized distributor or service center in the USA for repair or warranty information. If you do not know how to contact your distributor, call 1-800-328-8800.

Hearing aid compatibility

All proprietary telephones used with the Meridian 1 Option 11C comply with the requirements of FCC Part 68 Rule 68.316 for hearing aid compatibility.

Notice for Canadian installations

The Industry Canada - formerly called the Canadian Department of Communications - label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee that the equipment will operate to the user's satisfaction.

The Load Number (LN) assigned to each terminal device is the percentage of the total load that can be connected to a telephone loop using the device. This number prevents overloading. The termination on a loop can consist of any combination of devices, provided that the total of the Load Numbers does not exceed 100. An alphabetic suffix is also specified in the Load Number for the appropriate ringing type (A or B), if applicable. For example, LN = 20 A designates a Load Number of 20 and an "A" type ringer.

Before installing any equipment, users should ensure it is permissible to be connected to the facilities of the local telecommunications company. The equipment must be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telephone company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION

The Option 11C frame ground of each system cabinet must be tied to a reliable building ground reference.

WARNING

Users should not attempt to make electrical ground connections themselves, but should contact their local electrical inspection authority or electrician.

Repair facilities

The addresses for repair facilities for Canada and the United States are given below:

Canada

Northern Telecom Canada Ltd.
250 Sidney Street
Belleville, Ontario
Canada, K8N 5B7

United States

Northern Telecom Inc.
640 Massman Drive
Nashville, Tennessee
U.S.A. 37210

Canada and U.S.A. Network connections

Table 9 on page 70 contains information that must be given to the local telephone company when ordering standard network interface jacks for the Option 11C system.

Note: Table 8 includes columns for system port identification, Facility Interface Code (FIC), Service Order Code (SOC), USOC jack identification and associated Nortel equipment part numbers.

FCC compliance: registered equipment for Direct Inward Dial (DID) calls

Equipment registered for Direct Inward Dial (DID) calls must provide proper answer supervision. Failure to meet this requirement is a violation of part 68 of the FCC's rules.

Proper answer supervision is defined as follows:

- DID equipment returns answer supervision to the Central Office when DID calls are:
  - — answered by the called station
  - — answered by the attendant
  - — routed to a recorded announcement that can be administered by the CPE user
  - — routed to a dial prompt.
- DID equipment returns answer supervision on all DID calls forwarded to the Central Office. Permissible exceptions are if:
  - — a call is unanswered
  - — a busy tone is received
  - — a reorder tone is received.

Table 9
Network connection specifications

Ports MTS/WATS	Facility Interface Code	Service Order Code	REN	Network Jacks	Manufacturer network interface port designation
2-Wire, LSA, L-S (2-Wire, Local Switched Access, Loop-Start)	02LS2	9.0F	1.1B	RJ21X CA21X*	NT8D14
2-Wire, LSA, G-S (2-Wire, Local Switched Access, Ground-Start)	02GS2	9.0F	1.1B	RJ21X CA21X*	NT8D14
2-Wire, LSA, R-B (2-Wire, Local Switched Access, Reverse-Battery)	02RV2-T	9.0F	0.0B	RJ21X CA21X*	NT8D14
1.544 Mbps OSI, SF	04DV9-B	6.0P	N/A	RJ48 CA48*	NTAK09
1.544 Mbps OSI, SF	04Dv9-C	6.0P	N/A	RJ48 CA48*	NTAK09
Analog PL facilities					
E&M Tie Trunk (TIE line, lossless, 2-wire type 1 E&M)	TL11M	9.0F	N/A	RJ2EX CA2EX*	NT8D15
E&M 4-Wire DRTT (TIE line, lossless, dial repeating, 2-wire type 1 E&M)	TL31M	9.0F	N/A	RJ2GX CA2GX*	NT8D15
E&M 4-Wire DRTT (TIE line, lossless, dial repeating, 2-wire type 2 E&M)	TL32M	9.0F	N/A	RJ2HX CA2HX*	NT8D15

* RJ with CA for Canada

Notice for international installations

If there is insufficient planning or technical information present for your country of operation, contact your regional telecommunications distributor or authority for assistance.

Radio and TV interference

Option 11C complies with Part 15 of the FCC rules in the U.S.A. Operation is subject to the following two conditions:

- Option 11C may not cause harmful interference.
- Option 11C must accept any interference received, including interference that may cause undesired operation.

If the Meridian 1 Option 11C causes interference to radio or television reception, which can be determined by placing a telephone call while monitoring, the user is encouraged to try to correct the interference by the following measures:

- Reorient the receiving TV or radio antenna where this may be done safely.
- To the extent possible, relocate the receiver with respect to the telephone equipment.

If necessary, the user should consult the dealer or an experienced radio or television technician for additional suggestions. The user may also find helpful the booklet “How to Identify and Resolve Radio-TV Interference,” prepared by the Federal Communications Commission. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

Information for Canada

The Option 11C system does not exceed Class A limits for radio noise emissions from digital apparatus, as set out in the radio interference regulations of Industry Canada.

Chapter 5 — Important safety instructions

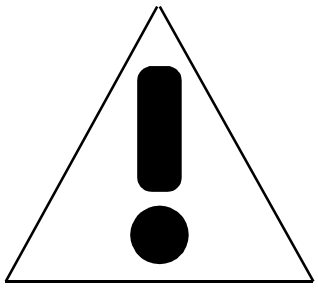
General information

SAVE THESE INSTRUCTIONS

This Chapter provides important safety information for installing and using your telephone equipment. Make sure this Chapter is readily available for use as a reference tool.

Symbols you should recognize

Whenever you see the symbol shown below on Option 11C equipment or documentation, it is intended to alert the you to the presence of important operating and maintenance instructions.



Safety instructions when installing telephone equipment

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.

Safety instructions when using telephone equipment

When using telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

1. Follow all warnings and instructions marked on the product.
2. Unplug the telephone from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
3. Do not use the telephone near water, for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement or near a swimming pool.
4. Do not place the telephone on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
5. Slots and openings in the cabinet and the back or bottom are provided for ventilation, to protect it from overheating. These openings should never be blocked or covered.

   The openings on a telephone should never be blocked by placing the product on the bed, sofa, rug, or other similar surface. The product should never be placed near or over a radiator or heat register. The product should not be placed in a built-in installation unless proper ventilation is provided.

6 The product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply, consult your distributor.

7 Some equipment is equipped with a three-wire grounding type plug: a plug having a third grounding pin. The plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace the obsolete outlet. Do not defeat the purposes of the grounding-type plug.

Some equipment is equipped with a polarized line plug: a plug having one blade wider that the other. This plug will fit into the power outlet only one way. This also is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still doesn't fit, contact your electrician to replace the obsolete plug. Do not defeat the purpose of the polarized plug.

8 Do not allow anything to rest on the power cord. Do not locate the product where the cord will be abused by persons walking on it.

9 Do not overload wall outlets and extension cords as this can result in the risk of fire or electrical shock.

10 Never push objects of any kind into the product through cabinet slots as they may touch dangerous voltage points, or short out parts that could result in a risk of fire or electrical shock. Never spill liquid of any kind onto the product.

11 To reduce the risk of electrical shock, do not disassemble a non-operating product.

12 Unplug the telephone from the wall outlet and refer servicing to qualified personnel under the following conditions:

a When the power supply cord or plug is damaged or frayed

b If liquid has been spilled into the telephone

c If the telephone has been exposed to rain or water

d If the telephone has been dropped or the cabinet has been damaged

e If the product exhibits a distinct change in performance

f If the telephone does not function properly under normal operating conditions

13 Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.

14 Do not use the telephone to report a gas leak in the vicinity of the leak.

Fiber optic cable handling procedures

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable. Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

Option 11C supports fiber optic cable interconnection between system cabinets using the following equipment:

- NTDK78 10 m Fiber Optic cable (multi-mode plastic fiber optic cable)
- NTDK84 10 m Dual Port Fiber Optic cable (multi-mode plastic fiber optic cable)
- NTDK22 10 m Fiber Expansion daughterboard (plastic fiber optic cable)
- NTDK23 10 m Fiber Receiver card (plastic fiber optic cable)
- NTDK24 3 km Fiber Expansion daughterboard (Multimode glass fiber optic cable)
- NTDK85 3 km Dual Port Fiber Expansion daughterboard (Multimode glass fiber optic cable)
- NTDK25 3 km Fiber Receiver card (Multimode glass fiber optic cable)
- NTDK79 3 km Fiber Expansion daughterboard (Single Mode glass fiber optic cable)
- NTDK80 3 km Fiber Receiver card (Single Mode glass fiber optic cable)

Note: Fiber optic cable is the only type of interconnection cable supported on a fully upgraded Option 11C or a first-time installation of an Option 11C.

The following safety precautions must be followed when handling fiber equipment:

- All persons handling Fiber Expansion daughterboards and Receiver cards must be Electrostatic Discharge (ESD) protected. A wrist strap provided with the cabinet also must be worn when handling fiber optic cables to prevent damage caused by static electricity.
- Always ensure the fiber optic cable is routed out of the way of any traffic through the premises.
- Never staple or bend the fiber optic cable at an extreme angle. Do not exceed the minimum bend radius of 1.5 in. (35 mm) (90° soft bend).

  Note: A conduit is not required for routing fiber optic cable between cabinets. However, if you require a conduit for identification or other reasons, use a conduit measuring a minimum of 1 in. (25 mm) in diameter.

Chapter 6 – Bracing cabinets against earthquakes

General information

This chapter provides important information for bracing the Option 11C system cabinets against earthquakes. Cabinets must be mounted on the wall in order to meet earthquake protection requirements.

Method for earthquake bracing

Earthquake bracing is performed by securely fastening a 3/4 in.(20 mm) sheet of plywood to the wall, then placing the system components on the backboard (not attaching them directly to the wall).

Procedure 1
Method for earthquake bracing Option 11C system cabinets

1 Determine the size of the backboard.

You will need a backboard that is large enough to accommodate all of your wall-mounted components. To determine the size of your backboard, refer to the wall plan that you developed according to the guidelines given in “Earthquake bracing requirements” on page 26. If you have not developed a wall plan, please do so immediately.

When you have determined the required backboard size, make sure it is within the following limits:

Table 10
Backboard size limits

	Backboard size
Minimum	2 ft by 6 ft (600 mm by 1800 mm)
Maximum	4 ft by 8 ft (1200 mm by 2400 mm)

2 Determine fastener requirements

To determine fastener requirements, you will need the following information:

- What fasteners to use.
- The minimum embedment of the fasteners into the wall.
- The vertical distance between fasteners.
- The horizontal distance between fasteners.
- For wood and metal stud walls, this requirement is determined by the spacing between wall studs, which must be within the following range:

Table 11
Stud spacing

	Stud spacing
Minimum	16 in. (400 mm)
Maximum	24 in. (600 mm)

- The required wall stud sizes for wood and metal stud walls.

Table 12
Hardware recommendations

Type of wall	Fastener	Vertical spacing between fasteners	Minimum embedment
Wood stud	#10 Wood Screws	12 in. (300 mm) on center	1 in. (25 mm)
Metal stud	#14 Sheet Metal Screws	12 in. (300 mm) on center	
Concrete	1/4 in. (6 mm) Hilti KB-II	24 in. (600 mm) on center	1 1/8 in. (28 mm)
Masonry	1/4 in. (6 mm) Ramset Redhead Dynabolt Sleeve Anchor	24 in. (600 mm) on center	

Table 13
Minimum wall stud sizes — 16 inch spacing

Wall Studs	Maximum Height of wall
Wood Studs	
2 X 4 (DF #2)	11 ft (3300 mm)
2 X 6 (DF #2)	19 ft (5700 mm)
Metal Studs	
2 1/2 X 20 Gauge	9 ft (2700 mm)
2 1/2 X 16 Gauge	10 ft (3000 mm)
2 1/2 X 14 Gauge	11 ft (3300 mm)
3 5/8 X 20 Gauge	12 ft (3600 mm)
3 5/8 X 18 Gauge	13 ft (3900 mm)
3 5/8 X 16 Gauge	14 ft (4200 mm)
3 5/8 X 14 Gauge	16 ft (4800 mm)
4 X 20 Gauge	14 ft (4200 mm)
4 X 18 Gauge	15 ft (4500 mm)
4 X 16 Gauge	16 ft (4800 mm)
4 X 14 Gauge	17 ft (5100 mm)
6 X 18 Gauge	20 ft (6000 mm)

Table 14
Minimum wall stud sizes - 24 inch spacing

Wall Studs	Maximum Height of wall
Wood Studs	
2 X 4 (DF #2)	10 ft (3000 mm)
2 X 6 (DF #2)	17 ft (5100 mm)
Metal Studs	
2 1/2 X 20 Gauge	8 ft (2400 mm)
2 1/2 X 18 Gauge	9 ft (2700 mm)
2 1/2 X 14 Gauge	10 ft (3000 mm)
3 5/8 X 20 Gauge	11 ft (3300 mm)
3 5/8 X 18 Gauge	12 ft (3600 mm)
3 5/8 X 16 Gauge	13 ft (3900 mm)
3 5/8 X 14 Gauge	15 ft (4500 mm)
4 X 20 Gauge	12 ft (3600 mm)
4 X 18 Gauge	13 ft (3900 mm)
4 X 16 Gauge	14 ft (4200 mm)
4 X 14 Gauge	16 ft (4800 mm)
6 X 18 Gauge	18 ft (5400 mm)

3 Determine the placement of fasteners

Refer to the figures on the following pages if you need assistance with the placement of fasteners on the backboard. In each figure, the minimum sized backboard (2 ft by 6 ft) and the maximum sized backboard (4 ft by 8 ft) are used as examples:

- **Figure 21 on page 83:** provides fastener locations for wood and metal stud walls with the minimum allowed stud spacing of 16 in. (400 mm).
- **Figure 22 on page 84:** provides fastener locations for wood and metal stud walls with the maximum allowed stud spacing of 24 in. (600 mm).
- **Figure 23 on page 85:** provides fastener locations for concrete and masonry walls.

Figure 21
Plywood fastener locations for wood and metal stud walls — 16 inch spacing

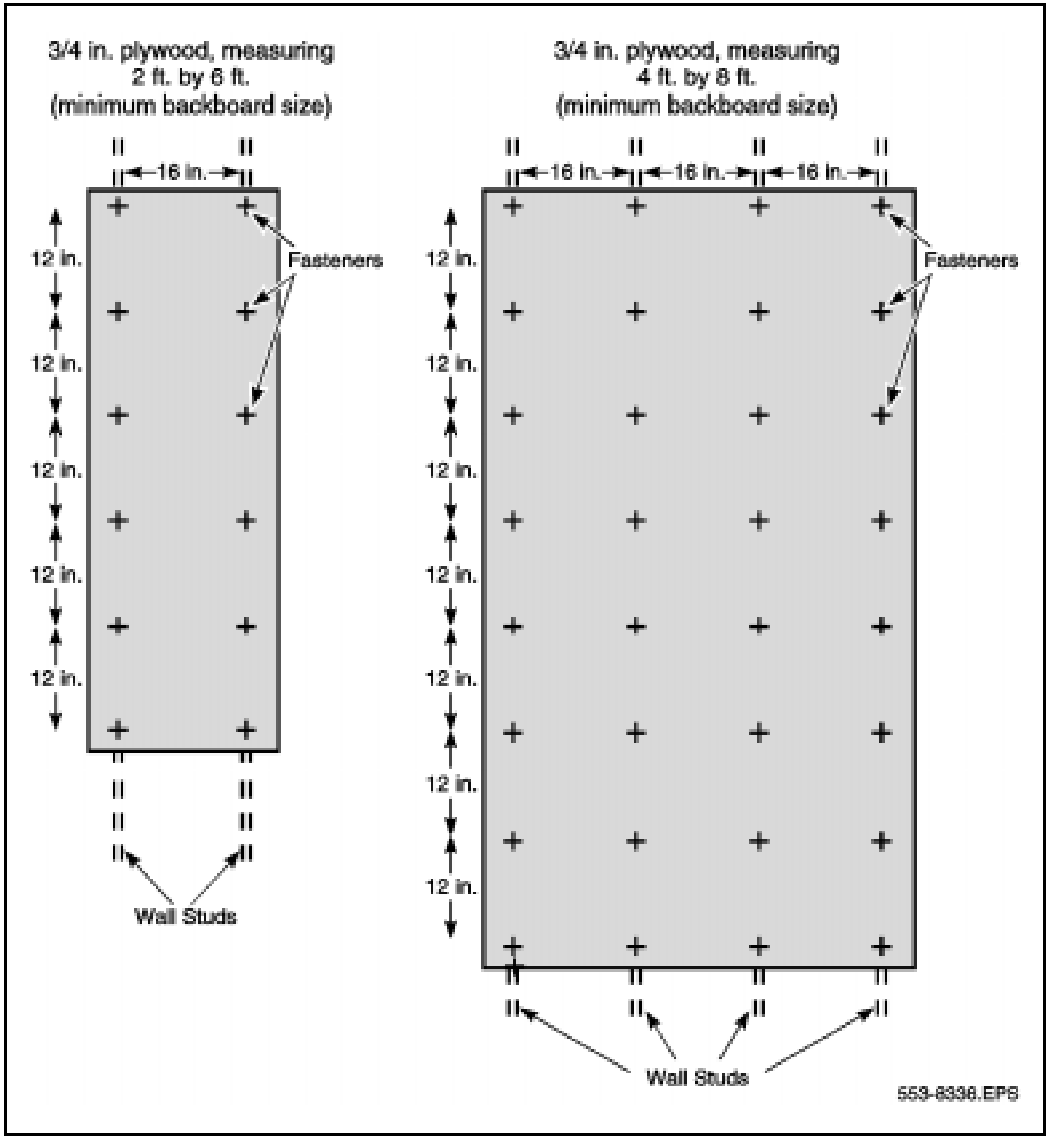


Figure 22
Plywood fastener locations for wood and metal stud walls — 24 inch spacing

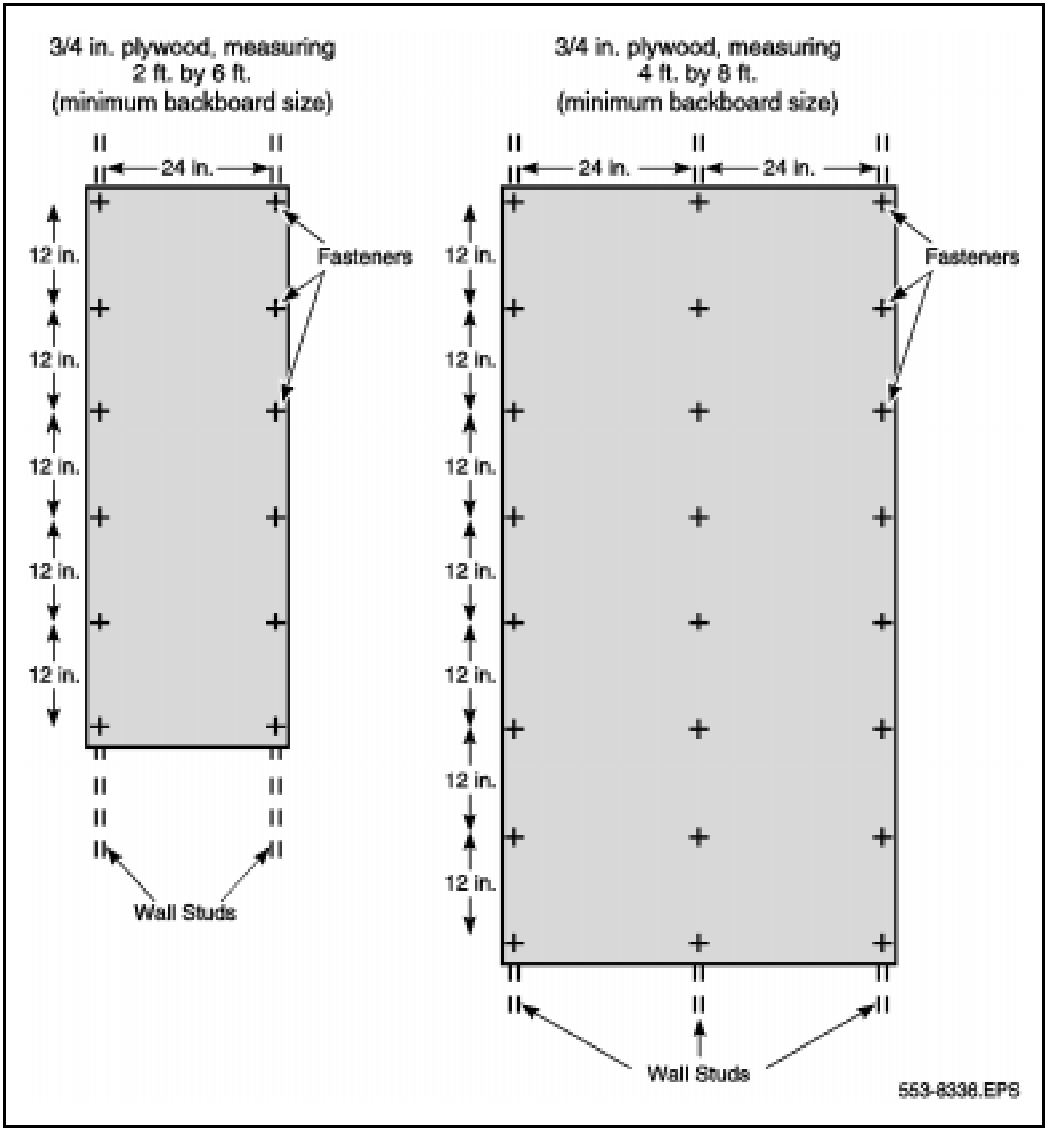
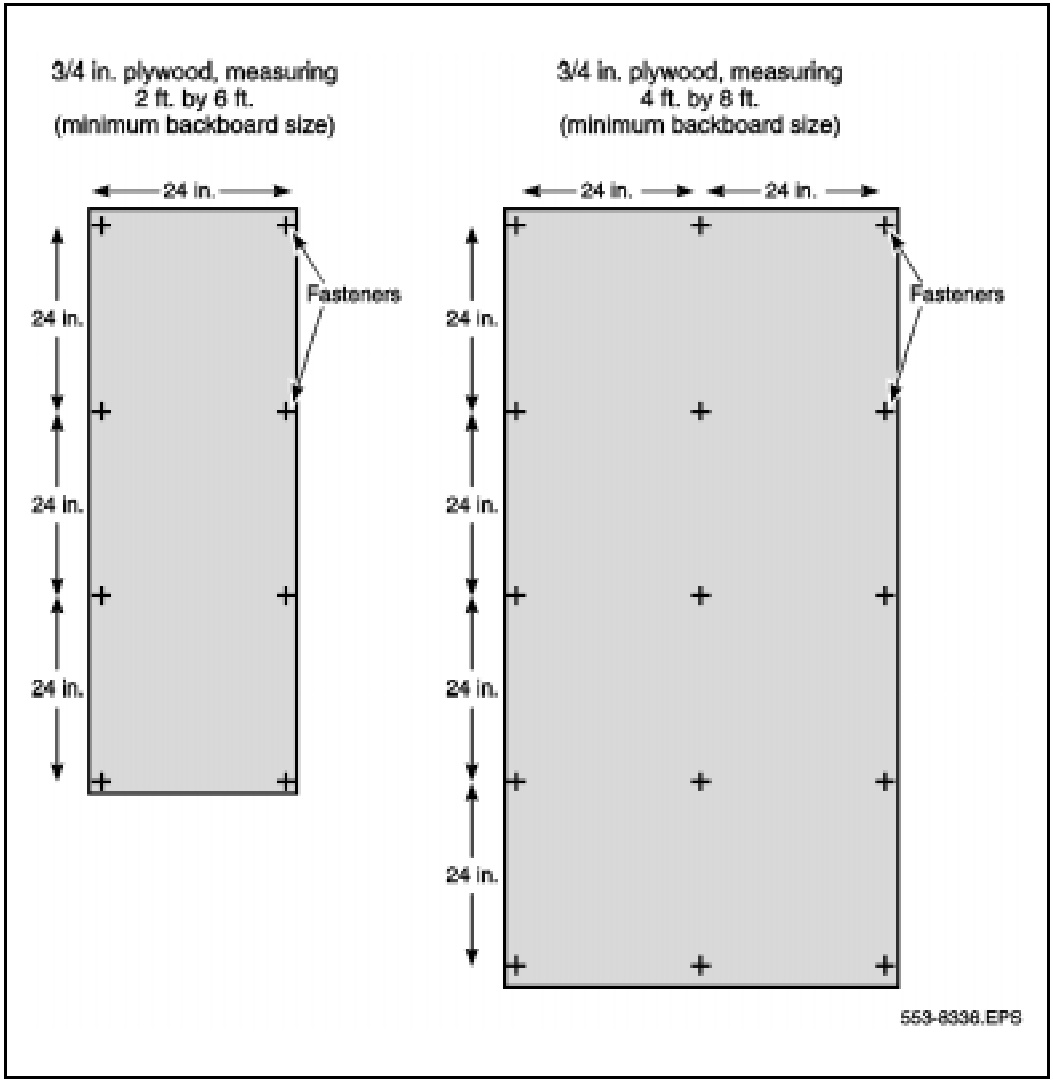


Figure 23
Plywood fastener locations for concrete and masonry walls



4 Proceed with Option 11C system installation

Now that you have securely fastened the backboard to the wall, you can proceed with the Option 11C system Installation.

End of Procedure

Chapter 7 – Preparing for installation

General information

Before proceeding with the installation, make sure you have all the tools necessary to install the Option 11C. Next, make sure you have checked for all site requirements, received all equipment, and that you have prepared an equipment layout plan and card slot assignment plan.

Tools checklist

To properly install the system, make sure that the following tools are available before starting to assemble the components:

- ☐ a variety of screwdrivers
- ☐ a tape measure
- ☐ a level
- ☐ pliers such as side cutters and longnose pliers
- ☐ an ECOS 1023 POW-R-MATE or similar type test meter
- ☐ appropriate cable terminating tools
- ☐ a drill for drilling lead holes for screws

Readiness checklist

Have you:

- ☐ read all ***safety instructions*** in the first part of this guide?
- ☐ checked to ensure you received all the equipment that was ordered?
- ☐ made sure your area meets all environmental requirements?
- ☐ checked for all power requirements?
- ☐ checked for proper grounding facilities?
- ☐ developed an equipment layout plan for the system?
- ☐ completed the card slot allocation plan?
- ☐ assembled all the tools required to proceed with the installation?

If you have completed all of the above items, you are ready to proceed with the installation of the system.

Chapter 8 – Installing a new system

General information

This chapter is used when installing a new system, with or without expansion cabinets. Make sure you have read and completed all instructions contained in the prior chapters of this guide.

Ensure the equipment layout plan and card slot layout plan have been created and are available and that site requirements, as described in “Chapter 3 — System and site requirements” on page 25 are met.

Installing the system

Follow the steps in Procedure 2 on page 90 to install the new Option 11C system. Complete each step as described before proceeding with the next step. Check off the box, located in the left margin next to each step, as it is completed.

References may be made to other chapters in this guide in order to provide additional information.

Procedure 2
New system installation

☐ **1** **Locate the carton containing the main cabinet and any expansion cabinets that are to be installed at this site.**

☐ **2** **Mount the cabinets as described in "Chapter 9 – Mounting the cabinets" on page 113.**

Make sure that they are mounted according to the equipment layout plan.

Make sure that they are securely mounted.

Make sure that the pedestal is installed if the cabinet is to be mounted on the floor, See "Mounting the cabinet on the floor" on page 118.

☐ **3** **Remove the drip tray from each cabinet to expose the cable routing grooves at the bottom rear of the cabinet.**

The drip tray is removed by sliding it outward.

☐ **4** **Install the cabinet ground wire for the main cabinet and any expansion cabinets at this site, as described in "Chapter 10 – Installing the system ground" on page 123.**

Make sure that a minimum #6 AWG ground wire is used.

Tag the main ground connection at the ground source to ensure that it is not accidentally disconnected.

Make sure to test the ground.

CAUTION

Wear the anti-static wrist strap provided in the bottom of the cabinet before handling the power supplies or other circuit cards. Static electricity can damage the components of power supplies and circuit cards.

☐ **5** **Install the power supplies in each cabinet as described in “Chapter 11– Installing the power supplies” on page 129.**

Make sure the circuit breaker on each power supply is in the OFF position.

Check the option switches on each power supply to ensure that they are correctly set.

☐ **6** **Install the reserve power supply if required.**
Refer to “Chapter 16 – Installing and connecting reserve power supplies” on page 201.

Make sure that the circuit breaker on the battery unit is set to OFF.

Make sure that all power connections are correct and secure.

☐ **7** **Skip this step if this is a single-cabinet system (no expansion cabinets) and go to Step 8 on page 102 of this chapter.**

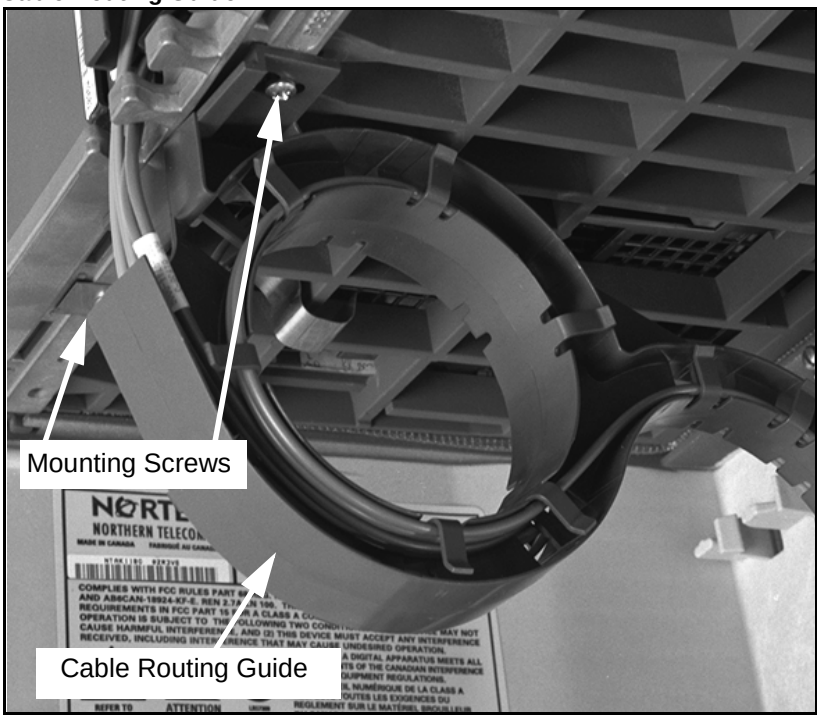
a) Install a Cable Routing Guide beneath slot 0 (SSC) in the main cabinet.

There are two types of Routing guides used in cabinets equipped with an NTDK20 SSC:

- The P0816832 Fibre Routing guide can be used in main cabinets equipped to support a maximum of two expansion cabinets or in expansion cabinets.
- The P0888475 Cable Routing guide is required to support three or four expansion cabinets and is supplied as standard with new systems using X11 Rlse 24 or later software. It is also compatible with systems when one or two expansion cabinets are being used and in expansion cabinets.

b) Install a Cable Routing Guide beneath slot 0 (Fbr Rcvr) in each expansion cabinet at this site, as shown in Figure 24 on page 93.
The Routing Guide is designed to be mounted in the cable connector area below the circuit cards. Secure the Routing Guide with the existing screws below the card slot (see Figure 24 on page 93).

Figure 24
Cable Routing Guide



c) Install a Fiber Expansion Daughter Board on the NTDK20 SSC as described in "Chapter 15 – Installing the circuit cards" on page 181 (see also Figure 25 on page 96)

- Expansion cabinets 1 and 3 are assigned to the connector labeled 'Fiber 1' (the upper connector). See Figure 26 on page 97.
- Expansion cabinets 2 and 4 are assigned to the connector labeled 'Fiber 2' (the lower connector). See Figure 26 on page 97.

d) Connect each fiber optic cable to the connector on the Fiber Expansion Daughterboard as shown in Figure 27 on page 98.

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable.

Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions.

Do not remove protective caps or plugs until ready to connect the cable.

– Once inserted, lock the connector in place by turning it a half turn clockwise as shown in Figure 29 on page 101.

– Repeat these actions for the remaining fiber optic connections.

– Connect the Glass Fiber Extension to the glass fiber optic cable as you did previously with the Dual Fiber Daughterboard.

Note: The glass fiber optic cable provides an extension to both connectors of the Dual Fiber Daughterboard. However, it is very important that the correct glass fiber optic cable is connected to each connector of the Dual Fiber Daughterboard. Check this now.

CAUTION

The NTDK20 SSC card is equipped with components on **both** sides of the circuit board. Be careful not to damage any of the components when handling the card.

If using the A0632902 cable:

– remove the two protective plugs from the connectors on the Fiber Expansion Daughterboard

– connect the cable to the Fiber Expansion Daughterboard making sure that the 'V' shaped groove on the cable connector is facing outward and that the connector is fully seated.

Note: The mark (if equipped) on the connector **should not** be visible when properly connected. See Figure 28 on page 100.

If using glass fiber optic cable:

– remove the protective plug from one connector on the Fiber Expansion Daughterboard and remove the protective cap from the corresponding plug (Tx or Rx) on the glass fiber optic cable

– insert the plug in its designated connector on the daughterboard

– once inserted, lock the connector in place by turning it a half turn clockwise, see Figure 29 on page 101

– repeat these actions for the second fiber optic connection.

Figure 25
NTDK20 SSC card and Fiber Expansion boards

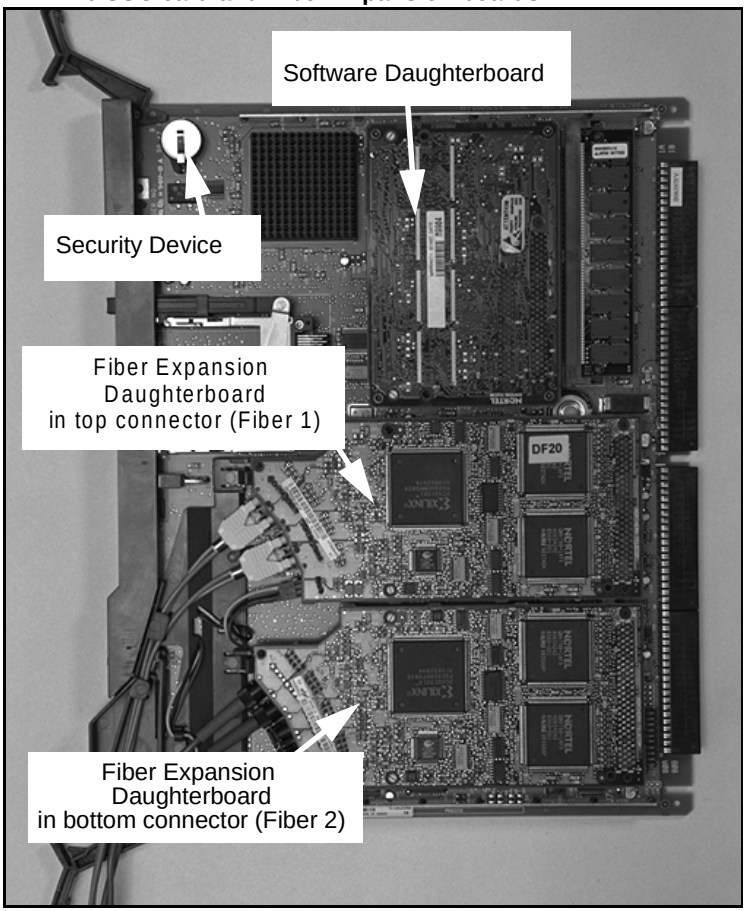


Figure 26
Cabinet assignments on Dual Port Daughterboards
(both types of daughterboards are shown)

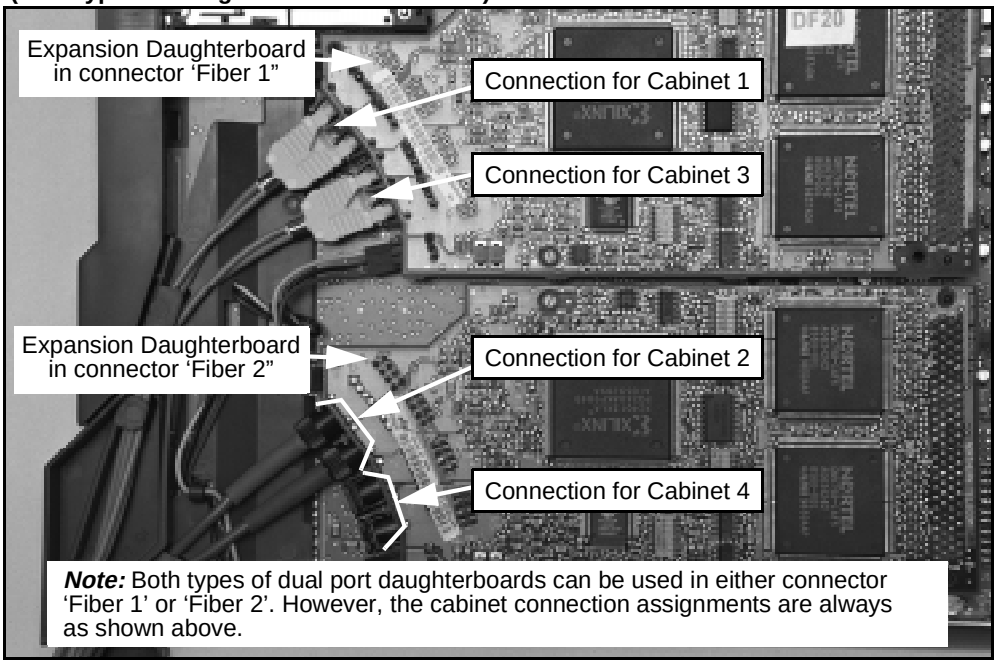
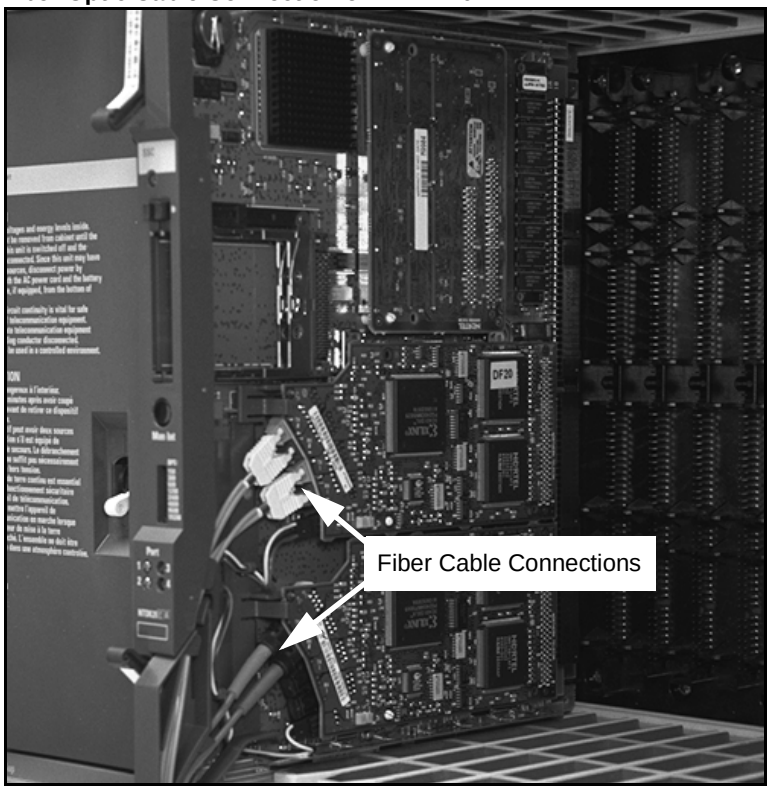


Figure 27
Fiber Optic Cable Connection on NTDK20



e) Route each fiber optic cable through the Fiber Routing Guide.

An A0632902 10 m fiber optic cable is used to connect the main cabinet to an expansion cabinet located within 10 m (33 ft). This cable is pre-cut and included with this system.

A glass fiber optic cable, supplied and installed by a local facilities provider, can be used to connect an expansion cabinet located up to 3 km (1.8 mi) from the main cabinet.

Do not staple or twist fiber optic cable. Do not bend it beyond a minimum 35 mm bend radius (90° soft bend).

f) Go to Step 8 on page 102 of this chapter.

Figure 28
Plastic Fiber Optic Cable Connection

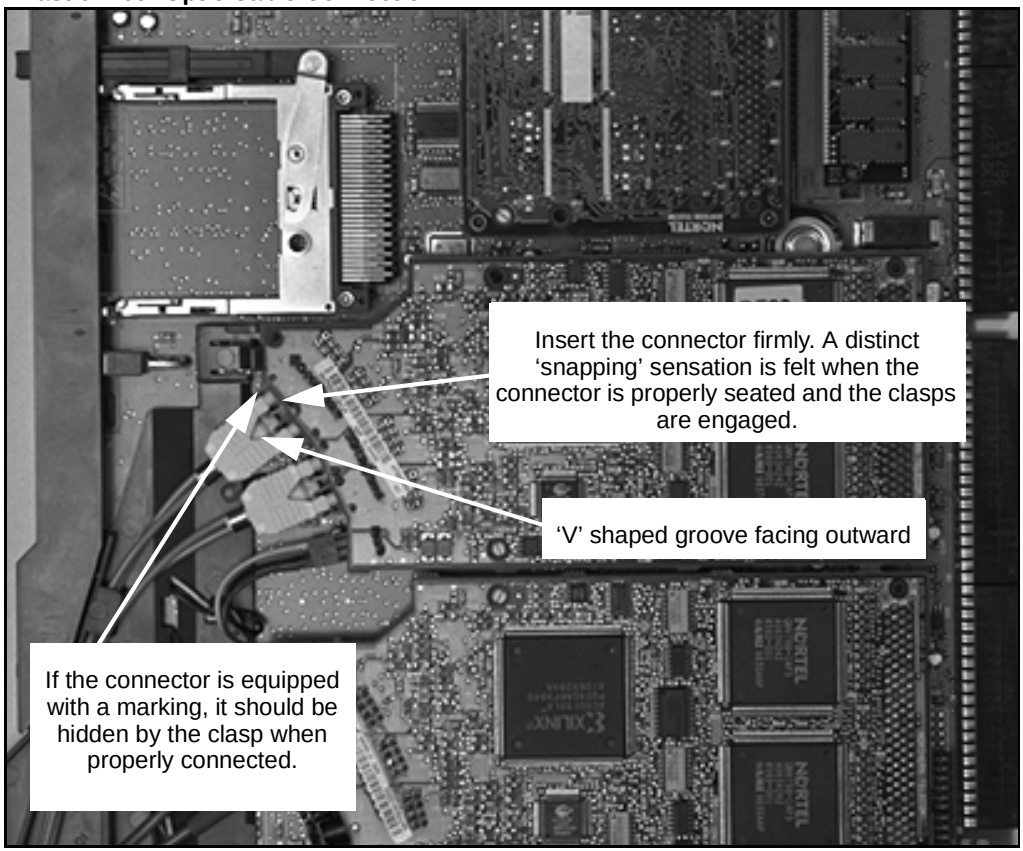
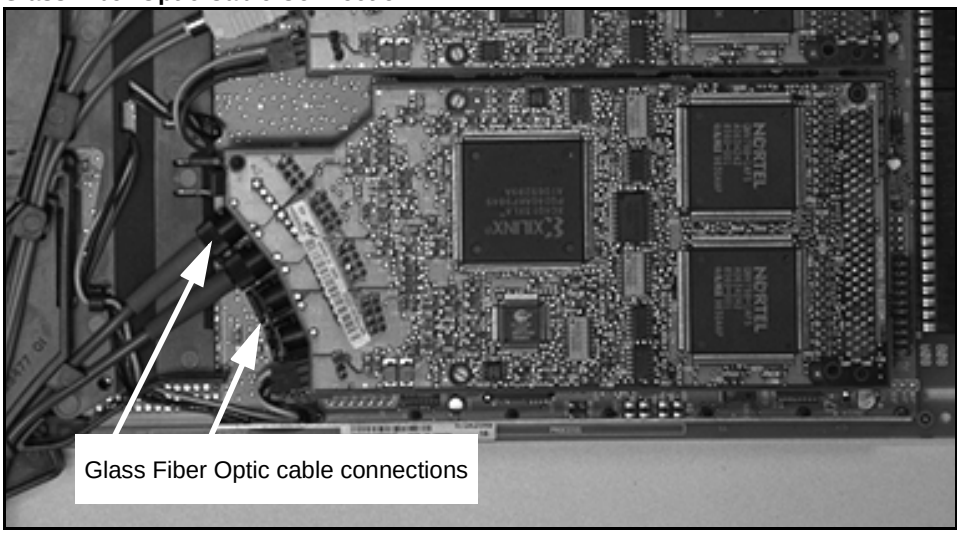


Figure 29
Glass Fiber Optic Cable Connection



☐ **8** **Install the Software Daughterboard and the Security Device on the NTDK20 SSC Card as shown in Figure 25 on page 96**.

CAUTION

The NTDK20 SSC card is equipped with components on **both** sides of the circuit board. Be careful not to damage any of the components when handling the card.

☐ **9** **Install the NTDK20 Small System Controller (SSC) card and the remaining circuit cards as outlined in the card slot assignment plan. Refer to "Chapter 15 – Installing the circuit cards" on page 181.**

Make sure all circuit cards are inserted in their assigned slots.

Make sure that the proper software daughterboard and the security device is installed on the NTDK20 SSC card.

Make sure the required number of Fiber Expansion daughterboards are installed on the NTDK20 SSC card for expansion cabinets (if equipped).

Make sure that circuit cards equipped with option switches or plugs are properly set.

Make sure the NTAK20 and NTAK93 daughterboards are attached to the NTAK09 circuit card, if required.

Make sure the NTAK20 and NTAK93/NTBK51/NTBK22 daughterboards are attached to the NTBK50 circuit card, if required.

☐ **10** **If the expansion cabinet is to be installed at a remote site and is not immediately accessible, or no expansion cabinet is being installed, go to Step 11 on page 108 of this chapter.**

If an expansion cabinet is located in the vicinity of the main cabinet, go to the following step (Step a) on page 103).

a) Install a Fiber Routing Guide beneath slot 0 (Fbr Rcvr) in the expansion cabinet as shown in Figure 24 on page 93.

The Fiber Routing Guide is designed to be mounted in the cable connector area below the circuit cards. Secure the Fiber Routing Guide with the existing screws below the card slot.

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable. Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

b) Connect the fiber optic cable to the connector on the Fiber Receiver card in the expansion cabinet as shown in Figure 30 on page 105.

If using the A0632902 cable:

- remove the two protective plugs from the connectors on the Fiber Receiver card
- connect the cable to the Fiber Receiver card making sure that the 'V' shaped groove on the cable connector is facing inward and that the connector is fully seated, see Figure 31 on page 106.

Note: The mark (if equipped) on the connector **should not** be visible when properly connected.

If using glass fiber optic cable:

- remove the protective plug from one fiber optic connector on the Fiber Receiver card and remove the protective cap from the corresponding plug (Tx or Rx) on the fiber optic cable
- insert the plug in its designated connector on the Fiber Receiver card, see Figure 32 on page 107
- once inserted, lock the connector in place by turning it a half turn clockwise
- repeat these actions for the second fiber optic connection.

c) Wind the excess fiber optic cable on the cable storage device located on the component side of the Fiber Receiver card in the expansion cabinet as shown in Figure 30 on page 105.

d) Insert the Fiber Receiver card in slot Fbr Rcvr (slot 0) of the expansion cabinet.

e) Route the fiber optic cable through the Fiber Routing Guide in the expansion cabinet as shown in Figure 24 on page 93.

f) Go to Step 11 on page 108 of this chapter.

Figure 30
Fiber optic cable (A0632902 shown) connector on Fbr Rcvr card

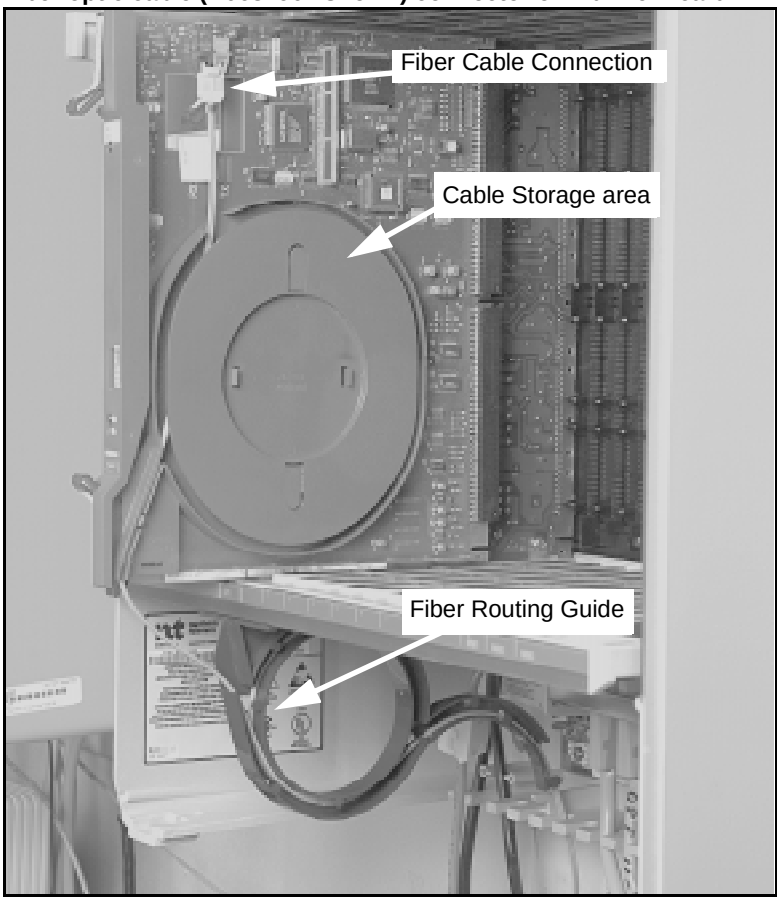


Figure 31
Plastic fiber optic cable connection

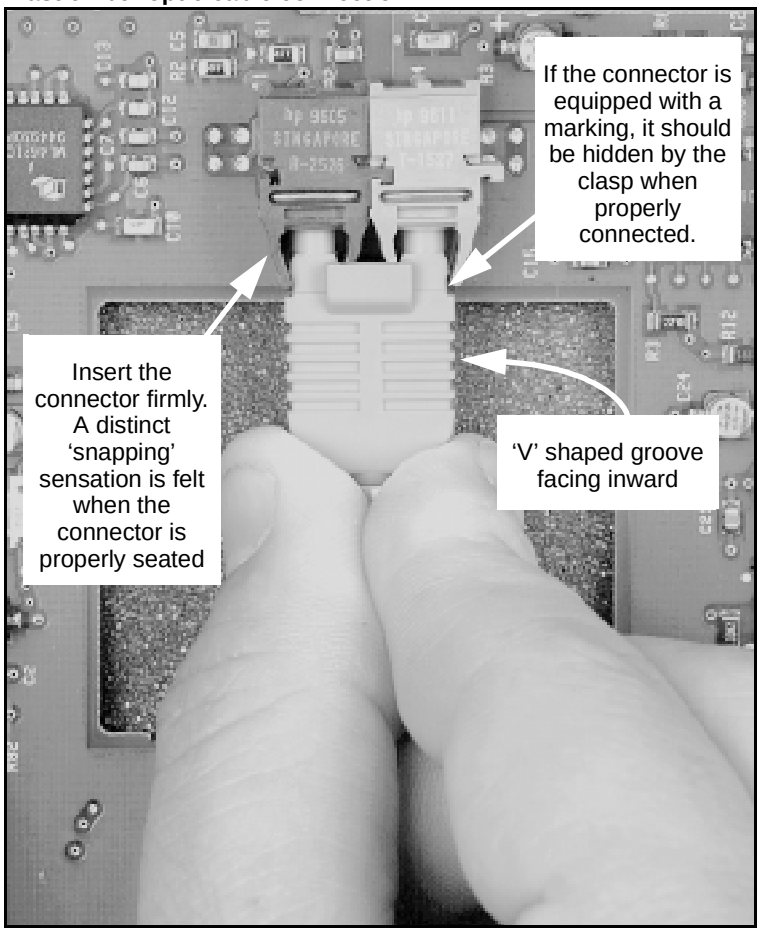
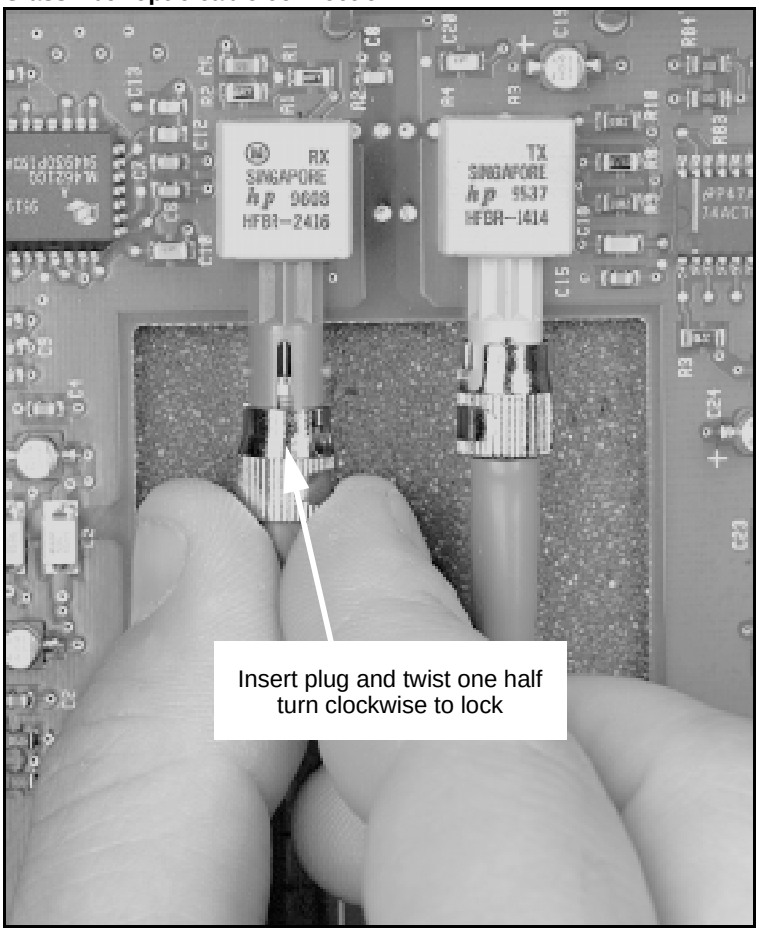


Figure 32
Glass fiber optic cable connection



☐ **11** **Install the cross-connect terminal. Refer to "Chapter 13 – Installing and connecting cross-connect terminal to cabinets" on page 167.**

Install the cross-connect terminal as shown on the equipment layout plan.

Assign terminal blocks for the power fail transfer units as well as the AUX cable from the main cabinet.

Allow space to connect up to ten NE-A25B cables for each cabinet.

Allow for additional cables at the cross-connect terminal if any slots are left vacant in preparation for future expansion.

Note: Each slot equipped with a line or trunk card requires an NE-A25B cable. The connectors J1 through J10 correspond to the slot numbers in each cabinet.

Don't forget to attach designations to the terminal blocks to identify the cables.

☐ **12** **Install the cables from the cabinets to the cross-connect terminal. Refer to "Chapter 13 – Installing and connecting cross-connect terminal to cabinets" on page 167**

Tag the cables for easy identification.

Install the cables neatly.

There should be one NE-A25B cable for each slot in the cabinet that is equipped with a line or trunk card.

Connect and terminate the AUX cable from the main cabinet.

In the main cabinet, leave the cable connectors for the slots assigned to the following free, if they are provided.

- NTAK02 circuit card
- NTAK03 circuit card
- NTAK09 circuit card
- NTAK10 circuit card
- NTAK79 circuit card
- NTBK22 circuit card
- NTBK50 circuit card

- Meridian Mail option
- any other line or trunk card
- any circuit card that requires custom cabling
- Don’t forget to reinstall the connector retaining bar in each cabinet.

Note: NE-A25B cables or custom cables can be installed on slots equipped with NTAK02 or NTAK03 circuit cards.

☐ **13** **Install the power fail transfer units (PFTUs) if provided. Refer to “Chapter 14 – Installing power fail transfer units” on page 175.**

Install the PFTU as according to the equipment layout plan.

Install the cables from the PFTU to the cross-connect terminal.

Don’t forget to install the power and control connections from the PFTU to the AUX cable.

☐ **14** **Connect the SDI interfaces on the SSC card and other circuit cards to the appropriate SDI port cables. If required, also connect the ethernet cable to the ethernet interface connector in the main cabinet. Refer to “Chapter 17 – Installing and connecting SDI and ethernet ports” on page 215.**

Make sure the baud rate and device option settings are properly set.

If the equipment operates in DTE mode, make sure that the A0601396 or A0601397 Modem eliminator is installed.

Connect communication equipment such as TTY terminals and modems to the SDI cables.

☐ **15** **Start up and test the system as described in "Chapter 18 – Starting up and testing the system" on page 235.**

Check all connections and make sure that the circuit cards are properly installed.

Make sure that the circuit breakers in each cabinet are set to **ON**.

If the system is equipped with one or more expansion cabinets, check the fiber related LEDs on the SSC card.

- The LED for the equipped Expansion Daughterboard should be **green**.
- If the LED is **red** (disabled indication):

  load overlay program 135 and enter ENL FL1 to enable expansion cabinet 1 (or ENL FL2 for expansion cabinet 2, if equipped).

- If the LED is **yellow** (fault indication):

  check all fiber optic cable to make sure that it is properly connected and not damaged.

☐ **16** **Connect the M2616 or M2008 administration and maintenance telephone equipped with a display. Configure it as Model 99. Refer to "Chapter 19 – Connecting the telephones" on page 259.**

Make sure that it is activated as a model 99.

☐ **17** **Install (if not previously installed) and activate the telephones. Refer to "Chapter 19 – Connecting the telephones" on page 259.**

Use the administration telephone to set the default models and default numbering plan.

Configure any custom telephone models which may be required.

Make sure the wiring to each telephone is properly connected.

Make sure all the telephones are in their correct location.

Make sure that all the required feature key caps are installed on the phones.

Make sure that the correct features are assigned to each telephone and are functioning.

☐ **18** **Connect the trunks to the system as described in "Chapter 20 – Connecting the trunks" on page 287**

Make sure that the wiring to each trunk is properly connected.

Make sure that the trunks are correctly assigned.

Make sure that all the trunks are working properly.

☐ **19** **Perform a system backup, using overlay 43.**

Dump or copy the configuration data to the primary and backup flash drives using the EDD command.

☐ **20** **Install any remaining equipment, such as external alarms (Refer to "Chapter 21 – Connecting an external alarm" on page 297) and the optional Meridian Mail feature, if provided.**

Note: Meridian Mail installation instructions are shipped in the carton containing the Meridian Mail equipment.

☐ **21** **Replace all drip trays and cabinet covers.**

☐ **22** **If one or more expansion cabinets are to be installed remotely (up to 3 km [1.8 mi] of the main cabinet) go to "Chapter 12 – Adding expansion cabinets" on page 141.**

End of Procedure

Chapter 9 – Mounting the cabinets

General information

This chapter explains two methods of installing cabinets. Procedure 3 on page 114 describes how to mount the cabinet on a wall, while Procedure 4 on page 118 describes how to mount the cabinet on the floor using a pedestal.

Earthquake bracing

If the Option 11C system cabinets require earthquake bracing, refer to "Earthquake bracing requirements" on page 26 before continuing.

Mounting the cabinet on a wall

Items required

To mount cabinets on a wall you need:

- the equipment layout plan as developed in the "Equipment layout plan" on page 44
- the mounting bracket supplied with each cabinet
- seven 1 in. #12 screws provided or other appropriate fasteners to secure the mounting bracket and cabinet to the wall
- a 3/4 in. (20 mm) sheet of plywood secured to the wall
- one 1 in. #12 screw and an alignment bracket if installing an expansion cabinet next to the main cabinet (horizontal expansion)

CAUTION

A fully loaded cabinet weighs up to 75 lb (34 kg). Make sure that the equipment is securely fastened to the wall. Use fasteners that are designed to hold securely in the type of surface chosen to support the equipment. When using 3/4 in. (20 mm) plywood or other similar material as a backboard, make sure that it is anchored directly to the wall studs in a minimum of six locations.

Procedure 3
Wall mounting

Note: If adding a cabinet next to an existing installed cabinet, start at Step 4 on page 114.

1 **Draw a level line on the plywood backboard indicating where the mounting brackets for each system cabinet will be located.**

Refer to the equipment layout plan for measurements, or refer to **"Equipment layout plan" on page 44.**

2 **Locate the mounting bracket and mounting screws shipped with each cabinet.**

3 **Rest the bottom of the bracket on the line drawn for the main cabinet and fasten the mounting bracket to the wall with five 1 in. #12 screws provided (or other suitable fasteners).**

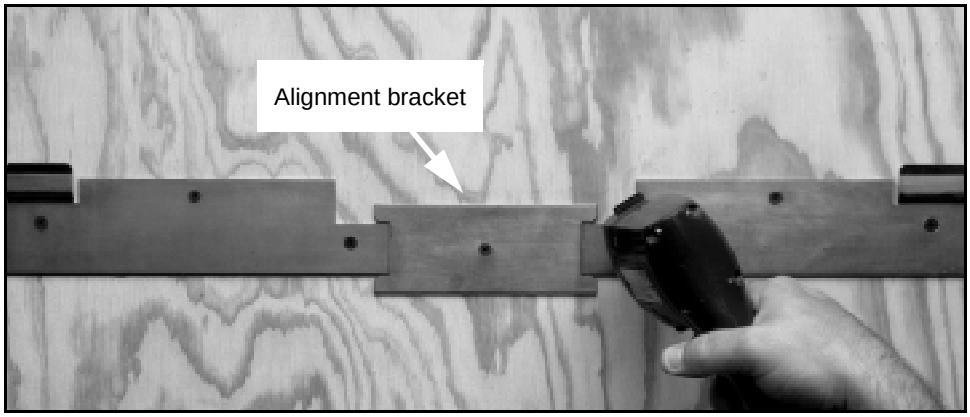
Make sure the mounting bracket is even with the line you have drawn and that the hook on the bracket is facing upward as shown in Figure 33 on page 115.

4 **Perform this step only if an expansion cabinet is to be located immediately next to the main cabinet (or an existing expansion cabinet). Otherwise, go to the next step (Step 5 on page 115).**

Fasten an alignment bracket (shipped with the cabinet) to the wall as shown in Figure 33 on page 115.

The alignment bracket determines the minimum distance between the main and expansion cabinets if mounted side-by-side. It is not required if the space between cabinets is significant.

Figure 33
Brackets for horizontal expansion



5 **Rest the bottom of the bracket on the line drawn for the expansion cabinet, and fasten the mounting bracket to the wall with five 1 in. #12 screws provided (or other suitable fasteners).**

Make sure the mounting bracket is even with the line drawn, and that the hook on the bracket is facing upward as shown in Figure 33 on page 115.

6 **Remove the main cabinet (or expansion cabinet if the main cabinet has been installed) from its carton and remove its front cover.**

If the front cover lock latches are in their locked position, use a screwdriver and turn the lug on each latch 90° to the unlocked position (Refer to Figure 34 on page 116).

Simultaneously slide both latches in towards the center of the cabinet.

Grasp the sides of the cover and pull the top outwards, then lift it upward to remove it from the cabinet.

Note: The bottom of the front cover is supported but not secured to the cabinet. Be careful not to drop it.

Figure 34
Unlocking the latches

7 **Remove the metal drip tray.**

Check the wrist strap in the bottom right of the cabinet. It may have come loose during transit. If so, attach it to the velcro tab on the inside right wall of the cabinet.

WARNING

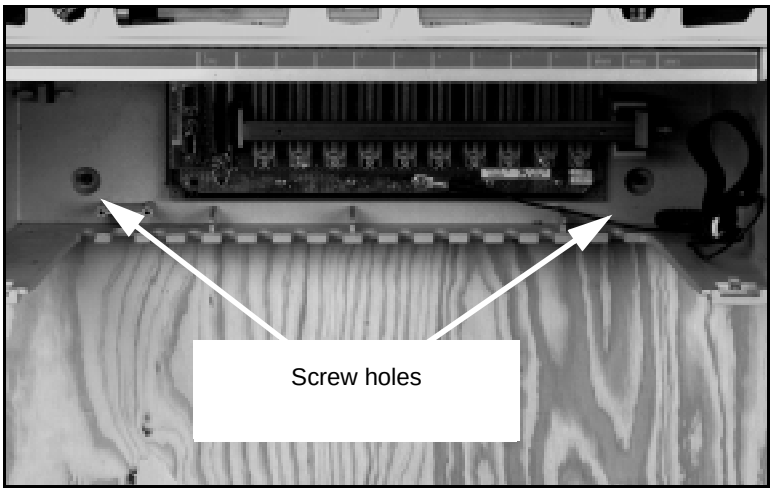
An empty cabinet weighs 25 lb (12 kg). Get help to lift the cabinet if necessary.

8 **Lift the cabinet and hang it on the mounting bracket hook.**

9 **Locate the two screw holes at the bottom towards the rear of the cabinet. See Figure 35 on page 117.**

10 **Adjust the cabinet so that it is straight and level. Fasten the bottom of the cabinet to the wall with the two 1 in. # 12 screws provided with the cabinet.**

Figure 35
Securing the cabinet to the wall



11 If additional expansion cabinets are being installed at this site, repeat Steps 6 through 10 to install those cabinets.

End of Procedure

Mounting the cabinet on the floor

Items required

To mount the cabinet on the floor you need:

- the optional pedestal for floor mounting
- four #14 screws provided to secure the cabinet to the pedestal
- the equipment layout plan as developed on page 44.

Procedure 4
Floor mounting

> **WARNING**
> An empty cabinet weighs 25 lb (12 kg). Get help to lift the cabinet if necessary.

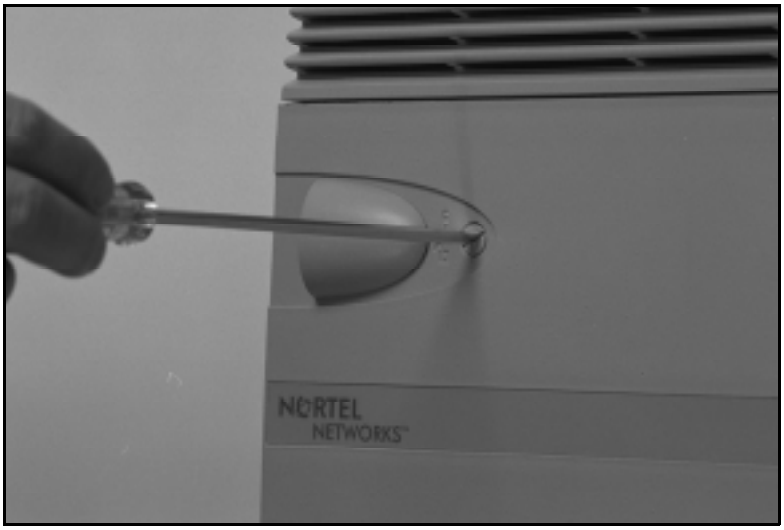
1 Remove the main cabinet (or expansion cabinet if the main cabinet has been installed) from its carton and remove its front cover.

If the front cover lock latches are in their locked position, use a screwdriver and turn the lug on each latch 90° to the unlocked position (Refer to Figure 36 on page 119).

Simultaneously slide both latches in towards the center of the cabinet.

Grasp the sides of the cover and pull the top outwards, then lift it upward to remove it from the cabinet.

Figure 36
Unlocking the latches



Note: The bottom of the front cover is supported but not secured to the cabinet. Be careful not to drop it.

2 Remove the metal drip tray.

Check the wrist strap in the bottom right of the cabinet. It may have come loose during transit. If so, attach it to the velcro tab on the inside right wall of the cabinet.

3 Locate the carton containing the pedestal.

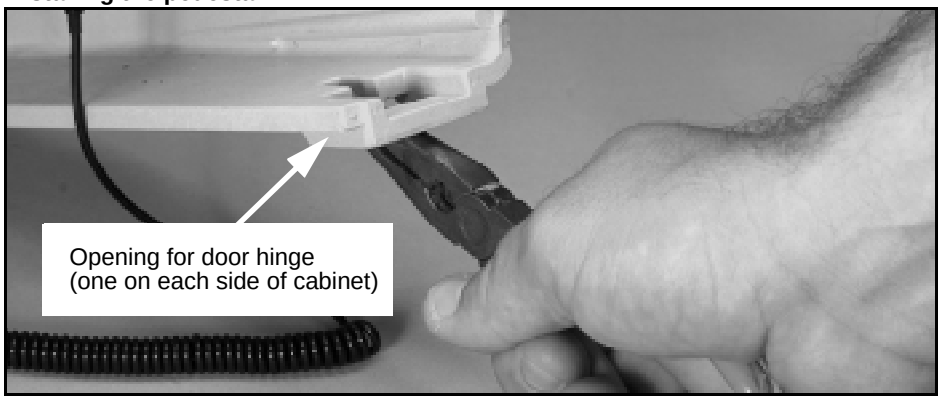
Remove the pedestal from the carton and locate the four leveling feet.

Install the feet into the base of the pedestal.

4 Install the cabinet on the pedestal.

Lean the cabinet backwards. From under the cabinet and with a pair of pliers, break off the two tabs located in the openings on the bottom of the cabinet where the door hinges join the cabinet as shown in Figure 37 on page 120.

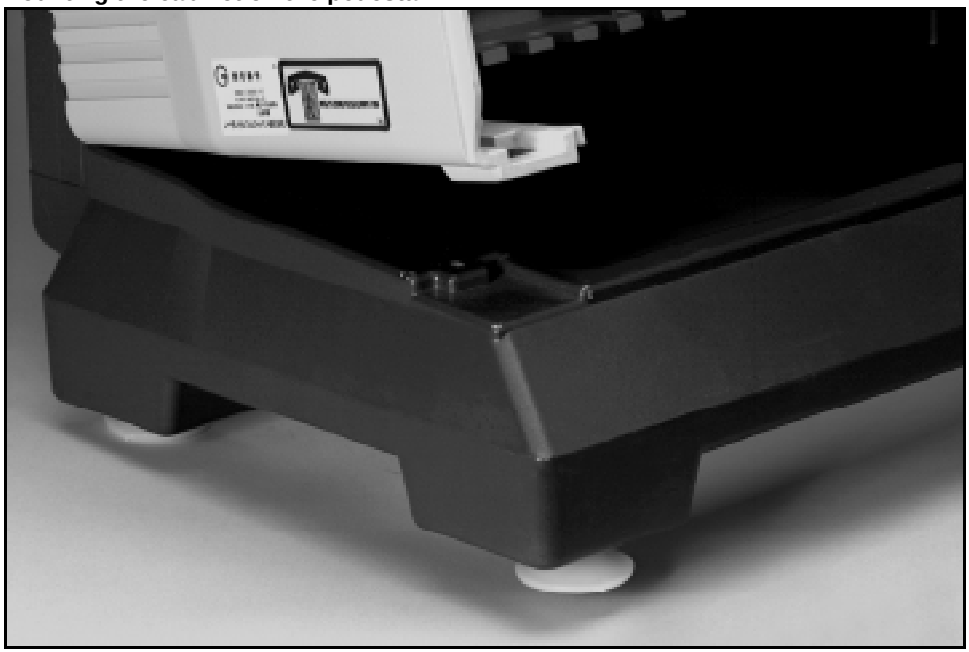
Figure 37
Installing the pedestal



Place the cabinet on the pedestal and make sure that it is properly seated. Align with the guide at the rear of the cabinet and pedestal (Refer to Figure 38 on page 121).

Install the four #14 screws that are shipped with the pedestal, two at the bottom rear and two where the tabs were removed, and secure the cabinet to the pedestal.Opening for door hinge (one on each side of cabinet)

Figure 38
Mounting the cabinet on the pedestal



5 **Position the cabinet according to the equipment layout plan.**

6 **If an additional expansion cabinet is being installed at this site, repeat this procedure for that cabinet.**

End of Procedure

Chapter 10 – Installing the system ground

General information

Procedure 5 on page 124 of this chapter describes how to install and connect the ground source to the Option 11C cabinets. Refer to the “Grounding requirements” on page 27 for further information.

WARNING

Proper grounding is extremely important.
Failure to complete the following steps could result in a system that is:

- unsafe for personnel using the equipment
- not protected from lighting or power surges
- subject to service interruptions.

Insulated ground wire **must** be used for system grounding.

Cabinets powered by the same service panel

For each system cabinet in collocated multi-cabinet situations, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to an NTBK80 ground bar. The ground bar is in turn connected to a ground source (the ground bus in the AC service panel).

Cabinets powered by different service panels

For each system cabinet in collocated multi-cabinet situations, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to an NTBK80 ground bar. If any cabinet cannot be powered from the same service panel, it must be grounded separate from the others back to the service panel that supplies it.

Grounding instructions for cabinets

The following procedure describes how to ground Option 11C cabinets. Repeat the steps for each cabinet installed in the system.

Procedure 5
Grounding cabinets

1 If the cabinet is equipped with a power supply unit, make sure that the AC power cord is disconnected from the power outlet.

> **WARNING**
> Power should never be connected to a cabinet that is not properly grounded.

2 If the cabinet is connected to a reserve power supply unit (battery backup), make sure that the circuit breaker on that unit is set to OFF.

> **WARNING**
> Backup power should never be connected to a cabinet that is not properly grounded.

3 If not previously installed, install an NTBK80 ground bar near the cabinet.

Note: The ground bar is intended to be used as a convenient bridging point for ground wires from up to three nearby Option 11C cabinets. Additional ground bars are required for remote cabinets, or when more than three cabinets are co-located.

4 **Install a #6 AWG (# 40 Metric Wire Gauge) ground wire from the ground lug in each cabinet to the NTBK80 ground bar (which is in turn connected with #6 AWG wire to the ground bus in the AC power service panel).**

Connect the ground wire to the ground lug located in the bottom of the cabinet next to the cable connectors (Refer to Figure 40 on page 127).

Route the ground wire through the third groove from the left in the bottom of the cabinet.

Connect the ground wire to the ground bar (Refer to Figure 39 on page 126).

Place a DO NOT DISCONNECT tag on the ground wire.

5 **Connect the grounding block to a suitable ground source (the ground bus in the AC power service panel).**

WARNING

The connection in the AC power service panel should be performed by a qualified technician or electrician.

6 **Place a DO NOT DISCONNECT tag on the ground wire at the service panel.**

End of Procedure

Figure 39
NTBK80 grounding block

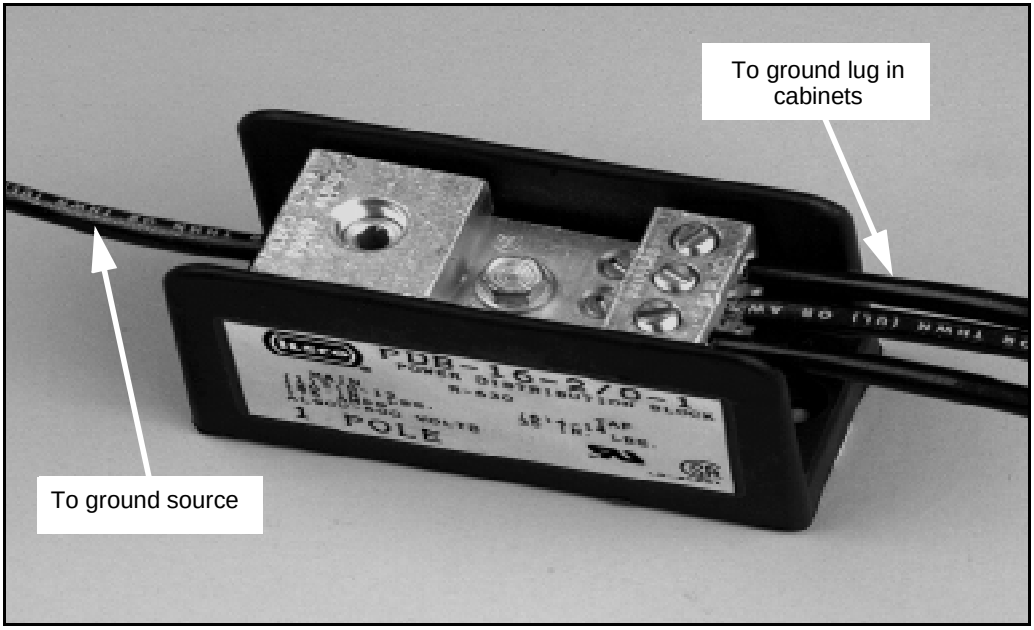
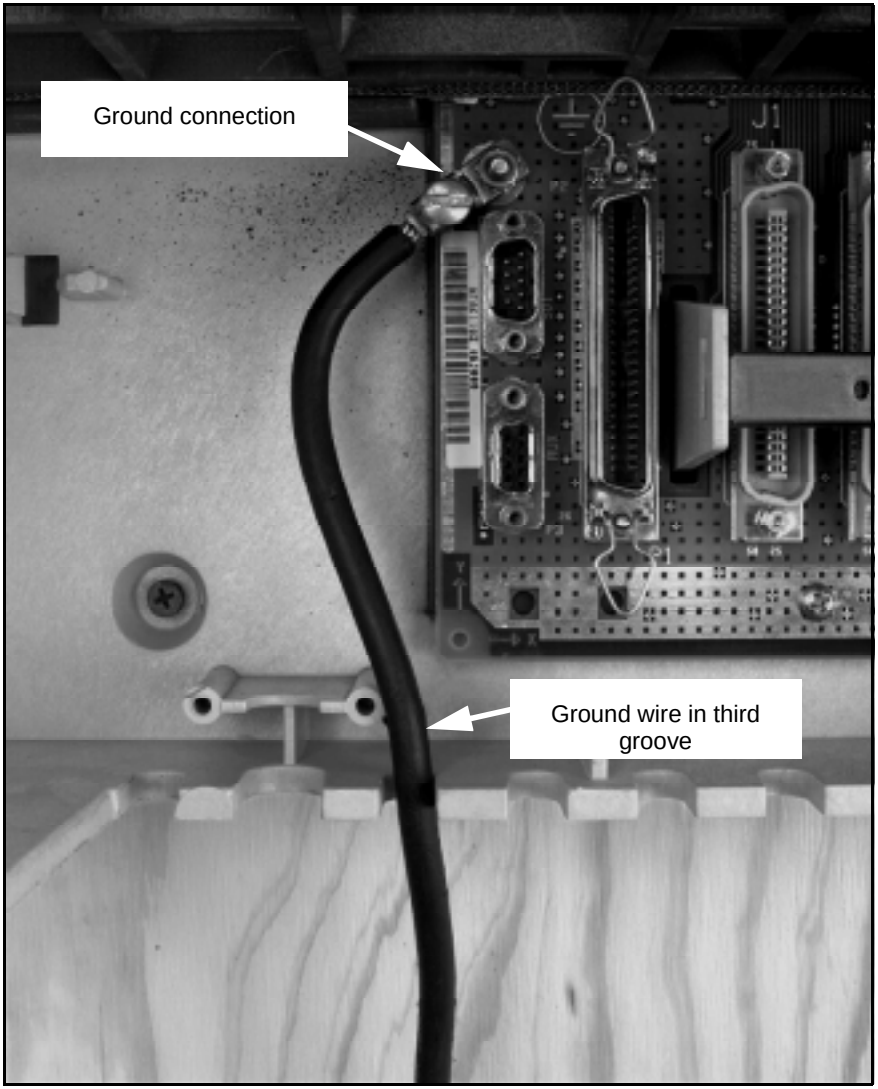


Figure 40
Ground lug in the NTAK11 system cabinets

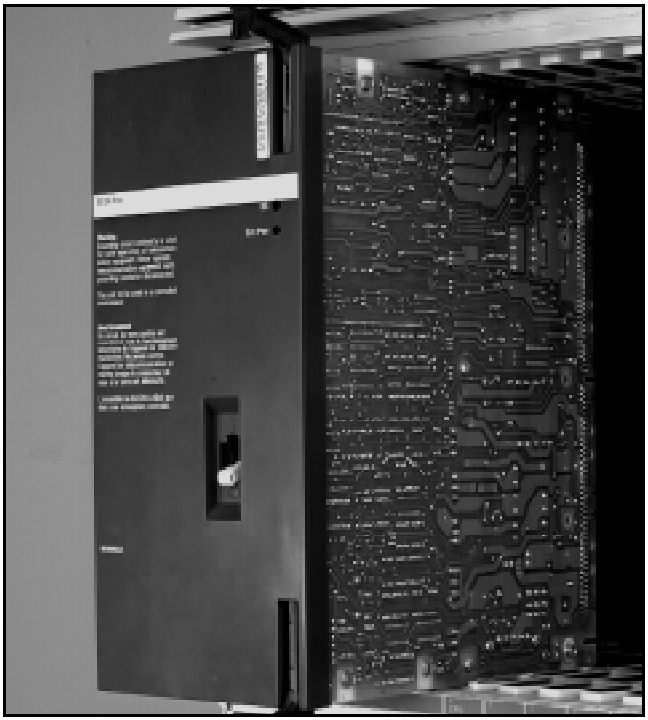


Chapter 11– Installing the power supplies

General information

This chapter describes how and where to install the power supplies used in the Option 11C system.

Figure 41
Power supply location — main and expansion cabinets



Power supplies

Power supplies are shipped separate from the cabinets.

AC- powered system

If installing an AC-powered system, an NTAK04 or NTDK78 ac/dc power supply is required with its appropriate line cord for each cabinet.

DC-powered system

If installing a DC-powered system, an NTAK05 or NTDK72 DC power supply is required for each cabinet.

- Additionally, one NTAK0420 power cable is required for each cabinet (for a DC power source).

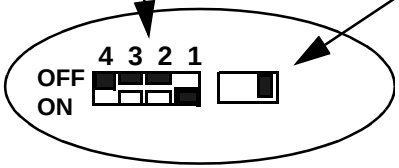
Switch settings

The power supplies are equipped with a series of switches which must be set before the units are installed in the cabinet (Refer to Figure 42 on page 131).

Figure 42
NTAK04, NTAK05, NTDK72 and NTDK78 power supply switch settings

	SW1	SW2	SW3	SW4
Message Waiting				
-150V	ON			
-120V	OFF			
Ringing				
86VRMS		OFF	OFF	OFF
80VRMS		ON	OFF	OFF
75VRMS		OFF	ON	OFF
70VRMS		OFF	OFF	ON

Frequency	Setting
50 Hz	
25 Hz	
20 Hz	



Switches located at top inside unit
Set switch in lower position for ON

Example:
The setting for North America is normally:
-150V for message waiting
and
86VRMS 20 Hz for ringing

AC power supply installation

AC power requirements

The AC-powered version requires a non-switched dedicated power outlet installed within 6 ft (1830 mm) of each cabinet, with:

- one non-switched dedicated outlet per cabinet with:
  - — Voltage: Recommended 100 to 240 volts
    Maximum limits 90 and 250 volts
    Single phase
  - — Frequency: 50 or 60 Hz
  - — Power (I/P Max): 750VA

Refer to “Commercial power requirements” on page 31 for detailed information about power requirements.

WARNING

Wait at least five minutes after power to the unit is switched off before removing the unit from the cabinet. Make sure that the power cord and battery backup connection (if equipped) are both disconnected.

CAUTION

The NTAK04 or NTDK78 ac/dc power supply cannot power up on battery alone. If the NTAK04 or NTDK78 is powered down while operating on DC reserve power, then AC power is required to power up.

Procedure 6
Installing the AC power supply

1 Set the AC breaker on the front of the power supply to the OFF position.

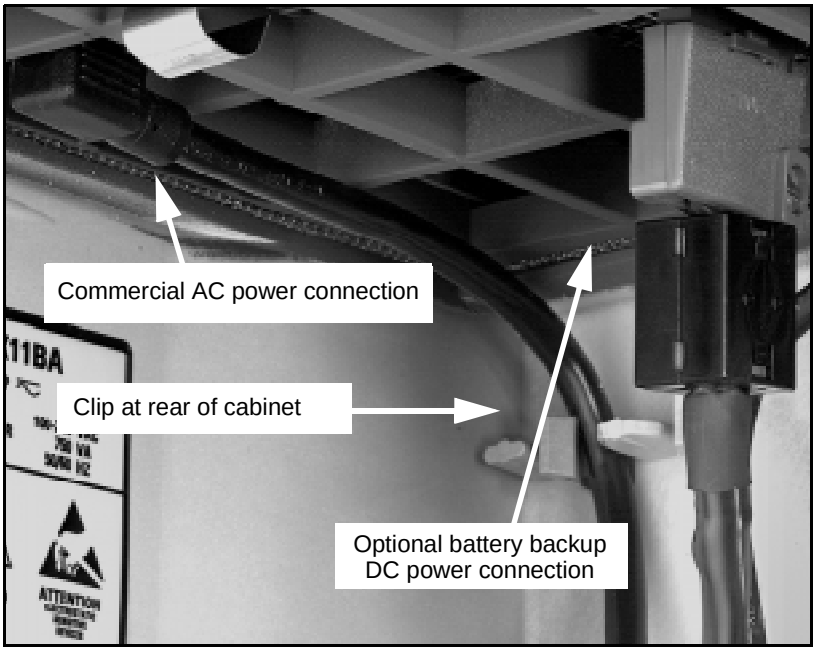
2 Make sure that the switches on the power supply are properly set as shown in Figure 42 on page 131.

3 **Insert the power supply into the first slot on the left of the card shelf (refer to Figure 41 on page 129).**

4 **Lock it into place with the card tabs.**

5 **Attach the power line cord to the connector on the left side of the power supply (see Figure 43 on page 133) by feeding the cord up through the card guides.**

Figure 43
AC power cable connection



6 **Secure the power line cord in place using the clip at rear of cabinet, see Figure 43 on page 133.**

7 **Route the rest of the power line cord down through the opening at the bottom of the cabinet.**

8 Test the ground of each system cabinet using the following:

a Set the circuit breakers feeding the AC outlet used to power the cabinet to OFF.

b Connect the power line cord to the NTAK04 or NTDK78 main cabinet power supply.

c Using an ohmmeter, measure the resistance from the ground pin on the line cord to the ground receptacle on the AC outlet.

The resistance must be less than 0.25 Ohms.
If the cabinets are powered from different service panels, the ground must be traced back to the panel serving the cabinet.

d Reset the circuit breaker once the ground connection is verified.

End of Procedure

DC power supply installation

Figure 44
DC power requirements

	Minimum (see note)	Nominal	Maximum
Recommended	-42.5 V dc	-52 V dc	-54 V dc
Limits	-42.5 V dc	-52 V dc	-57 V dc
Noise (CMESS)	—	—	25 dBrnc
Current	—	—	12 Amps
AC Ripple	—	—	100 mv RMS

Note: The NTAK05 or NTDK72 DC breaker will trip at -42.5 +/- 1.0Vdc.

Refer to the “DC-powered version” on page 39 for detailed information about DC power requirements.

Procedure 7
Installing the DC power supply

1 **Make sure the switches on the power supply are properly set. Refer to Figure 42 on page 131 of this chapter.**

2 **Insert the power supply into the first slot on the left of the card shelf (refer to Figure 41 on page 129).**

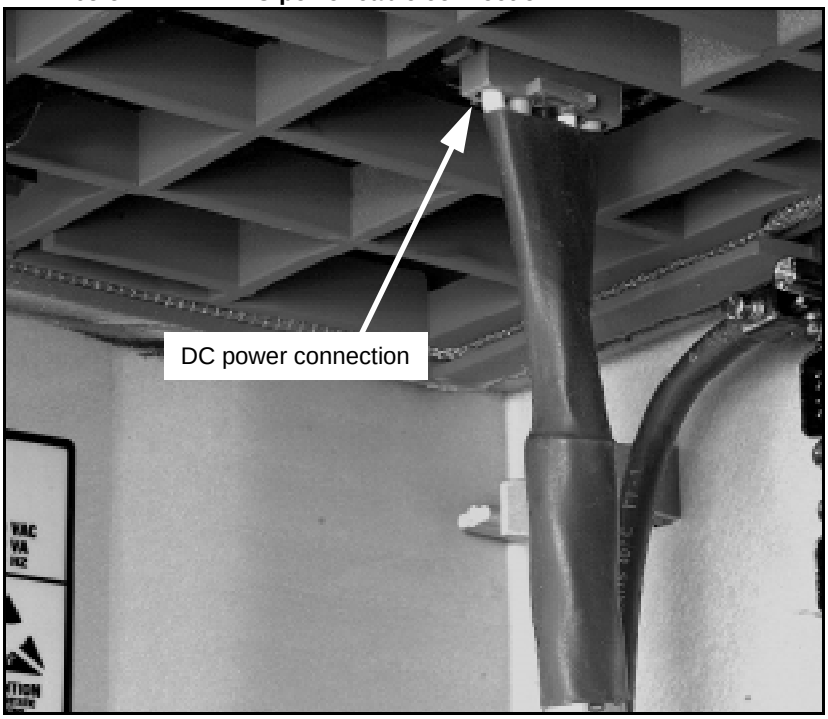
> **CAUTION**
> Make sure the circuit breaker on the faceplate of the power supply is OFF before continuing.

3 **Lock the power supply into place with the card tabs.**

4 **If a rectifier is to be installed with the system, install it using the instructions supplied with the rectifier.**

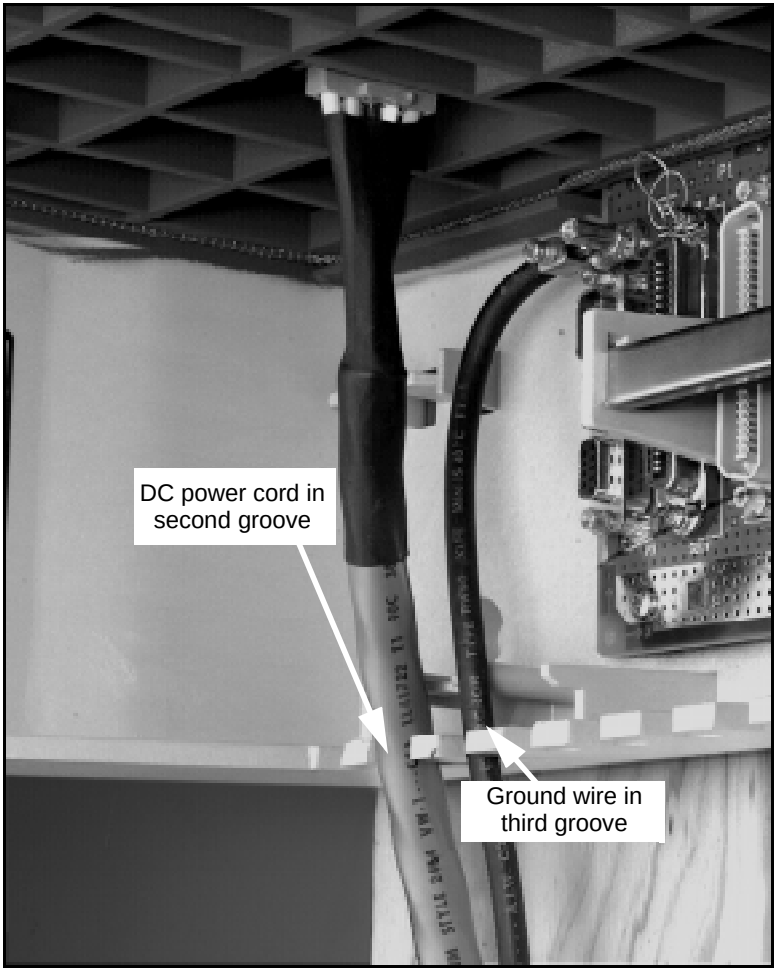
5 **Feed one end of the DC power cable up through the card guide and insert it into the connector on the right side of the DC power supply. See Figure 45 on page 136.**

Figure 45
NTAK05 or NTDK72 DC power cable connection



6 Route the rest of the power cable down through the opening at the bottom of the cabinet as shown in Figure 46 on page 137.

Figure 46
Power cord routing

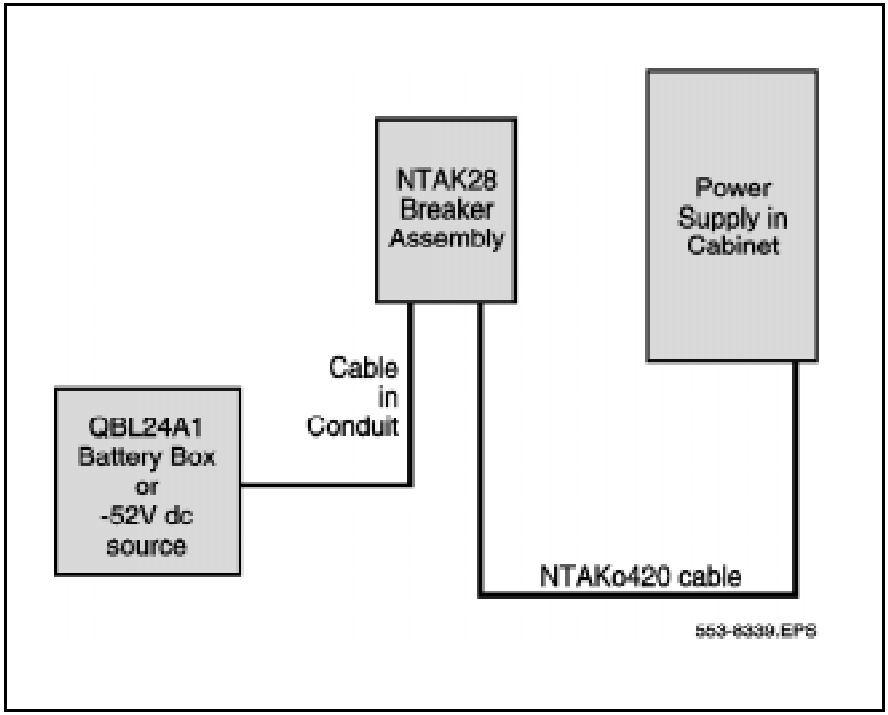


7 **Mount the NTAK28 Breaker Assembly to the wall within 3 ft (915 mm) of the cabinet it is serving. See Figure 47 on page 138.**

Secure the breaker assembly with four #10 1/2 in. (15 mm minimum) wood screws.

Note: One NTAK28 Breaker Assembly is required for each cabinet.

Figure 47
NTAK28 Breaker Assembly location



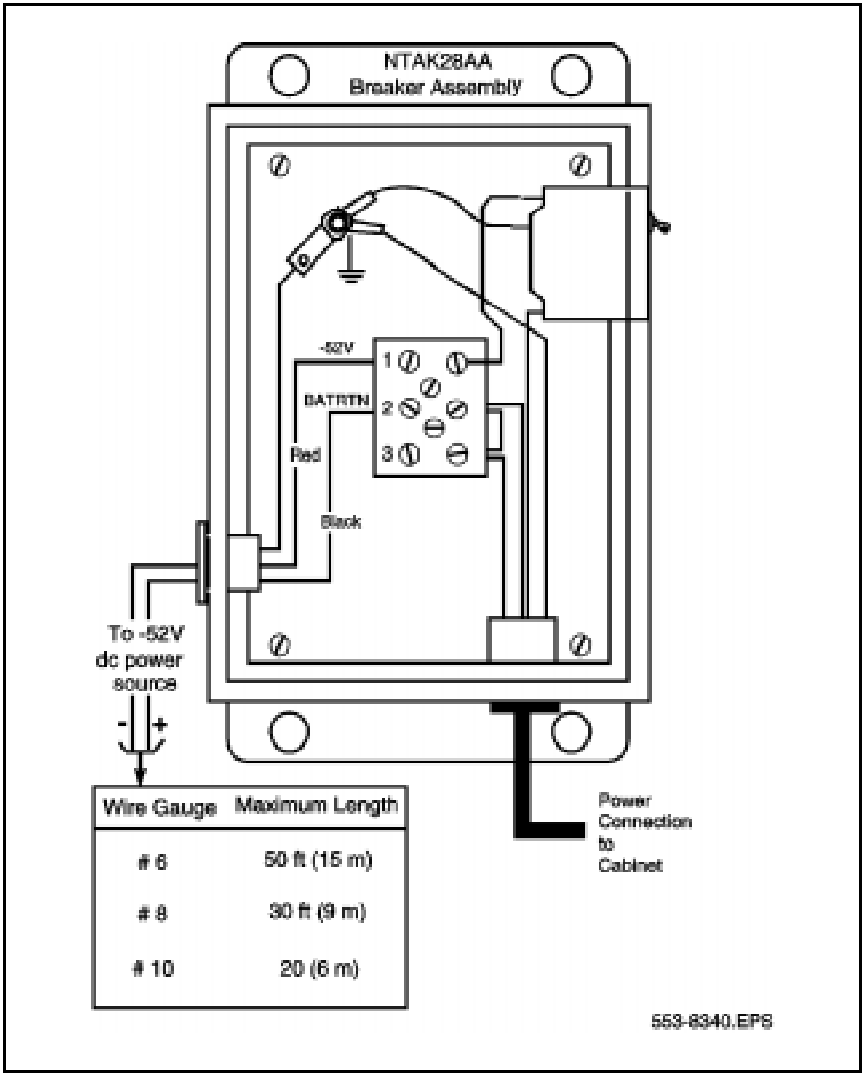
8 **Set the breakers on the NTAK28 Breaker Assembly and on the NTAK05 or NTDK72 power supply to OFF.**

9 **Connect the other end of the DC power cable (NTAK0420 cable) to the connector on the DC breaker assembly.**

10 **Connect the NTAK28 Breaker Assembly to a rectifier or other DC power source as shown in Figure 48 on page 139.**

———————— ***End of Procedure*** ————————

Figure 48
Power connection at the NTAK28 breaker assembly



Wire Gauge	Maximum Length
# 6	50 ft (15 m)
# 8	30 ft (9 m)
# 10	20 (6 m)

Chapter 12 – Adding expansion cabinets

General information

NTDK20 SSC card and expansion cabinets

NTDK20AB SSC

An existing NTDK20AB SSC card can only support Single Port Fiber Expansion daughterboards, for a maximum of two expansion cabinets.

NTDK20CA and later versions SSC

The NTDK20CA or later versions of SSC card can support both Single Port and Dual Port Fiber Expansion daughterboards. Systems equipped with three or four expansion cabinets must be equipped with an NTDK20CA or later version SSC card.

Adding a third and fourth expansion cabinet

When adding a third expansion cabinet to a system equipped with an NTDK20AB SSC card, the SSC must be upgraded or replaced with an NTDK20CA or later version of SSC. This can be achieved by:

- obtaining an NTDK20DA or later version SSC
- returning the NTDK20AB to the supplier for upgrading to an NTDK20CA SSC.
- upgrading the NTDK20AB to NTDK20CA with the NTDK19 SSC Upgrade Kit.

The SSC can then be equipped with a Single Port and a Dual Port Fiber Expansion Daughterboard, or two Dual Port Fiber daughterboards to serve three cabinets.
Two Dual Port Expansion Daughterboards are required when four expansion cabinets are installed.

The original Option 11C cabinet (NTAK11) will only support up to two expansion cabinets when used as the main cabinet. If adding a third or fourth expansion cabinet, it will be necessary to upgrade the cabinet using the NTDK18 Cabinet Upgrade Kit (main cabinet only). Main cabinets supplied new with X11 Rls 24 or later software (NTAK11DD or NTAK11BD) will already be the new style and do not need upgrading.

Procedure 8 on page 147 of this chapter describes how to:

- install expansion cabinets using the 10 m (33 ft) plastic fiber optic cable
- install expansion cabinets located up to 3 km (1.8 mi) from the main cabinet using glass fiber optic cable.

Cabinet configurations

Cabinets can be mounted on the floor or on the wall. If wall-mounted, the cabinets can reside side-by-side or vertical to one another. However, certain restrictions apply. Refer to the "Equipment layout plan" on page 44 for details.

> ***Note:*** If an equipment layout plan does not exist, it is recommended that one be created before starting to install cabinets.

Fiber optic equipment

Expansion cabinet up to 10 m (33 ft) from main cabinet

Table 15, "Equipment for 10 m (33 ft) maximum distance connection," on page 143 describes the equipment required to connect a plastic fiber optic intercabinet cable to a cabinet located up to 10 m (33 ft) from the main cabinet.

Expansion cabinet up to 3 km (1.8 mi) from main cabinet

Table 16 describes the equipment required to connect a glass fiber optic intercabinet cable to a cabinet located up to 3 km (1.8 mi) from the main cabinet.

Table 15
Equipment for 10 m (33 ft) maximum distance connection

Equipment	Description
A0632902 10 m plastic fiber optic cable, multi-mode	Connects an expansion cabinet up to 10 m (33 feet) from a main cabinet.
Note: Glass fiber optic cable can be used instead of the plastic A0632902 cable. See Table 16, "Equipment for 3 km (1.8 mi) maximum distance connection," on page 146 for equipment requirements.	
NTDK22 Single Port Fiber Expansion daughterboard **or** NTDK84 Dual Port Fiber Expansion daughterboard	Provides one 10 m (33 ft) fiber expansion interface in a main cabinet. Mounts on the NTDK20 SSC card. Provides two 10 m (33 ft) fiber expansion interfaces in a main cabinet. Mounts on the NTDK20CA and later versions of SSC card.
Note: The NTDK22 can connect to one expansion cabinet. The NTDK84 can connect to two expansion cabinets.	
NTDK23 Fiber Receiver card	Provides 10 m (33 ft) fiber interface at the expansion cabinet.
P0816832 Fiber Routing Guide **or** P0888475 Cable Routing Guide	Acts as a routing and storage device for up to two fiber optic cables. Used in main cabinets equipped with dual port Fiber Expansion daughterboards
Note: One P0816832 for each expansion cabinet and one for a main cabinet equipped with an NTDK20AC or earlier version SSC. Use a P0888475 Cable Routing Guide in cabinets equipped with an NTDK20CA or later version SSC.	

Fiber-optic cable information

One A0632902 Fiber Optic cable (plastic) is required for each expansion cabinet located within 10 m (33 ft) of the main cabinet.

> ***Note:*** Glass fiber optic cable can be used instead of the plastic A0632902 Fiber Optic cable.

One glass fiber optic cable is required for each expansion cabinet located up to 3 km (1.8 mi) of the main cabinet. This cable should be supplied and installed by a local cable facilities provider.

Note: Each cable must be dedicated to one expansion cabinet and must not be shared with other services

CAUTION

Do not staple fiber optic cable or bend it beyond a minimum 35 mm bend radius (90° soft bend).

CAUTION

Incorrectly connected fiber optic cables may cause the following problems:

– a series of repetitive fault indicating messages

– a complete failure of the expansion cabinet.

If fault indicating messages appear, check the fiber optic cable connections.

Since messages are stored in a buffer, they may continue to be displayed until the buffer is empty. After checking the cable connections, wait a couple of minutes for the messages to stop.

Reconfiguring existing cabinets to accommodate an additional expansion cabinet

Under certain circumstances, it may be required to rearrange cabinet connections or cabinet configurations. This may happen under the following scenarios:

- The existing main cabinet is equipped with two 10 m Dual Port or one 10 m Dual Port plus one 10 m Single Port expansion daughterboards and two expansion cabinets; one connected to port 1 of the top daughterboard and one connected to port 1 of the lower daughterboard. A cabinet is being added that requires 3 km expansion daughterboard. With this scenario, do the following:
  - Move the connection for the cabinet on port 1 of the lower daughterboard (Cabinet 2) to port 2 of the top daughterboard.
  - Change the designations at the cross-connect terminal for Cabinet 2 to Cabinet 3.
  - Reassign in software all services provided on cards 21 to 30 to cards 31 to 40.
  - Replace the lower 10 m expansion daughterboard with a 3 km expansion daughterboard.
  - Add the new cabinet as described in Procedure 8 on page 147.
- The existing main cabinet is equipped with two 10 m Dual Port expansion daughterboards connecting to three expansion cabinets. A remote expansion cabinet is to be added requiring a 3 km expansion daughterboard. Although one of the existing daughterboards has a port available, it can only be connected to a cabinet within 10 m (33 ft). With this scenario, do the following:
  - Select the Dual Port Expansion daughterboard that is being used for only 1 cabinet (a spare port is available on the daughterboard).
  - Replace it with a 3 km Dual Port Expansion daughterboard.
  - Replace the Receiver Card in the existing companion expansion cabinet with a 3 km receiver card.
  - With glass fiber optic cable, connect the existing expansion cabinet to the same port as previously assigned on the new expansion daughterboard.
  - Add the new cabinet to the remaining port as described in Procedure 8 on page 147.

.

Table 16
Equipment for 3 km (1.8 mi) maximum distance connection

Equipment	Description
Glass fiber optic cable, Multi-mode or Single Mode (maximum length 3 km [1.8 mi])	Connects an expansion cabinet up to 3 km (1.8 mi) from a main cabinet. This cable is supplied locally by a facilities provider. It must be dedicated to the expansion cabinet and must not be shared with other services or expansion cabinets.
Note: Multi-mode fiber optic cable is used with the NTDK24 or NTDK85 and NTDK25 card combination. Single Mode is used with the NTDK79 and NTDK80 card combination.	
NTDK24 Single Port Fiber Expansion daughterboard **or** NTDK79 Single Port Fiber Expansion daughterboard **or** NTDK85 Dual Port Fiber Expansion daughterboard	Provides one 3 km (1.8 mi) Multi-mode fiber expansion interface in a main cabinet. Mounts on the NTDK20 Small System Controller (SSC) card. Same as the NTDK24 but uses Single Mode fiber optic cable Provides two 3 km (1.8 mi) Multi-mode fiber expansion interfaces in a main cabinet. Mounts on the NTDK20CA and later versions of Small System Controller (SSC) card.
Note: The NTDK24 or NTDK79 can connect to one expansion cabinet. The NTDK85 can connect to two expansion cabinets.	
NTDK25 Fiber Receiver card **or** NTDK80 Fiber Receiver card	Provides 3 km (1.8 mi) fiber interface at the expansion cabinet. Uses multi-mode fiber optic cable Same as the NTDK25 but uses Single Mode fiber optic cable
P0816832 Fiber Routing Guide **or** P0888475 Cable Routing Guide	Acts as a routing and storage device for up to two fiber optic cables. Required to support three or four expansion cabinets. Supplied with all new systems using X11 Rlse 24 or later software. It is also compatible with systems when one or two expansion cabinets are being used and in expansion cabinets.

Conduit

Conduit is not usually needed for routing fiber-optic cable. However, if conduit is required for any reason, it should be a minimum of 1 in (25 mm) in diameter.

Grounding

At multi-cabinet sites, each cabinet requires a ground connection from the cabinet ground lug to a grounding block. The grounding block is connected to a suitable ground source. If the use of a single grounding block is inconvenient due to the distance between cabinets, a second or third grounding block can be used.

> ***Note:*** It is recommended that all cabinets on a site be powered from the same power panel, and that the cabinets be grounded to the power panel through the grounding bar.

For more information on grounding, refer to “Grounding requirements” on page 27.

Power

Each cabinet requires a dedicated outlet. All outlets should, if possible, be connected to the same power panel. Refer to “Commercial power requirements” on page 31 for more information.

Procedure 8
Adding an expansion cabinet

☐ **1** **Mount the expansion cabinet as described in “Chapter 9 – Mounting the cabinets” on page 113.**

Make sure that it is mounted according to the equipment layout plan.

Make sure that it is securely mounted.

Make sure that the pedestal is installed if the cabinet is to be mounted on the floor.

☐ **2** **Remove the drip tray from bottom of the cabinet to expose the cable routing grooves at the bottom of the cabinet.**

The drip tray is removed by sliding it outward.

☐ **3** **Install the cabinet ground wire as described in "Chapter 10 – Installing the system ground" on page 123.**

Make sure that a minimum #6 AWG ground wire is used.

Tag the main ground connection at the ground source to ensure that it is not accidentally disconnected.

Make sure to test the ground.

☐ **4** **Install the power supply as described in "Chapter 11– Installing the power supplies" on page 129.**

Make sure the circuit breaker on the power supply is in the OFF position.

CAUTION

Wear the anti-static wrist strap provided in the bottom of the cabinet before handling the power supplies or other circuit cards. Static electricity can damage the components of power supplies and circuit cards.

Check the option switches on the power supply to make sure that they are correctly set.

☐ **5** **Install the reserve power supply if required.**
Refer to "Chapter 16 – Installing and connecting reserve power supplies" on page 201.

Make sure that the circuit breakers on the battery unit is set to OFF.

Make sure that all power connections are correct and secure.

☐ **6** **Install a Fiber Routing Guide beneath slot 0 (Fbr Rx) as shown in Figure 49 on page 157.**

The Fiber Routing Guide is designed to be mounted in the cable connector area below the circuit cards. Secure the Guide with the existing screws below the card slot.

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable. Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

☐ **7** **Connect the fiber optic cable to the connector on the Fiber Receiver card as shown in Figure 50 on page 158.**

An A0632902 10 m fiber optic cable is used to connect the main cabinet to an expansion cabinet located within 10 m (33 ft).

A glass fiber optic cable, supplied and installed by a local facilities provider, can be used to connect an expansion cabinet located up to 3 km (1.8 mi) from the main cabinet.

Do not staple or twist fiber optic cable. Do not bend it beyond a minimum 35 mm bend radius (90° soft bend).

If using the A0632902 cable, remove the two protective plugs from the connectors on the Fiber Receiver card.
Connect the cable to the Fiber Receiver card making sure that the 'V' shaped groove on the cable connector is facing inward and that the connector is fully seated. See Figure 51 on page 159.
The mark (if equipped) on the connector should not be visible when properly connected.

If using glass fiber optic cable, remove the protective plug from one connector on the Fiber Receiver card and remove the protective cap from the corresponding plug (Tx or Rx) on the fiber optic cable.
Insert the plug in its designated connector on the Fiber Receiver card. Once inserted, lock the connector in place by turning it a half turn clockwise. See Figure 52 on page 160.
Repeat this procedure for the second fiber optic connection.

Wind the excess fiber optic cable on the cable storage device located on the component side of the Fiber Receiver card (see Figure 50 on page 158).

☐ **8** **If not already done, install the circuit cards in the expansion cabinet according to the card slot assignment plan.**
Refer to "Chapter 15 – Installing the circuit cards" on page 181.

Make sure all circuit cards are inserted in their assigned slots.

Make sure that the correct Fiber Receiver card is installed in the Fbr Rx slot (slot 0) of the new expansion cabinet.

Make sure that circuit cards equipped with option switches or plugs are properly set.

☐ **9** **Route the fiber optic cable through the Fiber Routing Guide as shown in Figure 49 on page 157.**

Be sure to wrap the cable two complete turns around the Fiber Routing Guide to allow extra cable for removing the Fiber Receiver card later.

Note: Do not staple fiber optic cable or bend it beyond a minimum 35 mm bend radius (90° soft bend).

☐ **10** **Install or expand the cross-connect terminal to accommodate the new expansion cabinet. Refer to "Chapter 13 – Installing and connecting cross-connect terminal to cabinets" on page 167.**

Install the cross-connect terminal as shown on the equipment layout plan.

Assign terminal blocks for the power fail transfer units as well as the AUX cable.

Allow space to connect up to ten NE-A25B cables for each cabinet.

Allow for additional cables at the cross-connect terminal if any slots are left vacant in preparation for future expansion.

Note: Each slot equipped with a line or trunk card requires an NE-A25B cable. The connectors J1 through J10 correspond to slot numbers in each cabinet.

Don't forget to attach designations to the terminal blocks to identify the cables.

☐ **11** **Install the cables from the cabinets to the cross-connect terminal. Refer to "Chapter 13 – Installing and connecting cross-connect terminal to cabinets" on page 167**

Tag the cables for easy identification.

Install the cables neatly.

There should be one NE-A25B cable for each slot in the cabinet that is equipped with a line or trunk card.

Connect and terminate the AUX cable.

☐ **12** **Install the power fail transfer units (PFTUs) if provided. Refer to "Chapter 14 – Installing power fail transfer units" on page 175.**

Install the PFTU as per the equipment layout plan.

Install the cables from the PFTU to the cross-connect terminal.

Don't forget to install the power and control connections from the PFTU to the AUX cable.

☐ **13** **If required, connect the SDI cable for the Fiber Receiver card. Refer to "Chapter 17 – Installing and connecting SDI and ethernet ports" on page 215.**

Make sure the baud rate and device option settings are properly set.

If the equipment operates in DTE mode, make sure that the A0601397 Modem eliminator is installed.

Connect communication equipment such as TTY terminals and modems to the SDI cables.

☐ **14** **Reinstall the drip tray at the bottom of the cabinet.**

☐ **15** **Power up the new expansion cabinet.**

Check all connections and make sure that the circuit cards are properly installed.

Connect the power line cords.

Set the breakers on the power supplies in the cabinet and reserve power supply (if provided) to ON.

Make sure that the circuit breakers in each cabinet are set to ON.

The following Steps 16 through 27 are performed at the main cabinet.

Note: Perform the following steps only if the Fiber Expansion Daughterboard was not previously installed and connected to the fiber optic cable at the main cabinet. The following steps apply only when adding an expansion cabinet to an existing working system.

☐ **16** **Remove the cover from the main cabinet and remove the drip tray at the bottom of the cabinet.**

☐ **17** **If a Fiber or Cable Routing Guide was not previously installed in the main cabinet, install one beneath slot 0 (SSC) as shown in Figure 49 on page 157.**

Note: A Fiber Routing Guide can accommodate a maximum of four fibre optic cables. The Cable Routing guide shown in Figure 49 on page 157 is required to support three or four expansion cabinets. It is supplied as standard with new systems using X11 Rlse 24 or later software. It is also compatible with systems when one or two expansion cabinets are being used and in expansion cabinets.

The Routing Guide is designed to be mounted in the cable connector area below the circuit cards as shown in Figure 49 on page 157. Secure the Cable Routing Guide with the existing screws below the card slot.

CAUTION

The following steps (Steps 18 through 25) in this procedure will interrupt service on the entire Option 11C system for approximately 20 minutes.

☐ **18** **Set the circuit breaker on the power supply in the main cabinet to OFF.**

☐ **19** **Unseat the NTDK20 Small System Controller (SSC) card. If the existing NTDK20 SSC is being replaced with an NTDK20CA or later version SSC, remove the existing Software Daughterboard and security device and install on the replacement NTDK20 SSC.**

☐ **20** **If not previously installed, install a Fiber Expansion daughterboard on the SSC card as described in "Chapter 15 – Installing the circuit cards" on page 181.**

Note: Dual Port Expansion daughterboards can only be used in systems equipped with an NTDK20CA or later version of SSC and X11 Rlse 24 or later software.

Expansion cabinet numbers are assigned by the system as follows:

- Expansion cabinets 1 and 3 are assigned to the connector labeled 'Fiber 1' (the upper connector).
- Expansion cabinets 2 and 4 are assigned to the connector labeled 'Fiber 2' (the lower connector).

Refer to Figure 53 on page 161 and Figure 54 on page 162 for location of connectors.

If the existing NTDK20CA or later version of SSC card is presently equipped with a Single Port Fiber Expansion daughterboard which is being replaced with a Dual Port Expansion daughterboard:

- Disconnect the fiber optic cable from the Single Port daughterboard.
- Replace the daughterboard with a Dual Port daughterboard.
- Reconnect the fiber optic cable as described in Step 21 on page 155.

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable. Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

☐ **21** **Connect the fiber optic cable to the Fiber Expansion Daughterboard on the NTDK20 SSC card as shown in Figure 54 on page 162 and Figure 55 on page 163.**

If using the A0632902 cable, remove the two protective plugs from the connectors on the Fiber Expansion Daughterboard.
Connect the cable to the Fiber Expansion Daughterboard making sure that the 'V' shaped groove on the cable connector is facing outward and that the connector is fully seated. The mark (if equipped) on the connector should not be visible when properly connected. See Figure 56 on page 164.

If using glass fiber optic cable, remove the protective plug from one connector on the Fiber Expansion Daughterboard and remove the protective cap from the corresponding plug (Tx or Rx) on the glass fiber optic cable.
Insert the plug in its designated connector on the daughterboard. Once inserted, lock the connector in place by turning it a half turn clockwise. See Figure 57 on page 165.

☐ **22** **Perform this step only if the SSC is an NTDK20CA or later version. Route the cable through the routing guide on the SSC.**

☐ **23** **Insert the NTDK20 SSC card in the CPU slot (slot SSC) of the main cabinet.**

☐ **24** **Route the fiber optic cable through the Cable Routing Guide in the main cabinet.**

Be sure to wrap the cable two complete turns around the Cable Routing Guide to allow extra cable for removing the SSC card later.

☐ **25** **Set circuit breaker on the power supply in the main cabinet to ON.**

The Option 11C system will reload (SYSLOAD) and service will be restored.

Check the fiber related LEDs on the SSC card.

- The LED for the equipped Expansion Daughterboard should be **green**.
- If it is **red** (disabled indication);
  Load overlay program 135 and enter ENL FL1 to enable expansion cabinet 1 (or ENL FL2 for expansion cabinet 2, ENL FL3 for expansion cabinet 2, ENL FL4 for expansion cabinet 4).
- If the LED is **yellow** (fault indication):
  Check all fiber optic cable to make sure that it is properly connected and not damaged.

Check system time and date using LD 2. Reset if required.

☐ **26** **Reinstall the drip tray on bottom of cabinet.**

☐ **27** **Reinstall cover on main cabinet.**

End of Procedure

Figure 49
Cable Routing Guide

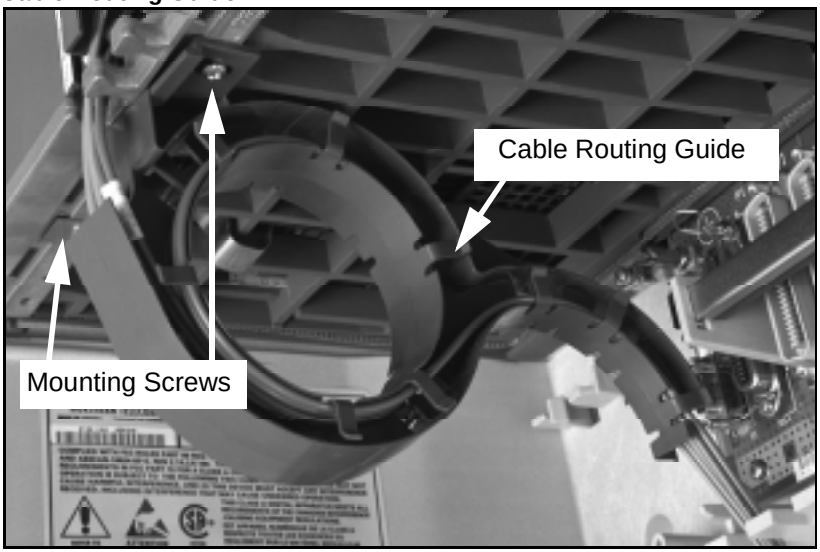


Figure 50
Fiber optic cable (A0632902 shown) connector on Fiber Receiver card

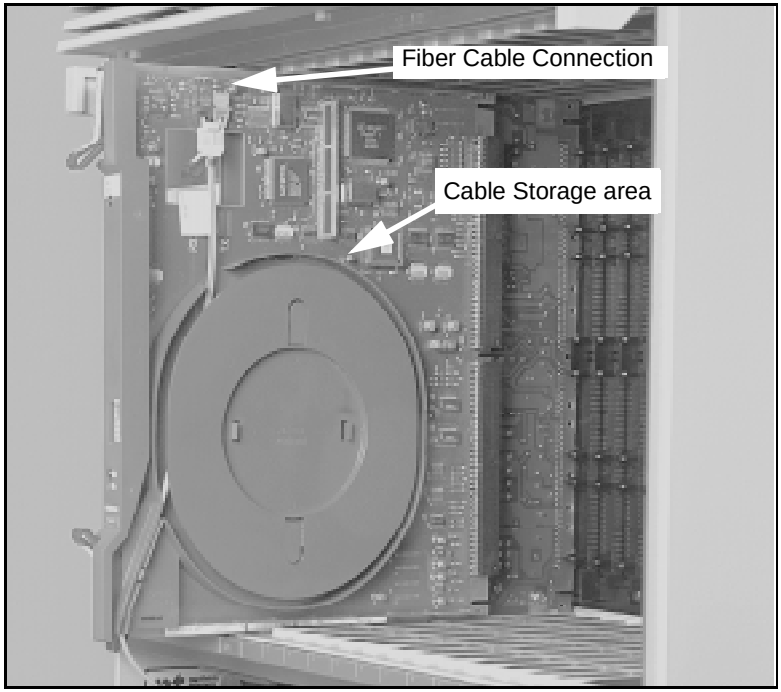


Figure 51
Plastic fiber optic cable connection

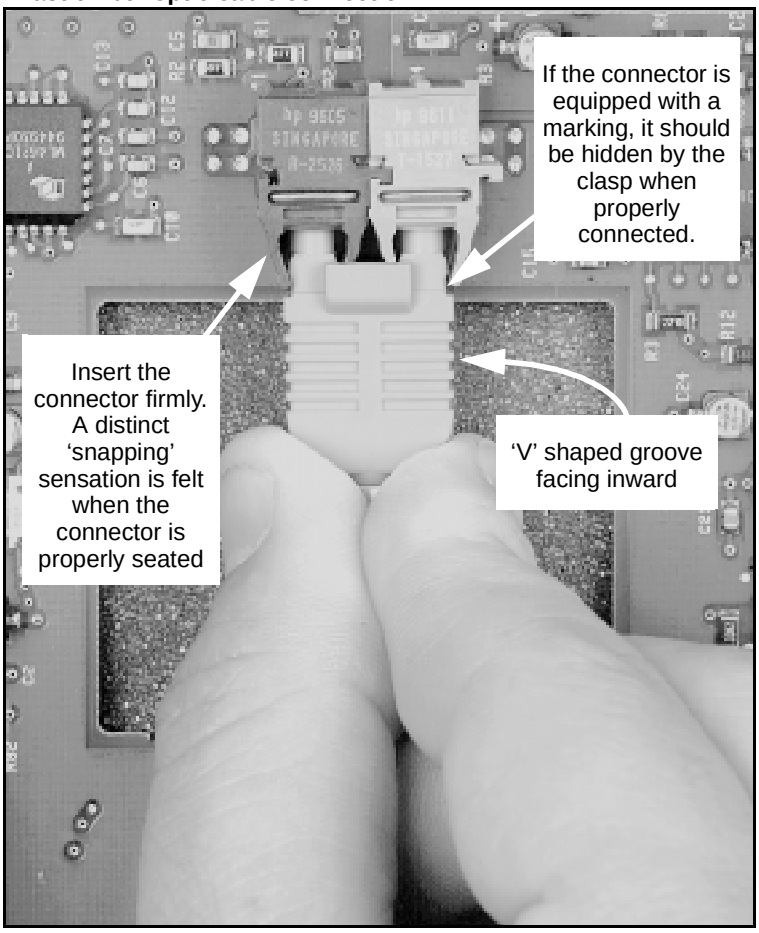


Figure 52
Glass fiber optic cable connection

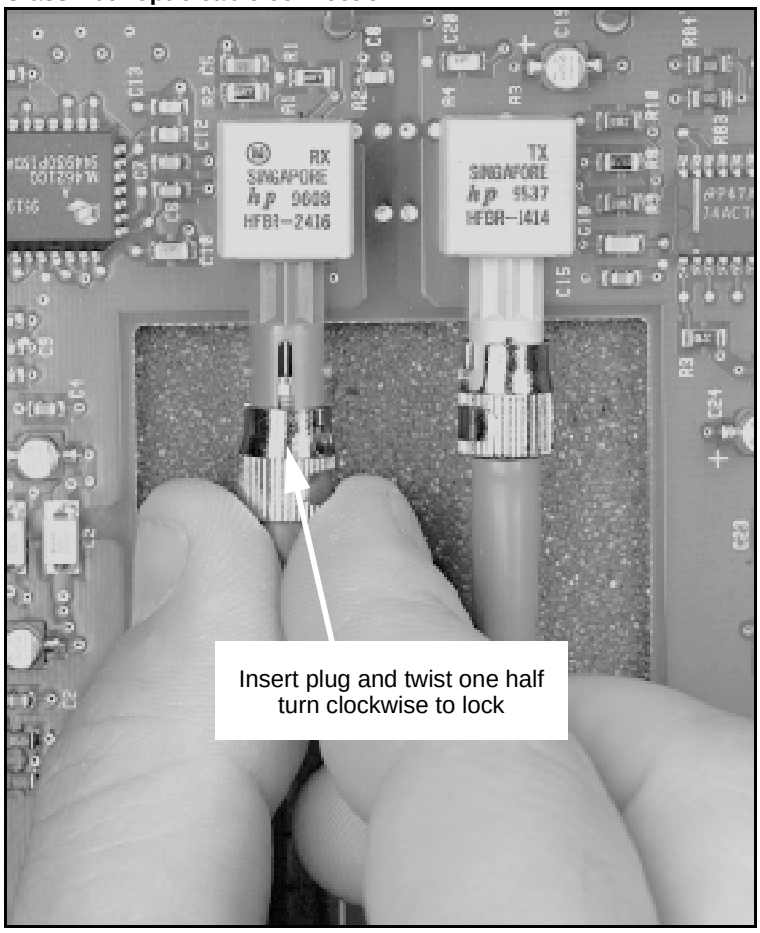


Figure 53
Fiber Expansion Daughter boards on the NTDK20 SSC card

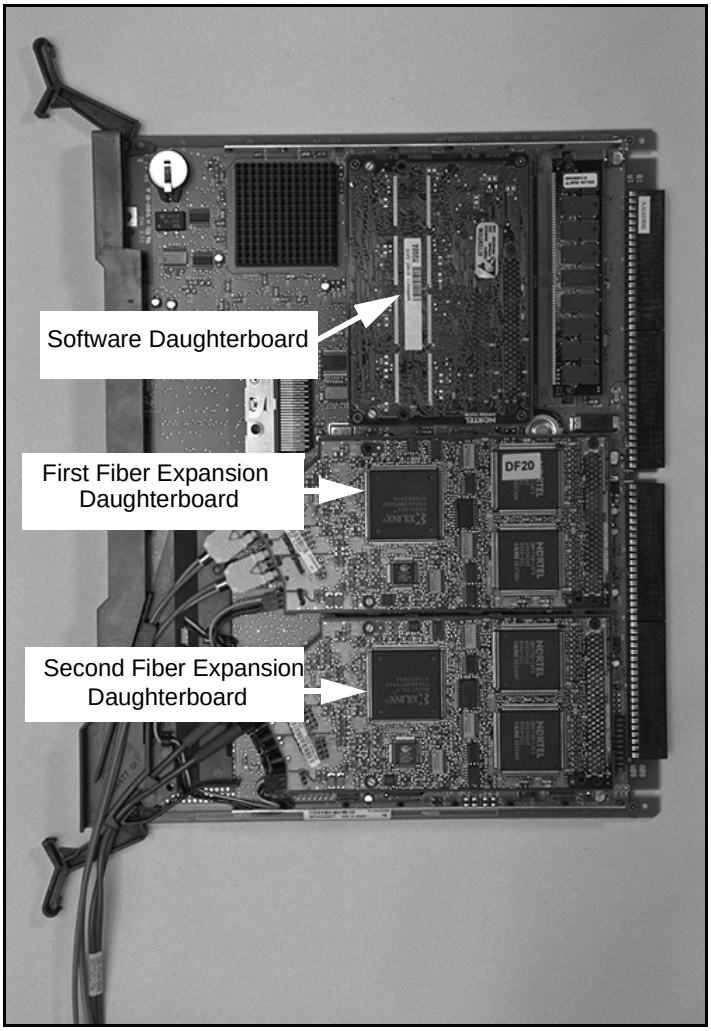


Figure 54
Cabinet assignments on Dual Port Daughterboards (both types of daughterboards are shown)

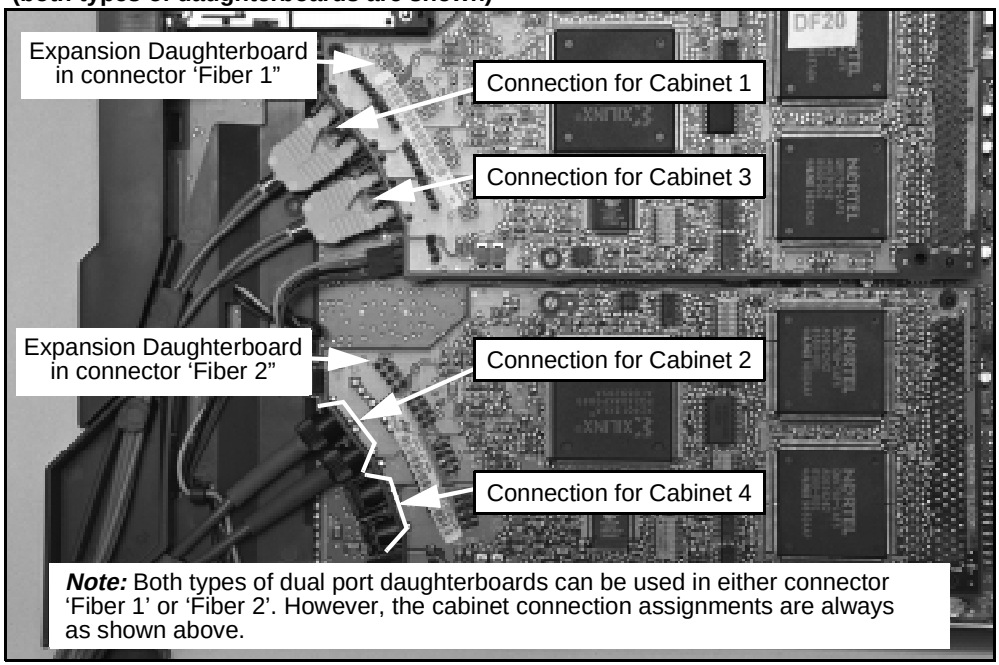


Figure 55
Fiber Optic Cable Connections

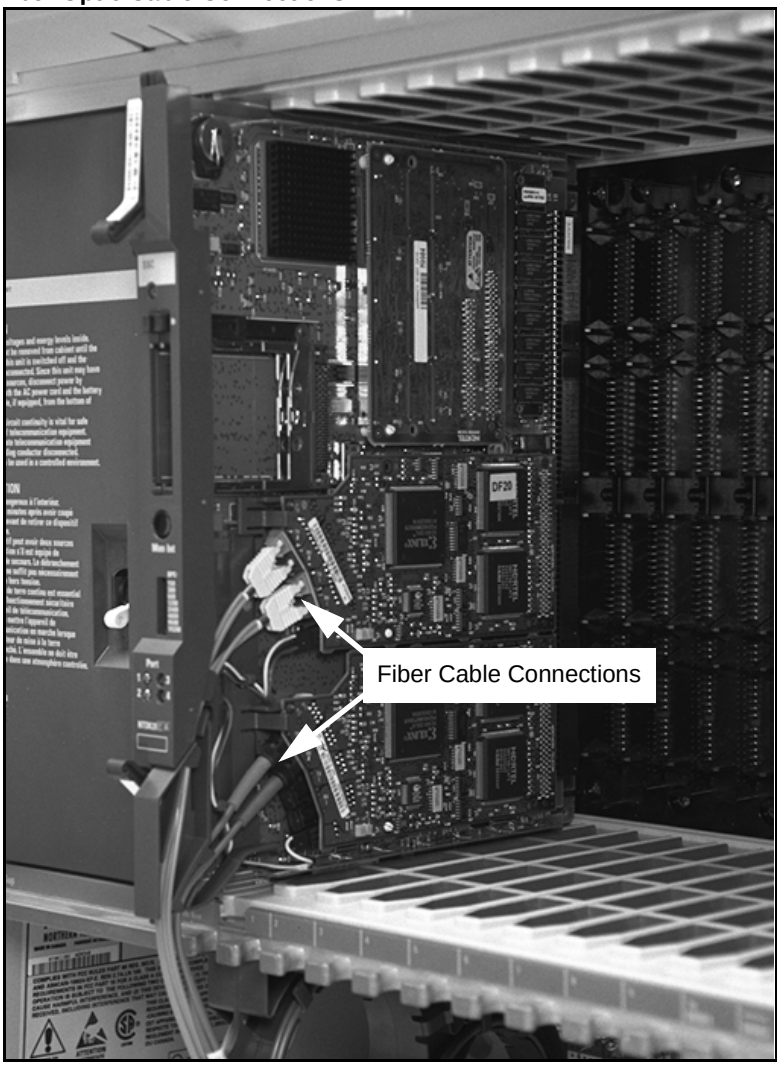


Figure 56
Plastic Fiber Optic Cable Connection

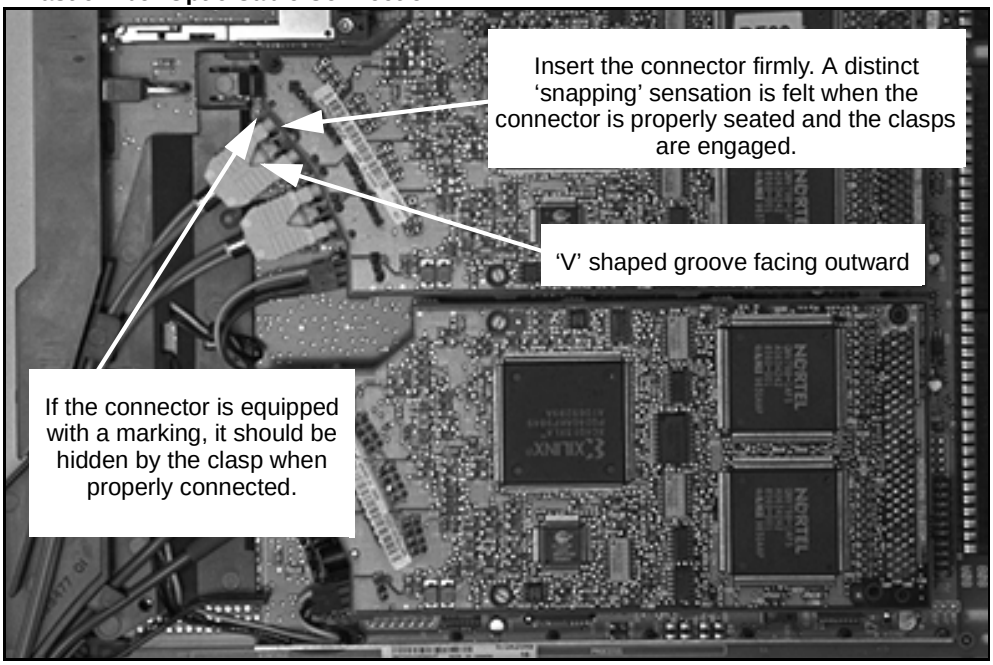
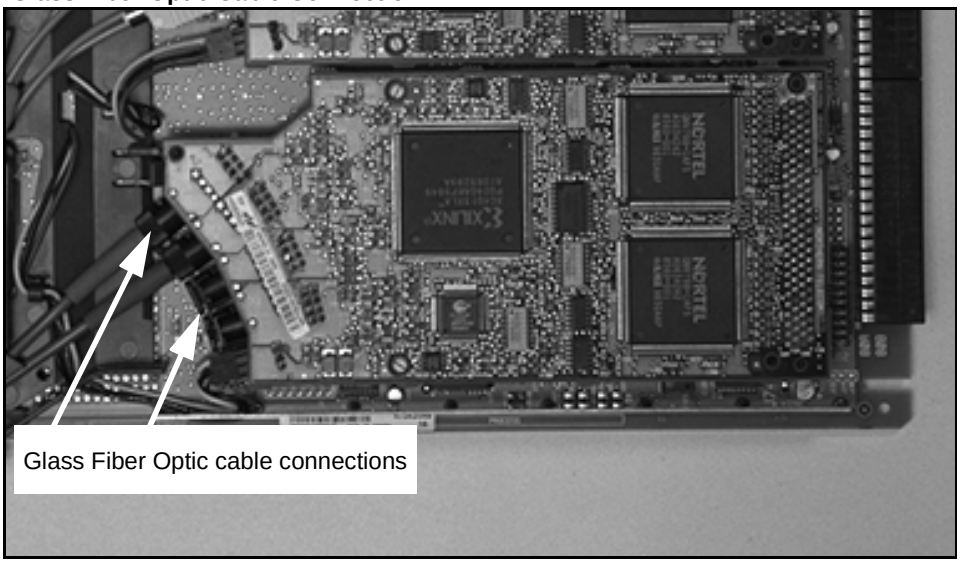


Figure 57
Glass Fiber Optic Cable Connection



Chapter 13 – Installing and connecting cross-connect terminal to cabinets

General information

This chapter describes how to install and connect a typical cross-connect terminal to an Option 11C system, using the BIX cross-connect system. Although the use of the BIX system is not mandatory, it is the recommended choice.

Information about the BIX cross-connect system is found in the following publications:

- *BIX In-Building Cross-Connect System Material Description* (NTP 631-4511-100)
- *BIX In-Building Cross-Connect System Planning* (NTP 631-4511-150)
- *BIX In-Building Cross-Connect System Material Installation and Servicing* (NTP 631-4511-200)

Information about 1.5 Mb and 2.0 Mb DTI/PRI related wiring and cables can be found in the Option 11C *1.5Mb DTI/PRI Administration and Maintenance Guide*, 553-3011-310 and in the Option 11C *2.0Mb DTI/PRI Administration and Maintenance Guide*, 553-3011-315.

This chapter contains the following procedures:

- Procedure 9 “Installing the cross-connect terminal” on page 169
- Procedure 10 “Connecting the cables” on page 172

Terminal block requirements

The cross-connect terminal requires sufficient connecting blocks to terminate the following wires:

- for the NTAK09 circuit card, use the NTBK04 cable
- up to ten 25-pair cables from each cabinet.
  - — Each slot that is equipped with a trunk or line circuit card requires a cable.
    - – The connectors J1 through J10 correspond to slot numbers 1 through 10 in the main cabinet.
    - – Connectors J1 through J10 correspond to slot numbers 11 through 20 in the first expansion cabinet.
    - – Connectors J1 through J10 correspond to slot numbers 21 through 30 in the second expansion cabinet.
    - – Connectors J1 through J10 correspond to slot numbers 31 through 40 in the third expansion cabinet.
    - – Connectors J1 through J10 correspond to slot numbers 41 through 50 in the fourth expansion cabinet.
    - – Allow for additional cables at the cross-connect terminal if any of the ten slots in each cabinet are initially left vacant.
  - — If the NTAK19EC 2-port SDI cable or NTAK19FB 4-port SDI cable are not used with the NTAK03 or NTAK02 cards, then a 25-pair cable is required for each of these cards.
- nine conductors comprising the AUX cable from each cabinet.
- one 25-pair cable from each QUA6 PFTU.
- wiring from telephones and trunks.

WARNING

Always use caution when installing or modifying telephone lines. Avoid installing telephone wiring during a lightning storm. Never touch uninsulated telephone wiring unless the line has been disconnected at the network interface.

Installing the cross-connect terminal

Procedure 9 describes how to install the cross-connect terminal.

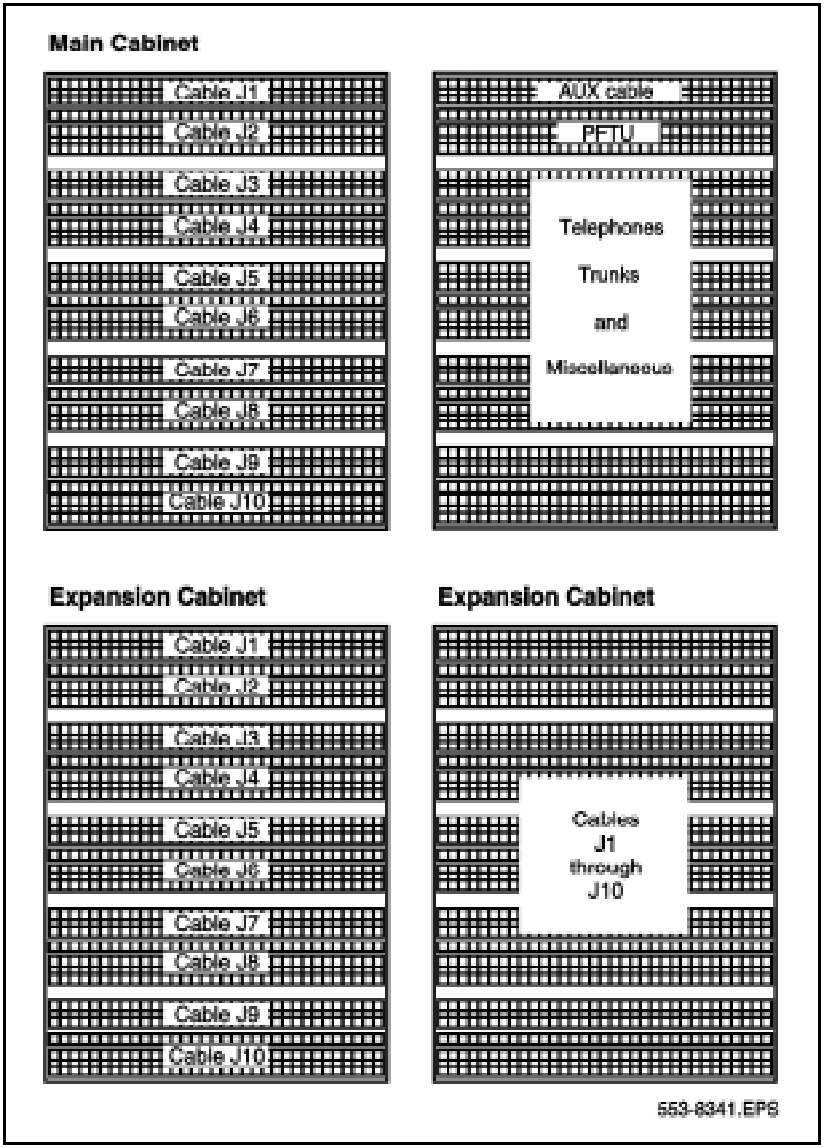
Procedure 9
Installing the cross-connect terminal

1 Consult the equipment layout plan to determine where the cross-connect terminal should be located.

2 Install the terminal blocks in a layout similar to that shown in Figure 58 on page 170.

If installing the BIX system, refer to *BIX Installation and Servicing* (NTP 631-4511-200).

Figure 58
Typical BIX cross-connect terminal layout



3 Attach labels on the cross-connect terminal to indicate the terminal blocks assigned to:

- 25-pair cables from the cabinets
- AUX wiring
- power fail transfer units (PFTU)
- telephones and consoles
- trunks
- other miscellaneous equipment.

Note: If installing the BIX cross-connect system, refer to *BIX Installation and Servicing* (NTP 631-4511-200) for information about labels used with these terminal blocks.

End of Procedure

WARNING

Always use caution when installing or modifying telephone lines. Avoid installing telephone wiring during a lightning storm. Never touch uninsulated telephone wiring unless the line has been disconnected at the network interface.

Connecting the cables

Each Option 11C system cabinet requires up to ten 25-pair cables. Each cabinet requires an additional terminal block at the cross-connect terminal for the termination of the 9-pin conductor auxiliary cable.

All cables are connected at the bottom of the cabinet and are routed through the openings in the lower part of the cabinet.

Note: Care must be taken when using NE-A25B cables with the NTAK02, and NTAK03 cards, as these cables are not wired out to station equipment or trunk circuits. Refer to Option 11C *1.5Mb DTI/PRI Administration and Maintenance Guide*, 553-3011-310, and Option 11C *2.0Mb DTI/PRI Administration and Maintenance Guide*, 553-3011-315, for 1.5 Mb and 2.0 Mb DTI/PRI related wiring and cables.

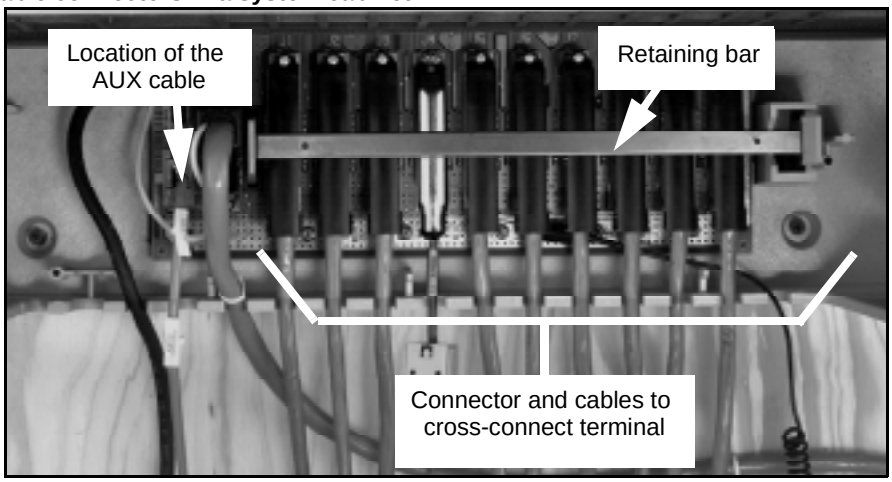
Procedure 10
Connecting the cables

1 **Remove the connector retaining bar from the connector panel in the lower part of each cabinet. See Figure 59 on page 172.**

2 **Using the card slot allocation plan, connect a 25-pair cable to each of the connectors that will contain a line or trunk card.**

Make sure to tag both ends of each cable with the cabinet and connector numbers.

Figure 59
Cable connectors in a system cabinet



3 **Route the cables down through the opening at the bottom of each cabinet.**

4 **Replace the retaining bar when you have connected all the cables to the cabinet.**

5 **Terminate all the 25-pair cables installed at the cross-connect terminal.**

Label all the cables at the cross-connect terminal blocks according to the card slot allocation plan.

6 Install the AUX cable on the lower 9-pin connector located on the left side of the connector area in the lower part of each cabinet (Refer to Figure 59 on page 172).

Terminate the AUX cable at the cross connector located on the left side of the connector according to the following table.

Color	Wire number	Designation	Connection
W-BL	1	BRTN	to QUA6-J1 1R
BL-W	2	BRTN	to QUA6-J1 2R
O-W	3	-48V AUX (250mA)	to QUA6-J1 25T, 25R
W-O	4	PFTS	to QUA6-J1 2T
G-W	5	-15V AUX	Console power*
W-G	6	+15V AUX	Console power*
* Each AUX cable can provide power for only one console.			

End of Procedure

Chapter 14 – Installing power fail transfer units

General information

Procedure 11 on page 176 of this chapter describes how to install a QUA6 Power Fail Transfer Unit (PFTU).

PFTUs can be connected to the expansion cabinets as well as to the main cabinet.

> ***Note:*** The QUA6 Power Fail Transfer Unit operates with loop-start and ground-start CO trunks. However, with ground-start trunks the associated telephone set must be equipped with a ground-start button.

If Power Fail Backup is required as a fail safe for this system, use analog trunks since digital trunks are not supported by a PFTU.

Installing the PFTU

Consult the equipment layout plan to determine where the PFTU should be located.

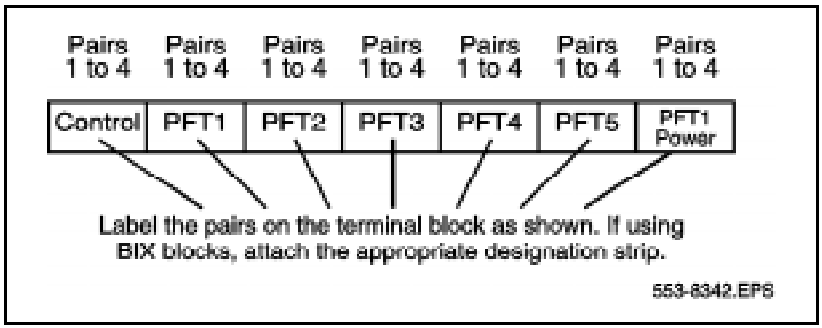
Procedure 11
Installing the PFTU

1 **Mount the PFTU on the wall near the system cross-connect terminal and secure it with four screws.**

2 **Install an NE-A25B-type 25-pair cable from connector J1 on the faceplate of the PFTU to its assigned location at the cross-connect terminal.**

3 **Label the pairs of the J1 cable on the cross-connect terminal block as shown in Figure 60 on page 176.**

Figure 60
J1 cable labeling



4 **Connect the PFTU power and control connections to the AUX cable (see Figure 61 on page 177) from the cabinet (Refer to Table 17, "Control and power connections on cable J1," on page 178).**

Figure 61
Auxiliary port location

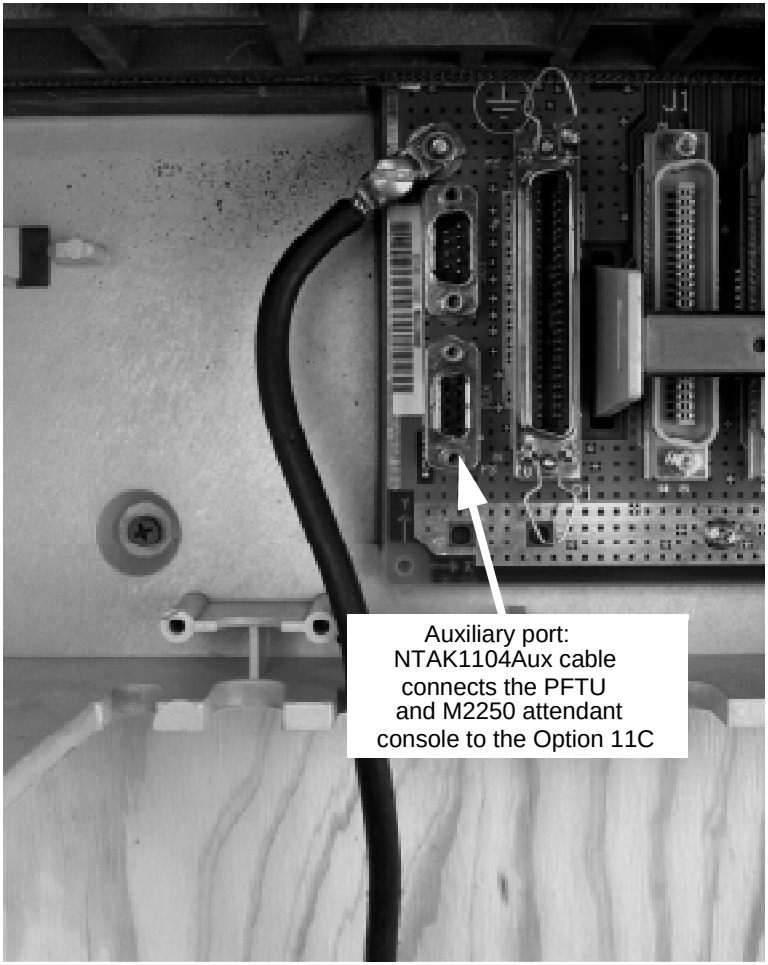


Table 17
Control and power connections on cable J1

J1 Cable from QUA6 (see Figure 62 on page 179)				
Function	**Pair Number**	**Pair Color**	**Connects to**	**Cross-connect to**
Control	1T	W-BL	(ALM)	Not used.
	1R	BL-W	BRTN	W-BL 1-dot connection on AUX cable from the cabinet
	2T	W-O	PFTS	W-O 1-dot connection on AUX cable from the cabinet. Transfer initiated by applying ground to this lead.
	2R	O-W	BRTN	BL-W 1-dot connection on AUX cable from the cabinet
	3T	W-G	(TC)	Console transfer switch. See console connections. Transfer initiated by applying ground to this lead.
	3R	G-W		Not used.
	4T	W-BR		Not used.
	4R	BR-W		Not used.
PFTU Power	25T 25R	S-V V-S	-48 V -48 V	O-W 1-dot connection on AUX cable. Maximum 250 mA draw on O-W lead.

5 Connect the attendant console to the PFTU:

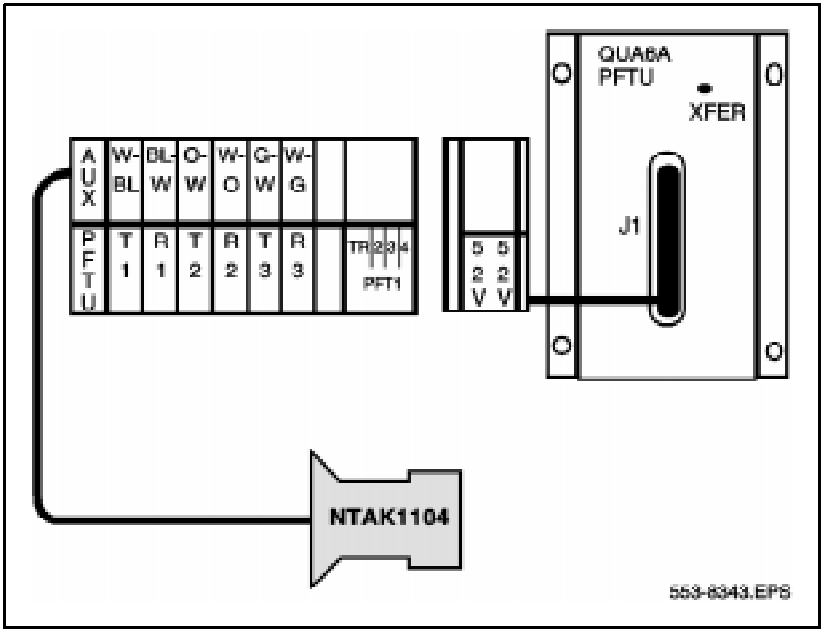
- attendant console 14 Tip (14T) to ground
- 3 Tip (3T) of PFTU to 11 Ring (11R) of attendant console (power fail transfer switch)
- attendant console 11 Tip (11T) to ground.

If power to the M2250 attendant console is not provided by two Digital Line card TNs, connect;

- G-W of AUX to 8 Tip (8T) of attendant console (-15 volts),
- W-G of AUX to 7 Tip (7T) of attendant console (+15 volts).

End of Procedure

Figure 62
Power Fail Transfer



PFTU control lead signals

To connect PFTUs from other manufacturers, use the information provided in the following table:

Table 18
PFTU control lead signals

NTAK1104 Aux. Cable Lead	Lead State when PFTU in Non-Transferred State	Lead State when PFTU in Transferred State
BRTN	GROUND	GROUND
BRTN	GROUND	GROUND
-48V AUX	-48V DC (250 mA max.)	-48V DC (250 mA max.)
PFTS	OPEN	GROUND

Note 1: Refer to Figure 61 on page 177 for an illustration of where the Auxiliary cable connects to the Option 11C system.

Note 2: If power is removed from the QUA6, a transfer of the PFTU may also be invoked.

Chapter 15 – Installing the circuit cards

General information

This chapter describes how and where to install the various circuit cards used in the system.

Some circuit cards are equipped with option switches, plugs and daughterboards.

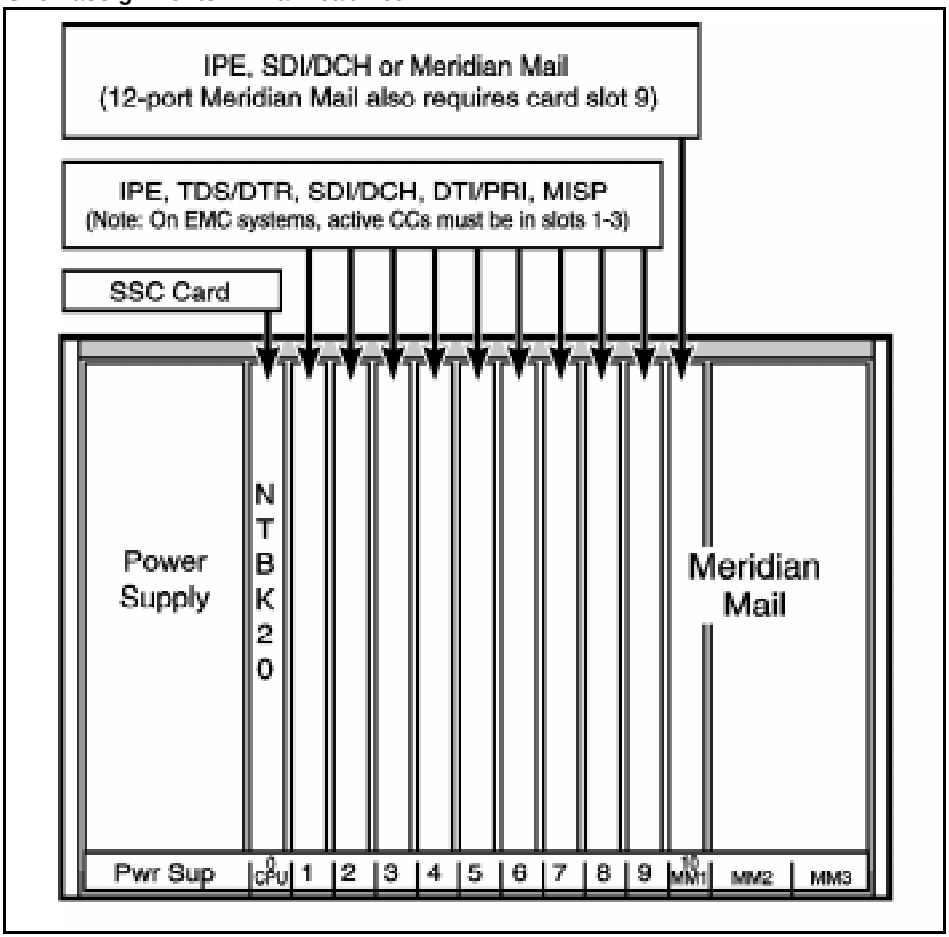
Always handle circuit cards with care to avoid damaging them due to static electricity. Always store unused circuit cards in an anti-static bag or the original packaging.

CAUTION

An anti-static wrist strap, provided in the bottom of the cabinet, must be worn when handling circuit cards. Static electricity can damage the components of circuit cards.

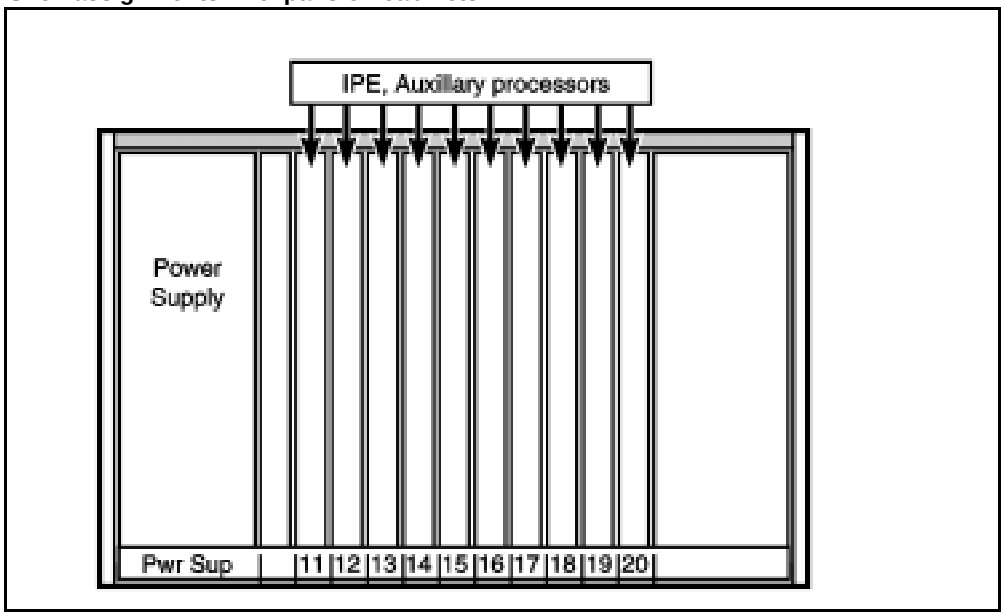
The Figure 63 on page 182 and Figure 64 on page 183 show the shelf assignments for the circuit cards in the main and expansion cabinets.

Figure 63
Shelf assignments — main cabinet



Note: DTI/PRI and TDS/DTR circuit cards must reside in the main cabinet, slots 1 to 9. The Meridian Mail option, if it is to be equipped, requires slot 10 in the main cabinet.

Figure 64
Shelf assignments — expansion cabinets



Circuit cards

A circuit card displaying a symbol of a switch on its faceplate is equipped with option switches or strapping plugs or both. Other circuit cards, such as the NTDK20 Small System Controller (SSC) card, are capable of mounting daughterboards and other add-on devices.

The following circuit cards are commonly used in the Option 11C system. A complete list of circuit cards requiring settings can be found in the *Circuit Card Installation and Testing* document, NTP *553-3001-211*.

NTDK20 Small System Controller (SSC) card

SSC card, Boot Code and Software Daughterboard compatibility

If the Software Daughterboard is an NTDK21, there are no compatibility issues and the installation can proceed.

Examine the Software Daughterboard being installed. If it is an NTDK81 Daughterboard, the Boot Code version on the NTDK20 SSC card must be REL 09 or higher.

The Boot Code will be REL 09 if:

- The Rlse number on the faceplate of the NTDK20 SSC is at least Rlse 11.

  or

- The Boot Code on the SSC has previously been updated to REL 09. Example: An NTDK20 SSC from a Spares Stock is being installed. The Boot Code may have previously been updated to REL 09 to make it compatible with both types of Software Daughterboards.

  Note: If the Boot Code is not REL 09 or higher the installation cannot proceed. An NTDK20 SSC Rlse 11 should be procured, or the Boot Code should be updated on the existing SSC (on an operational Option 11C system) as described in the Option 11C *Upgrades Procedures guide*, 'Using the Flash Boot ROM Utility'.

It should also be noted that X11 Rlse 23.30 or later software is required to use the NTDK81 Software Daughterboard. Software provided on the NTDK81 Software Daughterboard is Rlse 23.30 or later; only if software to be installed from a PCMCIA card will it be necessary to check the software release.

Expansion Daughterboards

Single port Fiber Expansion daughterboards can be installed on all versions of NTDK20 SSC.

Dual port Expansion daughterboards can be installed only on NTDK20CA and later versions of the SSC.

Procedure 12
NTDK20 SSC installation

Note: Read the information under the heading "SSC card, Boot Code and Software Daughterboard compatibility" on page 184 before starting this procedure.

1 Install the Software Daughterboard and the Security Device on the NTDK20 SSC Card as shown in Figure 65 on page 187.

CAUTION
The NTDK20 SSC card is equipped with components on both sides of the circuit board. Be careful not to damage any of the components when handling the card.

To install the Software Daughterboard and Security Device:

- Put on the anti-static wrist strap and insert the Software Daughterboard in the connector on the component side of the SSC card.
- Install any required Expansion Daughterboards.
- Insert the Security Device in the socket on the component side of the SSC card.

2 Make sure that the option plug is:

- **in place,** if the system is equipped with ethernet capability
- **removed,** if there is no ethernet Small System Controller (SSC), which is typically an upgraded Option 11 or Option 11E with an expansion cabinet connected with copper cable (no fiber optic cable).

3 If required, install a Fiber Expansion daughterboard on the SSC card for each expansion cabinet. If you are connecting three or four expansion cabinets, you will need to install one or two dual Fiber Expansion daughterboard(s).

Connect the Fiber Expansion Daughterboard to the connector labeled 'Fiber 1' for the first expansion cabinet, and to connector 'Fiber 2' if for the second expansion cabinet, and so on for each of the expansion cabinets.

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable. Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

4 Connect the fiber optic cable to the Fiber Expansion Daughterboard on the NTDK20 SSC card as shown in Figure 65 on page 187, Figure 66 on page 188 and Figure 67 on page 189.

If using the A0632902 cable, remove the two protective plugs from the connectors on the Fiber Expansion Daughterboard.
Connect the cable to the Fiber Expansion Daughterboard making sure that the 'V' shaped groove on the cable connector is facing outward and that the connector is fully seated. The black mark on the connector should not be visible when properly connected.

If using glass fiber optic cable, remove the protective plug from one connector on the Fiber Expansion Daughterboard and remove the protective cap from the corresponding plug (Tx or Rx) on the glass fiber optic cable.
Insert the plug in its designated connector on the daughterboard. Once inserted, lock the connector in place by turning it a half turn clockwise.

5 Insert the NTDK20 SSC card in the CPU slot (slot SSC) of the main cabinet.

End of Procedure

Figure 65
Fiber Expansion Daughterboards on the NTDK20 SSC card

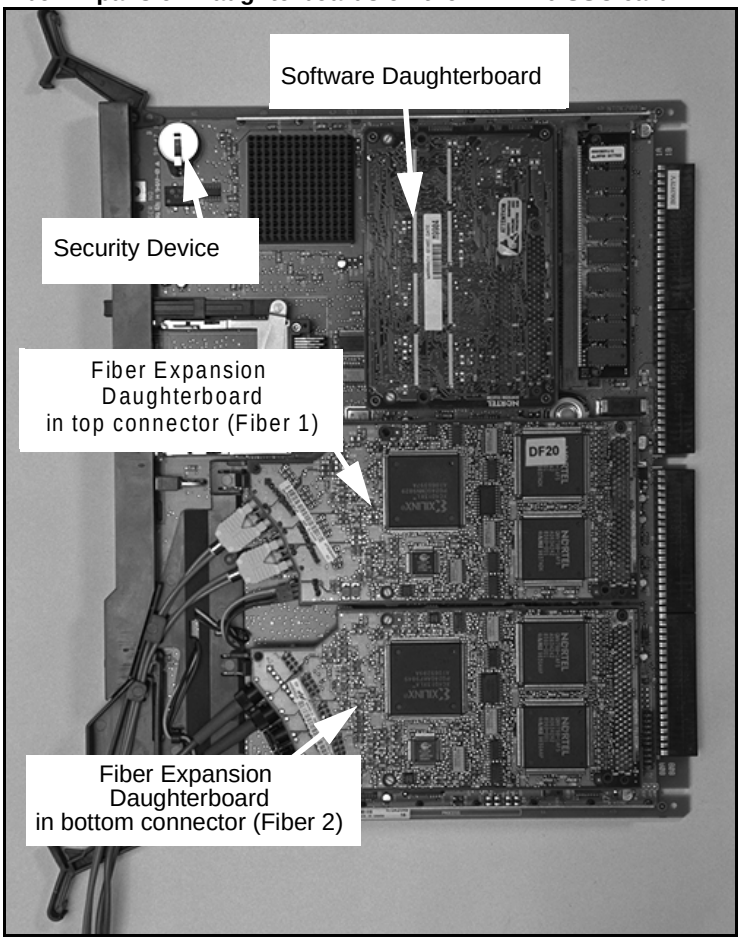


Figure 66
Fiber Optic Cable Connection

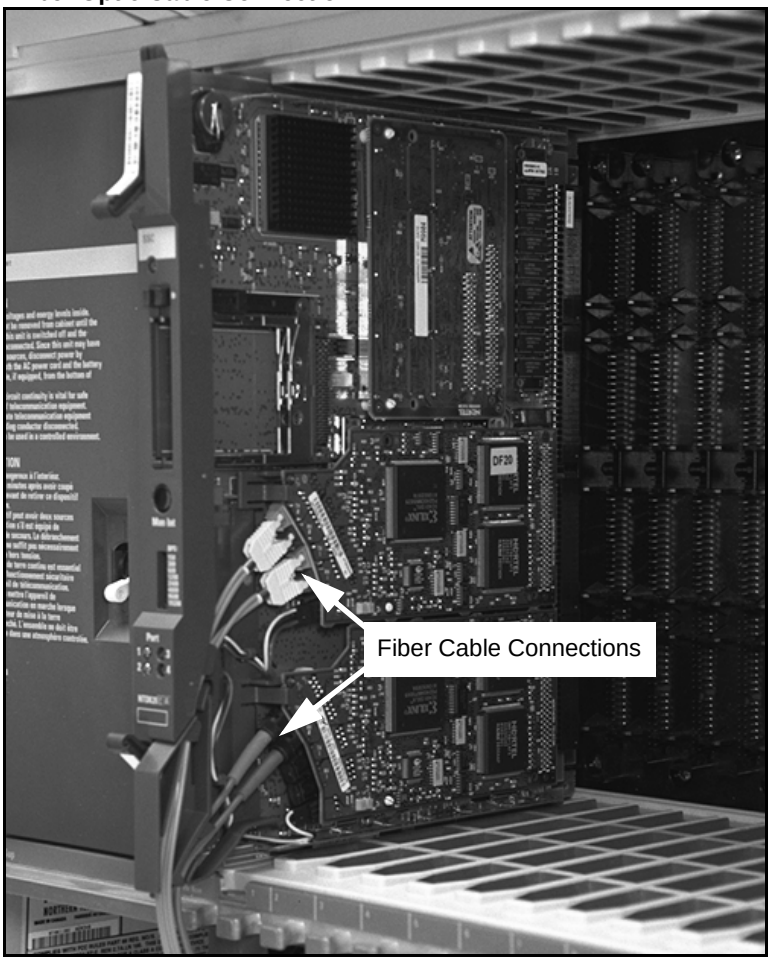
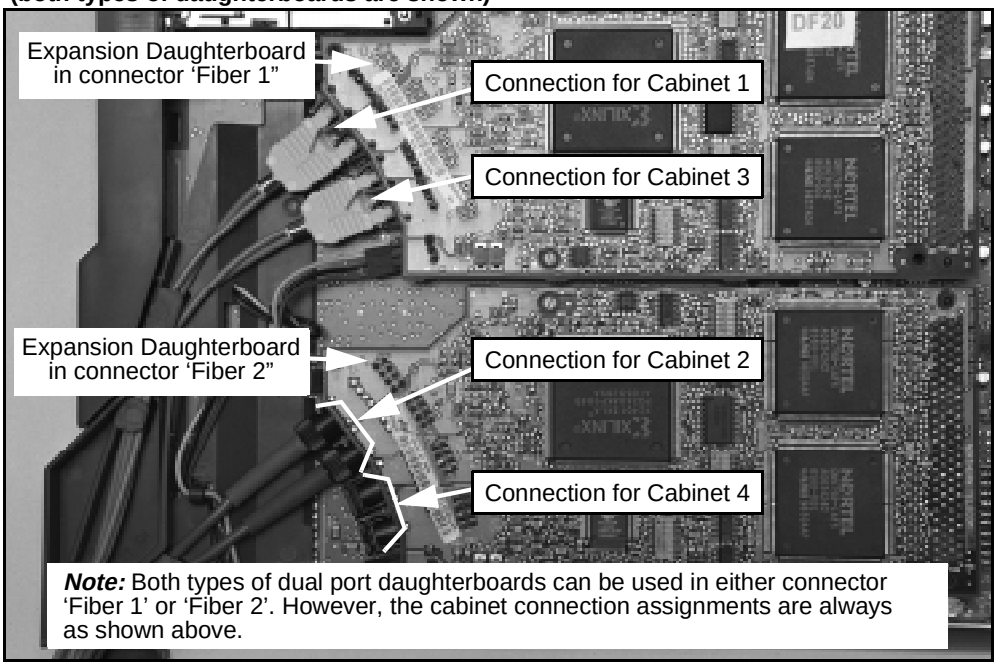


Figure 67
Cabinet assignments on Dual Port Daughterboards
(both types of daughterboards are shown)



NTAK02 SDI/DCH card

Before inserting the NTAK02 SDI/DCH card into its slot, you must set the switches and attach the jumper plugs.

Note: This circuit card can only be installed in the main cabinet.

The NTAK02 SDI/DCH switches allow you to configure the four SDI ports as a combination of the following:

- SDI
- ESDI

OR

- DCH/DPNSS.

The NTAK02 SDI/DCH card uses jumper plugs to configure the RS232/RS422 interfaces as:

- DTE

OR

- DCE.

Procedure 13
NTAK02 circuit card installation

1 Set the switches and jumper plugs for the NTAK02 SDI/DCH card according to the following tables.

Table 19
Switch settings

Port 0	Port 1	SW 1-1	SW 1-2
SDI	DCH	OFF	OFF
SDI	DPNSS	OFF	ON
—	ESDI	ON	ON

Table 20
Switch settings (continued)

Port 2	Port 3	SW 1-3	SW 1-4
SDI	DCH	OFF	OFF
SDI	DPNSS	OFF	ON
—	ESDI	ON	ON

Table 21
Jumper settings

Port	Jumper location	Strap for DTE	Strap for DCE	Jumper location	RS422	RS232
Port 0	J10	C - B	B - A			
Port 1	J7 J6	C - B C - B	B - A B - A	J9 J8	C - B C - B	B - A B - A
Port 2	J5	C - B	B - A			
Port 3	J4 J3	C - B C - B	B - A B - A	J2 J1	C - B C - B	B - A B - A

2 Insert the card in its assigned slot.

The NTAK02 SDI/DCH card may be installed in card slots 1 through 10.

3 Connect an NTAK19FB four port cable (or an NE-A25-B cable) from the corresponding connector at the bottom of the cabinet. If using an NE-A25-B cable, terminate it at the cross-connect terminal (since the NTAK19FB cable is equipped with connectors, it does not require termination at the cross-connect terminal).

End of Procedure

NTAK03 TDS/DTR card

The function of the NTAK03 TDS/DTR card is provided on the NTDK20 SSC card. However, the TDS/DTR card can co-exist with the SSC card if you wish to access extra TDS/DTR units or SDI ports. These functions must be manually programmed in the software overlays.

Note: The system may not operate properly if an NTAK03 circuit card is installed in a slot connected to telephones. Refer to Chapter 11 *Installing and connecting SDI ports to terminals and modems* to connect an NTAK03 circuit card to the cross-connect terminal.

Procedure 14
NTAK03 card installation

1 **Insert the card in its assigned slot.**

The NTAK03 TDS/DTR card may be inserted into any of the card slots 1 through 9.

2 **Connect an NTAK19EC cable (or an NE-A25-B cable) from the corresponding connector at the bottom of the cabinet. If you are using an NE-A25-B cable, terminate it at the cross-connect terminal (since the NTAK19EC cable is equipped with connectors, it does not require termination at the cross-connect terminal).**

———————— ***End of Procedure*** ————————

NT8D14 Universal Trunk card

The universal trunk card provides eight analog trunks which can function in the modes shown in the following table.

This line card can be installed in slots 1 through 10 in the main cabinet or 11 through 30 in the expansion cabinets.

Procedure 15
Universal Trunk card installation

1 Set the jumpers for the NT8D14 Universal Trunk circuit card according to the following table.

Table 22
NT8D14 Universal trunk — modes and option settings

Modes	Location	Jumper strap
Central (CO)	J1, J2	OFF
2-way tie trunk (loop Dial Repeat)	J1, J2	OFF
2-way tie trunk (Outgoing Incoming Dial)	J1, J2	OFF
Recorded Announcement (RAN)	J1, J2	OFF
Paging trunk	J1, J2	OFF
Japan CO/DID operation	J1, J2	OFF
DID operation Loop length>2000 ¾	J1, J2	ON
DID operation Loop length <2000¾	J1, J2	OFF
Note: OFF indicates no strap present. J1 and J2 locations apply to all eight trunks.		

2 Insert the card in its assigned slot.

The NT8D14 Universal Trunk card may be installed in card slots 1 through 30.

End of Procedure

NT8D15 E&M Trunk card

This trunk card provides four trunks which can function as 2W E&M, 4W E&M, and Paging.

Procedure 16
E&M Trunk card installation

1 Set the switches (see the following table) for the NT8D15 E&M trunk circuit card according to the following table.

Table 23
NT8D15 E&M Trunk card option settings

Mode of operation	J2	J9
4W — Type 1	ON	connect pins 2 - 3
4W — Type 2	ON	connect pins 2 - 3
2W — Type 1	ON	connect pins 2 - 3
Paging trunk	ON	connect pins 2 - 3

2 Insert the card in its assigned slot.

The NT8D15 E&M Trunk card may be installed in card slots 1 through 30.

End of Procedure

NTAG26 XMFR card

The function of the XMFR card is provided on the NTDK20 SSC card. However, this card can co-exist with the SSC card if you wish to access extra XMFR capability.

The XMFR (Extended Multi-frequency receiver) card is used to receive MF digit information. Connections are made between a PBX and a CO. Features such as Automatic Number Identification (ANI), Meridian 911 (M911) and Feature Group D (FGD) are supported on the Option 11C by the IPE MF Receiver.

Procedure 17
XMFR card installation

1 Insert the NTAG26 card in its assigned slot.

The NTAG26 card can be installed in slots 1 through 30.

2 Configure and enable the card through overlay 13 and 34.

After the card is enabled, the LED will flash three times to indicate it is conducting a self-test. If the LED remains lit, then the self-test has failed.

End of Procedure

NT5K21 XMFC card

The function of the XMFC (Extended Multi-frequency Compelled Sender/Receiver) card is provided on the NTDK20 SSC card. However, this card can co-exist with the SSC card if you wish to access extra XMFC capability.

The XMFC card provides four channels of R2 Standard signalling capability.

Procedure 18
XMFC card installation

1 Insert the NT5G21 card in its assigned slot.

The card can be installed in slots 1 through 30.

2 Configure and enable the card through overlay 13 and 34.

After the card is enabled, the LED will flash three times to indicate it is conducting a self-test. If the LED remains lit, then the self-test has failed.

End of Procedure

NT1R20 Off-Premise Station (OPS) analog line card

The OPS analog line card provides eight OPS lines. The card can be installed in slots 1 through 10 in the main cabinet or 11 through 30 in the expansion cabinets.

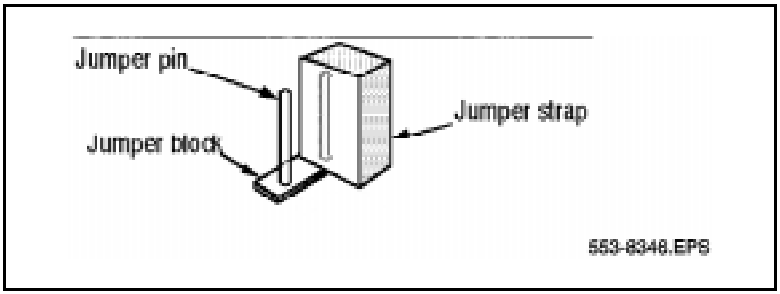
Procedure 19
OPS Analog card installation

1 Set the jumpers on the NT1R20 OPS card.

Each line interface unit, on the card, is equipped with two jumper blocks that are used to select the proper loop current, depending upon loop length (Refer to Table 24 on page 197 and Figure 68 on page 198).

For units connected to loops of 460 to 2300 ¾, both jumper blocks for that unit must have jumper straps installed. For loops that are 460 ¾ or less, jumper straps are not installed.

Figure 68
Set the jumpers



2 Insert the OPS card in its assigned slot.

The card may be installed in card slots 1 through 30 (except slot 10 on the right in the main cabinet if Meridian mail is to be installed).

3 Cross connect off-premise telephones as described in "Chapter 20 – Connecting the trunks" on page 287.

Refer to Figure 69 on page 199 for cross connection information for the OPS card.

End of Procedure

Table 24
OPS analog line card configuration

Application	On-premise station (ONS)			Off-premise station (OPS)			
Class of service (Note 1)	ONS			OPS			
Loop resistance	0 - 460 ohms			0 - 2300 ohms			
Jumper strap setting (Note 6)	Both JX. 0 and JX.1 off			Both JX. 0 and JX. 1 off		Both JX. 0 and JX. 1 on	
Loop loss dB (Note 3)	0-1.5	>1.5-2.5	2.5-3.0	0-1.5	1.5-2.5	2.5-3.0	4.5-15
TIMP (Note 1, 4)	600¾	600¾	600¾	600¾	600¾	600¾	600¾
BIMP (Note 1, 4)	600¾	3COM1	3COM2	600¾	3COM1	3COM2	3COM2
Gain treatment (Note 5)	No						Yes

Note 1: Configured in the Single line Telephone Administration program (LD 10).
Note 2: The maximum signaling range supported by the OPS analog line card is 2300 ohms.
Note 3: Loss of untreated (no gain devices) metallic line facility. Upper loss limits correspond to loop resistance ranges for 26 AWG wire.
Note 4: Default software impedance settings are:

	ONS CLS	OPS CLS
TIMP:	600 ohms	600 ohms
BIMP:	600 ohms	3COM2

Note 5: Gain treatment, such as a voice frequency repeater (VFR) is required to limit the actual OPS loop loss to 4.5 dB, maximum. VFR treatment of metallic loops having untreated loss greater than 15dB (equivalent to a maximum signaling range of 2300 ohms on 26 AWG wire) is not recommended.
Note 6: Jumper strap settings JX> 0 and JX. 1 apply to all eight units; “X” indicates the unit number, 0-7. “OFF” indicates that a jumper strap is not installed across both pins on a jumper block. Store unused straps on the OPS analog line card by installing them on a single jumper pin as shown below.

Figure 69
OPS analog line card: jumper block locations

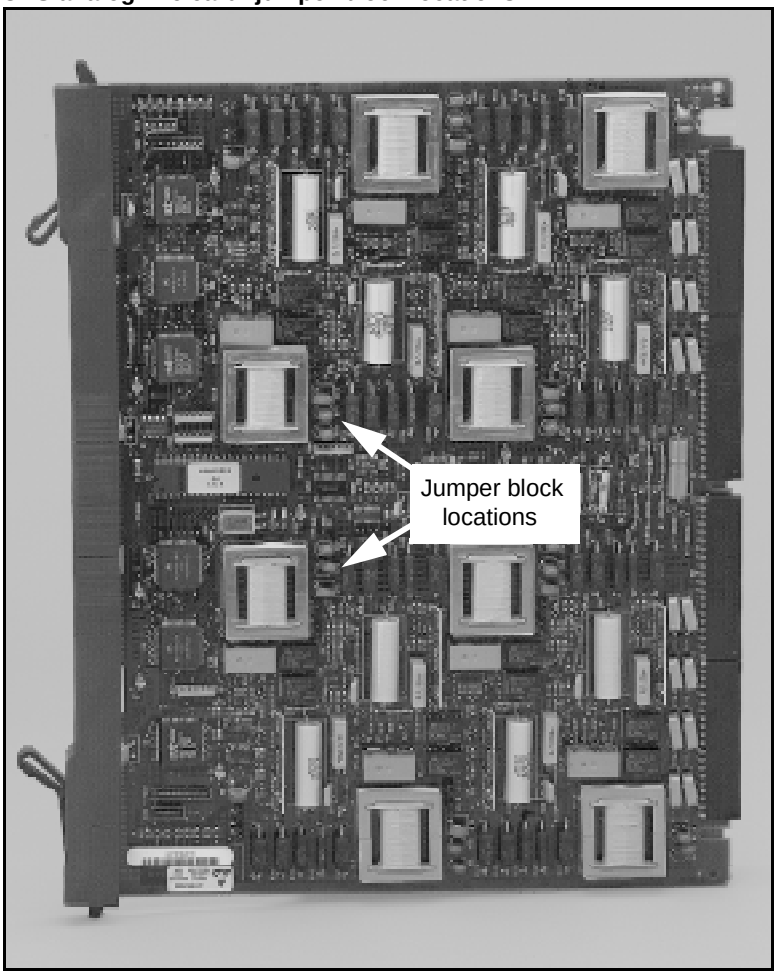
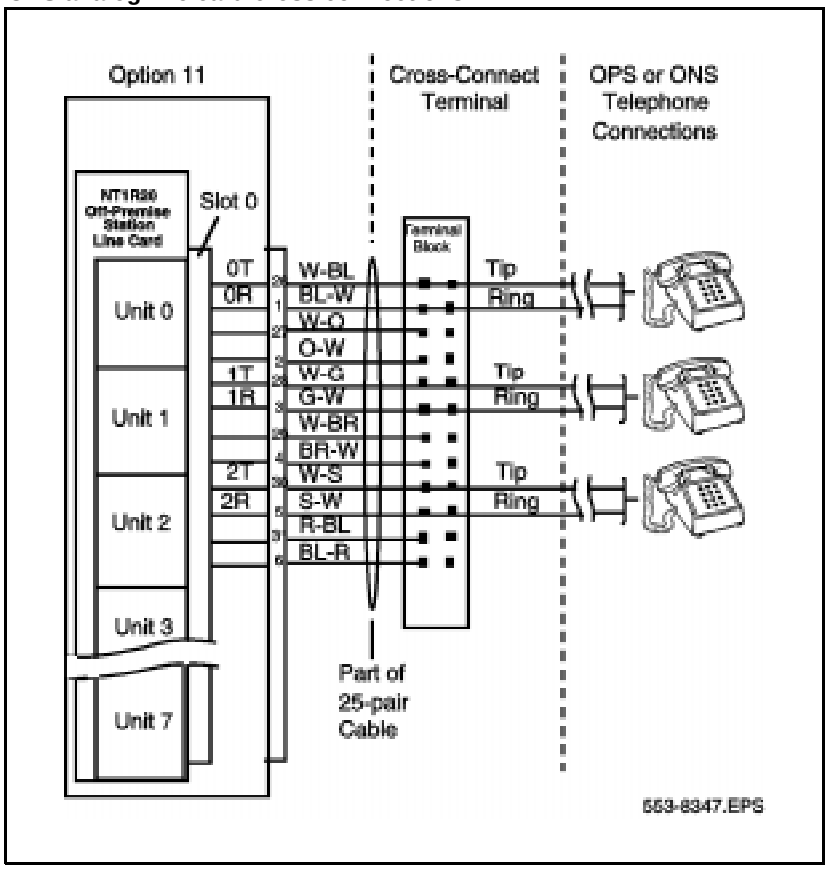


Figure 70
OPS analog line card cross connections



Chapter 16 – Installing and connecting reserve power supplies

General information

This chapter describes how to install and connect a reserve DC power supply to Option 11C cabinets.

If installing a multiple-cabinet system, each cabinet must have its own reserve power supply.

Types of reserve power

The types of reserve battery power are:

- The NTAK75 battery box, which has the following features:
  - designed to be float-charged by the NTAK04 or NTDK78 ac/dc power supply
  - provides a minimum of 2 hours of reserve DC power
  - mounts to the floor
  - supports one system cabinet
- The NTAK76 battery box, which has the following features:
  - designed to be float-charged by the NTAK04 or NTDK78 ac/dc power supply
  - provides a minimum of 15 minutes of reserve DC power
  - mounts to the wall
  - supports one system cabinet

- An Uninterruptible Power Supply (UPS) which will provide a continuous AC power supply. Install this unit according to the manufacturer's instructions.

CAUTION

If the NTAK04 or NTDK78 ac/dc power supply is powered down while it is operating on DC reserve power from a battery backup unit, the Option 11C system cannot be powered up again until AC power is restored. Be careful not to open the circuit breaker, either on the battery backup unit or on the NTAK04 or NTDK78, while the system is operating on battery backup.

Installing the NTAK75 battery unit

Follow the steps in Procedure 20 on page 202 to install an NTAK75 battery unit. Repeat the procedure for each system cabinet being installed.

Note: The system external ground must be installed before installing the battery backup unit.

Procedure 20
NTAK75 Battery Unit installation

1 Unpack the NTAK75 battery unit and place it according to the equipment layout plan.

— The battery unit must be a installed within 3 ft (915 mm) of the cabinet it is serving.

— Install to the side or below the Option 11C cabinet; not above.

— If installed below, the minimum clearance from the top of the NTAK75 to the bottom of the wall mounted Option 11C cabinet is 2 ft (610 mm).

— The battery unit should be installed in an open, well-ventilated area.

— The area must meet the following temperature limits:

Maximum allowed range: 0 ° to 45° C (32 to 110°F)
Recommended range: 20 ° to 35° C (68 to 95 °F).

2 Remove its cover.

The cover is secured by two captive screws on the front of the box.

3 **Set the switch on the top of the NTAK75 battery box to OFF.**

4 **Unpack the batteries and check the expiry dates.**

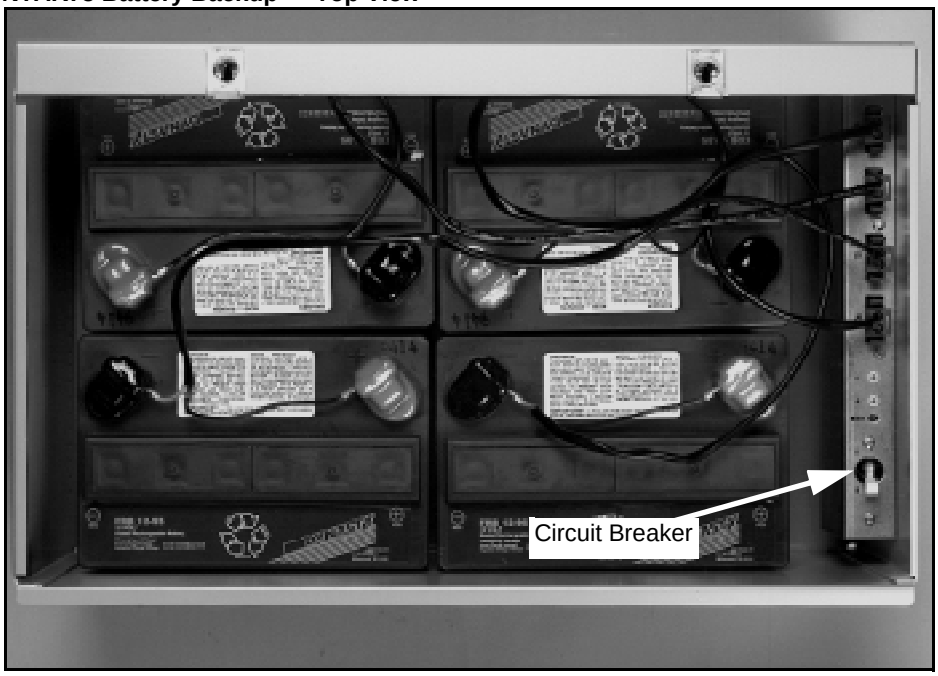
If the batteries do not have the same dates, contact your supplier.

WARNING

The battery cells can deliver high currents when short-circuited. Make sure that you do not inadvertently short-circuit the terminals of the batteries.

5 **Place the individual batteries into the battery box (see Figure 70 on page 203).**

Figure 70
NTAK75 Battery Backup — Top View



6 **Locate the four black/red jumper cables supplied with the NTAK75.**

7 **Connect the battery packs by installing the jumper cables between the +/- terminals of one battery pack to the connectors marked "J1 - J4."**

Any of the batteries may be attached to any connector (J1 - J4).

8 **Ensure the jumper wires are securely fastened by pulling out on the tabs of the connector.**

9 **Switch the NTAK75 breaker to the ON position.**

If the batteries are properly installed, the green LED will light. If this occurs, switch the breaker to OFF and proceed with step 10. If the LED does not light, return to Step 7 and check the wiring of the batteries.

10 **Set the breakers on the NTAK75 and NTAK04 or NTDK78 to OFF.**

11 **Plug the NTAK0420 cable from the battery box into the power supply in the cabinet (Figure 71 on page 205).**

Secure the cable with the cable retainer inside the cabinet.

12 **Set the breaker on the NTAK04 or NTDK78 to ON. The BATT LED on the NTAK04 or NTDK78 will remain off, indicating that the battery box breaker is OFF.**

The LED on the NTAK75 will light indicating that the NTAK0420 cable connections are correct.

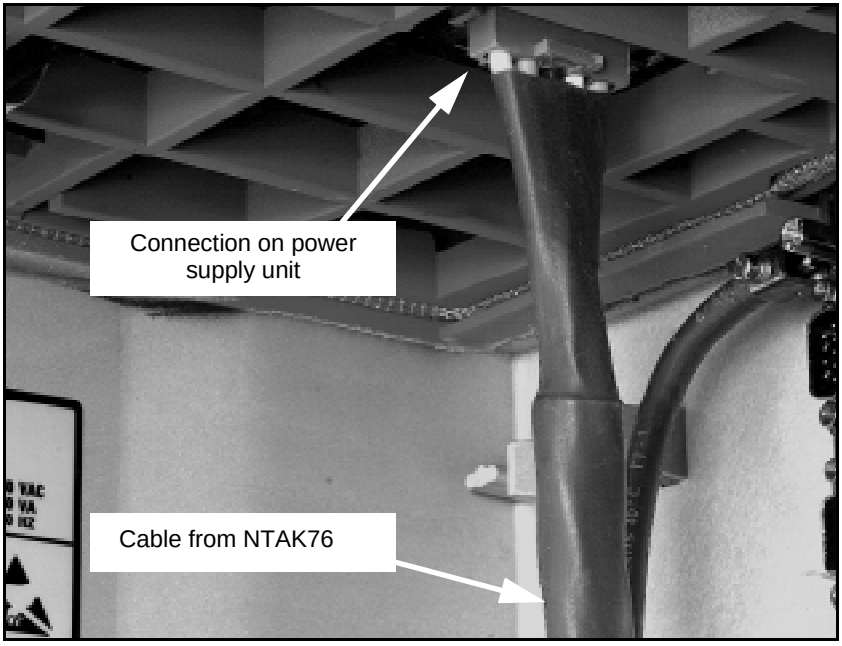
13 **Set the breaker on the NTAK75 to ON.**

The BATT LED on the NTAK04 or NTDK78 will be lit.

14 **Install the cover on the NTAK75.**

———————— ***End of Procedure*** ————————

Figure 71
Cable connections



Installing the NTAK76 battery unit

Follow Procedure 21 on page 206 to install an NTAK76 battery unit. Repeat the procedure for each system cabinet being installed.

Note: The system external ground must be installed before installing the battery backup unit.

Procedure 21
NTAK76 Battery Unit installation

1 Unpack the NTAK76 battery unit and place it according to the equipment layout plan.

— The battery unit must be installed within 3 ft (915 mm) of the cabinet it is serving.

— The battery unit must be installed beside or below the Option 11C cabinet; not above.

— If installed below, the minimum clearance from the top of the NTAK76 to the bottom of the wall mounted Option 11C cabinet is 2 ft (610 mm).

— The battery unit should be installed in an open, well-ventilated area.

— The area must meet the following temperature limits:

Maximum allowed range: 0 °to 45° C (32 to 110°F)
Recommended range: 20 ° to 35° C (68 to 95 °F)

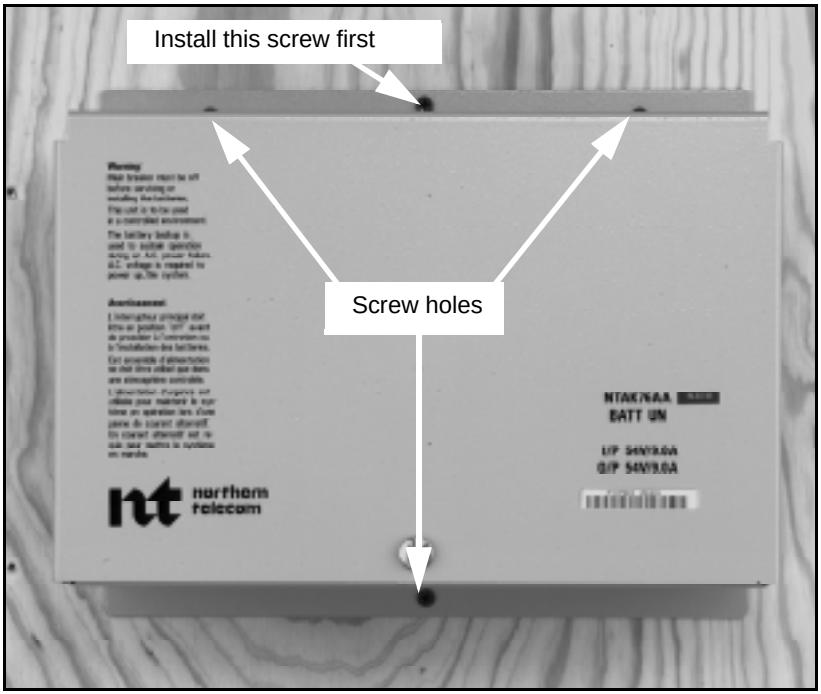
2 Remove the cover

The cover is secured by one captive screw on the front of the box. (Refer to Figure 72 on page 207).

3 Mount the battery unit to the wall using the four #8 3/4 inch wood screws provided with the unit.

Install the center screw at the top of the battery unit. Level the unit and install the remaining screws.

Figure 72
Mounting the NTAK76 battery unit to the wall



4 Set the switch on the front of the NTAK76 battery box to OFF. (Refer to Figure 73 on page 208).

WARNING

The battery cells can deliver high currents when short-circuited. Make sure that you do not inadvertently short-circuit the terminals of the batteries.

5 Unpack the batteries and check the expiry dates.

If the batteries do not have the same dates, contact your supplier.

6 Place the batteries in the battery unit with the terminal end down. Hold the batteries in place with the restraining bar.

7 **Locate the three white jumper wires and the red and black jumper cables supplied with the NTAK76 battery unit.**

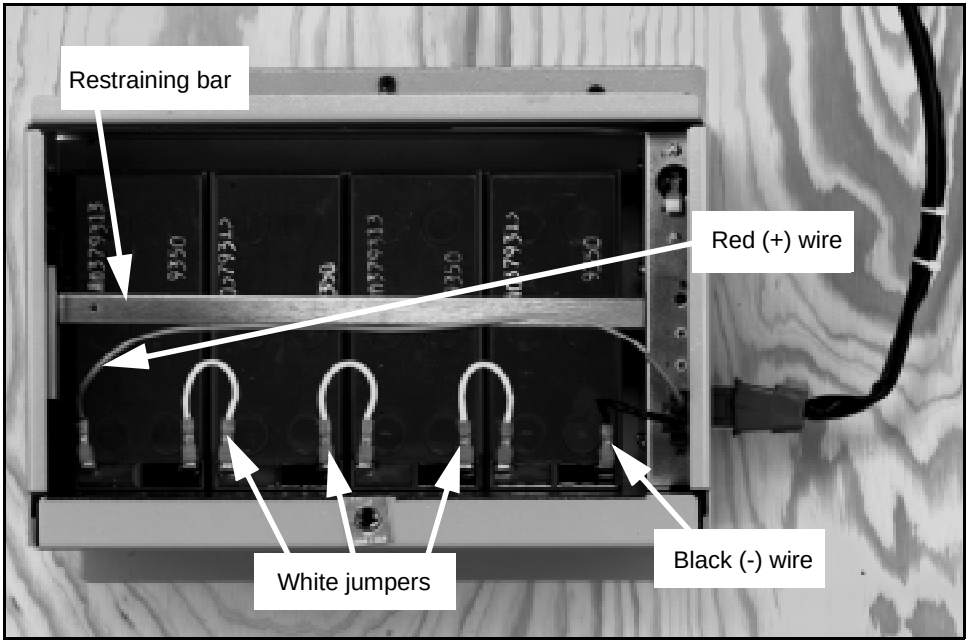
8 **Connect the battery packs in series by connecting the white jumper wires between the + (red) terminal of one battery pack to the - (black) terminal of the next battery pack. (See Figure 73 on page 208).**

9 **Connect the remaining red and black jumper cable to red and black terminals of the first and fourth battery pack.**

10 **Connect the jumper cable to the NTAK76 breaker panel, marked J1. (See Figure 73 on page 208).**

Note: The red positive (+) wire connects to the red (+) post of battery 1. The black negative (-) wire connects to the black post (-) of battery 4. Ensure all connections are secured.

Figure 73
Jumper connections



11 Set the breaker in the battery unit to ON to test for correct wiring.

The NTAK76 green LED (BATT) should switch on.

DC voltage can be measured between the test points whenever the green BATT LED is lit on the NTAK76. The test points are protected by high resistance: it is impossible to damage the battery unit by short-circuiting the test points to each other or to the metal case. For valid readings the test points must not be short circuited. The following different voltage readings can be made:

- open circuit battery voltage when the NTAK0420 cable is disconnected and the NTAK76 circuit breaker is closed
- NTAK04 or NTDK78 DC output when the NTAK0420 cable is connected and the NTAK76 circuit breaker is open
- NTAK04 or NTDK78 float charge voltage when the NTAK0420 cable is connected and the NTAK76 circuit breaker is closed

12 Set the breaker on the NTAK76 battery unit and the breaker on the NTAK04 or NTDK78 power supply to OFF.

13 Plug the NTAK0420 cable from the battery box into the power supply in the cabinet. See Figure 74 on page 210.

Secure the cable with the cable retainer inside the cabinet.

14 Set the breaker on the Option 11C power supply to ON.

The NTAK04 or NTDK78 “BATT” LED should be off and the NTAK76 LED should be on.

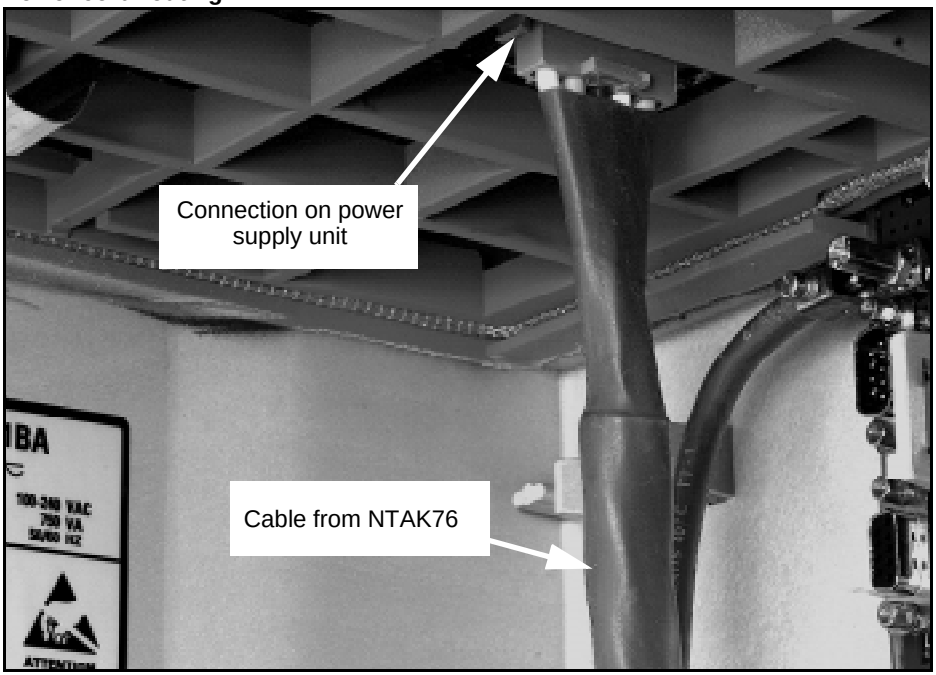
15 Set the breaker on the NTAK76 battery unit to ON.

The NTAK04 or NTDK78 “BATT” LED should be lit and the NTAK76 LED should be on.

16 Replace the cover on the system cabinet and secure the latch.

End of Procedure

Figure 74
Power cord routing



Connecting other battery backup systems

This procedure describes how to install and connect customer-supplied battery backup systems.

Charging capabilities of the Option 11 C are described in the *Option 11 Technical Reference Guide*.

The system external ground must be installed before installing the battery backup.

Procedure 22
Installing other battery systems

1 **Unpack the battery box and place it according to the equipment layout plan.**

2 **Remove its cover.**

3 **Set the switch on the battery box to OFF.**

4 **Unpack the batteries and check the expiry dates.**

If the batteries do not have the same dates, contact your supplier.

WARNING

The battery cells can deliver high currents when short-circuited. Make sure that you do not inadvertently short-circuit the terminals of the batteries.

5 **Place the batteries in the battery box.**

6 **Locate the black wires supplied with the box.**

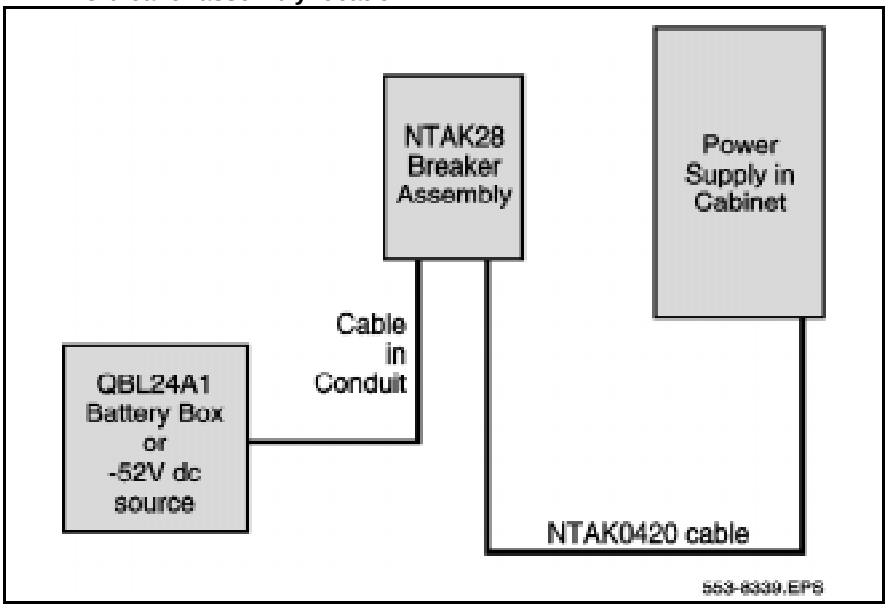
7 **Connect the battery packs in series by installing the black wires between the + (large) terminal of one battery pack to the - (small) terminal of the next battery pack.**

8 **Connect the black wire inside the battery box to the remaining positive (+) terminal and the red wire to the remaining negative (-) terminal.**

9 **Mount the NTAK28 Junction box securely to the wall within 900 mm (36 in.) of the cabinet it is serving. See Figure 75 on page 212.**

Note: One NTAK28 Junction box is required for each cabinet.

Figure 75
NTAK28 breaker assembly location



10 **Set the breakers on the NTAK28 Junction box and on the NTAK04 or NTDK78 power supply to OFF.**

11 **Connect the NTAK0420 cable from the NTAK28 junction box to the power supply in the cabinet.**

Secure the cable with the cable retainer in the cabinet.

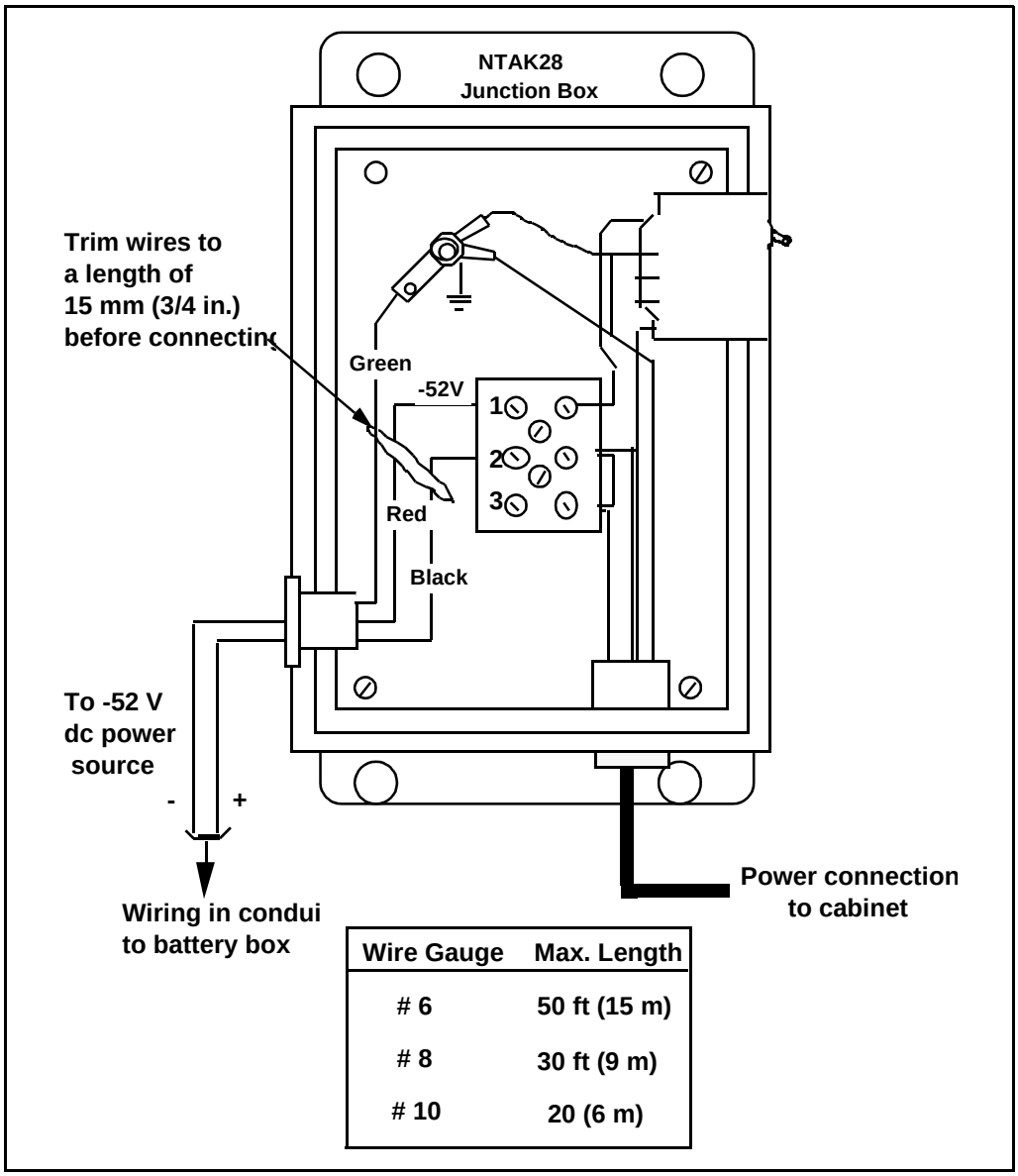
12 **Connect the other end of the DC power cable to the connector on the NTAK28 Junction Box.**

13 **Connect the cable from the battery box to the NTAK28 Junction box as shown in Figure 76 on page 213.**

14 **Set the breakers on the NTAK28 Junction box and on the NTAK04 or NTDK78 ac/dc power supply to ON.**

End of Procedure

Figure 76
NTAK28 circuit breaker assembly



Wire Gauge	Max. Length
# 6	50 ft (15 m)
# 8	30 ft (9 m)
# 10	20 (6 m)

Chapter 17 – Installing and connecting SDI and ethernet ports

General information

This Chapter contains modem setup requirements and two procedures for connecting communication devices to the Option 11C. The first explains how to install and connect SDI ports to terminals and modems. Instructions are provided on how to access ports through the NTDK20, NTDK23, NTDK25, NTDK80, NTAK02 and NTAK03 cards. The second procedure shows how to install and connect an ethernet cable to the Option 11C main cabinet.

Option 11C SDI ports are provided by the following cards:

- NTDK20 Small System Controller (SSC) card: provides three SDI ports
- NTDK23, NTDK25 and NTDK80 Fiber Receiver cards: each provides one SDI port
- NTAK02 SDI/DCH card: provides four ports of which up to two can be SDI ports
- NTAK03 TDS/DTR card: provides two SDI ports.

  Note: The functionality of the NTAK03 card has been incorporated into the NTDK20 Small System Controller (SSC) card. The Option 11C, however, supports these cards in conjunction with the SSC card.

Modem setup requirements

Modems connected to Option 11C should be set as follows:

- CD (Carrier Detect): Active if carrier detected on incoming call
- CTS (Clear to Send): Normal operation or forced active
- Hardware and software: Disabled flow control.

The ports on Option 11C will be disabled if devices connected to them generate extra “garbage” characters. For this reason, modems should not be used in the following modes:

- Loopback
- Auto Echo
- Self Test.

Note: The SDI ports are designed for use with “dumb” modems. “Intelligent” modems may be used, however care must be taken to ensure that they do not enter into modes of operation that will send extra characters to the system.

Table 25 on page 216 lists some of the problems that may be encountered.

Table 25
Modem problems

Problem	Solution
CDR is not printing on an ESDI port configured as 8 bits, no parity, and 1 stop bit.	Change the modem set-up to 7 bits, no parity, 1 stop bit, or add MTC or SCH to the ESDI user prompt.
Modem is not communicating with the Option 11C when the User is MTC, BUG or CTY (The default setting of 8 bits, no parity, 1 stop bit is incompatible with the modem).	Change the modem set-up to 7 bits or the parity to EVEN/ODD.

Installing and connecting SDI ports

NTDK20 card

The baud rate for port 0 is controlled by a switch setting on the circuit card's faceplate. Ports 1 and 2 are user configurable in overlay 17.

- Port 0 is the only SDI port that can be used for software installation and upgrades.
- All three ports on the NTDK20 SSC card can be used to connect terminals or modems.
- An NTBK48 3-port SDI cable must be used with the NTDK20 SSC card.

Note: The default baud rate of the SSC card is 1200 bps; the maximum data rate is 19,200 bps. When changing the DIP switch on the faceplate, make sure only one baud rate switch is set to ON (Refer to Table 26 on page 217).

Table 26
Default port configuration for the NTDK20 SSC card

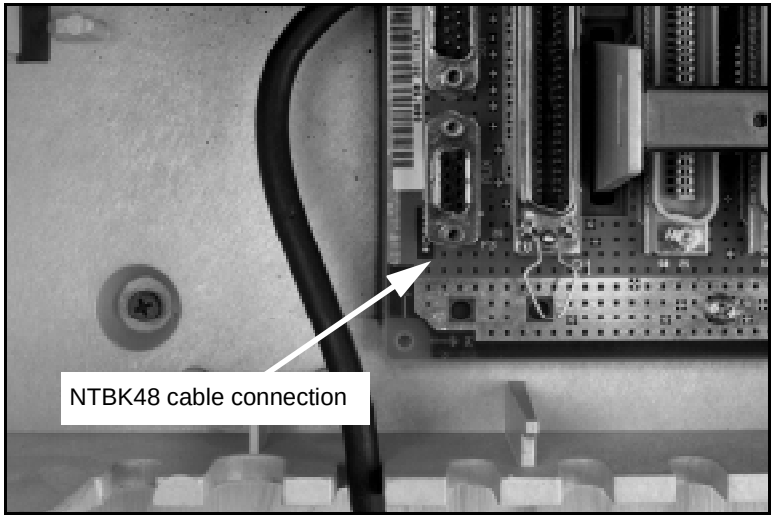
Port	Use	Baud rate	Data bits	Stop bits	Parity
0	MTC/SCH/BUG	Set by a DIP switch	8	1	None
1	MTC/SCH/BUG	1200 (See Note 1)	8	1	None
2	MTC/SCHBUG	1200 (See Note 2)	8	1	None

Procedure 23 on page 218 describes how to connect a terminal, modems and other devices such as CDR devices and additional TTYs to the SSC card.

Procedure 23
Connecting SDI ports on the SSC card

1 **Connect the NTBK48 3-port SDI cable to the 9-pin SDI connection at the bottom of the main cabinet.**

Figure 77
Cable connection



2 **Connect the system terminal to the cable marked "port 0" on the NTBK48 3-port cable.**

A Modem Eliminator Adapter is required to connect the Option 11C to a TTY terminal.

3 **If the system is to be accessed remotely, connect the system modem to the cable marked "port 1" on the NTBK48 cable.**

4 **Connect the modem to an outside line.**

5 **Test the modem for proper operation once the system is operating.**

Note: The remaining ports can be used for other equipment such as CDR devices or TTYs.

End of Procedure

NTDK23, NTDK25 and NTDK80 Fiber Receiver cards

The Fiber Receiver cards provide one SDI port per expansion cabinet.

The baud rate is set by a DIP switch on the card's faceplate. Other communication settings are identical to the port 0 configuration on the SSC card (Refer to Table 26 on page 217).

A Fiber Receiver card port must be configured using overlay 17 before it can be used to access overlays.

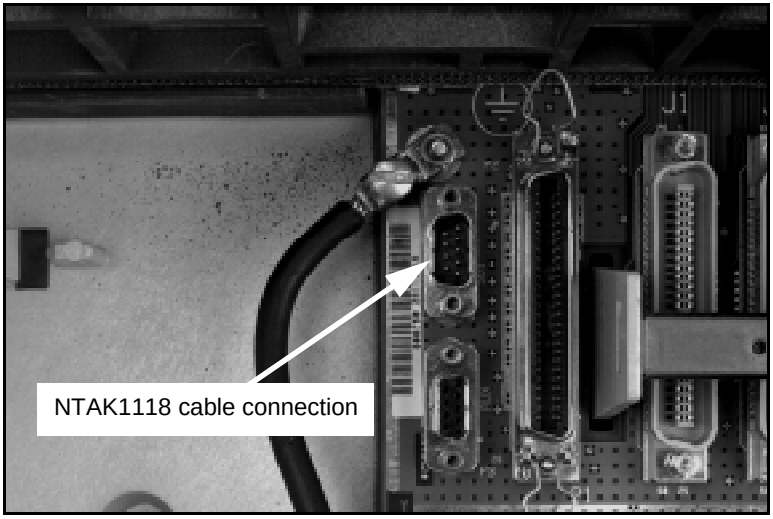
> ***Note:*** Although all device numbers can be assigned to any cabinet, TTY 0, 1 and 2 are usually assigned to the main cabinet. TTY 3, 4, 5, and 6 are typically assigned to the first, second, third, and fourth expansion cabinets respectively.

Procedure 24 on page 219 describes how to connect the SDI ports on Fiber Receiver cards.

Procedure 24
Connecting SDI ports to the Fiber Receiver card

1 Connect the NTAK1118 one-port SDI cable to the 9-pin SDI connection at the bottom of the expansion cabinet. See Figure 78 on page 219.

Figure 78
Cable connection



2 Connect the NTAK1118 SDI cable to a TTY terminal.

Note: A Modem Eliminator is required to connect to a terminal.

3 If the system is to be accessed remotely, connect the SDI cable to the system modem.

4 Connect the modem to an outside line.

5 Test the modem for proper operation once you have started up the Option 11C system.

———————— ***End of Procedure*** ————————

NTAK02 SDI/DCH card

The NTAK02 SDI/DCH card, which can only be used in the main cabinet, can be configured to support ports for the following:

- two SDI and two DCHI
- one SDI, one DCHI, two ESDI
- four ESDI.

NTAK02 ports can be used to access overlay software. These ports should be defined in the configuration database as the SDI logical type.

An NTAK19FB 4-port SDI cable is designed for use with the NTAK02 circuit card. However, an NE-A25B-type 25-pair cable can be used to extend the connections to the cross-connect terminal. See Table 27 on page 221 through Table 30 on page 224 for the connections for each port.

Table 27
NTAK02 pinouts — Port 0 at the cross-connect terminal

Cable		RS232			
		Signal		Designations (I=input/O=output)	
Pair	Color	DTE	DCE	DTE	DCE
1T 1R	W-BL BL-W	0 DTR	0 DCD	- O	- I
2T 2R	W-O O-W	DSR DCD	CH/CI DTR	I I	O O
3T 3R	W-G G-W	RTS CTS	CTS RTS	O I	I O
4T 4R	W-BR BR-W	RX TX	TX RX	I O	O I
5T 5R	W-S S-W	- SG	- SG	- -	- -

Table 28
NTAK02 connections at the cross-connect terminal — Port 1

Cable		RS422				RS232			
		Signal		Designations (I=input O=output)		Designations (I=input O=output)		Signal	
Pair	Color	DTE	DCE	DTE	DCE	DTE	DCE	DTE	DCE
5T 5R	W-S S-W	SCTEA -	SCTA -	O -	I -	O -	I -	SCT -	SCT -
6T 6R	R-BL BL-R	SCTEB DTR	SCTB DCD	O O	I I	- -	- -	CH/CI DTR	- DCD
7T 7R	R-O O-R	DSR DCD	CH/CI DTR	I I	O O	I I	O O	DSR DCD	CH/CI DTR
8T 8R	R-G G-R	RTS CTS	CTS RTS	O I	I O	O I	I O	RTS CTS	CTS RTS
9T 9R	R-BR BR-R	SCRA SCTA	SCTEA RXCA	I I	O O	I I	O O	SCR SCT	SCT -
10T 10R	R-S S-R	SCRB SCTB	SCTEB RXCB	I I	O O	- -	- -	- -	- -
11T 11R	BK-BL BL-BK	RXDA TXDA	TXDA RXDA	I O	O I	I O	O I	RXD TXD	TXD RXD
12T 12R	BK-O O-BK	RXDB TXDB	TXDB RXDB	I O	O I	- -	- -	- -	- -
25T 25R	V-S S-V	SG -	SG -	- -	- -	- -	- -	SG -	SG -

Table 29
NTAK02 connections at the cross-connect terminal — Port 2

Cable		RS422				RS232			
		Signal		Designations (I=input O=output)		Designations (I=input O=output)		Signal	
Pair	Color	DTE	DCE	DTE	DCE	DTE	DCE	DTE	DCE
13T 13R	BK-G G-BK			- -	- -	- O	- I	- DTR	- DCD
14T 14R	BK-BR BR-BK			- -	- -	I I	O O	DSR DCD	CH/CI DTR
15T 15R	BK-S S-BK			- -	- -	O I	I O	RTS CTS	CTS RTS
16T 16R	Y-BL BL-Y			- -	- -	I O	O I	RX TX	TXD RXD
17T 17R	Y-O O-Y			O -	I -	O -	I -	- SG	- SG

Table 30
NTAK02 connections at the cross-connect terminal — Port 3

Cable		RS422				RS232			
		Signal		Designations (I=input O=output)		Designations (I=input O=output)		Signal	
Pair	Color	DTE	DCE	DTE	DCE	DTE	DCE	DTE	DCE
17T 17R	Y-O O-Y	SCTEA -	SCTA -	O -	I -	O -	I -	SCT -	SCT -
18T 18R	Y-G G-Y	SCTEB DTR	SCTB DCD	O O	I I	- -	- -	CH/CI DTR	- DCD
19T 19R	Y-BR BR-Y	DSR DCD	CH/CI DTR	I I	O O	I I	O O	DSR DCD	CH/CI DTR
20T 20R	Y-S S-Y	RTS CTS	CTS RTS	O I	I O	O I	I O	RTS CTS	CTS RTS
21T 21R	V-BL BL-V	SCRA SCTA	SCTEA RXCA	I I	O O	I I	O O	SCR SCT	SCT -
22T 22R	V-O O-V	SCRB SCTB	SCTEB RXCB	I I	O O	- -	- -	- -	- -
23T 23R	V-G G-V	RXDA TXDA	TXDA RXDA	I O	O I	I O	O I	RXD TXD	TXD RXD
24T 24R	V-BR BR-V	RXDB TXDB	TXDB RXDB	I O	O I	- -	- -	- -	- -
25T 25R	V-S S-V	- SG	- SG	- -	- -	- -	- -	SG -	SG -

NTAK03 TDS/DTR card

The functionality of this card is incorporated into the design of the NTDK20 SSC card. Both cards, however, can exist simultaneously in a system.

An NTAK19EC cable is designed for use with the NTAK03 circuit card. However, an NE-A25B type 25-pair cable can be used to extend the connections to the cross-connect terminal. Table 31 on page 225 and Table 32 on page 226 show the connections for each port.

A modem eliminator is used to connect the RS232 converter cable and the NTAK19EC SDI cable to a terminal (not required when connecting to a modem).

Note: A modem eliminator is supplied with the system.

Table 31
NTAK03 connections at the cross-connect terminal — Port 0

Pair	Color	Signal	Designations (I=input, O=output)
1T 1R	W-BL BL-W	DSR DCD	I I
2T 2R	W-O O-W	- DTR	- O
3T 3R	W-G G-W	RTS CTS	O I
4T 4R	W-BR BR-W	RX TX	I O
5T 5R	W-S S-W	SG -	O -

Table 32
NTAK03 connections at the cross-connect terminal — Port 1

Pair	Color	Signal	Designations (I=input, O=output)
6T 6R	R-BL BL-R	DSR -	I -
7T 7R	R-O O-R	- DTR	- O
8T 8R	R-G G-R	RTS CTS	O I
11T 11R	BK-BL BL-BK	RX TX	I O
13T 13R	BK-G G-BK	- DCD	- I
22T 22R	V-O O-V	SG -	O -

Terminal setup

The terminal can be setup at any time, but it is not recommended that you do so during data transmission to avoid potential data loss.

Setup values are given in Table 34 on page 228, Table 35 on page 229 and Table 36 on page 230. Use the following procedure to set up the terminal.

Procedure 25
Setting up the terminal

1 **Turn on the power for the terminal.**

2 **Enter setup mode by pressing the <SETUP> key located on the top row of the special function keys.**

The current setup values are displayed.

3 **Change the value in each field on each setup screen as necessary.**

Use the following keys to view and change setup values:

Table 33
Setup (keys and functions)

Key	Function
Arrow key	Move from field to field
<Enter>	Scroll through possible values or cause requested action to take place (depends on type of field)
<Next Screen>	Move to next setup screen
<Prev Screen>	Move back to last screen

4 **Save changes by returning to the *General setup* screen, moving the cursor to the *Saved* field, and pressing *<Enter>*.**

End of Procedure

Table 34
HP700/32 setup values

Global set-up screen			
Host Port	1	Keyboard	U.S.
Background	Dark	Message Translations	English
Screen Saver	10 Min	Setup Translations	English
Refresh Rate	72 Hz	Clear Display	
Key Click	Yes	Clear Comm	
User Set-up Screen			
Smooth Scroll	Jump scroll	Display Width	80
Cursor Type	Blink Line	Display Width Allowed	80 or 132
Cursor	Off	Char Cell Height	16
2nd Message Line	On	Clr on Width Change	Yes
Message Line	On	Aux Mode	Off
Status Line	On	Aux to Host	Off
On Line	Yes	Print Terminator=FF	No
Local Echo	Off	Logical Page Size	24
Auto Wrap	Off	Number of Pages	1
Auto Linefeed	Off		
Display Ctrl Codes	Off		
Emulation Set-up			
Emulation	VT320	Cursor Keys	Normal
Terminal Id	VT220	Print Scroll Region	Off
Control Codes	7-bit	User Features Locked	No
Characters Mode	8-bit	User Keys Locked	No
Preferred Char Set	DEC Supplemental	Data Procession Keys	No
Key Pad Mode	Application		
Port 1 Set-up			
Communications	Full Duplex	Limited Transmit	Off
Data Length	8-bits	DSRI	No
Parity	None	CTS	Ignore
Stop Bits	1	CD	Ignore
Xmit Baud	2400	Break Disconnect	170ms
RecvBaud	=Xmit	Disconnect Delay	Never
Xmit pace	Xoff	Aux printer Type	National
Recv Pace	Xoff at 128		
Port 2 Set-up			
Communications	Full Duplex	Xmit pace	Xon/Xoff
Data Length	8-bits	Recv Pace	Xoff at 128
Parity	None	Limited Transmit	Off
Stop Bits	1	Break Duration	170ms
Xmit Baud	9600	Aux Printer Type	National
RecvBaud	=Xmit		
Keyboard Set-up			
Lock Key	Caps Lock	Warning Bell	Yes
Kbd Lock Enable	Yes	Auto Answerback	Yes
Save Tabs	Yes	Answerback =	
Auto Repeat	Yes	Conceal Answerback	No
Margin Bell	Yes	Do not set any tabs or programmed keys.	

Table 35
VT420 setup values

Global Set-Up	
On Line	**Comm1=RS232**
Sessions on Comm1	**70Hz**
CRT Saver	**Printer Shared**
Display Set-Up	
80 Columns	**No Status Display**
Interpret Controls	**Cursor Steady**
Auto Wrap	**3x24 pages**
Jump Scroll	**24 Lines/Screen**
Dark Screen	**Vertical Coupling**
Cursor	**Page Coupling**
Block Style Cursor	**Auto Resize Screen**
General Set-up	
VT400 Mode, 7-bit Controls	**Normal Cursor Keys**
User Defined Keys Unlocked	**No New Line**
User Features Unlocked	**UPSS DEC Supplemental**
8-bit Characters	**VT420 ID**
Application Keypad	**When Available Update**
Communications Set-Up	
Transmit=2400	**Disconnect, 2 s Delay**
Receive=Transmit	**Limited Transmit**
Xoff=64	**No Auto Answerback**
8bits, No Parity	**Answerback=**
1 Stop Bit	**Not Concealed**
No Local Echo	**Modem High Speed = ignore**
Data Leads Only	**Modem Low Speed = ignore**
Printer Set-Up	
Speed=2400	**8bits, No Parity, 1 Stop bit**
No printer to Host	**Print Full Page**
Normal Print Mode	**Print National Only**
XOFF	**No Terminator**
Keyboard Set-up	
Keyboard Set-up	**Local Compose**
Typewriter Keys	**Ignore Alt**
Caps Lock	**F1 = Hold**
Auto Repeat	**F2 = Print**
Keyclick High	**F3 = Set-Up**
Margin Bell	**F4 = Session**
Warning Bell High	**F5 = Break**
Character Mode	**,< and .> Keys**
<X] Delete	**<> Key**
	‘~Key
Tab Set-Up	
Leave this screen at the default values	

Table 36
VT220 setup values

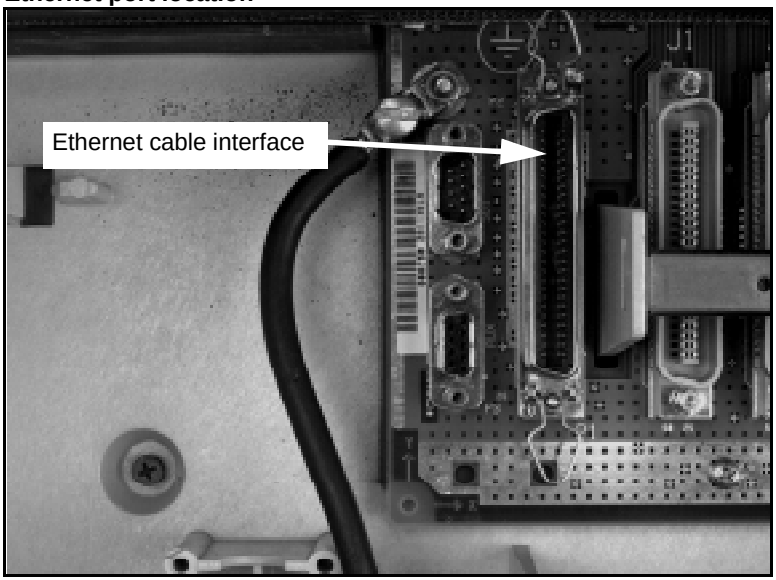
Global Set-Up		
On Line	**Comm1=RS232**	
Sessions on Comm1		**70Hz**
CRT Saver	**Printer Shared**	
Display Set-Up		
80 Columns	**Light Text, Dark Screen**	
Interpret Controls	**Cursor**	
Auto Wrap	**Block Style Cursor**	
Jump Scroll		
General Set-up		
VT200 Mode, 7-bit Controls	**Application Keypad**	
User Defined Keys Unlocked	**Normal Cursor Keys**	
User Features Unlocked	**No New Line**	
Multinational		
Communications Set-Up		
Transmit=2400	**No Local Echo**	
Receive=Transmit	**Data Leads Only**	
Xoff at 64	**Disconnect, 2 s Delay**	
8bits, No Parity	**Limited Transmit**	
1 Stop Bit		
Printer Set-Up		
Speed=9600		
Normal Print Mode	**Print Full Page**	
8bits, No Parity,	**Print National Only**	
1 Stop bit	**No Terminator**	
Keyboard Set-up		
Typewriter Keys	**Warning Bell**	
Caps Lock	**Break**	
Auto Repeat	**Answerback=**	
Keyclick High	**Not Concealed**	
Margin Bell		
Tab Set-Up Screen		
Leave this screen at the default values		

Installing and connecting an ethernet cable

Ethernet connection

The Option 11C system provides one 10 Mbps ethernet connection to a Local Area Network (LAN). The ethernet cable connector is located just left of the retaining bar in the main cabinet as shown in Figure 79 on page 231.

Figure 79
Ethernet port location



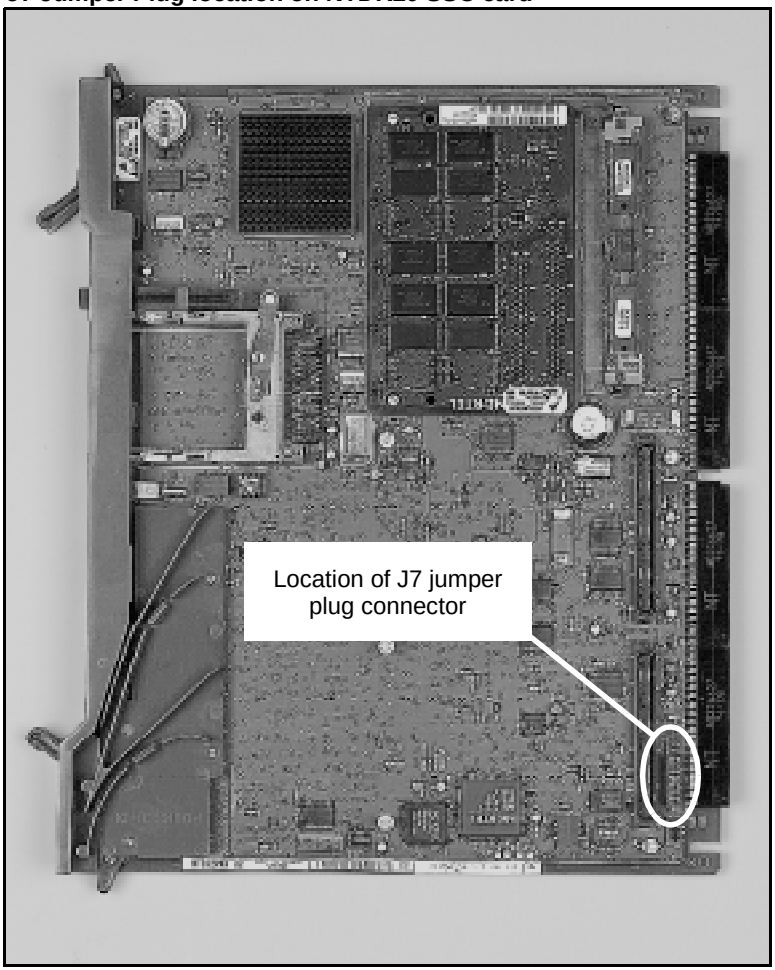
Note: An ethernet connection is not available on systems equipped with an NTDK26 Backwards Compatible Daughterboard on the NTDK20 SSC card (usually multi-cabinet systems interconnected with copper cable).

J7 Jumper plug

The J7 jumper plug must be in place on the NTDK20 SSC card for the ethernet function to operate. The jumper plug is present when the NTDK20 SSC card is shipped. However, it must be removed to accommodate the NTDK26 Backwards Compatible Daughterboard used in multi-cabinet systems that are not interconnected with fiber optic cable.

When a multi-cabinet system is upgraded from copper to fiber optic cable inter-cabinet connections, the NTDK26 Backwards Compatible Daughterboard must be replaced with fiber expansion daughterboards. The J7 jumper plug must be installed at the same time if the ethernet capability is required. See Figure 80 on page 232.

Figure 80
J7 Jumper Plug location on NTDK20 SSC card



Procedure 26
Connecting the Ethernet cable

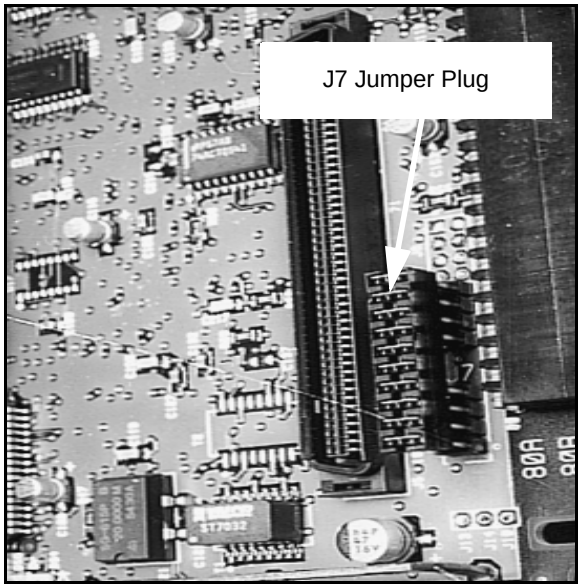
1 **Insert the 50-pin end of the cable into the cable connector on the left side of the retaining bar as shown below.**

2 **Route the cable through the fifth cable groove from the left side.**

The ethernet cable is a 50-pin amphenol to 15-pin AUI adaptor cable (Part number for ethernet cable NTDK27 A06030723). This provides a standard MAU attachment point.

Note: A jumper block located on connector J7 (near the Fiber 2 connector, see Figure 80 on page 232 and the following figure) on the component side of the NTDK20 SSC card must be in place for the ethernet connection to function. The NTDK20 SSC card is normally shipped with the plug installed. If the ethernet connection does not appear to function properly, check the jumper plug to make sure that it is installed.

Figure 81
Connector J7



3 **If not previously done, configure the ethernet port in software as described in the *X11 Administration Input/Output Guide.***

End of Procedure

Chapter 18 – Starting up and testing the system

General information

This Chapter describes how to start up the Option 11C and make sure that it is operating properly. It also includes how to install software in a new system.

Before continuing with the procedures outlined in this Chapter, verify that all pertinent hardware is either connected to, or installed in the system.

WARNING

Make sure that the circuit breaker on the power supply in each cabinet is set to OFF before proceeding.

Boot Code compatibility

CAUTION

If installing an NTDK81 Software Daughterboard make sure that it is compatible with the Boot Code version on the SSC card. It must be NTDK34AA REL 09, or higher, or NTDK34FA. Read the information in Chapter 15 – Installing the circuit cards, under the heading “SSC card, Boot Code and Software Daughterboard compatibility” on page 184 before proceeding.

Start-up procedures

There are two different start-up procedures when starting a new Option 11C system. They are as follows:

- use Procedure 27 on page 236 to start-up a system with no system or configuration data stored in the system's Primary Flash drive
- use Procedure 28 on page 238 to start up a new Option 11C with system and configuration data already available in the Primary Flash drive.

Procedure 27
Start-up procedure for a new programmed daughterboard

1 Connect the external power supply, if not already done.

If this system uses a commercial AC power supply, the power outlet should be tested to make sure that the correct voltage is present before plugging the power cord in the outlet.

If the system uses an external commercial AC power supply, plug the AC power cord from each cabinet into the commercial AC power supply outlet.

If the system uses a customer-provided DC power supply, plug the DC power cord from each cabinet into the DC power source.

2 For AC-powered systems, set the circuit breaker on the NTAK04 or NTDK78 ac/dc power supply in each cabinet to ON. For DC powered systems, set the circuit breaker on the NTAK28 circuit breaker assembly for each cabinet to ON. Set the circuit breaker on the NTAK05 or NTDK72 DC power supply in each cabinet to ON.

Observe the LED on the faceplate of the NTDK20 Small System Controller (SSC) card. The LED should light steadily for a moment, then flash three times as it performs its self test.

3 Set the circuit breaker on the battery backup unit to ON (if the system has reserve power).

Note: A system equipped with the NTAK04 or NTDK78 ac/dc power supply and a battery backup unit will continue to operate on DC reserve power if the AC supply fails. However, if the DC reserve power is interrupted, the NTAK04 or NTDK78 cannot be powered up again until AC power is restored.

4 Observe the TTY or terminal screen.

Note: The TTY must be connected to TTY port 0.

After the system is loaded, a menu driven program called the "Software Installation Program" will be automatically invoked. Procedure 29 on page 239 provides complete detailed instructions to install the system software.

5 Observe the screen a second time once the installation program has been completed.

Messages will appear on the TTY or terminal screen. When the message "INIXXX" appears, the system is operational.

6 Perform an EDD using LD 43.

End of Procedure

Procedure 28
Start-up procedure for a previously installed programmed daughterboard

1 Connect the external power supply, if not already done.

Note: If this system uses a commercial AC power supply, the power outlet should be tested to make sure that the correct voltage is present before plugging the power cord in the outlet.

If the system uses an external commercial AC power supply, plug the AC power cord from each cabinet into the commercial AC power supply outlet.

If the system uses a customer-provided DC power supply, plug the DC power cord from each cabinet into the DC power source.

2 For AC-powered systems, set the circuit breaker on the NTAK04 or NTDK78 ac/dc power supply in each cabinet to ON.

For DC powered systems, set the circuit breaker on the NTAK28 circuit breaker assembly for each cabinet to ON. Set the circuit breaker on the NTAK05 or NTDK72 DC power supply in each cabinet to ON.

Observe the LED on the faceplate of the NTDK20 Small System Controller (SSC) card. The LED should light steadily for a moment, then flash three times as it performs its self test.

3 Set the circuit breaker on the battery backup unit to ON (if the system has reserve power).

Note: A system equipped with the NTAK04 or NTDK78 ac/dc power supply and a battery backup unit will continue to operate on DC reserve power if the AC supply fails. However, if the DC reserve power is interrupted, the NTAK04 or NTDK78 cannot be powered up again until AC power is restored.

4 Observe the TTY or terminal screen.

Messages will appear on the TTY or the terminal screen. When the message “INIXXX” appears, the system is operational.

5 If required, set the system time and date using LD 2.

6 Perform an EDD using LD 43.

———————— ***End of Procedure*** ————————

Procedure 29
Installing the software

How to install software in a new system

Summary of steps

The Software Installation steps are summarized in the following list:

- Installing the Software Daughterboard and Security Device
- Setting the system time and date.
- Selecting the New System Installation menu
- Selecting Feature Set and packages
- Selecting a database
- Selecting Incremental Software Management (ISM) parameters
- Validating keycodes
- Loading the software.

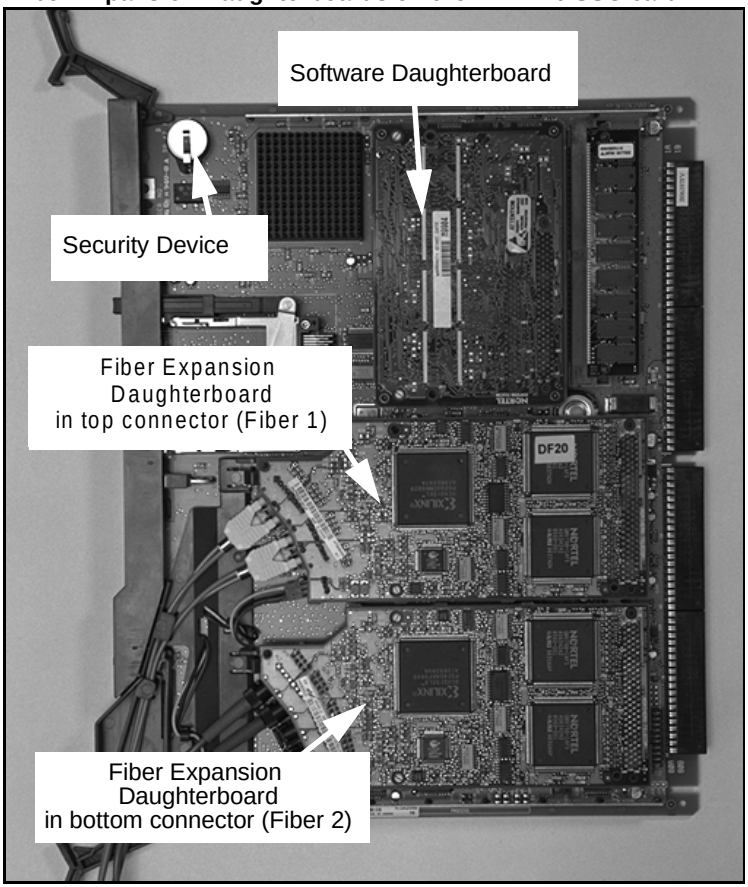
CAUTION
Wear the anti-static wrist strap provided in the bottom of the cabinet before handling circuit cards. Static electricity can damage the components of power supplies and circuit cards.

1 If not previously done, install the Software Daughterboard and Security Device on the NTDK20 Small System Controller (SSC) card.

To install the Software Daughterboard and Security Device refer to Figure 82 on page 240 and the following steps:

- Put on the anti-static wrist strap and insert the Software Daughterboard in the connector on the component side of the SSC card.
- Install any required Expansion Daughterboards.
  Note: If installing an NTDK81 Software Daughterboard, make sure it is compatible with the Boot Code on the SSC card. See “Chapter 15 – Installing the circuit cards” on page 181.
- Insert the Security Device in the socket on the component side of the SSC card.

Figure 82
Fiber Expansion Daughterboards on the NTDK20 SSC card



2 If not previously done, install the NTDK20 Small System Controller (SSC) card in its slot (slot 0) of the main cabinet.

Note: If a fiber optic cable is present, make sure that it is placed in the Fiber Routing Guide.

3 If not previously done, power up the system.

To power up the system:

- Make sure that the power is connected to the cabinet then set the circuit breaker on the front of the power supply unit to ON.

4 **Perform this Step only if an NTDK81 Software Daughterboard is being used.**

Skip this Step and go to Step 5 if an NTDK21 Software Daughterboard is being used.

Observe the terminal screen.

Observe the initial start-up messages to ensure that the Boot Code on the SSC is compatible with the NTDK81 Software Daughterboard. The following message will appear:

Flash Boot: NTDK34AA REL09

If the version of the Flash Boot is NTDK34AA REL 09, or higher, or NTDK34FA, the installation should proceed normally. Go to Step 5.

If the version of the Flash Boot is NTDK34AA REL 08 or lower, the following additional messages will appear:

No Program Store Flash installed
Program Store: 0 Mbytes
No Flash Drive installed
Flash Drive: 0 Mbytes
.
.
Flash Daughter board not installed. OS will not run.

The forgoing messages indicate that the system cannot be started up. The Boot Code must be updated to REL 09 or higher. Refer to "SSC card, Boot Code and Software Daughterboard compatibility" on page 184 and *Option 11C Upgrades Guide* for information about updating the Boot Code using the Flash Boot ROM utility.

Note: Boot Code updating requires an operational Option 11C system and if you have an X11/NTDK34AA REL 09, or higher you need an X11/23:30 PCMCIA card, or if you have an X11/NTDK34FA you need an X11/24 PCMCIA card.

5 Observe the terminal screen.

One of two messages will appear and the software installation proceeds accordingly. If the message is:

INSERT SOFTWARE DELIVERY CARD

Go to Step 6 on page 242.

OR IF the following is displayed:

SOFTWARE INSTALLATION PROGRAM

proceed with Step 7 on page 243.

6 Skip this step unless the Software Delivery (PCMCIA) card is being used to install the software.

If not previously done, install the Software Delivery card in the socket in the faceplate of the SSC card.

To install the Software Delivery card:

Insert the card in slot A in the PCMCIA socket located in the faceplate of the NTDK20 Small System Controller (SSC) card. Gently press on the Software Delivery card until it is firmly seated. Refer to Figure 83 on page 243.

Figure 83
PCMCIA card slot location

7 Observe the terminal screen.

If the following is displayed:

Current system time and date: 00:00:00 -- 00/00/00

proceed to Step 8 on page 244.

OR IF the following is displayed:

Software Installation Main Menu

proceed to Procedure 9 on page 244.

8 **Set the system Time and Date.**

Note: The Time and Date prompt appears only when the Install Setup Program detects a system Year Date that is not in the range of 1995-2095. The responses shown below are examples of how to enter the system Time and Date:

Enter new time (hh/mm/ss)

08:00:00 <cr>

Enter new date (yy/mm/dd)

95/05/01 <cr>

08:00:00 -- 95/05/01 is the new system time and date

y <cr>

9 **Select item 1 from the Main Menu.**

Software Installation Main Menu

1. New System Installation - From Software Daughterboard

2. System Upgrade

3. Utilities

4. New System Installation - From Software Delivery Card

[q]uit, [h]elp or [?], <cr> - redisplay

Enter selection

1 <cr>

Note: Select option one or four depending on the type of installation you are performing.

10 Select the Feature Set to be enabled.

Note: The Feature Set selected must match the ones provided with key codes. The Feature Set names shown below are examples only.

(The following feature sets are examples only:)

Select Feature Set You Wish to Enable:

1. General Business (NTSKxxxx)

2. Enhanced Business (NTSKxxxx)

3. Enterprise (NTSKxxxx)

4. NAS/VNS (NTSKxxxx)

[q]uit, [p]revious, [m]ain menu, [h]elp or [?], <cr> redisplay

(example only:)

Enter Selection: **2 <cr>** (Enhanced Business)

11 Indicate whether or not packages are to be added.

Feature Set Selection: Enhanced Business

Do you wish to add packages?

Select no, yes or abort:

n <cr> (no)

y <cr> (yes)

a <cr> (abort)

Note: Abort returns you to the main menu.

If the response was **NO** go to Step 13 on page 246.

If the response was **YES** go to Step 11 on page 245.

12 Select the Feature packages to be added.

Summary of Packages selected is:

0-2 4-5 7-14 16-25 28-29 32-64 67 70-77 79-83 86-93 95 98-104 107-111 113-116 118-120 122-125 127-129 131-133 135 137-141 167

Enter packages (s) to be added, blank line to end:

215-235 <cr>

Note: (<cr> ends selection entry or if no packages are to be added).

13 Confirm Feature Set and packages.

Your Feature Set Selection is “Enhanced Business”:

Additional Packages selected: 215-235

Summary of Packages selected is:

0-2 4-5 7-14 16-25 28-29 32-64 67 70-77 79-83 86-93 95 100-104 107-111 113-116 118-120 122-125 127-129 131-133 135 137-141 167

...

...

200-208 215-235

Is this selection correct?

n <cr> (no)

y <cr> (yes)

a <cr> (abort, return to main menu)

If the response was **NO** go to Step 10 on page 245.

If the response was **YES** go to Step 14 on page 247.

14 Select a Database.

If you are installing from a Software Delivery (PCMCIA) Card go to Step 17 on page 250.

IF you are installing from a Software Daughterboard continue here:

Select database to Install:

1. Pre-Configured database - Enhanced Business

2. Basic Configuration

3. CCBR Restore File

4. Option 11/11E Software Cartridge

[q]uit, [p]revious, [m]ain menu, [h]elp or [?], <cr> redisplay

Enter Selection: 3 or 4 <cr>

IF your selection was 3 ‘CCBR Restore File’, go to Step 19 on page 250.

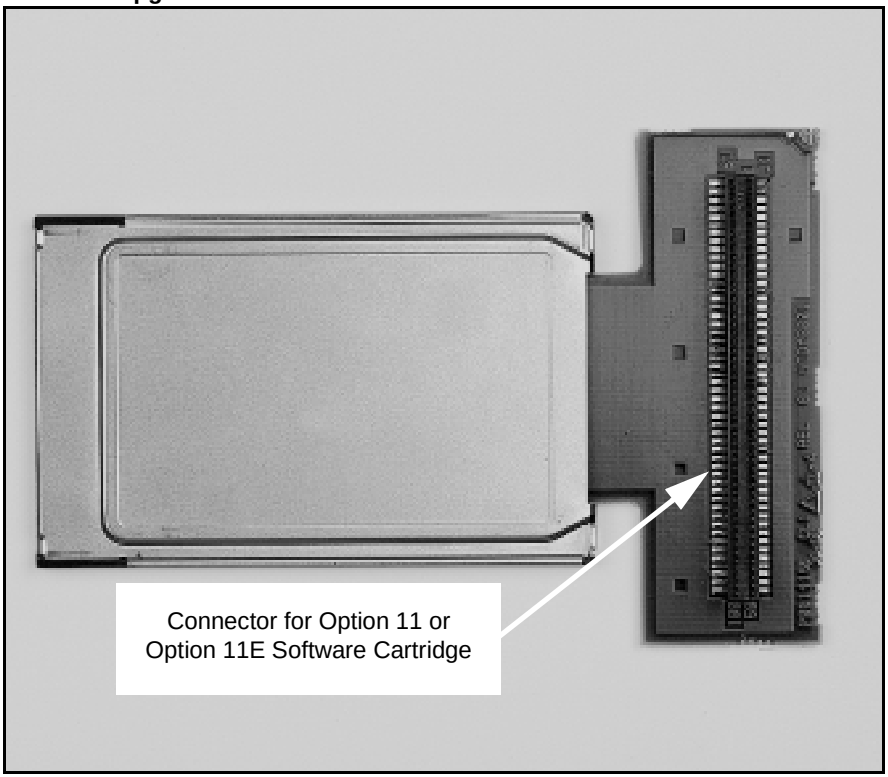
Note: This method only works with Option 11/11E CCBR files.

IF your selection was 4 ‘Option 11/11E Software Cartridge’ continue with the next step, Step 15 on page 248.

15 Connect the Option 11/11E Software Cartridge to the Database Upgrade Tool.

Refer to Figure 84 on page 248 for correct placement of the software cartridge.

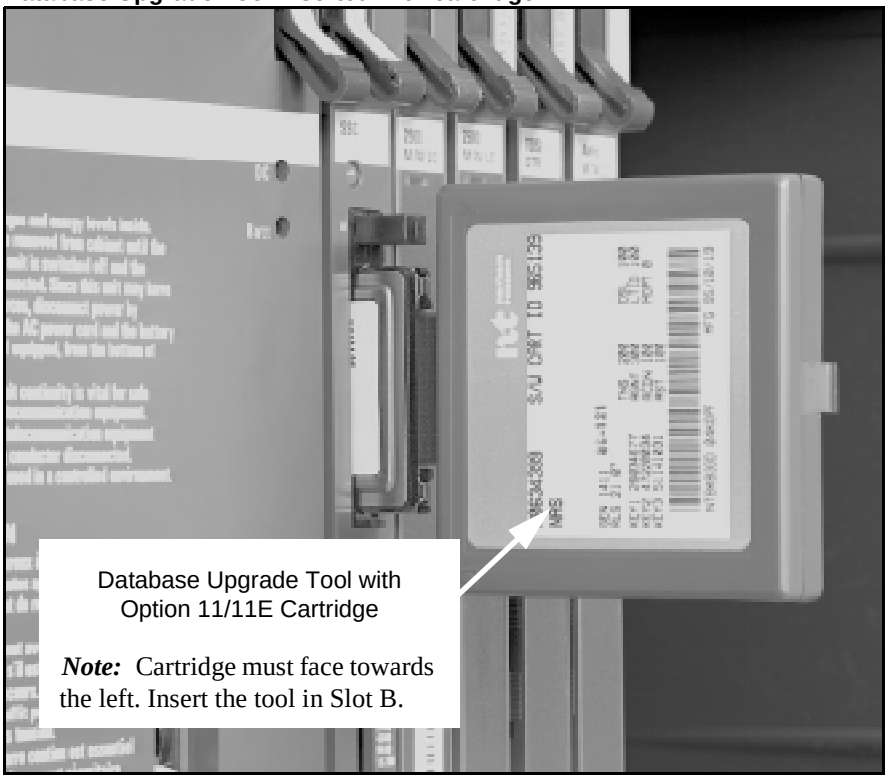
Figure 84
Database Upgrade Tool



16 Install the Database Upgrade Tool and cartridge.

Insert the Database Upgrade Tool with the attached Option 11/11E cartridge into drive b (see Figure 85 on page 249).

Figure 85
Database Upgrade Tool inserted with cartridge



17 Select a Database using the PCMCIA card.

If you are installing from a Software Daughterboard go to Step 14 on page 247.

If you are installing from a Software Delivery (PCMCIA) card continue here:

Select database to Install:

1. Pre-Configured database - Enhanced Business

2. Basic Configuration

3. Archived Database

[q]uit, [p]revious, [m]ain menu, [h]elp or [?], <cr> redisplay

Enter Selection: 3 <cr>

IF selection was 3 'Archived Database', go to Step 18 on page 250.

18 Select an Archived Database.

The available archived databases are displayed on the screen. (The following are given for example only.)

Archived Database available:

1. Company ABC

2. XYZ.Offices

3. Green.Packaging

[q]uit, [m]ain menu, [p]revious menu, <cr> - redisplay

19 Confirm database selection.

Do you wish to continue?

n <cr> (no)

y <cr> (yes)

a <cr> (abort, return to main menu)

If the response was **NO** go to Step 14 on page 247.

If the response was **YES** go to Step 20 on page 251.

20 Review ISM parameters.

Note: On a new installation, the ISM parameters displayed on the terminal screen will be the default settings associated with the Feature Set selection. These settings can be accepted without changes or changed to suit the requirements of the new system.

Current ISM Parameters:

TNS (1000) **(maximum number of terminal numbers)**

ACDN (0300) **(maximum number of ACD DNs)**

AST (0100) **(maximum number of associate Sets)**

LTID (0100) **(maximum number of Logical Terminal IDs)**

RAN_CON (0012) **(default RAN connection)**

RAN_RTE (9999) **(default RAN routes)**

MUS_CON (0100) **(default MUS connection)**

BRAND (0) **(brandline)**

ACD AGENTS (1000) **(maximum number of ACD agents)**

ANALOGUE TELEPHONES (0100) **(maximum number of analogue sets)**

BRI DSL (0100) **(maximum number of Digital Subscriber Loops)**

DIGITAL TELEPHONES (0100) **(maximum number Digital sets)**

WIRELESS TELEPHONES (0) **(maximum number Wireless sets)**

TMDI D-CHANNELS (0) **(maximum number of channels)**

MOPT (0000) **(Meridian Mail option)**

Note: The above underscores represent a space.

Do you wish to change ISM parameters?

n <cr> (no change)

y <cr> (change)

a <cr> (abort, return to main menu)

If the response was **YES** go to Step 21 on page 252.

If the response was **NO** go to Step 23 on page 254.

21 Select ISM parameters.

Enter new ISM parameters, <cr> to leave as is:

TNS (1000)

ACDN (0300)

AST (0100)

LTID (0100)

RAN_CON (0012)

RAN_RTE (9999)

MUS_CON (0100)

BRAND (0)

ACD AGENTS (1000)

ANALOGUE TELEPHONES (0100)

BRI DSL (0100)

DIGITAL TELEPHONES (0100)

WIRELESS TELEPHONES (0)

TMDI D-CHANNELS (0)

MOPT (0000)

22 Confirm ISM parameters.

New ISM parameters are:

TNS (1000)

ACDN (0300)

AST (0100)

LTID (0100)

RAN_CON (0012)

RAN_RTE (9999)

MUS_CON (0100)

BRAND (0)

ACD AGENTS (1000)

ANALOGUE TELEPHONES (0100)

BRI DSL (0100)

DIGITAL TELEPHONES (0100)

WIRELESS TELEPHONES (0)

TMDI D-CHANNELS (0)

MOPT (0000)

Is this correct?

n <cr> (no)

y <cr> (yes)

a <cr> (abort, return to main menu)

If the response was **NO** go to Step 20 on page 251.

If the response was **YES** go to Step 23 on page 254.

23 Define the AUX ID.

Note: The default AUX ID is the security ID provided with the Option 11C. It should be replaced with the previous Option 11 or Option 11E site ID.

Security ID: 20000326

Current AUX ID: 20000326

Do you wish to change the AUX ID?

y <cr> (yes)

n <cr> (no)

a <cr> (abort, return to main menu)

If the response was **NO** go to Step 25 on page 255.

If the response was **YES** go to Step 24 on page 254.

24 Enter the AUX ID.

Enter the Option 11/11E Security ID for the new AUX ID,

<cr> to maintain

12121212 <cr>

New AUX ID: 12121212

Is this correct?

y <cr> (yes)

n <cr> (no)

a <cr> (abort, return to main menu)

If the response was **NO** go to Step 23 on page 254.

If the response was **YES** go to Step 25 on page 255.

25 Review and confirm information entered.

New Installation Information Summary:

Security ID: 20000326

Aux ID: 12121212

Added Pkgs: 215-235

Feature Set: Enhanced Business

Database: Company.ABC

S/W Release: 2404C

ISM Parameters

TSN: 1000 1000

ACDN: 0300 0300

AST: 0100 0100

LTID: 0100 0100

RAN_CON (0012)

RAN_RTE (9999)

MUS_CON (0100)

BRAND (0)

ACD AGENTS (1000)

ANALOGUE TELEPHONES (0100)

BRI DSL (0100)

DIGITAL TELEPHONES (0100)

WIRELESS TELEPHONES (0)

TMDI D-CHANNELS (0)

MOPT: 0000 0000

Note: Both the old and the new parameter values are displayed.

Is this correct?

y <cr> (yes)

n <cr> (no)

a <cr> (abort, return to main menu)

If the response was **NO** go to Step 10 on page 245.

If the response was **YES** go to Step 26 on page 256.

26 Enter the keycodes

Enter new Keycodes:

Key 1:

Key 2:

Key 3:

xxxxxxxx <cr>

yyyyyyyy <cr>

zzzzzzzz <cr>

After the last keycode is entered, the system displays a message of successful or unsuccessful, follow the instructions given below.

'Keycode validation successful'

WARNING A system restart will be invoked as part of the software installation process"

If the **successful** message appears go to Step 27 on page 257.

'Keycode validation unsuccessful'

If the **unsuccessful** message appears, repeat this step, Step 26 on page 256.

After three unsuccessful keycode validation attempts, the following message appears:

Keycode validation unsuccessful.

Installation aborted...returning to main menu.

27 Complete the software installation.

Are you sure you wish to perform the installation?

y <cr> (yes)

n <cr> (no)

a <cr> (abort, return to main menu)

If the response was **YES** this is the end of the Software Installation program, continue with the next step, Step 5 on page 237.

If the response was **NO** go to Step 9 on page 244.

End of Procedure

Chapter 19 – Connecting the telephones

General information

This chapter contains instructions for connecting telephones to the cross-connect terminal. It also contains the location of the individual extension numbers (DNs) when you are implementing one of the default numbering plans and how to activate each telephone.

Refer to the instructions provided with the telephone or console and to NTP 553-3001-215, *Telephone Sets and Attendant Consoles Installation Procedures*, for detailed information about installing telephones and consoles.

The cable from the cabinet card slot containing the line card associated with the telephone being connected, must be installed before you continue. Refer to **“Chapter 13 – Installing and connecting cross-connect terminal to cabinets” on page 167**, if additional cabling is required.

Cable assignments

The cables from each cabinet are labeled J1 through J10 at the cross-connect terminal. Each cable represents a specific set of Terminal Numbers (TNs) as shown in Table 37 on page 269.

WARNING

Always use caution when installing or modifying telephone lines. Avoid installing telephone wiring during a lightning storm. Do not install telephone jacks in wet locations unless the jack is specifically designed for wet locations. Never touch uninsulated telephone wiring unless the line has been disconnected at the network interface.

Cross-connecting telephones

Connect the telephones according to the following figures. Cross-connections for Analog (500/2500 type) telephones are shown in Figure 86 on page 261, and for Meridian Digital Telephones in Figure 87 on page 262.

Procedure 30
Cross-connecting telephones

1 **Locate telephone terminations at the cross-connect terminal.**

2 **Connect Z-type cross-connecting wire to the leads of the telephone.**

3 **Locate line circuit card (TN) terminations at the cross-connect terminal.**

4 **Connect the other end of the cross-connecting wire to the assigned TN terminal block.**

End of Procedure

Figure 86
NE-500/2500-type telephone cross-connections

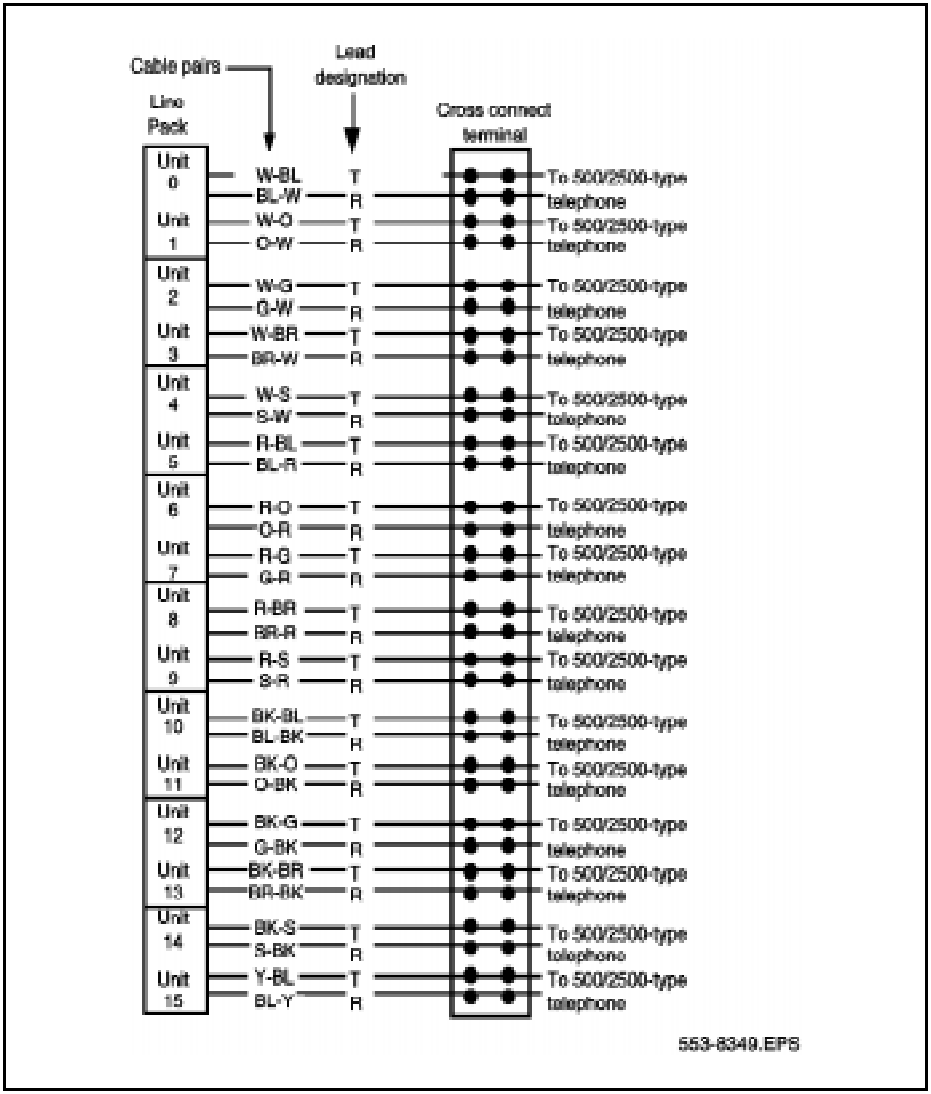
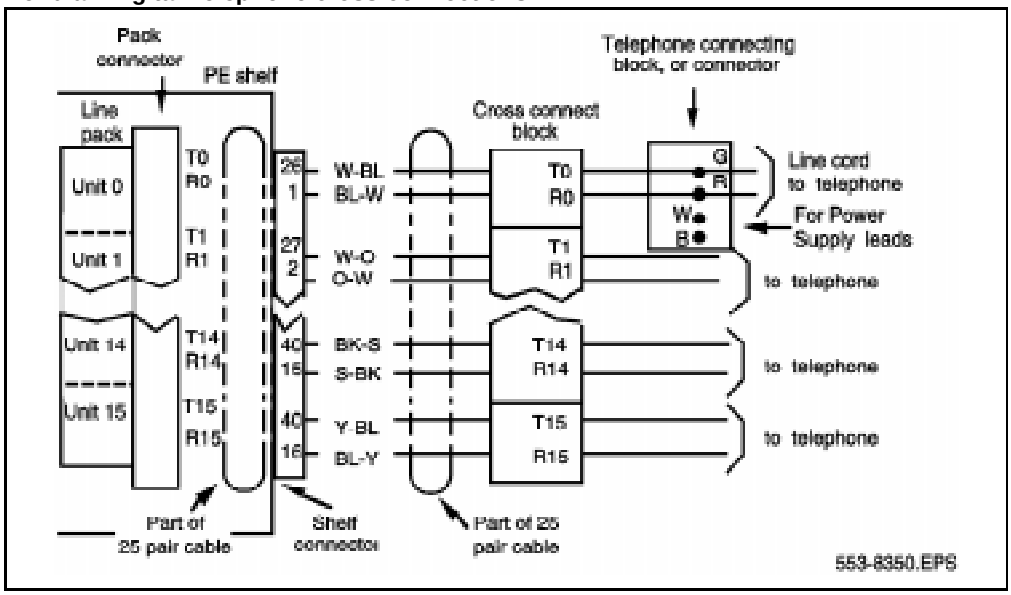


Figure 87
Meridian Digital Telephone cross-connections



Connecting telephones without a PFTU

Procedure 31
Connecting telephones without a PFTU

1 **Locate the telephone terminations on the cross-connect terminal.**

2 **Connect one end of the cross-connect wire to the leads of the telephone.**

3 **Locate the line card terminations on the cross-connect terminal.**

Refer to Table 37 on page 269.

4 Connect the other end of the cross-connect wire to the assigned TN terminal block.

Default DN assignments are given in the following Tables:

- Table 41, “Main Cabinet Default DN assignments,” on page 273
- Table 42, “Expansion Cabinet 1 Default DN assignments,” on page 274
- Table 43, “Expansion Cabinet 2 Default DN assignments,” on page 275
- Table 44, “Expansion Cabinet 3 Default DN assignments,” on page 276
- Table 45, “Expansion Cabinet 4 Default DN assignments,” on page 277

The telephone can now be activated as described on page 278.

Note: All the following tables show the **default** DNs.

End of Procedure

Connecting 500/2500-type telephones with a PFTU

Procedure 32
Connecting 500/2500-type telephones with a PFTU

1 Locate the telephone terminations on the cross-connect terminal.

2 Connect one end of the cross-connect wire to the leads of the telephone.

3 Locate the PFTU connections (unit PFT 1 through PFT 5) assigned to this telephone at the cross-connect terminal.

Refer to Table 40 on page 272.

4 Connect the other end of the cross-connect wire to the pair assigned to the telephone on the PFTU.

5 Connect a second cross-connect wire to the pair assigned to the line card on the PFTU.

6 Locate the line card terminations on the cross-connect terminal.

Refer to Table 37 on page 269 for the Main cabinet and Expansion cabinets 1 and 2.

Refer to Table 38 on page 270 for Expansion cabinets 3 and 4.

7 Connect the other end of the cross-connect wire to the assigned TN terminal block.

Default DN assignments are given in the following Tables:

- Table 41, “Main Cabinet Default DN assignments,” on page 273
- Table 42, “Expansion Cabinet 1 Default DN assignments,” on page 274
- Table 43, “Expansion Cabinet 2 Default DN assignments,” on page 275
- Table 44, “Expansion Cabinet 3 Default DN assignments,” on page 276
- Table 45, “Expansion Cabinet 4 Default DN assignments,” on page 277

The telephone can now be activated as described on page 278.

———————— ***End of Procedure*** ————————

Connecting off-premise telephones

Off-premise 500/2500-type telephones must be connected through an NTAK92AA Off-Premise Protection module. Each module can connect up to four analog telephones and can interface with an NT1R20 Off-Premise Station analog Line Card, an NT8D03 Analog Line Card or with an NT8D09 Message Waiting Line Card.

WARNING

The message waiting line card produces -150 volts which is considered hazardous on off-premise telephones. Make sure that the -150 V is disabled on off-premise telephones.

The voltage is disabled when the Class Of Service (CLS) assigned to the telephone is LPD (message waiting lamp denied) and MWD (Message Waiting Denied) in LD 10.

Refer to the *X11 Software guides* for information about LD 10.

Under no circumstances shall LPA or MWA be assigned in the Class of Service on off-premise telephones.

Procedure 33
Connecting an off-premise telephone

1 Mount the NTAK92AA Off-Premise protection module on the wall using four #10 1/2 in (minimum) screws.

2 Connect a #6 AWG (#40 Metric Wire Gauge) from the ground lug at the bottom of the NTAK92AA Off-Premise protection module to an earth ground. Refer to Figure 88 on page 267.

WARNING

If connecting to a message waiting line card, unseat the card from its assigned slot before proceeding with the next step.

3 **Connect two NTAK9204 cables (one from connector J1 and one from connector J2) from the protection module to the cross-connect terminal.**

Terminate the cables as shown in Figure 86 on page 261.

4 **Cross-connect the J1 cable to the Tip and Ring connections coming from the line card.**

Default DN assignments are given in the following Tables:

- Table 41, “Main Cabinet Default DN assignments,” on page 273
- Table 42, “Expansion Cabinet 1 Default DN assignments,” on page 274
- Table 43, “Expansion Cabinet 2 Default DN assignments,” on page 275
- Table 44, “Expansion Cabinet 3 Default DN assignments,” on page 276
- Table 45, “Expansion Cabinet 4 Default DN assignments,” on page 277

5 **Cross-connect the J2 cable to the off-premise telephone.**

6 **Install the regulatory label provided with the Off-Premise protection module on the inside right-hand wall of the cabinet near the velcro wriststrap fastener.**

7 **Install the line card in its assigned position.**

The telephone can now be activated as described on page 278.

End of Procedure

Connecting an attendant console

Procedure 34
Connecting attendant console

1 **Locate the attendant console terminations at the cross-connect terminal.**

2 **Locate the line card terminations at the cross-connect terminal.**

3 **With cross-connect wire, connect the line card and other connections to the console as shown in Figure 89 on page 268.**

End of Procedure

Figure 88
NTAK92AA Off-Premise Protection Module connections

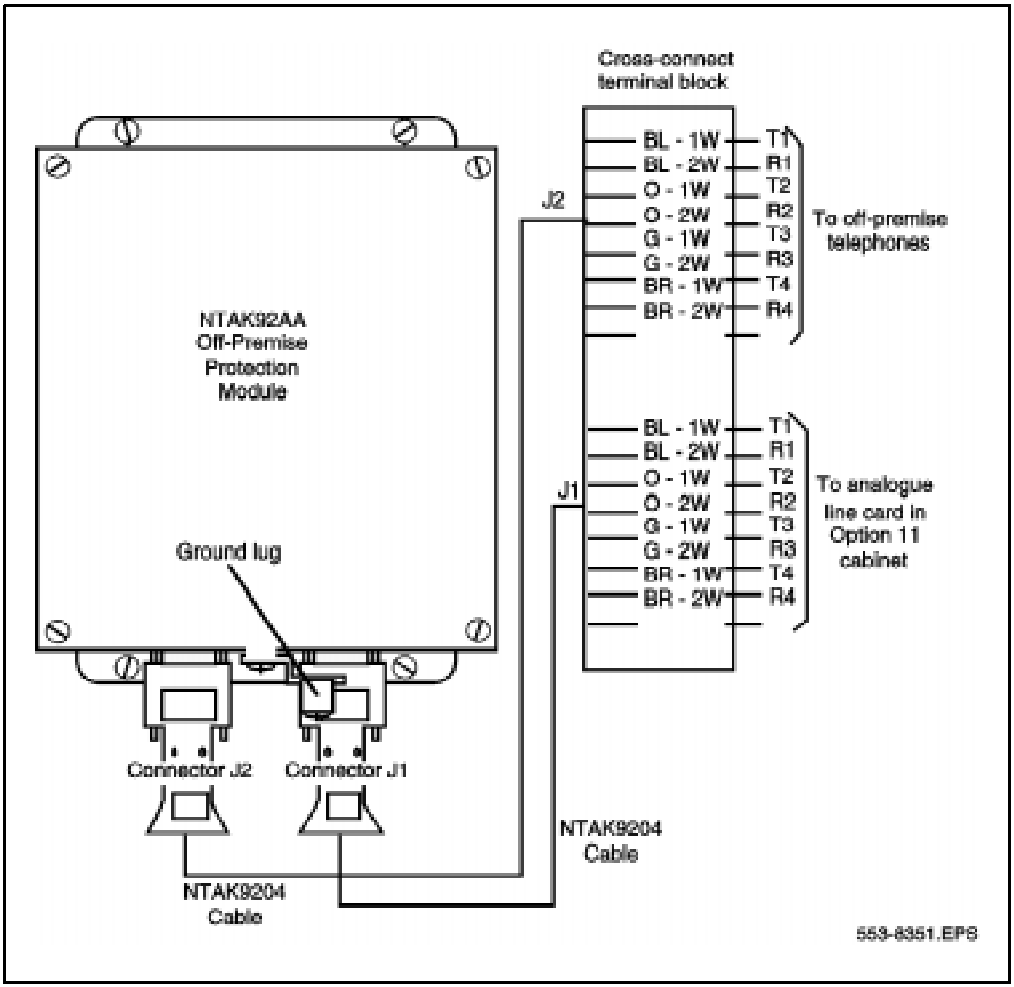
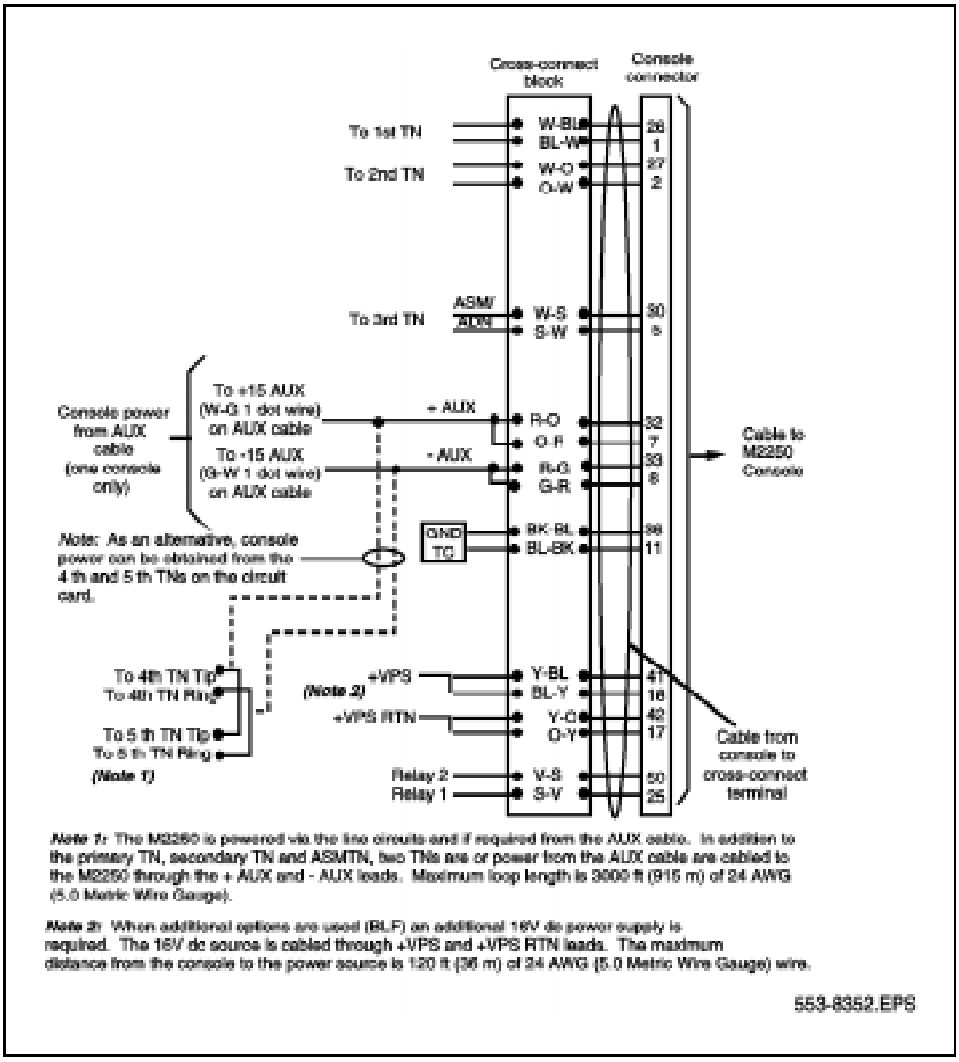


Figure 89
Attendant console connections



Note 1: The M2250 is powered via the line circuits and if required from the AUX cable. In addition to the primary TN, secondary TN and ASMTN, two TNs are or power from the AUX cable are cabled to the M2250 through the + AUX and - AUX leads. Maximum loop length is 3000 ft (915 m) of 24 AWG (5.0 Metric Wire Gauge).

Note 2: When additional options are used (BLF) an additional 16V dc power supply is required. The 16V dc source is cabled through +VPS and +VPS RTN leads. The maximum distance from the console to the power source is 120 ft (36 m) of 24 AWG (5.0 Metric Wire Gauge) wire.

553-8352.EPS

Table 37— Terminal number assignments — Main and Expansion Cabinets 1 and 2

Card	First TN.....Last TN	Cable	Cabinet
1	01 00.....01 15	J1	Main
2	02 00.....02 15	J2	Main
3	03 00.....03 15	J3	Main
4	04 00.....04 15	J4	Main
5	05 00.....05 15	J5	Main
6	06 00.....06 15	J6	Main
7	07 00.....07 15	J7	Main
8	08 00.....08 15	J8	Main
9	09 00.....09 15	J9	Main
10	10 00.....10 15	J10	Main
11	11 00.....11 15	J1	Expansion Cabinet 1
12	12 00.....12 15	J2	Expansion Cabinet 1
13	13 00.....13 15	J3	Expansion Cabinet 1
14	14 00.....14 15	J4	Expansion Cabinet 1
15	15 00.....15 15	J5	Expansion Cabinet 1
16	16 00.....16 15	J6	Expansion Cabinet 1
17	17 00.....17 15	J7	Expansion Cabinet 1
18	18 00.....18 15	J8	Expansion Cabinet 1
19	19 00.....19 15	J9	Expansion Cabinet 1
20	20 00.....20 15	J10	Expansion Cabinet 1
21	21 00.....21 15	J1	Expansion Cabinet 2
22	22 00.....22 15	J2	Expansion Cabinet 2
23	23 00.....23 15	J3	Expansion Cabinet 2
24	24 00.....24 15	J4	Expansion Cabinet 2
25	25 00.....25 15	J5	Expansion Cabinet 2
26	26 00.....26 15	J6	Expansion Cabinet 2
27	27 00.....27 15	J7	Expansion Cabinet 2
28	28 00.....28 15	J8	Expansion Cabinet 2
29	29 00.....29 15	J9	Expansion Cabinet 2
30	30 00.....30 15	J10	Expansion Cabinet 2

Table 38— Terminal number assignments — Expansion Cabinets 3 and 4

Card	First TN.....Last TN	Cable	Cabinet
31	31 00.....31 15	J1	Expansion Cabinet 3
32	32 00.....32 15	J2	Expansion Cabinet 3
33	33 00.....33 15	J3	Expansion Cabinet 3
34	34 00.....34 15	J4	Expansion Cabinet 3
35	35 00.....35 15	J5	Expansion Cabinet 3
36	36 00.....36 15	J6	Expansion Cabinet 3
37	37 00.....37 15	J7	Expansion Cabinet 3
38	38 00.....38 15	J8	Expansion Cabinet 3
39	39 00.....39 15	J9	Expansion Cabinet 3
40	40 00.....40 15	J10	Expansion Cabinet 3
41	41 00.....41 15	J1	Expansion Cabinet 4
42	42 00.....42 15	J2	Expansion Cabinet 4
43	43 00.....43 15	J3	Expansion Cabinet 4
44	44 00.....44 15	J4	Expansion Cabinet 4
45	45 00.....45 15	J5	Expansion Cabinet 4
46	46 00.....46 15	J6	Expansion Cabinet 4
47	47 00.....47 15	J7	Expansion Cabinet 4
48	48 00.....48 15	J8	Expansion Cabinet 4
49	49 00.....49 15	J9	Expansion Cabinet 4
50	50 00.....50 15	J10	Expansion Cabinet 4

Table 39
Power fail transfer unit connections

QUA6 J1 Cable			
Function	**Pair**	**Color**	**Connects to**
PFT 1	5T 5R	W-S S-W	Connect to the telephone
	6T 6R	R-BL BL-R	Connect to the telephone line card
	7T 7R	R-O O-R	Connect to the central office trunk
	8T 8R	R-G G-R	Connect to the trunk line card
PFT 2	9T 9R	R-BR BR-R	Connect to the telephone
	10T 10R	R-S S-R	Connect to the telephone line card
	11T 11R	BK-BL BL-BK	Connect to the central office trunk
	12T 12R	BK-O O-BK	Connect to the trunk line card
PFT 3	13T 13R	BK-G G-BK	Connect to the telephone
	14T 14R	BK-BR BR-BK	Connect to the telephone line card
	15T 15R	BK-S S-BK	Connect to the central office trunk
	16T 16R	Y-BL BL-Y	Connect to the trunk line card

Figure 90
Power fail transfer unit connections (Continued)

QUA6 J1 Cable			
Function	**Pair**	**Color**	**Connects to**
PFT 4	17T 17R	Y-O O-Y	Connect to the telephone
	18T 18R	Y-G G-Y	Connect to the telephone line card
	19T 19R	Y-BR BR-Y	Connect to the central office trunk
	20T 20R	Y-S S-Y	Connect to the trunk line card
PFT 5	21T 21R	V-BL BL-V	Connect to the telephone
	22T 22R	V-O O-V	Connect to the telephone line card
	23T 23R	V-G G-V	Connect to the central office trunk
	24T 24R	V-BR BR-V	Connect to the trunk line card

Table 40
Cable Pair Color Combinations

Color	W-Bl Bl-W	W-O O-W	W-G G-W	W-BR BR-W	W-S S-W	R-BL BL-R	R-O O-R	R-G G-R
Unit	0	1	2	3	4	5	6	7
Color	R-BR BR-R	R-S S-R	BK-BL BL-BK	BK-O O-BK	BK-G G-BK	BK-BR BR-BK	BK-S S-BK	Y-B B-Y
Unit	8	9	10	11	12	12	14	15

Table 41
Main Cabinet Default DN assignments

Cable	Unit	Default Directory Number (DN)							
J1	**0 - 7**	2200	2201	2202	2203	2204	2205	2206	2207
J1	**8 - 15**	2208	2209	2210	2211	2212	2213	2214	2215
J2	**0 - 7**	2216	2217	2218	2219	2220	2221	2222	2223
J2	**8 - 15**	2224	2225	2226	2227	2228	2229	2230	2231
J3	**0 - 7**	2232	2233	2234	2235	2236	2237	2238	2239
J3	**8 - 15**	2240	2241	2242	2243	2244	2245	2246	2247
J4	**0 - 7**	2248	2249	2250	2251	2252	2253	2254	2255
J4	**8 - 15**	2256	2257	2258	2259	2260	2261	2262	2263
J5	**0 - 7**	2264	2265	2266	2267	2268	2269	2270	2271
J5	**8 - 15**	2272	2273	2274	2275	2276	2277	2278	2279
J6	**0 - 7**	2280	2281	2282	2283	2284	2285	2286	2287
J6	**8 - 15**	2288	2289	2290	2291	2292	2293	2294	2295
J7	**0 - 7**	2296	2297	2298	2299	2300	2301	2302	2303
J7	**8 - 15**	2304	2305	2306	2307	2308	2309	2310	2311
J8	**0 - 7**	2312	2313	2314	2315	2316	2317	2318	2319
J8	**8 - 15**	2320	2321	2322	2323	2324	2325	2326	2327
J9	**0 - 7**	2328	2329	2330	2331	2332	2333	2334	2335
J9	**8 - 15**	2336	2337	2338	2339	2340	2341	2342	2343
J10	**0 - 7**	2344	2345	2346	2347	2348	2349	2350	2351
J10	**8 - 15**	2352	2353	2354	2355	2356	2357	2358	2359

Table 42
Expansion Cabinet 1 Default DN assignments

Cable	Unit	Default Directory Number (DN)							
J1	**0 - 7**	2360	2361	2362	2363	2364	2365	2366	2367
J1	**8 - 15**	2368	2369	2370	2371	2372	2373	2374	2375
J2	**0 - 7**	2376	2377	2378	2379	2380	2381	2382	2383
J2	**8 - 15**	2384	2385	2386	2387	2388	2389	2390	2391
J3	**0 - 7**	2392	2393	2394	2395	2396	2397	2398	2399
J3	**8 - 15**	2400	2401	2402	2403	2404	2405	2406	2407
J4	**0 - 7**	2408	2409	2410	2411	2412	2413	2414	2415
J4	**8 - 15**	2416	2417	2418	2419	2420	2421	2422	2423
J5	**0 - 7**	2424	2425	2426	2427	2428	2429	2430	2431
J5	**8 - 15**	2432	2433	2434	2435	2436	2437	2438	2439
J6	**0 - 7**	2440	2441	2442	2443	2444	2445	2446	2447
J6	**8 - 15**	2448	2449	2450	2451	2452	2453	2454	2455
J7	**0 - 7**	2456	2457	2458	2459	2460	2461	2462	2463
J7	**8 - 15**	2464	2465	2466	2467	2468	2469	2470	2471
J8	**0 - 7**	2472	2473	2474	2475	2476	2477	2478	2479
J8	**8 - 15**	2480	2481	2482	2483	2484	2485	2486	2487
J9	**0 - 7**	2488	2489	2490	2491	2492	2493	2494	2495
J9	**8 - 15**	2496	2497	2498	2499	2500	2501	2502	2503
J10	**0 - 7**	2504	2505	2506	2507	2508	2509	2510	2511
J10	**8 - 15**	2512	2513	2514	2515	2516	2517	2518	2519

Table 43
Expansion Cabinet 2 Default DN assignments

Cable	Unit	Default Directory Number (DN)							
J1	**0 - 7**	2520	2521	2522	2523	2524	2525	2526	2527
J1	**8 - 15**	2528	2529	2530	2531	2532	2533	2534	2535
J2	**0 - 7**	2536	2537	2538	2539	2540	2541	2542	2543
J2	**8 - 15**	2544	2545	2546	2547	2548	2549	2552	2551
J3	**0 - 7**	2552	2553	2554	2555	2556	2557	2558	2559
J3	**8 - 15**	2560	2561	2562	2563	2564	2565	2566	2567
J4	**0 - 7**	2568	2569	2570	2571	2572	2573	2574	2575
J4	**8 - 15**	2576	2577	2578	2579	2580	2581	2582	2583
J5	**0 - 7**	2584	2585	2586	2587	2588	2589	2590	2591
J5	**8 - 15**	2592	2593	2594	2595	2596	2597	2598	2599
J6	**0 - 7**	2600	2601	2602	2603	2604	2605	2606	2607
J6	**8 - 15**	2608	2609	2610	2611	2612	2613	2614	2615
J7	**0 - 7**	2616	2617	2618	2619	2620	2621	2622	2623
J7	**8 - 15**	2624	2625	2626	2627	2628	2629	2630	2631
J8	**0 - 7**	2632	2633	2634	2635	2636	2637	2638	2639
J8	**8 - 15**	2640	2641	2642	2643	2644	2645	2646	2647
J9	**0 - 7**	2648	2649	2650	2651	2652	2653	2654	2655
J9	**8 - 15**	2656	2657	2658	2659	2660	2661	2662	2663
J10	**0 - 7**	2664	2665	2666	2667	2668	2669	2670	2671
J10	**8 - 15**	2672	2673	2674	2675	2676	2677	2678	2679

Table 44
Expansion Cabinet 3 Default DN assignments

Cable	Unit	Default Directory Number (DN)							
J1	**0 - 7**	2680	2681	2682	2683	2684	2685	2686	2687
J1	**8 - 15**	2688	2689	2690	2691	2692	2693	2694	2695
J2	**0 - 7**	2696	2697	2698	2699	2700	2701	2702	2703
J2	**8 - 15**	2704	2705	2706	2707	2708	2709	2710	2711
J3	**0 - 7**	2712	2713	2714	2715	2716	2717	2718	2719
J3	**8 - 15**	2720	2721	2722	2723	2724	2725	2726	2727
J4	**0 - 7**	2728	2729	2730	2731	2732	2733	2734	2735
J4	**8 - 15**	2736	2737	2738	2739	2740	2741	2742	2743
J5	**0 - 7**	2744	2745	2746	2747	2748	2749	2750	2751
J5	**8 - 15**	2752	2753	2754	2755	2756	2757	2758	2759
J6	**0 - 7**	2760	2761	2762	2763	2764	2765	2766	2767
J6	**8 - 15**	2768	2769	2770	2771	2772	2773	2774	2775
J7	**0 - 7**	2776	2777	2778	2779	2780	2781	2782	2783
J7	**8 - 15**	2784	2785	2786	2787	2788	2789	2790	2791
J8	**0 - 7**	2792	2793	2794	2795	2796	2797	2798	2799
J8	**8 - 15**	2800	2801	2802	2803	2804	2805	2806	2807
J9	**0 - 7**	2808	2809	2810	2811	2812	2813	2814	2815
J9	**8 - 15**	2816	2817	2818	2819	2820	2821	2822	2823
J10	**0 - 7**	2824	2825	2826	2827	2828	2829	2830	2831
J10	**8 - 15**	2832	2833	2834	2835	2836	2837	2838	2839

Table 45
Expansion Cabinet 4 Default DN assignments

Cable	Unit	Default Directory Number (DN)							
J1	**0 - 7**	2840	2841	2842	2843	2844	2845	2846	2847
J1	**8 - 15**	2848	2849	2850	2851	2852	2853	2854	2855
J2	**0 - 7**	2856	2857	2858	2859	2860	2861	2862	2863
J2	**8 - 15**	2864	2865	2866	2867	2868	2869	2870	2871
J3	**0 - 7**	2872	2873	2874	2875	2876	2877	2878	2879
J3	**8 - 15**	2880	2881	2882	2883	2884	2885	2886	2887
J4	**0 - 7**	2888	2889	2890	2891	2892	2893	2894	2895
J4	**8 - 15**	2896	2897	2898	2899	2900	2901	2902	2903
J5	**0 - 7**	2904	2905	2906	2907	2908	2909	2910	2911
J5	**8 - 15**	2912	2913	2914	2915	2916	2917	2918	2919
J6	**0 - 7**	2920	2921	2922	2923	2924	2925	2926	2927
J6	**8 - 15**	2928	2929	2930	2931	2932	2933	2934	2935
J7	**0 - 7**	2936	2937	2938	2939	2940	2941	2942	2943
J7	**8 - 15**	2944	2945	2946	2947	2948	2949	2950	2951
J8	**0 - 7**	2952	2953	2954	2955	2956	2957	2958	2959
J8	**8 - 15**	2960	2961	2962	2963	2964	2965	2966	2967
J9	**0 - 7**	2968	2969	2970	2971	2972	2973	2974	2975
J9	**8 - 15**	2976	2977	2978	2979	2980	2981	2982	2983
J10	**0 - 7**	2984	2985	2986	2987	2988	2989	2990	2991
J10	**8 - 15**	2992	2993	2994	2995	2996	2997	2998	2999

Cross-connecting terminal Digital Subscriber Loops

Refer to 553-3011-311, *ISDN BRI Administration and Maintenance Guide*, for a complete description of terminal Digital Subscriber Loops (DSL) cross-connecting and installation.

Activating telephones

Activating telephones is straightforward. You activate each telephone by carrying out a procedure on the telephone itself. The software feature used to activate telephone sets is called "Automatic Set Configuration."

> ***Note:*** The data feature cannot be activated using the procedures in this chapter. If you want to program a telephone with the data feature, you must manually program it in LD 11 with Data class of service as described in the *X11 Software guides*.

Procedures for activating the following models of telephones are outlined:

- a default model with default extension number
- a customized model with a customized extension number.

These procedures are presented for telephones with and without character displays.

Telephone tones

There are a number of different telephone tones. The following table includes tones that you will hear during telephone activation:

Table 46
Telephone tones

Dial tone	A continuous tone.
Special dial tone	Three beeps followed by continuous dial tone.
Overflow tone	Like a busy tone, except faster and higher.
Relocation tone	A short high-pitched beep lasting for 4 seconds, followed by silence.

Note 1: Before activating a telephone, make sure that you have decided on its final location and are aware of the model number assigned to it and if it is to be customized.

Note 2: When activating Meridian Digital telephones, remember that they differ from the older Meridian Modular telephones. Meridian Modular telephones are allowed a combined total of 128 model telephones, whereas Meridian Digital telephones are allowed 128 models for each type of telephone. When you activate a Meridian Digital telephone, you must select the model associated with that telephone type or the telephone will not work.

Activating a default model with a character display

Procedure 35
Activating the telephone

1 **Plug the telephone set into the jack and wait 20 seconds before picking up the handset. If you do not receive a dial tone, replace the handset and wait another 10 seconds before going off-hook again. Repeat this procedure until dial tone is received.**

If successful, the character display shows either “MODEL? X” (if the telephone relocation feature is **not** in use) or “RELOC OR MODEL? X” (if the telephone relocation feature **is** in use). “X” represents the default model for the telephone that you are activating.

Note: If you do not see the prompt “MODEL X” after lifting the handset, disconnect the telephone from the wall jack, wait five seconds, and re-insert the telephone into the jack. The telephone now shows “MODEL X” when you lift the handset.

Note: The 20 second time interval is required for the system to determine whether the set is new or if it is being relocated using the Modular Telephone Relocation feature.

2 **Press the pound key (#) to select the default model.**

The character display shows “OK, EXTENSION? XXXX”. “XXXX” represents the default extension number for this telephone type.

3 Press the pound key again to select the default extension number.

You hear the relocation tone. The character display, shows “OK”.

OR

If the extension number is already in use by another telephone, you hear the special dial tone. If the telephone has a display it shows “MULTI-LINE, EXTENSION?”.

To accept the default extension number press the pound key.

To select a new extension number, manually enter an extension number and press the pound key.

OR

If the extension number is not available for use, the character display shows “ERROR, EXTENSION?“ and you hear overflow tone.

This happens when you choose an extension number manually or when extension numbers are entered for additional keys. A default extension number will not be offered if it is not available.

Step 3 must be repeated and you must manually enter a new extension number.

Note 3: If other keys require secondary extension numbers, you are prompted until you enter all of the required extension numbers for the model.

Note 4: These extension numbers cannot be defaulted. The text display prompting for further extension numbers is “KEY kk EXT?” where “kk” represents the key number requiring the extension number.

Note 5: Each prompt for another extension number is accompanied by special dial tone. When you are programming an extension number, the lamp associated with that number on the telephone is lit.

4 Hang up the telephone receiver.

After approximately 10 seconds, the telephone is configured.

Note: If you replace the handset before completing the prompt sequence, the installation will automatically fail. This can be useful if you make an error and want to restart the procedure.

End of Procedure

Activating a default model without a character display

Procedure 36
Activating the telephone

1 **Plug the telephone set into the jack and wait 20 seconds before picking up the handset. If you do not receive dial tone, replace the handset and wait another 10 seconds before going off-hook again. Repeat this procedure until dial tone is received.**

Note: The 20 second time interval is required for the system to determine whether the set is new or if it is being relocated using the Modular Telephone Relocation feature.

2 **Press the pound key (#) to select the default model.**

3 **Press the pound key again to select the default extension number.**

You hear a short, high-pitched beep lasting four seconds followed by silence (relocation tone).

Note: If the extension number is already in use by another telephone, you hear three beeps followed by continuous dial tone (special dial tone).

To accept the default extension number press the pound key.

To select a new extension number, manually enter an extension number and press the pound key.

If the extension number is not available for use, you hear a fast, high-pitched broken tone (overflow tone). (This happens when you choose an extension number manually or when extension numbers are entered for additional keys. A default extension number will not be offered if it is not available). Step 3 must be repeated and you must manually enter a new extension number.

Note: If other keys require secondary extension numbers, you are prompted until you enter all of the required extension numbers for the model. These extension numbers cannot be defaulted. You are prompted for each additional extension number with three beeps followed by continuous dial tone (special dial tone). When you are programming an extension number, the lamp associated with that number on the telephone is lit.

End of Procedure

Activating a customized model with a character display

Table 47
Activating a customized telephone

1 **Plug the telephone set into the jack and wait 20 seconds before picking up the handset. If you do not receive dial tone, replace the handset and wait another 10 seconds before going off-hook again. Repeat this procedure until dial tone is received.**

If successful, the character display shows either "MODEL? X" (if the telephone relocation feature is **not** in use) or "RELOC OR MODEL? X" (if the telephone relocation feature **is** in use). "X" represents the default model for the telephone that you are activating.

Note 1: If you do not see the prompt "MODEL X" after lifting the handset, disconnect the telephone from the wall jack, wait five seconds, and re-insert the telephone into the jack. The telephone now shows "MODEL X" when you lift the handset.

Note 2: The 20 second time interval is required for the system to determine whether the set is new or if it is being relocated using the Modular Telephone Relocation feature.

2 **Press the digits associated with the customized model and press the pound key (#).**

Dial tone disappears after the first digit is pressed and you hear special dial tone after you press the pound key. If you enter a valid model number the character display reads "OK, EXTENSION?". If you enter an invalid model, the previous prompt is reissued and you hear overflow tone.

3 Enter the customized extension number and press the pound key.

You hear relocation tone. The character display shows “OK”.

OR

If the extension number is already in use by another telephone, you hear special dial tone again. The character display shows “MULTI-LINE, EXTENSION?”.

OR

If the extension number is not available for use, you hear overflow tone. The character display shows “ERROR, EXTENSION?” and you must repeat this step.

Note: If other keys require secondary extension numbers, you are prompted until you enter all of the required extension numbers for the model. These extension numbers cannot be defaulted. The text display prompting for further extension numbers is “KEY kk EXT?” where “kk” represents the key number requiring the extension number. Each prompt for another extension number is accompanied by special dial tone. When you are programming an extension number, the lamp associated with that number on the telephone is lit.

4 Hang up the telephone handset.

After approximately 10 seconds, the telephone is configured.

Note: If you replace the handset before you complete the prompt sequence, the installation will automatically fail. This can be useful if you make an error and want to restart the procedure.

End of Procedure

Activating a customized model without a character display

Procedure 37
Activating a customized telephone

1 **Plug the telephone set into the jack and wait 20 seconds before picking up the handset. If you do not receive dial tone, replace the handset and wait another 10 seconds before going off-hook again. Repeat this procedure until dial tone is received.**

Note: The 20 second time interval is required for the system to determine whether the set is new or if it is being relocated using the Modular Telephone Relocation feature.

2 **Press the digits associated with the customized model and press the pound key (#).**

Dial tone disappears after the first digit is pressed, and you hear three beeps followed by continuous dial tone (special dial tone) after you press the pound key.

3 **Enter the customized extension number and press the pound key.**

You hear a short high-pitched beep lasting four seconds, followed by silence (relocation tone).

If the extension number is already in use by another telephone, you hear special dial tone again.

If the extension number is not available for use, you hear a fast, high-pitched broken tone (overflow tone), and you must repeat this step.

4 **Hang up the telephone handset.**

After approximately 10 seconds, the telephone is configured.

Note: If other keys require secondary extension numbers, you are prompted until you enter all of the required extension numbers for the model. These extension numbers cannot be defaulted. You are prompted for each additional extension number with three beeps followed by continuous dial tone (special dial tone). When you are programming an extension number, the lamp associated with that number on the telephone is lit.

End of Procedure

Activating terminals on a DSL

Refer to NTP 553-3011-311, *ISDN BRI Administration and Maintenance Guide*, for information about activating and initializing the various terminals that can be connected to a terminal DSL.

Chapter 20 – Connecting the trunks

General information

This Chapter describes how to connect trunks directly to the trunk card, with or without the use of a Power Fail Transfer Unit (PFTU).

> ***Note:*** The QUA6 Power Fail Transfer Unit operates with loop-start and ground-start CO trunks. However, with ground-start trunks the associated telephone set must be equipped with a ground-start button.

On the Option 11C during the initial software installation, the installer has the option of loading a default database containing pre-programmed trunk data into software. If necessary, the default data can be modified at any time to meet the specific needs of a customer. For a complete description of how to modify pre-programmed trunking data, refer to “Chapter 23 – Changing pre-programmed data” on page 357 in this Guide.

WARNING

Always use caution when installing or modifying telephone lines. Avoid installing telephone wiring during a lightning storm. Do not install telephone jacks in wet locations unless the jack is specifically designed for wet locations. Never touch uninsulated telephone wiring unless the line has been disconnected at the network interface.

Connecting trunks without PFTU

Procedure 38
Connecting trunks without PFTU

1 **From the assignment record, determine the location of the trunk connection and its associated Terminal Number (TN) at the cross-connect terminal.**

2 **With cross-connecting wire, connect the trunk to the TN.**

Make sure that the wiring is not reversed and is on the proper terminals.

The connections for trunks are listed in Table 48 on page 289, Table 49 on page 290 and Table 50 on page 291.

End of Procedure

Connecting trunks with PFTU

Procedure 39
Connecting trunks with PFTU

1 **Locate the PFTU terminal blocks at the cross-connect terminal.**

2 **Cross-connect the first pair of the assigned PFT to the telephone.**

Refer to Table 38 on page 270 for PFTU connections.

3 **Cross-connect the second pair of the PFT to the TN assigned to the telephone.**

4 **Cross-connect the third pair of the PFT to the central office trunk.**

5 **Cross-connect the third pair of the PFT to the TN assigned to the trunk.**

6 **Repeat for each trunk assigned to the PFTU.**

End of Procedure

NT8D14 Universal trunk card

The universal trunk card provides eight analog trunks which can function in the modes shown in Table 48 on page 289.

Table 48
NT8D14 Universal trunk — modes and option settings

Modes	Location	Jumper strap
Central (CO)	J1, J2	OFF
2- way tie trunk (loop Dial Repeat)	J1, J2	OFF
2 - way tie trunk (Outgoing Incoming Dial)	J1, J2	OFF
Recorded Announcement (RAN)	J1, J2	OFF
Paging trunk	J1, J2	OFF
Japan CO/DID operation	J1, J2	OFF
DID operation Loop length>2000 ¾	J1, J2	ON
DID operation Loop length <2000¾	J1, J2	OFF
Note: OFF indicates no strap present. J1 and J2 locations apply to all eight trunks.		

Refer to Table 49 on page 290 for the connections to the NT8D14 universal trunk at the cross-connect terminal.

Table 49
NT8D14 Universal trunk connections

Cable from cabinet			RAN mode	Paging mode	All other modes
Pair	**Color**		**Designations**		
1T 1R	W-BL BL-W	Unit 0	T0 R0	T0 R0	T0 R0
2T 2R	W-O O-W		CP MB	A PG	
3T 3R	W-G G-W	Unit 1	T1 R1	T1 R1	T1 R1
4T 4R	W-BR BR-W		CP MB	A PG	
5T 5R	W-S S-W	Unit 2	T2 R2	T2 R2	T2 R2
6T 6R	R-BL BL-R		CP MB	A PG	
7T 7R	R-O O-R	Unit 3	T3 R3	T3 R3	T3 R3
8T 8R	R-G G-R		CP MB	A PG	
9T 9R	R-BR BR-R	Unit 4	T4 R4	T4 R4	T4 R4
10T 10R	R-S S-R		CP MB	A PG	
11T 11R	BK-BL BL-BK	Unit 5	T5 R5	T5 R5	T5 R5
12T 12R	BK-O O-BK		CP MB	A PG	
13T 13R	BK-G G-BK	Unit 6	T6 R6	T6 R6	T6 R6
14T 14R	BK-BR BR-BK		CP MB	A PG	
15T 15R	BK-S S-BK	Unit 7	T7 R7	T7 R7	T7 R7
16T 16R	Y-BL BL-Y		CP MB	A PG	
Note: Remaining pairs are spare					

NT8D15 E&M Trunk card

Table 50
NT8D15 E&M Trunk card

Cables J1 through J10 from cabinet			2W Paging mode	2W Type 1 mode	4W Type 1 mode	4W Type 2 mode
Pair	**Color**		**Designations**			
1T 1R	W-BL BL-W	Unit 0	T0 R0	T0 R0	TA TB	TA TB
2T 2R	W-O O-W				RA RB	RA RB
3T 3R	W-G G-W			E M	E M	EA EB
4T 4R	W-BR BR-W		A PG		ESC ESCG	MA MB
5T 5R	W-S S-W	Unit 1	T1 R1	T1 R1	TA TB	TA TB
6T 6R	R-BL BL-R				RA RB	RA RB
7T 7R	R-O O-R			E M	E M	EA EB
8T 8R	R-G G-R		A PG		ESC ESCG	MA MB
9T 9R	R-BR BR-R	Unit 2	T2 R2	T2 R2	TA TB	TA TB
10T 10R	R-S S-R				RA RB	RA RB
11T 11R	BK-BL BL-BK			E M	E M	EA EB
12T 12R	BK-O O-BK		A PG		ESC ESCG	MA MB
13T 13R	BK-G G-BK	Unit 3	T3 R3	T3 R3	TA TB	TA TB
14T 14R	BK-BR BR-BK				RA RB	RA RB
15T 15R	BK-S S-BK			E M	E M	EA EB
16T 16R	Y-BL BL-Y		A PG		ESC ESCG	MA MB

Note: A and B are the transmit and receive pairs, where:
TA = Transmit Tip, and RA = Receive Tip
TB = Transmit Ring, and RB = Receive Ring

NT6D70 SILC and NT6D71 UILC cards

Refer to NTP 553-3011-311, *ISDN BRI Administration and Maintenance Guide,* for a complete description of trunk DSL installation and connections.

Activating a default model trunk

Due to the automatic thirty second time-out on the administration menu, be sure that you have prepared the data that you want to input before you begin. To determine corresponding TNs and trunks, check the location of trunk cards in the cabinet or use LD 32.

Procedure 40
Activating a default model trunk

1 **Pick up the handset of the administration telephone.**

2 **Enter the Option 11 administration Flexible Feature Code to access the administration menu.**

The prompt “PASSWORD?” appears.

3 **Enter the default administration telephone password.**

You hear special dial tone and the prompt
“TASK?”
appears in the top line of the character display.

The second line of the display reads “1 ADD TRUNK”.

4 **Select “1 ADD TRUNK” by entering the number “1”.**

The prompt “ROUTE ACCESS?” appears on the character display.

5 **Enter the access code of the route to which you want to add a trunk and press the pound key (#).**

The prompt
“TN?”
asks you to enter a TN (Terminal Number) from one of the installed trunk cards.

If you do not enter a valid route number, “TN?” does not appear and the screen remains the same. If the type of trunk card does not match the route, the prompt “ROUTE ACCESS?” appears again, and you hear overflow tone.

6 Enter the TN in Option 11 format (CCUU) and press the pound key.

The prompt
"MODEL"
appears. If you enter an invalid TN, the display shows "INVALID, TN?" and you must enter a new TN using the Option 11 format.

7 Press the digits to select a trunk model (as assigned in LD 16).

The character display shows
"OK".
After a delay of approximately 4 seconds you hear special dial tone. The sequence is repeated when the prompt
"TN?"
appears on the character display.
The next valid trunk TN is automatically incremented after each trunk is activated.

8 Terminate the sequence by hanging up the telephone receiver.

OR

Repeat the sequence by going through the steps again.

By entering "#" when the procedure repeats, you accept the next TN and are prompted for the model type.

By entering "#" again, you accept the previously accepted model.

Note: The model chosen during the first trunk activation sequence will be the default model for all subsequent trunks until you hang up the telephone or manually enter a new trunk model number.

End of Procedure

Activating a selected model trunk

Due to the automatic thirty second time-out on the administration menu, be sure that you have prepared the data that you want to input before you begin. To determine corresponding TNs and trunks, check the location of trunk cards in the cabinet or use LD 32.

Procedure 41
Activating a selected model trunk

1 **Pick up the handset of the administration telephone.**

2 **Enter the administration Flexible Feature Code to access the administration menu.**

3 **Enter the default administration telephone password.**

You hear special dial tone and the prompt “TASK?” appears on the top line of the character display. The second line of the character display reads “1 ADD TRUNK”.

4 **Select “1 ADD TRUNK” by entering the number “1”.**

The prompt
“ROUTE ACCESS?”
appears.

5 **Enter the access code of the configured trunk route to which you want to add the trunk and press the pound key (#).**

The prompt
“TN?”
asks you to enter a TN from one of the installed trunk cards. If you do not enter a valid route number, “TN?” does not appear and the screen remains the same. If the card does not match the route, the prompt “ROUTE ACCESS?” appears again, and you hear overflow tone.

6 **Enter the TN in Option 11 format (CCUU).**

The response
“MODEL?”
prompts you to select a model number for the trunk.

7 Enter a trunk model number for the specified TN and route and press the pound key.

The character display shows:

"OK"

After a delay of approximately 4 seconds you hear special dial tone and the sequence is repeated when the following prompt appears on the character display.

"TN?"

8 Hang up or repeat the sequence.

The sequence ends when the last unit in the card is used and the program is complete, or when you hang up the telephone receiver.

Note: The model used for the first trunk activated in the sequence will be the default for all subsequent trunks until the telephone is hung up unless you manually enter a new trunk model number.

End of Procedure

Chapter 21 – Connecting an external alarm

General information

There are two methods of connecting an external alarm to the system:

- through an alarm port assigned in software
- through contacts in a QUA6 Power Fail Transfer Unit (PFTU).

Alarm port assigned in software

The system can be equipped with an alarm port using an analog line connected to an Analog (2500/500)-type telephone or other similar type of ringing or alerting device.

The alarm will operate when a BSD090 message indicates a power fault in the system. Information about BSD090 messages is contained in the *X11 Software Guides*.

Procedure 42
Installing an alarm using an alarm port

1 **Install an analog (500/2500)-type line as described in “Chapter 19 – Connecting the telephones” on page 259.**

2 **Install an analog (500/2500)-type telephone or other similar alerting device used as an alarm to the line.**

The set can be typically assigned as a Model 20.

3 Use LD 15 and make the following changes. Only the prompts requiring a response are listed. Press *return* in response to the other prompts.

- Enter CHG in response to the prompt REQ
- Enter CDB in response to the prompt TYPE
- Enter the customer number (0-99) in response to the prompt CUST
- Enter the DN of the line assigned as an alarm port in response to the prompt ALDN.

Note: If the assigned DN is inadvertently called the alarm will activate. To avoid false alarms, make sure that the DN is not consistent with the assigned numbering.

– Press *return* in response to the remaining prompts.

End of Procedure

Alarm through a QUA6 PFTU

A QUA6 PFTU can be used to connect an external alarm through normally open or normally closed contacts of one of its units. The contacts will operate under the same conditions as the PFTU itself, and can support the following capacities:

Table 51
AC and DC capacities

	AC	DC
Maximum switching power	50.0 V A.	30.0 W
Maximum switching voltage	125.0 V rms	150.0 V
Maximum switching current	0.5 A	0.5 A

Figure 91 on page 299 shows an example of the contacts on one unit (PFT1) of the PFTU. The contacts are show in normal operating mode, not in failure mode. Table 52 on page 300 gives the connections for all units on the PFTU.

Figure 91
Contacts in PFTU

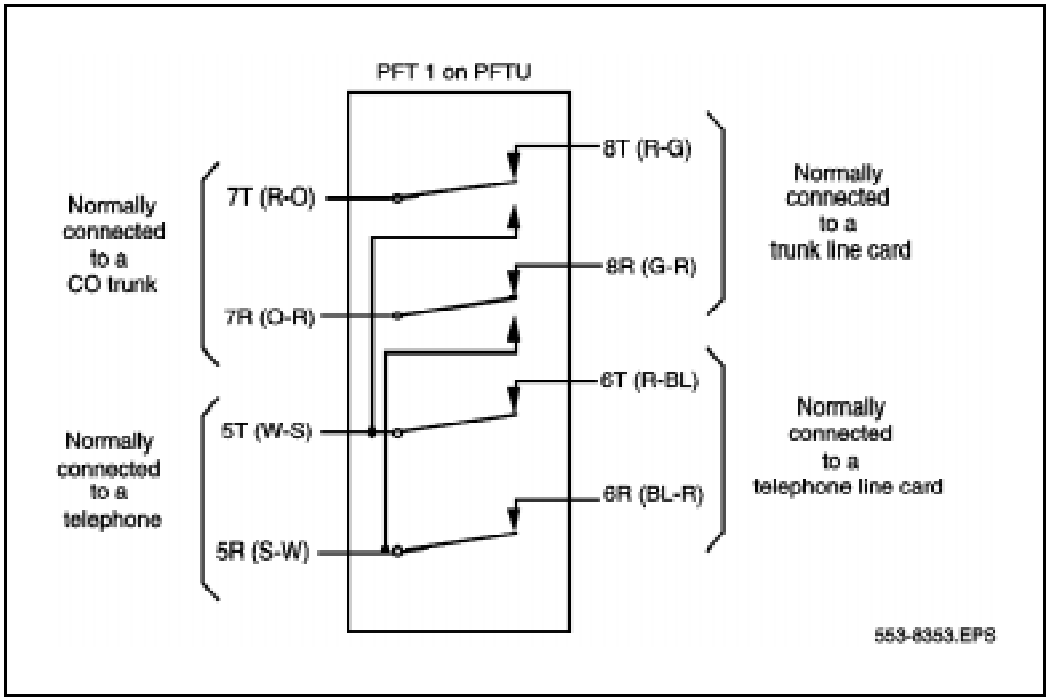


Table 52
Power fail transfer unit connections

Unit	Pair	Color	Normal mode	Failure mode
PFT 1	5T 5R	W-S S-W	Makes with 6T and 6R	Opens 6T and 6R Makes with 7T and 7R
	6T 6R	R-BL BL-R	Makes with 5T and 5R	Open
	7T 7R	R-O O-R	Makes with 8T and 8R	Opens 8T and 8R Makes with 5T and 5R
	8T 8R	R-G G-R	Makes with 7T and 7R	Open
PFT 2	9T 9R	R-BR BR-R	Makes with 10T and 10R	Opens 10T and 10R Makes with 11T and 11R
	10T 10R	R-S S-R	Makes with 9T and 9R	Open
	11T 11R	BK-BL BL-BK	Makes with 12T and 12R	Opens 12T and 12R Makes with 9T and 9R
	12T 12R	BK-O O-BK	Makes with 11T and 11R	Open
PFT 3	13T 13R	BK-G G-BK	Makes with 14T and 14R	Opens 14T and 14R Makes with 15T and 15R
	14T 14R	BK-BR BR-BK	Makes with 13T and 13R	Open
	15T 15R	BK-S S-BK	Makes with 16T and 16R	Opens 16T and 16R Makes with 13T and 13R
	16T 16R	Y-BL BL-Y	Makes with 15T and 15R	Open

—Table continued—

Table 53
Power fail transfer units (continued)

Unit	Pair	Color	Normal mode	Failure mode
PFT 4	17T 17R	Y-O O-Y	Makes with 18T and 18R	Opens 18T and 18R Makes with 19T and 19R
	18T 18R	Y-G G-Y	Makes with 17T and 17R	Open
	19T 19R	Y-BR BR-Y	Makes with 20T and 20R	Opens 20T and 20R Makes with 17T and 17R
	20T 20R	Y-S S-Y	Makes with 19T and 19R	Open
PFT 5	21T 21R	V-BL BL-V	Makes with 22T and 22R	Opens 22T and 22R Makes with 23T and 23R
	22T 22R	V-O O-V	Makes with 21T and 21R	Open
	23T 23R	V-G G-V	Makes with 24T and 24R	Opens 24T and 24R Makes with 21T and 21R
	24T 24R	V-BR BR-V	Makes with 23T and 23R	Open

Chapter 22 – Pre-programmed data

General information

When an Option 11C system is initially installed, customer data must be entered into the overlay programs. Telephones, for example, must be assigned features on their keys to allow them to function properly.

However, the Software Daughterboard can be pre-programmed with the customer data. If you load pre-programmed data into the system during the Installation process, some overlay entries will be automatically configured on the telephones. For example, you can choose a telephone model that has predetermined feature and key assignments and a preassigned class of service. This can be a significant time-saver if you have to program numerous types of telephone models.

Pre-programmed data is not mandatory for software installation. In fact, the Software Daughterboard can be programmed with the minimum number of files to allow the Option 11C to operate.

This chapter contains information on the following:

- Passwords and codes
- the Default numbering plan
- Flexible Feature Codes
- SDI ports
- Trunk routes and models
- and Model telephones.

Passwords and codes

The following table shows each function in the left column and a corresponding password or code on the right.

Table 54
Passwords and codes

Function	Code or extension(s)
TTY password (For access to TTY Option 11C overlays)	0000
Meridian Mail administration password	adminpwd
Administration telephone password	1234
Administration telephone FFC	*41
SPRE code	1
Telephone relocation Flexible Feature Code	*40
Telephone Removal Flexible Feature Code	*42
Telephone relocation password (SCRD)	1234

Default numbering plan

The default numbering plan for Option 11C is based on the following guidelines:

- The default numbering plan uses four digits and starts at 2200.
- The prime extension number (DN) for each telephone is in the range 2200-2XXX. The value of “XXX” varies depending on the number of telephones that you have in the system. Any secondary extension numbers use numbers outside this range. This arrangement allows Option 11 and Meridian Mail to automatically configure telephones and corresponding mailboxes without manual intervention.
- Meridian Mail uses extension 7000 for access, 7001 for Auto Attendant, 7002 for Express Messaging, and 7003 for Prompt Maintenance.
- Meridian Mail Virtual Agents are pre-configured for Card 10 in Unit 0, 1, 2, 8, 9, and 10 of the main cabinet.
- The Central Answering Position has an extension of 7700. This extension can be changed in LD 15.

First digits

The following table shows the default numbering plan for Option 11C:

Table 55
Default numbering plan—First digit

First digit	Pre-programmed use for digit
1	SPRE code
2	Not used
3	Not used
4	Not used
5	Not used
6	Not used
7	COT/TIE/DID/WATS/FEX/RAN/MUS/AWR/Paging Trunk access codes, Meridian Mail queues and attendant DN, Call park DNs
8	Not used
9	Not used
0	Attendant extension

Note: The first number of the default numbering plan is pre-programmed as 2200. The remaining numbers in the default numbering plan are designated in software, but do not become active until they are selected during the telephone activation procedure.

The digit "7" in the default numbering plan is programmed with many system features to assist you in configuring the Option 11C system. If you have the Meridian Mail card option software, it automatically configures user mail boxes to correspond with the 2200 numbering plan. In addition, the pre-programmed Meridian Mail queues in the Meridian Mail software match the default data on the Option 11C system.

Important extension numbers

Table 56
Default numbering plan—important extension numbers

Extension	Use
Attendant extension	0
First number in numbering plan	2200
Night number	7700*
Queue for Central Answering Position	7700 *
General ACD queue	7750 *
Meridian Mail miscellaneous ACD queues:	7000-7009
Meridian Mail extension Auto attendant extension Express messaging Prompt maintenance Miscellaneous queues	7000 7001 7002 7003 7004-7009
Meridian Mail position I.D.	7800-7811
Meridian Mail agent extensions	7830-7841
Call park extensions	7900-7919

***** The thresholds which control the agent AWC keys have been set as follows:

CWTH 1
CWLF 2
CWLW 4.

Extensions assigned to card slots

Table 57
Main cabinet

Slot number	Extension numbers
1	2200 through 2215
2	2216 through 2231
3	2232 through 2247
4	2248 through 2263
5	2264 through 2279
6	2280 through 2295
7	2296 through 2311
8	2312 through 2327
9	2328 through 2343
10	2344 through 2359

Table 58
Expansion cabinet 1

Slot number	Extension Numbers
1	2360 through 2375
2	2376 through 2391
3	2392 through 2407
4	2408 through 2423
5	2424 through 2439
6	2440 through 2455
7	2456 through 2471
8	2472 through 2487
9	2488 through 2503
10	2504 through 2519

Table 59
Expansion cabinet 2

Slot number	Extension Numbers
1	2520 through 2535
2	2536 through 2551
3	2552 through 2567
4	2568 through 2583
5	2584 through 2599
6	2600 through 2615
7	2616 through 2631
8	2632 through 2647
9	2648 through 2663
10	2664 through 2679

Table 60
Expansion cabinet 3

Slot number	Extension Numbers
1	2680 through 2695
2	2696 through 2711
3	2712 through 2727
4	2728 through 2743
5	2744 through 2759
6	2760 through 2775
7	2776 through 2791
8	2792 through 2807
9	2808 through 2823
10	2824 through 2839

Table 61
Expansion cabinet 4

Slot number	Extension Numbers
1	2840 through 2855
2	2856 through 2871
3	2872 through 2887
4	2888 through 2903
5	2904 through 2919
6	2920 through 2935
7	2936 through 2951
8	2952 through 2967
9	2968 through 2983
10	2984 through 2999

Flexible Feature Codes

Flexible Feature Code (FFC) data is used in many administrative procedures. The table below lists the FFCs for the Option 11C system.

Table 62
Flexible Feature Codes

FFC Prompt	FFC	Definition
ASRC	*40	Automatic Set Relocation
AREM	*42	Automatic Set Removal Code
ADMN	*41	Administration Set Access Code
CFWA	#1	Call Forward All Calls Activate
CFWD	#1	Call Forward All Calls Deactivate
C6DS	*70	6 Party Conference Code
HOLD	#4	Permanent Call Hold
MNTC	*43	Maintenance Access Code
PUGR	*71	Pick-up Group Code
RDLN	*72	Last Number Re-dial
RDST	*73	Store Last Number Re-dial
RGAA	*74	Ring Again Activate
RGAD	*75	Ring Again Deactivate
RGAV	*77	Ring Again Verify
SPCC	#2/*80	Speed Call Controller Code
SPCU	#3/*81	Speed Call User Code
SSPU	*89	System Speed Call User Code

SDI ports

The minimum system port configuration for Option 11C is 3 SDI ports, all of which can be found on the NTBK45 System Core card.

You can obtain additional ports by installing an NTAK02 SDI/DCH circuit card. The SDI/DCH card has 4 serial I/O ports with three possible configurations:

- 2 asynchronous ESDI ports with 2 DCHI ports
- 2 synchronous ESDI ports, or
- 2 SDI ports.

The default SDI port configuration is shown below. The value for "XX" is set on the faceplate of the CPU/CONF circuit card.

Table 63
Pre-configured SDI ports

TTY Number	Card	Port	Use	Configuration
0	0	0	MTC/SCH/BUG	XX/8/1/NONE
1	0	0	MTC/SCH/BUG	1200/8/1/NONE
2	0	1	MTC/SCH/BUG	1200/8/1/NONE
8	10	0	LSL	1200/8/1/NONE
9	10	1	CMS	4800

Administration and maintenance terminal port

Option 11E has two pre-configured maintenance ports on the NTBK45 System core card: ports 1 and 2.

Modem port

The pre-configured modem port allows the remote maintenance modem to be connected with further system programming. This port is pre-configured as TTY 0 (port 0 on the System core card) and is programmed for Maintenance (MTC), Service Change (SCH) and BUG messages.

Enhanced Serial Data Interface (ESDI) port

Port 9 is pre-programmed as an ESDI port and supports Meridian Mail. It functions as a Command Status Link with the following settings:

ESDI settings

Table 64
ESDI settings

Setting	Code
BPS	4800
CLOK	EXT
IADR	003
RADR	001
T1	10
T2	002
T3	040
N1	128
N2	08
K	7
RXMT	05
CRC	10
ORUR	005
ABOR	005
USER	CMS
ENL	NO

Telephone tones

The telephone tones in North America are as follows:

Dial tone A continuous tone.

Special dial tone Three beeps followed by continuous dial tone.

Overflow tone Like a busy tone, except faster and higher.

Relocation tone A short high-pitched beep lasting for 4 seconds, followed by silence.

Trunk routes

The following table shows pre-programmed trunk route information that you need on hand to activate and modify trunks.

Table 65
Pre-programmed trunk route information

Route	Type	Access Code	Mode	Interface
00 *	COT	7100	IAO	-
01 *	COT	7101	ICT	-
02 *	COT	7102	OGT	-
03	TIE	7103	IAO	-
04	TIE	7104	ICT	-
05	TIE	7105	OGT	-
06	DID	7106	ICT	-
07	WAT	7107	IAO	-
08	WAT	7108	ICT	-
09	WAT	7109	OGT	-
40	MUS	7140	OGT	-
41	AWR	7141	-	AUD
42	RAN	7142	-	DGT
43	RAN	7143	-	AUD
44	PAG	7144	OGT	-
50	FEX	7150	IAO	-
51	FEX	7151	ICT	-
52	FEX	7152	OGT	-

Note: Trunk routes marked with an asterisk (*) are configured support Call Detail Recording (CDR) output. The CDR is pre-configured as follows:

CDR YES

INC YES

OAL YES

AIA YES

Trunk models

Note: All trunks are programmed as immediate start / supervision = yes, with the exception of trunks with an asterisk beside them (*). Trunks marked with an asterisk (*) are set for wink start / supervision = yes.

Table 66
Trunk model information

Mode	Pack	Model	Signaling	DIP or DTN	BIMP and TIMP
COT	XUT	1	GRD	DIP	3COM/600
		2	LOP	DIP	3COM/600
		3	GRD	DTN	3COM/600
		4	LOP	DTN	3COM/600
		5	GRD	DIP	3COM/900
		6	LOP	DIP	3COM/900
		7	GRD	DTN	3COM/900
		8	LOP	DTN	3COM/900
TIE	XUT	1	OAD	DIP	3COM/600
		2	LDR	DIP	3COM/600
		3	OAD	DTN	3COM/600
		4	LDR	DTN	3COM/600
		5	OAD	DIP	3COM/900
		6	LDR	DIP	3COM/900
		7	OAD	DTN	3COM/900
		8	LDR	DIP	3COM/900

—continued—

Table 67
Trunk model information (continued)

Mode	Pack	Model	Signaling	DIP or DTN	BIMP and TIMP
	XEM	16	EAM	DIP	- /600
		17	EM4	DIP	-
		18	EAM	DTN	- / 600
		19	EM4	DIP	-
DID	XUT	1	LDR (Wink Start Supv = Yes	DIP	3COM/600
		2	LDR (Wink Start Supv = Yes	DTN	3COM/600
		3	LDR (Wink Start Supv = Yes	DIP	3COM/900
		4	LDR (Wink Start Supv = Yes	DTN	3COM/900
		5*	LDR (Wink Start Supv = Yes	DIP	3COM/600
		6*	LDR (Wink Start Supv = Yes	DTN	3COM/600
		7*	LDR (Wink Start Supv = Yes	DIP	3COM/900
		8*	LDR (Wink Start Supv = Yes	DTN	3COM/900
WAT	XUT	1	GRD	DIP	3COM/600
		2	LOP	DIP	3COM/600
		3	GRD	DTN	3COM/600
		4	LOP	DTN	3COM/600
		5	GRD	DIP	3COM/900
		6	LOP	DIP	3COM/900

—continued—

Table 68
Trunk model information (continued)

Mode	Pack	Model	Signaling	DIP or DTN	BIMP and TIMP
		7	GRD	DTN	3COM/900
		8	LOP	DTN	3COM/900
MUS	XUT	1			3COM/600
AWR	XUT	1			600/1200
RAN	XUT	1			600/1200
PAG	XUT	1	LDR	DIP	3COM/600
		2	OAD	DIP	3COM/600
		3	LDR	DTN	3COM/600
		4	OAD	DTN	3COM/600
		5	LDR	DIP	3COM/900
		6	OAD	DIP	3COM/900
		7	LDR	DTN	3COM/900
		8	OAD	DTN	3COM/900
	XEM	16	EAM	DIP	-/600
		17	EM4	DIP	-
		18	EAM	DTN	- /600
		19	EM4	DTN	-
FEX	XUT	1	GRD	DIP	3COM/600
		2	LOP	DIP	3COM/600
		3	GRD	DTN	3COM/600
		4	LOP	DTN	3COM/600
		5	GRD	DIP	3COM/900
		6	LOP	DIP	3COM/900
		7	GRD	DTN	3COM/900
		8	LOP	DTN	3COM/900

* These trunks are set for Wink start.

Model telephones

Note: OPS telephones do not have their own telephone models. You can, however, create OPS models in by entering DD in response to the CDEN prompt in LD 10.

With the exception of the administration and CAP model telephones, the models are organized according to software packages, as follows:

Administration telephones

- M2008 - one model
- M2616 - one model

CAP telephones

- M2616 - one model
- M2216 - one model

General Business telephones

- M2000 telephones
  - M2317 - two models
  - M2009 - two models
  - M2112 - two models
  - M3006 - two models
  - M2018 - two models
- Analog (500/2500 type) telephones - seven models
- M2006 - five models
- M2008 - fifteen models
- M2616 - twelve models
- M2216 - two models.

Hotel and Motel telephones

- 500- and 2500-type telephones - one model
- M2006 - two models
- M2008 - two models
- M2616 - one model

Health Care telephones

- M2006 - one model
- M2008 - four models
- M2616 - two models.

This section provides model numbers for each telephone type and tables showing the numbering and placement of the keys and the feature assigned to each key.

Acronyms for Class of Service options are shown in the following tables for each model telephone in this section.

Table 69
Class of service options - analog telephones

Prompt	Meaning
TLD	Toll Denied
HTA	Hunting Allowed
LNA	Last Number Redial Allowed
FNA	Call Forward No Answer Allowed
PUA	Pickup Allowed
XRA	Ring Again Allowed
MWA	Message Waiting Allowed

Table 70
Class of Service options - digital telephones

Prompt	Meaning
TLD	Toll Denied
AAD	Automatic Answerback Denied
ADD	Automatic Digit Display
HTA	Hunting Allowed
LNA	Last Number Redial Allowed
FNA	Call Forward No Answer Allowed
PUA	Pickup Allowed
XRA	Ring Again Allowed
MWA	Message Waiting Allowed

Table 71
Class of Service Options - ACD telephones

Prompt	Meaning
UNR	Unrestricted
AAD	Automatic Answerback Denied
ADD	Automatic Digit Display
HTA	Hunting Allowed
LNA	Last Number Redial Allowed
FND	Call Forward No Answer Allowed
PUD	Pickup Denied
MWA	Message Waiting Allowed

Administration telephones

M2008 model 99

Intended use: Administration (maintenance) telephone

Assigned Class of Service options:
MTA/ADD/LNA/FNA/GPUA/MWA/FBD

Key number position	Feature
7	Blank
6	Message
5	Transfer
4	Speed Call (personnel: 99)
3	Forward
2	Conference
1	DN
0	DN

M2616 model 99

Intended use: Administration (maintenance) telephone

Assigned Class of Service options:
MTA/LNA/FNA/GPUA/MWA/ADD//HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	-
Auto Dial	14	6	Message
Auto Dial	13	5	Transfer
Auto Dial	12	4	Ring Again
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Speed Call (personnel: 99)	8	0	DN

Central Answering Position (CAP) model telephones

M2616 and 2216 CAP telephone model 60

Intended use: Central Answering Position telephone

Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFD/AGN/FBD/SPV

Feature	Key number position	Key number position	Feature
Hot *	15	7	-
Make Set Busy	14	6	DN
Display Waiting Calls	13	5	Park
Auto Dial	12	4	Override
Auto Dial	11	3	Add
Auto Dial	10	2	Consult/Join
Auto Dial	9	1	Extend
Auto Dial	8	0	ACD Queue (7700)

* This key is used as a Hotline to connect to the office paging system. Assign it with the paging route access code and define it when you activate the telephone.

Note: With the M2616 CAP you must use an ACD character display. In the system software, the Extend key is actually called a Transfer key, the Consult/Join key is called a Conference key, and the Add key is called a No Hold Conference key.

General business models

M2000 series telephones

The M2000 series telephones - M2112, M2018, M2317, M2009, and M3000 - are limited to a **combined total** of 128 model telephones. (In other words, there can be no more than a combined total of 128 different models for all the M2000 series telephones.)

It is up to you to make sure that the model associated with the telephone you are activating is pre-defined. You must select the model associated with the telephone or the telephone will not work.

M2317 model 20

Intended use: Two-line general business telephone with display

Assigned Class of Service options: FND/GPUA/LND/MWD/ADD/FBD

Feature	Key number position	Key number position	Feature
-	-	5	Auto Dial
Auto Dial	10	4	Auto Dial
Auto Dial	9	3	Auto Dial
Auto Dial	8	2	Auto Dial
Auto Dial	7	1	DN
Auto Dial	6	0	DN

Default features available using M2317 model 20 softkeys

Key number position	Feature
29	Language
28	Privacy Release
27	Ring Again
26	Transfer
25	Charge Account
24	Calling Party Number
23	Conference
17	Call Park

M2317 model 25

Intended use: Two-line general business telephone with message indication and display

Assigned Class of Service options: FNA/GPUA/LND/MWA/ADD/FBD

Feature	Key number position	Key number position	Feature
-	-	5	Auto Dial
AutoDial	10	4	Auto Dial
Auto Dial	9	3	Auto Dial
Auto Dial	8	2	Auto Dial
Auto Dial	7	1	DN
Auto Dial	6	0	DN

Default features available using M2317 model 25 softkeys

Key number position	Feature
29	Language
28	Privacy Release
27	Ring Again
26	Transfer
25	Charge Account
24	Calling Party Number
23	Conference
20	Message
17	Call Park

M2009 model 21

Intended use: Two-line general business telephone

Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
8	Auto Dial
7	Auto Dial
6	Transfer
5	Ring Again
4	Pick Up
3	Call Forward
2	Conference
1	DN
0	DN

M2009 model 26

Intended use: Two-line general business telephones with message indication

Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
8	Auto Dial
7	Message
6	Transfer
5	Ring Again
4	Pick Up
3	Call Forward
2	Conference
1	DN
0	DN

M2112 model 22

Intended use: Two-line general business telephone

Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Feature	Key number position	Key number position	Feature
-	-	5	Ring Again
Auto Dial	10	4	Pick Up
Auto Dial	9	3	Call Forward
Auto Dial	8	2	Conference
Transfer	7	1	DN
Speed Call	6	0	DN

M2112 model 27

Intended use: Two-line general business telephone with message indication

Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Feature	Key number position	Key number position	Feature
-	-	5	Ring Again
Auto Dial	10	4	Pick Up
Auto Dial	9	3	Call Forward
Message	8	2	Conference
Transfer	7	1	DN
Speed Call	6	0	DN

M2018 model 24

Intended use: Two-line general business telephone

Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Feature	Key number position	Key number position	Feature
Auto Dial	17	8	Auto Dial
Auto Dial	16	7	Auto Dial
Auto Dial	15	6	Transfer
Auto Dial	14	5	Ring Again
Auto Dial	13	4	Pick Up
Auto Dial	12	3	Call Forward
Auto Dial	11	2	Conference
Auto Dial	10	1	DN
Auto Dial	9	0	DN

M2018 model 29

Intended use: Two-line general business telephone with message indication

Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Feature	Key number position	Key number position	Feature
Auto Dial	17	8	Auto Dial
Auto Dial	16	7	Message
Auto Dial	15	6	Transfer
Auto Dial	14	5	Ring Again
Auto Dial	13	4	Pick Up
Auto Dial	12	3	Call Forward
Auto Dial	11	2	Conference
Auto Dial	10	1	DN
Auto Dial	9	0	DN

500- and 2500-type telephones

Note: When you are activating a 500-type telephone, you must use a 2500-type telephone to define the features. Once you have done this, unplug the 2500-type telephone and replace it with the 500-type telephone that you are activating.

500- and 2500-type telephones model 20

Type of telephone: Support staff telephone with toll denied

Intended use: Business telephone

Assigned Class of Service options:
TLD/C6A/CFXD/DTN/FND/GPUA/LNA/XFA/XRA/FBD

500- and 2500-type telephones model 21

Type of telephone: Support staff telephone

Intended use: Business telephone

Assigned Class of Service options:
UNR/C6A/CFXD/DTN/FND/GPUA/LNA/XFA/XRA/FBD

500- and 2500-type telephones model 22

Type of telephone: Support staff telephone with message indication lamp

Intended use: Business telephone

Assigned Class of Service options:
MWA/TLD/C6A/CFXD/DTN/FNA/GPUA/LNA/XFA/XRA/FBD/LPA

500- and 2500-type telephones model 23

Type of telephone: Support staff telephone with message indication lamp

Intended use: Business telephone

Assigned Class of Service options:
MWA/UNR/C6A/CFXD/DTN/FNA/GPUA/LNA/XFA/XRA/FBD/LPA

500- and 2500-type telephones model 24

Type of telephone: Support staff telephone with message indication and no lamp

Intended use: Business telephone

Assigned Class of Service options:
MWA/TLD/C6A/CFXD/DTN/FNA/GPUA/LNA/XFA/XRA/FBD/LPD

500- and 2500-type telephones model 25

Type of telephone: Support staff with message indication and no lamp

Intended use: Business telephone

Assigned Class of Service options:
MWA/UNR/C6A/CFXD/DTN/FNA/GPUA/LNA/XFA/XRA/FBD/LPD

500- and 2500-type telephones model 26

Type of telephone: Courtesy telephone

Intended use: House telephone

Assigned Class of Service options: MNL/TLD

Hotel and Motel telephone models

500- and 2500-type telephones

Note: When you are activating a 500-type telephone, you must use a 2500-type telephone to define the features. Once you have done this, unplug the 2500-type telephone and replace it with the 500-type telephone that you are activating.

500- and 2500-type telephone model 40

Type of telephone: Guest room telephone
Intended use: Guest calls
Assigned Class of Service options: CCSA/MWA/DTN

Health care telephone models

500- and 2500-type telephones

Note: When you are activating a 500-type telephone, you must use a 2500-type telephone to define the features. Once you have done this, unplug the 2500-type telephone and replace it with the 500-type telephone that you are activating.

500- and 2500-type telephone model 50

Type of telephone: Nurses station telephone with speed call
Intended use: Health care telephone
Assigned Class of Service options: FND/LNA/GPUA/MWA/FBD

500- and 2500-type telephone model 51

Type of telephone: Nurses station telephone with message and speed call
Intended use: Health care telephone
Assigned Class of Service options: FNA/LNA/GPUA/MWA/NDD/FBD

500- and 2500-type telephone model 52

Type of telephone: Nurses station telephone with speed call and display
Intended use: Health care telephone
Assigned Class of Service options: FND/LNA/GPUA/MWA/ADD/FBD

500- and 2500-type telephone model 53

Type of telephone: Nurses station set with message, speed call and display
Intended use: Health care telephone
Assigned Class of Service options: FNA/LNA/GPUA/MWA/ADD/FBD

M2006 model 20

Intended use: General business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/FBD/UNR

Key number position	Feature
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 21

Intended use: General business telephone with message indicator
Assigned Class of Service options: FNA/GPUA/LNA/MWA/FBD/UNR

Key number position	Feature
5	Message
4	Transfer
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 22

Intended use: General business telephone with message indication and speed call
Assigned Class of Service options: FNA/GPUA/LNA/MWA/FBD/UNR

Key number position	Feature
5	Message
4	Speed Call
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 23

Intended use: General business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/FBD/TLD

Key number position	Feature
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 24

Intended use: General business telephone with message indicator
Assigned Class of Service options: FNA/GPUA/LNA/MWA/FBD/TLD

Key number position	Feature
5	Message
4	Transfer
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 25

Intended use: General business telephone with message indication and speed call
Assigned Class of Service options: FNA/GPUA/LNA/MWA/FBD/TLD

Key number position	Feature
5	Message
4	Speed Call
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 40

Intended use: Hotel guest room telephone without message indication
Assigned Class of Service options: CCSA/MWA/FBD/CNDD/TLD/FND

Key number position	Feature
5	Hot *
4	Hot *
3	Hot *
2	Hot *
1	Hot *
0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2006 model 41

Intended use: Hotel guest room telephone with message indication
Assigned Class of Service options: CCSA/MWA/FBD/FNA/CNDD/TLD

Key number position	Feature
5	Message
4	Hot *
3	Hot *
2	Hot *
1	Hot *
0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2006 model 50

Intended use: Nurses station telephone with speed call
Assigned Class of Service options: FND/LNA/GPUA/MWA/FBD

Key number position	Feature
5	Speed Call (personnel: 20)
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 20

Intended use: General business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
7	Auto Dial
6	Auto Dial
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 21

Intended use: General business telephone with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
7	Auto Dial
6	Message
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 22

Intended use: General business telephone with display
Assigned Class of Service options: FND/GPUA/LNA/MWA/ADD/FBD

Key number position	Feature
7	-
6	Auto Dial
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 23

Intended use: General business set with message indication and display
Assigned Class of Service options: FNA/GPUA/LNA/MWA/ADD/FBD

Key number position	Feature
7	-
6	Message
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 24

Intended use: Two-line general business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
7	Auto Dial
6	Transfer
5	Ring Again
4	Pick-Up
3	Forward
2	Conference
1	DN
0	DN

M2008 model 25

Intended use: Two-line general business telephone with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
7	Auto Dial
6	Message
5	Transfer
4	Pick-Up
3	Forward
2	Conference
1	DN
0	DN

M2008 model 26

Intended use: Two-line general business telephone with display
Assigned Class of Service options: FND/GPUA/LNA/MWA/ADD/FBD

Key number position	Feature
7	-
6	Transfer
5	Ring Again
4	Pick-Up
3	Forward
2	Conference
1	DN
0	DN

M2008 model 27

Intended use: 2-line gen. business set with message indication and display
Assigned Class of Service options: FNA/GPUA/LNA/MWA/ADD/FBD

Key number position	Feature
7	-
6	Message
5	Transfer
4	Pick-Up
3	Forward
2	Conference
1	DN
0	DN

M2008 model 28

Intended use: Two-line general business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
7	Auto Dial
6	Auto Dial
5	Auto Dial
4	Auto Dial
3	Forward
2	Conference
1	DN
0	DN

M2008 model 30

Intended use: Manager telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
7	Transfer
6	Voice Call
5	Speed Call (personnel: 20)
4	Ring Again
3	Forward
2	Conference
1	DN
0	DN

M2008 model 31

Intended use: Manager telephone with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
7	Voice Call
6	Message
5	Speed Call (personnel: 20)
4	Ring Again
3	Forward
2	Conference
1	DN
0	DN

M2008 model 32

Intended use: Manager telephone with display
Assigned Class of Service options: FND/GPUA/LNA/MWA/ADD/FBD

Key num.ber position	Feature
7	-
6	Voice Call
5	Speed Call (personnel: 20)
4	Ring Again
3	Forward
2	Conference
1	DN
0	DN

M2008 model 33

Intended use: Manager telephone with display and message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/ADD/FBD

Key number position	Feature
7	-
6	Message
5	Voice Call
4	Speed Call (personnel: 20)
3	Forward
2	Conference
1	DN
0	DN

M2008 model 40

Intended use: Two-line guest room telephone
Assigned Class of Service options: CCSA/MWA/FBD/CNDD/FND/TLD

Key number position	Feature
7	Hot *
6	Hot *
5	Hot *
4	Hot *
3	Hot *
2	Hot *
1	DN
0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2008 model 41

Intended use: Two-line guest room telephone with message indication
Assigned Class of Service options: CCSA/MWA/FBD/FNA/CNDD/TLD

Key number position	Feature
7	Message
6	Hot *
5	Hot *
4	Hot *
3	Hot *
2	Hot *
1	DN
0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2008 model 50

Intended use: Nurses station telephone with speed call
Assigned Class of Service options: FND/LNA/GPUA/MWA/NDD/FBD

Key number position	Feature
7	Auto Dial
6	Transfer
5	Speed Call
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 51

Intended use: Nurses station telephone with message and speed call
Assigned Class of Service options: FNA/LNA/GPUA/MWA/NDD/FBD

Key number position	Feature
7	Auto Dial
6	Message
5	Speed Call
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 52

Intended use: Nurses station telephone with speed call and display
Assigned Class of Service options: FND/LNA/GPUA/MWA/ADD/FBD

Key number position	Feature
7	-
6	Auto Dial
5	Speed Call
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 53

Intended use: Nurses station set with message, speed call and display
Assigned Class of Service options: FNA/LNA/GPUA/MWA/ADD/FBD

Key number position	Feature
7	-
6	Message
5	Speed Call
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 60

Intended use: Message center telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Key number position	Feature
7	Message Cancellation
6	Message Indication
5	Speed Call (personnel: 20)
4	Ring Again
3	Forward
2	Conference
1	DN
0	DN

M2008 model 61

Intended use: Message center telephone with display
Assigned Class of Service options: FND/GPUA/LNA/MWA/ADD/FBD

Key number position	Feature
7	-
6	Message Cancellation
5	Message Indication
4	Speed Call (personnel: 20)
3	Forward
2	Conference
1	DN
0	DN

M2216 model 20

Intended use: ACD agent with display
Assigned Class of Service options: LNA/FND/GPUA/MWA/ADD/FBD

Feature	Key number position	Key number position	Feature
Auto Dial	15	7	-
Auto Dial	14	6	Transfer
Auto Dial	13	5	Speed Call
Auto Dial	12	4	Forward
Auto Dial	11	3	Conference
Auto Dial	10	2	Make Set Busy
ACD calls waiting	9	1	Not Ready
DN	8	0	ACD DN (7750)

M2216 model 30

Intended use: ACD supervisor with display
Assigned Class of Service options: LNA/FND/GPUA/MWA/ADD/FBD

Feature	Key number position	Key number position	Feature
Auto Dial	15	7	-
Auto Dial	14	6	Transfer
Auto Dial	13	5	Speed Call
Auto Dial	12	4	Forward
Auto Dial	11	3	Conference
Display Agents	10	2	Make Set Busy
Display Queue	9	1	Not Ready
DN	8	0	ACD DN (7750)

M2616 model 20

Intended use: Secretary telephone with display

Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Feature	Key number position	Key number position	Feature
Auto Dial	15	7	-
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Transfer
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Auto Dial	8	0	DN

M2616 model 21

Intended use: Secretary telephone with display and message indication
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/ADD/HFD/FBD

Feature	Key number position	Key number position	Feature
Auto Dial	15	7	-
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Speed Call (personnel: 20)
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Transfer	8	0	DN

M2616 model 22

Intended use: Advanced business telephone
Assigned Class of Service options:
LNA/FND/GPUA/MWA/NDD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	Transfer
Auto Dial	14	6	Speed Call
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Auto Dial	8	0	DN

M2616 model 23

Intended use: Advanced business telephone with message indication
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/NDD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	Speed Call
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Transfer	8	0	DN

M2616 model 24

Intended use: Advanced business telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	-
Auto Dial	14	6	Speed Call
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Transfer	8	0	DN

M2616 model 25

Intended use: Advanced business telephone with message indication and display
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/ADD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	-
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Transfer	9	1	DN
Speed Call	8	0	DN

M2616 model 30

Intended use: Manager telephone
Assigned Class of Service options:
LNA/FND/GPUA/MWA/NDD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	Transfer
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Voice Call	8	0	DN

M2616 model 31

Intended use: Manager telephone with message indication
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/NDD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	Speed Call (personnel: 20)
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Voice Call	9	1	DN
Transfer	8	0	DN

M2616 model 32

Intended use: Manager telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	-
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Voice Call	9	1	DN
Transfer	8	0	DN

M2616 model 33

Intended use: Manager telephone with message indication and display
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/ADD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	-
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Voice Call	10	2	Conference
Transfer	9	1	DN
Speed Call (personnel: 20)	8	0	DN

M2616 model 40

Intended use: Front desk console with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/CNDA/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	-
Hot *	14	6	Speed Call (personnel: 20)
Control Class of Service	13	5	Ring Again
Message Registration	12	4	Pick-Up
Room Status	11	3	Forward
Message Cancellation	10	2	Conference
Message Indication	9	1	DN
Transfer	8	0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2616 model 50

Intended use: Nurses station telephone
Assigned Class of Service options:
LNA/FND/GPUA/MWA/NDD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	Transfer
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Hot *	9	1	DN
Group Call - Group 0 **	8	0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. Define them when you activate the set.

** Although group 0 is pre- defined in LD 18, you must assign extensions for this group when the telephones have been installed.

M2616 model 51

Intended use: Nurses station telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	Speed Call (personnel: 20)
Auto Dial	14	6	-
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Hot *	10	2	Conference
Group Call - Group 0 **	9	1	DN
Transfer	8	0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

** Although group 0 is pre-defined in LD 18, you must assign extensions for this group when the telephones have been installed.

M2616 model 61

Intended use: Message center telephone
Assigned Class of Service options:
LNA/FND/GPUA/MWA/NDD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	Transfer
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Message Cancellation	9	1	DN
Message Indication	8	0	DN

M2616 model 62

Intended use: Message center telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Feature	Key number position	Key number position	Feature
-	15	7	-
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Message Cancellation	10	2	Conference
Message Indication	9	1	DN
Transfer	8	0	DN

Chapter 23 – Changing pre-programmed data

General information

The pre-programmed data on the Option 11C system can provide an effective starting point for programming the system's telephone and trunking information.

This chapter shows how to change the default Option 11C numbering plan. You may want to change the numbering plan for one or more of the following reasons:

- to change the first number in the numbering plan
- to shift the start of the numbering plan to another card slot
- the default numbering plan interferes with the system data.

In addition to making changes to the default numbering plan, this section provides information about modifying model telephone and trunk programming stored in the Option 11C pre-programmed data.

Changing the default numbering plan

Extensions assigned differ from the default numbering plan

Compare the first digits assigned to this system with the default numbering plan as shown in the “Default numbering plan” on page 304.

- If the first digit is in the unused range, change the first number in the default numbering plan. To do this, follow the instructions in the section of this Chapter called “Changing the first number in the numbering plan” on page 358.
- If the first digit is being used by Meridian Mail, trunk routes, or other data, you must remove these interferences. Follow the instructions found later in this chapter in the section called“Removing numbering plan interferences” on page 362.

Changing the first number in the numbering plan

To change the first number in the numbering plan perform the following procedure:

Procedure 43
Changing the first number in the numbering plan

1 **Pick up the handset of the administration telephone.**

2 **Enter the administration Flexible Feature Code. (For some countries, this value is listed in the “Flexible Feature Codes” on page 310.)**

3 **Enter the administration telephone password. (For some countries, this value is listed in the, “Passwords and codes” on page 304.)**

4 **You hear special dial tone and the prompt “TASK?” appears on the top line of the character display.**

5 **Press the asterisk (*) three times.**

The second line of the character display reads “4 INSTALLATION OPTIONS”.

6 **Select “4 INSTALLATION OPTIONS” by entering the number “4”.**

The character display reads:

1 DEFAULT SETS

2 NUMBERING PLAN

7 **Select “2 NUMBERING PLAN” by entering the number “2”.**

The character display reads:

FIRST NUMBER (XXXX)?

8 **To create a new first number, enter the digits you want and press the pound key.**

The number you enter as the first number in the numbering plan is assigned to slot number one, unit zero of the main cabinet. The default numbers assigned to the remaining card and unit combinations are consecutive in the Option 11 system assuming that each slot consists of up to 16 units.

End of Procedure

Determining new extension numbers

If you wish to change the default numbering plan, and need to determine the extension number that will be assigned to a specific telephone, perform the following procedure:

Procedure 44
Determine the extension number

1 **Identify the line card to which the telephone is connected. Take the card slot number associated with the card and subtract 1.**

2 **Multiply this number by 16.**

3 **Add the first extension number in the new numbering plan.**

4 **Identify the unit number the telephone is terminated on and add it to the result obtained in step 3.**

End of Procedure

Example:

Assume the new numbering plan starts at extension number 4500. You wish to know the extension number of the telephone connected to card 8, unit 12:

1 Subtract 1 from the card slot number (8-1): = 7

2 Multiply by 16: x 16
=112

3 Add the first extension number:+4500

4 Add the unit number:+ 12
Number assigned to card 8, unit 12 4624

Note: If you are using a three digit numbering plan, follow the same procedure.

Example:

The new three digit numbering plan starts at extension number 300, and you wish to know the extension number of the telephone connected to card 8 unit 12:

1 Subtract 1 from the card slot number (8-1): = 7

2 Multiply by 16: x 16
=112

3 Add the first extension number: + 300

4 Add the unit number: + 12
Number assigned to card 8, unit 12 424

If you want the system to have a consecutive numbering plan, make sure that the line cards are in consecutive card slots in the Option 11 cabinet.

If the line cards are arranged consecutively, the pre-assigned telephone extensions are automatically configured during telephone activation, and you do not have to manually enter them.

Using the Meridian Mail auto-configure feature

The Meridian Mail auto-configure feature automatically matches up Meridian Mail mail boxes with telephone extensions. If you have the Meridian Mail card option and you want to use the Meridian Mail auto-configure feature, make sure of the following:

- The numbering plan is consecutive
- The first number in the Option 11 system and the Meridian Mail system are the same.

Shifting the numbering plan to a new card slot

The first number in the numbering plan is assigned to slot 1, unit 0. You may wish to shift the first number in the numbering plan to a different card slot, since the TDS/DTR card is pre-programmed for slot 1.

The following procedure describes how to shift the first number in the numbering plan to a specific card slot.

Procedure 45
Shift the first number in the numbering plan to a different card slot

1 **Locate the first line card. Subtract 1 from the card slot number it is housed in.**

2 **Multiply this number by 16.**

3 **Take the first number in the numbering plan and subtract the value obtained in step 2.**

Note: When you enter the value from step 3 in response to the prompt "FIRST NUMBER (XXXX)?" on the administration telephone menu, the number is shifted to the appropriate slot.

End of Procedure

Example:

The first number in the numbering plan is 2200. If you want the first number in the numbering plan to be 2300, and the first line card is located in slot 6, you will carry out the following calculation:

1 Locate the first line card. Subtract 1 from the card slot number it is housed in.

6 - 1 = 5

2 Multiply the number obtained in step 1 by 16:

5 X 16 = 80

3 Subtract this number from the first number in the numbering plan:

2300 - 80 = 2220

4 Enter this value in response to the “FIRST NUMBER (2200)?” prompt on the administration telephone:

FIRST NUMBER (2000)? 2220

Removing numbering plan interferences

This section contains various methods of removing any numbering plan interferences that may occur.

Interference with Meridian Mail data

The Option 11 system is shipped with pre-programmed data to support a Meridian Mail card option. The pre-programmed Meridian Mail data may cause problems in the following situations:

- there is a numbering plan conflict with pre-programmed Meridian Mail data and the programming required for another feature
- card slot 10 is required for another circuit card.

Obtaining the use of card slot 10

If card slot 10 is required for another circuit card, simply remove the six Meridian Mail agents programmed for this card slot. To do this, load LD 11 on the TTY and respond to the system prompts as shown below. Repeat the procedure once for each of the six units that you want to remove.

LD 11

REQ OUT <CR>

TYPE 2008 <CR>

TN 10 XX <CR> "XX" = a value of 0,1,2,8,9, or 10

Obtaining the use of Meridian Mail ACD queues

The Meridian Mail feature also uses a number of ACD queues in the Option 11 system. Refer to the section of this chapter called "Interference with ACD queues" for information on how to remove this data from the system.

Interference with ACD queues

The Option 11 has pre-programmed ACD queues for Meridian Mail, the Central Answering Position, and general purpose ACD. (For some countries, pre-programmed ACD queues are listed in "Important extension numbers" on page 306.) To remove these values, use LD 23.

> ***Note:*** Before you remove this data from the system, make sure that all ACD agent information is removed from the queue.

In LD 23, respond to the prompts as follows:

LD 23

REQ OUT

TYPE ACD

CUST 0

ACDN XXXX "XXXX" = Value of ACD queue

Repeat for each ACD queue you wish to remove.

Interference with Call Park extension numbers

System call park extension numbers are pre-programmed for the Central Answering Position. (For some countries, the default call part extensions are listed in “Important extension numbers” on page 306.) To remove this data from the system, load LD 50 and respond to the prompts as follows:

LD 50

REQ OUT

TYPE CPK

CUST 0

SPDN XXXX “XXXX” = Value of Call Park extension

Repeat for each Call Park extension you wish to remove.

Interference with SDI ports

Five SDI/ESDI ports are pre-programmed on the Option 11 system. Ports 8 and 9 are associated with the Meridian Mail card option, and ports 0, 1 and 2 are associated with the NTDK20 Small System Controller (SSC) card. Port 0 is associated with SSC card and cannot be removed. Any of the remaining ports can be removed using LD 17 as follows.

LD 17

REQ CHG

TYPE CFN

ADAN OUT TTY X “X” = the TTY that you are removing.

Interference with the SPRE code

If the pre-programmed SPRE code interferes with the programming required for the Option 11 system, use LD 15 to remove it. (For some countries, the default SPRE access code is listed in “First digits” on page 305.) For customer 0 enter the following in response to the SPRE prompt:

LD 15

SPRE Xy “y” = the value of the SPRE code

Note: To define a new SPRE code, type a space and enter the new number.

Interference with the attendant extension number

You cannot remove the attendant extension number entirely from the Option 11 system data; you can only replace it with another number.

LD 15

REQ CHG CHG = Change

TYPE CDB CDB = Customer Data Block

CUST x “x” = Customer number

.

ATDN xxxx “xxxx” = the new extension number

Changing or removing the pre-programmed night number

For some countries, the default value of the night number is listed in “Important extension numbers” on page 306. If you wish to change or remove the night number, use LD 15.

LD 15

REQ CHG CHG = Change

TYPE CDB CDB = Customer Data Block

CUST x “x” = Customer number

NIT1 bbbb, or X aaaa “bbbb” = the new extension number (DN)
Or
“aaaa” = the current night number
(the night number is now removed).

Interference with Flexible Feature Codes

If the pre-programmed Flexible Feature Codes interfere with the programming required for the Option 11 system, use LD 57 to remove the data from the system. (For some countries, default FFCs are listed in “Flexible Feature Codes” on page 310.)

LD 57

To change one or more access codes, type in the following commands:

REQ	CHG, END	Change or end
TYPE	FFC	FFC = Flexible feature codes
CUST	0-31	Customer Number
FFCT	YES,(NO)	FFC Confirmation tone
CODE	aaaa	Enter access code prompt (aaaa)
AAAA	xx	Enter the new access code prompt (AAAA)
CODE	<CR>	Return to REQ
REQ	END	End program

To remove one access code, type in the following commands:

REQ	OUT	Action request
TYPE	FFC	FFC = Flexible feature codes
CUST	0-31	Customer Number
FFCT	YES,(NO)	FFC Confirmation tone
ALL	NO	Remove specific access code
CODE	aaaa	Enter access code prompt (aaaa)
AAAA	xx	Enter the new access code prompt (AAAA)
CODE	<CR>	Return to REQ
REQ	END	End program

To remove all access codes, type in the following commands:

REQ OUT	Action request
TYPE FFC	FFC = Flexible feature codes
CUST 0-31	Customer Number
FFCT YES,(NO)	FFC Confirmation tone
ALL YES	Remove all access codes
CODE<CR>	Return to REQ
REQ END	End program

Creating, changing, and removing model telephones

If you need a model telephone different from the default models provided in Option 11C software, use overlays to design your own models using the information in the following table:

Table 72
Design your own models

Task	Overlay
Create your own model telephones:	
Analog telephones (500/2500 type telephones)	LD 10
Digital telephones	LD 11
Get information on model telephones	LD 20 (printout)

If you require additional assistance when creating your own model telephones and trunks, refer to the Option 11 *Software guides* that are shipped with every system.

Creating analog telephone models

The following information must be entered in LD 10 in order to create an analogue (500/2500- type) telephone model:

LD 10

REQ NEW

TYPE 500 M

MODL YYY "YYY" = the model number of the telephone that you are creating

Enter responses to the remaining prompts in order to complete the new model. (Refer to the Option 11 *Software guide*s for a complete list of prompts and possible responses).

Modifying analog model telephones

If you want to modify an analog telephone, use LD 10 and type in the following commands on the TTY:

LD 10

REQ CHG

TYPE 500 M

MODL YYY "YYY" = the model number of the telephone that you are modifying

For more information about LD 10 and its associated prompts and commands, refer to the *Option 11 Software Guides* that are shipped with the system.

Creating digital model telephones

When you create model telephones for digital telephones, you must program key 0 with a function that can act as a prime extension number or its equivalent. This includes telephones that are programmed to have Single Call Ringing (SCR), Multiple Call Ringing (MCR), Single Call Non-Ringing (SCN), Multiple Call Non-Ringing (MCN), and Automatic Call Distribution (ACD).

For ACD telephones, the model telephone defines the ACD queue. To define the extension number, you must enter the ID number of the agent or the Central Answering Position.

The following information must be entered in LD 11 in order to create a digital telephone model:

LD 11

REQ NEW

TYPE 2XXX M or 3000 M “XXX” = allowed telephone types

MODL YYY “YYY” = the model number of the telephone that you are creating (between 1 - 127)

Enter the responses to the remaining prompts in order to complete the new model. (Refer to the Option 11 *Software guides* for a complete list of prompts and possible responses).

Modifying digital model telephones

If you want to modify a digital telephone, load LD 11 and type in the following commands on the TTY:

LD 11

REQ CHG

TYPE 2XXX M or 3000 M “XXX” = allowed telephone types

MODL YYY “YYY” = the model number of the telephone that you are modifying

For more information about LD 11 and its associated prompts and commands, refer to the Option 11 *Software guides* that are shipped with the system.

Printing model information

To print information about model telephones, use LD 20.

Analog telephones

LD 20

REQ PRT

TYPE 500 M

MODL YYY "YYY" = the telephone model number. If you want to print all of the models for this telephone type, leave this value blank.

Digital telephones

Note: To print M3000 telephone models, you must enter "TYPE 3000 M". If you enter "TYPE 2XXX M", you print all the Meridian Digital Telephone models except the M3000.

LD 20

REQ PRT

TYPE 2XXX M or 3000 M "XXX" = the telephone type

MODL YYY "YYY" = the telephone model number (between 1 - 127) If you want to print all of the models for this telephone type, leave this value blank.

Removing model telephones

Use LD 10 to remove analog telephone models and LD 11 to remove digital telephone models. Respond as follows to the prompts in either overlay:

LD 10 or LD 11

REQ OUT

TYPE XXXX M "XXXX" = telephone type for the model you are removing (Example: 500, 2006, 2317, 2216, 3000, etc.)

CUST 0

MODL YYY "YYY" = the model number associated with the telephone type you are removing (Valid range is 1-127).

Creating model trunks and changing route access codes

If you need a trunk that is different from the default models provided in Option 11 software, use overlay 14 to design your own models. Route access codes are changed using the administration telephone.

If you require additional assistance when creating your own model telephones and trunks, refer to the Option 11 *Software guides* that are shipped with every system.

Creating model trunks

To create a new model trunk, load LD 14 and type in the following commands on the TTY:

LD 14

REQ NEW

TYPE aaa M "aaa" = the type of trunk that you are creating (TIE, COT, WATS, and so on).

MODL YYY "YYY" = the model number of the trunk that you are creating (between 1 - 127)

XTRK XUT, XEM, XCOT, This prompt only appears when you XDID define the first model in a group. Each group consists of 16 consecutive model definitions. (Refer to the group boundaries listed below.) Once the first model in a group is defined, the remaining model numbers in the group(s) are assumed to be of the same type.

Group boundaries are as follows:

1-15, 16-31, 32-47, 48-63, 64-79. 80-95, 96-111, 112-127.

Examples:

If, for example, you define a model trunk as XUT, with a model number of 12, all models in the group 1-15 will automatically be XUT models. If you define another model trunk as an XEM, with a model number of 33, all models in the group 32-47 will automatically be XEM models.

> ***Note:*** When you create trunk models you are not prompted for the trunk route or member number. This information is defined by using the administration telephone to program the XUT or XEM circuit card.

For more information about LD 14 and its associated prompts and commands, refer to the Option 11 *Software guides* that are shipped with the system.

Modifying model trunks

If you want to modify a trunk, load LD 14 and type in the following commands on the TTY:

LD 14

REQ CHG

TYPE aaa M "aaa" = the type of trunk that you are modifying

MODL YYY "YYY" = the model number of the trunk that you are modifying (between 1 - 127)

Removing model trunks

To remove a trunk model from the system, load LD 14 and respond to the prompts as follows:

LD 14

REQ OUT

TYPE XXX M "XXX" = the trunk type of the model that you are removing (Examples: COT, TIE, DID, FEX, WAT, etc.)

CUST 0

MODL YYY "YYY" = the model number associated with the trunk type you are removing (Valid range is 1-127).

Printing model information

To print information about model trunks, load LD 20 and type in the following commands on the TTY:

LD 20

REQ PRT

TYPE TTTT M "TTTT" = the trunk type

MODL YYY "YYY" = the model number. If you want to print all of the models for this trunk type, leave this value blank.

Changing a route access code

Use this procedure to change a route access code.

Procedure 46
Changing a route access code

1 **Pick up the handset of the administration telephone.**

2 **Enter the administration Flexible Feature Code to access the administration menu. (For some countries, this value is listed in “Flexible Feature Codes” on page 310.)**

3 **Enter the default administration telephone password. (For some countries, this value is listed in “Passwords and codes” on page 304.)**

You hear special dial tone and the prompt
“TASK?”
appears on the top line of the character display. If you press the asterisk, “2 CHANGE ROUTE ACCESS” appears on the second line of the character display.

4 **Select “2 CHANGE ROUTE ACCESS” by entering the number “2”.**

The prompt
“ROUTE ACCESS?”
appears on the character display.

5 **Enter the access code of the route to be modified and press the pound key (#).**

The prompt
“NEW ACCESS CODE?”
asks you for a new access code for the route.

6 Enter the new access code and press the pound key.

The display shows
“CODE CHANGED”.
After a delay of approximately 4 seconds you hear special dial tone and the sequence is repeated when the prompt
“ROUTE ACCESS?”
appears.

OR

If the route access code is not available for use, you hear overflow tone.

The display shows
“USED, ROUTE ACCESS?”
and you must repeat this step.
You must enter a **different** access code. This sequence continues until you enter an appropriate new access code.

7 Terminate the sequence by hanging up the telephone.

OR

Repeat the sequence by going through the steps again.

End of Procedure

Chapter 24 – Expansion cabinet as a power shelf for auxiliary processors

General information

This chapter contains the procedure for adding a cabinet to be used as a stand-alone power shelf for Aux processor units (such as Max IPE).

Expansion cabinet used as a power shelf

Follow this procedure to add an expansion cabinet used as a power shelf for auxiliary processor units.

Procedure 47
Expansion cabinet as a stand-alone power shelf

☐ **1** **Locate the carton containing the expansion cabinet. Install it as described in "Chapter 9 – Mounting the cabinets" on page 113.**

- Make sure that it is mounted according to the plan.
- Make sure that it is securely mounted.
- Make sure that the pedestal is properly installed if the cabinet is to be mounted on the floor.

☐ **2** **Make sure that the AC power cord is disconnected from the power outlet.**

☐ **3** **Install a #6 AWG (# 40 Metric Wire Gauge) ground wire from the cabinet to a ground source (the ground bus in the AC power service panel).**

Note: Do not connect the ground wire to the ground connection in an existing Option 11C cabinet. The ground wire must be connected to the ground source.

WARNING

The connection in the AC power service panel should be performed by a qualified technician or electrician.

Connect the ground wire to the ground lug located in the bottom of the cabinet next to the cable connectors.

Route the ground wire through the third groove from the left in the bottom of the cabinet.

Connect it to the Single Point Ground (SPG) and place a DO NOT DISCONNECT tag on it.

Note: Refer to the Option 11C “Grounding requirements” on page 27.

☐ **4** **Put on the wrist strap provided in the bottom of the cabinet and install the power supply with the circuit breaker at the OFF position. If this is an AC powered system, plug in the power supply cord in the commercial power supply receptacle and into the power supply. Refer “Chapter 11– Installing the power supplies” on page 129.**

CAUTION

A grounded wrist strap, provided with the cabinet, must be worn when handling circuit cards to prevent damage caused by static electricity.

- Make sure that the NTAK04 or NTDK78 AC/DC or NTAK05 or NTDK72 DC power supplies are installed and that their circuit breakers are set to OFF.

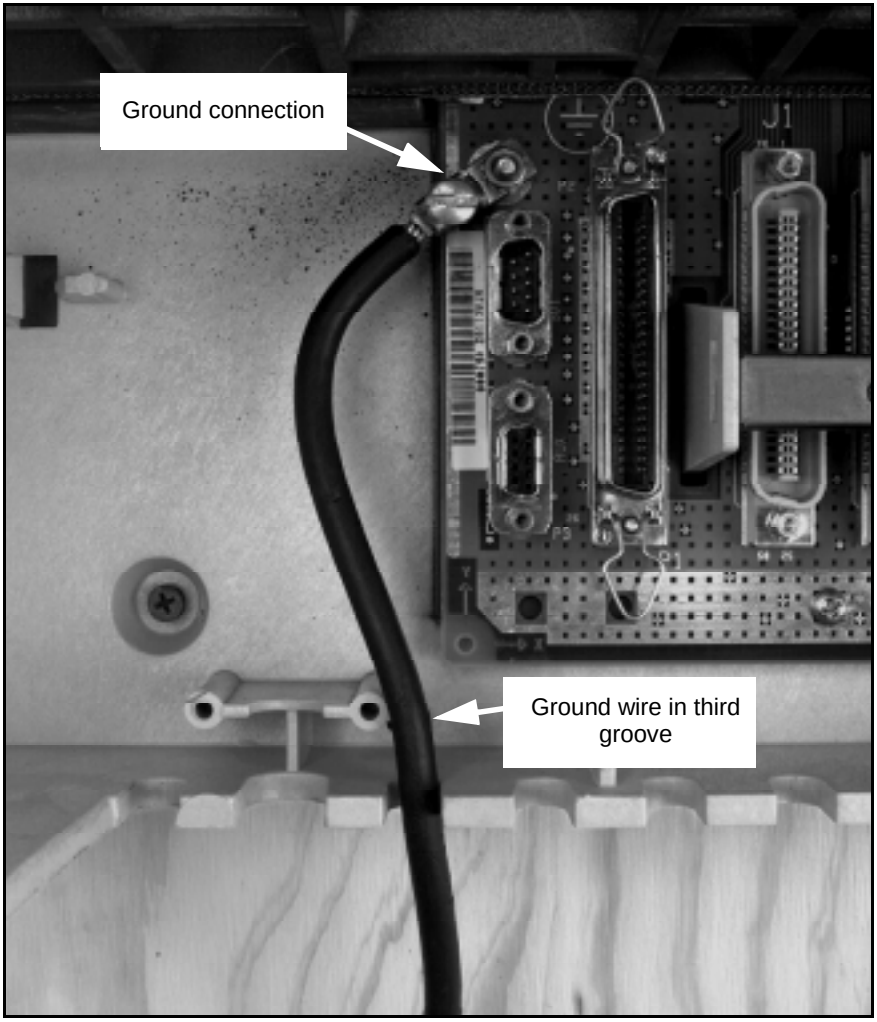
☐ **5** **Refer to the ACD Max documentation to complete the installation of the Max units and related cables.**

- Connectors for the cables in the expansion cabinet are located on the panel below the cabinet's shelf. Refer to **“Chapter 13 – Installing and connecting cross-connect terminal to cabinets” on page 167**.
- for information about connection cables to the cabinet.

Note: The slots in the expansion cabinet are labeled 11 through 20. The corresponding connectors for cables are labeled J11 through J20 or J1 through J10, depending on the type of cabinet.

End of Procedure

Figure 92
Ground connection



Meridian 1

Option 11C

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