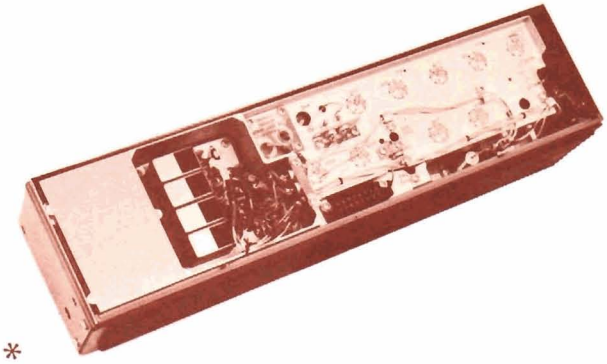
MOBILE RADIO

MASTR Progress Line

406–470 MHz, RECEIVER MODELS 4ER42E10-33 & 4ER42G10-33



SPECIFICATIONS *

	ER-42-E & G	
FCC Filing Designation		
Frequency Range	406—420 & 450—470 MHz	
Audio Output	5 watts at less than 5% distortion	
Sensitivity	Standard Receiver	Ultra-High Sensitivity Receiver
12-dB SINAD (EIA Method)	0.35 μV	0.20 μV
20-dB Quieting Method	0.50 μV	0.25 μV
Intermodulation (EIA)	-75 dB	-70 dB
Selectivity		
EIA Two-Signal Method	-85 dB (adjacent channel, 25 kHz channels)	
20-dB Quieting Method	-100 dB at ±20 kHz	
Spurious Response	-100 dB	
First Oscillator Stability		
Type ER-42-E Receivers	±.0005% (-30°C to +60°C)	
Type ER-42-G Receivers	+.0002% (-30°C to +60°C)	
Modulation Acceptance	±7.5 kHz	
Squelch Sensitivity		
Critical Squelch		
Standard Receiver	0.2 μV	
UHS Receiver	0.15 μV	
Maximum Squelch	Greater than 20 dB quieting (less than 1.5 μV)	
Maximum Frequency Separation	0.4%	
Frequency Response	+1 and -8 dB of a standard 6-dB per octave de-emphasis curve from 300 to 3000 Hz (1000-Hz reference)	

*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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ILLUSTRATIONS

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 MASTR Progress Line Receivers Types ER-42-E & G are double-conversion, superheterodyne FM receivers designed for operation in the 406-420 and 450-470 megahertz bands. The Type ER-42-E Receivers contain a standard oscillator with a frequency stability of ±0.0005%, while the Type ER-42-G Receivers contain an Integrated Circuit Oscillator Module (ICOM) with a frequency stability of ±0.0002%. Standard and ultra-high sensitivity (UHS) versions are available for both types.

The receivers are of single-unit construction and are completely housed in an aluminum casting for maximum shielding and rigidity. The top part of the casting contains the front end through the lst low IF amplifier stages. The bottom portion of the casting contains the audio squelch board and the optional Channel Guard encoder-decoder board.

CIRCUIT ANALYSIS

The MASTR Progress Line Receiver is completely transistorized, using silicon transistors throughout for added reliability. Input leads to the receiver are individually filtered by the 20-pin feed-through by-pass connector J443. A regulated +10 volts is used for all receiver stages except the audio PA stage which operates from the 12-volt system supply.

Centralized metering jack J442 is provided for use with General Electric Test Set Models 4EX3A10 or 4EX8K11, for ease of alignment and servicing. The Test Set meters the oscillator, multiplier, and limiter stages as well as the discriminator, and regulated 10 volts.

RF AMPLIFIER (A410/A411)

RF Amplifier A410/A411 is used only in ultra-high sensitivity (UHS) receivers and consists of two tuned helical resonators and an RF amplifier (Q1).

The RF amplifier uses a Field-Effect Transistor (FET) as the active device. A FET may be considered a semiconductor current path (or channel) whose resistance is varied by a voltage applied between the "gate" and "source" terminals. Lead identification for the FET is shown in Figure 2A. The FET has voltage-controlled characteristics, and may be compared to a vacuum tube in operation (see Figure 2B).

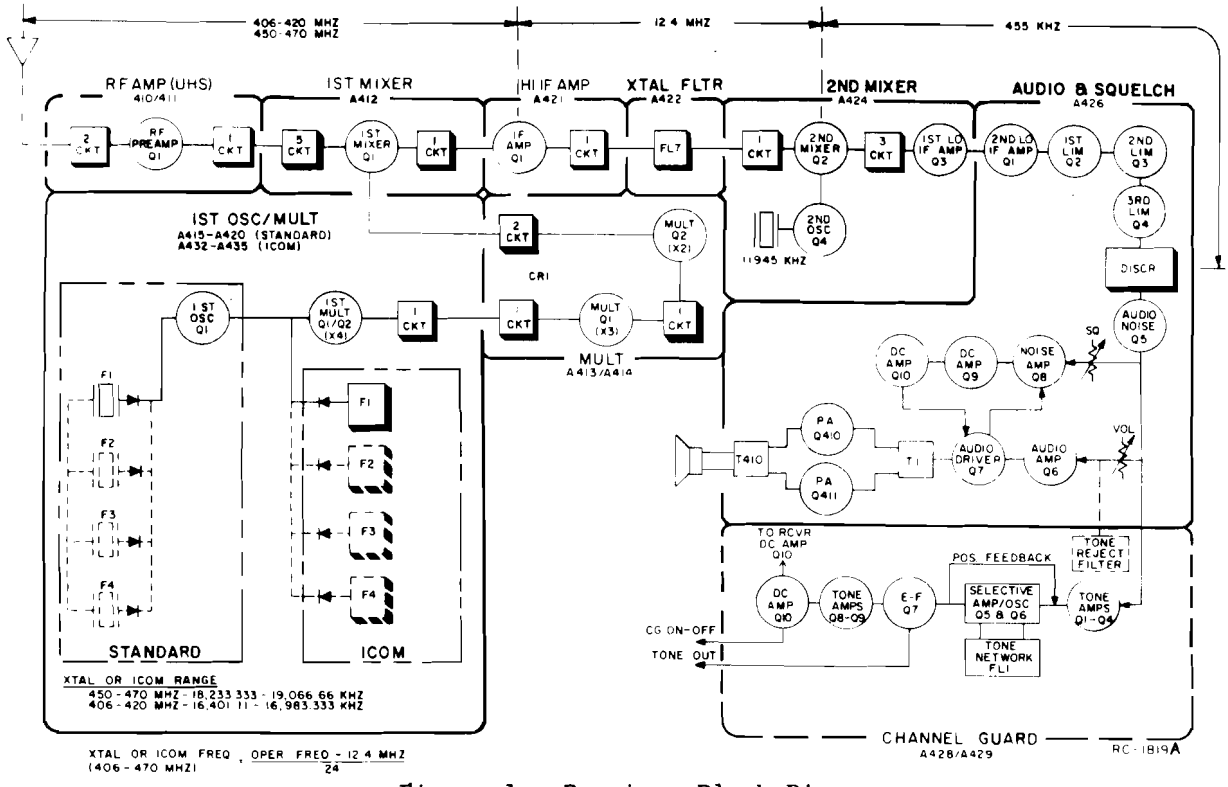


Figure 1 - Receiver Block Diagram

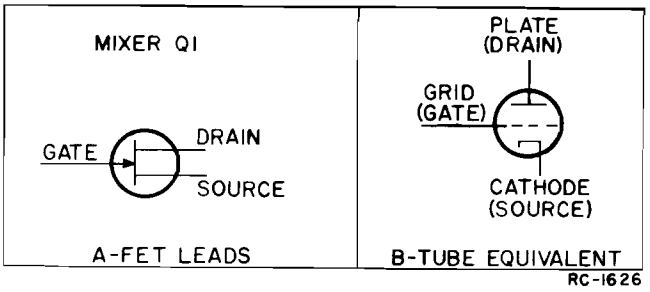


Figure 2 - FET Nomenclature

RF from the antenna is coupled through cable W444 to a tap on L410/L412. The tap is positioned to provide the proper impedance match to the antenna. RF energy is coupled to L411/L413 through an opening in the shield wall, and then to the source terminal of FET Q1.

Q1 operates as a grounded-gate amplifier. This method of operation provides a low impedance input to the amplifier. The amplified output is taken from the drain terminal and coupled through a tuned circuit (C7 and L2/L3) to the input of five helical resonators.

HELICAL RESONATORS

In receivers without the UHS option, the front end RF selectivity is provided by five tuned helical resonators (L414/L419 through L418/L423). RF cable W441 connects the RF signal from the antenna to a tap on L414/L419. The tap is positioned to provide the proper impedance match to the antenna. The output of L418/L423 is coupled through capacitor C1 to the 1st mixer assembly.

1ST OSCILLATOR AND MULTIPLIER

Receiver Models 4ER42E10-33 are equipped with standard Oscillator/Multiplier Boards A415-A420. Receiver Models 4ER42G10-33 are equipped with Oscillator/Multiplier Boards which use the Integrated Circuit Oscillator Module (ICOM).

Standard Oscillator/Multiplier Board (A415-A420)

The oscillator in the standard Oscillator/Multiplier Board is a transistorized Colpitts oscillator. The oscillator crystal operates in a fundamental mode at a frequency of approximately 16 to 19 megahertz. The crystal is cut to provide temperature compensation at the high end of the temperature range and is thermistor compensated at low temperatures. This provides instant warm-up with a frequency stability of ±0.0005% without crystal ovens or warmers.

In single-frequency receivers, a jumper from H1 to H2 connects regulated +10 volts to the crystal circuit. Feedback for the oscillator is developed across C47.

In multi-frequency receivers, a diode is connected in series with the crystal and up to three additional crystal circuits can be added. The 10-volt jumper is removed, and the proper frequency is selected by switching the desired crystal circuit to +10 volts by means of a frequency selector switch on the control unit. Switching the +10 volts to the crystal circuit forward biases the diode in series with the desired crystal, and the crystal frequency is applied to the base of oscillator transistor Q1. The oscillator output is coupled through C45 to the base of 1st Multiplier Q2.

The 1st multiplier output is coupled through T1/T2 to Multiplier Board A413/A414. T1/T2 is tuned to four times the crystal frequency. The 1st multiplier stage is metered at J442-4 through metering network C38, CR6, R17 and R18.

Oscillator/Multiplier Board With ICOM (A432-A435)

Oscillator/Multiplier Boards A432-A435 uses ICOM Module Model 4EG26A10.
The ICOM module consists of a crystal-controlled Colpitts oscillator, a voltage regulator, and a buffer output stage. The entire module (including crystal) is enclosed in a dust-proof aluminum can, with the ICOM frequency and the receiver operating frequency printed on the top. Access to the oscillator trimmer is obtained by prying off the plastic GE decal on the top of the can.

The oscillator frequency is temperature-compensated at both ends of the temperature range to provide instant frequency compensation, with a frequency stability of ±0.0002% without crystal ovens or warmers.

In single-frequency receivers, +10 volts for operating the ICOM is obtained by a jumper from H1 to H2. With the ICOM operating, diode CR1 is forward biased and the oscillator output is applied to the 1st multiplier Q1.

The 1st multiplier output is coupled through T1/T2 to multiplier board A413/A414. T1/T2 is tuned to four times the ICOM frequency. The 1st multiplier stage is metered at J442-4 through metering network C4, CR5, R5 and R6.

In multi-frequency receivers, up to three additional ICOM modules can be plugged into the board. The 10-volt jumper is removed and the proper frequency is selected by switching the desired ICOM to +10 volts by means of a frequency selector switch on the control unit.

CAUTION

All ICOM modules are individually compensated at the factory, and cannot be repaired in the field. Any attempt to remove the ICOM cover will void the warranty.

MULTIPLIER BOARD (A413/A414)

Following the oscillator board are two multiplier stages. A413-Q1 operates as a tripler, and Q2 operates as a doubler. Q2 is metered at J442-1 across metering resistor R6.

The output of Q2 is coupled through two helical resonator circuits to the source terminal of the 1st mixer. The helical resonators are tuned to six times the 1st multiplier output for a total multiplication of 24 times the crystal frequency.

1ST MIXER (A412)

The 1st Mixer uses a Field-Effect Transistor (FET) as the active device (Fig. 2). The FET mixer has several advantages over a conventional transistor mixer, including a high input impedance and an output that is relatively free of harmonics (low in intermodulation products).

RF from the helical resonators is applied to the gate of Q1, and injection voltage from the multiplier is applied to the source. The mixer output is taken from the drain with the output tuned to the 12.4 MHz high IF frequency.

HI IF AMPLIFIER (A421) AND CRYSTAL FILTER (A422)

A series-resonant circuit (A412-L2 and -C3) couples the mixer output to the emitter of the high IF amplifier A421. The transistor is connected as a grounded-base amplifier which provides a low impedance for the mixer input. The amplifier output is coupled through transformer T1 to the crystal filter.

Highly-selective crystal filter A422 provides the major selectivity for the receiver. The output of the filter is coupled through impedance-matching transformer A424-T2 to the base of the 2nd mixer.

2ND OSCILLATOR, 2ND MIXER AND 1ST LO IF AMPLIFIER (A424)

A424-Q4 operates in a Colpitts oscillator circuit, with feedback supplied through C18. The oscillator low-side injection voltage (11,945 kHz) is applied to the base of the 2nd mixer.

The High IF signal from the filter and the injection voltage from the 2nd oscillator is applied to the base of 2nd mixer Q2. The 445-kHz mixer output is applied to three tuned low IF circuits, L1, L2 and L3. These tuned circuits are required for shaping the nose of the IF waveform, and for rejecting any undesired output frequencies from the 2nd mixer.

The low IF signal is applied to the base of 1st low IF amplifier Q3. The output of Q3 is R-C coupled to the base of the 2nd low IF amplifier.

2ND LO IF AMPLIFIER AND LIMITERS (A426)

Additional amplification of the low IF signal going to the limiter stages is provided by 2nd low IF amplifier A426-Q1. This stage is metered at J442-2 through a metering network consisting of C19, CR3 and R25.

Following the 2nd low IF amplifier are three R-C coupled limiter stages (A426-Q2, -Q3 and -Q4). The 1st limiter is metered at J442-3 through metering network C20, CR4 and R26.

DISCRIMINATOR (A426)

The limiter output is applied to a Foster-Seely type discriminator, where diodes CR1 and CR2 rectify the 455-kHz signal to recover the audio. The discriminator is metered at J442-10 through metering network C16 and R23.

AUDIO - NOISE AMPLIFIER (A426)

The discriminator output is coupled through a low-pass filter (C16, C18, R21 and R22) to the base of audio-noise amplifier Q5. The filter removes any 455-kHz signal remaining in the discriminator output. Q5 operates as a emitter-follower to match the discriminator impedance to the VOLUME control, SQUELCH control, and Channel Guard input. The stage also provides power gain.

AUDIO AMPLIFIERS (A426)

Any audio present in the incoming signal is coupled from the emitter of Q5 through the VOLUME control and a de-emphasis network to the base of audio amplifier Q6. The de-emphasis network consists of C22, C23, R30 and R31.

Audio driver Q7 follows the audio amplifier. The audio output of Q7 is coupled through transformer T1 to provide phase inversion for the push-pull audio PA stage.

Q410 and Q411 operate as a push-pull Class AB audio PA stage. The PA output is coupled through audio transformer T410 to the loudspeaker. The yellow and white tertiary windings of T410 supply balanced feedback to the collector of Q7. The feedback winding minimizes distortion and prevents the pick-up of external electrical noise.

Base bias for the PA stage and the elimination of crossover distortion is controlled by bias adjust potentiometer R43. The potentiometer is set at the factory as shown in STEP 1 of the receiver Test Procedure.

NOTE

Do not adjust bias adjust potentiometer R43 unless PA transistors Q410 and Q411 have been replaced.

Audio high and low are also present at centralized metering jack J442, and can be used as shown in STEP 1 of the receiver Test Procedure. The output stage provides 5 watts at less than 5% distortion into a 3.5-ohm load at the receiver output terminals (3.2-ohm load at the Control Unit).

SQUELCH (A426)

Noise from the audio-noise amplifier operates the squelch circuit. With no carrier present in the receiver, this noise is coupled to the base of noise amplifier Q8 through a high-pass filter which attenuates frequencies below 3 kHz. The filter consists of C30, C31 and R45, as well as C34 and L3 in the collector circuit of Q8. The gain of Q8 is determined by the Squelch control, which varies the bias on the base of Q8. Thermistor RT2 keeps the critical squelch constant over wide variations in temperature.

The output of noise amplifier Q8 is rectified by diodes CR5 and CR6, and filtered by C36 and C37 to produce a negative DC voltage. This DC voltage is applied to the base of DC amplifier Q9, turning it off. When turned off, the collector voltage of Q9 rises to approximately 8 volts, turning on DC amplifier Q10. When conducting, the collector voltage of Q10 drops to almost ground potential, which removes the base bias to audio amplifier Q6 and audio driver Q7, turning them off.

When the receiver is quieted by a signal (unsquelched), the noise in the receiver is reduced, turning DC amplifier Q9 on and DC amplifier Q10 off. This allows the audio stages to conduct so that sound is heard in the speaker.

Resistor R53 connects from the emitter of audio driver Q7 to the emitter of noise amplifier Q8, providing a hysteresis loop in the squelch circuit. When a weak signal opens the squelch, the signal level may be reduced by 4 to 6 dB without the squelch closing. This limits squelch "flutter" or "picket-fence" operation.

With audio driver Q7 conducting, a positive voltage through R53 helps to reduce the gain of noise amplifier Q8. This positive feedback provides a quick, positive switching action in the squelch circuit. When the receiver squelches, audio driver Q7 turns off and its emitter potential drops to zero. This reduces the DC feedback through R53 to the emitter of noise amplifier Q8. Reducing the feedback causes Q8 to conduct harder, turning the audio stages off quickly.

Keying the transmitter removes the +10 volts from J19, turning off DC amplifier Q9 and turning on Q10 to mute the receiver.

CHANNEL GUARD (A428/A429)

Channel Guard Board Model 4EK16A10 is a fully transistorized encoder-decoder for use in the MASTR Professional Series mobile and station combinations. The tone frequencies are controlled by plug-in tone networks that are made with precision components for excellent stability and reliability. The tone frequencies range from 71.9 to 203.5 Hz.

Encoder (A428)

Keying the transmitter removes the receiver mute +10 volts, and forward biases feedback control diode CR5, causing it to conduct. When conducting, the diode shunts R39 which reduces the impedance of the positive feedback loop (R39, R35 and C19). This provides the necessary gain to the base of Q5 to permit oscillation.

The encoder tone is provided by selective amp-oscillator transistors Q5 and Q6 which oscillate at a frequency determined by the tone network. Negative feedback applied through the tone network to the base of Q5 prevents any gain in the stage except at the desired encode frequency.

Starting network R45, C21, C22 and CR6 provide an extremely fast starting time for the encoder tone. Keying the transmitter removes the receiver mute +10 volts, causing a pulse to be applied to the base of Q6 to quickly start the oscillator. Thermistor-resistor combination R32 and RT1 provides temperature compensation for the oscillator output. Limiter diodes CR3 and CR4 keep the tone amplitude constant.

Emitter-follower Q7 follows the oscillator circuit. The encoder tone is taken from the emitter of Q7 and applied to an

active low-pass filter (G101) on the transmitter.

Decoder (A428)

The decoder function is designed to eliminate all calls that are not tone coded for the Channel Guard frequency. As long as the CHANNEL GUARD-OFF switch on the control unit is left in the CHANNEL GUARD position, all signals are locked out except those from transmitters that are continuously tone coded for positive identification by the receiver.

Placing the CHANNEL GUARD-OFF switch in the OFF position instantly disables the Channel Guard operation so that all calls on the channel can be heard. When the hookswitch option is used, lifting the microphone from its hanger disables the Channel Guard Circuit.

Audio, tone and noise are taken from the emitter of the receiver audio-noise amplifier A426-Q5 and is fed through A428-J1 to four 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 to insure clipping by limiter diodes CR1 and CR2. The clipping action eliminates variation in the squelch performance due to changes in tone deviation. The signal is then applied to selective amplifiers Q5 and Q6 which amplify only the tone determined by the tone network.

The output of the selective amplifier is applied through emitter-follower Q7 to the high gain, broad-band tone amplifiers Q8 and Q9. The output of Q9 is rectified by detector diodes CR7 and CR8, and the resulting negative DC voltage controls the squelch gate. Q8 is normally biased for low gain. Then the tone is detected by CR7 and CR8, feedback is provided through R54 to quickly change the bias on Q8 for full gain. This ensures a more positive "unsquelching" action.

Squelch gate diode CR9 is normally forward biased by a positive DC voltage (approximately 1.5 volts) fed through R58. The forward bias causes CR9 to conduct, feeding a DC voltage to the base of DC amplifier A426-Q10 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 back-biases squelch gate diode CR9 and cuts off the positive bias to the receiver DC amplifier A426-Q10. However, the receiver noise squelch circuit continues to operate until a carrier quiets the receiver.

Placing the CHANNEL GUARD - OFF switch in the OFF position (or removing the microphone from its hookswitch) removes the ground to the base of the decoder DC switch (Q10), causing it to conduct. This back-biases squelch control diode CR9 and cuts off the positive bias to the receiver DC amplifier (A426-Q10). The receiver noise squelch circuit continues to operate until a carrier quiets the receiver.

A tone rejection filter connected in parallel with A426-J2 (in the receiver bypasses any incoming tone to ground. This attenuates the tone level reaching the receiver audio circuits. The filter is composed of C26, C27, C28, C29, L1 and R59.

An optional tone reject filter (A429) that is identical to the filter described above is available for use in two-way radios with transmitter Channel Guard only.

MAINTENANCE

DISASSEMBLY

To service the receiver from the top—

1. Pull locking handle down and pull radio about one inch out of mounting frame. (see Fig. 3).
2. Pry up cover at rear of receiver.
3. Slide cover back and lift off.

To service the receiver from the bottom—

1. Pull locking handle down. Pull radio out of mounting frame. (see Fig. 4).
2. Remove screws in bottom cover. Pry up cover at back of receiver.
3. Slide cover back and lift off.

To remove the receiver from the system frame—

1. Loosen the two Phillips-head retaining screws in front casting (see Figure 3), and pull casting away from system frame.
2. Remove the four screws in the back cover.
3. Remove the two screws holding the receiver at each end of the system frame.
4. Disconnect the antenna jack and the 20-pin connector from the front of the receiver, and slide the unit out of the system frame.

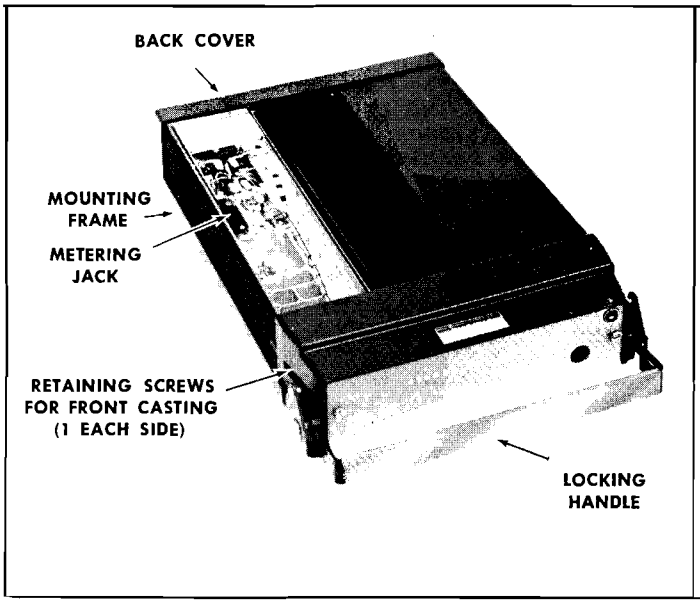


Figure 3 - Removing Top Cover

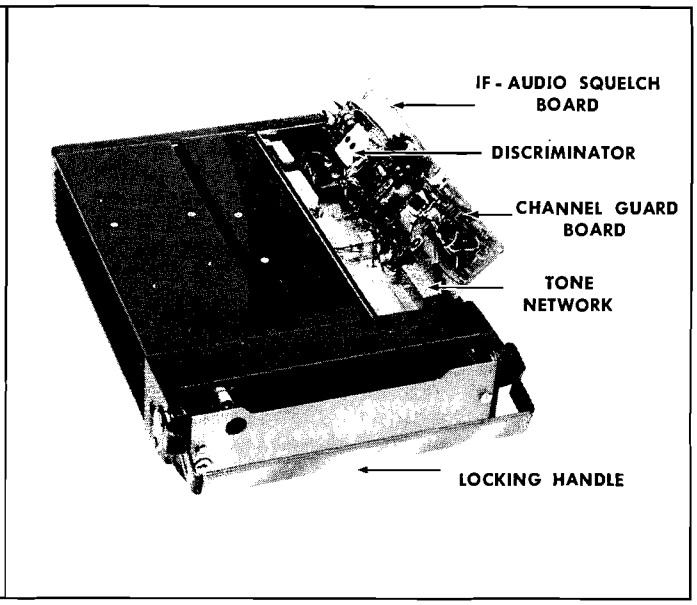


Figure 4 - Removing Bottom Cover

COMPLETE RECEIVER ALIGNMENT

EQUIPMENT REQUIRED

1. GE Test Set Models 4EX3A10, 4EX8K11, station test meter panel, or 20,000 ohms-per-volt multimeter.

2. A 450 to 460 kHz source (GE Test Set Model 4EX7A10), and 406-470 MHz signal source. Connect a one-inch piece of insulated wire no larger than .065 inch to generator output probe.

PRELIMINARY CHECKS AND ADJUSTMENTS

1. Connect Test Set to receiver centralized metering jack J442, and set meter sensitivity switch to the TEST 1 or 1-volt position.

2. For a large change in frequency or a badly mis-aligned receiver, set crystal trimmer C9 on 1st OSC/MULT board (ER-42-E only) to mid-capacity. In multi-frequency receivers, set C10, C11 or C12 to mid-capacity as required.

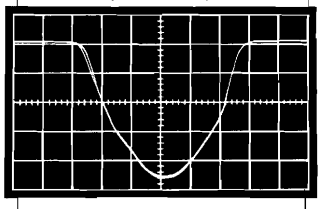
3. In multi-frequency receivers where the maximum frequency spacing is less than 500 kHz, align the unit on channel F1. If the frequency spacing is greater than 500 kHz, align the receiver on the center frequency.

4. With Test Set in position J, check for regulated +10 volts. If using Multimeter, measure from C425 to C426.

5. If using Multimeter, connect the positive lead to J442-16 (ground).

6. Disable the Channel Guard.

ALIGNMENT PROCEDURE

STEP	METERING POSITION: GE Test Set or Meter Panel	METERING POSITION: Multimeter - at J442	TUNING CONTROL	METER READING	PROCEDURE
			DISCRIMINATOR		
1.	A (DISC)	Pin 10	L1 and L2 (on IF-AUDIO SQUELCH board)	Zero	Remove three screws and swing open the IF-AUDIO & SQUELCH board. Adjust L1 (disc primary) 1/2 turn counterclockwise from the bottom of coil. Next, apply a 455-kHz signal to J2 and J4 and adjust L2 (disc secondary) for zero meter reading.
2.	A (DISC)	Pin 10		See Procedure	Alternately apply a 450-kHz and 460-kHz signal and check for readings of at least 0.3 volt, but not more than 0.5 volt on GE Test Set. Both readings must be within .05 volt. Do not attempt to balance reading any closer than 0.05 volt.
			OSCILLATOR AND MULTIPLIERS		
3.	D (MULT-1)	Pin 4	L5 (1st OSC/MULT) and L1 (2nd MULT)	See Procedure	Tune L5 for maximum meter reading. Then tune L1 for minimum meter reading.
4.	G (MULT-1)	Pin 4	L5 (1st OSC/MULT) and L1 and L2 (2nd MULT)	Maximum	Tune L5, L1 and L2 for maximum meter reading. If two peaks occur while tuning L1 and L2, use the peak with the slug nearest the top of the coil.
5.	G (MULT-2)	Pin 4	C423	See Procedure	Adjust C423 for a small dip in meter reading.
6.	A (DISC)	Pin 10		Zero	Apply an on-frequency signal into Hole 411. Adjust the signal generator for discriminator zero.
7.	B (2nd IF AMP)	Pin 2	C423 and C424	Maximum	Apply an on-frequency signal as above. Tune C423 and C424 for maximum meter reading, keeping signal below saturation.
			RF SELECTIVITY		
8.	B (2nd IF AMP)	Pin 2	L3 (1st Mixer)	Maximum	Apply an on-frequency signal in Hole 411 and tune L3 for maximum meter reading. If two peaks occur, use the peak with the slug nearest the bottom of the coil.
9.	B (2nd IF AMP)	Pin 2	C415 thru C418	Maximum	Apply an on-frequency signal in the Hole shown below, keeping the signal below saturation. Tune C415 thru C418 for maximum meter reading as shown below: Insert Generator Probe In: — Peak 1. Hole 411 — C418 thru C417 2. Hole 410 — C415, C416 thru C417
10.	B (2nd IF AMP)	Pin 2	C414 thru C418, L3 (on 1st Mixer) and C410, C411 and C7 (on UHS receivers)	See Procedure	Apply an on-frequency signal to the receiver antenna jack. Tune C410, C411 and C7 on UHS receivers for maximum meter reading. On all receivers, tune C414 for maximum meter reading, and tune C415 thru C418 and L3 for maximum quieting.
			2ND MIXER & HI IF		
The 2nd mixer, and high IF circuits have been aligned at the factory and will normally require no further adjustment. If adjustment is necessary use the procedure outlined in STEPS 11, 12 and 13. NOTE Refer to DATAFILE BULLETIN 1000-6 IF Alignment of Two-Way Radio FM Receivers for helpful suggestions on how to determine when IF alignment is required.					
11.	B (2nd IF AMP)	Pin 2	L3, L2, L1, T2 (2nd Mixer) and T1 (Hi IF AMP)	Maximum	Apply on-frequency, unmodulated signal and tune L3, L2, L1, T2 (2nd mixer) and T1 (Hi IF AMP) for maximum meter reading, keeping signal below saturation.
12.			L3, L2, L1, T2 (2nd Mixer) and T1 (Hi IF AMP) 		Connect scope, signal generator, and detector as shown in Figure 7. Set signal generator level for 30-50 μv and modulate with 10 kHz at 20 Hz. With detector at the collector of Q3 (2nd mixer board output), tune for double trace as shown on scope pattern.
13.	A (DISC)	Pin 10		See Procedure	Check to see that discriminator idling voltage in within ±.06 volt of zero with no signal applied. Check to see that modulation acceptance bandwidth is between ±7.5 and 9 kHz.
			FREQUENCY ADJUSTMENT		
14. Refer to the appropriate adjustment procedure for the ICOM or Standard Oscillator.					

