

297-1001-530

DMS-100 Family  
**Conference Circuit Guide**

TL06 and up Standard 03.05 May 1998

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**NORTEL**  
NORTHERN TELECOM



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DMS-100 Family

## Conference Circuit Guide

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**List of terms** **5-1**



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# About this document

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## When to use this document

This document describes the hardware and software for the NT3X67 six-port conference circuit card and the NT1X81 conference trunk module (CTM).

This document outlines provisioning, maintenance, and administrative requirements. This document provides references to documents containing detailed descriptions.

## How to check the version and issue of this document

This document is for all DMS-100 Family offices. More than one version of this document can be present. Check the release information in *Product Documentation Directory*, 297-8991-001. This information helps to determine if you have the latest version of this document. This directory helps to determine the arrangement of the document for your product.

## References in this document

This document refers to the following documents:

- *Alarm and Performance Monitoring Procedures*, 297-XXXX-543
- *Card Replacement Procedures*, 297-XXXX-547
- *Commands Reference Manual*, 297-1001-822
- *Feature Description Manual*, 297-XXXX-801
- *Hardware Description Manual*, 297-XXXX-805
- *Lines, Trunks, and Peripherals*, 297-XXXX-840
- *Log Report Reference Manual*, 297-XXXX-840
- *Office Parameters Reference Manual*, 297-XXXX-855
- *Operational Measurements Reference Manual*, 297-XXXX-814
- *Peripheral Modules Maintenance Guide*, 297-1001-592
- *Provisioning Guide*, PLN-8991-104
- *Translations Guide*, 297-XXXX-350
- *Trouble Locating and Clearing Procedures*, 297-XXXX-544

*Note:* XXX refers to the specific product computing load (PCL).

## What precautionary messages mean

The types of precautionary messages in NT documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information necessary for the proper performance of procedures and tasks. Attention boxes also can provide corrections of information or data. Danger, warning, and caution messages indicate possible risks.

Examples of the precautionary messages follow.

**ATTENTION** Information needed to perform a task

### **ATTENTION**

Deprovision the DS-3 ports not used before installation of a DS-1/VT Mapper. This condition is necessary for the DS-1 traffic to carry through the DS-1/VT Mapper. Correct provisioning of the DS-1/VT alone does not guarantee the carry-through of traffic.

**DANGER** Possibility of personal injury



### **DANGER**

#### **Risk of electrocution**

You must remove fuses F1, F2, and F3 before you open the front panel of the inverter. The inverter contains high-voltage lines. The high-voltage lines are active until the fuses are removed. You risk electrocution.

**WARNING** Possibility of equipment damage



### **WARNING**

#### **Damage to the backplane connector pins**

To avoid bent backplane connector pins, align the card and seat the card. Use light thumb pressure to align the card with the connectors. Next, use the levers on the card to seat the card into the connectors.

**CAUTION** Possibility of service interruption or degradation



**CAUTION**

**Possible loss of service**

Before continuing, confirm that you are removing the card from the inactive unit of the peripheral module. Subscriber service will be lost if you remove a card from the active unit.

## How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the following conventions.

### Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

**>BSY**

### Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

**>BSY CTRL**

### Variables

Variables are shown in lowercase letters:

**>BSY CTRL ctrl\_no**

You must enter the letters or numbers that the variable represents. A list that follows the command string explains each variable.

### Responses

Responses correspond to the MAP display and are shown in a different type:

```
FP 3 Busy CTRL 0: Command request has been submitted.  
FP 3 Busy CTRL 0: Command passed.
```

The command syntax in this document appears in the following section of a procedure:

***At the MAP Terminal***

- 1 To manually busy the CTRL on the inactive plane, type

**>BSY CTRL ctrl\_no**  
and pressing the Enter key.

*where*

ctrl\_no is the number of the CTRL (0 or 1)

*Example of a MAP response:*

```
FP 3 Busy CTRL 0: Command request has been submitted.  
FP 3 Busy CTRL 0: Command passed.
```

---

# Introduction

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## Overview

This document describes the hardware and software for the NT3X67 six-port conference circuit card and the NT1X81 conference trunk module (CTM).

This document outlines provisioning, maintenance, and administrative requirements. This document provides references to documents that contain detailed descriptions.



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# Six-party conference card

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## Overview

The NT3X67 six-party conference card provides conference facilities on a single card for use with digital multiplex system (DMS)-100 switches. The NT3X67 is the six-port conference card. The six-party conference card provides Centrex or Meridian Digital Centrex (MDC) offices with transfer, consultation hold, and call add-on capabilities. The six-party conference card provides MDC with plain old telephone service (POTS) offices with three-way and six-way calling. Traffic Operator Position System (TOPS) positions, service analysis positions, and attendant consoles require the six-party conference card.

## Hardware description

The six-party conference card consists of the NT3X67AA (North America) and NT3X67BB (International) six-party conference cards.

Conference shelf provisioning can occur in a maintenance trunk module (MTM) shelf or an integrated service module (ISM) shelf. The conference shelf consists of four MTM controller cards when provisioned in an MTM shelf. The MTM controller cards, range from one to five NT3X67 six-party conference cards and two power converter cards. As a result, these cards can total a maximum of 11 cards.

The conference shelf consists of a maximum of seven cards when provisioned in an ISM shelf. The cards include the ISM controller card, an ISM power converter card, and one to five NT3X67 six-party conference cards.

The following table lists the hardware required for a completely provisioned MTM conference shelf:

**Table 2-1**  
**MTM conference shelf hardware**

<b>Card name</b>	<b>Card product engineering code (PEC) and suffix</b>
Trunk module interface card	NT2X45AB, BA, CA
Trunk module processor card	NT0X70AA, BA
Trunk module control card	NT2X53AA
Group CODEC card	NT2X59AA, AB
Six-party conference card (5)	NT3X67AA, BB
Multi-output power converter card	NT2X09AA
5V power converter card	NT2X70AA, AE

The following table lists the hardware required for a completely provisioned ISM conference shelf.

**Table 2-2**  
**ISM conference shelf hardware**

<b>Card name</b>	<b>Card PEC and suffix</b>
ISM processor card	NTFX42AA
Six-party conference card (5)	NT3X67AA, BB
ISM DC converter card	NTFX43AA

### **NT3X67 six-party conference card**

The NT3X67 six-party conference card:

- has six circuits per card
- occupies three slots in an MTM or trunk module (TM). The slot on either side of the NT3X67 card must be empty.
- appears as a trunk to the switch
- functions as one six-party conference circuit or two three-port conference circuits
- requires six four-wire pulse code modulation (PCM) trunk appearances
- has 7.5W of power, from +5V logic power.

*Note:* The NT3X67BB card replaces the NT3X67BA card, and provides the toll break-in background feature.



**Hardware use limits**

The MTM shelf backplane wiring restricts the maximum number of NT3X67 cards that you can install in an MTM shelf to four. The MTM controller can serve five NT3X67 six-party conference cards.

**Electromagnetic interference (EMI) information**

The EMI testing occurs at the DMS-100 system level. Accurate EMI information on the six-party conference card does not apply.

**Sparing information**

To determine sparing information, use data to calculate the mean time between failures (MTBF). The MTBF of an MTM shelf equipped with five NT3X67 cards is approximately three years. Nortel recommends each site has a minimum of one spare card for each card type.

**Description**

The dimensions of the NT3X67 six-party conference card appear in the following list:

- Height: 317.5 mm (12.5 in.)
- Depth: 254 mm (10 in.)
- Width: 29 mm (1.13 in.)

Refer to the *Hardware Description Manual* for details about the functional blocks that form six-party conference card software.

**Software description**

The following table lists the software packages required for the basic functions of the conference circuit:

**Table 2-3**  
**Six-party conference card base software**

Feature package number	Package title
NTX001AA	Common Basic

**Software requirements**

The system supports a total of 30 voice channels for conferencing functions. You cannot configure each bridge to support more than six conferees. Applications that require that you bridge more than six conferees must chain together separate six-party circuits.

## Architecture

The controller cards provide message communication with the central control (CC) and overall peripheral module (PM) control. At the same time, the system assigns each six-party conference card to groups of three or six speech channels for voice conferencing.

Each NT3X67 six-party conference card has six circuits and occupies three card slots in an MTM or TM. The six-party conference card receives eight-bit PCM. The six-party conference card sends eight-bit PCM samples. The samples represent the linearized and compounded total of the speech samples from two of the speech signals.

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# Conference trunk module

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## Overview

The conference trunk module (CTM) is a stand-alone single-card peripheral module (PM). The CTM offers the same functionality as a completely equipped conference shelf. You can plug the CTM into a provisionable trunk slot in specified shelves. The specified shelves are maintenance trunk module (MTM) shelf, the integrated service module (ISM) shelf and the service trunk module (STM) shelf.

The CTM offers the flexibility of a completely-configured conference shelf in a single-card PM. The CTM has a smaller footprint and reduced shelf and frame requirements compared to the conference shelf. The conference shelf consists of an MTM controller card and one to five six-port conference circuit cards. The CTM reduces sparing inventory requirements because the CTM is a single-card PM.

## Hardware description

Each CTM card, NT1X81AA or NT1X81BA, has 30 ports that provide the capabilities of a completely provisioned conference shelf. The CTM has a DS30 link interface (I/F). You can plug the CTM into one of the provisionable trunk slots of the MTM, ISM, or STM. You must connect the DS30 cable directly to the backplane pins of the associated card slot.

The CTM hardware integrates MTM and conference circuit control and memory. Current extended multiprocessor system (XMS)-based peripheral module (XPM) utilities is the base for the central control (CC) PM loader software. These utilities permit the downloading of data using the message channel of the DS30 link on the two network planes. The data consists of loadfiles from either tape or disk.

### **NT1X81 CTM card**

The NT1X81 CTM card:

- has 30 circuits for each card
- occupies one slot in an MTM, ISM, or STM
- appears as a PM and as multiple trunks or service circuits to the switch
- functions as five separate six-port voice conference bridges
- can configure with five six-party connections or ten three-party connections
- communicates directly with the CC and central message controller (CMC) through the DS30 link message channels
- has an on-board power converter.

### **CTM hardware blocks**

#### **Microprocessor**

The CTM uses an 8085A N-channel metal oxide semiconductor (NMOS) microprocessor working at 3 MHz.

#### **Microprocessor EPROM**

The microprocessor has 4 kbyte of erasable programmable read-only memory (EPROM). The EPROM is in a 4-kbyte  $\times$  8 configuration. A single 32-kbyte  $\times$  8 QM27C256 EPROM integrated circuit (IC) organizes the 4-kbyte  $\times$  8 configuration. The microprocessor EPROM contains the MTM controller bootstrap loader.

#### **Microprocessor RAM**

The microprocessor has 32 kbyte of random access memory (RAM). The RAM is in a 32-kbyte  $\times$  8 configuration. A single QM62256 complementary metal oxide semiconductor (CMOS) RAM IC organizes the 32-kbyte  $\times$  8 configuration. The system uses this RAM in the same way that the MTM PM load uses RAM.

#### **Tone EPROM**

The CTM has 64 kbyte of EPROM. The EPROM is in a 64-kbyte  $\times$  8 configuration using a single EPROM IC like the QM27C512. This EPROM contains all of the MTM-generated tones required for conference applications.

**MTM controller ASIC**

The MTM controller application-specific integrated circuit (ASIC) is a TSC700 1.0- $\mu\text{m}$  standard cell ASIC. The ASIC consists of approximately 12 000 random gates. The ASIC consists of different megamodules for the RAM, read-only memory (ROM), and first in, first out (FIFO) used in the MTM.

**Conference ASIC**

The conference ASIC is a TSC700 1.0- $\mu\text{m}$  standard cell ASIC. The conference ASIC consists of approximately 12 000 random logic gates. The conference ASIC consists of different megamodules for the RAM and ROM functions of the conference circuit. This ASIC serves all five conference circuits for all five virtual six-port conference circuit conditions.

**DS30 I/F**

The DS30 I/F consists of a single NT5L67AA hybrid and glue logic for one DS30 link I/F on both network planes. The system performs the DS30 clock and data recovery internally in the MTM controller ASIC.

**On-board power converter**

The on-board power converter module provides +5V power for the CTM logic when  $-48\text{V}$  ( $-36\text{V}$  to  $-72\text{V}$ ) battery feed is available on the backplane. The relay circuitry can sense when there is no +5V external power supply or NT2X70 power converter card, on the shelf. In this condition, the relay circuitry switches the CTM power supply to the on-board power converter module.

**Hardware use limits**

You can install the CTM card in the following slots:

- slots 5 to 16 of an MTM shelf
- slots 3 to 20 of an ISM shelf
- slots 5 to 11 of an STM shelf
- slots 13 to 18 of an STM shelf

You can install a maximum of 12 CTM cards or 360 conference ports on an MTM shelf. The MTM shelf must have a backplane that provides  $-48\text{V}$  ( $-36\text{V}$  to  $-72\text{V}$ ). The MTM shelf must have an on-board power converter of the CTM that powers the CTM.

You can install a maximum of 17 CTM cards or 510 conference ports on an ISM shelf. The ISM shelf must have a backplane that provides  $-48\text{V}$  ( $-36\text{V}$  to  $-72\text{V}$ ). The ISM shelf must have an on-board power converter of the CTM that powers the CTM.

You can install a maximum of two CTM cards or 60 conference ports on a single STM shelf. This occurs because of the +5V power converters on the STM shelf that are not redundant.

You can provision a maximum of 512 CTM cards in an office.

#### **Electromagnetic interference (EMI) information**

The CTM does not increase measured EMI emissions on a system level. As a result, the CTM is not like an equivalent system that uses NT3X67 six-port conference cards.

#### **Sparing information**

To determine sparing information, use data to calculate the mean time between failures (MTBF). The MTBF is approximately 413 years when the CTM uses the CTM on-board power converter. The combined MTBF is approximately 38 years when the CTM derives power from the NT2X70AE power converter. Nortel recommends each site has a minimum of one spare card for each card type.

#### **Physical description**

The NT1X81 CTM card has the following dimensions:

- Height: 317.5 mm (12.5 in.)
- Depth: 254 mm (10 in.)
- Width: 29 mm (1.13 in.)

#### **Additional hardware parts**

The following section describes additional hardware for CTM including DS30 links and cables.

#### **CTM DS30 links**

The CTM has a separate pair of DS30 links to connect to both planes of the network module (NM). The CTM has a separate pair of DS30 links because the CTM is a stand-alone PM. The CTM communicates with the CC/CMC directly through the message channel of the DS30 link.

You can plug the DS30 cable for the CTM directly to the pins at the back of the MTM, ISM, or STM backplane. Plug the cable at the slot that corresponds to the position of the CTM.

The other end of the cable terminates at the peripheral speech link (PSL) panel. The PSL panel mounts on the speech link connecting (SLC) frame or at the enhanced network (ENET). The location depends on office requirements.

The direct link means that the CTM appears twice on the MAP display. The CTM appears as a PM because the CTM directly connects to the network. The CTM appears as multiple trunk, 30 in total.

### CTM DS30 cables

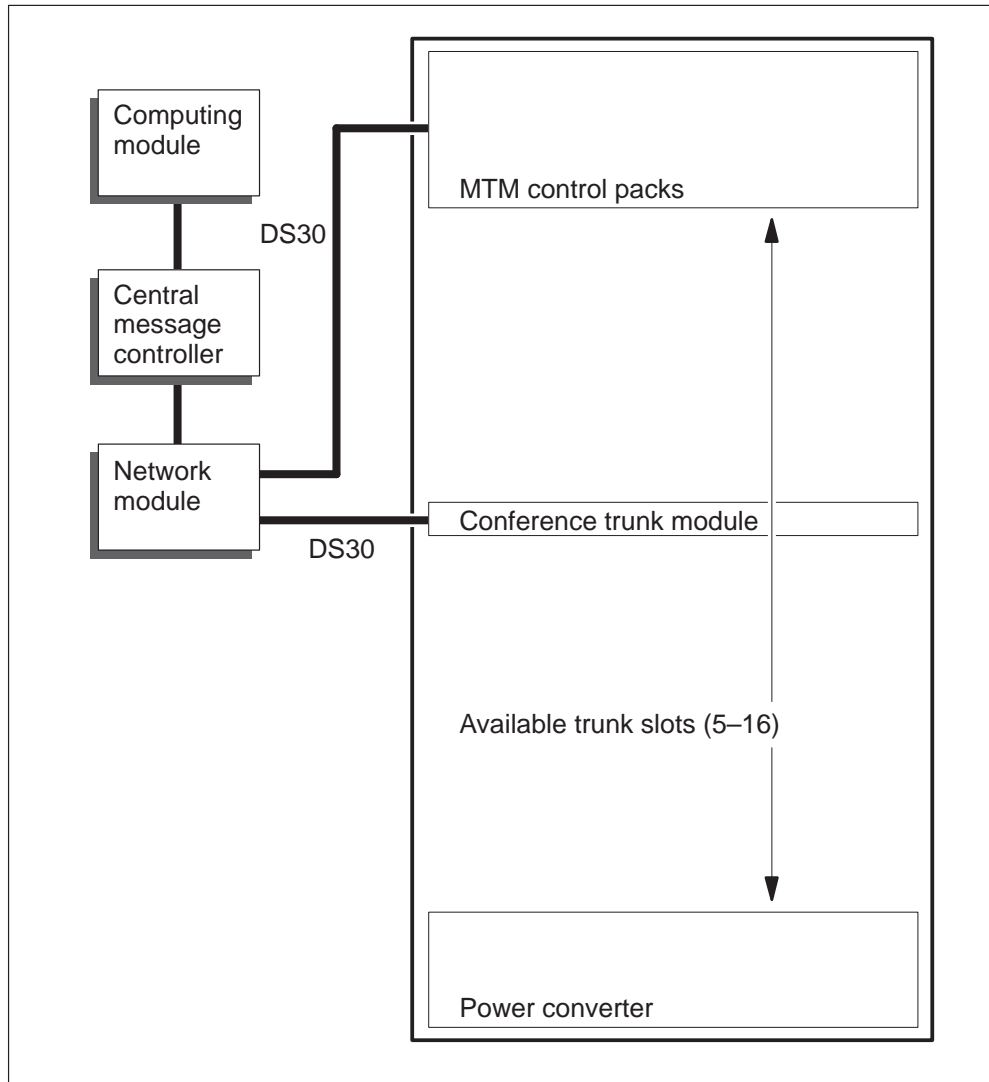
The following table lists cables used with CTM for offices configured with junctored networks (JNET) and ENETs:

**Table 3-1**  
**CTM cabling**

Office type	Cable PEC and suffix
<b>Shelf without flip plate</b>	
JNET/ENET office with speech link connecting (SLC) frame	NT0X96DX
JNET/ENET office without SLC	NT0X96DY
<b>Shelf with flip plate</b>	
JNET/ENET office with SLC	NT0X96CT
JNET/ENET office without SLC	NT0X96EU
JNET/ENET office with flip plate TIE point assembly with or without SLC	NT0X96CS
JNET/ENET office without SLC	NT0X96DY

The following diagram illustrates how the CTM fits into the network. The CTM in an MTM shelf configuration appears in the following diagram:

**Figure 3-1**  
**CTM system configuration**





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## Software description

The CTM has a set of functions equivalent to all of the current functions of a completely equipped conference shelf. The set of functions provides all functions in a single stand-alone circuit card. The two main types of functions appear in the following list:

- MTM functions
- conference functions

### MTM functions

The CTM provides the following MTM functions:

- loads and executes PM executable programs (PM loads and EXECS)
- sets up speech connections required for call processing
- performs PM sanity functions like sending the “Who-am-I, I-am-here”, message to the CC
- generates and checks network accuracy and parity
- performs CC instructions through CC-peripheral processor (PP) primitives execution and handles command protocol violation checking
- generates tones, as implemented on the NT2X59 group CODEC card
- provides digital pads on the NT2X45AB and NT2X45BA trunk module (TM) I/F cards
- provides speech channel bit inversion of speech pulse code modulation (PCM) and/or data PCM for international applications
- performs PM load checksum tests

*Note:* Each speech channel selection is not available on the CTM for the application of speech bit inversion. The NT2X45 TM I/F card in an equipped conference shelf provides speech bit inversion.

### Conference functions

The CTM performs the following conference functions:

- provides all conference operations offered by the NT3X67AA or NT3X67BB six-port conference circuit card
- supports both A-law and  $\mu$ -law PCM coding and decoding
- generates special tones like toll break-in (TBI) or intrusion tone
- configures as a dual three-port or single six-port operation
- queries configuration
- performs diagnostics

### Required software

The CTM requires an MTM peripheral firmware load because the CTM emulates the current MTM controller. The firmware load required is the same load that the MTM uses. The memory capacity for peripheral firmware loads is 32 kbyte.

The following table lists the software packages required for the basic functioning of the CTM:

**Table 3-2**  
**CTM base software**

Feature package number	Package title
NTX001AA	Common Basic

### Software requirements

A total of 30 voice channels have support for conferencing functions. You cannot configure each bridge to support more than six conferees. Applications that require that you to bridge more than six conferees must chain together separate six-port circuits.

### Architecture

The CTM is a single-circuit card DMS peripheral. The CTM provides five separate six-port voice conference bridges, or ten three-port bridges. The CTM provides a group of six and three-port bridges as long as three-port bridges are in pairs. The CTM has an on-board power converter. This on-board power converter allows the CTM to be separate of the shelf that it resides on.

The CTM is a stand-alone PM with a separate DS30 link I/F. The CTM functions as the equivalent of five separate six-port voice conference bridges. This functionality is possible when you package the controller and six-port conference circuits again, to a complementary metal oxide semiconductor (CMOS) large scale integration (LSI) application-specific integrated circuits (ASIC). The CTM provides the same performance as a completely configured conference shelf. The CTM has identical conferencing algorithms, features, and maintenance capabilities.

The CTM provisioning occurs in one of the trunk slots of the MTM, ISM, or STM shelves. The DS30 cable directly connects to the backplane pins of the associated slot.

### Physical provisioning information

You can insert the CTM into one of the 12-provisionable MTM, 17-provisionable ISM, or 13-provisionable STM trunk slots.

Each CTM has one power converter. You can provision a maximum of 12, 13 or 17 CTM cards on a single shelf.

Each office can support a maximum of 512 NT1X81AA CTM cards.

### NT1X81AA CTM

The NT1X81AA card is the basic CTM package.

The NT1X81AA card is compatible with a six-party conference card, NT3X67, configuration in the same office. You can use the NT1X81AA card to replace the NT3X67.

### NT1X81BA CTM

The NT1X81BA CTM has the same functionality as the AA version. The NT1X81BA CTM has the addition of audible tones for the Japanese market.

The card provides the generation of busy tone and ring-back tone required for three-way call setup. The tone samples are part of the firmware of the card. The remainder of the standard CTM toneset is not changed.



#### **CAUTION**

##### **Possible improper toneset operation**

For correct toneset operation, the NT1X81BA CTM card must not be present with NT1X81AA CTM cards in the same office, at the same time. The NT1X81BA CTM card must not be present with NT3X67AA six-party conference cards in the same office, at the same time. Before you install the NT1X81BA card, remove all NT1XAA and NT3X67AA cards from the office.



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# Operation, administration, and maintenance

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## Summary

This chapter describes general OA&M considerations. This chapter provides references to documents that contain complete information on each subject.

## Translation tables

This section provides a basic description of the tables required for the NT3X67 six-party conference card. This section also provides a basic description of the tables required for the NT1X81 conference trunk module (CTM).

For more detailed information about data entry procedures and the contents of the tables, refer to the *Translations Guide*.

## Six-party conference card tables

The six-party conference card tables common to all loads BCS14 and later versions appear in the following:

- CONF6PR
- CONF3PR
- KSETQCK
- MMCONF
- PRECONF
- TMINV
- STN

The following paragraphs provide a short description of each table.

**Table CONF3PR**

Table CONF3PR lists the conference trunk number, and the external trunk number of the first port. Table CONF3PR lists the equipment location of the conference trunk. Assign each three-port conference circuit, maximum 1364, a conference trunk circuit number, (0 to 1363). Assign each three-port conference circuit three consecutive external trunk numbers (one for each port).

**Table CONF6PR**

Table CONF6PR lists the conference trunk number and the external trunk number of the first port. Table CONF6PR lists the equipment location of the conference trunk. Assign each six-port conference circuit, maximum 1000, a conference trunk circuit number, (0 to 999). Assign each six-port conference circuit six consecutive external trunk numbers (one for each port).

**Table KSETQCK**

Table KSETQCK holds the directory numbers (DN) programmed against every quick conference key (QCK) feature assigned to an electronic business set (EBS) telephone. Enter data for this table against a key assigned to the QCK feature in table KSETFEAT. Enter data for table KSETFEAT before table KSETQCK.

**Table MMCONF**

The Integrated Business Network (IBN) meet-me conference feature requires table MMCONF. Assign a maximum of 16 directory numbers (DNs) for each IBN office for meet-me conferences. All these numbers can have conferences active at the same time. Provision enough six-port conference circuits in the digital multiplex service (DMS) switch to have conferences active at the same time.

**Table PRECONF**

Table PRECONF contains information about IBN preset conferences. This table allows IBN offices to assign 50 conferees for each conference. The preset conference identifier (PRECONF) and conferee identifier (CONFEREE) sorts entries in table PRECONF. The first entry to appear for each conference is always conferee 0.

**Table STN**

Tones that require trunk cards require table STN. The following list contains the tones that table STN includes:

- expensive route warning tone
- off-hook queuing tone
- receiver off-hook tone generator
- tone generator call waiting
- the IBN busy verification tone
- international executive busy override tone
- executive busy override tone
- preset conference normal notification tone
- distinctive call waiting tone
- teen service call waiting tones

**Table TMINV**

Table TMINV lists the following assignment data for each trunk module (TM):

- the TM type and number
- floor, row on floor, bay position in row, and base mounting position
- frame type and number that the TM mounts
- network assignments
- product engineering code (PEC) of the TM
- the load name of peripheral module (PM) software
- set of executive programs required for the TM
- the single-card CTM data
- the single card enhanced digital recording announcement machine (EDRAM) data

**CTM tables**

The tables that apply to the six-party conference card apply to the CTM. Table TMINV contains fields that define the location of the CTM. Tables CONF3PR and CONF6PR accept a single PEC code entry for the CTM. You must enter data for office parameter PM\_PCM\_PROTOCOL\_SELECTION in table OFCENG for the CTM. For additional information, refer to *Translations Guide*.

### **Datafill sequence for the six-party conference card and CTM**

The datafill sequence for the six-party conference card and CTM requires data entry of table KSETFEAT before table KSETQCK. Enter data in table TMINV before tables CONF3PR and CONF6PR.

### **Defining administration functions**

This section provides a summary of conference circuit administration.

The operating company must monitor the performance of the conference circuit in terms of the following:

- availability
- agreement
- quality of the conferences
- busy hour capacity
- use growth directions.

Operating company personnel provide accumulated performance information to the engineer and maintenance groups. The personnel program the switch to collect selected data through the use of operational measurements (OM) registers. The personnel determine the collection periods. Operating company personnel direct the register output to the correct recording device, like a printer or automated collection system. An example of an automated collection system is the Engineering and Administrative Data Acquisition System (EADAS).

### **System resources**

The operating company establishes the conference circuit level of service requirements. The operating company establishes quality requirements for the accuracy and performance of the conferences.

### **Component and system status**

The six-port conference bridge (CF6P) OM group provides information on the use of a six-port conference circuit. Registers are incremented when a circuit is seized, busy or waiting in a queue.

The following table lists the registers for OM group CF6P associated with component and system status.



**Table 4-1**  
**Six-port conference circuit and CTM status registers**

Register	Information
CF6MBU	Description: This register records the total number of conference circuits that are manual busy (ManB), seized and network management (NWM) busy.
	BCS history: Creation of this register occurred before BCS20.
CF6QOCC	Description: This register records requests that wait in the queue for assignment of a conference circuit. The queue only consists of waiting service analysis and trunk test position (TTP) requests.
	BCS history: Creation of this register occurred before BCS20.
CF6SZRS	Description: This register counts calls that correctly seize a conference circuit.
	BCS history: Creation of this register occurred before BCS20.

### Component failures and system faults

The conference circuit can have faults because of the following reasons:

- wrong datafill
- hardware failure
- degradation of memory
- communication failure between the conference circuit and a data terminal

Replace the card without additional in-service (INSV) troubleshooting if you identify a hardware fault in the conference circuit.

To correct checksum faults in firmware that you can download, reload the CTM. The time required to reload the CTM and the MTM is identical.

For detailed information on how to correct conference circuit failures or faults, refer to *Peripheral Modules Maintenance Guide*, 297-1001-592.

The following table lists the registers for OM group CF6P associated with component failures and system faults.

**Table 4-2**  
**Six-port conference circuit and CTM failure and fault registers**

Register	Information
CF6OVFL	Description: This register counts calls that do not find enough conference bridges.  BCS history: Creation of this register occurred before BCS20.
CF6QABAN	Description: This register counts calls abandoned in a queue. These calls wait to connect to a conference circuit.  BCS history: Creation of this register occurred before BCS20.
CF6QOVFL	Description: This register counts requests for a conference circuit. These requests encounter a circuit full condition.  BCS history: Creation of this register occurred before BCS20.
CF6SBU	Description: This register records if conference circuits are in one of the following states because of a busy action that originated in the system: <ul style="list-style-type: none"> <li>• remote busy</li> <li>• PM busy</li> <li>• system busy (SysB)</li> <li>• carrier failure</li> <li>• deloaded</li> </ul> BCS history: Creation of this register occurred before BCS20.
CF6TRU	Description: This register records conference circuits. These conference circuits can be one of the following states: <ul style="list-style-type: none"> <li>• call processing busy</li> <li>• call processing busy deload</li> <li>• lockout</li> </ul> BCS history: Creation of this register occurred before BCS20.

## Finding conference circuit information

This section identifies documents containing detailed information on the conference circuit. The references are in the following subjects:

- administration
- maintenance
- planning and engineering
- translations

The references are in numeric and alphabetical order.

**Note:** In the document numbers in the following tables, the following condition can apply. An xxxx or 8xxx represents the center four digits in some references. The designs indicate that the digits represented with an x are variable. These digits depend on the documentation layer number. The documentation layer number maps the Northern Telecom publication (NTP) to a PCL or product. For example, U.S. stand-alone DMS-100/200 is in documentation layer number 8001.

### Administration

Use administration documents to establish and check the accuracy of the conference circuit database. Use administration documents to monitor service performance. These documents provide the procedures required to gather and validate system OM data. The documents evaluate system performance and capacity, and check for effective use and operation of the conference circuit.

A list of administration reference documents appears in the following table:

**Table 4-3**  
**Administration documents**

NTP number	Title
297-xxxx-801	<i>Feature Description Manual</i>
297-xxxx-840	<i>Operational Measurements (OM) Reference Manual</i>

## Maintenance

Maintenance documents keep the conference circuit in normal operation. Maintenance documents restore the conference circuit to normal operation if the circuit fails. The conference circuit hardware and software requires this information to function normally. This information includes operation and maintenance methods, procedures and data for protective and corrective maintenance. This information includes methods for testing and validating conference circuit performance.

A list of maintenance reference documents appears in the following table:

**Table 4-4**  
**Maintenance documents**

<b>NTP number</b>	<b>Document</b>
297-xxxx-543	<i>Alarm and Performance Monitoring Procedures</i>
297-8xxx-544	<i>Trouble Locating and Clearing Procedures</i>
297-8xxx-547	<i>Card Replacement Procedures</i>
297-1001-592	<i>Peripheral Module Maintenance Guide</i>
297-xxxx-801	<i>Feature Description Manual</i>
297-xxxx-805	<i>Hardware Description Manual</i>
297-1001-822	<i>Commands Reference Manual</i>

## Planning and engineering

Use planning and engineering documents to size and order the conference circuit. These documents describe equipment, characteristics, compatibilities, limits, test equipment requirements and order information. In some events, these documents provide detailed traffic descriptions. Traffic descriptions include engineering procedures and algorithms for a first and a growth engineering job.

The following table lists planning and engineering reference documents:

**Table 4-5**  
**Planning and engineering documents**

<b>NTP number</b>	<b>Title</b>
297-xxxx-801	<i>Feature Description Manual</i>
PLN-8991-104	<i>Provisioning Guide</i>
297-8xxx-855	<i>Office Parameters Reference Manual</i>

### Translations

Translations documents provide the instructions, procedures, and forms for the preparation and management of input data. Input data includes information about the following:

- lines
- trunks
- service circuits
- customer features
- routing and charging characteristics
- equipment assignments
- different office information like traffic measurement schedules

Translations documents provide information and instructions to create, verify, retrieve, and change input data.

A list of translations reference documents appears in the following table:

**Table 4-6**  
**Translations reference documents**

<b>Document number</b>	<b>Title</b>
297-xxxx-801	<i>Feature Description Manual</i>
297-xxxx-350	<i>Translations Guide</i>
297-xxxx-855	<i>Office Parameters Reference Manual</i>

### Documentation key

A list of the important NTPs appears in numeric order in the following table:

**Table 4-7**  
**Documentation key**

Document number	Title	Description
297-xxxx-801	<i>Feature Description Manual</i>	This document provides DMS-100 feature descriptions. This NTP helps operating company personnel prepare for a new software load. This NTP allows you to understand the elements of the software features.
PLN-8991-104	<i>Provisioning Manual</i>	This document provides information required in order to provision the DMS-100 Group. For example, use this NTP to calculate the number of components. These components are required to accommodate the termination and the traffic capacity of a switch, given the grade of service.
297-1001-592	<i>Peripheral Module Maintenance Guide</i>	This document contains maintenance information about the PMs located in host offices.
297-xxxx-805	<i>Hardware Description Manual</i>	This document provides descriptions of DMS-100 circuit cards arranged by PECs. This manual is for maintenance and operating personnel in an operating company. The manual includes tables that cover the differences in recorded announcements.
297-1001-822	<i>Commands Reference Manual</i>	This document lists all menu and non-menu commands used at a MAP terminal in a DMS-100 switch. This NTP describes the menus and directories that the commands are executed from.
297-xxxx-350	<i>Translations Guide</i>	This document describes the office-dependent data common to all DMS switching units. Store data that depends on the office, in a series of data store lookup tables or data design. Use these tables in conjunction with software programs and circuits to advance the call through different stages of call processing. The data design section provides a description of these lookup tables. This section also provides the fields and correct entries.
—continued—		

**Table 4-7**  
**Documentation key** (continued)

Document number	Title	Description
297-xxxx-543	<i>Alarm and Performance Monitoring Procedures</i>	This document contains alarm and performance monitoring maintenance procedures for all PMs. Maintenance personnel in an operating company use the procedures described in this document.
297-xxxx-544	<i>Trouble Locating and Clearing Procedures</i>	This document provides the procedures to correct trouble related to lines, trunks, PMs, input/output devices, and external subsystems. This document provides the procedures to correct trouble related to network devices that include DRAM and EDRAM.
297-xxxx-547	<i>Card Replacement Procedures</i>	This document provides the procedures to replace cards for PMs, input and output devices, external subsystems, and network devices.
297-xxxx-814	<i>Operational Measurements (OM) Reference Manual</i>	This document contains descriptions of DMS-100 OM groups. The OM groups provide information on switch performance and activity.
297-xxxx-840	<i>Log Report Reference Manual</i>	This document provides information to help understand and use log reports that the DMS-100 switches generate. This NTP includes a summary of the log system and detailed log report descriptions.
297-xxxx-855	<i>Office Parameters Reference Manual</i>	This document describes the office parameters for all DMS switches. Office parameter data is in a series of data store lookup tables. Use of these tables occurs with software programs and circuits. This use of the tables provides the switch with the correct parameters for the features in a DMS unit.
—end—		

### Documentation index

A list of the important NTPs appear in the following table in alphabetical order:

**Table 4-8**  
**Documentation index**

<b>Document number</b>	<b>Title</b>	<b>Description</b>
297-xxxx-543	<i>Alarm and Performance Monitoring Procedures</i>	This document contains alarm and performance monitoring maintenance procedures for all PMs. Maintenance personnel in an operating company use the procedures covered in this document.
297-xxxx-547	<i>Card Replacement Procedures</i>	This document provides the procedures to replace cards for PMs, input and output devices, external subsystems, and network devices.
297-1001-822	<i>Commands Reference Manual</i>	This document lists all menu and non-menu commands used at a MAP in a DMS-100 switch. This NTP describes the menus and directories that the commands are executed from.
PLN-8991-104	<i>Provisioning Manual</i>	This document provides the information required to provision the DMS-100 Family. Use this NTP to calculate the number of components required to accommodate termination and traffic capacity of a switch, given the grade of service.
297-xxxx-801	<i>Feature Description Manual</i>	This document provides DMS-100 feature descriptions. This NTP helps operating company personnel prepare for a new BCS load. This NTP helps operating company personnel understand the elements of the software features.
297-xxxx-805	<i>Hardware Description Manual</i>	This document provides descriptions of DMS-100 circuit cards arranged by PECs. This manual is for maintenance and operating personnel in an operating company. This manual includes tables that cover the differences in recorded announcements.
297-xxxx-840	<i>Log Report Reference Manual</i>	This document provides information to help you understand and use log reports that the DMS-100 switches generate. This NTP includes a summary of the log system and detailed log report descriptions.
—continued—		



**Table 4-8**  
**Documentation index** (continued)

Document number	Title	Description
297-xxxx-855	<i>Office Parameters Reference Manual</i>	This document describes the office parameters for all DMS switches. A series of data store lookup tables store office parameter data. Use these tables in conjunction with software programs and circuits. These tables provide the switch with the correct parameters for the features in a DMS unit.
297-xxxx-814	<i>Operational Measurements (OM) Reference Manual</i>	This document contains descriptions of DMS-100 OM groups. The OM groups provide information on switch performance and activity.
297-1001-592	<i>Peripheral Module Maintenance Guide</i>	This document contains maintenance information about PMs located in host offices.
297-xxxx-350	<i>Translations Guide</i>	This document describes the office-dependent data common to all DMS switching units. A series of data store lookup tables store data that depends on the office. Data store lookup tables are also called data schema tables. Use these tables in conjunction with software programs and circuits. This use advances the call through different stages of call processing. The data schema section provides a description of these lookup tables along with the table fields and correct entries.
297-xxxx-544	<i>Trouble Locating and Clearing Procedures</i>	This document provides the procedures to correct trouble related to lines, trunks, PMs, input/output devices, and external subsystems. This document also provides the procedure to correct trouble related to network devices that include DRAM and EDRAM.
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## List of terms

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### **adaptive differential pulse code modulation (ADPCM)**

A technique that encodes speech samples and reduces the amount of storage space required in memory. The ADPCM uses 4-bit speech samples taken at an 8-kHz rate. The ADPCM saves 50% over the normal 8-bit samples used in 64-kbit/s pulse code modulation (PCM).

### **ADPCM**

*See* adaptive differential pulse code modulation (ADPCM).

### **alarm battery supply (ABS)**

A separate nominal –48V supply from the central office battery power supply. You will find the ABS distributed to the alarm circuits of the DMS-100 switch.

### **AOSS**

*See* auxiliary operator services system (AOSS).

### **auxiliary operator services system (AOSS)**

A system that helps operating companies with intercept and directory assistance.

### **bridge**

The connection of one circuit in parallel with another circuit without interruption of continuity for the first circuit.

### **CCC**

*See* central control complex (CCC).

### **CDSN**

*See* cabinetized dual shelf network (CDSN).

**central control complex (CCC)**

The part of the DMS-100 Family switch that contains every central control (CC) function. These functions include the central message controller (CMC), CPU, program store (PS), and data store (DS).

**central message controller (CMC)**

The CMC is a hardware device in the central control complex (CCC) frame. This device provides an interface between the CPU, network module controllers (NMC), and input/output controllers (IOC).

**CM**

*See* computing module (CM).

**CMC**

*See* central message controller (CMC).

**computing module (CM)**

The processor and memory of the dual-plane combined core (DPCC) that the DMS SuperNode uses. Each CM consists of a pair of CPUs with associated memory. These CPUs operate in a synchronous matched mode on two separate planes. One plane is active. The active plane maintains control of the system while the other plane is on standby.

**conference circuit**

A circuit that allows three or more stations to have a conversation.

**conference trunk module (CTM)**

A stand-alone peripheral module that offers the same functionality as a fully equipped conference shelf.

**CTM**

*See* conference trunk module (CTM).

**Digital Multiplex System (DMS)**

A central office (CO) switching system which converts external signals to digital data and stores the data in assigned time slots. Switching occurs through the reassignment of the original time slots.

**DMS**

*See* Digital Multiplex System (DMS).

**DMS-bus**

The messaging control component of a DMS SuperNode processor. The DMS-bus components are a pair of message switches (MS).

**DMS-core**

The call management and system control part of the DMS SuperNode processor. The DMS-core part consists of a computing module (CM) and a system load module (SLM).

**DS-0**

A protocol for data transmission that represents one channel in a 24-channel DS-1 trunk.

**DS-1**

The 8-bit 24-channel 1.544 Mbit/s digital signaling format as used in the DMS-100 Family. The DS-1 is the North American standard for digital trunks. The DS-1 is a closely specified bipolar pulse stream. The DS-1 signal is the standard signal used to interconnect Northern Telecom digital systems. Each DS-1 signal carries 24 information channels of 64 kbit/s (DS-0s).

**DS30**

A 10-bit 32-channel 2.048-Mbit/s speech-signaling and message-signaling link as used in the DMS-100 Family switches.

The protocol by which DS30 links communicate

**DS30A**

A 32-channel transmission link between the line concentrating module (LCM) and controllers in the DMS-100 Family switches. The DS30A resembles DS30, but DS30A is for use over shorter distances.

**extended multiprocessor system (XMS)**

A workstation-based microcomputer with networking capabilities with system software written in Bell-Northern Research (BNR) Pascal. The XMS follows the format of a Motorola 68000 microprocessor.

**frame supervisory panel (FSP)**

A hardware device that accepts the frame battery feed and ground return from the power distribution center (PDC). The FSP distributes the battery feed to the shelves of the frame or bay that mounts the FSP. The FSP uses auxiliary fuses and feeds to distribute the battery feed. The FSP also contains alarm circuits.

## **FSP**

*See* frame supervisory panel (FSP).

## **input/output controller (IOC)**

An equipment shelf that provides an interface between a maximum of 36 I/O devices and the central message controller (CMC). The IOC contains a peripheral processor (PP) that independently performs local tasks. This function relieves the load on the CPU. *See also* IOC shelf.

## **input/output device (IOD)**

A device that allows entry of data in a data processing system, receipt of data from the system, or entry and receipt.

## **input/output equipment (IOE) frame**

A frame that houses I/O devices.

## **IOC**

*See* input/output controller (IOC).

## **IOC shelf**

A shelf that provides an interface between a maximum of 36 input/output devices (IOD) and the central message controller (CMC). *See also* input/output controller.

## **IOD**

*See* input/output device (IOD).

## **IOE**

*See* input/output equipment frame (IOE).

## **IPE**

Intelligent peripheral equipment.

## **junctioned network (JNET)**

The junctioned network (JNET), a time-division multiplexed system, allows 1920 channels for each network pair (fully duplicated) to switch. External junctions, internal junctions, and a digital network interconnecting (DNI) frame are used to establish additional channels. Channels can route directly, or use alternate routing through the use of junctions, a DNI frame, and software control. The capacity for a DMS-100 switch is 32 network pairs or 61 440 channels (1920 channels × 32 network pairs).

**load**

A maintenance operation to load software in a switch component like a peripheral.

**maintenance and administration position**

*See* MAP.

**maintenance trunk module (MTM)**

The MTM is a peripheral module (PM) in a trunk module equipment (TME) frame. The MTM has test and service cards and contains special buses to accommodate test cards for maintenance. The MTM provides an interface between the DMS-100 Family digital network and digital or analog test and service circuits.

**MAP**

Maintenance and administration position. A group of parts that provide a user interface between operating company personnel and the DMS-100 Family switches. The interface consists of a video display unit (VDU) and keyboard, a voice communications module, test facilities, and special furniture.

**message switch (MS)**

A high-capacity communications facility that functions as the messaging hub of the dual-plane combined core (DPCC) of a DMS SuperNode processor. The MS concentrates and distributes messages to control messaging between the DMS-bus parts. The MS also allows other DMS-STP parts to communicate directly with each other.

**MEX**

Memory extension.

**modular supervisory panel (MSP)**

The MSP accepts the frame battery feed and ground return from the power distribution center. The MSP distributes the battery feed to the shelves of the frame or bay that mounts the MSP. The MSP distributes the battery feed through auxiliary fuses and feeds. The MSP also contains alarm circuits.

**MS**

*See* message switch (MS).

**MSP**

*See* modular supervisory panel (MSP).

## **MTM**

*See* maintenance trunk module (MTM).

## **network module (NM)**

The basic building block of the DMS-100 Family switches. The NM accepts incoming calls and connects the incoming calls to the correct output channels. The NM uses connection instructions from the central control complex to connect the incoming calls. Network module controllers control the activities in the NM.

## **NM**

*See* network module (NM).

## **OAU**

*See* office alarm unit (OAU).

## **office alarm unit (OAU)**

A peripheral module (PM) located in a trunk module equipment (TME) frame. The OAU resembles the maintenance trunk module (MTM). The OAU has circuit cards that provide an interface with office alarm circuits and not test circuits.

## **OM**

*See* operational measurements (OM).

## **operational measurements (OM)**

The hardware and software resources of the DMS-100 Family switches that control the collection and display of measurements. The OMS collect and display measurements taken on an operating system. The OM subsystem organizes the measurement data and manages data transfer to displays and records. The OM data provides information for maintenance, traffic, accounting, and provisioning decisions.

## **PCM30**

A 32-channel 2.048-Mbit/s speech-signaling and message-signaling link used in international trunks.

The protocol by which PCM30 links communicate.

## **peripheral module (PM)**

A hardware module in the DMS-100 Family switches that provides an interface to external line, trunk, or service facilities. A PM contains peripheral processors (PP) that perform local routines, and relieve the load on the CPU.



**peripheral processor (PP)**

A hardware device in the peripheral module (PM) that performs local processing independent of the CPU. Read-only memory (ROM) in the PM drives the PP, and releases CPU runtime for higher level activities.

**PM**

*See* peripheral module (PM).

**PP**

*See* peripheral processor (PP).

**port**

In a DMS switch, the port is the point at which a speech or message link can connect to one of several parts. These parts are a peripheral module (PM), network module (NM), input/output controller (IOC), or central message controller (CMC).

**service trunk module (STM)**

In the DMS-100 Family, a peripheral module that consists of two compact maintenance trunk modules.

**STM**

*See* service trunk module (STM).

**TM**

*See* trunk module (TM).

**trunk module (TM)**

A peripheral module (PM) in a trunk module equipment (TME) frame. The TM provides speech and signaling interfaces between a DS30 network port and analog trunks.

**trunk test position (TTP)**

The TTP is a MAP equipped to perform trunk testing.

**TTP**

*See* trunk test position (TTP).

**XMS**

*See* extended multiprocessor system (XMS).

### **XMS-based peripheral module (XPM)**

The generic name for peripheral modules (PM) that use the Motorola 68000 microprocessor. An XPM contains two processors in a hot standby configuration. The processors are a master processor (MP) and a signaling processor (SP).

### **XPM**

*See* XMS-based peripheral module (XPM).



## DMS-100 Family

# Conference Circuit Guide

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Allowing this equipment to be operated in such a manner as to not provide for proper answer supervision is a violation of Part 68 of FCC Rules, Docket No. 89-114, 55FR46066

The SL-100 system is certified by the Canadian Standards Association (CSA) with the Nationally Recognized Testing Laboratory (NRTL).

This equipment is capable of providing users with access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities is a violation of the Telephone Operator Consumer Service Improvement Act of 1990 and Part 68 of the FCC Rules

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