MOBILE RADIO

DESCRIPTION AND MAINTENANCE

MASTR® II HIGH POWER SOLID STATE STATION COMBINATIONS

TABLE OF CONTENTS

ILLUSTRATIONS

GENERAL ELECTRIC

COMBINATION NOMENCLATURE

DIGIT 1	DIGIT 2	DIGIT 3	DIGIT 4	DIGIT 5	DIGIT 6	DIGIT 7	DIGITS 8 & 9	DIGIT 10
Mechanical Package	Duty Cycle	Power Output	Channel Spacing	Control	Number of Freq.	Options	Frequency Range MHz	Oscillator Stability
V Floor Mount Cabinet	**C** Continuous Duty	**S** 128-256 W Solid State	**5** 25 kHz	**J** Local/ Tone Remote	**A** 1 Tx 1 Rx	**D*** Duplex	**56** 138 - 150.8 MHz	**A** +5 PPM
			6 30 kHz	**K** Local DC Remote	**B** 2 Tx 1 Rx	**G** CG & UHS	**66** 150.8 - 174 MHz	**B** +2 PPM
				N Local/ Repeat	**C** 2 Tx 2 Rx	**L**** CG & Duplex	**77** 406 - 420 MHz	**C** +5 PPM PLL Exciter
				R DC Remote	**D** 1 Tx 2 Rx	**N** Noise Blanker	**78** 420 - 450 MHz	**D** +2 PPM PLL Exciter
				T Tone Remote	**E** 3 Tx 3 Rx	**P** UHS	**88** 450 - 470 MHz	
				U DC Remote Repeat	**F** 4 Tx 4 Rx	**S** Standard	**89** 470 - 494 MHz	
				V Tone Remote/ Repeat	**R** 3 Tx 1 Rx	**U** Channel Guard	**91** 494 - 512 MHz	
				Y Repeat	**S** 4 Tx 1 Rx	**W** CG & NB		

* D & L Combinations are PTT with separate receiver antenna cables.

**L Station Combination have simultaneous Encode/Decode Channel Guard.

WARNING

No one should be permitted to handle any portion of the equipment that is supplied with high voltage; or to connect any external apparatus to the units while the units are supplied with power. KEEP AWAY FROM LIVE CIRCUITS.

Hi-level RF energy in the transmitter Power Amplifier assembly can cause RF burns. KEEP AWAY FROM THESE CIRCUITS WHEN THE TRANSMITTER IS ENERGIZED!

SPECIFICATIONS

EIA DIMENSIONS (H X W X D)	69" X 23" X 21"
WEIGHT	400 lbs.
INPUT VOLTAGE	117/220 VAC, 60 Hertz Only (50 Hertz Optional)
AC INPUT POWER	
Transmit	1020 Watts
Receive	185 Watts
Standby	160 Watts
RF OUTPUT POWER	
HIGH BAND	225 Watts
UHF BAND	200 Watts (406-420 MHz) 180 Watts (420-440 MHz) 160 Watts (440-450 MHz) 200 Watts (450-470 MHz) 180 Watts (470-512 MHz)
TEMPERATURE RANGE	-30°C to +60°C (-22°F to +140°F) A cabinet blower is provided for continuous duty operation above 40°C ambient.

FCC FILING NUMBERS

MODEL SERIES	DUTY CYCLE (EIA)	POWER OUTPUT (Internally Adjustable)	FREQUENCY	FCC FILING NUMBERS	
				Freq. Stab.	2 & 5 PPM Freq. Stab. with PLL Exciter
VC56	Continuous	128-256 W	138-174 MHz	KT-204-A (2 & 5 PPM)	KT-204-J
VC55	Continuous	128-256 W	506-512 MHz	KT-200-C (2 PPM)	

NOTE: FCC Type Acceptance not relevant to equipment operating in 406 to 506 MHz frequency range.

DESCRIPTION

The General Electric MASTR® II High Power Solid State Radio Combinations are designed for either DC or tone remote control, extended local control or repeater operation. A typical rack-up of the equipment in the high power station is shown in Figure 1 and 2. The station receiver is mounted in a shielded enclosure on the radio panel front door, along with a receiver system board which accommodates Channel Guard and other option boards. Jacks are provided on the system board for plug-in interface with the options and control functions. The transmitter exciter is located in a separate shielded compartment on the radio panel front door. See Figure 3.

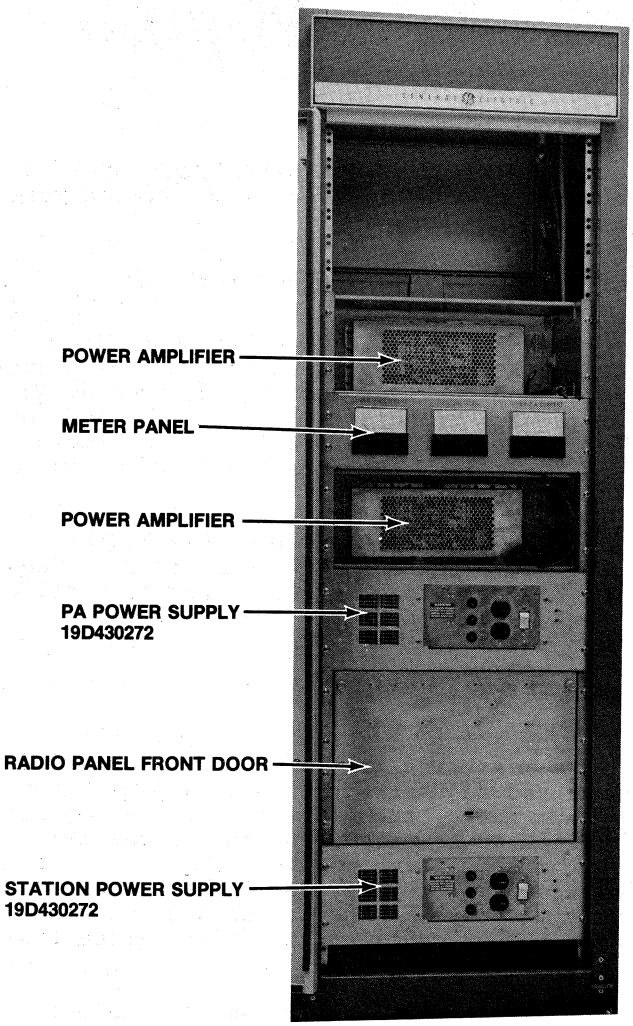


Figure 1 - Front View of Station With Door Removed

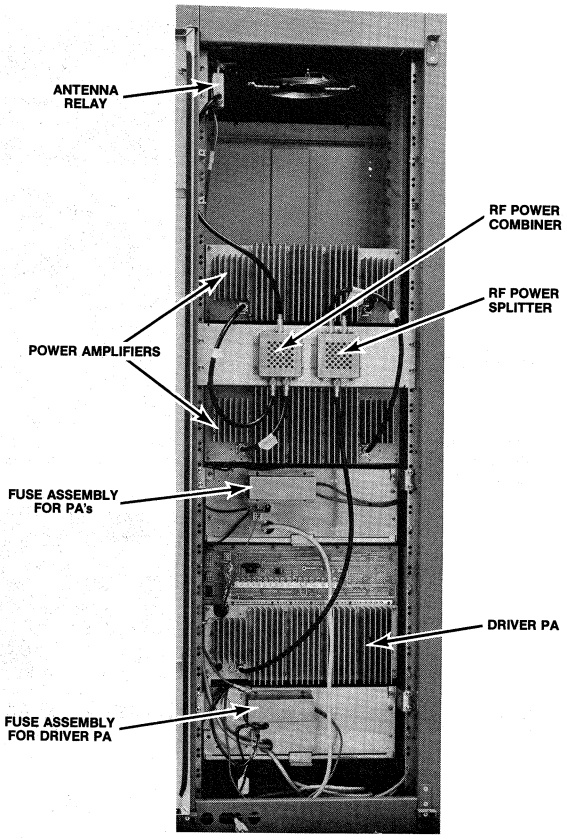


Figure 2 - Rear View of Station With Door Removed

The transmitter Driver power amplifier hinges from the bottom of the radio housing. The Driver PA assembly consists of a frame mounted to a heat sink. A cover snaps over the frame to form an RF-tight enclosure for the Driver PA board assembly.

Directly above the Driver PA assembly is the station control shelf. A mother board is mounted to this shelf which accommodates the 10 Volt Regulator/Control and DC or Tone Control Modules. The 10 Volt Regulator/Control Module supplies the regulated 10 Volts DC for station operation. The module contains the transmit/receive switching controls and a station microphone preamplifier. Front panel controls include the REM PTT and INTERCOM switches along with the TX LIGHT Light Emitting Diode (LED). External control connections are made to TB1201, located on the back of the mother board. See Figure 4.

The station power supply and the PA Power supply are plugged into an outlet strip which is connected to a 117 VAC power source. Both power supplies contain a power switch, primary and secondary fuses and two AC outlets located on the front panel. A high current fuse is located on the back panel. The station power supply provides input voltage for the station Receiver, Control, Exciter and PA Driver.

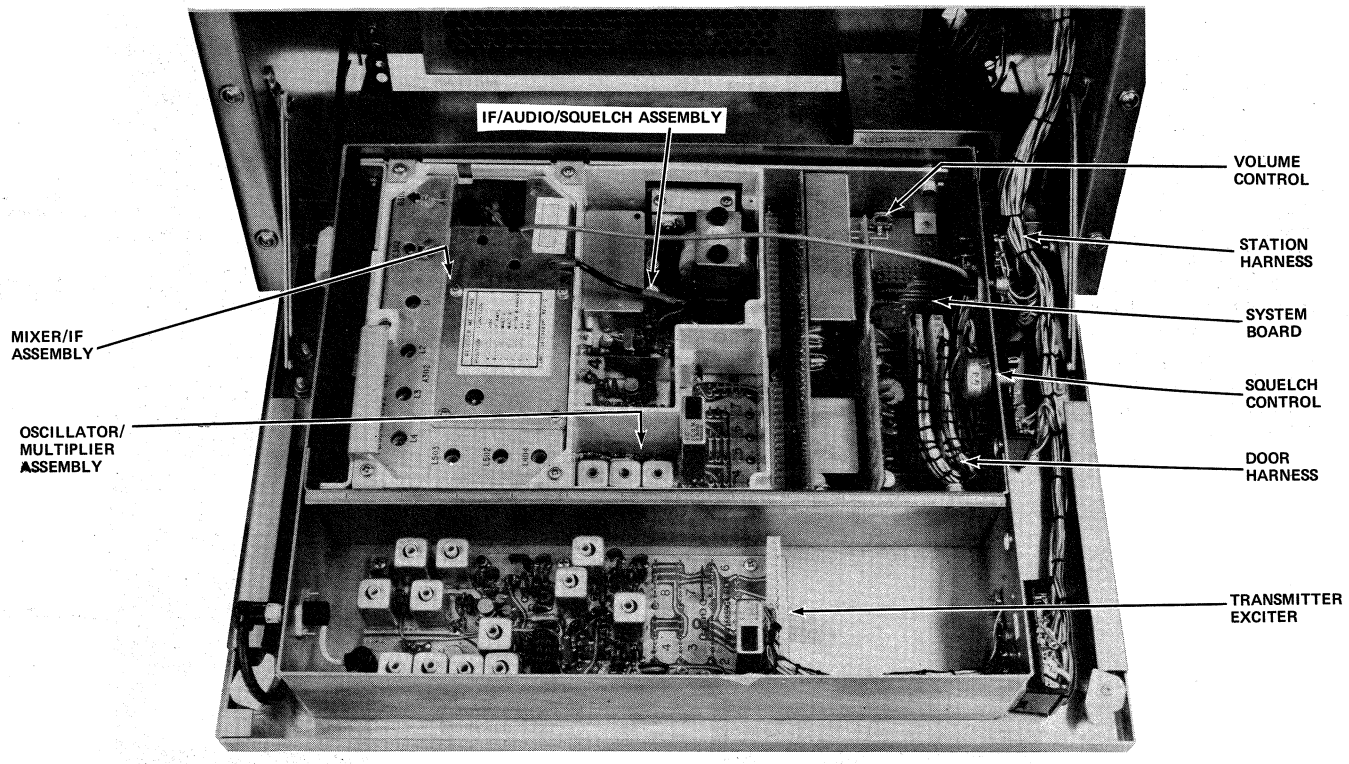


Figure 3 - Radio Panel Front Door

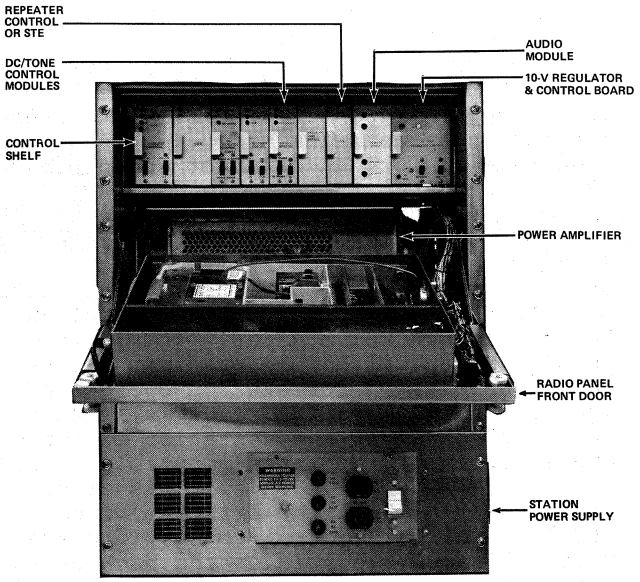


Figure 4 - Station Assemblies

The PA Power Supply mounted above the Radio Panel Front Door provides the supply voltage for the two RF Power Amplifiers mounted above the PA Power Supply.

A Meter Panel is mounted between the two Power Amplifiers. This meter panel contains a voltmeter and two current meters.

A RF Power COMBINER/SPLITTER Panel is mounted on a panel directly behind the meter panel.

INITIAL ADJUSTMENT

After the MASTR II Solid State High Power Station has been installed, the transmitter and receiver must be adjusted by an electronics technician who holds a First or Second Class FCC Radio telephone or Radiotelegraph license before the station can be placed in operation.

Make sure that a RADIO TRANSMITTER IDENTIFICATION Form (FCC FORM 452-C or General Electric Form NP270303) has been filled out and attached to the transmitter.

TRANSMITTER ADJUSTMENT

The adjustment for the transmitter includes measuring the forward and reflected power and adjusting the antenna length for optimum ratio, then setting the transmitter to rated power output (or to the specific power output which may be required by the FCC station authorization). Next, measuring the frequency and modulation and entering these measurements on the FCC-required station records.

For the complete transmitter adjustment, refer to the ALIGNMENT PROCEDURE in the MAINTENANCE MANUAL for the transmitter.

Local Control Modulation Adjustment

1. Set the MIC GAIN control R14 on the 10 Volt Regulator/Control Board to its fully clockwise position.

2. Apply a 1000 Hertz, 30 millivolt RMS signal across B1 and B2 of the 10 Volt Regulator/Control Board. Connect a 0.5 microfarad (or larger) DC blocking capacitor in series with the MIC HI lead (B1).

3. Set MOD ADJUST control R127 on the transmitter exciter for a 4.5 kHz deviation as indicated on a frequency modulation monitor.

4. While talking in a normal voice at the station microphone, adjust MIC GAIN Control R14 for a deviation of 3 kHz as measured on the deviation monitor.

Repeater Control Modulation Adjustment

1. Apply a 1000 microvolt on-frequency signal modulated with 1000 Hz tone at ±3 kHz deviation to the station receiver.

2. Adjust the TX MOD control R14 on the Repeater Audio Board to its maximum clockwise position.

3. Set the MOD ADJUST control R127 on the transmitter exciter for a 4.5 kHz deviation as indicated on a frequency modulation monitor.

4. Adjust TX MOD control R14 on the Repeater Audio Board for a 3.0 kHz deviation as indicated on the deviation monitor.

5. While talking in a normal voice at the station microphone, adjust MIC GAIN control R14 on the 10 Volt Regulator Board for a deviation of 4.5 kHz as measured on the deviation monitor.

RECEIVER ADJUSTMENT

The initial adjustment for the receiver includes tuning the input circuit to match the antenna. Refer to the FRONT END ALIGNMENT PROCEDURE in the MAINTENANCE MANUAL for the receiver.

To set the station VOLUME control (R3 on the System Board) use the following procedure:

1. Apply a 1000 microvolt on-frequency test signal modulated by 1,000 Hertz with ±3 kHz deviation to the receiver antenna jack J937.

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

3. Connect an AC VTVM across J905 terminals 1 & 2 and adjust R3 for a reading of 6.3 Volts RMS on the meter.

CAUTION

Adjustment of VOLUME control to settings higher than instructed in the INITIAL ADJUSTMENT will result in blowing the station service speaker fuse or damage to the Local Controller Speaker.

4. Set VOLUME switch S2 on the Service Speaker to the desired listening level.

To set the station SQUELCH control (R901 on the Receiver/Exciter door) use the following procedure:

1. Turn the SQUELCH control clockwise (to the right) as far as possible.

2. Turn the SQUELCH control counterclockwise (to the left) until the noise just disappears, then advance control another 20 degrees.

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 MASTR II DC Remote Control MAINTENANCE MANUAL or the Tone Remote Control MAINTENANCE MANUAL for these adjustments.

REPEATER CONTROL ADJUSTMENT

The repeater drop-out delay timing and 3-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.

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 the table of Maintenance Checks.

Test and Troubleshooting Procedures

The individual Maintenance Manual for the transmitter and receiver describe standard test procedures which the serviceman can use to compare the actual performance of the

MAINTENANCE CHECK	INTERVAL BETWEEN CHECKS	
	Every 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 each operating frequency for a zero discriminator reading. (See the Receiver Alignment Procedure MAINTENANCE Section.)		X
TRANSMISSION LINE - Check for positive indication of pressure on transmission line pressure gauge (if pressurized line is used).	X	
ANTENNA - Check antenna & mast for mechanical stability.	X	
MECHANICAL INSPECTION - Visually check cables, plugs, sockets, terminal boards & components for good electrical connections. Check for tightness of nuts, bolts & 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 & deviation as required by FCC.		X

transmitter or receiver against the specifications of the unit when shipped from the factory. In addition, specific troubleshooting procedures are available to assist the serviceman in troubleshooting the transmitter and receiver.

REMOVING IC's (and all other soldered-in components) can be easily accomplished by using a de-soldering tool such as a SOLDA-PULLT® or equivalent. To remove an IC, heat each lead separately on the solder side and remove the old solder with the de-soldering tool.

An alternate method is to use a special soldering tip that heats all of the pins simultaneously.

SYSTEM DESCRIPTION

Receiver

The station receiver consists of an oscillator/multiplier assembly (OSC/MULT), RF Assembly, Mixer/IF Assembly (MIF) and IF-Audio-Squelch Assembly (IFAS). In receivers with noise blankers, the noise blanker circuit replaces the standard MIF board. Refer to the Receiver MAINTENANCE MANUAL for a complete description of the station receiver.

Transmitter

The station transmitter consists of four separate assemblies, the exciter board assembly, the PA driver assembly, and the two High Power PA assemblies. The transmitter exciter is located in the Radio Panel Front Door. The driver PA assembly is located at the rear of the cabinet behind the Radio Panel Front Door. The High Power PA assemblies are located above the PA Power supply. Refer to the High Power PA and the PA Driver MAINTENANCE MANUALS for complete description of the station transmitters.

System Board A901

The station System Board is located on the Radio Panel Front Door and the receiver modules plug directly into the board. Along the edge of the System Board are two connectors which interconnect with the Remote Control Shelf and Power Supply. Plug-in Channel Guard and Carrier Control Timer option jacks are provided. A metering jack is provided for accommodating the General Electric Model 4EX3A11 Test Set. VOLUME Control R3 is located on the System Board. SQUELCH Control R901 is located on the Radio Panel Front Door.

A jumper is normally present between J933-4 and J933-8 in single-frequency transmit stations. A jumper is also present

between H47 and H48 on A901 in single-frequency receive stations. In multiple-frequency receive stations, selecting a particular receive frequency at the remote control unit applies a ground to the particular pin at J931 corresponding to the frequency selected. The ground is then connected via the System Board printed wiring to the receiver OSC/MULT to select the desired oscillator.

VOLUME/SQUELCH 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 & 19. The station VOLUME control (R3) is normally adjusted for 1 Watt output and the station speaker level is controlled by the service speaker VOLUME control.

DC Remote Control

In DC Remote Control systems, the control modules on the control shelf utilize DC currents selectively applied to a telephone pair at a remote control console. These DC currents activate circuits in the control modules to perform the desired functions. Refer to the MASTR II DC Remote Station Control Shelf MAINTENANCE MANUAL for a complete description of this system.

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, Channel Guard Board 19D417261G1 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.

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 circuit (Squelch Tail Eliminator) employs a phase shift of approximately 180° in the enocde function to eliminate undesirable noise bursts after each transmission.

The decoder operates in conjunction with the receiver to inhibit all calls that are not tone 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. In duplex combinations, a separate encoder is used in the exciter and a separate decoder is used in the receiver.

A Channel Guard Filter (19C320627G1) is used in the Remote Audio Board to attenuate frequencies below 203.5 Hertz to prevent the Channel Guard tone from being applied to the remote audio pair.

In duplex combination (7th Digit L) a separate Channel Guard Encoder board (19C321162G1) is located in the exciter compartment. This allows simultaneous Encode and Decode function.

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.

Meter Panel

The Meter Panel is mounted between the two output Power Amplifiers and contains three meters. This meter panel contains a voltmeter, that monitors the voltage of the two Power Amplifiers, and two current meters that monitor the current of each of the two Power Amplifiers.

RF Power Combiner/Splitter

The RF Power Splitter and the RF Power Combiner are mounted on a panel directly behind the Meter Panel. The RF Power Splitter equally divides the power output of the Driver Power Amplifier to provide the inputs for the two Power Amplifiers. The output of the two Power Amplifiers are fed into the RF Power Combiner which sums the two individual power inputs and provides the power output to the antenna.

CAUTION

Care should be taken that the cable lengths between the Combiner/Splitter panel and the final Power Amplifiers are maintained as supplied with the station. The cables along with the connectors are designed to provide a differential phase shift of 90° to the RF drive going to the Power Amplifiers and to remove the differential from the amplified outputs going to the power combiner. If the lengths are changed or the cables are altered in any way, excessively light power will be dissipated in resistor R2 located in the Power Combiner.

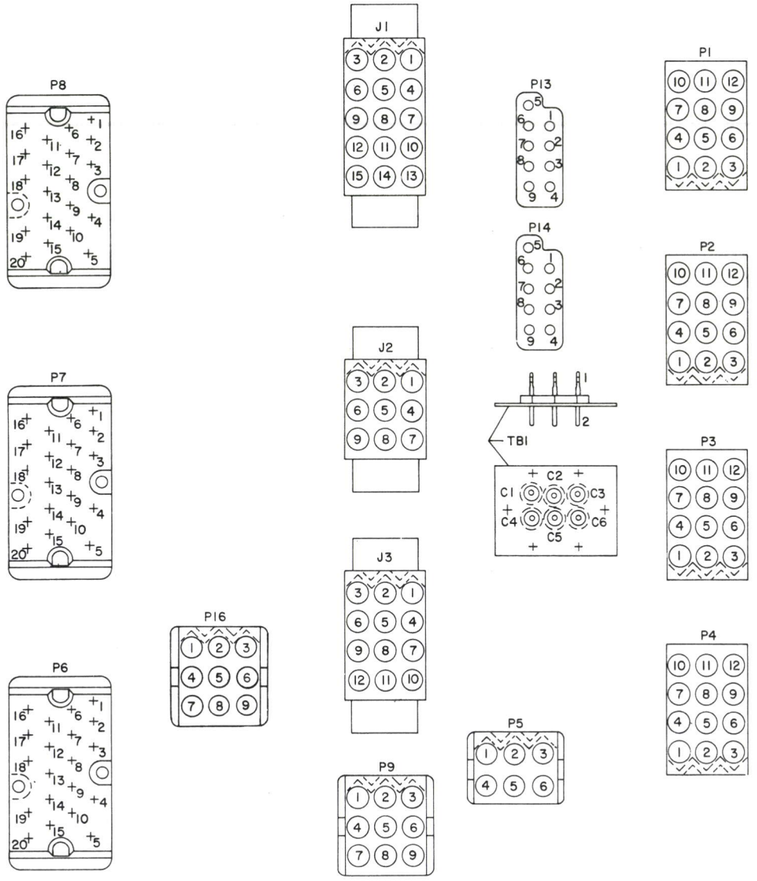
RF Circulator (Optional)

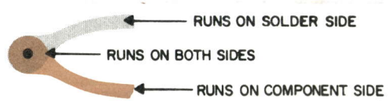
The RF CIRCULATOR is mounted on a panel attached to the rear rail at the top of the station. The circulator has three jacks, the input J1, the output J2 and the 50 ohm termination at J3. The circulator is inserted between the transmitter and the antenna and acts like an RF diode. It passes the transmitter power from its input J1 to the output J2 with very little loss but provides a very high attenuation to the passage of power in the opposite direction. Any RF power entering the output J2, such as reflected transmitter power from the antenna or RF power induced into the antenna by another close by transmitter, will be passed to the load at J3 and absorbed.

GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

GENERAL ELECTRIC*
U.S.A.

HARNESS 19C320811



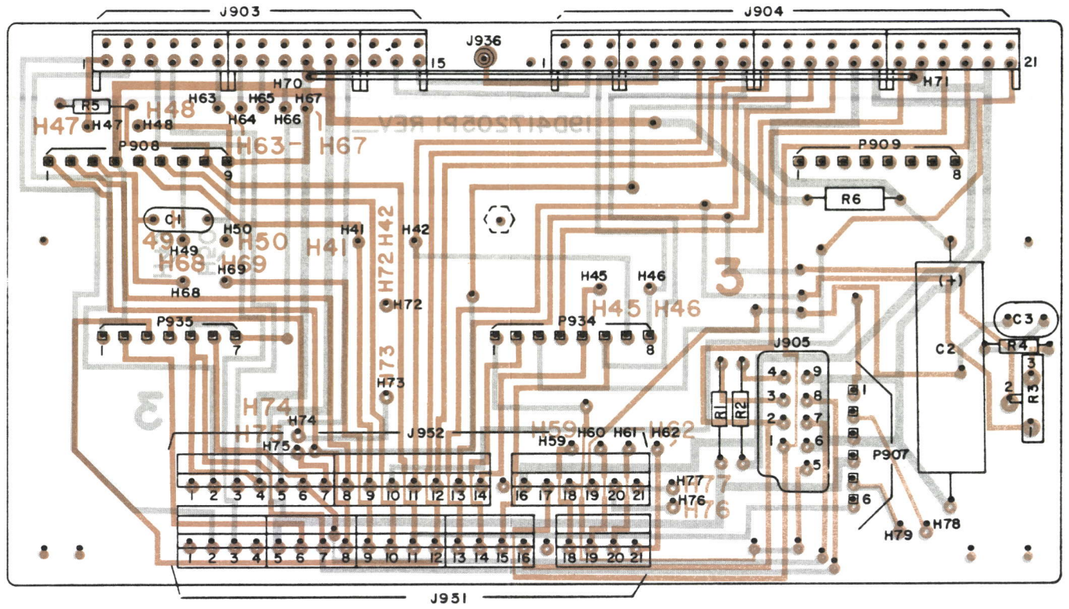


REFER TO WIRING DIAGRAM FOR THE FOLLOWING CONNECTIONS	
FROM	TO
H41	H42
H50	H77
H45	H46
H47	H48
H68	H69
H49	H76

NOTE:
1. CONNECTORS SHOWN FROM WIRING SIDE.

(19C328112, Rev. 1)

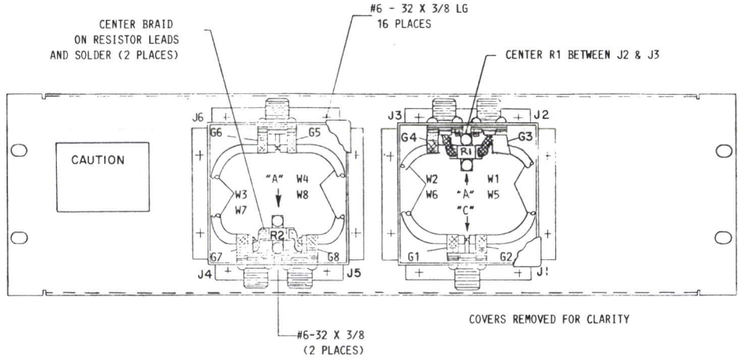
SYSTEM BOARD A901



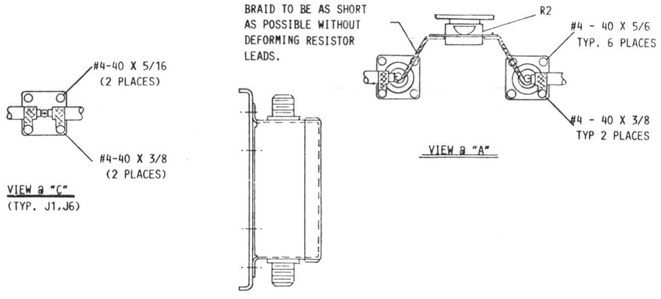
(19D417205, Sh. 2, Rev. 3)
(19D417205, Sh. 3, Rev. 3)

(19D423147, Rev. 2)

COMBINER/SPLITTER



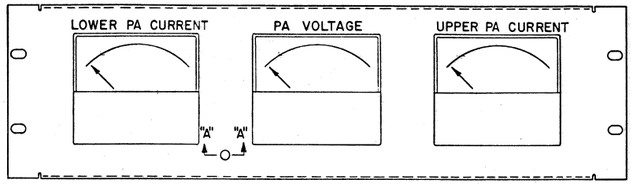
(19C331418, Rev. 1)

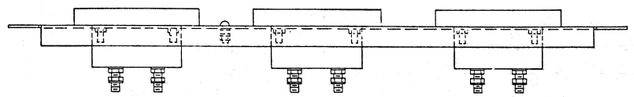


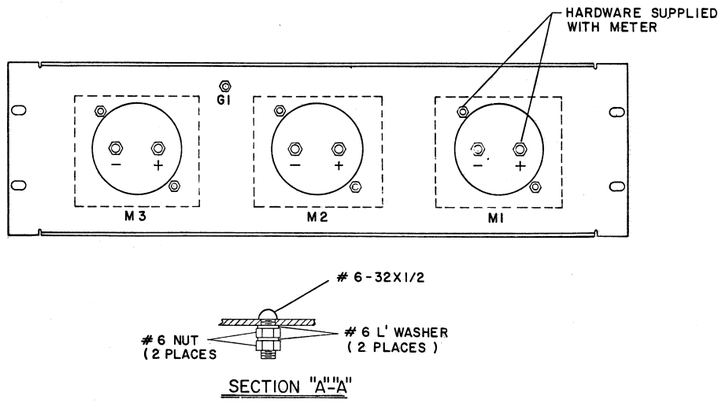
OUTLINE DIAGRAMS

HARNESS, SYSTEM BOARD AND COMBINER/SPLITTER

METER PANEL

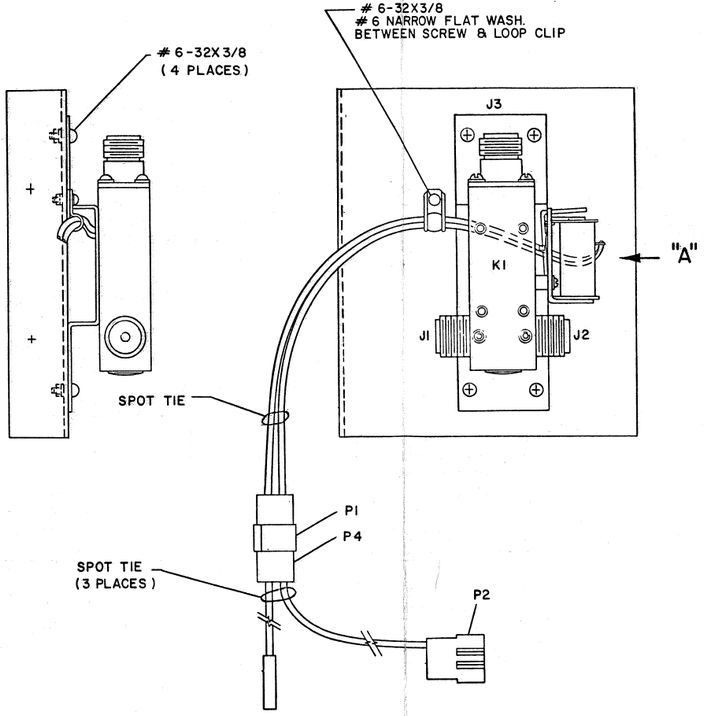




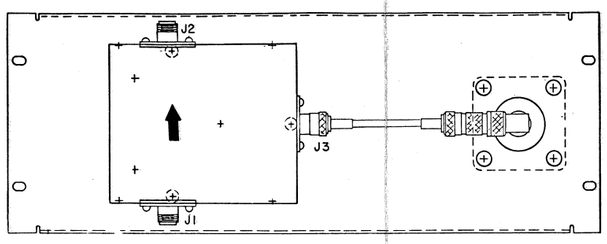


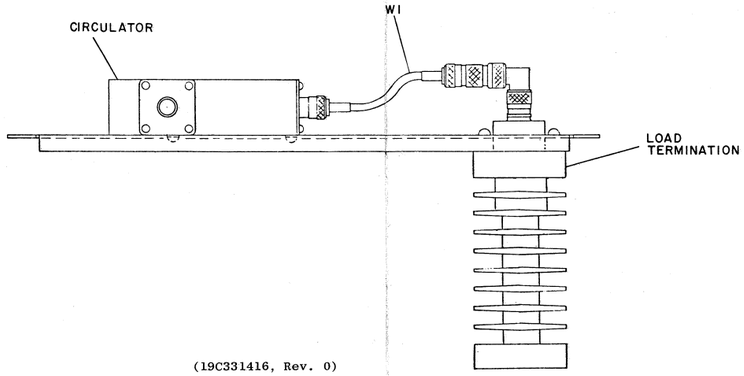
SECTION "A"-"A"

(19C331417, Rev. 0)



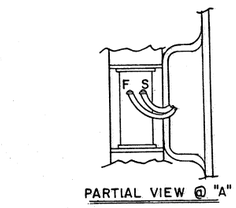
RF CIRCULATOR





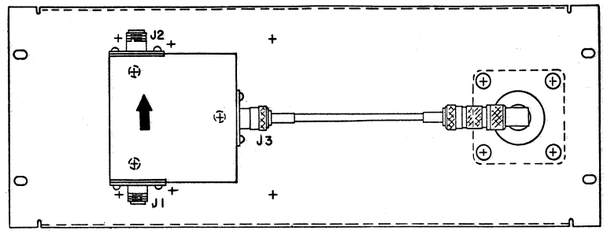
(19C331416, Rev. 0)

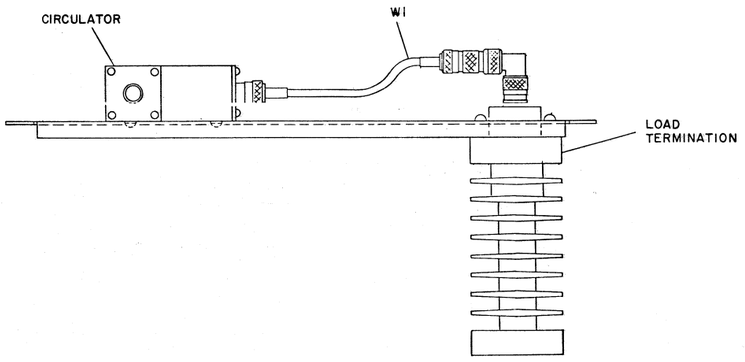
ANTENNA RELAY PANEL



(19C331419, Rev. 0)

RF CIRCULATOR

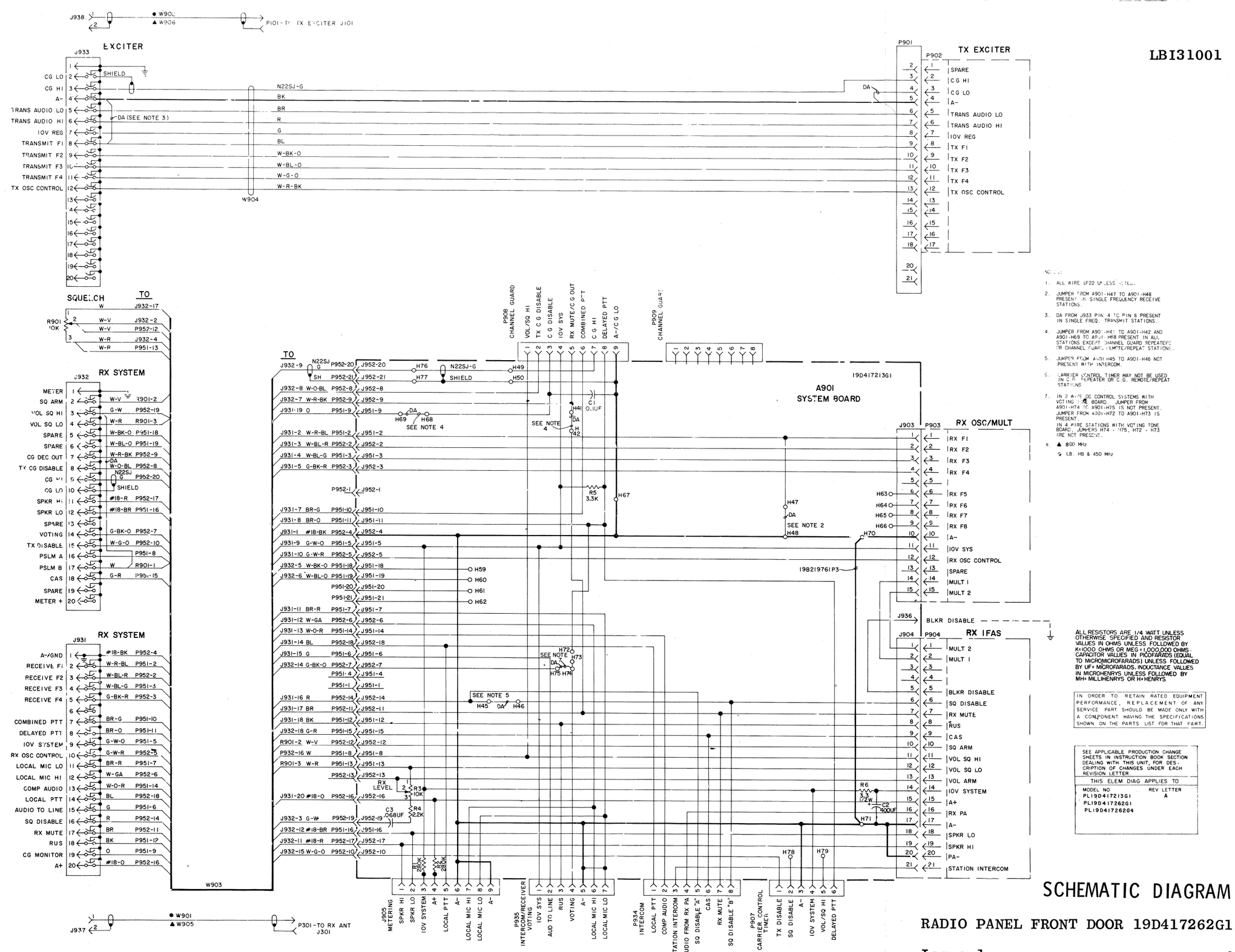




(19C331415, Rev. 0)

OUTLINE DIAGRAMS

METER PANEL, RF CIRCULATOR AND ANTENNA RELAY PANEL



NOTES:

1. ALL WIRE #22 UNLESS NOTED.
2. JUMPER FROM A901-H47 TO A901-H48 PRESENT IN SINGLE FREQUENCY RECEIVE STATIONS.
3. DA FROM J933 PIN 4 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.
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
   ● LB, HB & 450 MHz

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
PLI9D417213G1	A
PLI9D417262G1	
PLI9D417262G4	

SCHEMATIC DIAGRAM

RADIO PANEL FRONT DOOR 19D417262G1

Issue 1

(19E501154, Rev. 13)

PARTS LIST

LBI-4801B

MASTR II STATION RADIO PANEL
FRONT DOOR ASSEMBLY
19D417262G1

SYMBOL	GE PART NO.	DESCRIPTION
		DOOR ASSEMBLY 19D417262G1
A901		COMPONENT BOARD 19D417213G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	19A116080P7	Polyester: 0.1 uF ±20%, 50 VDCW.
C2	19A115680P24	Electrolytic: 400 uF +150% -10%, 18 VDCW; sim to Mallory Type TTX.
C3	19A116080P106	Polyester: 0.068 uF ±10%, 50 VDCW.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J903		Connnector. 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 2).
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	19B219374G2	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 - - - - - - - - - -
P901	19A116779P1	Contact, electrical: sim to Molex 08-50-0404. (Quantity 6).
P908	19A116779P1	Contact, electrical: sim to Molex 08-50-0404. (Quantity 9).
P909	19A116779P1	Contact, electrical: sim to Molex 08-50-0404. (Quantity 8).
P934	19A116779P1	Contact, electrical: sim to Molex 08-50-0404. (Quantity 8).
P935	19A116779P1	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 - - - - - - - - - -
W901	5491689P105	Cable, RF: approx 14 inches long, 350 VRMS, 500 VDC operating voltage. Includes J937, P301.
W902	5491689P104	Cable, RF: approx 4 inches long, 350 VRMS, 500 VDC operating voltage. Includes J938, P101.
W903		CABLE ASSEMBLY 19D417262G2
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J931 and J932	19C303426G1	Connector: 20 pin contacts.
		- - - - - - - - - - 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 08-50-0108.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R901	5496870P31	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.
	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 08-50-0108.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - - - -
	19C320679G1	Door.
	19B218178P1	Pawl. (Part of door latch).
	19C318151P1	Knob. (Part of door latch).
	N193P1208C6	Tap screw, phillips head: No. 6-20 x 1/2. (Part of door latch).
	5493361P8	Washer, spring tension. (Part of door latch).
	19A121676P1	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).

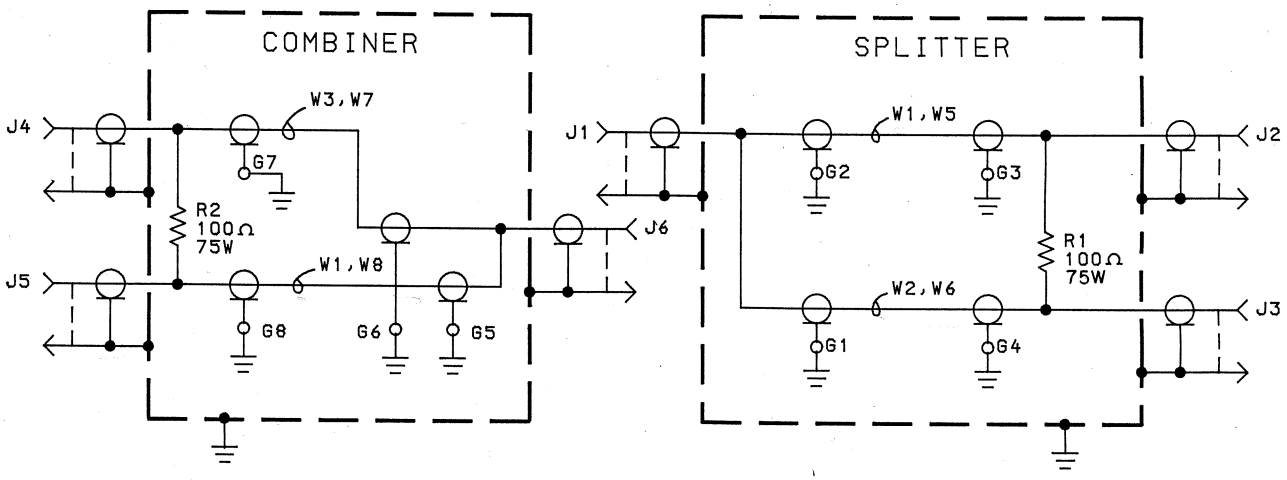
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

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 descriptions of parts affected by these revisions.

19D417213G1 Component Board

REV. A - To provide Carrier Control Alarm Tone capability.
Added H78 and H79.



MODEL NO.	REV. LETTER
PL19C33110961 PL19C33110962	

(19B233836, Rev. 2)

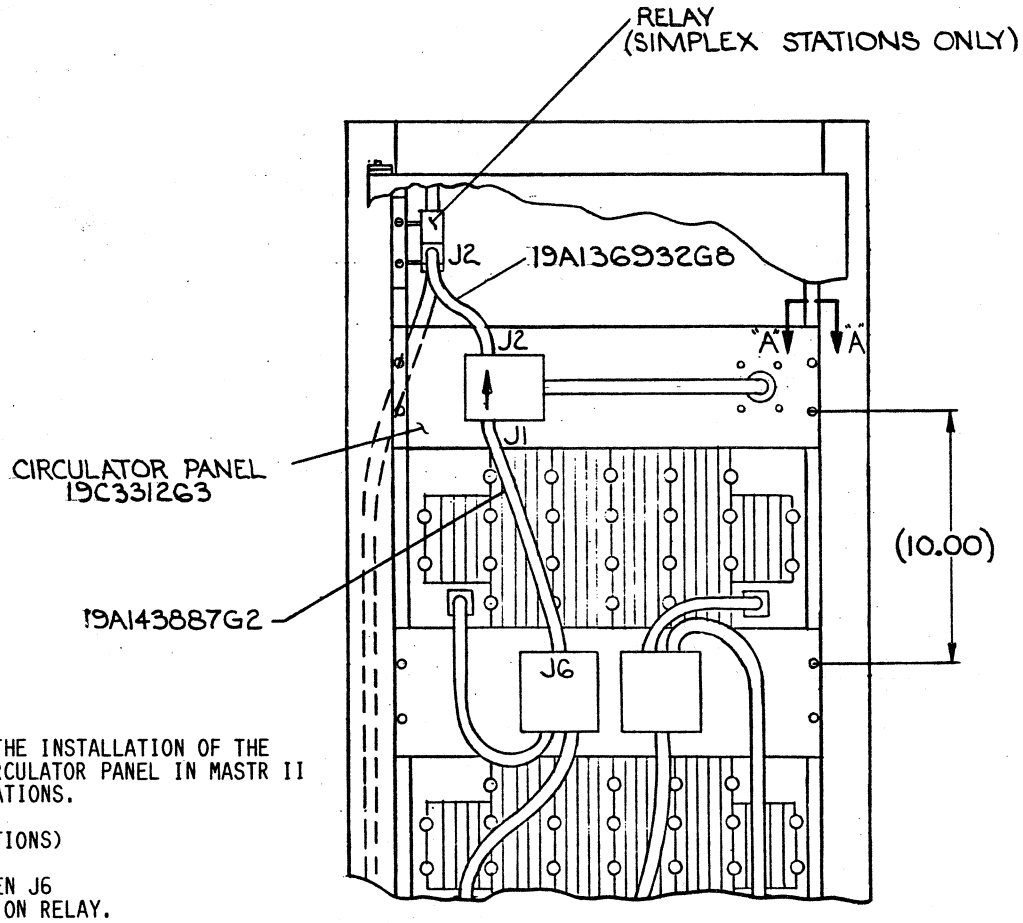
PARTS LIST

COMBINER/SPLITTER PANEL
19C331109G1 HIGH BAND
19C331109G2 UHF
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - JACKS AND RECEPTACLES - - - - - - - -
J1 thru J6	19A700067P1	Connector, receptacle, coax: sim to Amphenol 83-798.
		- - - - - - - - - - - RESISTORS - - - - - - - - - - -
R1 and R2	19A143832P1	Power termination: 100 ohms ±5%, 75 watt max; sim to KDI Pyrofilm.
		- - - - - - - - - - - CABLES - - - - - - - - - - -
W1 thru W4	19A143902G1	Cable: approx 14 inches long.
W5 thru W8	19A143902G2	Cable: approx 4-1/2 inches long.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19C331108G1	Cover.

SCHEMATIC DIAGRAM

COMBINER/SPLITTER



REAR VIEW OF STATION

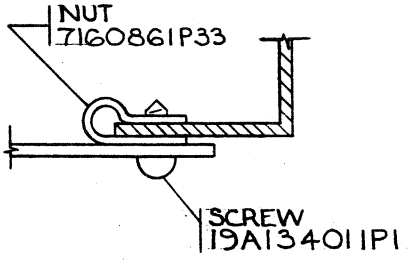
THESE INSTRUCTIONS COVER THE INSTALLATION OF THE 19C331263G1, G2, OR G3 CIRCULATOR PANEL IN MASTR II SOLID STATE HIGH POWER STATIONS.

INSTRUCTIONS (SIMPLEX STATIONS)

1. REMOVE RF CABLE BETWEEN J6 ON POWER ADDER AND J2 ON RELAY. DISCARD CABLE.
2. INSTALL CIRCULATOR PANEL ON REAR RAILS OF CABINET AS SHOWN. USE 4 SPRING NUTS & SCREWS PACKAGED WITH CIRCULATOR.
3. INSTALL RF CABLE 19A143887G2 BETWEEN J6 ON POWER ADDER AND J1 ON CIRCULATOR.
4. INSTALL RF CABLE 19A136932G8 BETWEEN J2 ON CIRCULATOR AND J2 ON RELAY.
5. MOVE RX/EXCITER DOOR AND CONTROL SHELF ASSY., UPPER POWER SUPPLY, FINAL POWER AMPLIFIERS, METER PANEL AND COMBINER PANEL DOWN THREE RACK UNITS (5.25") IN THE CABINET

INSTRUCTIONS (DUPLEX STATIONS)

1. INSTALL CIRCULATOR PANEL ON REAR RAILS OF CABINET AS SHOWN. USE 4 SPRING NUTS & SCREWS PACKAGED WITH CIRCULATOR.
2. INSTALL RF CABLE 19A143887G2 BETWEEN J6 ON POWER ADDER AND J1 ON CIRCULATOR
3. MOVE RX/EXCITER DOOR AND CONTROL SHELF ASSY., UPPER POWER SUPPLY, FINAL POWER AMPLIFIERS, METER PANEL AND COMBINER PANEL DOWN THREE RACK UNITS (5.25") IN THE CABINET

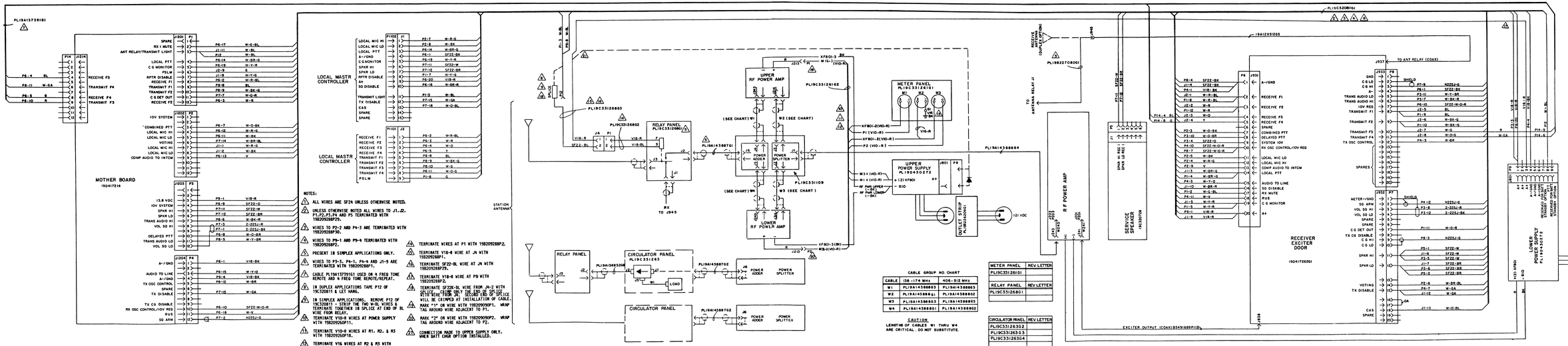


SECTION "A-A"
(TYP. 4 PLACES)

(19C331285, Rev. 1)

INSTALLATION DIAGRAM

CIRCULATOR PANEL (OPTIONAL)



(19B601697, Rev. 1)

INTERCONNECTION DIAGRAM

HIGH POWER SOLID STATE
WITHOUT CARD EDGE METERING
HIGH BAND AND UHF

PARTS LIST

METER PANEL
19C331261G1
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - METERS - - - - - - - - - -
M1	19A143720P2	Panel, DC: sim to GE 50-251300KNG, Scale: 0-20 DC amp.
M2	19A143720P1	Panel, DC: 1000 ohms/volt; sim to GE 50-251320KLAL, Scale: 0-50 DC volts.
M3	19A143720P2	Panel, DC: sim to GE 50-251300KNG, Scale: 0-20 DC amp.
		HARNESS ASSEMBLY 19C331261G2
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1		Connector. Includes:
	19A701868P1	Shell.
	19A701868P2	Contact, loose piece; sim to AMP 53680-4.
P2		Connector. Includes:
	19A701868P1	Shell.
	19A701868P2	Contact, loose piece; sim to AMP 53680-4.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	19B209260P18	Solderless terminal; sim to AMP 41125. (Quantity 4).
	19B209260P17	Solderless terminal; sim to AMP 42751-2. (Quantity 3).
	19B209260P11	Solderless terminal; sim to AMP 42864-2. (Quantity 2).
	19B209260P4	Solderless terminal; sim to AMP 41330. (Quantity 1).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

ANTENNA RELAY PANEL
19C331268G1
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - JACKS AND RECEPTACLES - - - - - -
J1 thru J3		(Part of K1).
J4		Connector. Includes:
	19B209288P12	Shell.
	19B209288P1	Contact, female: wire size 16-20 AWG. (Located on red wire).
	19B209288P29	Contact, female: wire size 22-30 AWG. (Located on blue wire).
		- - - - - - - - - - RELAYS - - - - - - - - - -
K1	7479680P6	Coaxial: 75 ohms ±10% coil res, 12 VDC nominal, 1 form C contact; sim to Amphenol 300-11941.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P1		Connector. Includes:
	19B209288P14	Shell.
	19B209288P2	Contact, male: wire size 14-20 AWG. (Quantity 2).
P2		Connector. Includes:
	19B209288P4	Shell.
	19B209288P2	Contact, male: wire size 14-20 AWG.
		- - - - - - - - - - MISCELLANEOUS - - - - - - - -
	19C331231P1	Relay support.
	19C331268G2	Harness. (Includes P1).
	19C331268G3	Harness. (Includes J4 & P2).
	4029851P13	Clip loop. (Secures 19C331268G2 & G3 harnesses).
	7142645P8	Splice, connector. (Located on wire from J4).

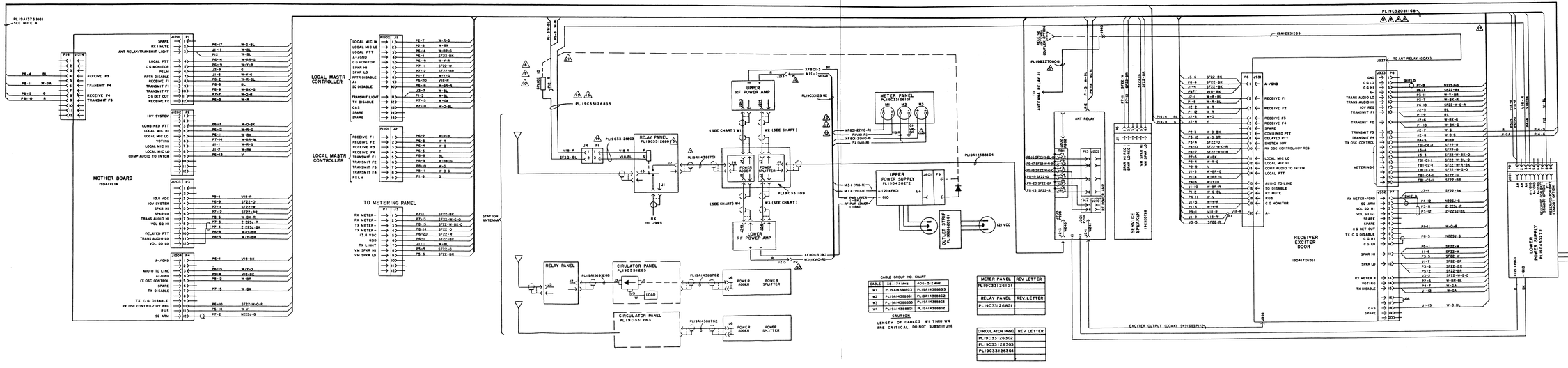
*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PARTS LIST

CIRCULATOR ASSEMBLY
19C331263G3 150.8-174 MHz
19C331263G2 406-450 MHz
19C331263G4 450-512 MHz
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - CABLES - - - - - - - - - -
W1	19A136932G7	Cable assembly. (Includes 2- 19A134434P1 connectors).
		- - - - - - - - - - MISCELLANEOUS - - - - - - -
	19B209608P6	Circulator. (150.8-174 MHz).
	19B209608P11	Circulator. (406-450 MHz).
	19B209608P12	Circulator. (450-512 MHz).
	7777145P4	Connector. (Located between terminal load and adapter).
	19A115828P1	Adapter. (Located between W1 and connector at terminal load).
	19B209608P3	Terminal load.
	19D432849P1	Panel.
	19A134011P1	Screw, thd. forming: 10-16 x 3/4. (Secures panel).
	7160861P33	Nut, sheet spring. (Secures panel).
	MS13P1OC6	Lockwasher, external tooth. (Used with J1-J3 on Circulator & secures terminal load).
	MS1P16010C6	Machine screw: 10-32 x 5/8. (Secures terminal load).
	MS1P16006C6	Machine screw: 10-32 x 3/8. (Used with J1-J3 on Circulator).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

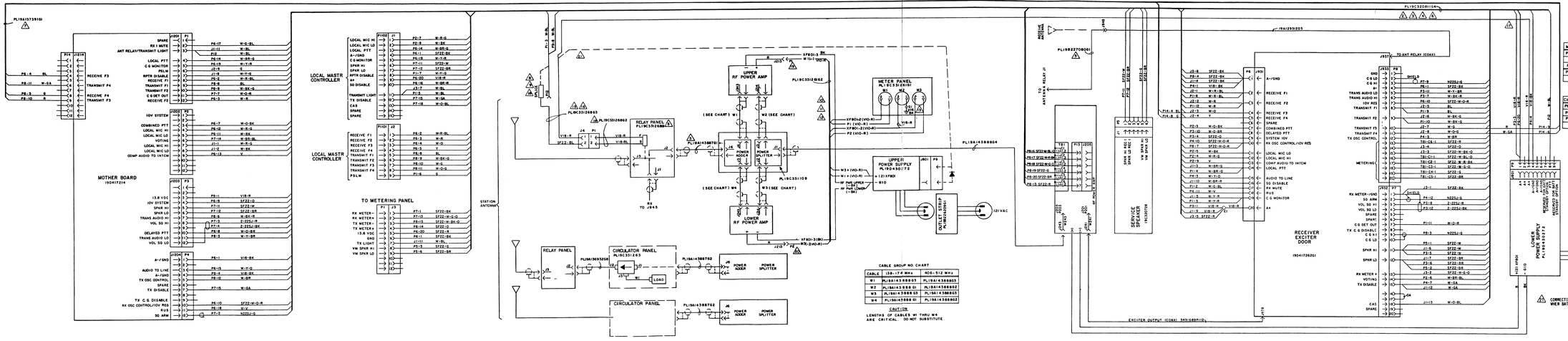


INTERCONNECTION DIAGRAM

HIGH POWER SOLID STATE
HIGH BAND WITH CARD EDGE METERING

Issue 2

(19B601705, Rev. 1)



CABLE GROUP NO. CHART

CABLE	138-174 MHz	406-512 MHz
W1	PL19A143888G5	PL19A143888G5
W2	PL19A143888 G1	PL19A143888G2
W3	PL19A143888 G5	PL19A143888G5
W4	PL19A143888 G1	PL19A143888G2

CAUTION
LENGTHS OF CABLES W1 THRU W4 ARE CRITICAL. DO NOT SUBSTITUTE

METER PANEL	REV LETTER
PL19C331266U1	

RELAY PANEL	REV LETTER
PL19C331 266G1	

CIRCULATOR PANEL	REV LETTER
PL19C331263G2	
PL19C331263G3	
PL19C331263G4	

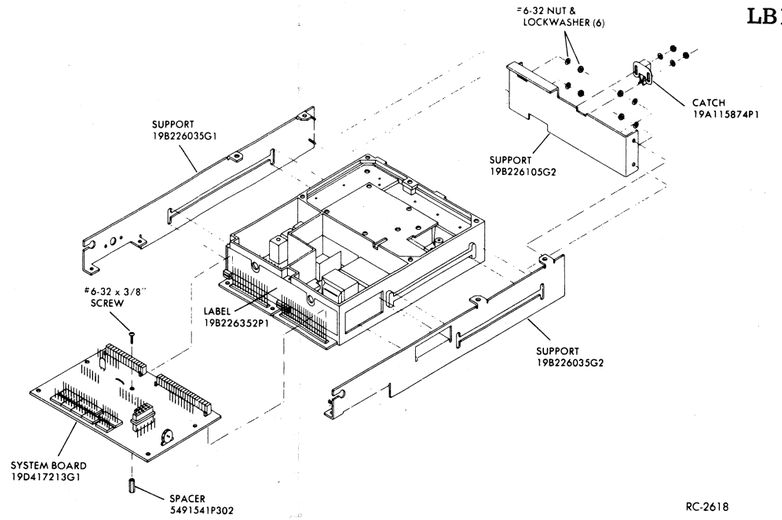
NOTES:

1. ALL WIRES ARE SF2N UNLESS OTHERWISE NOTED.
2. UNLESS OTHERWISE NOTED ALL WIRES TO J1-J2, P1-P2,P3,P4 AND P5 TERMINATED WITH 19B209288P30.
3. WIRES TO P3-2 AND P4-3 ARE TERMINATED WITH 19B209288P7.
4. WIRES TO P4-1 AND P5-4 TERMINATED WITH 19B209288P2.
5. PRESENT IN SIMPLEX APPLICATIONS ONLY.
6. WIRES TO P3-3, P4-1, P5-4 AND J1-9 ARE TERMINATED WITH 19B209288P3.
7. CABLE PL19A137591G1 USED ON 6 FREQ TONE REMOTE AND 8 FREQ TONE REMOTE/REPEAT.
8. IN DUPLEX APPLICATIONS TAPE P12 OF 19C320811 & LET HANG.
9. IN SIMPLEX APPLICATIONS, REMOVE P12 OF 19C320811 - STRIP THE TWO W-BL WIRES & TERMINATE TOGETHER IN SPLICE AT END OF BL WIRE FROM RELAY.
10. TERMINATE Y10-8 WIRES AT POWER SUPPLY WITH 19B209250P11.
11. TERMINATE Y10-8 WIRES AT R1, R2, & R3 WITH 19B209250P18.
12. TERMINATE Y16 WIRES AT R2 & R3 WITH 19B209250P17.
13. TERMINATE Y16-BK WIRE AT G1 WITH 19B209250P4.
14. TERMINATE WIRES AT P1 WITH 19B209288P2.
15. TERMINATE Y10-8 WIRE AT J4 WITH 19B209288P1.
16. TERMINATE SF22-BK WIRE AT J4 WITH 19B209288P3.
17. TERMINATE Y16-8 WIRE AT P9 WITH 19B209288P2.
18. TERMINATE SF22K-BL WIRE FROM J6-P2 WITH SPLICE. CRIMP ONLY THE END OF SPLICE WITH THE SF22K-BL WIRE. SECOND END OF SPLICE WILL BE CRIMPED AT INSTALLATION OF CABLE.
19. MARK "1" ON WIRE WITH 19B209509P1. WRAP TAG AROUND WIRE ADJACENT TO P1.
20. MARK "2" ON WIRE WITH 19B209509P2. WRAP TAG AROUND WIRE ADJACENT TO P2.
21. CONNECTION MADE TO UPPER SUPPLY ONLY, WHEN BATT CHGR OPTION INSTALLED.

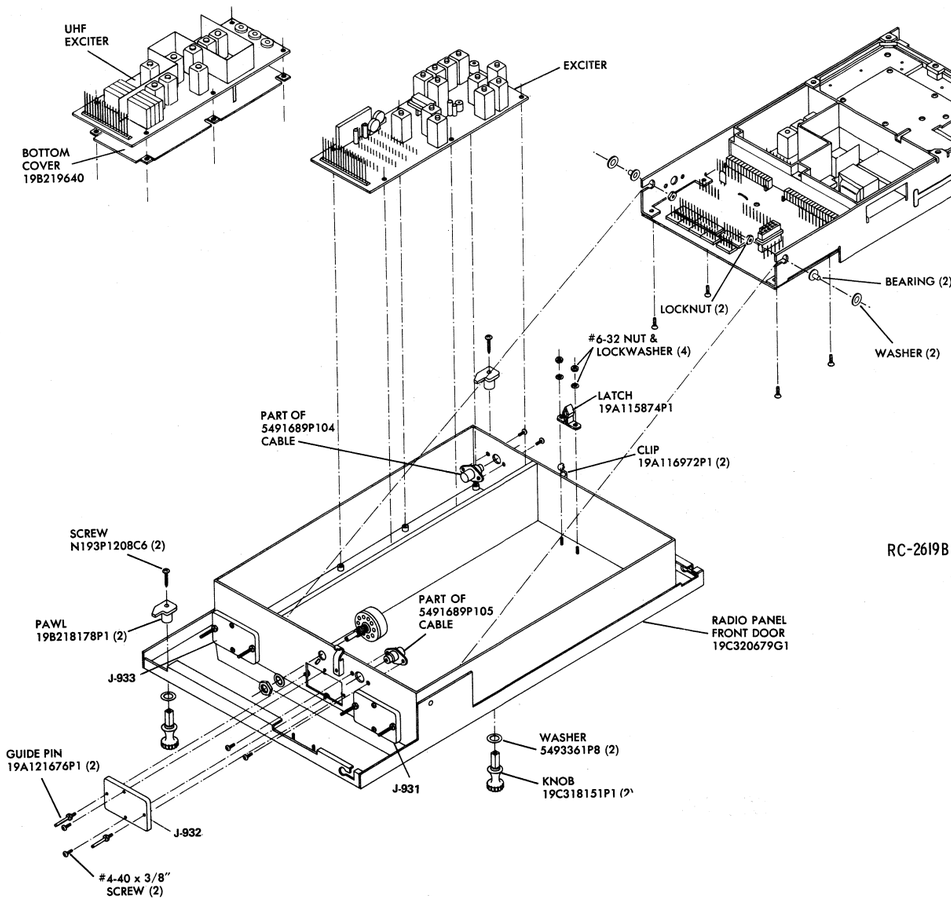
(19B401696, Rev. 1)

INTERCONNECTION DIAGRAM

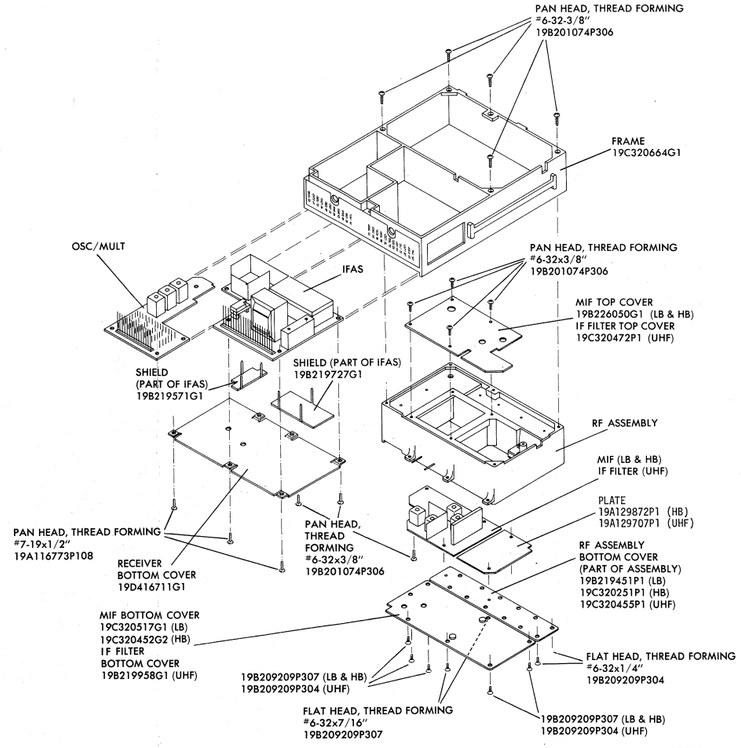
HIGH POWER SOLID STATE
UHF BAND WITH CARD EDGE METERING



RC-2618



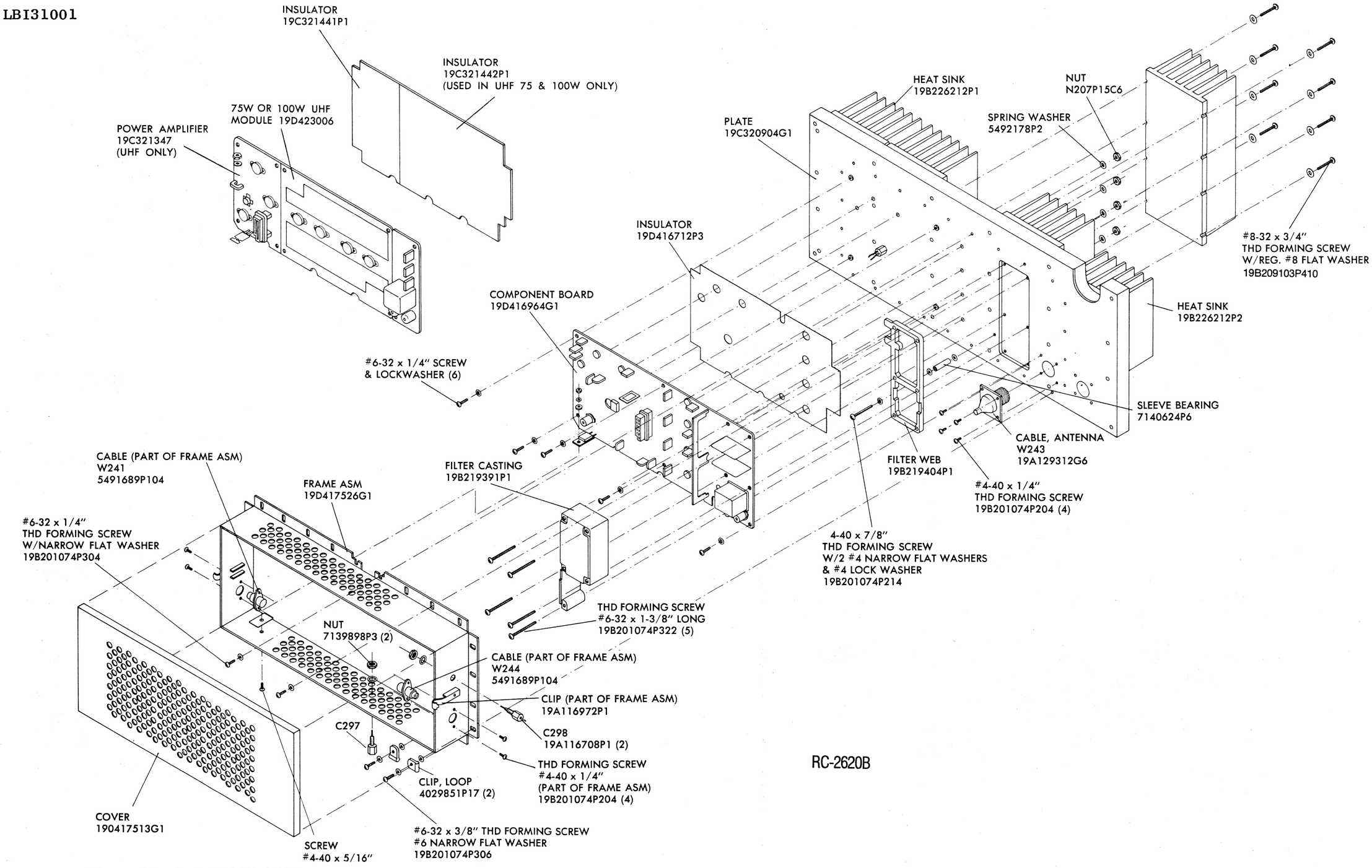
RC-2619B



RC-2762B

MECHANICAL PARTS BREAKDOWN

RADIO PANEL FRONT DOOR



RC-2620B

MECHANICAL PARTS BREAKDOWN

TRANSMITTER DRIVER AND POWER AMPLIFIERS

PARTS LIST

LBI4977C

FLOOR MOUNT STATION CABINET
CONTINUOUS AND INTERMITTANT DUTY
19D417358G1
(SEE RC2804)

SYMBOL	GE PART NO.	DESCRIPTION
1	19D417623G1	Grille.
2	19B226318P1	Grille plate. (Located under grille).
3	19B219744G2	Strain relief.
4	N80P15008C6	Machine screw: No. 8-32 x 1/2.
5	N210P15C6	Hex nut: No. 8-32.
6	N403P16C6	Lockwasher, external tooth: No. 8.
7	19A126220P1	Gasket, door.
8	19B209539P2	Lock, rear door: sim to Chicago Lock Co. 1703-6T.
9	19B209539P3	Key. Sim to Chicago Lock Co. 1000 GE.
10	19C320756G2	Door, rear. 64 inch.
11	19C320756G1	Door, front. 59 inch.
12	19A134011P1	Tap screw: No. 10-16 x 3/4. (Quantity 52).
13	7160861P33	Nut, sheet spring; sim to Tinnerman C19640-10AB-3B. (Quantity 16).
14	19B226160P2	Support.
15	N80P16008C6	Machine screw: No. 10-32 x 1/2.
16	N403P19C6	Lockwasher, external tooth: No. 10.
17	19B226094P2	Support.
18	N80P21012C6	Machine screw: No. 1/4-20 x 3/4.
19	N403P25C6	Lockwasher, external tooth: 1/4 inch.
20	N402P41C6	Flatwasher: No. 1/4.
21	N80AP16006C6	Machine screw, panhead: No. 8-32 x 3/8.
22	7160861P5	Nut, sheet spring; sim to Tinnerman C1505-1032-157.
23	19B226094P1	Support.
24	19A129902P1	Spring.
25	19B226088P1	Pin hinge.
26	19B226092G1	Frame.
27	19B209539P1	Lock, front. Sim to Chicago Lock Co. 4260-1.
28	N80P16007C6	Machine screw: No. 10-32 x 7/16.
29	N210P16C6	Hexnut: No. 10-32.
30	7160861P33	Nut, sheet spring; sim to Tinnerman C19640-10AB-3B.
31	NP257660	Nameplate. (GE).
32	4031053P7	Nut, sheet spring; sim to Tinnerman C12046-012-67.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES