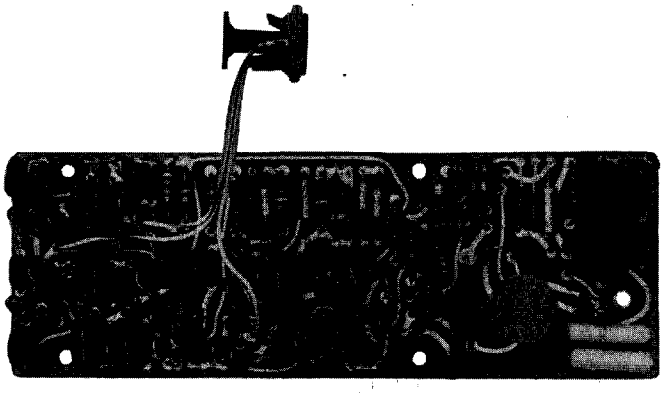
MOBILE RADIO

# MAINTENANCE MANUAL

## CHANNEL GUARD ENCODER/DECODER MODELS 4EK14B10 & 4EK14B11
## CHANNEL GUARD DECODE ONLY (OPTION 8026)
## TONE REJECT FILTER 19C317355-G2



### SPECIFICATIONS *

| | |
|---|---|
| Used with 4EK14B10 | MASTR Progress Line Executive Series and Royal Executive Mobile and Station Combinations |
| 4EK14B11 | MASTR Progress Line Custom Executive Mobile Combinations |
| Tone Frequencies | 71.9 to 203.5 Hertz |
| Encoder Distortion | Less than 3% |
| Decoder Response | ±1.5 dB from 71.9 to 203.5 Hertz (100 Hz Ref.) |
| Power Requirements | 10 VDC @ 50 Milliamperes |
| Number of Silicon transistors | 8 |
| Temperature Range | -30°C to +60°C (-22°F to 144°F) |

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

GENERAL ELECTRIC

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**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 Channel Guard Models 4EK14B10 and 4EK14B11 are fully transistorized Encoder/Decoder.

The encoder function provides coded tone modulation for the transmitter.

The decoder function is used with the receiver to eliminate all calls that are not tone coded for the channel guard frequency.

The tone frequencies are controlled by plug-in tone networks that are made with precision components for excellent stability and reliability. The channel guard board is located in the option area as shown in Figures 1 and 2.

Tone Reject Filter 19C317355G2 is available for use in a non-Channel Guard mobile or station receiving calls that are tone modulated.

## INSTALLATION

To install Channel Guard board in the field, refer to the installation diagrams listed in the table of contents. In 25-50 MHz applications only, the transmitter exciter board has to be modified.

## CIRCUIT ANALYSIS

References to symbol numbers mentioned in the following text are found on the Schematic Diagrams, Outline Diagrams and Parts Lists (see Table of Contents). A block diagram of the Channel Guard is shown in Figure 3.

Cable W603 (W604 for Royal) connects the supply voltage, encoder keying voltage and decoder functions for the Channel Guard board to the system terminal board (TB3). The encoder tone output is connected by a white-black shielded lead to the transmitter exciter board.

ENCODER

The encoder tone is provided by Q604 and Q605 which oscillate at a frequency determined by the tone network. Negative feedback, applied thru the tone network to the base of Q604, prevents any gain in the stage except at the operating frequency.

Keying the transmitter applied +10 Volts to the anode of feedback control diode CR605, causing it to conduct. When conducting, the diode shunts R635 which reduces the impedance of the positive feedback loop (R635, R633 and C617). This provides the necessary gain to the base of Q604 to permit oscillation, and the oscillator locks in on the Channel Guard frequency.

