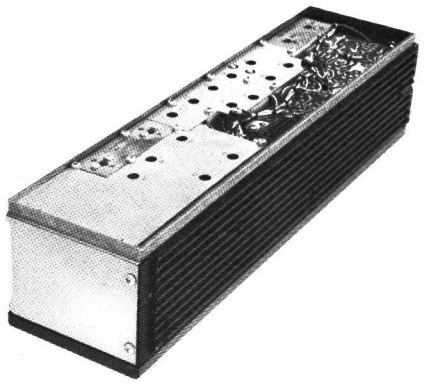
MOBILE RADIO

MASTR Progress Line

25-50 MHz RECEIVER MODELS 4ER39C68-85 (WITH NOISE BLANKER)

Maintenance Manual LBI-4124F

ER-39-C (NOISE BLKR)



SPECIFICATIONS *

FCC Filing Designation	**ER-39-C**
Frequency Range	25—50 MHz
Audio Output	5 watts at less than 5% distortion
Sensitivity	
12-dB SINAD (EIA Method)	0.25 μV
20-dB Quieting Method	0.35 μV
Selectivity	
EIA Two-Signal Method	-85 dB (adjacent channel, 20 kHz channels)
20-dB Quieting Method	-100 dB at ±15 kHz
Spurious Response	-100 dB
First Oscillator Stability	±.0005% (-30°C to +60°C)
Modulation Acceptance	±7 kHz (narrow-band)
Squelch Sensitivity	
Critical Squelch	0.15 μV
Maximum Squelch	Greater than 20 dB quieting (less than 1.5 μV)
Intermodulation (EIA)	-65 dB
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.

GENERAL ELECTRIC

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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 Receiver Type ER-39-C is a double conversion, superheterodyne FM receiver designed for operation on the 25-50 megahertz band.

The receiver is of single-unit construction and is completely housed in a copper-plated aluminum casting for maximum shielding and rigidity. The top compartment of the casting contains the RF, oscillator, converter, and 1st low IF amplifier, and noise blanker. The bottom portion of the casting contains the audio-squelch board and the optional Channel Guard 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 Model 4EX3A10 or 4EX8K11 for ease of alignment and servicing. The Test Set meters the noise blanker, multiplier, and limiter stages as well as the discriminator, and regulated 10 volts.

RF AMPLIFIERS (A341 & A344)

1st RF Amplifier (A341) consists of two high-Q helical resonators and an RF amplifier stage (Q2). The RF signal from the antenna is coupled by RF cable W441 to a tap on L341/L343/L345. The tap is positioned to insure the proper impedance match to the antenna. RF energy is coupled through the two coils by an opening in the shield wall to the base of 1st RF Amplifier

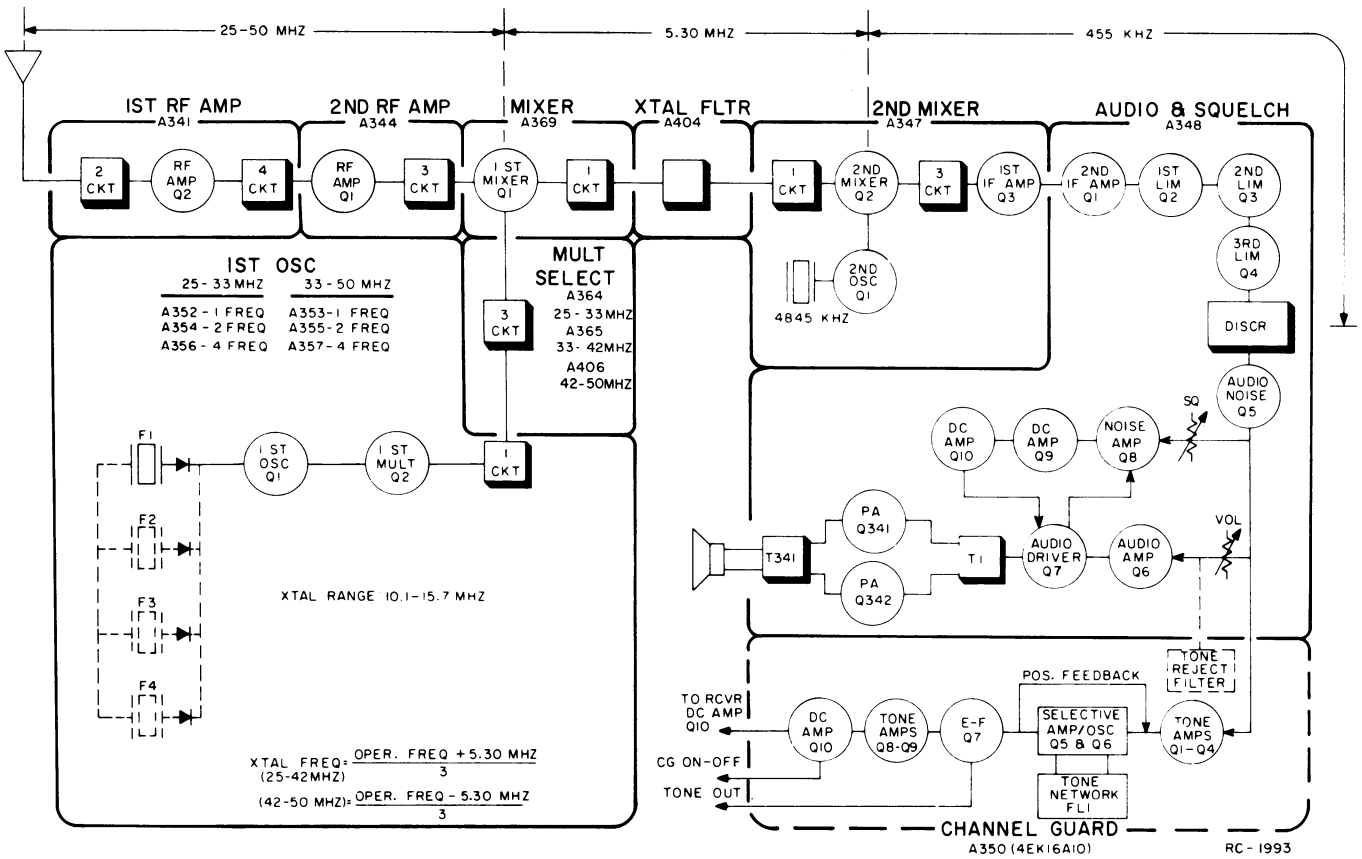


Figure 1 - Receiver Block Diagram

Q1. The coils are tuned to the incoming frequency by air trimmer capacitors C341 and C342.

The 1st RF amplifier uses a Field-Effect Transistor (FET) as the active device. The 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 2). The FET has voltage-controlled characteristics, and may be compared to a vacuum tube in operation (see Figure 2).

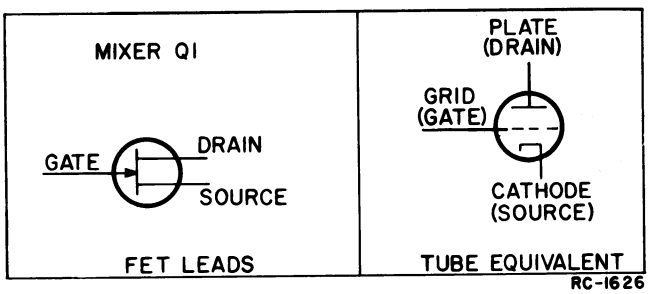


Figure 2 - FET Nomenclature

RF from the antenna is applied 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 three tuned circuits to the 1st mixer.

The output of A341-Q1 is taken from the drain and is coupled through two or four tuned circuits to the base of 2nd RF Amplifier A344-Q1.

