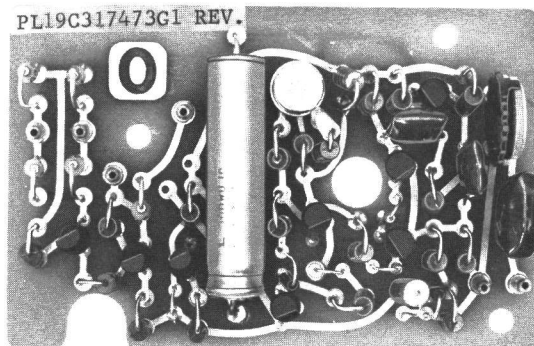


MASTR[®] PROGRESS LINE

CARRIER CONTROL TIMER BOARD 19C317473 G1

WITH CARRIER CONTROL TIMER KITS 19A127875 G1 thru G6



SPECIFICATIONS *

TIMING CYCLE:

Standard

1 Minute

Optional

Adjustable from 15 seconds
to 5 minutes

INPUT:

13.6 Volts @ 100 mA Maximum
60 mA Nominal

SILICON TRANSISTORS:

9

DIMENSIONS (H X W X D):

2 1/4" X 3 1/2" X 7/8"

OPTIONS

Option No.	GE Part No.	Application
7347	19A127875G1	MASTR Professional Mobile
7348	19A127875G2	MASTR ROYAL Professional & Imperial Mobile
8306	19A127875G3	MASTR Executive Mobile
8307	19A127875G4	MASTR ROYAL Executive Mobile
8308	19A127875G5	MASTR Executive Station
8309	19A127875G6	MASTR ROYAL Executive Station
7349	19B209358P112	Modification for adjustable timing cycle

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

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MASTR Royal Executive Mobile	5
MASTR Executive Tubed Station	6
MASTR Royal Executive Station	6

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.

DESCRIPTION

General Electric Carrier Control Timer Models 19A127875-G1 through -G6 were designed to shut off the transmitter after a one minute timing cycle, and to alert the operator that the transmitter is off by means of an alarm tone in the speaker.

The transmitter can be turned on again by releasing and rekeying the push-to-talk switch on the microphone. An optional potentiometer is available that permits the timing cycle (transmitter keyed time) to be adjusted from 15 seconds to 5 minutes.

The Carrier Control Timer can be used with all MASTR combinations except the three or four frequency MASTR Executive Tubed Mobiles or Stations.

INSTALLATION

For field installation of the Carrier Control Timer, refer to the appropriate installation instruction as listed in the Table of Contents.

CIRCUIT ANALYSIS

The Carrier Control Timer consists of a voltage switch (Q1 and Q2), a timing circuit (Q3 and Q4), a transmitter keying circuit (Q5 and Q6), a multivibrator (Q7 and Q9), and a transistor switch (Q8). The timer is supplied with a continuous +13.6 Volts.

Pressing the push-to-talk switch on the microphone ground J2 on negative ground units or J1 on positive ground units causing Q1 to turn on. Q1 turning on causes Q2 to turn on applying +13.6 volts to voltage regulator VR1. R4, VR1, and C1 regulates the voltage to +10 volts. When voltage is applied to the base of Q6 through R12 and R11, Q6 turns on keying the transmitter. At the same time voltage is applied to the base of Q8 through R14 and CR8 causing Q8 to turn on. Q8 turning on grounds the base of Q7 to keep the multivibrator from running.

The instant voltage is applied to R6, C2 starts charging through R6. Timing transistors Q3 and Q4 operate as a compound-connected emitter-follower. As C2 slowly charges up, the output voltage of the emitter follower rises proportionally. At the end of the timing cycle, the charge on C2 is sufficient to cause the emitter-follower output to exceed the breakdown voltage of zener diode VR2, turning on Q5. When Q5 turns on, its collector potential drops to near ground potential, turning off Q6 and Q8. Turning off Q6 opens the PTT ground

path and switches off the transmitter.

Turning off Q8 allows the 700-Hz multivibrator to start. The output at J6 is applied to the base of the receiver audio output stage which in turn alerts the operator that the transmitter has been turned off. The transmitter can be keyed again by releasing and repressing the PTT switch. Releasing the PTT switch turns off the alarm tone to the speaker and also allows C2 to discharge rapidly through R5 to reset the timing cycle. R21 is used to adjust the alarm tone level at the speaker.

On a standard unit, the timing cycle (Transmitter Keyed Time) will be one minute. When the option is factory-installed, the timer board is shipped with the timing cycle set for one minute. For field installation, holes are provided in the printed circuit board so R6 can be directly replaced with the potentiometer. Instructions for setting the potentiometer are contained in the adjustment section below. R6 may also be replaced by a resistor of a different value. Decreasing the value of R6 decreases the timing cycle, while increasing the value of R6 increases the timing cycle.

MAINTENANCE

DISASSEMBLY

To gain access to the carrier control timer, refer to the appropriate Installation Diagram for the location of the timer board.

ADJUSTMENT

Timing Cycle Adjustment

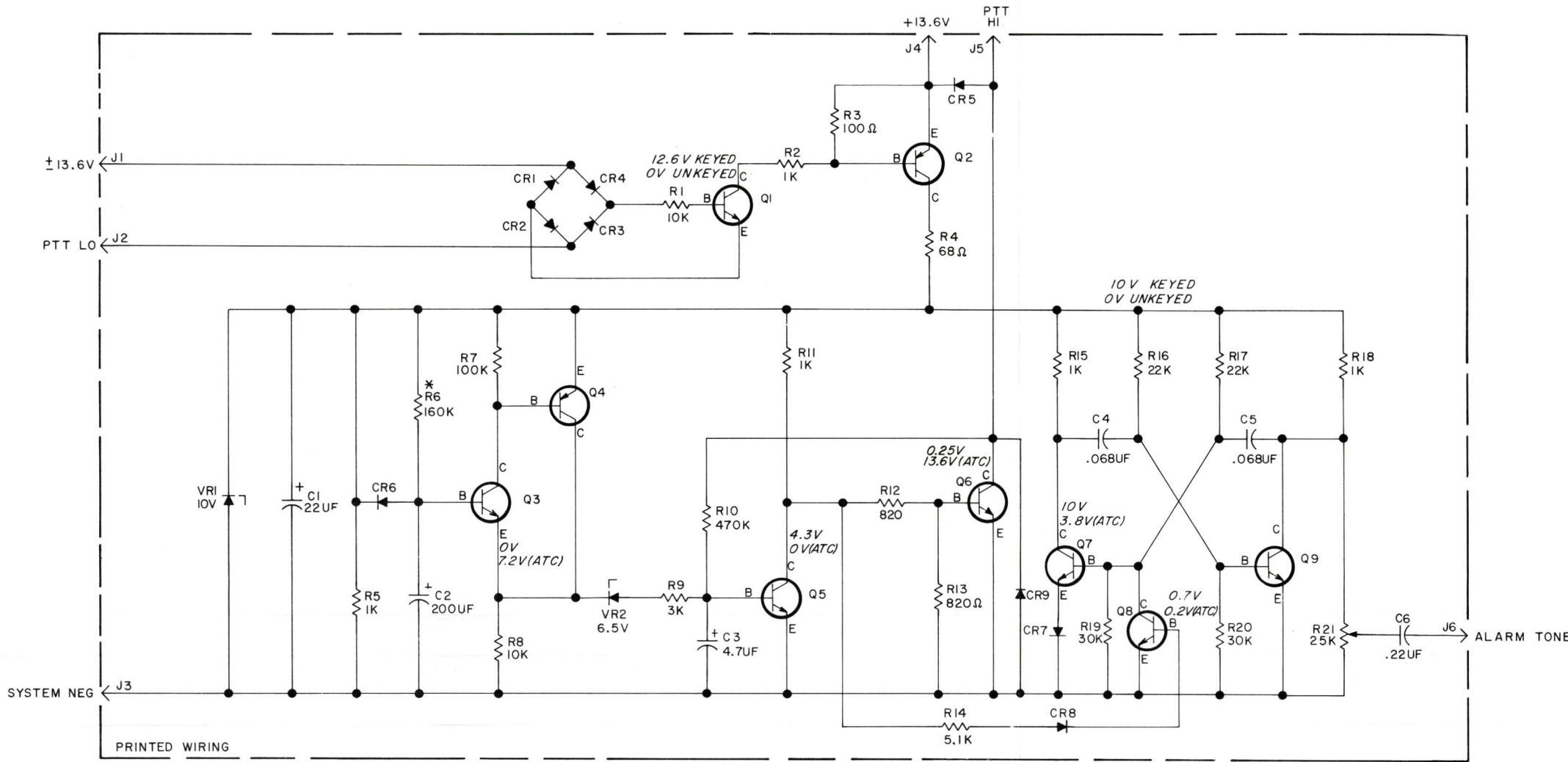
If the carrier control timer is equipped with the optional potentiometer, the potentiometer may be adjusted as follows:

1. Key the transmitter into a 50-ohm load. Keep the transmitter keyed until the carrier control timer unkeys the transmitter and the alarm tone is heard in the speaker.
2. Then, adjust the potentiometer (19B209358-P112) for more resistance if a longer timing cycle is desired, or decrease the resistance of the potentiometer if a shorter timing cycle is desired.

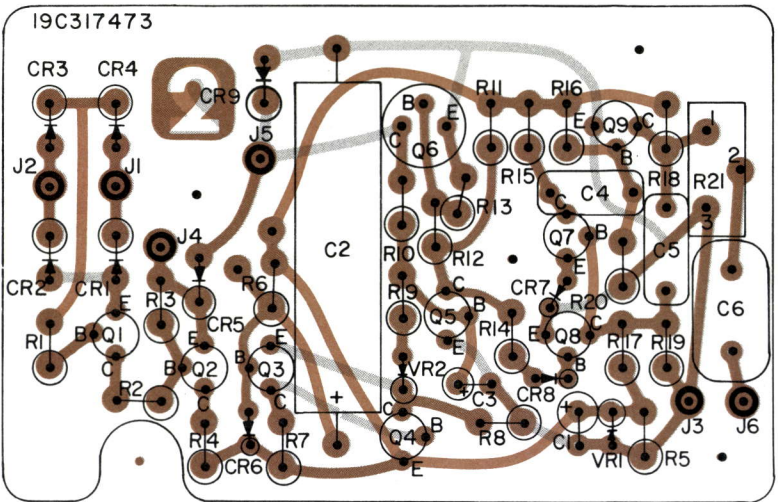
Alarm Tone Adjustment

Repeat Step 1 of Timing Cycle Adjustment. Adjust potentiometer R21 for an alarm tone level as desired.

SCHEMATIC DIAGRAM

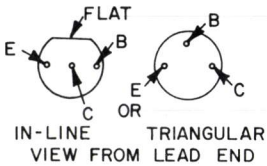


OUTLINE DIAGRAM

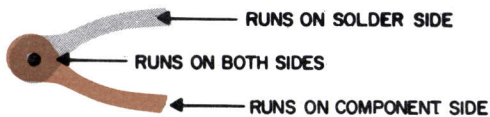


(19B219092, Rev. 1)
(19B216971, Sh. 1, Rev. 2)
(19B216971, Sh. 2, Rev. 2)

LEAD IDENTIFICATION
FOR Q1 THRU Q9



NOTE: LEAD ARRANGEMENT, AND NOT
CASE SHAPE, IS DETERMINING
FACTOR FOR LEAD IDENTIFICATION.



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 1/2 WATT UNLESS
OTHERWISE SPECIFIED AND RESISTOR
VALUES IN OHMS UNLESS FOLLOWED BY
K=1000 OHMS OR MEG=1,000,000 OHMS.
CAPACITOR VALUES IN PICO FARADS (EQUAL
TO MICROMICROFARADS) UNLESS FOLLOWED
BY UF= MICROFARADS. INDUCTANCE VALUES
IN MICROHENRYS UNLESS FOLLOWED BY
MH= MILLIHENRYS OR H= HENRYS.

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

THIS ELEM DIAG APPLIES TO
MODEL NO PL19C317473GI REV LETTER B

* THE VALUE SHOWN FOR R6 IS FOR A ONE
MINUTE TIME CYCLE. IF R6 IS REPLACED
BY POTENTIOMETER 19B209358P112 (OPTION
7349) THE TIMING CYCLE CAN BE VARIED
FROM 15 SECONDS TO 5 MINUTES.

VOLTAGE READINGS

READINGS ARE MEASURED TO MAIN CHASSIS
GROUND WITH A 20,000 OHM-PER-VOLT
METER. READINGS WITH NO LEGEND TAKEN
DURING TIMING CYCLE READINGS FOLLOWED
BY (ATC) TAKEN AFTER TIMING CYCLE.

(19D413628, Rev. 3)

SCHEMATIC & OUTLINE DIAGRAM

CARRIER CONTROL TIMER BOARD
19C317473G1

PARTS LIST

LBI4137C

CARRIER CONTROL TIMER
19C317473G1

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - CAPACITORS - - - - -
C1	5496267P10	Tantalum: 22 μ f \pm 20%, 15 VDCW; sim to Sprague Type 150D.
C2	19A115680P10	Electrolytic: 200 μ f \pm 150% -10%, 18 VDCW; sim to Mallory Type TTX.
C3	5496267P5	Tantalum: 4.7 μ f \pm 20%, 10 VDCW; sim to Sprague Type 150D.
C4 and C5	19A116080P6	Polyester: 0.068 μ f \pm 20%, 50 VDCW.
C6	19A116080P9	Polyester: 0.22 μ f \pm 20%, 50 VDCW.
		- - - - - DIODES AND RECTIFIERS - - - - -
CR1 thru CR5	4037822P1	Silicon, 1000 mA, 400 PIV.
CR6 thru CR8	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR9*	4037822P1	Silicon, 1000 mA, 400 PIV. Added by REV B.
		- - - - - JACKS AND RECEPTACLES - - - - -
J1 thru J6	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - TRANSISTORS - - - - -
Q1	19A115123P1	Silicon, NPN.
Q2	19A115768P1	Silicon, PNP; sim to Type 2N3702.
Q3	19A115123P1	Silicon, NPN.
Q4	19A115768P1	Silicon, PNP; sim to Type 2N3702.
Q5*	19A115362P1	Silicon, NPN; sim to Type 2N2925.
		Earlier than REV A:
	19A115123P1	Silicon, NPN.
Q6	19A115300P4	Silicon, NPN.
Q7 thru Q9	19A115123P1	Silicon, NPN.
		- - - - - RESISTORS - - - - -
R1	3R77P103K	Composition: 10K ohms \pm 10%, 1/2 w.
R2	3R77P102K	Composition: 1K ohms \pm 10%, 1/2 w.
R3	3R77P101K	Composition: 100 ohms \pm 10%, 1/2 w.
R4	3R77P680J	Composition: 68 ohms \pm 5%, 1/2 w.
R5	3R77P102K	Composition: 1K ohms \pm 10%, 1/2 w.
R6*	3R77P164J	Composition: 160K ohms \pm 5%, 1/2 w.
		Earlier than REV A:
	3R77P184J	Composition: 180K ohms \pm 5%, 1/2 w.
R7	3R77P104K	Composition: 100K ohms \pm 10%, 1/2 w.
R8	3R77P103K	Composition: 10K ohms \pm 10%, 1/2 w.
R9	3R77P302J	Composition: 3K ohms \pm 5%, 1/2 w.
R10*	3R77P474K	Composition: 470K ohms \pm 10%, 1/2 w.
		Earlier than REV A:
	3R77P684K	Composition: 680K ohms \pm 10%, 1/2 w.
R11*	3R77P102K	Composition: 1K ohms \pm 10%, 1/2 w.
		Earlier than REV A:
	3R77P152K	Composition: 1.5K ohms \pm 10%, 1/2 w.

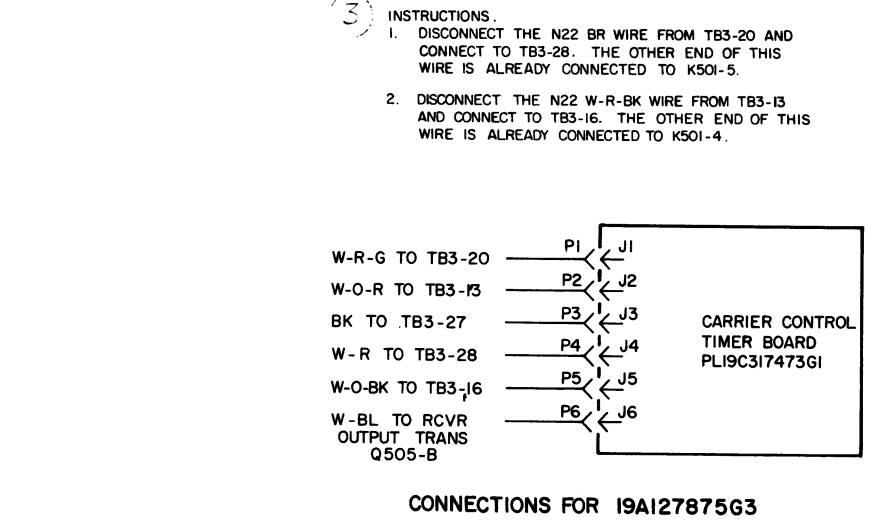
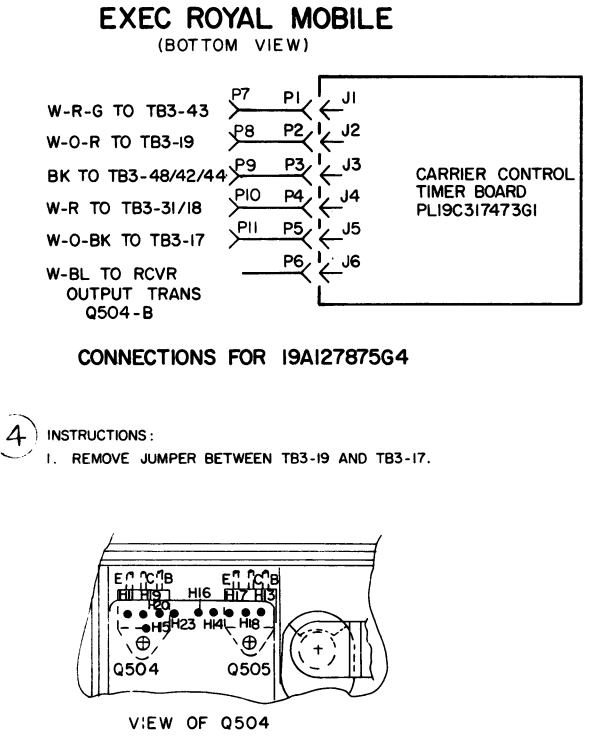
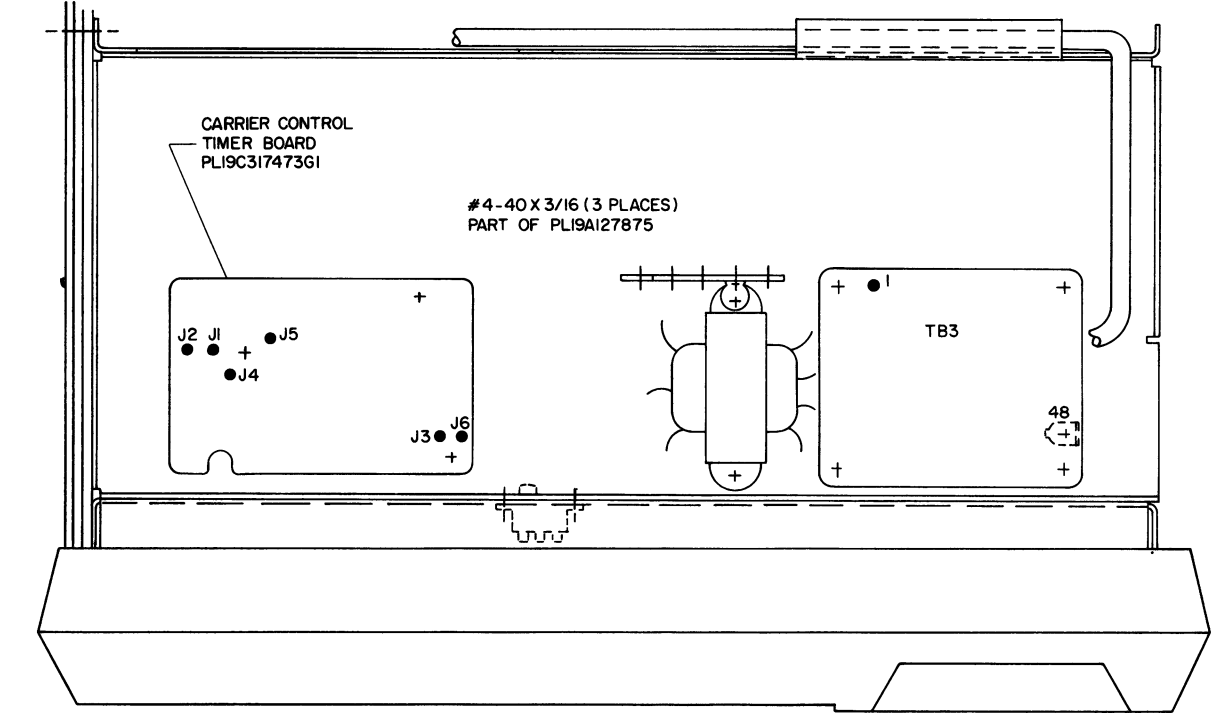
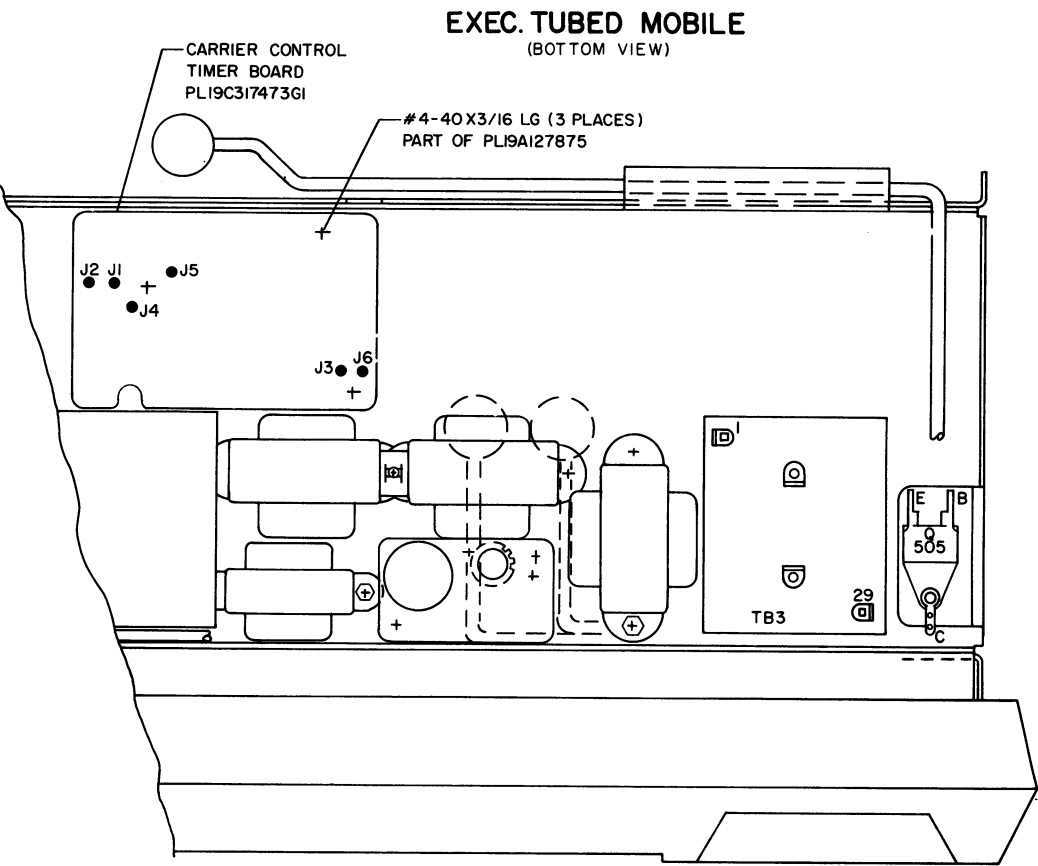
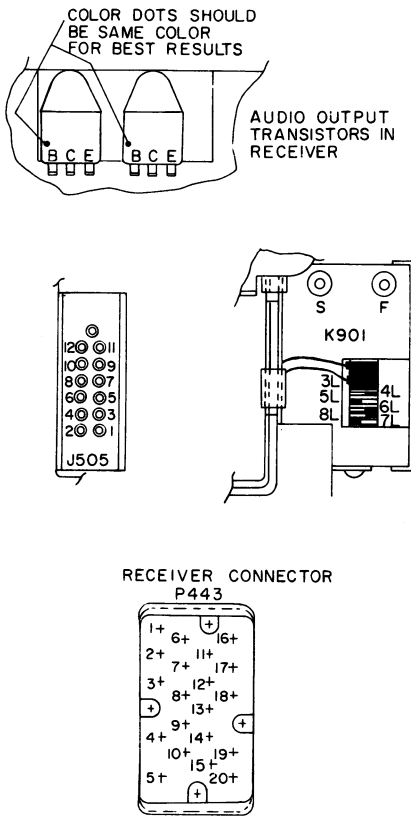
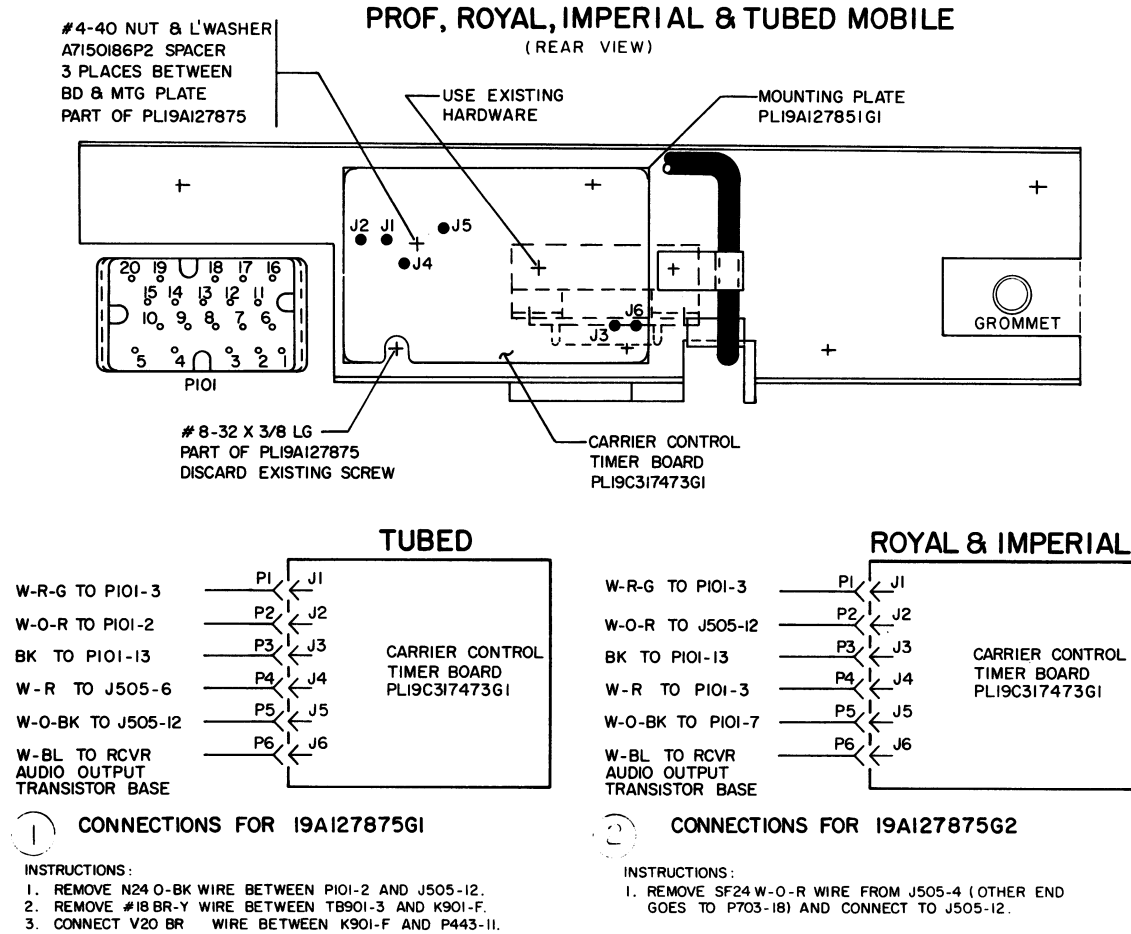
SYMBOL	GE PART NO.	DESCRIPTION
R12*	3R77P821K	Composition: 820 ohms \pm 10%, 1/2 w. Earlier than REV A:
	3R77P102K	Composition: 1K ohms \pm 10%, 1/2 w.
R13	3R77P821K	Composition: 820 ohms \pm 10%, 1/2 w.
R14	3R77P512J	Composition: 5.1K ohms \pm 5%, 1/2 w.
R15	3R77P102K	Composition: 1K ohms \pm 10%, 1/2 w.
R16 and R17	3R77P223K	Composition: 22K ohms \pm 10%, 1/2 w.
R18	3R77P102K	Composition: 1K ohms \pm 10%, 1/2 w.
R19 and R20	3R77P303J	Composition: 30K ohms \pm 5%, 1/2 w.
R21	19B209358P107	Variable, carbon film: approx 800 to 25K ohms \pm 10%, 0.25 w; sim to CTS Type X-201.
		- - - - - VOLTAGE REGULATORS - - - - -
VR1	4036887P11	Zener: 500 mW, 10.0 v. nominal.
VR2	4036887P6	Zener: 500 mW, 6.5 v. nominal.
		- - - - - MISCELLANEOUS - - - - -
	4036555P1	Insulator, washer: nylon. (Used with Q6).

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.

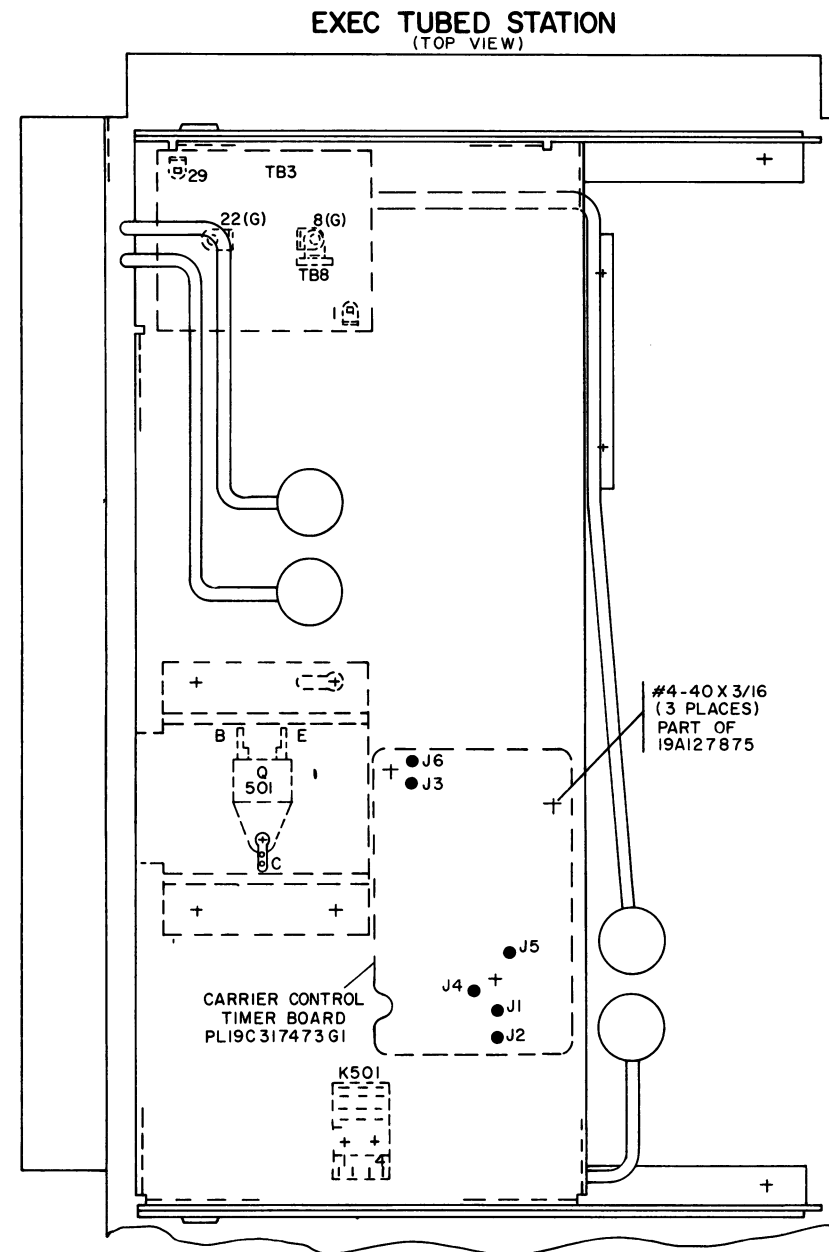
REV. A - To compensate for transistor variation.
Changed Q5, R6, R10, R11, and R12.

REV. B - To reduce failure of Q6 caused by negative voltage spikes from vehicles electrical systems.
Added CR9 across Q6.

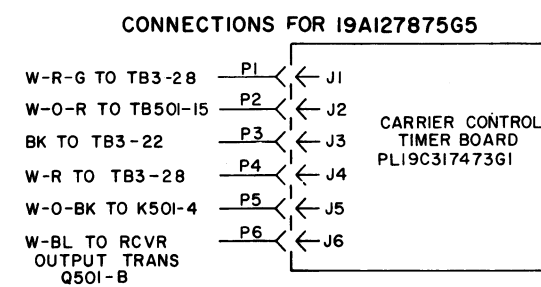


- NOTES: (FOR SHEETS 1 & 2)
- SOLDER ALL ELECTRICAL CONNECTIONS.
 - ALL WIRE IS SF24 UNLESS SPECIFIED OTHERWISE.
WIRES ARE CALLED FOR ON PL19AI27875.
 - P1 THRU P6 ARE FEMALE CONTACTS CALLED FOR
ON PL19AI27875.

INSTALLATION DIAGRAM
MASTR ROYAL & TUBED PROFESSIONAL MOBILE
MASTR EXECUTIVE TUBED MOBILE
MASTR ROYAL EXECUTIVE MOBILE

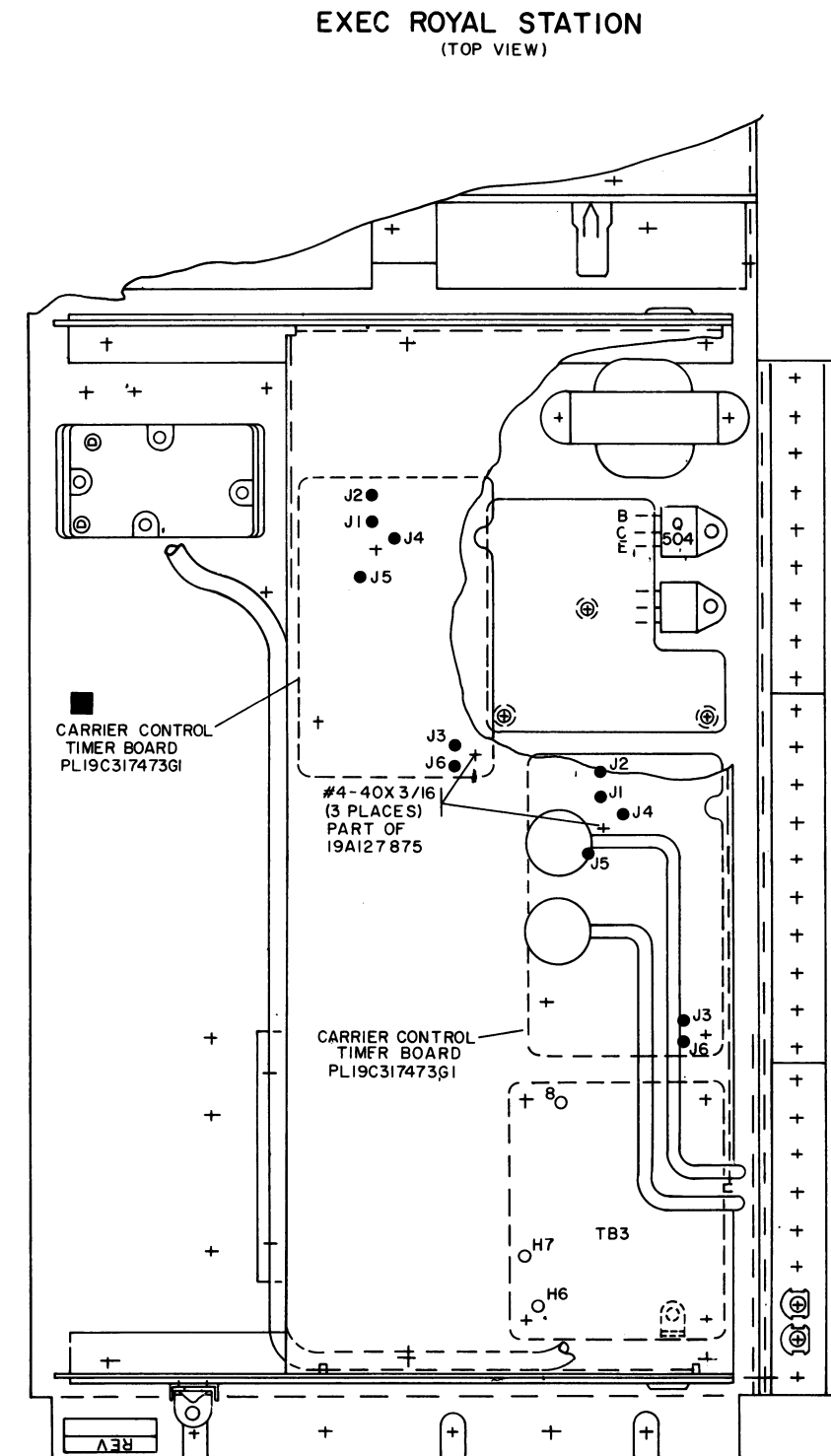


⑤ INSTRUCTIONS:
I. REMOVE N22 W-R-BK BETWEEN TB50I-15 AND K50I-4.



INSTALLATION DIAGRAM

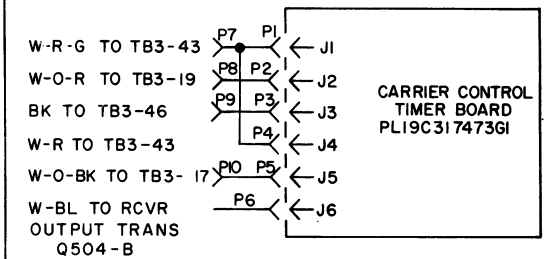
MASTR EXECUTIVE TUBED STATION
MASTR ROYAL EXECUTIVE STATION



■ TIMER OPTION SHALL BE ASSEMBLED IN THIS LOCATION WHEN STATION IS EQUIPPED WITH REMOTE CONTROL OPTION

⑥ INSTRUCTIONS:
1. REMOVE JUMPER BETWEEN TB3-17 AND TB3-19.

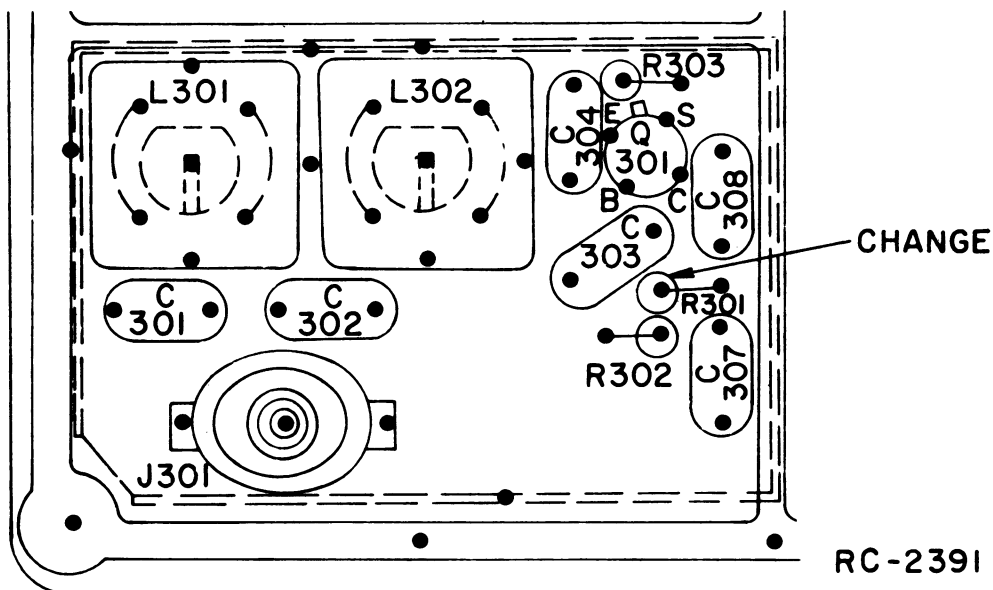
CONNECTIONS FOR 19A127875G6



P7 IS A FEMALE CONTACT (A4029840PI)
CALLED FOR ON PLI9AI27875G6

INSTRUCTIONS

This modification for 406-470 MHz receivers Types ER-49-A and ER-50-A reduces the susceptibility of these receivers to intermodulation interference by decreasing the receiver sensitivity.



PROCEDURE

1. Remove the top cover from the receiver.
2. Locate and replace R301 (see Figure 1) with a 1.5 K ohm, 5% 1/4 Watt resistor (GE PART NO. 3R152P152J).
3. Replace the top cover.

TEST SPECIFICATIONS

1. Receiver specification changes are as follows:

12-dB SINAD	Tune L302 for maximum receiver quieting. SINAD should be 0.8 microvolts or less.
EIA Intermodulation	unchanged (-60 dB)
2. More receiver sensitivity degradation can be obtained by decreasing the value of the 1.5 K ohm resistor in small increments.

MODIFICATION INSTRUCTIONS

Reduction of Intermodulation Interference
(Option 8302)

INSTRUCTIONS

This modification for 132-174 MHz receivers Type ER-48-C reduces the susceptibility of the receiver to intermodulation interference by decreasing the receiver sensitivity.

PROCEDURE

1. Remove the top cover from the receiver.
2. Unsolder the lead of capacitor C305 (see Figure 1) and solder one lead of a 39-ohm, 5%, 1/4-watt resistor (GE Part No. 3R152P390J) into the hole from which the capacitor lead was removed.
3. Solder the other lead of the resistor and capacitor together as shown in View "A".
4. Replace the top cover.

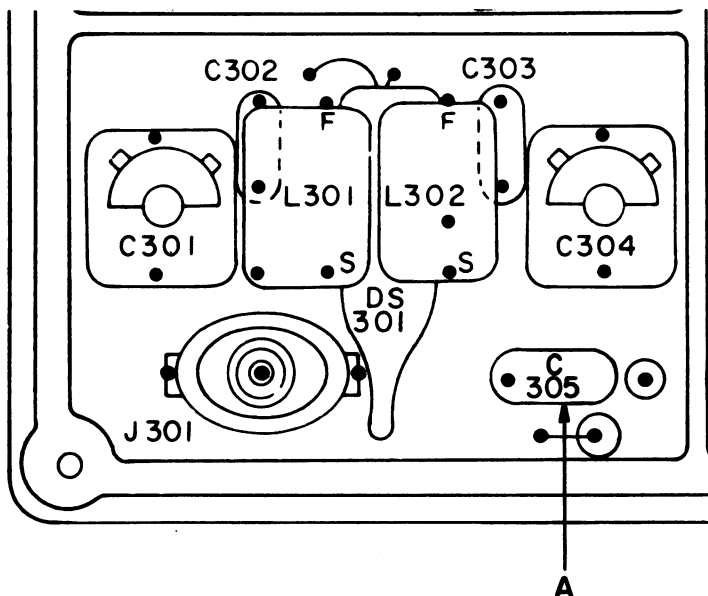


Figure 1 - Installation Diagram

TEST SPECIFICATIONS

1. Receiver specification changes are as follows:

20-dB Quieting	0.6 microvolts
12-dB SINAD	0.4 microvolts
EIA Intermodulation	unchanged (-70 dB)
Critical Squelch	less than 12-dB SINAD
2. More receiver sensitivity degradation can be obtained by increasing the value of the 39-ohm resistor in small increments.

MODIFICATION INSTRUCTIONS

Reduction of Intermodulation Interference
(Option 8302)

RC-2400