FRONT END ALIGNMENT

EQUIPMENT REQUIRED

1. GE Test Set Model 4EX3A10, 4EX8K11 station test meter panel or 20,000 ohms-per-volt multimeter.
2. A 406-470 MHz signal source. Connect a one-inch piece of insulated wire no larger than 0.065 inch to generator output probe.

PRELIMINARY CHECKS AND ADJUSTMENTS

1. Connect Test Set to receiver centralized metering jack J442 and set meter sensitivity switch to the TEST 1 (or 1-volt position on 4EX8K11).
2. With Test Set in position J, check for regulated +10 volts. If using Multimeter, measure from C425 to C426.
3. If using Multimeter, connect the positive lead to J442-16 (ground).
4. Disable the Channel Guard.

ALIGNMENT PROCEDURE

STEP	METERING POSITION: GE Test Set or Meter Pane	METERING POSITION: Multimeter - at J442	TUNING CONTROL	METER READING	PROCEDURE
			OSCILLATOR AND MULTIPLIERS		
1.	D (MULT-1)	Pin 4	L5 (1st OSC/MULT) and L1 (2nd MULT)	See Procedure	Tune L5 for maximum meter reading. Then tune L1 for minimum meter reading.
2.	G (MULT-2)	Pin 4	L5 (1st OSC/MULT) and L1 and L2 (2nd MULT)	Maximum	Tune L5, L1 and L2 for maximum meter reading. If two peaks occur while tuning L1 and L2, use the peak with the slug nearest the top of the coil.
3.	G (MULT-2)	Pin 4	C423	See Procedure	Adjust C423 for a small dip in meter reading.
4.	A (DISC)	Pin 10		Zero	Apply on on-frequency signal into Hole 411. Adjust the signal generator for discriminator zero.
5.	B (2nd IF AMP)	Pin 2	C423 and C424	Maximum	Apply an on-frequency signal as above. Tune C423 and C424 for maximum meter reading, keeping signal below saturation.
			RF SELECTIVITY		
6.	B (2nd IF AMP)	Pin 2	L3, C415-C418	Maximum	Apply an on-frequency signal in Hole 411 and tune L3 and C415 thru C418 for maximum meter reading, keeping the signal below saturation. If two peaks occur when tuning L3, use the peak with the slug nearest the bottom of the coil.
7.	B (2nd IF AMP)	Pin 2	C414 thru C418, L3 (on 1st Mixer) and C410, C411 and C7 (on UHS receivers)	See Procedure	Apply on on-frequency signal to the receiver antenna jack. Tune C410, C411 and C7 on UHS receivers for maximum meter reading. On all receivers, tune C414 for maximum meter reading, and then tune C415 thru C418 and L3 for maximum quieting.
			FREQUENCY ADJUSTMENT		
8.	Refer to the appropriate adjustment procedure for the ICOM or Standard Oscillator.				

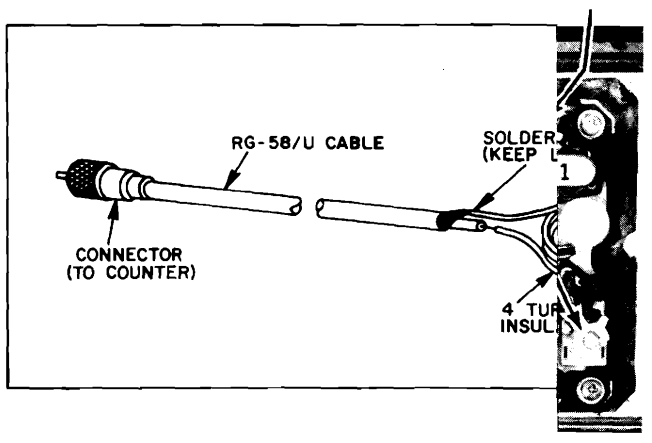


Figure 5 - Coaxial Cable and Te

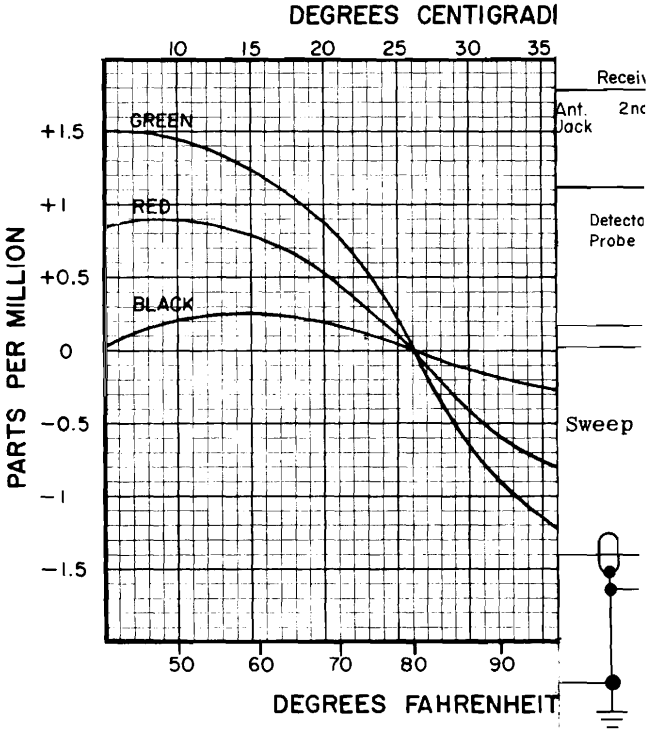
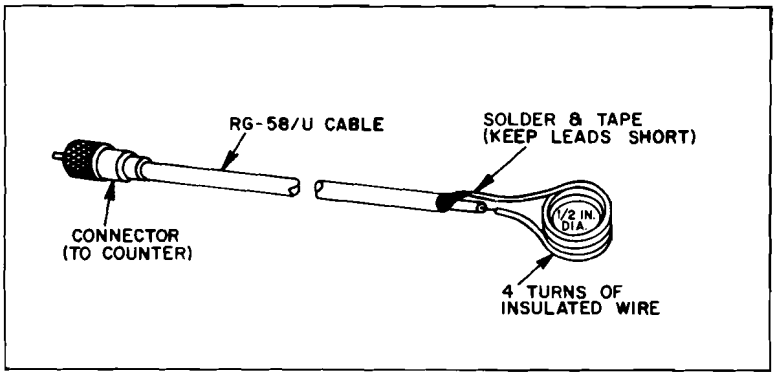


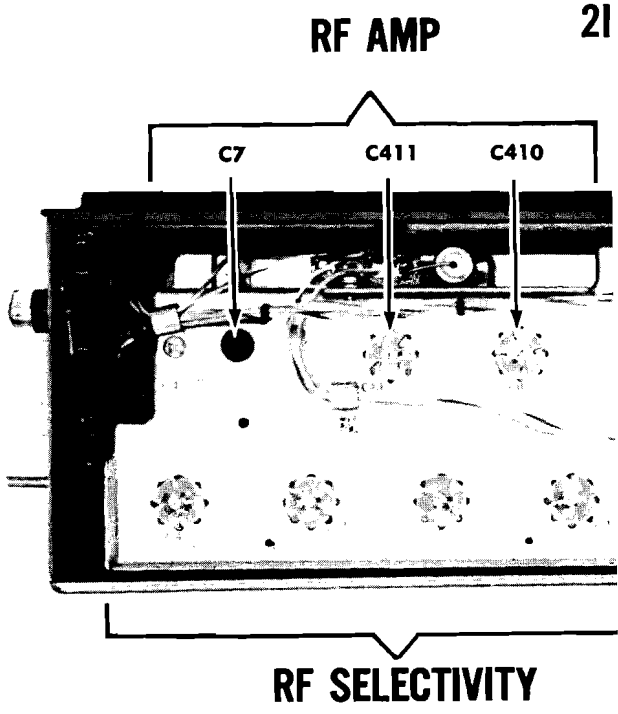
Figure 6 - ICOM Correction C

lignme



RC-1600

Figure 5 - Coaxial Cable and Test Loop



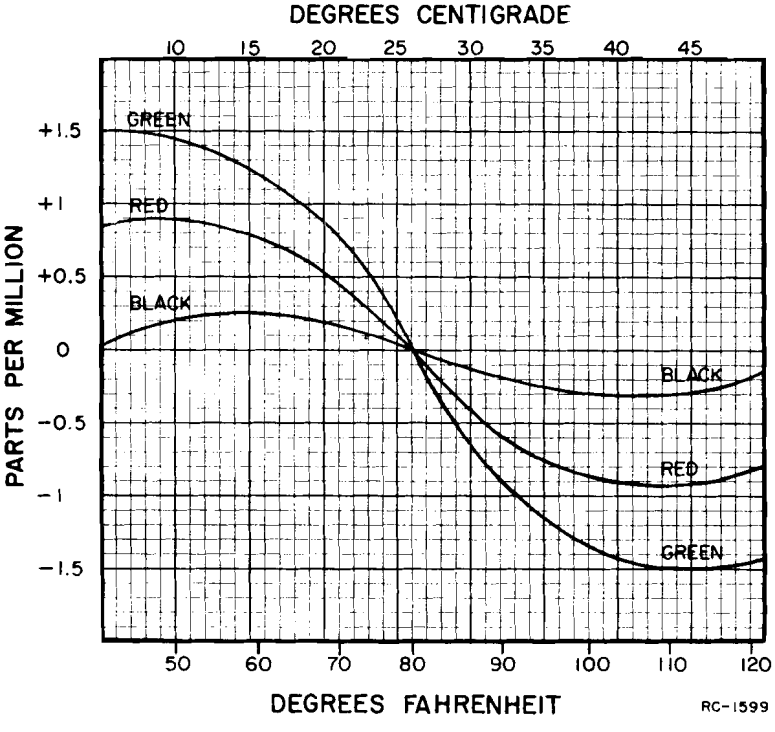
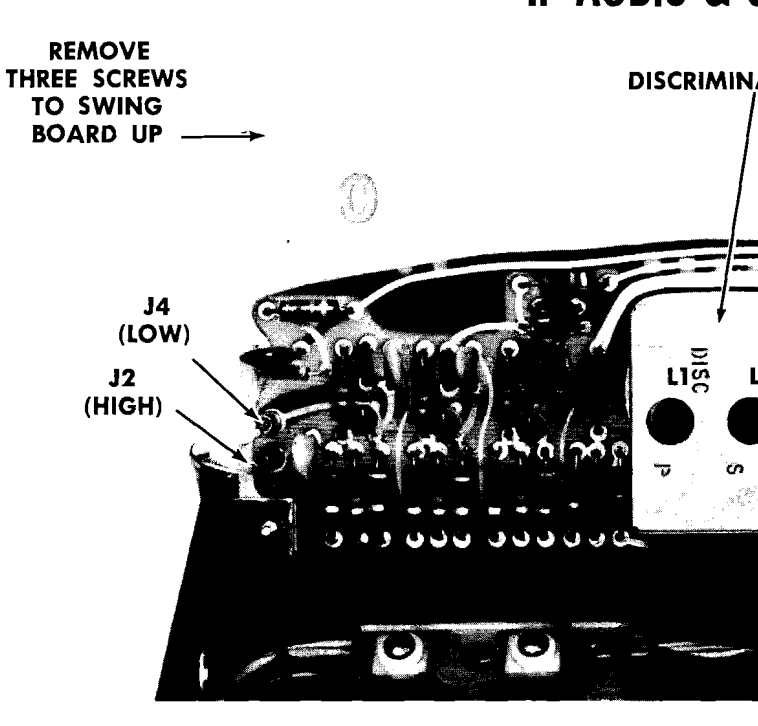
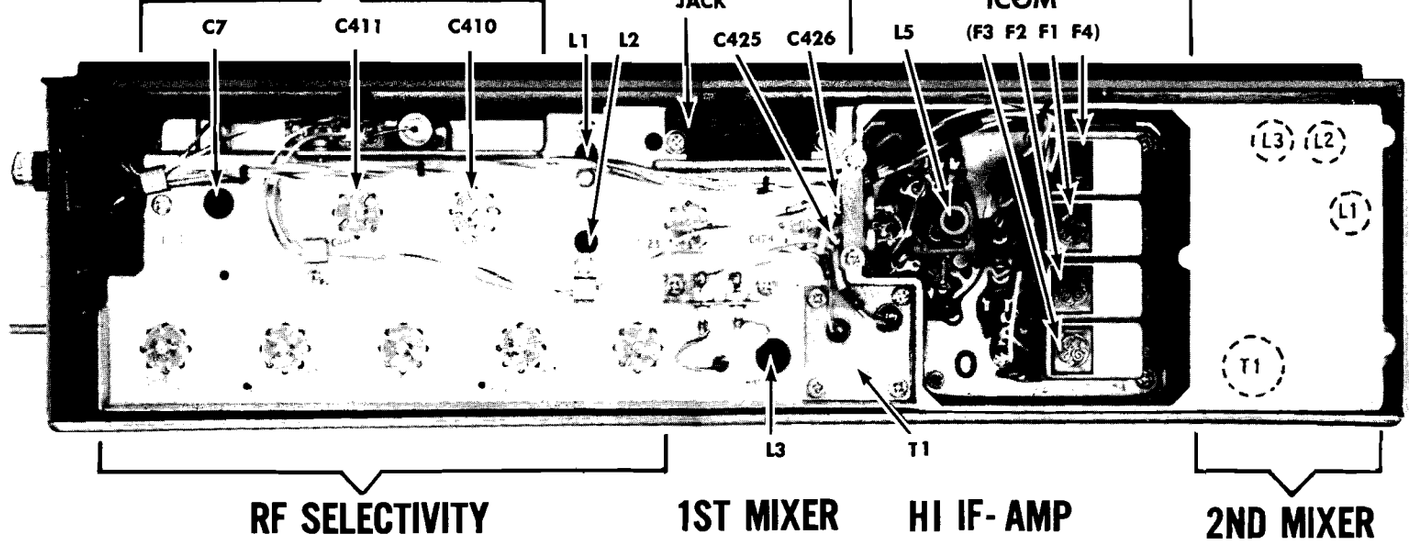
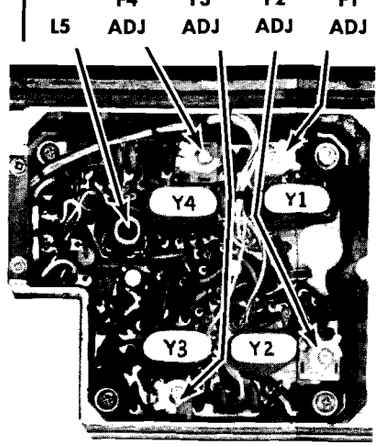


Figure 6 - ICOM Correction Curves







4EX3A10	meter -at J442	
A (Disc)	Pin 10	CS ls MU CI ar fc fr

ICOM MODULE

Due to the high st.
ed that zero discrimina
oscillator frequency.
in the following proced

EQUIPMENT REQUIRED:

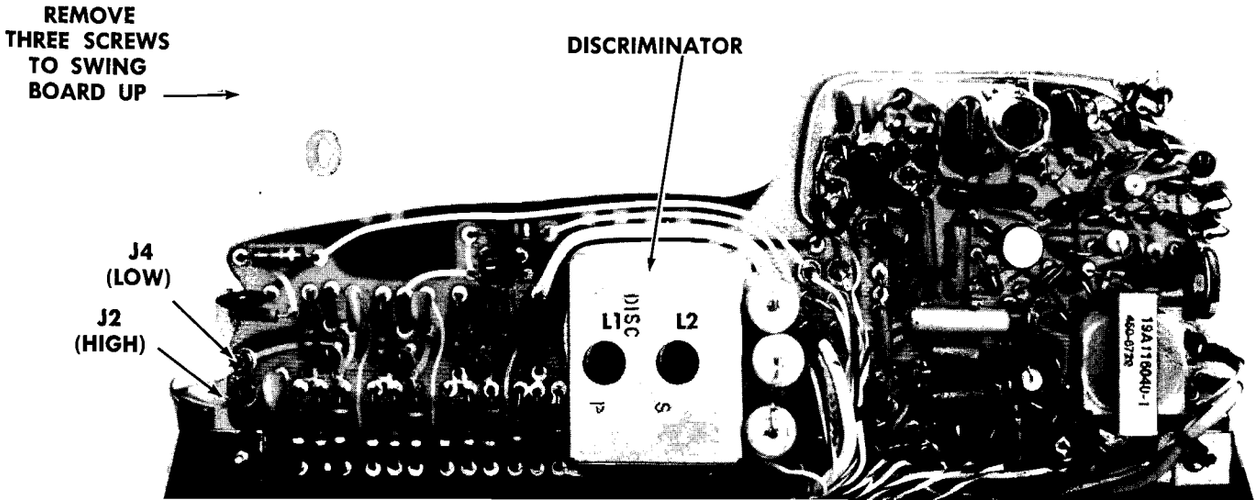
1. Frequency Counter
range. (The count
million.)
2. Coaxial cable with
3. Mercury thermomete

PROCEDURE:

1. Check the ICOM tem
the side of the IC
2. Connect the frequer
the 4-turn test loc
3. If the ICOM tempera
quency indication
stenciled on the IC
to obtain this fre
4. If the temperature
range, use the cor
frequency as follo
   a. Check the color
   ing curve to de
   lion (PPM).
   b. Multiply the fr
   multiply this f
   observing the s
   c. The frequency me
   cy ± the correct
   quired) to obta

ICOM Frec
ICOM Colc
Ambient T
Correctic
(From Fig
Multiply
(18.23333
Multiply
(72.933 M
Set the f
72.933332
- .000084
72.933248

IF-AUDIO & SQUELCH



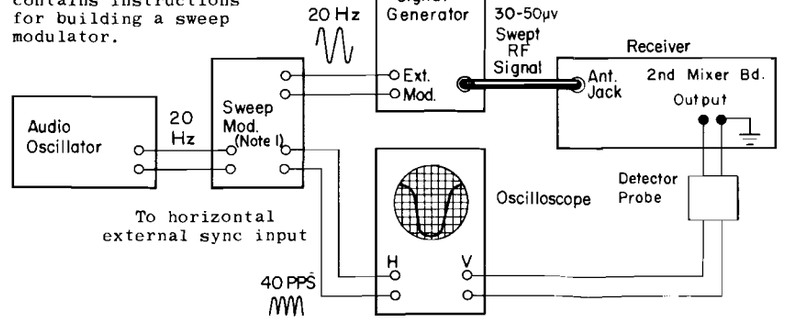
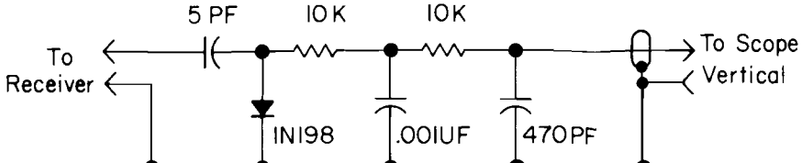
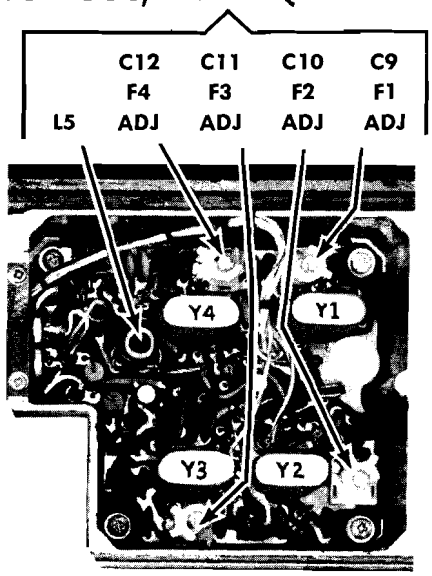
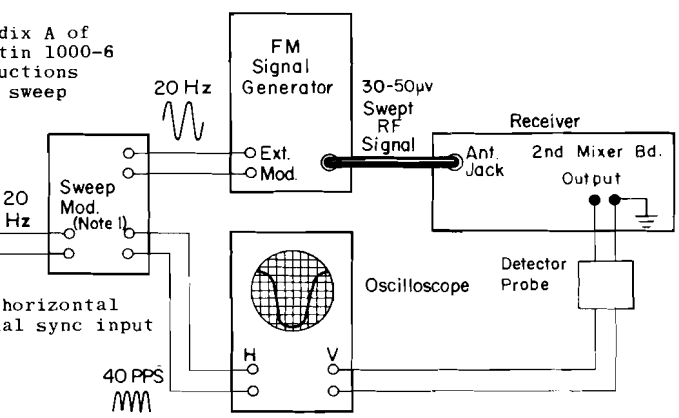


Figure 7 - Test Setup for 20-Hz Double-Trace Sweep Alignment

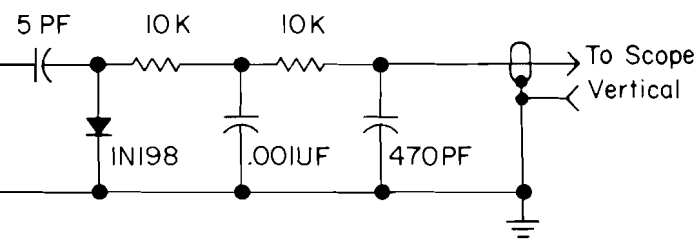


1ST OSC/MULT. (ER-42-E)





est Setup for 20-Hz Double-Trace Sweep Alignment



e 8 - Detector Probe for Sweep Alignment

FREQUENCY ADJUSTMENT

STANDARD OSCILLATOR

METERING POSITION		TUNING CONTROL	METER READING	PROCEDURE
4EX3A10	Multi-meter -at J442			
A (Disc)	Pin 10	C9 (on 1st OSC/ MULT) C10, C11 and C12 for multi-frequency	Zero	Apply an on-frequency signal to the antenna jack. Tune C9 for zero discriminator reading. In multi-frequency units, tune C10, C11 or C12 as required. ——— NOTE ——— For proper frequency control of the receiver, it is recommended that all frequency adjustments be made when the equipment is at a temperature of approximately 75°F. In no case should frequency adjustments be made when the equipment is outside the temperature range of 50° to 90°F.

ICOM MODULE

Due to the high stability of the ICOM module, it is not recommended that zero discriminator be used as the indication for setting the oscillator frequency. Instead, measure the ICOM frequency as described in in the following procedure.

EQUIPMENT REQUIRED:

1. Frequency Counter capable of measuring the 70-80 MHz frequency range. (The counter should have an accuracy of 0.4 part-per million.)
2. Coaxial cable with test loop as described in Figure 5.
3. Mercury thermometer.

PROCEDURE:

1. Check the ICOM temperature by taping the mercury thermometer to the side of the ICOM.
2. Connect the frequency counter to L5 (on the 1st Osc/Mult) using the 4-turn test loop and cable shown in Figure 5.
3. If the ICOM temperature is 80°F (±4°F) or 26.5°C (±2°C), the frequency indication on the counter should be 4 times the frequency stenciled on the ICOM case. Adjust the ICOM trimmer (if necessary) to obtain this frequency.
4. If the temperature is not within the 80°F (±4°F) or 26.5°C (±2°C) range, use the correction curves of Figure 6 for setting the ICOM frequency as follows:
   a. Check the color dot beneath the GE emblem and select the matching curve to determine the correction factor in parts-per-million (PPM).
   b. Multiply the frequency stenciled on the ICOM by 4 and then multiply this figure by the correction factor (from Figure 6) observing the sign (±) given to the correction factor.
   c. The frequency measured at L5 should be 4 times the ICOM frequency ± the correction factor. Adjust the ICOM trimmer (if required) to obtain this frequency.

——— FOR EXAMPLE ———

ICOM Frequency - 18.233333 MHz
ICOM Color Dot - Green
Ambient Temperature - 35°C (95°F)
Correction Factor - -1.15 PPM
(From Figure 6)

Multiply ICOM Frequency by 4;
(18.233333 MHz x 4 = 72.933332 MHz)

Multiply preceding figure by correction factor;
(72.933 MHz x -1.15 PPM = -83.87 hertz (or -84 hertz)

Set the frequency measured at L5 for 72.933248 MHz;

72.933332 MHz
- .000084 MHz
72.933248 MHz

a milliammeter in series
volt lead at P443-11. With
, adjust R43 for a reading
tely 20 milliamps. This
hould not be necessary un-
ut transistor has been re-

Refer to Receiver Trouble-
cedure).

r Alignment (Refer to
gnment on reverse side of

STEP 2
E SENSITIVITY
-dB SINAD)

ecks out properly, measure
itivity as follows:

-microvolt, on-frequency
ated by 1000 Hz with 3.3-kHz
J441.

NGE switch on the Distortion
the 200 to 2000-Hz distortion
on (1000-Hz filter in the
une the filter for minimum
ull on the lowest possible
30%, etc.)

NGE switch to the SET LEVEL
lter out of the circuit) and
nput LEVEL control for a +2
n a mid range (30%).

ng the signal generator out-
the RANGE control from SET
distortion range until a
ence (+2 dB to -10 dB) is
ween the SET LEVEL and
ange positions (filter out
n).

fference (Signal plus Noise
on to noise plus distortion
e "usable" sensitivity level.
ity should be less than rated
specification with an audio
least 2.5 watts (2.9 volts
ne 3.5-ohm receiver load us-
ortion Analyzer as a VTVM).

F. Leave all controls as they are and all equipment connected if the Modulation Acceptance Bandwidth test is to be performed.

SERVICE CHECK

If the sensitivity level is more than rated 12 dB SINAD, check the alignment of the RF stages as directed in the Alignment Procedure, and make the gain measurements as shown on the Troubleshooting Procedure.

STEP 3
MODULATION ACCEPTANCE BANDWITH (IF BANDWITH)

If STEPS 1 and 2 check out properly, measure the bandwidth as follows:

A. Set the Signal Generator output for twice the microvolt reading obtained in the 12-dB SINAD measurement.

B. Set the RANGE control on the Distortion Analyzer in the SET LEVEL position (1000-Hz filter out of the circuit), and adjust the input LEVEL control for a +2 dB reading on the 30% range.

C. While increasing the deviation of the Signal Generator, switch the RANGE control from SET LEVEL to distortion range until a 12-dB difference is obtained between the SET LEVEL and distortion range readings (from +2 dB to -10 dB).

D. The deviation control reading for the 12-dB difference is the Modulation Acceptance Bandwidth of the receiver. If should be more than ±7.5 kHz (but less that ±9.5 kHz).

SERVICE CHECK

If the Modulation Acceptance Bandwidth test does not indicate the proper width, make gain measurements as shown on the Receiver Troubleshooting Procedure.

Then connect a milliammeter in series with the +12 volt lead at P443-11. With no signal in, adjust R43 for a reading of approximately 20 milliamps. This adjustment should not be necessary unless an output transistor has been re-replaced.

G. Audio Gain (Refer to Receiver Trouble-shooting Procedure).

H. Discriminator Alignment (Refer to Receiver Alignment on reverse side of page).

STEP 2
USABLE SENSITIVITY
(12-dB SINAD)

If STEP 1 checks out properly, measure the receiver sensitivity as follows:

A. Apply a 1000-microvolt, on-frequency signal modulated by 1000 Hz with 3.3-kHz deviation to J441.

B. Place the RANGE switch on the Distortion Analyzer in the 200 to 2000-Hz distortion range position (1000-Hz filter in the circuit). Tune the filter for minimum reading or null on the lowest possible scale (100%, 30%, etc.)

C. Place the RANGE switch to the SET LEVEL position (filter out of the circuit) and adjust the input LEVEL control for a +2 dB reading on a mid range (30%).

D. While reducing the signal generator output, switch the RANGE control from SET LEVEL to the distortion range until a 12-dB difference (+2 dB to -10 dB) is obtained between the SET LEVEL and distortion range positions (filter out and filter in).

E. The 12-dB difference (Signal plus Noise and Distortion to noise plus distortion ratio) is the "usable" sensitivity level. The sensitivity should be less than rated 12 dB SINAD specification with an audio output of at least 2.5 watts (2.9 volts RMS across the 3.5-ohm receiver load using the Distortion Analyzer as a VTVM).

F. Leave all equipment Acceptance formed.

S

If the sen rated 12 dB SIN the RF stages a Procedure, and shown on the Tr

MODULA
BANDW

If STEPS 1 measure the banc

A. Set the Sig the microvo 12-dB SINAD

B. Set the RAN Analyzer in Hz filter c the input I ing on the

C. While incre Signal Gene trol from S until a 12- between the readings (f

D. The deviati 12-dB diffe Acceptance If should b less that ±

S

If the Modu test does not in gain measurement Troubleshooting

erly, and low gain. By following the ence of test steps starting with Step 1, defect can be quickly localized. Once

Before starting with the Receiver Test Procedures, be sure the receiver is tuned and aligned to the proper operating frequency.