The output of the 2nd RF Amplifier is coupled through three tuned circuits to the base of 1st Mixer A369-Q1.

1ST OSCILLATOR AND MULTIPLIER (A352-A357)

The receiver 1st oscillator operates in a transistorized Colpitts oscillator circuit. The oscillator crystal operates in a fundamental mode at a frequency of approximately 10 to 15 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 ±.0005% frequency stability as soon as the receiver is energized — without the warm-up time required by crystal ovens or warmers.

In single frequency receivers, bias for the oscillator is obtained by a jumper from H1 to H2 on the oscillator board.

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 and reduces its impedance. This applies the crystal frequency to the base of oscillator transistor Q1. Feedback for the oscillator is developed across C21/C22. The output is coupled to the base of 1st multiplier Q2.

The output of the 1st multiplier (tripler Q2) is transformer-coupled (T3/T4) to multiplier selectivity assembly A364/A365. The multiplier tank is tuned to three times the crystal frequency. The stage is metered at centralized metering jack J442-4 through metering network CR1, R1, C5 and C6.

MULTIPLIER SELECTIVITY (A364/A365/A404)

Following the 1st multiplier tank (T3/T4) are two additional L-C tuned circuits (L1, L2 and L3). Capacitor C34/C35/C36 couples the multiplier selectivity output to the base of the first mixer.

1ST MIXER (A345) AND CRYSTAL FILTER (A404)

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

In 1st mixer A345, RF from the 1st RF amplifier and injection voltage from the multiplier selectivity assembly are applied to the gate of Q1. The mixer output is taken from the drain with the output tuned to the 5.3 MHz high IF frequency.

A highly selective crystal filter (A404) following the 1st mixer provides the major selectivity for the receiver. The output of the filter is fed through impedance matching transformer A347-T1 to the base of the 2nd mixer.

2ND OSCILLATOR, 2ND MIXER AND 1ST LO IF AMPLIFIER (A347)

A347-Q1 operates in a Colpitts oscillator circuit, with feedback supplied through C4. The oscillator low-side injection voltage (4845 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 455 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 A347-Q3. The output of A347-Q3 is R-C coupled to the base of the 2nd low IF amplifier.

2ND LO IF AMPLIFIER AND LIMITERS (A348)

Additional amplification of the low IF signal going to the limiter stages is provided by 2nd low IF amplifier A318-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 (A348-Q2, Q3 and Q4). The 1st limiter is metered at J442-3 through metering network C20, CR4 and R26.

DISCRIMINATOR (A348)

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 (A348)

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 an 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 (A348)

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.

Q341 and Q342 operate as a push-pull, class AB audio PA stage. The PA output is coupled through audio transformer T341 to the loudspeaker. The yellow and white tertiary windings of T341 supply balanced feedback to the collector of Q7. The feedback winding minimizes distortion and prevents the pick-up of external electrical noise.

The PA stage provides a 5-watt output at less than 5% distortion into a 3.5-ohm load at the receiver output terminals (3.2-ohms at the Control Unit). 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 Q341 and Q342 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 Test Procedure.

SQUELCH (A348)

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. A network composed of C38, CR7 and R62 slows down the switching action of Q10, preventing an obnoxious "thump" from being 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.

NOISE BLANKER (A370/A372 - Figure 3)

An RF signal and noise pulse from the antenna is fed simultaneously to the Noise Blanker 1st RF Amplifier and the receiver 1st RF amplifier sections. The signal and noise is transformer coupled through T1/T2/T3 to the base of the first of two RF amplifier stages. The amplifier stages (Q1, Q2) raise the level of the noise pulse which is coupled through T10/T11/T12 and L10 to the base of the pulse detector Q3. A metering network consisting of R22, C21, and C17 permits the blanker to be metered at centralized metering jack J442-11.

Base bias for the pulse detector is established by R9 and CR1. CR1 is normally conducting, which keeps Q3 in a barely conducting state. A noise pulse applied to the base of Q3 causes it to conduct heavily. This results in a negative pulse at the output (collector) of Q3. Following Q3 is a low-pass RF filter consisting of C18, C22 and L5.

The output of the filter is fed to the base of pulse amplifier Q4. This stage is biased by CR3, R12 and R13 so that it is just conducting. The negative-going pulse from the pulse detector cuts CR3 off, which biases Q4 on, and a positive pulse appears at the output of pulse amplifier Q4.

Q5 and Q6 form part of the one-shot multivibrator circuit. Bias voltage through R17 keeps Q5 normally turned on. The positive voltage at the collector of Q5 keeps Q6 turned off. The positive-going pulse from the pulse amplifier (Q4) is fed to the base of Q5, cutting the stage off. As Q5 cuts off, Q6 is turned on; and the output is an 8-volt, 12 to 18 microsecond positive-going blanking pulse. The positive blanking pulse is fed to the emitter of 2nd RF Amplifier A344-Q1 and coil L2. The pulse cuts off Q1 and shunts L2 for the duration of the noise pulse.

The positive blanking pulse to the emitter of the 2nd RF amplifier A344-Q1 is controlled by the RF Level Shut-Off Switch A376. The output of the 1st Mixer is fed through a low-pass filter network in the RF level switch circuit to the base of the high IF level amplifier Q1. When the antenna signal input level is approximately 500-5000 microvolts, the high IF level output of Q1 is sufficient to turn level ON level-sensitive switch Q2. The output of Q2 is filtered through C7, C8, L2 and then turns ON the Noise Blanker (A370/A372)

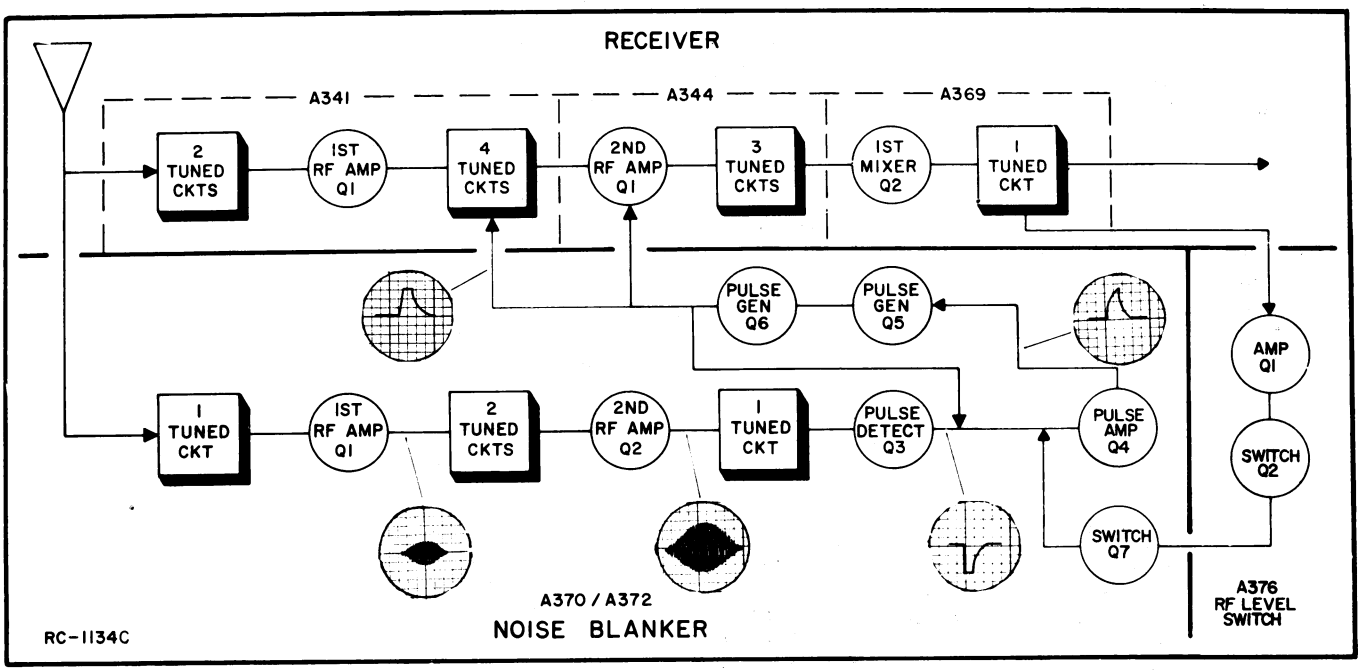


Figure 3 - Noise Blanker Block Diagram

switch Q7. The conduction of Q7 changes the bias to the 1st Pulse Amplifier Q4 and shorts the blanking pulse to ground.

The high IF output level (amplified by Q1) is not sufficient to turn Q2 ON when the antenna signal input is below the 500 to 5000 microvolt range. As a result, Q7 does not turn ON, and the positive blanking pulse is fed to the emitter of the 2nd RF Amplifier A344-Q1.

The blanking width is determined by R17 and C27. Diode CR6 keeps the output pulse a square wave. CR5 prevents oscillation at temperature extremes.

At the same time that the blanking pulse is applied to the receiver, samples of the pulse are fed to automatic repetition rate switch C30, C24, CR4, R13, R14 and R20. The pulse sample is coupled through C30 and is rectified by CR4. The rectified voltage charges C24 which then discharges through R13 and R14 to reverse bias CR3 and turn off pulse amplifier Q4. The components (C23, C24, R13 and R14) are selected so that the output pulses cannot blank the receiver continuously and prevent the desired signal from being heard.

The circuit time constant disables the blanking function whenever sinusoidal intermodulation signals produce beat frequencies of two kHz or higher. However, continuous impulse noise will not disable the blanker until a repetition rate of approximately 10 to 20 kHz is exceeded. The higher impulse noise repetition rate is provided by C23 which bypasses CR3 with the negative-going impulse noise. This turns on Q4 and allows the blanker to function.

As the noise signal from the antenna is applied to the Noise Blanker, the RF signal is applied to the receiver RF amplifier (A341). The six tuned circuits in the receiver front end provide a time delay for the RF signal, which enables the blanking pulse from the noise blanker to cut off the RF amplifier in the receiver before the noise pulse can get there.

The blanker may be disabled by shorting across the yellow dot on the noise blanker printed wiring board. Refer to the Noise Blanker Troubleshooting Procedure (as listed in the Table of Contents) for a complete performance check.

CHANNEL GUARD

Channel Guard Board Model 4EK16A10 is a fully transistorized encoder-decoder for use with 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 (A350)

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, 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 the transmitter.

Decoder (A350)

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 A348-Q5 and is fed through A350-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. When 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 A348-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 A348-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 (A348-Q10). The receiver noise squelch circuit continues to operate until a carrier quiets the receiver.

A tone rejection filter connected in parallel with A348-J12 (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 (A402) 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.
2. Pry up cover at rear 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 4), 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.

