Strata VI

INSTALLATION INSTRUCTIONS

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INSTALLATION INSTRUCTIONS

ILLUSTRATION LIST

01 GENERAL

01.01   This section describes the installation procedures necessary to ensure proper operation of the STRATA VI system.

02 PACKING

02.01   When a STRATA VI system is received, examine all packages and make careful note of any visible damage. If any damage is found, bring it to the attention of the delivery carrier and make the proper claims.

02.02   Check the STRATA VI system against the purchase order and packing slip. If it is determined that any cartons are missing, contact your delivery carrier immediately. If it is determined that any equipment within a carton is missing, contact your Toshiba supplier immediately.

02.03   After unpacking (before installation is started), inspect all equipment for damage. If any damage is detected, contact your delivery carrier immediately. If possible, retain all original packing material.

02.04   When handling (installing, removing, examining, etc.) a printed circuit board, **do not** touch the back (soldered) side or the edge connector. Always hold a PCB by its edge.

02.05   When packing or storing the CRDU and/or MCCU, ensure the following:

● **Do not** use plastic or any type of conductive material for packing either the CRDU or the MCCU.

● **Use** plain paper.

NOTE:
Conductive packing material may cause the internal back-up battery to discharge and damage the system.

02.06   Whenever storing or shipping the MCCU and/or CRDU, always ensure that the battery strap is in the **OFF** position (Figure 1).
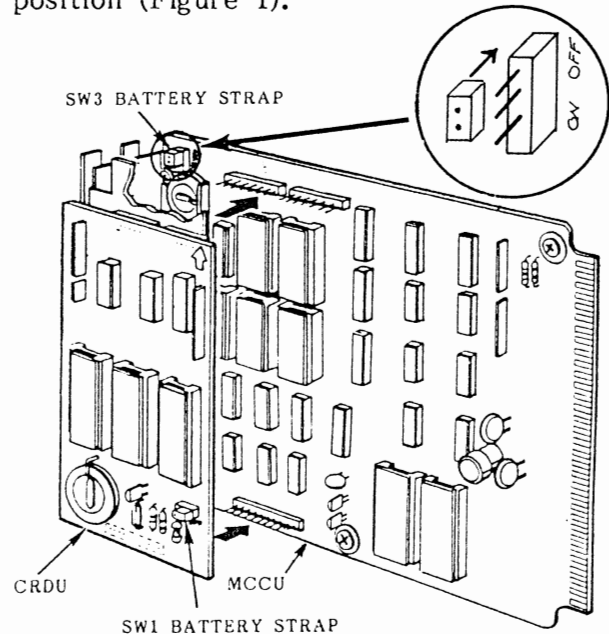
FIGURE 1

NOTE:
Always make sure the battery strap(s) on the MCCU and/or CRDU is in the "ON" position just prior to installation. If not, the SET LED on the MCCU will not operate.

03 MKSU LOCATION REQUIREMENTS

03.01 Power Requirements

03.02   The STRATA VI MKSU requires 24VDC. This is provided by the power supply, which in turn requires power from a grounded 115VAC outlet. The outlet should be separately fused and rated at 15 amps.

03.03   Two power supplies are available:

● MPSA-200 provides sufficient power for 16 stations, of which a maximum of three telephones may be BLF EKTs.

● The EPSA-104 is necessary if four or more BLF EKTs are required within a system. Up to 16 BLF EKTs may be installed with an EPSA-104 power supply.

03.04 The 54-inch cord provided to connect the power supply to the MKSU dictates the relative location of the power supply. The power supply is also equipped with a 10-ft. AC power cord.

03.05 Optional battery back-up units (PBBU) are available for both power supplies. The PBBU is a printed circuit board that mounts inside the power supply housing. The recommended battery pack, which is customer supplied, consists of two 12VDC batteries (maintenance-free automobile-type is recommended). With the optional battery back-up assembly installed, all functions of the STRATA VI system will operate for a period of time (which is in direct ratio with the type and size of batteries selected) after a loss of normal electrical power. No calls will be disconnected during switch-over to battery power.

03.10 Ventilation Requirements

03.11 Sufficient ventilation should exist to allow the dissipation of heat generated by the power supply and MKSU.

03.20 Environmental Factors

03.21 Humidity at the MKSU location should be within $20 \sim 80\%$ (without condensation), and the temperature should be relatively constant within a range of $0 \sim 50^{O}$ C. Exposure to dust and airborne chemicals should also be taken into consideration.

03.30 Cabling Considerations

03.31 The MKSU must be located so that all stations are within 1000 cable feet of it. Acceptable cable is 22 or 24 AWG inside telephone station cable, jacketed but not shielded, having two or more wire pairs.

04 MKSU MOUNTING

04.01 The MKSU is designed for either table or wall mounting, but comes from the factory configured for table mounting. For wall mounting instructions, refer to Paragraph **04.20.**

04.10 Table Mounting the MKSU

04.11 Since the MKSU is already configured for table mounting, the only requirement is to choose a suitable location and proceed to Section 100-006-250, MPSA-200 Installation or Section 100-006-255, EPSA-104 Installation.

04.20 Wall Mounting the MKSU

04.21 Prepare the MKSU for wall mounting by reversing the back cover to expose the two top mounting holes. Proceed as follows:

● Remove and save the five screws securing the back cover.

● Rotate the back cover 180°, and realign it so that the flanges with the two mounting holes project above the top of the MKSU, as shown in Figure 2.
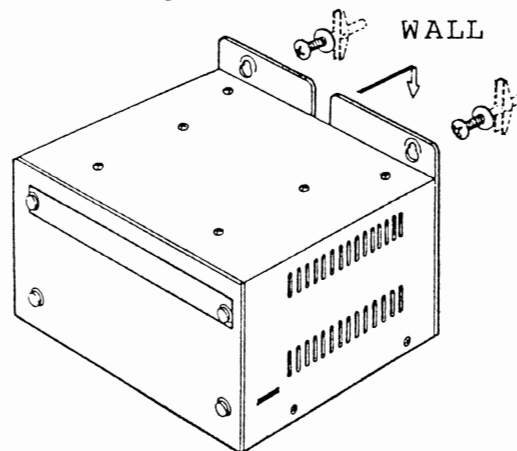

FIGURE 2

• Reinstall the back cover, and secure it with the five screws that were removed earlier.

04.22 Secure the MKSU, as shown in Figures 2 and 3, with fasteners through the upper two holes and the single lower hole in the backplate. The fasteners should be either 1/4-inch molly screws, toggle bolts, or lag screws, depending upon the type of wall surface being used.
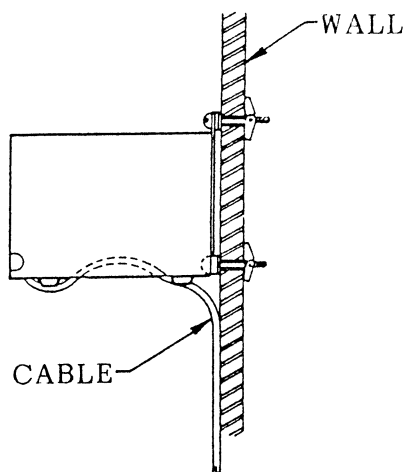

FIGURE 3

04.23 Prior to installing any printed circuit boards, install the power supply per instructions in Section 100-006-250, MPSA-200 Installation or Section 100-006-255, EPSA-104 Installation.

05 MTOU PCB OPTIONS

05.01 The MTOU houses several options that must be considered before it is installed in the MKSU, they are:

• Background Music Relay Service—the optional BR relay (K1 socket, Figure 4), if installed, provides a dry contact at the BR terminals on the front of the MTOU to control cut-off of BGM during an external page. The relay operates whenever an external page occurs.

• Night Relay Service—the optional NR relay (K2 socket), if installed, provides a dry contact at the NR terminals on the front of the MTOU. The W3 strap option (Figure 4) allows the relay to function in one of two modes.

FIGURE 4

a) Answering Machine Control— if the W3 strap is not cut, the relay is operated continuously when the system is in night service. This mode is intended for indirect control of an answering machine.

b) Night Bell Control—if the W3 strap is cut, the relay pulses at a 1-sec. on, 3-sec. off rate whenever the system is in night transfer mode and an incoming call is ringing the system. This mode is intended to be used for indirect control of an external night bell.

• External Page Impedance Selection—the external page output appears at the terminals labeled 8/600 on the front of the MTOU. The output impedance can be selected to be either 8 ohms or 600 ohms. If 8 ohms is selected, the output will be via a 3-watt
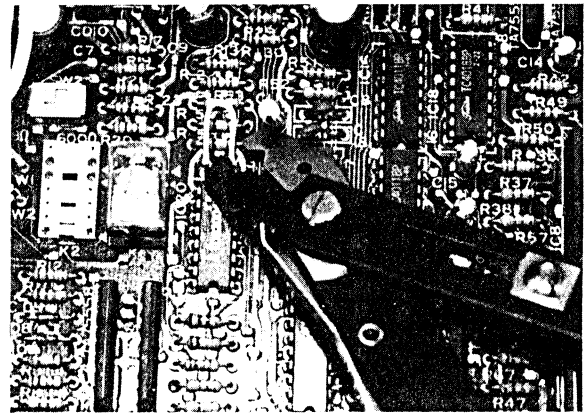
amplifier on the MTOU, and the voice path will be one way. If 600 ohms is selected, an external PA amplifier or talk-back amplifier is required and the internal voice path will be two way.