EST EQUIPMENT REQUIRED

istortion Analyzer similar to:
eath IM-12

ignal Generator similar to:
easurements M-560

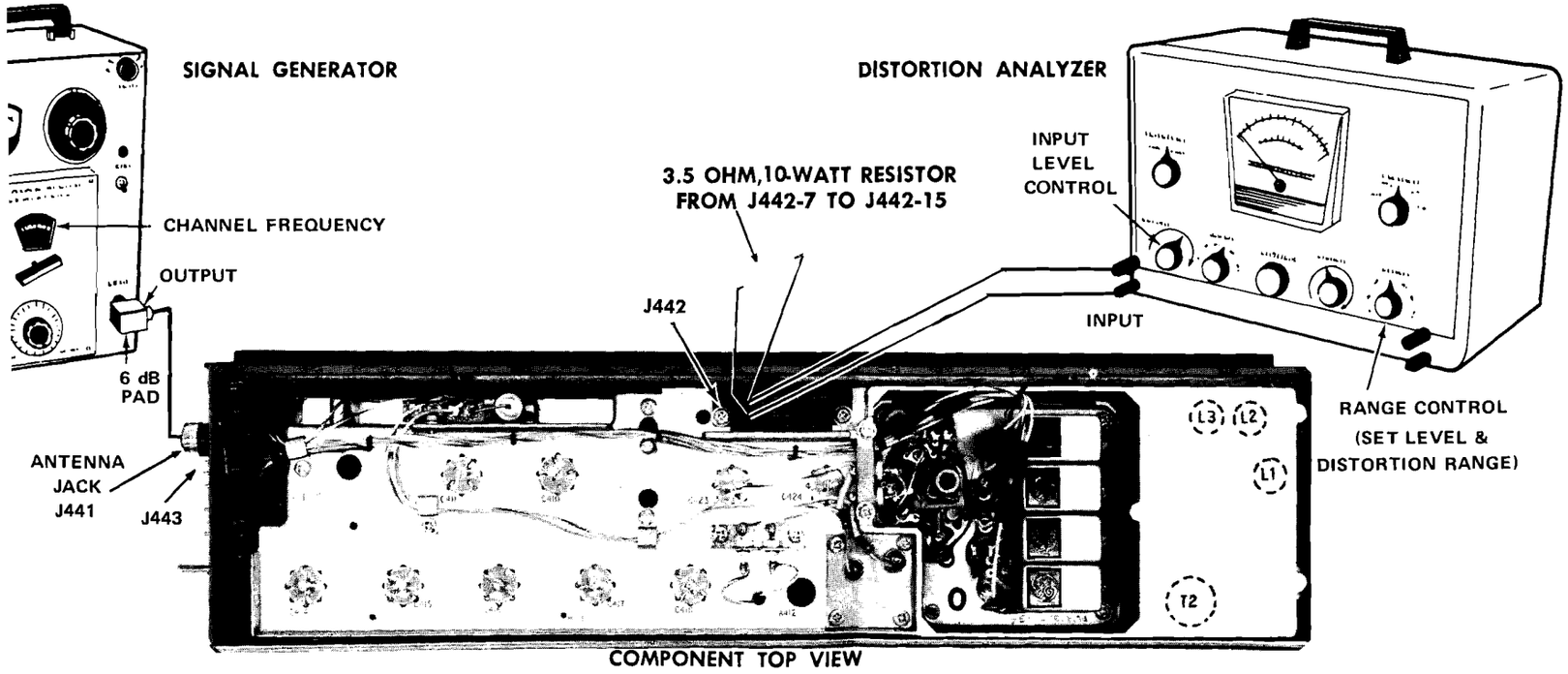
-dB attenuation pad, and 3.5-ohm, 0-watt resistor

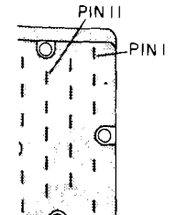
PRELIMINARY ADJUSTMENTS

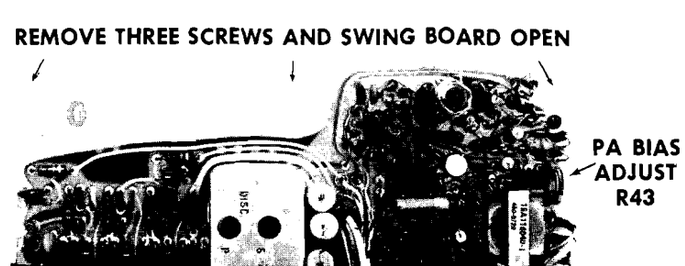
1. Connect the test equipment to the receiver as shown for all steps of the receiver Test Procedure.

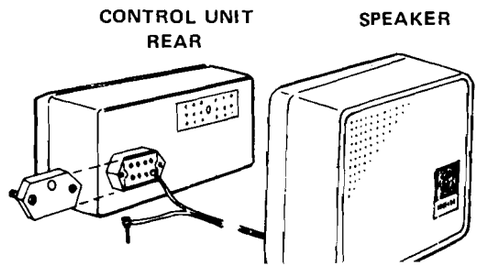
2. Turn the SQUELCH control fully clockwise for all steps of the Test Procedure.

3. Turn on all of the equipment and let it warm up for 20 minutes.









TEST PROCEDURE

Measure Audio Power Output as follows:

A. Apply a 1,000-microvolt, on-frequency test signal modulated by 1,000 hertz with ±3.3 kHz deviation to antenna ja J441.

B. With Five-Watt Speaker:

Disconnect speaker lead pin from J701 (on rear of Control Unit).

Connect a 3.5-ohm load resistor from J442-15 to J442-7. Connect the Distc tion Analyzer input across the resist as shown.

OR

With Handset:

Lift the handset off of the hookswitc Connect the Distortion Analyzer input from J442-15 to J442-7.

C. Adjust the VOLUME control for five-wa output (4.18 VRMS using the Distortio Analyzer as a VTVM).

D. Make distortion measurements accordin to manufacturer's instructions. Read should be less than 5%. If the recei sensitivity is to be measured, leave all controls and equipment as they ar

SERVICE CHECK

If the distortion is more than 5%, or maximum audio output is less than fiv watts, make the following checks:

E. Battery and regulator voltage---low v age will cause distortion. (Refer to Receiver Schematic Diagram for voltag

F. P.A. Bias Adjust (R43) -- Turn the

STEP 1-QUICKCHECKS

TEST SET CHECKS

These checks are typical voltage readings measured with GE Test Set Model 4EX3A10 in the Test 1 position, or Model 4EX8K10 or 11 in the 1-volt position.

Metering Position	Reading with No Signal in	Reading with 1 μv unmodulated input
A Disc idling	Less than ±.05 VDC	
B 2nd IF	.05 VDC	0.2 VDC
C 1st Lim	0.6 VDC	0.8 VDC
D Mult 1	1.0 VDC	
G Mult 2	0.3 VDC	
J Regulated +10 Volts	10 VDC	

SYMPTOM CHECKS

SYMPTOM	PROCEDURE
NO SUPPLY VOLTAGE	• Check power connections and continuity of supply leads, and check fuse in power supply. If fuse is blown, check receiver for short circuits.
NO REGULATED 10-VOLTS	• Check the 12-volt supply. Then check regulator circuit (See Troubleshooting Procedure for Power Supply).
LOW 1ST LIM READING	• Check supply voltages and then check oscillator reading at J442-4 & 5 as shown in STEP 2A. • Make SIMPLIFIED VTVM GAIN CHECKS from 2nd Mixer through 1st Limiter stages as shown in STEP 2A.
LOW OSCILLATOR/MULTIPLIER READINGS	• Check alignment of Oscillator (Refer to Front End Alignment Procedure). • Check voltage readings of 1st Oscillator/Multiplier Q1/Q2. • Check crystal Y1.
LOW RECEIVER SENSITIVITY	• Check Front End Alignment (Refer to Receiver Alignment Procedure). • Check antenna connections, cable and relay. • Check 1st and 2nd Oscillator injection voltage. • Check voltage readings of RF Amp, 1st Mixer and HI IF Amp. • Make SIMPLIFIED GAIN CHECKS (STEP 2A).
LOW AUDIO	• Check Audio PA (Q410 & Q411) voltage readings on schematic diagram. • Make simplified gain and waveform checks of audio and squelch stages (Steps 2A and 2B). • Make unsquelched voltage readings in Audio section (Refer to Receiver Schematic Diagram). • Check voltage readings on Channel Guard board.
HIGH DISTORTION AT LOW AUDIO LEVELS (50 MW)	• Set PA bias adjust R43 as specified under Service checks in STEP 1 of TEST PROCEDURES.
IMPROPER SQUELCH OPERATION	• Check voltage readings of Squelch circuit (Refer to Receiver Schematic Diagram). • Make gain and waveform checks of audio and squelch stages (Steps 2A and 2B).
DISCRIMINATOR IDLING TOO FAR OFF ZERO	• See if discriminator zero is in center of IF bandpass.

STEP 3-VOLTAGE RATIO READ

EQUIPMENT REQUIRED:

1. RF Voltmeter (Similiar to Boonton Model 9 Millivac Type MV-18 C).
2. Signal on receiver frequency (below satur Correct frequency can be determined by ze the discriminator. Use 1,000 Hertz signa 3.3 kHz deviation for audio stage.

PROCEDURE

1. Apply probes to input of stage and system tive (-10 VDC). Take voltage reading (E_1
2. Move probes to input of following stage a system negative. Take reading (E_2).
3. Convert readings by means of the followin mula:

$$\text{Volatge Ratio} = \frac{E_2}{E_1}$$

4. Check results with typical voltage ratios on diagram.

EP 3-VOLTAGE RATIO READINGS

MENT REQUIRED:

RF Voltmeter (Similiar to Boonton Model 91-CA or Millivac Type MV-18 C).

Signal on receiver frequency (below saturation). Correct frequency can be determined by zeroing the discriminator. Use 1,000 Hertz signal with 3.3 kHz deviation for audio stage.

DURE

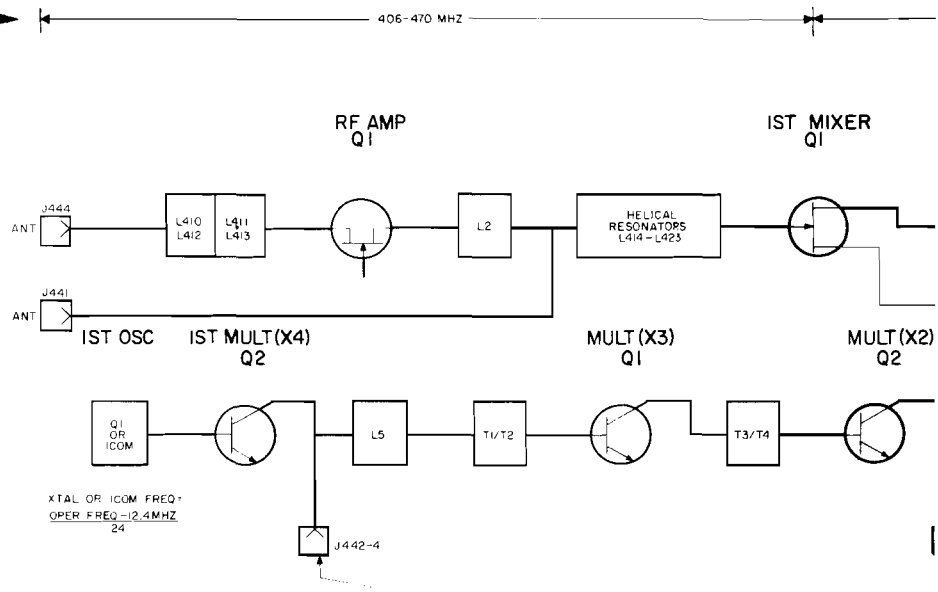
Apply probes to input of stage and system negative (-10 VDC). Take voltage reading (E_1).

Move probes to input of following stage and system negative. Take reading (E_2).

Convert readings by means of the following formula:

$$\text{Volatge Ratio} = \frac{E_2}{E_1}$$

Check results with typical voltage ratios shown on diagram.



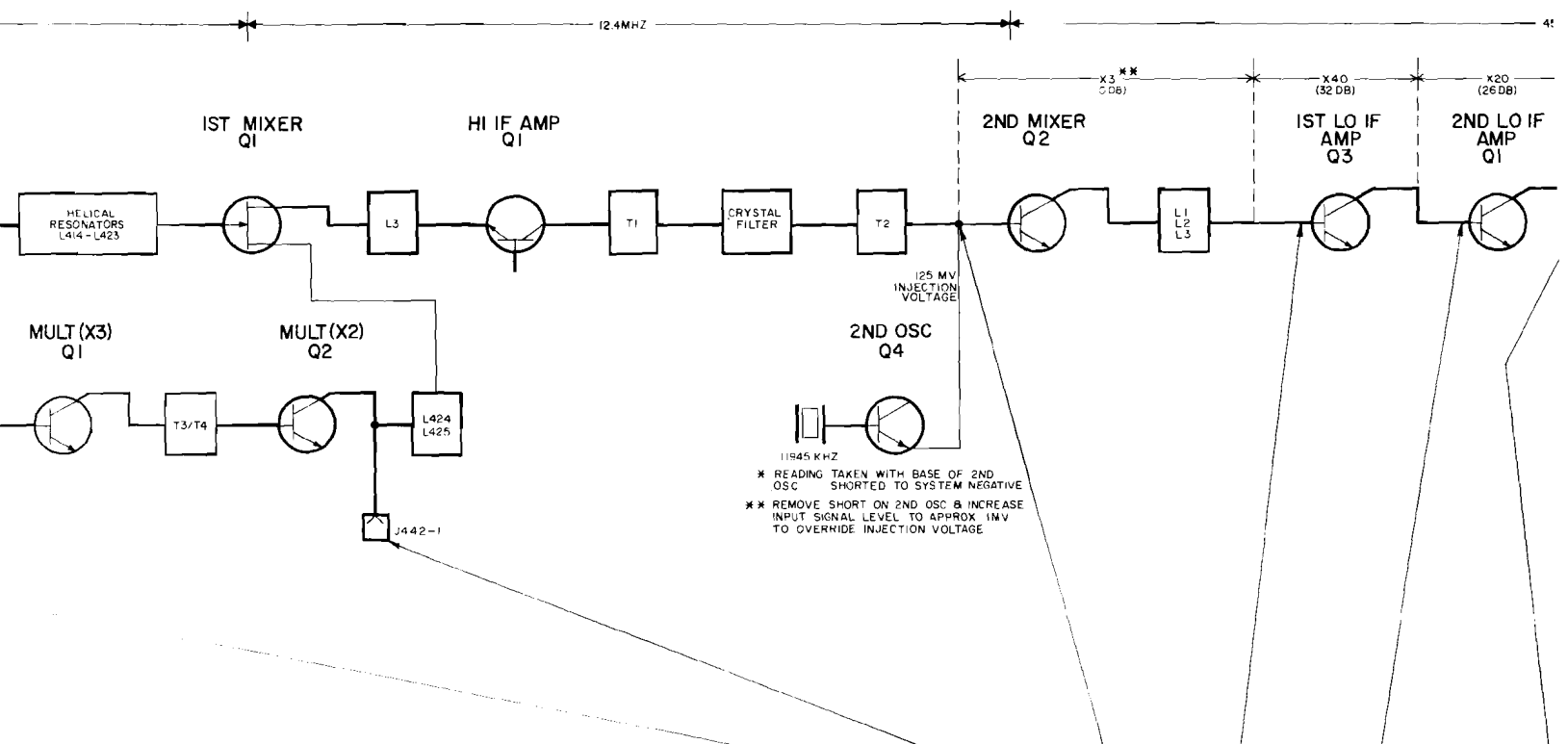
STEP 2A-SIMPLIFIED VTVM GAIN CHE

EQUIPMENT REQUIRED:

1. VTVM-AC & DC
2. Signal Generator (measurements M560 or equiv.)

PRELIMINARY STEPS:

1. Set VOLUME control for 4.18 volts across 3.5-ohm load. If this cannot be obtained, set to approx. 70% of max. rotation.
2. Set SQUELCH control fully counterclockwise.
3. Receiver should be properly aligned.
4. Connect VTVM between system negative and points indicated by arrow (except for 1st MULT which *references chassis ground*).



FIED VTVM GAIN CHECKS →

SIGNAL GENERATOR INPUT AT J441 MAINTAIN SETTING AT DISCRIMINATOR ZERO			UNMODULATED	UNMODULATED	UNMODULATED	UNMODULAT
PROCEDURE			INCREASE GENERATOR OUTPUT UNTIL VTVM READING ON 1.5 V SCALE DECREASES BY 50 MV	INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING DECREASES BY 5%	INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING DECREASES BY 5%	INCREASE SIGN GENERATOR OU FROM ZERO U VTVM READIN CREASES BY
READING	0.8 VDC	0.25 VDC	GENERATOR OUTPUT SHOULD BE APPROX 20 MILLIVOLTS	GENERATOR OUTPUT SHOULD BE APPROX 600 MICROVOLTS	GENERATOR OUTPUT SHOULD BE APPROX 5 MICROVOLTS	GENERATOR OU SHOULD BE AP 0.3 MICROVOL

.surements M560 or equiv.)

r 4.18 volts across 3.5-ohm
be obtained, set to approx.

ully counterclockwise.

operly aligned.

system negative and points
xcept for 1st MULT which
ound).

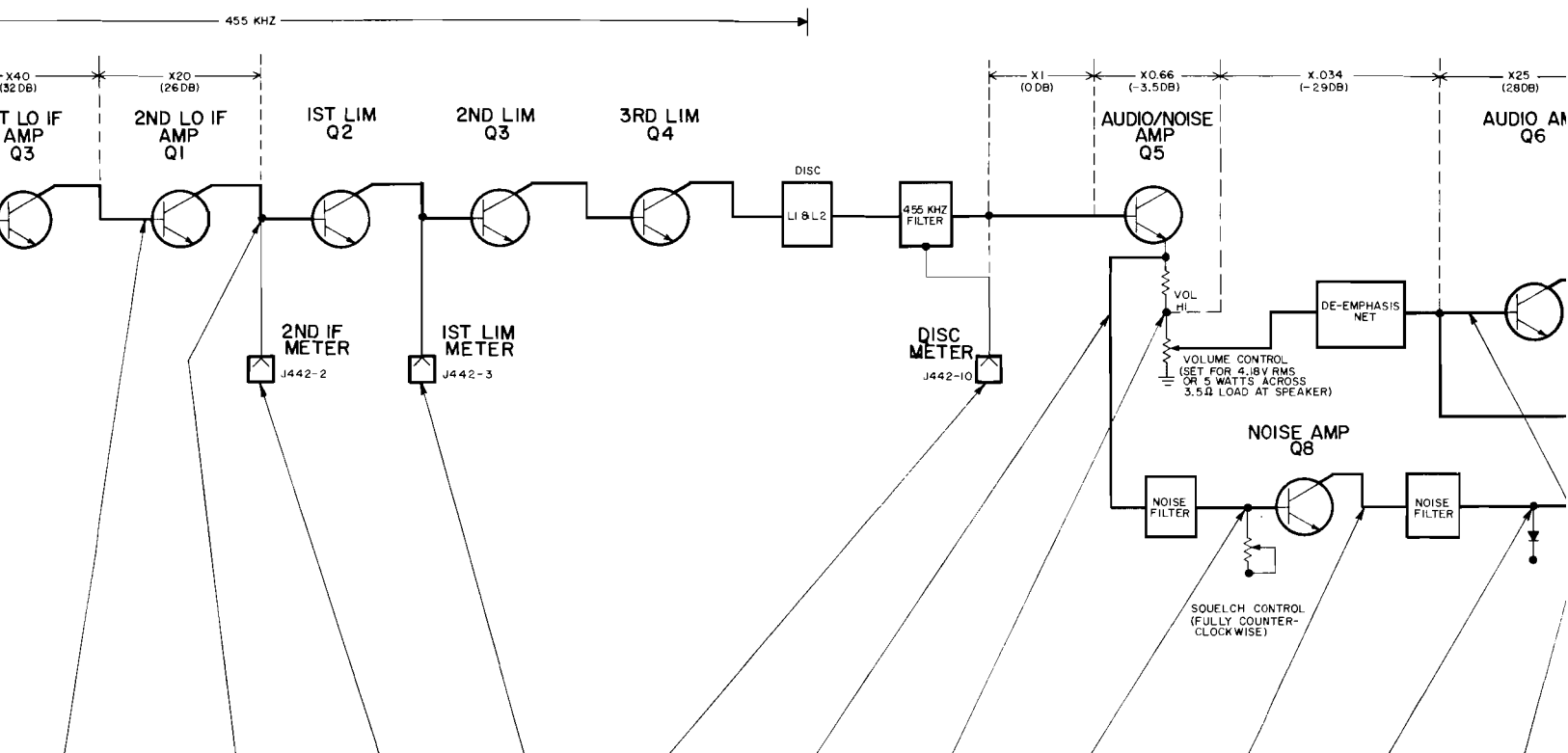
STEP 2B-AUDIO & SQUELCH WAVEFO

EQUIPMENT REQUIRED:

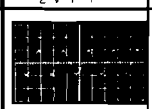
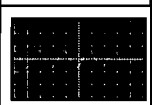
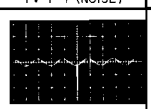
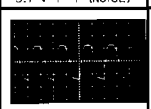
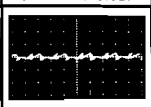
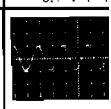
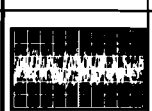
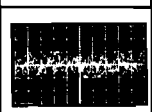
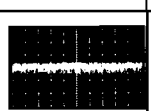
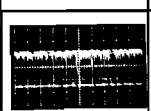
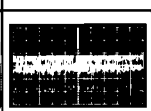
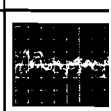
1. Oscilloscope.
2. Signal generator (measurements M560 to equivale

PRELIMINARY STEPS:

1. Set VOLUME control for 4.18 volts across 3.5-oh load. If this cannot be obtained, set to appro 70% of max. rotation.
2. Set SQUELCH control fully counterclockwise.
3. Receiver should be properly aligned.
4. Connect oscilloscope between system negative an points indicated by arrow.



UNMODULATED	UNMODULATED	1 MICROVOLT UNMODULATED	NO SIGNAL INPUT	STANDARD SIGNAL- 1 MILLIVOLT AT RCVR FREQ, MODULATED BY 1KHZ WITH 3.3KHZ DEV(10KHZ W.B)	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIG
INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING DECREASES BY 5%	INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING DECREASES BY 5%									
GENERATOR OUTPUT SHOULD BE APPROX 5 MICROVOLTS	GENERATOR OUTPUT SHOULD BE APPROX 0.3 MICROVOLTS	-0.6 VDC	- 2 VDC	0.8 VAC	0.75 VAC	0.55 VAC	0.15 VAC	2.3 VAC	0.05 VAC	

SCOPE SETTING							
	HORIZONTAL	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV
	VERTICAL	1 VOLT/DIV	1 VOLT/DIV	1 VOLT/DIV	2 VOLTS/DIV	0.5 VOLTS/DIV	50 MILLIVOLTS
PEAK-TO-PEAK VOLTAGE		2 V P-P	1.4 V P-P	1V P-P (NOISE)	5.7 V P-P (NOISE)	3 V P-P (NOISE)	0.1 V P-P
STANDARD SIGNAL (1 MILLIVOLT AT RECEIVER FREQ MODULATED BY 1KHZ WITH 3.3 KHZ DEVIATION (10 KHZ WIDE BAND))							
NOISE WAVE FORM (NO SIGNAL INPUT)							

UELCH WAVEFORMS →

ents M560 to equivalent).

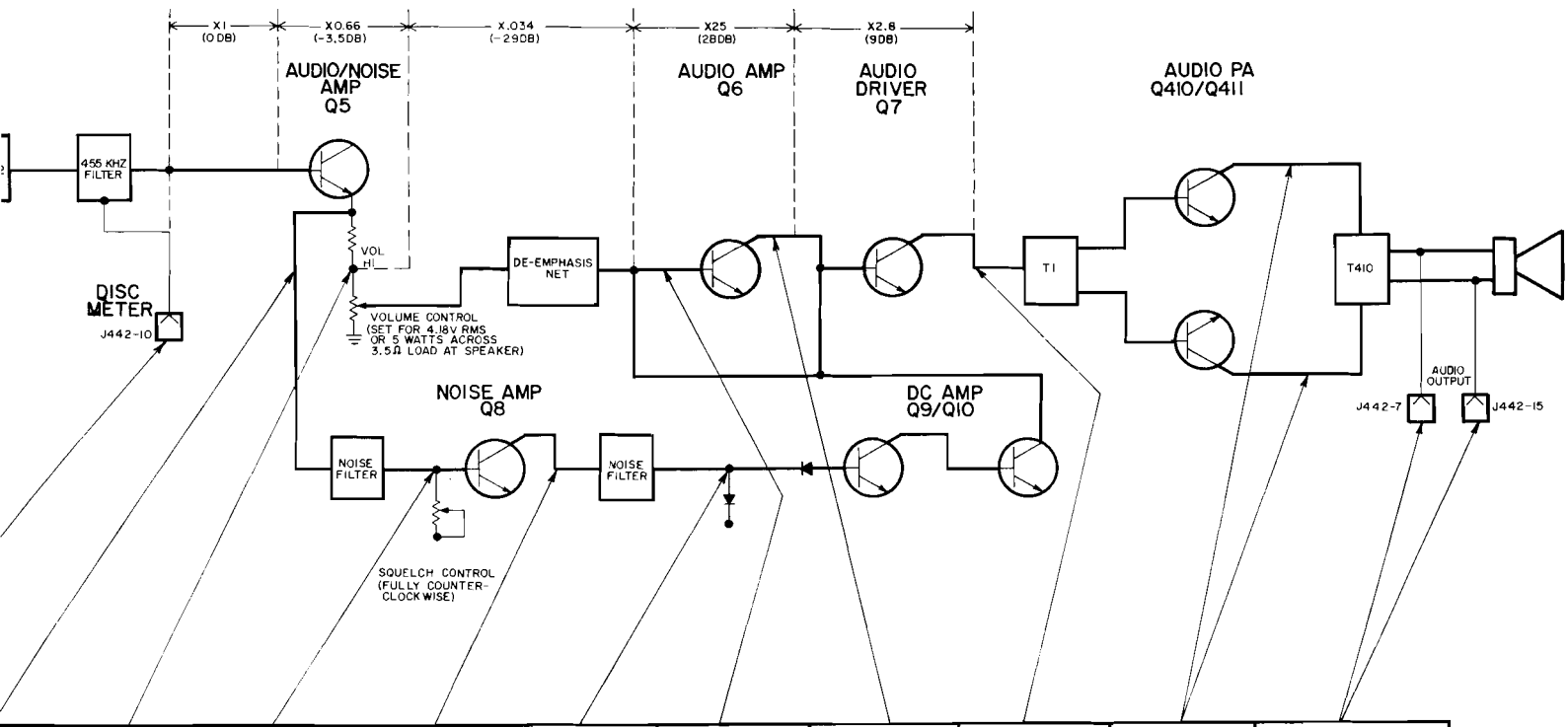
RC-1828 B

3 volts across 3.5-ohm
btained, set to approx.

counterclockwise.

y aligned.

en system negative and



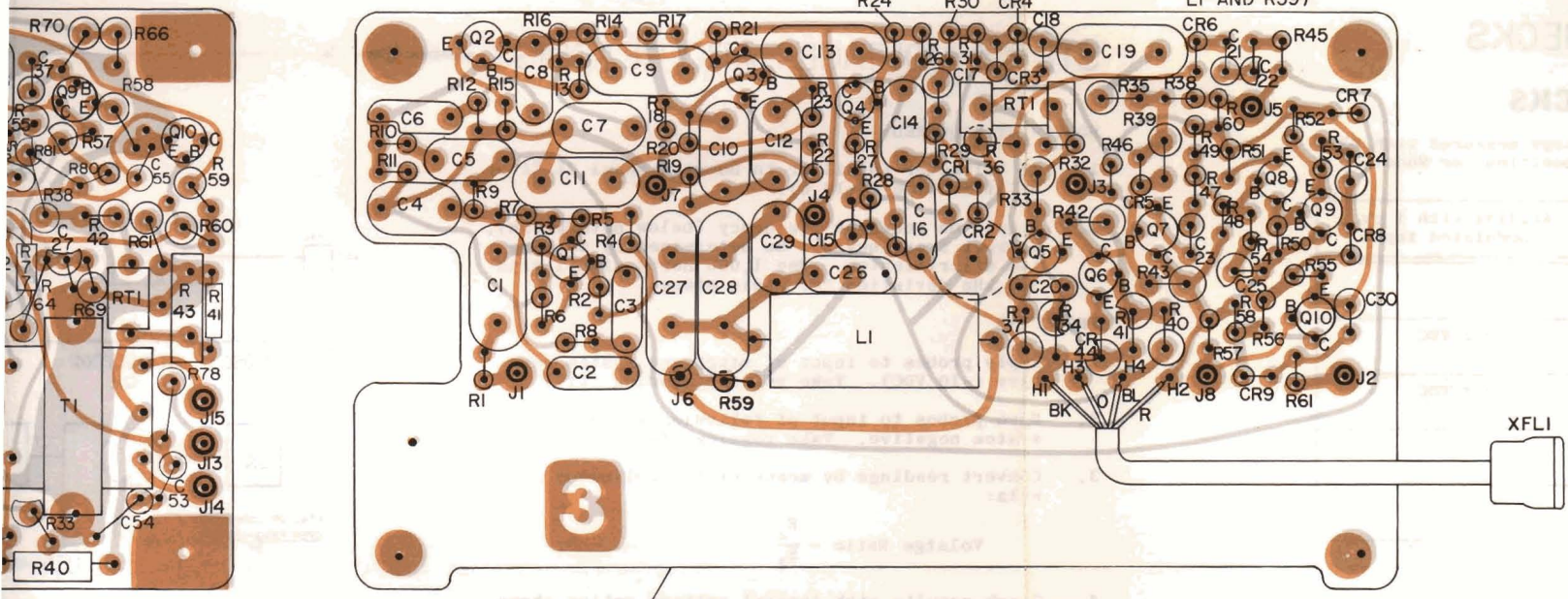
SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL
									CONNECT VTVM OR SCOPE ACROSS 3.5Ω LOAD BETWEEN J442-7 AND J442-15 WITH SPEAKER DISCONNECTED.
VAC	0.55 VAC	0.15 VAC	2.3 VAC	0.05 VAC		0.5 VAC	1.4 VAC	10 VAC	4.18 VAC
DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV	0.5 MS/DIV
DIV	1 VOLT/DIV	1 VOLT/DIV	2 VOLTS/DIV	0.5 VOLTS/DIV	50 MILLIVOLTS/DIV	1 VOLT/DIV	2 VOLTS/DIV	10 VOLTS/DIV	5 VOLTS/DIV
-P	1.4 V P-P	1 V P-P (NOISE)	5.7 V P-P (NOISE)	3 V P-P (NOISE)	0.1 V P-P	1.9 V P-P	4 V P-P	30 V P-P	12 V P-P