To service the receiver from the bottom--

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

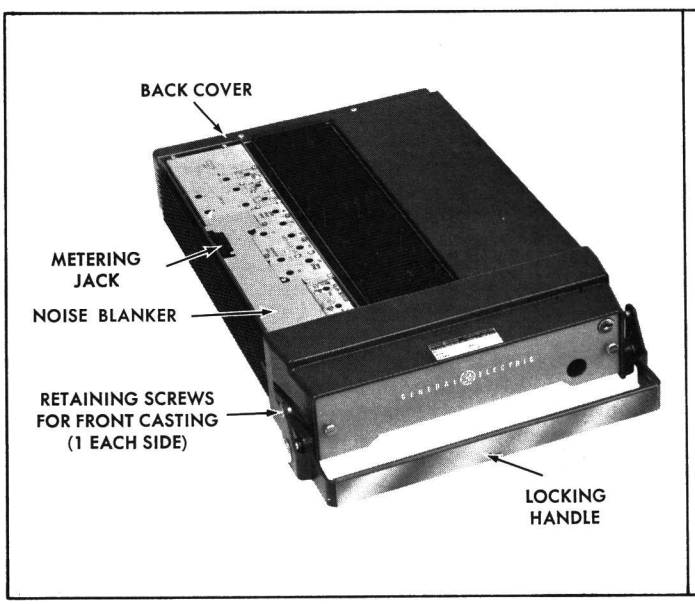


Figure 4 - Removing Top Cover

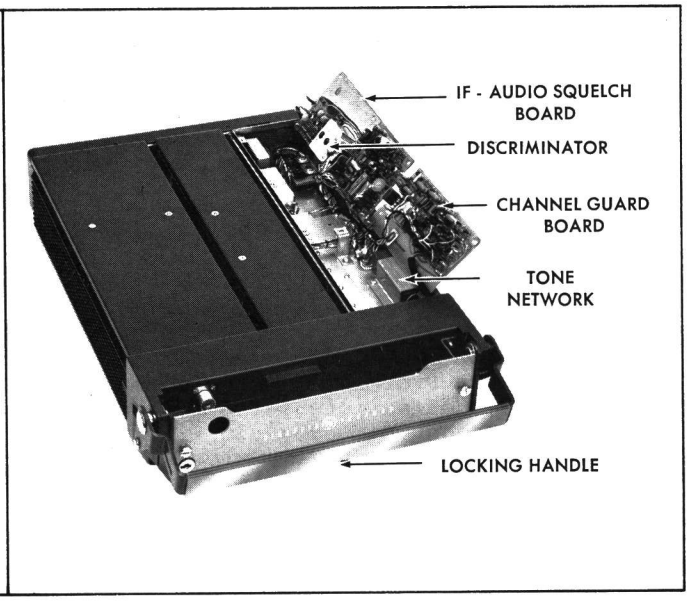


Figure 5 - Removing Bottom Cover

FRONT END ALIGNMENT

EQUIPMENT REQUIRED

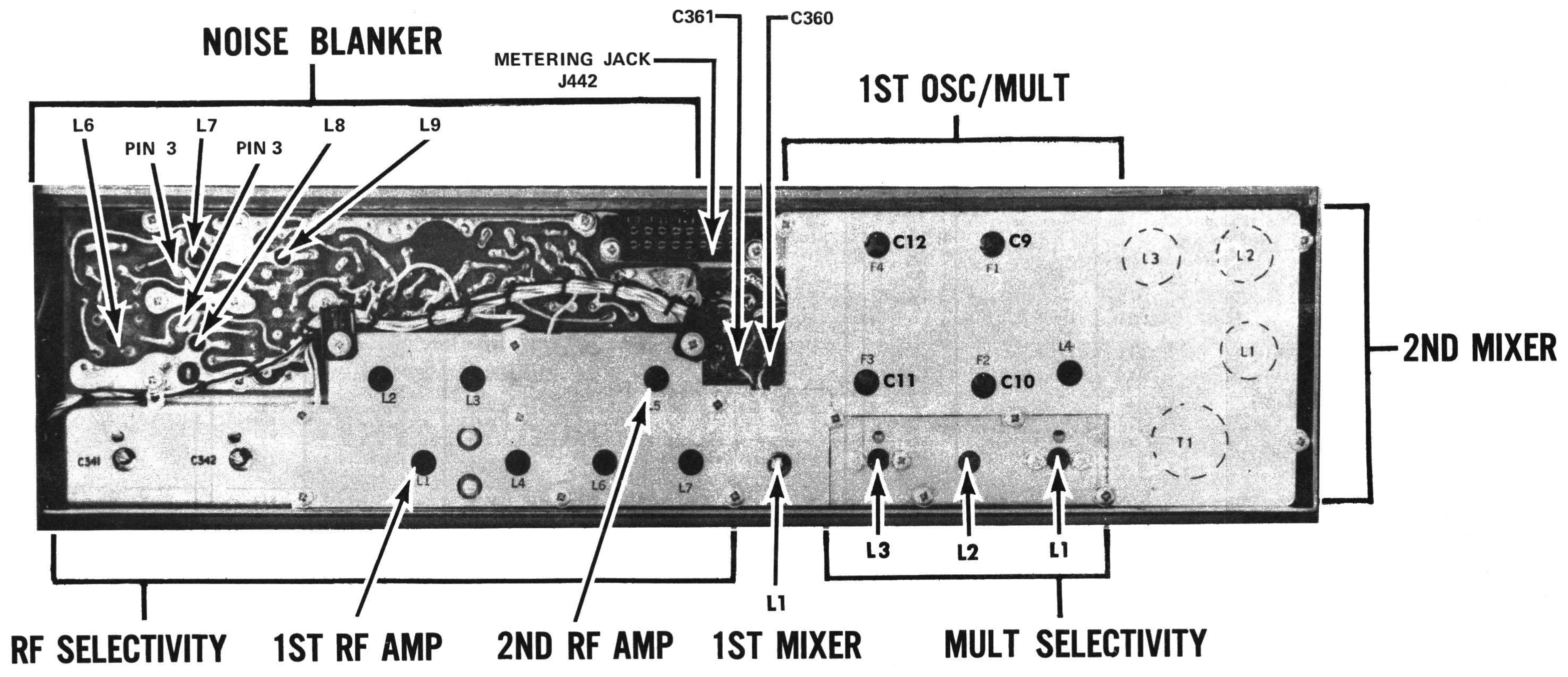
1. GE Test Set Models 4EX3A10, 4EX8K10, 11 (or 20,000 ohms-per-volt Multimeter with a 1-volt scale).
2. A 455 kHz and 25-50 MHz signal source. Connect a one-inch piece of insulated wire no larger than .065-inch diameter to generator output probe.

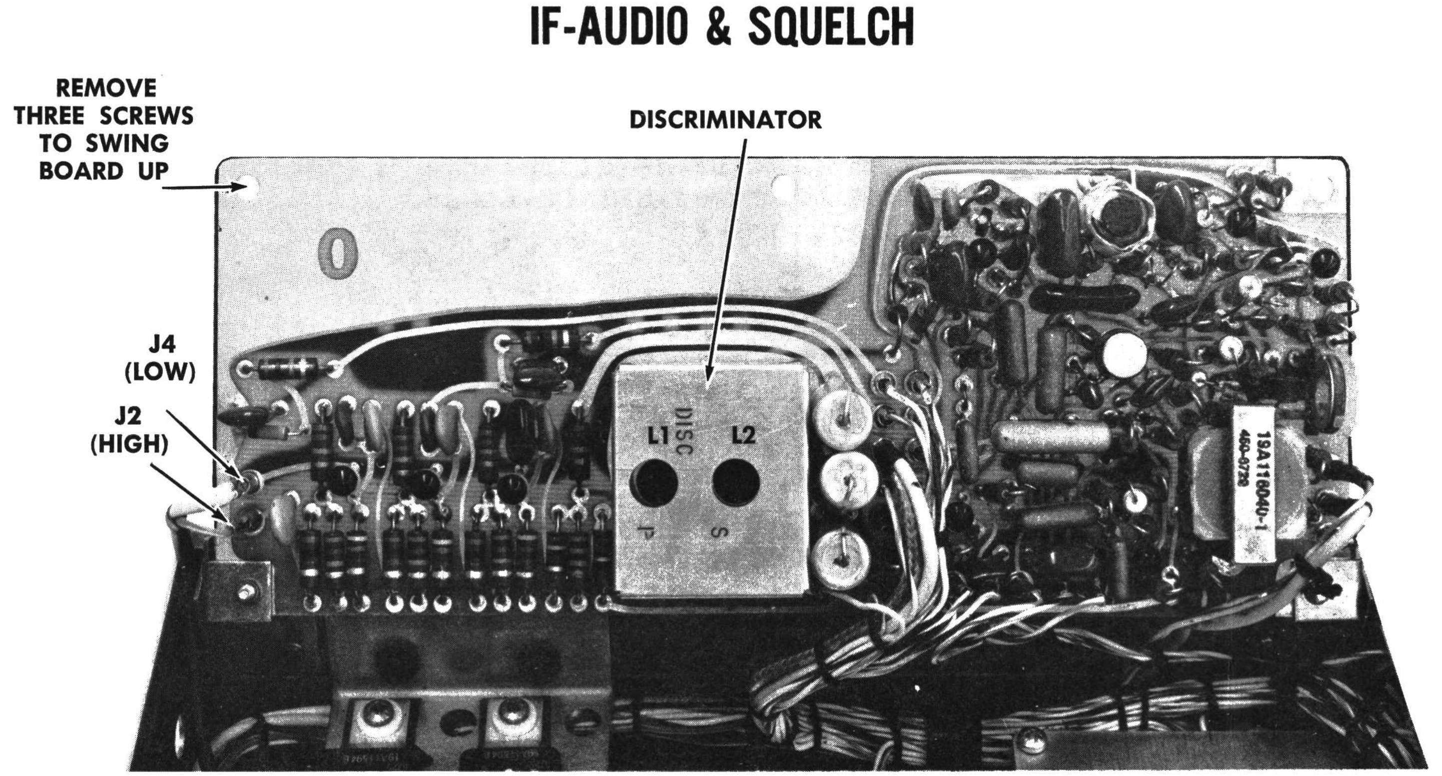
PRELIMINARY CHECKS AND ADJUSTMENTS

1. Connect Test Set to Receiver Centralized Metering Jack J442 and set meter sensitivity switch to the TEST 1 position (or 1-volt position on 4EX8K10, 11).
2. With Test Set in Position J, check for regulated +10 volts. If using Multimeter, measure from C360 to C361.
3. If using Multimeter, connect the positive lead to J442-16 (Ground).
4. Disable Channel Guard.

ALIGNMENT PROCEDURE

STEP	METERING POSITION: GE Test Set	METERING POSITION: Multimeter - at J442	TUNING CONTROL	METER READING	PROCEDURE
			OSCILLATOR/MULTIPLIER		
1.	D (MULT-1)	Pin 4	L4 (on 1st OSC/MULT) and L1, L2 (on MULT SELECTIVITY)	See Procedure	Tune L4 on 1st OSC/MULT and L1 on MULT SELECTIVITY for maximum meter reading. Next, tune L2 for minimum meter reading. Then tune L3 for maximum meter reading. Repeat step 1, changing voltage scale if necessary.
			RF AMPLIFIER & SELECTIVITY		
2.	A (DISC)	Pin 10		Zero	Apply an on-frequency signal adjacent to L7. Adjust the signal generator for discriminator zero.
3.	B (2nd IF Amp)	Pin 2	L1 (1st RF Amp), L6, L7, C341 and C342 (RF SELECTIVITY)	Maximum	Apply an on-frequency signal to the antenna jack, keeping below saturation. Tune L1 thru L7, C341, and C342 for maximum meter reading.
4.	"	"	L4 (1st OSC/MULT) and L1 and L2 (MULT SELECTIVITY)	Maximum	Apply an on-frequency signal as above, keeping below saturation. Tune L4 on 1st OSC/MULT and L1, L2 and L3 on MULT SELECTIVITY for maximum meter reading.
			FREQUENCY ADJUSTMENT		
5.	A (DISC)	Pin 10	C9 on 1st OSC (C10, C11 or 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.





