LBI-31882E

ERICSSON

Mobile Communications

EDACS ™

MASTR® II STATION
TRUNKED SYSTEMS

Maintenance Manual

TABLE OF CONTENTS

SPECIFICATIONS*

DIMENSIONS (H x W x D)	69 x 23 x 21 inches
WEIGHT	305 pounds
INPUT VOLTAGES	121/242 Vac, 60 Hz (50 Hz optional)
AC INPUT POWER	270 Watts
TEMPERATURE RANGE	-30°C to +60°C (-22°F to +140°F)

* These specifications are intended primarily for use during servicing. Refer to the appropriate Specification Sheet for the complete specifications.

GFB:LS:***:0690

INTRODUCTION

This manual presents an overview of the MASTR II station combination as used in trunked system applications. Information is provided on the interconnection of station components and adjustment/alignment procedures. Detailed information on the assemblies making up the MASTR II combination can be found in the following manuals:

- GETC Maintenance Manual
- Station Receiver Maintenance Manual
- Transmitter Maintenance Manual
- MASTR II Tone Remote Station Control Shelf Maintenance Manual
- Telephone Interconnect Manual
- Station Power Supply Manual

MASTR II STATION DESCRIPTION

The MASTR II station is used in trunked system applications is a complete two-way radio station designed for receiving and transmitting in the Public Service band. The station (see Figure 1) is a continuous duty combination capable of being operated locally or with tone remote control.

The station transmitter exciter is located in a shielded compartment in the radio housing front door (see Figure 2), along with the station receiver and system board (see Figure 3). The system board accommodates the optional Channel Guard board. Jacks are provided on the system board to interface with options and control functions.

The power amplifier (PA) hinges from the bottom of the radio housing. The PA consists of a frame mounted to a heat sink. A cover snaps into the frame to form an RF tight enclosure for the PA board assembly (see Figure 2).

Directly above the PA assembly is the station control shelf. A mother board is mounted to this shelf which accommodates the 10-volt regulator, Audio Control, Repeater Control and Tone Remote Control modules. See the separate Control Shelf manual for additional information.

A station power supply is located below each radio housing (see Figure 1). The front panel of the power supply has a power switch, three fuses and a duplex AC outlet. A high-current fuse is located on the back panel of the power supply.

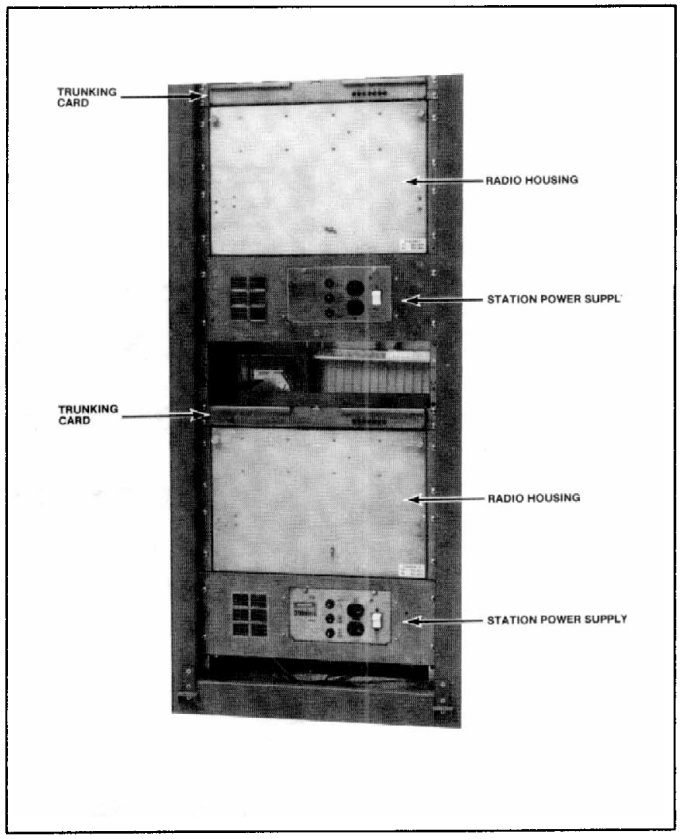

Figure 1 - Typical Station Front View (800 MHz Shown)

NOTE

Rack configurations may vary with system requirements.

RECEIVER

The station receiver consists of an Oscillator/Multiplier (OSC/MULT) assembly, RF assembly, IF Detector and an IF-Audio and Squelch (IFAS) assembly. Refer to the receiver maintenance manual for a complete description of the station receiver.

TRANSMITTER

The station transmitter consists of an exciter board assembly and a power amplifier assembly. The transmitter is a crystal-controlled, phase modulated design for single frequency operation. Refer to the transmitter maintenance manual for a complete description.

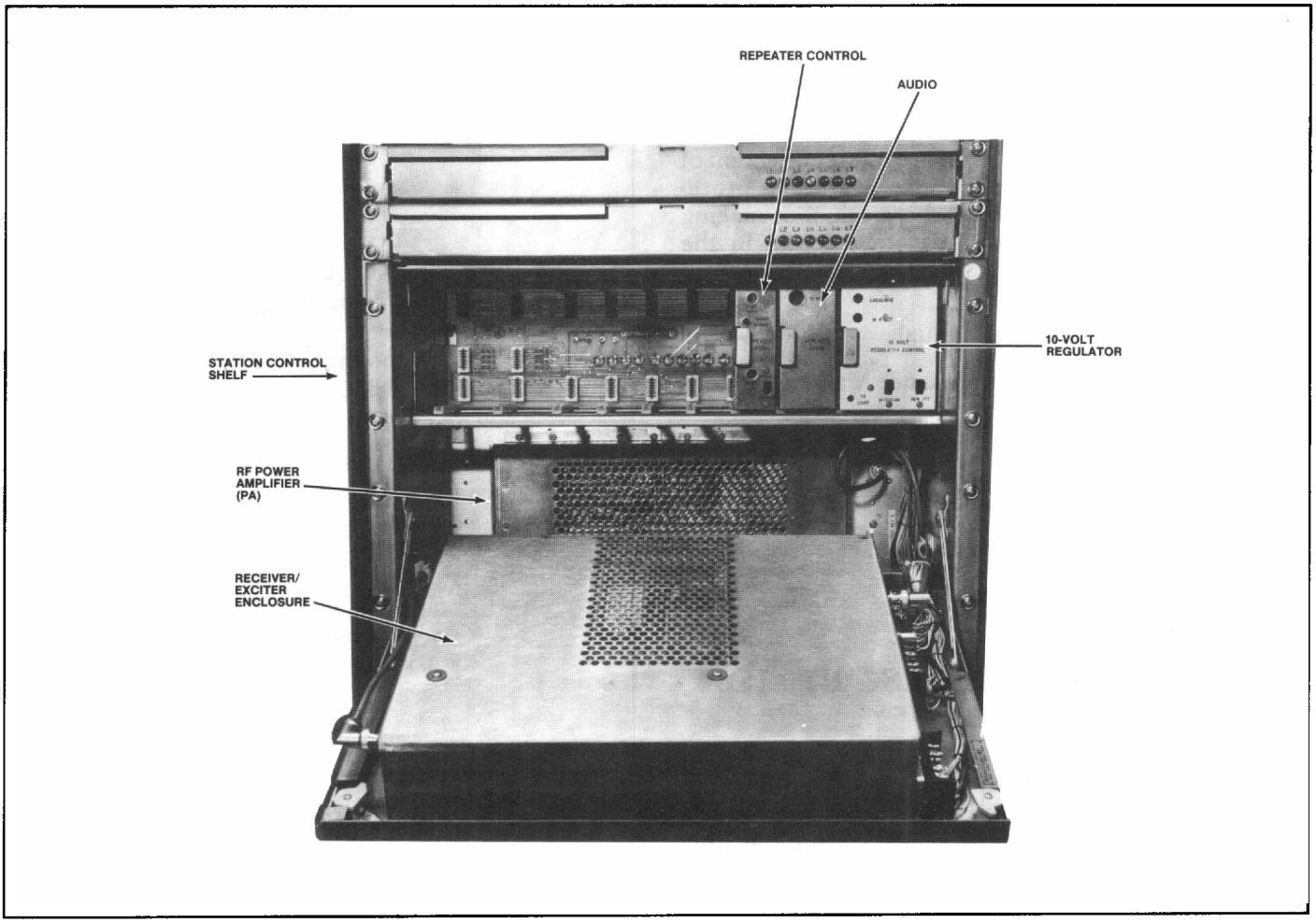

Figure 2 - Typical Radio Housing (800 MHz Shown)

SYSTEM BOARD A901

The station System board is located on the radio panel front door. Receiver modules plug directly into the board, and along the edge of the board are connectors for the Repeater control, Repeater Audio, and power supply modules. Jacks are provided for Channel Guard and other options, as well as a connection for the GE 4EX3A11 Test Set. A volume control (R3) is located on the System board, and the squelch control (R901) is located on the receiver/exciter door.

The VOLUME/SQUELCH line from the receiver Audio pre-amp is connected via J904-12 to the VOLUME (R3) and SQUELCH (R901) controls. The VOLUME arm is returned to the receiver IFAS board, where the audio is amplified by the receiver audio power amplifier circuit. The audio output of the PA is then connected to the speaker leads at J904-18 and -19. The station VOLUME control (R3) is normally adjusted for one watt output and the station speaker level is controlled by the service speaker VOLUME control.

TONE REMOTE CONTROL

A maximum of twelve different functions can be performed in the Tone Remote Control system. This is accomplished by applying two or three tones in sequence at the prescribed level to the transmission medium at a remote control console for detection at the control modules on the control shelf. Refer to the MASTR II Tone Remote Station Control Shelf maintenance manual for a complete description of this system.

CHANNEL GUARD

In stations equipped with Channel Guard (CG), Channel Guard board 19D417261 is plugged into the System board at P908 and P909. Each MASTR II receiver is equipped with a tone-reject filter to prevent the CG tone from being heard in the speaker. In addition, all transmitters have a Channel Guard Modulation control to adjust for proper deviation.

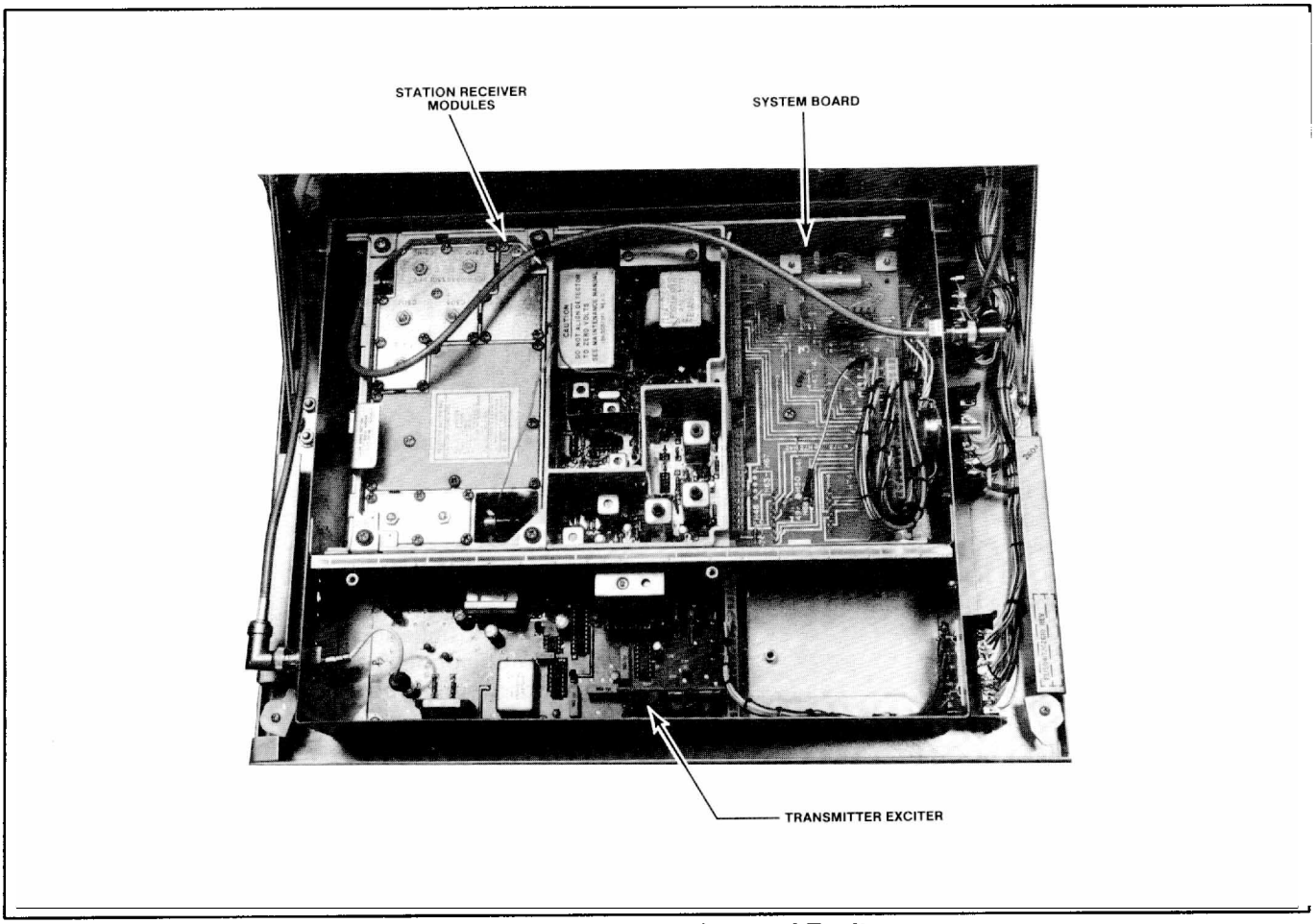

Figure 3 - Station Receiver and Exciter

Channel Guard is a continuous tone-controlled-squelch-system that provides communications control in accordance with EIA standard RS-220. The system utilizes standard tone frequencies from 71.9 to 203.5 Hertz with both the encoder and decoder operating on the same frequency. The STE (squelch Tail Eliminator) circuit employs a phase shift of approximately 180° in the encode function to eliminate undesirable noise burst after each transmission.

The decoder operates in conjunction with the receiver to inhibit all calls that are not coded with the proper Channel Guard tone frequency. The VOLUME/SQUELCH output of the receiver is applied to the Channel Guard decoder at P908-1. As long as no signal is received properly coded with the CG tone, a ground is supplied through P908-5 to mute the receiver. When a properly coded signal is received, the receiver unsquelches and the desired signal is heard. A channel Guard Filter is used in the Remote Audio board to attenuate frequencies below 203.5 Hz preventing the Channel Guard tone from being applied to the remote audio pair.

A repeater will not key in Channel Guard systems unless the received signal is coded with the proper Channel Guard tone. The CG monitor function, when selected at the Local Controller in Local/Repeater stations will not allow the repeater to key on an uncoded signal, but will allow the operator to hear all channel activity.

TRUNKING CARD (GETC)

The Trunking Card (GETC) is used in a trunked communication system to provide control and interface to the MASTR II station, site controller, dispatch console and other trunked stations at the same site. The GETC Shelf assembly consists of the GETC Logic Board, 9600 baud Modem Board and the Regulator Assembly, all mounted on a tray and enclosed in a shelf. The GETC is mounted above the station radio assembly, and provides control- channel (CC) and working-channel (WC) processing.

The control channel GETC (CC-GETC) performs a continuous 9600 bit per second (or 4800 bps) communication to mobiles and portables in the system. Mobile/portable channel requests are received by the control channel.

A working channel GETC (WC-GETC) performs channel handshaking with the mobile/portable unit(s), and allows voice/data/Voice Guard (VG) communication to other units in the system. The working channel also allows communication between mobile/portable unit(s) and the dispatch console.

INSTALLATION CONSIDERATION

The MASTR II station used in trunked applications is usually shipped and installed under the direction of Ericsson GE. The following paragraphs will familiarize you with some of the installation requirements. This information is useful during site planning.

CABINET INSTALLATION

Allow sufficient space in front of and behind the cabinets to permit front and rear door to open completely. Either door may be removed or inverted and hinged on the opposite side if desired.

Three knockouts are located along the rear bottom edge of the cabinet for cable entry. It is normally desirable to bring the cables up through the floor and place the cabinet over power receptacles or cable holes on the floor.

Conduit may be extended into the cabinet through one of the two 7 x 7 inch base plate openings in the cabinet bottom. Holes are located on the bottom of the cabinet for bolting the cabinet securely to the floor with 1/2-inch bolts. A cable entry hole (2 x 1 inch) is located at the top rear of the cabinet to bring in the antenna cables or conduit from above the station. The front and back sides of the station must always be accessible for servicing.

POWER AND GROUND CONNECTIONS

A 15-foot power cord, equipped with a standard three-prong plug, is supplied with the station. One of the prongs grounds the station to protect personnel. Check to be sure the power outlet complies with local ordinances.

If a 240-volt source is used for station power, the power supply must be configured properly. Refer to the power supply maintenance manual for details. The plug on the power cable must also be obtained and changed to mate with the 240 Vac outlet. A power cord plug is not supplied with the 50 Hz power supply.

The station should be connected to a good earth ground using a ground wire of adequate size. A ground stud is provided on all cabinets for a separate cabinet ground. Use No. 14 gauge or larger wire (depending on local ordinances and system requirements) for connecting the cabinet to a good building ground. After the ground lead from the power cable is connected to the building ground, check continuity between building ground and the cabinet.

ANTENNA AND INTERFACE CABLE INSTALLATION

A typical installation will require connections to the receive (multicoupler) and transmit (combiner) antennas, remote audio connections, and serial interface connections to GETC shelves. Connections for your installation may differ depending on system requirements. Refer to Figure 4 and the interconnection diagram for station connection locations.

RECEIVER AND TRANSMITTER ANTENNA CONNECTIONS

Transmit and receive antenna connections are required for each channel (receiver/transmitter combination) in the equipment rack. Typically the antenna cables are routed through holes in the top of the equipment cabinet.

Connect the receiver antenna for the channel to connector J945. Connect the transmitter antenna for the channel to the transmitter connector.

REMOTE AUDIO INPUT

If stations are controlled from a dispatch center, remote audio input connections will be required. Connections are made at terminal block TB1201 on backplane assembly 19D417214. Receive audio connections are made to terminals 10 and 11, typically marked AUDIO. Transmit audio connections are made at terminals 17 and 18, typically marked DUPLEX AUDIO. Refer to Figure 4 and the interconnection diagram for connection points.

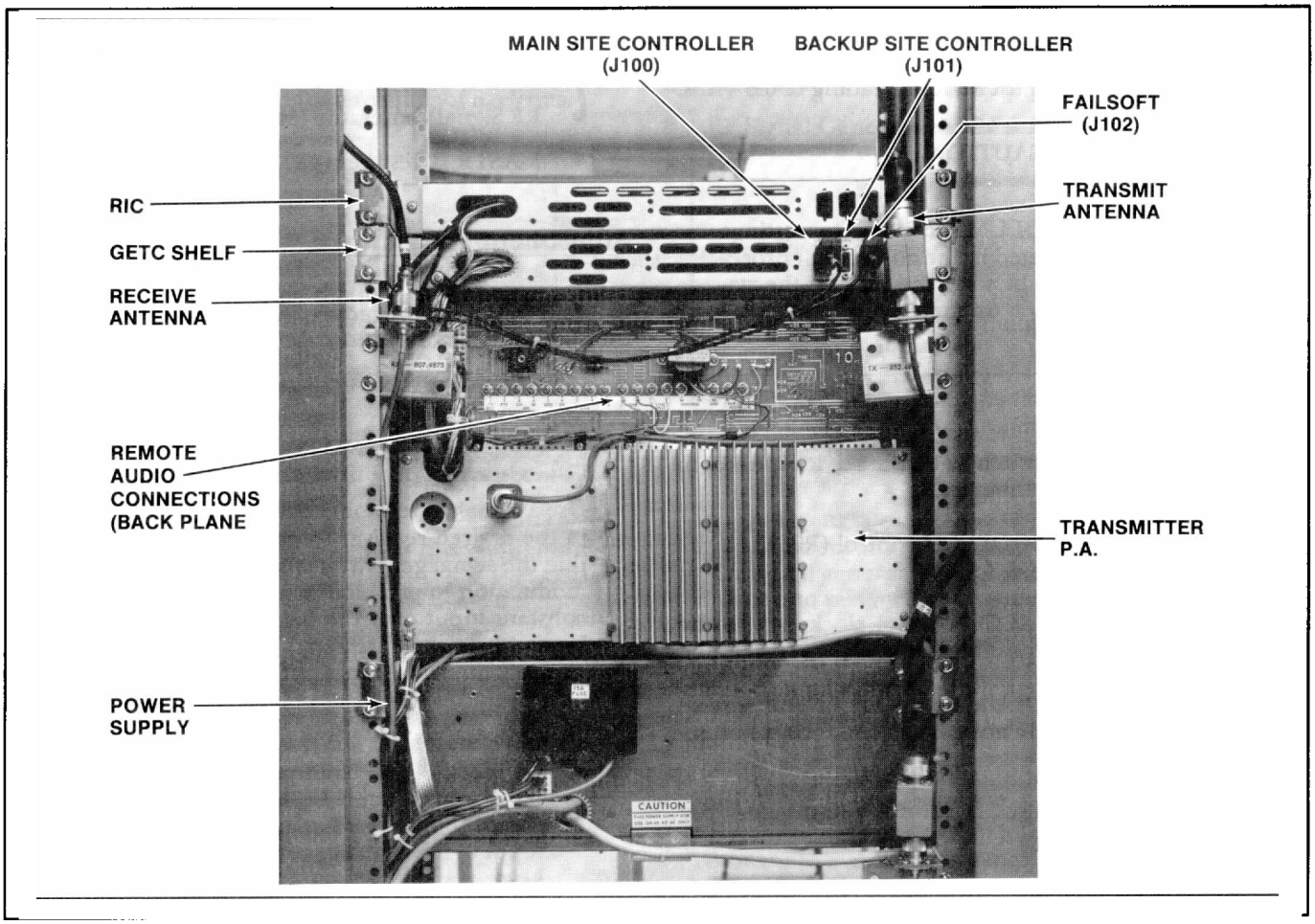

Figure 4 - Sample Station Connections

REPEATER INTERCONNECT (RIC)

Connections to the RIC are made through cable 19C320811G15. This cable connects to the RIC at connector TB2/P40 and TB1/P41 as shown in the interconnection diagram. Refer to the Telephone Interconnect manual for information on the telephone interconnect option.

INITIAL ADJUSTMENT

After the station has been installed, the transmitter and receiver must be adjusted by an electronic technician before the station is placed in operation.

TRANSMITTER ADJUSTMENT

Adjustment of the transmitter includes measuring the forward and reflected power and adjusting the antenna for optimum standing wave ratio (s.w.r). The transmitter is then set to rated power output for the application. Operating frequency and modulation level should be measured and recorded. Complete transmitter adjustments can be found in the applicable station transmitter maintenance manual.

RECEIVER ADJUSTMENT

The initial adjustment for the receiver includes tuning the input circuit to match the antenna. Refer to the applicable receiver maintenance manual for alignment instructions. Use the following procedure to set the station VOLUME control (R3 on the System board):

1. Apply a 1000 microvolt on-frequency test signal to receiver jack J937. The signal should be modulated by 1000 Hz to ±3 kHz deviation.

2. Turn service speaker switch S1 to desired RCVR position.

3. Connect an AC voltmeter across J905 terminals 1 and 2, and adjust R3 for a reading of 6.3 Vrms.

CAUTION

Adjustment of VOLUME control to settings higher than instructed in the adjustment procedure may result in blowing the fuse on the station service speaker or damage to the Local Controller Speaker.

4. Set VOLUME switch S2 on the service speaker to the desired listening level.

Adjust the station SQUELCH control (R901) on the Receiver/Exciter door) as follows:

1. Turn the SQUELCH control clockwise (to the right) as far as possible.
2. Adjust the VOLUME control in the service speaker until the noise is at a comfortable listening level.
3. Turn the SQUELCH control counterclockwise until the noise just disappears, then advance the control another 20 degrees.

RECEIVER ADJUSTMENT FOR TRUNKED STATIONS

Certain receiver adjustments and fine tuning are necessary before a MASTR II station can be used in a trunked system. The procedure for aligning the receiver IF of the station involves re-peaking the IF adjustments using an RF signal source being modulated with a 9600 baud pseudorandom data signal and using the MASTR II test set for DC meter readings. An oscilloscope is also used to observe the data signal (eye pattern) while making adjustments. Additional information can be found in the receiver maintenance manual.

Equipment Required

The equipment necessary for receiver IF adjustment is listed below. Equipment performing similar functions may also be used.

- Oscilloscope (Tektronix 468 or similar
- Voice Guard® Digital Test Generator (19A149117P1 or similar)
- RF Signal Generator (HP-8640B or similar)
- MASTR II Test Set (4EX3A12 or similar)

Adjustment Procedure

The following procedure will align the receiver IF for optimum data detection. Refer to the receiver maintenance manual when performing this procedure.

NOTE

Use a signal generator capable of producing RF in the desired receiver frequency range. Insure that the signal generator is capable of direct FM modulation to produce constant deviation with constant input over the frequency range of 10 Hz to 4.8 kHz.

1. Connect a 9600 baud pseudorandom modulating signal (from a VG9600 module or a Voice Guard Digital Test Generator) to the modulation input of the signal generator. Set deviation for 3 kHz.
2. Set the signal generator to the operating frequency of the receiver. Connect the generator RF output to the receiver antenna.
3. Adjust the RF level out of the signal generator to produce a below-limiting reading on the "B" position of the MASTR II test set.
4. Connect an oscilloscope to VOL/SQ HI (IFAS Board terminal 11 in the receiver) and adjust the oscilloscope display to show an eye pattern as shown in Figure 5.

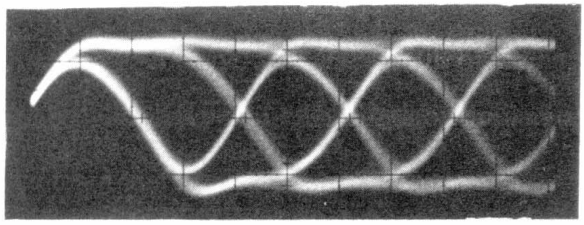

Figure 5 - Eye Pattern at VOL/SQ HI

NOTE

Receiver front-end and local oscillator must be properly aligned before adjusting the IFAS board.

5. Adjust T4 (T604), T3 (T603) and T2 (T602) on the IFAS board for peak output while staying out of limiting.

6. Adjust the MIF (OSCILLATOR/MULTIPLIER board) coils and crystal filter for a maximum reading (some peaks are broad) on the "B" position of the test set while staying out of limiting.

7. Start with the MIF crystal filter and slightly detune the MIF adjustments (each side of the peak) to find the best eye pattern display on the oscilloscope. Stay near the peak of the "B" reading.

8. Remove all test equipment.

REMOTE CONTROL ADJUSTMENTS

The transmitter modulation gain, the remote audio input and line output must be adjusted before placing the station in operation. Refer to the Tone Remote Control Shelf maintenance manual for these adjustment.

REPEATER CONTROL ADJUSTMENT

The repeater drop-out delay tuning and three-minute limit timing must be adjusted before placing the station in operation. Refer to the MASTR II Repeater Station Control Shelf maintenance manual for these adjustments.

STATION ALIGNMENT

The complete station alignment procedure for a trunked system is contained in the appendix. This procedure should be performed when the system is first installed, and thereafter as necessary when repairs or replacements are made. The procedure may also be used as a test procedure.

PREVENTIVE MAINTENANCE

To insure high operating efficiency and to prevent mechanical and electrical failures from interrupting system operations, routine checks should be made of all mechanical and electrical parts at regular intervals. This preventive maintenance should include the checks as listed in Table 1.

TEST AND TROUBLESHOOTING PROCEDURES

Refer to the individual equipment manuals for detailed information on adjustment and troubleshooting. Interconnection diagrams, schematics and parts lists are provided in this manual to assist in isolating a problem down to a particular piece of equipment.

Table 1 - Routine Maintenance

MAINTENANCE CHECKS	INTERVAL BETWEEN CHECKS 6 MONTHS	AS REQUIRED
Transmitter Alignment - Compare meter readings at transmitter multiplier metering jacks with voltages read during initial tune up. Touch up multiplier tuning. Check power output. (See alignment procedure for transmitter).		X
Receiver - While receiving an unmodulated signal on the station frequency(s), adjust OSC-1 trimmer for a zero discriminator reading. (See the receiver alignment procedure).		X
Transmission Line - Check for positive indication of pressure of transmission line pressure gauge (if pressurized line is used).	X	
Antenna - Check antenna and mast for mechanical stability.	X	
Mechanical Inspection - Visually check cables, plugs, sockets, terminal boards and components for good electrical connections. Check for tightness of nuts, bolts and screws to make sure that nothing is working loose from its mounting.	X	
Cleaning - Use a vacuum cleaner to remove dust which has accumulated inside the cabinet.	X	
Frequency Check - Check transmitter frequency and deviation as required.	X	

ERICSSON

Ericsson GE Mobile Communications Inc.
Mountain View Road•Lynchburg, Virginia 24502

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APPENDIX A

SYSTEM ALIGNMENT GUIDE

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This document is intended as a guide to aligning a PST system in the field. This procedure may also be used as a test of some of the important parameters associated with the stations and GETCs. Each channel should be taken off line through the use of the system manager as it is aligned if it is required to keep the system operational throughout this procedure.

Make preliminary setups as follows:

1. Turn the DELAY TIMER on the Repeater Control board counter-clockwise to its minimum value.

2. Turn the LIMIT TIMER on the Repeater Control board clockwise to its maximum value.

3. *For 800 MHz only.* Confirm switches S1-1 thru S1-7 and S2-1 thru S2-4 on the GETC are set properly for the station transmit frequency. See Appendix A of the GETC service manual LBI for the setting of these switches for any transmit frequency.

4. Set switches S3-1 thru S3-5 on the GETC for the proper channel number.

The following tests are to be performed in sequence. It may be useful to record results or simply check off as steps are completed on the data sheets. The following test equipment is required:

Audio Oscillator
H.P. 204D or equiv.

D.M.M. (with dB scale)
Fluke 8050A or equiv.

Signal Generator
H.P. 8640B or equiv.

Communication System Analyzer
IFR FM/AM-1200S or equiv.

1. This test confirms the station microphone circuitry is working and sets the maximum deviation for high speed data and voice signals. Proceed as follows:

   a. Kill the GETC by disconnecting the power connection (P10) from J10.

   b. Inject a 1 kHz tone at 33 mV RMS (through a 22 μF capacitor) into the MIC Preamp input. Connect the + end of the capacitor to TB1201-4. Connect the audio generator to the - side of the capacitor and to TB1201-3. Set the LOCAL MIC control on the 10V Regulator board to maximum (fully clockwise).

   c. Key the transmitter by connecting the PTT lead (TB1201-2 on the backplane board) to ground.

   d. Adjust the audio modulation limiting pot. on the exciter board (R104 for 400 MHz, R52 for 800 MHz) to produce 3750 Hz ±100 Hz deviation. *For NPSPAC, use 3000 Hz ±50 Hz.*

   e. Unkey the transmitter and remove the input audio. Set the LOCAL MIC control on the 10V Regulator board to its mid-range position.

2. This test adjusts the repeater audio, the line output level, and the analog voter levels if applicable. Proceed as follows:

   a. Connect an on-frequency RF signal at a 100 μV level to the receiver antenna jack. Modulate this signal with a 1 kHz tone to produce a deviation of 3000 Hz. *For NPSPAC, use 2400 Hz.*

   b. Verify the transmitted tone is 1000 Hz and adjust the REP TX LEVEL on the Repeater Audio board to produce 3000 ±100 Hz deviation in the transmitted signal (2400 ±50 Hz for NPSPAC). *Note: It may be required to turn the injected RF off and then back on to cause the station to transmit again once the transmitter limit timer has expired.*

c. Establish a max. telephone level. See Appendix A for a discussion of phone lines and max. telephone levels.

d. Terminate the 4-wire receive audio output (TB1201-10 & 11 on the control shelf backplane board with a 600 ohm load paralleled with a high impedance audio level meter. (If attached in the system, this connection may provide a 600 ohm load already.) Adjust the LINE OUTPUT control on the control shelf Audio board for an output level equal to 10 dB below the voice grade telephone lines' max. telephone level.

e. *In a voting configuration*; verify the presence of the 1000 Hz tone on the front jacks of the analog voter's receiver card. Connect the audio level meter to these front jacks and adjust the pot. To obtain a -20 dBm level.

f. *In a voting configuration*; connect the audio level meter to the output audio on the analog voters' audio module. Kill the digital portion of the voter by switching off the main power supply to the digital voter. At this time verify that the appropriate analog receiver module's yellow and green lamps are lit. *Note: It may be required to turn the injected RF off and then back on to cause the station to transmit again once the transmitter limit timer has expired.* Set the analog voter output level by adjusting the pot. on the analog voter audio module. The voter output should be equal to 10 dB below the voice grade telephone lines' max. telephone level. Measure the audio level at the station line input (TB1201-17 & 18) in order to discern the line loss to be expected. Reapply power to the voter GETCs.

g. Raise the input deviation to 5.0 kHz. Verify the output deviation is 3500 ±200 Hz. (3000 ±50 Hz for NPSPAC).

h. Remove the signal input and verify that the station unkeys. Insert the signal input and verify that the station keys.

3. With the station keyed, measure the transmitter output frequency. It must be within 500 Hz of the specified frequency or within ±1 ppm; whichever is tighter.

4. With the station keyed, measure the transmitter RF output power level. It must be 100 ±5 watts. If necessary, adjust the power control pot. on the power amplifier assembly. Measure that the power output of the combiner is in line with the combiner specifications. Disconnect the receiver test equipment.

5. This test sets the station transmit compression amplifier and adjusts the transmitter deviation for the station 4-wire audio input. Proceed as follows:

   a. Connect a 1000 Hz tone at a level 4 dB (6.5 dB for NPSPAC) below the voice grade telephone lines' max. telephone level minus the expected line loss to the 4-wire transmit audio input at TB1201-17 & 18 on the control shelf backplane board. *Another alternative is to connect the tone at a level 4 dB (6.5 dB for NPSPAC) below the voice grade lines' max. telephone level at the sending end that eventually connects to the station's 4-wire transmit audio input.*

   b. Connect an audio level meter to pin P8-6 with respect to chassis of the station receiver/exciter door. This point measures the level of the audio being fed to the transmitter.

   c. Set the LINE INPUT level and the REM TX level on the control shelf Audio board to their maximum (fully clockwise) position.

   d. Key the transmitter with the REM PTT switch and note the meter reading. Now, continue to key the transmitter and slowly turn the LINE INPUT pot. in the counter-clockwise direction until the level meter reads 1 dB lower. This sets the threshold level of the compression amplifier to about 5 dB below max. telephone level (7.5 dB for NPSPAC) so that the max. telephone level will be operating at about 5 dB (7.5 dB for NPSPAC) into compression.

   e. Reduce the 1000 Hz tone to a level 10 dB below the voice grade telephone lines' max. telephone level minus the expected line loss. *Or just 10 dB below the alignment level at the sending end.*

f. Turn the REM TX pot. fully counter-clockwise, then, while keying the transmitter, turn it slowly clockwise until the transmitter carrier is deviated 3000 Hz ±100 Hz. (2400 ±50 Hz for NPSPAC).

g. Unkey the transmitter. Disconnect all test equipment, restart the GETC by placing jumper J30 in its normal position from 2-3, and reconnect all cables to their normal connections.

6. This test sets the high speed data output level. Proceed as follows:

   a. Force this channel to transmit high speed data. If the system is capable of dip switch controlled test modes then set the dip switches as necessary to run the test where the transmitter will be keyed, and the high speed data path will be enabled and send continuous 2400 Hz tone (this may be referred to as test "C"). *At the tine of this writing this is accomplished by setting S2-8 to the open position (1) and S3-1 through S3-6 to 010000. Remember to reset the GETC after setting the dip switches.* If the system is not capable of these test modes then one of the following may be used: 1) Force the channel to assume operation as the control channel by turning all other channels off or configuring the channel as the control channel through the use of the system manager; or 2) Make a Voice Guard transmission on this channel.

   b. Confirm the deviation produced by the high speed data is 3000 Hz (±100 Hz). (2400 ±50 Hz for NPSPAC). If necessary, adjust R31 on the GETC board.

7. This test sets the low speed data output level. Proceed as follows:

   a. If the system is capable of dip switch controlled test modes then set the dip switches as necessary to run the test where the transmitter will be keyed, and the repeat audio path will be enabled and send continuous 25 Hz tone (this may be referred to as test "B"). *At the time of this writing this is accomplished by setting S2-8 to the open position (1) and S3-1 through S3-6 to 100000. Remember to reset the GETC after setting the dip switches.* Continue on to step c.

   b. If the system is not capable of dip switch controlled test modes then force this channel to assume operation as a working channel. Key into this channel from a portable or mobile with no modulation. *Hold a finger or hand over the microphone input.*

   c. Confirm the deviation produced by the low speed data is 750 Hz (±100 Hz). If necessary, adjust the LOW SPEED MODULATION LEVEL (R50) (CHANNEL GUARD MODULATION LEVEL) pot. on the receiver/exciter door.

8. This test sets the 1950 Hz tone level if present. This test is for a voting configuration.

   a. Terminate the 4-wire receive audio output (TB12-10 & 11 on the control shelf backplane board) with a 600 ohm load paralleled with a high impedance audio level meter. (If attached in he system, this connection may provide a 600 ohm load already.)

   b. Confirm the presence of a 1950 Hz tone at the voice max. telephone level. If necessary, adjust the level pot. on the top of the 1950 Hz tone card. *See discussion in Appendix A!*

9. This test sets the modem levels for a station remotely located from the voter in a voting configuration.

   a. Adjust R2 (PH TX ADJ), on the GETC, to produce 10 dB below the data grade line max. telephone level on J6-8 and J6-9.

   b. Adjust R2 on the applicable Digital Receiver GETC in the voter in a similar manner.

   c. Adjust R1 (PH RX ADJ), on the GETC, for 0.11 volts RMS measured on U18-1.

   d. Adjust R1 on the applicable Digital Receiver Getc in the voter in a similar manner.

PST STATION TEST

TESTED BY _____ DATE _____

DIVISION _____ SITE _____

CHANNEL # _____

1.	TRANSMITTER LIMITER	(3750 Hz)	_____
2.	B. REP TX LEVEL	(3000Hz)	_____
	C. SYSTEM VOICE ALIGNMENT LEVEL		
	SYSTEM DATA ALIGNMENT LEVEL		
	D. LINE OUTPUT	(voice align.-10)	_____
	E. ANALOG VOTER INPUT	(-20 dBm)	_____
	F. ANALOG VOTER OUTPUT	(align.-10)	_____
	EXPECTED LINE LOSS		_____
	G. REP LIMITING	(3500 Hz)	_____
3.	TRANSMITTER FREQUENCY		_____
4.	CHANNEL POWER OUT	(100 WATTS)	_____
	COMBINER POWER OUT		_____
5.	D. LINE INPUT COMPRESSOR THRESHOLD		_____
	F. REM TX LEVEL	(3000 Hz)	_____
6.	HIGH SPEED DEVIATION	(3000 Hz)	_____
7.	LOW SPEED DEVIATION	(750 Hz)	_____
8.	1950 Hz	(voice sys. align.)	_____
9.	A. STATION R2	(data align. -10 dB)	_____
	B. VOTER R2	(data align. -10 dB)	_____
	C. STATION R1	(0.11 volts RMS)	_____
	D. VOTER R1	(0.11 volts RMS)	_____

APPENDIX A PHONE LINES AND TEST TONE LEVELS

Max. telephone level. This is the maximum level that can be put through the phone lines without limiting and without interfering with other lines. The telephone company will tell you what the max. telephone level is. They will either give the level to you in Volume Units (VU) or test tone or TLP. VU is average voice which is generally considered to be 10 dB below max. telephone level. Test tone is normally given in dBm and is equal to the max. telephone level. WARNING: Some telephone companies refer to average voice as test tone. These telephone companies have a figure that they call TLP. The TLP level is 3 dB above the max. telephone level referred to in this document. In a number of cases the user will provide wires within his building or his complex of buildings. Normally these are short and involve very little loss. In this case, a max. telephone level of 10 dBm is appropriate.

Phone line grades. All phone lines carrying data must be type 3002 data grade lines without additional conditioning. There will be a separate max. telephone level for the data grade lines and the voice grade lines. Type 2000 voice grade lines are sufficient for voice channels with the following exception. The 1950 Hz tone must arrive at the voter at a level not less than -30 dBm. This can cause difficulties. For instance, if you order a voice grade line and don't specify the loss you would normally get a line with 10 dB of loss at 1000 Hz. The 1950 Hz loss will normally be 8 dB or more than at 1000 Hz. By adding the 4 dB long-term variation and the 3 dB short-term variation, the worst case 1950 Hz loss would be 25 dB. It then follows that you cannot send any lower than -5 dBm. If the phone company will not allow you to send continuous tone as high as -5 dBm, then you will have to ask for a lower loss circuit or add conditioning.

In addition. When ordering phone line for a voting system, if possible, get all voice lines of the same type with similar characteristics. This will held to prevent strange changes in pitch and intensity as a signal is voted between sites.

APPENDIX B

DRAWINGS AND PARTS LISTS

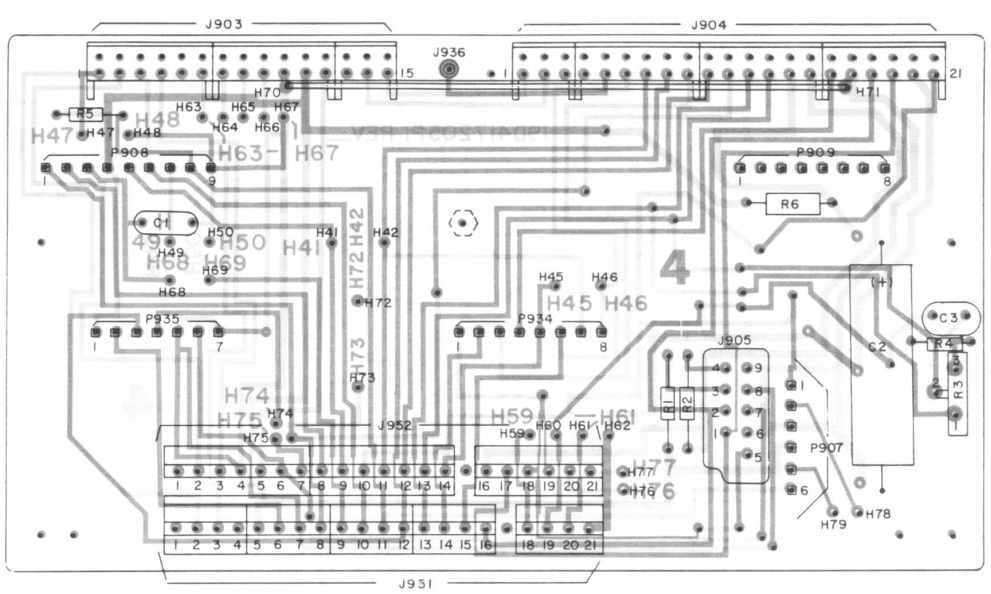
TABLE OF CONTENTS

LBI-38271
MASTR II
ASSOCIATED ASSEMBLIES

SYMBOL	GE PART NO.	DESCRIPTION
		MODIFICATION KIT 19A149572G1 VOTER CO-LOCATED 19A149572G2 VOTER NOT CO-LOCATED 19A149572G3 SATELLITE RECEIVER 19A149572G4 MAIN SITE RS232 COMM 19A149572G5 MAIN SITE 9600 BAUD MODEM
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB10	19C301086P1	Terminal board. (Used in G5).
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	7143066P12	Wire. (Specify length). (Used in G1 and G2).
	19A700136P3	Insulative Sleeving, Electrical: sim to 19C301208. (Used in G2).
	19A705726G1	Connector. (Used in G1).
	19A705726G2	Connector. (Used in G4 and G5).
	H212CRP256C	Deposited carbon: 5.6K ohms + or -5%, 1/4 w. (Used in G3, G4 and G5).
	19B234814G9	Jumper cable. (Used in G4).
	19A115871P29	Wire, stranded, orange. (Used in G3).
	N80P13004B6	Machine screw: No. 6-32 x 1/4. (Used in G5).
	N403P13B6	Lockwasher: No. 6. (Used in G5).
	N210P13B6	Nut, steel: No. 6-32. (Used in G5).
	19J706152P5	Retainer strap: sim to Panduit Corp. SST-1. (Used in G5).
		HARNESS ASSEMBLY 19B234809G1 VG VOTER RECEIVER 19B234809G2 VG VOTER SELECTOR 19B234809G3 PST SITE CONTROLLER GETC 19B234809G4 PST VOTER RECEIVER GETC 19B234809G5 PST VOTER SELECTOR SHELF 19B234809G6 PST VOTER MAIN SITE
		- - - - - - - - - - - JACKS - - - - - - - - - - -
J100	19B209727P18	Connector: 9 contacts; sim to AMP 205203-1. (Used in G5).
		- - - - - - - - - - - PLUGS - - - - - - - - - - -
P2	19A700041P28	Shell. (Used in G4 and G5).
P6	19A700041P42	Connector. (Used in G1, G2 and G3).
P7	19A700041P42	Connector. (Used in G2 and G5).
P8	19A700041P32	Shell. (Used in G1, G2, G4 and G5).
P9	19A700041P32	Shell. (Used in G1, G2, G5 and G6).
P10	19A116659P190	Connector. (Used in G1, G2 and G3).
P10	19A116659P17	Connector, printed wiring: sim to Molex 09-50-3-41. (Used in G4 and G5).
P19	19A700041P32	Shell. (Used in G4 and G5).
P26	19A700041P42	Connector. (Used in G4 and G5).
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB10	19C301086P8	Feed thru: 12 terminals rated 15 amps at 1200 VRMS; sim to GE CR151B75412AA.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	N80P13004B6	Machine screw: No. 6-32 x 1/4.
	N80P13007B6	Machine screw, panhead: No. 6-32 x 7/16.
	19A700041P26	Contact: sim to Molex 08-50-0113. (Used in G1, G2 and G3).
	19A116781P3	Contact, electrical: wire range No. 16-20 AWG; sim to Molex 08-50-0105. (Used in G1, G2, G3, G4 and G5).
	N403P13B6	Lockwasher: -No. 6.
	7160508P2	Nut, sheet spring: sim to Tinnerman C1356-632-24.
	19J706152P5	Retainer strap: sim to Panduit Corp. SST-1. (Used in G1, G2 and G3).
	19A115871P1	Wire, stranded, white-orange. (Used in G1, G2 and G4).
	19J706152P5	Retainer strap: sim to Panduit Corp. SST-1. (Used in G4, G5 and G6).
	19A149502P3	Sleeving.
	19A115871P3	Wire, stranded, white-brown. (Used in G1 and G2).
	19A115871P4	Wire, stranded. (Used in G1 and G4).
	19A115871P5	Wire, stranded, white-green. (Used in G1, G2, G3, G4 and G5).
	19A115871P6	Wire, stranded. (Used in G4 and G5).
	19A115871P9	Wire, stranded, white-orange-red. (Used in G4).
	19A115871P10	Wire, stranded. (Used in G2 and G5).
	19A115871P19	Wire, stranded. (Used in G5).
	19A115871P20	Wire, stranded. (Used in G5).
	19A700134P12	Wire, stranded. (Used in G3).
	19A115871P35	Wire, stranded. (Used in G6).
	19A115871P29	Wire, stranded, orange.
	19A115871P30	Wire, stranded, black. (Used in G1, G2, G4, G5 and G6).
	19A115871P31	Wire, stranded. (Used in G2 and G6).
	19A115871P32	Wire, stranded. (Used in G1, G2, G3, G4 and G5).
	19A115871P33	Wire, stranded. (Used in G1, G2, G4, G5 and G6).
	19A115871P34	Wire, stranded. (Used in G6).
	19A115871P36	Wire, stranded. (Used in G3 and G5).
	19A116889P2	Wire, stranded. (Used in G1, G2, G3, G4 and G5).
	19A116889P10	Wire, stranded. (Used in G1, G2, G3, G4 and G5).
	19A115871P22	Wire, stranded. (Used in G5).
	19A704779P26	Connector, printed wiring: sim to Molex 08-55-0101. (Used in G4, G5 and G6).
	19B209727P11	Contact, electrical: sim to AMP 1-66504-0. (Used in G5).
	19B209727P10	Screwlock; female, sim to Amp 205817-1. (Used in G5).
	19A702405P32	Connector, Receptacle: sim to Dupont 48051. (Used in G5).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYSTEM BOARD A901
19D417213G1



RUNS ON SOLDER SIDE

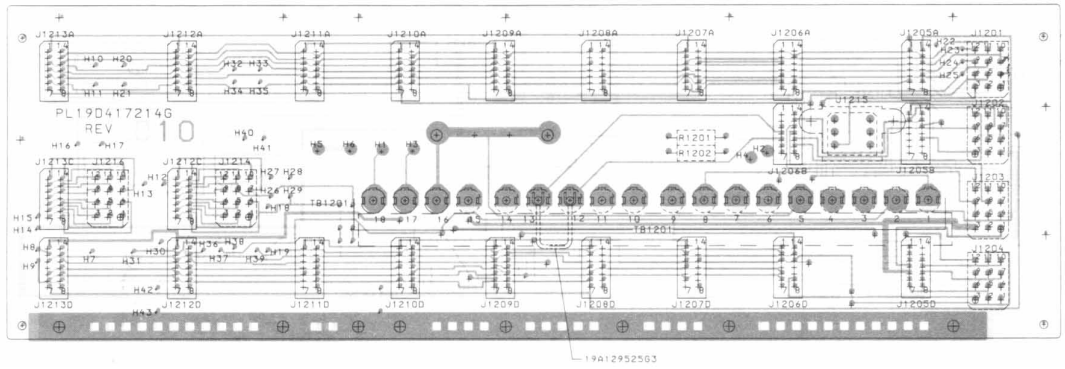
RUNS ON BOTH SIDES

RUNS ON COMPONENT SIDE

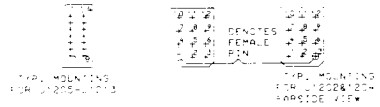
(19D423147, Sh. 1, Rev. 2)
(19D417205, Sh. 3, Rev. 4)
(19D417205, Sh. 2, Rev. 4)

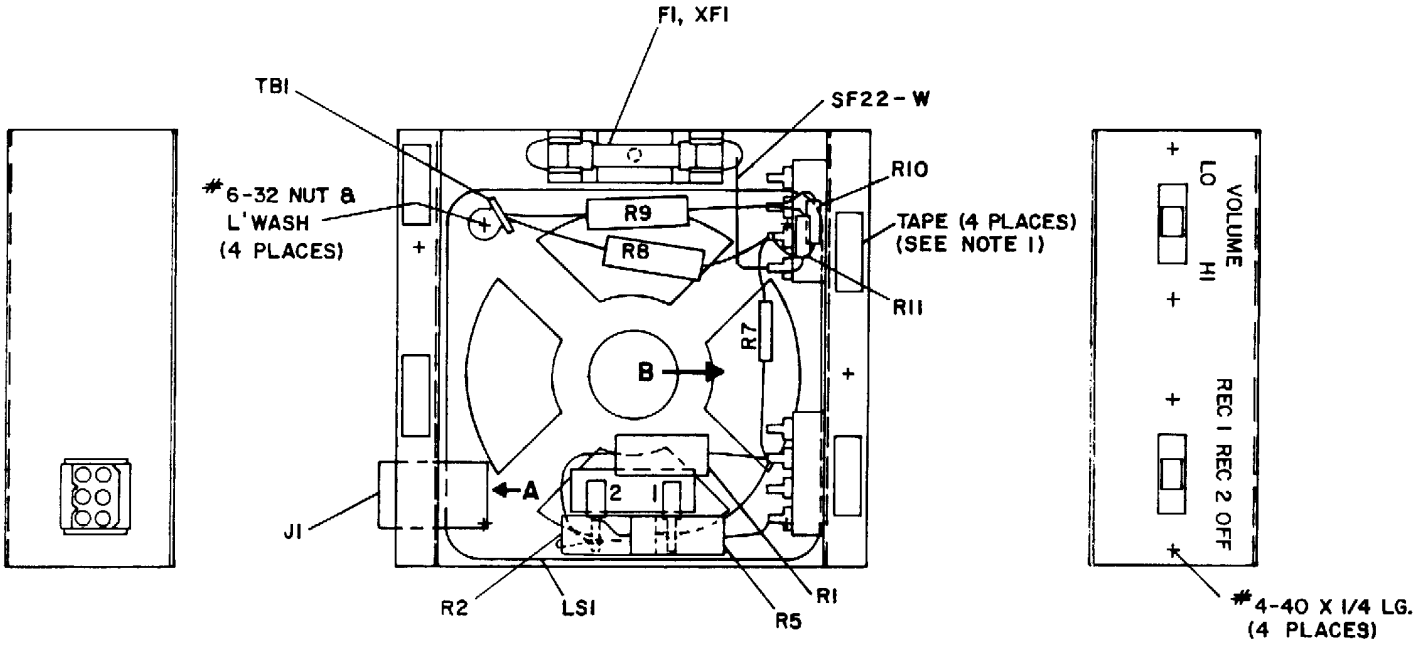
REFER TO WIRING DIAGRAM FOR THE FOLLOWING CONNECTIONS	
FROM	TO
H41	H42
H50	H77
H45	H46
H47	H48
H68	H69
H49	H76

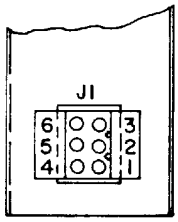
CONTROL SHELF MOTHER BOARD
19D417214G1



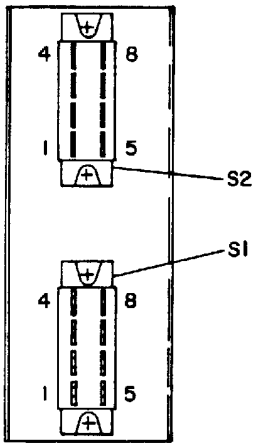
(19D423897, Sh. 1, Rev. 7)
(19D423897, Sh. 1, Rev. 10)
(19D423897, Sh. 2, Rev. 10)







VIEW A



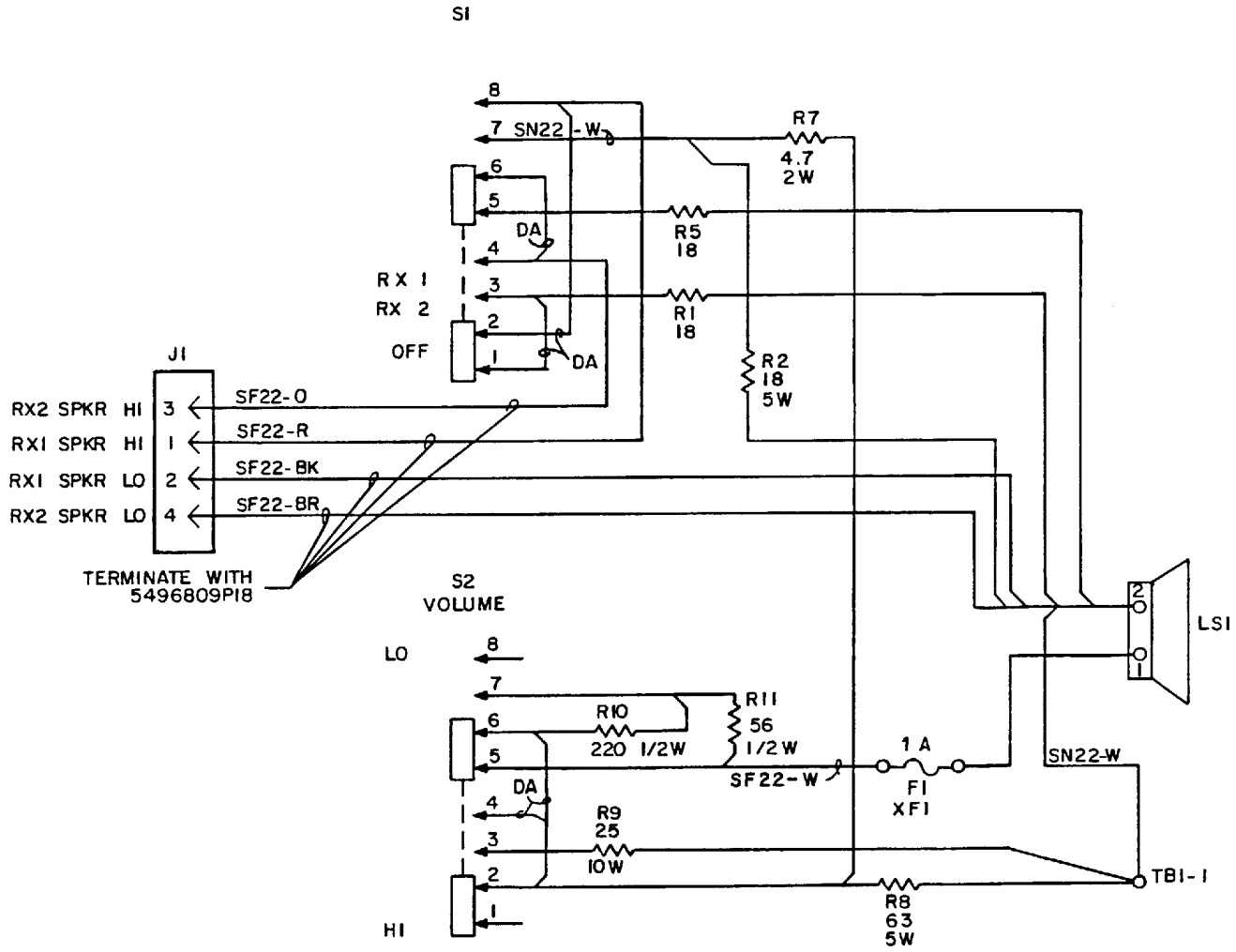
VIEW B

NOTES:

1. INSTALL TAPE ALONG FLANGE, ONE ON EACH SIDE OF MOUNTING HOLES.

SERVICE SPEAKER
19C320728G2

(19C328482, Sh. 1, Rev. 3)



ALL RESISTORS ARE 5 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF=MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=MILLIHENRYS OR H=HENRYS.

SERVICE SPEAKER
19C320728G2

(19C320731, Sh. 1, Rev. 9)

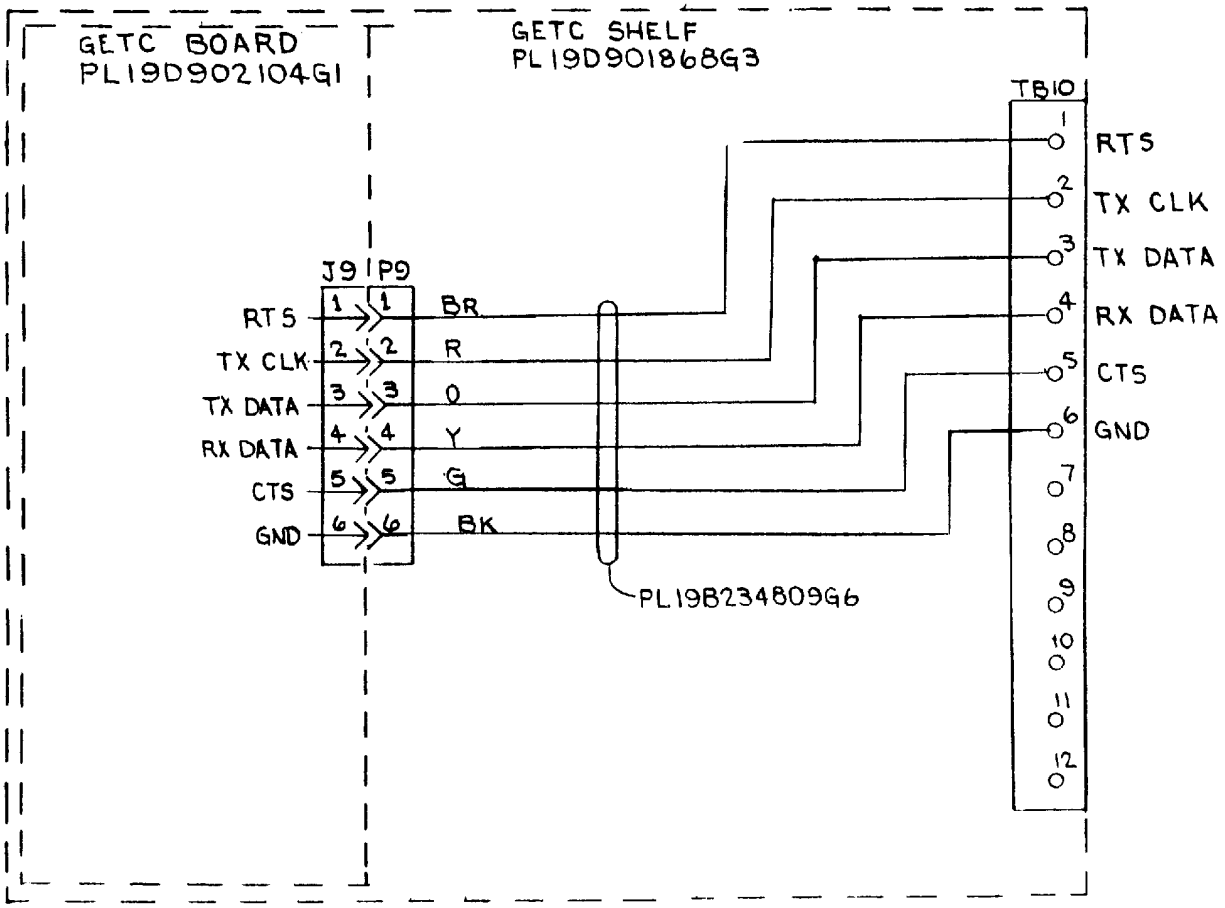
LBI4816E

SERVICE SPEAKER
19C320728G2

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - - FUSES - - - - - - - - - - -
F1*	1H18P3	Quick blowing: 1 amp at 250 v, sim to Littelfuse 312001 or Bussmann AGC-1.
		In REV E & earlier:
	1R16P1	Quick blowing: 1/2 amp at 250 v; sim to Littelfuse 312.500 or Bussmann AGC-1/2.
		In REV D:
	1R16P14	Quick blowing: 3/8 amp 250 v; sim to Littelfuse 312.375 or Bussmann AGC-3/8.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1		Connector. Includes:
	19B209288P22	Shell.
	5498809P18	Contact, pin: male, sim to Molex Products 1380-T.
		- - - - - - - - - - LOUDSPEAKERS - - - - - - - - -
LS1	19A116964P1	Permanent magnet: 3.5 inch, 18 ohms ±10% imp, 15 to 19 ohms ±20% DC res, resonant frequency 290 Hz; sim to Oaktron S-9847.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	5493035P53	Wirewound: 18 ohms ±5%, 5 w.
R2	5493035P3	Wirewound: 2 ohms ±5%, 5 w; sim to Hamilton Hall Type HR. Deleted by REV D.
	5493035P53	Wirewound: 18 ohms ±5%, 5 w. Added by REV F.
R3*	19B209490P1	Variable, wirewound: 35 ohms ±20%, 2.25 w; sim to CTS Type 118. Deleted by REV D.
R4*	5493035P2	Wirewound: 1 ohm ±5%, 5 w. Deleted by REV C.
R5*	5493035P3	Wirewound: 18 ohms ±5%, 5 w; sim to Hamilton Hall Type HR. Added by REV B.
R6*	5493035P27	Wirewound: 10 ohms ±5%, 5 w; sim to Hamilton Hall Type HR. Added by REV C. Deleted by REV D.
R7*	19A700050P21	Wirewound: 4.7 ohms ±10%, 2 w. Added by REV D.
R8*	5493035P17	Wirewound: 63 ohms ±5%, 5 w; sim to Hamilton Hall Type HR.
		In REV D:
	3R78P620J	Composition: 62 ohms ±5%, 1 w. Added by REV D.
R9*	5493035P44	Wirewound: 25 ohms ±5%, 10 w; sim to Hamilton Hall Type HR.
		In REV D:
	19B209022P48	Wirewound: 24 ohms ±5%, 2 w. Added by REV D.
R10*	19A700113P47	Composition: 220 ohms ±5%, 1/2 w. Added by REV D.
R11*	19A700113P33	Composition: 56 ohms ±5%, 1/2 w. Added by REV D.
		- - - - - - - - - - SWITCHES - - - - - - - - - -
S1	19B209261P5	Slide: DPDT, sim. to Switchcraft 11D1033B.
S2*	19B209261P5	Slide: DPDT, sim. to Switchcraft 11D1033B. Added by REV D.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB1*	7775500P44	Phenolic: 1 insulated, 1 ground. Added by REV D.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - - SOCKETS - - - - - - - - - - -
XF1*	7141008P1	Fuseholder: 30 amps at 125 v; sim to Bussmann 3998. Added by REV D.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	4032480P1	Nut, sheet spring: sim to Vector Electronic Co. No. 440. (Secures S1, S2).
	19B201074P204	Tap screw, phillips POZIDRIV: No. 4-40 x 1/4. (Secures S1, S2).
	N80P13005C6	Machine screw: No. 8-32 x 5/16. (Secures Service Speaker).
	7141225P3	Hex Nut: No. 6-32. (Secures Service Speaker).
	N404P13C6	Lockwasher, internal tooth: No. 8. (Secures Service Speaker).

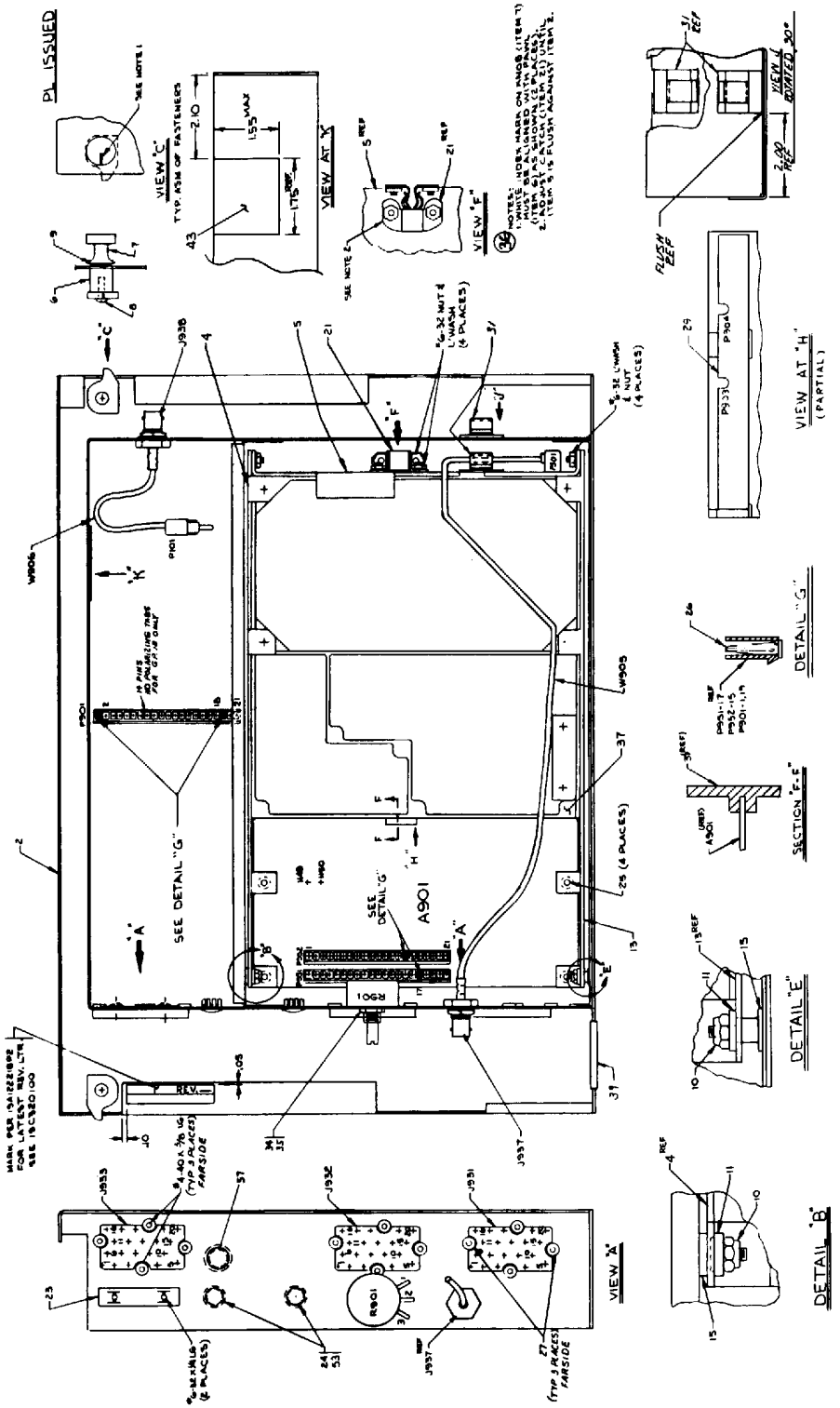
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



NOTE : ALL WIRES SF 24 UNLESS OTHERWISE SPECIFIED

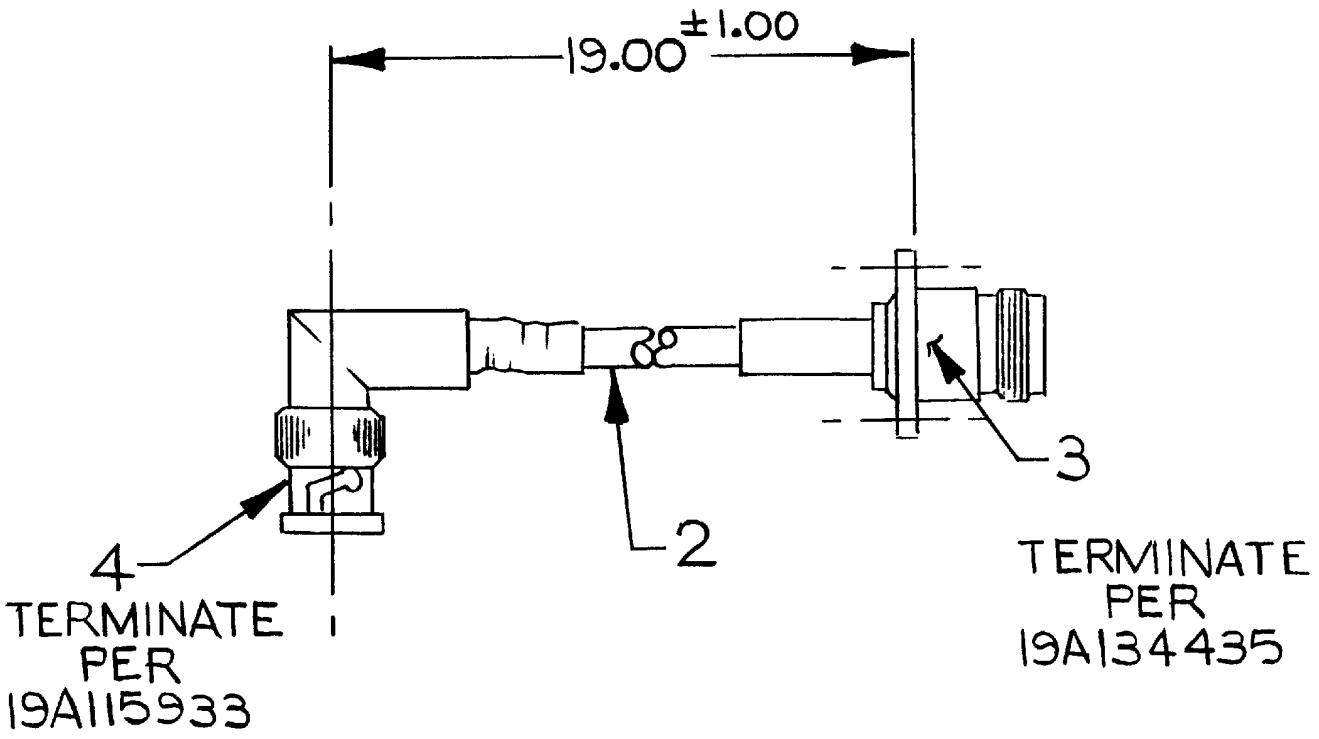
MAIN SITE (VOTER MODIFICATION)

(19B235064, Sh. 1, Rev. 0)



RADIO HOUSING FRONT DOOR
19D417262G4

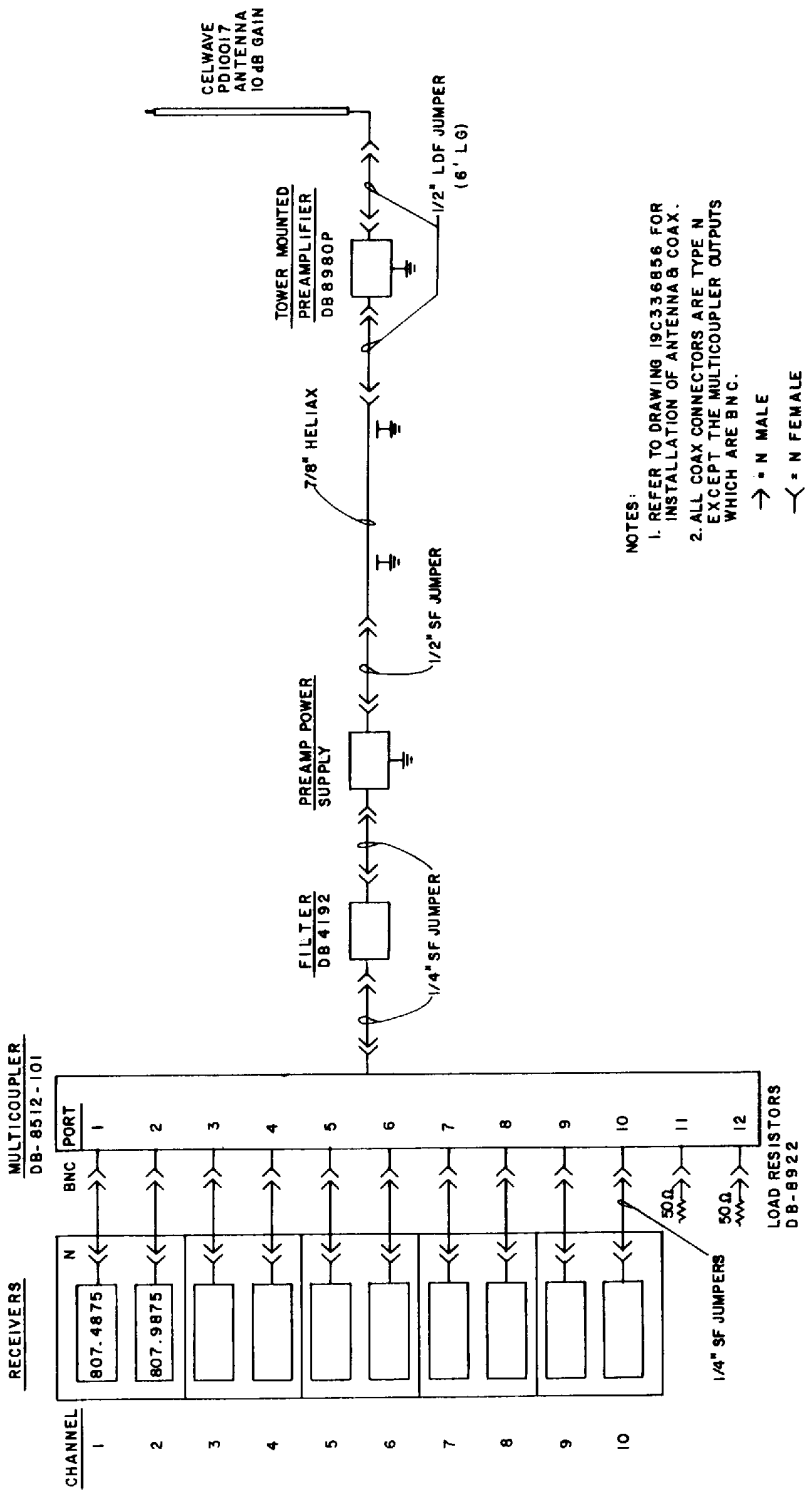
(19D417262, Sh. 2, Rev. 12)



1

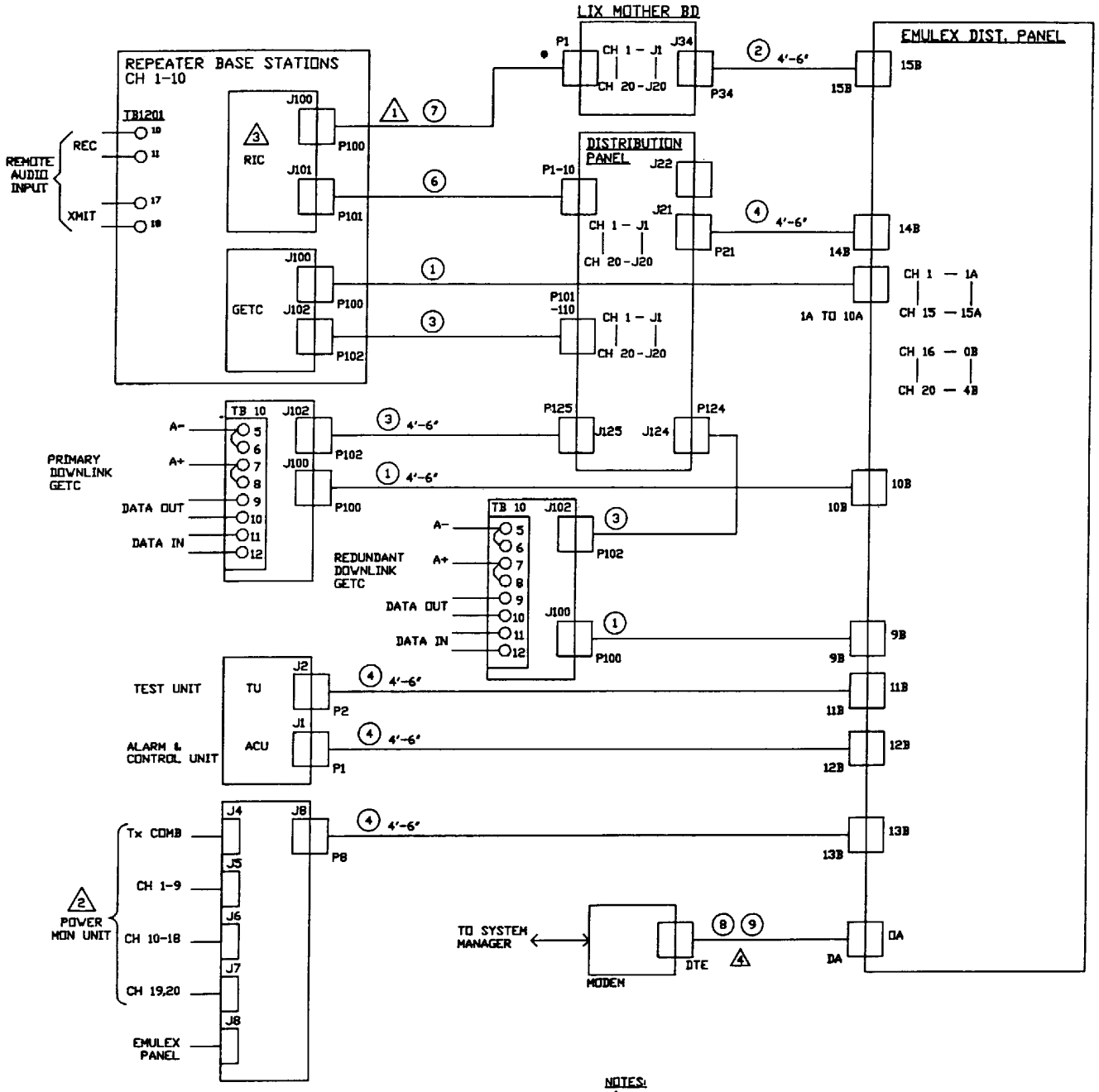
CABLE
19A136933

(19A136933, Sh. 1, Rev. 0)



TYPICAL RECEIVER ANTENNA & MULTICOUPLER SYSTEM

(19C336881, Sh. 1, Rev. 0)

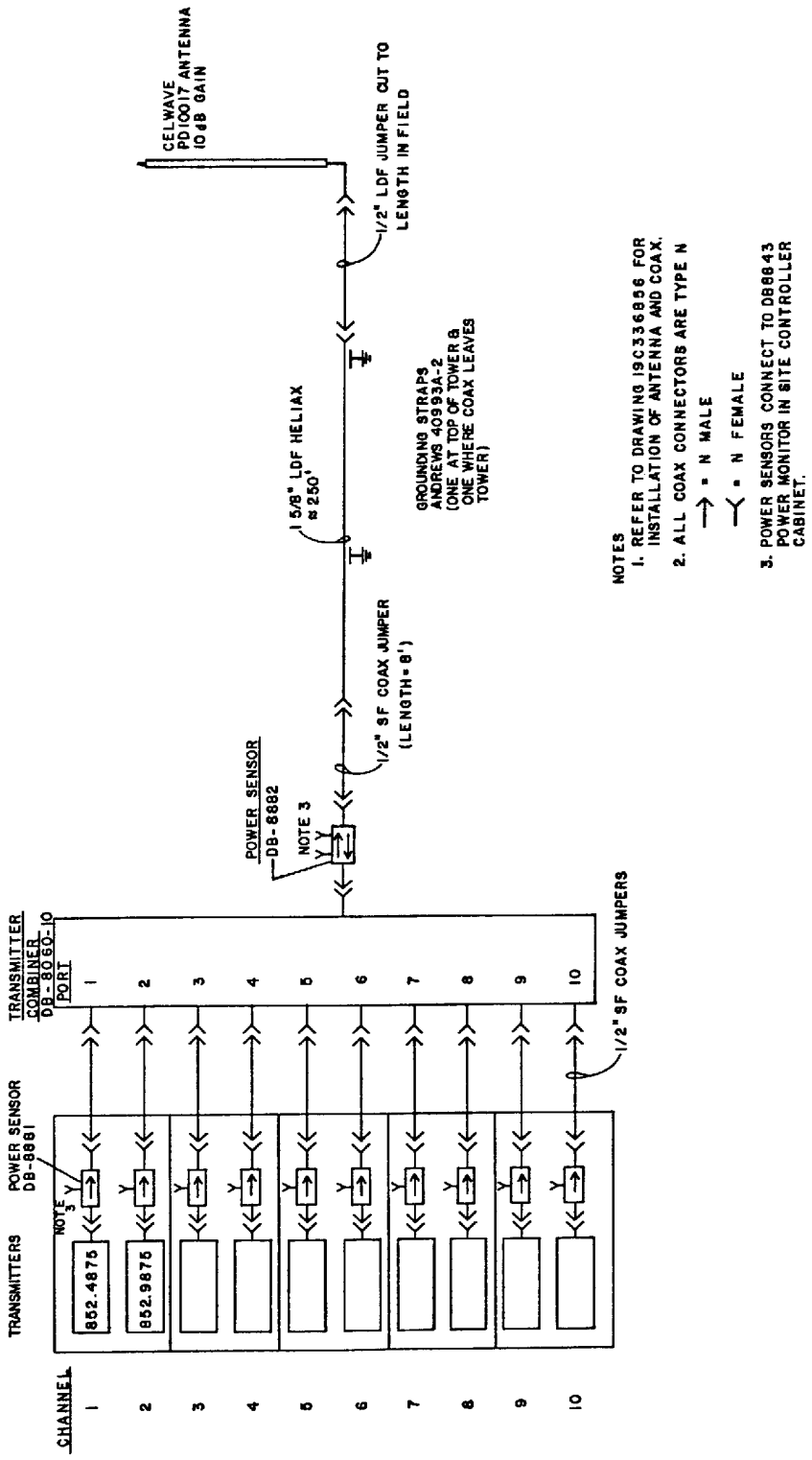


NOTES:

1. NUMBER IN CIRCLE REFERS TO CABLE PART SHOWN ON SHEET 2 OF THIS DRAWING.
2. SEE 19D902048 FOR INTERCONNECTION TO STATIONS.
3. MAY NOT BE USED IN ALL STATIONS.
4. P8 CABLE USED WHEN SYSTEM MANAGER CONNECTED VIA MODEM. P9 CABLE USED WHEN SYSTEM MANAGER CONNECTED VIA RS232 LINK.

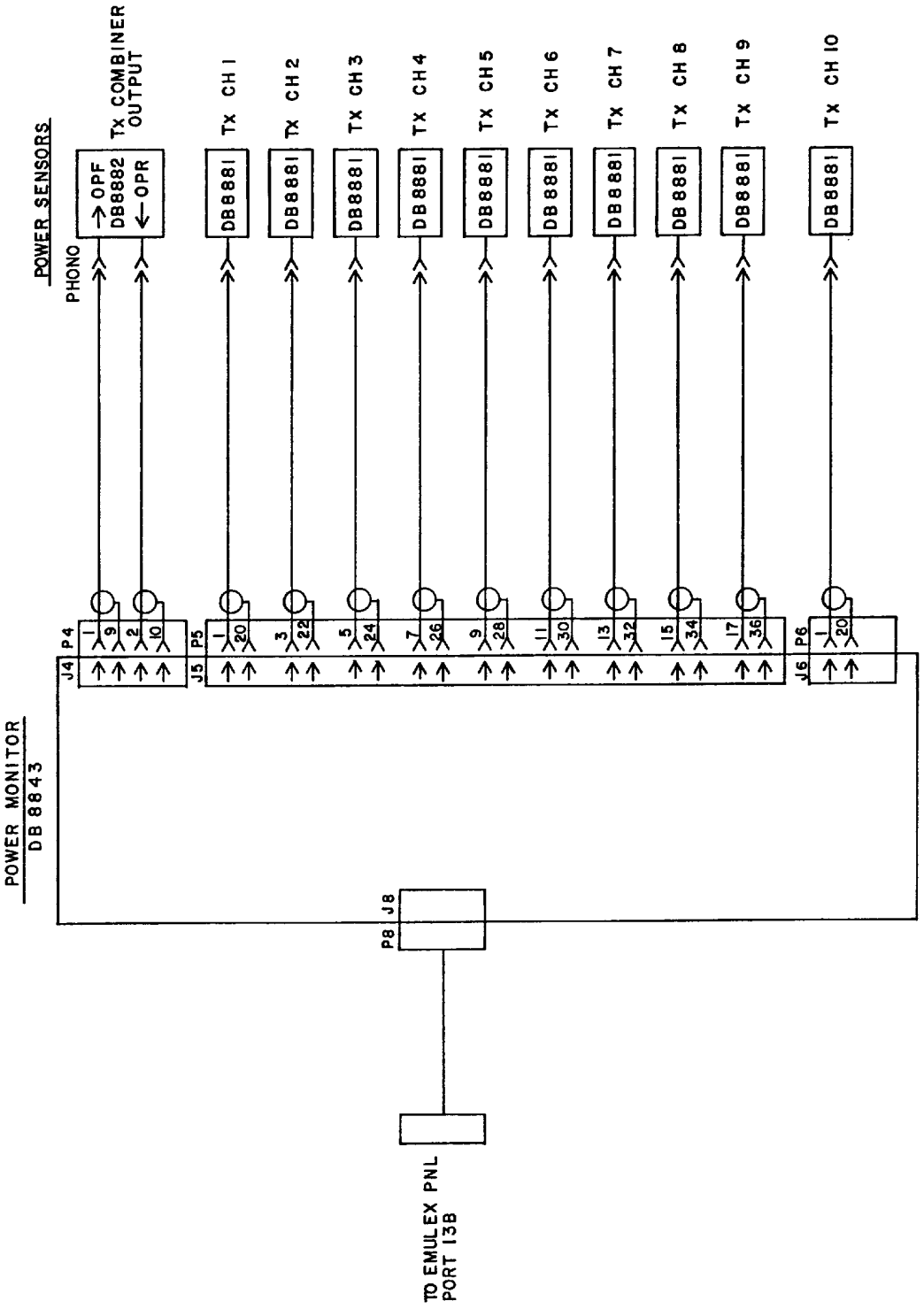
TYPICAL TRUNKING HARDWARE AT REPEATER SITE

(19C336882, Sh. 1, Rev. 5)



TYPICAL TRANSMIT ANTENNA & COMBINING SYSTEM

(19C336880, Sh. 1, Rev. 0)



TYPICAL POWER MONITOR CONNECTIONS

(19C356879, Sh. 1, Rev. 0)

MASTR II 800 MHz STATION RADIO PANEL FRONT DOOR ASSEMBLY 19D417262G4

SYMBOL	PART NUMBER	DESCRIPTION
		DOOR ASSEMBLY 19D417262G4
A901		**COMPONENT BOARD 19D417213G1**
		——— CAPACITORS ———
C1	19A116080P107	Polyester: 0.1 µF ±20%, 50 VDCW.
C2	19A115680P24	Electrolytic: 400 µF +150% -10%, 18 VDCW; sim to Mallory Type TTX.
C3	19A116080P106	Polyester: 0.068 µF ±10%, 50 VDCW.
C4 thru C7	19A704534P	Tantalum: 1 µF ± 20%, 35 VDCW.
		——— JACKS AND RECEPTACLES ——
J903		Connector. Includes:
	19A116659P1	Connector, printed wiring: 3 contacts rated at 5 amps; sim to Molex 09-52-3032. (Quantity 1).
	19A116659P	Connector, printed wiring: 6 contacts rated at 5 amps; sim to Molex 09-52-3062. (Quantity 4).
J904		Connector. Includes:
	19A116659P1	Connector, printed wiring: 3 contacts rated at 5 amps; sim to Molex 09-52-3032. (Quantity 1).
	19A116659P4	Connector, printed wiring: 6 contacts rated at 5 amps; sim to Molex 09-52-3062. (Quantity 3).
J905		Connector: 9 contacts.
J936	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J951		Connector. Includes:
	19A116659P13	Connector, printed wiring: 4 contacts rated at 5 amps; sim to Molex 09-64-1041. (Quantity 5).
J952		Connector. Includes:
	19A116659P11	Connector, printed wiring: 7 contacts rated at 5 amps; sim to Molex 09-64-1071. (Quantity 2).
	19A116659P12	Connector, printed wiring: 6 contacts rated @ 5 amps; sim to Molex 09-64-1061. (Quantity 1).
		——— PLUGS ———
P907	19A701785P1	Contact, electrical; sim to Molex 08-50-0404. (Quantity 6).
P908	19A701785P1	Contact, electrical; sim to Molex 08-50-0404. (Quantity 9).
P909	19A701785P1	Contact, electrical; sim to Molex 08-50-0404. (Quantity 8).
P934	19A701785P1	Contact, electrical; sim to Molex 08-50-0404. (Quantity 8).
P935	19A701785P1	Contact, electrical; sim to Molex 08-50-0404. (Quantity 7).
		——— RESISTORS ———
R1 and R2	19A701250P444	Metal film: 280K ohms ± 1%, 1/4 w
R3	19B209358P106	Variable, carbon film: approx 300 to 10K ohms ±10%, 1/4 w; sim to CTS Type X-201
R4	19A700106P71	Composition: 2.2K ohms ±5%, 1/4 w.
R5	19A700106P75	Composition: 3.3K ohms ± 5%, 1/4 w.
R6	19A700113P3	Composition: 3.3 ohms ± 5%, 1/2 w.
		——— CABLES ———
W903		**CABLE ASSEMBLY 19D417262G2**
		——— JACKS AND RECEPTACLES ——
J931 and J932	19C303426G1	Connector: 20 pin contacts.

SYMBOL	PART NUMBER	DESCRIPTION
		——— PLUGS ———
P951 and P952		Connector. Includes:
	19A116659P25	Shell.
	19A116781P5	Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106.
	19A116781P6	Contact, electrical: wire range No. 22-26 AWG; sim to Molex 08-50-0106.
		——— RESISTORS ———
R901	5496870P3	Variable, carbon film: 10K ohms ±20%, sim to Mallory LC(25K).
W904		**EXCITER CABLE 19D417262G3**
		—— JACKS AND RECEPTACLES ——
J933	19C303426G1	Connector: 20 pin contacts.
		——— PLUGS ———
P901		Connector. Includes:
	19A116659P25	Shell.
	19A116781P6	Contact, electrical: wire range No. 22-26 AWG; sim to Molex 08-50-0106.
W905		**CABLE ASSEMBLY 19A136930G2**
J937	19A115938P12	Connector, coaxial: (BNC Series); sim to Amephenol 31-324.
		——— PLUGS ———
P30	119A134357P8	Cable, RF: approx 21 inches long.
W906		**CABLE ASSEMBLY 19A136930G1**
		—— JACKS AND RECEPTACLES ——
J938	19A115938P1	Connector, coaxial: (BNC Series); sim to Amphenol 31-318.
		——— PLUGS ———
P101	19A134357P6	Cable, RF: approx 6 inches long.
		——— MISCELLANEOUS ———
	19C320679G1	Door.
	19B234589P1	Pawl. (Part of door latch).
	19C336435P1	Knob. (Part of door latch).
	N193P1208	C6Tao screw, phillips head: No. 6-20 x 1/2. (Part of door latch).
	5493361P8	Washer, spring tension. (Part of door latch).
	19A121678P1	Guide pin. (Used with J931-J933).
	19B209519P1	Polarity tab. (Used with P901, P951, P952).
	7115130P9	Lockwasher, interal tooth: No. 3/8. (Used with R901 mounting).
	7165075P2	Hex nut, brass: thd. size No. 3/8-32.(Used with R901 mounting).
	19A115874P1	Catch, friction.(Latches A901).

* COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a Revision Letter which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for the descriptions of parts affected by these revisions.

REV. A - COMPONENT BOARD 19D417213G1

To provide carrier control alarm tone access holes to provide alarm tone capability, added holes H78 and H79 at P907 pin 2 and 5.

REV. B - COMPONENT BOARD 19D417213G1

To improve adjacent channel selectivity and to isolate audio PA power return from common ground. Disconnected J904-20 from J904-17 and all other connections. Connected J904-20 to J951-21.

REV. C - COMPONENT BOARD 19D417213G1

To improve adjacent channel sensitivity when used with a MASTR IIe Control Shelf. Added 1 µf capacitors C4 through C7 (19A704534P4).

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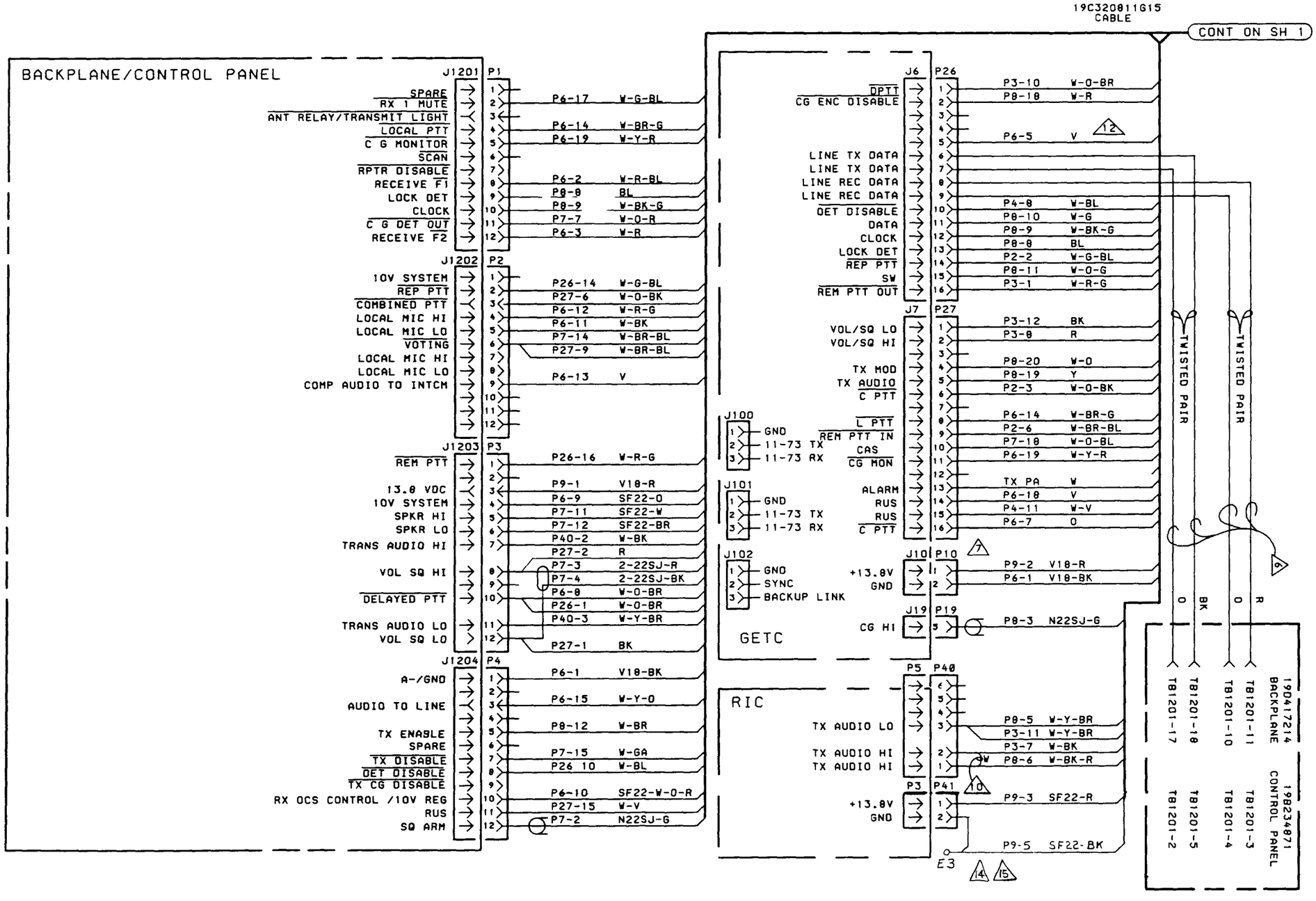
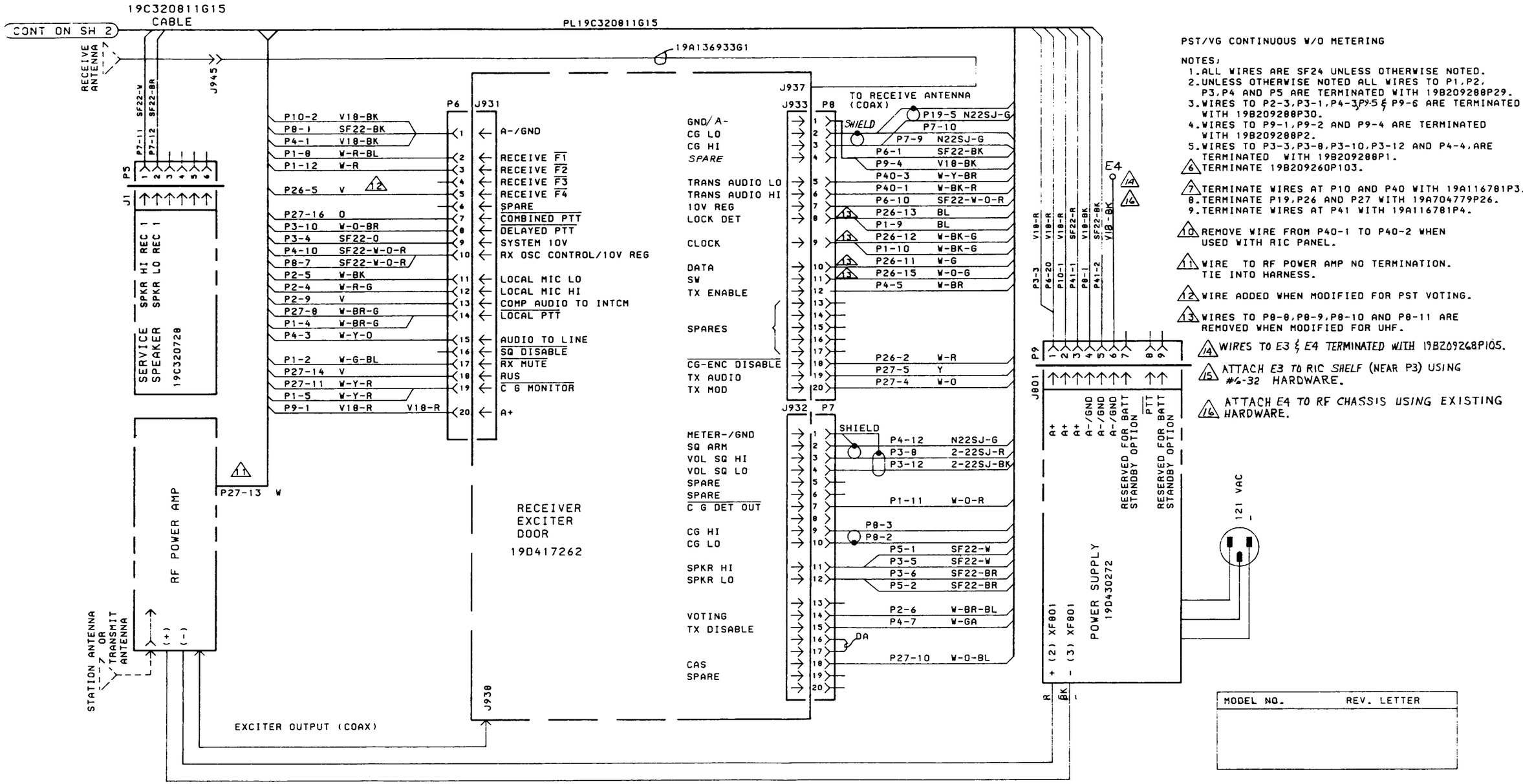


MASTR II STATION

(19D438278, Sh. 2, Rev. 5)



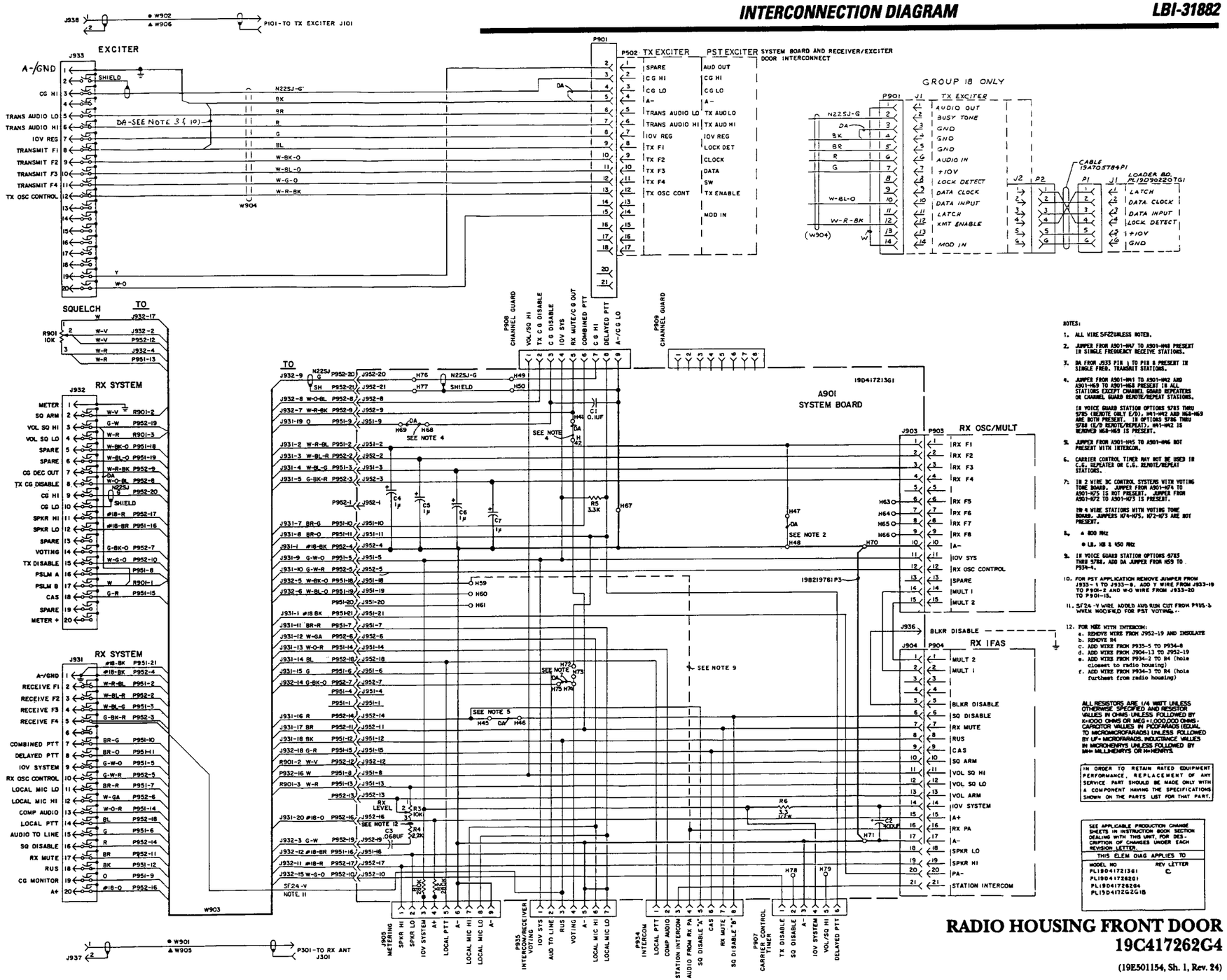
PST/VG CONTINUOUS W/O METERING

NOTES:
1. ALL WIRES ARE SF24 UNLESS OTHERWISE NOTED.
2. UNLESS OTHERWISE NOTED ALL WIRES TO P1, P2, P3, P4 AND P5 ARE TERMINATED WITH 19B209288P29.
3. WIRES TO P2-3, P3-1, P4-3, P5-5 & P9-6 ARE TERMINATED WITH 19B209288P30.
4. WIRES TO P9-1, P9-2 AND P9-4 ARE TERMINATED WITH 19B209288P2.
5. WIRES TO P3-3, P3-8, P3-10, P3-12 AND P4-4, ARE TERMINATED WITH 19B209288P1.
6. TERMINATE 19B209260P103.
7. TERMINATE WIRES AT P10 AND P40 WITH 19A116781P3.
8. TERMINATE P19, P26 AND P27 WITH 19A704779P26.
9. TERMINATE WIRES AT P41 WITH 19A116781P4.
10. REMOVE WIRE FROM P40-1 TO P40-2 WHEN USED WITH RIC PANEL.
11. WIRE TO RF POWER AMP NO TERMINATION. TIE INTO HARNESS.
12. WIRE ADDED WHEN MODIFIED FOR PST VOTING.
13. WIRES TO P8-8, P8-9, P8-10 AND P8-11 ARE REMOVED WHEN MODIFIED FOR UHF.
14. WIRES TO E3 & E4 TERMINATED WITH 19B209268P105.
15. ATTACH E3 TO RIC SHELF (NEAR P3) USING #6-32 HARDWARE.
16. ATTACH E4 TO RF CHASSIS USING EXISTING HARDWARE.

MODEL NO.	REV. LETTER

MASTR II STATION

(19D438278, Sh. 1, Rev. 8)



NOTES:

1. ALL WIRE 5FZ2UNLESS NOTED.
2. JUMPER FROM A901-H47 TO A901-H48 PRESENT IN SINGLE FREQUENCY RECEIVE STATIONS.
3. DA FROM J935 PIN 1 TO PIN 8 PRESENT IN SINGLE FREQ. TRANSMIT STATIONS.
4. JUMPER FROM A901-H41 TO A901-H42 AND A901-H69 TO A901-H68 PRESENT IN ALL STATIONS EXCEPT CHANNEL GUARD REPEATERS OR CHANNEL GUARD REMOTE/REPEAT STATIONS.

   IN VOICE GUARD STATION OPTIONS 5783 THRU 5785 (REMOTE ONLY E/D), H41-H42 AND H68-H69 ARE BOTH PRESENT. IN OPTIONS 5786 THRU 5788 (E/D REMOTE/REPEAT), H41-H42 IS REMOVED H68-H69 IS PRESENT.
5. JUMPER FROM A901-H45 TO A901-H46 NOT PRESENT WITH INTERCOM.
6. CARRIER CONTROL TIMER MAY NOT BE USED IN C.G. REPEATER OR C.G. REMOTE/REPEAT STATIONS.
7. IN 2 WIRE DC CONTROL SYSTEMS WITH VOTING TONE BOARD, JUMPER FROM A901-H74 TO A901-H75 IS NOT PRESENT. JUMPER FROM A901-H72 TO A901-H73 IS PRESENT.

   IN 4 WIRE STATIONS WITH VOTING TONE BOARD, JUMPERS H74-H75, H72-H73 ARE NOT PRESENT.
8. ▲ 800 MHz
   ● LO, HB & 450 MHz
9. IN VOICE GUARD STATION OPTIONS 5783 THRU 5788, ADD DA JUMPER FROM H59 TO P934-4.
10. FOR PST APPLICATION REMOVE JUMPER FROM J933-1 TO J933-8. ADD Y WIRE FROM J933-19 TO P901-2 AND W-O WIRE FROM J933-20 TO P901-15.
11. SF24-V WIRE ADDED AND RUN CUT FROM P935-5 WHEN MODIFIED FOR PST VOTING.
12. FOR MDC WITH INTERCOM:
    a. REMOVE WIRE FROM J952-19 AND INSULATE
    b. REMOVE R4
    c. ADD WIRE FROM P935-5 TO P934-8
    d. ADD WIRE FROM J904-13 TO J952-19
    e. ADD WIRE FROM P934-2 TO R4 (hole closest to radio housing)
    f. ADD WIRE FROM P934-3 TO R4 (hole furthest from radio housing)

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF= MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR H=HENRYS.

IN ORDER TO RETAIN RATED EQUIPMENT PERFORMANCE, REPLACEMENT OF ANY SERVICE PART SHOULD BE MADE ONLY WITH A COMPONENT HAVING THE SPECIFICATIONS SHOWN ON THE PARTS LIST FOR THAT PART.

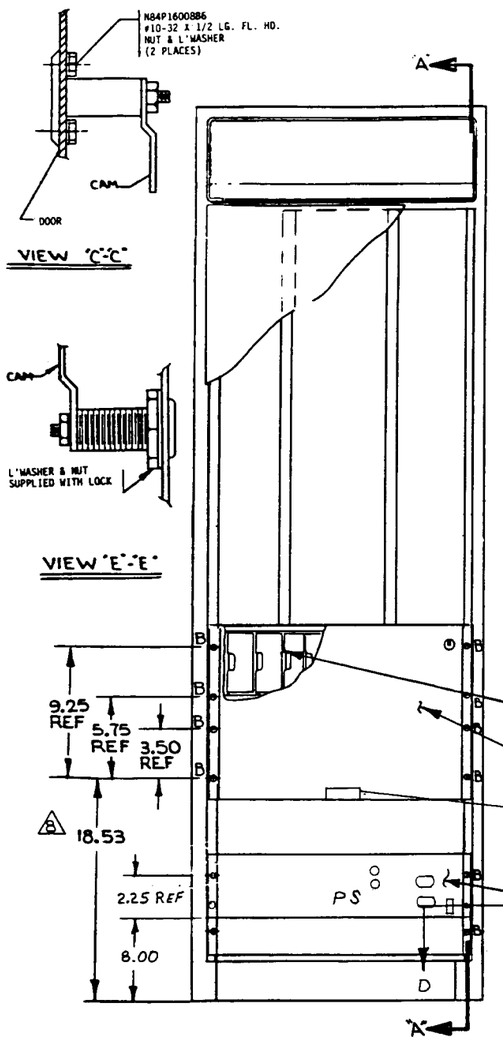
SEE APPLICABLE PRODUCTION CHANGE SHEETS IN INSTRUCTION BOOK SECTION DEALING WITH THIS UNIT, FOR DESCRIPTION OF CHANGES UNDER EACH REVISION LETTER.

THIS ELEM DIAG APPLIES TO

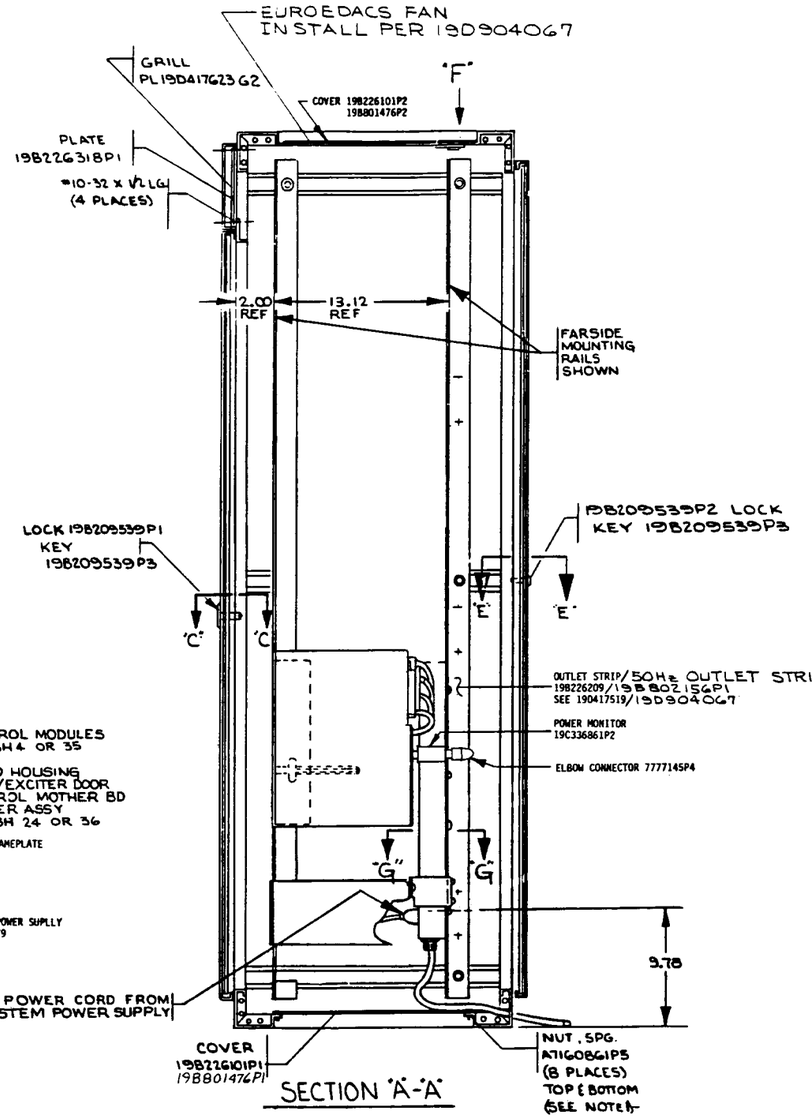
MODEL NO	REV LETTER
PL19D417213G1	C
PL19D417282G1	
PL19D417282G4	
PL19D417ZG2G1, B	

RADIO HOUSING FRONT DOOR 19C417262G4

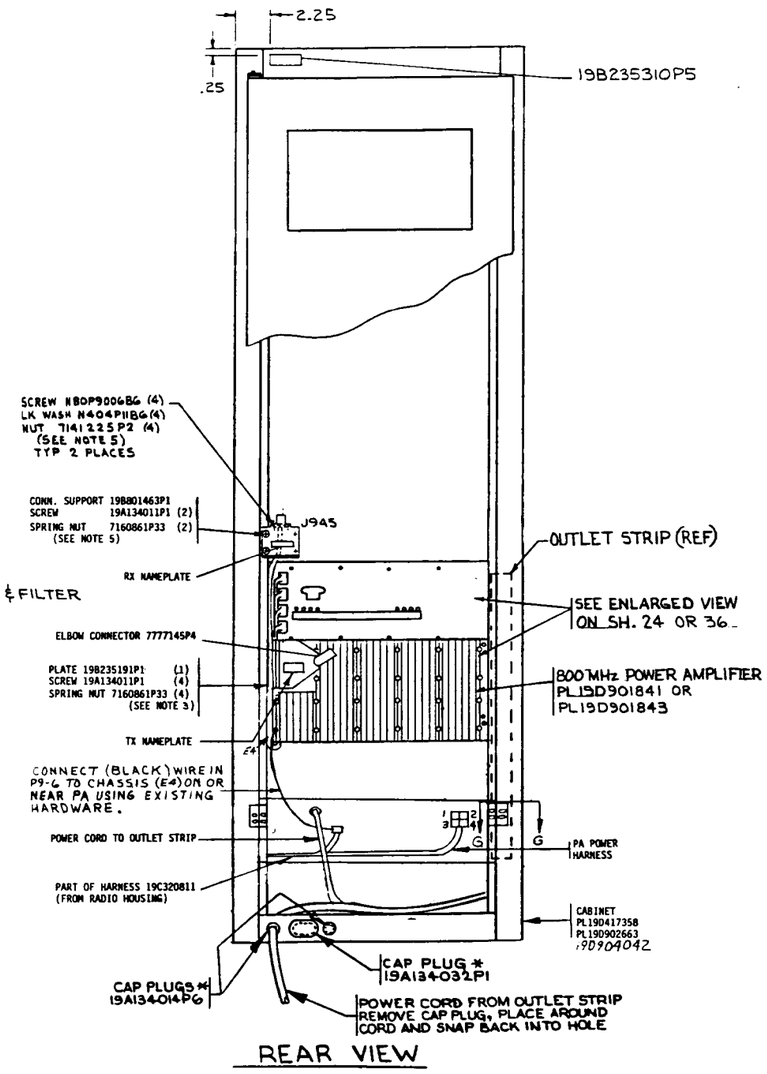
(19E501154, Sh. 1, Rev. 24)



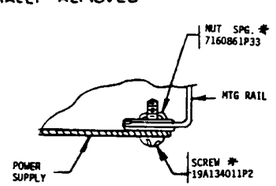
FRONT VIEW
WITH DOOR PARTIALLY REMOVED FOR CLARITY



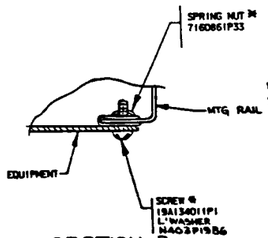
SECTION "A"-"A"



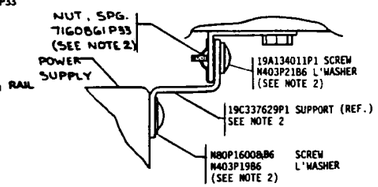
REAR VIEW



SECTION "D"
POWER SUPPLY MTG.



SECTION B
AT 'B' DESIGNATIONS



VIEW "G"-"G"

MASTR II STATION

(19D424565, Sh. 25, Rev. 11)

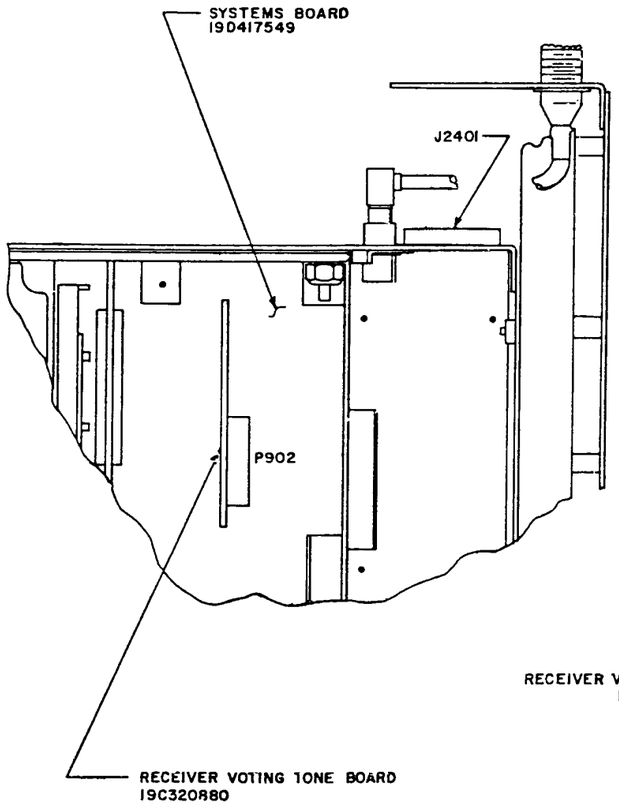
(17)
(27)

NOTES: 800 MHZ V. M. CABINET
1. ITEMS WHICH REFERENCE AN (*) ARE PART OF HDW. KIT PL 19A130031G24.
2. PART OF POWER SUPPLY KIT PL19A14932668.
3. PART OF CONNECTOR SUPPORT KIT PL19A70518662.
4. SEE INTR. DIAG. 19R622600 FOR GE-MARC V APPLICATION OR 19D438279 INTR. DIAG. FOR NON GE-MARC APPLICATION.
5. PART OF CONNECTOR SUPPORT KIT PL19A70518661.

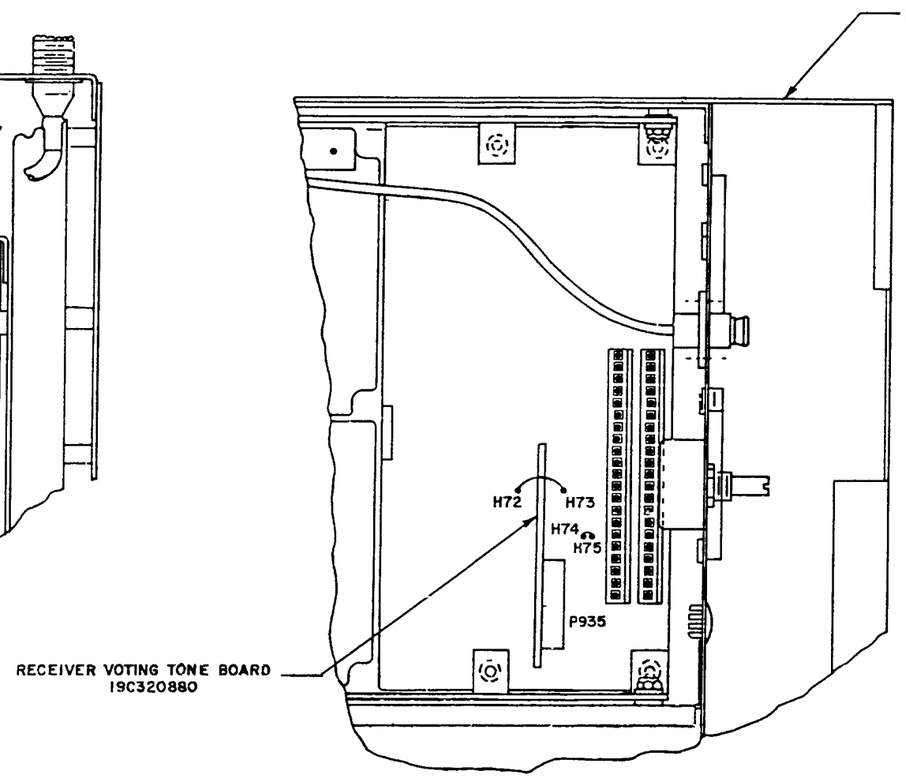
⚠5 IN SIMPLEX APPLICATIONS REMOVE P12 OF 19C320811-STRIP THE W-BL WIRE & TERMINATE TOGETHER IN SPLICE AT END OF BLUE WIRE FROM RELAY. SPOT TIE PER DETAIL M.

⚠8 MOUNT RADIO HOUSING IMMEDIATELY ABOVE POWER SUPPLY FOR PST.

THESE INSTRUCTIONS COVER THE INSTALLATION OF THE RECEIVER VOTING TONE BOARD (19C320800 OR 19C336900) IN THE MAIN RECEIVER CHASSIS (19D417262) AND ON THE SYSTEMS BOARD (19D417549) LOCATED IN THE AUX RECEIVER CHASSIS (19D417546).



(1) FIG. 1
(AUX RECEIVER)



(2) FIG. 2
(MAIN RECEIVER)

NOTES:

1) INTERCOM AND RCVR VOTING TONE BOARD ARE NOT COMPATIBLE.

2) EACH VOTED RECEIVER REQUIRES A SEPARATE LINE. WHEN AN AUXILIARY RECEIVER IS PRESENT IN A STATION COMBINATION WITH VOTING, THE AUDIO MAY NOT BE COMBINED EITHER THROUGH 2ND RCVR 600 OHMS HI OR BY PARALLELING THE OUTPUT LINES.

(1) INSTRUCTIONS FOR INSTALLING RECEIVER VOTING TONE BOARD (19C320880 OR 19C336900).

1) REMOVE THE COVER (IF PRESENT).

2) AUX RECEIVER
PLUG RECEIVER VOTING TONE BOARD ON SYSTEMS BOARD (19D417549) AT P902 AS SHOWN IN FIG. 1.

3) MAIN RECEIVER (FIRST DIGIT NOT S)
MODIFY 19D417213 SYSTEM BOARD AS FOLLOWS:

A) IN 2-WIRE DC CONTROL (STATIONS WITH FIFTH DIGIT R,U AND SEVENTH DIGIT G,N,P,S,U,W). REMOVE JUMPER A901. H74 TO A901-H75. INSTALL JUMPER A901-H72 TO A901-H73.

B) IN 4-WIRE DC OR TONE CONTROL WITH SEVENTH DIGIT D,L OR WHEN OPTION 9507 OR OPTION 9601 IS PRESENT, REMOVE JUMPER A901-H74 TO A901-H75.

C) PLUG IN RECEIVER VOTING TONE BOARD AT P935 AS SHOWN IN FIG. 2.

4. MAIN RECEIVER (FIRST DIGIT OF S)
MODIFY 19D317213 SYSTEM BOARD AS FOLLOWS:

A) IN 2-WIRE DC CONTROL (STATIONS WITH SEVENTH DIGIT R,U AND NINTH DIGIT G,N,P,S,U,W). REMOVE JUMPER A901. H74 TO A901-H75. INSTALL JUMPER A901-H72 TO A901-H73.

B) IN 4-WIRE DC OR TONE CONTROL WITH NINTH DIGIT D,L OR WHEN OPTION 9507 OR OPTION 9601 IS PRESENT, REMOVE JUMPER A901-H74 TO A901-H75.

C) PLUG IN RECEIVER VOTING TONE BOARD AT P935 AS SHOWN IN FIG. 2.

5) REPLACE THE COVER.

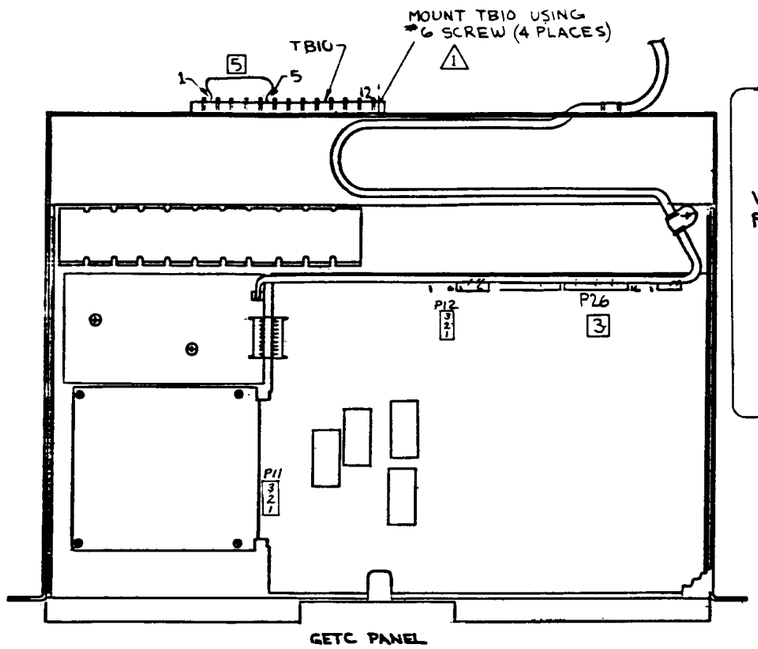
CONNECTIONS:

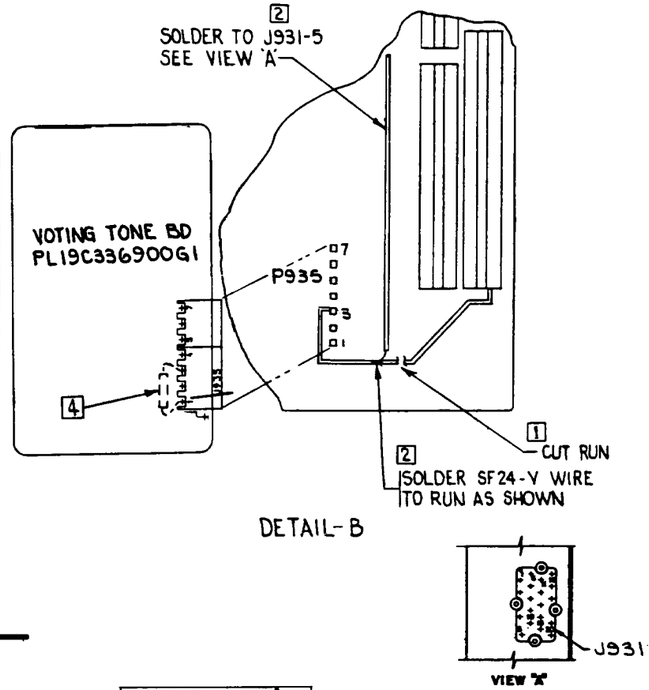
1. IN 2-WIRE DC CONTROL SYSTEMS WITH VOTING TONE BOARD, JUMPER FROM A901-H74 TO A901-H75 IS NOT PRESENT. JUMPER FROM A901-H72 TO A901-H73 IS PRESENT.