05.02 To equip either of the two relay service functions; obtain the optional relay from your Toshiba supplier and install it in the proper location on the MTOU, per Figure 5.
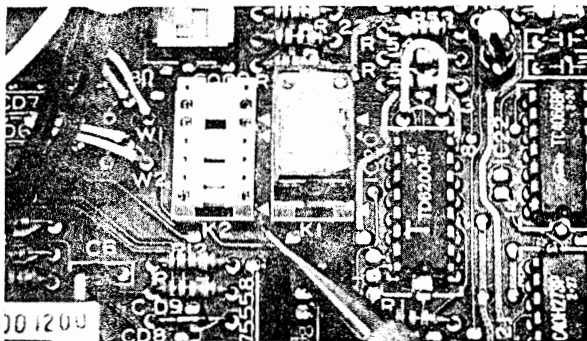

FIGURE 5

05.03 External page impedance is selected with the SW2 switch located adjacent to the relay sockets on the MTOU PCB (Figure 6). Decide if 8- or 600-ohm impedance is required, then make the selection by positioning the SW2 switch to "8" or "600", whichever is required. Figure 6 shows the switch in the 8-ohm position.
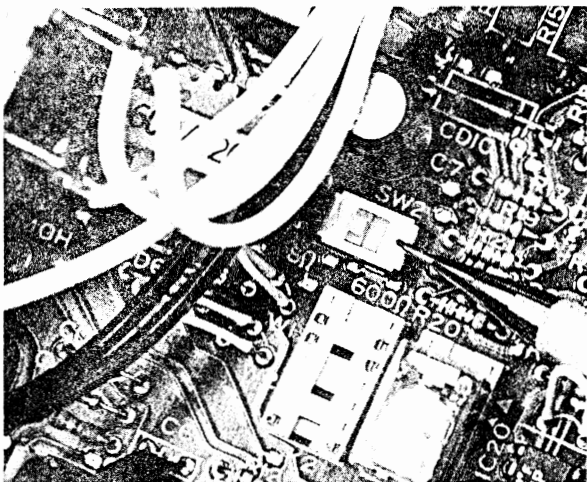
FIGURE 6

06 PRINTED CIRCUIT BOARDS

06.01 A maximum of seven PCBs can be installed in the MKSU. They are:

NOTE:
For proper static electricity protection, install the PCBs in the following sequence.

● MTOU (Tone Unit)—one per system.

● CRDU (Repertory Dial Unit)—one per system, to be installed **on** the MCCU PCB when the Automatic Dialing-Station option is required.

● MCCU (Central Control Unit)—one per system.

● MSTU (Station Interface Unit)—install one for each group of eight stations. System maximum is two (16 stations).

● MCOU (Central Office Unit)—install one for each group of three CO/PBX lines. System maximum is two (six lines). Two types of MCOU are available.

  a) MF—to be used when DTMF outpulsing is required.

  b) DP—to be used when rotary dial outpulsing is required.

06.10 MTOU PCB Installation

06.11 The MTOU front panel provides the connection point for the 24VDC input from the external power supply. Therefore, it must be installed first.

06.12 Install the MTOU PCB in the MKSU as shown in Figure 7.

CO 4,5,6

CO 1,2,3   Ext 10-17   Ext 18-25
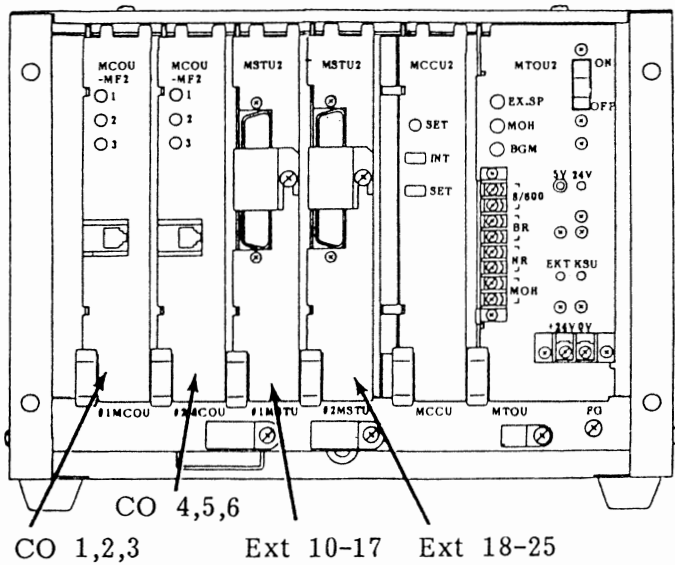
FIGURE 7

06.20 Power Connection

06.21 Plug the power supply into a 115VAC outlet and check its output voltage to be sure it is between 23.2 and 28.2VDC. If the voltage is not within these limits, replace the power supply before proceeding.

06.22 Disconnnect the power supply from the 115VAC outlet. Remove the plastic protective cover from the power terminal strip on the MTOU, and, with the supplied cord, connect the power supply to the terminal strip and the MKSU frame ground (see Figure 8) in the following manner.

White:	"24V"
Black:	"OV"
Green:	"FG" on MKSU
	"E" on power supply

Make sure the wires are connected to matching terminals at each end. Secure the power cord to the MKSU with the plastic cable clamp that is provided.

06.23 Use the additional green wire packed with the system to bond the "E" and "0V" terminals on the power supply (see Figure 8).

FIGURE 8

06.24 For protection against static electricity, a green jumper wire is attached to the "FG" screw (refer to Figure 8). This wire must be connected to the "OV" terminal on the MTOU power strip. Reinstall the plastic protective cover on the power strip at this time.

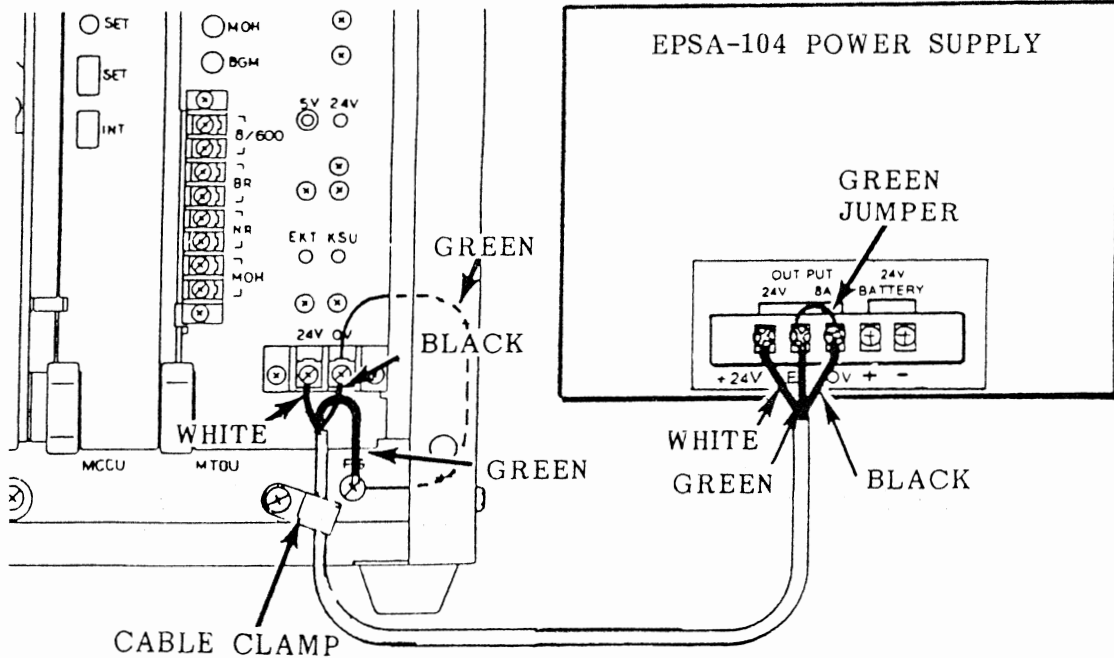**06.25** The Toshiba STRATA VI electronic key telephone system requires a solid earth ground on the "FG" terminal on the MKSU tray. Failure to provide such a ground may lead to confusing trouble symptoms in the system and, in extreme cases, circuit board failure.

● In most installations, within the continental United States, the ground provided by the "third wire ground" at the commercial power outlet will be satisfactory for all STRATA VI requirements. However, in a small percentage of installations this ground may be installed incorrectly. Therefore, prior to installing a STRATA VI system, the third wire ground must be tested for continuity by either measuring the resistance between the 3rd prong terminal (earth ground) and a metal cold water pipe, or by using a commercially available earth ground indicator. If neither of these procedures are possible, then the test procedures outlined in Paragraph **06.26** should be performed.

CAUTION:
Hazardous voltage is exposed during the following test. Use great care when working with AC powerline voltage.

06.26 Test Procedure

1. Obtain a suitable voltmeter and set it for a possible reading of up to 250VAC.

2. Connect the meter probes between the two main AC voltage points on the wall outlet. The reading obtained should be 90∼130VAC.

3. Move one of the meter probes to the 3rd prong terminal (GND). Either the same reading or a reading of O volts should be obtained.

4. If the reading is 0V, leave one probe on the GND terminal and move the other probe to the 2nd voltage terminal. If a reading of 0V is obtained on both voltage terminals, the outlet **is not** properly grounded. Omit Steps 5∼7, and proceed directly to Step 8.

5. If a reading of 0V on one terminal and a reading of 90∼130VAC on the other terminal is not obtained, the outlet **is not** properly grounded. Omit Steps 6 & 7, and proceed directly to Step 8.

6. If a reading of 0V on one terminal and a reading of 90∼130VAC on the other terminal is obtained, remove both probes from the outlet.

7. Set the meter on the "OHMS/Rx1" scale, place one probe on the GND terminal and the other probe on the terminal which gave a reading of 0V. A reading of less than one ohm should be obtained. If a reading of less the one ohm is not obtained, the outlet **is not** adequately grounded.

8. If the above tests show that the outlet is not properly grounded, that condition should be corrected (per Article 250 of the National Electrical Code) by a qualified electrician before the STRATA VI system is connected.

06.27 Ensure that the power switch on the MTOU is **OFF**, then plug the power supply into the 115VAC outlet

and measure the voltage at the MTOU input terminals. Correct any problems before proceeding.

06.30 PCB Installation

06.31 Mount the CRDU on the MCCU if required (see Figure 9).
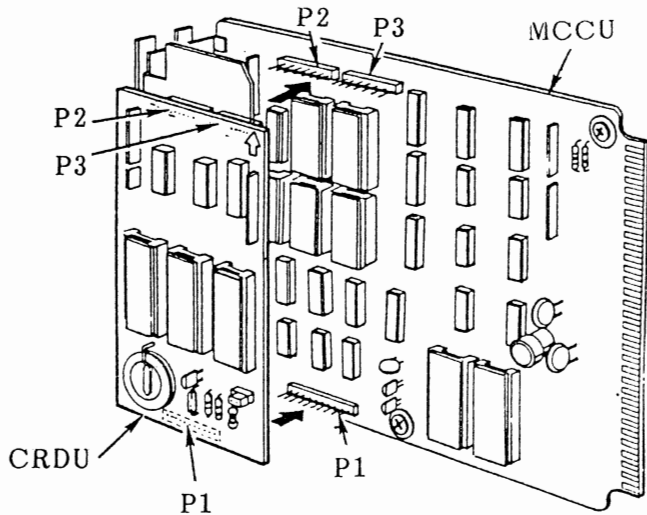

P2 P3 MCCU

P2
P3

CRDU

P1

P1

FIGURE 9

06.32 Connect the memory back-up battery on the MCCU (and on the CRDU if the system is so equipped). Refer to Figure 10, locate the SW1

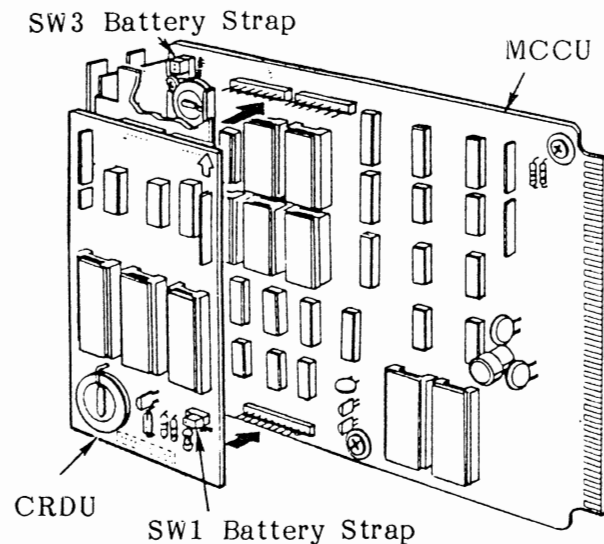SW3 Battery Strap

MCCU

CRDU

SW1 Battery Strap

FIGURE 10

battery strap on the CRDU, and the SW3 battery strap on the MCCU; the plugs are shown in the off or disconnected position. To connect each battery, remove and reinstall the strapping plugs so that they bridge the center pin with the pin labeled **ON.**

06.33 Install the MCCU in the correct MKSU position (Figure 7).

06.34 Follow the position arrangement in Figure 7, and install the required MSTU PCB(s).

- #1 MSTU serves extensions 10∼17.

- #2 MSTU serves extensions 18∼25.

06.35 Select the proper type of MCOU PCB (MF or DP) and install the required number in the position(s) shown in Figure 7.

- #1 MCOU serves CO lines 1∼3.

- #2 MCOU serves CO lines 4∼6.

07 CABLE CONNECTIONS

07.01 Main Distribution Frame (MDF) Configuration

07.02 Two 66MI-50 split connection blocks (Figure 11) are recommended as the fully-equipped STRATA VI main distribution frame (MDF).

07.03 A 25-pair male-amphenol-ended cable is connected directly to the front of each MSTU PCB and fastened with the metal bracket that is provided (Figure 12).

07.04 Secure the cable(s) to the bottom of the MKSU shelf (Figure 12) using the plastic cable clamp(s) provided. Route the cable(s) under the MKSU and toward the rear, as shown in Figure 13.
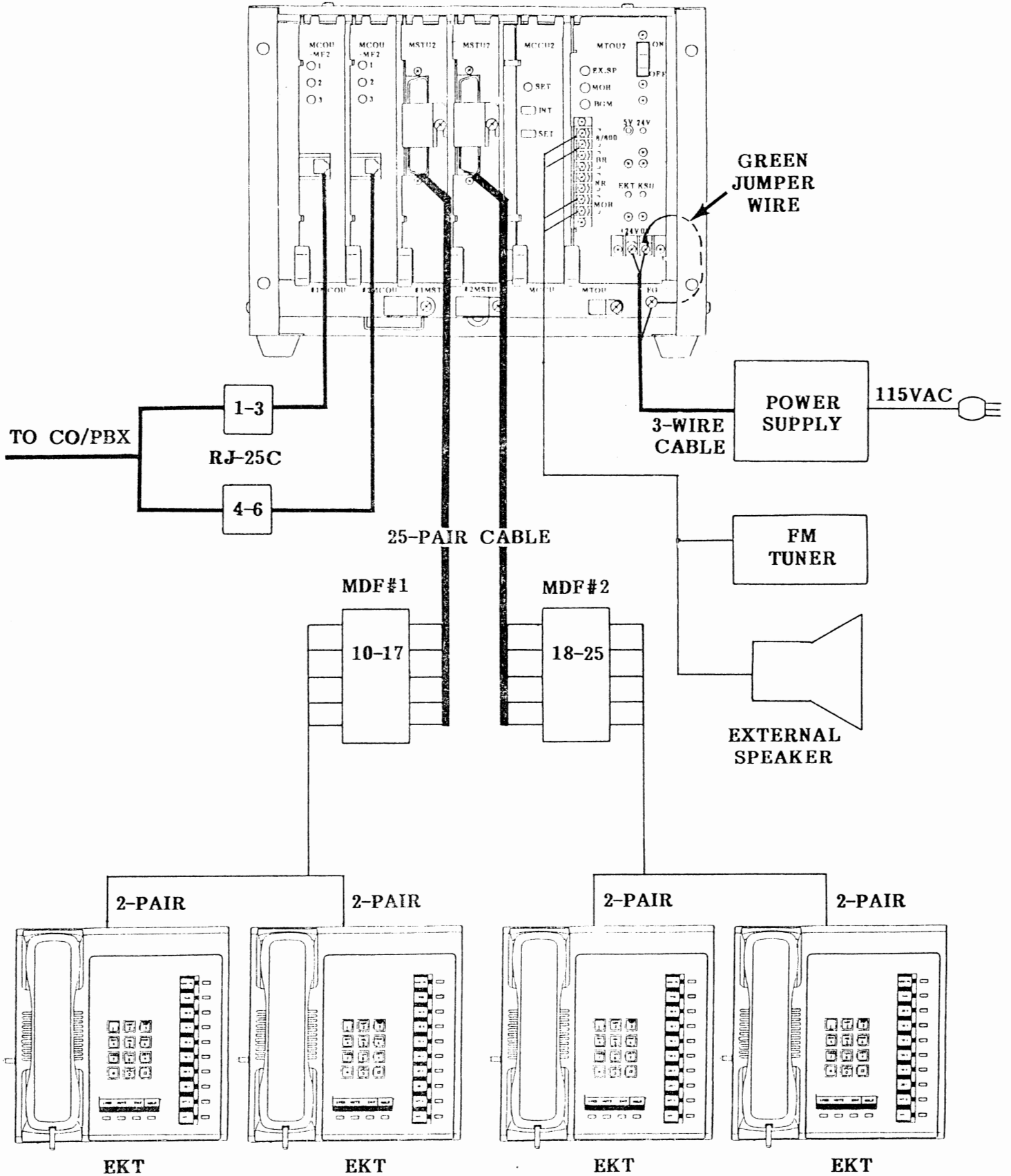
07.05 Route the cable from #1

