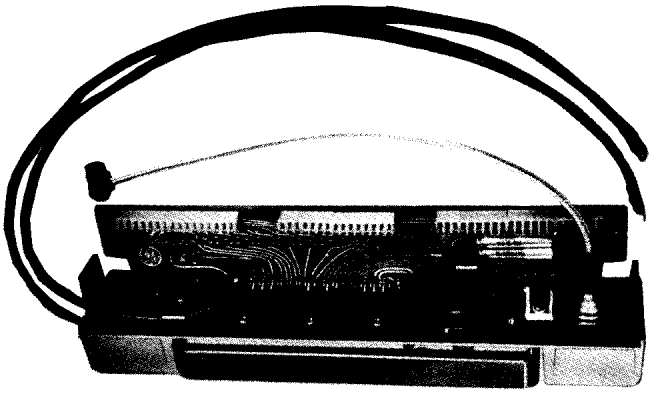
MOBILE RADIO

MASTR® II MAINTENANCE MANUAL

FRONT PANEL & SYSTEM BOARD



Maintenance Manual LBI4750F

DATAFILE FOLDER - DF4093

FRONT PANEL & SYSTEM BOARD 19D416653G1 & 19D417084G1, G2

SPECIFICATIONS *

For "M" Series Combinations	19D416653G1
For "E" Series Combinations	19D417084G1
For "E" Series Duplex Combinations	19D417084G2
Input Voltage	12 Volts DC
Output	Regulated 10 Volts DC At 0.1 to 0.5 amperes

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

GENERAL ELECTRIC

TABLE OF CONTENTS

WARNING

Although the highest DC voltage in the radio is supplied by the vehicle battery, high current may be drawn under short circuit conditions. These currents can possibly heat metal objects such as tools, rings, watchbands, etc. enough to cause burns. Be careful when working near energized circuits!

High-level RF energy in the transmitter Power Amplifier assembly can cause RF burns. KEEP AWAY FROM THESE CIRCUITS when the transmitter is energized!

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

GENERAL ELECTRIC*
U.S.A.

DESCRIPTION

The System Board mounts to the front casting of the radio, and terminates the power/control cable through jack J901 on the front panel. The System Board provides all power and control functions through printed wiring runs and jacks J902, J903 and J904 to the modules making up the transmitter and receiver functions.

The jack provides 30 control pins that are soldered directly to the System Board, two power pins, and holes for eight optional pins. For 38-pin connectors refer to the modification Instructions listed in the Table of Contents.

Power cables from the two power pins run directly from J901 through the left side rail to the bottom of the transmitter PA assembly.

Transmitter exciter and receiver modules plug in from the bottom to jacks on the rear of the System Board.

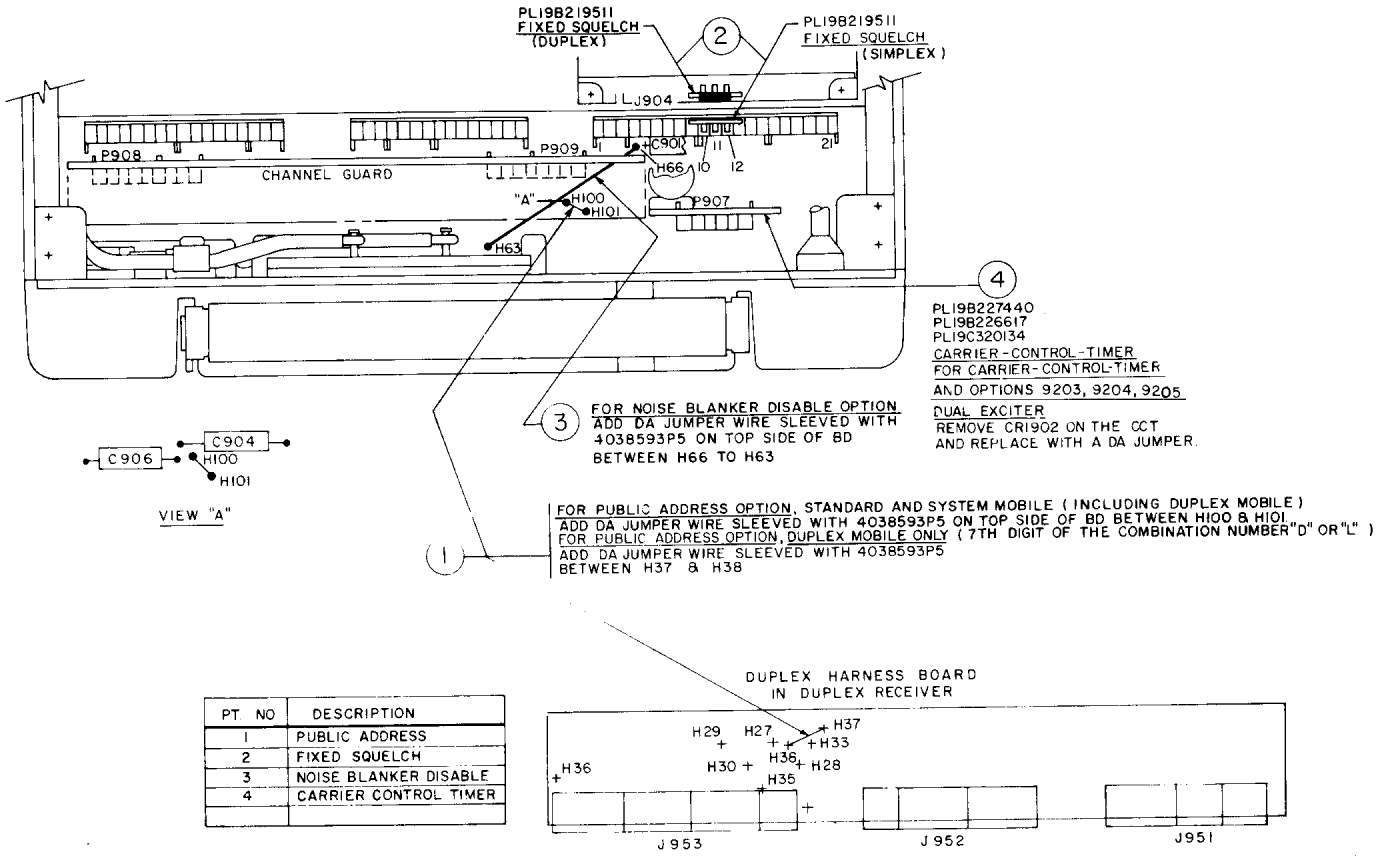
A hybrid integrated circuit 10-Volt regulator and control module, a centralized metering jack, and pins for plugging in Channel Guard, Carrier Control Timer and Fixed Squelch Options are also mounted on the System Board (see Figure 1). Also jumper connections are required for Noise Blankers and the Public Address option.

NOTE

In Channel Guard applications, a jumper between H71 and H72 on the System Board is removed.

Centralized metering jack J905 is provided for use with General Electric Test Set 4EX3A11 or Test Kit 4EX8K12. The red metering plug provides continuous access to the regulated 10 Volts, A+, transmitter and receiver audio, and PTT.

The black metering plug on the Test Set is used for metering the transmitter.



PT NO	DESCRIPTION
1	PUBLIC ADDRESS
2	FIXED SQUELCH
3	NOISE BLANKER DISABLE
4	CARRIER CONTROL TIMER

(19C320634, Rev. 10)

Figure 1 - System Board Options and Modifications

CIRCUIT ANALYSIS

10-VOLT REGULATOR IC

The 10-Volt Regulator IC contains the following circuits:

- 10-Volt Regulator Reference Amplifiers
- Compensation Voltage Divider
- Receiver Muting and Delay
- Transmitter Keying and Delay
- Receiver Oscillator Control
- Transmitter Disable

A typical regulator IC is shown in Figure 2.

10-Volt Regulator

The 10-Volt regulator includes regulator amplifiers Q1 and Q2 (in the IC), and regulator pass transistor Q901. Q901 is mounted on the side of the front casting which acts as a heatsink for the transistor. The regulator circuit provides a closely-controlled supply voltage for the transmitter exciter and receiver (except for the audio PA), and for Channel Guard and Carrier Control Timer options when present. Input voltage (A+) is supplied from the Control Unit on J901-29.

Turning on the radio applies voltage (A+) through input filter L901, C901 and C902 to pin 1 of the regulator and to the base of Q1, causing it to conduct. This turns on PNP regulator pass transistor Q901 and an output voltage appears at the collector. When the output voltage (at pin 3) reaches 10 Volts, zener diode VR1 breaks down, and Q2 starts conducting.

If the output voltage starts to increase, the base current of Q2 also increases, causing it to conduct harder. This causes Q1 to conduct less, decreasing the forward bias on Q901. The voltage drop across Q901 increases and the output remains constant.

When the input voltage starts to drop, the output voltage also tends to drop, causing Q2 to conduct less. This allows Q1 to conduct harder, increasing the forward bias on Q901 and causing it to conduct harder. This reduces the voltage drop across Q901 to keep the output constant.

Service Note: The 10-Volt regulator is protected against short circuits. When supply voltage is present but there is no 10-Volt output, the trouble is probably not in the 10-Volt regulator. Always check for a short (or high drain) on the 10-Volt line

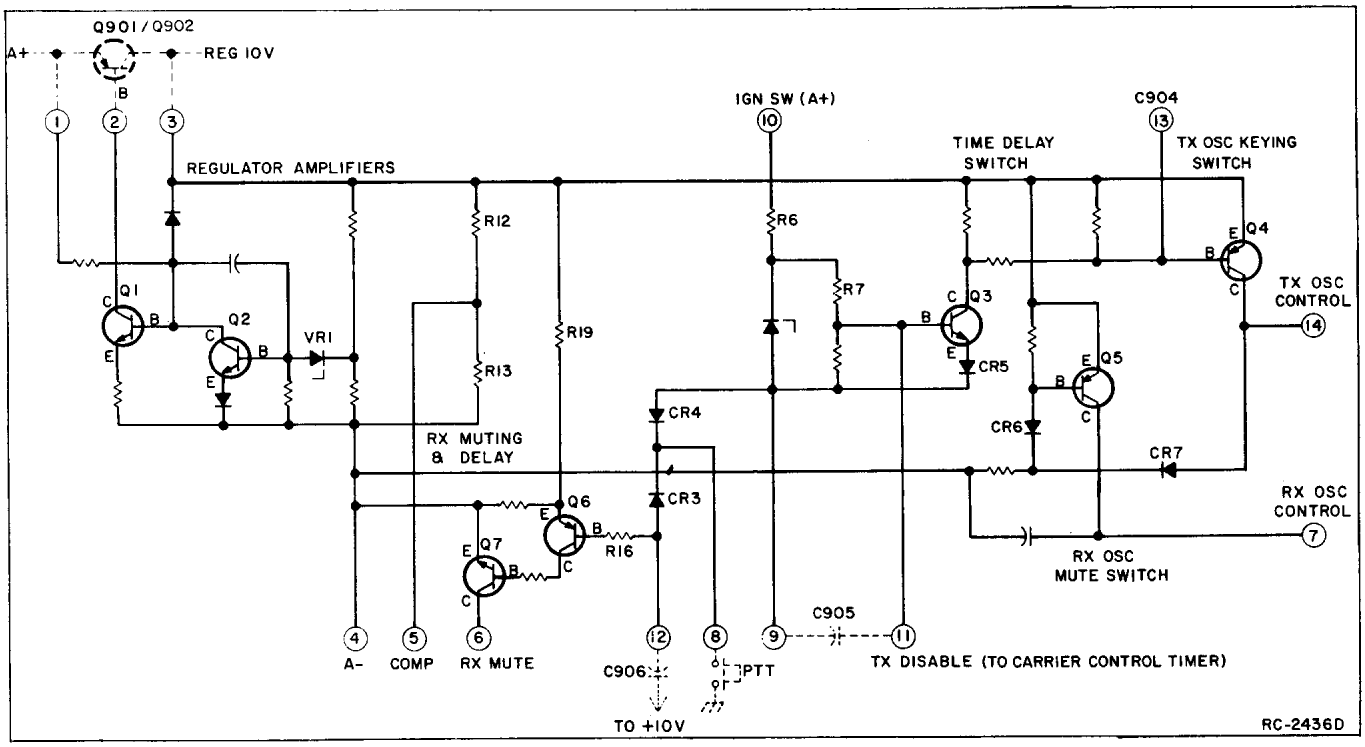


Figure 2 - Typical Regulator IC

before replacing the regulator (see Trouble-shooting Procedure.)

Compensation Voltage Divider

When the regulator is turned on, the 10-Volt output is applied to a voltage divider network consisting of R12 and R13. This high impedance source provides a stable 5-Volt compensation input (at pin 5) to the transmitter and receiver ICOMs. This source must not be used for any other purpose.

Receiver Muting & Delay

Pressing the PTT switch grounds the base of Q6 in the receiver muting and delay circuit, turning it on. Turning on Q6 turns on Q7, causing its collector to drop to A-. The A- at pin 6 is applied to the receiver squelch and audio ICs, muting the receiver.

With the PTT switch pressed, C906 starts to charge from the +10-Volt line. When the PTT switch is released, C906 keeps Q6 and Q7 on for approximately 50 milli-seconds as the capacitor discharges through R19, the emitter-base junction of Q6, and R16. This delays the turn-on of the receiver audio for 50 milliseconds.

NOTE

In duplex applications cut the jumper or printed wire run between H95 and H96 on the bottom of system board. This prevents receiver muting when the transmitter is keyed.

Transmitter Keying & Delay

Pressing the PTT switch on the microphone connects pin 8 of the regulator IC to A-. Capacitor C905 starts to charge through R6 and R7. In 15 milliseconds, C905 is charged to a voltage high enough to allow time delay switch Q3 to turn on. This causes transmitter oscillator control switch Q4 to turn on. Turning on Q4 applies voltage to the transmitter ICOM(s), keying the transmitter. Keying the transmitter ICOM is the only keying control function in the transmitter. The collector voltage of Q4 also reverse biases CR6, turning off Q5 and removing the supply voltage to the receiver ICOM(s).

The 15 millisecond time delay in the transmitter oscillator keying circuit allows the antenna switch to energize before RF is applied to the antenna switch. When the PTT is released, diode CR901 delays the antenna switch from de-energizing until the RF is removed from the contacts.

Receiver Oscillator Control

When the radio is in the receive mode (transmitter unkeyed), transmitter oscillator control switch Q4 is off and receiver oscillator control switch Q5 is conducting. The voltage at the collector of Q5 is applied to the receiver ICOM(s).

Transmitter Disable

In radios equipped with a Carrier Control Timer, pin 11 connects to P907-1 (TX DISABLE) on the Carrier Control Timer plug. When the timing cycle on the Carrier Control Timer runs out, A- is applied to pin 11, turning off the transmitter oscillator control voltage which turns off the transmitter.

REPEATING ICOMS

A matrix on the bottom of the System Board can be modified to permit both the transmitter and receiver to repeat the use of the same frequency without the use of additional ICOMs. This can be done by simply cutting frequency selection runs on the System Board, adding isolation diodes across the cut runs, and then connecting the repeated channels together with a jumper. With this modification, the frequency selector switch will have the same transmitter or receiver frequency on one or more switch positions as desired, using only one ICOM for each of the repeated channels. A simplified example of the System Board modified for repeating ICOMs is shown in Figure 3. For more detailed information and for instructions for modifying Dual Front Ends, refer to the Modification Instructions for Repeating ICOMs (see Table of Contents).

For example, to repeat transmitter channels F1, F3, F5 and F7:

1. Cut the runs between H2 and H3, H16 and H17, H30 and H31, and H44 and H45.
2. Connect a diode (cathode end towards the frequency select lead) across each of the cut runs.
3. Connect a #26 AWG sleeved jumper from H4 to H18, H18 to H32 & H32 to H46.

To repeat receiver channels F3, F6 and F8:

1. Cut the runs between H19 and H20, H40 and H41, and H54 and H55.
2. Connect a diode (cathode end towards the frequency select lead) across each of the cut runs.
3. Connect a #26 AWG sleeved lead from H21 to H42, and from H42 to H56.

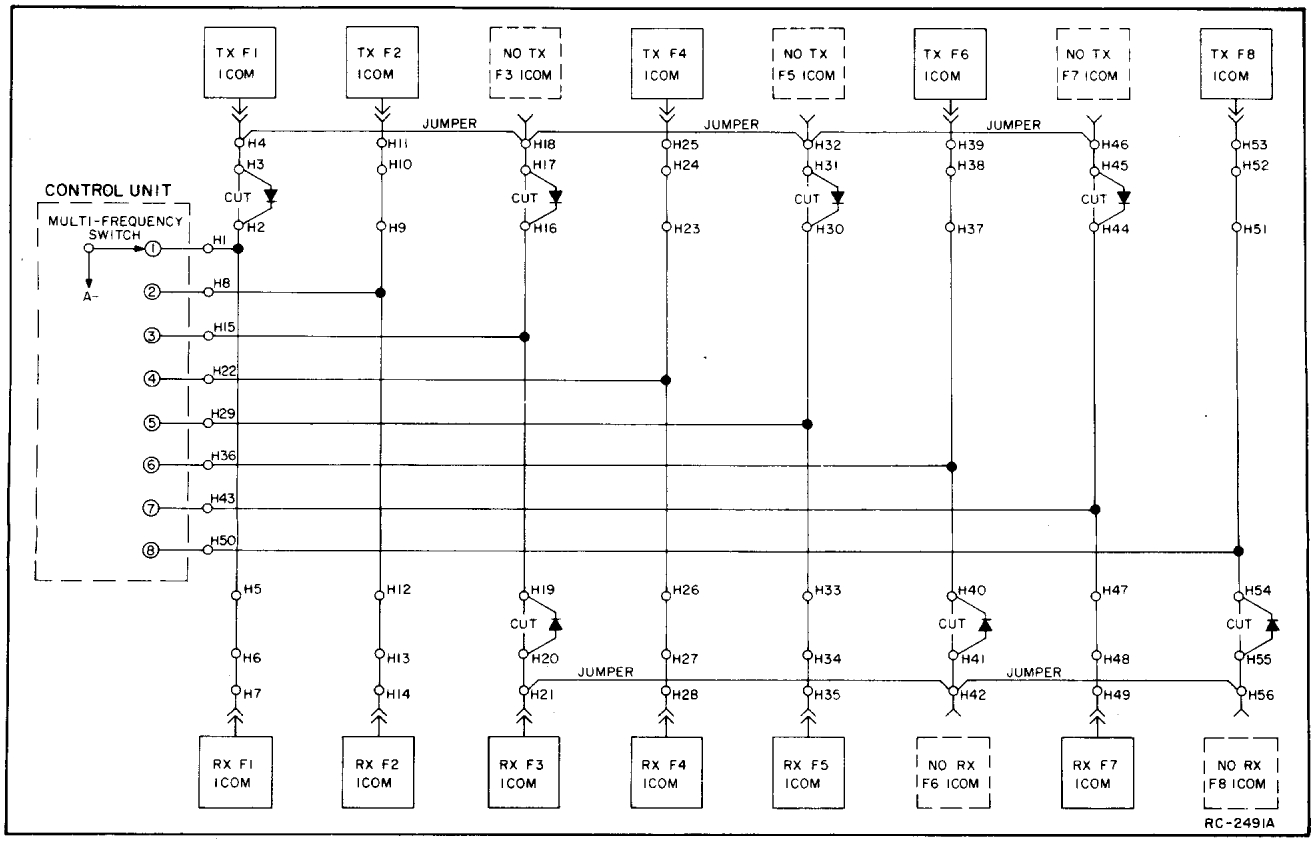


Figure 3 - Repeating ICOMs

MAINTENANCE

DISASSEMBLY

To service the System Board from the top (see Mechanical Parts Breakdown):

1. Pull the locking handle down, then pry up the top cover at the front notch and lift off the cover.

To service the board from the bottom:

1. Pull the locking handle down and pull the radio out of the mounting frame.
2. Remove the top cover, then loosen the two bottom cover retaining screws and remove the bottom cover.

To remove the System Board from the radio:

1. Remove the top and bottom covers.
2. Disconnect the receiver antenna input plug (A), and the exciter output plug (B). (see Figure 4).
3. Remove the five screws (C) holding the receiver RF assembly to the module mounting frame. Then remove the two screws (D) holding the receiver audio PA heatsink to the right side rail.
4. Remove the five screws (E) holding the receiver boards to the module mounting frame (see Figure 5).
5. Remove the six screws (F) holding the exciter board and its bottom cover to the module mounting frame.
6. Press straight down on the plug-in Exciter and then the Osc/Mult and IFAS boards to avoid bending the pins when unplugging the boards from the System Board Jacks.
7. In "M" Model radios, remove the four screws (G) in each of the side rails and remove the side rails (see Figure 4). In "E" Model radios, remove the seven screws in the side rails, and remove the side rails. Unsolder any leads to the System Board if desired. NOTE: Remove the shield on the left side rail to expose the power cables, and if desired, unsolder the cables from the bottom of the PA Assembly.
8. Disconnect the PTT leads from J910 on the System Board, and the antenna plug from the PA assembly.
9. If it is necessary to remove the System Board from the front casting, remove the mounting screw (H) from regulator transister Q901. Then remove six screws (J) (three along the top and three along the bottom) on System jack J901 and remove the System Board.

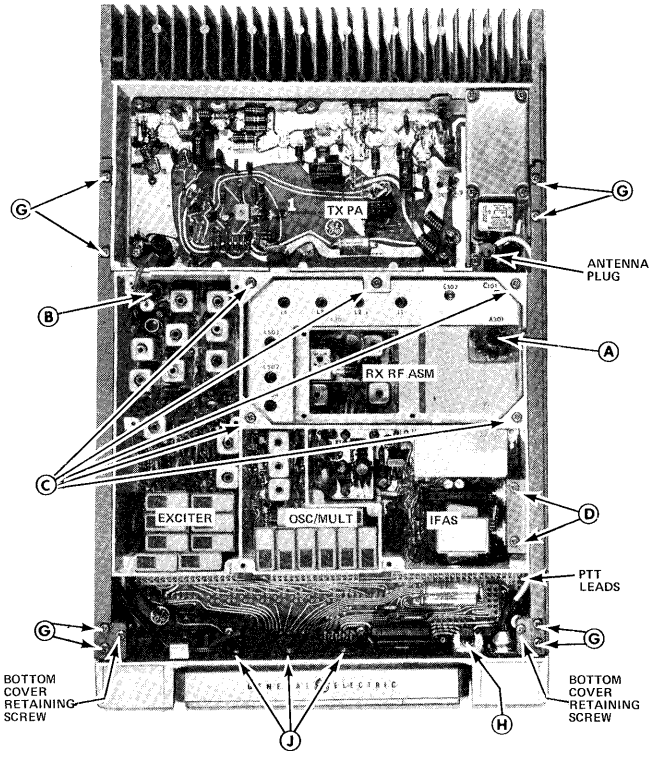


Figure 4 - Disassembly Procedure (Top View)

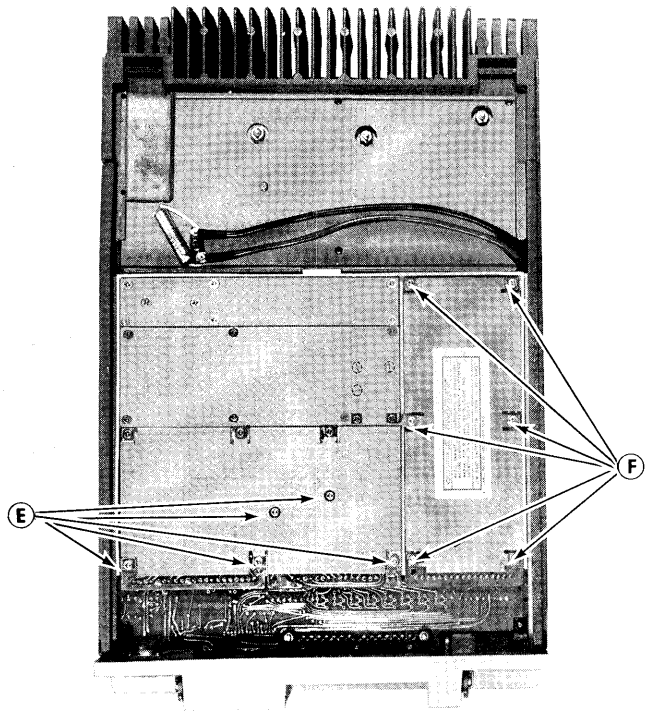
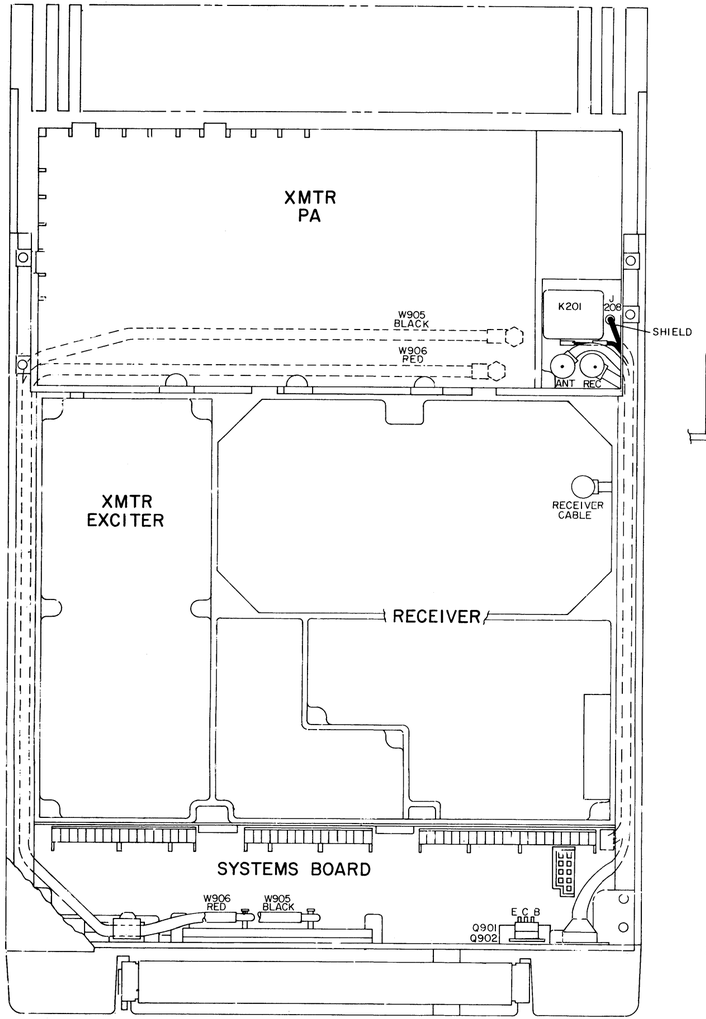


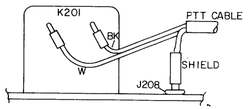
Figure 5 - Disassembly Procedure (Bottom View)

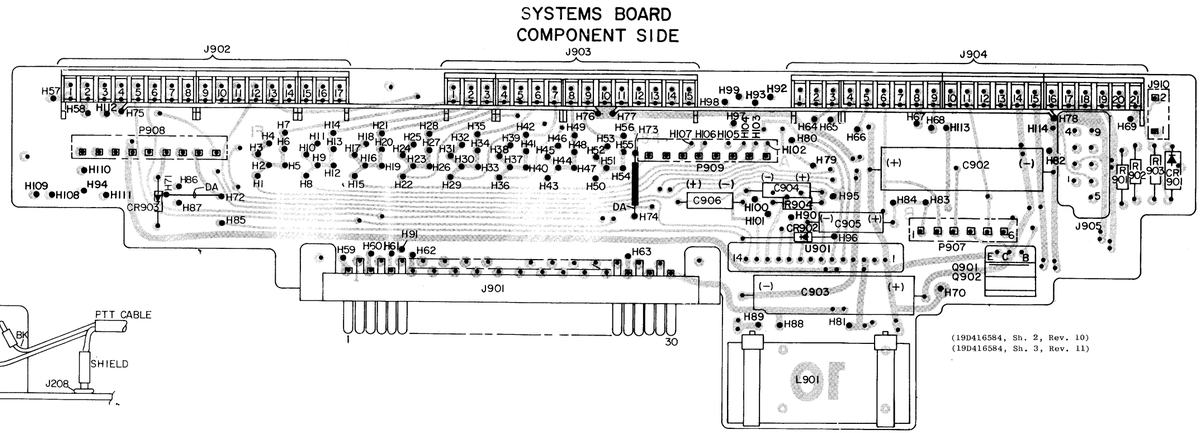
TROUBLESHOOTING

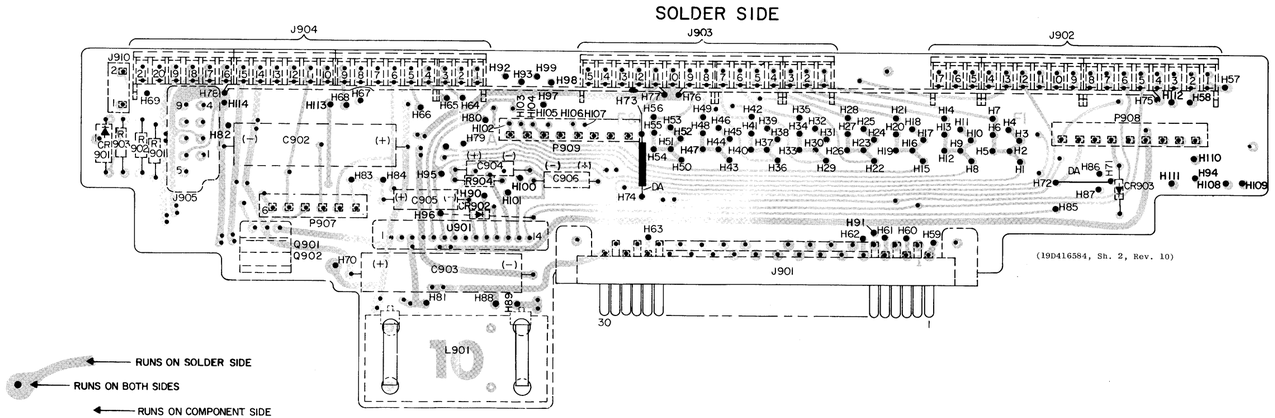
10-VOLT REGULATOR U901

SYMPTON	PROCEDURE
No 10-Volt output	1. Check input voltage (A+) at pin 1 of U901. 2. Remove the Power/Control cable from J901. Check for shorts from Pins 3, 7 and 14 to A-. These readings should be no less than 100 ohms. 3. Check Pass transistor Q901. 4. Replace U901.
Regulator output too high	1. Check Q901. 2. Replace U901.
No switched 10-Volts for transmitter or receiver	1. Check for shorts from Pins 7 and 14 to A-. 2. Check to see that Pin 8 of U901 goes to A- when PTT switch is pressed. 3. Replace U901.







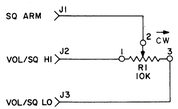


OUTLINE DIAGRAM

FRONT PANEL & SYSTEM BOARD

FIXED SQUELCH OPTION

SCHEMATIC DIAGRAM



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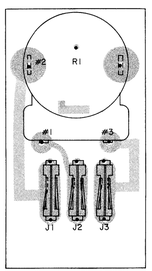
OUTLINE DIAGRAM



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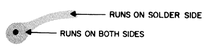
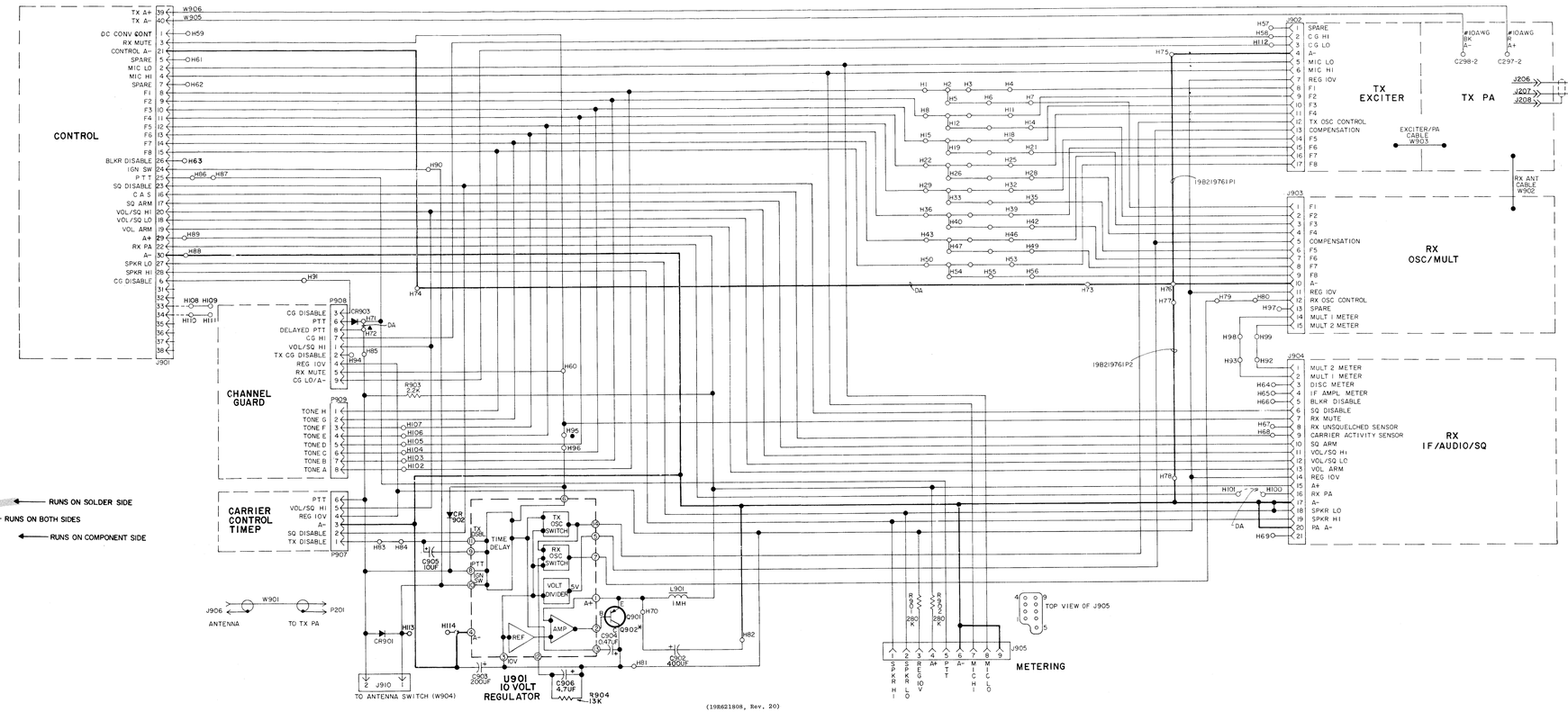
(19C320121, Sh. 3, Rev. 1)





	REV LETTER
"M" MODEL FRONT PANEL 19D416653G1	B
"E" MODEL FRONT PANEL 19D417084G1	B
SYSTEM BOARD 19D416602G1	F

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.

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 MICROFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF= MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR HH=HENRYS.

NOTE:
1. ▲REMOVE FOR CHANNEL GUARD. DA= #22 AWG WIRE SIZE.
2. ✱ Q902 ON 19D417084G1 ONLY.
3. ● RUN FROM H95 TO H96 IS REMOVED TO DISABLE RX MUTE FOR DUPLEX OPERATION. REFER TO DUPLEX INTERCONNECTION DIAGRAM

SCHEMATIC DIAGRAM

FRONT PANEL & SYSTEM BOARD

PARTS LIST

LBI4749E

FRONT PANEL AND SYSTEM BOARD
19D416653G1 "M" SERIES
19D417084G1 "E" SERIES
19D417084G2 "E" SERIES DUPLEX

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q901	19A116375P1	Silicon, PNP.
Q902*	19A116942P1	Silicon, PNP. (Used with 19D417084G1 only). Added by REV A.
		- - - - - - - - - - CABLES - - - - - - - - - -
W901		ANTENNA CABLE 19A129312G1 (Not used in 19D417084G2)
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J906		Connector. Includes receptacle and adapter:
	19A700067P1	Receptacle, coaxial: sim to Amphenol 83-798.
	4029082P2	Adapter: sim to Amphenol 83-765.
	5491689P84	Cable, RF: approx 13-3/4 inches long, 350 VRMS, 500 VDC operating voltage. (includes P201).
W905 and W906		POWER LEAD 19A129315G1 (BLACK) 19A129315G2 (RED)
	19B209268P113	Terminal, solderless: wire size No. 12-10 AWG; sim to AMP 72-0726.
	7117269P1	Terminal, solderless: wire size No. 14 AWG. (Used with contact 19B219394P1).
	19B219394P1	Contact.
		SYSTEM BOARD 19D416602G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C901*	19A115680P10	Electrolytic: 200 µf +150% -10%, 18 VDCW; sim to Mallory Type TTX. Deleted by REV A.
C902*	19A115680P24	Electrolytic: 400 µf +150% -10%, 18 VDCW; sim to Mallory Type TTX.
		Earlier than REV A:
	19A115680P10	Electrolytic: 200 µf +150% -10%, 18 VDCW; sim to Mallory Type TTX.
C903	19A115680P10	Electrolytic: 200 µf +150% -10%, 18 VDCW; sim to Mallory Type TTX.
C904	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C905	19B200240P10	Tantalum: 10 µf ±5%, 15 VDCW.
C906*	5496267P5	Tantalum: 4.7 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
		In REV B & C:
	5496267P213	Tantalum: 2.2 µf ±10%, 20 VDCW; sim to Sprague Type 150D.
		In REV A & earlier:
	19C300075P15001J	Polyester: 0.015 µf ±5%, 100 VDCW; sim to GE Type 61F. Added by REV A.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR901	4037822P1	Silicon, 1000 mA, 400 PIV.
CR902*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV. Added by REV D.
CR903*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV. Added by REV E.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J901	19D416398G1	Connector. Includes 30 (19A116669P1) contacts. When 38 contacts are used, Terminal Kit 19A129869G1 containing 8 (19A116689P1) contacts is required.
J902		Connector. Includes:
	19A116659P3	Printed wiring: 8 contacts; sim to Molex 09-52-3082.
	19A116659P4	Printed wiring: 6 contacts; sim to Molex 09-52-3062.
	19A116659P1	Printed wiring: 3 contacts; sim to Molex 09-52-3032.
J903		Connector. Includes:
	19A116659P3	Printed wiring: 8 contacts; sim to Molex 09-52-3082.
	19A116659P1	Printed wiring: 3 contacts; sim to Molex 09-52-3032.
	19A116659P15	Printed wiring: 4 contacts; sim to Molex 09-52-3042.
J904		Connector. Includes:
	19A116659P4	Printed wiring: 6 contacts; sim to Molex 09-52-3062.
	19A116659P1	Printed wiring: 3 contacts; sim to Molex 09-52-3032.
J905	19B219374G2	Connector. Includes 9 (19A116651P1) contacts.
J910	19A142706P1	Contact, electrical. (Quantity 2).
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L901	19A115894P1	Audio freq: 1.0 mh inductance, 0.35 ohms DC res.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P907	19A142706P1	Contact, electrical. (Quantity 6).
P908	19A142706P1	Contact, electrical. (Quantity 9).
P909	19A142706P1	Contact, electrical. (Quantity 8).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R901 and R902	19C314256P22803	Metal film: 280K ohms ±1%, 1/4 w.
R903	19A700019P41	Composition: 2.2K ohms ±5%, 1/4 w.
R904*	19A143400P50	Composition: 13K ohms ±5%, 1/4 w. Added by REV B.
		- - - - - - - INTEGRATED CIRCUITS - - - - - - -
U901*	19D416564G4	10-Volt Regulator.
		In REV B-E:
	19D416564G3	10-Volt Regulator.
		Earlier than REV A:
	19D416564G1	10-Volt Regulator.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19A115185P3	Retainer strap. (Used with L901).
	19B219398P1	Support. (Used with J901).
	19B219761P1	Jumper. (Connects J902 & J903).
	19B219761P2	Jumper. (Connects J903 & J904).
	19D417096G1	Casting. (E SERIES).
	19D416485G1	Casting. (M SERIES).
	7109043P1	Ring, retainer: shaft dia size 3/16; sim to National Lock Washer Co. WA510. (Used with W905, W906).

SYMBOL	GE PART NO.	DESCRIPTION
	19A116023P1	Insulator, plate. (Used with Q901).
	19A134016P1	Insulator, bushing. (Used with Q901).
	19B201074P206	Tap screw, Phillips POZIDRIV®: No. 4-40 x 3/8. (Used with Q901).
	N84P9010C6	Machine screw, phillips: No. 4-40 x 5/8. (Secures J906).
	19B201074P306	Tap screw, Phillips POZIDRIV®: No. 6-32 x 3/8. (Secures J901).
		ASSOCIATED ASSEMBLIES
W902	5491689P83	Receiver Antenna Cable: (STANDARD), 4-3/4 inches long; 350 VRMS, 500 VDC operating voltage.
W902	5491689P77	Receiver Antenna Cable: (NOISE BLANKER/PRE-AMP), 6 inches long; 350 VRMS, 500 VDC operating voltage.
W903	5491689P86	Exciter/PA Cable: 3-1/2 inches long; 350 VRMS, 500 VDC operating voltage.
W904		PUSH-TO-TALK CABLE 19A129314G1
	4036634P1	Contact, electrical; sim to AMP 42428-2. (Used with black & white wire on shielded end).
	4029840P1	Contact, electrical: sim to Amp 41854. (Used with shield).
	19A116781P6	Contact, electrical: wire range No. 22-26 AWG; sim to Molex 08-50-0108. (Used with black & white wire on connector block end).
	19A116659P16	Connector block. 2 contact; sim to Molex 09-50-4031.
		FIXED SQUELCH BOARD 19B219511G1 (Mounts on System Board)
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J3	19A116428P3	Contact, electrical: sim to AMP 85487-3 (Strip Form).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	19B209358P6	Variable, carbon film: approx 300 to 10K ohms ±20%, 0.25 w; sim to CTS Type U-201.

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.

REV. A - Front Panel Assembly 19D416653G1
To improve operation.
Changed U901 and added C906.

REV. A - System Board 19D416602G1
To improve operation.
Deleted C901 and changed C902.

REV. B - To prevent receiver muting caused by ignition noise.
Changed C906 and added R904.

REV. C - To improve performance under high RF fields.
Connected speaker low to A-, and added Holes H108 thru H12.

REV. D - To allow direct substitution of 10-Volt regulator hybrids.
Changed C906. Added CR902.

REV. E - To prevent Channel Guard module from turning on XMIT indicator when transmitter is not keyed.
Added CR903.

REV. F - To improve operation. Changed U901.

REV. A - Front Panel Assembly 19D417084G1
To increase current capability of 10 Volt regulator used in radios with Dual Front End or Phase Lock Loop Exciter.
Replace Q901 with Q902.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

PAGE 1 - MODIFICATION INSTRUCTIONS

PURPOSE: THIS MODIFICATION IS APPLIED TO MASTR II (M OR E MOBILES WITH NO MAJOR OPTIONS) COMBINATIONS WHICH REQUIRE DIODE STRAPPING ✱ (PER CUSTOMER REQUEST) FOR COMMON FREQUENCY POSITIONS (RX OR TX) TO ELIMINATE REPEATING ICOM'S OR BLANK FREQUENCY SELECT SWITCH POSITIONS.
TO APPLY WITH MAJOR OPTIONS, SEE PAGE 2.

REQUIRED PARTS: A TOOL TO CUT PWB RUNS (KNIFE OR ROTARY GRINDER) DM WIRE, SLEEVING, 19A115250P1 DIODES.

INSTALLATION: REMOVE THE TOP AND BOTTOM COVERS OF THE RADIO. ON THE SYSTEM BOARD (19D416602 IS PART OF THE FRONT PANEL ASSEMBLY 19D416653). PERFORM THE FOLLOWING FUNCTIONS:

1. SELECT COMMON FREQUENCY POSITIONS (THOSE TO BE COMBINED) FROM COLUMN "A" BELOW.
2. CUT CORRESPONDING RUNS FROM COLUMN "B". REPLACING EACH CUT RUN WITH A DIODE.
3. CONNECT COMMON FREQUENCIES TOGETHER WITH DM WIRE JUMPERS (SLEEVED) PER COLUMN "C".
4. TEST TRANSMIT AND RECEIVE DIODE CONNECTIONS SEPARATELY. CHECK FOR CONTINUITY BETWEEN ANODES. CHECK FOR OPEN CIRCUIT BETWEEN CATHODES WITH BOTH POLARITIES OF THE METER.
5. REPLACE COVERS

NOTE: ICOM WILL OPERATE IN ANY OF THE STRAPPED POSITIONS.

✱ THIS KIT IS CALLED FOR ON EACH DELETE ICOM OPTION WHICH IS REQUIRED TO DELETE ICOMS FOR REPEATING FREQUENCIES OR FOR UNEVEN TRANSMITT/RECEIVE FREQUENCIES.

TRANSMITTER CHART

"A" FREQUENCY	"B" CUT RUN BETWEEN HOLES BELOW ADD DIODE CATHODE ◀ ANODE		"C" ADD DM JUMPER
F1	H2	H3	H4
F2	H9	H10	H11
F3	H16	H17	H18
F4	H23	H24	H25
F5	H30	H31	H32
F6	H37	H38	H39
F7	H44	H45	H46
F8	H51	H52	H53

RECEIVER CHART

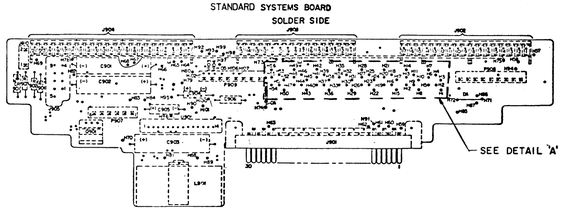
"A" FREQUENCY	"B" CUT RUN BETWEEN HOLES BELOW ADD DIODE CATHODE ◀ ANODE		"C" ADD DM JUMPER
F1	H5	H6	H7
F2	H12	H13	H14
F3	H19	H20	H21
F4	H26	H27	H28
F5	H33	H34	H35
F6	H40	H41	H42
F7	H47	H48	H49
F8	H54	H55	H56

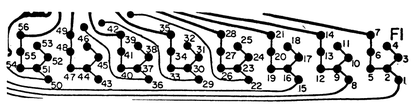
EXAMPLE: TO STRAP RECEIVER F2, F3, AND F6

1. COLUMN A SEE F2, F3, F6
2. CUT RUNS BETWEEN H12-H13, H19-H20, AND H40-H41
3. ADD DIODES BETWEEN H12-H13, H19-H20, AND H40-H41
4. ADD DM JUMPERS BETWEEN H14-H21 AND H21-H42

DIODE STRAPPING, MASTR II

STANDARD SYSTEMS BOARD
SOLDER SIDE





DETAIL 'A'

(19C321247, Sh. 1, Rev. 3)

PAGE 2 - MODIFICATION INSTRUCTIONS

MAJOR OPTIONS

12 FREQUENCY MOBILE

USE INSTRUCTIONS PER PAGE 1 WITH THE EXCEPTION THAT DIODE STRAPPING IS NOT COMPATIBLE WITH F9 THRU F12.

DUPLEX MOBILE

DIODE STRAPPING IS NOT COMPATIBLE.

WIDE SPACED TRANSMITTER - OPTIONS 9203, 9204

USE INSTRUCTIONS PER PAGE 1.

DUAL FRONT END

WHEN THIS MODIFICATION IS USED IN A SYSTEM MOBILE WITH THE D.F.E. (DUAL FRONT END) OPTION (9201 OR 9202) THE APPLICATION IS DIFFERENT. ONLY THE BLANK FREQUENCY POSITIONS IN THE STANDARD RECEIVER & D.F.E. CAN BE STRAPPED. IN OTHER WORDS, SINCE THE RECEIVER AND D.F.E. OSCILLATOR POSITIONS ARE WIRED IN PARALLEL, ANY MODIFICATION WILL AFFECT BOTH ITEMS. THEREFORE, THE DIODE STRAPPING CAN ONLY BE APPLIED TO THE OSCILLATOR POSITIONS WHICH ARE EMPTY IN BOTH THE RECEIVER AND D.F.E. SEE TWO EXAMPLES BELOW. REFER TO PAGE 1 FOR INSTRUCTIONS. RETURN UNUSED KITS TO STOCK.

FIRST EXAMPLE: ASSUME DIGIT VI OF THE RADIO COMBINATION NUMBER IS "E" (3 FREQUENCY TX/3 FREQUENCY RX). CUSTOMER WANTS ONLY ONE ICOM IN THE RECEIVER AND TWO ICOM'S IN THE D.F.E. (TOTAL 3). TWO DELETE RECEIVER ICOM OPTIONS (9049 OR 9050) ARE REQUIRED TO DELETE THE TWO UNNECESSARY ICOM'S IN THE RECEIVER. THE TWO ICOM'S IN THE D.F.E. ARE CALLED FOR IN THE D.F.E. COMBINATION NUMBER. THEREFORE, ALL THREE FREQUENCY POSITIONS ARE OCCUPIED, ONE IN THE RECEIVER, TWO IN THE D.F.E., SO NO DIODE STRAPPING IS REQUIRED.

SECOND EXAMPLE: ASSUME DIGIT VI OF THE RADIO COMBINATION NUMBER IS "G" (5 FREQUENCY TX/5 FREQUENCY RX). CUSTOMER WANTS ONLY TWO ICOM'S IN THE RECEIVER AND ONE ICOM IN THE D.F.E. (TOTAL 3). THE REMAINING TWO FREQUENCIES WILL BE PROVIDED BY DIODE STRAPPING. THREE DELETE RECEIVER ICOM OPTIONS (9049 OR 9050) ARE REQUIRED TO DELETE THE THREE UNNECESSARY ICOM'S IN THE RECEIVER. ONLY ONE D.F.E. ICOM IS CALLED FOR WITH THE D.F.E. COMBINATION NUMBER. THEREFORE, ONLY THREE OF THE FIVE AVAILABLE POSITIONS ARE OCCUPIED, REQUIRING STRAPPING TO THE TWO UNUSED POSITIONS. THE CUSTOMER ORDER SHOULD CALL OUT POSITIONS TO STRAP. (FOR EXAMPLE, STRAP FREQUENCY 3 TO POSITION 4, AND FREQUENCY 2 TO POSITION 5). THE RECEIVER JUMPER CHART ON PAGE 1 IS USED AS NORMAL. ONE DIODE KIT WILL BE LEFT OVER.

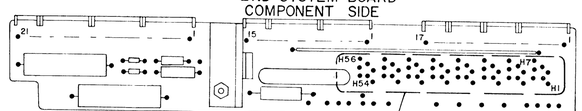
NOTE THAT THIS INSTRUCTION DOES NOT AFFECT THE TRANSMITTER DIODE STRAPPING IN THIS APPLICATION.

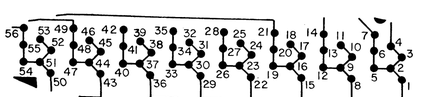
WIDE SPACED TRANSMITTER AND DUAL FRONT END - REQUIRES OPTION 9205

FOR STANDARD RECEIVER STRAPPING, USE INSTRUCTIONS ON PAGE 1. DIODE STRAPPING OF THE TRANSMITTER ICOM'S IN THE 1ST (TOP) EXCITER IS NOT COMPATIBLE. FOR 2ND EXCITER AND DUAL FRONT END ICOM'S, DIODE STRAPPING IS PERFORMED ON THE 2ND SYSTEM BOARD 19D417298 PER THE INSTRUCTIONS AND CHARTS ON PAGE 1. THE HOLE LAYOUT FOR STRAPPING ON THE 2ND SYSTEM BOARD IS IDENTICAL TO THE STANDARD SYSTEM BOARD. SEE DETAIL "B".

DIODE STRAPPING, MASTR II

2ND SYSTEM BOARD
COMPONENT SIDE



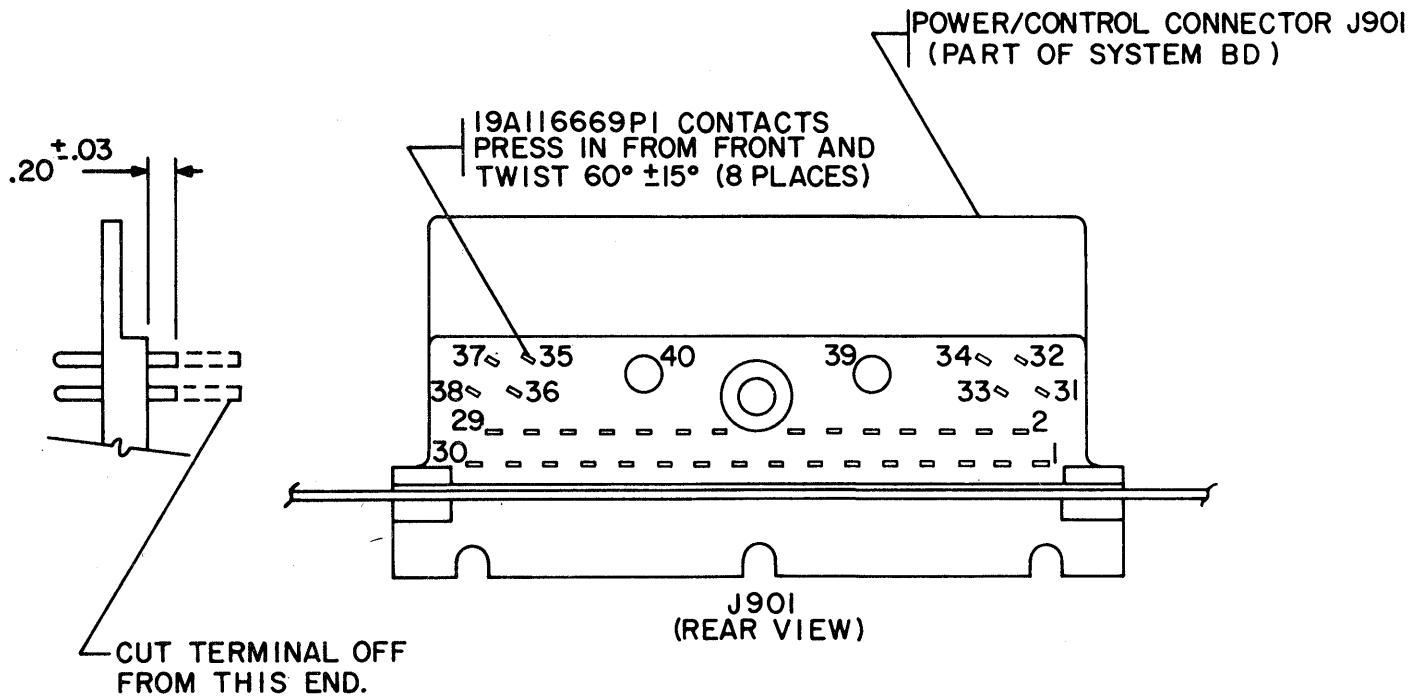


DETAIL "B"

(19C321247, Sh. 2, Rev. 1)

MODIFICATION INSTRUCTIONS

FOR REPEATING ICOMS



THESE INSTRUCTIONS COVER INSTALLATION OF MODIFICATION KIT PL19A129869G1 FOR APPLICATION OF 38 PIN CONNECTOR.

INSTRUCTIONS:

1. REMOVE TOP COVER FROM FRAME.
2. INSERT 19A116669P1 CONTACTS FROM FRONT SIDE OF CONNECTOR, THEN TWIST 60° AND CUT OFF.
3. REPLACE TOP COVER.

(19B226041, Rev. 2)

MODIFICATION INSTRUCTIONS

38-PIN CONNECTOR