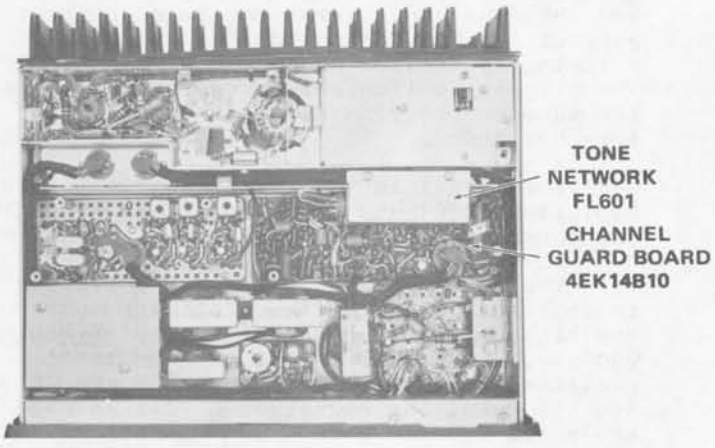



Figure 1 - Executive & Royal Executive

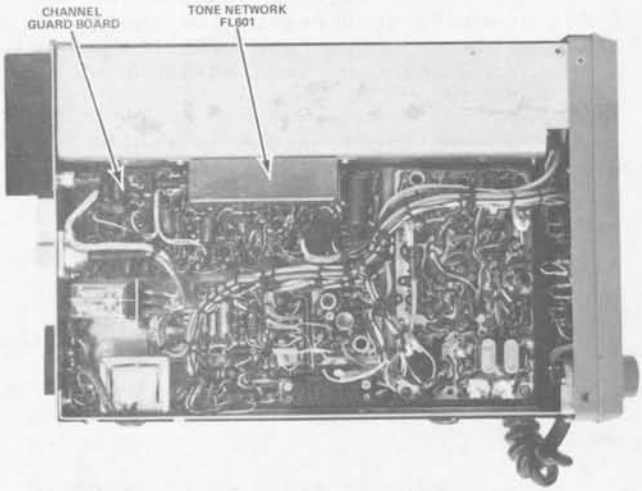



Figure 2 - Custom Executive

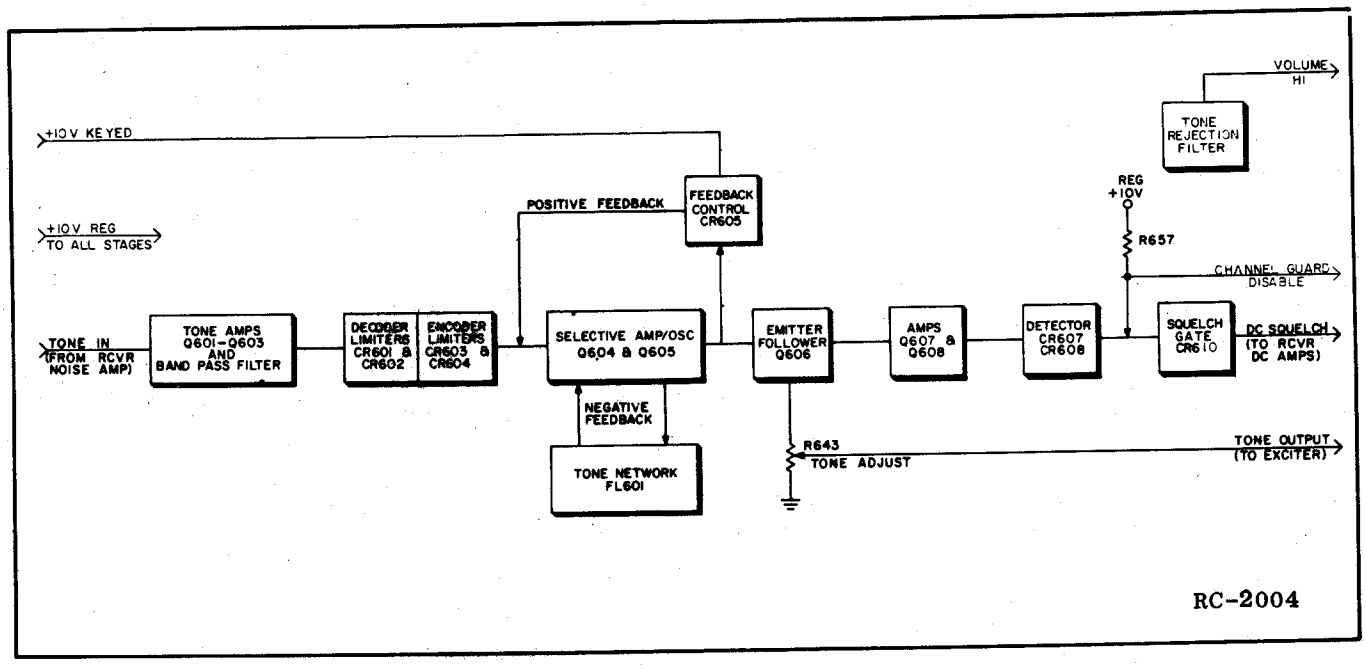



Figure 3 - Channel Guard Block Diagram

An extremely fast starting time for the encoder tone is provided by a starting network consisting of R641, C618, C619 and CR606. This network utilizes a positive pulse from the +10 Volts keying voltage to provide the positive feedback required to start oscillation.

Thermistor-resistor combination R663-RT604 provides temperature compensation for the oscillator output, and limiter diodes CR603 and CR604 keep the amplitude of the tone constant.

The oscillator output is fed to emitter-follower Q606, and then to TONE ADJUST potentiometer R643. This control is normally set for a ±0.75 kHz deviation as outlined in the Transmitter Modulation Adjustment Procedure.

The encoder tone is applied to the modulator stage on the transmitter exciter board.

## DECODER

The decoder function is designed to eliminate all calls that are not tone coded for the Channel Guard Frequency. As long as the MONITOR switch is not depressed, all signals are locked out except those from transmitters that are continuously tone coded for positive identification by the receiver. Pressing the MONITOR switch instantly disables the Channel Guard and noise squelch circuits so that all calls on the channel can be heard.

Audio, tone and noise are taken from the collector of audio-noise amplifier Q316 in the receiver and is fed thru J601-4 to three tone amplifier and bandpass filter circuits. The filters remove the audio and high-frequency noise from the signal, and the tone amplifiers provide sufficient gain of all Channel Guard tones to insure clipping by limiter diodes CR601 and CR602. The clipping action eliminates variation in the squelch performance due to changes in tone deviation.

The signal is then applied to selective amplifiers Q604 and Q605, which amplify only the tone determined by the tone network.

The output of the selective amplifier is applied through emitter-follower Q606 to the high gain, broad-band tone amplifiers Q607 and Q608. The output of Q608 is rectified by detector diodes CR607 and CR608, and the resulting negative DC voltage controls the squelch gate. Q607 is normally biased for low gain. When the tone is detected by CR607 and CR608, feedback is provided through R655 to quickly change the bias on Q607 for full gain. This ensures a more positive "unsquelching" action.

Squelch gate diode CR610 is normally forward biased by a positive DC voltage (approximately 1.5 Volts) fed through R657. The forward bias causes CR610 to conduct, feeding a DC voltage to the base of noise amplifiers Q320 and Q321 in the receiver. This removes the bias on the receiver audio stages and holds them off.

When the proper tone is applied to the decoder, the negative DC voltage from the detector diodes CR607 & CR608 back-biases squelch gate diode CR610, and cuts off the positive bias to the DC amplifiers. However, the receiver noise squelch circuit continues to operate until a carrier quiets the receiver.

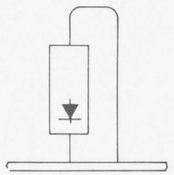
Pressing the MONITOR switch on the control unit grounds the base biasing circuit of the DC amplifiers and disables both the Channel Guard and noise squelch circuits. If the optional hookswitch is provided, removing the microphone from its hanger automatically disables Channel Guard while maintaining normal noise squelch operation.

A tone rejection filter connected in parallel with the VOLUME control bypasses the tone to ground, thereby attenuating the tone level reaching the audio circuits. The filter is composed of L601, C624, C626, C629, C630 and R659.

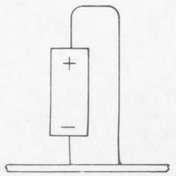
## ADJUSTMENT

The decode function and the tone reject filter function requires no adjustment. To adjust the tone level of the encode function, proceed as follows:

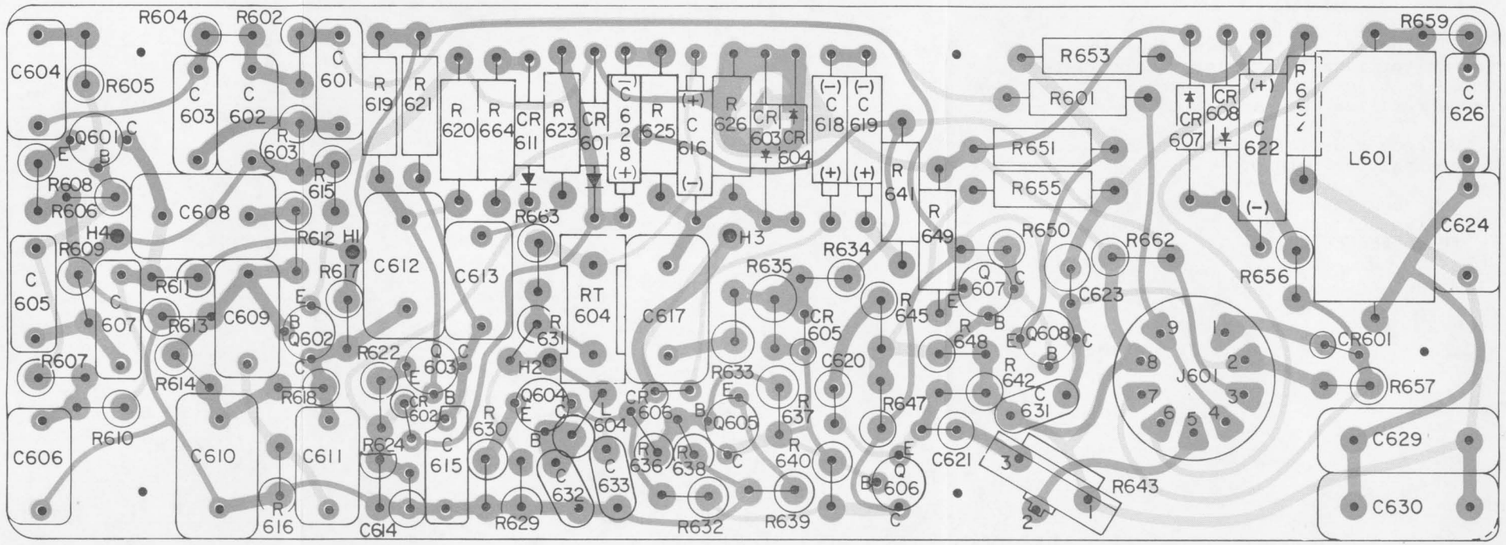
1. Connect a deviation monitor to the transmitter output.
2. Key the transmitter and adjust R643 on the Channel Guard board for ±0.75 kHz deviation.

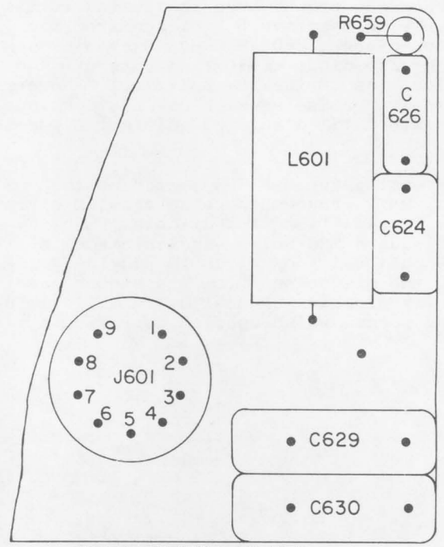


CR602
CR605
CR606
CR610



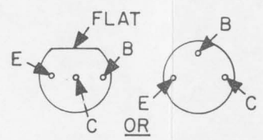
C614
C620
C621
C623




TONE REJECT FILTER
19C317355G2

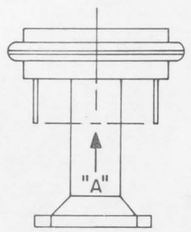
LEAD IDENTIFICATION
FOR Q601 - Q608



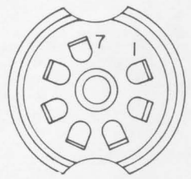

IN-LINE TRIANGULAR
VIEW FROM LEAD END

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

XFL601

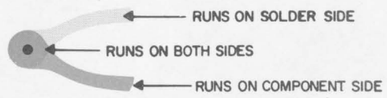



XFL601



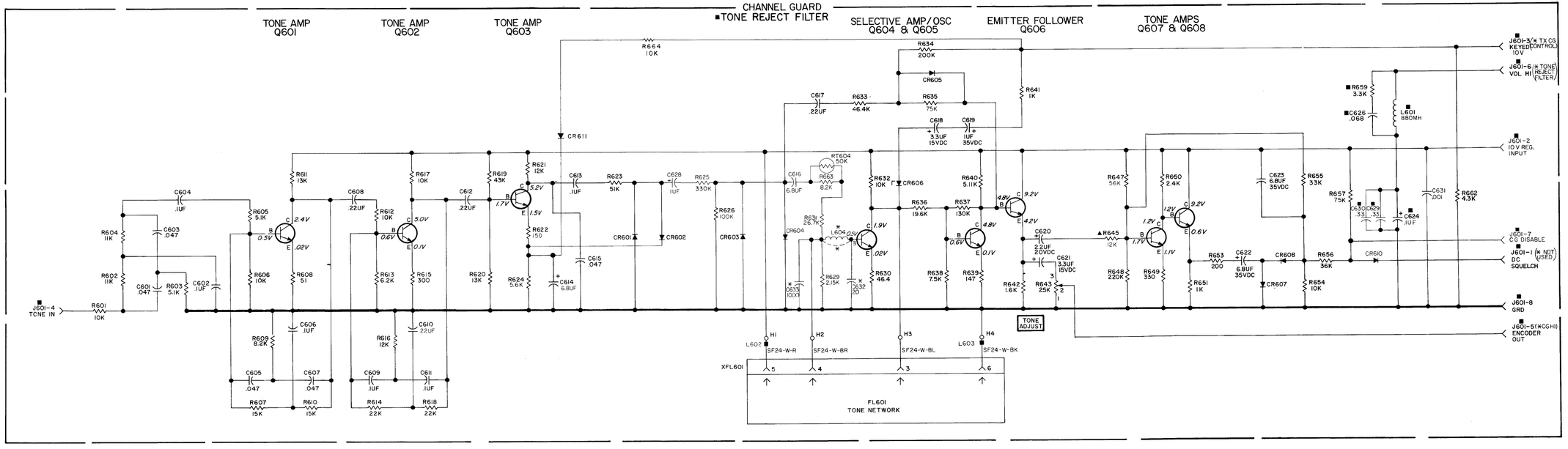

VIEW "A"

(19C317634, Rev. 3)
(19B216922, Sh. 1, Rev. 4)
(19B216922, Sh. 2, Rev. 3)




## OUTLINE DIAGRAM

CHANNEL GUARD ENCODER/DECODER
MODELS 4EK14B10 AND 4EK14B11




| 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 |
| 4EK14B10 | C |
| 4EK14B11 | B |

▲VALUE OF R645 IS DETERMINED BY TEST (SEE TEST SPECS)
*REPLACE L604 WITH DA WIRE FOR 4EK14B10. L604, C632, & C633 USED IN 4EK14B11 ONLY.

## VOLTAGE READINGS

VOLTAGE READINGS ARE TYPICAL READINGS MEASURED FROM TRANSISTOR PIN TO GROUND WITH A 20,000 OHM-PER-VOLT METER, AND WITH NO TONE INPUT AND THE ENCODER NOT KEYED.

■ COMPONENTS THAT ARE COMMON TO CHANNEL GUARD & TONE REJECT FILTER.
* ALTERNATE FUNCTION WHEN USED WITH THE EXECUTIVE II RADIO.

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

(19R621326, Rev. 5)

# SCHEMATIC DIAGRAM

CHANNEL GUARD ENCODER/DECODER
MODELS 4EK14B10 AND 4EK14B11

## PARTS LIST

LBI-4142C

CHANNEL GUARD ENCODER/DECODER
4EK14B10 (19C317355G1)
4EK14B11 (19C317355G3)

| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C601 | 19A116080P205 | Polyester: 0.047 µf ±5%, 50 VDCW. |
| C602 | 19A116080P207 | Polyester: 0.1 µf ±5%, 50 VDCW. |
| C603 | 19A116080P205 | Polyester: 0.047 µf ±5%, 50 VDCW. |
| C604 | 19A116080P7 | Polyester: 0.1 µf ±20%, 50 VDCW. |
| C605 | 19A116080P205 | Polyester: 0.047 µf ±5%, 50 VDCW. |
| C606 | 19A116080P207 | Polyester: 0.1 µf ±5%, 50 VDCW. |
| C607 | 19A116080P205 | Polyester: 0.047 µf ±5%, 50 VDCW. |
| C608 | 19A116080P9 | Polyester: 0.22 µf ±20%, 50 VDCW. |
| C609 | 19A116080P207 | Polyester: 0.1 µf ±5%, 50 VDCW. |
| C610 | 19A116080P109 | Polyester: 0.22 µf ±10%, 50 VDCW. |
| C611 | 19A116080P207 | Polyester: 0.1 µf ±5%, 50 VDCW. |
| C612 | 19A116080P9 | Polyester: 0.22 µf ±20%, 50 VDCW. |
| C613 | 19A116080P7 | Polyester: 0.1 µf ±20%, 50 VDCW. |
| C614 | 5496267P1 | Tantalum: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D. |
| C615 | 19A116080P5 | Polyester: 0.047 µf ±20%, 50 VDCW. |
| C616 | 5496267P1 | Tantalum: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D. |
| C617 | 19A116080P9 | Polyester: 0.22 µf ±20%, 50 VDCW. |
| C618 | 5496267P9 | Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D. |
| C619 | 5496267P17 | Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D. |
| C620 | 5496267P13 | Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D. |
| C621 | 5496267P9 | Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D. |
| C622 and C623 | 5496267P18 | Tantalum: 6.8 µf ±20%, 35 VDCW; sim to Sprague Type 150D. |
| C624 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C626 | 19A116080P206 | Polyester: 0.068 µf ±5%, 50 VDCW. |
| C628 | 5496267P17 | Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D. |
| C629 and C630 | 19A116080P110 | Polyester: 0.33 µf ±10%, 50 VDCW. |
| C631 | 5494481P111 | Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. |
| C632* | 5496218P46 | Ceramic disc: 20 pf ±5%, 500 VDCW, temp coef 0 PPM. Added by REV A in Model 4EK14B11 only). |
| C633* | 5494481P112 | Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. Added by REV A in Model 4EK14B11 only). |
| | | - - - - - - - DIODES AND RECTIFIERS - - - - - - - |
| CR601 and CR602 | 19A115250P1 | Silicon. |
| CR603 and CR604 | 5494922P1 | Silicon, sim to 1N456. |
| CR605 | 19A115250P1 | Silicon. |
| CR606 | 4036887P3 | Silicon, Zener. |
| CR607 and CR608 | 19A115250P1 | Silicon. |
| CR610 | 19A115250P1 | Silicon. |
| CR611* | 19A115250P1 | Silicon. Added to 4EK14B10 by REV C; Added to 4EK14B11 by REV B. |
| | | - - - - - - - - - TONE NETWORKS - - - - - - - - - |
| FL601 | 19B205280 | Tone Detector. (Check group numbers for desired frequency). |
| | G1 | 71.9 Hz |
| | G2 | 77.0 Hz |
| | G3 | 82.5 Hz |
| | G4 | 88.5 Hz |
| | G5 | 94.8 Hz |
| | G6 | 100.0 Hz |
| | G7 | 103.5 Hz |
| | G8 | 107.2 Hz |
| | G9 | 110.9 Hz |
| | G10 | 114.8 Hz |
| | G11 | 118.8 Hz |
| | G12 | 123.0 Hz |
| | G13 | 127.3 Hz |
| | G14 | 131.8 Hz |
| | G15 | 136.5 Hz |
| | G16 | 141.3 Hz |
| | G17 | 146.2 Hz |
| | G18 | 151.4 Hz |
| | G19 | 156.7 Hz |
| | G20 | 162.2 Hz |
| | G21 | 167.9 Hz |
| | G22 | 173.8 Hz |
| | G23 | 179.9 Hz |
| | G24 | 186.2 Hz |
| | G25 | 192.8 Hz |
| | G26 | 203.5 Hz |
| | G30 | 74.4 Hz |
| | G31 | 79.7 Hz |
| | G32 | 85.4 Hz |
| | G33 | 91.5 Hz |
| | G34 | 97.4 Hz |
| | | - - - - - - - JACKS AND RECEPTACLES - - - - - - |
| J601 | 19B209303P1 | Plug, phen: 9 pins. |
| | | - - - - - - - - - INDUCTORS - - - - - - - - - |
| L601 | 19A115690P1 | Reactor: 880 mh ind, 120 amp ±15% DC res; sim to Artted AC5672. |
| L602* and L603* | 19A115700P2 | RF Choke: sim to SLS207. Added by REV A in Model 4EK14B10 only. |
| L604* | 19B209420P125 | Choke, RF: 10.0 µh ±10%, 3.10 ohms DC res max; sim to Jeffers 4446-4. Added by REV A in Model 4EK14B11 only). |
| | | - - - - - - - - - TRANSISTORS - - - - - - - - - |
| Q601 | 19A115362P1 | Silicon, NPN; sim to Type 2N2925. |
| Q602 and Q603 | 19A115123P1 | Silicon, NPN. |
| Q604 thru Q607 | 19A115362P1 | Silicon, NPN; sim to Type 2N2925. |
| Q608 | 19A115123P1 | Silicon, NPN. |
| | | - - - - - - - - - RESISTORS - - - - - - - - - |
| R601 | 3R77P103K | Composition: 10K ohms ±10%, 1/2 w. |
| R602 | 3R77P113J | Composition: 11K ohms ±5%, 1/2 w. |
| R603 | 3R77P512J | Composition: 5.1K ohms ±5%, 1/2 w. |
| R604 | 3R77P113J | Composition: 11K ohms ±5%, 1/2 w. |
| R605 | 3R77P512J | Composition: 5.1K ohms ±5%, 1/2 w. |
| R606 | 3R77P103J | Composition: 10K ohms ±5%, 1/2 w. |
| R607 | 3R77P153J | Composition: 15K ohms ±5%, 1/2 w. |
| R608 | 3R77P510J | Composition: 51 ohms ±5%, 1/2 w. |
| R609 | 3R77P822J | Composition: 8.2K ohms ±5%, 1/2 w. |
| R610 | 3R77P153J | Composition: 15K ohms ±5%, 1/2 w. |
| R611 | 3R77P133J | Composition: 13K ohms ±5%, 1/2 w. |
| R612 | 3R77P103J | Composition: 10K ohms ±5%, 1/2 w. |
| R613 | 3R77P622J | Composition: 6.2K ohms ±5%, 1/2 w. |
| R614 | 3R77P223J | Composition: 22K ohms ±5%, 1/2 w. |
| R615 | 3R77P301J | Composition: 300 ohms ±5%, 1/2 w. |
| R616 | 3R77P123J | Composition: 12K ohms ±5%, 1/2 w. |
| R617 | 3R77P103J | Composition: 10K ohms ±5%, 1/2 w. |
| R618 | 3R77P223J | Composition: 22K ohms ±5%, 1/2 w. |
| R619 | 3R77P433J | Composition: 43K ohms ±5%, 1/2 w. |
| R620 | 3R77P133J | Composition: 13K ohms ±5%, 1/2 w. |
| R621 | 3R77P123J | Composition: 12K ohms ±5%, 1/2 w. |
| R622 | 3R77P151J | Composition: 150 ohms ±5%, 1/2 w. |
| R623 | 3R77P513J | Composition: 51K ohms ±5%, 1/2 w. |
| R624 | 3R77P562J | Composition: 5.6K ohms ±5%, 1/2 w. |
| R625 | 3R77P334J | Composition: 330K ohms ±5%, 1/2 w. |
| R626 | 3R77P104J | Composition: 100K ohms ±5%, 1/2 w. |
| R629 | 19A116278P233 | Metal film: 2.15K ohms ±2%, 1/2 w. |
| R630 | 19A116278P65 | Metal film: 46.4 ohms ±2%, 1/2 w. |
| R631 | 19A116278P342 | Metal film: 26.70K ohms ±2%, 1/2 w. |
| R632 | 19A116278P301 | Metal film: 100K ohms ±2%, 1/2 w. |
| R633 | 19A116278P365 | Metal film: 46.40K ohms ±2%, 1/2 w. |
| R634 | 3R77P204J | Composition: 200K ohms ±5%, 1/2 w. |
| R635 | 19A116278P385 | Metal film: 75K ohms ±2%, 1/2 w. |
| R636 | 19A116278P329 | Metal film: 19.60K ohms ±2%, 1/2 w. |
| R637 | 19A116278P412 | Metal film: 130K ohms ±2%, 1/2 w. |
| R638 | 19A116278P285 | Metal film: 7.5K ohms ±2%, 1/2 w. |
| R639 | 19A116278P117 | Metal film: 147 ohms ±2%, 1/2 w. |
| R640 | 19A116278P269 | Metal film: 5.11K ohms ±2%, 1/2 w. |
| R641 | 3R77P102J | Composition: 1K ohms ±5%, 1/2 w. |
| R642 | 3R77P162J | Composition: 1.6K ohms ±5%, 1/2 w. |
| R643 | 19B209358P107 | Variable, carbon film: approx 800 to 25K ohms ±10%, 0.25 w; sim to CTS Type X-201. |
| R645A | 3R77P822J | Composition: 8.2K ohms ±5%, 1/2 w. |
| R645B | 3R77P912J | Composition: 9.1K ohms ±5%, 1/2 w. |
| R645C | 3R77P103J | Composition: 10K ohms ±5%, 1/2 w. |
| R645D | 3R77P113J | Composition: 11K ohms ±5%, 1/2 w. |
| R645E | 3R77P123J | Composition: 12K ohms ±5%, 1/2 w. |
| R645F | 3R77P133J | Composition: 13K ohms ±5%, 1/2 w. |
| R645G | 3R77P153J | Composition: 15K ohms ±5%, 1/2 w. |
| R645H | 3R77P752J | Composition: 7.5K ohms ±5%, 1/2 w. |
| R647 | 3R77P563J | Composition: 56K ohms ±5%, 1/2 w. |
| R648 | 3R77P224J | Composition: 220K ohms ±5%, 1/2 w. |
| R649 | 3R77P331J | Composition: 330 ohms ±5%, 1/2 w. |
| R650 | 3R77P242J | Composition: 2.4K ohms ±5%, 1/2 w. |
| R651 | 3R77P102J | Composition: 1K ohms ±5%, 1/2 w. |
| R653 | 3R77P201J | Composition: 200 ohms ±5%, 1/2 w. |
| R654 | 3R77P103J | Composition: 10K ohms ±5%, 1/2 w. |
| R655 | 3R77P333J | Composition: 33K ohms ±5%, 1/2 w. |
| R656 | 3R77P363J | Composition: 36K ohms ±5%, 1/2 w. |
| R657 | 3R77P753J | Composition: 75K ohms ±5%, 1/2 w. |
| R659 | 3R77P332J | Composition: 3.3K ohms ±5%, 1/2 w. |
| R662 | 3R77P432J | Composition: 4.3K ohms ±5%, 1/2 w. |
| R663 | 3R77P822J | Composition: 8.2K ohms ±5%, 1/2 w. |
| R664* | 3R77P103J | Composition: 10K ohms ±5%, 1/2 w. Added to 4EK14B10 by REV C; Added to 4EK14B11 by REV B. |
| | | - - - - - - - - - THERMISTORS - - - - - - - - - |
| RT604 | 5490828P22 | Thermistor: 50K ohms ±10%, color code yellow; sim to Carborundum type 703H-J4. |
| | | - - - - - - - - - SOCKETS - - - - - - - - - |
| XFL601 | 19B209341P1 | Socket, tube: 7 pins; sim to Elco 04-720-XX. |
| | | - - - - - - - - - MISCELLANEOUS - - - - - - - - - |
| | 19A122138P1 | Knob. (Used with XFL601). |
| | N197P408C13 | Wood, screw. (Used with XFL601 in Tubed and Royal Executive only). |
| | N80P9005C13 | Screw, machine. (Mounts printed circuit board). |
| | N404P11C13 | Lockwasher, internal tooth: No. 4. (Mounts printed circuit board in Tubed and Royal Executive only). |
| | 19B201074P304 | Tap screw, Phillips POZIDRIV®: No. 6-32 x 1/4. (Mounts 19B205387P1 support in Tubed and Royal Executive only). |
| | 19B205387P1 | Support. (Mounts FL601 in Tubed and Royal Executive only). |
| | 4032591P28 | Pressure sensitive pad. (Used with 19B205387P1 support in Tubed and Royal Executive only). |
| | 19D416585P5 | Support. (Used with XFL601 in Custom Executive). |
| | 19B201074P205 | Tap screw, Phillips POZIDRIV®: No. 4-40-5/16. (Secures XFL601 in Custom Executive). |
| | 19B201074P204 | Tap, screw, Phillips POZIDRIV®: No. 4-40-1/4. (Secures printed wiring board in Custom Executive). |
| | 19A122213G1 | Cover Kit. Includes: |
| | 19B209209P305 | Screw, tap: Phillips POZIDRIV®: No. 6-32 x 5/16. (Mounts cover thru the side rail). |
| | 19B201074P305 | Screw, tap: Phillips POZIDRIV®: No. 6-32 x 5/16. (Mounts cover to Tone Network). |
| W601 | | CABLE ASSEMBLY 19B226872G2 |
| | | - - - - - - - - - - PLUGS - - - - - - - - - - |
| P601 | 19B209341P2 | Socket, tube: 9 pins; sim to Elco 04-920-XX. |
| P907 | | Connector. Includes: |
| | 19A116659P81 | Shell. |
| | 19A116781P6 | Contact, electrical: wire range No. 22-26 AWG; sim to Molex 08-50-0108. (Quantity 7). |
| | 19A116781P5 | Contact, electrical: wire range No. 16-20 AWG; sim to Molex 08-50-0106. (Quantity 1). |
| | 19A134048P1 | Wood screw, phillips head: No. 4, 1/2 inch long. |
| | 19A122138P1 | Knob. |
| W603 | 19B205345G2 | Channel Guard Cable, Tubed Executive combinations. |
| W604 | 19B216090G2 | Channel Guard Cable, Royal Executive combinations. |

## 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 description of parts affected by these revisions.

REV. A - Model 4EK14B10 only

To eliminate RF interference. Added L602 and L603.

REV. A - Model 4EK14B11 only

REV. B - Model 4EK14B10 only

To eliminate RF interference in Custom Executive applications
Added C362, C363 and L604.

REV. C - Model 4EK14B10 only

REV. B - Model 4EK14B11 only

To stabilize encoder frequency.
Added CR611 and R664.

## PARTS LIST

LBI-4171B

TONE REJECT FILTER
19C317355G2

| SYMBOL | GE PART NO. | DESCRIPTION |
|---|---|---|
| | | - - - - - - - - - CAPACITORS - - - - - - - - - |
| C624 | 19A116080P107 | Polyester: 0.1 µf ±10%, 50 VDCW. |
| C626 | 19A116080P206 | Polyester: 0.068 µf ±5%, 50 VDCW. |
| C629 and C630 | 19A116080P110 | Polyester: 0.33 µf ±10%, 50 VDCW. |
| | | - - - - - - - JACKS AND RECEPTACLES - - - - - - |
| J601 | 19B209303P1 | Plug, phen: 9 pins. |
| | | - - - - - - - - - INDUCTORS - - - - - - - - - |
| L601 | 19A115690P1 | Coil, RF: 880 mh ±5%, sim to Artted AC5672. |
| | | - - - - - - - - - RESISTORS - - - - - - - - - |
| R659 | 3R77P332J | Composition: 3.3K ohms ±5%, 1/2 w. |
| | | - - - - - - - - - MISCELLANEOUS - - - - - - - - - |
| | N80P9005C13 | Screw, machine. (Mounts printed circuit board). |
| | N404P11C13 | Lockwasher. (Mounts printed circuit board). |
| | 19A122213G1 | Cover Kit. Includes: |
| | 19B209209P305 | Screw, tap: Phillips Pozidriv®: No. 6-32 x 5/16. (Mounts cover thru the side rail). |
| | 19B201074P305 | Screw, tap: Phillips POZIDRIV®: No. 6-32 x 5/16. (Mounts cover to Tone Network). |
| W601 | | CABLE ASSEMBLY 19B226872G2 |
| | | - - - - - - - - - - PLUGS - - - - - - - - - - |
| P601 | 19B209341P2 | Socket, tube: 9 pins; sim to Elco 04-920-XX. |
| P907 | | Connector. Includes: |
| | 19A116659P81 | Shell. |
| | 19A116781P6 | Contact, electrical: wire range No. 22-26 AWG; sim to Molex 08-50-0108. (Quantity 7). |
| | 19A116781P5 | Contact, electrical: wire range No. 16-20 AWG; sim to Molex 08-50-0106. (Quantity 1). |
| | 19A134048P1 | Wood screw, phillips head: No. 4, 1/2 inch long. |
| | 19A122138P1 | Knob. |
| W603 | 19B205345G2 | Channel Guard Cable, Tubed Executive combinations. |
| W604 | 19B216090G2 | Channel Guard Cable, Royal Executive combinations. |



*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

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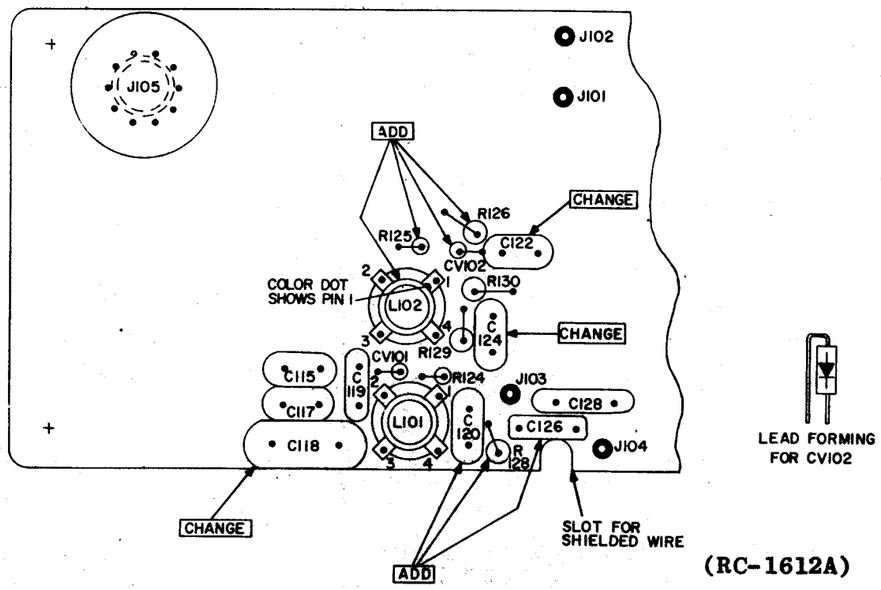



Figure 1 - Component Location (Exciter Board)

## PROCEDURE

1. Remove the four screws holding the transmitter exciter. Then remove connections from J101, J102 and J105 and remove the exciter board.

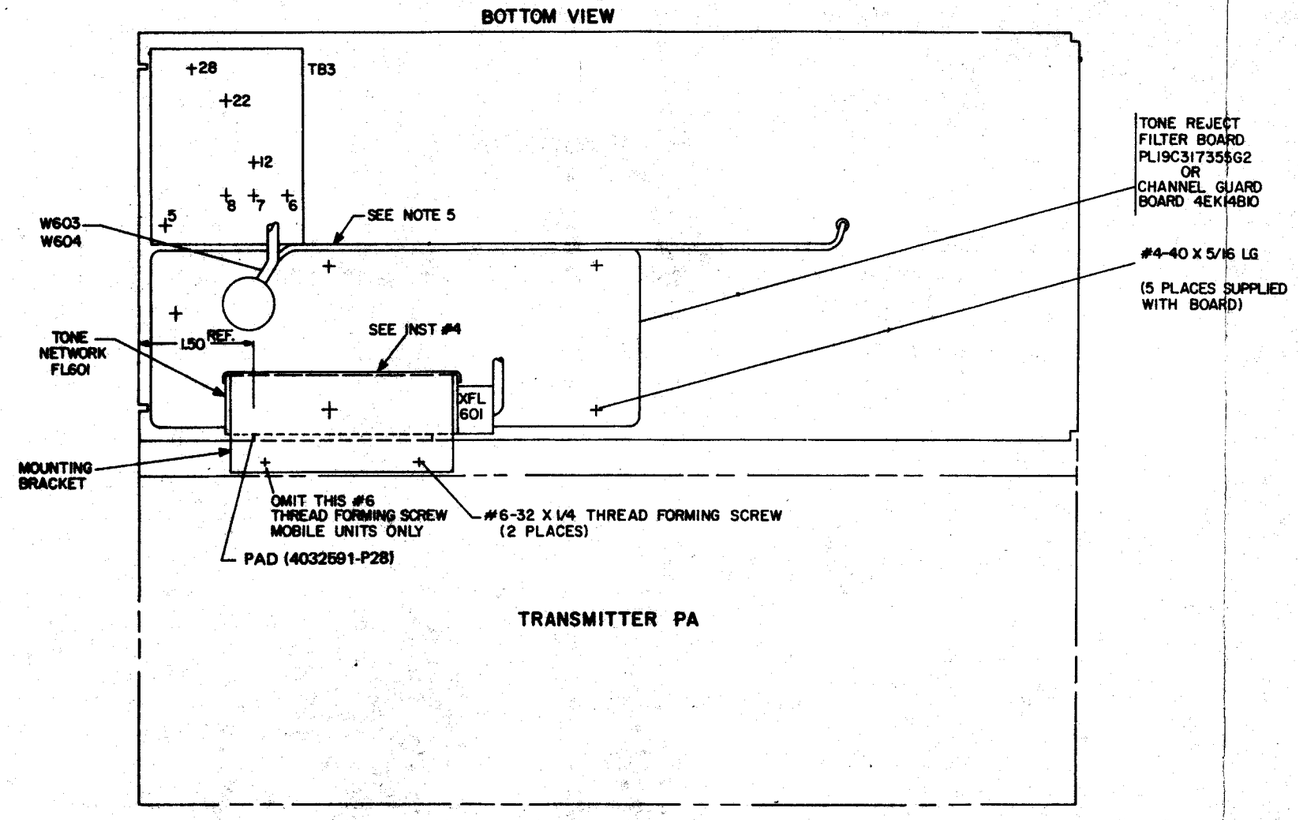
2. Modify the exciter board using appropriate kit (19A122624G1 thru G3) as instructed in Table 1. Component location is shown in Figure 1.

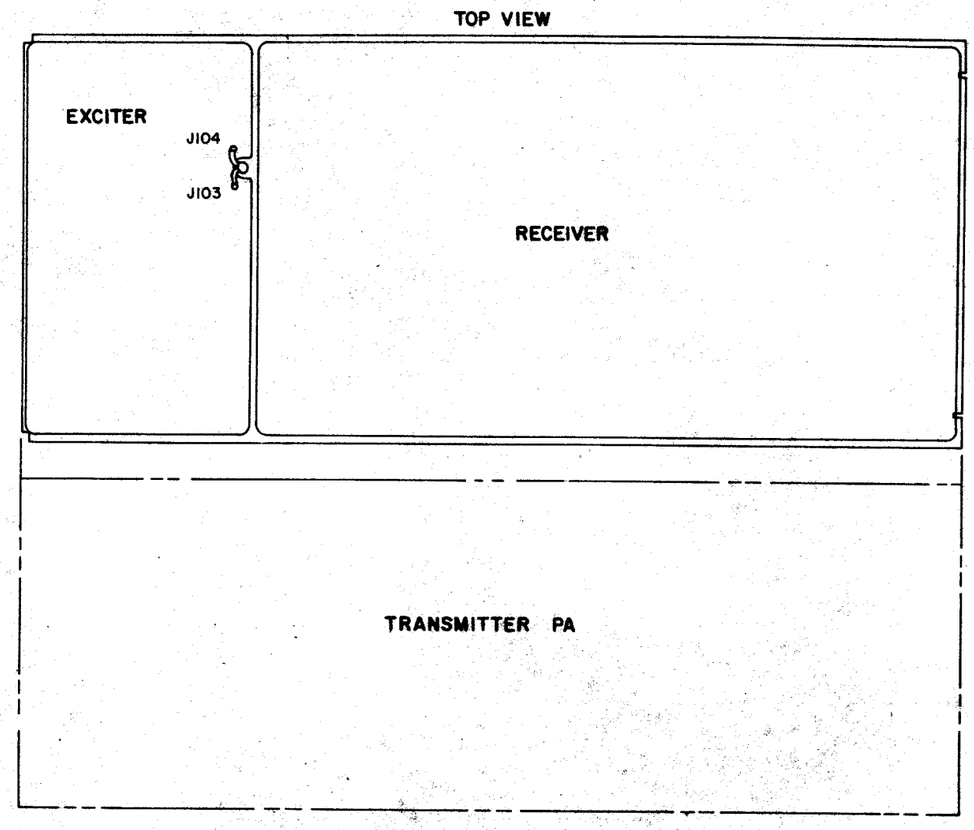
| EXCITER MODEL NUMBER | MODIFICATION KIT NUMBER | ADD | REPLACE | CHANGE MODEL NUMBER FROM | CHANGE MODEL NUMBER TO |
|---|---|---|---|---|---|
| 4EG21A10<br>4EG21A12 | 19A122624-G1<br>Service Parts Kit #0035 | C120 (470 pf, 100 VDCW)<br>C126 (0.01 µf, 40 VDCW)<br>CV102<br>L102A<br>R125 A (0.15 megohm, 1/4w)<br>R126 (10,000 ohms, 1/2 w)<br>R128 (15,000 ohms, 1/2 w) | C125 with<br>C118 A (.0015 µf, 100 VDCW);<br>C121 with<br>C122 A (220 pf, 500 VDCW);<br>and C123 with<br>C124 (150 pf, 100 VDCW) | 4EG21A10<br>4EG21A12 | 4EG21A11<br>3EG21A13 |
| 4EG21B10<br>4EG21B12 | 19A122624-G2<br>Service Parts Kit #0036 | C120 (470 pf, 100 VDCW)<br>C126 (0.01 µf, 40 VDCW)<br>CV102<br>L102B<br>R125 B (0.12 megohm, 1/4w)<br>R126 (10,000 ohms, 1/2 w)<br>R128 (15,000 ohms, 1/2 w) | C125 with<br>C118 A (.0015 µf, 100 VDCW);<br>C121 with<br>C122 A (220 pf, 500 VDCW);<br>and C123 with<br>C124 (150 pf, 100 VDCW) | 4EG21B10<br>4EG21B12 | 4EG21B11<br>4EG21B13 |
| 4EG21C10<br>4EG21C12 | 19A122624-G3<br>Service Parts Kit #0037 | C120 (470 pf, 100 VDCW)<br>C126 (0.01 µf, 40 VDCW)<br>CV102<br>L102 C<br>R125 C (0.1 megohm, 1/4w)<br>R126 (10,000 ohms, 1/2 w)<br>R128 (15,000 ohms, 1/2 w) | C125 with<br>C118 A (.001 µf, 100 VDCW);<br>C121 with<br>C122 B (180 pf, 500 VDCW);<br>and C123 with<br>C124 (150 pf, 100 VDCW) | 4EG21C10<br>4EG21C12 | 4EG21C11<br>4EG21C13 |

Table 1 - Exciter Board Modification

## INSTALLATION DIAGRAM

25-50 MHz TRANSMITTER EXCITER MOD.
19A122624-G1, G2 & G3




| CONNECTIONS CHART FOR MASTR PROGRESS LINE EXECUTIVE SERIES | | |
|---|---|---|
| FROM | WIRE COLOR | TO |
| W603 | G | STATION TB8-1 MOBILE TB3-17 |
| W603 | BR | TB3-23 |
| W603 | W-O-R | TB3-6 |
| W603 CENTER CONDUCTOR | W-BL | TB3-7 |
| W603-SHIELD OF ABOVE | | TB3-8 |
| W603 | BK | TB3-22 |
| W603 CENTER CONDUCTOR | W-BK | EXCITER-J103 |
| W603-SHIELD OF ABOVE | | EXCITER-J104 |
| W603 | V | TB3-5 |
| W603 | W-R-G | TB3-12 |

**PROCEDURE**

1. Mount the Channel Guard board or the Tone Reject Filter board as shown using the five #4-40 screws supplied with the board.
2. Install the cable W603 (W604 for Royal) from the Channel Guard board or the Tone Reject Filter board to TB3 and the Exciter board. Make the connections as shown in the appropriate chart. Remove the Exciter board to feed the shielded cable through the hole in the chassis and the slot in the Exciter board.
3. Insert the tone network into the mounting bracket. Plug the socket XFL601 from the Channel Guard board into the Tone Network. Install the pressure sensitive pad 4032591-P28 on the chassis as shown, approximately 0.3" down from mounting support of Tone Network.
4. Rotate the Tone Network until the marking appears on this surface (see Diagram). Mount the assembly as shown using the two #6-32 thread-forming screws supplied.
5. When the Decode only option (8014) or Tone Reject Filter (19C317355-G2) are used, cut-off and discard the shielded cable connecting the Channel Guard board and the Exciter board.
6. Install the accessory cover with the hardware supplied.

| CONNECTION CHART FOR MASTR PROGRESS LINE ROYAL EXECUTIVE | | |
|---|---|---|
| FROM | WIRE COLOR | TO |
| W604 | W-G-O | TB3-27 |
| W604 | BR | TB3-41 |
| W604 | W-O-R | TB3-26 |
| W604 CENTER CONDUCTOR | W-BL | TB3-37 |
| SHIELD OF ABOVE | | TB3-44 |
| W604 CENTER CONDUCTOR | W-BK | EXCITER-J103 |
| SHIELD OF ABOVE | | EXCITER-J104 |
| W604 | R | TB3-5 |
| W604 | G | TB3-29 |

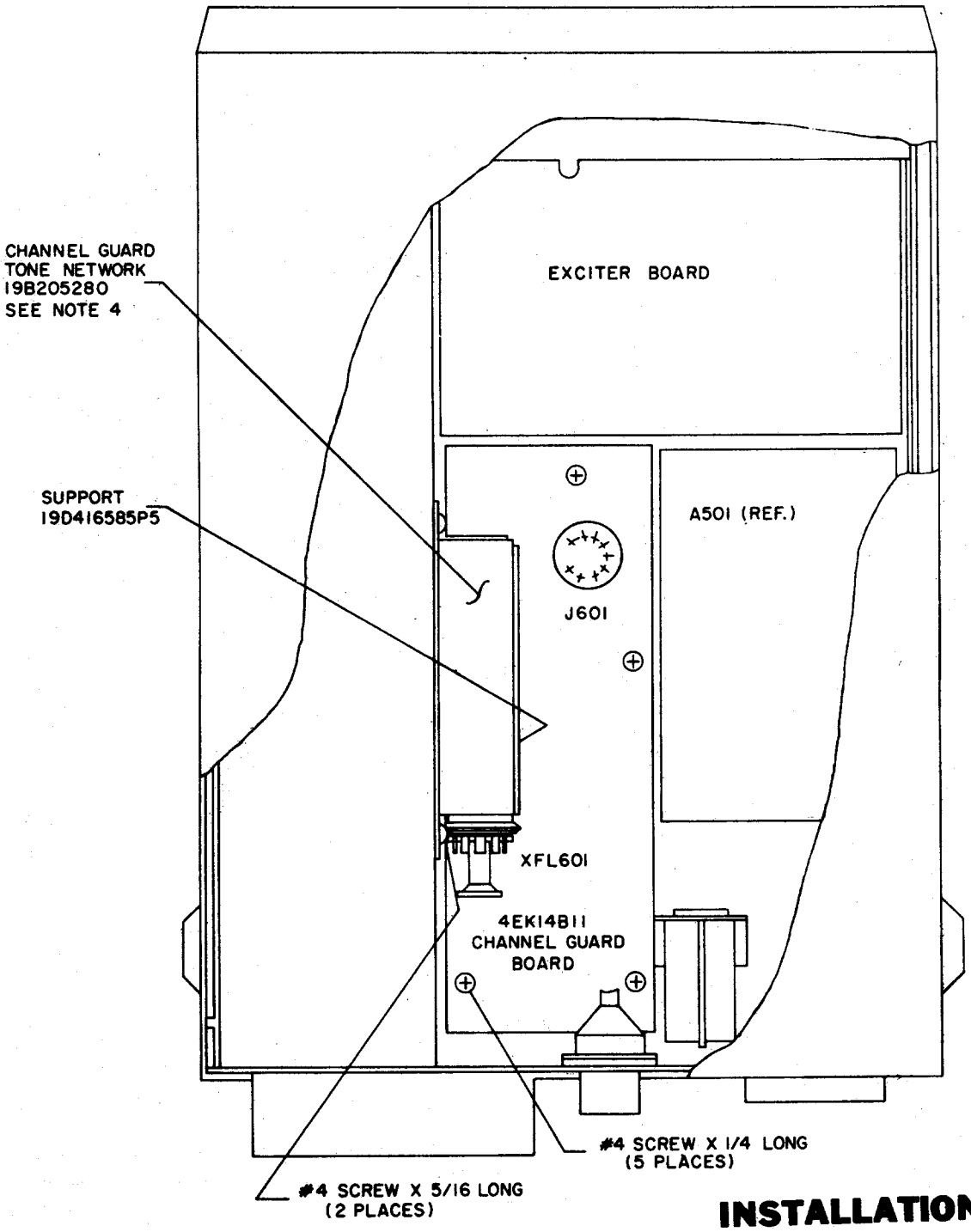
(19D413570, Rev. 1)

# INSTALLATION DIAGRAM

CHANNEL GUARD MODEL 4EK14B10

NOTES:

1. MOUNT CHANNEL GUARD BOARD ON CHASSIS AS SHOWN.
2. CUT SPOT TIE HOLDING P601 TO HARNESS & PLUG INTO J601.
3. ASSEMBLE TONE NETWORK INTO MOUNTING BRACKET, PLUG SOCKET (XFL601) FROM CHANNEL GUARD BOARD INTO TONE NETWORK & MOUNT AS SHOWN.
4. TONE NETWORK TO BE ORIENTED SO MARKING APPEARS ON THIS SURFACE.




(19C320202, Rev. 1)

# INSTALLATION DIAGRAM

CHANNEL GUARD MODEL 4EK14B11

Issue 1