MKSU

FIGURE 11

- 8 -

MSTU (Ext. 10   17) to Block 1 and the cable from #2 MSTU (Ext. 18   25) to Block 2.
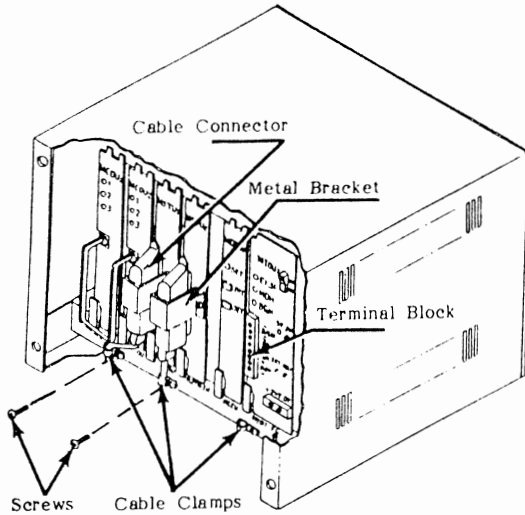

FIGURE 12

07.06   Use   the   industry-standard color code sequence and terminate the cables from the MSTU PCBs on the MDF blocks as shown in Figures 14 and 15.   (Use one side of each block for each cable.)
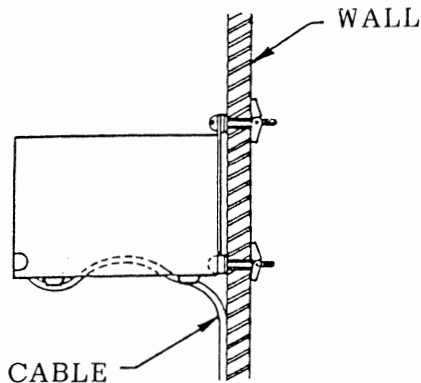

FIGURE 13

07.10 Station Cable Connections

07.11   Terminate   the   individual   2-pair station cables consecutively on each MDF block; attach them to the side opposite the MSTU cable.   Use bridging clips to connect the MSTU cable pairs to the station cable pairs.

07.12   The cables used for station wiring should be industry-standard quad or twisted pair.

07.13   The   overall   length   of   the cable run must not exceed 1000 ft. for 24 AWG wire.

WARNING:
When installing station ca-
ble, do not run parallel to
and within 3 ft. of an AC
power line; any power lines
should be crossed at right
angles (90⁰) only.

07.14   At the station locations, terminate the station cable in a conventional 4- or 6-conductor modular station connector to accommodate the modular line cord from the EKT.   The standard modular EKT cord length is 7 ft., while the maximum allowed length is 25 ft.

07.15   Figures   14   and   15   show   the EKT wiring arrangement.

07.16   The   various   manufacturers   of modular   station   blocks   have   employed different   color   codes   to   indicate   the sequence   of   pairs   in   their   blocks. However, the color code most commonly used is shown in Figures 14 and 15. Verify the configuration of your modular blocks before connecting the station cables.

07.20 Intercom Code Assignment

07.21   Intercom   codes   are   assigned permanently to specific MSTU cable appearances in STRATA VI.   Make sure the station cables are connected to the proper terminals (Figures 14 and 15).

TO #1 MSTU

2-PAIR JACKETED
STATION CABLE

MODULAR STATION BLOCK

BRIDGING
CLIPS

MODULAR
CORD

Ext. 10

EKT

NOT USED
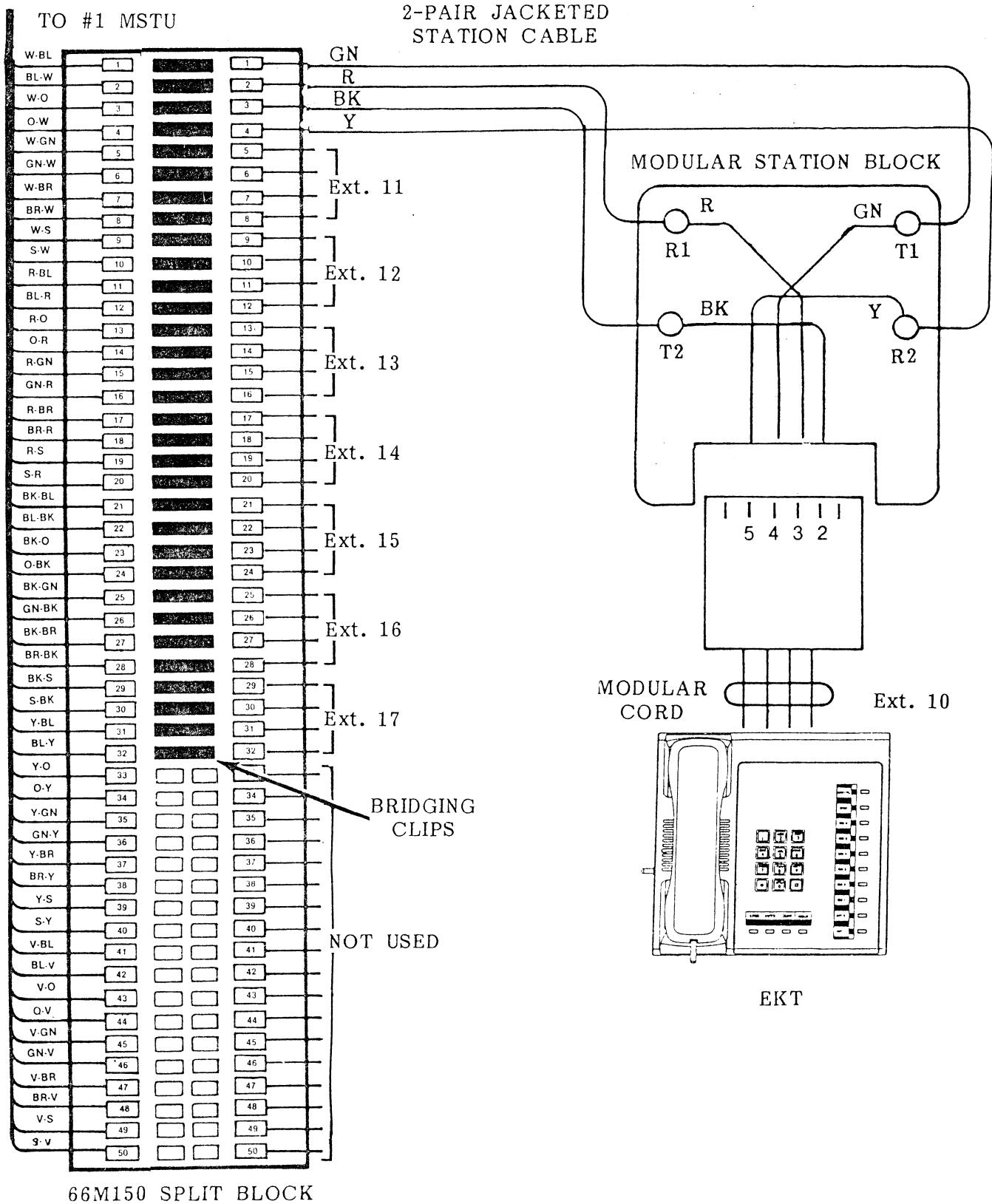
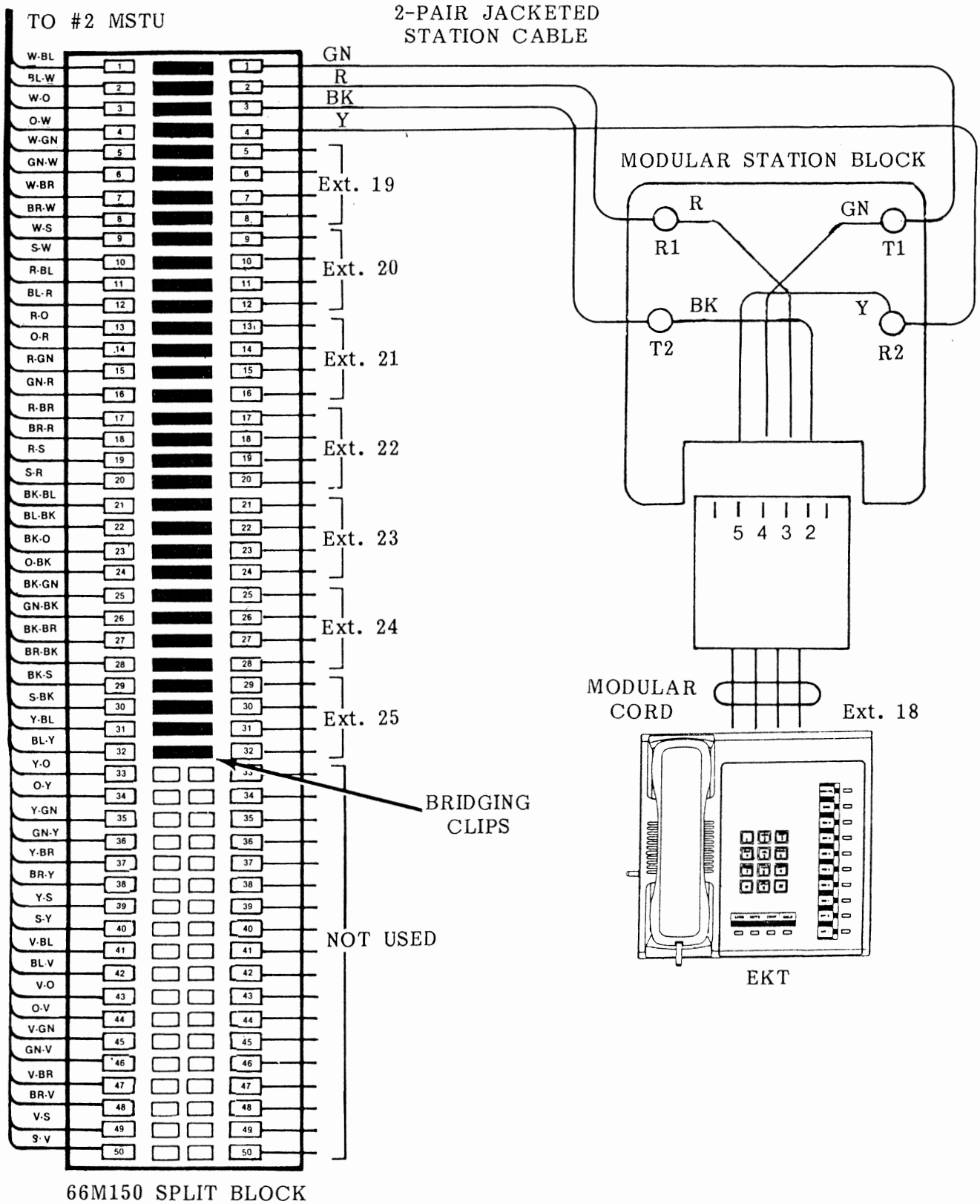66M150 SPLIT BLOCK

FIGURE 14

- 10 -

FIGURE 15

- 11 -

NOTE:
White and blue (T3 & R3) are
not used for STRATA VI sta-
tion line connectors.

07.30 CO Line Connection

07.31 The CO/PBX lines are introduced into the STRATA VI system via 6-wire modular line cords (no longer than 25 ft.) connected directly to a jack on the MCOU PCB. Each modular cord contains three lines. The opposite end of each cord then terminates directly into an RJ-25C jack provided by the telephone company (Figure 16).
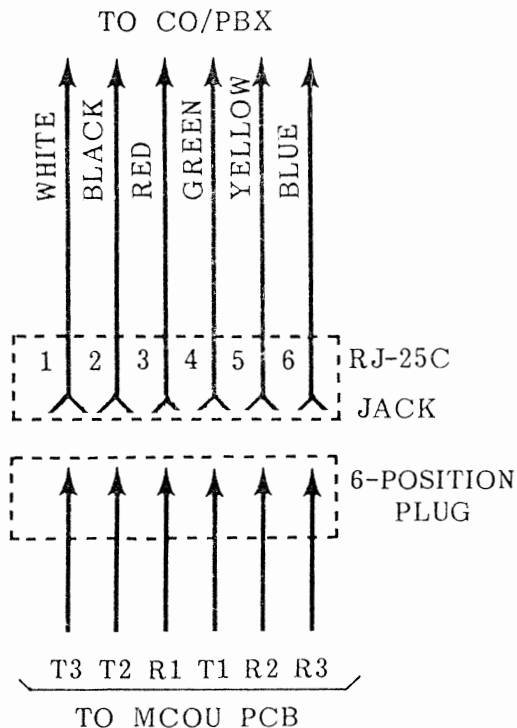
FIGURE 16

- #1 MCOU serves CO lines 1~3.

- #2 MCOU serves CO lines 4~6.

07.32 Secure the modular cords to the MKSU shelf (Figure 17) using the plastic cable clamps that are provided.
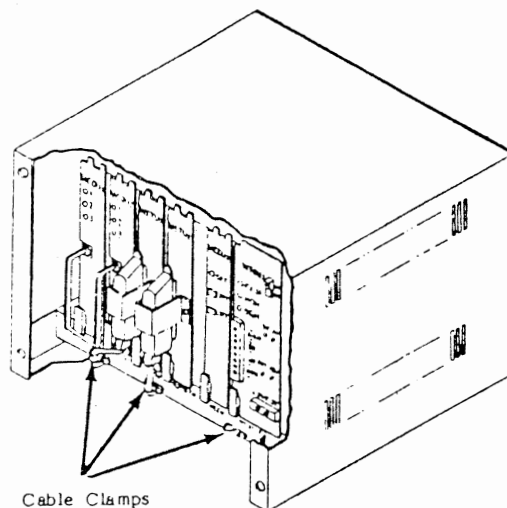
FIGURE 17

08   ELECTRONIC KEY TELEPHONE INFORMATION

08.01   General

08.02 All STRATA VI EKTs may be used as desk units or wall-mounted telephones. Each one measures:

Width	8.8 inches (224 mm)
Depth	9.1 inches (230 mm)
Height	4.0 inches (102 mm)

and is equipped with 14 line and feature keys in addition to its push-button dial pad. Six of the keys are utilized for central office/PBX lines, two for intercom lines and the remaining six keys are used for feature operation (Figure 18).

08.03 Each EKT features a modular handset cord and is connected to the system via a 4-conductor modular line cord.

08.04 An optional Busy Lamp Field (BLF) EKT (Figure 19) provides LED indication on which stations are in use.

08.05 The 20-key EKT (Figure 20)
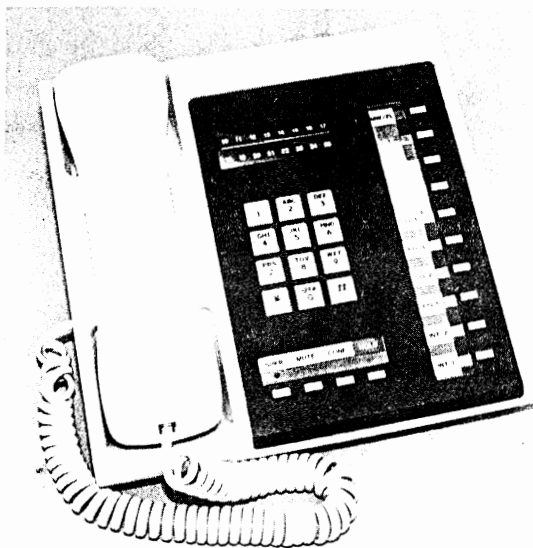
Speaker Volume-Ring
Tone & Intercom Voice

Dial Pad

Speaker Volume-Dial
Tone & Voice Level

Handset

Speaker

Modular Cord

Flash & Message
Waiting Key

Do Not Disturb
Key

Outside Line
Access Keys

Intercom Access
Keys

Intercom, Outside
Line, DND and
MW/FL LEDs

Microphone

Speaker On/Off LED

Speaker On/Off Key

Mute Key

Hold Key

Conference Key
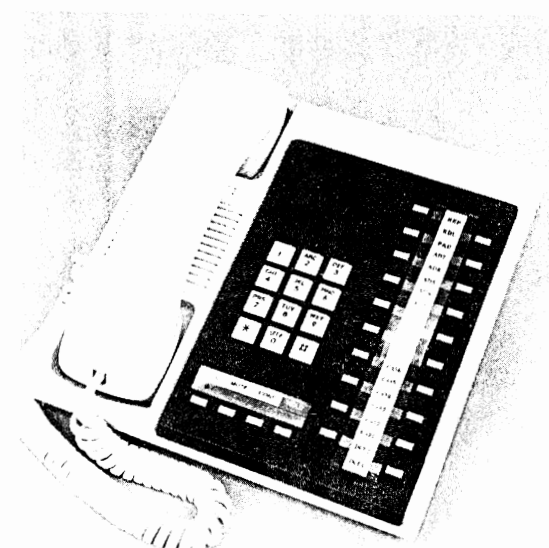
FIGURE 18

FIGURE 19

FIGURE 20

has the same overall dimensions as the standard EKT, and is installed in exactly the same manner. See Program 5XX in Section 100-006-300, Programming, for inputting information concerning the 20-key. It is equipped with 10 additional feature keys—see Section 100-006-100, General Description, for additional information.

08.10 EKT Wall Mounting

08.11 An optional handset hanger kit is required to convert either type of EKT for wall mounting. The EKT may be mounted on a wall or any other flat, vertical surface to which the base can be secured.

08.12 When selecting the mounting site, consider the EKT weight and the additional stresses to which the mounting will be subjected.

08.13 Mounting screws or mollies, appropriate for the surface on which the telephone is to be secured, must be provided by the installer.

08.14 Locking tabs secure the base to the EKT. The direction in which the base is attached to the EKT determines whether it will be used as a desk unit or wall unit (it is factory-configured as a desk unit). Disengage the locking tabs by pushing downward on the base (Figure 21).
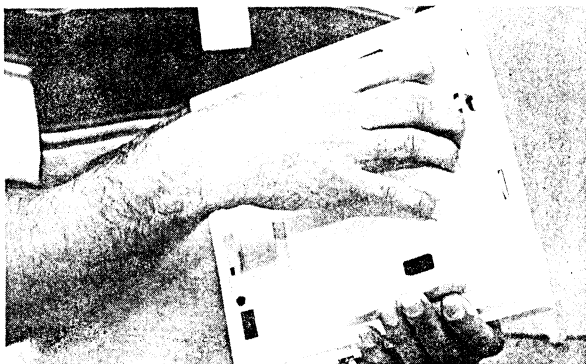
FIGURE 21

08.15 Refer to Figure 22, choose which of the choices are appropriate for the tail cord route, and then cut them.
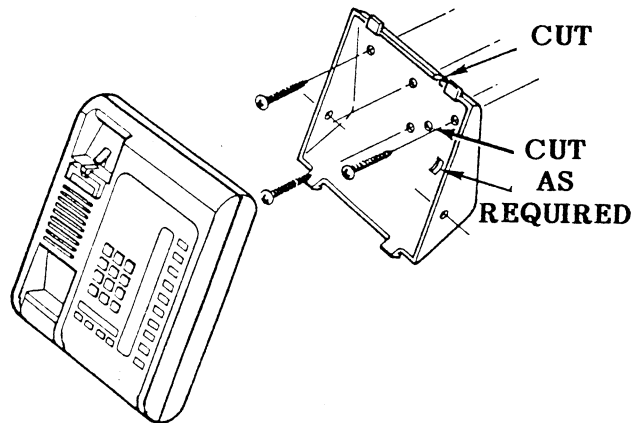
FIGURE 22

08.16 Secure the base to the desired wall site. Use a spirit level and make certain the top of the base is level and that the deeper portion is down.

08.17 Route the tail cord through the holes in the base and secure the EKT (Figure 23). Test the sturdiness of the EKT mounting.
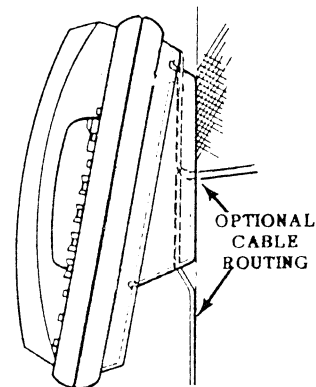
FIGURE 23

08.20 Converting the EKT

08.21 Refer to Figure 24, the op-

tional handset hanger kit (available from your Toshiba supplier) must be used whenever the EKT is wall-mounted.
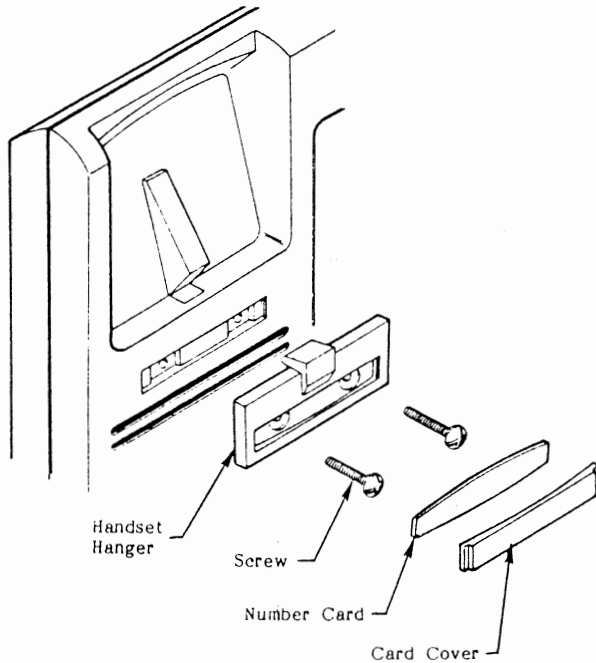
FIGURE 24

08.22   Remove the card cover by inserting a paper clip in the hole at one end. Bend the cover up and remove it and the number card.

08.23   Install the handset hanger into place and tighten the self-tapping screws. Reinstall the number card and card cover and connect the modular plug to the modular jack.

09 SYSTEM POWER-UP INITIALIZE

09.01   The STRATA VI has a list of standard system data assignments stored in ROM that can be entered at any time by performing the initialize sequence outlined below. The system must be initialized when it is first installed or whenever the MCCU PCB is changed. This will allow the system to be tested and any faults to be corrected before time is spent on programming.

NOTE:
Do not initialize if using a pre-programmed, battery-protected MCCU.

09.02   Refer to Figure 25 and verify that the battery on the MCCU (and CRDU, if equipped) is connected to ensure that data changes entered after initialization will not be lost due to power failure.

NOTE:
The SET LED will not function if the MCCU battery is not connected.

FIGURE 25

09.03   To initialize the system data memory, refer to Figure 26 and perform the following steps:

a) Place the power switch on the MTOU PCB in the **ON** position.

b) Depress the **INT** switch on the MCCU, and hold it in.

c) Depress the **SET** switch and allow it to lock.

- 15 -

FIGURE 26

d) Depress and release the **SET** switch again.

e) Release the **INT** switch.

f) Cycle the MTOU power switch **OFF** and **ON.**

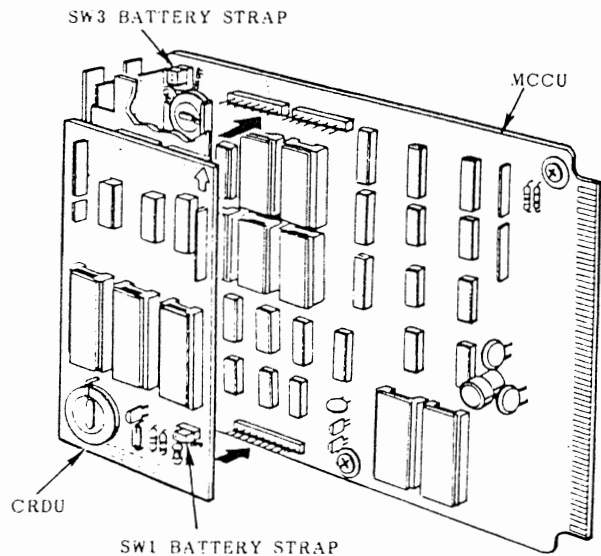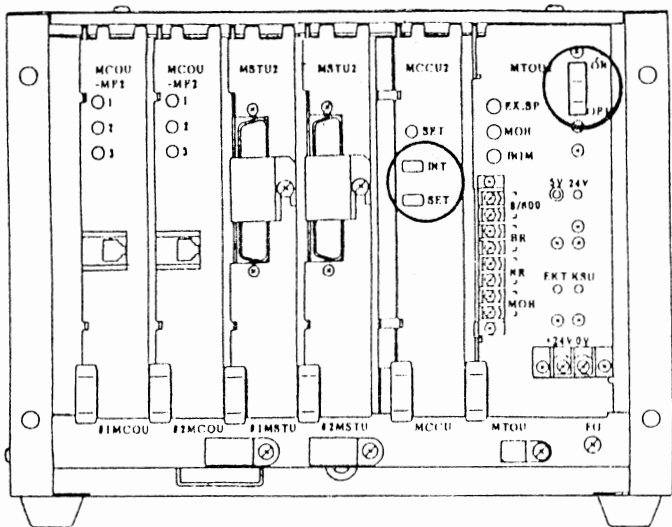**09.10** The Automatic Dialing memory will contain random numbers when the system is powered up initially. To clear the memory; therefore preventing meaningless numbers from being dialed, proceed as follows:

a) To clear Automatic Dial-System memory (24 numbers):

- Lock in the **SET** switch on the MCCU—the MCCU LED and the MW/FL LED on Ext. 17 will be on.

- Operate the ⌷SPKR⌷ key on Ext. 17—SPKR LED will be on steadily.

- Dial ⌷#⌷ ⌷*⌷ ⌷*⌷ on the dial pad—the SPKR LED will flash continuously.

- Operate the following keys:

⌷INT 1⌷ ⌷CO 1⌷ ⌷CO 3⌷ ⌷CO 5⌷—the corresponding LEDs will light steadily.

- Operate the ⌷HOLD⌷ key—all Ext. 17 LEDs (except MW/FL) will go off.

- Release the **SET** switch on the MCCU—the MCCU LED and the MW/FL LED on Ext. 17 will go off.

b) To clear the optional Automatic Dial-Station memory:

- Lock in the **SET** switch on the MCCU—the MCCU LED and the MW/FL LED on Ext. 17 will go on.

- Operate the ⌷SPKR⌷ key on Ext. 17—the SPKR LED will be on steadily.

- Dial ⌷#⌷ ⌷*⌷ ⌷#⌷ on the dial pad— SPKR LED will flash continuously.

- Operate the following keys: ⌷INT 2⌷ ⌷CO 2⌷ ⌷CO 4⌷ ⌷CO 6⌷—the corresponding LEDs will light.

- Operate the ⌷HOLD⌷ key—all Ext. 17 LEDs (except MW/FL) will go off.

- Release the **SET** switch on the MCCU—the MCCU LED and the MW/FL LED on Ext. 17 will go off.

09.11 If the appropriate preceeding sequence fails, refer to Section 100-006-500, Fault Finding Procedures, for assistance in locating the fault.

10 SYSTEM TEST PROCEDURES

10.01 EKT Functional Check

10.02 Verify the basic system func-

tions and confirm the proper functioning of the EKT itself. Refer to Figure 27, and perform the following test procedure at each station. Begin with Ext. 10.
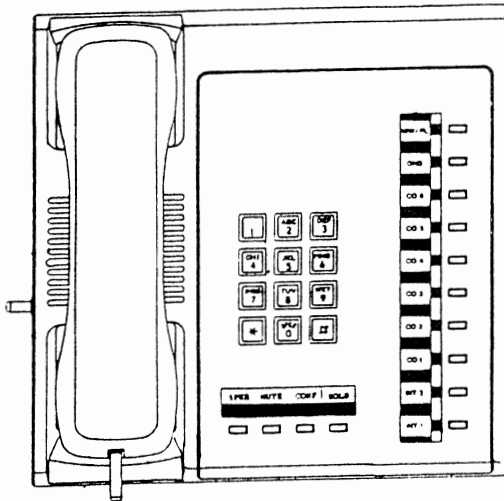
FIGURE 27

10.03 With handset on-hook:

- Operate [INT 1] key
  INT 1 LED: I-use flash
  SPKR LED: on steady
  Listen for INT dial tone via EKT speaker

- Adjust speaker volume with the volume control on the rear right side of the EKT.

- Operate [INT 2] key
  INT 2 LED: I-use flash
  SPKR LED: on steady
  Listen for INT dial tone via EKT speaker

- Operate [CO 1] key
  CO 1 LED: I-use flash
  SPKR LED: on steady
  Listen for CO/PBX dial tone via EKT speaker

- Dial any digit (2 ~ 9) on the dial pad and dial tone will stop.

- Operate [MW/FL] key
  Listen for circuit break followed by dial tone after approximately 2 seconds.

- Operate [CO 2] key
  CO 1 LED: I-use flash
  SPKR LED: on steady
  Listen for CO/PBX dial tone via EKT speaker

NOTE:
If no CO/PBX facility is connected to a CO key, dial tone will not be heard but the LED is still functional.

- Operate [CO 3] key
  CO 3 LED: I-use flash
  SPKR LED: on steady
  Listen for CO/PBX dial tone via EKT speaker

- Operate [CO 4] key
  CO 4 LED: I-use flash
  SPKR LED: on steady
  Listen for CO/PBX dial tone via EKT speaker

- Operate [CO 5] key
  CO 5 LED: I-use flash
  SPKR LED: on steady
  Listen for CO/PBX dial tone via EKT speaker

- Operate [CO 6] key
  CO 6 LED: I-use flash
  SPKR LED: on steady
  Listen for CO/PBX dial tone via EKT speaker

- Operate [SPKR] key
  SPKR LED: off
  EKT speaker: off

- Operate [DND] key
  DND LED: on

- Operate [DND] key
  DND LED: off

- Operate CO1 key
    CO 1 LED: I-use flash
    SPKR LED: on
    Listen for CO/PBX dial tone
    via EKT speaker

- Operate HOLD key
    CO 1 LED: I-hold flash
    Speaker off (no dial tone)
    SPKR LED: off

- Operate CO1 key
    CO 1 LED: I-use flash
    SPKR LED: on
    Listen for CO/PBX dial tone
    via EKT speaker

- Operate CONF key
    CO 1 LED: Conference call
    flash rate
    Dial tone continues

- Operate CO1 key followed by the
  SPKR key

    CO 1 LED: off
    SPKR LED: off
    Dial tone: off

- Call EKT from another station
    Listen for caller's voice via
    speaker after warning tone
    INT LED at called station:
    I-called flash

- Depress 1 at calling station
    Tone signalling heard via speaker

- Adjust tone signalling volume with
  the volume control on the rear
  left-hand side of the EKT being
  tested.

- Operate INT1 key
    INT 1 LED: I-use flash
    SPKR LED: on
    Listen for INT dial tone via
    EKT speaker

- Lift handset
    SPKR LED: off
    Speaker: off
    Listen for dial tone via handset
    receiver

- Call another station and talk into
  the handset transmitter
    Verify that your voice can be
    heard via the speaker on the
    called EKT.

- Hold down the SPKR key, and set
  handset back on-hook
    INT 1 LED: I-use flash
    SPKR LED: on

- Tap the EKT microphone and verify
  that the sound can be heard over
  the speaker on the called EKT.

- Press the MUTE key while con-
  tinuing to tap the microphone and
  verify that the sound cannot be
  heard via the speaker of the called
  EKT.

- Operate SPKR key
    INT 1 LED: off
    SPKR LED: off

10.04   This completes the station
functional check; repeat the procedure
for all stations in the system.

10.10   Feature Check

10.11   Verify that all system fea-
tures function properly per Section
100-006-400, Operating Procedures.

11   MISCELLANEOUS EQUIPMENT CONNECTIONS

11.01   Wiring Connections

11.02   All connections to the equip-
ment (other than EKTs or CO/PBX
lines) are made via the barrier strip
mounted on the front of the MTOU
PCB, as shown in Figure 28.

11.10   Music-on-Hold/Background Music Source

11.11   Connect the customer-provi-
ded MOH/BGM program source (tape
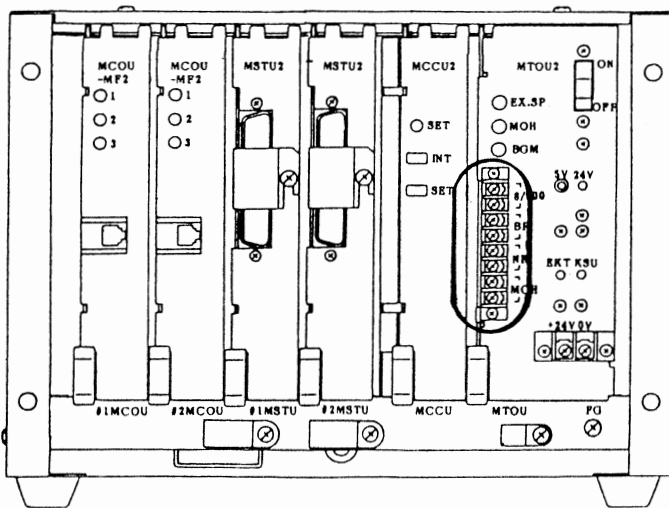deck, tuner, or commercial source) via

FIGURE 28

the two MOH terminals on the MTOU barrier strip. Input impedance is 600 ohms.

11.20 Music–On–Hold Volume Control

11.21 Adjust the MOH volume with the **MOH** volume control on the front of the MTOU. Maximum volume is limited by internal circuits in order to comply with FCC regulations. See Paragraph **11.80** for the correct volume setting sequence.

11.30 External Paging Connections

11.31 The STRATA VI provides access to an external paging system by dialing a single digit (7). The single output connection is made via the 8/600 terminals on the front of the MTOU terminal, and can be used in one of three ways:

a) To operate a customer-provided speaker directly, via an internal 3-watt amplifier located on the MTOU PCB.

b) If more than 3 watts are required, an external customer-provided amplifier can be connected to operate the external speaker.

c) If talk-back capability is required, a customer-provided talk-back amplifier/speaker can be connected.

NOTE:
See Paragraph 11.80 for the correct volume setting sequence.

11.40 Direct External Speaker Connection

11.41 The exact number of speakers that may be connected to the 8-ohm, 3-watt output will depend on the type of speaker used, the conductor resistance, and the desired volume.

11.42 The 8-ohm output impedance must be selected with the SW2 switch on the MTOU (Figure 29). The switch must be on the side labeled "8".
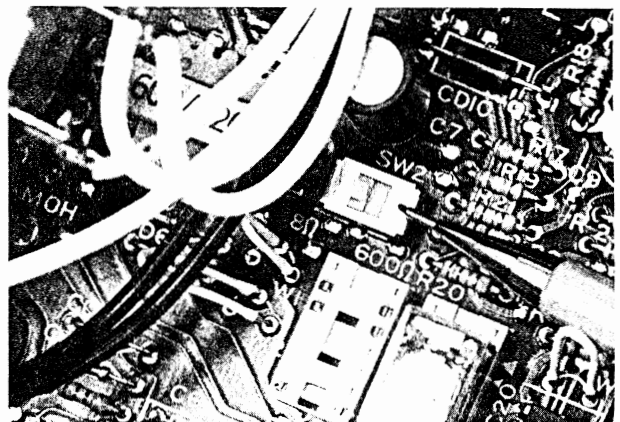

FIGURE 29

11.43 Connect the external speaker to the two 8/600 terminals on the MTOU PCB.

11.44 Adjust the speaker volume with the **EX-SP** volume control on the front of the MTOU. See Paragraph **11.80** for the correct volume setting sequence.

11.50 External Amplifier Connection

11.51 If more power is required

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than the MTOU amplifier can deliver, a customer-provided external amplifier may be connected to the 8/600 terminals on the MTOU. The external speaker(s) should then be connected to the external amplifier.

11.52 Determine which output impedance is most suitable for the amplifier being used, and make the selection with the SW2 switch on the MTOU (Figure 29).

11.53 If the 8-ohm impedance is chosen, the **EX.SP** volume control may be used to control the **input** level to the external amplifier. If the 600-ohm impedance is chosen, the level is fixed and the input must be controlled by the external amplifier itself. See Paragraph **11.80** for the correct volume setting sequence.

11.60 Talk-back Amplifier

11.61 A customer-provided talk-back speaker/amplifier may be connected to the external page (8/600) terminals on the MTOU.

11.62 For talk-back operation, the SW2 switch on the MTOU must be set at "600". The MTOU amplifier is not used for the 600-ohm mode in order to permit a 2-way voice path.

11.63 The **EX.SP** volume control on the front of the MTOU will not function when the 600-ohm mode is selected.

11.70 Background Music

11.71 Background music (BGM) can be provided in two ways through the STRATA VI system:

a) Internal to the system using the MOH source.

b) External to the system when an external amplifier is used on the External Page feature.

11.72 Internal BGM uses the music-on-hold program source that is connected to the MOH input terminals on the MTOU. It is broadcast through all EKT speakers (under the individual control of each station user) and will be heard if the **SPKR** key is operated with the handset on-hook and no line selected.

11.73 As a programmable option, the BGM from the MOH source can be heard via the external speaker (see Section 100-006-300, Programming).

11.74 The BGM is automatically preempted when a page or ringing signal must be output from an EKT speaker or the external speaker.

11.75 Overall system BGM volume is set with the BGM volume control on the front of the MTOU PCB (see Paragraph **11.80** for the correct volume setting sequence). The volume at individual stations is set with the volume control on the rear right-hand side of the EKT involved.

11.76 If BGM is connected via an external amplifier on the external page, it can be heard from the external speaker(s) only. The STRATA VI, if required, can provide a dry contact
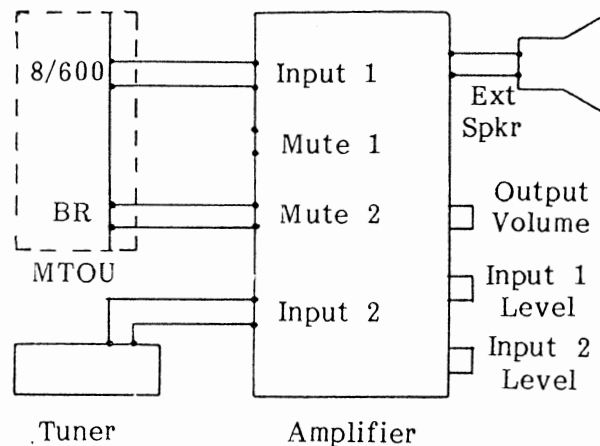

FIGURE 30

control signal for muting the external BGM when a page is in progress.

11.77 To provide external BGM control, obtain and install the optional BR (K1) relay on the MTOU PCB, see Paragraph **05.01.** Connect the BR terminals on the MTOU to the control terminals (mute, mike switch, etc.) on the amplifier (see Figure 30).

11.80 Volume Setting Sequence

11.81 Refer to Figure 31. Adjust the volume for MOH, BGM and External Page with the following sequence.
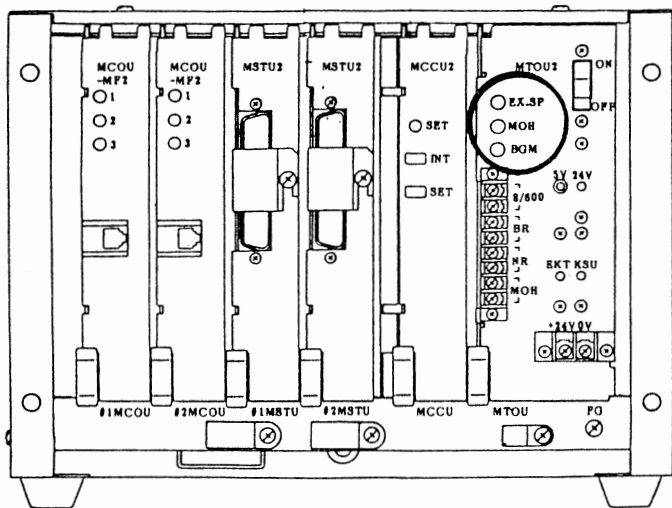

FIGURE 31

11.82 Adjust the MOH level first, using the following procedure:

1) Set the MOH volume control on the front of the MTOU to its lowest level (counterclockwise).

2) Lift the handset on one station and call another station using two CO/PBX lines.

3) At the called station, put the incoming call on hold, and listen on the **handset** (not the speaker) of the other EKT.

4) Using the volume control on the MOH **source,** adjust the MOH to the most comfortable level without distortion.

5) If a higher level is needed than can be provided by the MOH source, turn the MOH volume control on the MTOU slowly clockwise to achieve the most comfortable level without distortion.

6) Release the connection between the two CO lines.

7) **No** further changes should be made using the MOH control or the MOH source volume control.

11.83 If an external speaker is to be used in the system; adjust the external page and BGM levels as follows:

1) Adjustments should be made while an actual external page test is in progress. Adjust the voice loudness to a comfortable level. The procedure varies depending on the paging system configuration and the setting of the 8/600-ohm switch (SW2) on the MTOU:

- 8 ohms **with no** external amplifier—adjust output level using the **EX.SP** volume control on the front of the MTOU.

- 8 ohms **with** an external amplifier—adjust output level using the **EX.SP** volume control on the front of the MTOU along with the controls on the external amplifier.

- 600 ohms—the level through the STRATA VI is fixed in this mode; adjustments must be made using the controls on the external amplifier.

2) If background music is to be heard

through the STRATA VI over external speaker(s):

a) Adjust voice page level per above procedure.

b) With music playing over the speaker(s), adjust the volume to a comfortable level using **only** the BGM control on the front of the MTOU. **Do not** tamper with the **EX.SP** control, external amplifier adjustments, or MOH adjustments.

c) If background music is connected directly to the external amplifier instead of through the system, all adjustments must be made on the external amplifier.

11.84   If no external speaker is to be used in the system, adjust the BGM level as follows:

1) Using an EKT in the speakerphone mode, make a call on a CO line, and adjust the EKT speaker to a comfortable level.

NOTE:
This should be done in an area with background noise that is about average for that particular installation.

2) Disconnect the CO call and activate BGM at the EKT using the SPKR key.

3) Using **only** the BGM volume control on the front of the MTOU, adjust the BGM to a comfortable level. **Do not** use the EKT volume control.

11.90 Night Relay Service

11.91   As an option, the STRATA VI can provide a dry contact for the purpose of controlling an external loud ringing bell (or similar device) or an answering machine when the system is in the "Nite" mode.

11.92   To provide this service, obtain and install the optional NR (K 2) relay on the MTOU PCB per Paragraph **05.01**. Connect the external device to the NR contacts on the front of the MTOU.

IMPORTANT:
The NR and BR relay contacts are rated at 24 VDC/1.0 Amp and are not intended to operate high power devices directly. If the power required for the device being controlled exceeds the contact ratings, an external slave relay must be used.

11.93   The W3 strap option on the MTOU allows the NR relay to function in one of two modes (see Figure 4).

a) Answering Machine Control—if the W3 strap remains intact, the relay is operated continuously when the system is in night service. This mode is intended for indirect control of an answering machine.

b) Night Bell Control—if the W3 strap is cut, the relay pulses at a 1-sec. on, 3-sec. off rate when the system is in night service and an incoming call is ringing the system. The mode is intended to be used for indirect control of an external night bell.

NOTES: