Meridian 1

Telephone and attendant console installation

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About this document

This document contains the installation procedures for attendant consoles, telephones, and add-on modules. See Figure 1 for apparatus designations.

"Wiring installation" on page 3 includes information about the wiring for all telephones and attendant consoles.

"Wiring installation" on page 3 describes the installation and removal process for QCW-type and M1250/M2250 attendant consoles.

"Telephones" on page 39 provides procedures for installing and removing the SL-1, M1109, M2000, M2006/M2008, M2016S, M2216, M2616, and M3000 telephones.

"Add-on modules" on page 81 includes installation and removal information for all add-on modules and options for all telephones and attendant consoles.

Note: There are two distinct versions of Modular telephone sets—both are supported. The versions can be clearly distinguished by the first four letters in the model identification label on the bottom of the set. The two types are the "NTZK" models and the "NT2K" models. When appropriate, differences are noted in this document.

Figure 1
Apparatus designations

Amphenol connector

3 2

3 2

3 2

3 2

3 2

Cable
Marker

Connecting Block

Service Fitting

Utility
Column

553-1858
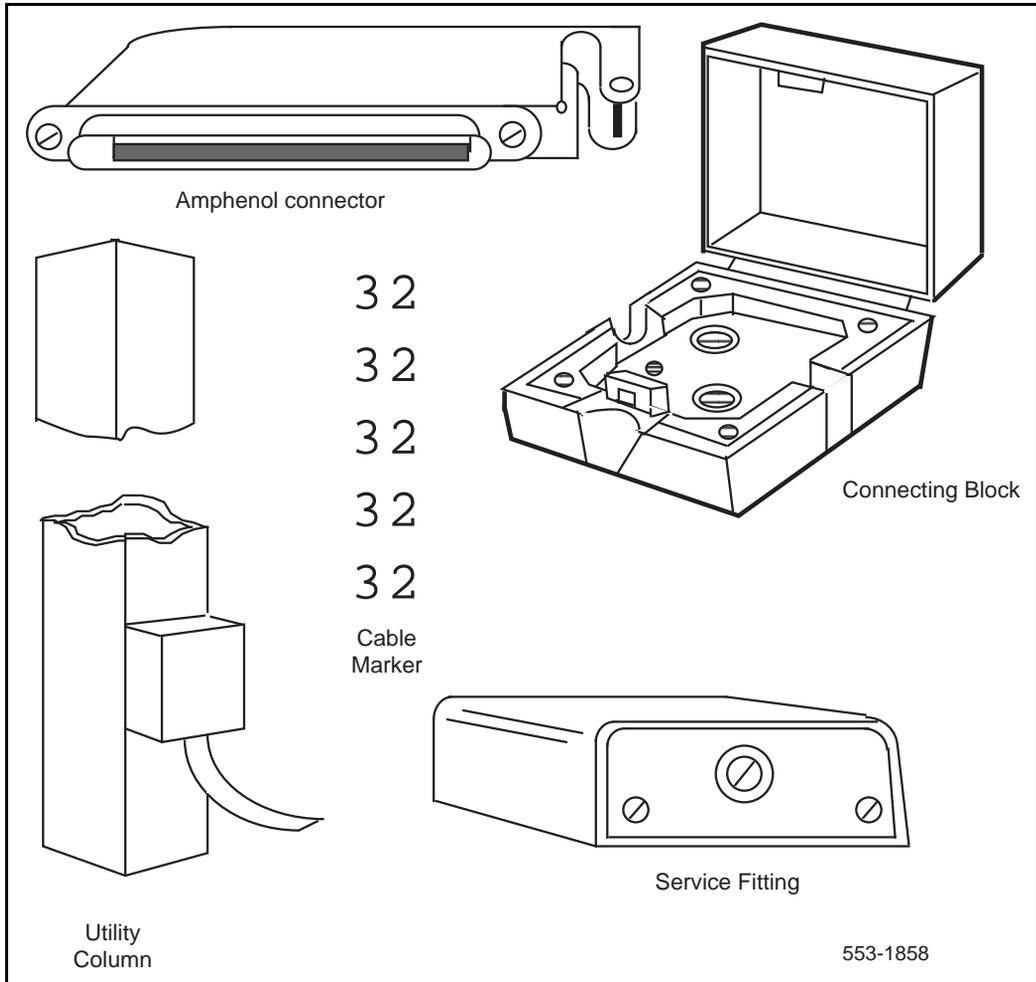
Wiring installation

Wiring for telephones and attendant consoles

This chapter discusses the installation and removal procedures for wiring for telephones and attendant consoles.

Each 500/2500-type telephone requires one pair of Z station wire or equivalent. Each SL-1 telephone requires two pairs of Z station wire or equivalent. You can use existing 16- or 25-pair connectorized cable. Each attendant console requires a 16-pair cable terminated on an Amphenol connector.

When zone cabling and conduit are used, assign a block of numbers or letters to each zone (see Figure 2). Allow for growth when assigning blocks of numbers.

Cable markers are normally an adhesive-backed cloth tape 1/2 inches wide by 3-1/2 inches long (15 mm by 65 mm) with preprinted numbers.

For limits and cabling, refer to Figures 3 through 5.

For a list of terminal connections, see Table 1.

Figure 2
Zone cabling and conduit assignment
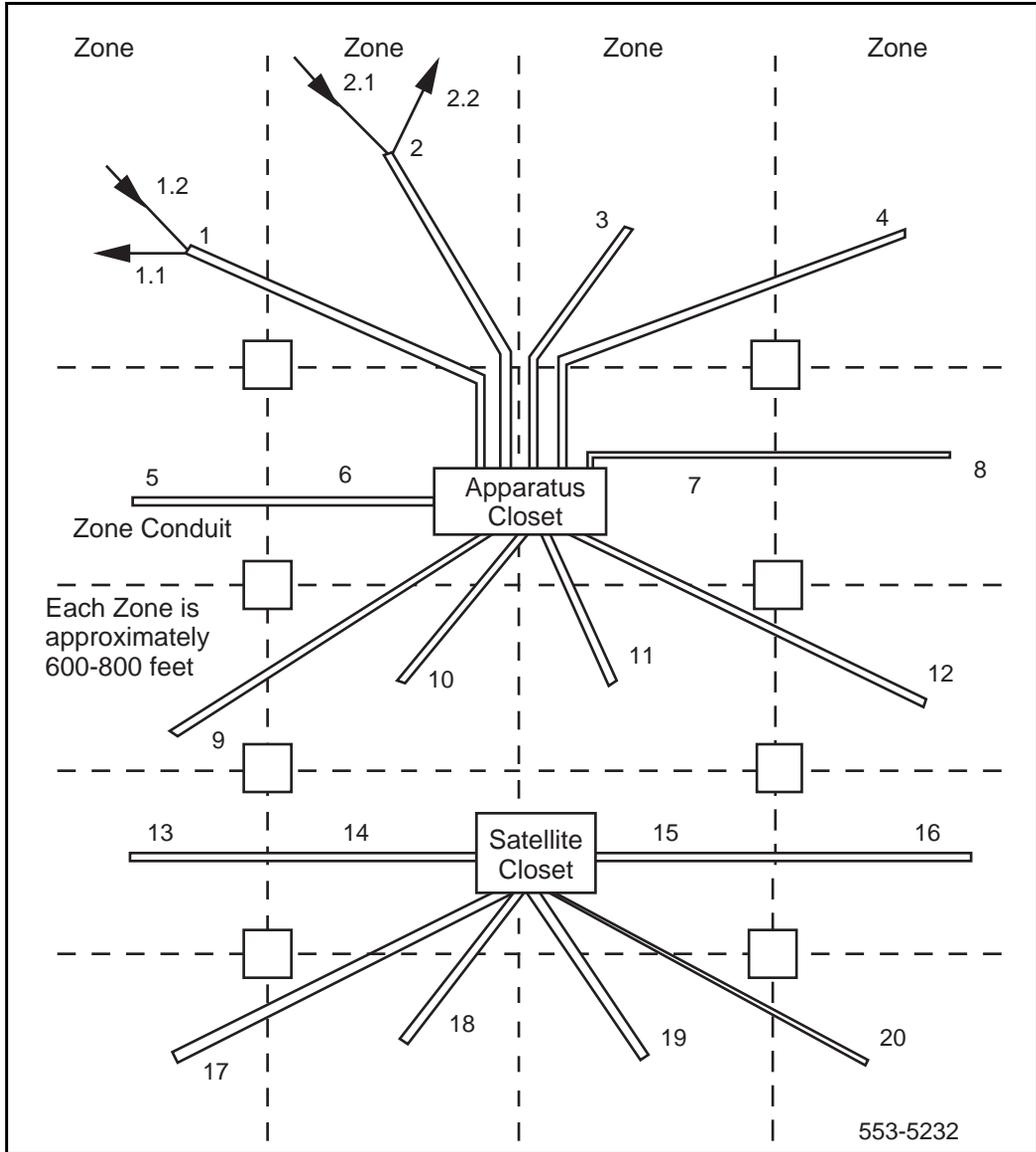
Figure 3
NE-500/2500-type telephones—limits and cabling
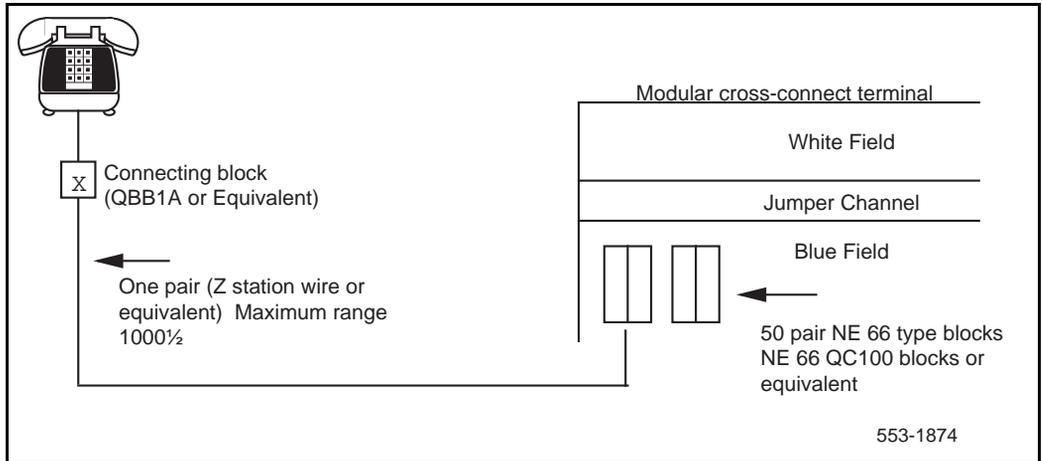
Procedure 1
Installing wiring

1   Assign a number to the wire or cable used.

2   Attach the assigned number to the wire or cable at the end nearest the telephone, using a cable marker.

3   Run the wire or cable between the telephone location and nearest cross-connect point (if not previously run).

4   Connect the cable or wire to the telephone connecting block.

5   Designate the telephone connecting block.

6   Cross-connect the pairs at intermediate cross-connect points (if required) and terminate at the cross-connect terminal.

7   Terminate leads at the cross-connect terminal and designate the blocks according to the house cable plan.

Table 1
Terminal connections

Connecting block Designations			Inside wiring Colors	
NE-47QA or QBB1B	**NE-284-74-500 1 adapter**	**NE-625F TELADAPT plugs and jacks**	**Z station wire**	**16/25-pair cable**
G	1T	T1 (G)	G	W-BL
R	1R	R1 (R)	R	BL-W
BK	X1	AUX (BK)	BK	W-O
Y	X2	GND (Y)	Y	O-W
5	R	T2 (BL)		W-SL
6	B	R2 (W)		SL-W

Normal operating ranges

Telephones   The normal operating range for SL-1 telephones, with and without add-on modules, is 189 ¾ or 6000 cable feet (1830 m), whichever is reached first. For example:

22 AWG wire range = 6000 feet (1830 m)
24 AWG wire range = 3700 feet (1125 m)
26 AWG wire range = 2300 feet (700 m)

The outside plant cable must not exceed 1 ¾ per mile, or 189 ¾ per 6000 kilometers.

SL-1 telephones equipped with a QKK1 extension kit have a maximum range of 8000 feet (2440 m). For example:

22 AWG wire range = 8000 feet (2440 m)
24 AWG wire range = 5500 feet (1675 m)
26 AWG wire range = 3690 feet (1125 m)

The outside plant cable must not exceed 0.085 ¾ per mile, or 189 ¾ per 6000 kilometers.

Note: The 24 V and 15 V supplies can be obtained from the QUT1 centralized power supply located at the cross-connect terminal. A separate fuse must be used for each set.

Meridian Modular Telephones have a maximum permissible loop length of 3500 ft (915 m), assuming 24 AWG (0.5 mm) wire with no bridge taps. A 15.5 dB loss at 256 kHz defines the loop length limit.

Attendant consoles   The normal operating range for the QCW1C (or earlier vintage) and QCW2A attendant consoles, with and without add-on modules, is 189 ¾ or 6000 cable feet (1830 m), whichever is reached first. For example:

22 AWG wire range = 6000 feet (1830 m)
24 AWG wire range = 3700 feet (1125 m)
26 AWG wire range = 2300 feet (700 m)

The normal operating range of the QCW1D and QCW2B (or later vintage) attendant consoles is 8000 cable feet (2440 m) using cable rated at a maximum of 0.085 ¾ per mile (1600 m). For example:

22 AWG wire range = 8000 feet (2440 m)
24 AWG wire range = 5500 feet (1675 m)
26 AWG wire range = 3690 feet (1125 m)

The normal operating range of the M1250 attendant console is 8000 cable feet (2440 m) using cable rated at a maximum of 0.085 ¾ per mile (1600 m). For example:

22 AWG wire range = 8000 feet (2440 m)
24 AWG wire range = 5500 feet (1675 m)
26 AWG wire range = 3690 feet (1125 m)

Note: The 24 V and 15 V supplies can be obtained from QUT1 centralized power supply located at the cross-connect terminal. A separate fuse must be used for each console. You can also obtain 24 V of power from a QPC61 line card. The maximum resistance is 30 ¾.

The outside plant cable must exceed 1 ¾ per mile, or 189 ¾ per 6000 kilometers.

M2250 attendant consoles have a maximum permissible loop length of 3500 ft (915 m), assuming 24 AWG (0.5 mm) wire with no bridge taps. A 15.5 dB loss at 256 kHz defines the loop length limit.

Figure 4
SL-1 telephones—limits and cabling

Without add-on modules

Modular cross-connect terminal

White Field

Jumper Channel

Blue Field

X Connecting block

Two pairs (Z station wire
or equivalent)

50 Pair NE 66
type blocks

With add-on modules

Modular cross-connect terminal

White Field

Jumper Channel

Blue Field

X Connecting block

Two pairs (Z station wire
or equivalent)

50 Pair NE 66
type blocks

115/24 V plug-in transformer P0547127 (one for each set)

115/15 V plug-in transformer P0547128
(one for each set— used for Lamp Field Array)

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Figure 5
QCW-type attendant console—limits and cabling

Without add-on modules

Modular cross-connect terminal

White Field

Jumper Channel

Blue Field

X Amphenol connector

Recommended NE A16
connector cable

50 Pair NE 66
type blocks

115/24 V Plug-in Transformer P054127
A separate transformer must be used for each set.

Maximum 25 feet (7.7 m)

With add-on modules

Modular cross-connect terminal

White Field

Jumper Channel

Blue Field

X Amphenol connector

Recommended NE A16
connector cable

50 Pair NE 66
type blocks

115/24 V Plug-in Transformer P054128   (Used for Lamp Field Array (LFA) module only.)
115/24 V Plug-in transformer P0547127 (Used for Basic Console and other add-on modules.)
A separate transformer is required for each set.

Maximum 25 feet (7.7 m)

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Attendant consoles

This section describes installation instructions for the QCW and M1250/2250 attendant consoles. For Meridian 1 Attendant PC Software installation instructions, refer to the *Meridian 1 Attendant PC Installation Guide*.

Packing and unpacking

Use proper care while unpacking any attendant console. Check for damaged containers so that appropriate claims can be made to the transport company for items damaged in transit.

If an attendant console must be returned to the factory, pack it in the appropriate container to avoid damage during transit. Remember to include all loose parts (cords, handset, power unit, labels, and lenses) in the shipment.

Installation and removal

Use the following procedures to install and remove QCW and M1250 attendant consoles.

> *Note:* Although QCW and M1250/M2250 attendant consoles do not require a static discharge ground connection, the connection should be installed to protect any earlier vintage attendant consoles that may be used as replacements.

Choose a clean, level work surface and place several sheets of soft, clean paper between the attendant console and the work surface. This will prevent scratching or otherwise damaging the top cover, the liquid crystal display (LCD) indicators and screen, and the feature keys of the attendant console.

Procedure 2
Installing QCW attendant consoles

1   Ensure that a 16-pair or 25-pair cable equipped with a 25-pair Amphenol connector is installed at the attendant console's location.

2   Unpack and inspect the attendant console for damage. If the attendant console is damaged, notify your supplier.

3   Designate the attendant console according to the features provided (see Procedure 8 and Figure 6).

4   Connect the Amphenol connector on the attendant console line cord to the Amphenol connector on the attendant console cable.

5   Cross-connect the attendant console at the cross-connect terminal (see Procedure 9).

6   Using a minimum of 24 AWG cross-connect wire, connect a static discharge ground (use a water pipe or the building main ground system) to pins 15 and 40 (slate-black pair) of the attendant console cable at the cross-connect terminal nearest the attendant console location. Connect the ground within 200 ft (68 m) of the attendant console using an approved ground connector or a clamp. Do not connect the attendant console to the Meridian 1 system ground.

7   Remove the cover from the attendant console:

       — Place the attendant console on a desk with the front edge slightly beyond the edge of the desk.

       — Insert a paper clip into each release hole in the front edge of the attendant console housing.

       — Press the releaser through the release hole inward against the cover until the cover releases.

       — Lift off the cover.

       — Unscrew the captive retaining screws securing the cover to the housing.

       — Remove the cover.

8   With a voltmeter, measure the AC and DC voltages between the metal
frame of the attendant console and the quick-connect terminal VSS1A
on the lower left side of the attendant console circuit board.

Make sure that the voltage measurements are less than ±40 V. If the
voltage is greater than ±40 V, grounding is inadequate and a better
ground must be connected.

9   Replace the attendant console cover:

— Place the attendant console on a desk with the front edge slightly
beyond the edge of the desk.

— Fit the cover to the housing and tighten the captive retaining
screws.

— Position the faceplate so that the keys will pass through the
cutouts in the cover.

— Tilt the back edge of the cover toward the rear of the attendant
console and insert the locating tabs into the slots on the attendant
console cover.

— Keeping the locating tabs in the slots, tilt the front edge of the
cover down, passing the keys through the cutouts in the cover.

— Press the front edge of the faceplate down until the cover catches
snap into place.

— Ensure that the cover is securely held in place without binding the
keys.

10   Configure the attendant console in the Meridian 1 system. Refer to the
X11 input/output guide (553-3001-400).

Figure 6
Typical QCW-type attendant console faceplate layout
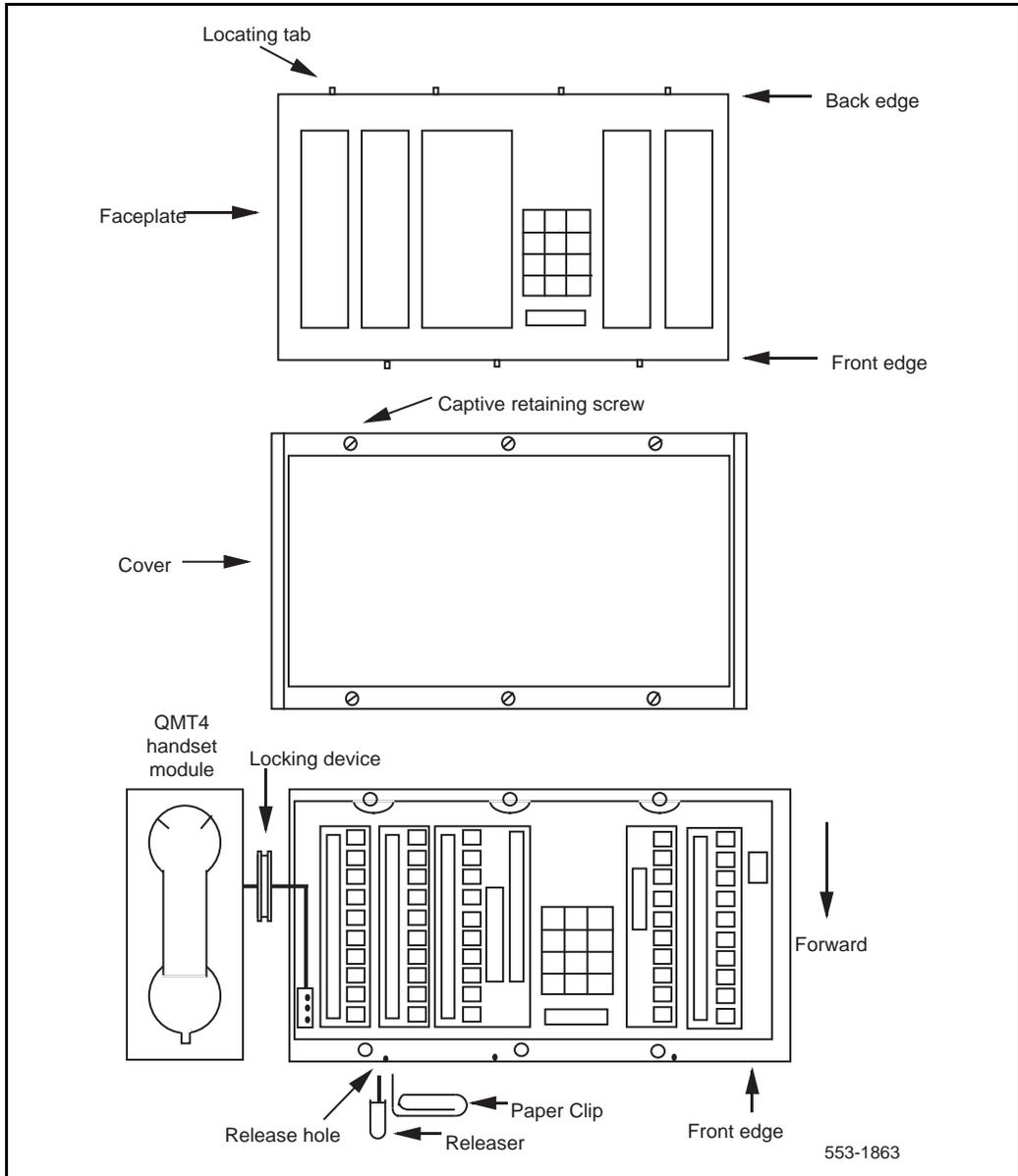
Procedure 3
Installing the M1250/M2250 attendant consoles

1   Ensure that a 16-pair or 25-pair cable equipped with a 25-pair Amphenol connector is installed at the attendant console's location.

2   Unpack and inspect the attendant console for damage. If the console is damaged, notify your supplier.

3   Designate the console according to the features provided.

4   Connect the Amphenol plug on the attendant console to the Amphenol jack coming from the Main Distribution Frame (MDF).

   —   Fasten the Amphenol connectors together and secure the captive screws on the cable.

   —   Ensure that the connectors are secured in a connector mounting, if provided, or to the wall. Do not leave connectors unprotected on the floor.

5   Add a line circuit for the attendant console, if not already done. Refer to *Circuit card installation and testing* (553-3001-211).

6   Cross-connect the attendant console at the cross-connect terminal (see Procedure 9).

7   Enter the related attendant console data in the Meridian 1 system. Refer to the *X11 input/output guide* (553-3001-400).

8   Test the console features using the attendant console user guide.

   Note: Refer to *Circuit card installation and testing* (553-3001-211) for circuit card installation procedures.

Procedure 4
Removing the M1250 and M2250 attendant consoles

1   Remove related attendant console data from the system memory. Refer to the *X11 input/output guide* (553-3001-400).

2   Locate and remove cross-connections from the attendant console cable at the cross-connect terminal (see Procedure 9).

3   Remove the circuit card if required. Refer to *Circuit card installation and testing* (553-3001-211).

   Note: Do not remove the circuit card if any of the remaining units on the card are assigned.

4   Disconnect the Amphenol connector on the end of the cable that leads to the cross-connect terminal from the connector on the cable leading to the attendant console.

5   Pack the attendant console, handset, and cords in a suitable container.

Procedure 5
Removing the M1250/M2250 attendant console top cover

1   Disconnect any plugs and cords from the attendant console.

2   Remove the ten 10-mm fastening screws in the flange of the attendant console, as well as one 10-mm and one 40-mm screw on the base of the attendant console (see Figure 7 for the M2250 assembly drawing).

3   Holding the top cover and the base together by hand, turn the attendant console right-side up and place it back on the work surface.

4   Carefully lift the faceplate straight up and disconnect the following cable connections:

   — on the M1250

      J1—16-pin plug ribbon cable

      J2—16-pin plug ribbon cable

   — on the M2250

      J2—20-pin plug ribbon cable

Figure 7
M2250 assembly drawing (exploded view)

553-1302
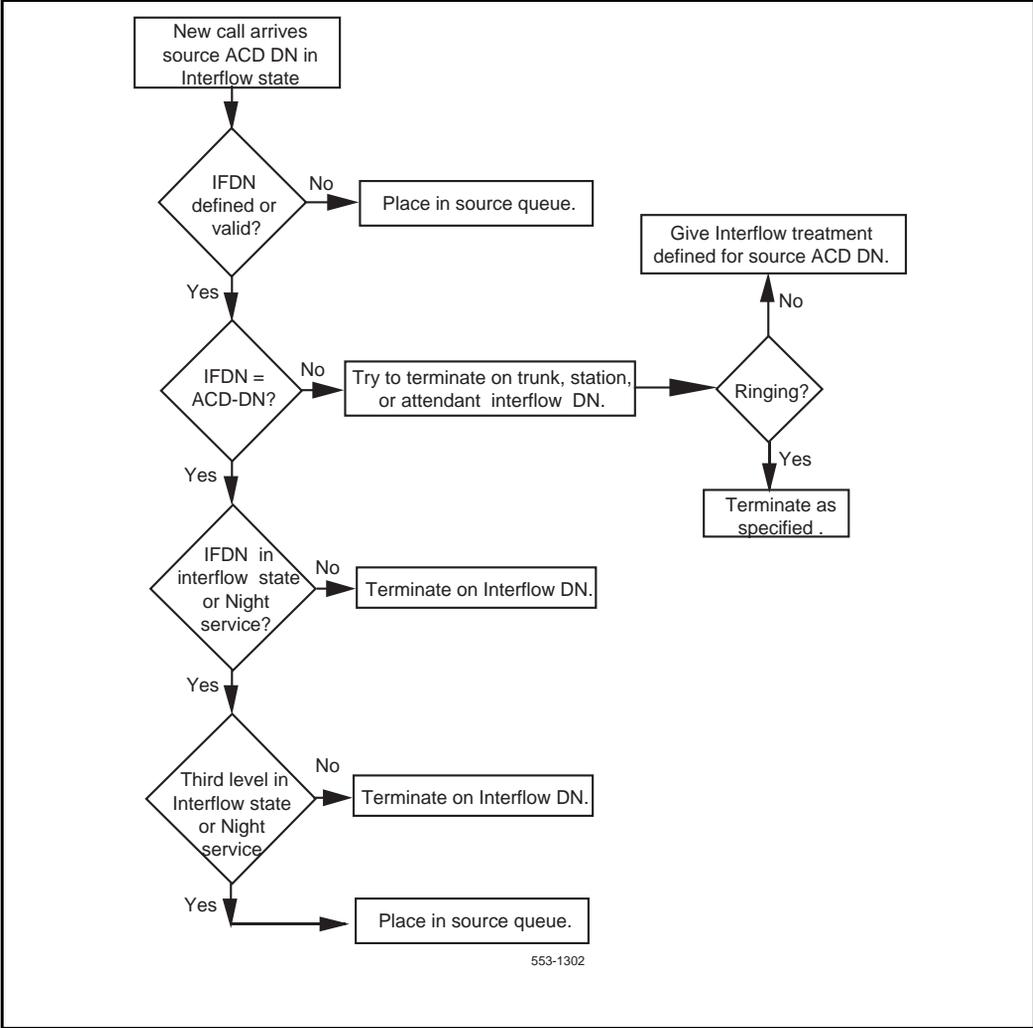
When you are setting the QMT2 switch on the M1250 attendant console's PCB, ON indicates that the QMT2 is enabled, and OFF indicates it is disabled (see Procedure 6). You can query the status of the switch by going to the Diagnostics menu and selecting the QMT2 option. The Display menu CHANGE feature provides only a temporary change to the QMT2 status.

> *Note:* On attendant consoles with a digit display attached to the top cover, do not connect or disconnect the cable to the digit display unless the attendant console line cord is disconnected.

Procedure 6
Installing the M1250/M2250 attendant console top cover

1   Set the QMT2 dip switch. To locate the dip switch, look at the attendant console from the top. The QMT2 dip switch is the only dip switch on the topmost circuit board. Set the switch to ON (enable QMT2) or OFF (disable QMT2).

   Note: The QMT2 feature must be enabled in system software. Refer to LD 12 in the *X11 input/output guide* (553-3001-400).

2   Carefully lift the top cover straight up and make the following cable connections:

   — on the M1250

      J1—16-pin plug ribbon cable

      J2—16-pin plug ribbon cable

      J7—2-pin speaker lead

   — on the M2250

      J2—20-pin plug ribbon cable

3   Put the top cover back on the attendant console:

   — Place the top cover onto the base housing, and turn the attendant console upside down.

   — Reinsert and tighten the ten 10-mm fastening screws on the flange.

   — Reinsert and tighten one 10-mm and one 40-mm fastening screw on the back.

4   Return the attendant console to its working position, reconnect the plugs and cords, and test the features.

Procedure 7
Loopback test on the M1250 and M2250 attendant consoles

1   Make a loopback connector. Prepare a blank 25-way RS-232 plug by internally connecting pins 2 and 3 together with strapping wire.

2   Press the Shift key. This accesses Level 1 mode.

3   Press the F4 Function key to access the Diagnostics menu on the liquid crystal display (LCD) screen.

4   Plug the loopback connector into the Data Port RS-232 jack in the back of the console.

5   Select the Data Port option from the Diagnostics menu by dialing "3". The LCD screen displays OK when the test is successfully completed.

     If there is a hardware fault in the M1250, 90H is displayed. If there is a hardware fault on the M2250, A0H is displayed.

     If the blank RS-232 connector is not plugged into the data port correctly (Step 4), the display will read 90H or A0H.

6   Press the Asterisk (*) key to repeat the test.

7   To exit the test mode press the octothorpe (#). This returns you to the main Diagnostics menu.

8   Press the octothorpe to return to normal operating mode.

9   Remove the loopback connector from the Data Port RS-232 jack.

Designating attendant consoles

Refer to the work order to determine the features and key designations for each attendant console. Designate each key on the attendant console by placing its feature name (from the designation sheet) in the key cap that fits on the key.

For the QCW-type attendant console, the directory number (DN) designation window is located beneath the keypad on the face of the attendant console. The DN designation window on the M1250 attendant console is located above the keypad.

Procedure 8
Designating attendant consoles

1   Remove the cap from each key requiring a designation by gently pulling upward on the cap.

2   Remove the appropriate designation from the sheet of designations.

3   Place the designation in the cap, place the cap over the corresponding key, and gently press down. Repeat this procedure for all keys requiring designations.

4   Insert a paper clip in the hole at the left or right end of the DN designation window. Pry the window open.

5   Insert the number tag, and replace the designation window.

The following figures show the typical key designations for QCW-type and M1250 attendant consoles:

— Figure 8 shows the QCW attendant console designations.

— Figures 9 and 10 show the key designations for the M1250/M2250 attendant console in Shift mode.

— Figures 11 and 12 show the M1250/M2250 attendant console in Unshift mode.

Figure 8
Typical key designations for the QCW attendant console

TGB9	ICI9	NITE		C O W M O J M O N	Digit Display		VOL UP	
TGB8	ICI8	POS BSY					VOL DOWN	
TGB7	ICI7						EXCL SRC	
TGB6	ICI6	LPK 5					EXCL DEST	
TGB5	ICI5	LPK 4					SIG SRC	
TGB4	ICI4	LPK 3			1 2 3		SIG DEST	
TGB3	ICI3	LPK 2			4 5 6		RLS SRC	
TGB2	ICI2	LPK 1			7 8 9		RLS DEST	
TGB1	ICI1	LPK 0			* 0 #		CONT	
TGB0	ICI0	RLS	S R C	D E S T			HOLD	

Strip A
Trunk group busy indicator and control of T G access (flexible assignment)

Strip B
Incoming call type indicators and selection keys (flexible assignment)

Strips C, D, and E
Operating keys (fixed assignment)

Strip F
Operating keys (fixed assignment)

Strip G
Operating and feature keys (Flexible assignment)

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Figure 9
M1250/M2250 key designations in Shift mode (QMT2 not enabled)
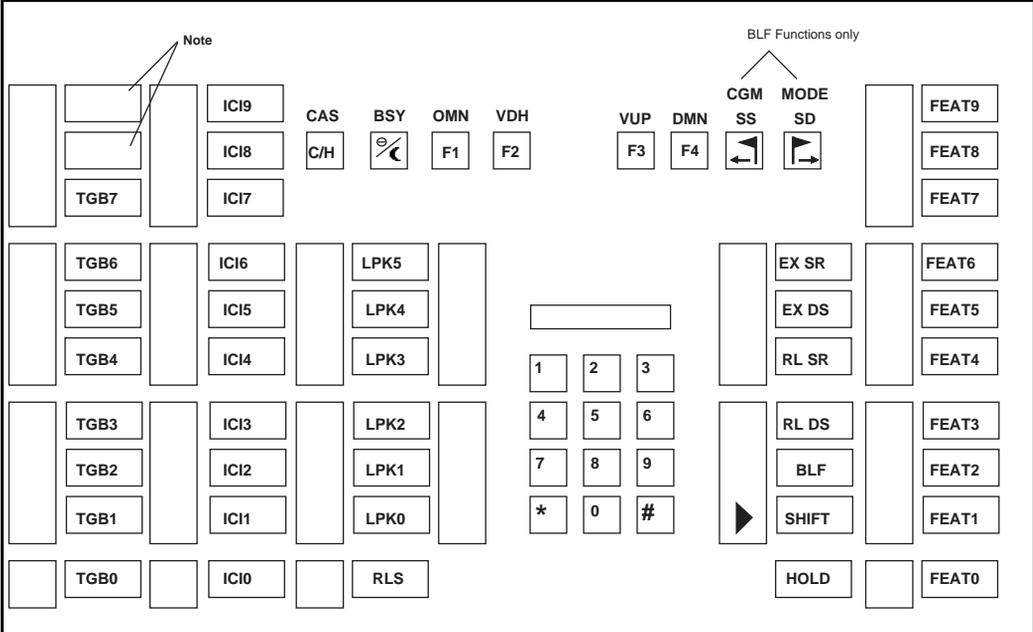
Note: These two keys are used as Trunk Group Busy keys 08 and 09 on the M2250 attendant console. They are not used on the M1250 attendant console.

Figure 10
M1250/M2250 key designations in Shift mode (QMT2 enabled)
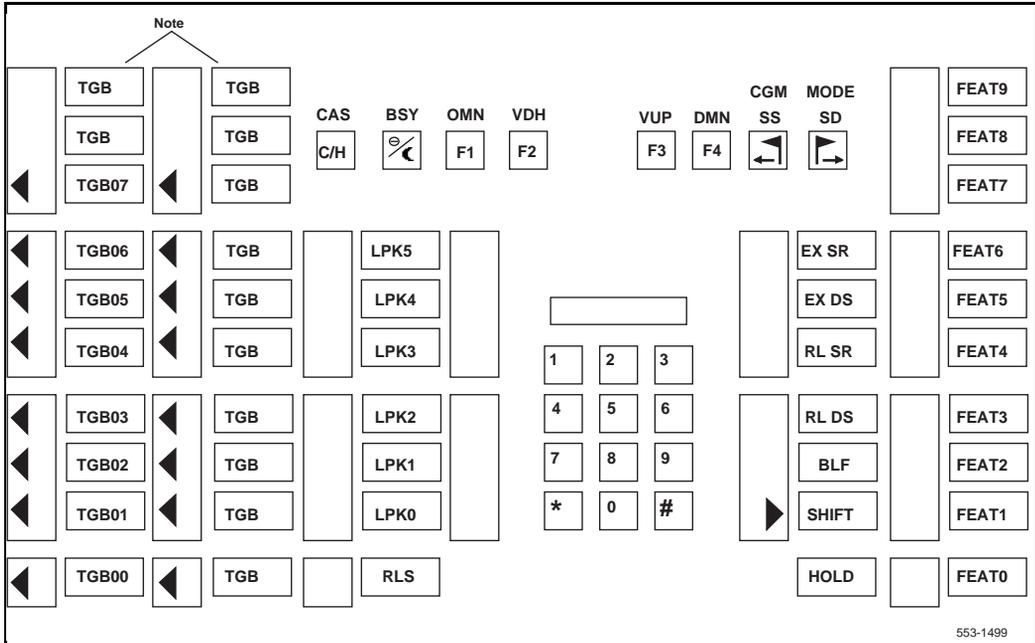
Note: The top two keys in these columns are used as Trunk Group Busy keys only on the M2250. Therefore, the numbering scheme is as follows:

M1250		M2250	
		TGB09	TGB19
		TGB08	TGB18
TGB07	TGB15	TGB07	TGB17
TGB06	TGB14	TGB06	TGB16
TGB05	TGB13	TGB05	TGB15
TGB04	TGB12	TGB04	TGB14
TGB03	TGB11	TGB03	TGB13
TGB02	TGB10	TGB02	TGB12
TGB01	TGB09	TGB01	TGB11
TGB00	TGB08	TGB00	TGB10

Figure 11
M1250/M2250 key designations in Unshift mode (QMT2 enabled)

▶	ICI09	▶	ICI19	CAS C/H	BSY ☽	OMN F1	VDH F2	VUP F3	DMN F4	SS ⎘	SD ⎗	FEAT9
▶	ICI08	▶	ICI18									FEAT8
▶	ICI07	▶	ICI17									FEAT7
▶	ICI06	▶	ICI16		LPK5					EX SR		FEAT6
▶	ICI05	▶	ICI15		LPK4					EX DS		FEAT5
▶	ICI04	▶	ICI14		LPK3		1 2 3			RL SR		FEAT4
▶	ICI03	▶	ICI13		LPK2		4 5 6			RL DS		FEAT3
▶	ICI02	▶	ICI12		LPK1		7 8 9			CONF 6		FEAT2
▶	ICI01	▶	ICI11		LPK0		* 0 #			SHIFT		FEAT1
▶	ICI00	▶	ICI10		RLS					HOLD		FEAT0

553-1498
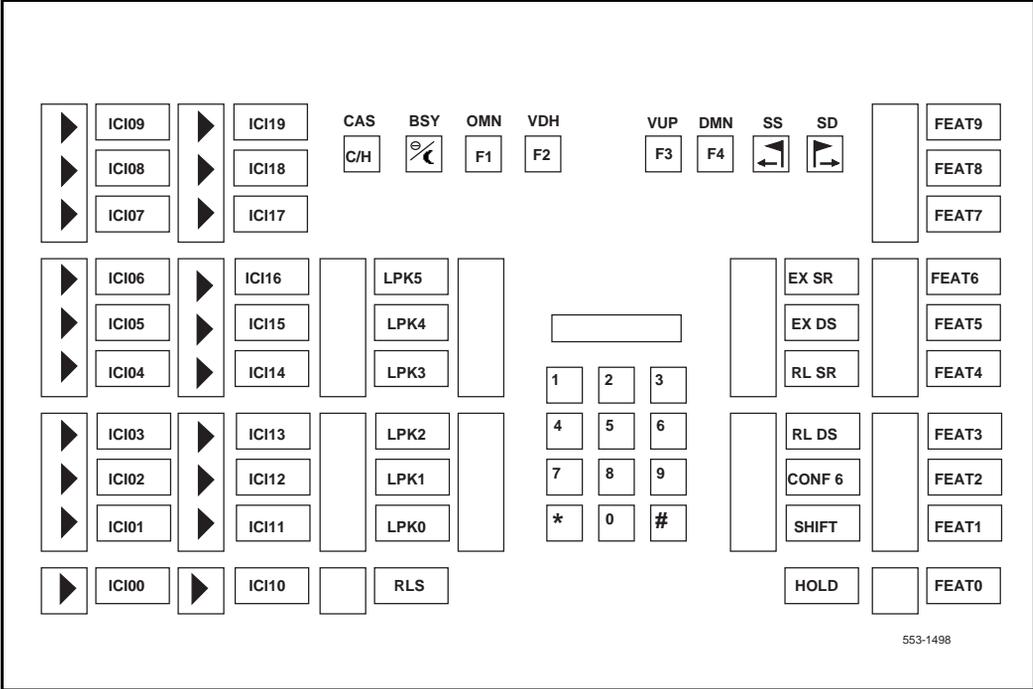
Figure 12
M1250/M2250 designations in Unshift mode (QMT2 not enabled)

553-6075
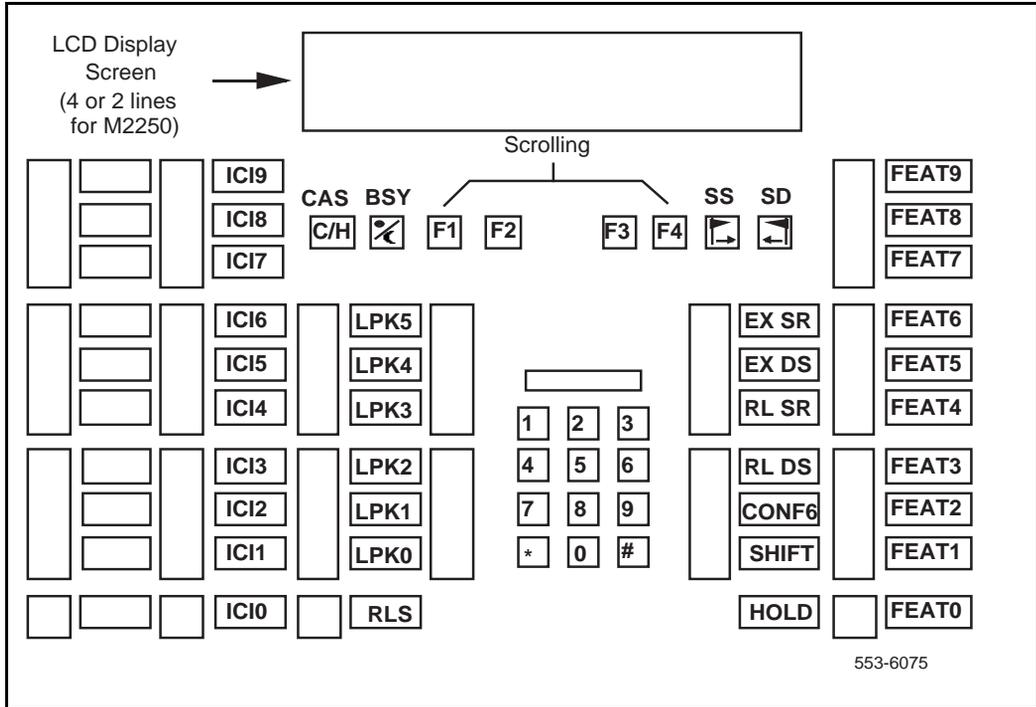
Cross-connecting attendant consoles

Terminations are located on the vertical side of the distributing frame when frame-mounted blocks are used and in the blue field when wall-mounted blocks are used.

Line circuit card (TN) terminations are located on the horizontal side of the distributing frame when frame-mounted blocks are used and in the white field when wall-mounted blocks are used.

Procedure 9
Cross-connecting attendant consoles

1   Locate the attendant console terminations at the cross-connect terminal.

2   Connect Z-type cross-connecting wire to the leads of the attendant console.

3   Locate the line circuit card (TN) terminations.

4   Run and connect the other end of the cross-connecting wire to the assigned TN terminal block.

See Table 2 for details on Z-type cross-connecting wire and Table 3 for a list of inside wiring colors.

Table 2
Z-type cross-connecting wire

Size	Gauge	Color	Designation
1 pr	24	Y-BL	Tip
		BL-Y	Ring
3 pr	24	W-BL	Voice T
		BL-W	Voice R
		W-O	Signal T
		O-W	Signal R
		W-G	Power
		G-W	Power

Table 3
Inside wiring colors

Z station wire	16/25-pair cable	Connect to equipment TN
G	W-BL	First pair Tip
R	BL-W	First pair Ring
BK	W-O	Second pair Tip
Y	O-W	Second pair Ring

Figure 13
QCW and M1250 attendant console cross-connections

Console connector

Cable to console

553-1861

See notes on next page
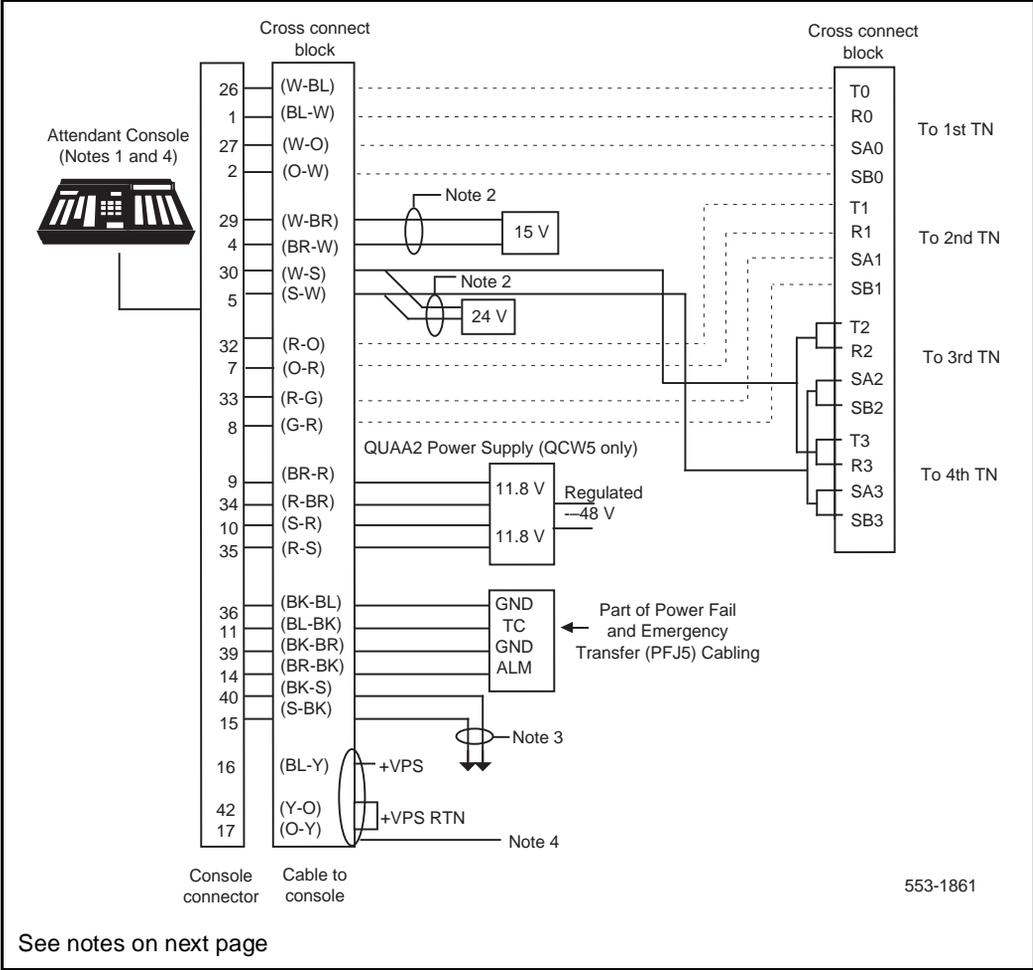
The following notes refer to Figure 13, which illustrates QCW and M1250 attendant console cross-connections. For a listing of the QCW and M1250 attendant console cross-connections, see Table 4.

Note 1: Attendant consoles require 24 V of power. Attendant consoles equipped with the QMT3 module require 15 V of power in addition to the 24 V power supply.

Note 2: You can obtain 24 V of power from the following:

— 24 V transformers located within 25 ft (7.7 m) of the console. A separate transformer is required for each attendant console.

— QUT1 or QUAA1 centralized power supply. A separate fuse is required for each attendant console.

— Two circuits with a maximum loop resistance of 300 ¾. This cross-connection must not be used if the power is obtained from a source other than the Meridian 1 line circuit.

Note 3: (M1250) Connect to a solid ground (not the Meridian 1 system ground). The maximum distance between the ground source and the attendant console must be less than 200 ft (61 m). Run the ground directly to the console cable connector if the connection through the cross-connector exceeds 200 ft (61 m).

Note 4: When the BLF/CGM option is used on the M1250, an additional 16 V dc power supply must be cabled through the +VPS (pin 16) and the +VPS RTN (pins 42 and 17) wires. The maximum loop limit from the attendant console to the connector is 120 ft (36 m) at 24 AWG.

Table 4
QCW and M1250 attendant console cross-connections (Part 1 of 2)

Mounting cord	16/25-pair Connector Cable				
Lead designation	Pin number	Pin number	Pair number	Color	Connected to
Voice 1 (SRC)	26	26	1T	W-BL	First pair of TN #1
	1	1	R	BL-W	
Signal 1 (SRC)	27	27	2T	W-O	Second pair of TN #1
	2	2	R	O-W	
Spare	28	28	3T	W-G	
	3	3	R	G-W	
15 V of power	29	29	4T	W-BR	P0547128 (Note 1)
15 V of power	4	4	R	BR-W	Plug-in transformer
25 V of power	30	30	5T	W-S	P0547127 (Notes 1 and 2) Plug-in transformer
25 V of power	5	5	R	S-W	
Spare	31	31	6T	R-BL	
	6	6	R	BL-R	
Voice 2	32	32	7T	R-O	First pair of TN #2
Voice (DEST)	7	7	R	O-R	
Signal 2	33	33	8T	R-G	Second pair of TN #2
Signal (DEST)	8	8	R	G-R	
GRD 11.8 V	34	34	9T	R-BR	QUAA2 power supply (QCW5 only)
	9	9	R	BR-R	
GRD 11.8 V	35	35	10T	R-S	QUAA5 power supply (QCW5 only)
	10	10	R	S-R	

Table 4
QCW and M1250 attendant console cross-connections (Part 2 of 2)

Mounting cord	16/25-pair Connector Cable				
Lead designation	Pin number	Pin number	Pair number	Color	Connected to
Emergency transfer	36	36	11T	BK-BL	GND (Note 3)
	11	11	R	BL-BK	TC (Note 4)
Spare	37	37	12T	BK-O	
Spare	12	12	R	O-BK	
Spare	38	38	13T	BK-G	
Spare	13	13	R	G-BK	
Major	39	39	14T	BK-BR	GND (Note 3)
Alarm	14	14	R	BR-BK	ALM (Note 4)
GND	40	40	15T	BK-S GND	See static discharge
GND	15	15	R	S-BK	Installation procedure
spare	41	42–45	16T	Y-BL	
	16	16–2	R	BL-Y	

Note 1: The 15-V and 25-V supplies can be obtained at the cross-connect terminal when a QUT1 power supply is provided.

Note 2: The 25-V supply can also be obtained from two additional units on a line circuit card.

Note 3: Connect to Pin 3 or 28 of the appropriate PFJ5 terminal block.

Note 4: Connect TC to Pin 29 or 5 and ALM to Pin 4 or 31 of the appropriate PFJ5 terminal block.

Note 5: This applies to QPC297 and QPC61 circuit cards.

Figure 14
M2250 attendant console cross-connections

See notes on next page.
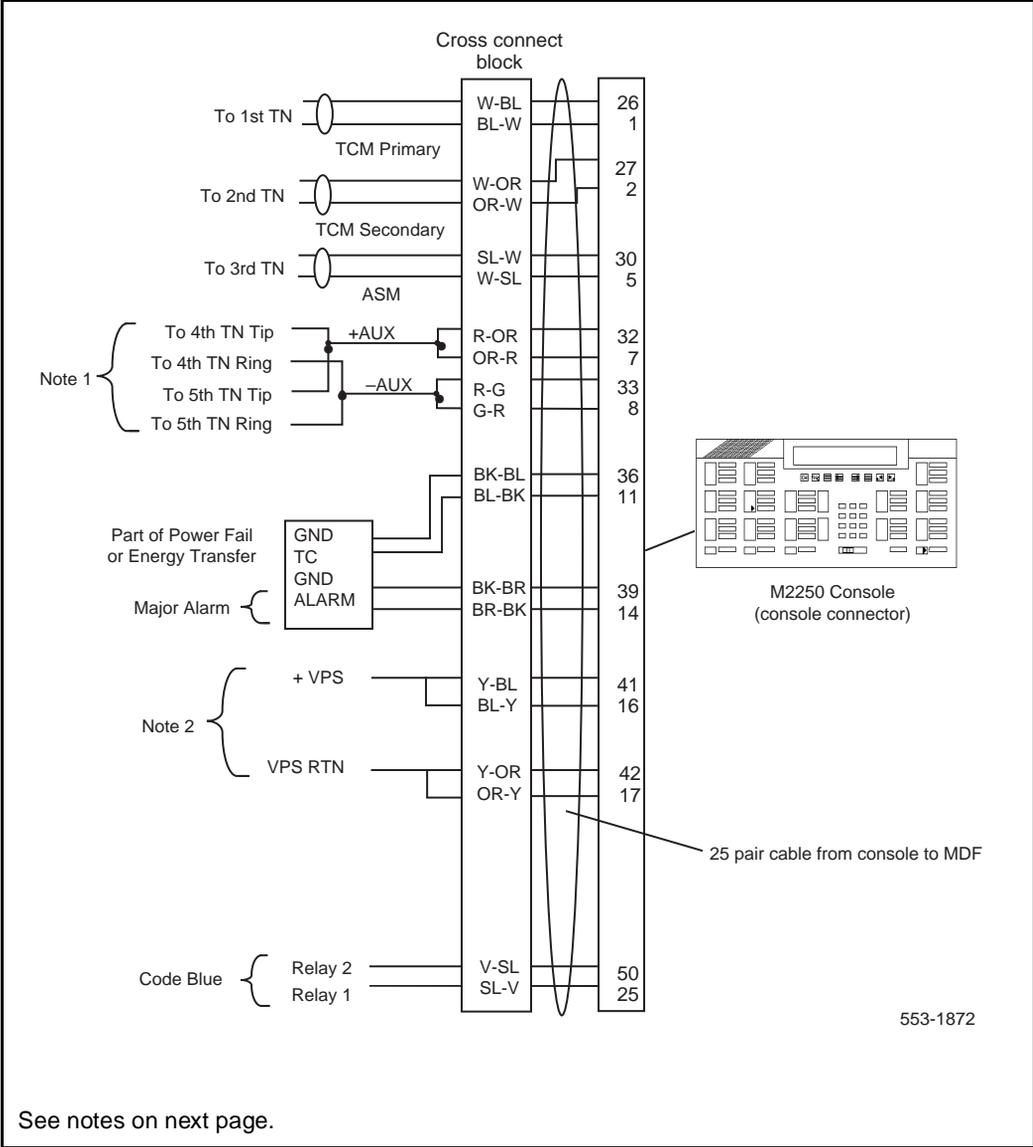
The following notes refer to Figure 14, which illustrates the M2250 attendant console cross-connections.

Note 1: The M2250 is powered by means of the line circuits. In addition to the primary TN, secondary TN, and ASM TN, two TNs are cabled to the M2250 using the +AUX and –AUX leads. The maximum loop length is 3000 ft of 24 AWG wire.

Note 2: When additional options are used (BLF or display backlight option), an additional 16 V dc power supply is required. The 16 V dc source is cabled using +VPS and VPS RTN leads. The maximum distance from the console to the power source is 120 feet of 24 AWG wire. Please note if both options are installed, only one 16 V dc power supply is required.

Note 3: It is recommended that five consecutive TNs on the line circuit be allocated for each console.

Note 4: When used with the ISDLC, the M2250 requires QPC578 vintage D or later.

Note 5: The third TN must be cross-connected to the console cable WH/SL pair whether or not an ASM (Attendant Supervisory Module) is installed. This third TN provides additional console power which is required.

Table 5 explains where each M2250 cable pair is connected. Table 6 lists the M2250 typical cross-connections.

Table 5
M2250 attendant console connections (Part 1 of 2)

Mounting cord	16/25-pair connector cable			
Lead designation	Pin number	Pair number	Color	Connected to
TCM primary	26	1T	W-BL	TN #1
	1	R	BL-W	
TCM secondary	27	2T	W-O	TN #2
	2	R	O-W	
Attendant Supervisory Module	30	5T	W-SL	TN #3
	5	R	SL-W	
Spare	31	6T	R-BL	
	6	R	BL-R	
+AUX	32	7T	R-O	TN #4
	7	R	O-R	
–AUX	33	8T	R-G	TN #5
	8	R	G-R	
Spare	34	9T	R-BR	
	9	R	BR-R	
Spare	35	10T	R-SL	
	10	R	SL-R	
Power Fail or	36	11T	BK-BL	GND (Note 1)
Energy Transfer	11	R	BL-BK	TC (Note 2)

Table 5
M2250 attendant console connections (Part 2 of 2)

Mounting cord	16/25-pair connector cable			
Lead designation	Pin number	Pair number	Color	Connected to
Spare	37	12T	BK-O	
Spare	12	R	O-BK	
Spare	38	13T	BK-G	
Spare	13	R	G-BK	
GND	39	14T	BK-BR	GND (Note 1)
Major Alarm	14	R	BR-BK	ALM (Note 2)
Spare	40	15T	BK-SL	
	15	R	SL-BK	
VPS	41	16T	Y-BL	
	16	R	BL-Y	
VPS RTN	42	17T	Y-O	
	17	R	O-Y	
Spare				
Code Blue	50	25T	Y-SL	Relay 2
	25	R	SL-Y	Relay 1

Note 1: Connect to Pin 3 or 28 of the appropriate PFJ5 terminal block.

Note 2: Connect TC to Pin 29 or 5 and ALM to Pin 4 or 31 of the appropriate PFJ5 terminal block.

Table 6
M2250 typical cross-connections (Part 1 of 2)

Pair	Pins	Pair Color	DLC Connections	ISDLC Connections
1T	26	W-BL	Unit	Unit
1R	1	BL-W	0	0
2T	27	W-O	Unit	Unit
2R	2	O-W	1	8
3T	28	W-G	Unit	Unit
3R	3	G-W	2	1
4T	29	W-BR	Unit	Unit
4R	4	BR-W	3	9
5T	30	W-S	Unit	Unit
5R	5	S-W	4	2
6T	31	R-BL	Unit	Unit
6R	6	BL-R	5	10
7T	32	R-O	Unit	Unit
7R	7	O-R	6	3
8T	33	R-G	Unit	Unit
8R	8	G-R	7	11
9T	34	R-BR	Unit	Unit
9R	9	BR-R	8	4
10T	35	R-S	Unit	Unit
10R	10	S-R	9	12
11T	36	BK-BL	Unit	Unit
11R	11	BL-BK	10	5
12T	37	BK-O	Unit	Unit
12R	12	O-BK	11	13

Table 6
M2250 typical cross-connections (Part 2 of 2)

Pair	Pins	Pair Color	DLC Connections	ISDLC Connections
13T	38	BK-G	Unit	Unit
13R	13	G-BK	12	6
14T	39	BK-BR	Unit	Unit
14R	14	BR-BK	13	14
15T	40	BK-S	Unit	Unit
15R	15	S-BK	14	7
16T	41	Y-BL	Unit	Unit
16R	16	BL-Y	15	15

Telephones

Packing and unpacking

Use proper care while unpacking any digital telephone. Check for damaged containers so that appropriate claims can be made to the transport company for items damaged in transit.

If a telephone must be returned to the factory, pack it in the appropriate container to avoid damage during transit. Remember to include all loose parts (cords, handset, power unit, labels, and lenses) in the shipment.

Installation and removal

On QSU71 telephones, key 8 must be assigned as NUL, and key 9 as RLS. Do not remove the circuit card if any remaining units on the card are assigned.

Procedure 10
Installing 500/2500, SL-1, M1009, M1109, and M1309 telephones

1   Ensure that the wiring is installed at the telephone's location.

2   Unpack and inspect the telephone for damage. Assemble the handset and line cords if necessary.

3   Install the required designations on the telephone.

4   Connect the telephone to the connecting block or connector.

5   Cross-connect the telephone wiring at the cross-connect terminal.

6   Configure the telephone in the system. Refer to the *X11 input/output guide* (553-3001-400).

Procedure 11
Removing 500/2500, SL-1, M1009, M1109, and M1309 telephones

1   Remove telephone data from the system. Refer to the *X11 input/output guide* (553-3001-400).

2   Disconnect the telephone from the connecting block or connector.

3   Pack the telephone in a container.

4   If necessary, remove the cross-connections for the telephone at the cross-connect terminal.

5   Remove the line circuit card if required. Refer to *Circuit card installation and testing* (553-3001-211).

Procedure 12
Installing the SL-1 telephone faceplate

1   Place the telephone on a desk with the front edge slightly beyond the edge of the desk.

2   Fit the cover to the housing and tighten the captive retaining screws.

3   Position the faceplate so that the keys will pass through the cutouts in the faceplate (see Figure 15).

4   Tilt the back edge of the faceplate toward the rear of the telephone and insert the locating tabs into the slots on the cover.

5   Keeping the locating tabs in the slots, tilt the front edge of the faceplate down, passing the keys through the cutouts in the faceplate.

6   Press the front edge of the faceplate down until the faceplate catches snap into place.

7   Ensure that the faceplate is securely held in place without binding the keys.

Figure 15
SL-1 telephone faceplate

Locating tabs

Faceplate

Faceplate catch

Cover

Captive retaining screw

Front edge

Captive screw

Release hole

Paper clip

Releaser

553-1864
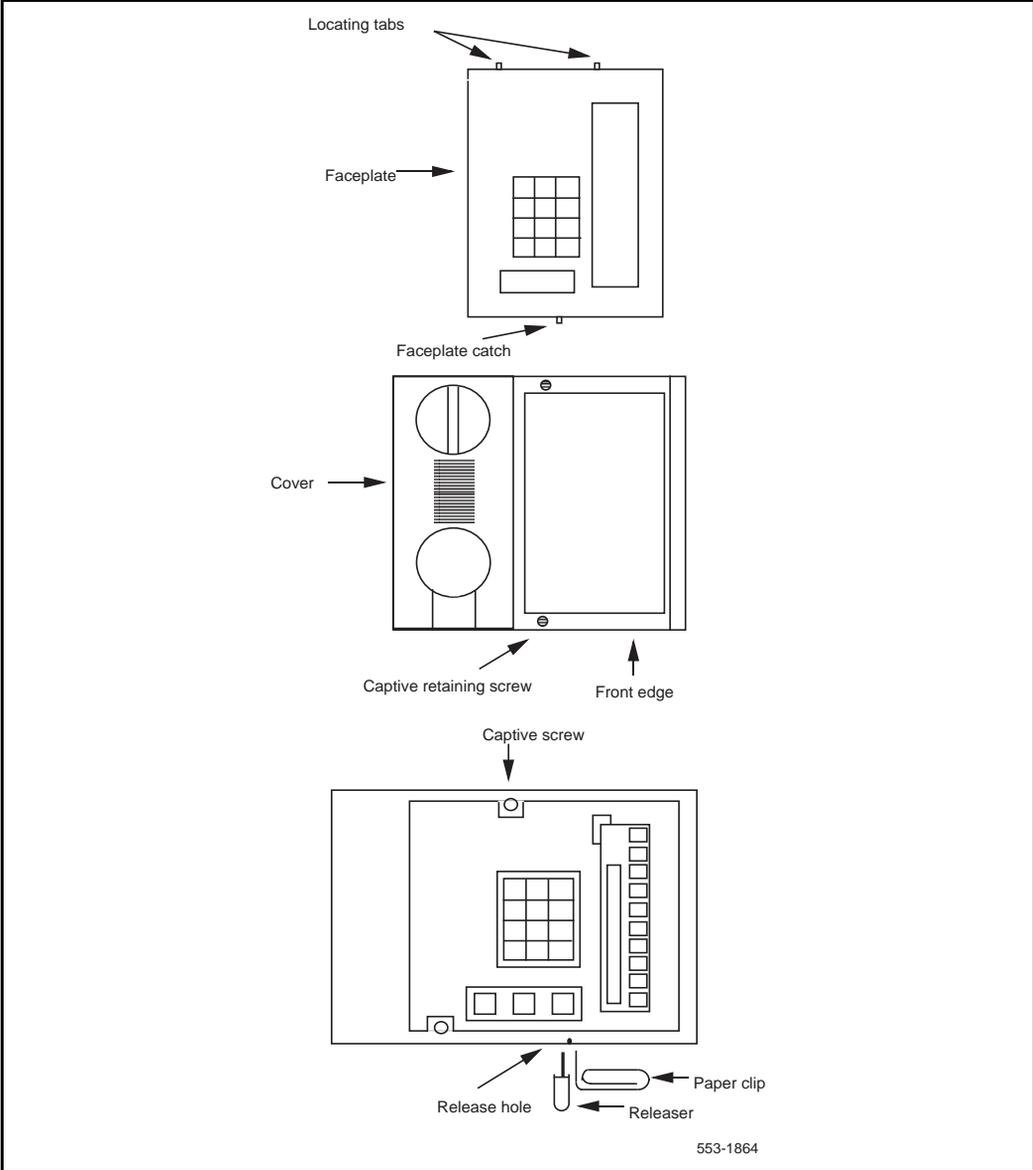
Procedure 13
Removing the SL-1 telephone faceplate

1   Place the SL-1 telephone on a desk with the front edge slightly beyond the edge of the desk.

2   Insert a paper clip into each release hole in the front edge of the telephone housing, and pry the faceplate open (see Figure 15).

3   Lift the faceplate off.

4   Unscrew the captive retaining screws securing the cover to the housing, and remove the cover.

Procedure 14
Installing the M2000 digital telephones

1   Complete the wiring and cross-connections as shown in Figure 16 before connecting the telephone(s) to the connecting block(s).

2   Place the telephone upside down on a number of sheets of soft, clean paper on a solid, level work surface to prevent damage to movable keys and the telephone face.

3   Connect the handset cord 4-conductor TELADAPT connectors to the handset and the telephone and snap into place.

4   After connecting the handset cord to the connector in the base of the telephone, turn the smooth side of the handset cord up (away from telephone base) before tucking it under the restraining tab to ensure that the telephone will sit level on the desk after installation is complete.

5   Connect the 6-conductor line cord to the telephone base, and route it under the tabs.

6   Turn the telephone right side up and place it in the normal operating position.

7   Designate buttons for key labels.

8   Insert the line cord TELADAPT connector into the connecting block and snap it into place.

9   Test the telephone using LD 31. See *X11 input/output guide* (553-3001-400).

Figure 16
M2000 digital telephone connections

TELADAPT
connector box

White	1	
Black	2	
(R) Red	3	
(T) Green	4	
Yellow	5	
Blue	6	

M2000
digital
telephone

Meridian 1

To closet
Power Supply (Note 3)

Data Option
power supply
(see Note 2)

Alternate local
power supply
(M2112 only—
see Note 1)

553-1887

Note 1: Leads 1 and 6 are used for closet power (25 V ac), or for alternate power supply, as required depending on local conditions.

Note 2: The data option power supply connects directly to a 5-pin connector in the rear of the telephone.

Note 3: If a QUT1 closet power supply is used, each M2112 telephone must be powered by one tap of one winding. However, it is permissible to connect two 12.5 V ac windings in series to provide 25 V ac for one Handsfree unit.

Table 7
M2000 trouble-locating procedures (Part 1 of 2)

	Data communication failure
1	If voice communication is normal but data communication fails, check for dc output voltage at power supply connector pins or replace power supply plug-in transformer.
	Attempt to make a data call from the terminal keyboard. If not successful, proceed with step 2.
2	Remove the transformer from the AC receptacle, unplug the 5-pin power supply connector at the back of the telephone, and replace the data option circuit board (see Procedure 73 and Procedure 74). Reconnect the data option power supply.
	Make a new attempt to start a data call. If trouble persists, continue with the ISDLC failure procedure.
	ISDLC failure
1	Check the Meridian 1 system maintenance terminal (TTY or CRT) and check for displayed error and location codes. An "NWS 401 L S C" or an "NWS 501 L S C U" code indicates that the automatic (routine) diagnostic test has detected a fault.
	Check for the following indications:
	L = faulty circuit card (ISDLC card) loop number
	S = circuit pack location (shelf number)
	C = number of the faulty circuit card
	U = unit number of a faulty telephone (appears only in conjunction with the NWS 501 code)
2	Replace faulty components.
	Try to establish a call. If unsuccessful, check the telephone.

Table 7
M2000 trouble-locating procedures (Part 2 of 2)

	Telephone (voice or dialing) failure
1	Check the line cord and handset cord to determine if all TELADAPT connectors are firmly in place and reconnect the loose ones. Ensure that the polarity of the Tip and Ring leads is correct.
	Lift the handset and listen for the dial tone and/or dial a directory number. If unsuccessful, proceed with step 2.
2	Wiggle the line cord and/or handset cord while listening for sounds from the handset. If crackling or ticking sounds are heard, replace the cords.
	Try to establish a call. If unsuccessful, proceed with step 3.
3	Replace the telephone.
	Try to establish a call. If unsuccessful, proceed with step 4.
4	Check wiring between the line card, the distribution panel, and the telephone for breaks or loose connections. If necessary, rerun the wiring.
	Operate the telephone.
	Note: Note: If no error codes are shown at the maintenance terminal (that is, no automatic diagnostic test was running), the Network and Signaling Diagnostic (LD 30) can be loaded and run manually from the system TTY. Refer to the *X11 input/output guide* (553-3001-400).

Procedure 15
Installing Meridian Modular Telephones
(M2006/M2008/M2016S/M2616/M2216ACD)

1   Complete the wiring and cross-connections (loop power) before connecting the telephone to the connecting block. See Figures 17 and 18.

2   Place the telephone upside down on a number of sheets of soft, clean paper on a solid, level work surface to prevent damage to movable keys and the telephone's face.

3   Connect the handset cord (5-conductor TELADAPT connectors) to the handset and snap it into place (not applicable to M2216ACD).

4   Connect the other end of the handset cord to the connector in the bottom cover of the telephone. Turn the smooth side of the handset cord up (away from the telephone bottom cover) before tucking it under the restraining tab to ensure that the telephone will sit level on the desk after installation is complete (not applicable to M2216ACD).

5   Connect the line cord to the telephone bottom cover. Route the cord through the channels.

6   Turn the telephone right side up and place it in the normal operating position.

7   Print the directory number on the designation card. Using a paper clip, remove the number lens from the telephone. Insert the designation card and snap the lens back into place.

8   Designate the feature keys.

9   Insert the line cord TELADAPT connector into the connecting block and snap it into place.

10   Perform the self-test (see Procedure 16) and acceptance test procedures. See LD 31 in the *X11 input/output guide* (553-3001-400).

11   Supply the user with a quick reference card and all user documentation. Make sure the SPRE number is printed on the quick reference card.

Figure 17
Meridian Modular Telephone connections

White
Black

Meridian
Digital
Telephone

(R)   Red
(T)   Green

Yellow
Blue

Meridian
SL-1

Alternate power

Wall mount
transformer

To closet
Power Supply

553-1886

Note: The optional power may be required only if the set has options such as the Meridian Programmable Data Adapter.
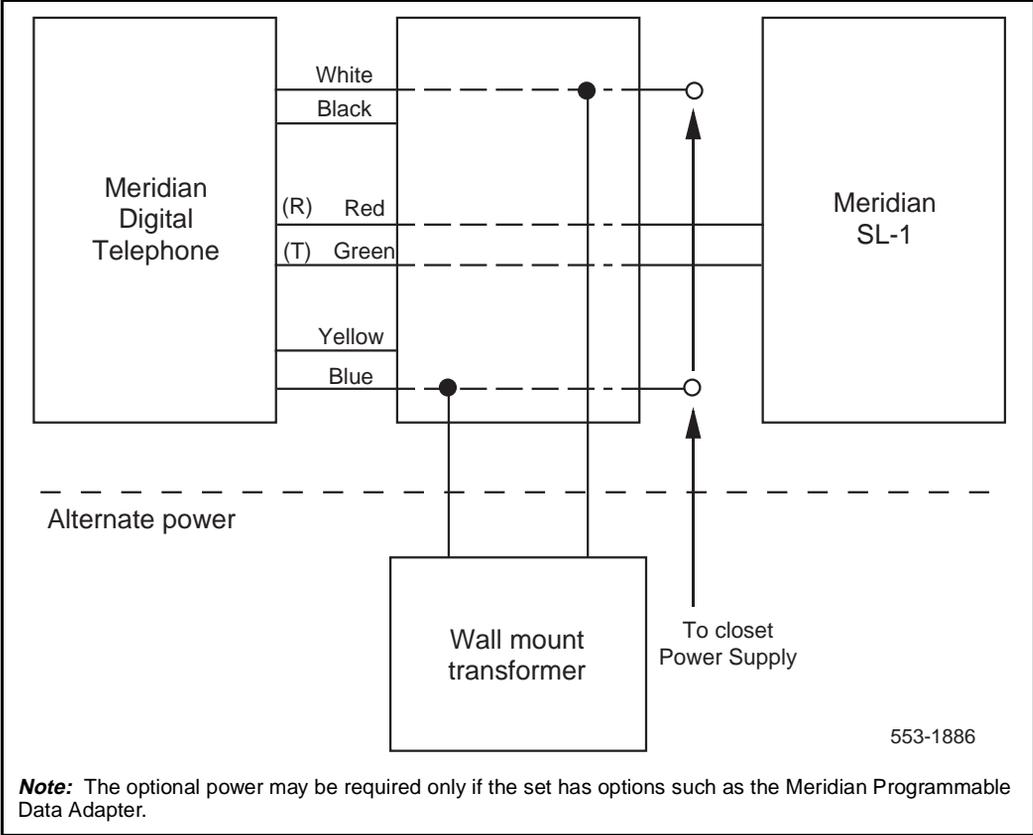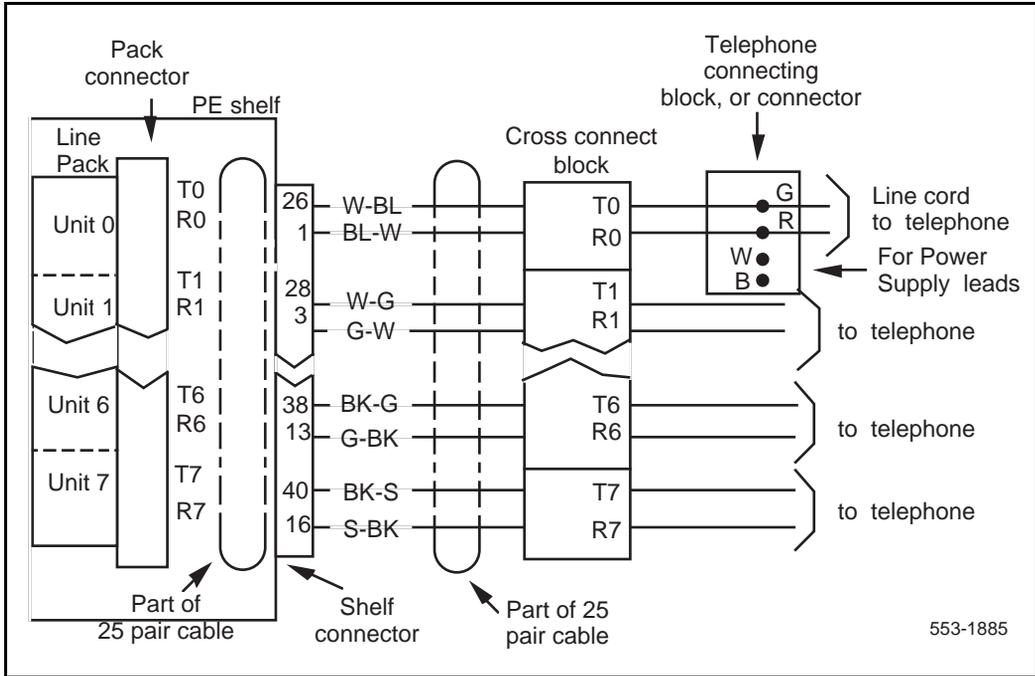
Figure 18
Meridian Modular Telephone cross-connections

Meridian Modular Telephones self-test

Meridian Modular Telephones have a self-testing capability. Perform the self-test after installing a Meridian Modular Telephone or any of the hardware options to ensure proper operation.

Procedure 16
Meridian Modular Telephones self-test

1   Unplug the line cord from the telephone.

2   While holding down the RLS key, plug in the line cord to the telephone. Let go of the RLS key.

3   Use Table 8 to perform the necessary steps and check results.

Table 8
Meridian Modular Telephones self-test steps and results (Part 1 of 2)

Step	Action	Result
1	Begin test (plug in line cord while holding down the RLS key). The handset is on hook.	Speaker beeps once, all LCDs flash. Message Waiting lamps light steadily. Display reads: LOCAL DIAGNOSTIC MODE PRESS RLS KEY TO EXIT
2	Press each Function key, from zero to fifteen (if you have Key Expansion Modules, continue pressing the Function keys, in any order).	Adjacent LCD goes off when a key is pressed.
3	Press the Hold key.	Speaker beeps.
4	Press each dial pad key.	Speaker beeps each time a key is pressed.
5a	Lift the handset (if applicable). Press the dial pad keys. Replace the handset.	Speaker beeps. Handset beeps.

Table 8
Meridian Modular Telephones self-test steps and results (Part 2 of 2)

| Step	Action	Result
5b	Plug in the headset (if applicable).	Speaker beeps.
	Press the dial pad keys.	Headset beeps.
	Unplug the headset.	
6	Press the right side of the volume control key.	Speaker beeps.
		Display is filled with dark squares.
	Press the right side of the volume control key.	Speaker beeps.
		Display is blank.
	Press the right side of volume control key.	Speaker beeps.
		Display shows symbols including digits 0–9 and uppercase alphabet
	Press the right side of the volume control key.	Speaker beeps.
		Display shows symbols including upper- and lowercase alphabet.
	Press the right side of the volume control key.	Speaker beeps.
		Display shows various symbols.
	Press the right side of the volume control key.	Speaker beeps.
		Display shows symbols.
	Press the right side of the volume control key.	Speaker beeps.
		Display is filled with dark squares.
7	Press the RLS key (end of test).	Message Waiting lamp goes off.
		Display shows idle screen within 10 seconds.

Procedure 17
Installing the M2317 telephone

1   Complete the wiring and cross-connection according to Figure 19 before connecting the telephone to the TELADAPT connector block.

2   Place the telephone upside down on a number of sheets of soft, clean paper and on a solid, level work surface to prevent damage to movable keys and the telephone's face.

3   Connect the handset cord 4-conductor TELADAPT connectors to the handset and to the telephone and snap into place.

4   Turn the smooth side of the cord away from the telephone base and secure it under the restraining tab. This ensures that the telephone sits level after the installation is complete.

5   Connect the 6-conductor line cord to the telephone base, and place it under the restraining tabs.

6   Turn the telephone face up, and place it in the normal operating position.

7   Print the directory number (DN) on the designation card and place it in the designation card holder.

8   Designate button labels for programmable keys, and place them under the button cover.

9   Insert the line cord TELADAPT connector block and snap it into place. Place the line cord under the restraining tabs.

10   Plug the 5 V power supply connector into the back of the telephone.

11   Plug the power supply into an AC utility outlet.

12   After the M2317 digital telephone is connected to a line that is both enabled and designated as an M2317 digital line, the startup screen displays INITIALIZATION V6.4. Within 5 seconds, the Idle state screen is displayed, and the M2317 is operational. The term V6.4 represents the firmware issue number, and may differ with some installations.

13   If the M2317 has been connected to a line that is designated as a digital line, but is not enabled, the display will prompt CONTACT SYSTEM ADMINISTRATOR. The line must be enabled using LD 32 from the maintenance terminal, and by enabling the features outlined in the work order. Refer to the *X11 input/output guide* (553-3001-400) for the required routines, prompts, and responses.

If the M2317 has been connected to a line that is neither defined as a digital line nor enabled, refer to the *X11 input/output guide* (553-3001-400) for required routines, prompts, and responses.

14   Verify that all the requested features are enabled by accessing them with the soft keys, or programmable keys, from the M2317 telephone and observing the display screen.

15   Perform the self-test (see Procedure 18) and acceptance test procedures. See LD 31 in the *X11 input/output guide* (553-3001-400).

Figure 19
M2317 digital telephone cross-connections
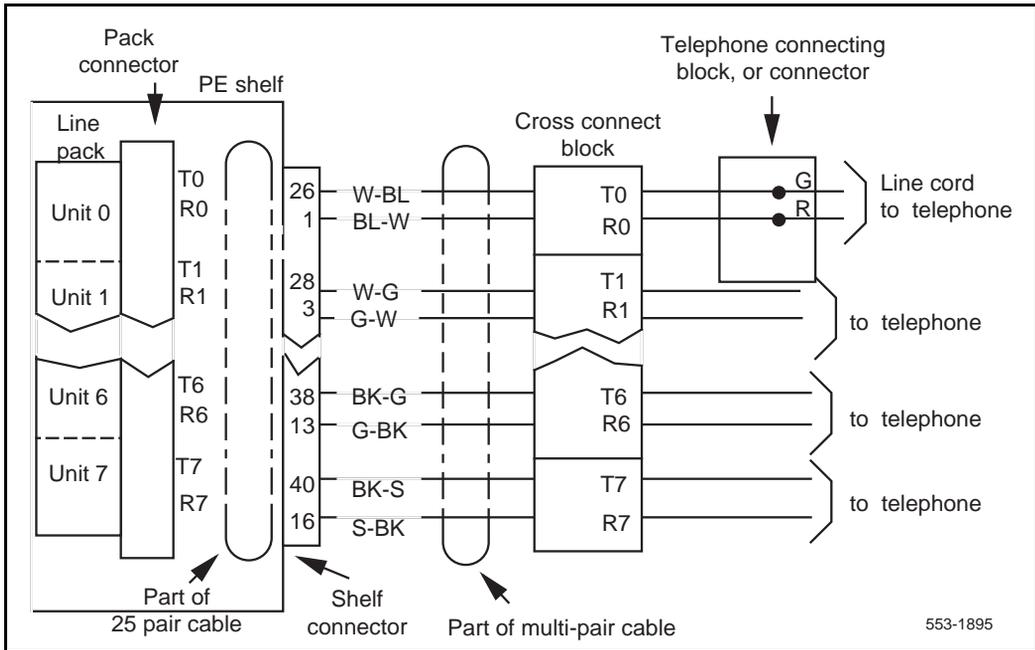
M2317 telephone self-test

The M2317 telephone has a self-testing capability. You can perform this test whether or not the telephone is connected to the Meridian 1 system. The test checks the proper functioning of the keys and liquid crystal display (LCD) indicators on the set. Follow the steps listed in Procedure 18 and Table 9 to perform the M2317 self-test.

Procedure 18
M2317 telephone self-test

1   Connect the telephone to the AC power supply.

     The LCD screen displays "Initialization … vX.X" (note that you have only 3 to 5 seconds to begin step 2).

2   Press softkey 5 twice, then press softkey 4 twice.

3   Use Table 9 to perform the necessary steps and check results.

4   Unplug the power supply to end the test.

Table 9
M2317 telephone key/LCD indicator self-tests

Step	Key operated	Required response
1	Any programmable key	Toggles the corresponding indicator on/off
2	Any dial pad key	Displays the corresponding character in the top line of the display screen
3	Volume control	Displays characters ">" for volume up and "<" for volume down in the top line of the display screen
4	Softkey 1	Both display lines are filled with characters as follows: ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEFGHIJKLMN OPQRSTUVWXYZABCDEFGHIJKLMNOPQRSTUVWXYZAB
5	Softkey 2	Both display lines are filled with characters as follows: abcdefghijklmnopqrstuvwxyzabcdefghijklmn opqrstuvwxyzabcdefghijklmnopqrstuvwxyzab
6	Softkey 3	All LCD pixels are turned on
7	Softkey 4	Display is blank
8	Softkey 5	Both display lines are filled with characters as follows: 888888888888888888888888888888888888888 888888888888888888888888888888888888888

When the M2317 digital telephone or the data option fails to function properly, follow the steps listed in Table 10 in sequence to isolate the problem area.

Table 10
M2317 trouble-locating procedures (Part 1 of 2)

	Loop power failure
1	Plug in the telephone.
2	The LCDs flash once to indicate the power is OK.
	Data communication failure
1	If voice communication is normal but data communication fails, check for DC output voltage at the power supply connector pins or replace the power supply plug-in transformer. Attempt to make a data call from the terminal keyboard (refer to *Meridian 1 telephones description and specifications* (553-3001-108)). If not successful, proceed with step 2.
2	Make a call to the DN (voice or data) to verify that the port is enabled.
3	Use an EIA or RS-232 breakout box in conjunction with the terminal cable to verify lead states and replace or repair cable if pinouts are incorrect. Attempt to make a data call from the terminal keyboard (refer to *Meridian 1 telephones description and specifications* (553-3001-108)). If still not successful, proceed with step 4.
4	Remove the transformer from the AC receptacle, unplug the 5-pin power supply connector at the back of the telephone, and replace the data option circuit board (see Procedure 74). Reconnect the data option power supply. Make a new attempt to start a data call. If trouble persists, continue with the ISDLC failure procedure.
5	Use the self-test procedure to verify that the telephone electronics are operating correctly.

Table 10
M2317 trouble-locating procedures (Part 2 of 2)

	ISDLC failure
1	Go to the system maintenance terminal (TTY or CRT) and check for displayed error and location codes. An "NWS 401 L S C" or an "NWS 501 L S C U" code indicates that the automatic (routine) diagnostic test has detected a fault.
	Check for the following indications:
	L = faulty circuit card (ISDLC card) loop number
	S = circuit card location (shelf number)
	C = number of the faulty circuit card
	U = unit number of a faulty telephone (appears only in conjunction with the NWS 501 code)
2	Replace the faulty components.
	Try to establish a call. If unsuccessful, check the telephone.
	Telephone (voice or dialing) failure
1	Check the line cord and handset cord to determine if all TELADAPT connectors are firmly in place and reconnect the loose ones. Ensure that the polarity of the Tip and Ring leads is correct.
	Lift the handset and listen for the dial tone and/or dial a directory number. If unsuccessful, proceed with step 2.
2	Wiggle the line cord and/or handset cord while listening for sounds from the handset. If crackling or ticking sounds are heard, replace the cords.
	Try to establish a call. If unsuccessful, proceed with step 3.
3	Replace the telephone.
	Try to establish a call. If unsuccessful, proceed with step 4.
4	Check the wiring between the line card, distribution panel, and telephone for breaks or loose connections. If necessary, rerun the wiring.
	Operate the telephone.

Note: If no error codes are shown at the maintenance terminal, the Network and Signaling Diagnostic (LD 30) can be loaded and run manually from the system TTY. Refer to the *X11 input/output guide* (553-3001-400).

Procedure 19
Installing the M3000 Touchphone set

1   Place the Touchphone set upside down on a number of sheets of soft, clean paper on a solid, level work surface to prevent damage to movable keys and the telephone's face.

Installing Asynchronous Data Option (ADO)

2   Remove the four self-tapping screws that fasten the stand to the Touchphone body. Lift the stand off the locating posts in a straight, upward motion.

3   Snap the ADO into the rear of the Touchphone body, with the ribbon cable and header connector protruding from the front of the ADO housing.

4   Plug the 34-pin header connector at the end of the ribbon cable into the receptacle located in the body of the Touchphone set and press firmly.

Assemble the Touchphone set and Stand

5   Place the stand over the Touchphone body and position over the four locating posts.

6   Using the four self-tapping screws removed earlier, fasten the stand securely to the Touchphone body.

Connect the Cords

7   If the handset is not already connected to the Touchphone set, connect the cord's TELADAPT connector to the Touchphone body. Route the cord under the plastic tabs in the stand and out the exit slot. Snap the other end of the cord into the handset receptacle.

8   Connect the line cord TELADAPT connector to the Touchphone body jack, and route the cord through the channel in the stand. Connect the other end of the line cord to the baseboard or wall connector.

9   Plug the power transformer cord into the mating connector in the Touchphone body and press firmly.

10   Route the power cord through its channel in the stand. Plug the transformer into an AC wall outlet. The Touchphone display screen will show STARTING UP and will prompt the user to PLEASE WAIT.

Note 1: The characters displayed between the prompt PLEASE WAIT and the string of five numbers at the bottom of the display are special codes used for service routines only. Unless this is an initial installation, ignore them.

Note 2: If installing the telephone for the first time, enter the initialization code. This clears the directory and prepares the telephone for installation.

Initialization

11   If the Touchphone set being installed is connected to a line that is defined as an M3000 Touchphone line, and is enabled, the STARTING UP screen display will automatically change to the IDLE screen display within 10 seconds.

If the prompt STARTING UP … PLEASE WAIT remains on the screen longer than 15 seconds, the Touchphone set being installed is connected to a line defined as an M3000 line, but the line is not enabled. The line must be enabled using LD 32 from the maintenance terminal, and by enabling the features outlined in the work order. Refer to the *X11 input/output guide* (553-3001-400) for the required routines, prompts, and responses.

If the Touchphone set being installed is connected to a line that is neither defined as an M3000 line nor enabled, refer to LD 11 in the *X11 input/output guide* (553-3001-400). Refer to step 12 for feature verification.

12   If the Touchphone set to be installed has arrived directly from the factory, or if it has come from another location with a stored internal directory that is unrelated to the new location, touch positions 1 3 3 2 (in that sequence) in the number string at the bottom of the STARTING UP screen display prior to loading data and features.

Note: If digits 1, 3, 3, and 2 are operated on the STARTING UP screen, the internal memory store of that Touchphone will be wiped clean.

Figure 20
M3000 Touchphone cross-connections
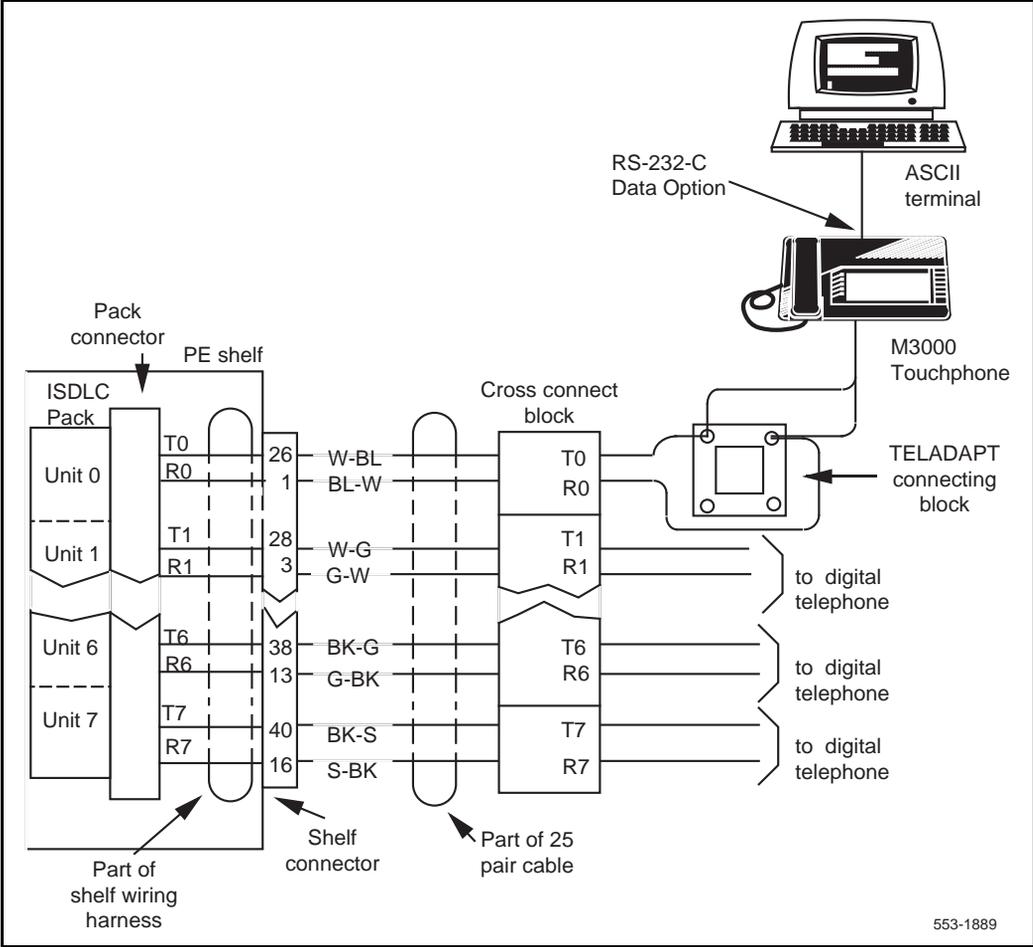
553-1889

13   Verify that all features requested in the work order are enabled by touching TOUCH PROFILE on the IDLE screen, then LIST FEATURES on the TOUCH PROFILE screen. Enabled features will show a black box beside them. Features not enabled will show a blank box.

The M3000 is now operational. Should the M3000 Touchphone set fail to operate, see *Meridian 1 telephones description and specifications* (553-3001-108).

For an illustration of the M3000 Touchphone cross-connections, see Figure 20.

M3000 trouble locating

Trouble conditions are either reported by the telephone user (customer report) or by the Meridian 1 trouble-indicating system by means of automatic routine tests. For recommended trouble-locating routines refer to Table 11. For detailed diagnostic program descriptions and input/output reference, consult the *X11 input/output guide* (553-3001-400).

When the Touchphone set and/or the data option fails to function properly, follow the steps in sequence as listed in Table 11 to isolate the problem area.

Table 11
M3000 trouble-locating procedures (Part 1 of 2)

	Data communication failure
1	If the Touchphone screen shows the prompt CHECK TERMINAL AND TRY AGAIN, check for a disconnected RS-232 plug or a power failure at the DTE or the computer terminal and take corrective action.
	The Touchphone screen should change to the Data Call Initiation state. See *Meridian 1 telephones description and specifications* (553-3001-108). Attempt to make a data call from the terminal keyboard. If unsuccessful, check subsequent steps.
2	If the Touchphone screen shows the prompt REPORT DATA CHANNEL PROBLEM, check out the following:
	(a) Check if the data TN has been disabled in LD 32, or if the system disabled it due to excessive errors. If so, reenable the data TN in LD 32.
	(b) If the station was recently relocated, the data TN may not have been redefined (set relocation does not automatically move the voice and data TNs together). Check LD 20 to see if the data TN is defined. If not, use Overlay 11 to make the data TN and voice TN conform (note that the data TN must be 8 units higher than the voice TN, with the same loop, shelf, and card number).
	(c) The data option is defective or disconnected from the Touchphone circuit board, or switch 5 on the SL-1 system QPC464 peripheral buffer card is not set for quad density. Check switch 5 on the QPC464 first, and if that is set correctly, check if the ribbon cable connector from the data option is plugged into the Touchphone set securely (the Touchphone stand must be removed to check the ribbon cable).
	Attempt to make a data call from the terminal keyboard. Refer to *Meridian 1 telephones description and specifications* (553-3001-108). If not successful, proceed with step 3.
3	Replace the data option (see Procedures 73 and 74).
	Make a new attempt to start a data call. If trouble persists, continue with "ISDLC failure."

Table 11
M3000 trouble-locating procedures (Part 2 of 2)

<table>
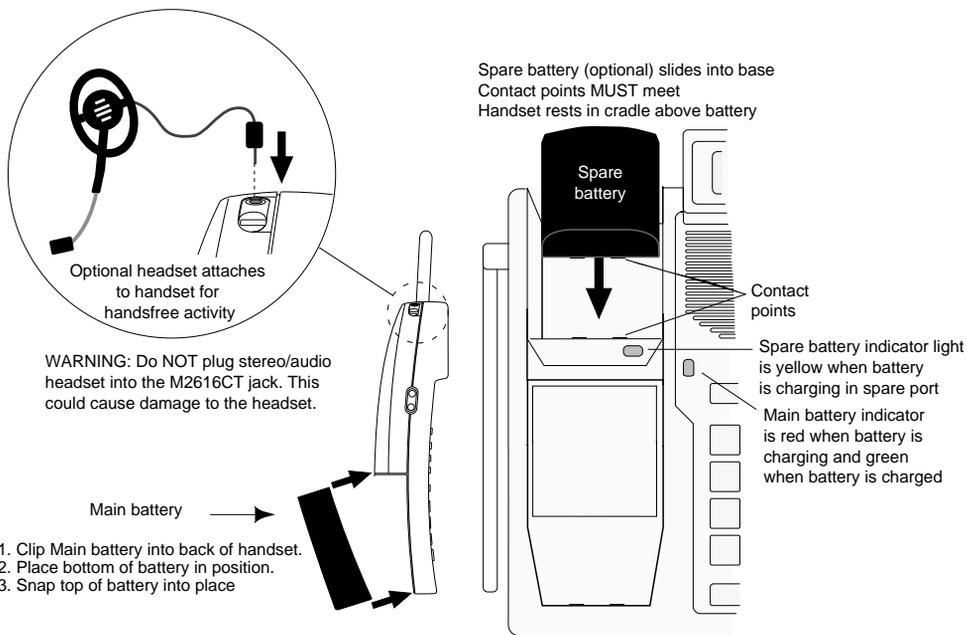<tr><td></td><td>**ISDLC failure**</td></tr>
<tr><td>1</td><td>Check the system maintenance terminal (TTY or CRT) for displayed error and location codes. An "NWS 401 L S C" or an "NWS 501 L S C U" code indicates that the automatic (routine) diagnostic test has detected a fault. Check for the following indications:

L = faulty circuit pack (ISDLC card) loop number

S = shelf number where circuit card is located

C = the number of the faulty circuit card

U = the unit number of a faulty telephone (appears only in conjunction with the NWS 501 code)</td></tr>
<tr><td>2</td><td>Replace the faulty components (for replacement procedures refer to *Circuit card installation and testing* (553-3001-211).

Try to establish a call. If unsuccessful, proceed to check the Touchphone set.</td></tr>
<tr><td></td><td>**Touchphone (voice or dialing) failure**</td></tr>
<tr><td>1</td><td>Check the line cord and handset cord to determine if all TELADAPT connectors are firmly in place and reconnect them where loose.

Lift the handset and listen for the dial tone and/or dial a directory number. If unsuccessful, proceed with step 3.</td></tr>
<tr><td>2</td><td>Verify that the port is enabled.</td></tr>
<tr><td>3</td><td>Wiggle the line cord and/or handset cord while listening for sounds from the handset. If crackling or ticking sounds are heard, replace the cords.

Try to establish a call. If unsuccessful, proceed with step 4.</td></tr>
<tr><td>4</td><td>Replace the Touchphone set.

Try to establish a call. If unsuccessful, proceed with step 5.</td></tr>
<tr><td>5</td><td>Check wiring between the line card, distribution panel, and telephone for breaks or loose connections. If necessary, rerun the wiring.

Operate the Touchphone set.</td></tr>
</table>

Note: If no error codes are shown at the maintenance terminal (that is, no automatic diagnostic test was running), the Network and Signaling Diagnostic (LD 30) can be loaded and run manually from the Meridian 1 system TTY by keying in "LD 30" and the suspected loop number. Refer to the *X11 input/output guide* (553-3001-400).

Procedure 20
M2616CT Installation

WARNING

The M2616CT is not intended for direct connection to the public switched network or other exposed plant networks, because the exposed pins on the handset cradle (where the handset sits) creates a possible outlet for harmful voltage. The M2616CT is designed to be used with a Meridian PBX.

1   Complete the wiring and cross-connections (loop power) before connecting the telephone to the connection block.

2   Place the telephone upside down on a padded level work surface to prevent damage to the telephone face.

3   connect the line cord into the bottom of the telephone base. Route the cord through the channels.

4   Plug the AC adapter (Class 2 power supply) output DIN connector into the bottom of the M2616CT set next to the line cord connection. Route the cord through the channels.

5   Turn the telephone right side up and place it in the normal operating position.

6   Insert the line cord TELEDAPT connector into the connecting block.

7   Plug the AC adapter (Class 2 power supply) input into the commercial 11V electrical main outlet.

8   Print the directory number on the designation card. Using a paper clip remove the number lens from the telephone. Insert the designation card and snap the lens back into place

9   Designate the feature keys.

Procedure 21
M2616CT Installing the battery

Spare battery (optional) slides into base
Contact points MUST meet
Handset rests in cradle above battery

Spare
battery

Contact
points

Spare battery indicator light
is yellow when battery
is charging in spare port

Main battery indicator
is red when battery is
charging and green
when battery is charged

Optional headset attaches
to handset for
handsfree activity

WARNING: Do NOT plug stereo/audio
headset into the M2616CT jack. This
could cause damage to the headset.

Main battery

1. Clip Main battery into back of handset.
2. Place bottom of battery in position.
3. Snap top of battery into place

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1   Place the handset battery in the base of the handset so the battery engages with the contact points.

2   Snap the battery into place.

3   Slide the spare battery (optional purchase) into the spare battery compartment, located at the top of the handset cradle. The yellow indicator lights when the battery is properly connected.

The battery begins to charge as soon as the handset is placed in its cradle. The main handset battery 700 mAh fully recharges in approximately 2.25 hours, the 1000 mAh battery charges in approximately 2.50. It should be noted that the that the spare battery charging port on the base unit provides a "trickle charge" that charges the battery at a slower rate than through the handset.

Procedure 22
M2616CT Wall mounting

The M2616CT base is equipped with a reversible footstand that allows you to mount the telephone on the wall. The procedure is described below:

1   Remove the handset and place the telephone upside down on a level work surface covered with soft material to prevent damage to movable keys and the telephone face.

2   Disconnect all cords from the set.

3   Remove the two screws from the footstand assembly.

4   Unsnap the footstand assembly by pressing inward at the back of the footstand where it meets the base, and pulling upward.

5   Rotate the footstand 180 degrees and screw the footstand back into place to the set's bottom cover.

6   Tighten all screws and replace all cords.

7   Mount the telephone on the wall using the wall-mount holes proved on the bottom of the footstand.

Procedure 23
M2616CT Meridian 1 system administration

To configure the M2616CT set refer to X11 Software input/output guide (553-3001-400) for complete information and procedures on LD11 to configure the Meridian Digital Telephone. For the Locator key (key 14) to function, do not assign a feature to this key. Handsfree is required for the M2616CT to function properly.

Procedure 24
M2616CT Handset Registration to Base Unit

Each M2616CT handset is automatically registered to its respective base unit. In cases where a substitute handset is required for troubleshooting purposes, a different M2616CT handset can be reregistered by placing the handset on-hook, and unplugging, then re-plugging in the AC power adapter and telephone line cord.

Procedure 25
M2616CT Manual RF (Radio Frequency selection)

The M2616CT uses 900 MHz narrowband signaling. Other products also use these channels. Due to interference from other products, there may be a time when the installer must confirm the user's M2616CT so that other 900 MHz products will not cause interference. A function available on Key 14 in addition to the Locator feature is the Manual RF Selection feature. Use the following steps to us the Manual RF Selection feature:

1   Add a feature (any feature) on the Meridian 1 Key 14.

2   Press Key 14 and AUTO appears on the display.

3   Toggle the volume key until you receive the desired channel (CH00 through CH19)

4   Press Key 14 again.

5   Remove the feature from Key 14 to have access to the Locator feature. By selecting one channel instead of scanning, you will have quicker response to the voice channel and be able to clear the interference in your area.

Table 12
Frequency Ranges

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
CH00	902.6	CHO5	910.6	CH10	915.8	CH15	921.4
CH01	904.0	CH06	912.0	CH11	916.4	CH16	923.0
CH02	905.6	CH07	914.2	CH12	918.4	CH17	924.8
CH03	907.2	CH08	914.8	CH13	919.6	CH18	926.4
CH04	908.8	CH09	915.2	CH14	921.4	CH19	927.6

M3900 Series Meridian Digital Telephone

The M3900 Series Meridian Digital Telephones provide versatile functionality to the desktop environment. The M3900 Series Meridian Digital Telephones have five models:

- M3901 entry level telephone

- M3902 Basic Telephone

- M3903 Enhanced Telephone

- M3904 Professional Telephone

- M3905 Call Center Telephone

For more information on the M3900 Series Meridian Digital Telephone refer to the *M3900 Series Meridian Digital Telephone* (553-3001-216) document.

Designating telephones

Before designating telephones, check the work order for features enabled and key designations. Designate each key by placing its feature name (from the designation sheet) in the key cap that fits on the key.

Procedure 26
Designating 500-type telephones

1   Remove the finger wheel and number card from its envelope.

2   Designate the number card with the appropriate directory number and station designator.

3   Insert the number card into the finger wheel (making sure the number card is properly oriented).

4   Place the telephone on a flat surface.

5   Place the finger wheel over the clamp on the dial, with the "0" hole directly over the digit "9," making sure the finger wheel depressions are properly positioned on the prongs of the clamp plate.

6   Rotate the finger wheel counterclockwise until the clamp spring snaps into the notch on the underside of the finger wheel.

Procedure 27
Removing the finger wheel from 500-type telephones

1   Place the telephone on a flat surface.

2   Rotate the finger wheel clockwise as far as possible.

3   Insert a paper clip into the small hole between the digits "9" and "0" located on the edge of the grooved section of the finger wheel.

4   Press down on the releaser to disengage the finger wheel clamp spring.

5   Rotate the finger wheel further clockwise until the clamp spring releases.

6   Remove the finger wheel when it becomes loose. The dial returns to normal position.

Procedure 28
Designating 2500-type telephones

1   The designation window is located directly below the dial pad. Insert a paper clip into the hole at the left or right end of the designation window.

2   Gently pry the window toward the center and remove.

3   Insert number tag with the appropriate directory number and station designator, and replace the designation window.

Procedure 29
Designating SL-1, digital, and Meridian Modular Telephones

1   Remove the cap from each key requiring a designation.

2   Place the designation in the cap, place the cap over the corresponding key, and gently press down. Repeat for all keys requiring designations.

3   Insert a paper clip into the hole at the left or right end of the designation window.

4   Gently pry the window toward the center and remove, and insert the number tag.

5   Replace the designation window.

Connecting telephones

Procedure 30 describes how to connect SL-1 and M1109 Compact telephones.

Figure 21 illustrates and Table 13 lists the SL-1 and M1109 telephone connections.

Procedure 30
Connecting SL-1 and M1109 telephones

1　Ensure that the terminal connector is compatible with the telephone connector.

2　Connect the set cord to the terminal connecting block, or couple the Amphenol or the TELADAPT connector (if provided).

3　Secure the cover of the connector (if provided).

Figure 21
SL-1 and M1109 telephone connections

Note: See notes listed in Table 13.
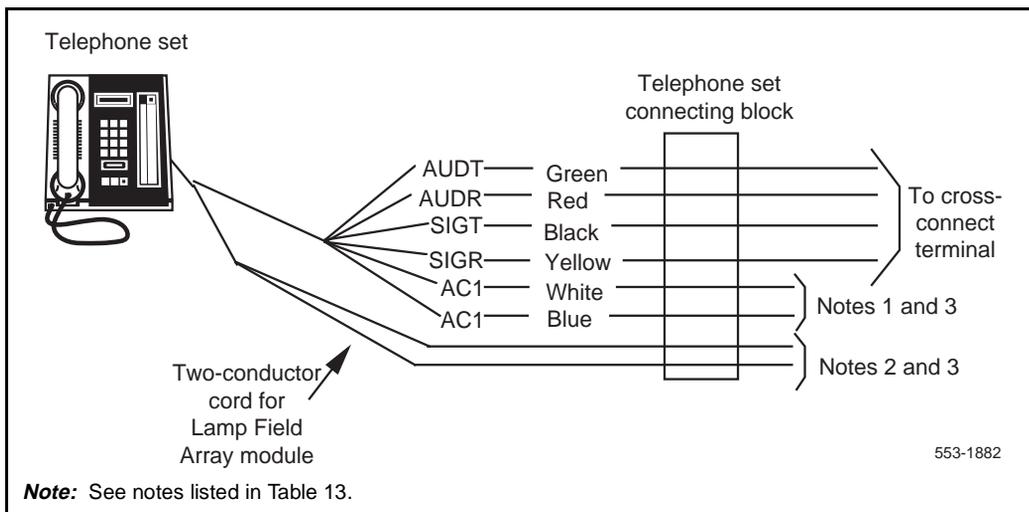
Table 13
SL-1 and M1109 telephone connections

Mounting Cord		Connecting block designations			Inside wiring colors	
Lead name	Color	NE-47QA or QBB1B	NE-283 74-5001 Adapter	NE-625F TELADAPT	Z station wire	16/25-pair cable
Audio T	G	G	1T	T1 (G)	G	W-BL
Audio R	R	R	1R	R1 (R)	R	BL-W
SIG T	BK	BK	X1	AUX (BK)	BK	W-O
SIG R	Y	Y	X2	GND (Y)	Y	O-W
AC1	BL	5	R	T2 (BL)		W-SL
AC1	W	6	B	R2 (W)		SL-W

Note 1: To prevent sending false signals to the CPU, connect and disconnect leads in the following sequence:

Connecting	Disconnecting
1. Signal pair (SIGT, SIGR)	1. Power pair
2. Audio pair (AUDT, AUDR)	2. Audio pair
3. Power pair (AC1, AC1)	3. Signal pair

Note 2: A 24 V ac supply is required when the telephone is equipped with a digit display, such as QUS1C logic Handsfree unit, a QKK-type remote powering kit (for extended range), or QMT1 or QMT2 key/lamp modules.

Note 3: 15 V ac supply required when equipped with a QMT3 Lamp Field Array module. An extra 3-conductor cord kit is required.

Note 4: The 115/24 V ac or 115/15 V ac transformers must be located within 25 ft (7.7 m) of the telephone (each requires a separate transformer). With the QUT1 or QUAA1 centralized power unit, each telephone requires a separate fuse to prevent noise or cross talk.

Procedure 31 describes how to connect 500- and 2500-type telephones.

Table 14 lists the NE-500/2500 telephone connections.

Procedure 31
Connecting 500/2500-type telephones

1   Ensure that the terminal connector is compatible with the telephone connector.

2   Connect the telephone mounting cord.

     TELADAPT cords (NE-625F connector) do not require terminations. Insert the plastic connector on the end of the telephone mounting cord into the NE-625F-type receptacle.

3   Connect the mounting cord to an NE-284-74-5001 Amphenol adapter if reusing a 16- or 25-pair cable. Plug the adapter into the cable connector. Fasten the connector together with the screws provided at the end of each connector.

Table 14
NE-500/2500 telephone connections

Mounting cord	NE-47QA or QBBIB block designation	NE-284-74-5001 designation	Cable color pairs (16 to 25 not used)	Connect to TN
TIP (green)	G	1T	W-BL	TIP
RING (red)	R	1R	BL-W	RING
GND (yellow)	BK	X2		
	Y	X1		

Cross-connecting telephones

Be sure to connect the telephones according to Figures 22, 23, and 24. Figure 22 provides the diagram for cross-connecting 500/2500-type telephones on a peripheral equipment (PE) module. Tables 15, 16, and 17 show 500/2500 telephone cross-connections on an intelligent peripheral equipment (IPE) module.

Cross-connections for SL-1 telephones are shown in Figure 23, and the Meridian Modular Telephone cross-connections are shown in Figure 24.

Procedure 32
Cross-connecting telephones

1   Locate the telephone terminations at the cross-connect terminal.

Telephone terminations are located on the vertical side of the frame when frame-mounted blocks are used and in the blue field when wall-mounted blocks are used.

2   Connect Z-type cross-connecting wire to the leads of the telephone (see Tables 18 and 19).

3   Locate the line circuit card (TN) terminations.

Line circuit card (TN) terminations are located on the horizontal side of the distributing frame when frame-mounted blocks are used and in the white field when wall-mounted blocks are used.

4   Run and connect the other end of the cross-connecting wire to the assigned TN terminal block.

Figure 22
NE-500/2500-type telephone cross-connections for PE modules

Note: This connection applies only to line cards equipped with the Parallel Message Waiting Lamp feature. This connects to a second message waiting indication, a lamp bank for example. The maximum loop resistance is 2000½.

553-1873
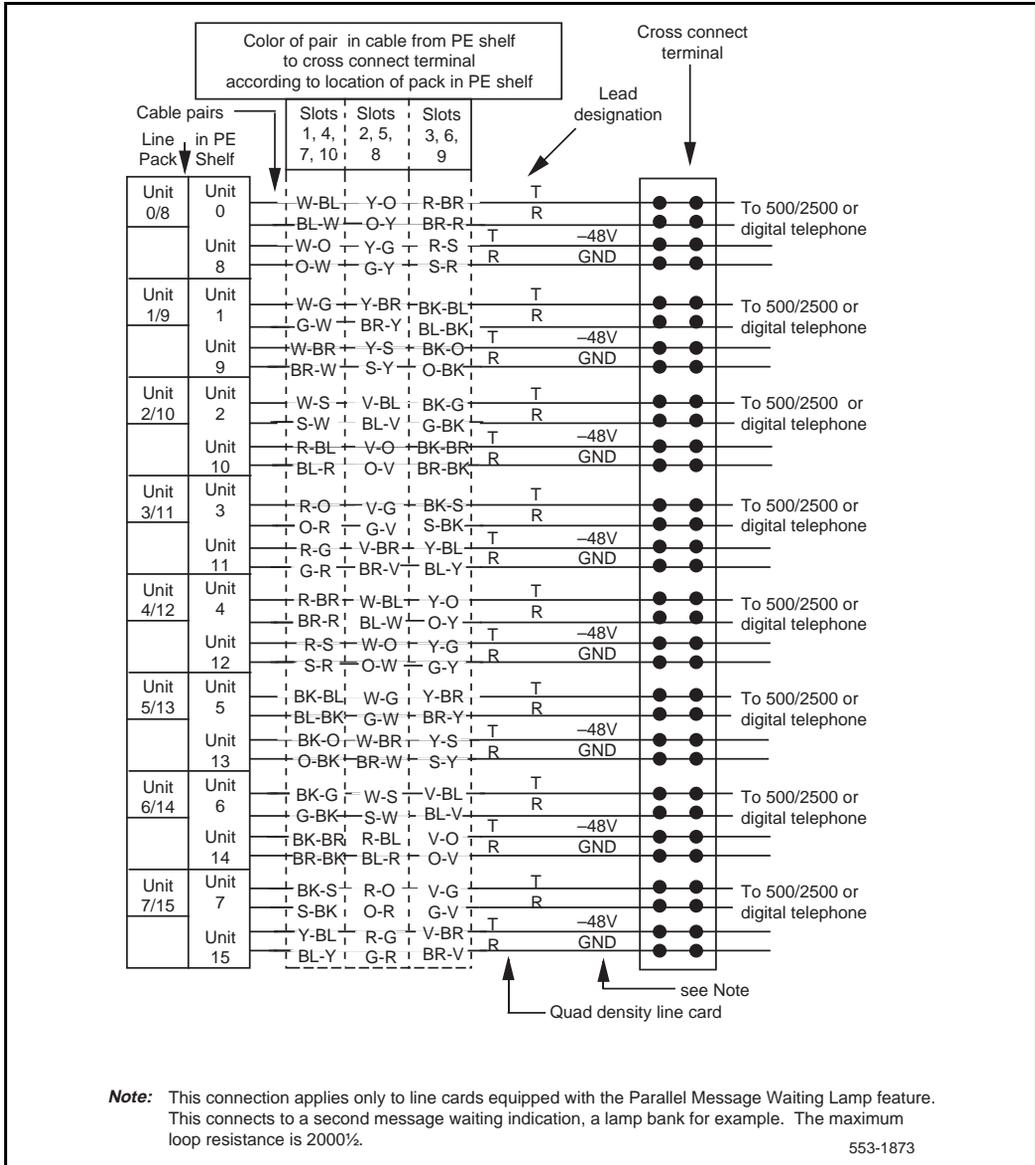
Table 15
500/2500 line card pair-terminations for IPE module connectors A, E, K, R

| Pair | Pins | Pair color | I/O panel connectors | | | | Unit |
			A	E	K	R	16/card
1T/1R	26/1	W-BL/BL-W	slot 0	slot 4	slot 8	slot 12	0
2T/2R	27/2	W-O/O-W					1
3T/3R	28/3	W-G/G-W					2
4T/4R	29/4	W-BR/BR-W					3
5T/5R	30/5	W-S/S-W					4
6T/6R	31/6	R-BL/BL-R					5
7T/7R	32/7	R-O/O-R					6
8T/8R	33/8	R-G/G-R					7
9T/9R	34/9	R-BR/BR-R					8
10T/10R	35/10	R-S/S-R					9
11T/11R	36/11	BK-BL/BL-BK					10
12T/12R	37/12	BK-O/O-BK					11
13T/13R	38/13	BK-G/G-BK					12
14T/14R	39/14	BK-BR/BR-BK					13
15T/15R	40/15	BK-S/S-BK					14
16T/16R	41/16	Y-BL/BL-Y					15

Table 16
500/2500 line card pair-terminations for IPE module connectors B, F, L, S

Pair	Pins	Pair color	I/O panel connectors				Unit
			B	F	L	S	16/card
1T/1R	26/1	W-BL/BL-W	slot 1	slot 5	slot 9	slot 13	0
2T/2R	27/2	W-O/O-W					1
3T/3R	28/3	W-G/G-W					2
4T/4R	29/4	W-BR/BR-W					3
5T/5R	30/5	W-S/S-W					4
6T/6R	31/6	R-BL/BL-R					5
7T/7R	32/7	R-O/O-R					6
8T/8R	33/8	R-G/G-R					7
9T/9R	34/9	R-BR/BR-R					8
10T/10R	35/10	R-S/S-R					9
11T/11R	36/11	BK-BL/BL-BK					10
12T/12R	37/12	BK-O/O-BK					11
13T/13R	38/13	BK-G/G-BK					12
14T/14R	39/14	BK-BR/BR-BK					13
15T/15R	40/15	BK-S/S-BK					14
16T/16R	41/16	Y-BL/BL-Y					15
17T/17R	42/17	Y-O/O-Y	slot 2	slot 6	slot 10	slot 14	0
18T/18R	43/18	Y-G/G-Y					1
19T/19R	44/19	Y-BR/BR-Y					2
20T/20R	45/20	Y-S/S-Y					3
21T/21R	46/21	V-BL/BL-V					4
22T/22R	47/22	V-O/O-V					5
23T/23R	48/23	V-G/G-V					6
24T/24R	49/24	V-BR/BR-V					7
25T/25R	50/25	V-S/S-V					Spare

Table 17
500/2500 line card pair-terminations for IPE module connectors C, G, M, T

Pair	Pins	Pair color	I/O panel connectors				Unit
			C	**G**	**M**	**T**	**16/card**
1T/1R	26/1	W-BL/BL-W	slot 2	slot 6	slot 10	slot 14	8
2T/2R	27/2	W-O/O-W					9
3T/3R	28/3	W-G/G-W					10
4T/4R	29/4	W-BR/BR-W					11
5T/5R	30/5	W-S/S-W					12
6T/6R	31/6	R-BL/BL-R					13
7T/7R	32/7	R-O/O-R					14
8T/8R	33/8	R-G/G-R					15
9T/9R	34/9	R-BR/BR-R	slot 2	slot 6	slot 11	slot 15	0
10T/10R	35/10	R-S/S-R					1
11T/11R	36/11	BK-BL/BL-BK					2
12T/12R	37/12	BK-O/O-BK					3
13T/13R	38/13	BK-G/G-BK					4
14T/14R	39/14	BK-BR/BR-BK					5
15T/15R	40/15	BK-S/S-BK					6
16T/16R	41/16	Y-BL/BL-Y					7
17T/17R	42/17	Y-O/O-Y					8
18T/18R	43/18	Y-G/G-Y					9
19T/19R	44/19	Y-BR/BR-Y					10
20T/20R	45/20	Y-S/S-Y					11
21T/21R	46/21	V-BL/BL-V					12
22T/22R	47/22	V-O/O-V					13
23T/23R	48/23	V-G/G-V					14
24T/24R	49/24	V-BR/BR-V					15
25T/25R	50/25	V-S/S-V					Spare

Table 18
Z-typecross-connecting wire

Size	Gauge	Color	Designation
1 pr	22	Y-BL	Tip
		BL-Y	Ring
3 pr	24	W-BL	Voice T
		BL-W	Voice R
		W-O	Signal T
		O-W	Signal R
		W-G	Power
		G-W	Power

Table 19
Inside wiring colors

Inside wiring colors		Connect to equipment TN
Z station wire	**16/25-pair cable**	
G	W-BL	First pair Tip
R	BL-W	First pair Ring
BK	W-O	Second pair Tip
Y	O-W	Second pair Ring

Figure 23
SL-1 telephone cross-connections
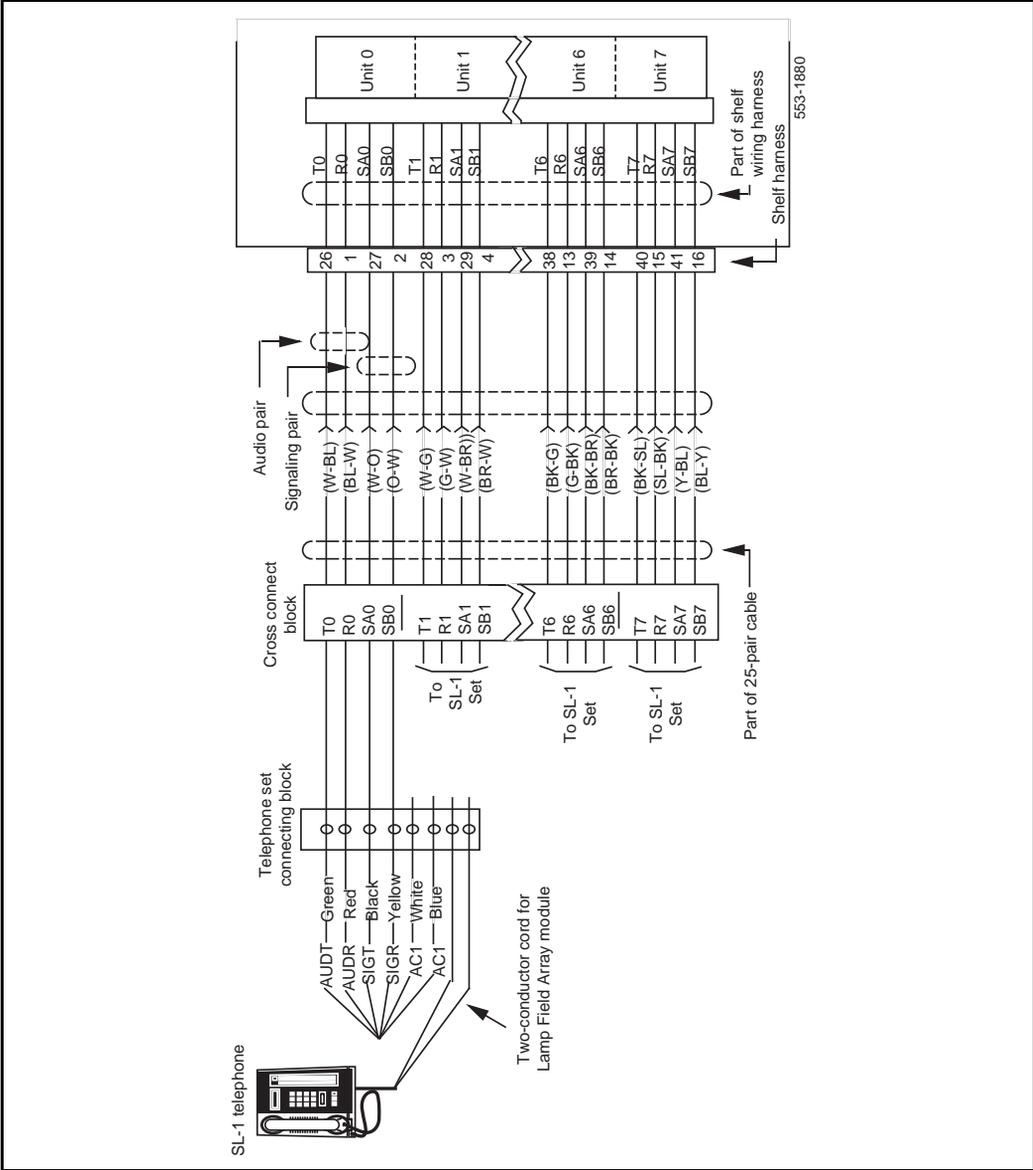
Figure 24
Meridian Modular Telephone cross-connections
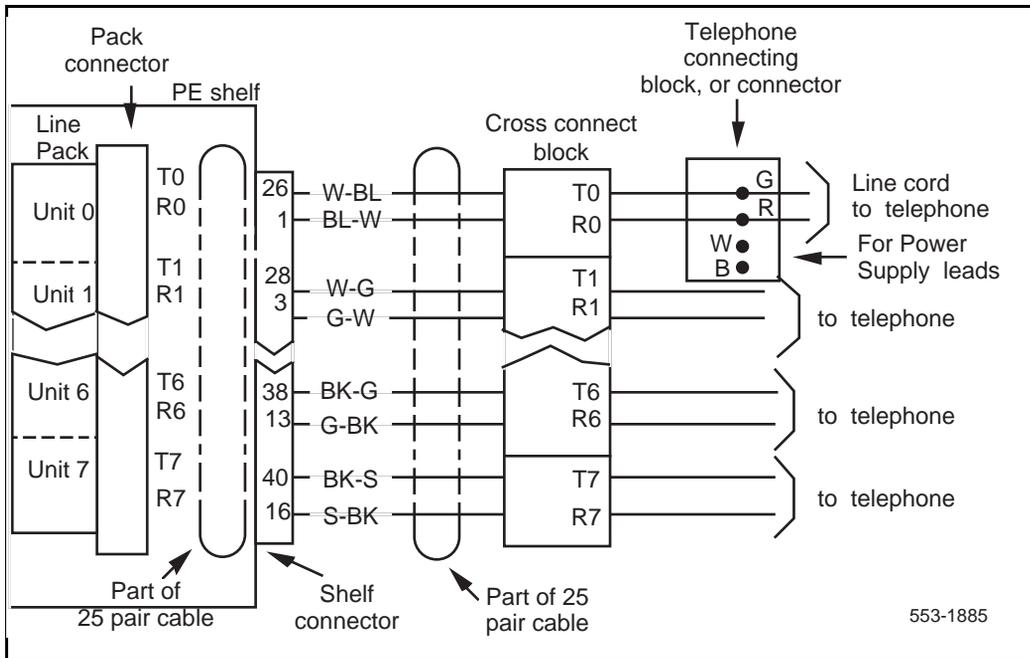
Add-on modules

Packing and unpacking

Use proper care while unpacking any add-on module. Check for damaged containers so that appropriate claims can be made to the transport company for items damaged in transit.

If a module must be returned to the factory, pack it in the appropriate container to avoid damage during transit. Remember to include all loose parts in the shipment.

Note: There are three distinct versions of Modular telephone sets—all three are supported. The versions can be clearly distinguished by the first four letters in the upper left-hand corner of the model identification label on the bottom of the set. The three types are the "NTZK" models and the "NT2K" models with date code prior to January 1998 and the NT2K with date code of January 1998. In addition, the two jacks face in the same direction on NT2K and NT9K sets, and in opposite directions on NTZK sets. When appropriate, differences between the models are noted in this document.

QMT1 and QMT2 add-on modules

The QMT1 key/lamp module has 10 nonlocking keys and 8 LEDs, while the QMT2 key/lamp module has 20 nonlocking keys and 16 LEDs. Add modules to the right side of an SL-1 telephone or attendant console.

The SL-1 telephone can have up to six additional key strips (for example, six QMT1 modules, or two QMT1 and two QMT2 modules). However, the number of additional key strips that you can add may be limited by other equipment that is connected to the telephone. A full description of equipment that can be added to an SL-1 telephone, along with their limitations, is described in *Meridian 1 telephones description and specifications* (553-3001-108).

The QCW-type attendant console accommodates one QMT2 or two QMT1 modules.

When the M1250 or M2250 attendant console is delivered from the factory, the QMT2 option switch is OFF. To turn the switch ON, you must open the attendant console (see Procedure 6).

Each telephone that has a key/lamp module installed requires a 25 V ac power supply.

Procedures 33, 34, 35, and 36 describe how to connect and disconnect add-on key modules. Tables 20 through 23 give switch settings for the various applications of add-on modules. Table 24 gives the jack numbering for add-on module connecting.

Faceplate

See Figure 25 as a reference for the removal and installation of the QMT1 and QMT2 add-on module faceplate.

Procedure 33
Installing the QMT1 and QMT2 add-on module faceplate

1   Place the add-on module on a desk with the front edge slightly beyond the edge of the desk.

2   Fit the cover to the housing and tighten the captive retaining screws.

3   Position the faceplate so that the keys will pass through the cutouts in the faceplate.

4   Tilt the back edge of the faceplate toward the rear of the module, and insert the locating tabs into the slots on the attendant console cover.

5   Keeping the locating tabs in the slots, tilt the front edge of the faceplate down, passing the keys through the cutouts in the faceplate.

6   Press the front edge of the faceplate down until the faceplate catches snap into place.

7   Ensure that the faceplate is securely held in place without binding the keys.

Procedure 34
Removing the QMT1 and QMT2 add-on module faceplate

1   Place the add-on module on a desk with the front edge slightly beyond
     the edge of the desk.

2   Insert a paper clip into each release hole in the front edge of the
     module housing to release the faceplate (see Figure 25).

3   Lift the faceplate off.

4   Unscrew the captive retaining screws securing the cover to the
     housing, and remove the cover.

Procedure 35
Connecting the QMT1 and QMT2 add-on module

1   Verify that the address switches are correctly set.

2   Remove the filler plate from the right side of the telephone, attendant
     console, or add-on module. Store the filler plate.

3   Place the left side of the new module against the right side of the
     telephone, attendant console, or installed module, aligning the filler
     plate openings.

4   Lock the new module in place by inserting the locking device, attached
     to the wiring harness, over the edges of the filler plate openings.

5   Extend the module harness into the existing unit and insert the plug
     into the jack.

     If the QMT2 module is of C vintage or earlier, remove the screws
     securing the circuit board to the module housing and remove the circuit
     board. Insert the plug of the wiring harness into the connector, replace
     the circuit board, and secure with the screws.

6   Provide the 25 V ac supply if this is the first module being added to an
     SL-1 telephone.

Figure 25
QMT1 and QMT2 add-on module faceplate

QMT2 20-button module

QMT1 10-button module

Locating tab

Faceplate

Faceplate catch

Cover

Front edge

Release hole

Paper clip

Releaser

553-1862
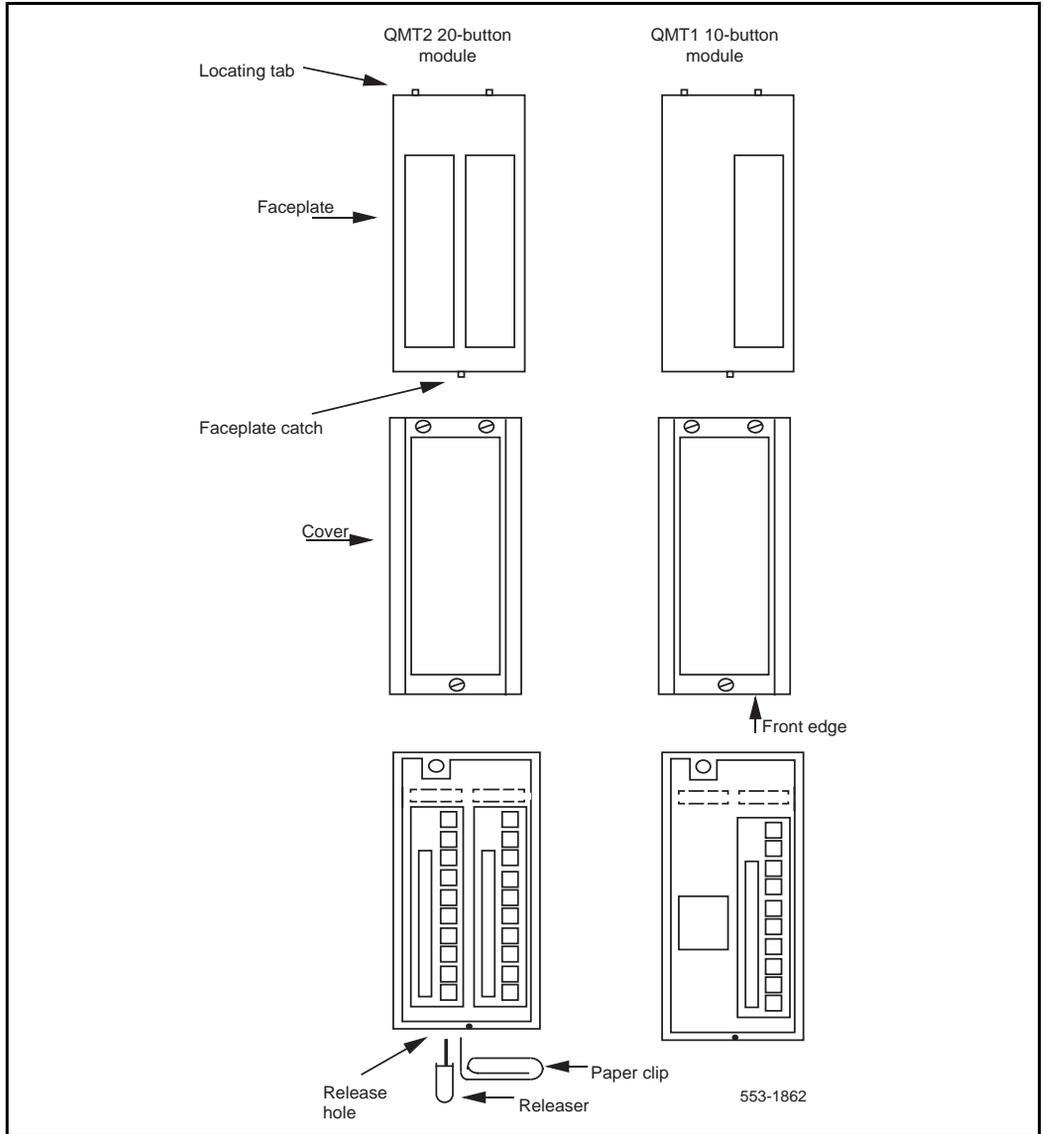
Procedure 36
Disconnecting the QMT1 and QMT2 add-on module

1   Remove the data from system memory. Refer to *X11 input/output guide* (553-3001-400).

2   Remove the plug on the end of the module wiring harness from the jack in the adjacent unit.

   If the QMT2 module is vintage C or earlier, remove the screws securing the circuit board to the module housing.

3   Remove the locking device, connecting the module to the adjacent unit.

4   Locate the stored filler plate and insert it in the filler plate opening.

5   Disconnect the 25 V ac supply if not required.

Figure 26
Add-on module connection to the SL-1 telephone

QSU type
telephone Set

Locating tabs

Faceplate catch

Faceplate

QMT2 20- key
module

QMT3 Lamp
Field Array
module

Cover   Captive retaining screw

Captive
screw

Locking device

QMT2D & later
versions

QMT2 C
versions

QMT3 Lamp
Field Array
module

Bottom PCB
of module

Locking
device

Release hole

Filler plate opening

Address Switches

Connector cable

Add-on module
connector cable

553-1867

Figure 27
Add-on module connection to an attendant console
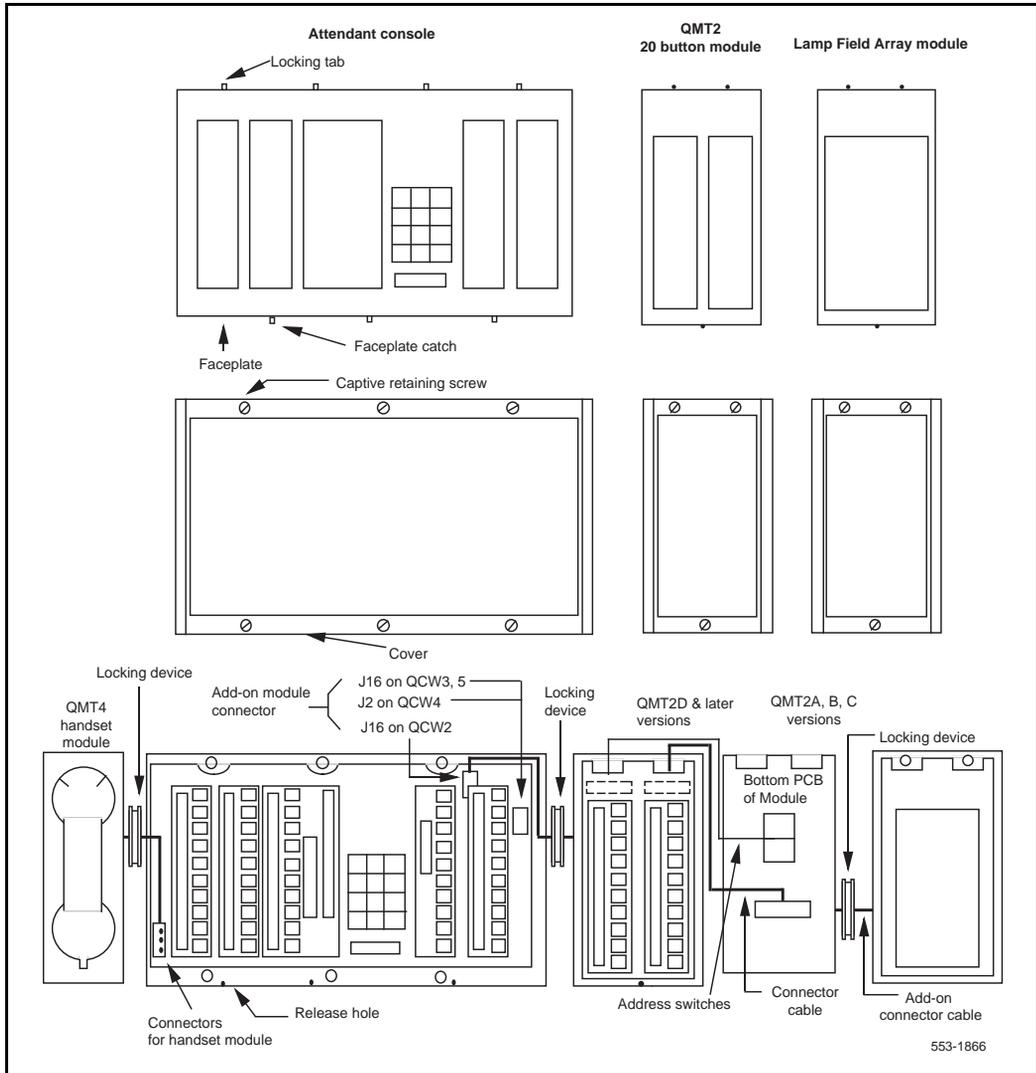
Table 20
QMT1 key/lamp module address switch settings (SL-1 telephones)

Added key/lamp strip number (Note)	Address switch settings					
	1	2	3	4	5	6
1	0	0	X	0	0	0
2	0	X	0	0	0	0
3	0	X	X	0	0	0
4	X	0	0	0	0	0
5	X	0	X	0	0	0
6	X	X	0	0	0	0
Switch OFF = 0						
Switch ON = X						

Note: When a QMT1 module is added to an SL-1 telephone, the address switch contained in the module must be set according to the corresponding strip number; for example, the first module added is strip 1 and the second module added is strip 2. The number of key strips that can be added to an SL-1 telephone varies from four to six key strips, depending on the type of other add-on modules or kits that are connected to the telephone. Refer to *Meridian 1 telephones description and specifications* (553-3001-108) for add-on module limitations.

Table 21
QMT2 key/lamp module address switch settings (SL-1 telephones)

Added key/lamp strip number (Note)	Address switch settings					
	1	2	3	4	5	6
1, 2	0	0	X	0	X	0
2, 3	0	X	0	0	X	X
3, 4	0	X	X	X	0	0
4, 5	X	0	0	X	0	X
5, 6	X	0	X	X	X	0
Switch OFF = 0						
Switch ON = X						

Note: When a QMT2 module is added to an SL-1 telephone, the address switch contained in the module must be set to the corresponding strip number; for example, the first module added is strip 1 and 2 and the switch is set to address 1 and 2. If a QMT1 precedes a QMT2, then the switch is set to address 2 and 3. The number of key strips that can be added to an SL-1 telephone varies from four to six key strips, depending on the type of other add-on modules or kits that are connected to the telephone. Refer to *Meridian 1 telephones description and specifications* (553-3001-108) for add-on module limitations.

Table 22
QMT1 module address switch settings (attendant consoles)

Added key/lamp strip number (Note)	Address switch settings					
	1	2	3	4	5	6
First module 4	X	0	0	0	0	0
Second module 5	X	0	X	0	0	0
Switch OFF = 0						
Switch ON = X						
Note: Only two 10-key/lamp strips can be added to an attendant console. The first strip added is assigned to address 4, the second to address 5.						

Table 23
QMT2 module address switch settings (attendant consoles)

Added key/lamp strip number (Note)	Address switch settings					
	1	2	3	4	5	6
Strips 4 and 5	X	0	0	X	0	X
Switch OFF = 0						
Switch ON = X						
Note: Only one QMT2 key/lamp strip can be added to an attendant console.						

Table 24
Jack numbering for add-on module connection

Equipment	Jack number
SL-1 telephones (see Note)	J1
SL-1 telephone equipped with QKK3 kit	J2 of QKK3
QMT1 add-on module	J2
QMT2C add-on module	J1
QMT2D add-on module	J2
QMT3 add-on module	J6
QCW2, 3, and 5 attendant consoles	J16
QCW4 attendant console	J2

Note: On SL-1 telephones with a digit display, jack J1 is extended to the connector located beside the right-hand filler plate.

Designating add-on modules

Be sure to refer to the work order for features enabled and key designations. Refer to *Meridian 1 telephones description and specifications* (553-3001-108) for add-on module limitations. See Figure 26 for an illustration of the add-on module connection to an SL-1 telephone, and see Figure 27 for an illustration of the add-on module connection to an attendant console.

Procedure 37
Designating add-on modules

1   Remove the cap, by gently pulling upward, from each key requiring a designation.

2   Remove the appropriate designation from the sheet of designations.

3   Place the designation in the cap, place the cap over the corresponding key, and gently press down. Repeat for all keys requiring designations.

4   Insert a paper clip into the hole at the left or right end of the designation window, and gently pry open the window.

5   Insert the number tag, and replace the designation window.

QMT3 Lamp Field Array

The addition of a QMT3 Lamp Field Array (LFA) on an SL-1 telephone reduces the number of add-on modules that can be equipped on the telephone. Refer to *Meridian 1 telephones description and specifications* (553-3001-108) for a full description of the types and limitations of add-on modules that can be added to an SL-1 telephone.

Refer to *M1250 and M2250 Attendant Consoles description* (553-2201-117) for a description of QCW-type attendant consoles equipped with a QMT3 Lamp Field Array. See "Busy Lamp Field/Console Graphics Module" on page 99 for installation of an LFA on M1250 and M2250 attendant consoles.

The QMT3 LFA module is added to the right-hand side of the attendant console or SL-1 telephone. It can be used with any combination of 10- or 20-key modules and requires a separate 15 V ac power supply.

The QMT3 module should be installed at the extreme right of the attendant console or other add-on modules to avoid the need to disassemble the QMT3 module to gain access to its connector.

The Lamp Field Array module obtains its power through the attendant console. The requirements are

— a reference ground line (0 V)

— 5 V to power the CMOS electronics that control the Lamp Field Array module (c. 50 mA)

— a power source of –12 V for the display of the Lamp Field Array module (c. 10 mA)

— backlighting power

The Lamp Field Array module mounts on the back of the attendant console and is held on with snapfits and two screws.

See Table 25 for the jack numbering for the QMT3 module connection.

See Figure 28 for an illustration of the QMT3 LFA connections to an attendant console and Figure 29 for an illustration of the QMT3 LFA connections to an SL-1 telephone.

Procedure 38
Connecting a QMT3 module to an SL-1 telephone or a
QCW attendant console

1   Unpack and inspect the Lamp Field Array (LFA) for damage. If it is damaged, notify your supplier.

2   Remove the faceplate and cover from the attendant console or from the SL-1 telephone, and from any add-on module that is connected to the right-hand side of the attendant console or telephone.

3   Disconnect the switchhook cable connector from the PCB of the telephone.

     If you are adding the LFA to a QSU3 or QSU1F (and later vintage) telephone, go to step 7.

4   Remove the LED strip and cable connector from the telephone.

5   Remove the four dial pad retaining screws. Remove the dial pad cable connector from the PCB.

6   Remove the retaining screws at the top and bottom of the PCB. Remove the PCB from the telephone.

If you are adding the LFA to a QSU1C through QSU1E vintage telephone, go to step 9.

7   For pre-QSU3D vintage SL-1 telephones: Remove the retaining screws from around the dial pad and remove the dial pad.

Note: Some dial pads are soldered to the PCB and cannot be disconnected.

8   Remove the retaining screws from the PCB and remove the PCB.

9   Install a 2-conductor power cord (with spade-tip connectors) through the base of the telephone alongside the existing line cord. Secure the power cord to the line cord with plastic cable tie.

10   Replace the PCB and secure with retaining screws.

11   Connect the two leads of the power cord to the AC2 quick-connect terminals.

12   Replace the dial pad (if necessary) and secure with retaining screws.

13   Remove the filler plate from the right side of the set (or right-most add-on module).

14   Lock the LFA to the set (or attached add-on module) by slipping the locking device on the LFA wiring harness over the edges of the filler plate opening. Connect the LFA wiring harness to the jack on the telephone (or attached add-on module).

15   Reconnect the switchhook cable connector. Reconnect the LED strip (if necessary) and secure with retaining screws.

16   Cross-connect (at the main cross-connect terminal or the intermediate cross-connect point) 15 V ac from the power unit to the attendant console or telephone.

17   Reattach the faceplate and cover to the attendant console or SL-1 telephone and the add-on module.

18   Configure the QMT3 in the system. Refer to the *X11 input/output guide* (553-3001-400).

Procedure 39
Disconnecting the QMT3 module from an SL-1 telephone or
a QCW attendant console

1   Remove Lamp Field Array data from the system memory. Refer to the
     X11 input/output guide (553-3001-400).

2   Remove the faceplate and cover from the attendant console or the
     SL-1 telephone and from the add-on module connected to the
     right-hand side of the telephone.

3   Disconnect the Lamp Field Array module.

4   Reattach the cover and faceplate on the set or attendant console and
     on the add-on module.

5   Pack the Lamp Field Array module in a container.

6   Test the SL-1 telephone or attendant console. Refer to the *Meridian 1*
     telephones description and specifications (553-3001-108).

Table 25
Jack numbering for QMT3 module connection

Equipment	Jack number
SL-1 telephones (Note)	J1
SL-1 telephone equipped with a QKK3 kit	J2 of QKK3
QMT1 add-on module	J2
QMT2C add-on module	J1
QMT2D add-on module	J2
QMT3 add-on module	J6
QCW2, 3, and 5 attendant consoles	J16
QCW4 attendant console	J2
Note: On telephones with a digit display, jack J1 is extended to the connector located beside the right-hand filler plate.	

Figure 28
QMT3 Lamp Field Array connections to the attendant console
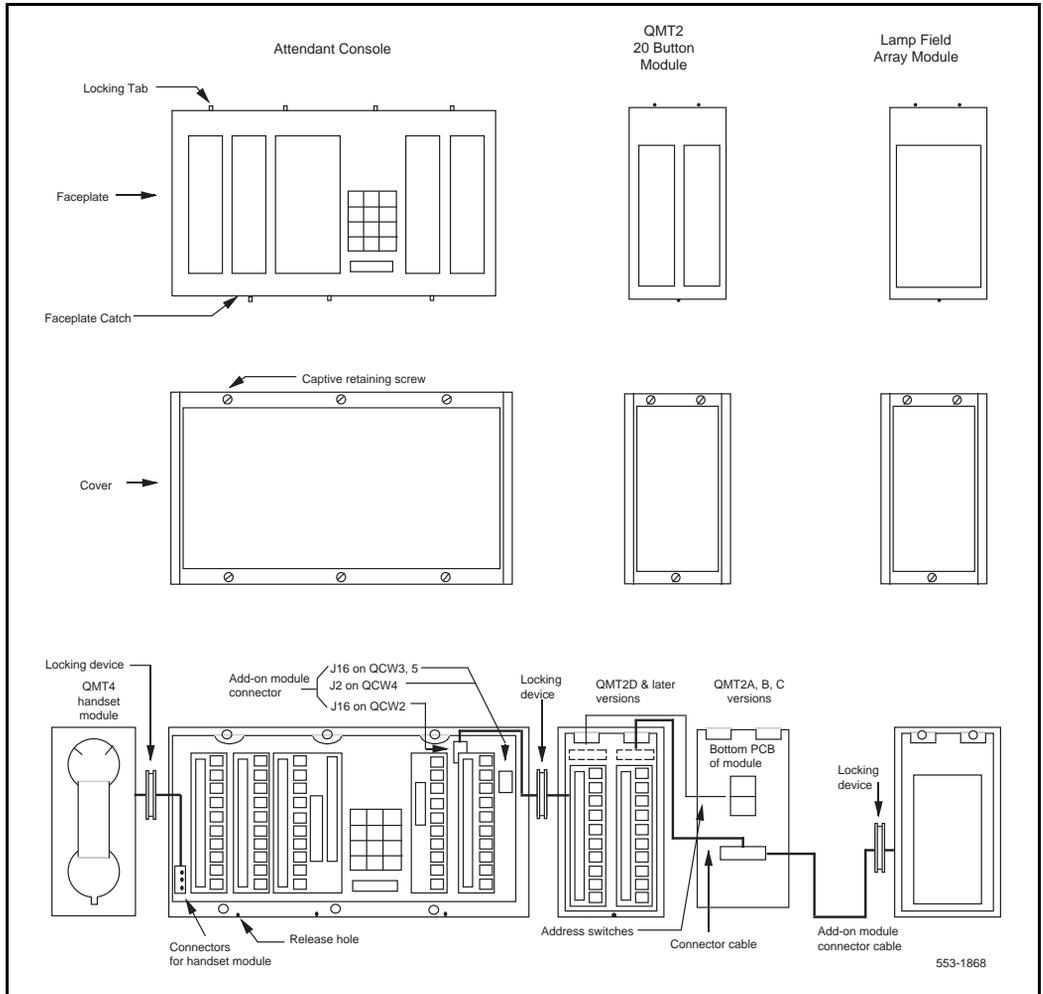
Figure 29
QMT3 Lamp Field Array connections to the SL-1 telephone
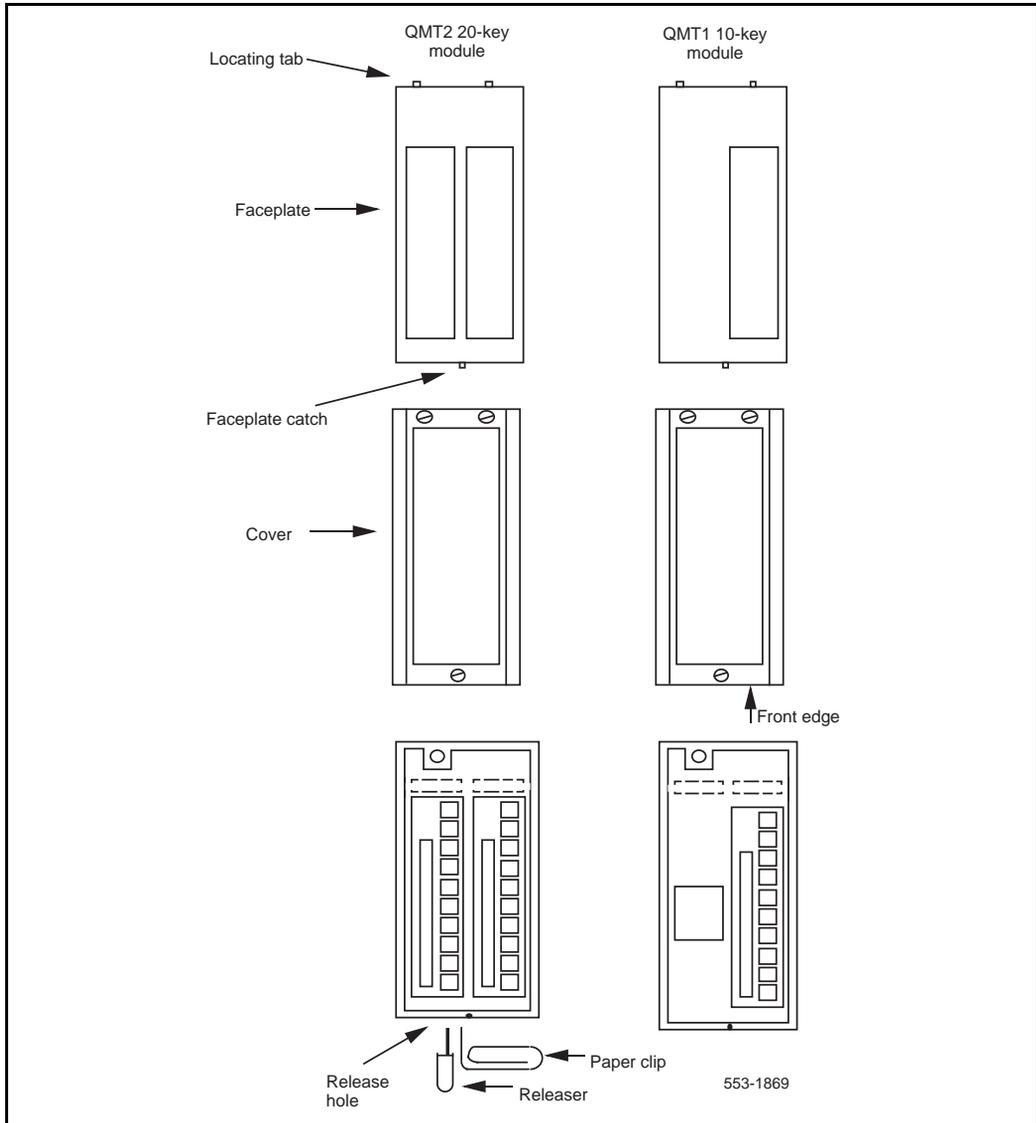
Busy Lamp Field/Console Graphics Module

The Busy Lamp Field/Console Graphics Module (BLF/CGM) obtains its power through the attendant console (see Figure 30). The requirements are

— a reference ground line (0 V)

— power source of 5 V for the CMOS electronics that control the Lamp Field Array module (c. 50 mA)

— power source of –12 V for the display of the Console Graphics Module (c. 10 mA)

— backlighting power

An external floating 16 V dc (300 mA) power supply is required to be cabled in at the local Main Distribution Frame (MDF) at a maximum of 120 ft (36 m) from the attendant console when the BLF/CGM is installed (A0367601—Transformer). This provides all the power requirements for the M2250 applications, and for backlighting support on the M1250. Basic functionality is supported on the M1250 without the power supply.

The BLF/CGM has a battery that provides backup power to maintain the Supplementary Information when the console is powered down. The battery lifetime is 5 years. To replace the battery, return the BLF/CGM to your supplier.

The BLF/CGM mounts on the back of the attendant console and is held on with snapfits and two screws.

The attendant console's top cover must be removed to install the BLF/CGM.

Refer to the *M1250/2250 Attendant Consoles user guide—North America* (P0800563) or the *Busy Lamp Field/Console Graphics Module user guide* (P0706875) for further information. Refer to *M1250 and M2250 Attendant Consoles description* (553-2201-117) for a description of M1250 and M2250 attendant consoles equipped with a BLF/CGM.

Follow normal antistatic precautions when installing the BLF/CGM onto the attendant console.

Figure 30
The Busy Lamp Field/Console Graphics Module on the M1250/M2250 attendant console
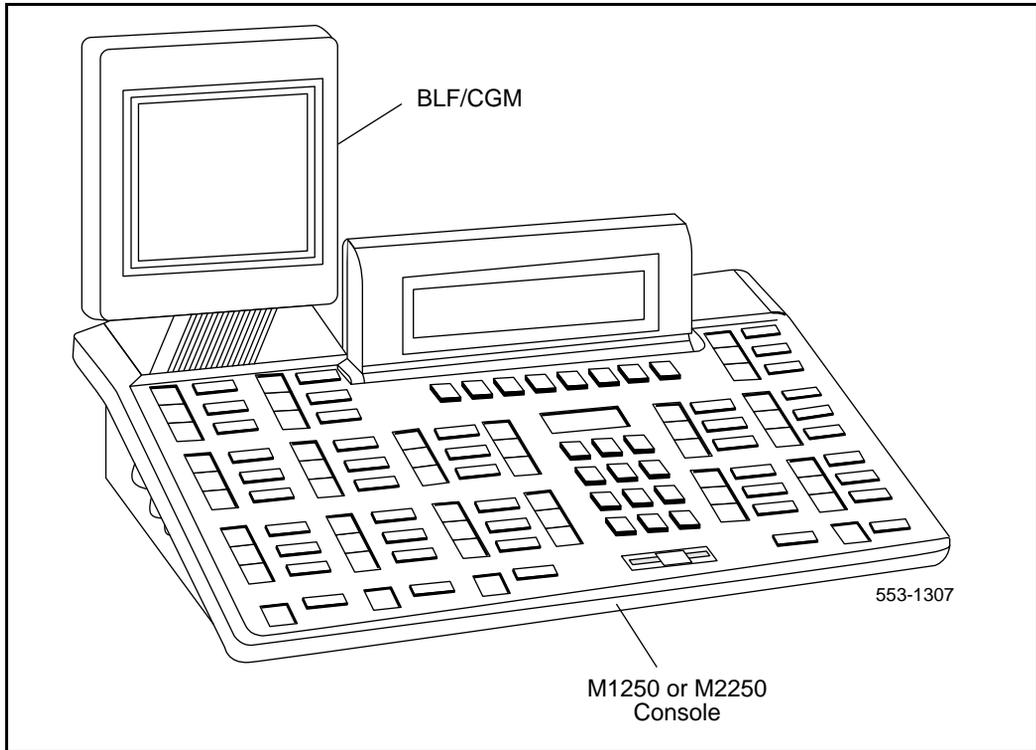
Procedure 40
Connecting the BLF/CGM to M1250 and M2250 attendant consoles

1   Disconnect the main power/system cable from the rear of the attendant console, and remove the handset jack plug from the side.

2   Move the adjustable display to the down position to protect it from damage while installing the Busy Lamp Field/Console Graphics Module (BLF/CGM). Also move the volume slider switch to the far left (see Figure 31).

Figure 31
Volume slider position
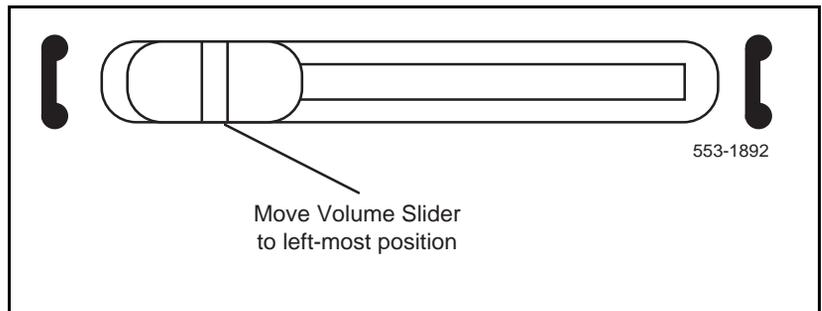
553-1892

Move Volume Slider
to left-most position

3   Place the attendant console facedown on a properly prepared work surface, taking care to avoid scratching or damaging the top cover or display. Remove the adjustable stand, if required.

The stand is secured with four screws. Remove the stand as a complete assembly, and set aside.

4   Remove the 12 fastening screws in the base of the attendant console that secure the top cover to the console base (see Figure 32). Holding the console base and cover firmly, turn it over so that the top cover is on, facing up.

5   For M1250 attendant consoles, raise and hold the top cover to disconnect the two flat cable connectors as well as the alerter cable connector from the bottom PCB (see Figure 33).

For the M2250 attendant console, raise and hold the top cover to remove the single cable connector only. The alerter cable does not need to be removed (see Figure 33).

Figure 32
Removing the fastening screws
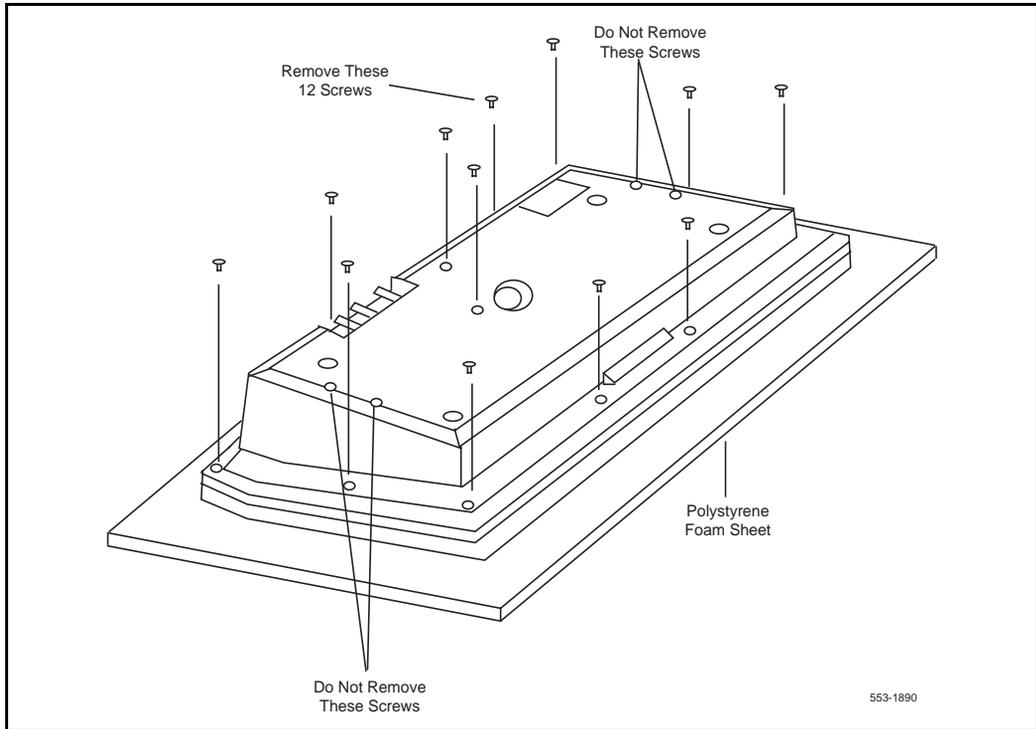
6   Remove the top cover and place it upside down to the left of the
        attendant console.

7   Remove the knockout section on the back of the attendant console
        (see Figure 34) with a small screwdriver or similar tool. Remove any
        remnants of the breakaway tags.

8   Feed the flat ribbon cable for the Busy Lamp Field/Console Graphics
        Module (BLF/CGM) through the knockout hole in the base of the
        attendant console.

9   Hold the BLF/CGM unit over the console in a vertical position, ensuring
        that the two locators on the bottom bracket of the BLF/CGM are
        located in the knockout hole.

10   Push down on the attendant console, while holding the BLF/CGM unit,
        until the two locators snap into place (see Figure 35).

Figure 33
Removing the top cover

Figure content labels:
On M1250 models remove
a) Flat cables (2 places)
b) Alerter connector

Top cover

Base

On M2250 models
remove flat cable

553-1308
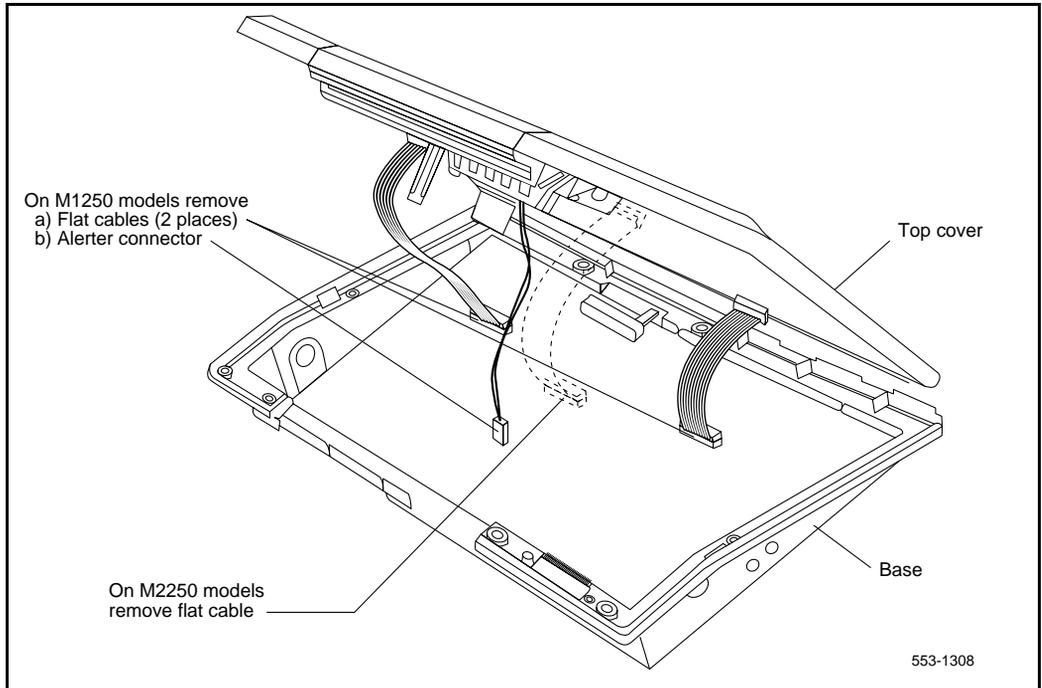
11   Fit the BLF/CGM ribbon cable onto the top cover circuit board, into the flexible strip connector J4 (so that the blue line on the cable faces away from the circuit board).

12   Hold the top cover over the attendant console and reconnect the cable connector(s) onto the base of the attendant console.

For the M1250, reconnect the alerter cable. Ensure that the protrusion on the support spacer is located in the correct slot on the console (see Figure 36).

13   Place the top cover on the console. Slide it back and down into place (see Figure 37). Check that all the cables are in the correct positions and that none are trapped.

14   Push the BLF/CGM display into position by rotating it back (see Figure 37).

Figure 34
Attendant console knockout section

Knockout Section
(Clean Away 6 Tags)

Base

553-1893
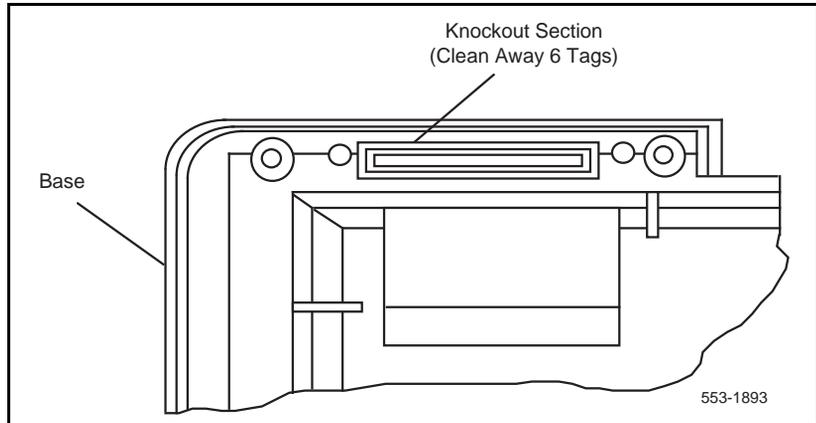
15 Ensuring that the volume slider is fully engaged in the correct slider, hold the top cover and console base firmly together. Turn the assembly upside down (see Figure 38).

16 Reinsert the 12 screws that secure the top cover to the console base and tighten.

17 Insert the two new screws supplied with the BLF/CGM that attach it to the base, and tighten (see Figure 38).

18 Cable in BLF power at the local Main Distribution Frame (MDF) as per M1250, M2250 cross-connections (see Procedure 9).

19 If required, replace the adjustable stand.

20 Reconnect the main system cable to the rear of the console.

21 If the BLF/CGM has been correctly installed, the main menu appears when you supply power to the attendant console. Test the BLF/CGM by selecting a menu option. Refer to *Busy Lamp Field/Console Graphics Module user guide* (P0706875) for programming information.

22 Define the Busy Lamp Field in the system database. Refer to *X11 features and services* (553-3001-305).

23 Test the Busy Lamp Field features using *M1250/2250 Attendant Consoles user guide—North America* (P0800563).

Figure 35
Connecting the BLF/CGM to the attendant console

BLF/CGM Flat cable

BLF/CGM

Base

553-1309
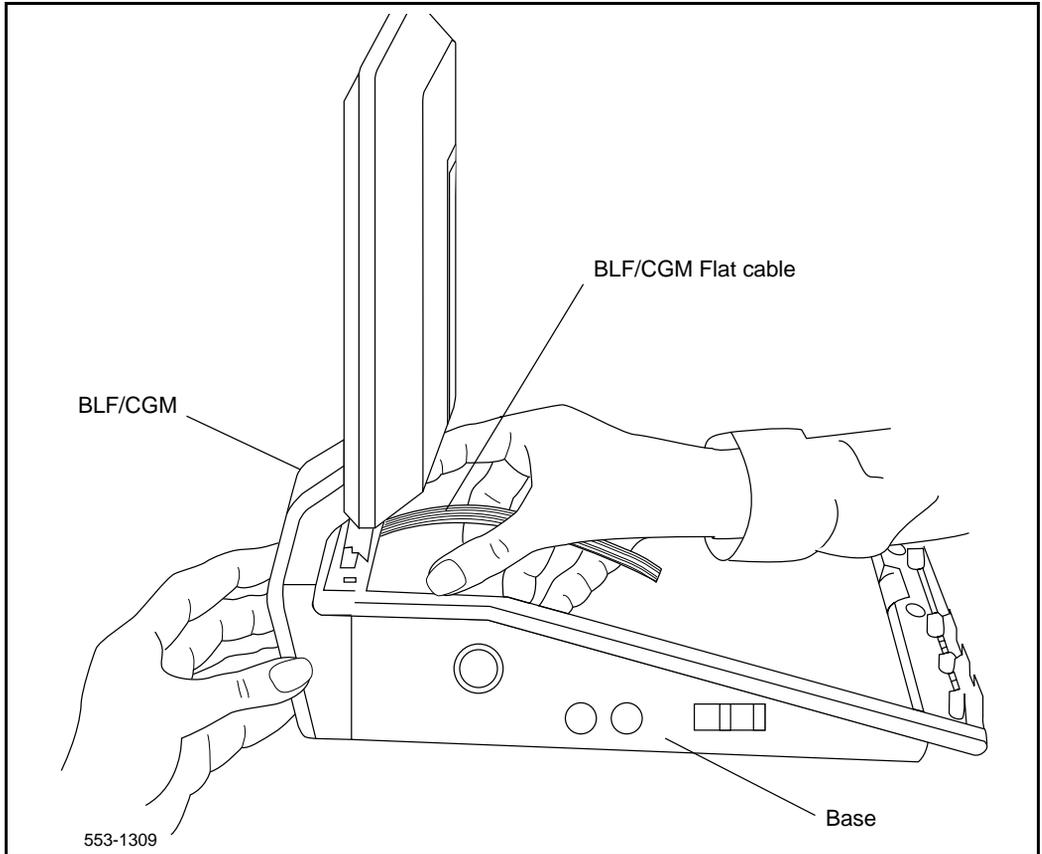
Figure 36
Support spacer

Top cover PCB

Boss on top cover

Ensure that protrusion
is located in slot

Support Spacer

Base PCB
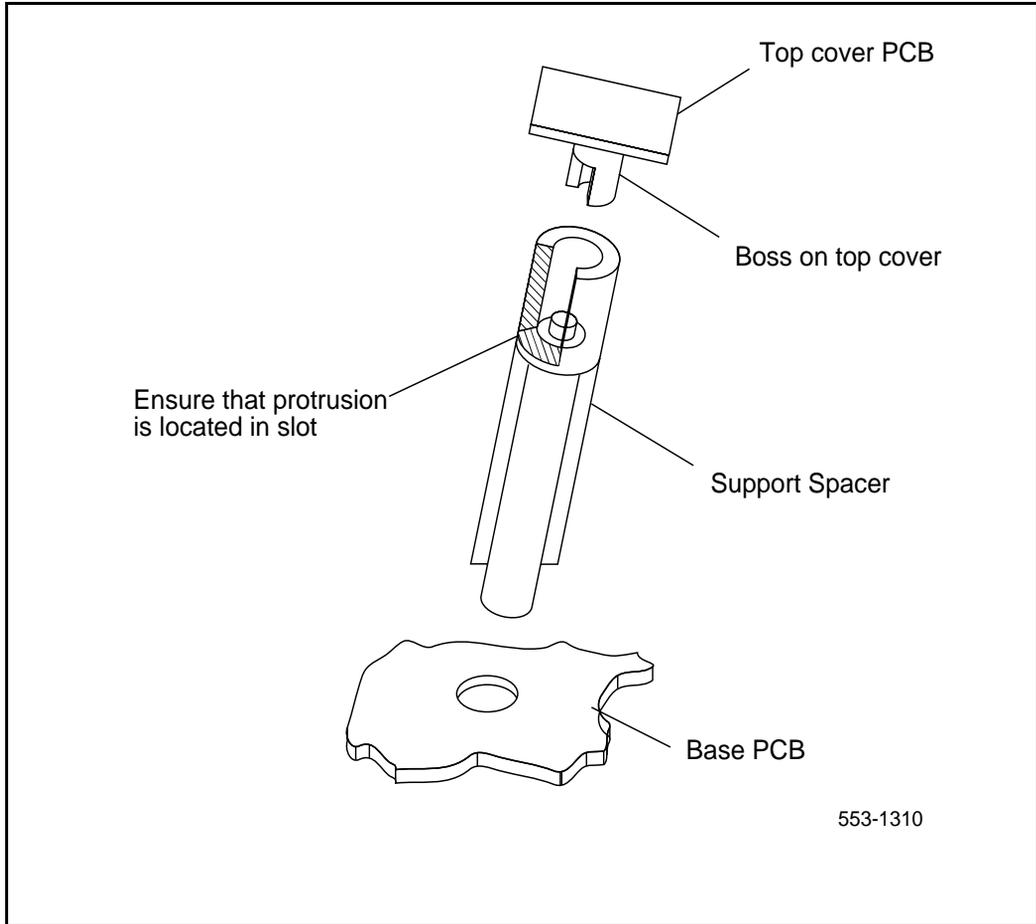
553-1310

Figure 37
Positioning the top cover and the BLF/CGM

553-1894
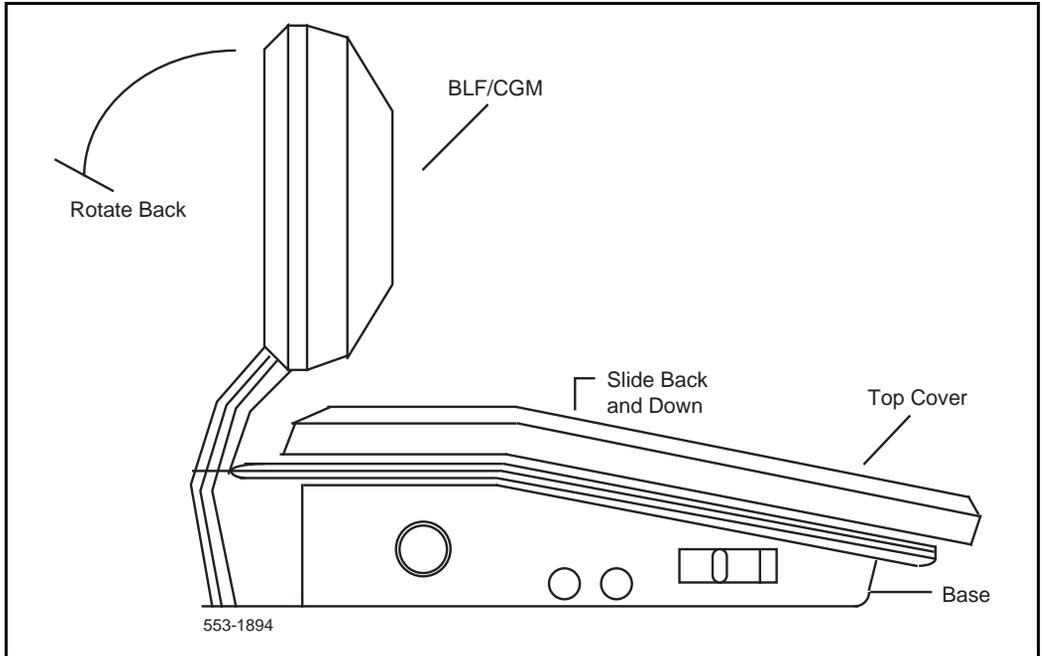
Figure 38
Attaching the top cover to the attendant console base and BLF/CGM

Fit 2 new screws

Re-Insert
12 Screws

553-1311

Polystyrene foam sheet
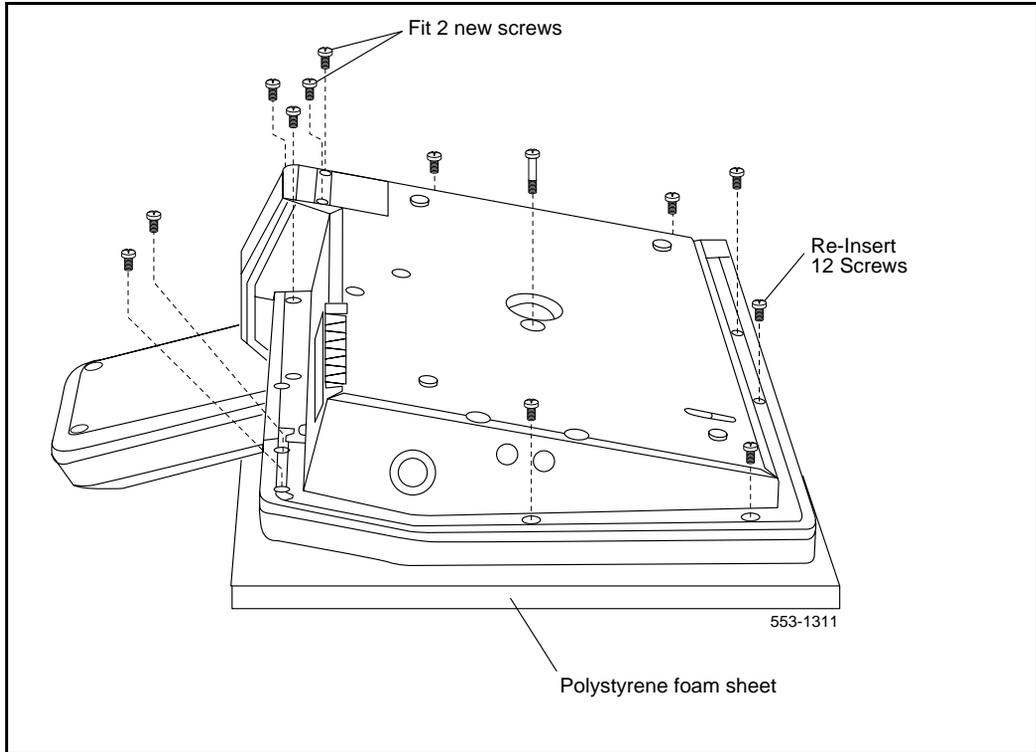
Procedure 41
Removing the Busy Lamp Field/Console Graphics Module

1   Disconnect the main power/system cable from the rear of the attendant console, and remove the handset jack plug from the side.

2   Move the adjustable display to the down position to protect it from damage while removing the BLF/CGM. Also move the volume slider switch to the far left (see Figure 31).

3   Place the attendant console facedown on a properly prepared work surface, taking care to avoid scratching or damaging the top cover or display. Remove the adjustable stand, if required.

     The stand is secured with four screws. Remove the stand as a complete assembly, and set it aside.

4   Remove the 12 fastening screws in the base of the attendant console that secure the top cover to the console base (see Figure 32).

     Remove the two screws securing the BLF/CGM to the base of the attendant console.

5   Holding the console base and cover firmly, turn it back over so that the top cover is on, facing up.

6   For M1250 attendant consoles, raise and hold the top cover to disconnect the two flat cable connectors as well as the alerter cable connector from the bottom PCB (see Figure 33).

     For the M2250 attendant console, raise and hold the top cover to remove the single cable connector only. The alerter cable does not need to be removed (see Figure 33).

7   Unplug the BLF/CGM ribbon cable from the attendant console.

8   Remove the top cover and place it upside down to the left of the attendant console.

9   Pull back the snap-fits on the BLF/CGM to disengage the BLF/CGM from the attendant console.

10   Place the top cover on the console. Slide it back and down into place (see Figure 37). Reconnect all cables in the correct positions, and make sure that none are trapped.

11   Ensuring that the volume slider is fully engaged in the correct slider, hold the top cover and console base firmly together. Turn the assembly upside down (see Figure 38).

12   Reinsert the 12 screws that secure the top cover to the console base and tighten.

13   If required, replace the adjustable stand.

14   Reconnect the main system cable to the rear of the console.

Attendant Supervisory Module (M2250 console)

The M2250 digital attendant console needs the Attendant Supervisory Module (ASM) to allow supervision. The M2250 cannot be connected to a QPC297 Attendant Console Monitor circuit card. With the ASM installed, the M2250 attendant console can be supervised just like any other attendant console. An M2250 attendant console configured as a supervisor does not need the ASM installed.

To accept the ASM, the minimum vintage M2250 attendant console is AD. To fully support the ASM, the minimum vintage BLF/CGM is AB. The third PWR TN must be programmed and wired out to support the ASM (see Figure 14).

Procedure 42
**Installing an Attendant Supervisory Module in an M2250
attendant console**

CAUTION

Before handling internal set components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

---

1   Disconnect the main power/system cable from the rear of the attendant console, and remove the handset jack plug from the side.

2   Move the adjustable display to the down position to protect it from damage while installing the ASM. Move the volume slider switch to the left-most position.

3   Place the attendant console facedown on a properly prepared work surface, taking care to avoid scratching or damaging the top cover or display. Remove the adjustable stand, if equipped.

The stand is secured with four screws. Loosen the screws and remove the stand as a complete assembly, and set aside.

4   Remove the 12 fastening screws in the base of the attendant console that secure the top cover to the console base (see Figure 32). Holding the console base and cover firmly, turn it back over so that the top cover is on, facing up.

5   Raise and hold the top cover to remove the single cable connector. The alerter cable does not need to be removed (see Figure 33). Remove the top cover and place it upside down to the left of the attendant console.

6   The attendant console's main PCB has holes located in the upper right-hand side, near grid positions D1, D5, and A5 (see Figure 39). Insert one standoff in each of the holes, twisting it until it is secure.

CAUTION

Once you insert a standoff, it cannot be removed. Be sure to place each standoff in the correct hole on the main PCB, as shown in Figure 39.

---

7   Position the ASM board over the J3 connector on the console's main PCB. Align the holes on the ASM board with the standoffs and carefully work the ASM pin connector onto connector J3 until firmly seated. See Figure 39.

8   Hold the top cover over the attendant console and reconnect the cable connector onto the base of the console.

9   Place the top cover on the console. Slide it back and down into place. Check that all the cables are in the correct positions, and that none are trapped.

10   Ensure that the volume switch is fully engaged in the correct slider. Hold the top cover and console base firmly together. Turn the assembly upside down.

11   Reinsert the 12 screws that secure the top cover to the console base and tighten.

12   If required, replace the adjustable stand.

13   Reconnect the main system cable to the rear of the console.

14   Test the supervisory console feature to make sure you can now properly supervise the M2250 attendant console. Refer to *M1250/2250 Attendant Consoles user guide—North America* (P0800563).

Figure 39
Identifying the correct grid positions on the main PCB and attaching the ASM
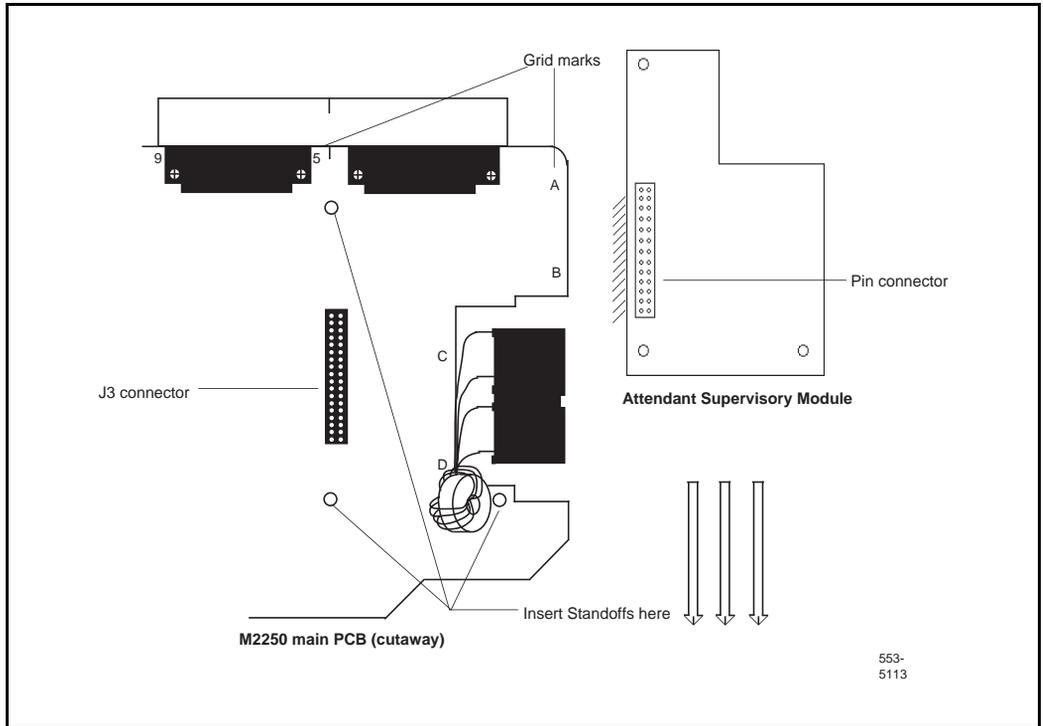
QMT4 and QMT15 handset modules

The following procedures describe the installation and removal of QMT4 and QMT15 handset modules:

— Procedure 43 explains how to connect QMT4A or B handset modules to a QCW2, QCW3, or QCW4 (or earlier vintage) attendant consoles.

— Procedure 44 explains how to disconnect QMT4A and B handset modules.

— Procedure 45 explains how to connect QMT4C handset modules to all types of attendant consoles.

— Procedure 46 explains how to connect QMT15 amplified handset modules to QCW4E (and later vintages of) attendant consoles.

— Procedure 47 explains how to disconnect a QMT15 amplified handset module or a QMT4C handset module from QCW4E (and later vintages of) attendant consoles.

— Procedure 48 explains how to connect QMT15 amplified handset modules to QCW2, QCW3, or QCW4D (and earlier vintages of) attendant consoles.

— Procedure 49 explains how to disconnect QMT15 amplified handset modules from QCW2, QCW3, or QCW4D (or earlier vintages of) attendant consoles.

The QMT4 A/B handset module can be attached to the left side of the attendant console or left freestanding, but it cannot be connected to the QCW4E attendant console.

See Figure 40 for an illustration of the QMT4 A/B handset module attached and connected to the attendant console.

The QMT4C can be installed on all attendant consoles.

See Figure 41 for an illustration of the QMT4A, B, and C handset module.

The QMT15 amplified handset module (see Figure 42) cannot be installed on QCW4E (and earlier) attendant consoles equipped with a QMT3 Lamp Field Array (LFA) module.

The QMT15 module cannot be installed on QCW2, QCW3, or QCW4D (and earlier) attendant consoles equipped with a QMT3 LFA module.

See Figure 43 for an illustration of the current limiting kit connections.

Procedure 43
Connecting the QMT4 A/B handset module on a QCW2, QCW3, or QCW4D (or earlier vintages of) attendant console

1   Unplug the handset from the attendant console.

2   For QCW2 only: Disengage the first LED strip on the left side of the attendant console by loosening the retaining clips at each end of the LED strip.

3   Remove the filler plate from the right side of the handset module and the left side of the attendant console. Store the filler plates.

4   Place the right side of the handset module against the left side of the attendant console aligning the filler plate openings.

5   Lock the module to the attendant console by inserting the plug adapter into the filler plate opening.

6   Insert the module wiring harness through the plug adapter into the attendant console.

7   In the attendant console, disconnect the six leads connecting the handset jacks to the printed circuit board (PCB). Insulate and store the six leads.

8   Connect the six leads of the module wiring harness to the attendant console PCB (see Table 26).

9   For QCW2 only: Replace the LED strip and secure with the two retaining clips.

10   Plug the handset into the jacks on the left side of the handset module.

Procedure 44
Disconnecting the QMT4 A/B handset module

1   For QCW2 only: Disengage the first LED strip on the left side of the attendant console by loosening the retaining clips at each end of the LED strip.

2   In the attendant console, disconnect the six leads of the handset module wiring harness from the PCB.

3   Locate the six insulated handset jack leads stored in the attendant console base.

4   Remove the tape from the ends of the leads and connect the leads to the PCB.

5   Unlock the handset module from the attendant console by removing the plug adapter from the filler plate.

6   Install a filler plate in the filler plate opening on the attendant console.

7   For QCW2 only: Reinstall the LED strip and secure it with the two retaining clips.

8   Plug the handset into the handset jacks on the lower left side of the attendant console.

Procedure 45
Connecting the QMT4C handset module

1   Unplug the handset from the attendant console.

2   Insert the plugs on the right side of the QMT4C into the jacks on the left side of the attendant console.

3   Plug the handset into the left side of the handset module.

Figure 40
The QMT4 A/B handset module attached and connected to the attendant console
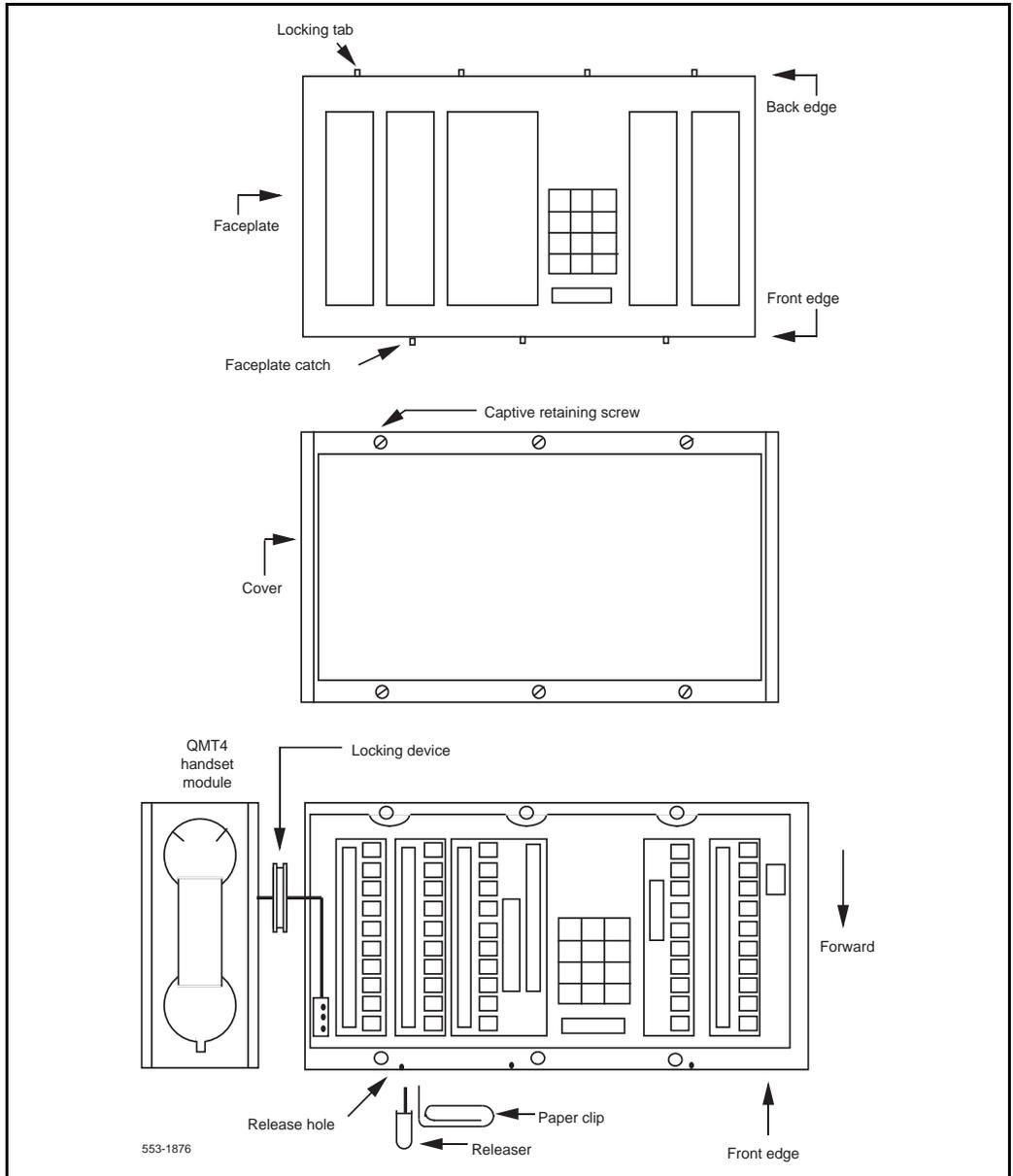
Procedure 46
Connecting the QMT15 amplified handset module to a QCW4E
(and later) attendant console

1   Unplug the handset from the attendant console.

2   Remove and store the filler plate from the opening on the left side of
     the attendant console.

3   Insert the plugs on the right side of the QMT15 module into the jacks
     on the left side of the attendant console.

4   Ensure that the locking device on the right side of the module is
     properly seated in the opening on the left side of the attendant console.

5   Tighten down the two locking screws on the locking device. The
     locking screws should protrude through the bottom of the locking
     device and press against the inside of the attendant console housing.

6   Plug the handset into the left side of the handset module.

Procedure 47
Disconnecting a QMT4C or QMT15 handset module from
a QCW4E attendant console

1   Unplug the handset from the handset module.

2   If QMT4C, unplug the module from the left side of the attendant
     console and go to step 6.

3   If QMT15, loosen the two locking screws on the locking device until the
     screws no longer protrude through the bottom of the locking device.

4   Unplug the module from the side of the attendant console.

5   Install a filler plate in the opening on the left side of the attendant
     console.

6   Plug the handset into the left side of the attendant console.

Procedure 48
Connecting a QMT15 amplified handset module to a QCW2,
QCW3, or QCW4D (or earlier) attendant console

1   Remove and store the filler plate from the opening on the left side of
         the attendant console.

2   Pass the connector assembly (housed in the handset module) through
         the locking device on the right side of the module.

3   Insert the plugs on the right side of the QMT15 module into jacks on
         the left side of the attendant console.

4   Ensure that the locking device on the right side of the module is
         properly seated in the opening on the left side of the attendant console.

5   Tighten down the two locking screws on the locking device. The
         locking screws should protrude through the bottom of the locking
         device and press against the inside of the attendant console housing.

6   Extend the connector assembly from the QMT15 module to the jack in
         the attendant console. Insert the plug into the jack.

         —   If the attendant console is equipped with QMT1 and/or QMT2
            add-on key/lamp module(s), remove the faceplate(s) and
            cover(s), extend the connector assembly through the openings
            between the modules, and connect the plug into the jack in the last
            module.

         —   If the QMT2 module is of C vintage or earlier, remove the screws
            securing the circuit board to the module housing and remove the
            circuit board. Insert the plug of the connector assembly into jack
            J1, replace the circuit board, and secure with screws.

7   Ensure that the connector assembly wiring does not interfere with the
         attendant console and module (if equipped) covers.

8   Replace the cover and faceplate on the QMT1 and/or QMT2 modules
         if equipped.

9   Plug the handset into the handset module.

Procedure 49
Disconnecting a QMT15 amplified handset module from a QCW2,
QCW3, or QCW4D (or earlier) attendant console

1   Unplug the handset from the handset module.

2   Remove the faceplate and cover from the QMT1 and/or QMT2
    key/lamp module(s) if equipped.

3   Remove the connector assembly plug from the jack in the attendant
    console or last key/lamp module (if equipped).

    If the QMT2 module is vintage C or earlier, remove the screws
    securing the circuit board to the module housing and remove the circuit
    board. Remove the connector assembly plug from jack J1. Replace the
    circuit board and secure with screws.

4   Remove the connector assembly from the module(s) and/or attendant
    console.

5   Loosen the two locking screws on the locking device (between the
    handset module and the attendant console) until the screws no longer
    protrude through the bottom of the locking device.

6   Unplug the QMT15 handset module from the attendant console.

7   Install a filler plate in the opening on the left side of the attendant
    console.

8   Replace the cover and faceplate on the QMT1 and/or QMT2 module(s)
    if provided.

9   Plug the handset into the attendant console.

Table 26
QMT4 A/B handset module wiring harness connections

Lead color	PCB designation
V-O	AAA
V-G	BBB
S-BR	CCC
S-W	DDD
V-S	HANDSET
V-BR	VSS

Table 27
Attendant console and key/lamp add-on module jack numbering

Equipment	Jack Number
QMT1 add-on module	J2
QMT2C add-on module	J1
QMT2D add-on module	J2
QCW2, QCW3, and QCW5 attendant consoles	J16
QCW4 attendant console	J2

Figure 41
QMT4A, B, and C handset module

Faceplate

Top View
handset assembly removed
QMT4C

Plugs

Faceplate

Top view
handset assembly removed
QMT4A, B

Handset assembly

Cover

Foot

Base

Filler plate

Plugs on QMT4C
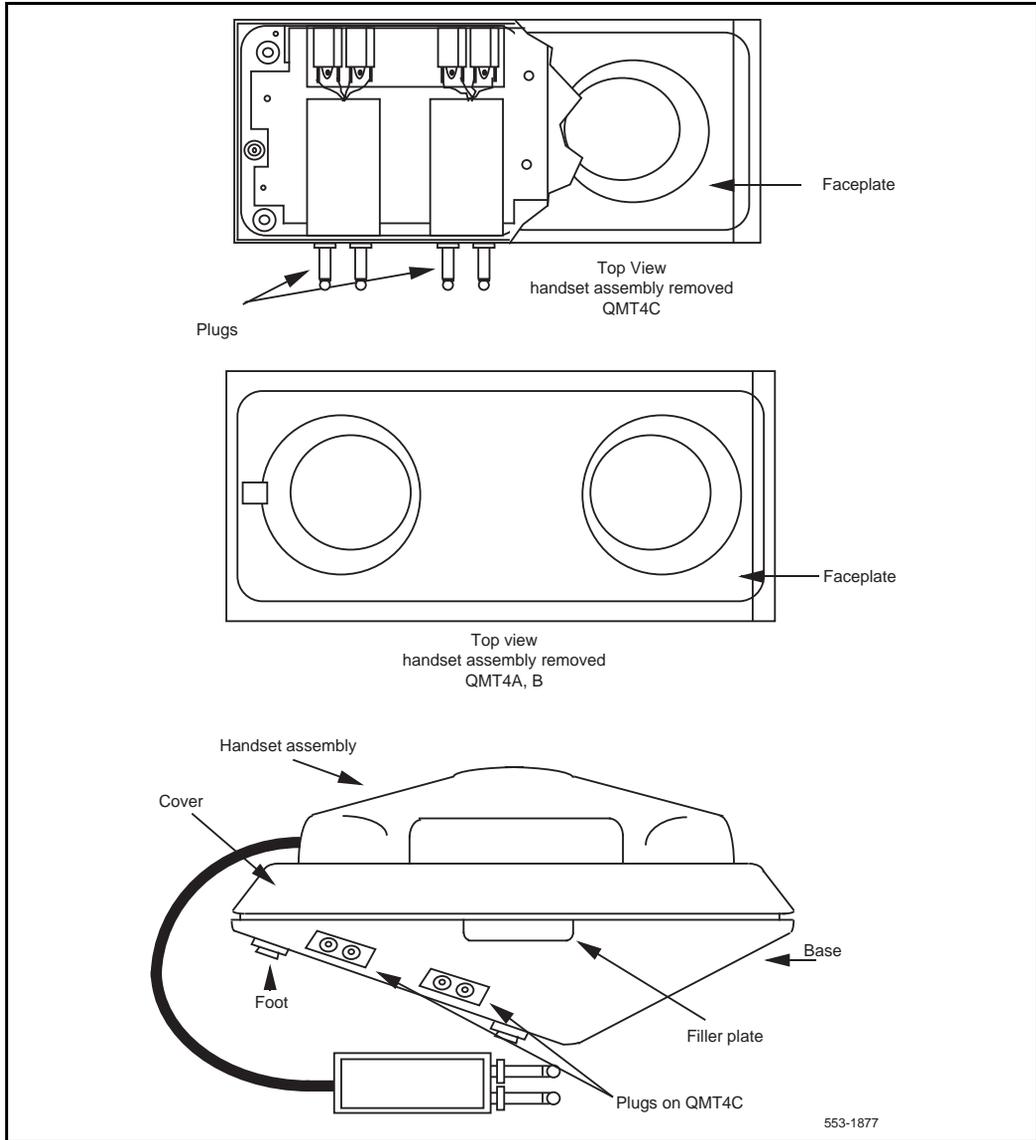
553-1877

Figure 42
QMT15 amplified handset module

Faceplate

Top view
handset assembly removed
QMT 15

QPC17 circuit
pack assembly

Locking screws

Plug adapter

NE-G3QDRNC-03
handset assembly

Cover

Base

Foot

Plug adapter

Locking screws
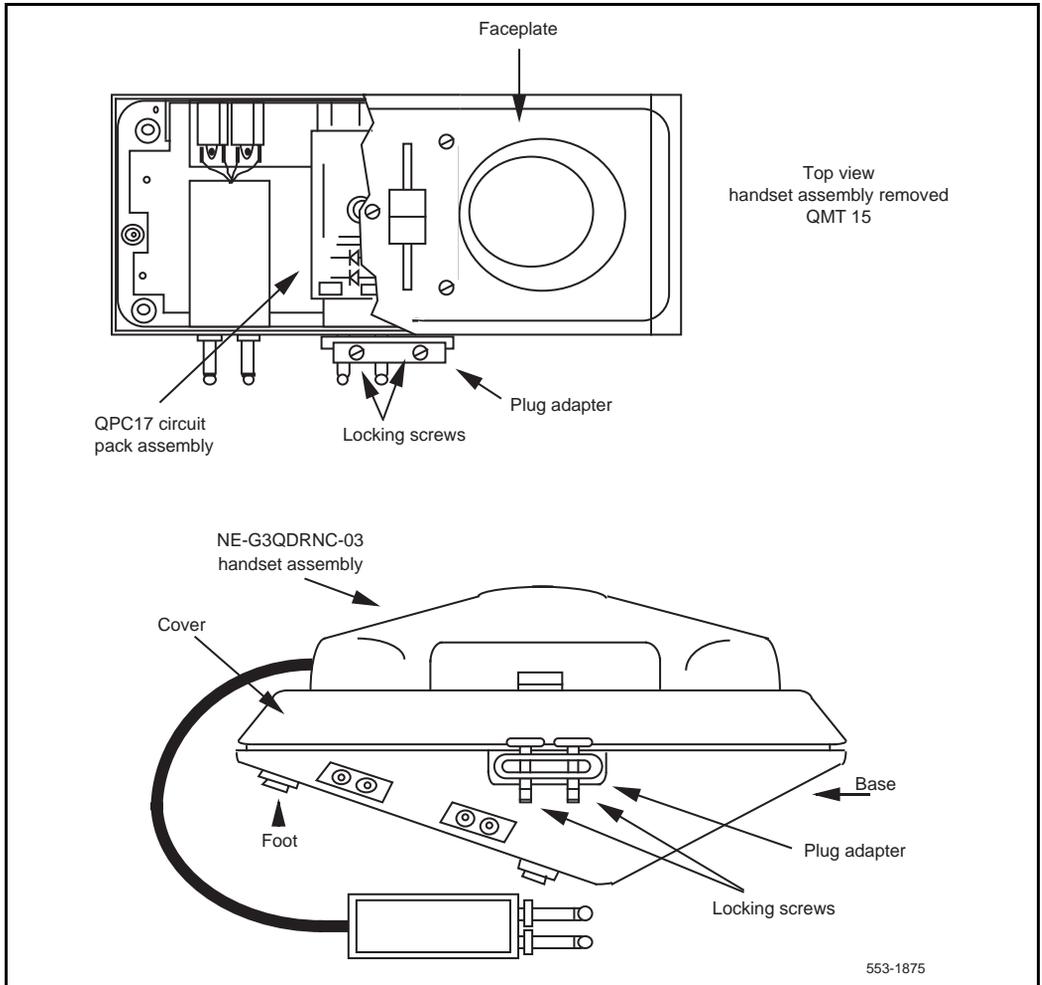
553-1875

Figure 43
Current limiting kit connections
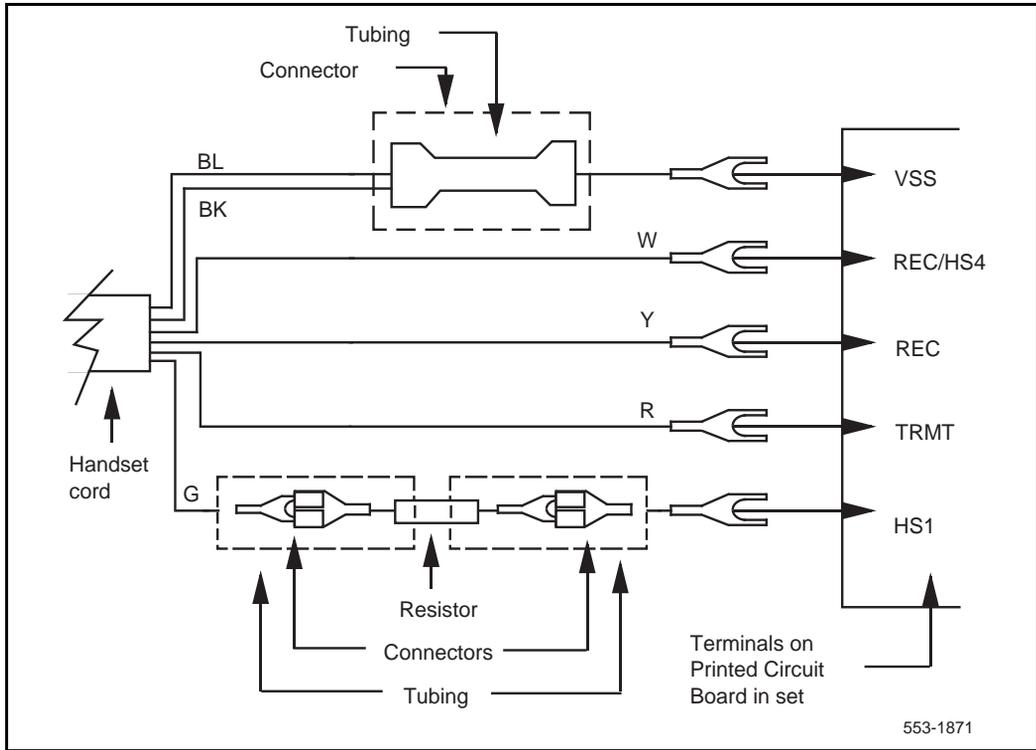
553-1871

Amplified handset on SL-1 telephones

A Current Limiting kit (P0630408) is required to install the amplified handset on an SL-1 telephone.

Procedure 50
Connecting an amplified handset

1   Disconnect the existing handset cord from terminals TRMR, REC/HS4, REC, and VSS on the printed circuit board (PCB) in the telephone.

2   Remove the handset and cord from the telephone.

3   Connect the white lead from the cord of the amplified handset to terminal REC/HS4 on the PCB in the telephone.

4   Connect the yellow lead from the cord of the amplified handset to terminal REC on the PCB in the telephone.

5   Connect the red lead from the cord of the amplified handset to terminal TRMR on the PCB in the telephone.

6   Connect the blue and black leads from the cord of the amplified handset together with the bridging connector supplied with the Current Limiting kit.

7   Connect the extension lead (provided with the kit) to the bridging connector and insulate with tubing.

8   Connect the extension lead to the terminal VSS on the PCB in the telephone.

9   Connect the green lead from the cord of the amplified handset to the connector on the resistor (provided with the kit) and insulate with tubing.

10   Connect the extension lead (provided with the kit) to the resistor and insulate with tubing.

11   Connect the extension lead to connector HS1 on the PCB in the telephone.

12   Secure the handset cord to the telephone with the retaining clip on the cord.

Procedure 51
Disconnecting an amplified handset

1   Disconnect the amplified handset cord from terminals VSS, REC/HS4, REC, TRMR, and HS1 on the printed circuit board in the telephone.

2   Remove the handset and cord from the telephone.

3   Connect one white lead from the cord of the regular G-type handset to terminal REC/HS4 on the PCB in the telephone.

4   Connect the second white lead from the cord of the handset to terminal REC on the PCB in the telephone.

5   Connect the red lead from the cord of the handset to terminal TRMR on the PCB in the telephone.

6   Connect the black lead from the cord of the handset to terminal VSS on the PCB in the telephone.

7   Secure the handset cord to the telephone with the retaining clip on the cord.

NE-G6QDC amplified handset on SL-1 telephones

A Current Limiting kit P0630408 is required to install the amplified handset on an SL-1 telephone.

Procedure 52
Installing an amplified handset

1   Unpack and inspect the Current Limiting kit and handset for damage.

2   Remove the faceplate and cover from the SL-1 telephone.

3   Connect the Current Limiting kit and the amplified handset.

4   Reattach the cover and faceplate to the telephone.

5   Test the telephone by placing a call and adjusting the volume control on the handset.

Procedure 53
Removing an amplified handset

1   Remove the faceplate and cover from the telephone.

2   Disconnect the Current Limiting kit and handset and connect the
        regular handset.

3   Reattach the faceplate and cover to the telephone.

4   Test the telephone by placing a call.

QKK1 and QKK3 Handsfree unit interface kits

The QKK1 kit is used to modify an SL-1 telephone when a QSU-type
Handsfree unit is to be added to the telephone.

The QKK3 kit is used to modify an SL-1 telephone when a QSU-type
Handsfree unit is to be added to the telephone and Automatic Answerback is
to be provided. The addition of a QKK3 kit reduces the number of key strip
modules that can be added to an SL-1 telephone. Refer to *Meridian 1
telephones description and specifications* (553-3001-108) for add-on module
limitations.

Both kits require a 24 V ac power supply and can be used to extend the range
of the telephone as described in *Meridian 1 telephones description and
specifications* (553-3001-108).

Procedures 54 and 55 explain how to connect and disconnect the QKK1
interface kit, and Procedures 56 and 57, the QKK3 interface kit.

Procedure 54
Connecting the QKK1 kit

1 Disconnect the loudspeaker leads.

2 Remove the left-hand filler plate from the telephone.

3 Mount the PCB of the kit in the base of the telephone using the two attached mounting screws.

4 Connect the Y-BR lead of the PCB to the C15 terminal in the telephone or to the REM PWR terminal.

5 Insert connector P3 of the kit into jack J3 of the telephone.

6 Insert the kit's 15-pin plug assembly into the left-hand filler plate opening.

7 Connect the 25 V ac auxiliary power supply to the telephone.

8 Connect the loudspeaker leads.

Procedure 55
Disconnecting the QKK1 kit

1 Disconnect the loudspeaker leads.

2 Remove the kitS 15-pin plug assembly from the left-hand filler plate opening in the telephone.

3 Remove connector P3 of the kit from jack J3 of the telephone.

4 Disconnect the Y-BR lead of the kit PCB from the C15 terminal in the telephone or from REM PWR terminal.

5 Remove the two mounting screws that secure the kit PCB in the base of the telephone. Remove the PCB.

6 Connect the loudspeaker leads.

7 Insert a filler plate into the filler plate opening.

8 Disconnect the 25 V ac if it is not required.

Procedure 56
Connecting the QKK3 kit

1   Disconnect the loudspeaker leads.

2   Remove the left-hand filler plate from the telephone.

3   Mount the PCB of the kit in the base of the telephone using the two attached mounting screws.

4   Insert connector P3 of the kit into jack J3 of the telephone.

5   If the telephone is equipped with a digit display or add-on module, move connector P1 of the digit display or add-on module from jack J1 of the telephone to jack J2 of the kit.

6   Insert connector P1 of the kit into jack J1 of the telephone.

7   Insert the kit's 15-pin plug assembly into the filler plate opening.

8   Connect a 25 V ac auxiliary power supply to the telephone.

9   Connect the loudspeaker leads.

Procedure 57
Disconnecting the QKK3 kit

1   Disconnect the loudspeaker leads.

2   Remove the kit's 15-pair plug assembly from the left-hand filler plate opening in the telephone.

3   Remove connector P1 of the kit from jack J1 of the telephone.

4   If the telephone is equipped with a digit display or add-on module, move connector P1 of the digit display or add-on module from jack J2 of the kit to jack J1 of the telephone.

5   Remove connector P3 of the kit from jack J3 of the telephone.

6   Remove the two mounting screws securing the kit PCB in the base of the telephone. Remove the PCB.

7   Connect the loudspeaker leads.

8   Insert a filler plate into the filler plate opening.

9   Disconnect the 25 V ac supply if it is not required.

QSU1 Handsfree unit

Connection of a Handsfree unit to an SL-1 telephone requires a QKK1 Handsfree or QKK3 automatic Handsfree interface kit.

Only the QUS1C2 vintage Handsfree unit requires modification when used with a QKK3 interface kit. Other vintages of QUS1C Handsfree units do not require modification.

Procedure 58
Connecting the QSU1 Handsfree unit

1   Remove straps E1 and E2 on the PCB of the telephone if equipped; otherwise, move the connection from terminal TRMR to KR2 and from terminal REC/HS4 to KR4.

For QSU1C and QSU1D telephones, the dial pad must be removed to gain access to E2. For QSU1F telephones, disconnect one end of E1 and E2 by loosening the screw terminal and bending back the straps. Ensure that these straps do not contact any other terminal. Tighten the screws. These wiring modifications must be reversed if the QKK unit is removed.

2   Install the interface kit as described in Procedure 54 (QKK1) or Procedure 56 (QKK3).

3   Plug the Handsfree unit into the interface kit's 15-pin connector.

Procedure 59
Modifying a QUS1C2 Handsfree unit used with a QKK3 interface kit

1   Loosen the retaining screws on the bottom of the Handsfree unit, and remove the cover.

2   Move the Y-S lead from terminal B.*(2C for QUS1C4/5) to terminal VBB with the R-G lead.

3   Move the S-Y lead from terminal R.*(M2 for QUS1C4/5) to terminal ON with the O-V lead.

4   Move the G lead from terminal M2.*(2O for QUS1C4/5) to terminal OFF with the S-V lead.

5   Replace the cover on the QUS1C unit and tighten the retaining screws.

It is not necessary to return these leads to their original terminals when using a QKK2 interface kit.

Procedure 60
Disconnecting the QSU1 Handsfree unit

1   Reconnect straps E1 and E2 on the PCB of the telephone, if equipped. Otherwise, move the connection from terminal KR2 to TRMR and from terminal KR4 to REC/HS4.

For QSU1C and QSU1D telephones, the dial pad must be removed to gain access to E2. For QSU1F telephones, bend the E1 and E2 straps back to the terminals and reconnect. Tighten the screws.

2   Unplug the Handsfree unit from the interface kit's 15-pin connector.

3   Remove the interface kit if not required for remote powering.

Handsfree unit on a QSU71 telephone

QSU71 telephones are shipped with Handsfree enabled. If Handsfree has been disabled, follow the steps in Procedure 61.

Procedure 61
Enabling Handsfree

1   Remove the handset and place it beside the telephone.

2   Place the telephone facedown on a flat surface and leave it in this position until after the base and TELADAPT cords are reattached.

3   Disconnect the TELADAPT cords from the base of the telephone.

4   Remove the four retaining screws from the base of the QSU71 telephone and carefully lift off the base.

5   Locate the 3-pin header connector J6 on the upper housing circuit board. If Handsfree is disabled, the header connector removable plug will not be inserted into the connector J6 socket pin 1 (pin 1 of the 3-pin header connector is indicated by a white dot on the circuit board).

6   Unplug the removable header connector by gently pulling on the solid head of the removable plug.

7   Place the removable plug into the connector, ensuring pins 1 and 2 are connected to the pins 1 and 2 of the connector socket.

8 If Automatic Answerback is required, go to Procedure 63; otherwise, reattach the base of the telephone to the upper housing cover using the four screws removed in step 4.

9 Reconnect the TELADAPT cords to the base of the telephone.

10 Turn the telephone faceup and place the handset on the hook.

Procedure 62
Disabling Handsfree

1 Remove the handset and place it beside the telephone.

2 Place the telephone facedown on a flat surface and leave it in this position until after the base and TELADAPT cords are reattached.

3 Disconnect the TELADAPT cords from the base of the telephone.

4 Remove the four retaining screws from the base of the QSU71 telephone and carefully lift off the base.

5 Locate the 3-pin header connector J6 on the upper housing circuit board.

If Handsfree is enabled, header connector removable plug pins 1 and 2 will be inserted into the connector J6 socket pins 1 and 2 (pin 1 of the 3-pin header connector is indicated by a white dot on the circuit board).

6 Unplug the header connector by gently pulling on the solid head of the removable plug.

7 Place the removable plug into the connector, ensuring pin 1 is not connected to the connector socket.

8 Reattach the base of the telephone to the upper housing cover using the four screws removed in step 4.

9 Reconnect the TELADAPT cords to the base of the telephone.

10 Turn the telephone faceup and place the handset on the hook.

QKK8 Automatic Answerback

The QKK8 Automatic Answerback kit can be installed only in M1109 Compact (QSU71) telephones.

Procedure 63
Installing the QKK8 unit

1   Remove the handset and place it beside the telephone.

2   Place the telephone facedown on a flat surface and leave the telephone in this position until after the base and TELADAPT cords are reattached.

3   Disconnect the TELADAPT cords from the base of the telephone.

4   Remove the four retaining screws from the base of the QSU71 telephone, and carefully lift off the base and place it beside the telephone.

5   Place the QKK8 unit on top of the mounting holes located on the top right corner of the base (viewed with the base flat, handset to the left).

6   Secure the QKK8 unit to the base of the telephone with the screws provided.

7   Connect the QKK8 connecting plug to the J3 connector (located on the upper housing circuit board).

8   Reattach the base of the telephone to the upper housing using the screws removed in step 4.

9   Turn the telephone faceup and place the handset on the hook.

Procedure 64
Removing the QKK8 unit

1   Remove the handset and place it beside the telephone.

2   Place the telephone facedown on a flat surface and leave it in this position until after the base and TELADAPT cords are reattached.

3   Disconnect the TELADAPT cords from the base of the telephone.

4   Remove the four retaining screws from the base of the QSU71 telephone, and carefully lift off the base and place it beside the telephone.

5   Disconnect the QKK8 connecting plug from the J3 connector (located on the upper housing circuit board).

6   Remove the screws attaching the QKK8 unit to the base of the telephone, and remove the QKK8 unit from the base.

7   Reattach the base of the telephone to the upper housing using the screws removed in step 4.

8   Turn the telephone faceup and place the handset on the hook.

See Table 28 for a listing of the SL-1 telephone connections.

Table 28
SL-1 telephone connections

Mounting cord		Connecting block designations				Inside wire colors	
Lead name	Color	NE-47QA or QBB1B	NE-283 73 5001 adapter	NE-625F TELADAPT	Z station wire	16-25-pair	Connect to equipment TN
Audio T	G	G	1T	T1 (G)	G	W-BL	First pair Tip
Audio R	R	R	1R	R1 (R)	R	BL-W	First pair Ring
SIG T	BK	BK	X1	AUX (BK)	BK	W-O	Second pair Tip
SIG R	Y	Y	X2	GRD (Y)	Y	O-W	Second pair Ring
AC1	BL	5	R	T2 (BL)		W-SL	Aux power Note 1
AC1	W	6	B	R2 (W)		SL-W	

Note 1: Connect to auxiliary power when the telephone is equipped with add-on modules. Telephones with a Digit Display always require an auxiliary 25-V supply.

Use one of the following for auxiliary power:

25 V ac and 15 V ac transformers located within 25 ft of the telephone.

QUT1 or QUAA1 centralized power supply. To prevent noise and cross talk, each telephone should have its own transformer or fuse (if using centralized power).

Note 2: See the cross-connections to SL-1 system equipment.

QKM11 adapter kit

The QKM11A adapter kit is used to upgrade existing QSU6B or QSU7C SL-1 telephones to vintage QSU6C or QSU7D, respectively. This kit replaces covers, relocating the agent jacks from the left-hand side to the front of the telephone. The kit includes a molded plastic cover, cable assembly, hole plug buttons, and required screw, and washers.

Procedure 65
QKM11 adapter kit installation

1   Remove the faceplate and cover from the telephone (vintage QSU6B or QSU7C).

2   Detach the loudspeaker and foam insert.

3   Unscrew and remove the lower jacks from the left-hand side of the telephone.

4   Remove the connector cable between the QPC266 subboard and QPC100 main board.

5   Remove the QPC266 subboard from the base of the telephone and attach it to the underside of the new cover with supplied screws.

6   Using the cable connector supplied with the adapter kit, reconnect the QPC266 subboard to the QPC100 main board.

7   Connect the jacks (removed in step 3) into the front of the new telephone cover.

8   Connect the foam insert and loudspeaker (removed in step 2) to the new telephone cover.

9   Use the hole plug buttons supplied with the adapter kit to fill the holes in the left-hand side of the telephone (where the agent jacks were).

10   Attach the new cover and faceplate to the telephone.

11   Test the telephone. Refer to the *X11 input/output guide* (553-3001-400).

QKM13 Light Probe kit

The light probe enables sight-impaired attendants or SL-1 telephone users to use existing QCW-type attendant consoles or QSU-type SL-1 telephones.

The probe has a light sensor on one end and a small button on the other end. To operate the probe, the user presses the button and then scans the LED strips on the attendant console or SL-1 telephone. A tone is heard in the headset or handset when the light sensor is placed over an LED that is on.

Some devices inside the Light Probe kit can be damaged by static electricity. Before working on the Light Probe kit, touch the ground or faceplate contact of the set or attendant console to discharge electricity from your body.

The QKM13A kit cannot be added to an attendant console equipped with the QMT3 Busy Lamp Module.

A P0643059 connector kit is required to install the QKM13 in an SL-1 telephone.

Procedure 66
Installing the QKM13 Light Probe kit in an attendant console

1   Remove the faceplate and cover from the attendant console and add-on module(s) if equipped.

2   Remove the left-hand filler plate from the attendant console.

3   This step applies to all attendant consoles except QCW4E and later vintages.

— Connect the S-G lead from the Light Probe PCB to terminal BBB located on the left front corner of the PCB in the attendant console base assembly.

— Connect the S-Y lead from the Light Probe PCB to terminal VSS located on the left front corner of the PCB in the attendant console base assembly.

— Plug the connector on the BL-R lead into connector J16 (J2 on QCW4 attendant consoles) located at the right rear corner of the PCB in the attendant console base assembly, or the extension jack in the last add-on module, if equipped.

4   This step applies only to QCW4E (and later vintage) attendant consoles.

— Turn the attendant console upside down.

— Remove the slide at the bottom of the attendant console to obtain access to the line cord connector.

— Remove the screw securing the connectors and separate the connectors.

— Turn the attendant console rightside up.

— Remove the three screws along the top edge and the three screws along the bottom edge of the main printed circuit board (PCB) of the attendant console.

— Lift the PCB assembly from the attendant console.

— Using a spare lead from the Light Probe kit, extend the S-G lead to terminal JK5-S located near the line cord connector on the lower PCB.

— Using a spare lead from the Light Probe kit, extend the S-Y lead to terminal COMM located near the line cord connector on the lower PCB.

— Reinstall the main PCB in the attendant console.

— Plug the connector on the BL-R lead into connector J2 located at the right rear corner of the PCB in the attendant console base assembly, or the extension jack in the last add-on module, if equipped.

— Turn the attendant console upside down, reconnect the line cord connector, and secure it to the bottom of the attendant console with the retaining screw.

— Reinstall the slide on the line cord connector opening and turn the attendant console rightside up.

5   Insert the Light Probe PCB into the filler plate opening on the left side of the attendant console.

6   Replace the cover and faceplate on the attendant console and module(s), if equipped.

7   Plug the Light Probe cable into the jack on the PCB in the filler plate opening on the left side of the attendant console.

8   Plug the headset or handset into either jack on the attendant console
and test the Light Probe. A tone should be heard only when the probe
is over a lit LED. The headset or handset should be plugged into the
jack (on the attendant console) that provides the loudest tone.

Procedure 67
Removing the QKM13 Light Probe kit from an attendant console

1   Unplug the Light Probe cable from the PCB jack in the filler plate
opening on the left side of the attendant console.

2   Remove the faceplate and cover from the attendant console and
add-on module(s), if equipped.

3   This step applies to all attendant consoles except QCW4E and later
vintages.

— Disconnect the connector on the BL-R lead from connector J16
(J2 on QCW4 attendant consoles) located at the right rear corner
of PCB in the attendant console base assembly, or the extension
jack in last add-on module, if equipped.

— Disconnect the S-G lead from the Light Probe PCB to the terminal
BBB located on the left front corner of the PCB in the attendant
console base assembly.

— Disconnect the S-Y lead from the Light Probe PCB to the terminal
VSS located on the left front corner of the PCB in the attendant
console base assembly.

4   This step applies only to QCW4E (and later vintage) attendant
consoles.

— Turn the attendant console upside down.

— Remove the slide at the bottom of the attendant console to obtain
access to the line cord connector.

— Remove the screw securing the connectors and separate the
connectors.

— Turn the attendant console rightside up.

— Disconnect the connector on the BL-R lead from connector J2
located at the right rear corner of the PCB in the attendant console
base assembly, or the extension jack in the last add-on module, if
equipped.

— Remove the three screws along the top edge and three screws
along the bottom edge of the main PCB of the attendant console.

— Lift the PCB assembly from the attendant console.

— Disconnect the S-G lead from the Light Probe kit to the terminal JK5-S located near the line cord connector on the lower PCB.

— Disconnect the S-Y lead from the Light Probe kit to the terminal COMM located near the line cord connector on the lower PCB.

— Reinstall the main PCB in the attendant console.

— Turn the attendant console upside down, reconnect the line cord connector, and secure it to the bottom of the attendant console with a retaining screw.

— Reinstall the slide on the line cord connector opening and turn the attendant console rightside up.

5   Remove the Light Probe PCB from the filler plate opening on the left side of the attendant console.

6   Insert the filler plate into the opening on the left side of the attendant console.

7   Replace the cover and faceplate on the attendant console and module(s), if equipped.

8   Pack and store the QKM13 Light Probe kit, or return it to the supplier.

Procedure 68
Installing the QKM13 Light Probe kit in an SL-1 telephone

1   Remove the faceplate and cover from the set and add-on module(s), if equipped.

2   Remove the filler plate from the left side of the telephone.

3   Insert the Light Probe PCB into the filler plate opening on the left side of the telephone.

4   Remove the two wires on terminal REC/HS4 on the set PCB and connect the wires to the connector kit.

5   Connect the wire from the connector kit to terminal REC/HS4 on the telephone PCB.

6   Connect the S-G lead from the Light Probe PCB to terminal REC/HS4 on the telephone PCB.

7   Remove the two wires from terminal VSS on the set PCB and connect the wires to the connector kit.

8   Connect the wire from the connector kit to terminal VSS on the set PCB.

Figure 44
Light Probe PCB connections to an attendant console and SL-1 telephone
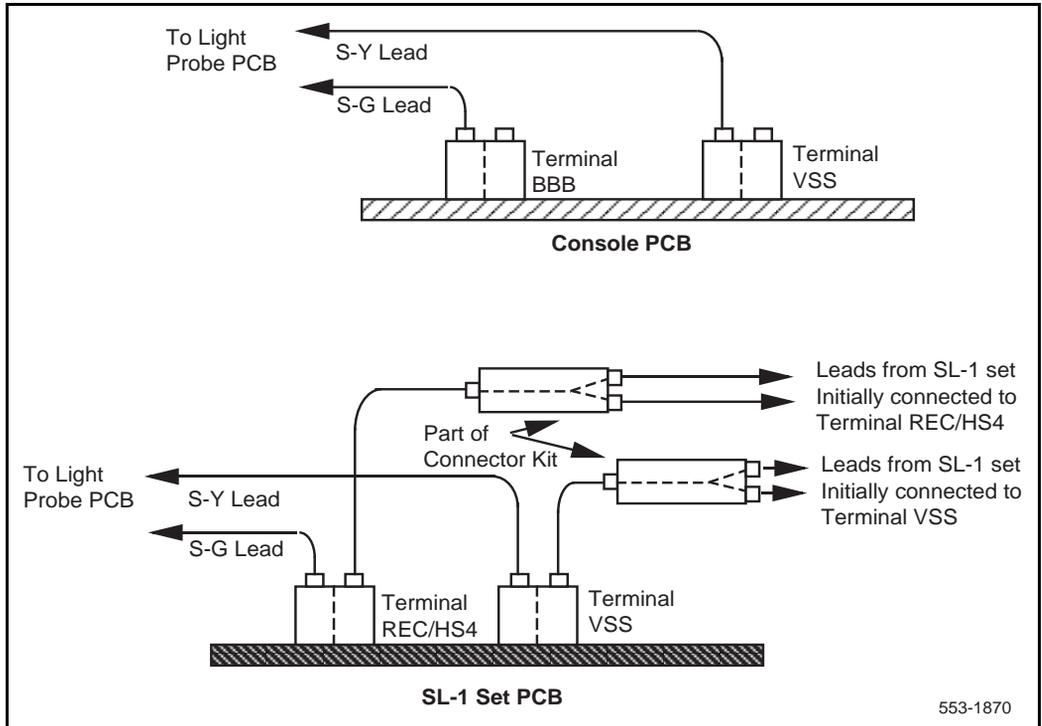
9   Connect the S-Y lead from the light probe PCB to terminal VSS on the telephone PCB.

10   Plug the Light Probe PCB socket (BL-R lead) into jack J1 in the set or into the extension jack in the last add-on module.

11   Replace the cover and faceplate on the telephone and add-on module(s), if equipped.

12   Plug the Light Probe cable into the jack on the PCB in the filler plate opening on the left side of the telephone and test it. A tone should be heard only when the probe is over a lit LED.

Procedure 69
Removing the QKM13 Light Probe kit from an SL-1 telephone

1   Unplug the Light Probe cable from the PCB jack in the filler opening on the left side of the telephone.

2   Remove the faceplate and cover from the telephone and add-on module(s), if equipped.

3   Unplug the Light Probe PCB socket (BL-R lead) from jack J1 in the telephone or from the extension jack in the last add-on module.

4   Disconnect Light Probe PCB leads S-Y and S-G from terminals VSS and REC/HS4 on the telephone PCB.

5   Disconnect the wire going to the connector kit from terminal VSS on the telephone PCB.

6   Disconnect the two wires connected to the opposite end of the connector kit and connect these wires to terminal VSS on the telephone PCB.

7   Disconnect the wire going to the connector kit from terminal REC/HS4 on the telephone PCB.

8   Disconnect the two wires connected to the opposite end of the connector kit and connect these wires to terminal REC/HS4 on the telephone PCB.

9   Remove the Light Probe PCB from the filler plate opening and the connector kits from the telephone.

10   Insert the filler plate into the opening on the left side of telephone.

11   Replace the cover and faceplate on the telephone and add-on module(s), if equipped.

12   Test the telephone to ensure proper operation.

13   Pack and store the QKM13 Light Probe kit or return it to the supplier.

QUT1 power unit and transformer

The QUT1 power unit is designed to supply power for add-on units of up to 11 SL-1 telephones or attendant consoles from a centralized location.

When AC transformers are used to provide auxiliary power to attendant consoles or sets, a separate 25 V and/or 15 V ac transformer is required for each attendant console or telephone.

Figure 45 illustrates the QUT1 power unit faceplate, and Figure 46, the QUT1 power unit connection.

Table 29 gives data on QUT1 power unit fusing, and Table 30 lists the QUT1 connections. Tables 31, 32, and 33 list the allowable distances from the QUT1 to the telephone, the Lamp Field Array module, and the attendant console, respectively.

Table 29
QUT1 power unit fusing

Fuse	Use	Type	Rating (A)
F1	117 V ac line	QFF1A	2-1/3
F6-F14	25 V	QFF1G	1/2
F3-F5*	12.5 V	QFF1G	1/2
F3-F5**	12.5 V	QFF1G	1/2
Note: * Z option: F3-F3, F5-F5 in series, 25 V. ** Y option: F3-F3, F5-F5 in parallel, 12.5 V.			

Table 30
QUT1 connections (Part 1 of 2)

NE-66 pair	Color	QUT1	Voltage
1	W-BL BL-W	FUSE 6	25 V
2	W-O O-W	FUSE 7	25 V
3	W-G G-W	FUSE 8	25 V
4	W-BR BR-W	FUSE 9	25 V
5	W-S S-W	FUSE 10	25 V
6	R-BL BL-R	FUSE 11	25 V
7	R-O O-R	FUSE 12	25 V
8	R-G G-R	FUSE 13	25 V
9	R-BR BR-R	FUSE 14	25 V
10	R-S S-R	FUSE 2	12.5 V
11	BK-BL BL-BK	FUSE 3	12.5 V
12	BK-O O-BK	FUSE 4	12.5 V
13	BK-G G-BK	FUSE 5	12.5 V

Table 30
QUT1 connections (Part 2 of 2)

NE-66 pair	Color	QUT1	Voltage
14	BK-BR	—	—
	BR-BK		
15	BK-S	—	—
	S-BK		
16	Y-BL	—	—
	BL-Y		
17	Y-O	—	—
	O-Y		
18	Y-G	—	—
	G-Y		
19	Y-BR	—	—
	BR-Y		
20	Y-S	—	—
	S-Y		
21	V-BL	—	—
	BL-V		
22	V-O	—	—
	O-V		
23	V-G	—	—
	G-V		
24	V-BR	—	—
	BR-V		
25	V-S	—	—
	S-V		

Procedure 70
Installing the QUT1 power unit

1   Unpack and inspect the QUT1 unit. If it is damaged, repack and return it to your supplier.

2   Determine from the work order where to install the power units (equipment room or terminal closet).

3   Place the power unit faceup on a flat surface.

4   Completely loosen the two screws securing the cover of the unit and remove the cover.

5   Remove the two screws, securing the metal backboard to the power unit (at diagonally opposite corners).

6   Mount the backboard on a wall within 6 ft (1830 mm) of a 117 V ac electrical outlet.

7   Place the power unit on the backboard so that the holes in the back of the power unit engage the hooks on the backboard.

8   Secure the power unit to the backboard with the two machine screws previously removed.

9   Loosen the two screws securing the connector clamp located on the front (lower left) of the power unit and slide the clamp downward.

10   Select an NE-A25B (or equivalent) connector cable of suitable length.

11   Insert the connector on the cable into the connector jack on the power unit. Run the cable slightly to the right and then down through the bottom entry hole of the power unit.

12   Mount a 25-pair NE-66 (or equivalent) connecting block in the yellow field of the wall-mounted cross-connect terminal or on the horizontal side bottom row of the distributing frame. Designate the connecting block.

13   Terminate the end of the cable on the connecting block, following the sequence provided in Figure 46.

14   Insert the appropriate fuses (if not provided) in the fuse holders on the power unit, as required.

15   Place the cover on the power unit. Secure the cover with the two retaining screws provided with the cover.

16   Cross-connect to the attendant console or telephone as required.

Figure 45
QUT1 power unit faceplate

553-1878
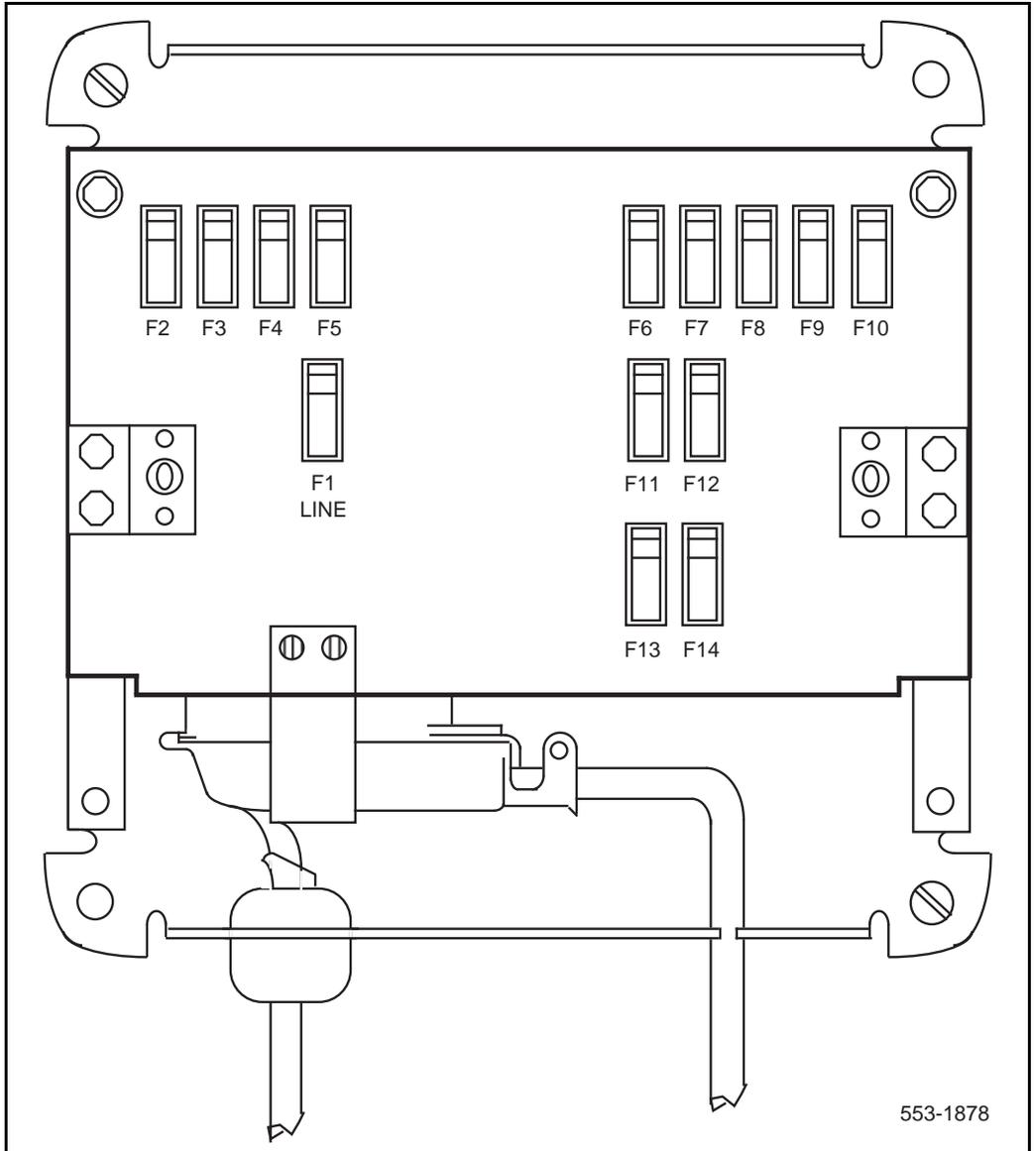
Figure 46
QUT1 power unit connection
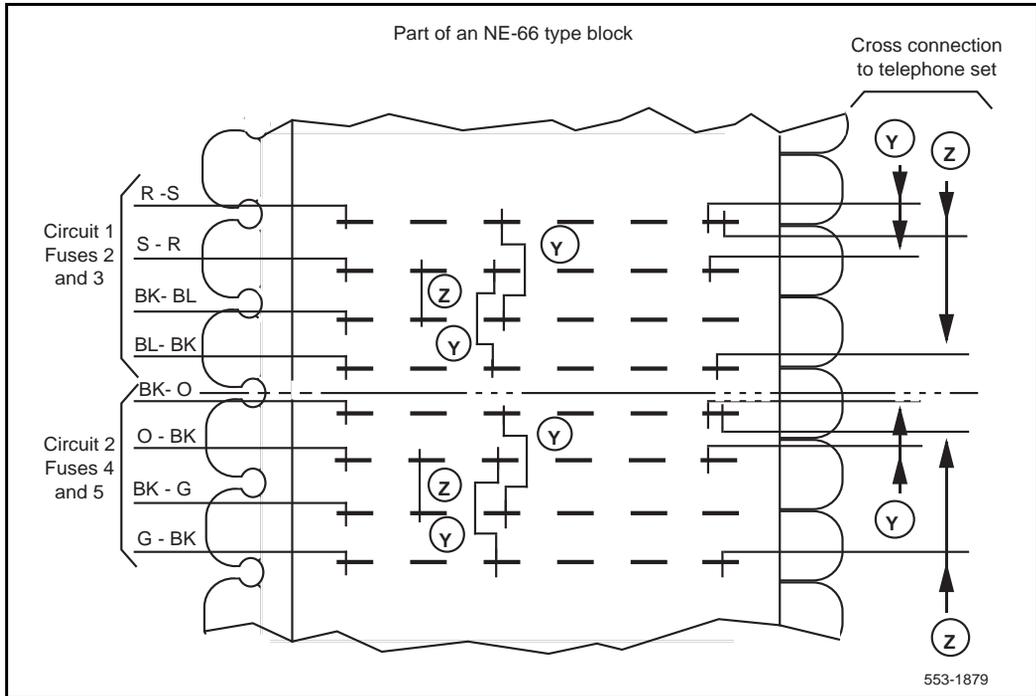
Procedure 71
Removing the QUT1 power unit

1   Completely loosen the two screws securing the cover of the power
unit, and remove the cover.

2   Remove the AC plug from the 117 V ac electrical outlet.

3   Loosen the two screws securing the connector clamp, located on the
front (lower left) of the power unit, and slide the clamp downward.

4   Disconnect the connector on the cable from the connector jack on the
power unit.

5   Remove the two machine screws securing the power unit to the
backboard.

6   Unhook the power unit from the backboard. Place the unit faceup on a
flat surface.

7   Remove the screws securing the metal backboard to the wall. Remove
the backboard.

8   Secure the metal backboard to the removed power unit with the two
machine screws previously removed.

9   Replace the cover on the power unit, and secure it with mounting
screws.

10   Remove the 25-pair connector cable running to the cross-connect
terminal, if it is no longer required.

11   Remove the power cross-connections from the 66-type connecting
block to the attendant console or telephone.

Procedure 72
Installing the transformer

1   Plug a 15 V or 25 V ac transformer into a 115 V ac power outlet located
within 25 ft (7620 mm) of the telephone or attendant console.

2   Connect and run the 3-wire 24 AWG Z station wire from the
transformer to the attendant console or the telephone connecting
block.

3   Connect the attendant console or telephone.

Procedure 73
Removing the transformer

1   Unplug the 15 V or 25 V ac transformer from the 115 V ac power outlet.

2   Disconnect and remove the Z station wire from the transformer and attendant console or telephone connecting block.

Table 31
Allowable distance from the QUT1 to the telephone

Telephone equipped with	22 AWG ft (m)	24 AWG ft (m)	26 AWG ft (m)
10 KL module *	11000 (3390)	7150 (2200)	4550 (1400)
20 KL module **	5550 (1710)	3500 (1076)	2200 (677)
10 + 20 KL module	3650 (1120)	2300 (708)	1450 (446)
20 +. 20 KL module	2650 (815)	1700 (524)	1050 (324)
20 +. 20 +KL module	2100 (647)	1300 (400)	850 (262)
HFU + 10 KL module ***	905 (278)	575 (177)	365 (112)
HFU + 20 KL module	755 (232)	480 (148)	320 (98)
HFU + 20 + 10 KL module	650 (200)	410 (126)	260 (80)
HFU + 20 + 20 &pl. 10 KL module	500 (154)	315 (97)	200 (62)

Note: Cable pairs can be doubled to double the allowable distance to the telephone.
      * 10 KL = 10-button key/lamp.
    ** 20 KL = 20-button key/lamp.
  *** HFU = Handsfree unit.

Table 32
Allowable distance from the QUT1 to the Lamp Field Array module

22 AWG ft (m)	24 AWG ft (m)	26 AWG ft (m)
130 (40)	80 (24.6)	50 (15.4)

Table 33
Allowable distance from the QUT1 to the attendant console

Equipment	22 AWG	24 AWG	26 AWG
Attendant console	1850 (568)	1200 (369)	750 (231)
Attendant console + LA module	1600 (492)	1000 (308)	650 (200)
Attendant console + 10 KL module	1600 (492)	1000 (308)	650 (200)
Attendant console + 10 KL + LA module	1400 (431)	900 (277)	550 (169)
Attendant console + 20 KL module	1400 (431)	900 (277)	550 (169)
Attendant console + 20 KL + LA module	1250 (385)	800 (246)	500 (154)
Note: The distances given in this table are for the 24-V supply.			

M2000/M2317/M3000 Data Options

If an existing digital telephone was not originally equipped with the Data Option, or if the existing Data Option has become defective, that option can be added or replaced. The following procedure explains how to install the Data Option for the M2000 series telephones.

CAUTION

CMOS devices inside the telephone can be damaged by electrostatic discharge. Before opening any M2000 telephone, discharge your hands and tools by touching any grounded metal surface or conductor.

---

1   Remove the handset, and place the telephone upside down on a level workplace (a desktop, for example).

2   Disconnect all cords from the telephone.

3   Loosen and remove five screws in the base of the telephone, lifting the base upward.

4   If the telephone is not equipped with the ADO, proceed with step 5.

   If the telephone is equipped with a defective ADO, carefully disconnect the ribbon cable connector from the header connector in the digital printed circuit board. Loosen and remove the two self-tapping screws that fasten the ADO to the telephone base and remove the defective ADO. Proceed with step 6. See Figure 47.

5   Remove the breakout section in the rear of the telephone base by tapping it with the handle of a small screwdriver.

6   Place the black plastic connector shroud over the RS-232-C interface connector.

   Note: It is not possible to install the shroud after the board has been inserted in the telephone base.

7   Tip the circuit board up and insert it, connector end first, under the tabs in the base. Position it over the molded locating pins; then lower the board completely into position in the telephone base. Use the three slotted, self-tapping screws supplied with the board and install them through the mounting holes. Tighten the screws.

8   Plug the ribbon cable connector into the header connector, located on the existing circuit board of the telephone (mounted on the faceplate assembly). There is only one such connector on the telephone's circuit board. Make sure the connector is snug.

9   In M2112 telephones equipped with Handsfree, make certain that the rubber gasket covering the microphone cavity is firmly in place before closing the case.

10   Reassemble the telephone by placing the base section on the faceplate section. Reinstall the five screws.

11   Tighten the screws, reconnect all cords, and place the telephone in its former position.

12   Refer to Procedures 74 or 75 to connect the power supply and data terminal to the ADO.

Procedure 74
Installing the M2000/M2317 data terminal

1   Connect the RS-232-C interface connector from the data terminal to the matching header connector in the back of the telephone (see Figure 47).

2   Insert the two captive screws in the connector body into the threaded holes in the header connector. Secure them tightly to prevent accidental disconnection during data terminal operation.

3   Insert the keyed power supply plug securely into the 5-pin power connector located to the right of the RS-232-C connector.

4   Plug the wall transformer into the nearest AC outlet. The data terminal is now operational.

Note 1: If an ADM3, ADM5, or ADM11 terminal is used in conjunction with the RS-232-C connector in the Asynchronous Data Option, pin 22 in the RS-232-C cable must be disconnected. These ADM terminals will go into test mode if this pin is not disconnected.

Note 2: A special 9-pin connector is required to connect the Apple Macintosh to the RS-232-C connector in the M2000 Asynchronous Data Option. The connections are shown in Table 34.

Figure 47
M2000/M2317 data terminal and Data Option power supply connection

553-1888
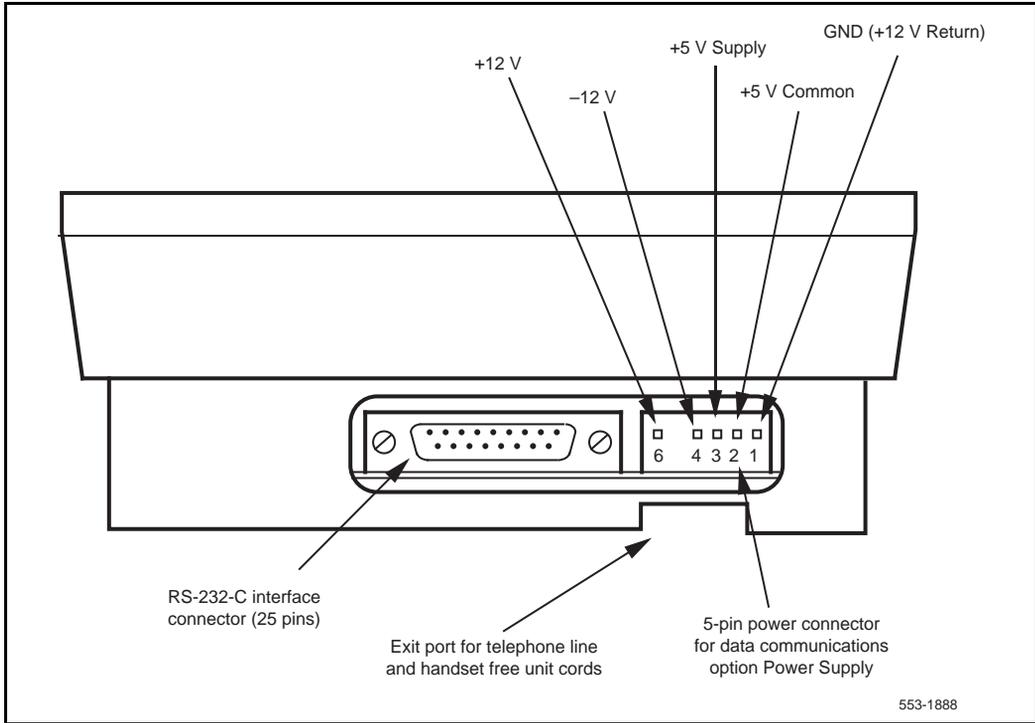
Table 34
Connections for the Apple Macintosh to the M2000/M2317
Asynchronous Data Option (ADO)

9-pin connector (from terminal)		25-pin (RS-232-C) connector (at ADO port)
Pin 3	to	Pin 7
Pin 5	to	Pin 2
Pin 9	to	Pin 3
Note: Strap pins 4 and 5 and pins 6, 8, and 20 together.		

Table 35
RS-232-C signals and associated pin numbers for M2317 telephones

Circuit designation			Pin number	Signal source		
EIA	Common	CCITT		DTE	DCE	Name
AA		101	1		X	Frame ground
BA	TXD	103	2	X		Transmit data
BB	RXD	104	3		X	Receive data
CA	RTS	105	4	X		Request to send
CB	CTS	106	5		X	Clear to send
CC	DSR	107	6		X	Data set ready
AB	GND	102	7	X		Signal ground
CD	DTR	108.2	20	X		Data terminal ready
CE	RI	125	22		X	Ring indicator

Procedure 75
Installing the M3000 data terminal

1   Connect the RS-232-C interface connector from the data terminal to the Data Option connector in the back of the M3000 Touchphone set.

2   Insert the two captive screws in the connector body into the threaded holes in the Data Option connector. Secure tightly to prevent accidental disconnection during data terminal operation.

3   Ensure that the Touchphone power supply transformer is plugged in the wall outlet, and connected to the Touchphone.

Figure 48 illustrates the M3000 data terminal and DTE/computer terminal connection.

Table 36 shows the connector pin numbers together with the signals associated with each pin as it applies to the standard RS-232-C interface.

Note: If an ADM3, ADM5, or ADM11 terminal is used in conjunction with the RS-232-C connector in the Asynchronous Data Option (ADO), pin 22 in the RS-232-C cable must be disconnected. These ADM terminals will go into test mode if this pin is not disconnected.

Figure 48
M3000 data terminal and DTE/computer terminal connection

RS-232-C interface   Data Option   Touchphone stand   553-1896
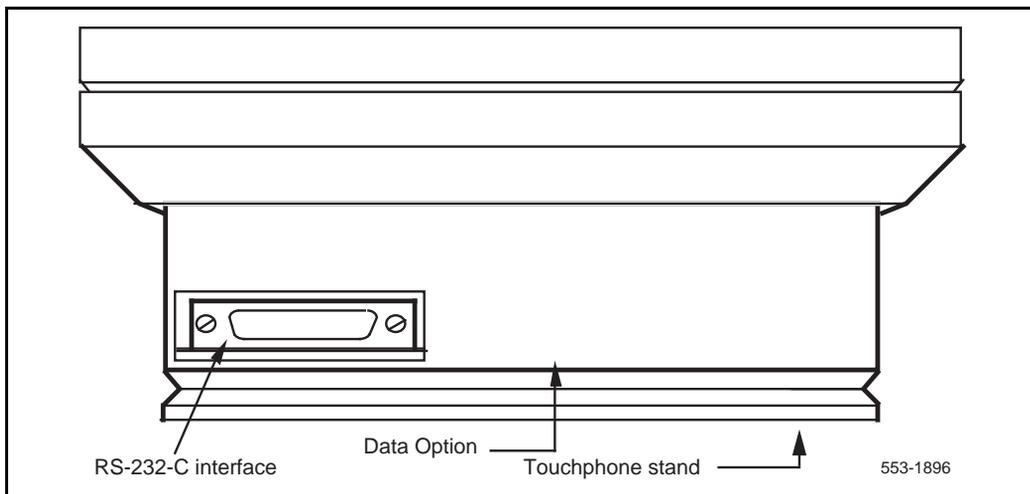
Table 36
RS-232-C signals and associated pin numbers for the M3000 Touchphone set

Circuit designation			Pin number	Signal source		
EIA	Common	CCITT		DTE	DCE	Name
AA		101	1		X	Frame ground
BA	TXD	103	2	X		Transmit data
BB	RXD	104	3		X	Receive data
CA	RTS	105	4	X		Request to send
CB	CTS	106	5		X	Clear to send
CC	DSR	107	6		X	Data set ready
AB	GND	102	7	X		Signal ground
CD	DTR	108.2	20	X		Data terminal ready
CE	RI	125	22		X	Ring indicator

Note: A special 9-pin connector is required to connect the Apple Macintosh to the RS-232-C connector in the M3000 Asynchronous Data Option. See Table 37 for the cable connections.

Table 37
Connections for the Apple Macintosh to the M3000 Data Option

9-pin connector (from terminal)		25-pin (RS-232-C) connector (at Data Option port)
Pin 3	to	Pin 7
Pin 5	to	Pin 2
Pin 9	to	Pin 3
Note: Strap pins 4 and 5 and pins 6, 8, and 20 together.		

Meridian Modular Telephones

Use the procedures listed here for adding hardware options to the M2006, M2008/M2008HF, M2016S, M2616, and M2216ACD sets only. These options are available with X11 release 14 and later.

CAUTION

Use only the line cord provided with your Meridian Modular Telephone when installing and removing options. The acceptable line cord is A0346862.

Figure 49 shows an exploded view for reference when dismantling the telephone to get to its internal components. Some telephone types are slightly smaller than the M2616 and do not have the center screw in the base, but otherwise they are the same. The center screw may not be required.

Refer to Figure 51 on page 176 to locate the various components of the M2006 and M2008/M2008HF telephones. Refer to Figure 52 on page 177 to locate components on the M2616, M2016S, and M2216ACD telephones.

Figure 49
Exploded view of the M2616/M2016S/M2216ACD telephone

Stand

Base

Fillerplate

Set

553-1846
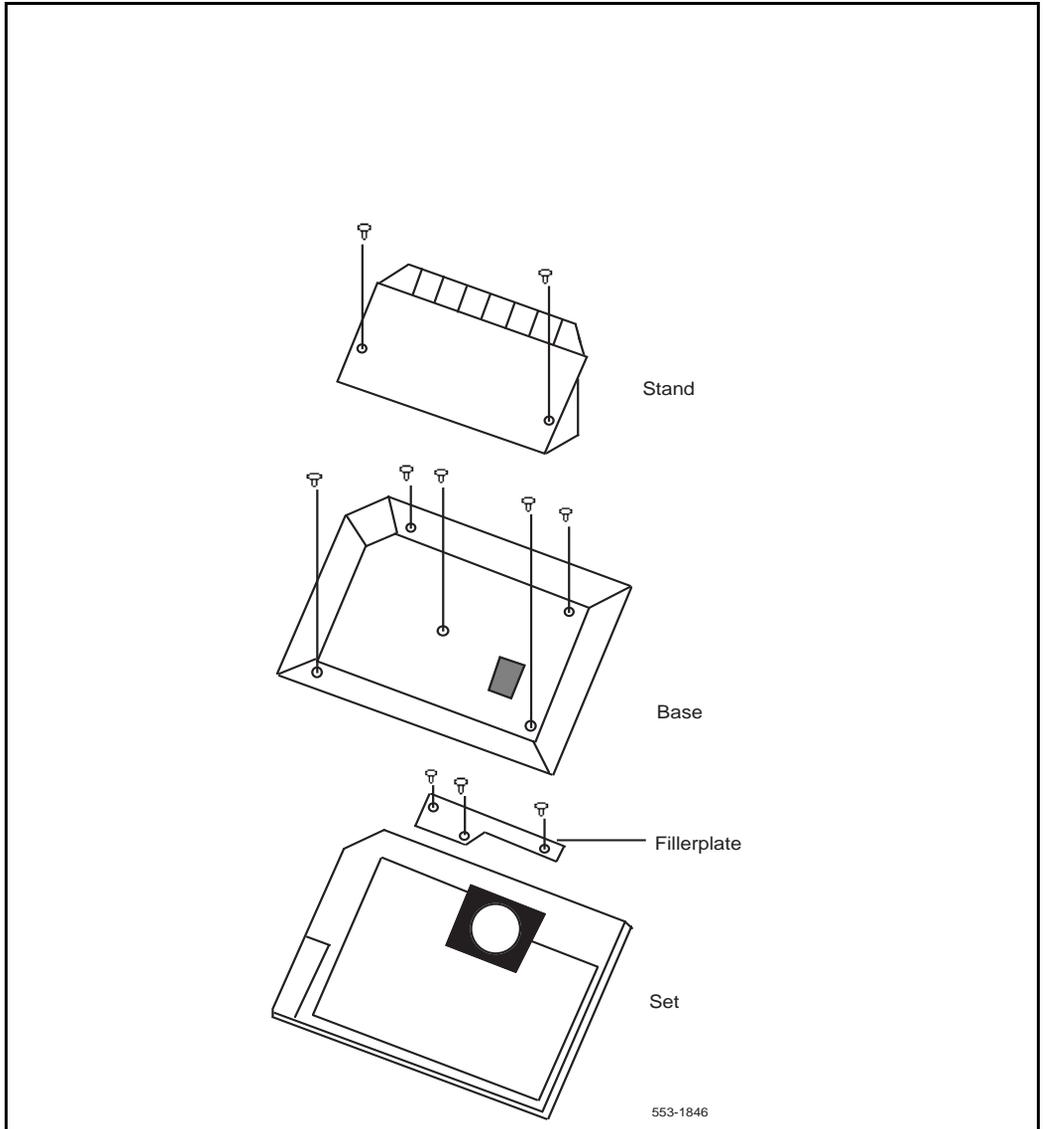
Analog Terminal Adapter

The Analog Terminal Adapter (ATA) allows the use of an off-the-shelf analog device (FAX, Modem, Telephone) to operate simultaneously with your Meridian Digital Telephone set. The Analog Terminal Adapter board fits into the footstand space of your Meridian Digital Telephone set.

Functional description

The Analog Terminal Adapter will be compatible with the Meridian Digital Telephone set. It is mounted in the redesigned footstand of your Meridian Digital Telephone set. The Meridian Digital Telephones (M2006/8 and M22/2216) footstand is modified to accommodate the ATA. The ATA requires a separate AC adapter which provides a 24 volt AC external power source. The ATA does not draws power from your Meridian Digital Telephone set.

The Analog Terminal Adapter (ATA) provides a RJ11 connection for analog equipment to operate on the same line as your Meridian Digital Telephone set.The Analog Terminal Adapter allows you to transmit and receive data using the public switched telephone network (PSTN). The ATA supports an analog device link to the desktop or laptop computer users (with modems) in the digital telephone environment. Currently, it is necessary to install a separate analog phone line to be able to interface with the PSTN.

You can use the ATA for the following analog devices:

— FAX Machine

— Modem

— Analog Telephone

ATA operating parameters

The ATA data parameters are stored locally although the configuration is set in the Meridian 1 system. Data parameters must be set in the system after installing the ATA in the telephone. If the parameters are set before the telephone is installed, the configuration information will be lost.

Simultaneous voice, FAX/modem calls require X11 release 22 equipped with Flexible Voice/Data Terminal Number feature. Overlay 11 is configured in the Meridian 1 system when implementing the Flexible Voice and Data Feature. See the *X11 input/output guide* (553-3001-400) for prompt and response details.

The ATA will not provide simultaneous voice and data if the X11 software release is prior to release 22.

The Analog Terminal Adapter (ATA) is capable of receiving dial pulse or DTMF address signaling from the analog equipment.

The ATA uses the 2nd channel of the TCM loop to add an analog port to the digital terminal. It has an RJ11 type jack accessible from the back of the telset.

The analog interface of the ATA is a 2-wire source, providing A and B leads (tip and ring) across which analog equipment (modem/fax) is connected. The loop length will be >100 feet. The analog interface of the ATA is compatible with the port types listed in Table 38.

Table 38
Port types compatible with ATA

County	Port Type(s)	Defining Standard(s)
United States	ONS Station Interface Class A OPS Station Interface	EIA/Tia-464A FCC Rules Part 68
Canada	ONS Station Interface Class 1300 OPS Station Interface	CAN3-T512.1 CS-03 Part I

Refer to *Analog Terminal Adapter Quick Reference card or Installing an Analog Terminal Adapter* for detailed information on this feature.

Procedure 76
Installing and removing the Analog Terminal Adapter

CAUTION

Before handling internal telephone components, you must discharge
static electricity from your hands and tools by touching any grounded
metal surface or conductor.

Use the following procedures to add the Analog Terminal Adapter (ATA) to
the telephone and to connect it to a FAX or modem. The ATA is supported on
Meridian Digital Telephones only.

1   Flexible voice and data capabilities are available with X11 release 22
or later. When the ATA is installed, the System Administrator must
activate the Flexible Voice and Data Feature by configuring Overlay
11.

Note: The Flexible Voice and Data Feature is not available on releases
prior to 22.

2   To Activate the Flexible Voice and Data Feature, use the following chart to configure Overlay 11 (for more detailed information, refer to NTP *X11 input/output guide* (553-3001-400)).

Table 39:
Flexible Voice and Data feature configuration

Prompt	Response	Description
REQ	NEW/CHG	New, or change
TYPE	aaaa	Telephone type, whereaaaa=2006,2008, 2016, or 2616
TN	lscu	Terminal Number where u=16-31
CLS	FLXA	Flexible voice/data allowed. This Class of service can only be assigned to 2006, 2008, 2016, 2216 or 2617 sets. When configured to CLS=FLXA
	VCE	(FLXD) = Flexible voice/data denied. Voice Class of Service (VCE) can be assigned to the upper TN unit (16-31) and Data class of Service (DTA) can be assigned to the lower TN (0-15). A Single Call Ringing (SCR) key can be designated a Data Mode (DTNK) key.
KEY		Prime Directory Number Key, SCR, SCN, MCR or MCN and xxx.
-Key	xxSCRyyyy	Single Call Ringing
	xxSCNyyyy	Single Call Non Ringing Data Mode Key, where xx=key number and yyy=Data Directory Number.

3   Disconnect and remove all cords (including the handset cord) from the telephone.

4   Place the telephone, face-down, on a padded level surface.

5   Using a #1 Phillips screw driver, remove both screws and separate the footstand from the phone base.

6   If you have the NT9K ATA ready set or the NT2K with date code of January 1998 or later:

• Remove and retain the footstand (you will reattach this footstand back onto the set base after ATA installation is complete.

• Skip to the ATA Installation Procedure 13 on page 165.

7   If you have the NT2K or the NTZK phone set, remove and discard the footstand (you will use the redesigned footstand required for the installation of the ATA).

8   If you have an MCA or MPDA installed, unplug it from the data line jack in the phone base.

9   Remove the back covering of the phone base by removing the four screws.

Footstand
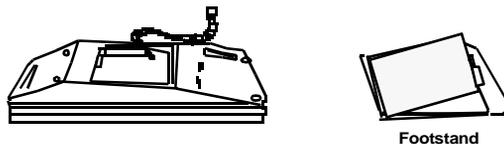
10   If the phone is equipped with a Power Option board and/or cable, you must remove it before installing the ATA. The Power Option board is located on the left side of the telephone):

- Remove the two small screws from the Power Option board (near the top) and set them aside.

- To disconnect the Power Option board from the **NTZK** telephone, grasp the board firmly on each side and slowly rock the Power Option board while applying upward pressure until it is released form the 2X7 pin connector.

- To disconnect the **NT2K** Power Option board from the set simply remove the screws from the Power Option board and base and lift the board out of the set.

- If the Power Option board has a ribbon cable, disconnect the cable from the 2X7pin connector on the main board and remove the cable

Inside Phone Base

2x7 pin connector

2x3 pin connector

Display board
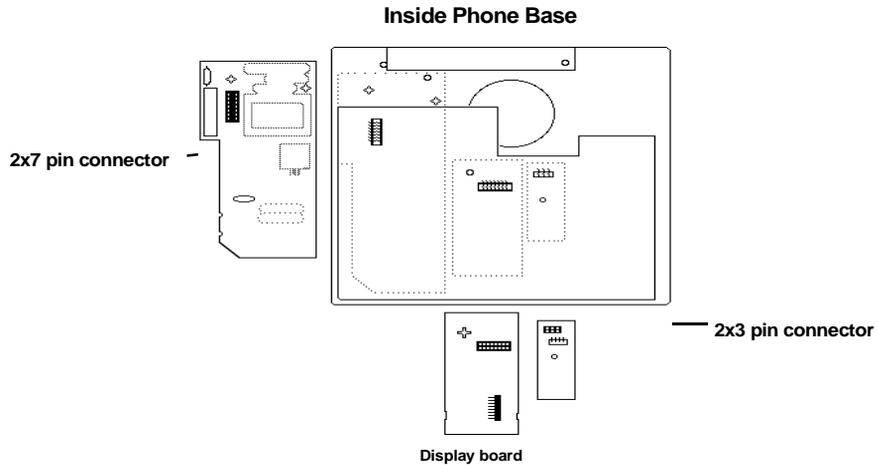
11   If the phone is equipped with the External Alerter Option, you must remove it before installing the ATA. The External Alerter Option board is located at the right center of the telephone:

- Remove the screws from the External Alerter Option board.

- Grasp the board firmly on each end and pull upward to remove from the 2X3 pin connector

12   Install the Jumper board on the 2X7 pin connector inside the phone set base.

- There are 2 Jumper boards provided. Use the brown Jumper board for the NTZKxxxx phone set and the black Jumper board for the NT2Kxxxx phone set with a date code prior to January 1998.

- If a Power Option board was not installed on the NT2Kxxxx and the NTZKxxxx there will be 2 Jumper plugs on the 2X7 pin connector that must be removed before installing the Jumper board.

13   Remove the knockout located on the back panel of the footstand in order to install the ATA. It is the smaller knockout, located inside the large knockout. The small ATA knockout can be remove by pressing it in with thumb presser.

14   Install the ATA Printed Circuit board into the footstand.

15   Plug the ATA 8-conductor line cord, included in the package, into the data jack in the base of the telephone. Plug the other end of this cord into the data jack of the ATA located in the footstand.

16   Reassemble the footstand on the base and screw it into position using a #1 Phillips screwdriver.

17   Plug the 24v AC Power Transformer into the circular mini DIN connector on the backpanel of the footstand.

18   Plug the transformer end of the AC Power Transformer into the AC commercial electrical outlet.

19   You are now ready to connect the analog device to the RJ11 connector on the back of the footstand. Refer to the manufacturer's documentation for installation instructions for the FAX, modem or telephone you have selected

Meridian Communications Adapter and Meridian Programmable Data Adapter

The Meridian Communications Adapter (MCA) mounts within the telephone and allows asynchronous and synchronous ASCII terminals, and personal computers to be connected to the telephone using an RS-232C or V.35 interface on a DB-25 connector. The MCA replaces the Meridian Programmable Data Adapter (MPDA). With X11 release 18 and later, data programming can be implemented on the MCA through a service change (LD11) as well as the keypad. With X11 releases 14 through 17 support data commands on the keypad only.

Use the following procedures to add the Meridian Communications Adapter (MCA) or Meridian Programmable Data Adapter (MPDA) to the telephone and to connect it to your terminal or personal computer.

Note: The Meridian Programmable Data Adapter is supported by X11 releases 14 through 17. The Meridian Communications Adapter is supported by X11 release 14 and later.

When using the MCA for synchronous data connections, configure the telephone with a display option to view the data parameters.The MPDA and MCA are supported on Meridian Digital Telephones only.

When installing an MCA or MPDA to NTZK or NT2K phone sets with date code prior to January 1998 requires the installation of a Power Option board along with an additional power source.

When installing an MCA in an NT9K phone set or an NT2K with date code of January 1998 you will only install the MCA (an additional Power Option board and Jumper board is not required).

- See Procedure 79 on page 174 for M2006/M2008 NTZK sets.
- See Procedure 80 on page 178 for M2616/M2216ACD NTZK sets.
- See Procedure 81 on page 182 for M2006/M2008/M2008HF NT2K sets.
- See Procedure 76 on page 162 for installing an MCA onto an NT9K or NT2K with date code of January 1998.

The MCA can be placed as far from its associated data terminal or computer port as is consistent with EIA RS-232 or V.35.

When the MCA is used as a V.35 interface, an additional cable is required to convert the DB-25 into a 34-pin rectangular connector. This does not apply to asynchronous configurations. If the pins are left in V.35 mode, asynchronous operation is not supported, and the MCA looks as though it is locked up.

Remove the two 14-pin jumper plugs or one 20-pin jumper plug inside the MCA from the RS-232 socket(s) and install the V.35 socket.

Note: The female cable ordering code is A0408927. The male cable ordering code is A0408928. The A0300752 and A0300753 cables are still supported, unless used with applications similar to IBM front-end.

Modem pooling is not supported on the MCA.

When a call is connected between two MCAs, and power is removed from one, the MCA does not release until the power is restored.

The MCA always remembers the most recent data parameters. In the case of power failure, you do not have to reset any data settings.

See Table 40 for a listing of the V.35 CCITT signals supported by the MCA.

Table 40
V.35 CCITT signals supported by the MCA (Part 1 of 2)

V.35 CCITT	MCA DB-25 pin no.	Abbr.	Adaptor cable		Signal Source		Description
			DB-25 Pin No.	V.35 Pin No.	DTE	MCA	
101	1	DG	1	A			Protective ground*
103A	2	SDA	2	P	X		Transmit data A
104A	3	RDA	3	R		X	Receive data A
105	4	RTS	4	C	X		Request to send
106	5	CTS	5	D		X	Clear to send
107	6	DSR	6	E		X	Data set ready
102	7	S	7	B			Signal ground
109	8	CD	8	F		X	Carrier detect
—	9/10	—	9/10	CC/L			No connection
—	11	—	11	K	X		**
115B	12	SCRB	12	X		X	Serial clock receive B
103B	13	SDB	13	S	X		Transmit data B
114B	14	SCTB	14	AA		X	Serial clock transmit B

Note: * Pin 1 is connected to the MCDS shelf frame.
          ** These leads are ignored by the MCA controller.

Table 40
V.35 CCITT signals supported by the MCA (Part 2 of 2)

V.35 CCITT	MCA DB-25 pin no.	Abbr.	Adaptor cable		Signal Source		Description
			DB-25 Pin No.	V.35 Pin No.	DTE	MCA	
114A	15	SCTA	15	Y		X	Serial clock transmit A
104B	16	RDB	16	T		X	Receive data B
115A	17	SCRA	17	V		X	Serial clock receive A
—	18/19	—	18/19	M/HH			No connection
108.2	20	DTR	20	H	X		Data terminal ready
—	21	—	21	EE			No connection
125	22	RI	22	J		X	Ring indicator
113B	23	SCTEB	23	W	X		Tran sign elemt time B
113A	24	SCTEA	24	U	X		Tran sign elemt time A
—	25	—	25	MM	X		**

Note: * Pin 1 is connected to the MCDS shelf frame.
          ** These leads are ignored by the MCA controller.

Procedure 77
Installing and removing the Meridian Communications Adapter or
Meridian Programmable Data Adapter

CAUTION

Before handling internal telephone components, you must discharge
static electricity from your hands and tools by touching any grounded
metal surface or conductor.

If you have a NT9K phone or the NT2K with date code of January 1998 you
do not need to install a Power Option board to operate the MCA.

1   Remove the handset and place the telephone upside down on top of a
level, solid work surface (a desktop, for example) covered with soft
material or paper to prevent damage to movable keys and the
telephone face.

2   Disconnect all cords from the telephone.

3   Remove the footstand.

- For NT2K and NTZK with date code prior to January 1998
remove the two screws from the footstand assembly and
unsnap the footstand by pressing inward at the back of the
footstand where it meets the base and pull upward. Discard the
footstand you will be using the redesigned footstand ordered
with your ATA.

- For NT9K and NT2K with date codes of January 1998 retain
the footstand, skip to Procedure 10 on page 171.

4   If the telephone is not equipped with the Meridian Programmable Data
Adapter (MPDA) or Meridian Communications Adapter (MCA), go to
Procedure 6 on page 171. If you wish to replace an existing MPDA or
MCA, carefully disconnect the end of the 8-pin TELADAPT jack
plugged into the telephone by pressing firmly on the latch-tab and
slowly lifting up.

5   Turn the telephone footstand assembly over and put it in the normal
use position. Remove the two self-tapping screws that fasten the
MPDA or MCA to the telephone footstand assembly and remove the
MPDA or MCA by pulling outward and up. Go to Procedure 11 on
page 172 to replace the MPDA or MCA.

6   Remove the back covering of the phone base by removing the four screws.

7   If the NTZK or the NT2K (with date code prior to January 1998) phone set is equipped with a Power Option board and/or cable, you must remove the Power Option board and/or cable before installing the MCA.

 • Remove the two small screws from the Power board (near the top) and set them aside.

 • To disconnect the Power Option board from the NTZK telephone, grasp the board firmly on each side and slowly rock the board while applying upward pressure, until it is released from the 2X7 pin connector.

 • To disconnect the NT2K Power Option board from the set, simply remove the screws from the base and lift the board out of the set.

 • If the Power Option board has a ribbon cable disconnect he cable from the 2X7 pin connector on the main board and remove the cable.

8   If the phone is equipped with the External Alerter board, you must remove it before installing the MCA with redesigned footstand.

 • The External Alerter board is located at the right center of the telephone.

 • Remove the screws form the board, grasp the board firmly on each end and pull upward to remove it from the 2X3 pin connector.

9   Install the Jumper board onto the 2X7 pin connector inside the phone base.

 • If the phone set did not have a Power Option board installed on the NT2K or the NTZK then there will be 2 Jumper plugs on the 2X7 connector. Remove them before installing the Jumper board.

 • The redesigned footstand will have 2 jumpers. Use the black one for the NT2K phone and the brown one for the NTZK phone.

10   Remove the large MCA knockout section in the rear of the telephone footstand assembly, and remove the small tabs. It is best to remove this knockout with a screwdriver.

Figure 50
Installing the MCA

553-6328
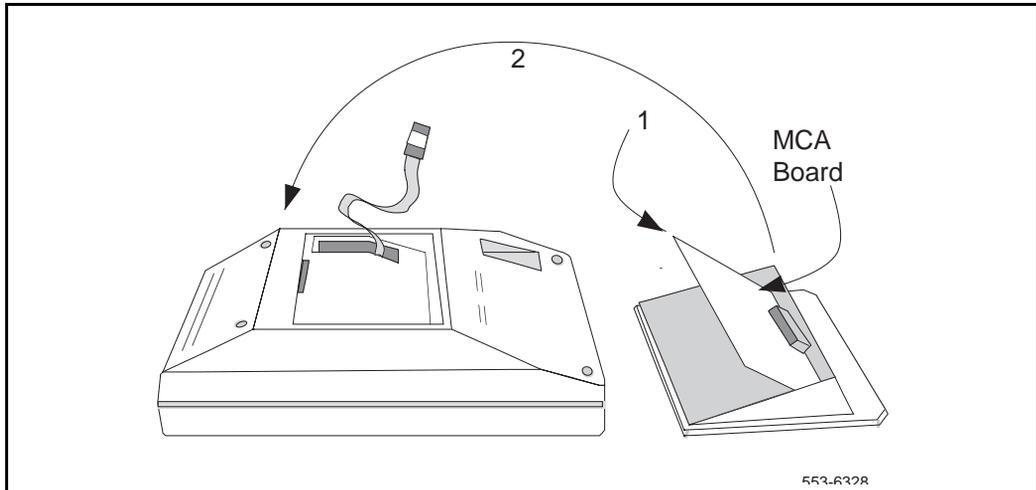
11   For MCA, set option plugs to the required configuration, RS-232 or
V.35. The factory default is RS-232.

12   Tilt the MPDA or MCA circuit board up and insert the DB-25 connector
socket into the breakout section. Then slide the board connector
end-first under the tabs in the footstand assembly and position it over
the locating pins. Position and lower it completely onto the telephone
footstand assembly. Insert the two self-tapping Phillips-head screws
supplied with the MPDA or MCA into the mounting holes and tighten
them with a #1 Phillips screwdriver.

13   Plug one end of an 8-conductor line cord supplied with a TELADAPT
adapter in the jack J1 of the MPDA or MCA (latch tab facing down) and
plug the other end of the line cord into the data jack in the base of the
modular telephone. Make certain the latch tab of each cable end is
firmly snapped into place.

14   Carefully route the excess cable so that it will not become pinched
between the footstand and base.

15   Reassemble the base and footstand assembly sections, ensuring that
the footstand is firmly seated on the base.

16   Tighten the screws

- Reconnect all cords, connect the new 24v ACtransformer to the set.

- Plug in the new transformer into the 110v AC commercial electrical outlet.

- Place the telephone in the normal operating position.

Note 1: Place the label supplied with the MPDA or MCA on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

Note 2: If an ADM3, ADM5, or ADM11 terminal is used in conjunction with the DB-25 connector-C interface connector in the Asynchronous Programmable Data Adapter, pin 22 in the DB-25 connector cable must be disconnected. These ADM terminals will go into test mode if this pin is not disconnected.

Procedure 78
Connecting the data terminal

1   Connect the DB-25 connector-C interface connector from the data terminal to the matching header connector in the back of the modular telephone.

2   Insert the two captive screws in the connector body into the threaded holes in the header connector and secure tightly to prevent accidental disconnection during data terminal operation.

Power Supply Board (NTZK models)

Use the following procedures to add a Power Supply Board to the telephone for connection to a transformer or closet power supply. Procedure 79 is for the M2006 and M2008. Procedure 80 is for the M2616, and M2216ACD.

Procedure 79
Installing and removing the M2006/M2008
Power Supply Board on NTZK sets

CAUTION

Connect the optional Power Supply to your Meridian Modular Telephone only. Equipment damage may result from incorrect connections. Both the closet power supply and the transformer are for use with the Meridian Modular Telephone only.

CAUTION

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

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1   Remove the handset and place the telephone upside down on top of a level, solid work surface (such as a desktop) covered with soft material or paper to prevent damage to movable keys and the telephone face.

2   Disconnect all cords from the telephone.

3   Remove the two screws from the footstand assembly and unsnap the footstand assembly by pressing inward at the back of the footstand where it meets the base and pulling upward.

4   If the telephone is equipped with a Meridian Programmable Data Adapter (MPDA) or Meridian Communications Adapter (MCA), unplug the data cable from telephone's base jack.

5   Remove the four screws securing the base of the telephone to the top cover. Remove the base and set it aside.

6   If the telephone is equipped with a display, disconnect the display ribbon cable from the display board and move it out of the way.

7   If the telephone is not equipped with the power supply board, remove the jumpers from P1 connector pins on the main board. Go to step 9.

If the telephone is equipped with a power supply board, go to step 8.

8   The power supply board is located on the left side of the telephone. Remove two small screws from the power supply board (near the top) and set them aside. Grasp the board firmly on each side. Work the board loose from the connector by slowly applying upward pressure to alternate sides until released.

If you are not replacing the power supply board, place the jumpers (A0288529) connecting the bottom two sets of pins on the P1 connector.

9   Place the power supply board so that the alignment pin on the telephone fits into Slot A on the board (see Figures 51 and 52). Align the mounting holes in the board (near the top) over the mounting holes in the telephone and carefully press down so that the H1 connector on the board slides onto the P1 pins.

10   Take the self-tapping Phillips-head screws supplied with the power supply board and install them into the mounting holes. Tighten firmly with a #1 Phillips screwdriver.

11   If the telephone has a display, reconnect the display ribbon cable, routing the cable as described in Procedure 82.

Note: Do not allow R5 on the power supply board to become bent during this procedure.

12   Replace the base. If the telephone is equipped with an MPDA or MCA, reconnect the data cable to the base telephone jack and replace the footstand (ensuring that the MPDA or MCA cable does not get pinched between the base and footstand). Make sure the footstand is firmly seated to the base.

Note: Place the label supplied with the power supply board on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

13   Tighten all screws, reconnect the line cord, and place the telephone in the normal operating position.

Figure 51
M2006/2008 telephone and option boards

Power board

H1 connector
P1 connector
R 5
Slot B
Slot A

P3 connector
P2 connector

J1 connector
J2 connector

Display board

H1 connector

Alerter board

553-1847
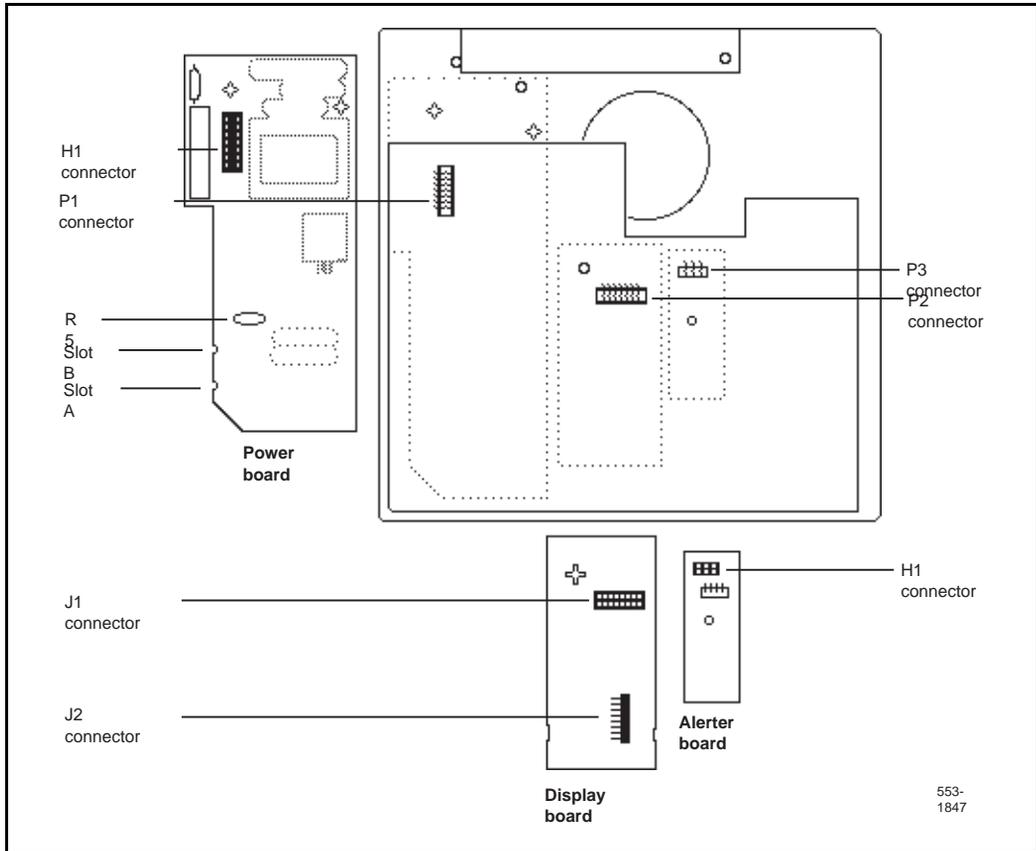
Figure 52
M2616/M2216ACD telephone and option boards
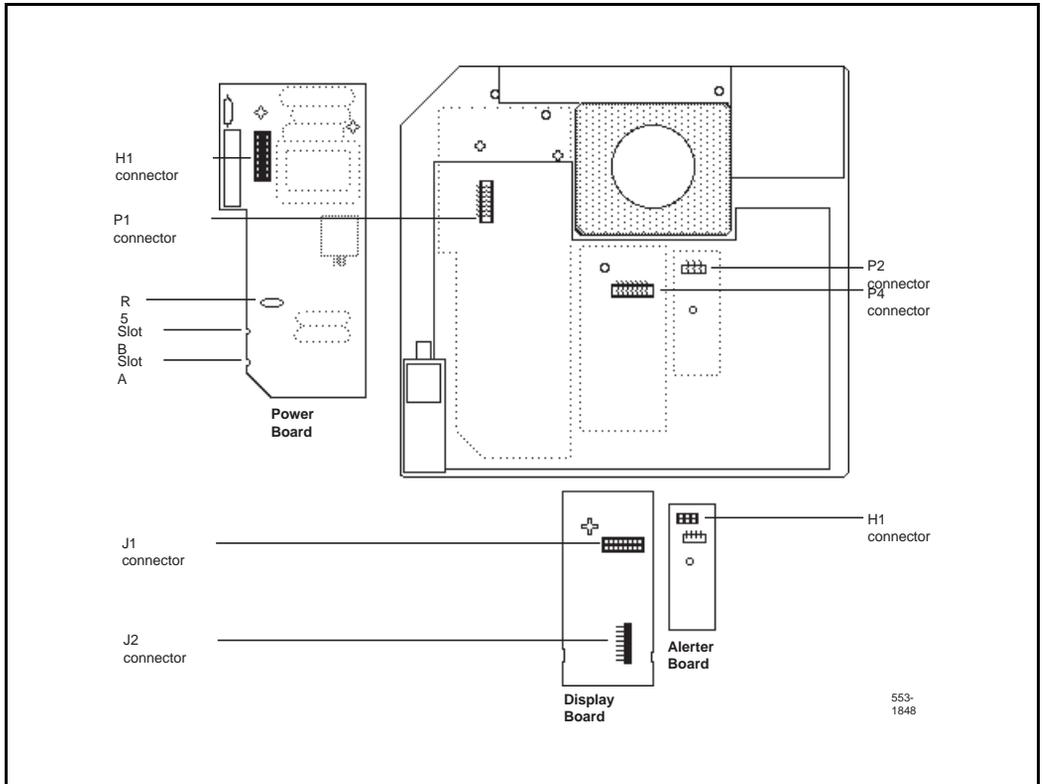
Procedure 80
Installing and removing the M2616/M2216ACD Power Supply Board on NTZK sets

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CAUTION

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

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1   Remove the handset and place the telephone upside down on top of a level, solid work surface (such as a desktop) covered with soft material or paper to prevent damage to movable keys and the telephone face.

2   Disconnect all cords from the telephone.

3   Remove the two screws from the footstand assembly and unsnap the footstand assembly by pressing inward at the back of the footstand where it meets the base and pulling upward.

4   If the telephone is equipped with an MPDA or MCA, unplug the data cable from the base telephone jack.

5   Remove the four or five screws securing the base to the top cover. Remove the base and set it aside.

6   If the telephone is equipped with display, disconnect the Display ribbon cable from the display board and move it out of the way.

7   If the telephone is not equipped with a power supply board, remove jumpers from the P1 connector pins on the main board. Go to step 9.

   If the telephone is equipped with a power supply board, go to step 8.

8   The power supply board is located on the left side of the telephone. Remove two small screws from the power supply board (near the top) and set them aside. Grasp the board firmly on each side. Work the board loose slowly until it is released.

   If you are not replacing the power supply board, place the jumpers (A0288529) connecting the bottom two sets of the pins on the P1 connector.

---

9   Place the power supply board so that Slot B fits into the alignment pin on the telephone (see Figure 52). Align the mounting holes in the board (near the top) over mounting holes in the telephone and carefully press down so that the H1 connector on the board slides onto the pins of the header (P1 on the M2616 or J2 on the M2006/M2008).

10   Take the self-tapping Phillips-head screws supplied with the power supply board and install them into the mounting holes. Tighten firmly with a #1 Phillips screwdriver.

11   If the telephone has a display, reconnect the display ribbon cable, routing the cable as described in Procedure 83.

      Note: Do not allow R5 on the power supply board to become bent during this procedure.

12   Replace the base. If the telephone is equipped with an MPDA or MCA, reconnect the data cable to the base telephone jack and replace the footstand (ensuring the MPDA or MCA cable does not get pinched between the base and footstand). Make sure the footstand is firmly seated to the base.

      Note: Place the label supplied with the power supply board on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

13   Connect the telephone to a local transformer (Figure 53) or closet power supply (Figure 54) as shown. Refer to *Meridian 1 telephones description and specifications* (553-3001-108) for requirements.

Figure 53
Configuration of a local plug-in transformer
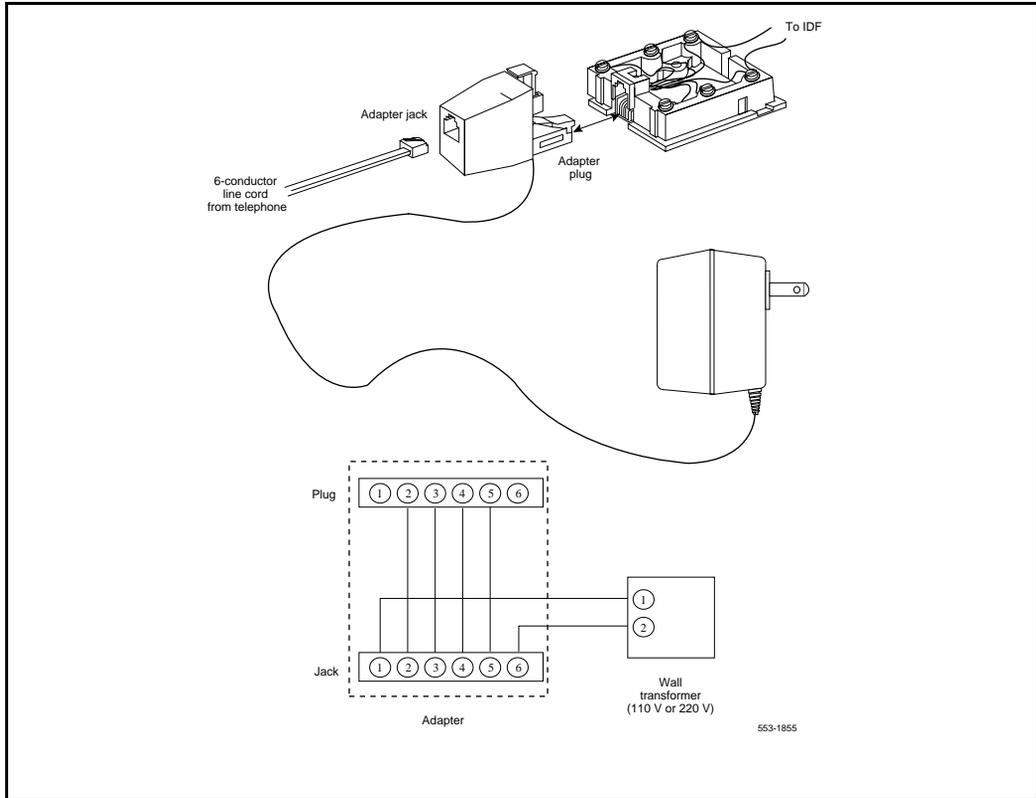
Figure 54
Closet power supply configuration

Amphenol connector

3 2
3 2
3 2
3 2
3 2
Cable
Marker

Connecting Block

Service Fitting

Utility
Column

553-1858
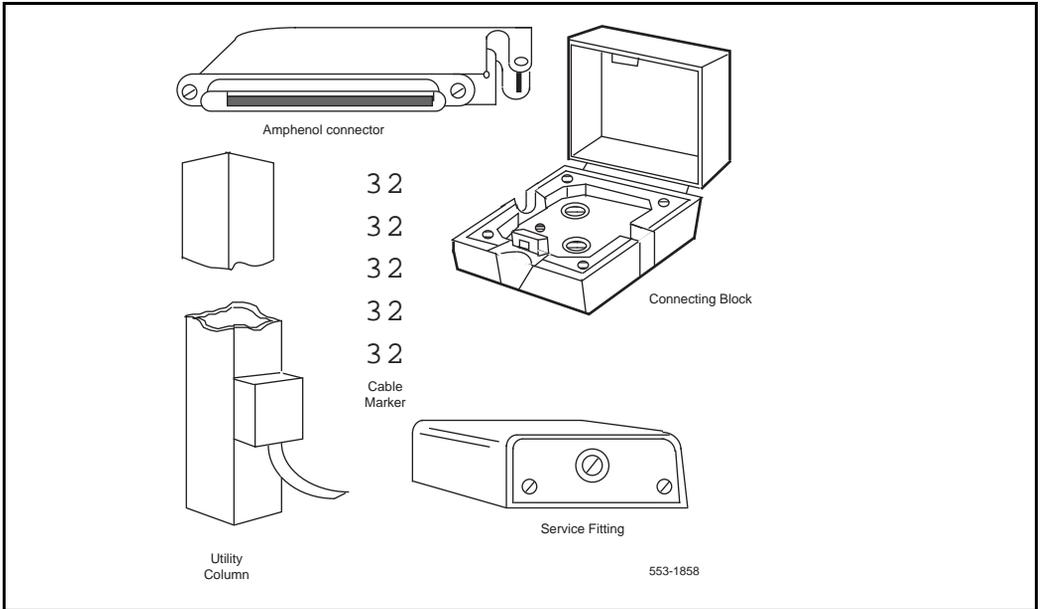
Power Supply Board (NT2K models)

Use the following procedure to add a Power Supply Board to the telephone for connection to a transformer or closet power supply. This procedure applies to the M2006, M2008/M2008HF, M2216ACD and M2616 Meridian Modular telephones, NT2K models.

CAUTION

Connect the optional Power Supply to your Meridian Modular Telephone only. Equipment damage may result from incorrect connections. Both the closet power supply and the transformer are for use with the Meridian Modular Telephone only.

Procedure 81
Installing and removing the M2006 orM2008 Power Supply Board on NT2K sets

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CAUTION

Before handling internal components of telephones, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

Opening the Telephone

1 Disconnect and remove all cords (including the handset) from the telephone.

2 Place the telephone, upside-down, on a padded, level surface.

3 If your set does not have an MCA or MPDA adapter, go to step 7.

4 Using a #1 Phillips screwdriver, remove both screws from the footstand.

5 Remove the footstand from the base by pressing in the back of the footstand as you lift it from the base.

6 Unplug the MCA or MPDA from the data line jack on the base, and set the footstand aside.

7 Remove all screws on the base of the telephone.

---

8   Remove the base from the telephone.

Attaching the Power Module

9   Lay the Power Module assembly into position on the left side of the telephone. Be careful not to bend R5 (the big disk) on the Power Module during installation.

10   If you are adding a Power Module to the set for the first time (not replacing an existing Power Module), the connector (J2 on the M2006 and M2008/M2008HF, P1 on the M2616) on the main board should have jumpers which must be removed at this point.

11   Connect the Power Module to the main board with the ribbon cable, keeping the red edge of the ribbon cable from the front of the telephone as show in Figure 55.

CAUTION

This is a polarity-sensitive connection. The cable and the connector on the main board (J2 on the M2006 and M2008/M2008HF, and P1 on the M2616) are keyed.

---

12   Screw the Power Module into position on the left side of the telephone.

Figure 55
Ribbon cable placement

Cable routed
underneath
Power Module

2

1

M2008HF/M2616
Microphone

553-6329
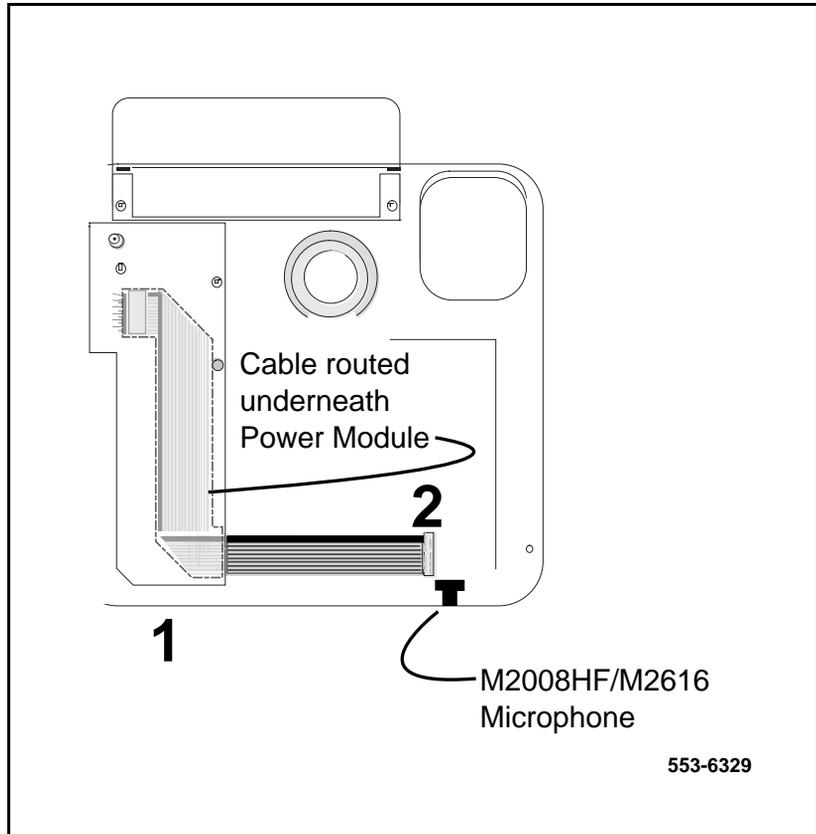
Reattaching the Base

13   Make sure that all ribbon cables are lying flat and not caught on any
posts on the telephone cover or base.

CAUTION

For the M2616 and M2008HF, check that the microphone has not been
moved from its black rubber holder, which in turn should be seated in
the main board near the ribbon cable you've just attached.

---

14   Replace the base.

15   Insert all screws and tighten them.

16   If the telephone has an MCA or MPDA, plug its cable into the jack on the telephone base.

17   Install the footstand, and secure with two screws.

18   Reconnect all cords, including the handset.

Note: Place the label supplied with the power supply board on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

Installing Displays

The following procedures cover installation of the various displays on the various sets.

1   Installing NT2K24WA or NT2K25YL displays on NTZK sets.

- M2008—Use Procedure 82 on page 186.

- M2616 or M2216ACD—Use Procedure 83 on page 189.

2   Installing NT2K28AA displays on NTZK or NT2K sets.

- Use Procedure 84 on page 192.

3   Installing NT2K24WA or NT2K25YL displays on NT2K sets.

- M2008—Use Procedure 85 on page 197.

Installing NT2K24WA or NT2K25YL displays on NTZK sets

To install the display on an M2008 set, use Procedure 82. To install the display on an M2616 or M2216ACD set, use Procedure 83 on page 189.

Procedure 82
Installing and removing the M2008 Display on NTZK sets

CAUTION

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

---

1   Remove the handset and place the telephone upside down on top of a level, solid work surface covered with soft material or paper to prevent damage to movable keys and the telephone face.

2   Disconnect all cords from the telephone.

3   Remove the two screws from the footstand assembly and unsnap the footstand assembly by pressing inward at the back of the footstand where it meets the base and pulling upward.

4   If the telephone is equipped with an MPDA or MCA, unplug the data cable from the base telephone jack. Remove the four screws securing the base to the telephone. Remove the base and set it aside.

5   The power supply board (if equipped) is located on the left side of the telephone. Remove the two small screws from the power supply board (near the top) and set aside. Grasp the board firmly on each side. Carefully work the board loose until it is released.

6   If the telephone is not equipped with a display, go to step 9. If the telephone is equipped with a display, go to step 7.

Removing the display board

7   The display board is located at the left center of the telephone. Disconnect the display ribbon cable from the display board. Remove the small screw from the board. Grasp the board firmly on each end and pull upward to remove. To replace, go to step 9.

Removing the display

8   Remove the two or three screws from the display module. Remove the display from the telephone. To install the display option, go to step 11.

Installing the display board

9   Place the J1 connector of the display board over the P2 pins of the telephone (see Figure 57). Press down slowly until J1 slides onto the P2 pins and is firmly seated.

Figure 56
Display cable routing
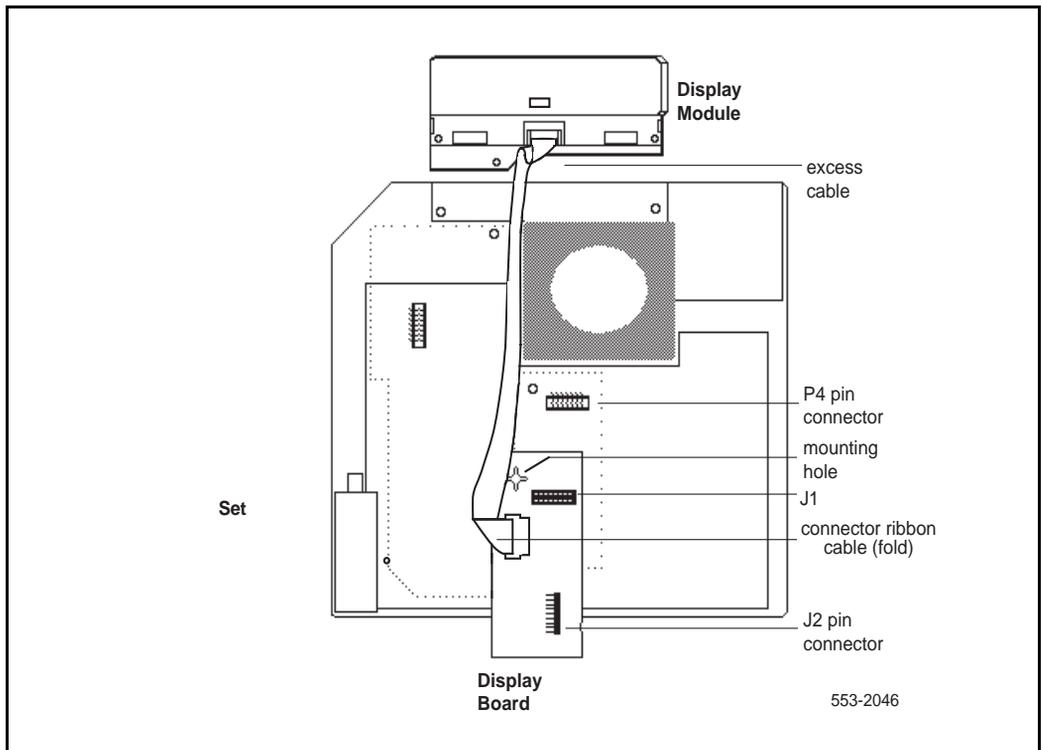
10   Insert the self-tapping Phillips-head screw supplied with the display into the mounting hole (near the top). Tighten it firmly with a #1 Phillips screwdriver.

Installing the display

11   Place the display facedown near the top of telephone and align the two mounting holes of the display with the two mounting holes of the telephone.

12   Insert two self-tapping Phillips-head screws from the faceplate into the mounting holes; tighten them firmly with a #1 Phillips screwdriver.

Note: Do not allow R5 on the power supply board to become bent during this procedure.

13   Install the power supply board (see Procedure 79).

14   Fold the ribbon cable near the connector to align with the J2 pins on the display board, ensuring that the notch on the ribbon cable is facing toward the display board. Carefully work the ribbon cable connector onto the J2 pins until it is firmly seated. Route the cable flat beside the power supply board, gathering excess cable under the display. Be careful not to press the cable beneath the alignment posts or studs of the base. See Figure 57.

15   Replace the base. If the telephone is equipped with an MPDA or MCA, reconnect the data cable to the base telephone jack and replace the footstand (ensuring that the MPDA or MCA cable does not get pinched between the base and footstand). Make sure the footstand is firmly seated to the base.

16   Tighten all the screws, reconnect all cords, and place the telephone in the normal operating position.

Note: Place the label supplied with the display on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

17   Perform the self-test (Procedure 6) and acceptance test procedures. See LD 31 in the *X11 input/output guide* (553-3001-400).

Procedure 83
Installing and removing the M2616/M2216ACD Display on NTZK sets

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CAUTION

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

---

1 Remove the handset and place the telephone upside down on top of a level, solid work surface covered with soft material or paper to prevent damage to movable keys and the telephone face.

2 Disconnect all cords from the telephone.

3 Remove the two screws from the footstand assembly and unsnap the footstand assembly by pressing inward at the back of the footstand where it meets the base and pulling upward.

4 If the telephone is equipped with an MPDA or MCA, unplug the data cable from the base telephone jack. Remove the five screws securing the base to the telephone. Remove the base and set it aside.

5 If the telephone is not equipped with a display, go to step 9. If the telephone is equipped with a display, go to step 6.

Removing the display board

6 The display board is located at the left center of the telephone. Disconnect the display ribbon cable from the display board. Remove the small mounting screw from the board. Grasp the board firmly on each end and pull upward to remove it. To replace it, go to step 9.

Removing the display

7 The power supply board is located on the left side of the telephone. Remove the two small screws from the power supply board (near the top) and set them aside. Grasp the board firmly on each side. Carefully work the board loose until released.

8 Remove the two or three screws from the display Module. Remove the display from the telephone. To install the display, go to step 11.

Installing the display board

9   Place the J1 connector of the display board over the P2 pins of the telephone (see Figure 57). Press down slowly until J1 slides onto the P2 pins and is firmly seated.

   Note: If the center screw is included, do not perform step 10.

10   Insert the self-tapping Phillips-head screw supplied with the display into the mounting hole (near the top). Tighten firmly with a #1 Phillips screwdriver.

Installing the display

11   Place the display face-down near the top of the telephone and align the two mounting holes of the display with the mounting holes in the telephone.

12   Insert two self-tapping Phillips-head screws from the faceplate into the mounting holes; tighten them firmly with a #1 Phillips screwdriver.

13   Install the power supply board (see Procedure 80). This step is not necessary on M2616 unless you have other hardware options.

14   Fold the ribbon cable near the connector to align it with the J2 pins on the display board, ensuring that the notch on the ribbon cable is facing toward the display board. Carefully work the ribbon cable connector onto the J2 pins until firmly seated. Route the cable flat beside the power supply board, gathering excess cable under the display. Be careful not to press the cable beneath the alignment posts or studs of the base. See Figure 57.

   Note: Do not allow R5 on the power supply board to become bent during this procedure.

15   Replace the base. If the telephone is equipped with an MPDA or MCA, reconnect the data cable to the base telephone jack and replace the footstand (ensuring that the MPDA or MCA cable does not get pinched between the base and the footstand). Make sure the footstand is firmly seated in the base.

   Note: Place the label supplied with the display on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

Figure 57
Display cable routing
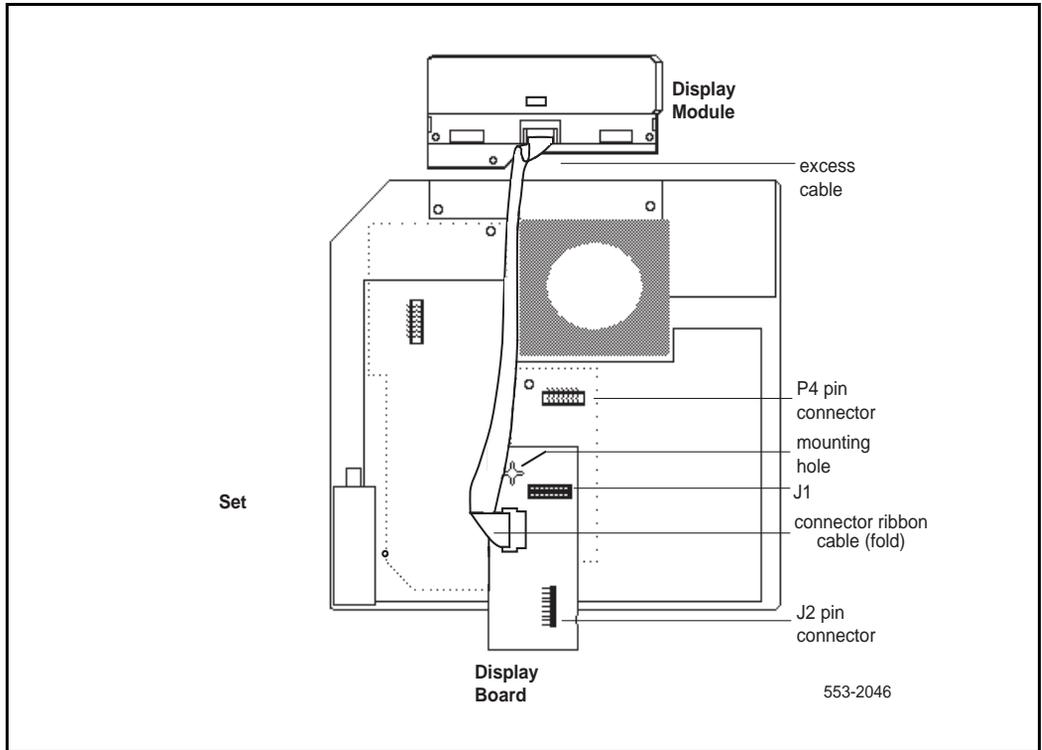
Display Module

excess cable

P4 pin connector

mounting hole

J1

connector ribbon cable (fold)

J2 pin connector

Set

Display Board

553-2046

16   Tighten all screws, reconnect all cords, and place the telephone in the normal operating position.

17   Perform the self-test (see Procedure 16) and acceptance test procedures. See LD 31 in the *X11 input/output guide* (553-3001-400).

Installing NT2K28AA displays on NTZK or NT2K sets

Use the following procedure to add an NT2K28AA display to M2008 and M2616 telephones.

Procedure 84
Installing NT2K28AA displays on NTZK or NT2K sets

CAUTION

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

Opening the Telephone

1   Disconnect and remove all cords (including the handset) from the telephone.

2   Place the telephone, upside-down, on a padded, level surface.

3   Using a #1 Phillips screwdriver, remove the two screws from the footstand.

4   Carefully remove the footstand from the base. Press inward at the back of the footstand where it meets the base and pull upward.

5   If the telephone has a Meridian Communications Adapter, unplug its cable from the base telephone jack.

6   Loosen all screws on the base of the telephone.

7   Remove the base from the telephone.

Removing the Fillerplate

8   Loosen the screws that hold the fillerplate.

9   Remove the fillerplate, being careful not to touch the foam in the speaker housing.

Attaching the Display Module

10   Position the Display Module as shown in Figure 58.

11   Lower the Display Module into place.

12   Insert the fillerplate screws in the Display Module screw holes

---

Figure 58
Positioning the display module

553-6325
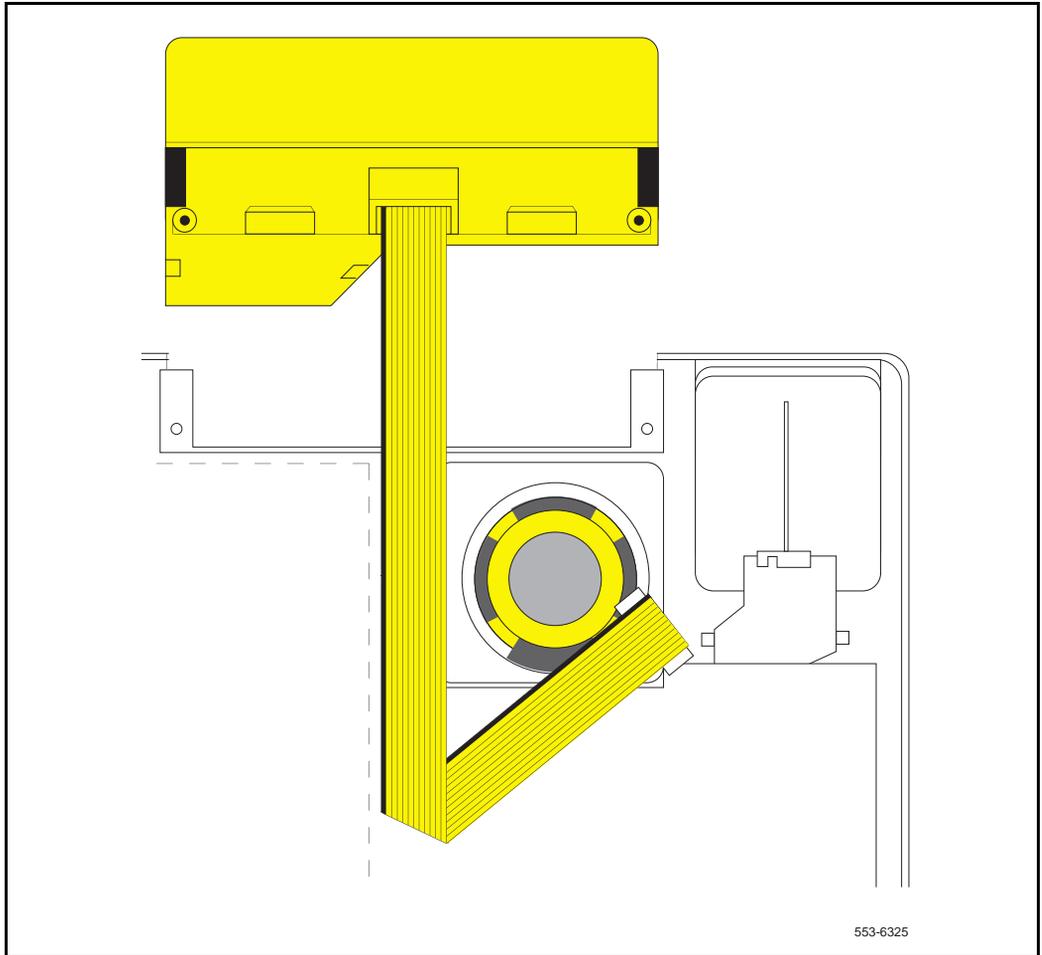
13   Tighten the fillerplate screws.

Note: Place the label supplied with the display on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

Connecting the Display Module Ribbon Cable

14   **NTZK models**: Make sure that the ribbon cable is folded as shown in Figure 59.

Figure 59
Connecting the Display Module Ribbon Cable, NTZK model

553-6326
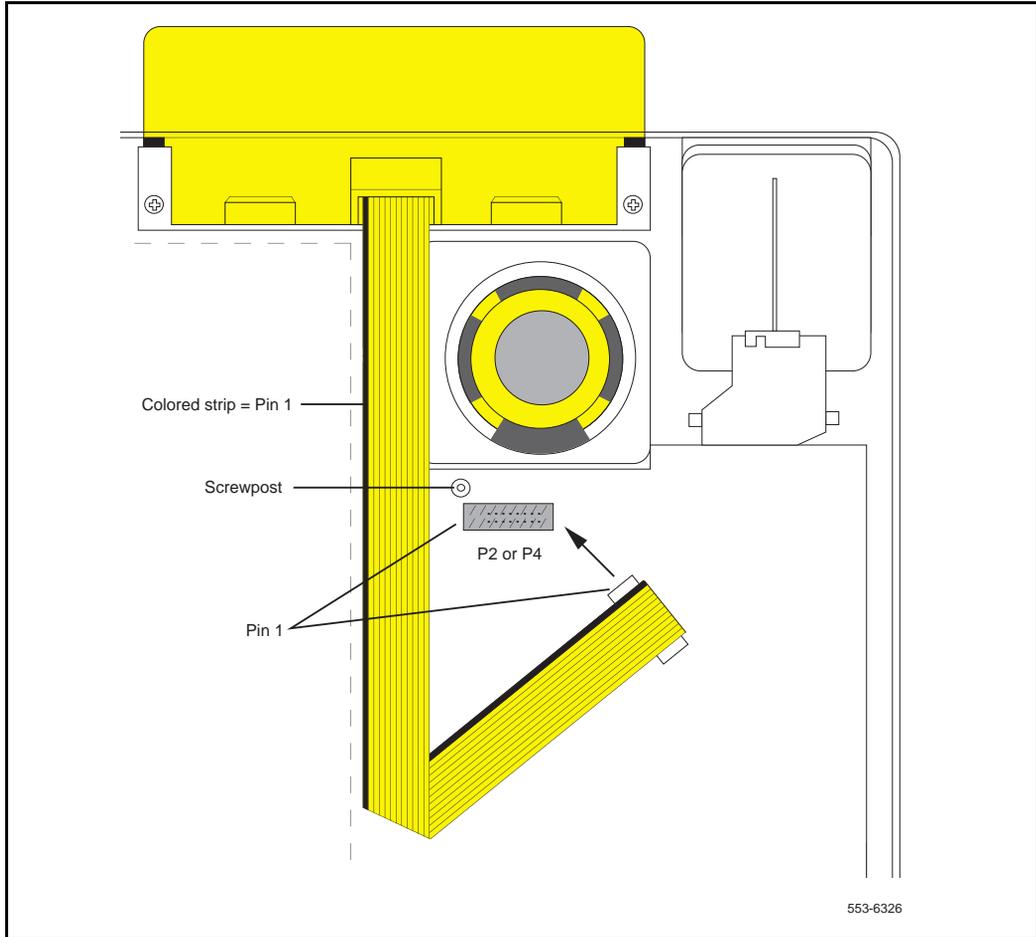
15   **NT2K models**: Make sure that the ribbon cable is folded as shown in Figure 60.

Figure 60
Connecting the Display Module Ribbon Cable, NT2K model

Colored strip = Pin 1

Screwpost

P4   M2616 only

Pin 1

P2   M2008 only

553-6327
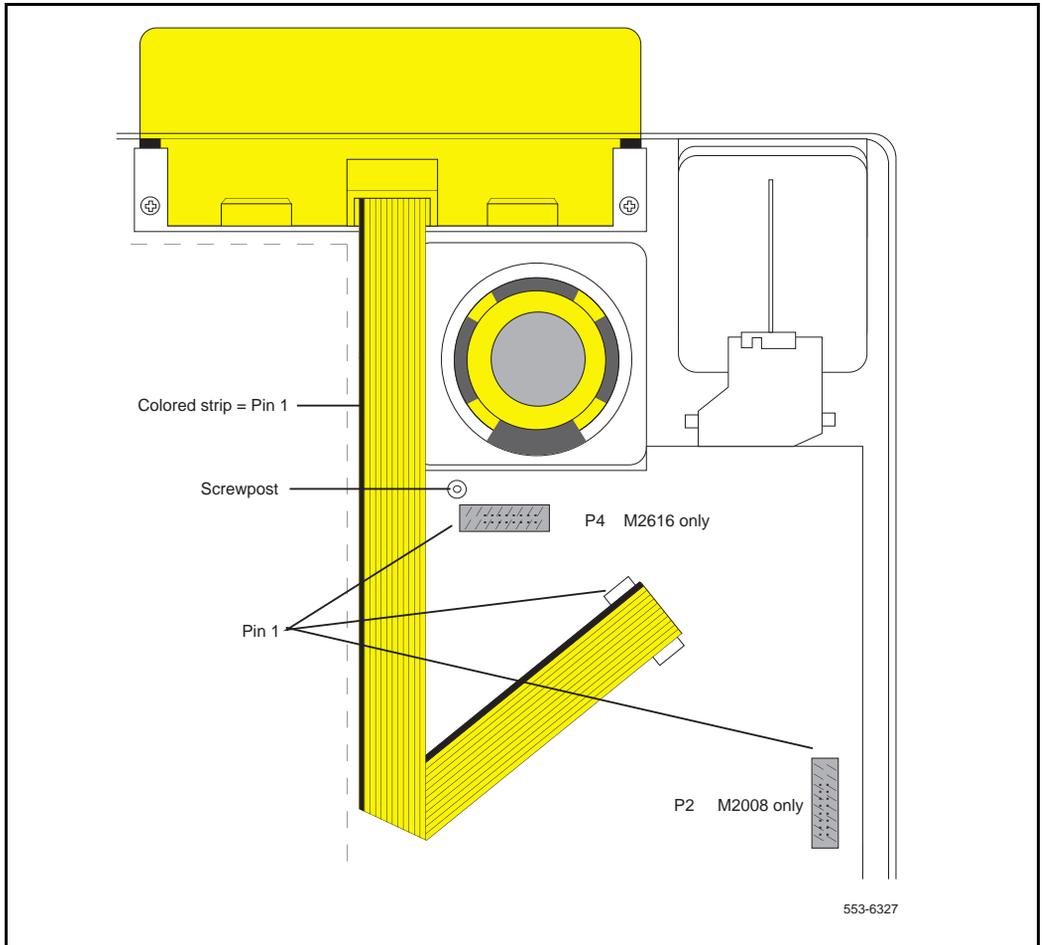
16   Make sure the red line on the ribbon cable lines up with the white dot
beside the connector pins (P2 on an NTZK M2008, J3 on an NT2K
M2008, and P4 on an M2616) on the mother board.

17   Slide the ribbon cable connector onto the connector pins (P2 on an NTZK M2008, J3 on an NT2K M2008, and P4 on an M2616) on the mother board.

CAUTION

This is a polarity-sensitive connection.

---

18   Ensure that the pins line up with the connector correctly and carefully work the connector on until it is firmly seated.

Reattaching the Base

19   Make sure the ribbon cable is lying flat and not caught over or under any alignment posts or studs on the telephone base. (For the M2616, allow it to cover the screwpost and do not replace the screw on re-assembly.)

20   Replace the base.

21   Insert all screws (except the center screw on the M2616) and tighten them.

Reattaching the Footstand

22   If the telephone has a Meridian Programmable Data Adapter (MPDA) or Meridian Communications Adapter (MCA), plug its cable into the jack on the telephone base.

23   Replace the footstand, positioning it firmly on the base.

24   Insert and tighten all screws.

Note: Place the label supplied with the display on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

Reconnecting the Telephone

25   Reconnect all cords.

26   Turn the telephone right-side-up and place it in a normal operating position.

27   Reconnect the handset.

Installing NT2K24WA or NT2K25YL displays on NT2K sets

Use Procedure 85 to install the display on the M2008 set. Use Procedure 86 on page 200 to install the display on the M2616 set.

Procedure 85
Installing and removing the M2008 Display on NT2K sets

CAUTION
Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

---

1   Remove the handset and place the telephone upside down on top of a level, solid work surface covered with soft material or paper to prevent damage to movable keys and the telephone face.

2   Disconnect all cords from the telephone.

3   Remove the two screws from the footstand assembly and unsnap the footstand assembly by pressing inward at the back of the footstand where it meets the base and pulling upward.

4   If the telephone is equipped with an MPDA or MCA, unplug the data cable from the base telephone jack. Remove the four screws securing the base to the telephone. Remove the base and set it aside.

5   The power supply board (if equipped) is located on the left side of the telephone. Remove the two small screws from the power supply board (near the top) and set aside. Grasp the board firmly on each side. Carefully work the board loose until it is released.

6   If the telephone is not equipped with a display, go to step 9. If the telephone is equipped with a display, go to step 7.

Removing the display board

7   The display board is located at the left center of the telephone. Disconnect the display ribbon cable from the display board. Remove the small screw from the board. Disconnect the P0738600 cable from connector J3 on the M2008. Remove the board and cable from the set. To replace, go to step 9.

Removing the display

8   Remove the two or three screws from the display module. Remove the display from the telephone. To install the display option, go to step 11.

Installing the display board

9   Connect the P0738600 cable to the J1 connector of the display board. Place the board on the mounting post (see Figure 61).

Figure 61
Connecting the cable to the display board
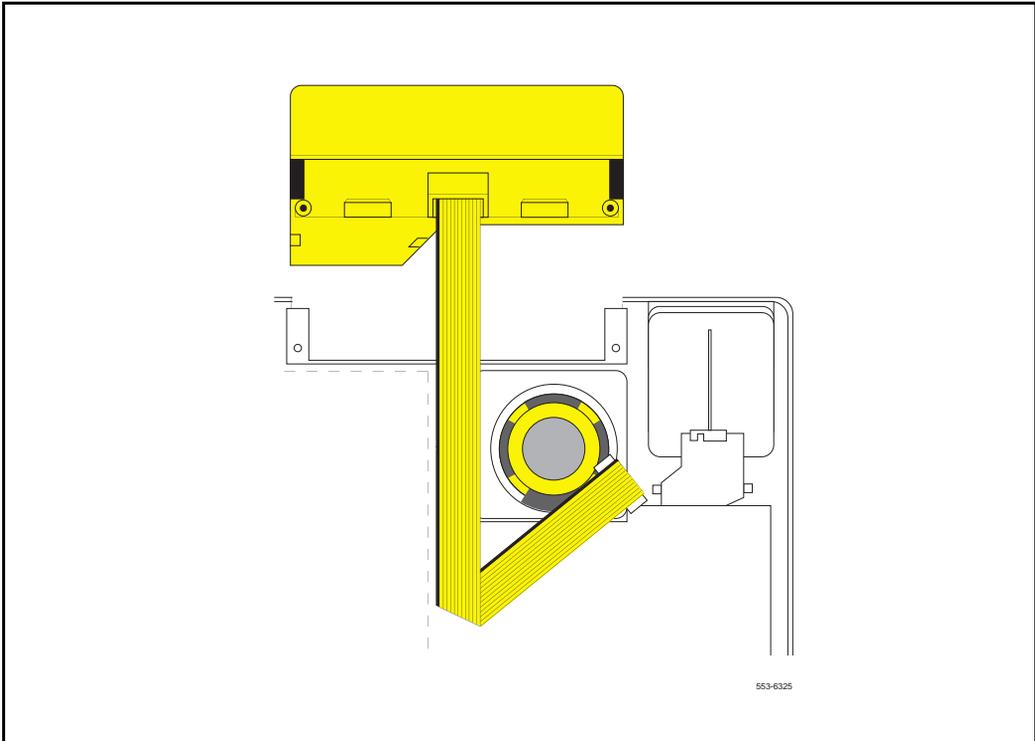
553-6325

10   Insert the self-tapping Phillips-head screw supplied with the display into the mounting hole (near the top). Tighten it firmly with a #1 Phillips screwdriver.

11   Connect the loose end of the P0738600 cable to the J3 pins of the telephone. Press down until the connector slides onto the J3 pins and is firmly seated.

Installing the display

12   Place the display facedown near the top of telephone and align the two mounting holes of the display with the two mounting holes of the telephone.

13   Insert two self-tapping Phillips-head screws from the faceplate into the mounting holes; tighten them firmly with a #1 Phillips screwdriver.

Note: Do not allow R5 on the power supply board to become bent during this procedure.

14   If the MPDA or MCA option is installed, install the power supply board (see Procedure 81).

15   Fold the ribbon cable near the connector to align with the J2 pins on the display board, ensuring that the notch on the ribbon cable is facing toward the display board. Carefully work the ribbon cable connector onto the J2 pins until it is firmly seated. Route the cable flat beside the power supply board, gathering excess cable under the display. Be careful not to press the cable beneath the alignment posts or studs of the base. See Figure 61.

16   Replace the base. If the telephone is equipped with an MPDA or MCA, reconnect the data cable to the base telephone jack and replace the footstand (ensuring that the MPDA or MCA cable does not get pinched between the base and footstand). Make sure the footstand is firmly seated to the base.

Note: Place the label supplied with the display on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

17   Tighten all the screws, reconnect all cords, and place the telephone in the normal operating position.

18   Perform the self-test (Procedure 16) and acceptance test procedures. See LD 31 in the *X11 input/output guide* (553-3001-400).

Procedure 86
Installing and removing the M2616 Display on NT2K sets

CAUTION

Before handling internal telephone components, you must discharge
static electricity from your hands and tools by touching any grounded
metal surface or conductor.

---

1   Remove the handset and place the telephone upside down on top of a
level, solid work surface covered with soft material or paper to prevent
damage to movable keys and the telephone face.

2   Disconnect all cords from the telephone.

3   Remove the two screws from the footstand assembly and unsnap the
footstand assembly by pressing inward at the back of the footstand
where it meets the base and pulling upward.

4   If the telephone is equipped with an MPDA or MCA, unplug the data
cable from the base telephone jack. Remove the five screws securing
the base to the telephone. Remove the base and set it aside.

5   If the telephone is not equipped with a display, go to step 9. If the
telephone is equipped with a display, go to step 6.

Removing the display board

6   The display board is located at the left center of the telephone.
Disconnect the display ribbon cable from the display board. Remove
the small mounting screw from the board. Grasp the board firmly on
each end and pull upward to remove it. To replace it, go to step 9.

Removing the display

7   The power supply board is located on the left side of the telephone.
Remove the two small screws from the power supply board (near the
top) and set them aside. Grasp the board firmly on each side. Carefully
work the board loose until released.

8   Remove the two or three screws from the display Module. Remove the
display from the telephone. To install the display, go to step 11.

Installing the display board

9 Place the J1 connector of the display board over the P4 pins of the telephone (see Figure 61). Press down slowly until J1 slides onto the P4 pins and is firmly seated.

10 Insert the self-tapping Phillips-head screw supplied with the display into the mounting hole (near the top). Tighten firmly with a #1 Phillips screwdriver.

Installing the display

11 Place the display face-down near the top of the telephone and align the two mounting holes of the display with the mounting holes in the telephone.

12 Insert two self-tapping Phillips-head screws from the faceplate into the mounting holes; tighten them firmly with a #1 Phillips screwdriver.

13 Install the power supply board (see Procedure 80). This step is not necessary on M2616 unless you have other hardware options.

14 Fold the ribbon cable near the connector to align it with the J2 pins on the display board, ensuring that the notch on the ribbon cable is facing toward the display board. Carefully work the ribbon cable connector onto the J2 pins until firmly seated. Route the cable flat beside the power supply board, gathering excess cable under the display. Be careful not to press the cable beneath the alignment posts or studs of the base. See Figure 61.

Note: Do not allow R5 on the power supply board to become bent during this procedure.

15 Replace the base. If the telephone is equipped with an MPDA or MCA, reconnect the data cable to the base telephone jack and replace the footstand (ensuring that the MPDA or MCA cable does not get pinched between the base and the footstand). Make sure the footstand is firmly seated in the base.

Note: Place the label supplied with the display on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

16 Tighten all screws, reconnect all cords, and place the telephone in the normal operating position.

17 Perform the self-test (see) and acceptance test procedures. See LD 31 in the *X11 input/output guide* (553-3001-400)

External Alerter Board

Use this procedure to add an External Alerter Board to the M2006, M2008, M2216ACD, or M2616 telephone. See Figure 62 for information on hooking up the third-party External Alerter device.

Procedure 87
Installing and removing the External Alerter Board

CAUTION

Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

---

1   Remove the handset and place the telephone upside down on a level, solid work surface covered with soft material or paper to prevent damage to movable keys and the telephone face.

2   Disconnect all cords from the telephone.

3   Remove the two screws from the footstand assembly and unsnap the footstand assembly by pressing inward at the back of the footstand where it meets the base and pulling upward.

4   If the telephone is equipped with an MPDA or MCA, unplug the data cable from the base telephone jack.

5   Remove the four screws securing the base of the telephone to the top cover. Remove the base and set aside.

6   If the telephone is not equipped with an External Alerter Board, go to step 8. If you wish to replace an existing External Alerter Board, go to step 7.

Removing the External Alerter Board

7   The External Alerter Board is located at the right center of the telephone. Remove the screws from the board. Grasp the board firmly on each end and pull upward to remove.

Installing the External Alerter Board

8   Place the H1 connector of the External Alerter Board over the P3 pins of the telephone (see Figure 51 for M2006/M2008; see Figure 52 for M2616/M2216ACD). Align the mounting hole over the mounting post. Carefully work H1 onto the P3 pins until firmly seated. Place the self-tapping Phillips-head screw supplied with the External Alerter Board into the mounting hole and tighten it with a #1 Phillips screwdriver.

9   To signal the External Alerter when the telephone's handset or speaker is active, place the jumpers (AO288529) connecting the two right-most pins on the alerter board.

To signal the External Alerter when the telephone is ringing or buzzing, place the jumpers connecting the two left-most pins on the External Alerter Board.

10   If the telephone is not yet equipped with the power supply board, install it (see Procedure 80 for M2006/M2008; see Procedure 81 for M2616/M2016S/M2216ACD).

Note: Do not allow R5 on the power supply board to become bent during this procedure.

11   Replace the base. If the telephone is equipped with an MPDA or MCA, reconnect the data cable to the base telephone jack and replace the footstand (ensuring that the MPDA or MCA cable does not get pinched between the base and the footstand). Make sure the footstand is firmly seated in the base.

12   Tighten all screws, reconnect the line cord, and place the telephone in the normal operating position.

Note: Place the label supplied with the External Alerter on the outside of the bottom cover of the telephone. This allows proper identification and tracking of the option level of the set.

13   For the connecting block configuration, see Figure 62.

14   Perform the self-test (see Procedure 16) and acceptance test procedures. See LD 31 in the *X11 input/output guide* (553-3001-400).

Figure 62
External Alerter connecting block configuration

553-6325
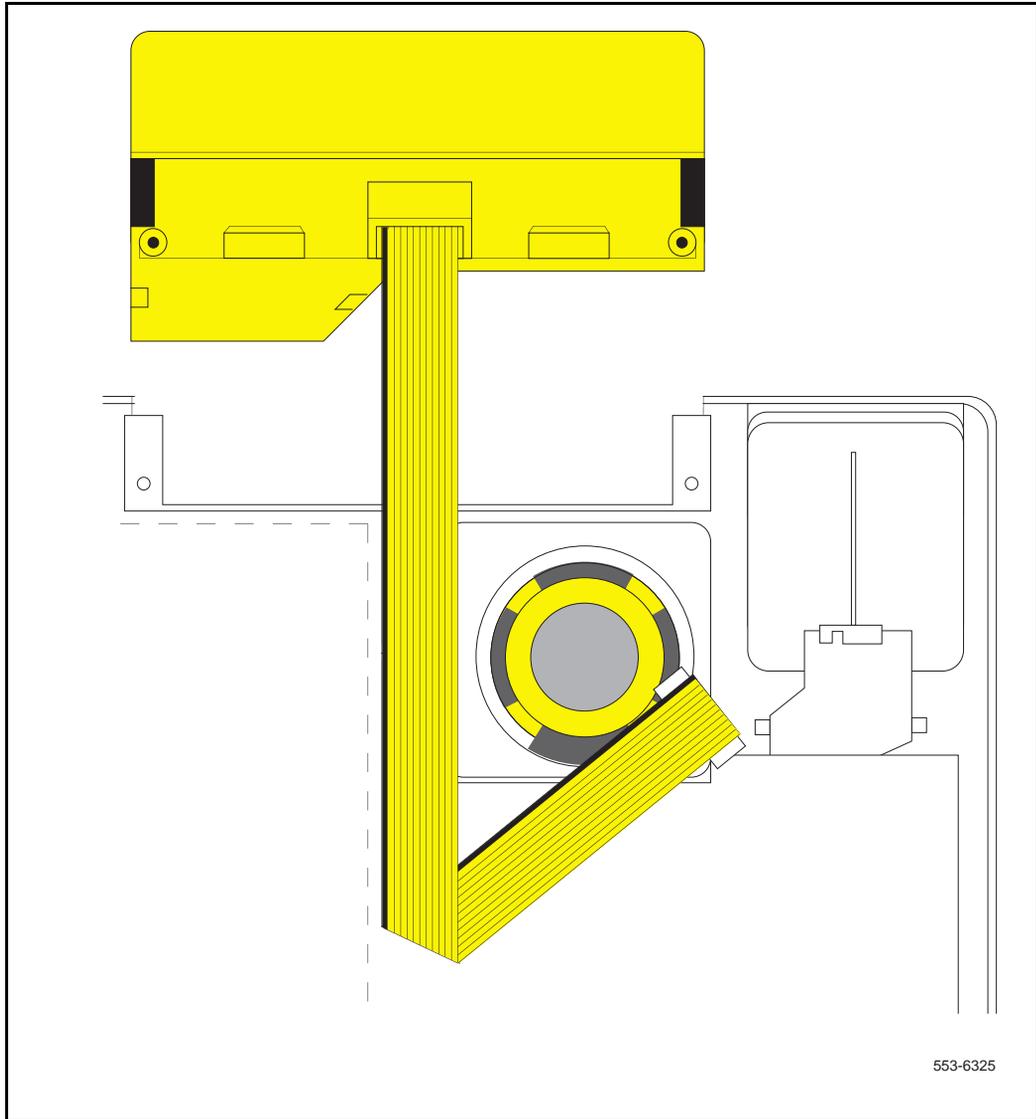
Key Expansion Modules

Use this procedure to add one (single) or two (double) Key Expansion Modules to the M2616 or M2216ACD telephones.

Note 1: Before installing the Key Expansion Module(s), you must have the associated footstand.

Note 2:   Adding a Key Expansion Module to a telephone requires a power supply board along with an additional power source (see Procedure 70 for M2006/M2008; see Procedure 80 for M2616/M2216ACD).

Procedure 88
Installing and removing Key Expansion Module(s) on the M2616 and M2216ACD telephones

1   Remove the handset and place the telephone upside down on top of a level, solid work surface covered with soft material or paper to prevent damage to movable keys and the telephone face.

2   Disconnect all cords from the telephone.

3   Remove the two screws from the footstand assembly and unsnap the footstand assembly from the telephone by pressing inward at the back of the footstand where it meets the base and pulling upward.

Note: If the M2616/M2216ACD is equipped with a Meridian Programmable Data Adapter (MPDA) or Meridian Communications Adapter (MCA), it must be removed and installed into the Key Expansion Module footstand. Use Procedure 77.

4   If the telephone is not equipped with a Key Expansion Module(s), go to step 7. If you are replacing the Key Expansion Module(s), go to step 5.

Removing the Key Expansion Module(s)

5   Remove the screws from the footstand assembly (where it meets the Key Expansion Module), and unsnap the footstand assembly from the Key Expansion Module and telephone by pressing inward at the back of the footstand where it meets the base and pulling upward.

6   Remove the interface cable from the telephone by pressing down on the locking tab. If equipped, remove the interface cable from the first Key Expansion Module (closest to the telephone).

Installing the Key Expansion Module(s)

7   If the telephone is not yet equipped with the power supply board, install the Power Board (see Procedure 80).

8   Align the bottom of the Key Expansion Module(s) to the bottom of the telephone (see Figure 63).

9   Snap the ribbon cable connector into the bottom interface jack on the Key Expansion Module.

   Note: Use the cable supplied with the module. This is a special cable required for EMI compliance.

   Snap the other end of the ribbon cable into the interface jack in the telephone (left side). Gather the excess cable in the base of the Key Expansion Module.

10   To add a second Key Expansion Module, snap a second ribbon cable connector into the bottom interface jack on the second Key Expansion Module. Snap the other end of the ribbon cable into the top interface jack on the first Key Expansion Module (see Figure 63). Gather the excess cable in the base of the second Key Expansion Module.

11   If the telephone is equipped with an MPDA or MCA, reconnect the data cable to the base telephone jack. Make sure the MPDA or MCA cable (and interface cable) do not get pinched between the base and footstand.

12   Secure the footstand to the Key Expansion Module(s) and telephone by placing the tabs of the footstand into the slots provided on the base of the Key Expansion Module and telephone and pressing down. Make sure the footstand is firmly seated on the base.

   Note: Use the cable supplied with the module. This is a special cable required for EMI compliance. Newer versions of the Key Expansion Module use a longer modified cable than was used on earlier versions.

   Ensure that the ribbon cable(s) are not pinched between the footstand and mounting posts.

13   Insert the three (four if you have two modules) self-tapping, Phillips-head screws supplied with the Key Expansion Module into the mounting holes in the bottom of the footstand. Tighten firmly with a #1 Phillips screwdriver.

Note: Place the label supplied with the Key Expansion Module(s) on the outside of the bottom cover or footstand of the telephone. This allows proper identification and tracking of the option level of the set.

14   Perform the self-test (see Procedure 16) and acceptance test procedures. See LD 31 in the *X11 input/output guide* (553-3001-400).

Figure 63
Key Expansion Module connections (bottom view)
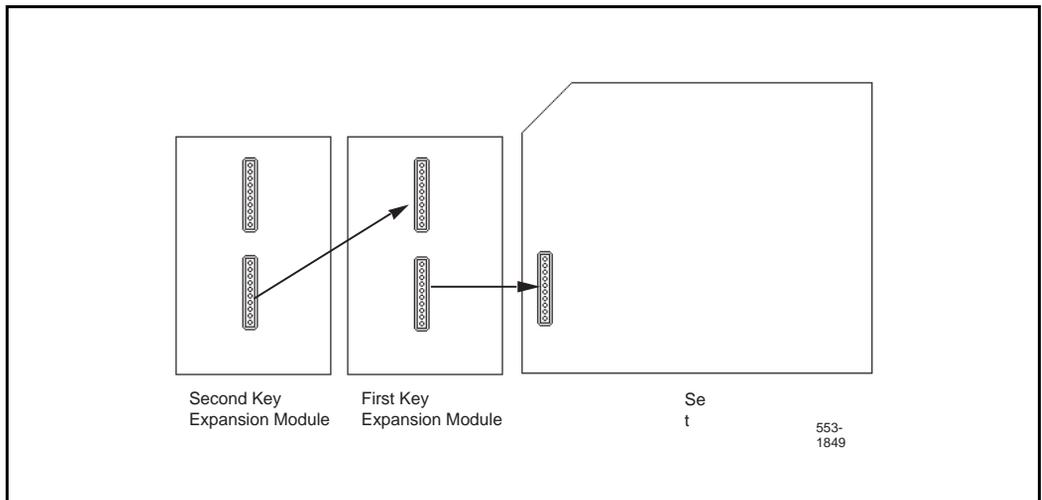
Wall mounting

The M2006, M2008, M2616, and M2016S telephones are equipped with a reversible footstand that allows for wall mounting. The wall mount clip should be purchased and inserted in the handset well to hold the handset securely in place on wall-mounted telephones. You can hang Meridian Modular Telephones on the wall with an installed display or Key Expansion Module.

> *Note:* The footstand cannot be reversed when the Meridian Programmable Data Adapter or Meridian Communications Adapter is equipped, so telephones with data cannot be wall-mounted. Additionally, some wall plates are too deep to allow for wall mounting on top of the plate. In these cases you should mount the telephone on the wall next to the plate.

An additional clip is provided for wall mounting the telephone. This clip is attached to the switchhook rest to prevent the handset from slipping when mounted on the wall.

Procedure 89
Wall mounting instructions for Meridian Modular Telephones

1   Remove the handset and place the telephone upside down on top of a level, solid work surface covered with soft material or paper to prevent damage to movable keys and the telephone face.

2   Disconnect all cords from the telephone.

3   Remove the two screws from the footstand assembly and unsnap the footstand assembly by pressing inward at the back of footstand where it meets the base, and pulling upward.

4   Rotate the footstand 180° and snap the footstand back into place on the telephone bottom cover. Make sure the footstand is firmly seated on the base of the telephone.

5   Tighten all screws and replace all cords.

6   Insert the wall mounting clip in the switchhook rest.

7   Mount the telephone on the wall using the wall mount holes provided on the bottom of the footstand.

Troubleshooting

Use Table 41 to check problems encountered when installing Meridian Modular Telephones and their options.

Table 41
Troubleshooting Meridian Modular Telephones (Part 1 of 4)

Symptom	Solution	
Telephone does not work.	1	Unplug the line cord from the telephone and plug it back in.
	2	If the telephone uses external power, make sure the transformer or closet power supply is properly connected and that the power supply board is properly installed.
		If the telephone does not use external power, make sure that jumpers are placed connecting the bottom two sets of pins on the P1 connector on the main circuit board.
All LCDs flash and telephone does not function.	1	Press the Release (Rls) key.
	2	Unplug the line cord from the telephone and plug it back in.
Telephone wobbles.	1	Ensure that all cords are properly routed through channels in the footstand.
	2	Check that the footstand is firmly seated on the telephone.
	3	Ensure that all feet are firmly seated in the footstand.
Display does not work.	1	Unplug the line cord from the telephone and plug it in again.
	2	Ensure that the transformer is plugged in or the closet power is connected (M2008 only).
	3	Ensure that the power supply board is installed properly (M2008 only).

Table 41
Troubleshooting Meridian Modular Telephones (Part 2 of 4)

Symptom		Solution
Display does not work. (cont.)	4	Check that the display ribbon cable is properly connected to the display board and has not been pinched.
	5	Ensure that the display board is installed correctly and held securely with a mounting screw.
	6	M2006, M2008, M2616—ensure that ADD class of service is configured in LD 11. See the *X11 input/output guide* (553-3001-400).
There is no response when you type <CR> or AT at the terminal.	1	Press the P key and dial 28 to make sure you are in terminal mode.
	2	Make sure your PC or terminal's power is on and you are online.
	3	If the equipment connected to your MCA is not configured as Data Terminal Equipment, you will need to connect using a null modem cable.
	4	Make sure the MCA is receiving external power. Check to see that the power cables are connected properly and the external power supply is running.
	5	If you have a display on your phone, press the P key and dial 63 to get into EIA Monitor mode. Be sure the MCA is receiving signals from your terminal by watching the display while entering carriage returns on the keyboard. If the indicator flashes, the connection is correct. If not, check the cable to make sure it is the standard RS-232 and is properly connected.
	6	Press the P key and dial 62 to ensure that the MCA is in the asynchronous mode. Press the P key and dial 20 to change to the asynchronous mode.
	7	Press the P key and dial * to ensure that the MCA is in the idle mode.

Table 41
Troubleshooting Meridian Modular Telephones (Part 3 of 4)

Symptom	Solution
The prompt CALL CONNECTED. SESSION STARTS is followed by RELEASE.	Check the configuration parameters of the far end data device. If they do not match those of your MCA, the call will be dropped. You will have to change the parameters of your MCA to match.
Garbled prompts are sent to your terminal when you type <CR>.	Enter a period (.) followed by <CR> to perform an autoparity.
You are connected to a host computer, but get no response when you try to log on.	First, release the call. Turn on Remote Loopback and make the call again. Type some characters at your terminal. If they echo back and appear on your terminal, the problem is with the far end data device. If the characters do not appear on your terminal, the problem is with the MCA. Call your telephone system administrator.
You try to make a data call from the initial prompt (or Main menu) in keyboard dialing. You see the prompt CALLING.	First, hold down the break key(s) for two seconds, enter <CR>, and try again to make the data call. If the problem persists, your MCA is probably disabled. Call your telephone system administrator.
MCA does not operate at all.	1 Check the LED in the back of the telephone to see if it is flashing. If the LED is steadily lit, the MCA needs to be configured in your system, or it may be bad. If the LED is not lit, the MCA requires external power. 2 Make sure the cable from your terminal or PC is connected to the MCA. 3 Check the data parameters for your display. 4 Be sure the transformer is plugged in, or the closet power is connected. 5 Be sure the cable between the MCA and your telephone is connected and has not been pinched. 6 Be sure the power card is installed correctly. Verify that the jumper settings are correct for either RS-232 or V.35 (whichever you are using).

Table 41
Troubleshooting Meridian Modular Telephones (Part 4 of 4)

Symptom	Solution	
Key Expansion Module does not work.	1	Unplug and plug in the line cord.
	2	Ensure that the transformer is plugged in or that the closet power supply is connected.
	3	Ensure that the power supply board is installed properly.
	4	Make sure that the ribbon cable connecting the telephone and the Key Expansion Module is routed properly and is not pinched.
External Alerter does not work.	1	Ensure that the External Alerter Board is installed properly.
	2	Check that connections between the alerting device and the telephone connecting block are correct.
	3	Make sure that the jumpers are placed on the pins on the External Alerter Board as described in Procedure 87 on page 202.
	4	Ensure that the transformer is plugged in or the closet power is connected.
	5	Ensure that the power supply board is installed properly.

Note 1: If the pseudorandom pattern 511 data is idle, the telephone keypad dialing is inoperative. Use the release key to clear this condition.

Note 2: If you are using an RS-232 cable to connect the MCA to an ADM3/5 terminal, be sure pin 22 is disconnected.

Note 3: Change the baud rate before you change the mode from synchronous to asynchronous.

Note 4: Some terminals may drop DTR with the break. If this happens, RELEASE is not displayed.

Figure 64
Flowchart for troubleshooting MCA

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Index

Meridian 1

Telephone and attendant console installation

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