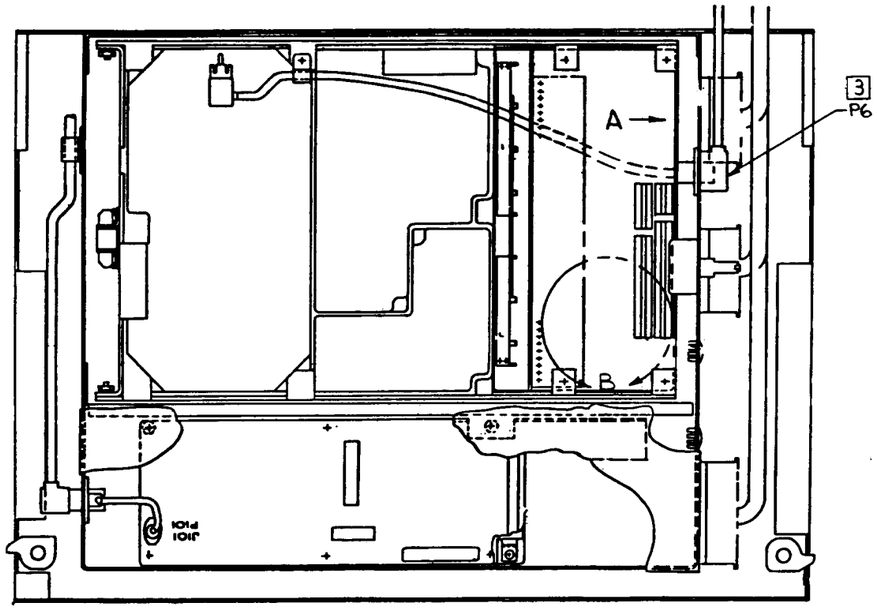
IN 4-WIRE STATIONS WITH VOTING TONE BOARD, JUMPER H74-H75; H72-H73 ARE NOT PRESENT.

RECEIVER VOTING TONE BOARD

(19D417633, Sh. 1, Rev. 9)







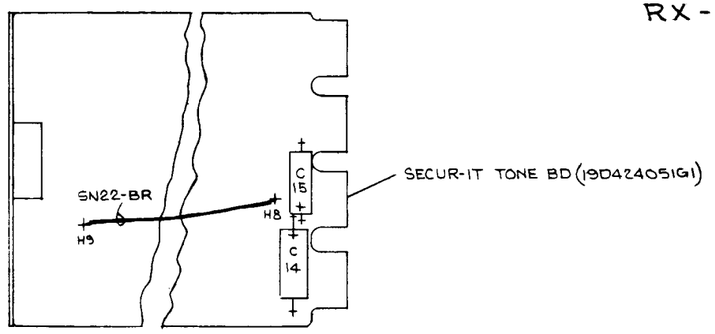
(1) MOD. PST STATION RECEIVER FOR VOTING (RS232)

1. CUT RUN ON STATION CONTROL BOARD 19D417213 (SEE DETAIL B)
2. SOLDER VIOLET WIRE TO RUN (SEE DETAIL B) & OTHER END TO J931-5 (SEE VIEW A).
3. SOLDER VIOLET WIRE TO P6-5. INSERT TERMINATED END INTO P26-5 ON GETC SHELF, LACING WIRE INTO EXISTING HARNESS.
4. SOLDER A 5.6K, 1/4W RESISTOR BETWEEN J935-1 & J935-3 ON SOLDER SIDE OF VOTING TONE BOARD 19C33690G1 AS SHOWN IN DETAIL B. J935 (TONE BD.) PLUGS INTO P935 AS SHOWN IN DETAIL B.
5. CONNECT WHITE JUMPER FROM TB10-1 TO TB10-5 ON REAR OF GETC.
6. REMOVE SN22-BR WIRE FROM H8-H9 ON 19D424051G1 SECUR-IT BOARD (SEE DETAIL-C).
7. CONNECT J11 TO P11-2 & 3, AND J12 TO P12-2 & 3.

CONNECTION CHART (3)	
O TO	TB10-10
R TO	TB10-9
O TO	TB10-8
BK TO	TB10-7

(2) MOD. PST STATION RECEIVER FOR VOTING (9600 BAUD MODEM)

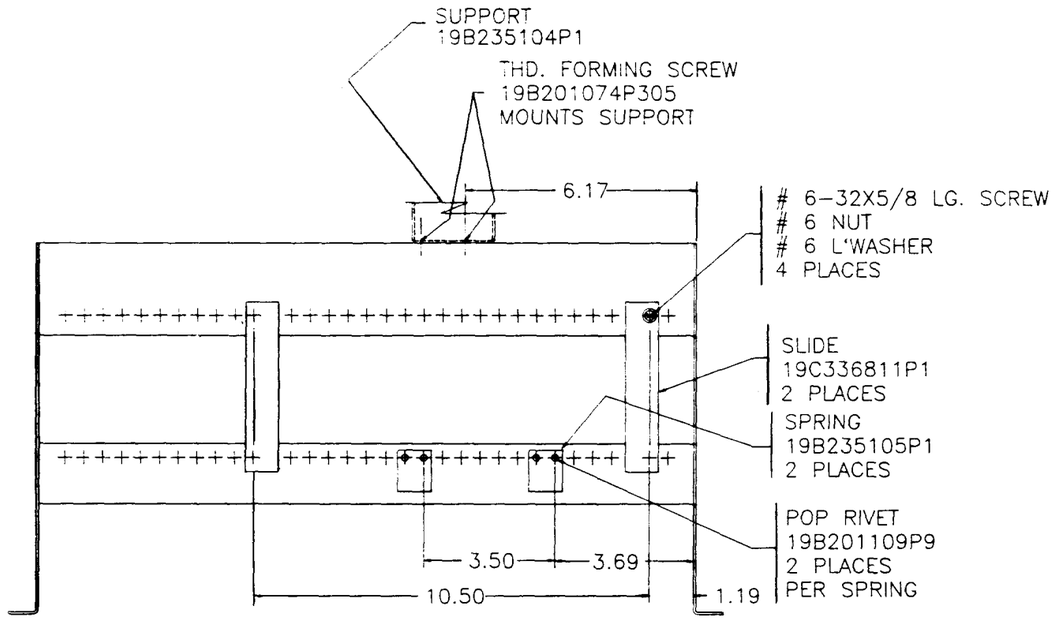
1. MOUNT TB10 AS SHOWN. INSTALL 2 SCREWS & L'WASHERS IN EACH TB10-7,8,9 & 10.
2. PERFORM STEPS 1 THRU 4 OF PART 1.
3. CLIP WIRE TIES AS NECESSARY IN 19C320811 HARNESS TO REMOVE R-O AND O-BK TWISTED PAIRS BACK FAR ENOUGH TO NEATLY DRESS TO TB10. RETIE 19C320811 HARNESS WITH TIES PROVIDED. CONNECT TWISTED PAIR PER CONNECTION CHART.
4. REMOVE SN22-BR WIRE FROM H8-H9 ON 19D424051G1 SECUR-IT BOARD (SEE DETAIL-C).



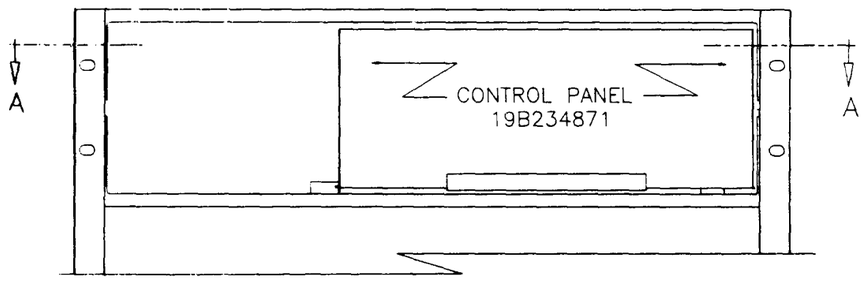
RX-EXC DOOR

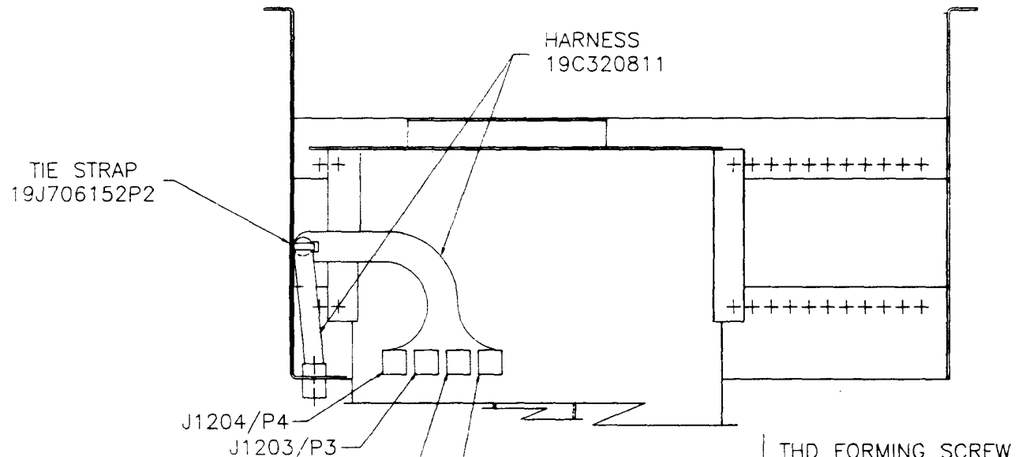
STATION RECEIVER MODIFICATIONS FOR VOTING

(19D438441, Sh. 1, Rev. 5)

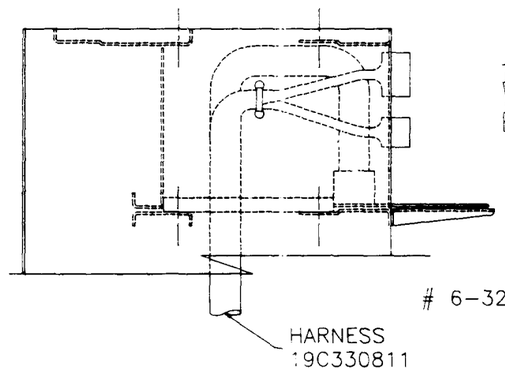


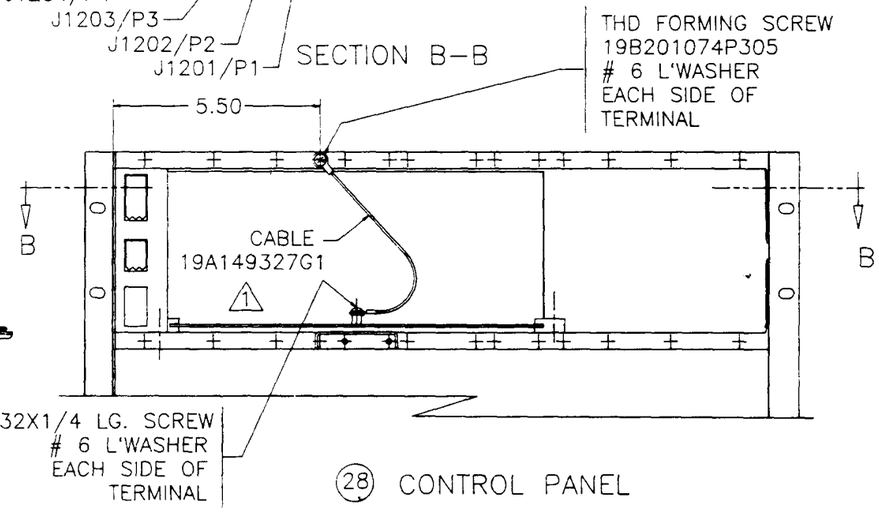
SECTION A-A
(WITH CONTROL PANEL REMOVED)





SECTION B-B



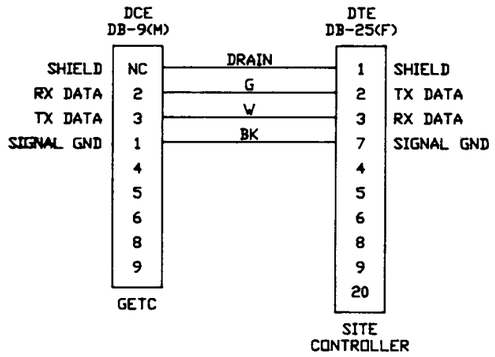


(28) CONTROL PANEL

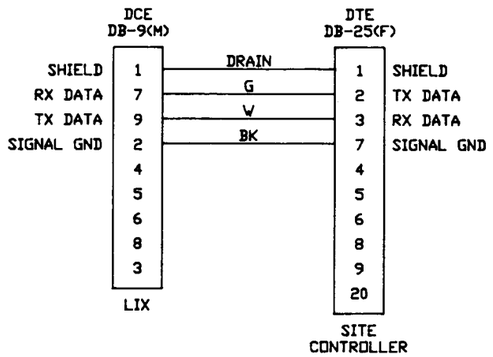
CONTROL SHELF

(19D417485, Sh. 2A, Rev. 5)

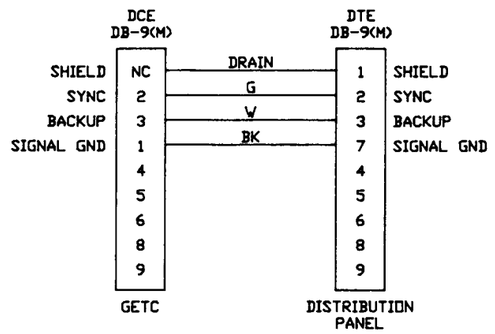
(1) STATION GETC TO SITE CONTROLLER
DOWNLINK GETC TO SITE CONTROLLER



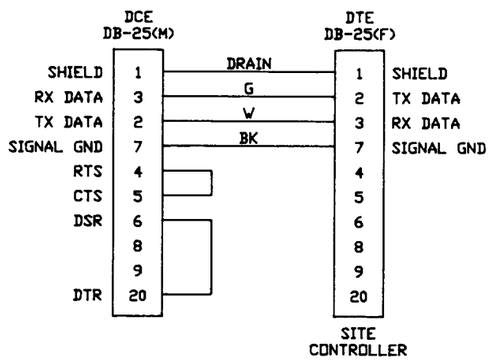
(2) LIX TO SITE CONTROLLER



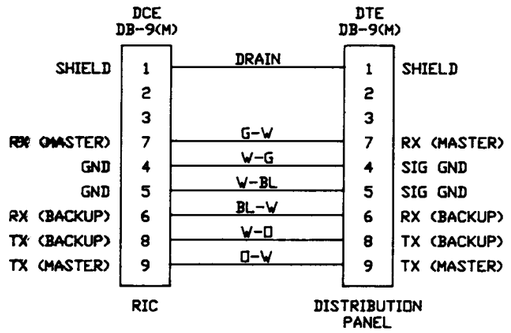
(3) STATION GETC TO DISTRIBUTION PANLE (FIALSOFT GETC)
DOWNLINK GETC TO DISTRIBUTION PANEL (FAILSOFT GETC)



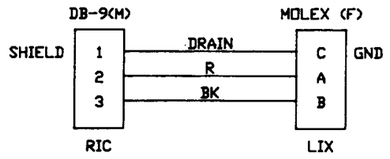
(4) DISTRIBUTION PANEL (RIC) TO SITE CONTROLLER
POWER MONITOR TO SITE CONTROLLER
TU TO SITE CONTROLLER
ACU TO SITE CONTROLLER



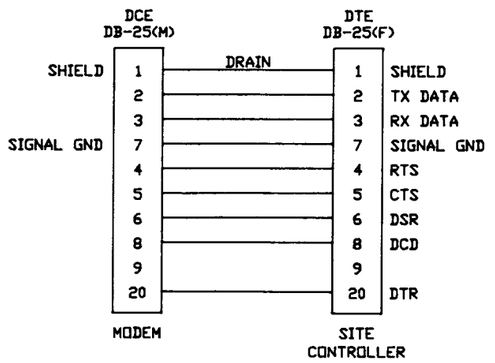
(6) RIC TO DISTRIBUTION PANEL (RIC)



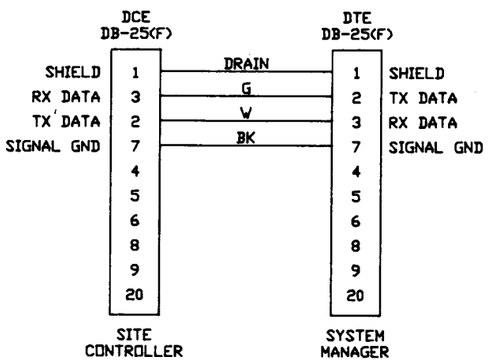
(7) RIC TO LIX



(8) MODEM TO SITE CONTROLLER



(9) SITE CONTROLLER TO SYSTEM MANAGER



INTERCONNECTING CABLE FOR PST REPEATER SITE

NOTES:

1. CONNECTOR ENDS ARE DEFINED AS DATA TERMINAL EQUIPMENT (DTE) AND DATA COMMUNICATION EQUIPMENT (DCE).

   DTE INCLUDES THE SITE CONTROLLER EMULEX PANEL AND THE FAILSOFT DISTRIBUTION PANEL INPUTS.

   DCE INCLUDES THE GETC, RIC, LIX, FAILSOFT DISTRIBUTION PANEL OUTPUT, POWER MONITOR, TEST UNIT, ACU AND MODEMS

2. CABLE MODEL NUMBERS ARE:
   BELDEN MODEL 9927 - 4 WIRE WITH SHIELD (PARTS 1,2,3,4 & 9)
   BELDEN MODEL 8133 - 6 WIRE WITH SHIELD (PART 6)
   BELDEN MODEL 8134 - 8 WIRE WITH SHIELD (PART 8)
   GE PART 7147255P1 - 2 WIRE WITH SHIELD (PART 7)

CABLING

(19C336882, Sh. 2, Rev. 5)