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Meridian 1

# **DASS2**

## Installation Guide

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## Revision history

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Standard 5.00. This is a global document and is up-issued for X11 Release 25.0x.

**October 1997**

Issue 4.00 released as Standard for Generic X11 Release 23.0x.

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Standard version issued for X11 including Supplementary features Release 20, to document updates to hardware references.

**July 1993**

Standard version issued for Group H (Phase 8B).

**October 1992**

Standard version issued for Group G (Phase 7C).



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# About this guide

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## Reference list

The following are the references for this section:

- *DASS Product Overview Guide (553-3911-100)*
- *DASS Features and Services Guide (553-3911-300)*
- *DASS Maintenance Guide (553-3911-500)*
- *DPNSS1 Product Overview Guide (553-3921-100)*
- *DPNSS1 Installation Guide (553-3921-200)*
- *DPNSS1 Features and Services Guide (553-3921-300)*
- *DPNSS1 Maintenance Guide (553-3921-500)*
- *ISDN PRI Installation (553-2901-201)*
- *ISDN PRI/BRI Feature Description and Administration (553-2901-301)*
- *ISDN PRI Maintenance (553-2901-501)*
- *Meridian 1 System Installation Procedures (553-3001-210)*
- *Meridian 1 General Maintenance Information (553-3001-500)*
- *X11 Features and Services (553-3001-306)*
- *Basic and Network Alternate Route Selection Description (553-2751-100)*
- *Meridian 1 System Overview (553-3001-100)*
- *Traffic Measurement Formats and Output (553-2001-450)*

The DASS2 Installation Guide is part of the suite of Nortel Networks technical publications (NTPs) designed specifically for DASS2 applications.

This guide contains descriptions and schematics of all hardware required to install a DASS2 link, as well as providing procedures for running the installation overlay programs.

## Applicability of this guide

The intended audience of the DASS2 Installation Guide is all craftspersons charged with installing DASS2 networks.

## How this guide is organized

The DASS2 Installation Guide has been arranged in the following sections:

- *IDA equipment overview* - contains a description and schematic of the hardware components required to install a DASS2 link
- *DCHI installation and removal* - describes the procedures required to install and remove the NT5K35, NT5K75, and NT6D11AD DCHI cards
- *PRI installation and removal* - describes the procedures required to install and remove the NT8D72 PRI card and the NTCK43 DPRI card
- *Clock Controller installation and removal* - describes the procedures required to install and remove the QPC775 Clock Controller

## Related documents

Refer to the following documents for additional information:

### **DASS2 documents:**

- BTNR 190 Requirements Document
- *DASS Product Overview Guide (553-3911-100)*
- *DASS Features and Services Guide (553-3911-300)*
- *DASS Maintenance Guide (553-3911-500)*

### **DPNSS1 documents:**

- BTNR 188 Requirements Document
- *DPNSS1 Product Overview Guide (553-3921-100)*
- *DPNSS1 Installation Guide (553-3921-200)*
- *DPNSS1 Features and Services Guide (553-3921-300)*
- *DPNSS1 Maintenance Guide (553-3921-500)*

### **ISDN documents:**

- *ISDN PRI Installation (553-2901-201)*
- *ISDN PRI/BRI Feature Description and Administration (553-2901-301)*
- *ISDN PRI Maintenance (553-2901-501)*

### **Meridian 1 documents:**

- *Meridian 1 System Installation Procedures (553-3001-210)*
- *Meridian 1 General Maintenance Information (553-3001-500)*
- *X11 Features and Services (553-3001-306)*
- *Basic and Network Alternate Route Selection Description (553-2751-100)*
- *Meridian 1 System Overview (553-3001-100)*
- *Traffic Measurement Formats and Output (553-2001-450)*



# Integrated Digital Access (IDA) equipment overview

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## Reference list

The following are the references for this section:

- *Spares Planning (553-3001-153)*

The Integrated Digital Access (IDA) feature provides the hardware and software platform on the Meridian 1 for the support of DASS2 signaling protocols. The information contained in this section is defined at the IDA level.

## DASS2 hardware requirements

The following hardware is required for each DASS2 link on Meridian 1 system Options 21, 21E, 51/51C, 61/61C, 71 and 81/81C:

- one NTAG54 Dual Daughterboard (for NTCK43AB or higher vintages of the Dual PRI)

or

- one NT5K35 D-channel Handler Interface

or

- one NT5K75 D-channel Handler Interface - an enhanced version of the NT5K35 which provides up to 160 D-channel port addresses. This card supports two switch-selectable modes of operation — standard mode and expanded mode. Standard mode D-channels may be assigned an input/output port address in the range 0-15; expanded mode D-channels may be assigned port addresses in the range 0-159. Each port has a set of DIP switches allowing full configuration flexibility. **Please see the section entitled “Engineering note pertaining to port addressing modes” on page 16 in this chapter.**

or

- one NT6D11AE D-channel Handler Interface - an enhanced version of the NT5K75 which is fully backward compatible with the NT5K75 and NT5K35. This card supports two switch-selectable modes of operation — standard mode and expanded mode. Standard mode D-channels may be assigned an input/output port address in the range 0-15; expanded mode D-channels may be assigned port addresses in the range 0-159. Each port has a set of DIP switches allowing full configuration flexibility. **Please see the section entitled “Engineering note pertaining to port addressing modes” on page 16 in this chapter.**

*Note:* The NT5K75 and NT6D11AE cannot operate in expanded addressing mode on Meridian 1 Options 21 and 21E.

- one NTCK43 dual-port PRI card (NTCK43AB or higher)

or

- one NT8D72 Primary Rate Interface card (NT8D72BA is required for EuroISDN applications)

- one QPC949D CPU ROM (up to and including Group G) and NTND08AA CPU ROM (up to and including Group H) are required to support the expanded capability of the NT5K75 and NT6D11AE DCHI
- one of the following cables:
  - NT5K40AA PRI to Line Terminating Equipment cable (15 pin D-type to twin BNC, 4 meters)
  - NT5K41AA PRI to Line Terminating Equipment cable (15 pin D-type to twin BNC, 8 meters)
  - NT5K86AA PRI to Line Terminating Equipment cable (15 pin D-type to twin BNC, 12 meters, TX shield connected to FGND)
  - NT5K86BA PRI to Line Terminating Equipment cable (15 pin D-type to twin BNC, 12 meters, RX shield connected to FGND)
  - NT5K86AA PRI to Line Terminating Equipment cable (15 pin D-type to twin BNC, 12 meters, TX and RX shields connected to FGND)
- one QCAD328 DCHI to PRI cable
- one NT8D85 ENET to PRI cable
- one QPC775 Clock Controller (QPC775 is required on Option 81/81C systems, and where EuroISDN is being supported.) This cable is required if the DASS2 loop is to be used as a timing synchronisation source for the Meridian 1 PBX.
- one NT8D79AD PRI to Clock Controller cable. This cable is required if the DASS2 loop is to be used as a timing synchronisation source for the Meridian 1 PBX.
- one loop of the QPC414 ENET dual loop network interface card

- for the NTCK43 DPRI card, the following cables are used:
  - NTCK45AA 120 Ohm Dual PRI to I/O Panel cable (8ft)
  - NTCK78AA 120 Ohm Dual PRI cable for ST Machines (50ft)
  - NTCK79AA 75 Ohm Dual PRI Coax Cable (40ft)
  - NT8D7217 Dual PRI I/O Panel to Multiplexer cable (50ft)
  - NTCK46AA Dual PRI to DASS/DPNSS NT6D11 DCHI cable (6ft)
  - NTCK46AB Dual PRI to DASS/DPNSS NT6D11 DCHI cable (18ft)
  - NTCK46AC Dual PRI to DASS/DPNSS NT6D11 DCHI cable (35ft)
  - NTCK46AD Dual PRI to DASS/DPNSS NT6D11 DCHI cable (50ft)
  - Clock Controller cables (1 to 2 port cables):
    - NTCK47AA Dual PRI to Clock Controller cable (2ft)
    - NTCK47AB Dual PRI to Clock Controller cable (4ft)
    - NTCK47AC Dual PRI to Clock Controller cable (6ft)
    - NTCK47AD Dual PRI to Clock Controller cable (8ft)
    - NTCK47AE Dual PRI to Clock Controller cable (10ft)
  - Clock Controller Cables (1 to 4 port cables)
    - NTCK81AA Dual PRI to Clock Controller cable (2ft)
    - NTCK81AB Dual PRI to Clock Controller cable (4ft)
    - NTCK81AC Dual PRI to Clock Controller cable (6ft)
    - NTCK81AD Dual PRI to Clock Controller cable (8ft)
    - NTCK81AE Dual PRI to Clock Controller cable (10ft)

**Note:** Presently, the network loop used for DASS2 cannot be odd-numbered if the associated even-numbered loop is programmed as being used for existing peripheral equipment, that is, as TERM, TERD, or TERQ in Overlay 17. If all peripheral equipment is IPE, this constraint applies only when Meridian Mail is equipped. Refer to Table 1.

**Table 1**  
**Programming network loops**

ENET Loop	Allowed					Not Allowed
Even	Meridian Mail	PRI	PRI	Any	---	Meridian Mail
Odd	Meridian Mail	PRI	Meridian Mail	---	Any	PRI

## Engineering note pertaining to port addressing modes

There is a distinction between Group G and Group H functionality regarding port addressing modes.

### Group G

Standard address mode (0-15) can be any of the following:

- DPNSS1 (DDSL)
- DASS2 (DDSL)
- APNSS (LSSL)
- Q931 (DCHI)
- ISL (DCHI)
- SDI
- ESDI

Expanded address mode (0-159) can be either of the following:

- DPNSS1 (DDSL)
- DASS2 (DDSL)

The expanded mode addressing has no impact on the standard mode addressing, that is, DASS2 D-channel (DDSL) 7 in the expanded mode can exist with the Q931 D-channel (DCHI) 7 in the standard mode.

Theoretically, it is possible to have 160 DASS2 D-channels and 16 other I/O devices. In practise, however, there is a limit of 40 addresses in expanded mode and 16 in standard mode, for a total of 56 addresses.

The port address numbers assigned to the NT5K75 and NT6D11AE operating in expanded mode must not conflict with addresses assigned to other I/O port types. To avoid potential conflicts and to simplify system configuration, it is recommended that, in the expanded mode, the port addresses for the NT5K75 and NT6D11AE avoid the standard mode range (0-15) and be numbered in the range 16-159 instead.

**Group H**

Standard address mode (0-15) can be any of the following:

- DPNSS1 (DDSL)
- DASS2 (DDSL)
- APNSS (LSSL)
- Q931 (DCHI)
- ISL (DCHI)
- SDI
- ESDI

If the MSDL is used, standard mode can have a range of 0-63, and can be any of the following:

- Q931 (DCHI)
- ISL (DCHI)
- ESDI

Expanded address mode (0-159) can be either of the following:

- DPNSS1 (DDSL)
- DASS2 (DDSL)

The expanded mode addressing has no impact on the standard mode addressing, that is, DASS2 D-channel (DDSL) 7 in the expanded mode can exist with the Q931 D-channel (DCHI) 7 in the standard mode.

Theoretically, it is possible to have 64 addresses using the MSDL with Q931, ISDL, or ESDI, plus 160 addresses using the expanded mode for DASS2 for a total of 224 addresses. In practise, however, there is a limit of 64 addresses using MSDL with Q931, ISDL, or ESDI, plus 40 addresses using the expanded mode for DASS2, for a total of 104 addresses.

Presently, MSDL does not support SDI ports on DASS2, so the likely configuration would involve a mixture of standard mode addressing, MSDL addressing, and expanded mode addressing for DASS2. Such an example could be as follows:

0-7 (8 addresses) in the standard mode

8-15 (32 addresses) in the MSDL mode

16-55 (40 addresses) in the expanded mode

The port address numbers assigned to the NT5K75 and NT6D11AE operating in expanded mode must not conflict with addresses assigned to other I/O port types. To avoid potential conflicts and to simplify system configuration, it is recommended that, in the expanded mode, the port addresses for the NT5K75 and NT6D11AE avoid the standard mode range (0-15) and be numbered in the range 16-159 instead.

## Note to installers

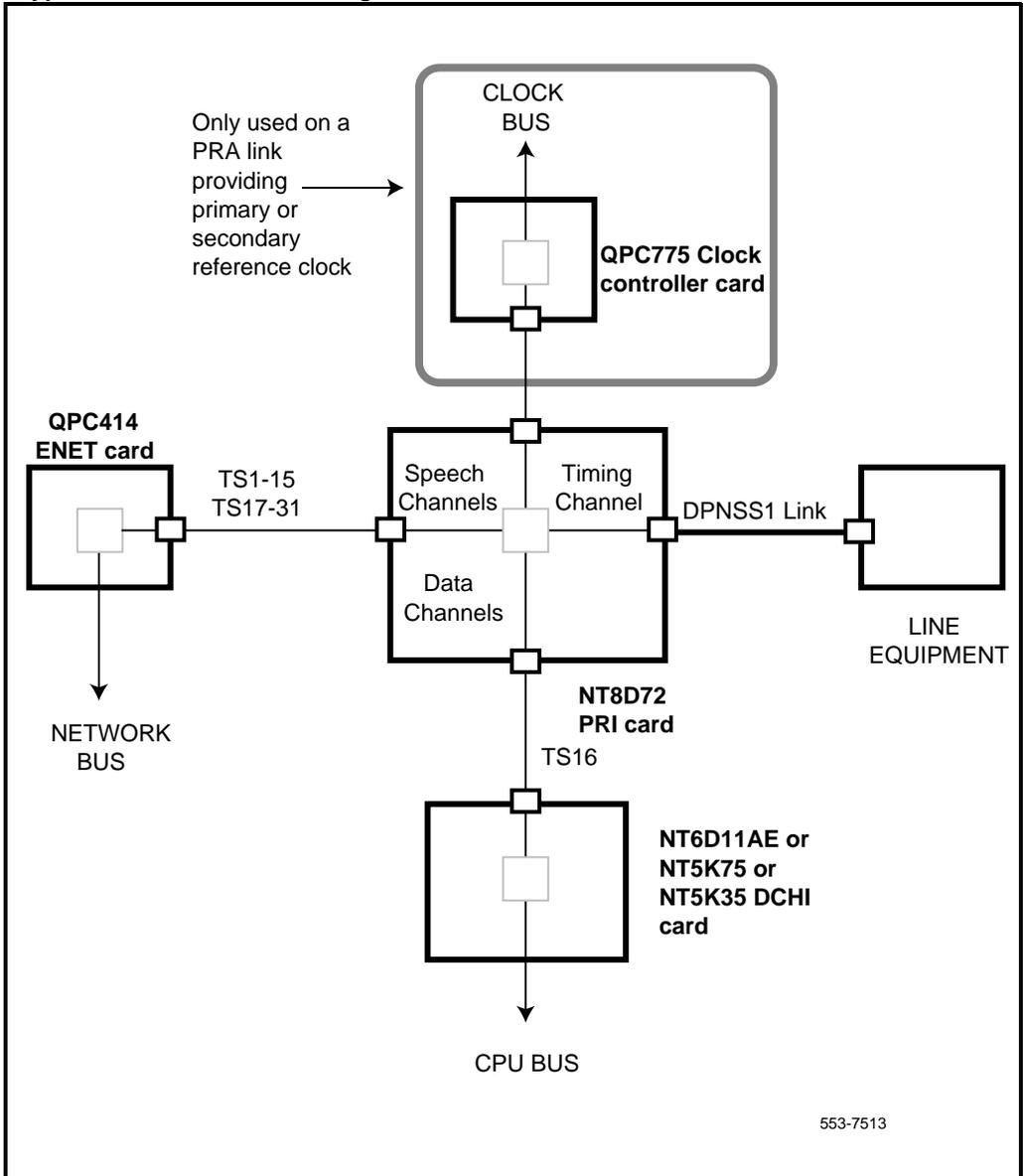
Either the DCHI or the NT8D72 PRI may be installed first. However, PRI loops must be configured in software before defining DCHI links.

Before beginning an installation, do the following:

- Consult the *Spares Planning (553-3001-153)* document and follow the instructions
- Bring spares of all cables and boards
- Remember that the link test procedures require a successful 24-hour bit error-rate test before the link can be used for live system traffic

Figure 1 illustrates a typical DASS2 hardware configuration.

**Figure 1**  
**A typical DASS2 hardware configuration**



## NT5K35, NT5K75 and NT6D11AE DCHI cards

### NT5K35 and NT5K75 power requirements

The NT5K35 and NT5K75 DCHI power requirements are shown in Table 2.

**Table 2**  
**NT5K23 and NT5K75 power requirements**

Voltage	Worst case consumption
+5 Volt	3.0 Amp
+12 Volt	50 milliamperes
-12 Volt	50 milliamperes

### NT6D11AE power requirements

The power requirements for the NT6D11AE are shown in Table 3.

**Table 3**  
**NT6D11AE power requirements**

Voltage	Worst case consumption
+5 Volt	3.0 Amp
+12 Volt	0.75 Amp
-12 Volt	0.75 Amp

### NT5K35, NT5K75, NT6D11AE faceplates

The NT5K35, NT5K75 and NT6D11AE DCHIs have one light-emitting-diode (LED), to indicate an active or inactive state, and two external connectors:

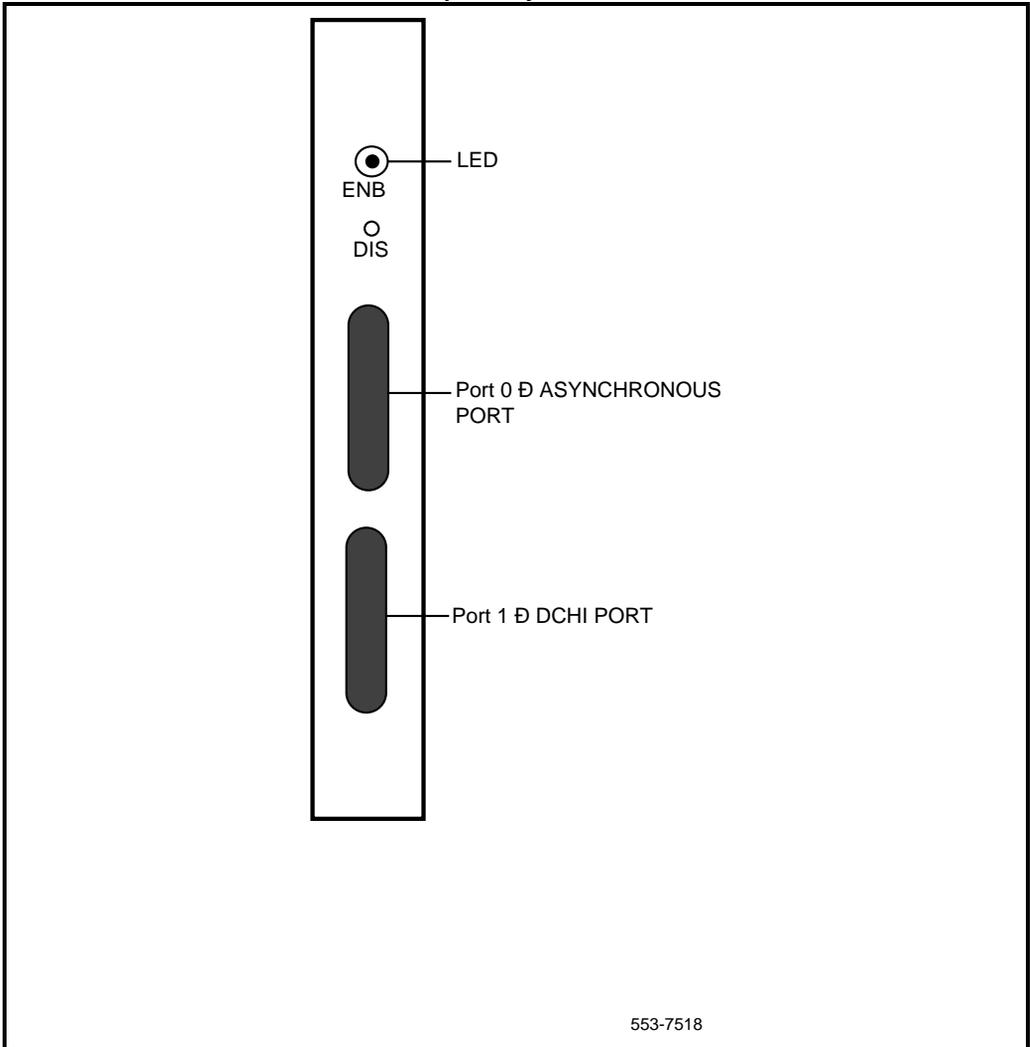
- Port 0 is a standard asynchronous port providing an interface for non-IDA applications.

*Note:* This port should only be used for testing or debugging DASS2 links.

- Port 1 is the D-channel Interface port.

Figure 2 illustrates the layout of the NT5K35, NT5K75 and NT6D11AE card faceplates.

**Figure 2**  
**NT5K35, NT5K75, NT6D11AE DCHI faceplate layout**



## NT8D72 PRI

### Power requirements

The NT8D72 PRI uses power and ground connections from the CE backplane. Table 4 describes the power requirements of the NT8D72 PRI card.

**Table 4**  
**NT8D72 power requirements**

Voltage	Worst case consumption
+5 Volt	6 Amp
+12 Volt	50 milliamperes
-12 Volt	50 milliamperes

### NT8D72 faceplate

The NT8D72 PRI contains five LEDs and six external connectors. Table 5 describes the NT8D 72 PRI card's external connectors. Figure 3 shows the NT8D72 faceplate layout.

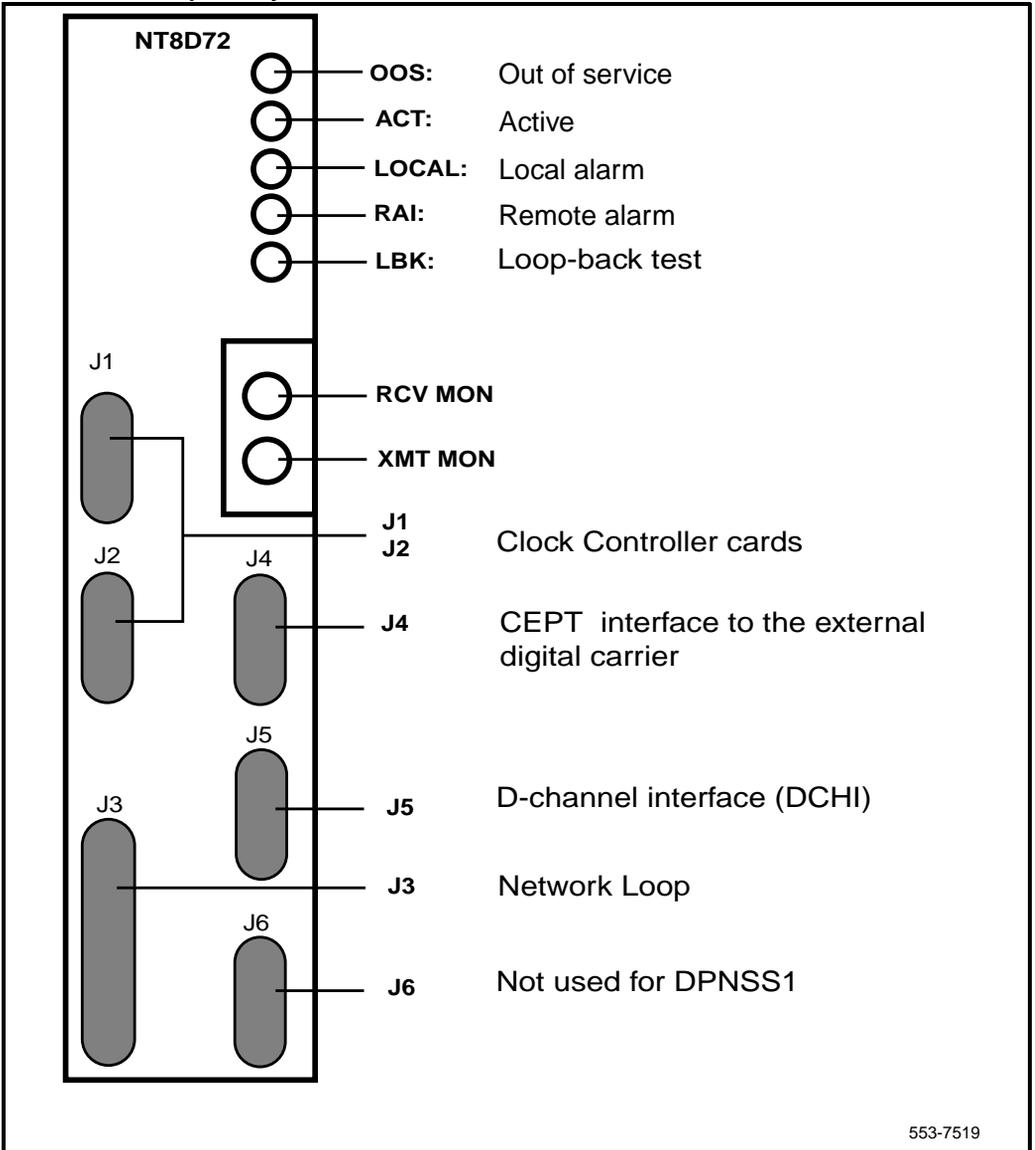
**Table 5**  
**NT8D72 external connectors**

Faceplate Designation	Type	Connect to
J1	9-pin female, D-connector	CC - CPU 0
J2	9-pin female, D-connector	CC - CPU1
J3	36-pin connector	Network Loop
J4	15-pin male, D-connector	Line
J5	15-pin male, D-connector	DCHI
J6	15-pin female, D-connector	Not used for DASS2
RCV MON	Miniature bantam jack	Test
XMT MON	Miniature bantam jack	Test

### Carrier interface

The NT8D72 PRI provides an interface to the 2Mb/s external digital line either directly or through an office repeater or line terminating unit (LTU).

**Figure 3**  
**NT8D72 PRI faceplate layout**



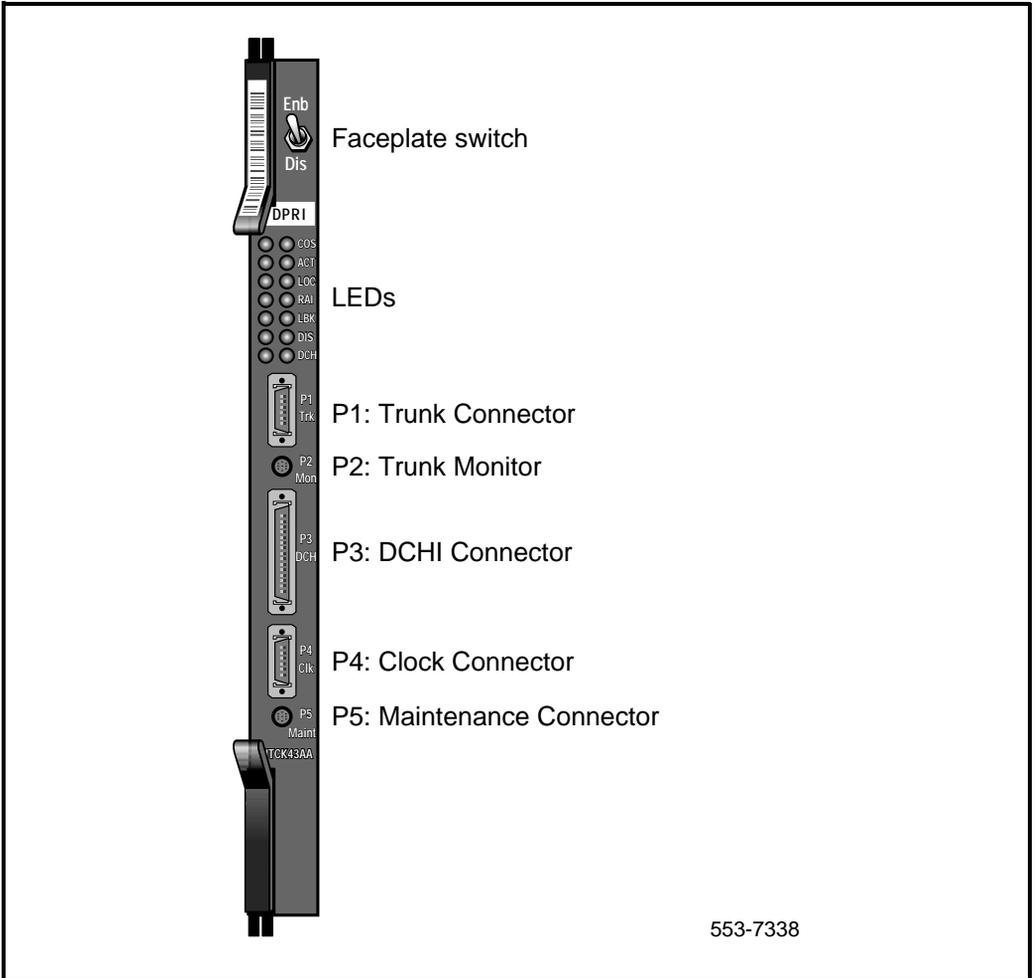
## **NTCK43 DPRI**

The NTCK43 is a dual (two port) 2.0 Mbit Primary Rate Interface card for Meridian 1 Options 51 to 81 and “N” and “T” series systems. It reduces the PRI footprint by integrating the functionalities of two NT8D72 PRI cards and one QPC414 ENET into one card. The NTCK43 occupies a single Network shelf slot providing two primary rate network connections.

### **NTCK43 faceplate**

The NTCK43 DPRI contain a set of vertical LEDs for each PRI Loop plus one Led giving the DDCH status. The faceplate includes five external connectors of which three are used by the customer. These are the Trunk connection P1, the external DCHI connector P3 and the clock controller connector P4. Figure 4 shows the faceplate layout.

**Figure 4**  
**NTCK DPRI faceplate**



## External connectors

Table 6 gives information about the external connectors located on NTCK43.

**Table 6**  
**External connectors on the NTCK43**

Faceplate Connector	Connector Type	Description
P1	9-pin female, D-connector	Dual External Trunk Connection
P2	9-pin female, DIN	Monitor Port
P3	26-pin female, D-connector	Dual DCHI interface
P4	15-pin female, D-connector	Clock Controller Port
P5	9-pin female, DIN	Maintenance Port

## LEDs

Table 7 gives information about the external connectors located on NTCK43 DPRI faceplate. A more detailed description of the LEDs follow.

**Table 7**  
**LEDs on the NTCK43**

U0	U1	Abbr.	Description
Red	Red	OOS	Out of Service
Green	Green	ACT	Active
Red	Red	RED	Local Alarm
Yellow	Yellow	RAI	Remote Alarm
Green	Green	LBK	Loopback
Red	Red	DIS	Loop Status OFF = Loop Enabled ON = Loop Disabled
Multi-coloured		DCH	DCH Status  OFF = No DDCH Daughterboard Installed  RED = DDCH Disabled  Flashing RED = DDCH Download in progress

## **LED descriptions**

### **OOS**

This red LED indicates that the particular PRI channel is in an Out-of-Service state, having received either the “disable loop” or “enter Out-of-Service state” message from software. This is also the state of both channels after power-up, completion of self-test, and exiting remote loopback mode.

### **ACT**

This green LED indicates that the channel is in the active state, having received the “enable loop” message from software.

### **RED**

This red LED indicates that the channel is in the Local alarm state. This is the state when the channel has a local problem with the received CEPT signal such as Loss of signal, Loss of Multi-frame Alignment, or Loss of Frame Alignment.

### **RAI**

This yellow LED is turned on and off by firmware to indicate that the channel has received either a RAI or an AIS signal from the remote end and notified software that it has persisted but not yet cleared.

### **LBK**

This green LED indicates that the channel is in one of the various per loop loopback states.

### **DIS**

This red LED indicates that the Loop is disabled.

### **DCH**

This dual colour red/green LED indicates that the on-board DDCH is present (red) or is present and enabled (green).

## Hardware required for DPRI configuration

The following hardware is required when configuring the NTCK43 DPRI on Meridian 1 Options 51 to 81C and “N” and “T” series systems.

**Note:** Either the DCHI card or the DPRI card may be installed first. However, DPRI loops must be configured in software before defining DCH links.

### PRI

- one NTCK43 DPRI

### DCHI

- one externally connected NT6D11 (ISDN PRI and DPNSS1/DASS2 applications)

**Note:** For DPNSS1/DASS2 applications, the NTND08AA CPU ROM is required to support the NT6D11 AD DCHI operating in the expanded mode.

For the NT6D11 operating in standard mode, the SDI/ESDI ports must be assigned a unique port address in the range 0-15. The port address numbers assigned to the NT6D11 operating in expanded mode must not conflict with addresses assigned to other I/O port types. To avoid potential conflicts and to simplify system configuration, it is recommended that, in the expanded mode, the port addresses for the NT6D11 be numbered in the range 16-159.

or optionally

- one NT5K35 or one NT5K75,

or optionally

- the Dual DASS/DPNSS Daughterboard NTAG54AA (interfaces to NTCK43AB and later)

**Note:** The NTND08AA or QPC949D CPU ROM is required to support the NTAG54AA operating in the expanded mode (GPT addressing).

## Clock Controller

- QPC471 or QPC775 Clock Controller(s)

For EuroISDN applications, and for use on the Meridian 1 system Option 81 in international markets, vintage QPC77E is required.

*Note:* The QPC775 Clock Controller card currently is not compatible with Stratum 3 clocking in the U.S.A. Therefore, it is available for only the Canadian and International markets.

## Other hardware

Additional hardware may also be required for PRI capability and applications. Installation instructions are given in other Nortel Networks publications or supplied by the manufacturer. This additional hardware may include:

- one Channel Service Unit (CSU), or Line Terminating Unit (LTU)
- one office repeater
- one QMT8 Asynchronous Data Module (ADM)

## Cabling

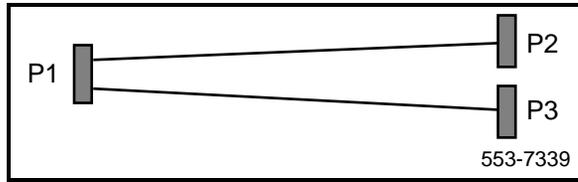
This section lists the types of cable used and the lengths required for internal and external NTCK43 DPRI connections.

### DPRI cables

The various cables associated with the Dual PRI are given below. Note that the D-channel and Clock Controller cables have length variations to facilitate different configurations. These cable length variations match the lengths that are presently available for the NT8D72BA.

#### NTCK45AA

120 Ohm Dual PRI to I/O Panel cable (8ft).



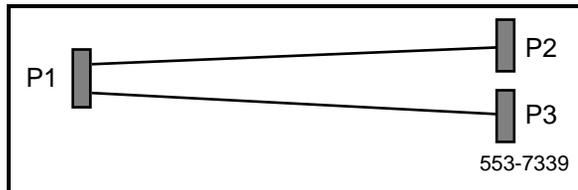
Connector P2 supplies the PRI Trunk connection for Unit 0.

Connector P3 supplies the PRI Trunk connection for Unit 1.

*Note:* This cable is not used for ST Machines.

#### NTCK78AA

120 Ohm Dual PRI cable for ST Machines (50ft).



Connector P2 supplies the PRI Trunk connection for Unit 0.

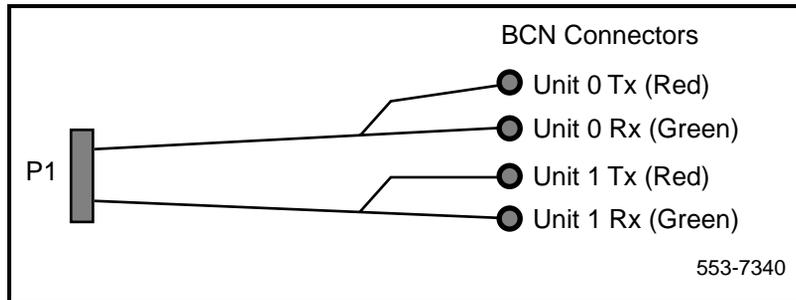
Connector P3 supplies the PRI Trunk connection for Unit 1.

*Note:* This cable is used for ST Machines only.

**NTCK79AA**

75 Ohm Dual PRI Coax Cable (40ft)

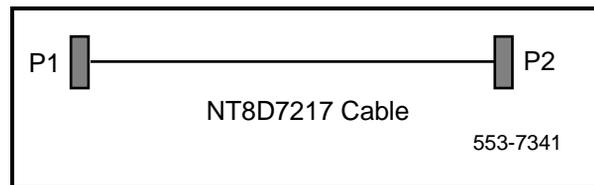
This cable is 75 Ohm Dual Coaxial cable which interfaces to P1 on the faceplate side and to external equipment such as an LIU.



**External DPRI cable**

**NT8D7217**

Dual PRI I/O Panel to Multiplexer cable (50ft).



*Note:* This cable is not used for ST Machines.

**External NT6D11 DCHI D-channel cables****NTCK46AA**

Dual PRI to DASS/DPNSS DCHI cable (6ft)

**NTCK46AB**

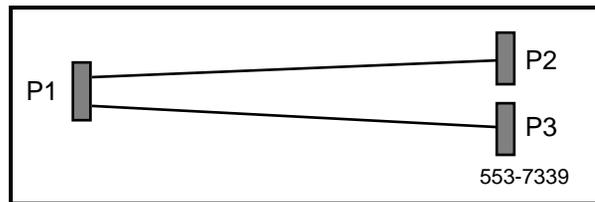
Dual PRI to DASS/DPNSS DCHI cable (18ft)

**NTCK46AC**

Dual PRI to DASS/DPNSS DCHI cable (35ft)

**NTCK46AD**

Dual PRI to DASS/DPNSS DCHI cable (50ft)



Connector P2 supplies the DCHI connections for Unit 0.

Connector P3 supplies the DCHI connections for Unit 1.

**Clock Controller cables (1 to 2 port cables)****NTCK47AA**

Dual PRI to Clock Controller cable (2ft)

**NTCK47AB**

Dual PRI to Clock Controller cable (4ft)

**NTCK47AC**

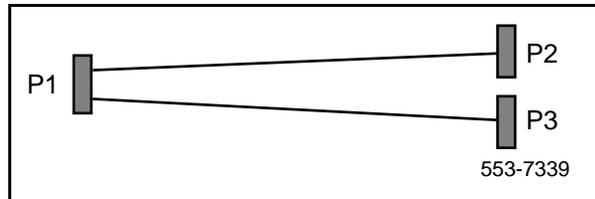
Dual PRI to Clock Controller cable (6ft)

**NTCK47AD**

Dual PRI to Clock Controller cable (8ft)

**NTCK47AE**

Dual PRI to Clock Controller cable (10ft)



Cable NTCK47 is the clock control cable used for most configurations. The NTCK47 can be used for all clocking options that use a Single CPU.

It can also be used for all clocking options using a Dual CPU where a Dual PRI provides one of the references and the other reference is provided from a different source, that source being either a different Dual PRI, a NT8D72 PRI or a DTI.

**Clock Controller Cables (1 to 4 port cables)**

**NTCK81AA**

Dual PRI to Clock Controller cable (2ft)

**NTCK81AB**

Dual PRI to Clock Controller cable (4ft)

**NTCK81AC**

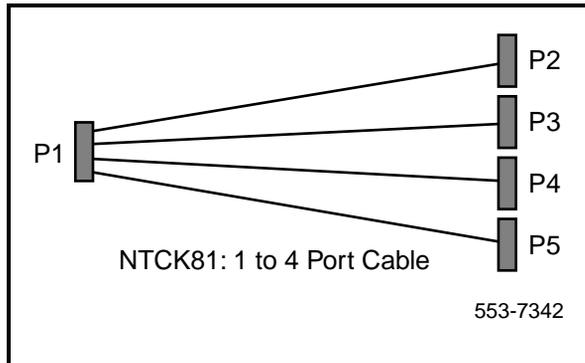
Dual PRI to Clock Controller cable (6ft)

**NTCK81AD**

Dual PRI to Clock Controller cable (8ft)

**NTCK81AE**

Dual PRI to Clock Controller cable (10ft)

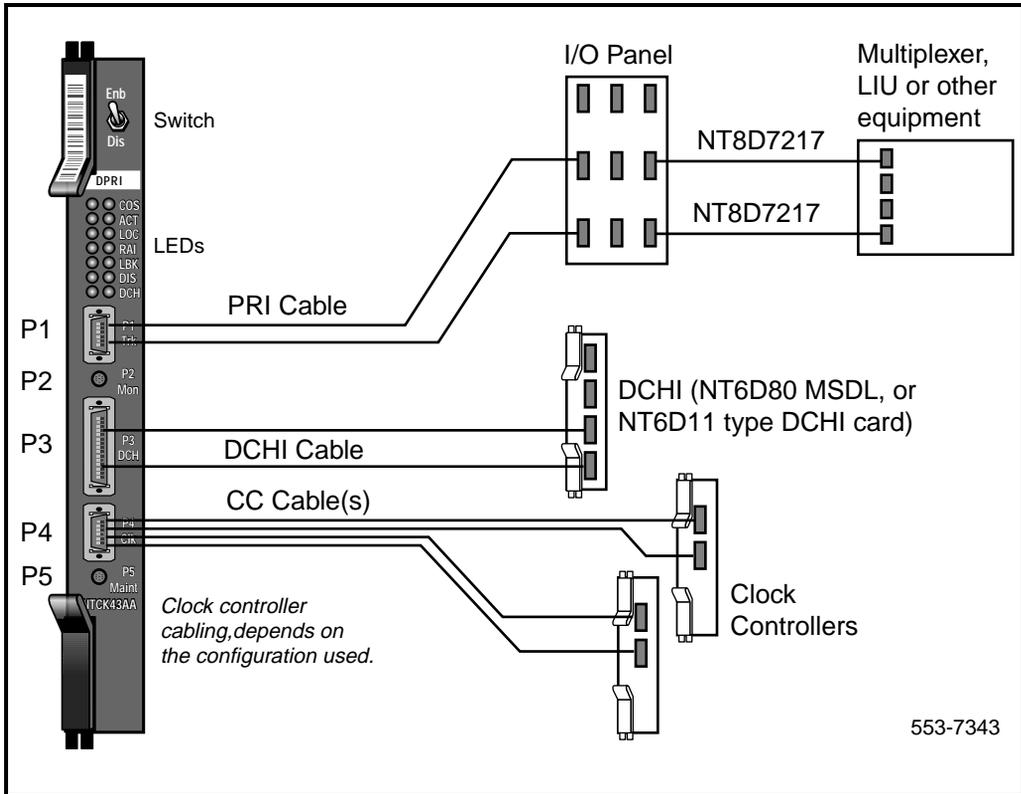


Cable NTCK81 is used only in the situation where 1 Dual PRI provides both references to both CPU's, i.e. where the Dual PRI is the sole source of clocking references for the system. If a system has other PRIs installed (DPRIs or NT8D72) other than the Dual PRI, it is recommended that one of the clocking references be taken from that other source. This will de-risk the impact of a Dual PRI card failure on the system.

### NTCK43 DPRI carrier interface

The NTCK43 DPRI provide an interface to the 2Mb/s external digital line either directly or through an office repeater, line terminating unit (LTU), or Channel Service Unit (CSU). This is depicted by Figure 5.

Figure 5  
NTCK43 DPRI carrier interface



## **Clocking configurations pertaining to the NTCK43 DPRI**

A number of different configurations arise when talking about Clock Controllers. The are:

- a Single CPU System
- a Dual CPU System

A single CPU system has one Clock Controller card. This card can receive references clocks from 2 sources referred to as the primary and secondary sources. These 2 sources can originate from a PRI, DTI etc. PRI cards such as the NT8D72 are capable of supplying 2 references of the same clock source. These are known as Ref1 (available at J1) and Ref2 (available at J2) on the NT8D72.

The Dual PRI is capable of supplying 2 references from each clock source i.e. 4 references in total. Dual PRI can thus supply Ref1 and Ref2 from its Primary and Ref1 and Ref2 from its Secondary.

### **Clock Controller Options**

This section describes the various clocking configurations options available as well as the Clock Controller cables and Clock switch options that support these configurations.

Table 8 provides a summary of the Clock Controller Options. Table 9 provides a description of these Options. Figure 6 to Figure 9 provide illustrations.

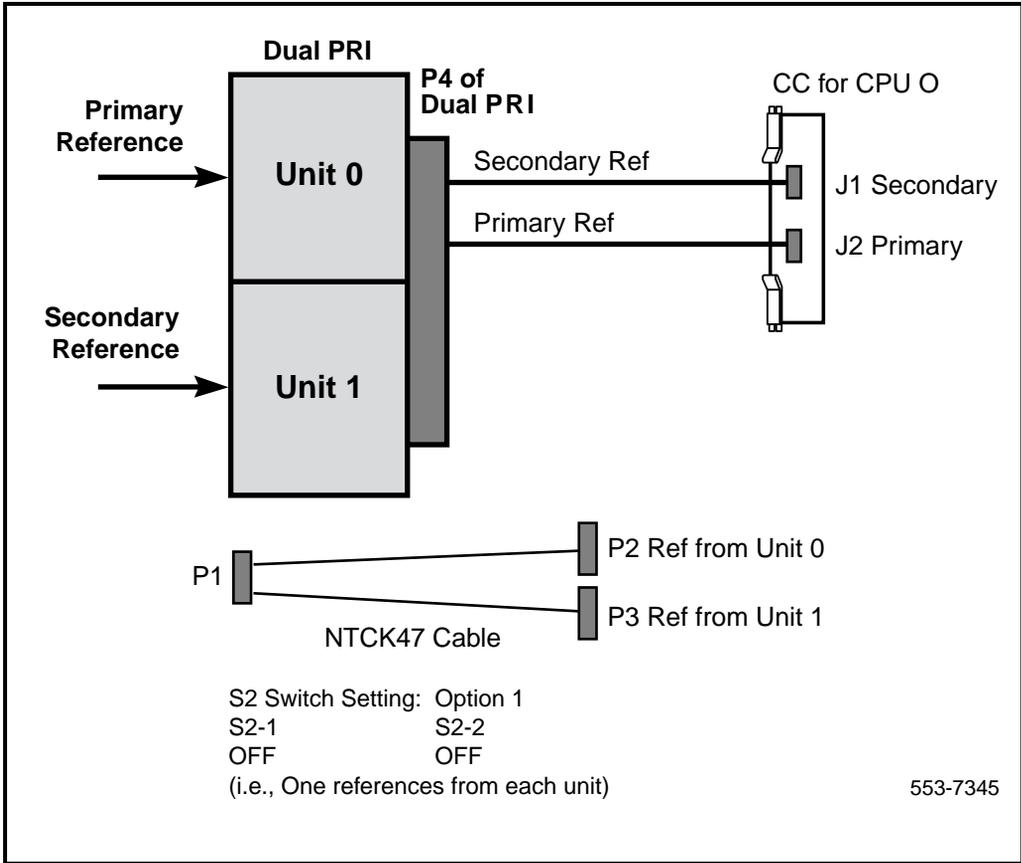
**Table 8**  
**Clock Controller Options - summary**

CC Option	S2-1	S2-2	CPU type	Cable	Notes
Option 1	OFF	OFF	Single	NTCK47	Ref 1 from U0 on P2. Ref 2 from U1 on P3.
Option 2	OFF	ON	Dual	NTCK47	Ref 1 from U0 on P2. Ref 2 from U0 on P3.
Option 3	ON	OFF	Dual	NTCK47	Ref 1 from U1 on P2. Ref 2 from U1 on P3.
Option 4	ON	ON	Dual	NTCK81	Ref 1 from U0 on P2. Ref 2 from U0 on P3. Ref 1 from U1 on P4. Ref 2 from U1 on P5.

**Table 9**  
**Clock Controller Options - description**

CC Option	Description
Option 1	<p>This option provides a single CPU system with 2 clock sources derived from the 2 units of the Dual PRI.</p> <p>Connector P2 provides a clock source from Unit 0.</p> <p>Connector P3 provides a clock source from Unit 1.</p> <p>Refer to Figure 6.</p>
Option 2	<p>This option provides a Dual CPU system with 2 references of a clock source derived from unit 0 of the DPRI.</p> <p>Connector P2 provides a Ref 1 clock source from Unit 0.</p> <p>Connector P3 provides a Ref 2 clock source from Unit 0.</p> <p>Refer to Figure 7.</p>
Option 3	<p>This option provides a Dual CPU system with 2 references of a clock source derived from unit 1 of the DPRI.</p> <p>Connector P2 provides a Ref 1 clock source from Unit 1.</p> <p>Connector P3 provides a Ref 2 clock source from Unit 1.</p> <p>Refer to Figure 8.</p>
Option 4	<p>This option provides a Dual CPU system with 2 references from each clock source derived from the DPRI.</p> <p>Connector P2 provides a Ref 1 clock source from Unit 0.</p> <p>Connector P3 provides a Ref 2 clock source from Unit 0.</p> <p>Connector P4 provides a Ref 1 clock source from Unit 1.</p> <p>Connector P5 provides a Ref 2 clock source from Unit 1.</p> <p>Refer to Figure 9.</p>

Figure 6  
CC Option 1



**Figure 7**  
**CC Option 2**

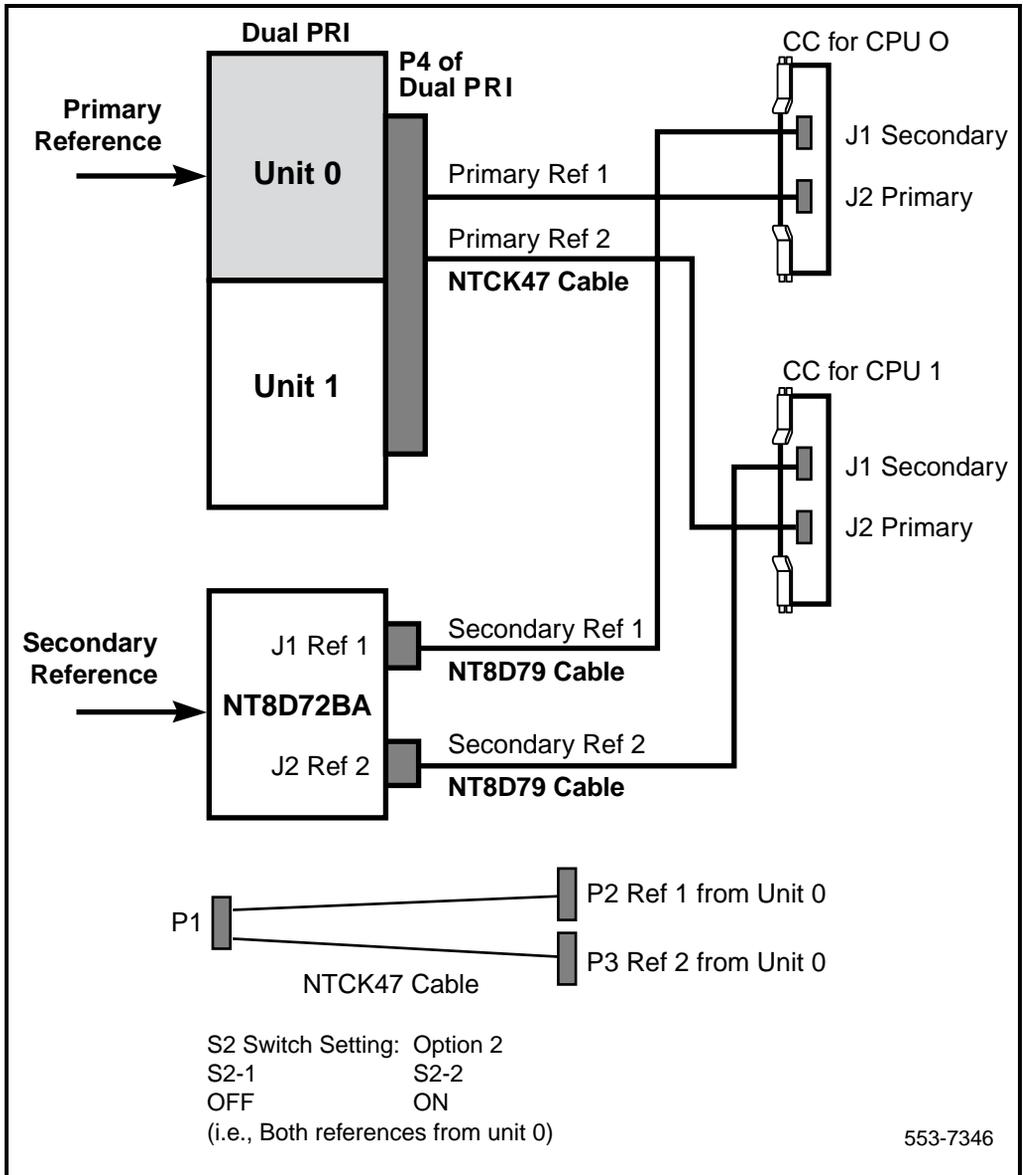
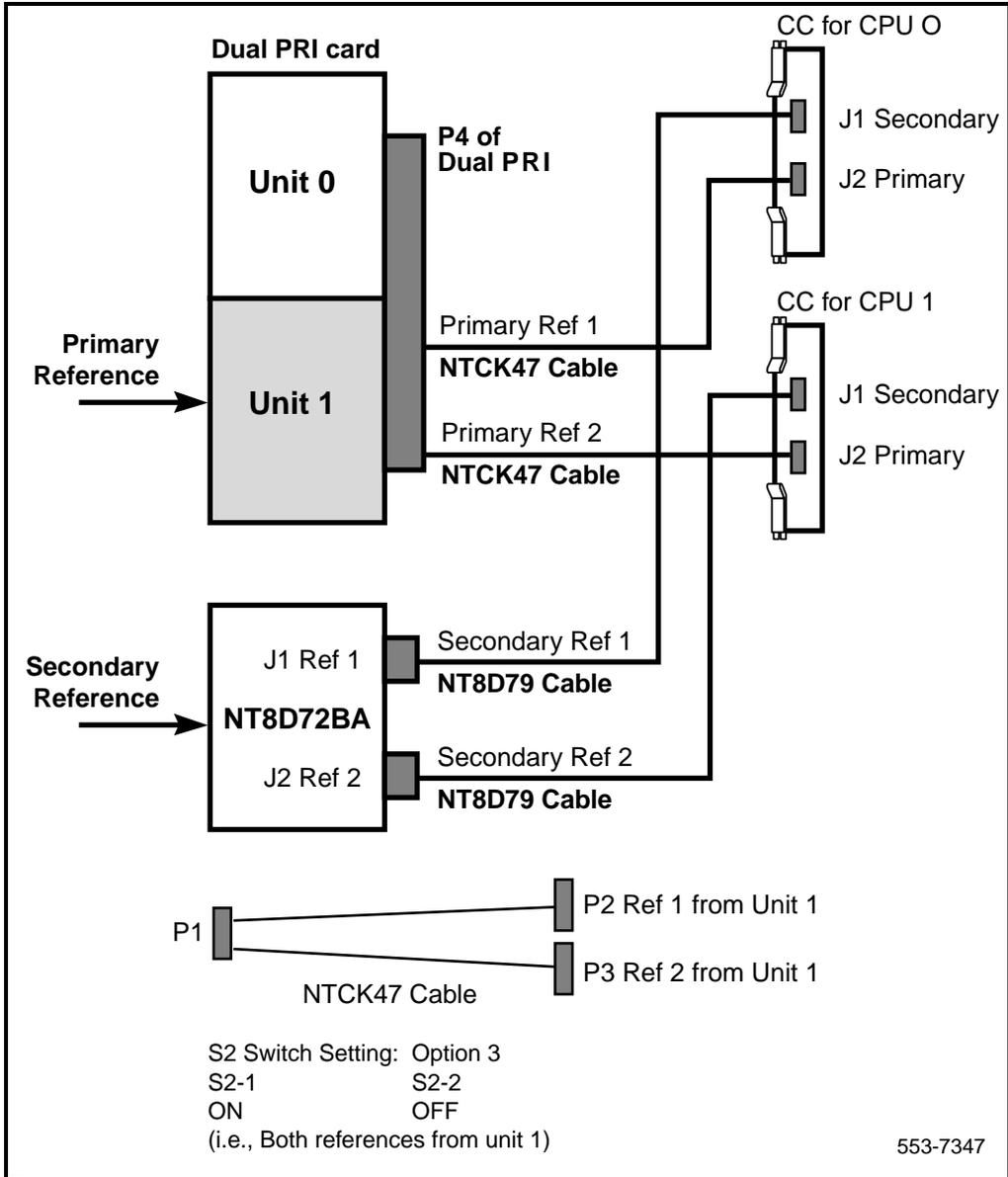
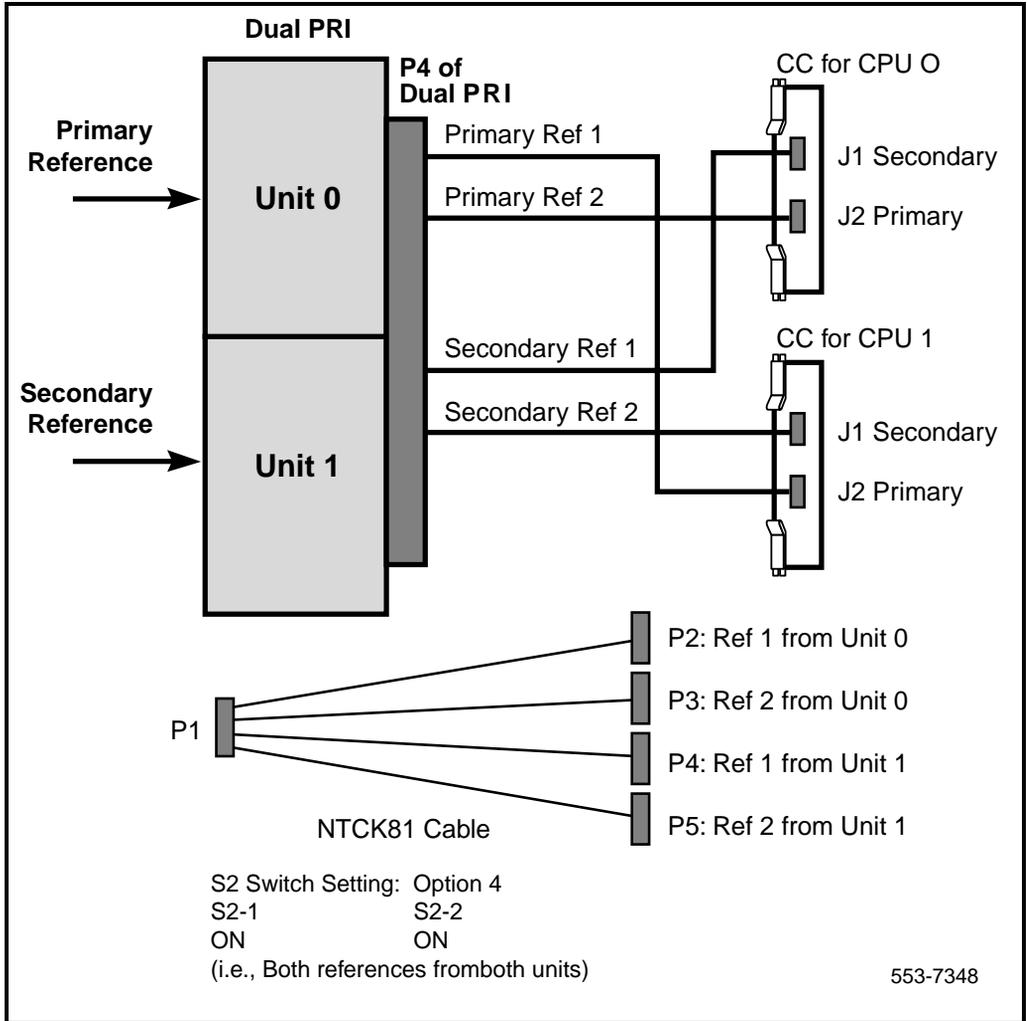


Figure 8  
CC Option 3



**Figure 9**  
**CC Option 4**



## Clock Controller

### QPC775

Clock Controller card(s) have to be fitted in Meridian 1 system Options 21, 21E, 51/51C, and 61/61C when DASS2 links are installed. On Meridian 1 system Options 51/51C and 61/61C, card slots are dedicated for the Clock Controller. On the Meridian 1 system Option 21/21E the Clock Controller must be placed in one of the first four network positions.

For Meridian 1 system Options 71 or 81/81C, two Clock Controller cards are used for synchronization; the Clock Controllers extend timing signals to multiple groups via a junctor board. The QPC775E must be used on Option 81/81C systems.

In a standalone switch or one with only analogue networking, the Clock Controller is not normally fitted.

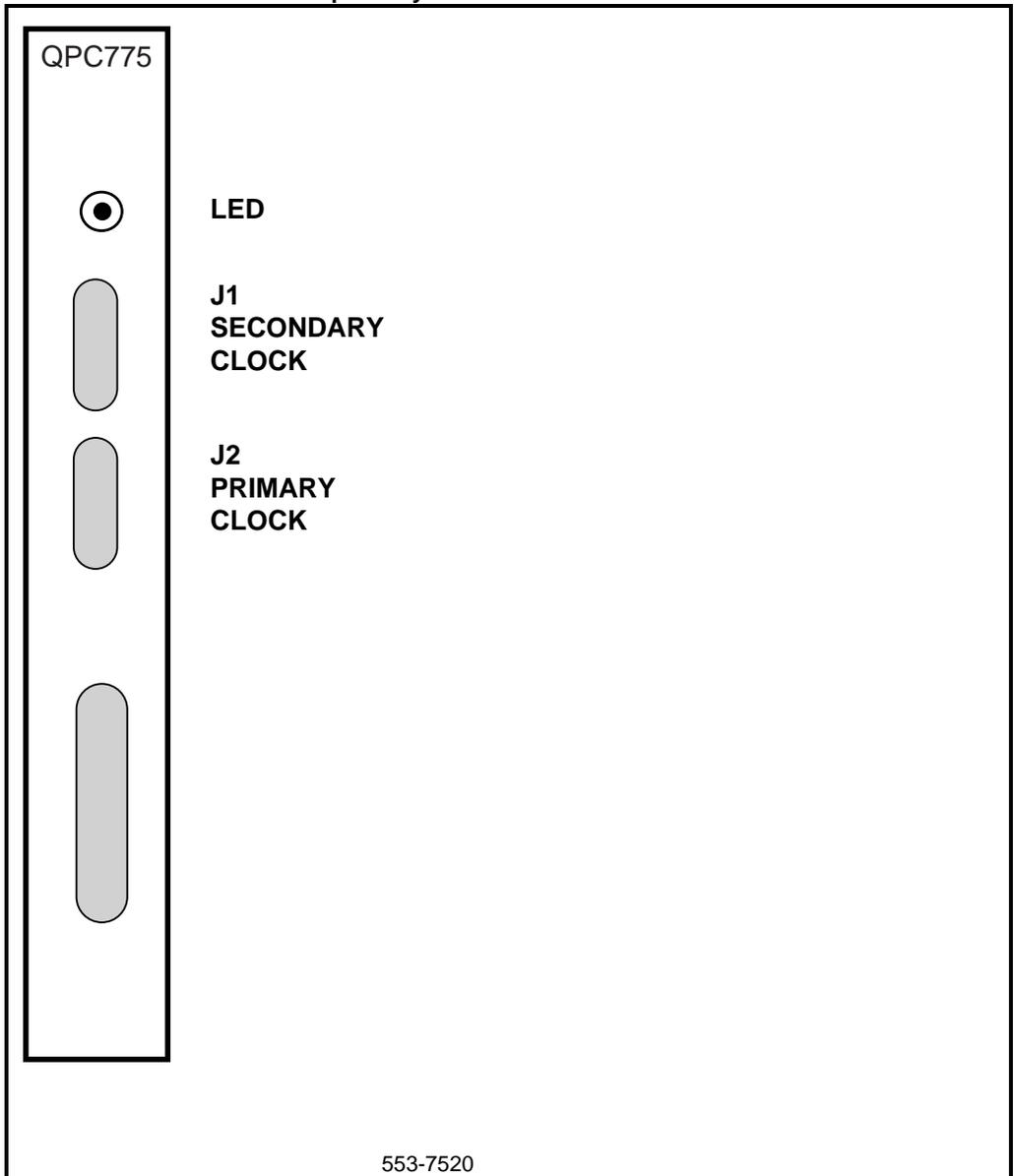
Synchronization between switches must always be provided in the case of DASS2 trunks, and every digital network must be individually checked for clocking configurations. If the Meridian 1 is to provide clocking over a link, then there are no additional configuration changes required on the Meridian 1 system. If the Meridian 1 is to be synchronized to a particular link, then the associated PRI card must be physically connected to the Clock Controllers of the Meridian 1.

In a dual processor system, the synchronization link must be connected to both Clock Controllers to allow for change over. The Clock Controller(s) can be connected to two synchronization links, the second being programmed to provide the system clocking if the first choice fails.

DIP switches are set on the Clock Controller card according to the system type, and in systems with 3PE board(s), DIP switches must be set accordingly on the 3PE.

Figure 10 illustrates the layout of a QPC775 Clock Controller faceplate.

**Figure 10**  
**QPC775 Clock Controller faceplate layout**

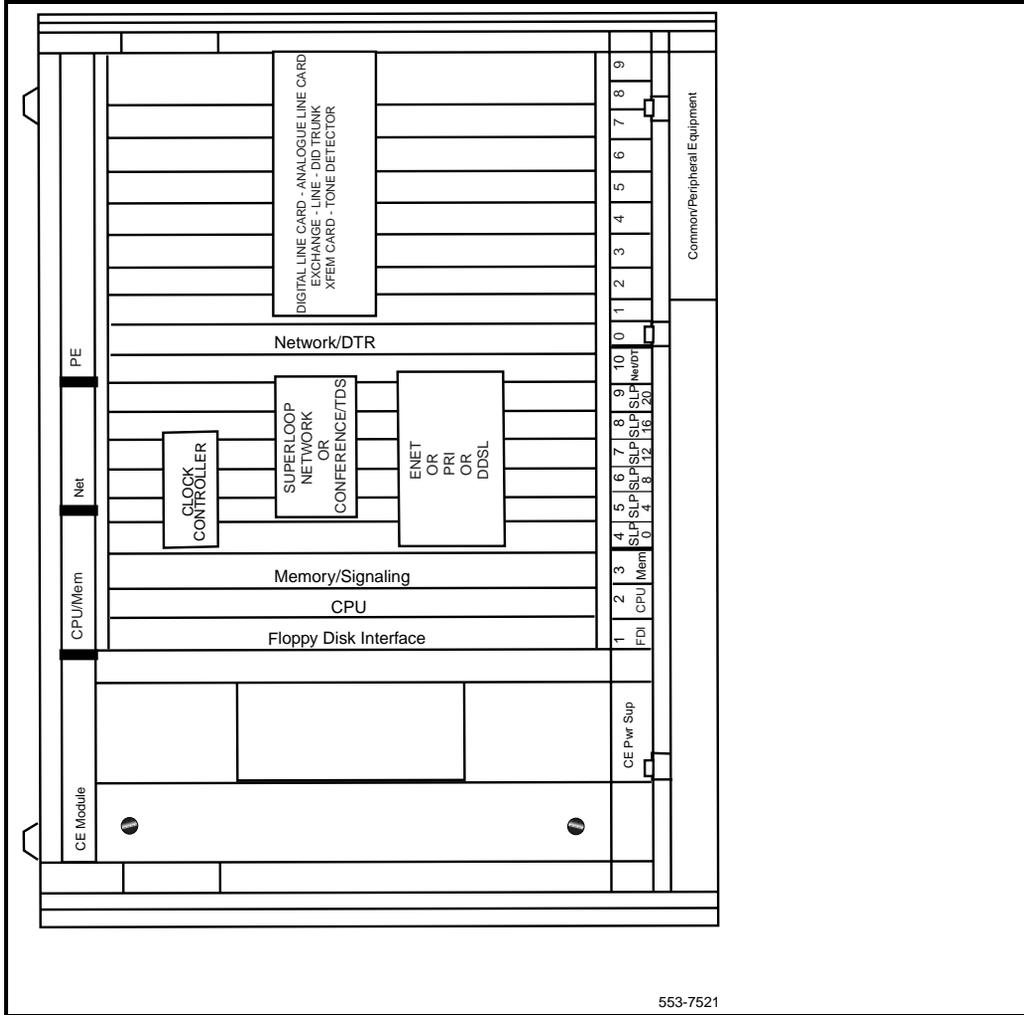


## Schematics for Meridian 1 systems

Figure 11 shows a schematic of a Network module in Meridian 1 system Options 21/21E.

*Note:* Option 21E has one fewer CPE slot than Option 21.

**Figure 11**  
**Meridian 1 system Option 21/21E**

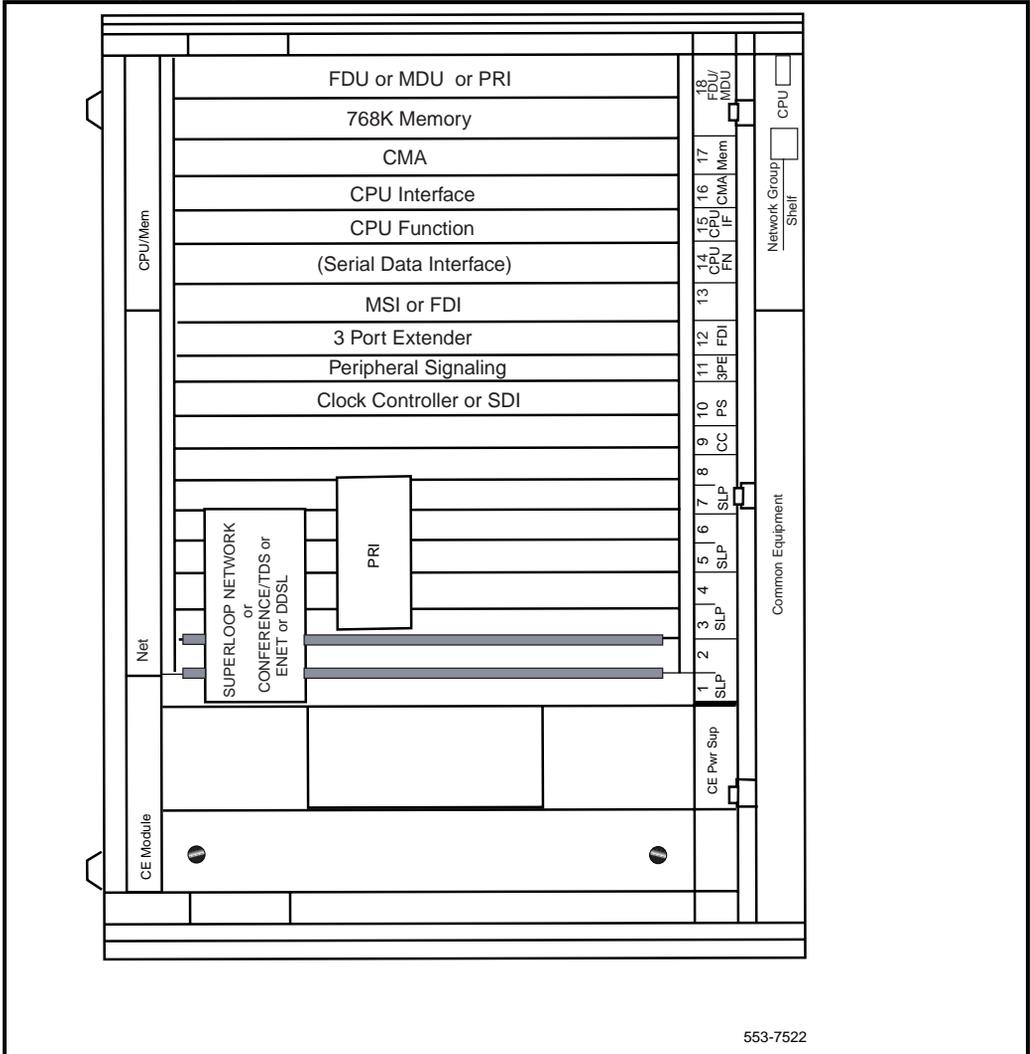


553-7521

### Meridian 1 system Options 51/61

For DASS2, the D-channel is configured in slot 13 (the SDI slot) on Option 61. Figure 12 shows a schematic of a CPU/Network module in Meridian 1 system Options 51/61.

**Figure 12**  
**Meridian 1 system Options 51/61**

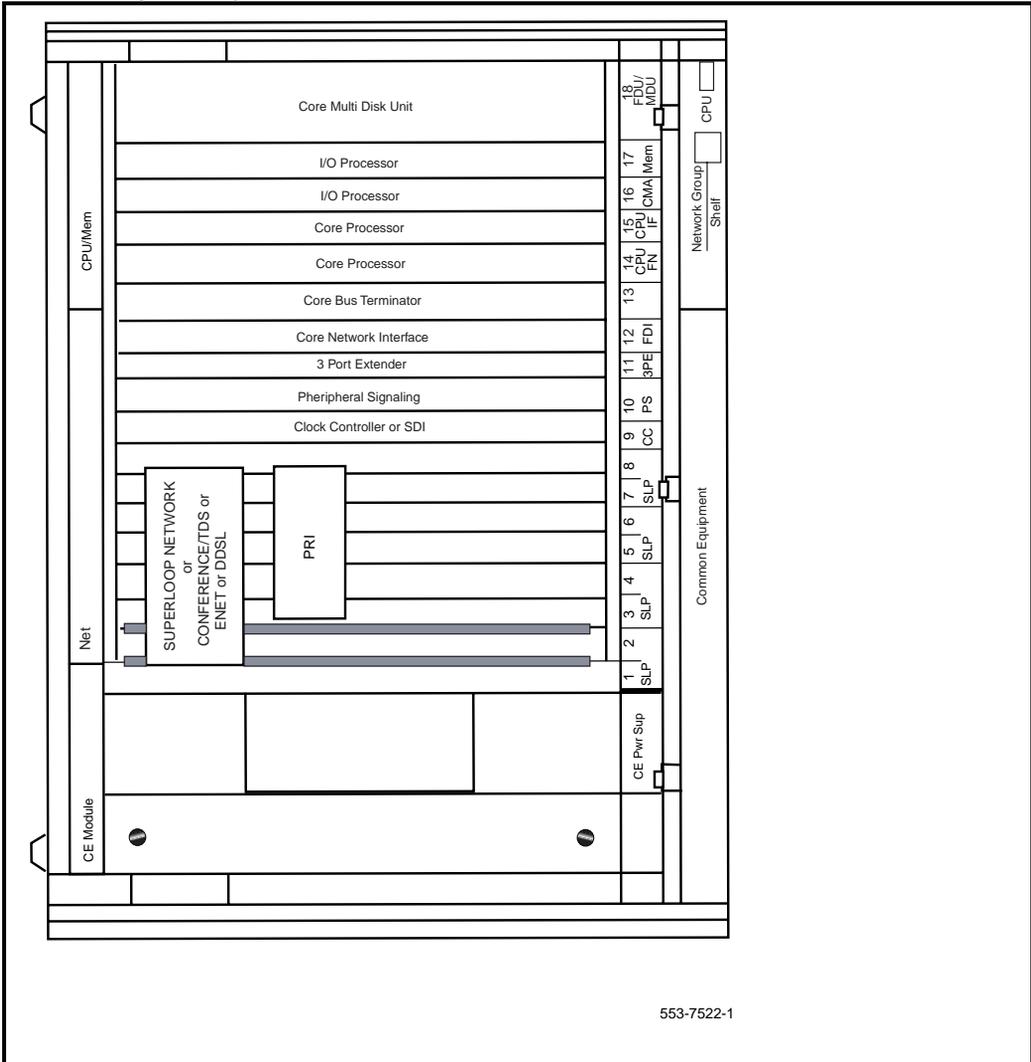


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### Meridian 1 system Option 51C/61C

Figure 13 shows a schematic of a Core/Network module in Meridian 1 system Options 51C and 61C.

**Figure 13**  
**Meridian 1 system Options 51C/61C**

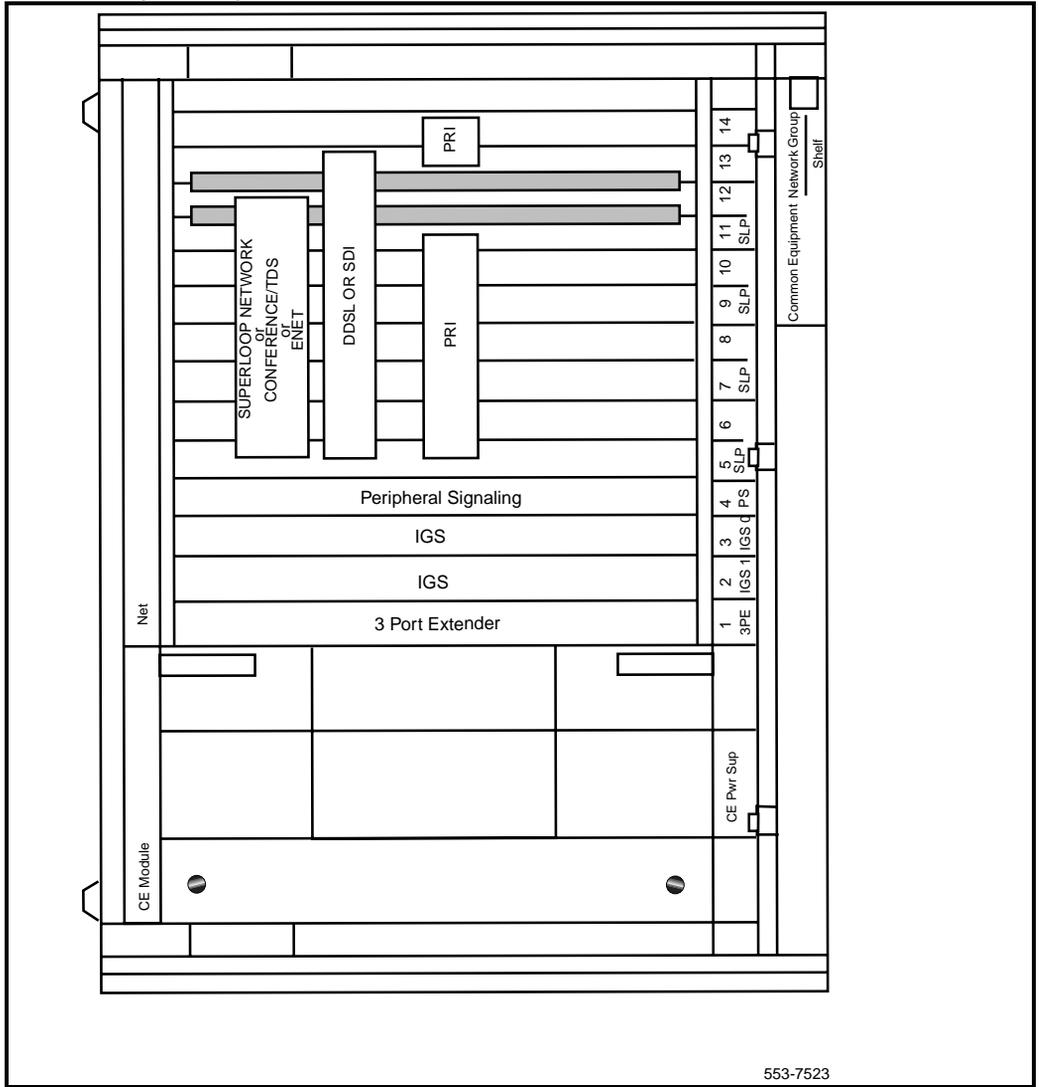


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### Meridian 1 system Option 71/81/81C

Figure 14 shows a schematic of a Network module in Meridian 1 system Options 71, 81, and 81C.

**Figure 14**  
**Meridian 1 system Option 71/81/81C**

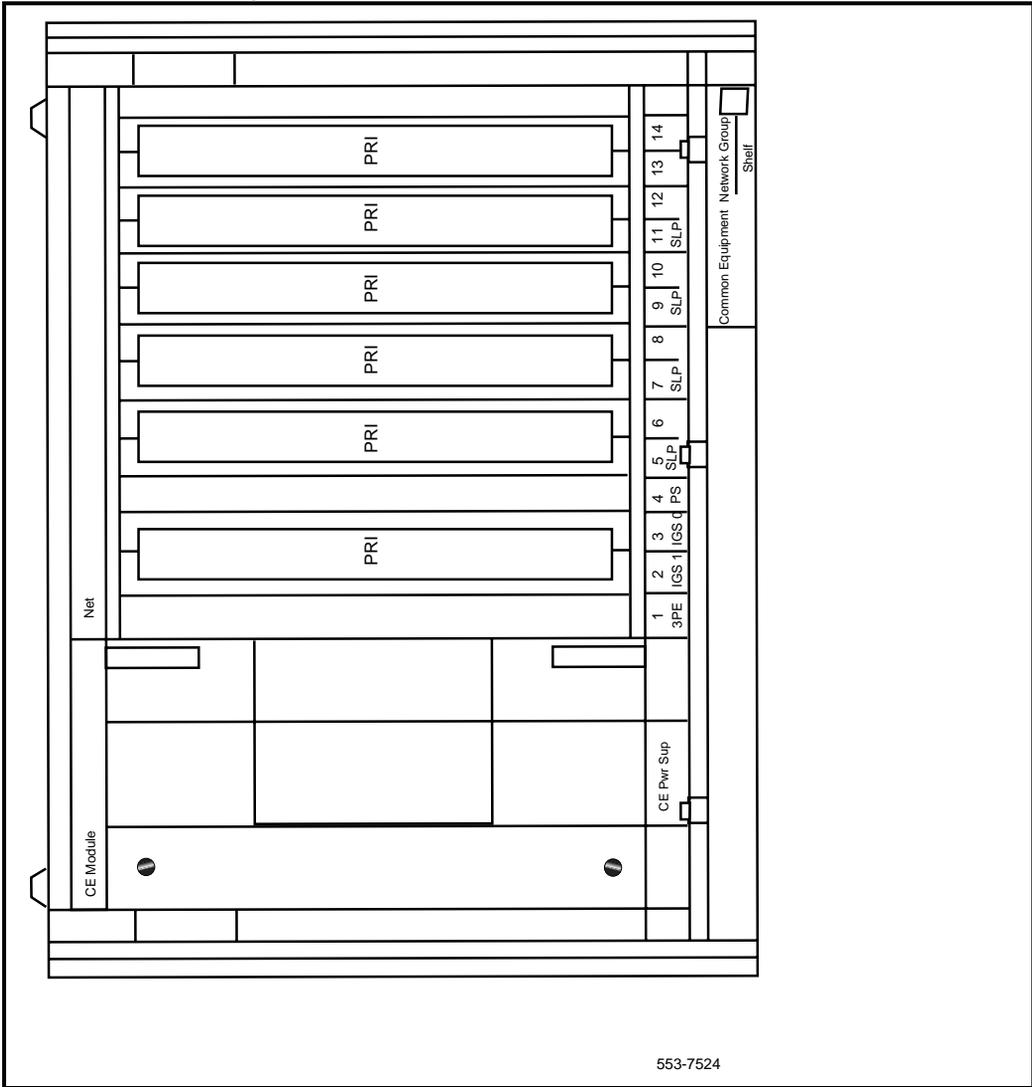


553-7523

### Meridian 1 network expansion shelf

Figure 15 shows a schematic of a Meridian 1 Network Expansion module with six PRI cards.

**Figure 15**  
**Meridian 1 network expansion module with six PRI cards**



553-7524

## Cabling requirements

### Cables and cable lengths

Table 10 describes the cable types and cable lengths.

**Table 10**  
**Cables and cable lengths**

Cable Type	From	To	Maximum length (meters)
NT5K40AA or NT5K41AA or NT5K86AA or NT5K86BA or NT5K86CA	NT8D72 PRI	Line Terminating Equipment	NT5K40AA - 4 NT5K41AA - 8 NT5K86AA - 12 NT5K86BA - 12 NT5K86CA - 12
QCAD328A	NT8D72 PRI	NT5K35 or NT5K75 or NT6D11AE DCHI	1.8
NT8D85AD  NT8D75AC/AD (Meridian 1 system Option 61 only)	QPC414 ENET  QPC775 Clock Controller	NT8D72 PRI  QPC775 Clock Controller	1.8  NT8D75AC - 1.2 NT8D75AC - 1.8
NT8D82AD	NT5K35 or NT5K75 or NT6D11AE DCHI	I/O panel	1.8
NT8D79AD	NT8D72 PRI	QPC775 Clock Controller	1.8 m

#### NT5K40AA, NT5K41AA

- Construction - 75 ohm dual co-axial type with solid inner conductor and braided shield
- PRI connection (front) - J4, 15-pin, male, subminiature D with jack-screws
- LTE connection (rear) - twin 75 ohm BNC crimp plug, transmit and receive

**NT5K86AA/BA/CA**

- Construction - 75 ohm dual co-axial type with solid inner conductor and braided shield
- NT5K86AA TX shield connected to FGND  
NT5K86BA RX shield connected to FGND  
NT5K86CA TX and RX shields connected to FGND
- PRI connection (front) - J4, 15-pin, male, subminiature D with jack-screws
- LTE connection (rear) - twin 75 ohm BNC crimp plug, transmit and receive

**NT5K40AA, NT5K41AA wire list**

Table 11 provides a wire list for the NT5K40AA and NT5K41AA cables.

**Table 11**  
**NT5K40AA and NT5K41AA wire list**

Signal	From (card end)	To (I/O end)
XTIP (transmit)	J1-1	J2 Inner Conductor
XRING (transmit)	J1-9	J2 Shield
RTIP (receive)	J1-3	J3 Inner Conductor
RRING (receive)	J1-11	J3 Shield

**NT5K86AA wire list**

Table 12 provides a wire list for the NT5K86AA cable.

**Table 12**  
**NT5K86AA wire list**

Signal	From (card end)	To (I/O end)
XTIP (transmit)	J1-1	J2 Inner Conductor
XRING (transmit)	J1-9	J2 Shield
RTIP (receive)	J1-3	J3 Inner Conductor
RRING (receive)	J1-11	J3 Shield
FRAME GROUND	J1-2	J2 Shield

**NT5K86BA wire list**

Table 13 provides a wire list for the NT5K86BA cable.

**Table 13**  
**NT5K86BA wire list**

<b>Signal</b>	<b>From (card end)</b>	<b>To (I/O end)</b>
XTIP (transmit)	J1-1	J2 Inner Conductor
XRING (transmit)	J1-9	J2 Shield
RTIP (receive)	J1-3	J3 Inner Conductor
RRING (receive)	J1-11	J3 Shield
FRAME GROUND	J1-2	J3 Shield

**NT5K86CA wire list**

Table 14 provides a wire list for the NT5K86CA cable.

**Table 14**  
**NT5K86CA wire list**

<b>Signal</b>	<b>From (card end)</b>	<b>To (I/O end)</b>
XTIP (transmit)	J1-1	J2 Inner Conductor
XRING (transmit)	J1-9	J2 Shield
RTIP (receive)	J1-3	J3 Inner Conductor
RRING (receive)	J1-11	J3 Shield
FRAME GROUND	J1-2	J2 Shield, J3 Shield

### QCAD328A

The NT5K35, NT5K75 and NT6D11AE D-channel interface connects to the NT8D72 PRI by means of the QCAD328A, which is a special RS422 cable. This cable has the following attributes:

- Construction - 24 AWG (0.511 mm), stranded
- P1 Connector (from DCHI) - 25-pin male, subminiature D
- P2 Connector (to PRI) - 15-pin male, subminiature D

### QCAD328A wire list

Table 15 provides a wire list for the QCAD328 cable.