TROUBLESHOOTING PROCEDURE

406—470 MHz RECEIVER
MODELS 4ER42E10-33 & 4ER42G10-33

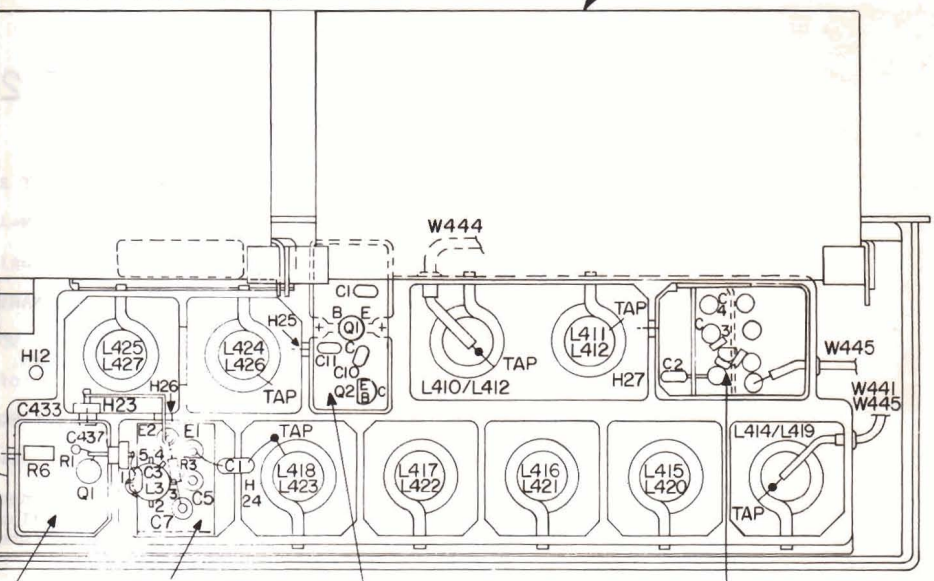
ENCODER-DECODER A428

TONE REJECT FILTER A429 (CONSISTS OF C26 THRU C29, LI AND R59)



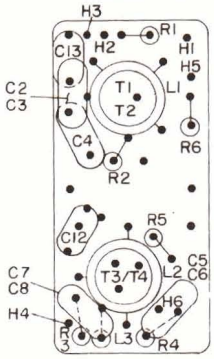
(19C311794, Sh. 1, Rev. 3)
(19C311794, Sh. 2, Rev. 3)

BOTTOM VIEW

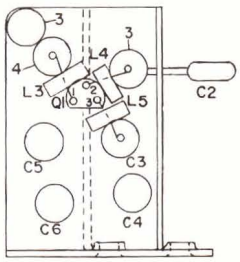


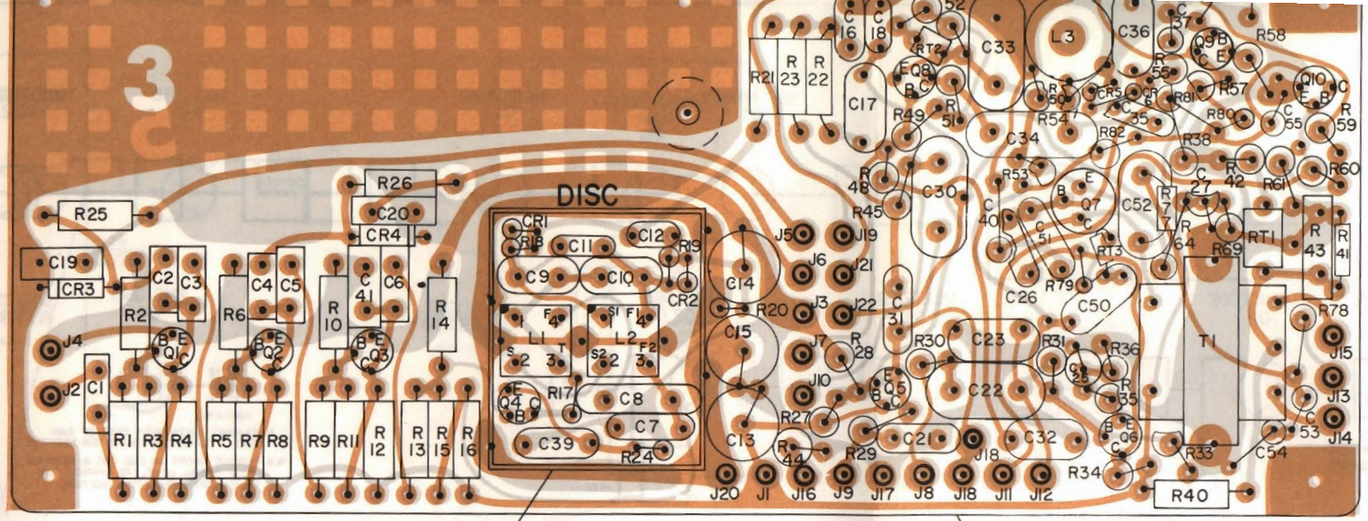
IST MIXER
A412

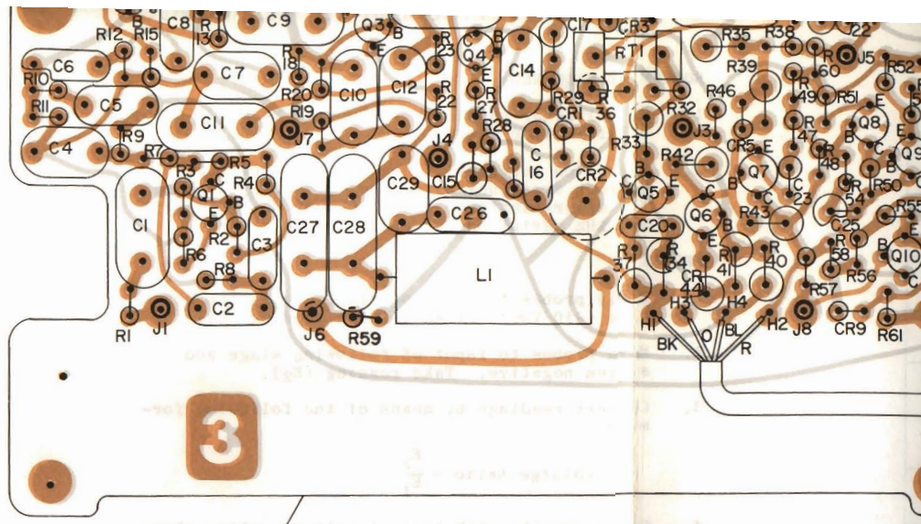
MULT
A413/A414



RF AMP
A410/A411



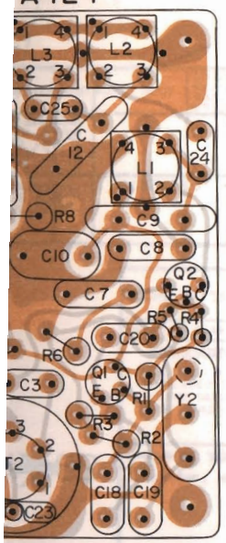




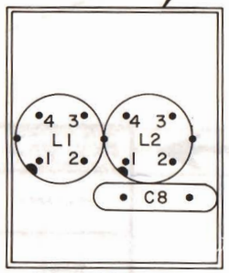
(19C311803, Sh. 1, Rev. 3)
(19C311803, Sh. 2, Rev. 5)

(19C311794, Sh. 1, Rev. 3)
(19C311794, Sh. 2, Rev. 3)

D MIXER
A424



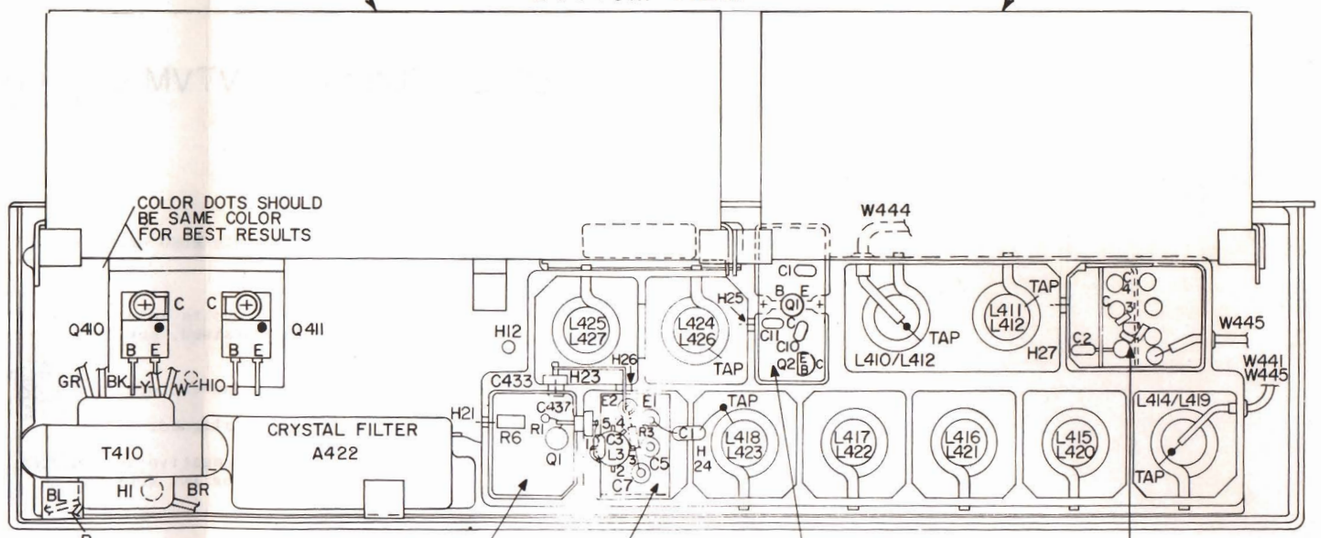
5, Sh. 1, Rev. 3)
5, Sh. 2, Rev. 3)



ALTERNATE L1 & L2

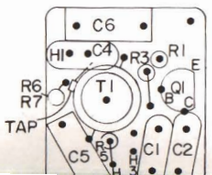
PIN NUMBER MARKING ON SIDE OF COIL CAN OR COLOR DOT IDENTIFIES PIN NUMBER 1 ON DISCRIMINATOR AND 2ND MIXER COILS.

BOTTOM VIEW

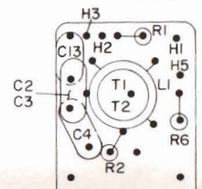


IST MIXER
A412

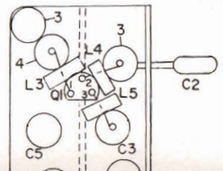
HI IF AMP
A421



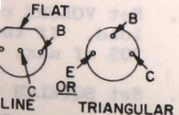
MULT
A413/A414



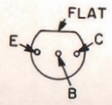
RF AMP
A410/A411



RANSISTOR LEAD
DENTIFICATION

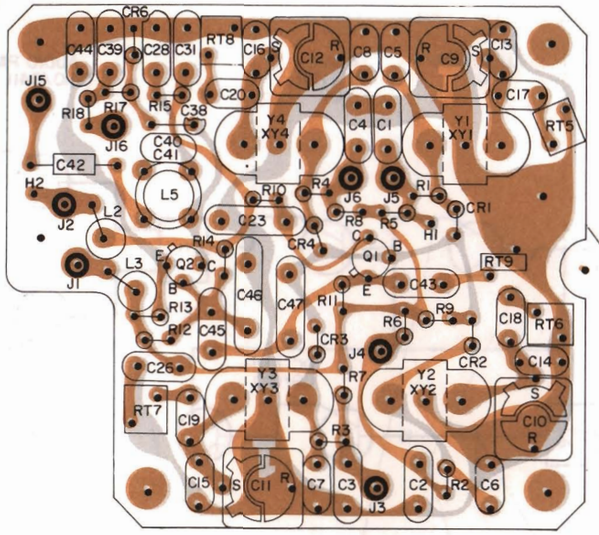


(A426-Q10 ONLY)



406-420 MHZ 450-470 MHZ

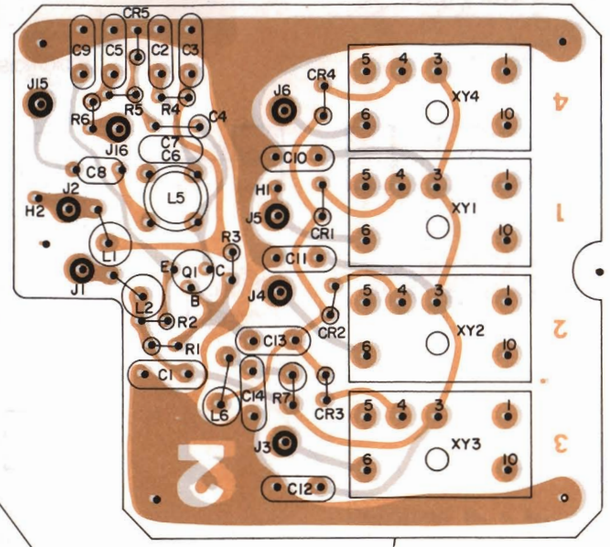
A415-1 FREQ - A418
A416-2 FREQ - A419
A417-4 FREQ - A420



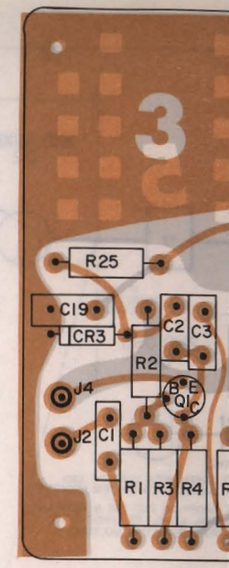
(19B204934, Sh. 1, Rev. 1)
(19B204934, Sh. 2, Rev. 1)

406-420 MHZ 450-470 MHZ

A432-1 FREQ - A434
A433-4 FREQ - A435



(19B216041, Sh. 1, Rev. 2)
(19B216041, Sh. 2, Rev. 2)

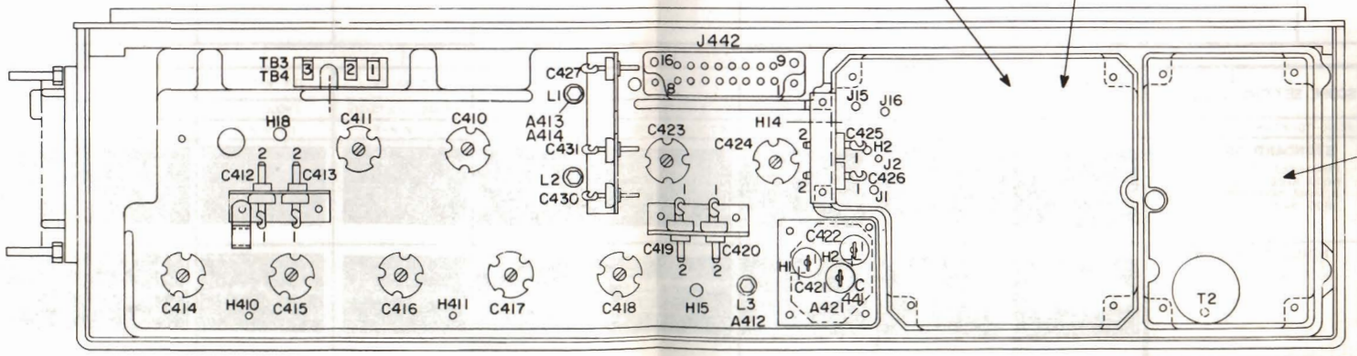


TO A426-J4

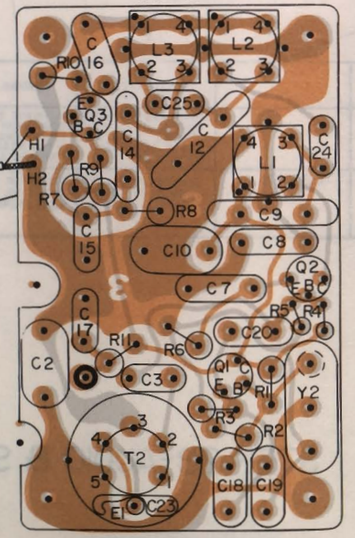
TO A426-J2

TOP VIEW

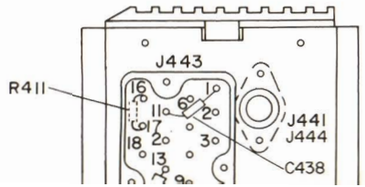
CENTRALIZED METERING JACK



2ND MIXER A424

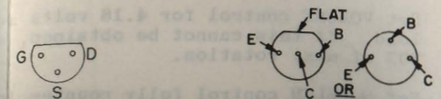


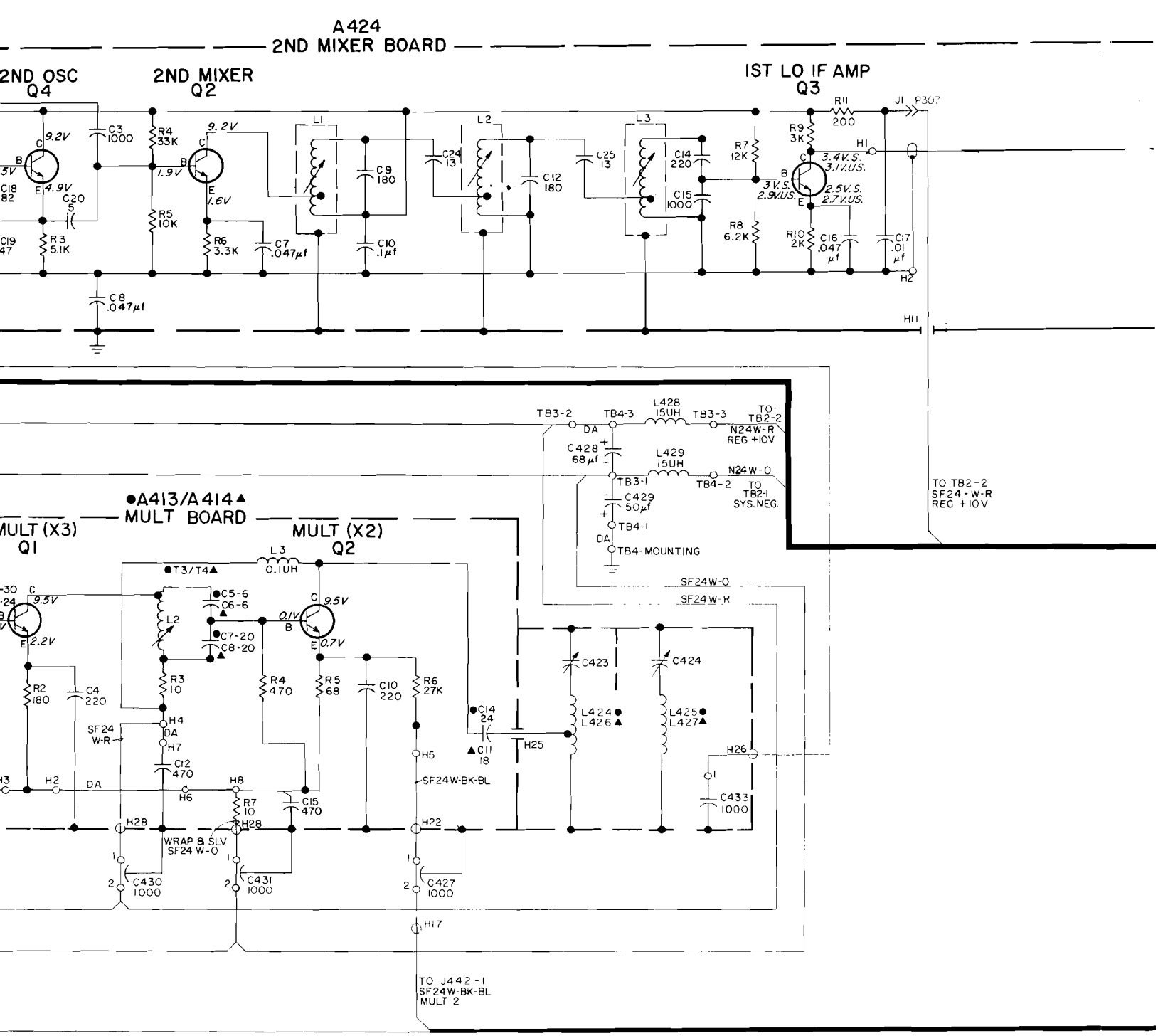
(19B216045, Sh. 1, Rev. 3)
(19B216045, Sh. 2, Rev. 3)



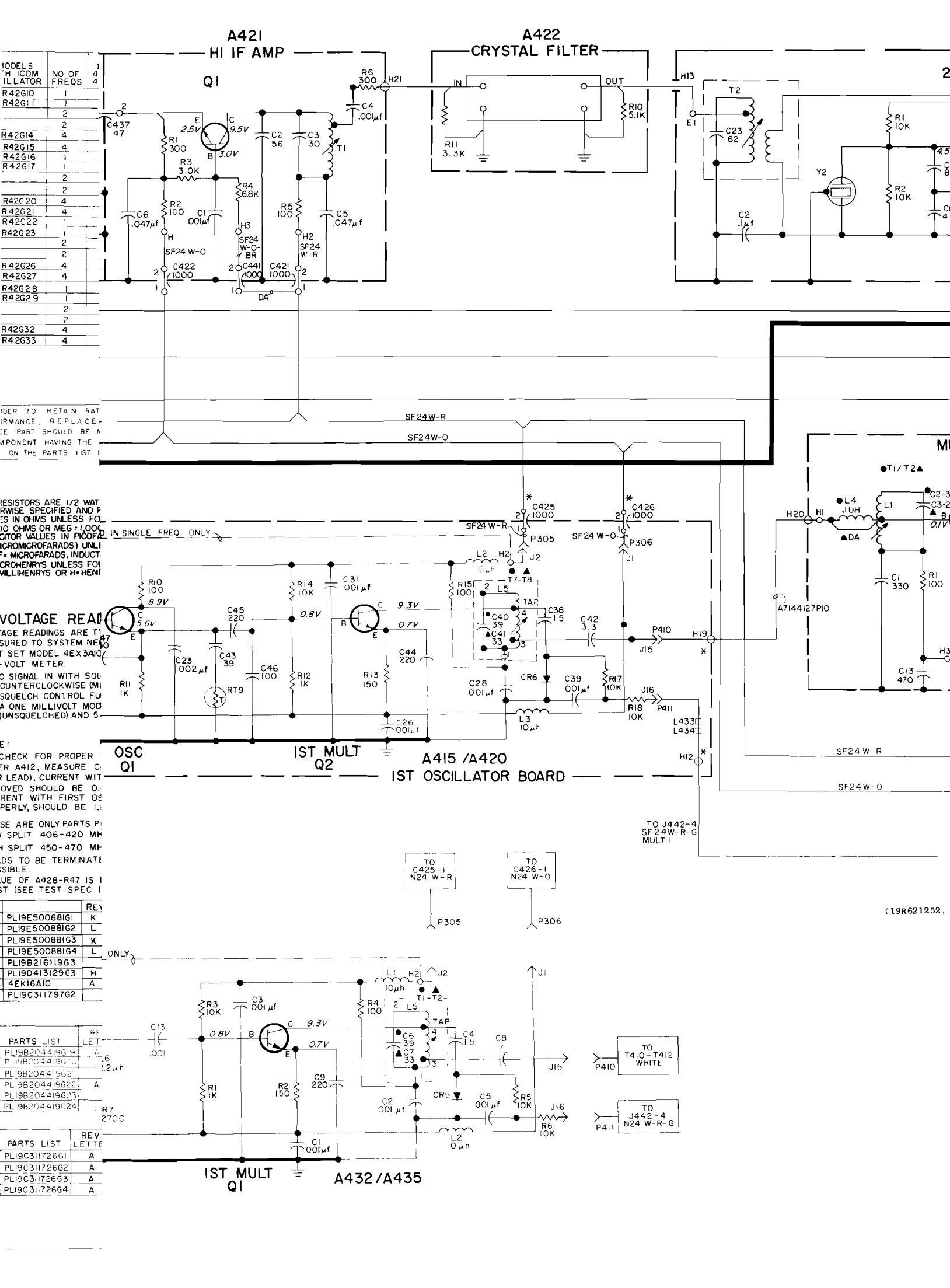
RUNS ON SOLDER SIDE

TRANSISTOR LEAD IDENTIFICATION




A424
2ND MIXER BOARD
2ND OSC
Q4
2ND MIXER
Q2
IST LO IF AMP
Q3
J1 P307
R11 200
R9 3K
R7 12K
R8 6.2K
R10 2K
C16 .047 µf
C17 .01 µf
C14 220
C15 1000
C3 1000
R4 33K
R5 10K
R6 3.3K
C7 .047µf
C8 .047µf
C9 180
C10 .1µf
C12 180
C20 5
R3 5.1K
L1
L2
L3
C24 13
C25 13
9.2V
4.9V
1.9V
1.6V
3.4V.S.
3.1V.U.S.
3V.S.
2.9V.U.S.
2.5V.S.
2.7V.U.S.
H1
H2
H11
TB3-2
TB4-3
L428 15UH
TB3-3
TO TB2-2 N24W-R REG +10V
C428 68µf
L429 15UH
N24W-O
TB3-1
TB4-2
TO TB2-1 SYS. NEG.
C429 50µf
TB4-1
TB4-MOUNTING
TO TB2-2 SF24-W-R REG +10V
●A413/A414▲
MULT BOARD
MULT (X3)
Q1
MULT (X2)
Q2
L3 0.1UH
●T3/T4▲
●C5-6
C6-6
●C7-20
C8-20
L2
9.5V
2.2V
0.1V
0.7V
R2 180
C4 220
R3 10
R4 470
R5 68
C10 220
R6 27K
C12 470
R7 10
C15 470
●C14 24
▲C11 18
C423
C424
L424● L426▲
L425● L427▲
H25
H26
C433 1000
H4
H7
H5
H6
H8
H28
H22
SF24 W-R
SF24W-BK-BL
WRAP & SLV SF24 W-O
C430 1000
C431 1000
C427 1000
H17
TO J442-1 SF24W-BK-BL MULT 2
SF24W-O
SF24W-R
DA

, Rev. 24)

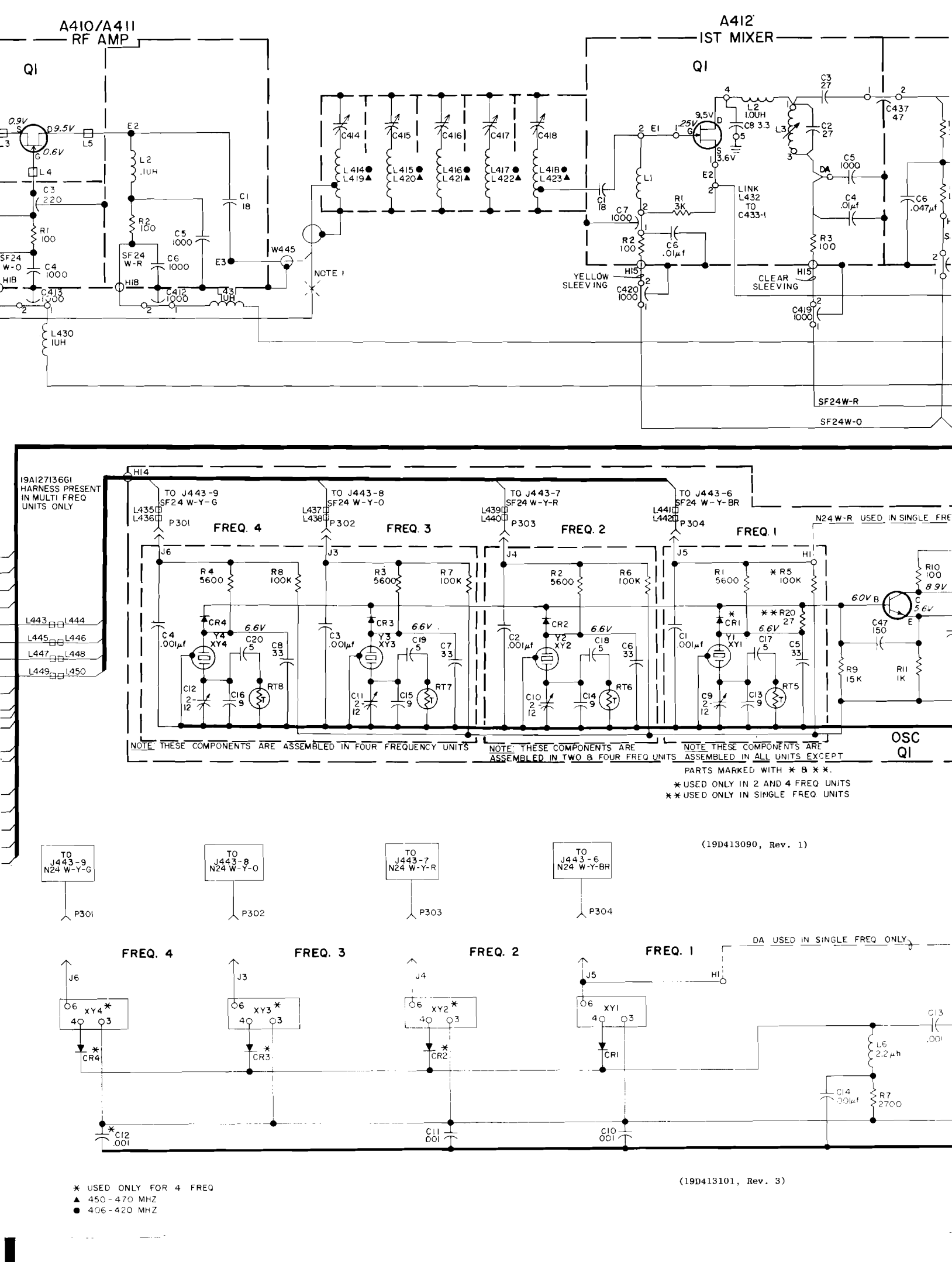


MODELS WITH ICOM OSCILLATOR	NO. OF FREQS
R42G10	1
R42G11	1
	2
	2
R42G14	4
R42G15	4
R42G16	1
R42G17	1
	2
	2
R42C20	4
R42G21	4
R42C22	1
R42G23	1
	2
	2
R42G26	4
R42G27	4
R42G28	1
R42G29	1
	2
	2
R42G32	4
R42G33	4

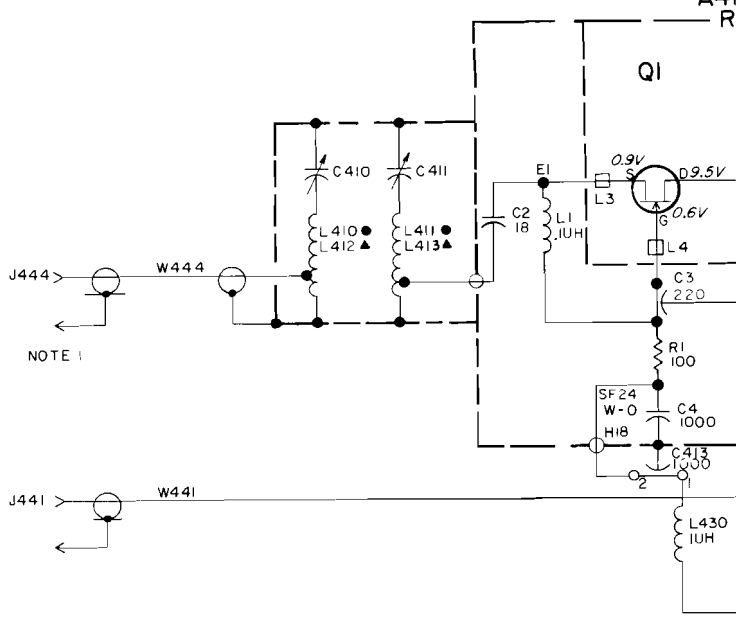
PARTS LIST	REV. LETTER
PL19E500881G1	K
PL19E500881G2	L
PL19E500881G3	K
PL19E500881G4	L
PL19B216119G3	
PL19D413129G3	H
4EK16A10	A
PL19C311797G2	

PARTS LIST	REV. LETTER
PL19B204419G9	A
PL19B204419G20	A
PL19B204419G21	
PL19B204419G22	A
PL19B204419G23	
PL19B204419G24	

PARTS LIST	REV. LETTER
PL19C311726G1	A
PL19C311726G2	A
PL19C311726G3	A
PL19C311726G4	A


A410/A411
RF AMP
Q1
A412
1ST MIXER
Q1
L1
L2
L3
L4
L5
C1
C2
C3
C4
C5
C6
C7
C8
R1
R2
R3
C414
C415
C416
C417
C418
L414
L415
L416
L417
L418
L419
L420
L421
L422
L423
W445
NOTE 1
LINK L432 TO C433-1
YELLOW SLEEVING
CLEAR SLEEVING
C420 1000
C419 1000
C412 1000
C413 1000
L43 1UH
L430 1UH
SF24W-R
SF24W-O
19A127136G1
HARNESS PRESENT IN MULTI FREQ UNITS ONLY
TO J443-9 SF24 W-Y-G
TO J443-8 SF24 W-Y-O
TO J443-7 SF24 W-Y-R
TO J443-6 SF24 W-Y-BR
P301
P302
P303
P304
FREQ. 4
FREQ. 3
FREQ. 2
FREQ. 1
N24 W-R USED IN SINGLE FRE
OSC Q1
CR1
CR2
CR3
CR4
RT5
RT6
RT7
RT8
XY1
XY2
XY3
XY4
NOTE THESE COMPONENTS ARE ASSEMBLED IN FOUR FREQUENCY UNITS
NOTE THESE COMPONENTS ARE ASSEMBLED IN TWO & FOUR FREQ UNITS
NOTE THESE COMPONENTS ARE ASSEMBLED IN ALL UNITS EXCEPT
PARTS MARKED WITH * & **.
* USED ONLY IN 2 AND 4 FREQ UNITS
** USED ONLY IN SINGLE FREQ UNITS
(19D413090, Rev. 1)
TO J443-9 N24 W-Y-G
TO J443-8 N24 W-Y-O
TO J443-7 N24 W-Y-R
TO J443-6 N24 W-Y-BR
DA USED IN SINGLE FREQ ONLY
* USED ONLY FOR 4 FREQ
▲ 450-470 MHZ
● 406-420 MHZ
(19D413101, Rev. 3)

MODELS WITH DISCRETE CIRCUIT OSCILLATOR	MODELS WITH ICOM OSCILLATOR	NO. OF FREQS	FREQ RANGE 406-420=LO 450-470=HI	CHANNEL GUARD	U.H.S RECEIVER A410/A411 PRESENT
4ER42E10	4ER42G10	1	LO		
4ER42E11	4ER42G11	1	HI		
4ER42E12		2	LO		
4ER42E13		2	HI		
4ER42E14	4ER42G14	4	LO		
4ER42E15	4ER42G15	4	HI		
4ER42E16	4ER42G16	1	LO	X	
4ER42E17	4ER42G17	1	HI	X	
4ER42E18		2	LO	X	
4ER42E19		2	HI	X	
4ER42E20	4ER42G20	4	LO	X	
4ER42E21	4ER42G21	4	HI	X	
4ER42E22	4ER42G22	1	LO		X
4ER42E23	4ER42G23	1	HI		X
4ER42E24		2	LO		X
4ER42E25		2	HI		X
4ER42E26	4ER42G26	4	LO		X
4ER42E27	4ER42G27	4	HI		X
4ER42E28	4ER42G28	1	LO	X	X
4ER42E29	4ER42G29	1	HI	X	X
4ER42E30		2	LO	X	X
4ER42E31		2	HI	X	X
4ER42E32	4ER42G32	4	LO	X	X
4ER42E33	4ER42G33	4	HI	X	X



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

VOLTAGE READINGS

VOLTAGE READINGS ARE TYPICAL READINGS MEASURED TO SYSTEM NEGATIVE (J442-8) WITH TEST SET MODEL 4EX3A10 OR A 20,000 OHM-PER-VOLT METER.

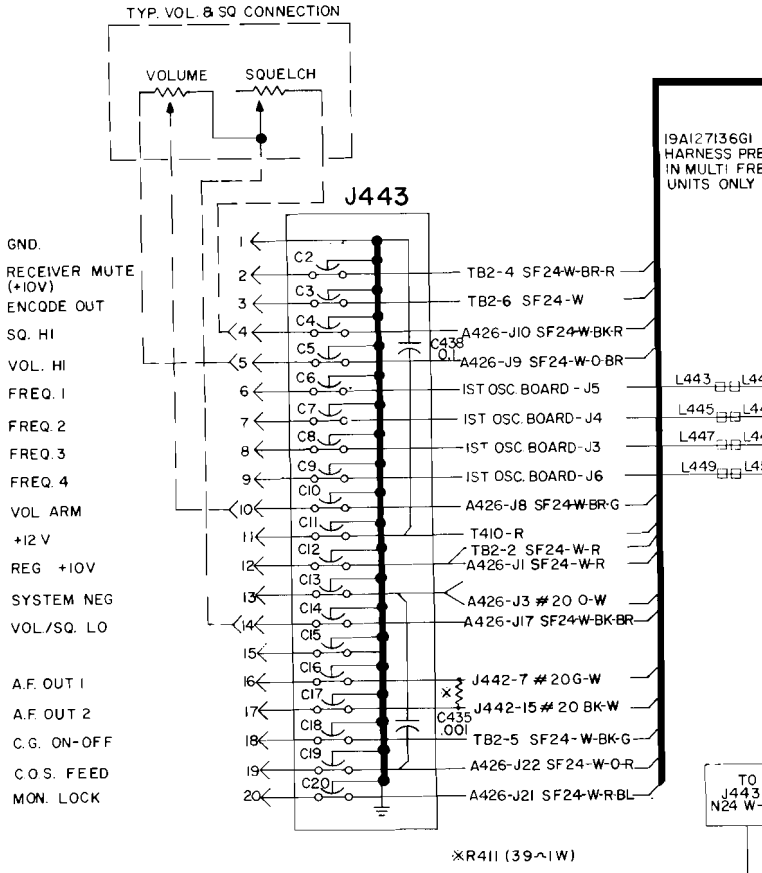
S= NO SIGNAL IN WITH SQUELCH CONTROL FULLY COUNTERCLOCKWISE (MAXIMUM SQUELCH)

US= SQUELCH CONTROL FULLY CLOCKWISE WITH A ONE MILLIVOLT MODULATED SIGNAL (UNSQUELCHED) AND 5 WATT AUDIO OUTPUT.

NOTE:

TO CHECK FOR PROPER OPERATION OF 1ST MIXER A412, MEASURE CURRENT 10V CIRCUIT (W-R LEAD), CURRENT WITH FIRST OSC XTAL REMOVED SHOULD BE 0.6 TO 0.8 MA. CURRENT WITH FIRST OSC OPERATING PROPERLY, SHOULD BE 1.2 TO 1.6 MA.

●THESE ARE ONLY PARTS PRESENT ON A429.
● LOW SPLIT 406-420 MHZ
▲HIGH SPLIT 450-470 MHZ
* LEADS TO BE TERMINATED AS SHORT AS POSSIBLE.
■ VALUE OF A428-R47 IS DETERMINED BY TEST (SEE TEST SPEC 19A127182)



		REV
	PL19E500881G1	K
	PL19E500881G2	L
	PL19E500881G3	K
	PL19E500881G4	L
A424	PL19B216119G3	
A426	PL19D413129G3	H
A428	4EK16A10	A
A429	PL19C311797G2	

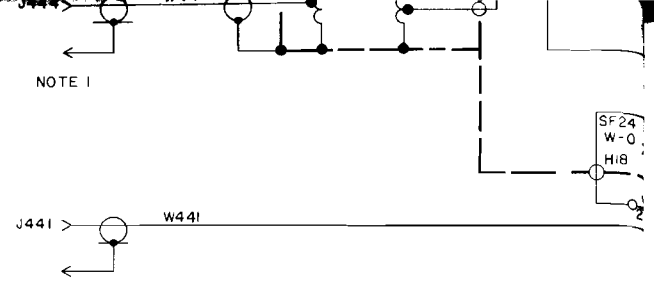
SYM NO	PARTS LIST	REV LETTER
A415	PL19B204419G19	A
A416	PL19B204419G20	
A417	PL19B204419G21	
A418	PL19B204419G22	A
A419	PL19B204419G23	
A420	PL19B204419G24	

SYM NO	PARTS LIST	REV. LETTER
A432	PL19C311726G1	A
A433	PL19C311726G2	A
A434	PL19C311726G3	A
A435	PL19C311726G4	A

-4 AND W445 PRESENT ONLY IN S. RECEIVER.

-1 PRESENT ONLY IN NON-U.H.S. EIVER.

4ER42E20	4ER42G20	4	LO	X	
4ER42E21	4ER42G21	4	HI	X	
4ER42E22	4ER42C22	1	LO		X
4ER42E23	4ER42G23	1	HI		X
4ER42E24		2	LO		X
4ER42E25		2	HI		X
4ER42E26	4ER42G26	4	LO		X
4ER42E27	4ER42G27	4	HI		X
4ER42E28	4ER42G28	1	LO	X	X
4ER42E29	4ER42G29	1	HI	X	X
4ER42E30		2	LO	X	X
4ER42E31		2	HI	X	X
4ER42E32	4ER42G32	4	LO	X	X
4ER42E33	4ER42G33	4	HI	X	X



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NOTE:

TO CHECK FOR PROPER OPERATION OF 1ST MIXER A412, MEASURE CURRENT 10V CIRCUIT (W-R LEAD), CURRENT WITH FIRST OSC XTAL REMOVED SHOULD BE 0.6 TO 0.8 MA. CURRENT WITH FIRST OSC OPERATING PROPERLY, SHOULD BE 1.2 TO 1.6 MA.

▬THESE ARE ONLY PARTS PRESENT ON A429.
● LOW SPLIT 406-420 MHZ
▲ HIGH SPLIT 450-470 MHZ
* LEADS TO BE TERMINATED AS SHORT AS POSSIBLE
■ VALUE OF A42B-R47 IS DETERMINED BY TEST (SEE TEST SPEC 19A127182)

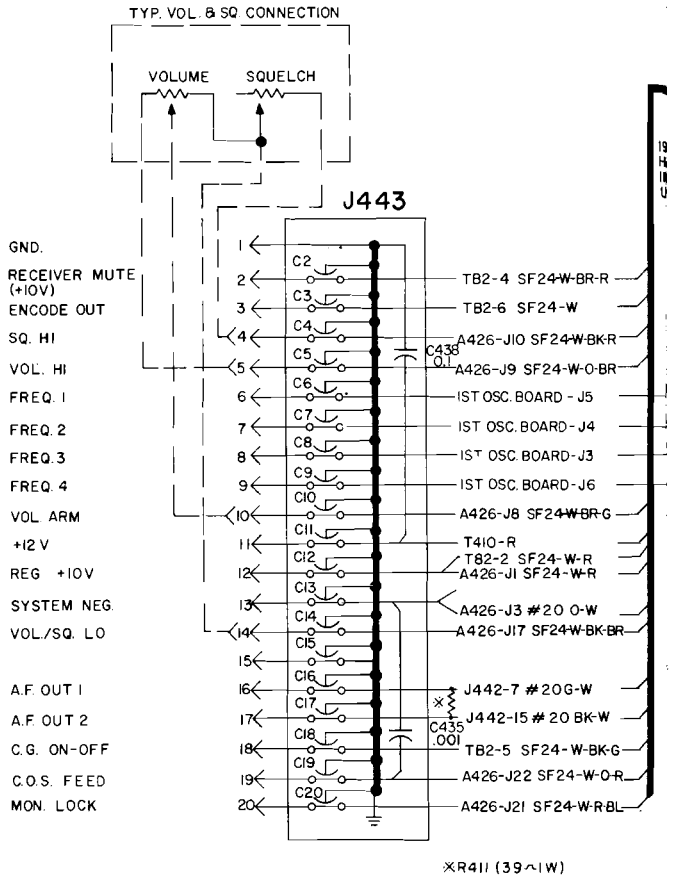
		REV
	PLI9E500881G1	K
	PLI9E500881G2	L
	PLI9E500881G3	K
	PLI9E500881G4	L
A424	PLI9B216119G3	
A426	PLI9D413129G3	H
A428	4EK16A10	A
A429	PLI9C311797G2	

NOTE
1. W444 AND W445 PRESENT ONLY IN U.H.S. RECEIVER.

W441 PRESENT ONLY IN NON-U.H.S. RECEIVER.

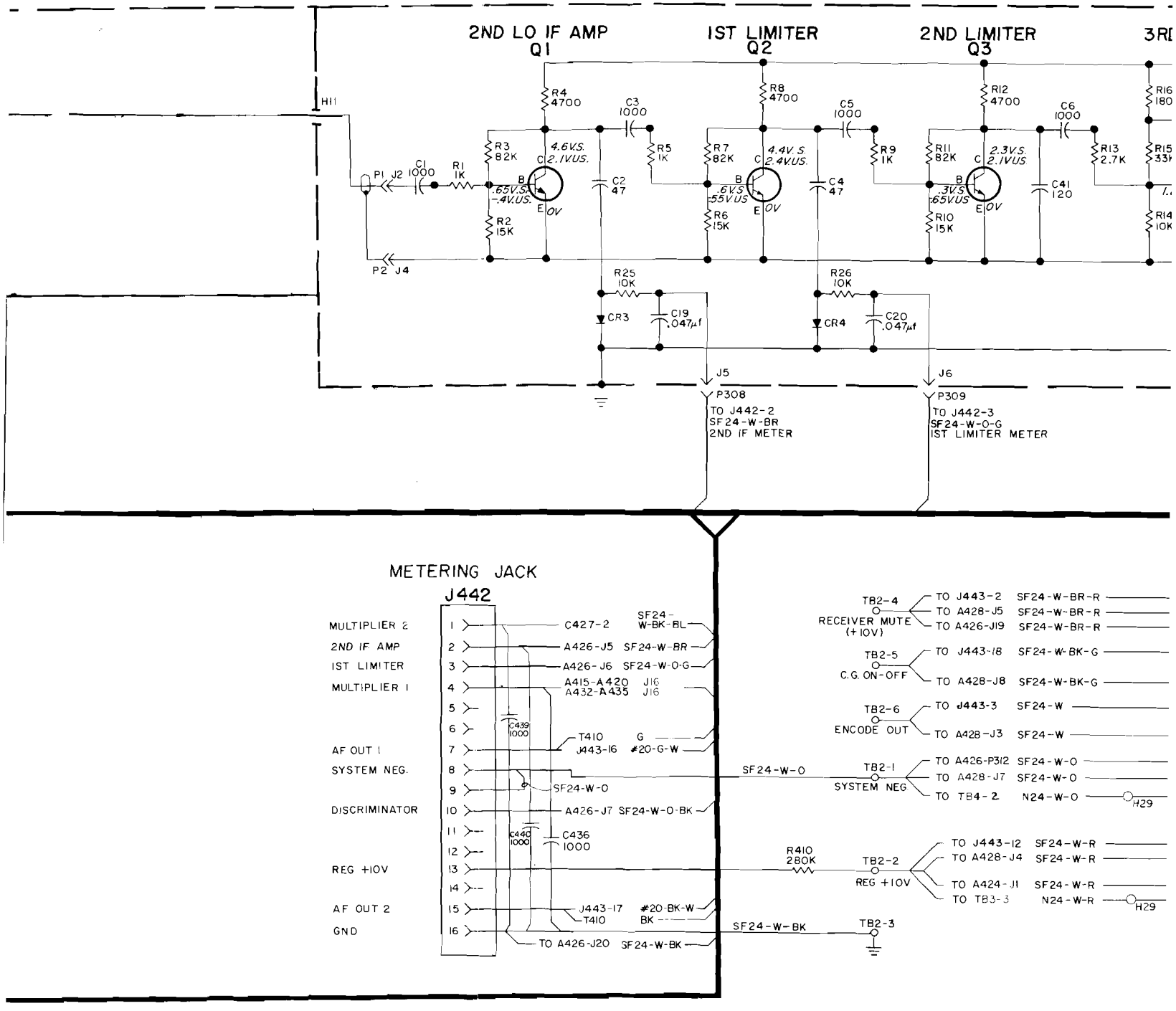
SYM NO	PARTS LIST	REV LETTER
A415	PLI9B2044 9G19	A
A416	PLI9B2044 9G20	
A417	PLI9B2044 19G21	
A418	PLI9B2044 19G22	A
A419	PLI9B2044 19G23	
A420	PLI9B2044 19G24	

SYM NO	PARTS LIST	REV. LETTER
A421	PLI9B2044 19G25	
A422	PLI9B2044 19G26	
A423	PLI9B2044 19G27	
A424	PLI9B2044 19G28	
A425	PLI9B2044 19G29	
A426	PLI9B2044 19G30	
A427	PLI9B2044 19G31	
A428	PLI9B2044 19G32	
A429	PLI9B2044 19G33	



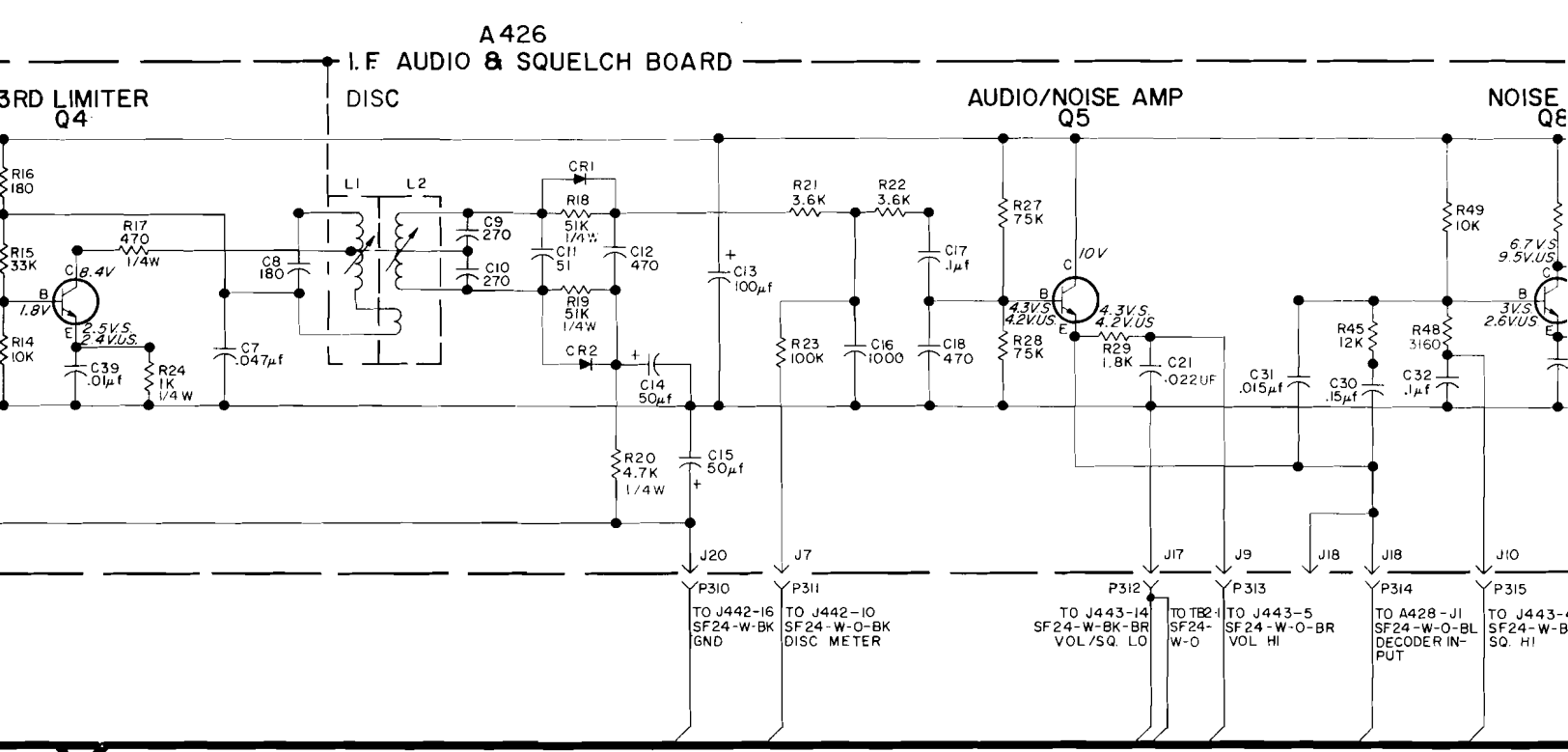
SCHEMATIC DIAGRAM

406—470 MHz RECEIVER

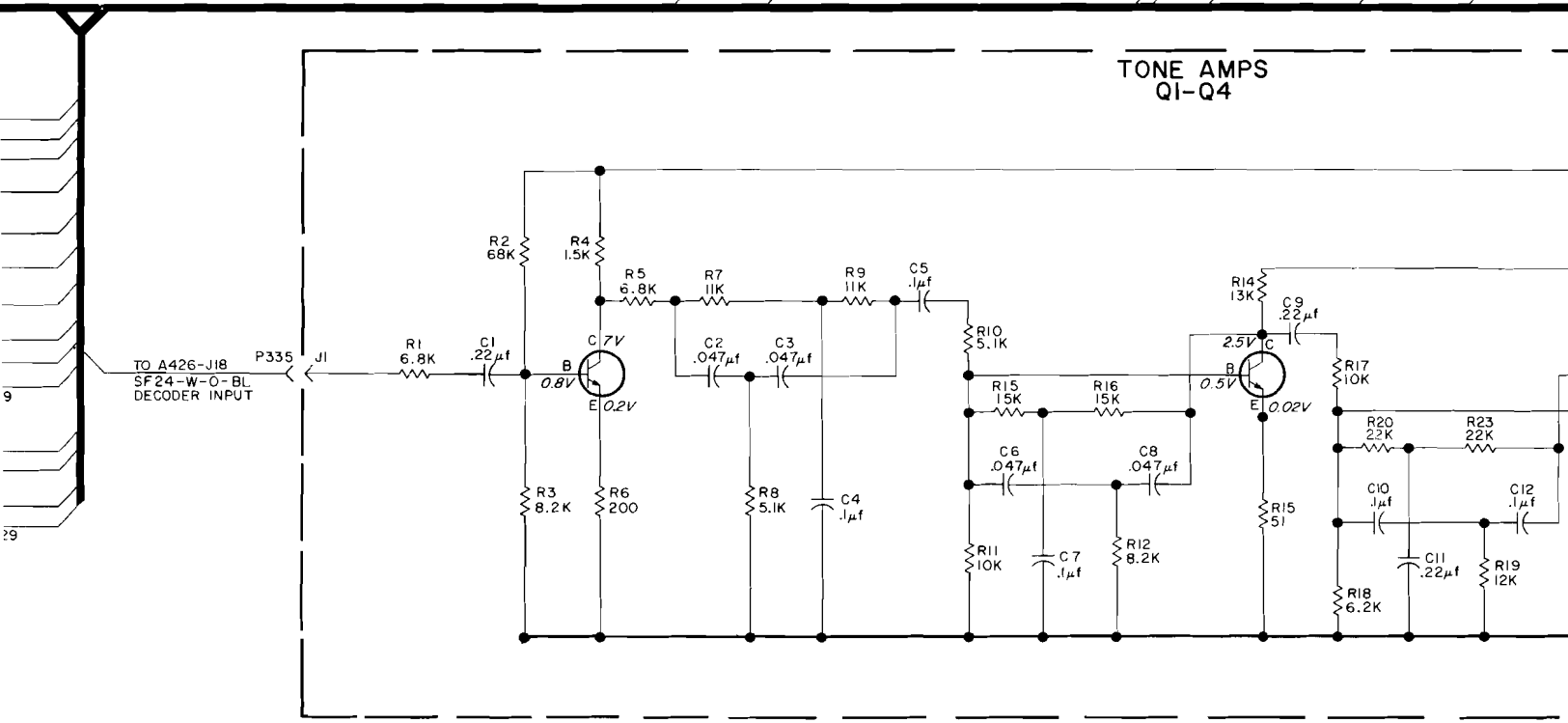

2ND LO IF AMP
Q1
IST LIMITER
Q2
2ND LIMITER
Q3
3RD
H11
P1 J2
C1 1000
R1 1K
R2 15K
R3 82K
R4 4700
C2 47
C3 1000
R5 1K
R6 15K
R7 82K
R8 4700
C4 47
C5 1000
R9 1K
R10 15K
R11 82K
R12 4700
C41 120
C6 1000
R13 2.7K
P2 J4
R25 10K
R26 10K
CR3
CR4
C19 .047μf
C20 .047μf
J5
J6
P308
TO J442-2
SF24-W-BR
2ND IF METER
P309
TO J442-3
SF24-W-O-G
IST LIMITER METER
METERING JACK
J442
MULTIPLIER 2
2ND IF AMP
IST LIMITER
MULTIPLIER 1
AF OUT 1
SYSTEM NEG.
DISCRIMINATOR
REG +10V
AF OUT 2
GND
C427-2
SF24-W-BK-BL
A426-J5 SF24-W-BR
A426-J6 SF24-W-O-G
A415-A420 J16
A432-A435 J16
C439 1000
T410 G
J443-16 #20-G-W
SF24-W-O
A426-J7 SF24-W-O-BK
C440 1000
C436 1000
R410 280K
J443-17 #20-BK-W
T410 BK
TO A426-J20 SF24-W-BK
SF24-W-BK
TB2-3
TB2-4
RECEIVER MUTE (+10V)
TO J443-2 SF24-W-BR-R
TO A428-J5 SF24-W-BR-R
TO A426-J19 SF24-W-BR-R
TB2-5
C.G. ON-OFF
TO J443-18 SF24-W-BK-G
TO A428-J8 SF24-W-BK-G
TB2-6
ENCODE OUT
TO J443-3 SF24-W
TO A428-J3 SF24-W
TB2-1
SYSTEM NEG
TO A426-P312 SF24-W-O
TO A428-J7 SF24-W-O
TO TB4-2 N24-W-O
H29
TB2-2
REG +10V
TO J443-12 SF24-W-R
TO A428-J4 SF24-W-R
TO A424-J1 SF24-W-R
TO TB3-3 N24-W-R
H29

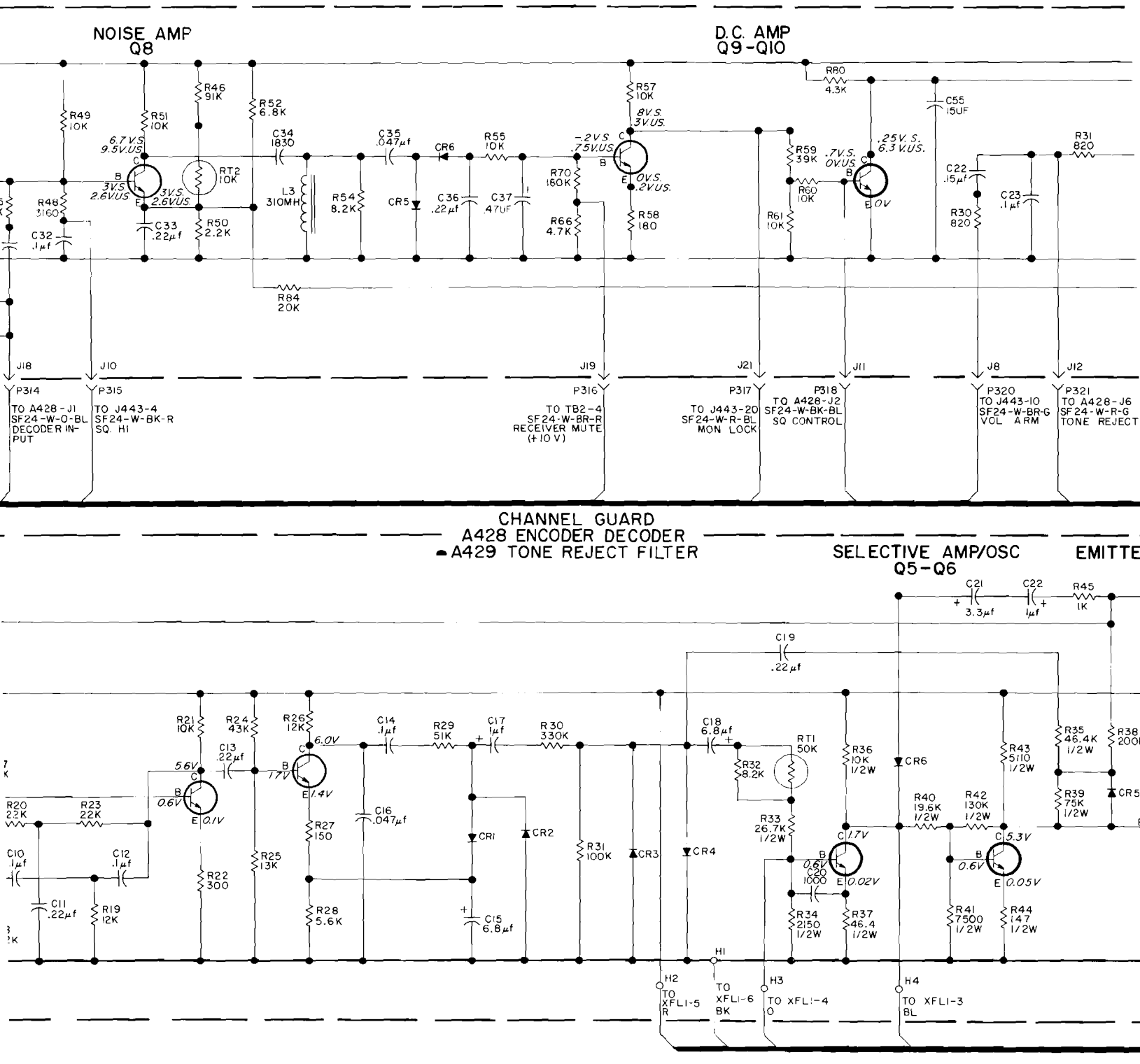
A426

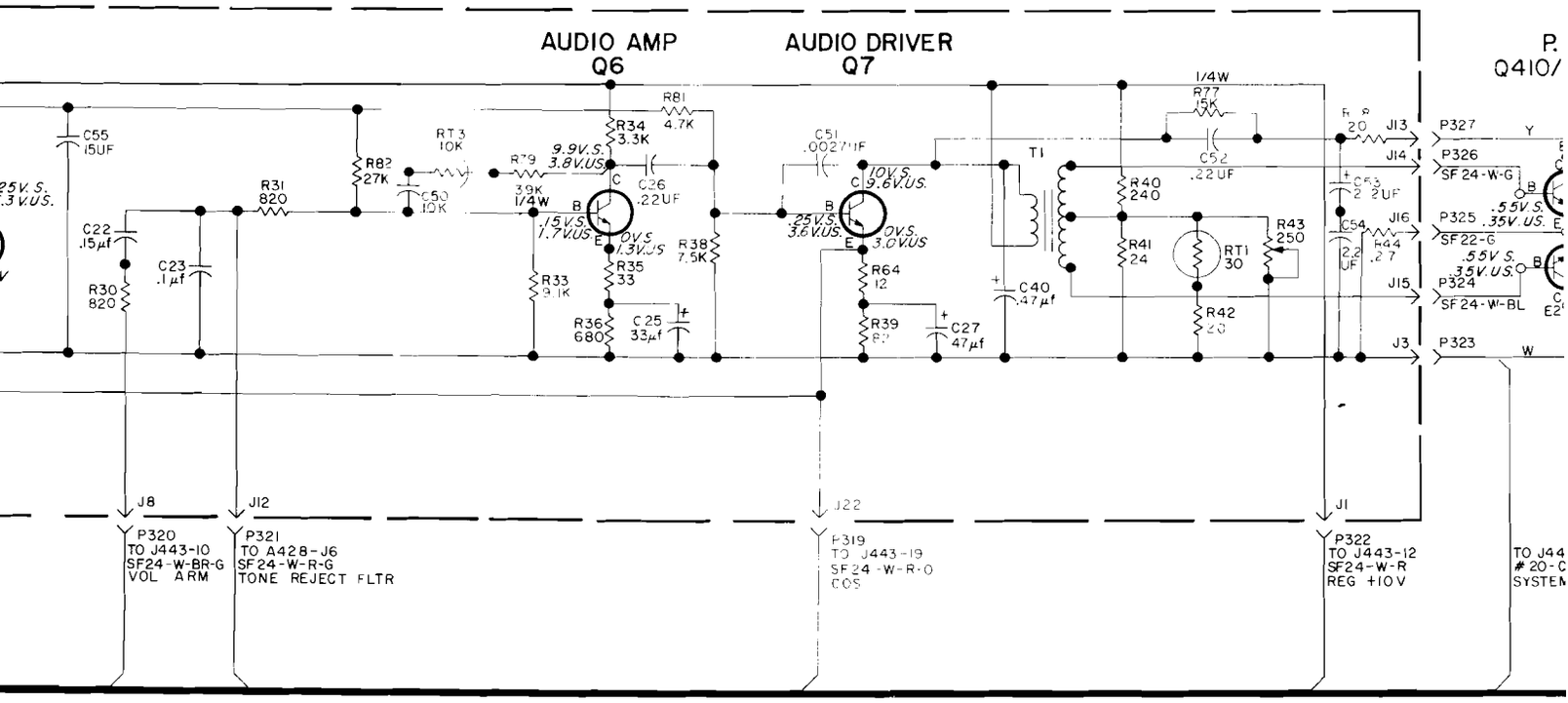
I.F. AUDIO & SQUELCH BOARD

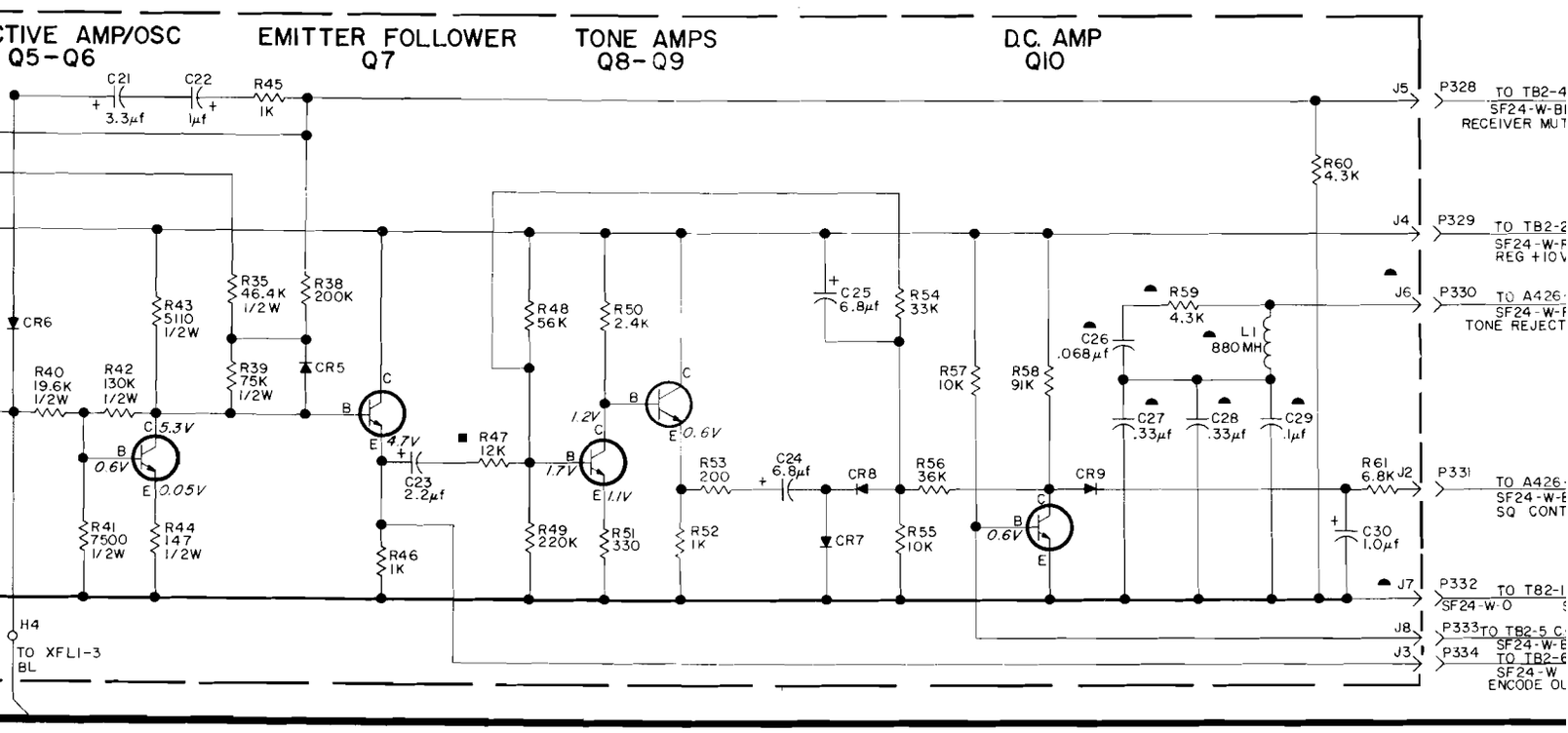


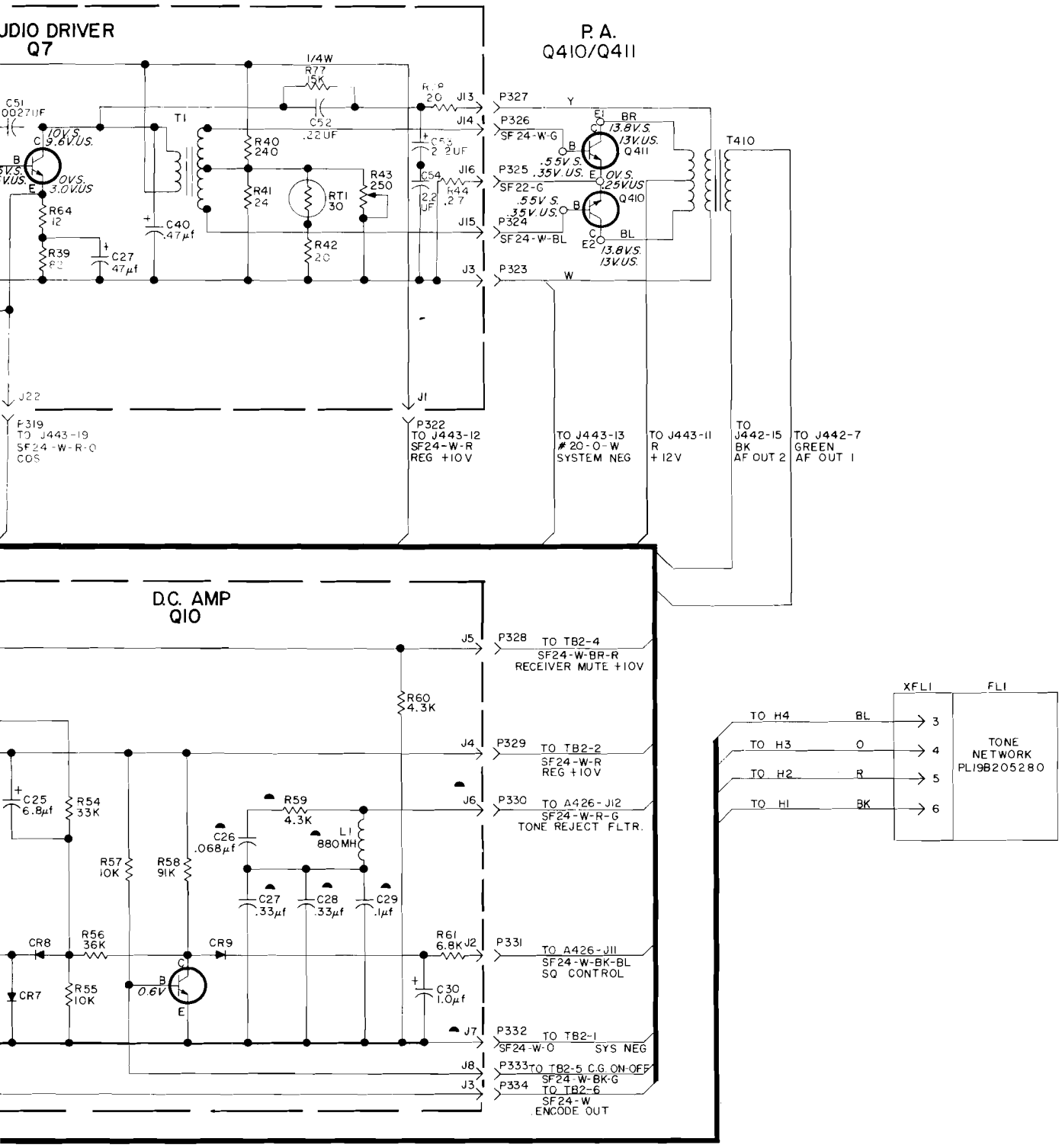
TONE AMPS Q1-Q4




NOISE AMP
Q8
D.C. AMP
Q9-Q10
CHANNEL GUARD
A428 ENCODER DECODER
A429 TONE REJECT FILTER
SELECTIVE AMP/OSC
Q5-Q6
EMITTE
R49 10K
R51 10K
R46 91K
R52 6.8K
C34 1830
C35 .047µf
CR6
R55 10K
R57 10K
8V.S. 3V.US.
-2V.S. .75V.US.
R80 4.3K
C55 15UF
R59 39K
.7V.S. 0V.US.
.25V.S. 6.3V.US.
R31 820
C22 .15µf
C23 .1µf
R30 820
R60 10K
R61 10K
R70 160K
R66 4.7K
R58 180
R54 8.2K
CR5
C36 .22µf
C37 .47UF
L3 310MH
RT2 10K
6.7V.S. 9.5V.US.
3V.S. 2.6V.US.
3V.S. 2.6V.US.
C33 .22µf
R50 2.2K
R48 3160
C32 .1µf
R84 20K
J18
J10
J19
J21
J11
J8
J12
P314
TO A428-J1 SF24-W-O-BL DECODER IN-PUT
P315
TO J443-4 SF24-W-BK-R SQ. HI
P316
TO TB2-4 SF24-W-BR-R RECEIVER MUTE (+10 V)
P317
TO J443-20 SF24-W-R-BL MON LOCK
P318
TO A428-J2 SF24-W-BK-BL SQ CONTROL
P320
TO J443-10 SF24-W-BR-G VOL ARM
P321
TO A428-J6 SF24-W-R-G TONE REJECT
C21 3.3µf
C22 1µf
R45 1K
C19 .22µf
R21 10K
R24 43K
R26 12K
C14 .1µf
R29 51K
C17 1µf
R30 330K
C18 6.8µf
RT1 50K
R32 8.2K
R36 10K 1/2W
CR6
R43 5110 1/2W
R35 46.4K 1/2W
R38 200
R39 75K 1/2W
CR5
R40 19.6K 1/2W
R42 130K 1/2W
C13 .22µf
6.0V
5.6V
1.7V
0.6V
1.4V
0.1V
1.7V
0.6V
0.02V
5.3V
0.6V
0.05V
R20 22K
R23 22K
C10 .1µf
C12 .1µf
C11 .22µf
R19 12K
R22 300
R25 13K
R27 150
R28 5.6K
C16 .047µf
CR1
CR2
C15 6.8µf
R31 100K
CR3
CR4
R33 26.7K 1/2W
C20 1000
R34 2150 1/2W
R37 46.4 1/2W
R41 7500 1/2W
R44 147 1/2W
H1
H2
TO XFLI-5 R
TO XFLI-6 BK
H3
TO XFLI-4 O
H4
TO XFLI-3 BL


AUDIO AMP
Q6
AUDIO DRIVER
Q7
C55 15UF
C22 .15μf
R30 820
C23 .1μf
R31 820
R82 27K
RT3 10K
C50 10K
R81
R34 3.3K 4.7K
R79 3.9K 1/4W
9.9V.S. 3.8V.US
.15V.S. 1.7V.US
0V.S 1.3V.US
C26 .22UF
R33 9.1K
R35 33
R36 680
C25 33μf
R38 7.5K
C51 .0027UF
10V.S. 9.6V.US.
.25V.S. 3.6V.US.
0V.S. 3.0V.US
R64 12
R39 82
C27 47μf
T1
C40 .47μf
1/4W
R77 15K
C52 .22UF
R40 240
R41 24
RT1 30
R43 250
R42 20
R 20
C53 2.2UF
C54 2.2 UF
R44 27
J13
J14
J16
J15
J3
J8
J12
J22
J1
P320
TO J443-10
SF24-W-BR-G
VOL ARM
P321
TO A428-J6
SF24-W-R-G
TONE REJECT FLTR
P319
TO J443-19
SF24-W-R-O
COS
P322
TO J443-12
SF24-W-R
REG +10V
P327
P326
SF24-W-G
P325
SF22-G
P324
SF24-W-BL
P323
.55V.S.
.35V.US.


CTIVE AMP/OSC
Q5-Q6
EMITTER FOLLOWER
Q7
TONE AMPS
Q8-Q9
D.C. AMP
Q10
C21 3.3μf
C22 1μf
R45 1K
R43 5110 1/2W
R35 46.4K 1/2W
R38 200K
CR6
CR5
R40 19.6K 1/2W
R42 130K 1/2W
R39 75K 1/2W
C 5.3V
B 0.6V
E 0.05V
R41 7500 1/2W
R44 147 1/2W
C 4.7V
B
E
C23 2.2μf
R46 1K
R47 12K
R48 56K
R50 2.4K
1.2V
0.6V
1.7V
1.1V
R49 220K
R51 330
R52 1K
R53 200
C24 6.8μf
CR8
CR7
R56 36K
R55 10K
C25 6.8μf
R54 33K
R57 10K
R58 91K
0.6V
CR9
R59 4.3K
C26 .068μf
L1 880MH
C27 .33μf
C28 .33μf
C29 .1μf
R60 4.3K
R61 6.8K
C30 1.0μf
J5
J4
J6
J2
J7
J8
J3
H4
TO XFL1-3
BL
P328
TO TB2-4
SF24-W-BL
RECEIVER MUT
P329
TO TB2-2
SF24-W-R
REG +10V
P330
TO A426-
SF24-W-R
TONE REJECT
P331
TO A426-
SF24-W-B
SQ CONT
P332
TO T82-I
SF24-W-O
P333
TO TB2-5 C
SF24-W-B
P334
TO TB2-6
SF24-W
ENCODE OU



SCHEMATIC DIAGRAM

406—470 MHz RECEIVER
MODELS 4ER42E10-33 & 4ER42G10-33

PARTS LIST

LBI-4021E

406-470 MHz RECEIVERS
4ER42E10-33, 4ER42G10-33

SYMBOL	GE PART NO.	DESCRIPTION
A410* and A411*		RF AMPLIFIER 19C317950G1
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5493392P5	Ceramic, feed-thru: 220 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C4 thru C6	5493392P107	Ceramic, stand-off: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type SS5A.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L1 and L2	19B209420P1	Coil, RF: 0.10 µh ±5%, 0.08 ohms DC res max; sim to Jeffers 4416-1J.
L3 thru L5	19A116632P1	Torridal core.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A116154P1	N Channel, field effect.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1 and R2	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
		In REV F and earlier:
A410* and A411*		RF AMPLIFIER A410 19C311975G1 (406-420 MHz) A411 19C311975G2 (450-470 MHz)
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5493392P107	Ceramic, stand-off: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type SS5A.
C2	7484398P3	Silver mica: 250 pf ±10%, 500 VDCW; sim to Underwood Type J1HF.
C3	5493392P7	Ceramic, feed-thru: .001 pf +100%-0%, 500 VDCW; sim to Allen Bradley Type FA5C.
C4	5493392P107	Ceramic, stand-off: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type SS5A.
C5	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
C6	5491601P124	Phenolic: 1.8 pf ±5%, 500 VDCW.
C7	7484389P1	Variable 1.5-7 pf, temp coef 0 PPM; sim to Erie Style 503.
C8	5491601P122	Phenolic: 1.2 pf ±5%, 500 VDCW.
		- - - - - - - - - TERMINALS - - - - - - - - -
E1	19B209055P1	Terminal; sim to Electrical Industries ABAS-40W-RR.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L1	19B209420P1	Coil, RF: 0.10 µh ±5%, 0.08 ohms DC res max; sim to Jeffers 4416-1J.
L2	19A127429P1	Coil.
L3	19A127429P2	Coil.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A116154P1	N Channel, field effect.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - RESISTORS - - - - - - - - -
R1 and R2	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R3	3R152P470K	Composition: 47 ohms ±10%, 1/4 w.
A412		FIRST MIXER ASSEMBLY 19C311974G1
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496218P312	Ceramic disc: 18 pf ±10%, 500 VDCW, temp coef -150 PPM.
C2		(Part of L3).
C3	5496218P249	Ceramic disc: 27 pf ±5%, 500 VDCW, temp coef -80 PPM.
C4	19B209243P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C5	5493392P107	Ceramic, stand-off: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type SS5A.
C6	19B209243P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C7	5493392P7	Ceramic, feed-thru: .001 pf +100%-0%, 500 VDCW; sim to Allen Bradley Type FA5C.
C8		(Part of L3).
		- - - - - - - - - TERMINALS - - - - - - - - -
E1 and E2	19B209055P8	Terminal, feed-thru.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L1	19A127430G1	Choke.
L2		(Part of L3).
L3	19B216440G1	Coil assembly, includes:
C2	5496218P249	Ceramic disc: 27 pf ±5%, 500 VDCW, temp coef -80 PPM.
C8*	19A116114P12	Ceramic: 3.3 pf ±5%, 100 VDCW; temp coef 0 PPM. Added to 19E500881G1, G3 by REV J, Added to 19E500881G2, G4 by REV K.
L2	19B209420P113	Coil, RF: 1 µh ±10%, 0.74 ohms DC res max; sim to Jeffers 4426-6.
	5491798P8	Tuning slug.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A116154P1	N Channel, field effect.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P302J	Composition: 3000 ohms ±5%, 1/4 w.
R2 and R3	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
A413 and A414		MULTIPLIER BOARD ASSEMBLY A413 19B216360G1 A414 19B216360G2
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5494481P106	Ceramic disc: 330 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C2		(Part of T1).
C3		(Part of T2).
C4	5496372P149	Ceramic disc: 220 pf ±10%, 500 VDCW, temp coef -3300 PPM.
C5		(Part of T3).
C6		(Part of T4).
C7		(Part of T3).
C8		(Part of T4).
C9*	5494481P107	Ceramic disc: 470 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Deleted by REV E.
C10	5496372P149	Ceramic disc: 220 pf ±10%, 500 VDCW, temp coef -3300 PPM.
C11	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.

SYMBOL	GE PART N
C12 and C13	5494481P107
C14	5496218P548
C15*	5494481P7
L1	
L2	
L3	19B209420P1
L4	
Q1*	19A115329P1
	19A116059P1
Q2	19A115991P1
R1	3R152P101K
R2	3R152P181J
R3	3R152P100K
R4	3R152P471K
R5	3R152P680J
R6	3R152P273K
R7*	3R152P100K
T1 and T2	
C2	5496218P350
C3	5496218P248
L1	19B216373P5
L4	19B209420P1
	5491798P7
T3 and T4	
C5	5496218P439
C6*	5496218P237
	5496218P436
	5496218P437
C7	5496218P750
C8*	5496218P246
	5496218P748
	5496218P749

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1 thru R4	3R152P562J	Composition: 5600 ohms ±5%, 1/4 w.
R5 thru R8	3R152P104K	Composition: 0.1 megohm ±10%, 1/4 w.
R9	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R10	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R11 and R12	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R13	3R152P151J	Composition: 150 ohms ±5%, 1/4 w.
R14	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R15	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R17 and R18	3R152P103K	Composition: 10,000 ohms ±10%, 1/4 w.
R20	3R152P270K	Composition: 27 ohms ±10%, 1/4 w.
		- - - - - - - - - THERMISTORS - - - - - - - -
RT5 thru RT8	19B209284P7	Disc: 62 ohms res nominal at 25°C, color code violet.
RT9	19B209284P8	Disc: 945 ohms res nominal at 25°C, color code gray.
		- - - - - - - - - TRANSFORMERS - - - - - - - -
T7 and T8		COIL ASSEMBLY T7 19B204950G1 T8 19B204950G2
		- - - - - - - - - CAPACITORS - - - - - - - -
C40	5496218P253	Ceramic disc: 39 pf ±5%, 500 VDCW, temp coef -80 PPM.
C41	5496218P251	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L5	19A121728P1	Coil. Includes tuning slug 5491798P5.
		- - - - - - - - - SOCKETS - - - - - - - - -
XY1 thru XY4		Refer to Mechanical Parts (RC-1823).
		- - - - - - - - - CRYSTALS - - - - - - - -
		When reordering give GE Part No. and specify exact freq needed.
		Crystal freq = (OF -12.4 MHz) ÷ 24.
Y1 thru Y4	19B206576P6	Quartz: freq range 15175.000 to 17925.000 KHz, temp range -30°C to +85°C. (405-420 MHz)
Y1 thru Y4	19B206576P7	Quartz: freq range 17925.001 to 20685.000 KHz, temp range -30°C to +85°C. (450-470 MHz)
A421		1F AMPLIFIER ASSEMBLY 19B216356G1
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A116655P19	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C2*	7489162P21	Silver mica: 56 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
		In 19E500881G1, G3 of REV H and earlier: In 19E500881G2, G4 of REV J and earlier:
	5490008P21	Silver mica: 56 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C3	5496218P650	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -470 PPM.
C4	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C5 and C6	19B209243P5	Polyester: 0.047 µf ±20%, 50 VDCW.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1*	19A115328P1	Silicon, NPN.
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P301J	Composition: 300 ohms ±5%, 1/4 w.
R2	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R3	3R152P302J	Composition: 3000 ohms ±5%, 1/4 w.
R4	3R152P682J	Composition: 6800 ohms ±5%, 1/4 w.
R5	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R6	3R152P301J	Composition: 300 ohms ±5%, 1/4 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1	19B216372G1	Coil assembly. Includes tuning slug 5491798P7.
A422		CRYSTAL FILTER ASSEMBLY 19B204616G8
		- - - - - - - - - FILTERS - - - - - - - - - -
FL7	19C304358G1	Bandpass filter.
		- - - - - - - - - RESISTORS - - - - - - - - -
R10	3R152P512J	Composition: 5100 ohms ±5%, 1/4 w.
R11	3R152P332K	Composition: 3300 ohms ±10%, 1/4 w.
A424		SECOND MIXER ASSEMBLY 19B216119G3
		- - - - - - - - - CAPACITORS - - - - - - - - -
C2	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C3	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C7 and C8	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C9	5496219P369	Ceramic disc: 180 pf ±5%, 500 VDCW, temp coef -150 PPM.
C10	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C12	5496219P369	Ceramic disc: 180 pf ±5%, 500 VDCW, temp coef -150 PPM.
C14	5496219P471	Ceramic disc: 220 pf ±5%, 500 VDCW, temp coef -220 PPM.
C15	7491395P109	Ceramic disc: 1000 pf ±10%, 500 VDCW; sim to RMC Type JL.
C16	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C17	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C18	5490008P25	Silver mica: 82 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C19	5490008P19	Silver mica: 47 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C20	5490008P1	Silver mica: 5 pf ±0.5%, 500 VDCW; sim to Electro Motive Type DM-15.
C23		(Part of T2).
C24 and C25	5496219P43	Ceramic disc: 13 pf ±5%, 500 VDCW, temp coef 0 PPM.
		- - - - - - - - JACKS AND RECEPTACLES - - - - - -
J1	4033513P4	Contact, electrical; sim to Bead Chain L93-3.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L1 thru L3	19C311181G3	Coil assembly.
		- - - - - - - - - PLUGS - - - - - - - - - -
P1	4029840P2	Contact, electrical: sim to Amp 42827-2.
P2	4029840P1	Contact, electrical: sim to Amp 41854.

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q2	19A115245P1	Silicon, NPN.
Q3	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q4	19A115245P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 and R2	3R77P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R3	3R77P512J	Composition: 5100 ohms ±5%, 1/2 w.
R4	3R152P333K	Composition: 33,000 ohms ±10%, 1/4 w.
R5	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R6	3R77P332K	Composition: 3300 ohms ±10%, 1/2 w.
R7	3R77P123K	Composition: 12,000 ohms ±10%, 1/2 w.
R8	3R77P622J	Composition: 6200 ohms ±5%, 1/2 w.
R9	3R77P302J	Composition: 3000 ohms ±5%, 1/2 w.
R10	3R77P202J	Composition: 2000 ohms ±5%, 1/2 w.
R11	3R77P201J	Composition: 200 ohms ±5%, 1/2 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - -
T2		COIL ASSEMBLY I9B216120G2
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C23	5496218P258	Ceramic disc: 62 pf ±5%, 500 VDCW, temp coef -80 PPM.
	5491798P3	Tuning slug.
		- - - - - - - - - - CRYSTALS - - - - - - - - - -
Y2	19A110398P1	Quartz: freq 11945.00 KHz, temp range -30°C to +75°C.
A426		IF AUDIO AND SQUELCH BOARD 19D413129G3
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C2	5496219P717	Ceramic disc: 47 pf ±10%, 500 VDCW, temp coef -750 PPM.
C3	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C4	5496219P717	Ceramic disc: 47 pf ±10%, 500 VDCW, temp coef -750 PPM.
C5 and C6	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C7	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C8	19A116656P180J1	Ceramic disc: 180 pf ±5%, 500 VDCW, temp coef -150 PPM.
C9 and C10	5490008P37	Silver mica: 270 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C11	5496219P656	Ceramic disc: 51 pf ±5%, 500 VDCW, temp coef -470 PPM.
C12	5494481P108	Ceramic disc: 470 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C13	19A115680P107	Electrolytic: 100 µf +150% -10%, 15 VDCW; sim to Mallory Type TT.
C14 and C15	19A115680P104	Electrolytic: 50 µf +150% -10%, 25 VDCW; sim to Mallory Type TT.
C16	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C17	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C18	5494481P108	Ceramic disc: 470 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C19 and C20	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C21*	19A116080P3	Polyester: 0.022 µf ±20%, 50 VDCW.
		Earlier than REV A:
	19B209243P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C22	19A116080P108	Polyester: 0.15 µf ±10%, 50 VDCW.
C23	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C24*	19B209243P106	Polyester: 0.068 µf ±10%, 50 VDCW. Deleted by REV A.
C25	5496267P6	Tantalum: 33 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
C26*	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
		In REV E and earlier:
	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
		Earlier than REV A:
	19B209243P14	Polyester: 0.33 µf ±20%, 250 VDCW.
C27*	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
		Earlier than REV C:
	5496267P6	Tantalum: 33 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
C28*	5496267P229	Tantalum: 0.68 µf ±10%, 35 VDCW; sim to Sprague Type 150D. Deleted by REV A.
C29*	5496267P17	Tantalum: 1.0 µf ±10%, 35 VDCW; sim to Sprague Type 150D. Deleted by REV A.
C30	19A116080P8	Polyester: 0.15 µf ±20%, 50 VDCW.
C31	19A116080P102	Polyester: 0.015 µf ±10%, 50 VDCW.
C32	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C33	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C34	4029003P207	Silver mica: 1830 pf ±2%, 500 VDCW; sim to Electro Motive Type DM-20.
C35	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C36*	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
		Earlier than REV C:
	19B209243P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C37*	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
		Earlier than REV A:
	5496267P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C38*	5496267P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D. Deleted by REV C.
		Earlier than REV A:
	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C39	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C40*	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
		Earlier than REV A:
	19B209243P117	Polyester: 0.22 µf ±10%, 50 VDCW.
C41	5490008P129	Silver mica: 120 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15.
C42*	19B209243P4	Polyester: 0.033 µf ±20%, 50 VDCW. Deleted by REV A.
C43*	5496267P213	Tantalum: 2.2 µf ±10%, 20 VDCW; sim to Sprague Type 150D. Deleted by REV A.
C49*	5496267P9	Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D. Added by REV A. Deleted by REV C.
C50*	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW. Added by REV A.
C51*	5494481P127	Ceramic disc: 2700 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added by REV A.
C52*	19A	
C53* and C54*	549	
C55*	549	
CR1 and CR2	19A	
CR3* and CR4*	19A	
	403	
CR5 and CR6	19A	
CR7*	19A	
CR8*	19A	
J1 thru J22	403	
L1	19A	
L2	19A	
L3	19A	
Q1 thru Q6	19A	
Q7	19A	
Q8	19A	
Q9	19A	
Q10*	19A	
	19A	
R1	3R7	
R2	3R7	
R3	3R7	
R4	3R7	
R5	3R7	
R6	3R7	
R7	3R7	
R8	3R7	
R9	3R7	
R10	3R7	
R11	3R7	
R12	3R7	
R13	3R7	
R14	3R7	
R15	3R7	
R16	3R7	
R17	3R7	
R18 and R19	3R7	
R20	3R7	
R21 and R22	3R7	

SYMBOL	GE PART NO.	DESCRIPTION
C19 and C20	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C21*	19A116080P3	Polyester: 0.022 µf ±20%, 50 VDCW.
		Earlier than REV A:
	19B209243P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C22	19A116080P108	Polyester: 0.15 µf ±10%, 50 VDCW.
C23	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C24*	19B209243P106	Polyester: 0.068 µf ±10%, 50 VDCW. Deleted by REV A.
C25	5496267P6	Tantalum: 33 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
C26*	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
		In REV E and earlier:
	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
		Earlier than REV A:
	19B209243P14	Polyester: 0.33 µf ±20%, 250 VDCW.
C27*	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
		Earlier than REV C:
	5496267P6	Tantalum: 33 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
C28*	5496267P229	Tantalum: 0.68 µf ±10%, 35 VDCW; sim to Sprague Type 150D. Deleted by REV A.
C29*	5496267P17	Tantalum: 1.0 µf ±10%, 35 VDCW; sim to Sprague Type 150D. Deleted by REV A.
C30	19A116080P8	Polyester: 0.15 µf ±20%, 50 VDCW.
C31	19A116080P102	Polyester: 0.015 µf ±10%, 50 VDCW.
C32	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C33	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C34	4029003P207	Silver mica: 1830 pf ±2%, 500 VDCW; sim to Electro Motive Type DM-20.
C35	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C36*	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
		Earlier than REV C:
	19B209243P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C37*	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
		Earlier than REV A:
	5496267P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C38*	5496267P10	Tantalum: 22 µf ±20%, 15 VDCW; sim to Sprague Type 150D. Deleted by REV C.
		Earlier than REV A:
	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C39	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C40*	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
		Earlier than REV A:
	19B209243P117	Polyester: 0.22 µf ±10%, 50 VDCW.
C41	5490008P129	Silver mica: 120 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15.
C42*	19B209243P4	Polyester: 0.033 µf ±20%, 50 VDCW. Deleted by REV A.
C43*	5496267P213	Tantalum: 2.2 µf ±10%, 20 VDCW; sim to Sprague Type 150D. Deleted by REV A.
C49*	5496267P9	Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D. Added by REV A. Deleted by REV C.
C50*	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW. Added by REV A.
C51*	5494481P127	Ceramic disc: 2700 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added by REV A.
C52*	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW. Added by REV A.
C53* and C54*	5496267P213	Tantalum: 2.2 µf ±10%, 20 VDCW; sim to Sprague Type 150D. Added by REV A.
C55*	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D. Added by REV C.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1 and CR2	19A115250P1	Silicon.
CR3* and CR4*	19A115250P1	Silicon.
		In REV F and earlier:
	4038056P1	Germanium.
CR5 and CR6	19A115250P1	Silicon.
CR7*	19A115250P1	Silicon. Deleted by REV C.
CR8*	19A115250P1	Silicon. Added by REV A. Deleted by REV C.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1 thru J22	4033513P4	Contact, electrical; sim to Bead Chain L93-3.
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L1	19A115711P6	Transformer, freq: 455 KHz; sim to TOKO PEFCN-14733-CX12.
L2	19A115711P7	Transformer, freq: 455 KHz; sim to TOKO PEFCN-14734-BNL2.
L3	19A127134G1	Choke.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 thru Q6	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q7	19A115300P4	Silicon, NPN; sim to Type 2N3053.
Q8	19A115123P1	Silicon, NPN; sim to Type 2N2712.
Q9	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q10*	19A116774P1	Silicon, NPN; sim to Type 2N5210.
		In REV G and earlier:
	19A115123P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77P102K	Composition: 1000 ohms ±10%, 1/2 w.
R2	3R77P153J	Composition: 15,000 ohms ±5%, 1/2 w.
R3	3R77P823K	Composition: 82,000 ohms ±10%, 1/2 w.
R4	3R77P472K	Composition: 4700 ohms ±10%, 1/2 w.
R5	3R77P102K	Composition: 1000 ohms ±10%, 1/2 w.
R6	3R77P153J	Composition: 15,000 ohms ±5%, 1/2 w.
R7	3R77P823K	Composition: 82,000 ohms ±10%, 1/2 w.
R8	3R77P472K	Composition: 4700 ohms ±10%, 1/2 w.
R9	3R77P102K	Composition: 1000 ohms ±10%, 1/2 w.
R10	3R77P153J	Composition: 15,000 ohms ±5%, 1/2 w.
R11	3R77P823K	Composition: 82,000 ohms ±10%, 1/2 w.
R12	3R77P472K	Composition: 4700 ohms ±10%, 1/2 w.
R13	3R77P272K	Composition: 2700 ohms ±10%, 1/2 w.
R14	3R77P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R15	3R77P333J	Composition: 33,000 ohms ±5%, 1/2 w.
R16	3R77P181K	Composition: 180 ohms ±10%, 1/2 w.
R17	3R152P471J	Composition: 470 ohms ±5%, 1/4 w.
R18 and R19	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R20	3R152P472K	Composition: 4700 ohms ±10%, 1/4 w.
R21 and R22	3R77P362J	Composition: 3600 ohms ±5%, 1 2 w.

SYMBOL	GE PART NO.	DESCRIPTION
L426	19B204938G20	Coil.
L427	19B204936P16	Coil.
L428 and L429	7488079P18	Choke, RF: 15 µh ±10%, 1.2 ohms DC res; sim to Jeffers 4421-9K.
L430 and L431	7488079P6	Choke, RF: 1.0 µh ±10%, 0.30 ohms DC res; sim to Jeffers 4411-8K.
L432	19A127433P1	Coil.
L433 and L434	19A115700P2	Bead, ferrite.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P305 thru P322	4029840P2	Contact, electrical: sim to Amp 42827-2.
P323	4029840P1	Contact, electrical: sim to Amp 41854.
P324	4029840P2	Contact, electrical: sim to Amp 42827-2.
P325	4029840P1	Contact, electrical: sim to Amp 41854.
P326	4029840P2	Contact, electrical: sim to Amp 42827-2.
P327	4029840P1	Contact, electrical: sim to Amp 41854.
P328 thru P335	4029840P2	Contact, electrical: sim to Amp 42827-2.
P410 and P411	4029840P2	Contact, electrical: sim to Amp 42827-2.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q410* and Q411*	19A116741P1	Silicon, NPN.
		In 19E500881G1, G3 of REV B-K: In 19E500881G2, G4 of REV B-L:
	19A116203P2	Silicon, NPN.
		Earlier than REV B:
	19A115948P1	Silicon, NPN.
		- - - - - - - - - RESISTORS - - - - - - - - -
R410	19A116278P444	Metal film: 0.28 megohm ±2%, 1/2 w.
R411*	3R78P390K	Composition: 39 ohms ±10%, 1 w. Added by REV B.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T410	19A116041P1	Audio freq: freq range 300 to 4000 Hz, Pri: 1.00 ohm ±15% DC res, Sec 1: 0.23 ohm ±10% DC res, Sec 2: 10.5 ohms ±15% DC res.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB1	7487424P2	Miniature, phen: 1 terminal.
TB2	7487424P26	Miniature, phen: 6 terminals.
TB3 and TB4	7487424P24	Miniature, phen: 3 terminals.
		- - - - - - - - - - CABLES - - - - - - - - - -
W441	19B205634G3	Coaxial cable: 50 ohm, approx 5 inches long. Includes (J441) 19B209122P3 connector.
W444	19B205634G7	Coaxial cable: 50 ohm, approx 7 inches long. Includes (J444) 19B209122P4 connector.
W445	19A122550G1	RF: 50 ohm imp, approx 4 inches long.
		MULTI-FREQUENCY MODIFICATION KIT 19A127096G1 and G2
	19A127136G1	Harness assembly.
P301 thru P304	4029840P2	Contact, electrical; sim to Amp 42827-2. (Part of 19A127136G1 Harness assembly).
L435 thru L442	19A115700P2	Bead, ferrite. (Part of 19A127136G1 Harness assembly).
L443 thru L450	19A115700P2	Bead, ferrite.

SYMBOL	GE PART NO.	DESCRIPTION
		MECHANICAL PARTS (SEE RC-1823)
1	19C303495G4	Bottom cover. (Station)
	19C303385G1	Bottom cover. (Mobile)
2	19C317344P3	Heat sink.
3	19A121723P1	Support. (Mounts C425 and C426)
4	4033089P1	Clip. (Part of XY1-XY4).
5	19B200525P9	Rivet. (Part of XY1-XY4).
6	19A115793P1	Contact. (Part of XY1-XY4).
7	4039307P1	Crystal socket. (Part of XY1-XY4).
8	4035306P59	Fiber washer. (Used with Y2).
9	4034252P5	Can. (Used with T1).
10	19C303389G1	Chassis.
11	19A121722P1	Plate.
12	4036765G4	Screw. (Part of C410, C411, C414-C418, C423 and C424).
13	7117825P1	Washer. (Part of C410, C411, C414-C418, C423 and C424).
14	19A121724P1	Support. (Mounts C419 and C420).
15	19A127372P1	Support. (Mounts C427, C430 and C431).
16	7145451P1	(Not Used).
17	19B204583G3	Hinge.
18	19B216727P1	Support. (Used with Q410 and Q411).
19	19A116023P2	Plate, insulated. (Used with Q410 and Q411).
20	19A115222P3	Insulator. (Used with Q410 and Q411).
21	4029851P6	Clip, loop.
22	19B204583G1	Hinge.
23	19B204583G2	Hinge.
24	19A121676P1	Guide pin.
25	19C303495G3	Top cover. (Station, except Repeaters and VM).
	19C303676G2	Top cover. (Station, Repeater and VM only).
	19C303385G2	Top cover. (Mobile).
26	19A121297P2	Angle.
27	7160861P4	Nut, sheet spring. (Used to secure cover).
28	4036555P1	Insulator, disc. (Used with Q7 on A426).
29	4035267P2	Button, plug.
30	N115P1508C13	Screw, flathead, self tap: No. 8 x 30.

SYMBOL	GE PART NO.	DESCRIPTION
C4	5491601P123	Phenolic: 1.5 pf ±5%, 500 VDCW; sim to Quality Components Type MC.
C5	5494481P112	Ceramic disc: .001 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C6		(Part of T1).
C7		(Part of T2).
C8	5496219P238	Ceramic disc: 7 pf ±5%, 500 VDCW; temp coef -80 PPM.
C9	5490008P135	Silver mica: 220 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15.
C10 thru C14	5494481P112	Ceramic disc: .001 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1 thru CR5	19A115250P1	Silicon.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J1 thru J6	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
J15 and J16	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L1 and L2	7488079P16	Choke, RF: 10 µh ±10%, 0.6 ohm DC res max; sim to Jeffers 4421-7K.
L5		(Part of T1 or T2).
L6	7488079P35	Choke, RF: 2.20 µh ±10%, 0.50 ohms DC res max; sim to Jeffers 4412-9K.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115330P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R2	3R152P151J	Composition: 150 ohms ±5%, 1/4 w.
R3	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R4	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R5 and R6	3R152P103K	Composition: 10,000 ohms ±10%, 1/4 w.
R7	3R77P272K	Composition: 2700 ohms ±10%, 1/2 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - - -
T1 and T2		COIL ASSEMBLY T1 19B204950G1 T2 19B204950G2
		- - - - - - - - - - CAPACITORS - - - - - - - -
C6	5496218P253	Ceramic disc: 39 pf ±5%, 500 VDCW, temp coef -80 PPM.
C7	5496218P251	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L5	19A121728P1	Coil. Includes tuning slug 5491798P7.
		OSCILLATORS
Y1 thru Y4	4EG26A10	When reordering specify ICOM Frequency. ICOM Freq = Operating Freq -12.4 MHz ÷ 24. Integrated Circuit Oscillator Module (ICOM).
	19D413070P1	Cap, decorative.
		- - - - - - - - - - SOCKETS - - - - - - - - - -
XY1 thru XY4	19B216043G1	Socket, (ICOM).

SYMBOL	GE PART NO.	DESCRIPTION
		CHASSIS AND RF CIRCUIT 19E500881G1 thru G4
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C410 and C411		Refer to Mechanical Parts (RC-1823).
C412 and C413	5493392P7	Ceramic, feed-thru: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C414 thru C418		Refer to Mechanical Parts (RC-1823).
C419 thru C422	5493392P7	Ceramic, feed-thru: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C423 and C424		Refer to Mechanical Parts (RC-1598).
C425 thru C427	5493392P7	Ceramic, feed-thru: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C428	5496267P11	Tantalum: 68 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C429	19A115680P4	Electrolytic: 50 µf +150% -10%, 25 VDCW; sim to Mallory Type TT.
C430 and C431	5493392P7	Ceramic, feed-thru: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C433	5493392P107	Ceramic, stand-off: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type SS5A.
C435 and C436	7774750P4	Ceramic disc: .001 µf +100% -0%, 500 VDCW.
C437	5493392P3	Ceramic, feed-thru: 47 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C438	5491189P6	Polyester: 0.1 µf ±20%, 50 VDCW.
C439* and C440*	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added by REV A.
C441*	5493392P7	Ceramic, feed-thru: .001 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type FA5C. Added by REV F.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1*	19A116062P2	Selenium. Deleted in 19E500881G1, G3 by REV H, Deleted in 19E500881G2, G4 by REV J.
		- - - - - - JACKS AND RECEPTACLES - - - - - -
J441		(Part of W441).
J442	19B205689G2	Connector: 18 contacts rated at 5 amps min at 1000 VDC max.
J443	19C303426G1	Connector: 20 pin contacts.
J444		(Part of W444).
		- - - - - - - - - INDUCTORS - - - - - - - - -
L410	19B204938G7	Coil.
L411	19B204938G15	Coil.
L412	19B204938G8	Coil.
L413	19B204938G16	Coil.
L414	19B204938G11	Coil.
L415 thru L417	19B204936P13	Coil.
L418	19B204938G17	Coil.
L419	19B204938G12	Coil.
L420 thru L422	19B204936P14	Coil.
L423	19B204938G18	Coil.
L424	19B204938G19	Coil.
L425	19B204936P15	Coil.

SYMBOL	GE PART NO.	DESCRIPTION
Q9 and Q10	19A115123P1	Silicon, NPN; sim to Type 2N2712.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P682K	Composition: 6800 ohms ±10%, 1/4 w.
R2	3R152P683J	Composition: 68,000 ohms ±5%, 1/4 w.
R3	3R152P822J	Composition: 8200 ohms ±5%, 1/4 w.
R4	3R152P152J	Composition: 1500 ohms ±5%, 1/4 w.
R5	3R152P682K	Composition: 6800 ohms ±10%, 1/4 w.
R6	3R152P201J	Composition: 200 ohms ±5%, 1/4 w.
R7	3R152P113J	Composition: 11,000 ohms ±5%, 1/4 w.
R8	3R152P562J	Composition: 5600 ohms ±5%, 1/4 w.
R9	3R152P113J	Composition: 11,000 ohms ±5%, 1/4 w.
R10	3R152P512J	Composition: 5100 ohms ±5%, 1/4 w.
R11	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R12	3R152P822J	Composition: 8200 ohms ±5%, 1/4 w.
R13	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R14	3R152P133J	Composition: 13,000 ohms ±5%, 1/4 w.
R15	3R152P510J	Composition: 51 ohms ±5%, 1/4 w.
R16	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R17	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R18	3R152P622J	Composition: 6200 ohms ±5%, 1/4 w.
R19	3R152P123J	Composition: 12,000 ohms ±5%, 1/4 w.
R20	3R152P223J	Composition: 22,000 ohms ±5%, 1/4 w.
R21	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R22	3R152P301J	Composition: 300 ohms ±5%, 1/4 w.
R23	3R152P223J	Composition: 22,000 ohms ±5%, 1/4 w.
R24	3R152P433J	Composition: 43,000 ohms ±5%, 1/4 w.
R25	3R152P133J	Composition: 13,000 ohms ±5%, 1/4 w.
R26	3R152P123J	Composition: 12,000 ohms ±5%, 1/4 w.
R27	3R152P151J	Composition: 150 ohms ±5%, 1/4 w.
R28	3R152P562J	Composition: 5600 ohms ±5%, 1/4 w.
R29	3R152P513J	Composition: 51,000 ohms ±5%, 1/4 w.
R30	3R152P334J	Composition: 0.33 megohm ±5%, 1/4 w.
R31	3R152P104J	Composition: 0.1 megohm ±5%, 1/4 w.
R32	3R152P822J	Composition: 8200 ohms ±5%, 1/4 w.
R33	19A116278P342	Metal film: 26,700 ohms ±2%, 1/2 w.
R34	19A116278P233	Metal film: 2150 ohms ±2%, 1/2 w.
R35	19A116278P365	Metal film: 46,400 ohms ±2%, 1/2 w.
R36	19A116278P301	Metal film: 10,000 ohms ±2%, 1/2 w.
R37	19A116278P65	Metal film: 46.4 ohms ±2%, 1/2 w.
R38	3R152P204J	Composition: 0.2 megohm ±5%, 1/4 w.
R39	19A116278P385	Metal film: 75,000 ohms ±2%, 1/2 w.
R40	19A116278P329	Metal film: 19,000 ohms ±2%, 1/2 w.
R41	19A116278P285	Metal film: 7500 ohms ±2%, 1/2 w.
R42	19A116278P412	Metal film: 130,000 ohms ±2%, 1/2 w.
R43	19A116278P269	Metal film: 5110 ohms ±2%, 1/2 w.
R44	19A116278P117	Metal film: 147 ohms ±2%, 1/2 w.
R45 and R46	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
		NOTE The value of Resistor R47 must be obtained from the component, then find corresponding value in parts list for the correct part number.
R47A	3R152P822J	Composition: 8200 ohms ±5%, 1/4 w.
R47B	3R152P912J	Composition: 9100 ohms ±5%, 1/4 w.

SYMBOL	GE PART NO.	DESCRIPTION
R47C	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R47D	3R152P113J	Composition: 11,000 ohms ±5%, 1/4 w.
R47E	3R152P123J	Composition: 12,000 ohms ±5%, 1/4 w.
R47F	3R152P133J	Composition: 13,000 ohms ±5%, 1/4 w.
R47G	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
R47H	3R152P752J	Composition: 7500 ohms ±5%, 1/4 w.
R48	3R152P563J	Composition: 56,000 ohms ±5%, 1/4 w.
R49	3R152P224J	Composition: 0.22 megohms ±5%, 1/4 w.
R50	3R152P242J	Composition: 2400 ohms ±5%, 1/4 w.
R51	3R152P331J	Composition: 330 ohms ±5%, 1/4 w.
R52	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R53	3R152P201J	Composition: 200 ohms ±5%, 1/4 w.
R54	3R152P333J	Composition: 33,000 ohms ±5%, 1/4 w.
R55	3R152P103J	Composition: 10,000 ohms ±5%, 1/4 w.
R56	3R152P363J	Composition: 36,000 ohms ±5%, 1/4 w.
R57	3R152P103K	Composition: 10,000 ohms ±10%, 1/4 w.
R58	3R152P913J	Composition: 91,000 ohms ±5%, 1/4 w.
R59*	3R152P182J	Composition: 1800 ohms ±5%, 1/4 w.
		In REV C and earlier:
	3R152P432J	Composition: 4300 ohms ±5%, 1/4 w.
R60	3R152P432J	Composition: 4300 ohms ±5%, 1/4 w.
R61	3R152P682K	Composition: 6800 ohms ±10%, 1/4 w.
		- - - - - - - - - THERMISTORS - - - - - - - - -
RT1	5490828P22	Thermistor: 50,000 ohms ±10%, color code yellow; sim to Globar Type 763H.
		- - - - - - - - - SOCKETS - - - - - - - - - -
XFL1	19A121920G3	Reed, mica-filled phen: 7 pins rated at 1 amp at 500 VRMS with 4-1/2 inches of cable.
A429		TONE REJECT FILTER 19C311797G2 REV B
		- - - - - - - - - CAPACITORS - - - - - - - - -
C26	19A116080P206	Polyester: 0.068 µf ±5%, 50 VDCW.
C27 and C28	19A116080P210	Polyester: 0.33 µf ±5%, 50 VDCW.
C29	19A116080P205	Polyester: 0.047 µf ±5%, 50 VDCW.
		- - - - - - - JACKS AND RECEPTACLES - - - - - -
J6 and J7	4033513P4	Contact, electrical; sim to Bead Chain L93-3.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L1	19A115690P1	Coil, RF: 880 mh ±5%, sim to Artted AC5672.
		- - - - - - - - - RESISTORS - - - - - - - - -
R59*	3R152P182J	Composition: 1800 ohms ±5%, 1/4 w.
		In REV A and earlier:
	3R152P432J	Composition: 4300 ohms ±5%, 1/4 w.
A432 thru A435		OSCILLATOR/MULTIPLIER BOARD A432 19C311726G1 A433 19C311726G2 A434 19C311726G3 A435 19C311726G4
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1 thru C3	5494481P112	Ceramic disc: .001 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.

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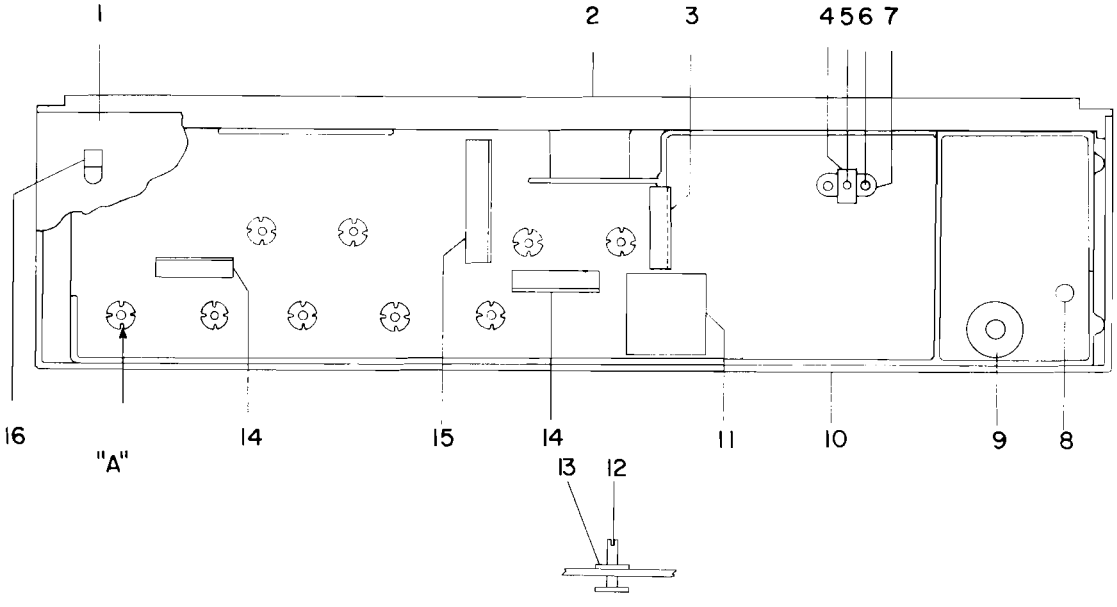
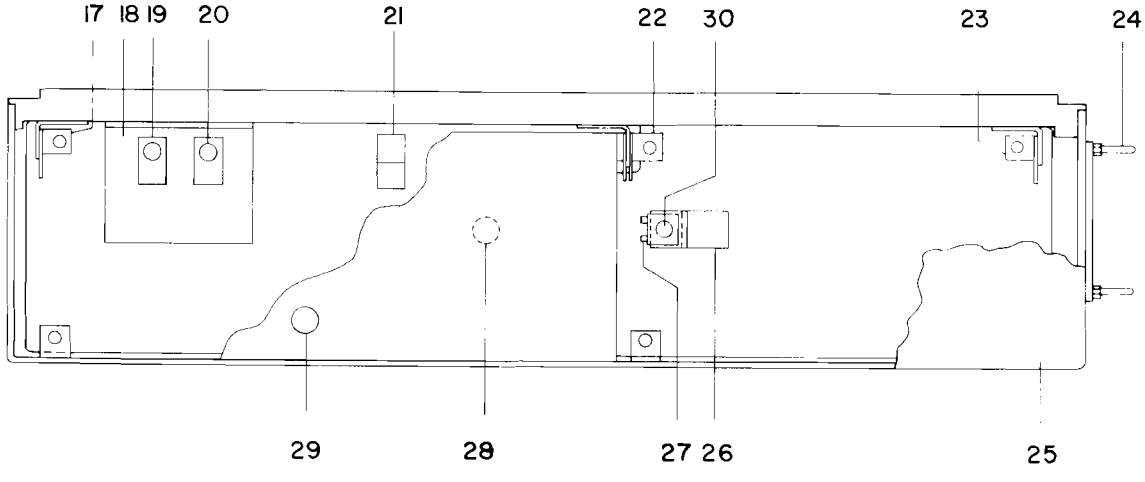
SYMBOL	GE PART NO.	DESCRIPTION
R23	3R77P104K	Composition: 0.10 megohm ±10%, 1/2 w.
R24	3R152P102J	Composition: 1000 ohms ±5%, 1/4 w.
R25 and R26	3R77P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R27 and R28	3R77P753J	Composition: 75,000 ohms ±5%, 1/2 w.
R29	3R77P182J	Composition: 1800 ohms ±5%, 1/2 w.
R30*	3R77P821J	Composition: 820 ohms ±5%, 1/2 w.
		In REV C and earlier:
	3R77P102J	Composition: 1000 ohms ±5%, 1/2 w.
R31	3R77P821J	Composition: 820 ohms ±5%, 1/2 w.
R32*	3R77P752J	Composition: 7500 ohms ±5%, 1/2 w. Deleted by REV A.
R33*	3R77P912J	Composition: 9100 ohms ±5%, 1/2 w.
		Earlier than REV A:
	3R77P203J	Composition: 20,000 ohms ±5%, 1/2 w.
R34	3R77P332K	Composition: 3300 ohms ±10%, 1/2 w.
R35	3R77P330K	Composition: 33 hms ±10%, 1/2 w.
R36	3R77P681J	Composition: 680 ohms ±5%, 1/2 w.
R37*	3R77P822J	Composition: 8200 ohms ±5%, 1/2 w. Deleted by REV A.
R38*	3R77P752J	Composition: 7500 ohms ±5%, 1/2 w.
		Earlier than REV A:
	3R77P622J	Composition: 6200 ohms ±5%, 1/2 w.
R39*	3R77P820J	Composition: 82 ohms ±5%, 1/2 w.
		Earlier than REV A:
	3R77P131J	Composition: 130 ohms ±5%, 1/2 w.
R40	3R77P241J	Composition: 240 ohms ±5%, 1/2 w.
R41*	3R152P240J	Composition: 24 ohms ±5%, 1/4 w.
		Earlier than REV A:
	3R77P300J	Composition: 30 ohms ±5%, 1/2 w.
R42*	3R77P200J	Composition: 20 ohms ±5%, 1/2 w.
		Earlier than REV A:
	3R77P160J	Composition: 16 ohms ±5%, 1/2 w.
R43	19B209358P101	Variable, carbon film: approx 25 to 250 ohms ±10%, 0.2 w; sim to CTS Type X-201.
R44	19B209022P101	Wirewound: 0.27 ohms ±105%, 2 w; sim to IRC Type BWH.
R45	3R77P123J	Composition: 12,000 ohms ±5%, 1/2 w.
R46	3R77P913J	Composition: 91,000 ohms ±5%, 1/2 w.
R48*	19A116278P249	Metal film: 3160 ohms ±2%, 1/2 w.
		Earlier than REV B:
	3R77P302J	Composition: 3000 ohms ±5%, 1/2 w.
		Earlier than REV A:
	3R77P332J	Composition: 3300 ohms ±5%, 1/2 w.
R49	3R77P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R50	3R77P222J	Composition: 2200 ohms ±5%, 1/2 w.
R51	3R77P103J	Composition: 10,000 ohms ±5%, 1/2 w.
R52	3R77P682J	Composition: 6800 ohms ±5%, 1/2 w.
R53*	3R77P303J	Composition: 30,000 ohms ±5%, 1/2 w. Deleted by REV E.
		In REV A, B:
	3R77P473J	Composition: 47,000 ohms ±5%, 1/2 w.
		Earlier than REV A:
	3R77P303J	Composition: 30,000 ohms ±5%, 1/2 w.

SYMBOL	GE PART NO.	DESCRIPTION
R54	3R77P822J	Composition: 8200 ohms ±5%, 1/2 w.
R55	3R77P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R57	3R77P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R58	3R77P181K	Composition: 180 ohms ±10%, 1/2 w.
R59	3R77P393K	Composition: 39,000 ohms ±10%, 1/2 w.
R60 and R61	3R77P103K	Composition: 10,000 ohms ±10%, 1/2 w.
R62*	3R77P103K	Composition: 10,000 ohms ±10%, 1/2 w. Deleted by REV C.
		Earlier than REV A:
	3R77P223K	Composition: 22,000 ohms ±10%, 1/2 w.
R63*	3R77P432J	Composition: 4300 ohms ±5%, 1/2 w. Deleted by REV A.
R64*	3R77P120J	Composition: 12 ohms ±5%, 1/2 w.
		Earlier than REV C:
	3R77P180J	Composition: 18 ohms ±5%, 1/2 w.
R65*	3R77P154K	Composition: 0.15 megohm ±10%, 1/2 w. Deleted by REV B.
R66	3R77P472K	Composition: 4700 ohms ±10%, 1/2 w.
R70	3R77P184J	Composition: 0.18 megohm ±5%, 1/2 w.
R75*	3R77P473J	Composition: 47,000 ohms ±5%, 1/2 w. Added by REV A. Deleted by REV C.
R76*	3R77P912J	Composition: 9100 ohms ±5%, 1/2 w. Added by REV A. Deleted by REV C.
R77*	3R152P153J	Composition: 15,000 ohms ±5%, 1/4 w.
		Earlier than REV C:
	3R152P562J	Composition: 5600 ohms ±5%, 1/4 w. Added by REV A.
R78*	3R77P200J	Composition: 20 ohms ±5%, 1/2 w.
		In REV A, B, and C:
	3R77P100J	Composition: 10 ohms ±5%, 1/2 w.
R79*	3R152P393J	Composition: 39,000 ohms ±5%, 1/4 w. Added by REV A.
R80*	3R152P432J	Composition: 4300 ohms ±5%, 1/4 w. Added by REV C.
R81*	3R152P472J	Composition: 4700 ohms ±5%, 1/4 w. Added by REV C.
R82*	3R77P273J	Composition: 27,000 ohms ±5%, 1/2 w. Added by REV C.
R84*	3R77P203J	Composition: 20,000 ohms ±5%, 1/2 w. Added by REV E.
		- - - - - - - - - - THERMISTORS - - - - - - - -
RT1	5490828P41	Thermistor: 30 ohms ±10%, color code black, white; sim to Globar Type B1211H-4.
RT2	5490828P9	Thermistor: 10,000 ohms ±10%, color code yellow; sim to Globar Type 551H-8.
RT3*	5490828P9	Thermistor: 10,000 ohms ±10%, color code yellow; sim to Globar Type 551H-8. Added by REV A.
		- - - - - - - - - TRANSFORMERS - - - - - - - -
T1	19A116040P1	Audio freq: 300 to 4000 Hz, Pri: 19.3 ohms ±10% DC res, Sec: 23.5 ohms ±10% DC res.
A428		ENCODER/DECODER 4EK16A10
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C2 and C3	19A116080P205	Polyester: 0.047 µf ±5%, 50 VDCW.
C4	19A116080P207	Polyester: 0.1 µf ±5%, 50 VDCW.



VIEW "A"



406-470 MHZ RECEIVER 4ER42E10-33
4ER42G10-33

RC-1823A

Changes in the eq
a "Revision Lette
to the Parts List

CHANNEL GUARD ENC

Rev. A - To obtai

CHASSIS & RF ASSE

Rev. A - To facil
Changed

Rev. B - To incor

Rev. C - To incor
Q1. Add

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped on the unit includes all previous revisions. Refer to the Parts List for description of parts affected by these revisions.

CHANNEL GUARD ENCODER/DECODER MODEL 4EK16A10

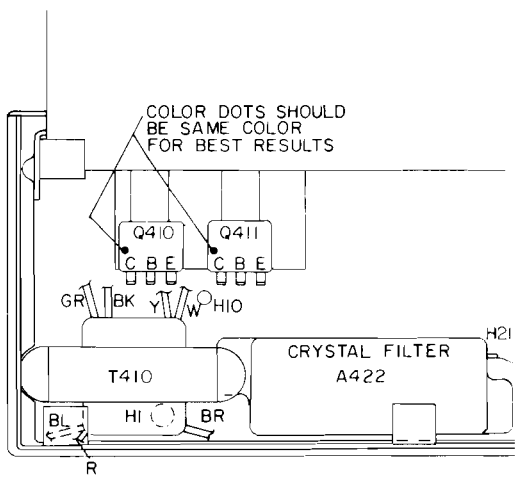
Rev. A - To obtain correct output level. Changed R8.

CHASSIS & RF ASSEMBLY 19E500881-G1 thru -G4

Rev. A - To facilitate tuning of low IF and improve critical squelch. Added C439 and C440. Changed C6 & C8 on A413/A414.

Rev. B - To incorporate new PA transistors. Changed Q410 and Q411. Added R411.

Outline Diagram Was:



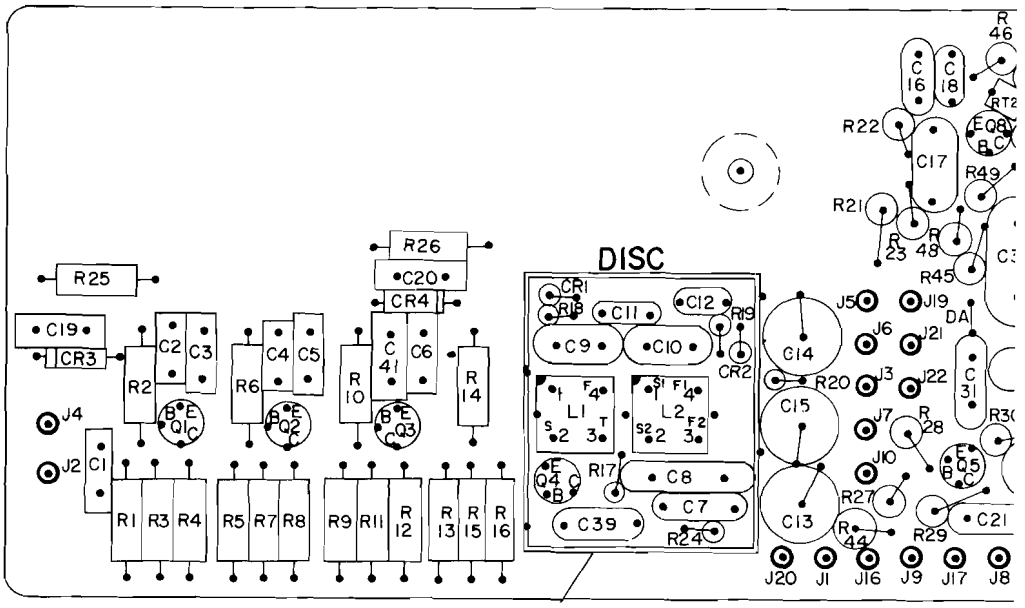
Rev. C - To incorporate a new multiplier transistor and decouple supply voltage. Changed Q1. Added C15 and R7.

IF AUDIO & SQUELCH BOARD A426 (19D413129-G3)

Rev. A - To make IF Audio & Squelch board compatible with new PA squelch operation. Deleted C24, C28, C29, C42, C43, R3 C49-C54, CR8, R75-R79 and RT3. Changed C21, C26, C37, R42, R48, R53 and R62.

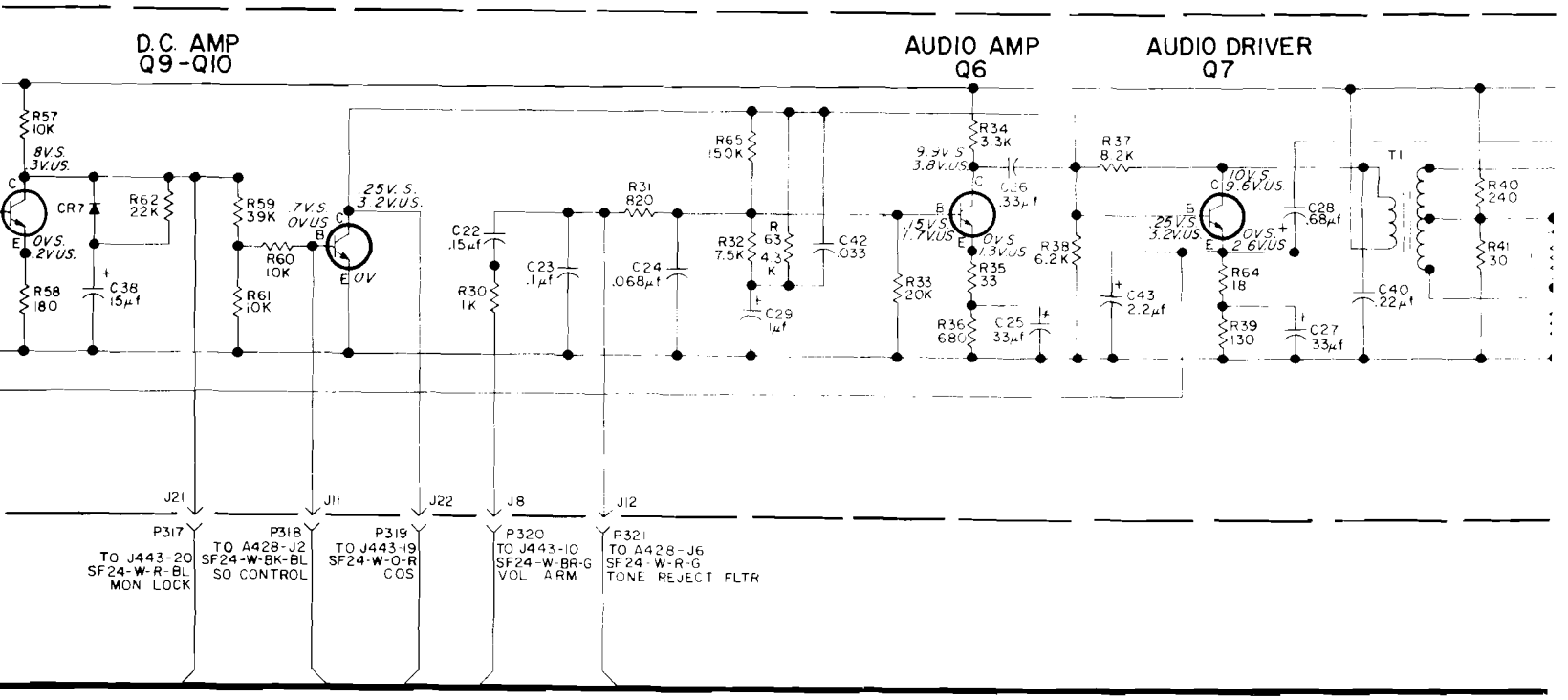
Outline Diagram Was:

IF-AUDIO & SQUELCH BOARD
A426



Schematic Diagram Was:

IF AUDIO & SQUELCH BOARD
A426



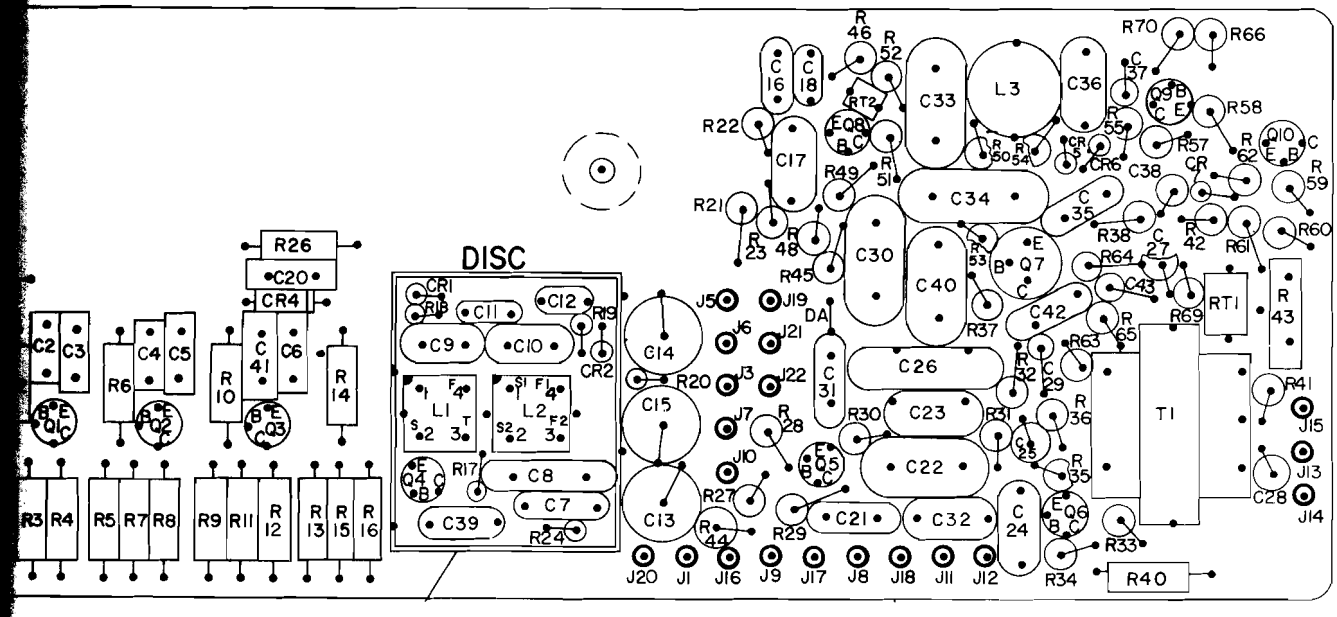
O & SQUELCH BOARD A426 (19D413129-G3)

LBI-3999

To make IF Audio & Squelch board compatible with new PA transistors and to improve squelch operation. Deleted C24, C28, C29, C42, C43, R32, R37, R63 and R65. Added C49-C54, CR8, R75-R79 and RT3. Changed C21, C26, C37, C38, C40, R33, R38, R39, R41 R42, R48, R53 and R62.

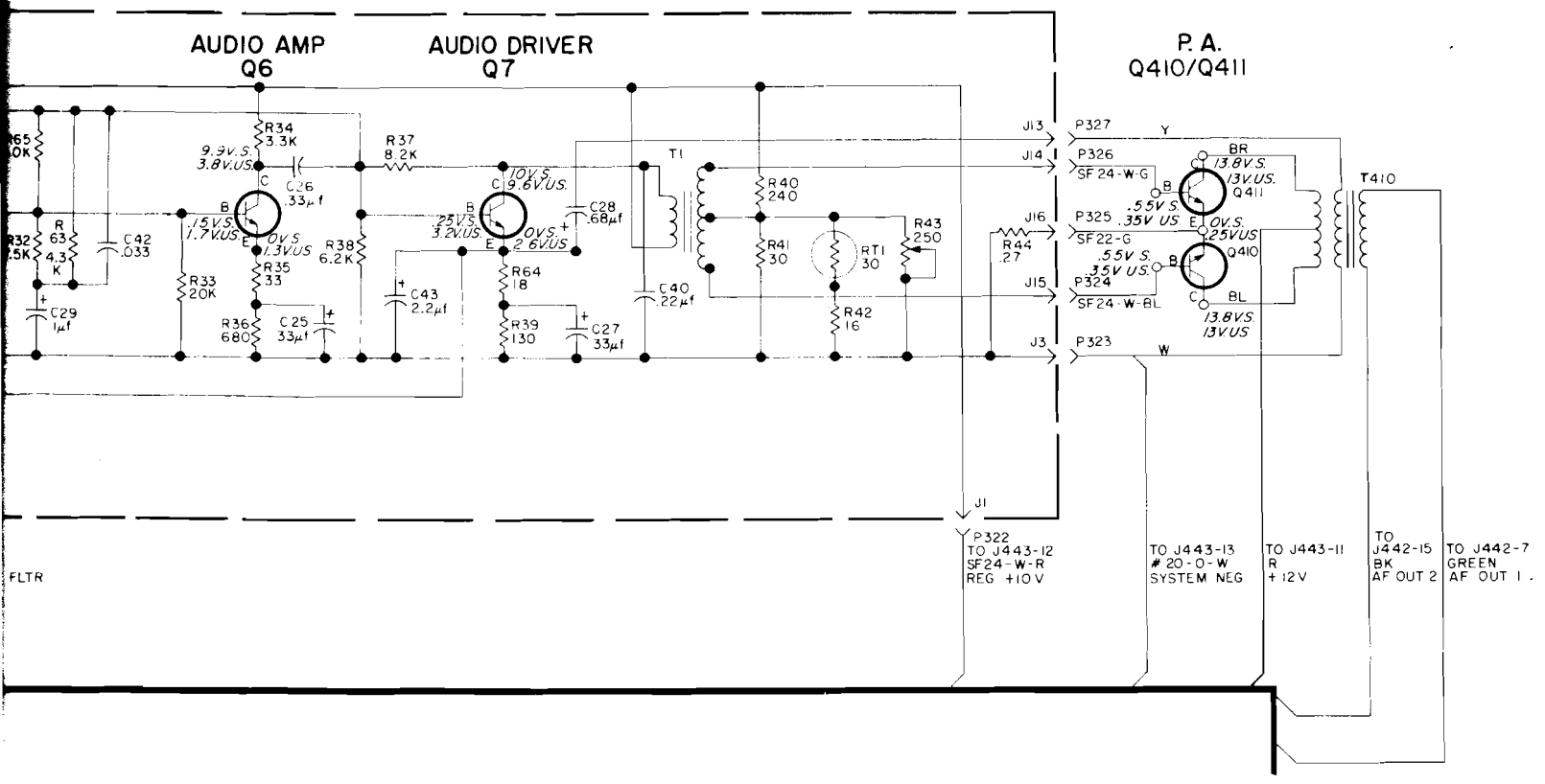
Outline Diagram Was:

IF-AUDIO & SQUELCH BOARD
A426



Schematic Diagram Was:

IF AUDIO & SQUELCH BOARD
A426



PRODUCTION CHANGES

406—470 MHz MASTR RECEIVER
MODELS 4ER42E10-33 & 4ER42G10-33

ARD A426 (19D413129-G3)

ove receiver frequency response.
R30 and R78.

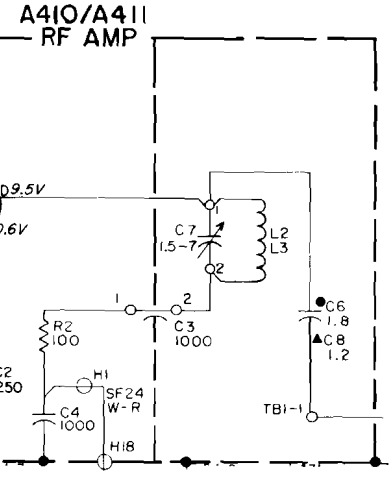
d Encoder/Decoder A428 (Model 4EK16A10)
Filter A429 (19C311797-G2)

xcessive roll-off at 300 Hertz.

/ 19E500881-G1 THRU -G4

lze the R.F. Amplifier and to improve
end tuning of the multiplier assembly.
ne R.F. amplifier board. Changed C5,
on the multiplier assembly.

Diagram was:



CHASSIS & RF ASSEMBLY 19E500881-G2 and G4

REV. H - To improve band-end tuning.
Changed C6 and C8.

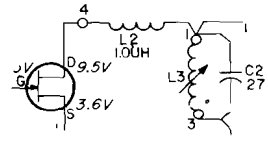
REV. J - To remove unnecessary protection.
Deleted CR1.

CHASSIS & RF ASSEMBLY 19E500881-G1 and G3

REV. H - To remove unnecessary protection.
Deleted CR1.

REV. J - To prevent oscillations in the high IF amplifier and mixer. Changed C2 on the IF amplifier assembly 19B216356G1 & G2. Added C8 to First Mixer assembly 19C311974G1 as part of L3.

SCHEMATIC WAS:



REV. K - To incorporate a new transistor.
Changed Q410 and Q411.

CHASSIS & RF ASSEMBLY 19E500881-G2 and G4

REV. L - To incorporate a new transistor.
Changed Q410 and Q411.

OARD A426 (19D413129-G3

e critical squelch action.
53 and added R84.

sate for vendor change.
26.

orate silicon diodes.
R3 and CR4.

squelch action at -30° C.
10.

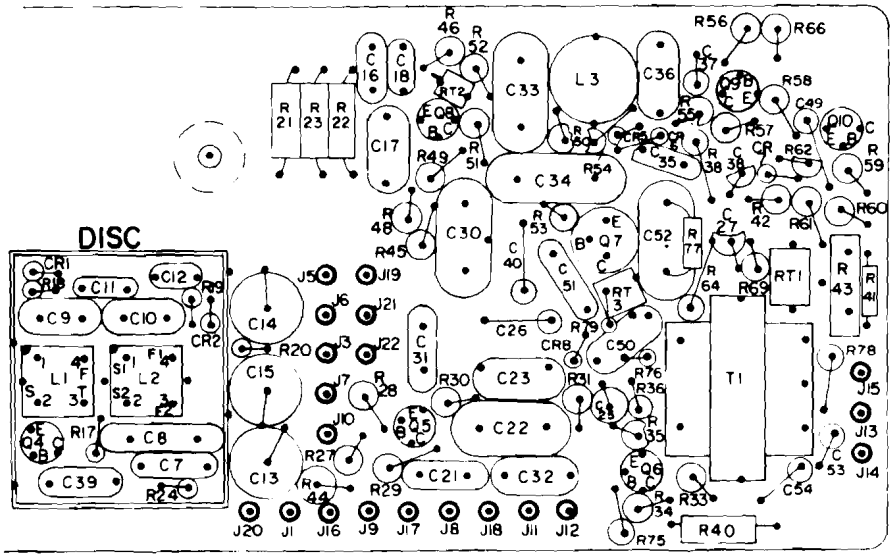
) & SQUELCH BOARD A426 (19D413129-G3)

v. B - To control more closely the squelch control rotation. Changed R48.

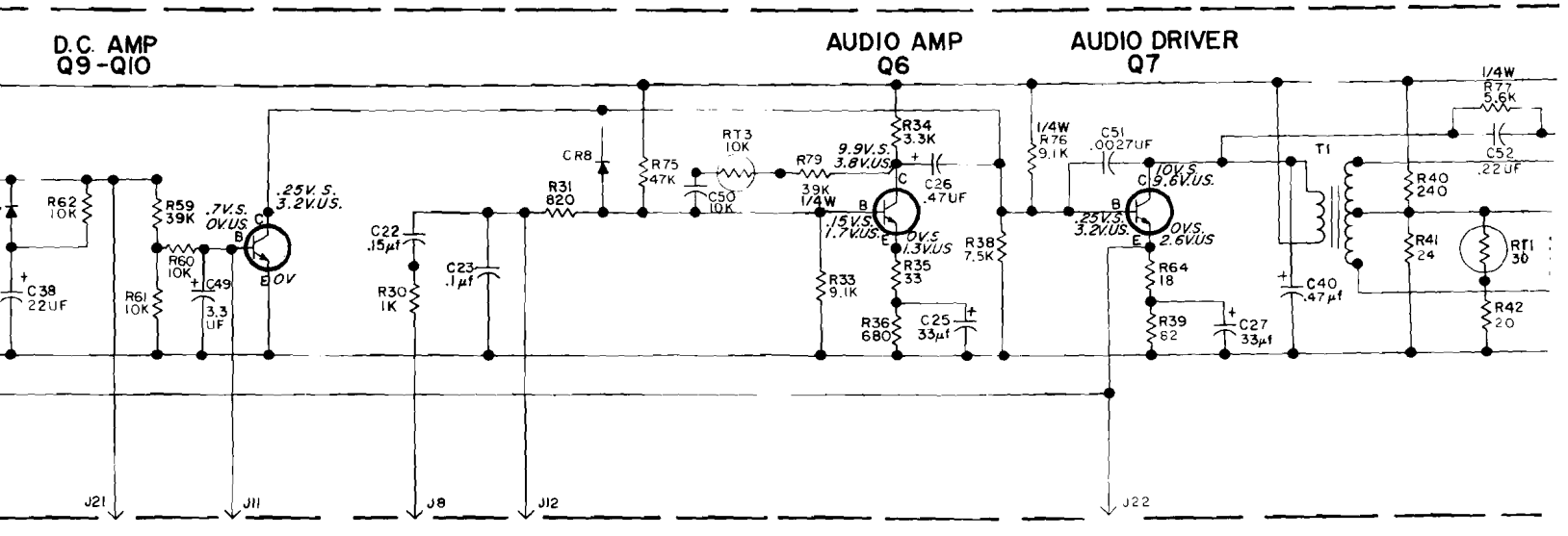
v. C - To eliminate barely audible squelch switching transients and to reduce receiver squelch tail. Deleted C38, C49, CR7, CR8, R62, R75 and R76. Added C55, R80, R81, and R82. Changed C27, C36, R53, R64 and R77.

OUTLINE DIAGRAM WAS:

IF-AUDIO & SQUELCH BOARD



SCHEMATIC DIAGRAM WAS:



CHANNEL GUARD ENCODER/DECODER MODEL 4EK16A10

Rev. B - To increase stop-band attenuation. Changed R8.

Rev. C - To optimize frequency response. Changed C29.

TONE REJECT FILTER 19C311797-G2

Rev. A - To optimize frequency response. Changed C29.

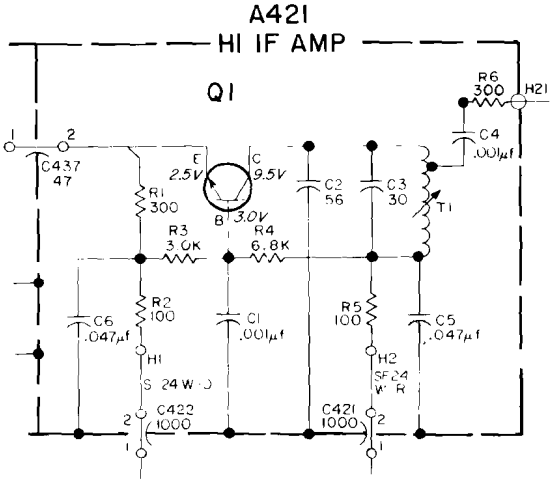
CHASSIS & RF ASSEMBLY 19E500881-G1 thru -G4

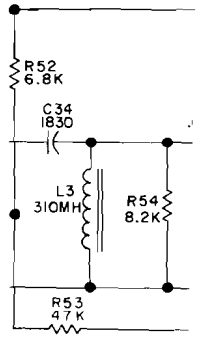
Rev. D - To eliminate squelch opening thump in receivers with Channel Guard. Removed white-orange wire between J443-13 and TB2-1. Added a white-orange wire between P312 (on J17 on IF audio and squelch board) and TB2-1.

Rev. E - To stabilize the tripler stage. Removed C9 on A413/A414.

Rev. F - To improve sensitivity when used with dual front-end. Added C441. Changed DC feed point of R4 to C441-2. Jumpered C441-1 to C421-1.

SCHEMATIC DIAGRAM WAS:





ORDERING SERVICE PARTS

Each component appearing on the schematic diagram is identified by a symbol number, to simplify locating it in the parts list. Each component is listed by symbol number, followed by its description and GE Part Number.

Service parts may be obtained from Authorized GE Communication Equipment Service Stations or through any GE Radio Communication Equipment Sales Office. When ordering a part, be sure to give:

1. GE Part Number for component
2. Description of part
3. Model number of equipment
4. Revision letter stamped on unit

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance.

Should further information be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, contact the nearest Radio Communication Equipment Sales Office of the General Electric Company.

MAINTENANCE MANUAL

LBI-3999

DF-1086

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

GENERAL ELECTRIC

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