COMPLETE RECEIVER & NOISE BLANKER ALIGNMENT

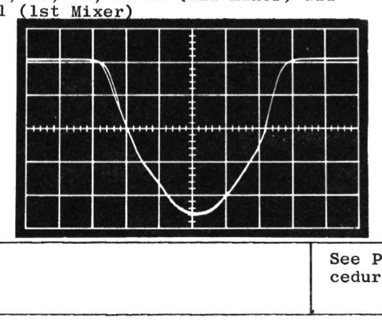
EQUIPMENT REQUIRED

1. GE Test Set Models 4EX3A10, 4EX8K10, 11 (or 20,000 ohms-per-volt Multimeter with a 1-volt scale).
2. A 455 kHz signal cource (GE Test Set Model 4EX7A10) and 25-50 MHz signal cource. Connect a one-inch piece of insulated wire no larger than .065-inch diameter 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 position (or 1-volt position on 4EX8K10, 11).
2. For large changes in frequency or a badly mis-aligned receiver, set crystal trimmer C9 to mid-capacity. In multi-frequency receivers, set C10, C11 or C12 to mid-capacity as required. Where the maximum frequency spacing is less than 100 kHz, align the unit on channel F1. If the frequency spacing is greater than 100 kHz, align the receiver on the center frequency.
3. With Test Set in Position J, check for regulated +10 volts. If using Multimeter, measure from C360 to C361.
4. If using Multimeter, connect the positive lead to J442-16 (Ground).
5. For large changes in frequency or a badly mis-aligned receiver, adjust all slugs on the Noise Blanker to the bottom of the coil form (closest to printed wiring board).
6. Disable the Channel Guard.

ALIGNMENT PROCEDURE

STEP	METERING POSITION: GE Test Set	METERING POSITION: Multimeter - at J442	TUNING CONTROL	METER READING	PROCEDURE
			DISCRIMINATOR & OSCILLATOR		
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 readings any closer than 0.05 V.
3.	D (MULT-1)	Pin 4	L4 (on 1st OSC/MULT) and L1, L2 & L3 (on MULT SELECTIVITY)	See Procedure	Tune L4 on 1st OSC/MULT and L1 on MULT SELECTIVITY for maximum meter reading. Tune L2 for minimum meter reading. Change voltage scale if necessary. Then tune L3 for maximum meter reading. Repeat step 3.
			RF AMPLIFIERS & SELECTIVITY		
4.	A (DISC)	Pin 10		Zero	Apply an on-frequency signal adjacent to L6 (RF SELECTIVITY). Adjust the signal generator for discriminator zero.
5.	B 2nd IF AMP	Pin 2	L7, L6, L4, L3 and L2 (RF SELECTIVITY) L5 (2nd RF AMP)	Maximum	Apply an on-frequency signal and tune as shown below, keeping signal below saturation. Apply Signal Generator Probe To: / Tune: L6 — L7 L4 — L6 and L5 L1 (1st RF AMP) — L4, L3 and L2
6.	B 2nd IF AMP	Pin 2	C341, C342 (RF SELECTIVITY) and L1 (1st RF AMP)	Maximum	Apply an on-frequency signal to antenna jack J441. Tune C341, C342 and L1 for maximum meter reading, keeping signal below saturation.
7.	"	"	L7, L6, L4, L3, L2, C342 and C341 (RF SELECTIVITY), L5 (2nd RF AMP), L1 (1st RF AMP)	Maximum	Apply an on-frequency signal as above, keeping below saturation. Tune L7, L6, L5, L4, L3, L2, L1, C342 and C341 for maximum meter reading.
8.	"	"	L3 on MULT SELECTIVITY	Maximum	Apply an on-frequency signal as above, keeping below saturation. Tune L2 and L3 on MULT SELECTIVITY Board for maximum meter reading.
			2ND MIXER & LO IF		
The 1st and 2nd mixer, and low 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 9, 10, and 11. L1 (on 1st Mixer) provides impedance matching for the crystal filter input and should only be tuned when observing IF trace on oscilloscope. —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.					
9.	B (2nd IF AMP)	Pin 2	L3, L2, L1, T1 (2nd Mixer)	Maximum	Apply on-frequency, unmodulated signal and tune L3, L2, L1 and T1 for maximum meter reading, keeping signal below saturation.
10.			L3, L2, L1, T1 on (2nd Mixer) and L1 (1st Mixer) 		Connect scope, signal generator, and detector as shown in Figure 5. 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.
11.	A (DISC)	Pin 10		See Procedure	Check to see that discriminator idling voltage is within ±.05 volt of zero with no signal applied. Check to see that modulation acceptance bandwidth is between ±7 and 9 kHz.

ALIGNMENT PROCEDURE

STEP	METERING POSITION: GE Test Set	METERING POSITION: Multimeter - at J442	TUNING CONTROL	METER READING	PROCEDURE
			NOISE BLANKER		
12.	H (BLANKER)	Pin 11 (-) and Pin 16 (+)	L9, L8, L7 and L6 on NOISE BLANKER	Maximum	Apply a signal according to the following table: Receiver operating frequency / Frequency of applied signal 25-27 MHz — 4 MHz above operating freq. 27-33 MHz — 4 MHz below operating freq. 33-42 MHz — 4 MHz below operating freq. 42-50 MHz — 4 MHz above operating freq. Apply signal generator probe to: / Tune: Pin 3 of L8 — L9 (2nd peak) Pin 3 of L7 — L8 (1st peak) Antenna Jack — 25-33 MHz (L7, 1st peak; L6 2nd peak) 33-50 MHz (L7 and L6; 1st peak)
13.	"	"	"	Maximum	Apply signal on blanker frequency to the antenna jack. Retune L6, L7, L8 and L9 for maximum meter reading.
14.	"	"	"	0.1 V	Apply a 1,000-microvolt signal on blanker frequency to antenna jack. Reading should be approximately 0.1 volt.
			FREQUENCY ADJUSTMENT		
15.	A (DISC)	Pin 10	C9 on 1st OSC (C10, C11 or 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.

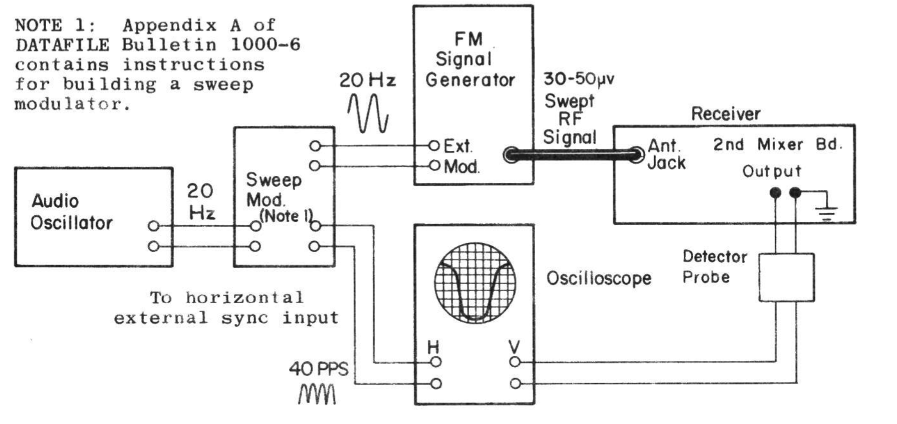


Figure 6 - Test Setup for 20-Hz Double-Trace Sweep Alignment

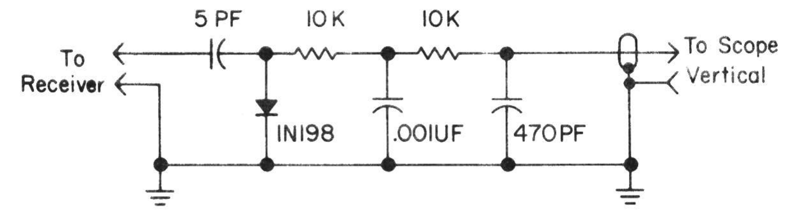


Figure 7 - Detector Probe for Sweep Alignment

TEST PROCEDURES

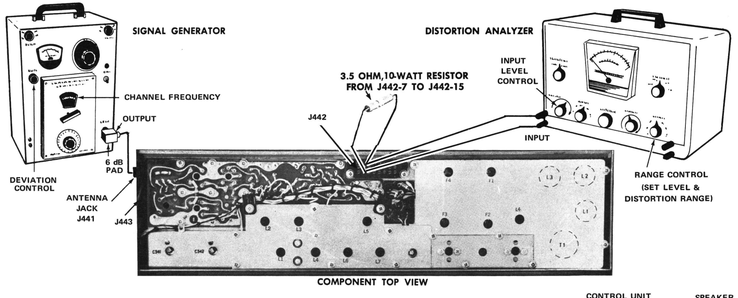
These Test Procedures are designed to help you to service a receiver that is operating---but not properly. The problems encountered could be low power, poor sensitivity, distortion, limiter not operating properly, and low gain. By following the sequence of test steps starting with Step 1, the defect can be quickly localized. Once the defective stage is pin-pointed, refer to the "Service Check" listed to correct the problem. Additional corrective measures are included in the Troubleshooting Procedure. Before starting with the Receiver Test Procedures, be sure the receiver is tuned and aligned to the proper operating frequency.

TEST EQUIPMENT REQUIRED

- Distortion Analyzer similar to: Heath IM-12
- Signal Generator similar to: Measurements M-560
- 6-dB attenuation pad, and 3.5-ohm, 10-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.



STEP 1
AUDIO POWER OUTPUT AND DISTORTION

TEST PROCEDURE

Measure Audio Power Output as follows:

A. Apply a 1,000-microvolt, on-frequency test signal modulated by 1,000 hertz with ±3.0 kHz deviation to antenna jack J441.

B. With Five-Watt Speaker:

Disconnect speaker lead pin from J701-2 (on rear of Control Unit).

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

OR

With Handset:

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

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

D. Make distortion measurements according to manufacturer's instructions. Reading should be less than 5%. If the receiver sensitivity is to be measured, leave all controls and equipment as they are.

SERVICE CHECK

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

E. Battery and regulator voltage---low voltage will cause distortion. (Refer to Receiver Schematic Diagram for voltages.)

F. P.A. Bias Adjust (R43) -- Turn the SQUELCH control fully counterclockwise. 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 Troubleshooting 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 3.0-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 0.25 microvolts 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 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 0.25 microvolts, 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 BANDWIDTH (IF BANDWIDTH)

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. It should be more than ±7 kHz (but less than ±9 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.

TROUBLESHOOTING PROCEDURE

Before starting the Noise Blanker troubleshooting procedure, make sure the receiver is operating properly. Align the Noise Blanker as described on the ALIGNMENT PROCEDURE Sheet. Then make the following Troubleshooting checks:

STEP 1—PERFORMANCE CHECK

Equipment Required:

- RF Signal Generator coupled through a 6 dB pad.
- Pulse Generator with repetition rate and level controls (similar to General Electric Model 4EX4A10)
- AC VTVM

Procedure:

1. Connect Pulse Generator and RF Signal Generator to receiver antenna jack through a T-connector and connect VTVM to receiver output as shown in Figure 1.

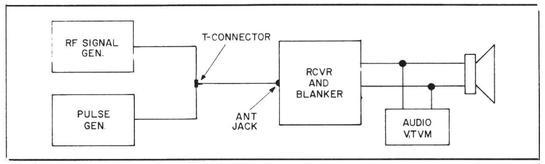


Figure 1 - Equipment Connection Diagram

2. Apply an unmodulated RF Signal and check the 20 dB quieting sensitivity of the receiver. (Measure with Model 4EX4A10 Pulse Generator connected but turned off).
3. Disable pulse section of the noise blanker by shorting Q4 base to emitter. (A yellow dot is located between the base and emitter connections on solder side of the noise blanker board).
4. Set the pulse generator (Model 4EX4A10) repetition rate to 1500 Hz and adjust the output level control on pulse generator until receiver sensitivity is degraded as much as possible (approximately 45 dB).
5. Remove base-emitter short from Q4. The receiver sensitivity should restore to within 5 dB of 20 dB quieting level obtained in step 2 above.

STEP 2—QUICK CHECKS

Equipment Required:

- Audio Voltmeter (VTVM)
- Audio Oscillator (sine wave)

SYMPTOMS	PROCEDURE
No regulated 10-volts	Check the 12-volt supply. Then check regulator circuit. (Refer to troubleshooting procedure for power supply.
No blanking	Check waveforms (STEP 3) and voltage ratios (STEP 4).
Partial or no blanking	a. Check RF attenuation as follows: Connect signal generator to Antenna Jack. Adjust the output of the signal generator for 0.2 volts on the 2nd IF amplifier (position B on test set) and note the signal generator reading. Short the Q5 base to emitter pattern (identified by red ink dot) and increase the signal generator output until the same 2nd IF amplifier reading is obtained. Signal level must increase 60 dB or more.
	b. Check repetition rate switch. Connect a 6-kHz sine wave signal from audio oscillator through a 0.33-μF capacitor to point "A" located on the noise blanker board. Adjust the output of the audio oscillator for 2-volts, peak-to-peak. Observe the output of the pulse generator (on noise blanker) with an oscilloscope. The repetition rate of the pulse generator should not increase over 2 kHz or decrease under 1 kHz. (This is true for sine wave inputs like intermodulation in the blanker channel but not for strong impulse noise from antenna.)
	c. Check vehicle ignition system. Worn-out points, bad spark plugs, or breaks in ignition wiring can cause a "dirty" ignition pulse to be generated causing the blanker to operate incorrectly.

STEP 4—VOLTAGE RATIO READINGS

Equipment Required:

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

Procedure:

1. Apply probe to input of stage (for example, base of 1st RF Amp). Peak resonant circuit of stage being measured and take voltage reading (E_1).
2. Move probe to input of following stage (2nd RF Amp). Repeak first resonant circuit. Then peak circuit being measured and take reading (E_2).
3. Convert readings by means of the following formula.

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

4. Check results with typical voltage ratios shown on diagram for each stage.

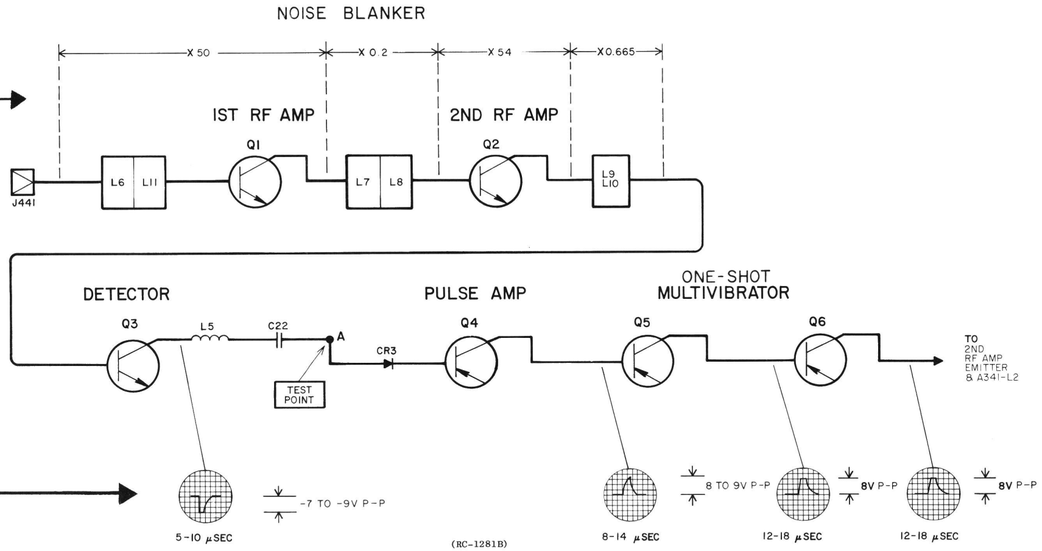
STEP 3—WAVE FORMS

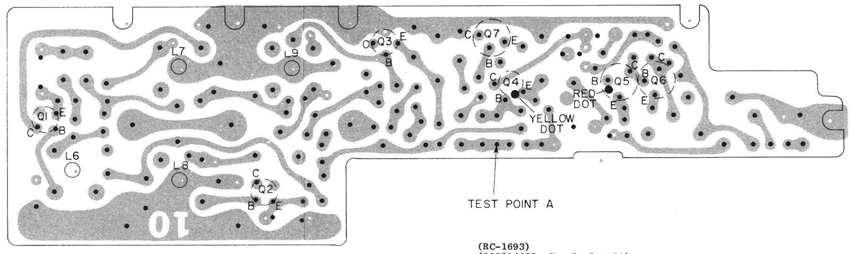
Equipment Required:

- Oscilloscope
- Noise Generator

Procedure:

Adjust noise generator for maximum output level and observe waveforms on oscilloscope at the indicated points.





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TROUBLESHOOTING PROCEDURE

Before starting the Noise Blanker troubleshooting procedure, make sure the receiver is operating properly. Align the Noise Blanker as described on the ALIGNMENT PROCEDURE Sheet. Then make the following Troubleshooting checks:

STEP 1—PERFORMANCE CHECK

Equipment Required:

- RF Signal Generator coupled through a 6 dB pad.
- Pulse Generator with repetition rate and level controls (similar to General Electric Model 4EX4A10)
- AC VTVM

Procedure:

1. Connect Pulse Generator and RF Signal Generator to receiver antenna jack through a T-connector and connect VTVM to receiver output as shown in Figure 1.

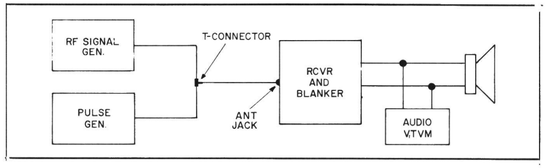


Figure 1 - Equipment Connection Diagram

2. Apply an unmodulated RF Signal and check the 20 dB quieting sensitivity of the receiver. (Measure with Model 4EX4A10 Pulse Generator connected but turned off).
3. Disable pulse section of the noise blanker by shorting Q4 base to emitter. (A yellow dot is located between the base and emitter connections on solder side of the noise blanker board).
4. Set the pulse generator (Model 4EX4A10) repetition rate to 1500 Hz and adjust the output level control on pulse generator until receiver sensitivity is degraded as much as possible (approximately 45 dB).
5. Remove base-emitter short from Q4. The receiver sensitivity should restore to within 5 dB of 20 dB quieting level obtained in step 2 above.

STEP 2—QUICK CHECKS

Equipment Required:

- Audio Voltmeter (VTVM)
- Audio Oscillator (sine wave)

SYMPTOMS	PROCEDURE
No regulated 10-volts	Check the 12-volt supply. Then check regulator circuit. (Refer to troubleshooting procedure for power supply.
No blanking	Check waveforms (STEP 3) and voltage ratios (STEP 4).
Partial or no blanking	a. Check RF attenuation as follows: Connect signal generator to Antenna Jack. Adjust the output of the signal generator for 0.2 volts on the 2nd IF amplifier (position B on test set) and note the signal generator reading. Short the Q5 base to emitter pattern (identified by red ink dot) and increase the signal generator output until the same 2nd IF amplifier reading is obtained. Signal level must increase 60 dB or more.
	b. Check repetition rate switch. Connect a 6-kHz sine wave signal from audio oscillator through a 0.33-μF capacitor to point "A" located on the noise blanker board. Adjust the output of the audio oscillator for 2-volts, peak-to-peak. Observe the output of the pulse generator (on noise blanker) with an oscilloscope. The repetition rate of the pulse generator should not increase over 2 kHz or decrease under 1 kHz. (This is true for sine wave inputs like intermodulation in the blanker channel but not for strong impulse noise from antenna.)
	c. Check vehicle ignition system. Worn-out points, bad spark plugs, or breaks in ignition wiring can cause a "dirty" ignition pulse to be generated causing the blanker to operate incorrectly.

STEP 4—VOLTAGE RATIO READINGS

Equipment Required:

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

Procedure:

1. Apply probe to input of stage (for example, base of 1st RF Amp). Peak resonant circuit of stage being measured and take voltage reading (E_1).
2. Move probe to input of following stage (2nd RF Amp). Repeak first resonant circuit. Then peak circuit being measured and take reading (E_2).
3. Convert readings by means of the following formula.

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

4. Check results with typical voltage ratios shown on diagram for each stage.

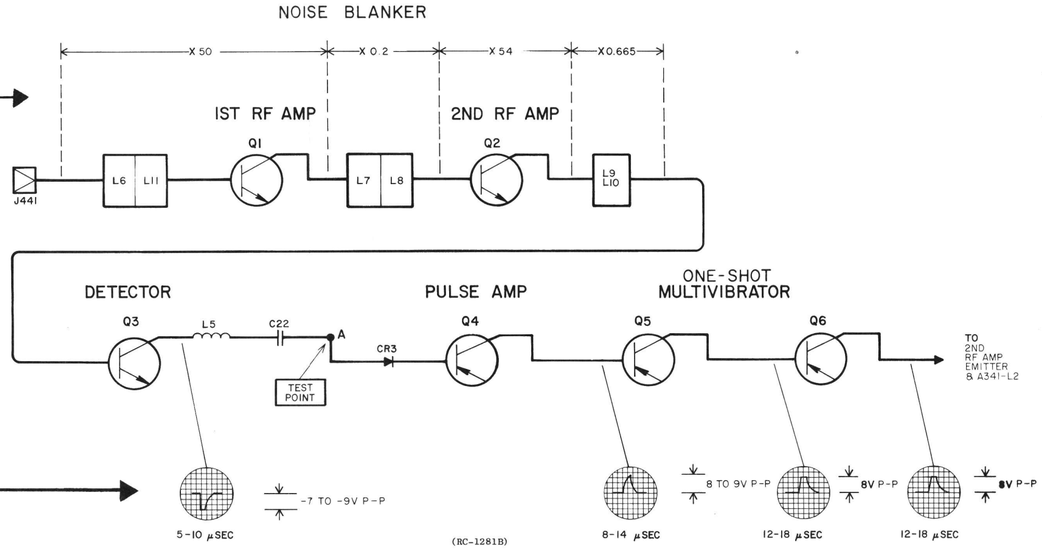
STEP 3—WAVE FORMS

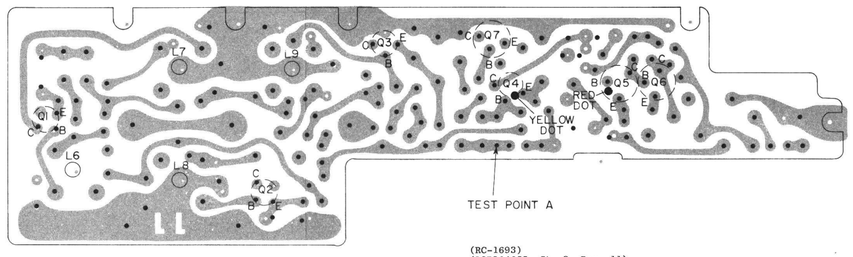
Equipment Required:

- Oscilloscope
- Noise Generator

Procedure:

Adjust noise generator for maximum output level and observe waveforms on oscilloscope at the indicated points.