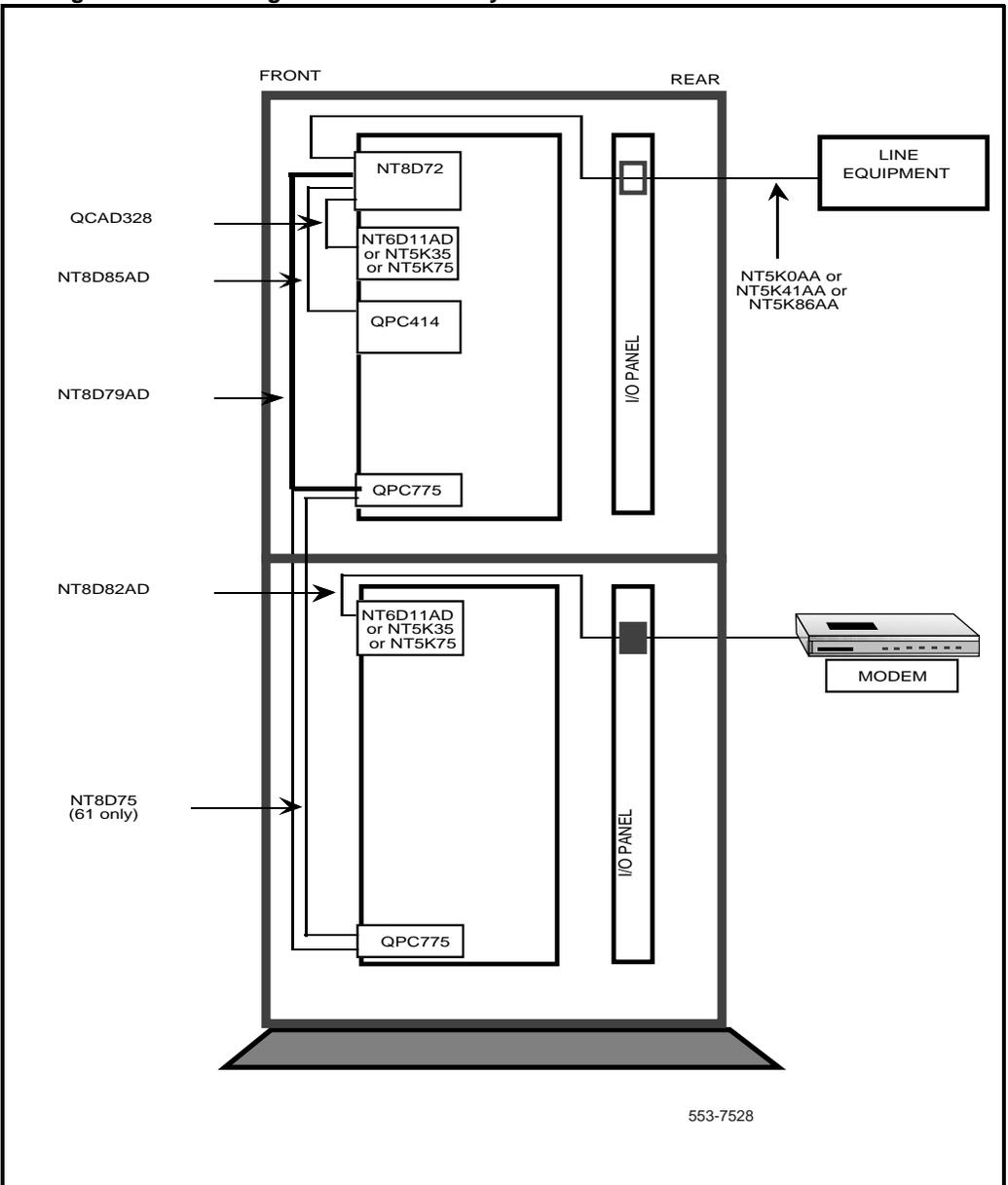
**Table 15**  
**QCAD328A wire list**

From DCHI (25 Pin)	To PRI (15 Pin)
P1-2	P2-2
P1-13	P2-10
P1-20	P2-15
P1-15	P2-9
P1-14	P2-11
P1-3	P2-4
P1-16	P2-12
P1-17	P2-5
P1-12	P2-13
P1-8	P2-8
P1-1	P2-1
P1-5 TO P1-8	
P1-7 TO P1-1	

### Cabling schematic

Figure 16 provides a schematic illustration of IDA cabling.

**Figure 16**  
**Cabling schematic for a generic Meridian 1 system**





# DCHI installation and removal

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## Reference list

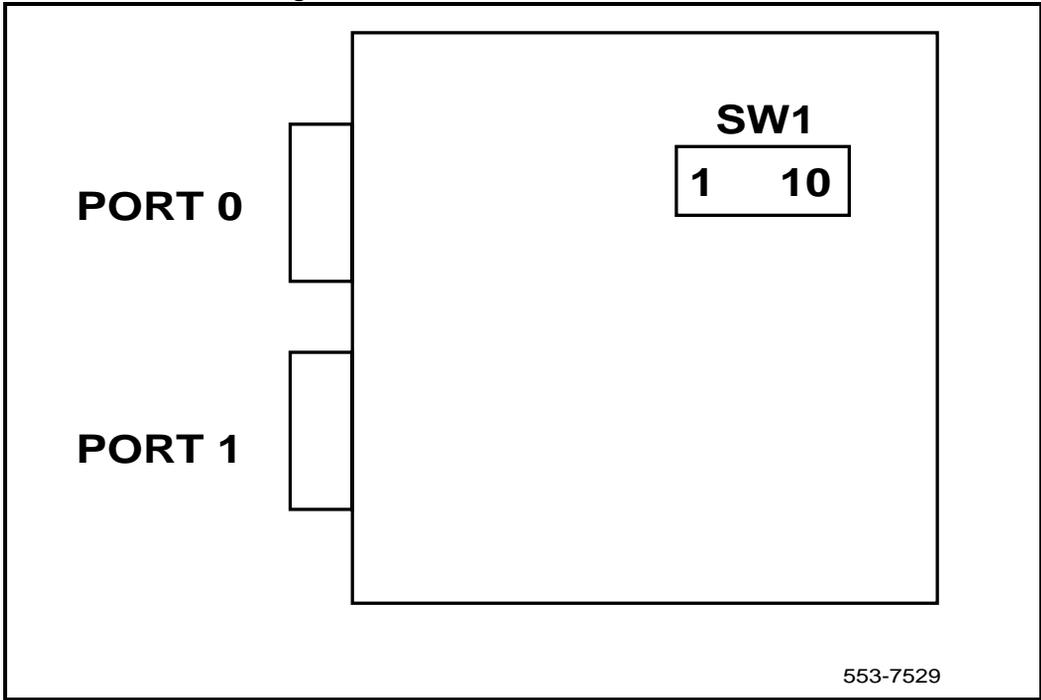
The following are the references in this section:

- *ISDN PRI/BRI Feature Description and Administration (553-2901-301)*
- *Spares Planning (553-3001-153)*
- *DPNSS1 Features and Services Guide (553-3921-300)*
- *DPNSS1 Maintenance Guide (553-3921-500)*

## Setting up the NT5K35 DIP switch settings

The NT5K35 has a single bank of DIP switches, as shown in Figure 17.

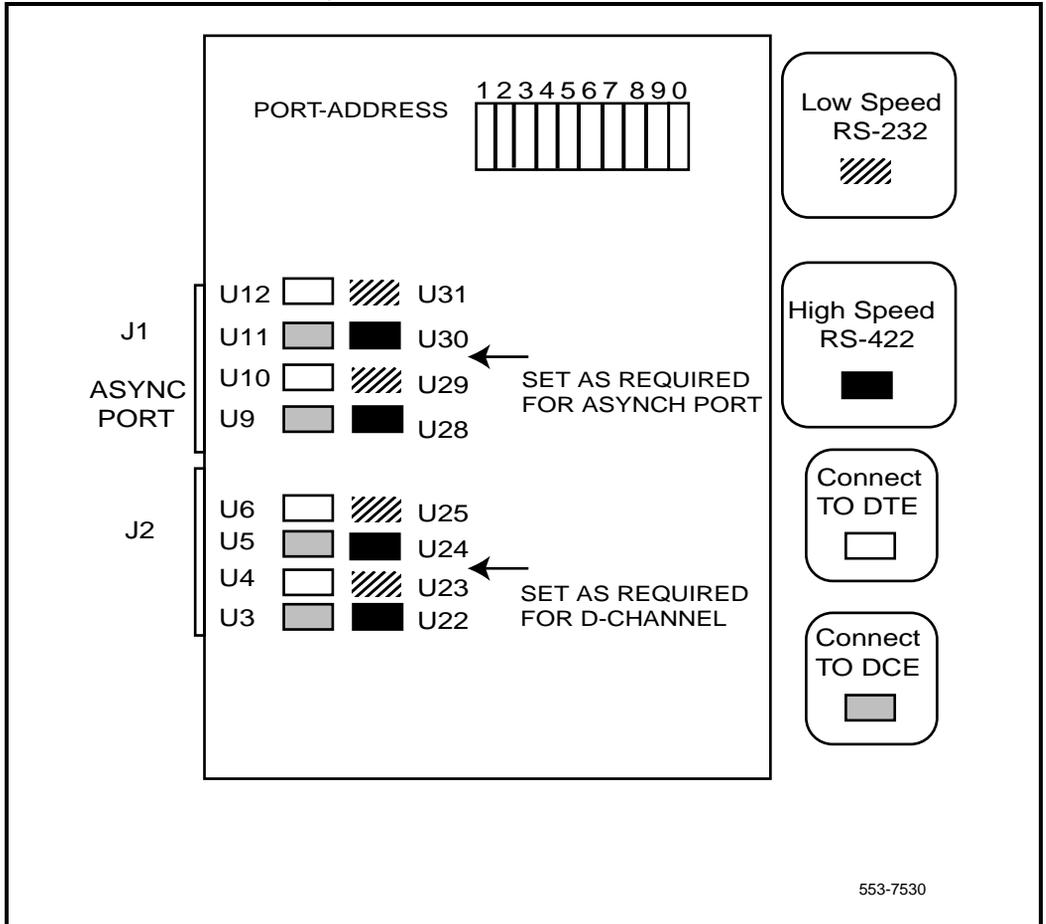
**Figure 17**  
**NT5K35 DIP switch settings**



## Jumper settings

The NT5K35 has two banks of option straps, one for each port. These select between DCE and DTE operation and whether the signaling interface is RS232 (asynchronous) or RS422 (DASS2). Figure 18 shows the jumper strap settings on the NT5K35 card.

**Figure 18**  
**NT5K35 Jumper strap settings**



### DASS2 configuration

For DASS2 high speed (64Kb/s) and DCE connection, insert plugs in positions U3 + U5 + U22 + U24. Please note that J1 is not used and the positions of plugs U9 - U12 and U28 - U31 are not relevant.

### Port address switch settings

Table 16 lists the NT5K35 port address switch settings for **dual port operation**.

*Note:* S7 and S9 have no effect for dual port operation.

**Table 16**  
**NT5K35 Port address switch settings for dual port operation**

Port Number		S4	S5	S6	S8	S0
Even	Odd					
0	1	OFF	OFF	OFF	OFF	OFF
2	3	OFF	OFF	ON	OFF	OFF
4	5	OFF	ON	OFF	OFF	OFF
6	7	OFF	ON	ON	OFF	OFF
8	9	ON	OFF	OFF	OFF	OFF
10	11	ON	OFF	ON	OFF	OFF
12	13	ON	ON	OFF	OFF	OFF
14	15	ON	ON	ON	OFF	OFF

Table 17 lists the NT5K35 port address switch settings for **single port operation**.

*Note:* S1, S2 and S3 are reserved for future use and should be set to OFF.

**Table 17**  
**NT5K35 Port address switch settings for single port operation**

Port Number	S4	S5	S6	S7	S8	S9	S0
0	OFF	OFF	OFF	OFF	ON	OFF	OFF
1	OFF	OFF	OFF	ON	ON	OFF	OFF
2	OFF	OFF	ON	OFF	ON	OFF	OFF
3	OFF	OFF	ON	ON	ON	OFF	OFF
4	OFF	ON	OFF	OFF	ON	OFF	OFF
5	OFF	ON	OFF	ON	ON	OFF	OFF
6	OFF	ON	ON	OFF	ON	OFF	OFF
7	OFF	ON	ON	ON	ON	OFF	OFF
8	ON	0	OFF	OFF	ON	OFF	OFF
9	ON	0	OFF	ON	ON	OFF	OFF
10	ON	0	ON	OFF	ON	OFF	OFF
11	ON	0	ON	ON	ON	OFF	OFF
12	ON	ON	OFF	OFF	ON	OFF	OFF
13	ON	ON	OFF	ON	ON	OFF	OFF
14	ON	ON	ON	OFF	ON	OFF	OFF
15	ON	ON	ON	ON	ON	OFF	OFF

## Setting up the NT5K75

Prior to installing the NT5K75, the following switch and strap options must be set:

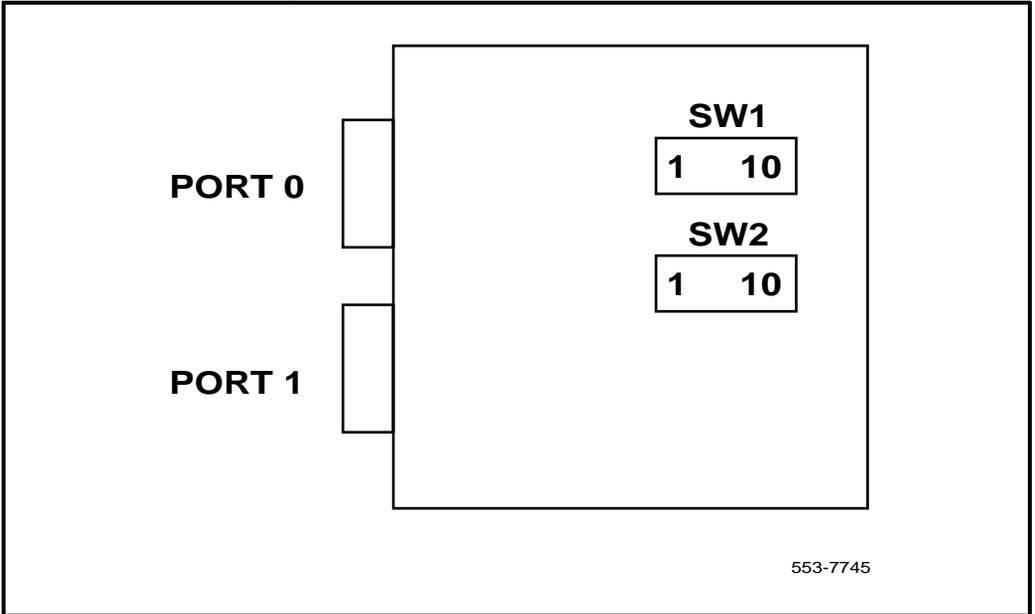
- Port addressing mode (standard, expanded, or disabled)
- Port addresses (standard mode: 0-15; expanded mode: 0-159 possible, 16-159)
- Line interface jumper options (RS232 or RS422, DTE or DCE)

### NT5K75 DIP switch settings

The NT5K75 has two sets of DIP switches. Each port has its own bank of 10 DIP switches (SW1 & SW2) to select the port address (8 bits) and mode of operation (2 bits). SW1 is used for port 0 settings, SW2 is used for port 1 settings. Port 0 is used to select whether the asynchronous ESDI port is to be disabled or not (must be set to “disable” for DASS2). Port 1 is used to select the standard or expanded D-channel addressing mode on the NT5K75.

The DIP switches are located as shown in Figure 19.

**Figure 19**  
**NT5K75 DIP switch settings**



## Port addressing modes

### Port 0 Mode Selection

Port 0 is used to select whether the asynchronous ESDI port is be disabled or not. Table 18 describes port 0 mode selection for the NT5K75.

*Note:* The asynchronous ESDI port must be set to “disabled”.

**Table 18**  
**Port 0 mode selection for NT5K75**

Port Mode	Switch Setting	
	SW1.1	SW1.2
Not used	0	-
Asynchronous ESDI	1	0
Port disabled	1	1

### Port 1 mode selection

Port 1 is used to select the standard or expanded D-channel addressing mode on the NT5K75. Table 19 describes port 1 mode selection for the NT5K75.

**Table 19**  
**Port 1 mode selection for NT5K75**

Port Mode	Switch Setting	
	SW2.1	SW2.2
Synchronous, D-channel, standard addressing (emulates the NT5K35)	0	0
Synchronous, D-channel, expanded addressing	0	1
Not used	1	0
Port disabled	1	1

## Port address switch settings

### Port address switch settings in the standard mode

These apply to either SW1 or SW2 when the card is in standard mode.

Table 20 describes the port address switch settings in the standard mode for the NT5K75.

*Note:* S3, S4, and S5 are reserved for future use and should be set to OFF.

**Table 20**  
**NT5K75 Port address switch settings in the standard mode**

Port Address	Switch Setting							
	Group No.			Device No				
	S3	S4	S5	S6	S7	S8	S9	S10
0	0	0	0	0	0	0	0	x
1	0	0	0	0	0	0	1	x
2	0	0	0	0	0	1	0	x
3	0	0	0	0	0	1	1	x
4	0	0	0	0	1	0	0	x
5	0	0	0	0	1	0	1	x
6	0	0	0	0	1	1	0	x
7	0	0	0	0	1	1	1	x
8	0	0	0	1	0	0	0	x
9	0	0	0	1	0	0	1	x
10	0	0	0	1	0	1	0	x
11	0	0	0	1	0	1	1	x
12	0	0	0	1	1	0	0	x
13	0	0	0	1	1	0	1	x
14	0	0	0	1	1	1	0	x
15	0	0	0	1	1	1	1	x

### Port address switch settings in the expanded mode

The port address switch settings, shown in Table 21, only apply to SW2 (that is, the D-channel port).

**Note:** Half group numbers are required for expanded mode operation. Please note also that the port number is partially formed from the half group number of the shelf on which the NT5K75 DCHI resides. **Please refer to the information described in the Engineering note, found in the “DASS2 hardware requirements” on page 12 section for information pertaining to port addressing.**

**Table 21**  
**NT5K75 Port address switch settings in the expanded mode (Part 1 of 3)**

Port Address	Switch Setting							
	Half Group No.			Device No.				
	S3	S4	S5	S6	S7	S8	S9	S10
0	0	0	0	0	0	0	0	0
1				0	0	0	0	1
2				0	0	0	1	0
3				0	0	0	1	1
4				0	0	1	0	0
5				0	0	1	0	1
6				0	0	1	1	0
7				0	0	1	1	1
8				0	1	0	0	0
9				0	1	0	0	1
10				0	1	0	1	0
11				0	1	0	1	1
12				0	1	1	0	0
13				0	1	1	0	1

**Table 21**  
**NT5K75 Port address switch settings in the expanded mode (Part 2 of 3)**

Port Address	Switch Setting							
	Half Group No.			Device No.				
	S3	S4	S5	S6	S7	S8	S9	S10
14				0	1	1	1	0
15				0	1	1	1	1
16				1	0	0	0	0
17				1	0	0	0	1
18				1	0	0	1	0
19				1	0	0	1	1
20				1	0	1	0	0
21				1	0	1	0	1
22				1	0	1	1	0
23				1	0	1	1	1
24				1	1	0	0	0
25				1	1	0	0	1

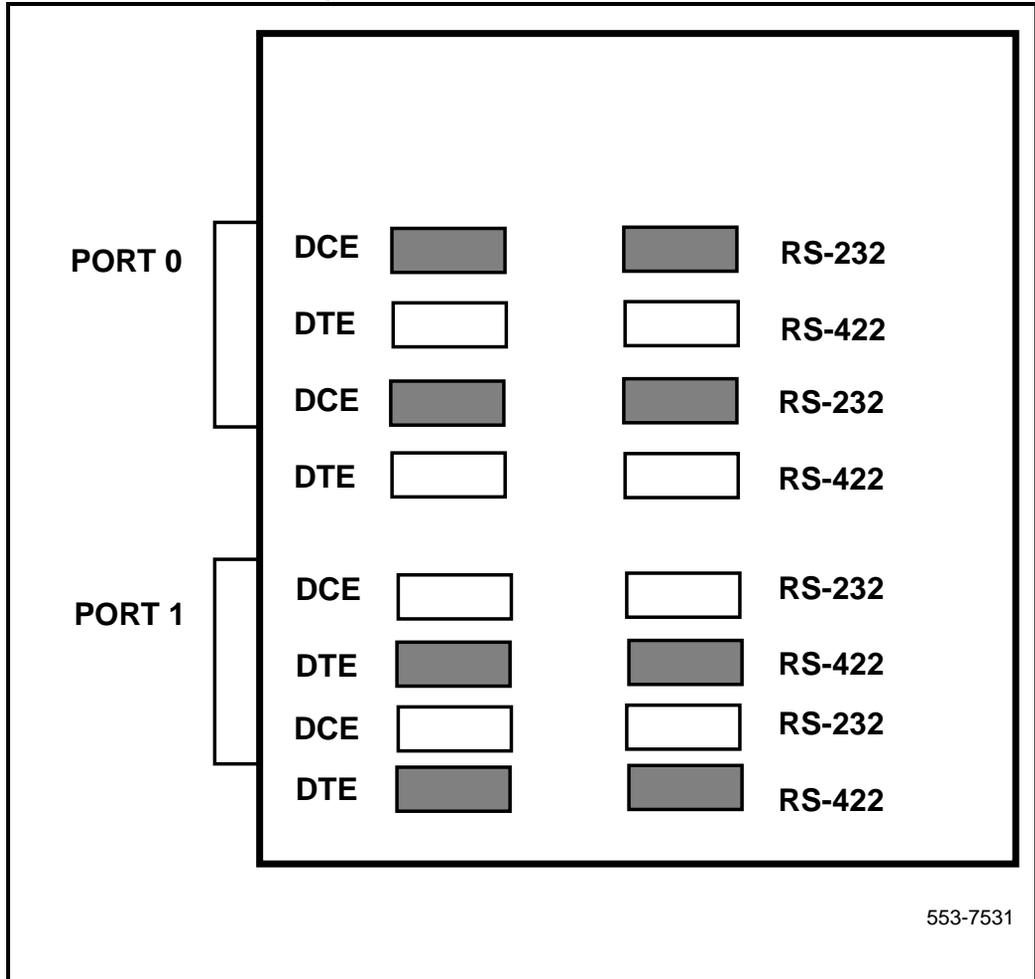
**Table 21**  
**NT5K75 Port address switch settings in the expanded mode (Part 3 of 3)**

Port Address	Switch Setting							
	Half Group No.			Device No.				
	S3	S4	S5	S6	S7	S8	S9	S10
26				1	1	0	1	0
27				1	1	0	1	1
28				1	1	1	0	0
29				1	1	1	0	1
30				1	1	1	1	0
31				1	1	1	1	1
32-63	0	0	1					
64-95	0	1	0					
96-127	0	1	1					
128-159	1	0	0					

### Jumper settings

The NT5K75 has two banks of option straps, one for each port. These select between DCE and DTE operation and whether the signaling interface is RS232 (asynchronous) or RS422 (DASS2). The DASS2 configuration is shown in Figure 20.

Figure 20  
NT5K75 Jumper strap settings for DASS2



## Setting up the NT6D11AE/AF

Prior to installing the NT6D11AE/AF, the following switch and strap options must be set:

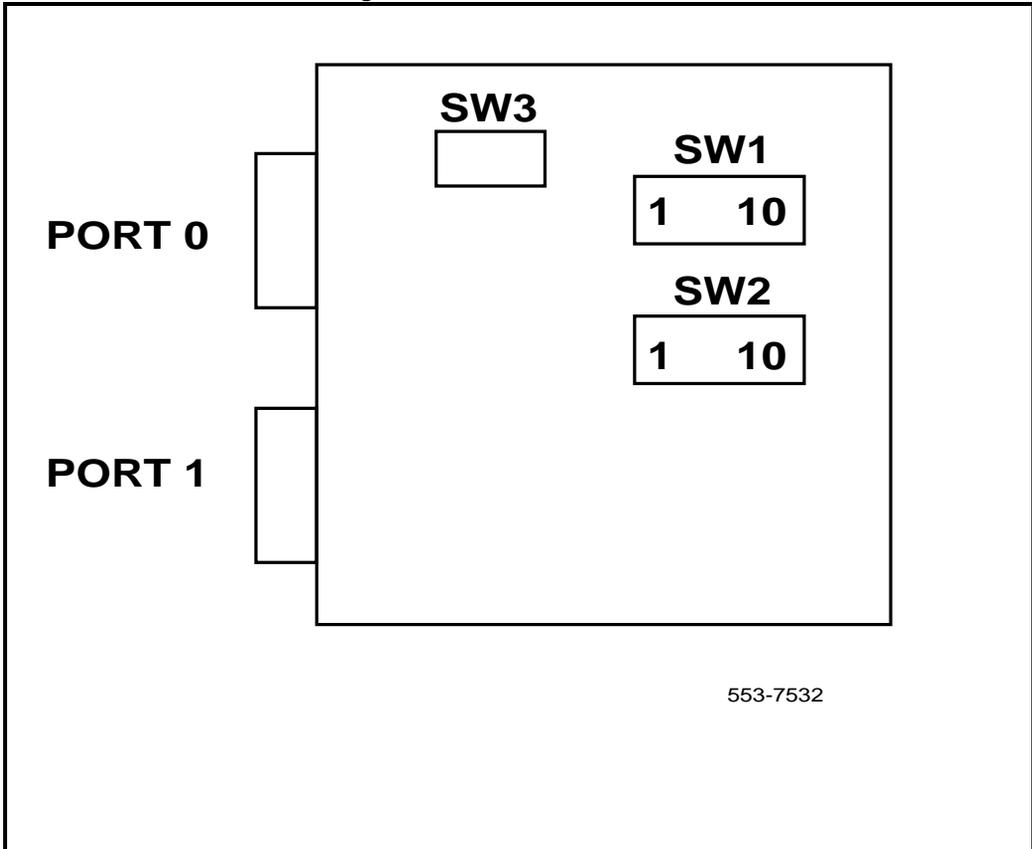
- Firmware selection (set for DASS2)
- Port addressing mode (standard, expanded, or disabled)
- Port addresses (standard mode: 0-15; expanded mode: 0-159 possible, 16-159 recommended)
- Line interface jumper options (RS232 or RS422, DTE or DCE)

### DIP switch settings

The NT6D11AE/AF has three sets of DIP switches. Each port has its own bank of 10 DIP switches (SW1 & SW2) to select the port address (8 bits) and mode of operation (2 bits). SW1 is used for port 0 settings, SW2 is used for port 1 settings. SW3 is used to select between ISDN or DASS2 signaling. Port 0 is used to select whether the asynchronous ESDI port is to be disabled or not (must be set to “disable” for DASS2). Port 1 is used to select the standard or expanded D-channel addressing mode on the NT6D11AE/AF.

The DIP switches are located as shown in Figure 21.

Figure 21  
NT6D11AE/AF DIP switch settings



## Port addressing modes

### Port 0 Mode selection

Port 0 is used to select whether the asynchronous ESDI port is to be disabled or not. Table 22 describes the port 0 mode selection for the NT6D11AE/AF.

*Note:* The asynchronous ESDI port must be set to “disabled”.

**Table 22**  
**Port 0 mode selection for NT6D11AE/AF**

Port Mode	Switch Setting	
	SW1.1	SW1.2
Not used	0	-
Asynchronous ESDI	1	0
Port disabled	1	1

### Port 1 mode selection

Port 1 is used to select the standard or expanded D-channel addressing mode on the NT6D11AE/AF. Table 23 describes the port 1 mode selection for the NT6D11AE/AF.

**Table 23**  
**Port 1 mode selection for NT6D11AE/AF**

Port Mode	Switch Setting	
	SW2.1	SW2.2
Synchronous, D-channel, standard addressing	0	0
Synchronous, D-channel, expanded addressing	0	1
Not used	1	0
Port disabled	1	1

## Port address switch settings

### Port address switch settings in the standard mode

Table 24 provides the port address switch settings in standard mode. These apply to either SW1 or SW2 when the NT6D11AE/AF is in standard mode.

*Note:* S3, S4, and S5 are reserved for future use and should be set to OFF.

**Table 24**  
**NT6D11AE/AF Port address switch settings in the standard mode**

Port Address	Switch Setting							
	Group No.			Device No.				
	S3	S4	S5	S6	S7	S8	S9	S10
0	0	0	0	0	0	0	0	x
1	0	0	0	0	0	0	1	x
2	0	0	0	0	0	1	0	x
3	0	0	0	0	0	1	1	x
4	0	0	0	0	1	0	0	x
5	0	0	0	0	1	0	1	x
6	0	0	0	0	1	1	0	x
7	0	0	0	0	1	1	1	x
8	0	0	0	1	0	0	0	x
9	0	0	0	1	0	0	1	x
10	0	0	0	1	0	1	0	x
11	0	0	0	1	0	1	1	x
12	0	0	0	1	1	0	0	x
13	0	0	0	1	1	0	1	x
14	0	0	0	1	1	1	0	x
15	0	0	0	1	1	1	1	x

### **Port address switch settings in the expanded mode**

Table 25 provides the port address switch settings in expanded mode. These settings only apply to SW2 (that is, the D-channel port).

*Note:* Half group numbers are required for expanded mode operation. Please note also that the port number is partially formed from the half group number of the shelf on which the NT6D11AE/AF resides. **Please refer to the information described in the Engineering note, found in the “DASS2 hardware requirements” on page 12 section for information pertaining to port addressing.**

**Table 25**  
**NT6D11AE/AF Port address switch settings in expanded mode (Part 1 of 2)**

Port Address	Switch Setting							
	Half Group No.			Device No.				
	S3	S4	S5	S6	S7	S8	S9	S10
0	0	0	0	0	0	0	0	0
1				0	0	0	0	1
2				0	0	0	1	0
3				0	0	0	1	1
4				0	0	1	0	0
5				0	0	1	0	1
6				0	0	1	1	0
7				0	0	1	1	1
8				0	1	0	0	0
9				0	1	0	0	1
10				0	1	0	1	0
11				0	1	0	1	1
12				0	1	1	0	0
13				0	1	1	0	1
14				0	1	1	1	0
15				0	1	1	1	1
16				1	0	0	0	0
17				1	0	0	0	1
18				1	0	0	1	0
19				1	0	0	1	1

**Table 25**  
**NT6D11AE/AF Port address switch settings in expanded mode (Part 2 of 2)**

Port Address	Switch Setting							
	Half Group No.			Device No.				
	S3	S4	S5	S6	S7	S8	S9	S10
20				1	0	1	0	0
21				1	0	1	0	1
22				1	0	1	1	0
23				1	0	1	1	1
24				1	1	0	0	0
25				1	1	0	0	1
26				1	1	0	1	0
27				1	1	0	1	1
28				1	1	1	0	0
29				1	1	1	0	1
30				1	1	1	1	0
31				1	1	1	1	1
32-63	0	0	1					
64-95	0	1	0					
96-127	0	1	1					
128-159	1	0	0					

## Protocol selection

SW3 is used to select the D-channel protocol, as shown in Table 26.

**Table 26**  
**Protocol selection switch settings**

Protocol	Switch Setting	
	SW3.1	SW3.2
DASS2 (NT5K35/NT5K75 emulation)	0	0
ISDN (NT6D11AB/AC emulation)	1	1

## Valid switch combinations

Table 27 and Table 28 show the only allowable switch setting combinations for the NT6D11AE/AF (not including address switch settings).

### Port 0

Port 0 can be configured as asynchronous ESDI, or disabled. If the port is configured as disabled, it will not be visible to the system CPU.

**Table 27**  
**Port 0 switch settings**

Mode	Switch setting			
	SW1.1	SW1.2	SW3.1	SW3.2
Asynchronous ESDI	1	0	0	0
Asynchronous ESDI	1	0	1	1
Port disabled	1	1	-	-

**Port 1**

The following are the only valid emulation modes combinations. If the port is configured as disabled, it will not be visible to the system CPU.

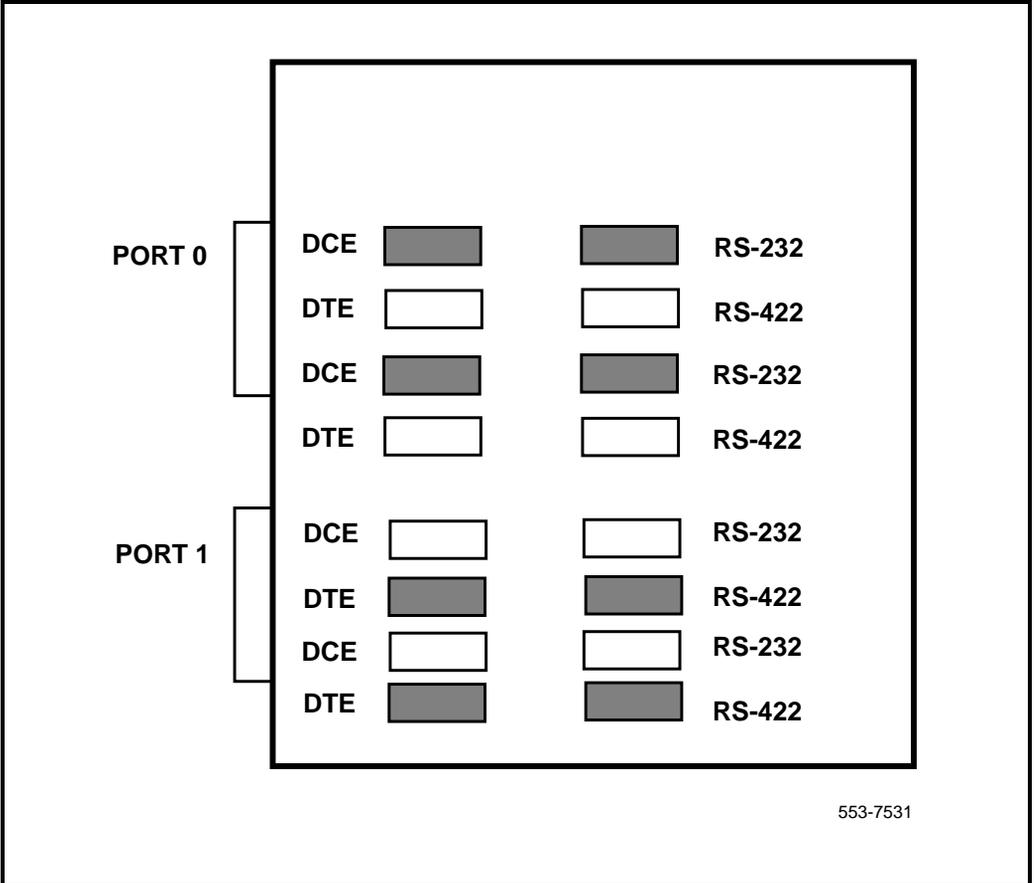
**Table 28**  
**Port 1 switch settings**

Mode	Emulates	Switch setting			
		SW2.1	SW2.2	SW3.1	SW3.2
DASS2	NT5K35AA	0	0	0	0
ISDN	NT6D11AB/AC	0	0	1	1
Expanded DASS2	NT5K75AA	0	1	0	0
Port disabled		1	1	-	-

## Jumper settings

The NT6D11AE/AF has two banks of option straps, one for each port. These select between DCE and DTE operation and whether the signaling interface is RS232 (asynchronous) or RS422 (DASS2). The DASS2 configuration is shown in Figure 22.

**Figure 22**  
**NT6D11AE/AF jumper strap settings for DASS2 configuration**



## Installing the DCHI

The procedures outlined in Table 29 apply when installing the NT5K35, NT5K75 or NT6D11AE/AF DCHI card on Meridian system Options 21, 21E, 51/51C, 61/61C, 71 and 81/81C.

### **Note to installers**

Either the DCHI card or the PRI card may be installed first. However, PRI loops must be configured in software before defining DCHI links.

**Note that for the NT5K75 or NT6D11AE/AF in expanded mode, the port number is partially formed from the half group number of the shelf on which the card resides.**

Before beginning an installation, do the following:

- Consult the *Spares Planning (553-3001-153)* document and follow the instructions
- Bring spares of all cables and boards
- Remember that the link test procedures require a successful 24-hour bit error-rate test before the link can be used for live system traffic.

**Note:** The NT5K75 or NT6D11AE/AF cannot be used in expanded mode for Meridian 1 system Options 21/21E.

**Table 29**  
**Steps for installing the DCHI**

Step	Action
1	<p>Determine the cabinet and shelf location for the DCHI card being installed.</p> <p>On Options 51/51C, 61/61C, 71, 81/81C, and machine types NT, and XT, the DCHI card can be installed in any spare network shelf slot appropriate for an I/O port card.</p> <p>On single CPU systems (Options 21/21E and machine types ST/STE), the DCHI card can be installed in any spare Network Equipment slot</p> <p><b>Note that for the NT5K75 or NT6D11AE/AF in expanded mode, the port number is partially formed from the half group number of the shelf on which the card resides.</b></p>
2	Unpack and inspect card.
3	Set option switches on the DCHI card. <b>Do not configure the asynchronous port on the NT5K35, NT5K75 or NT6D11AE/AF card.</b>
4	Set faceplate toggle switch to DISABLE.
5	Install the DCHI card into the assigned shelf and slot.
6	Connect the DCHI card port J2 to NT8D72 PRI port J5 with a QCAD328A cable.
7	Set faceplate toggle switch to ENABLE.
8	Enable the DCHI card using Overlay 75 to enable the circuit card with command ENL DDSL N. Refer to IDA Startup in the <i>DPNSS1 Maintenance Guide (553-3921-500)</i> for additional information.

## Removing the DCHI

Table 30 outlines the steps involved in removing a DCHI card.

**CAUTION**

The NT5K35, NT5K75, or NT6D11AE/AF DCHI must be software disabled before it is hardware disabled, or initialization will occur.

**Table 30**  
**Steps for removing DCHI**

Step	Action
1	Disable the DCHI using Overlay 75, command DIS DDSL N.
2	If the circuit card is being completely removed, not replaced, remove data from memory. See the <i>DPNSS1 Features and Services Guide (553-3921-300)</i> .
3	Determine the cabinet and shelf location of the DCHI card to be removed.
4	Set faceplate toggle switch to DISABLE.
5	Disconnect the DCHI cables.
6	Remove the DCHI card.
7	Pack and store the card.

## Setting up the NTAG54AA

The NTAG54AA is a dual (two port) daughterboard version of the NT6D11AF to support DPNSS1/DASS2 applications with the Dual PRI card (NTCK43AB vintage or higher). It is dual density, i.e. it replaces two NT6D11 D Channel handlers, and supports two addressing modes:

- NT or standard mode: 128 I/O ports though only 16 unique addresses are supported by the current software;
- GPT or extended addressing mode: 160 ports available though there is a limit of 40 addresses.

The selection of the addressing modes is done on a port basis through two sets of dip switches which reside on the NTCK43AB Motherboard (refer to the section “S3 AND S7: On-board NTAG54 address switch settings” on page 103, of the section NTCK43 DPRI in the PRI installation and removal chapter for details).

## NTAG54 installation and removal

### Note to installers

Before beginning an installation, do the following:

- Consult the *Spares Planning (553-3001-153)* document and follow the instructions.
- Bring spares of all cables and boards.
- Remember that test procedures require a 24-hour minimum bit error-rate testing before being used. See the *ISDN PRI/BRI Feature Description and Administration (553-2901-301)* document for these test procedures.
- Either the NTAG54 or the DPRI card may be installed first. However, DPRI loops must be configured in software before defining DCH links.

### Installing the NTAG54 Daughterboard

Installation instructions for the NTAG54 card are the same for Meridian 1 system options 51/51C, 61/61C, 71, 81 and SL-1 systems ST/STE, NT and XT.

Set the address for the NTAG54 (see the Switch settings section to set the address). If a NTAG54 is present on a Dual PRI card then an external D Channel should not be connected to P3. If a NTAG54 is present the LED "DCH" will light up.

### Installing the NTAG54 card

#### **CAUTION**

The static discharge bracelet located inside the cabinet must be worn before handling circuit cards. Failure to wear the bracelet can result in damage to the circuit cards.

- 1      Unpack and inspect the NTAG54 Daughtercard.
- 2      Mount the NTAG54. The NTAG54 can be mounted on any Dual PRI of vintage NTCK43AB or higher. Slots that are occupied by BTU's prevent the insertion of Daughterboards.

The NTAG54 comes with 4 stand-offs so that it can be mounted onto the Dual PRI. These are easily pushed into 4 corresponding mounting holes on the Dual PRI.

The NTAG54 is mounted so that it mates correctly with P9 and P11 on the Dual PRI motherboard.

## Removing the NTAG54 Daughterboard

Removal instructions for the NTAG54 are the same for Meridian 1 system options 21/21E, 51/51C, 61/61C, 71, 81 and SL-1 systems ST/STE, NT and XT.

### Removing the NTAG54 card

#### **CAUTION**

The static discharge bracelet located inside the cabinet must be worn before handling circuit cards. Failure to wear the bracelet can result in damage to the circuit cards.

The NTAG54 can only be removed when it is disabled in S/W.

The associated PRI link must also be disabled.

- 1      Disable the faceplate switch on the Dual PRI. If S1 is not disabled the Meridian 1 system will initialize.
- 2      Remove the Dual PRI and DDCH.



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# PRI installation and removal

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## Reference list

The following are the references in this section:

- *ISDN PRI/BRI Feature Description and Administration (553-2901-301)*
- *ISDN PRI Maintenance (553-2901-501)*
- *DASS Maintenance Guide (553-3911-500)*

## Non DPRI

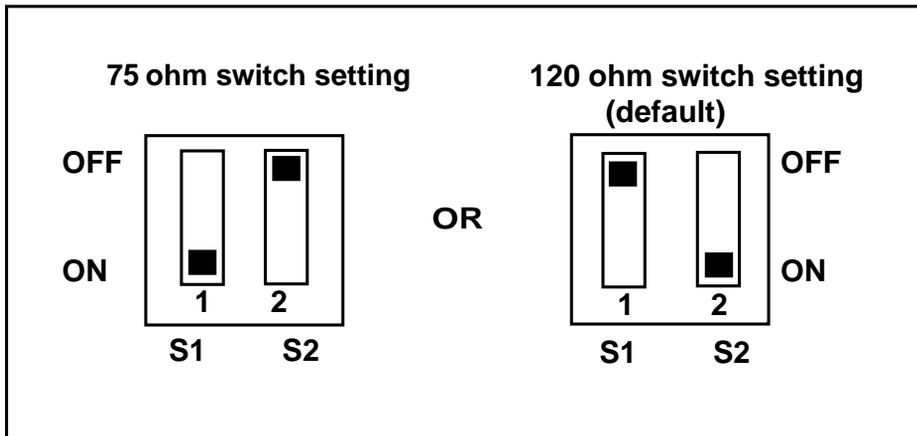
### Setting up the NT8D72

#### NT8D72 DIP switch settings

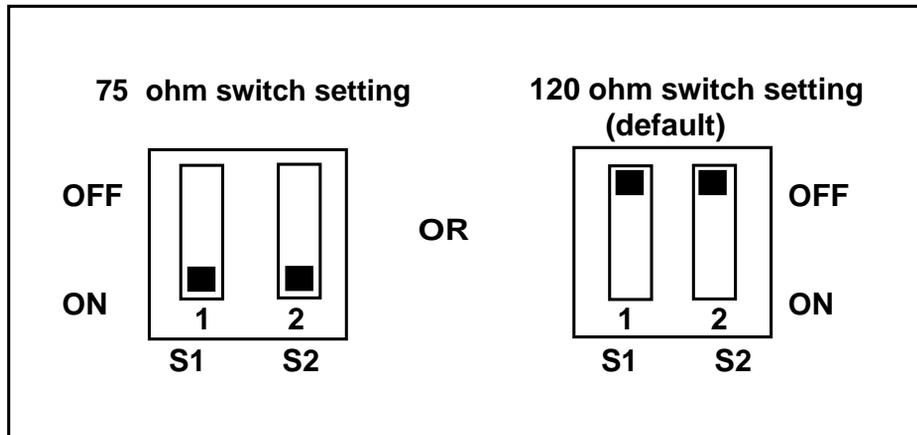
DASS2 links require that the DIP switch setting on the NT8D72 be at the 75 or 120 ohm position. Figure 23 illustrates the NT8D72 DIP switch settings.

Figure 23  
NT8D72 DIP switch settings

**NT8D72AA, NT8D72AB**



**NT8D72BA**



553-7533

## NT8D72 connections

Table 31 describes NT8D72 connections.

**Table 31**  
**NT8D72 PRI connections**

Connector	Description
J1 and J2	Connection to the Clock Controller(s), allowing the Meridian 1 to utilize clock from the connected system, as programmed in the software.
J3	Connection to the QPC414 network card.
J4	Front panel connection to Line Terminating Equipment. The following pin assignments are selected via the DIP switch on the NT8D72.
J4-1	XMIT-TIP - transmit to network
J4-9	XMIT-RING - transmit to network
J4-2	Shield return
J4-3	RCVR-TIP - receive from network
J4-11	RCVR-RING
J4-4	Shield return
J5	Connection to the NT5K35, NT5K75, or NT6D11AE/AF DCHI, via QCAD328 cable.
RCV MON	Miniature bantam connection, used for testing.
XMT MON	Miniature bantam connection, used for testing.

## PRI circuit card locations

Each NT8D72 PRI card requires two adjacent slots on a shelf. The positioning of the PRI card is machine-specific, and must adhere to the following guidelines.

### **Meridian 1 system Option 21/21E**

On the Meridian 1 system Option 21 and 21E, PRI cards can be placed in slots in the NT8D11 Common/Peripheral Equipment Module and the NT8D47 Remote Peripheral Equipment Module. **Note that on the 21E, one extra slot is available.**

The following slots can be used if they are not required for other cards.

### **SHELF SLOT**

#### **Network 4 – 9**

### **Meridian 1 system Option 51/51C, 61/61C**

The NT8D72 PRI circuit card occupies two adjacent slots on a network shelf. As many as three circuit cards can be plugged into a network shelf. The actual number depends on the loops and superloops configured on the Meridian 1 system.

The following slots can be used if they are not required for other cards.

### **SHELF SLOT**

#### **Network 3 – 8**

When there are no vacant card slots on the network shelves for the installation of PRI2 cards, a network shelf with a power converter circuit card may be added to the system. Specific locations will depend on available space. Please refer to the *Installing an Additional Network shelf* section for installation procedures.

If an additional cabinet is required to install more network shelves, use a QPC58 cabinet.

### **Meridian 1 system Options 71 and 81/81C**

As many as four circuit cards can be plugged into an empty network shelf, along with a Power Converter circuit card. Specific locations will depend on available space.

When no vacant positions are available to install PRI cards, additional Network shelves can replace Peripheral Equipment shelves located on the rear of the Common Equipment or Disk shelves.

If an additional cabinet is required to install more Network shelves, use a QPC108 cabinet with system Options 71 and 81/81C.

The following slots can be used if they are not required for other cards.

<b>SHELF</b>	<b>SLOT</b>
<b>Network</b>	<b>5 - 11, 13-14</b>

## Installing the NT8D72 PRI on Meridian 1 systems

The following procedures should be followed when installing the NT8D72 PRI on Meridian 1 systems 21, 21E, 51/51C, 61/61C, 71, and 81/81C.

*Note:* On Meridian 1 system Options 51/51C, 61/61C, 71 and 81/81C, do not fit the PRI card in the Bus Terminating Unit (BTU) position. Due to physical width restraints, BTUs and PRIs cannot fit next to each other on a shelf.

**Table 32**  
**Steps for installing the NT8D72 PRI card (Part 1 of 2)**

Step	Action
1	Determine the cabinet and shelf location of the circuit card to be installed; please refer to "PRI circuit card locations" on page 92 which immediately precedes this section.
2	Unpack and inspect circuit cards.
3	Set the option switch on the PRI circuit card to the 75/120 ohm position.
4	Install PRI circuit card in the assigned shelf and slot.
5	Install Network circuit card (if no Network loop connection is available).
6	If required, install I/O adapters in I/O panel.
7	Run and connect the PRI cables.

**Table 32**  
**Steps for installing the NT8D72 PRI card (Part 2 of 2)**

Step	Action
<p style="text-align: center;"><b>CAUTION</b></p> <p>The NT8D79AA cable connecting the Clock Controller and a PRI card must NOT be routed through the center of the cabinet past the power harness. Instead, it should be routed around the outside of the equipment shelves</p>	
8	If required, install connecting blocks at MDF or wall mounted cross-connect terminal.
9	If required, designate connecting blocks at MDF or wall mounted cross-connect terminal.
10	If required, install Network Channel Terminating Equipment (NCTE).
11	Cross-connect PRI circuits.
12	Add related office data into switch memory.
13	Run IDA status check. Refer to the <i>DASS Maintenance Guide (553-3911-500)</i> for the IDA verification tests, IDA status check, and IDA startup test.

## Removing the NT8D72 PRI on Meridian 1 systems

The following procedures should be followed when removing the NT8D72 PRI on Meridian 1 systems 21, 21E, 51, 61, 71, and 81.

**Table 33**  
**Steps for removing the NT8D72 PRI card**

Step	Action
1	Disable Network Loop using Overlay 75. The command is DIS DDCS "loop number."
2	If the circuit card is being completely removed, not replaced, remove data from memory.
3	Determine the cabinet and shelf location of the circuit cards to be removed.
4	Remove cross connections at MDF to wall-mounted cross-connect terminal.
5	Tag and disconnect cables from card. Rearrange Clock Controller card cables if required.
6	Remove PRI and Network circuit cards. <b>Note:</b> If the other circuit of a dual Network card is in use, do NOT remove the Network card.
7	Pack and store circuit card.

## Installing a Meridian 1 network expansion shelf

This procedure is used when additional network shelf space is required for PRI cards on Meridian 1 switches. Please refer to the “Integrated Digital Access (IDA) equipment overview” on page 11 for a schematic representation of a Meridian 1 network expansion shelf.

### CAUTION

Do not place the circuit cards in the shelf until Step 7 is completed.

**Table 34**  
**Steps for installing a network expansion shelf**

Step	Action
1	Determine the cabinet and shelf location of the Network shelf to be installed.
2	Unpack and inspect the shelf.
3	Remove the existing left or right rear Peripheral Equipment (PE) shelf (if required).
4	Install the additional Network shelf in the PE (Step 3) location.
5	Install a QUD15 cooling unit directly below the Network shelf and secure with four mounting screws.

**Table 34**  
**Steps for installing a network expansion shelf**

<p><b>6</b></p>	<p>Install and connect the QCAD172A power cable to the added QUD15 cooling unit as follows:</p> <p>If the added QUD15 is located below the left Network shelf, unplug the C11 connector from the QCAD111 power harness that connects to the existing left side QUD15.</p> <p>If the added QUD15 is located below the right Network shelf, unplug the C21 connector from the QCAD111 power harness instead of the C11.</p> <ul style="list-style-type: none"><li>— Plug the C11 or C21 connector into the single-ended connector of the QCAD172A power cable.</li><li>— Plug one of the two connectors at the other end of the C11 or C21 connector that was removed.</li><li>— Plug the remaining connector of the QCAD172A power cable into the added QUD15.</li></ul>
<p><b>7</b></p>	<p>At the QCAD111 power wiring harness, untie and then connect:</p> <ul style="list-style-type: none"><li>— the C17 power connection cable to the <b>right</b> rear Network shelf</li><li>— the C19 power connection cable to the <b>left</b> rear Network shelf</li></ul>
<p><b>8</b></p>	<p>Install PRA trunks and enter related shelf and PRI office data into switch memory.</p>

## NTCK43 DPRI

### Setting up the NTCK43

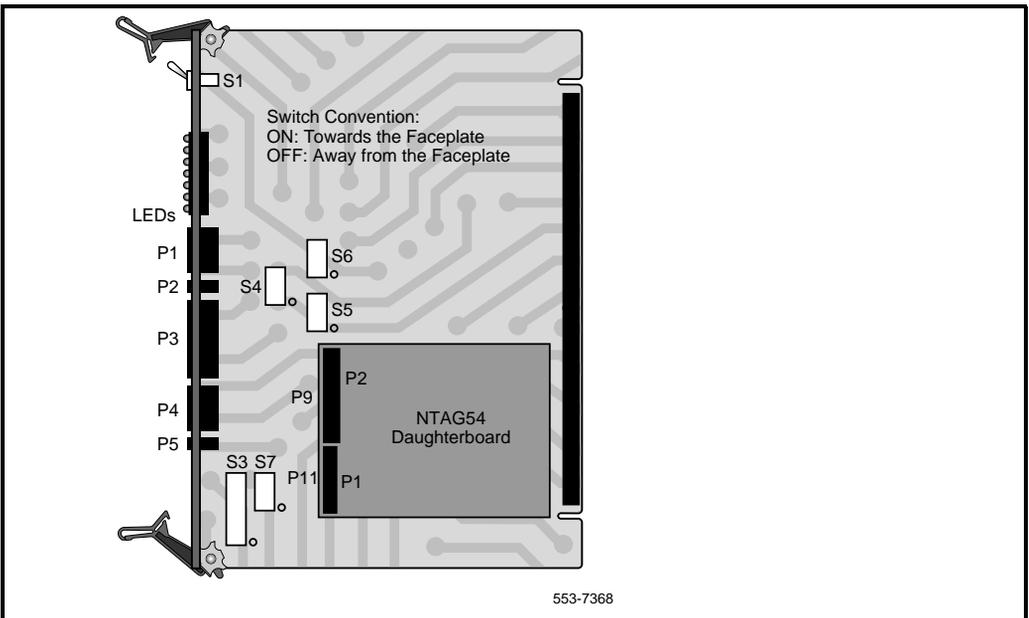
#### NTCK43 circuit card locations

Each NTCK43 DPRI circuit card requires 1 slot on a shelf. DPRI cards can be placed in any network slot.

#### NTCK43 switch settings

Figure 24 depicts the NTCK43 DPRI switch settings.

**Figure 24**  
NTCK43 switch settings



The NTCK43 DPRI card has 6 switches, namely S1 to S6. These control the following functions:

### S1: Faceplate Switch

S1 is the Faceplate Switch and corresponds to the ENET enable switch. Refer to Table 35.

**Table 35**  
**Faceplate switch setting - S1**

Switch	UP	DOWN
S1	Dual PRI Enabled	Dual PRI Disabled

### S2: Clock Controller Functions

*Note:* Switches S2 to S6 follow the convention for ON/OFF as follows:

ON is Towards the Faceplate.

OFF is Away from Faceplate.

Four options are available. Table S2 gives a summary of the switch settings. Refer to “Clock Controller Options” on page 37 of the “Integrated Digital Access (IDA) equipment overview” in this book.

*Note:* S2(3-4) are not presently used.

**Table 36**  
**Clock Controller settings - S2**

S2-1	S2-2	Clock Options
OFF	OFF	Option 1
OFF	ON	Option 2
ON	OFF	Option 3
ON	ON	Option 4

### S3: On-board DDCH address switch

This switch sets the address of the DDCH daughterboard only. It does not set the address of external D Channel handlers which are used with the Dual PRI. If external D Channel handlers are used then their address is set on the external DCHI card itself.

Also, this section does not cover the S3 switch settings for DPRIs using the NTAG54AA daughterboard. Please refer to “S3 AND S7: On-board NTAG54 address switch settings” on page 103 of this document. The DDCH is a two-unit MSDL Daughterboard, supporting Unit 0 and Unit 1 only.

This address corresponds to the DNUM (0-15) that is assigned to Unit 0 of the DDCH during configuration. As a DDCH has 2 D Channels it is half the capacity of the MSDL but then it does not take up a cardslot. Address 0 is not normally assigned to the DDCH as it is commonly assigned to the System Terminal TTY0.

The DDCH Address (0-15) is set on S3 lower 8 switch positions, S3 (1-8) in Binary format, i.e. S3-1 is the Least Significant Bit. Thus S3 positions 5-8 will be always ON (towards the faceplate). DDCH address can be in the range binary 0000 (Zero) to 1111 (Fifteen).

If the DDCH is not installed then the address set on the S3 switch does not matter. However if the DDCH is installed but not used then the address set on S3 should not conflict with any other DCHI address.

**Note:** S3 (9-10) are not used and are spare.

**Note:** The DDCH Address is set by setting the relevant positions of S3 to OFF.

**Example 1:** Setting up an address (DNUM) of “15” for the DDCH requires switch S3 positions 1, 2, 3 & 4 away from the Faceplate (OFF) and setting S3 positions 5-8 towards the Faceplate (ON).

**Example 2:** Setting up an address (DNUM) of “9” for the DDCH requires switch S3 positions 1 & 4 away from the Faceplate (OFF) and setting S3 positions 2,3, 5-8 towards the Faceplate (ON).

Table 37 gives a summary of the S3 on-board switch functions.

**Table 37**  
**Summary of on-board DDCH switch functions - S3**

Switch	ON	OFF
S3-(1-8)	-	DDCH address
S3-9	Spare	Spare
S3-10	Spare	Spare

*Note:* S7 is not used with the DDCH daughter board (NTBK51) so all S7 switches should be set to “OFF” deactivating address matching in NT addressing mode.

**S3 AND S7: On-board NTAG54 address switch settings**

These switches reside on the NTAG54AA daughterboard.

The DPRI supports two PRI ports. S3 sets the DASS2/DPNSS1 address (DNUM) for the higher of the two ports on the board. S7 sets the corresponding DASS2/DPNSS1 address (DNUM) for the lower of the two ports on the board.

**Table 38**  
**SW3 NTAG54AA on-board switch settings**

Switch	Switch settings	
SW3: Port 1	SW3.8	SW3.9
Synchronous, D-channel, NT addressing	ON	OFF
Synchronous, D-channel, Expanded GPT addressing	OFF	OFF
Not used	ON	ON
Port disabled	OFF	ONN

**Table 39**  
**SW7 NTAG54AA on-board switch settings**

Switch	Switch settings	
SW3: Port 1	SW7.8	SW7.9
Synchronous, D-channel, NT addressing	ON	OFF
Synchronous, D-channel, Expanded GPT addressing	OFF	OFF
Not used	ON	ON
Port disabled	OFF	ONN

If the NTAG54 is installed but not used then the address set on S3 and S7 should not conflict with any other address.

The following settings, as shown in Table 40, apply to either SW3 (for port 1) or SW7 (for port 0) on the DPRI NTCK43AB (or higher vintage) motherboard when the card is in normal addressing mode.

**Table 40**  
**S3, S7 NTAG54AA witch settings, normal addressing mode (Part 1 of 2)**

DASS2/ DPNSS1 address (DNUM)	Switch Setting S3 or S7							
	S7.1 or S3.1	S7.2 or S3.2	S7.3 or S3.3	S7.4 or S3.4	S7.5 or S3.5	S7.6 or S3.6	S7.7 or S3.7	S7.10 or S3.10
0	ON	ON	ON	ON	ON	ON	ON	X
1	OFF	ON	ON	ON	ON	ON	ON	X
2	ON	OFF	ON	ON	ON	ON	ON	X
3	OFF	OFF	ON	ON	ON	ON	ON	X
4	ON	ON	OFF	ON	ON	ON	ON	X
5	OFF	ON	OFF	ON	ON	ON	ON	X
6	ON	OFF	OFF	ON	ON	ON	ON	X
7	OFF	OFF	OFF	ON	ON	ON	ON	X
8	ON	ON	ON	OFF	ON	ON	ON	X
9	OFF	ON	ON	OFF	ON	ON	ON	X
10	ON	OFF	ON	OFF	ON	ON	ON	X
11	OFF	OFF	ON	OFF	ON	ON	ON	X
12	ON	ON	OFF	OFF	ON	ON	ON	X
13	OFF	ON	OFF	OFF	ON	ON	ON	X
14	ON	OFF	OFF	OFF	ON	ON	ON	X

**Table 40**  
**S3, S7 NTAG54AA witch settings, normal addressing mode (Part 2 of 2)**

DASS2/ DPNSS1 address (DNUM)	Switch Setting S3 or S7							
15	OFF	OFF	OFF	OFF	ON	ON	ON	X
16-31					OFF	ON	ON	X
32-47					ON	OFF	ON	X
48-63					OFF	OFF	ON	X
64-79					ON	ON	OFF	X
80-95					OFF	ON	OFF	X
96-111					ON	OFF	OFF	X
112-127					OFF	OFF	OFF	X

The following settings, as shown in Table 41, apply to either SW3 (for channel 1) or SW7 (for channel 0) on the DPRI NTCK43AB (or higher vintage) motherboard when the card is in expanded mode.

**Table 41**  
**S3, S7 NTAG54AA witch settings, extended addressing mode (Part 1 of 2)**

DASS2/ DPNSS1 address (DNUM)	Switch Setting S3 or S7							
	S7.10 or S3.10	S7.1 or S3.1	S7.2 or S3.2	S7.3 or S3.3	S7.4 or S3.4	S7.5 or S3.5	S7.6 or S3.6	S7.7 or S3.7
0	ON	ON	OFF	ON	ON	ON	ON	ON
1	OFF	ON						
2	ON	OFF	ON	ON	ON	ON	ON	ON
3	OFF	OFF	ON	ON	ON	ON	ON	ON
4	ON	ON	OFF	ON	ON	ON	ON	ON
5	OFF	ON	OFF	ON	ON	ON	ON	ON
6	ON	OFF	OFF	ON	ON	ON	ON	ON
7	OFF	OFF	OFF	ON	ON	ON	ON	ON
8	ON	ON	ON	OFF	ON	ON	ON	ON
9	OFF	ON	ON	OFF	ON	ON	ON	ON
10	ON	OFF	ON	OFF	ON	ON	ON	ON
11	OFF	OFF	ON	OFF	ON	ON	ON	ON
12	ON	ON	OFF	OFF	ON	ON	ON	ON
13	OFF	ON	OFF	OFF	ON	ON	ON	ON
14	ON	OFF	OFF	OFF	ON	ON	ON	ON

**Table 41**  
**S3, S7 NTAG54AA witch settings, extended addressing mode (Part 2 of 2)**

DASS2/ DPNSS1 address (DNUM)	Switch Setting S3 or S7							
15	OFF	OFF	OFF	OFF	ON	ON	ON	ON
16	ON	ON	ON	ON	OFF	ON	ON	ON
17	OFF	ON	ON	ON	OFF	ON	ON	ON
18	ON	OFF	ON	ON	OFF	ON	ON	ON
19	OFF	OFF	ON	ON	OFF	ON	ON	ON
20	ON	ON	OFF	ON	OFF	ON	ON	ON
21	OFF	ON	OFF	ON	OFF	ON	ON	ON
22	ON	OFF	OFF	ON	OFF	ON	ON	ON
23	OFF	OFF	OFF	ON	OFF	ON	ON	ON
24	ON	ON	ON	OFF	OFF	ON	ON	ON
25	OFF	ON	ON	OFF	OFF	ON	ON	ON
26	ON	OFF	ON	OFF	OFF	ON	ON	ON
27	OFF	OFF	ON	OFF	OFF	ON	ON	ON
28	ON	ON	OFF	OFF	OFF	ON	ON	ON
29	OFF	ON	OFF	OFF	OFF	ON	ON	ON
30	ON							
31	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
32-63						OFF	ON	ON
64-95						ON	OFF	ON
96-127						OFF	OFF	ON
128-159						ON	ON	OFF

*Note:* addresses 3D00H-3FFFH are never used. The original extended mode system architecture only allowed a maximum of 5 groups to be configured.

**S4: Tx/Rx grounding options**

Switch S4 provides the option to connect Frame Ground (FGND) to the carrier cable shield of the receive and / or transmit pair. This option is used in Some 75 Ohm applications. Table 42 gives a summary of the switch settings.

For 120 Ohm applications S4 (1-4) are set to OFF.

**Table 42**  
**Summary of on-board DDCH switch functions - S3**

Switch	ON	OFF
	(Switch closed)	(Switch open)
S4-1	PRI 0 Rx Shield Grounded	PRI 0 Rx Shield Open
S4-2	PRI 0 Tx Shield Grounded	PRI 0 Tx Shield Open
S4-3	PRI 1 Rx Shield Grounded	PRI 1 Rx Shield Open
S4-4	PRI 1 Tx Shield Grounded	PRI 1 Tx Shield Open

**S5-6: Impedance matching**

CCITT recommendations provide options for the use of either 75 Ohm coaxial or 120 Ohm twisted pair cable. Both of these impedances are provided by the line interface. The impedance is switch selectable. Table 43 gives a summary of the switch settings.

**Table 43**  
**Summary of on-board DDCH switch functions - S3**

<b>Switch</b>	<b>ON</b>	<b>OFF</b>
S6 (PRI unit 0)	75 ohm	120 ohm
S5 (PRI unit 1)	75 ohm	120 ohm

## Installing the NTCK43 DPRI

### CAUTION

The static discharge bracelet located inside the cabinet must be worn before handling circuit cards. Failure to wear the bracelet can result in damage to the circuit cards.

- 1 Determine the cabinet and shelf location where the Dual PRI is to be installed. The Dual PRI can be installed in any Network slot.
- 2 Unpack and inspect circuit cards.
- 3 Set the option switches on the DPRI circuit card before installation. Refer to “NT8D72 DIP switch settings” on page 89.  
  
S1 (faceplate switch) must be OFF when installing the Dual PRI otherwise an M1 Initialise may occur. S1 on the Dual PRI corresponds to the faceplate switch on the QPC414 Network card.
- 4 Install DPRI circuit card in the assigned shelf and slot.  
  
The faceplate LEDs should flash 3 times.  
  
Enable faceplate switch S1. This is the “Loop Enable” switch.
- 5 If required, install I/O adapters in I/O panel.
- 6 Run and connect the DPRI cables (refer to the “Cabling requirements” on page 51 section if required).
- 7 If required, install connecting blocks at MDF or wall mounted cross-connect terminal.
- 8 If required, designate connecting blocks at MDF or wall mounted cross-connect terminal.
- 9 If required, install Network Channel Terminating Equipment (NCTE).
- 10 Run PRI Verification Test.
- 11 Add related office data into switch memory. Refer to the work order and *ISDN PRI/BRI Feature Description and Administration (553-2901-301)*.
- 12 Run PRA status check. Refer to *ISDN PRI Maintenance (553-2901-501)* for the PRA verification tests, DPRI self-test, PRA status check, and PRA start-up test.

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## Removing the NTCK43 DPRI

### CAUTION

The static discharge bracelet located inside the cabinet must be worn before handling circuit cards. Failure to wear the bracelet can result in damage to the circuit cards.

- 1 Determine the cabinet and shelf location of the DPRI card to be removed.
- 2 If the DPRI card is being completely removed, not replaced, remove data from memory. See *ISDN PRI/BRI Feature Description and Administration (553-2901-301)*.
- 3 Disable Network Loop using Overlay 60. The command is DISL "loop number."  
  
The associated DCHI may have to be disabled first. The faceplate switch S1 should not be disabled until both PRI loops is disabled first.
- 4 Remove cross connections at MDF to wall-mounted cross-connect terminal.
- 5 Tag and disconnect cables from card.  
  
Rearrange Clock Controller cables if required.
- 6 Remove the Dual PRI card only if both loops are disabled. Faceplate switch S1 must be in the OFF (DIS) position before the card is removed, otherwise M1 will initialise.  
  
**Note:** If the other circuit of a Dual PRI card is in use, DO NOT remove the card.
- 7 Pack and store the DPRI card and circuit card.



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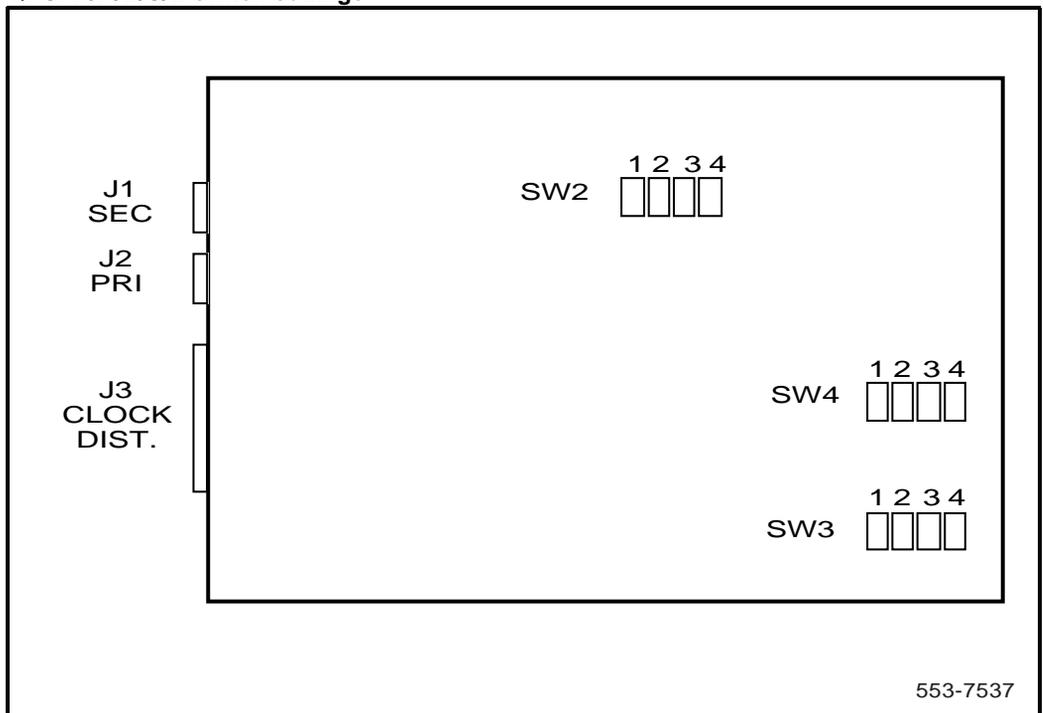
# Clock Controller installation and removal

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## Setting up the QPC775

The switch settings for the QPC775A/B/C/D Clock Controller card are shown in Figure 25 and Table 44.

**Figure 25**  
**QPC775A/B/C/D switch settings**



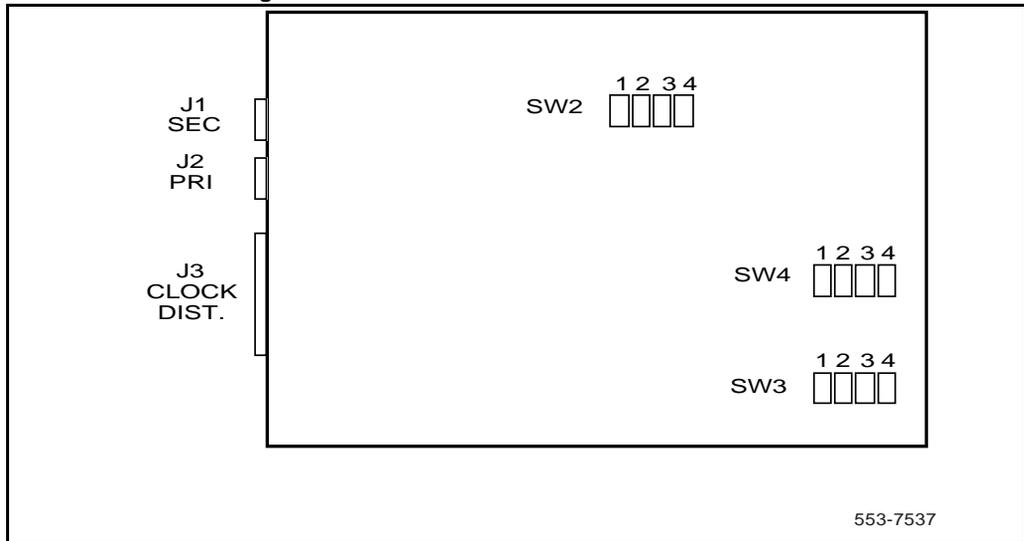
**Table 44**  
**QPC775A/B/C/D**

System Model	Switch 1 1 2 3 4	Switch 2 1 2 3 4	Switch 4 1 2 3 4
71,81	OFF	OFF	ON
21, 21E, 51, 51C, 61, 61C	ON	OFF	ON

**QPC775E switch settings**

Figure 26 shows the switch settings for the QPC775E. Table 45 describes the switch settings for the QPC775E.

**Figure 26**  
**QPC775E switch settings**



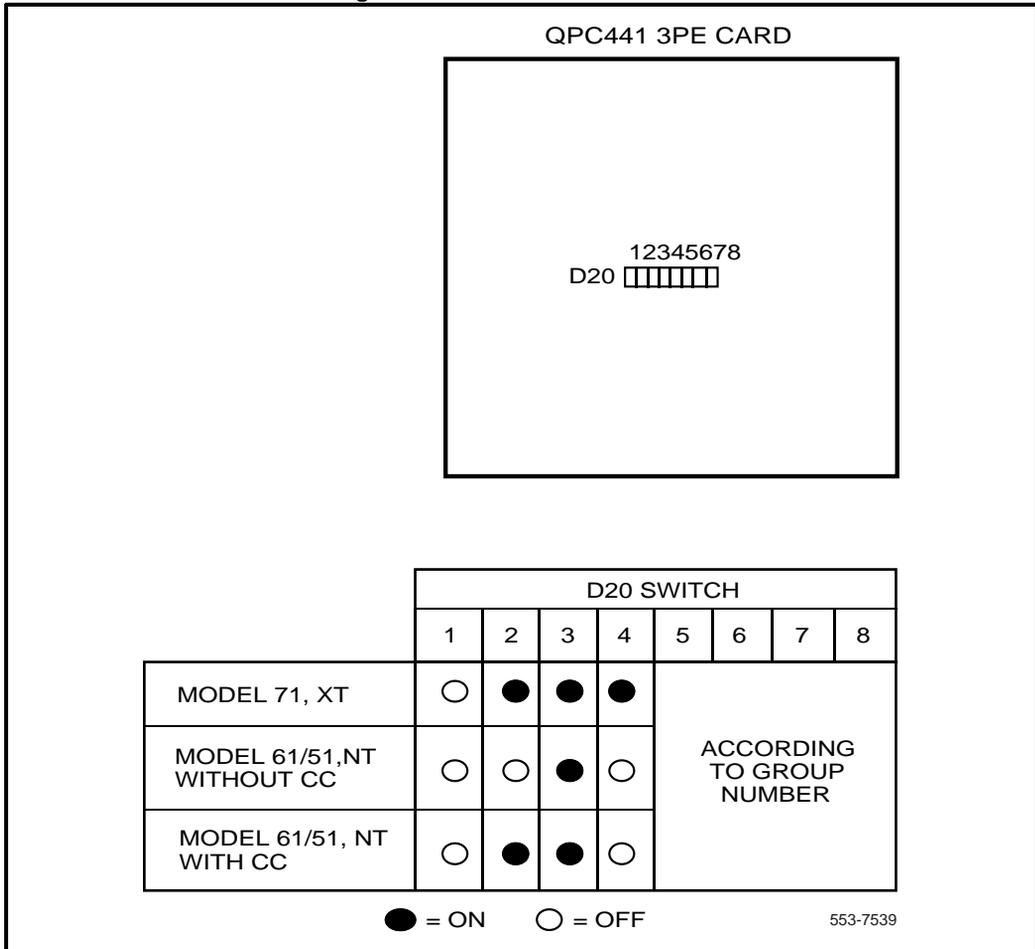
**Table 45**  
**QPC775E switch settings**

System	SW1	SW2	SW4			
	1 2 3 4	1 2 3 4	1	2	3	4
ST, STE, 21A, 21, 21E	ON	OFF	OFF	OFF	OFF	OFF
MS	ON	ON	OFF	OFF	OFF	OFF
RT, N, NT, 51, 61  Cable length between faceplate connectors: 0 - 4.3 m 4.6 - 6.1 m 6.4 - 10.1 m 10.4 - 15.2 m	ON	OFF	OFF	ON	OFF OFF ON ON	OFF ON OFF ON
XN, XT, 71, 81  Cable length between faceplate connectors: 0 - 4.3 m 4.6 - 6.1 m 6.4 - 10.1 m 10.4 - 15.2 m	OFF	OFF	OFF	ON	OFF OFF ON ON	OFF ON OFF ON

## QPC441 3PE card switch settings

The Three-Port Extender (3PE), used in Meridian 1 system Options 51/51C, 61/61C, 71, and 81/81C, extends CPU data, address and control signals between one segmented network shelf (half-group) and a QPC215 Segmented Bus Extender on a CPU shelf. For the QPC441 3PE cards in Network Shelves housing Clock Controller cards, the switch settings shown in Figure 27 are set.

**Figure 27**  
**QPC441 3PE card switch settings**



## Installing or replacing the QPC775 on Meridian 1 system Options 21/21E

Table 46 outlines the steps used to install or replace the QPC775 Clock Controller card in Meridian 1 system Options 21/21E.

**CAUTION**

Do not deviate from this procedure. Deviation will not cause the switch to SYSLOAD or initialize, but will stop call processing.

**Table 46**  
**Steps for installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 21/21E (Part 1 of 3)**

Step	Action	Response
1	<p>Determine the cabinet and shelf location of the circuit card to be installed.</p> <p>The following slots can be used if they are not required for other cards.</p> <p><b>SHELF SLOT</b>  <b>Network 4 - 7</b></p>	
2	<p>Unpack and inspect circuit card.</p>	
3	<p>Set option switches and insert option plugs on the new Clock Controller.</p> <p>SW2 - ON            SW3 - OFF            SWA (1,2) - ON</p> <p><i>Note:</i> "ON" in switch setting also means "1" or "CLOSED". "OFF" in switch setting also means "0" or "OPEN".</p>	

**Table 46**  
**Steps for installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 21/21E (Part 2 of 3)**

Step	Action	Response
4	On the Clock Controller being added, set faceplate toggle switch to DISABLE.	
5	When replacing an existing Clock Controller, make sure the existing card is software disabled, using Overlay 60.	
6	Check the counters in Overlay 60. If necessary, reset the counters using the RCNT command.	
7	On the Clock Controller being replaced, set the faceplate toggle to DISABLE.	
8	Disconnect cables from Clock Controller card and remove card from the shelf.	The Clock Controller status display in this mode will indicate NO UART (no universal asynchronous receiver transmitter). This is normal, however, do not perform a clock status check when receiving this code.
9	Install replacement Clock Controller in the same slot.	
10	Run and connect cables: Connect Primary reference to J2. Connect Secondary reference, if available, to J1.	

**Table 46**  
**Steps for installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 21/21E (Part 3 of 3)**

<b>Step</b>	<b>Action</b>	<b>Response</b>
11	Set faceplate toggle switch to ENABLE.	
12	Turn off DISABLE LED using Overlay 60 and the command ENL Clock Controller 0.	
13	Add related office data into switch memory.	
14	<p>To track on a primary or secondary reference clock, use Overlay 60. The command is:</p> <p>TRCKPCK (for Primary)            SCK (for Secondary)            FRUN (for Free-Run)</p> <p>Tracking on a Reference Clock: The Clock Controller, when enabled, will be in free-run mode. It should stay in this mode for several minutes before being switched to tracking mode.</p>	

## Installing or replacing the QPC775 on Meridian 1 system Options 51/51C, 61/61C

Table 47 outlines the steps used to install or replace the QPC775 Clock Controller card in Meridian 1 system Options 51/51C, 61/61C.

**CAUTION**

Do not deviate from this procedure. Deviation will not cause the switch to SYSLOAD or initialize, but will stop call processing.

**CAUTION**

If CC-0 is to be replaced, CC-1 and CPU-1 must be active. Similarly, if CC-1 is to be replaced, CC-0 and CPU-0 must be active.

**Table 47**  
**Steps for installing or replacing the QPC775 Clock Controller in Meridian 1 Options 51/51C, 61/61C (Part 1 of 6)**

Step	Action	Response
1	Determine the cabinet and shelf location of the circuit card to be installed.  <i>Note:</i> System Options 51 and 61 contain card slots that are dedicated for the Clock Controller. The card slot is number 9 on the Network shelf.	
2	Unpack and inspect circuit cards.	
3	Set option switches and insert option plugs on the Clock Controller being added. For information about QPC775 switch settings, refer to page 113.	

**Table 47**  
**Steps for installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 51/51C, 61/61C (Part 2 of 6)**

Step	Action	Response
4	<p>For the QPC441 3PE cards in Network Shelves housing Clock Controller cards:</p> <p>For models with a Clock Controller, set option switch positions 1 and 4 to OFF, and positions 2 and 3 to ON.</p> <p>For models without a Clock Controller, set option switch positions 1, 2 and 4 to OFF, and position 3 to ON.</p> <p>(refer to QPC441 3PE card schematic).</p>	
5	<p>On the Clock Controller being added, set faceplate toggle switch to DISABLE.</p>	
6	<p>When replacing an existing Clock Controller, make sure the existing card is software disabled, using Overlay 60.</p>	<p><b>Note:</b> ERR20 messages may be generated. These can usually be ignored. However, excessive clock switching should be avoided, especially when counters are near the maintenance or out-of-service thresholds.</p> <p>Excessive switching could generate threshold-exceeded messages or cause the PRI to be automatically disabled.</p>
7	<p>Check the counters in Overlay 60. If necessary, reset the counters using the RCNT command.</p>	

**Table 47**  
**Steps for installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 51/51C, 61/61C (Part 3 of 6)**

Step	Action	Response
8	On the Clock Controller being replaced, set the faceplate toggle to DISABLE.	
<p style="text-align: center;"><b>CAUTION</b></p> <p>Call processing will cease if the CC-to-CC cable (J3 connector) is connected and BOTH Clock Controller cards are disabled by their faceplate switches.</p>		
9	Disconnect cables from Clock Controller (CC) card.	<p>If the CC to CC cable (connector J3) is disconnected, the card in the active shelf will be active. The clock cannot be switched unless this cable is connected at both ends.</p> <p>The clock status display will indicate NO UART (no universal asynchronous receiver transmitter). This is normal, however, do not perform a clock status check when receiving this code.</p>

**Table 47**  
**Steps for installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 51/51C, 61/61C (Part 4 of 6)**

Step	Action	Response
10	Remove CC card from shelf.	<p>If the CC card is removed from the active shelf, the Peripheral Shelf (PS) card will distribute clock.</p> <p>If the CC to CC cable (connector J3) is disconnected, and the faceplate switch of the CC in the active shelf is or becomes disabled then the clock control will become disabled and the PS card will distribute clock, and when clock status is read by the CPU, the CC card will respond as being active clock, but disabled.</p>
11	<p>Install replacement Clock Controller in the same slot.</p> <p>The Clock Controller card can also be plugged into the active shelf without switching the CPU.</p>	

**Table 47**  
**Steps for installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 51/51C, 61/61C (Part 5 of 6)**

Step	Action	Response
12	<p>Run and connect cables:</p> <ul style="list-style-type: none"> <li>—Always set the faceplate switch to DISABLE before removing or installing the CC-to-CC cable (J3 connector), but remember, call processing will cease if the cable is connected and BOTH Clock Controllers are disabled.</li> <li>—Connect Primary reference to J2.</li> <li>— If available, connect Secondary reference to J1.</li> <li>—Connect cables cable between Clock Controllers (J3 to J3), for Meridian 1 system option 61 only.</li> </ul>	
13	Set faceplate toggle switch to ENABLE.	
14	Turn off DISABLE LED using Overlay 60 and the ENL command.	
15	Add related office data into switch memory.	
16	Repeat steps 2 to 14 for second Clock Controller.	

**Table 47**  
**Steps for installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 51/51C, 61/61C (Part 6 of 6)**

Step	Action	Response
17	<p>To track on a primary or secondary reference clock, use Overlay 60. The command is:</p> <p>TRCKPCK (for Primary)                      SCK (for Secondary)                      FRUN (for Free-Run)</p> <p><b>Tracking on a Reference Clock:</b> The Clock Controller will be in free-run mode when enabled. It should stay in this mode for several minutes before being switched to tracking mode.</p>	

## Installing or replacing the QPC775 on Meridian 1 system Option 71 or 81/81C

Table 48 outlines the steps used to install or replace the QPC775 Clock Controller card in Meridian 1 system Options 71 and 81/81C.

### CAUTION

Do not deviate from this procedure. Deviation will not cause the switch to SYSLOAD or initialize, but will stop call processing.

### CAUTION

If CC-0 is to be replaced, CC-1 and CPU-1 must be active. Similarly, if CC-1 is to be replaced, CC-0 and CPU-0 must be active.

**Table 48**  
**Installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 71 and 81/81C (Part 1 of 6)**

Step	Action	Response
1	Unpack and inspect circuit cards. (Note that Option 81 systems require QPC775E cards.)	
2	Set option switches and insert option plugs on the Clock Controller being added.  SW2 - OFF SW3 - OFF SW4 (1,2) - ON  "ON" in switch setting also means "1" or "CLOSED". "OFF" in switch setting also means "0" or "OPEN".	

**Table 48**  
**Installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 71 and 81/81C (Part 2 of 6)**

Step	Action	Response
3	<p>For the QPC441 3PE cards in Network Shelves housing Clock Controller cards:</p> <p>Set option switch position 1 to OFF, and positions 2, 3, and 4 to ON (refer to QPC441 3PE card schematic).</p>	
4	<p>On the Clock Controller being added, set faceplate toggle switch to DISABLE.</p>	
5	<p>When replacing an existing Clock Controller, make sure the existing card is software disabled, using Overlay 60.</p>	<p><b>Note:</b> ERR20 messages may be generated. These can usually be ignored. However, excessive clock switching should be avoided, especially when counters are near the maintenance or out-of-service thresholds.</p> <p>Excessive switching could generate threshold-exceeded messages or cause the PRI to be automatically disabled.</p>
6	<p>Check the counters in Overlay 60. If necessary, reset the counters using the RCNT command.</p>	
7	<p>On the Clock Controller being replaced, set the faceplate toggle to DISABLE.</p>	

**Table 48**  
**Installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 71 and 81/81C (Part 3 of 6)**

Step	Action	Response
<p style="text-align: center;"><b>CAUTION</b></p> <p>Call processing will cease if the CC-to-CC cable (J3 connector) is connected and BOTH Clock Controller cards are disabled by their faceplate switches.</p>		
8	Disconnect cables from Clock Controller card.	<p>If the Clock Controller to Clock Controller cable (connector J3) is disconnected, the card in the active shelf will be active. The clock cannot be switched unless this cable is connected at both ends.</p> <p>The clock status display will indicate NO UART (no universal asynchronous receiver transmitter). This is normal, however, do not perform a clock status check when receiving this code.</p>

**Table 48**  
**Installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 71 and 81/81C (Part 4 of 6)**

Step	Action	Response
9	Remove card from shelf.	<p>If the Clock Controller card is removed from the active shelf, the Peripheral Shelf (PS) card will distribute clock.</p> <p>If:</p> <ul style="list-style-type: none"><li>— the Clock Controller to Clock Controller cable (connector J3) is disconnected, and the faceplate switch of the Clock Controller in the active shelf is or becomes disabled</li></ul> <p>Then:</p> <ul style="list-style-type: none"><li>— clock control will become disabled and the PS card will distribute clock, and</li></ul>
10	<p>Install replacement Clock Controller in the same slot.</p> <p>The Clock Controller card can also be plugged into the active shelf without switching the CPU.</p>	

**Table 48**  
**Installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 71 and 81/81C (Part 5 of 6)**

Step	Action	Response
11	Run and connect cables: — Always set the faceplate switch to DISABLE before removing or installing the CC-to-CC cable (J3 connector), but remember, call processing will cease if the cable is connected and BOTH Clock Controllers are disabled. — Connect Primary reference to J2. — If available, connect Secondary reference to J1. — Connect cables cable between Clock Controllers (J3 to J3), for Meridian 1 system option 61 only.	
12	Set faceplate toggle switch to ENABLE.	
13	Turn off DISABLE LED using Overlay 60 and the ENL command.	
14	Add related office data into switch memory.	
15	Repeat steps 2 to 14 for second Clock Controller.	

**Table 48**  
**Installing or replacing the QPC775 Clock Controller**  
**in Meridian 1 Options 71 and 81/81C (Part 6 of 6)**

Step	Action	Response
16	<p>To track on a primary or secondary reference clock, use Overlay 60. The command is:</p> <p>TRCKPCK (for Primary)                      SCK (for Secondary)                      FRUN (for Free-Run)</p> <p><b>Tracking on a Reference Clock:</b> The Clock Controller will be in free-run mode when enabled. It should stay in this mode for several minutes before being switched to tracking mode.</p>	





Meridian 1  
**DASS2**  
Installation Guide

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