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STEP 1 - QUICK CHECKS

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 Micro-volt Unmodulated
A (Disc Idling)	Less then ±.05 VDC	
B (2nd IF)	.15 VDC	.7 VDC
C (1st Lim)	.7 VDC	0.8 VDC
D (Mult-1)	0.6 VDC	
J (Reg. +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/MULTI-PLIER READINGS	• Check alignment of Oscillator, (Refer to Front End Alignment Procedure). • Check voltage readings of 1st Oscillator/Multi-plier Q1/Q2. • Check crystal Y1.
LOW RECEIVER SENSITIV-ITY	• 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 1st Mixer, HI IF Amp and 2nd Mixer. • Make SIMPLIFIED GAIN CHECKS (STEP 2A).
LOW AUDIO	• Check Audio PA (Q341 & Q342) 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 OPERA-TION	• 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).
DISTORTION IDLING TOO FAR OFF ZERO	• See if discriminator zero is in center of IF bandpass.

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STEP 3-VOLTAGE RATIO READINGS

EQUIPMENT REQUIRED:

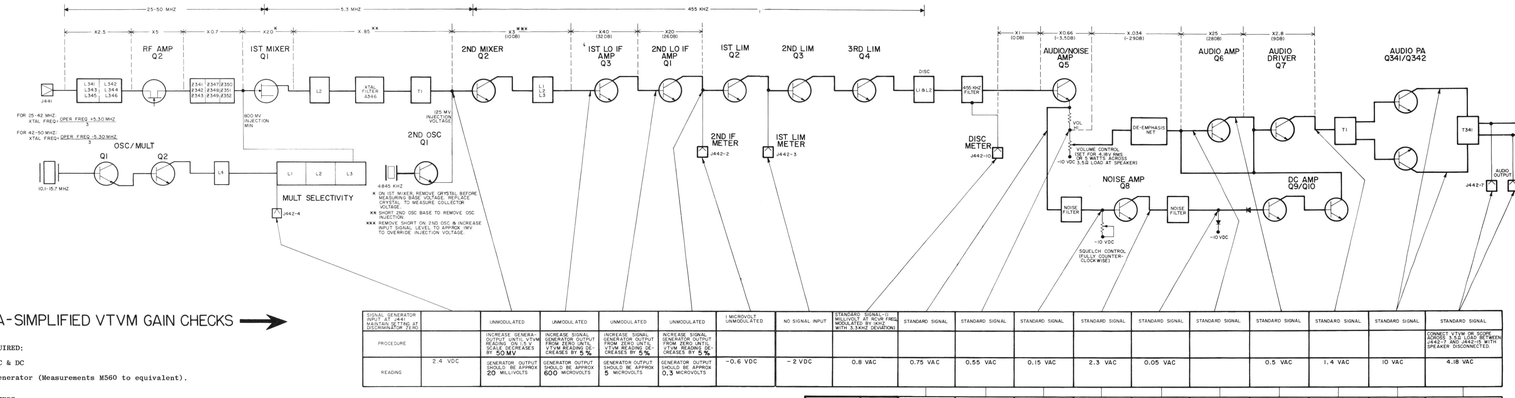
1. RF Voltmeter (similar to Boonton Model 91-CA or Millivac Type MV-18 C.
2. Signal on receiver frequency (below saturation). Correct frequency can be determined by zeroing the discriminator. Use 1,000 hertz signal with 3.0 kHz deviation.

PROCEDURE:

1. Apply probe to input of stage (for example, base of RF amp). Peak resonant circuit of stage being measured and take voltage reading (E_1).
2. Move probe to input of following stage (1st mixer*). Re-peak first resonant circuit then peak circuit being mea-sured and take reading (E_2).
3. Convert readings by means of the following formula.

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

4. Check results with typical voltage ratios shown on diagram.



STEP 2A-SIMPLIFIED VTVM GAIN CHECKS

EQUIPMENT REQUIRED:

1. VTVM - AC & DC
2. Signal generator (Measurements M560 to equivalent).

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.

SIGNAL GENERATOR MODULATION MASTR SETTING (FM DISCRIMINATOR TYPE)		UNMODULATED	UNMODULATED	UNMODULATED	UNMODULATED	1 MICROVOLT UNMODULATED	NO SIGNAL INPUT	STANDARD SIGNAL (1 MV, 1 kHz TONE FREQ MODULATED BY 1kHz WITH 3.5kHz DEVIATION)	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL	STANDARD SIGNAL
PROCEDURE		INCREASE GENERA-TOR OUTPUT UNTIL VTVM READING ON X 3 V RANGE INCREASES BY 50 MV	INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING INCREASES BY 5 %	INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING INCREASES BY 5 %	INCREASE SIGNAL GENERATOR OUTPUT FROM ZERO UNTIL VTVM READING INCREASES BY 5 %													CONNECT VTVM OR SCOPE PROBE TO J442-5 (- LEAD) BETWEEN J442-7 AND J442-15 WITH SPEAKER DISCONNECTED
READING	2.4 VDC	GENERATOR OUTPUT SHOULD BE APPROX 20 MILLIVOLTS	GENERATOR OUTPUT SHOULD BE APPROX 600 MICROVOLTS	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		0.5 VAC	1.4 VAC	10 VAC	4.38 VAC

STEP 2B-AUDIO & SQUELCH WAVEFORMS

EQUIPMENT REQUIRED:

1. Oscilloscope.
2. Signal generator (Measurements M560 to equivalent).

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 oscilloscope between system negative and points indicated by arrow.

SCOPE SETTING										
	.5 MS/DIV I VOLT/DIV 2 V P-P	.5 MS/DIV I VOLT/DIV 1.4 V P-P	.5 MS/DIV I VOLT/DIV I V P-P (NOISE)	.5 MS/DIV 2 VOLTS/DIV 5.7 V P-P (NOISE)	.5 MS/DIV .5 VOLTS/DIV .3 V P-P (NOISE)	.5 MS/DIV 50 MILLIVOLTS/DIV 0.1 V P-P	.5 MS/DIV I VOLT/DIV 1.9 V P-P	.5 MS/DIV 2 VOLTS/DIV 4 V P-P	.5 MS/DIV 10 VOLTS/DIV 10 V P-P	.5 MS/DIV 5 VOLTS/DIV 9 V P-P
STANDARD SIGNAL (1 MILLIVOLT AT RECEIVER FREQ MODULATED BY 1KHZ WITH 3.5KHZ DEVIATION)										
NOISE WAVE FORM (NO SIGNAL INPUT)										

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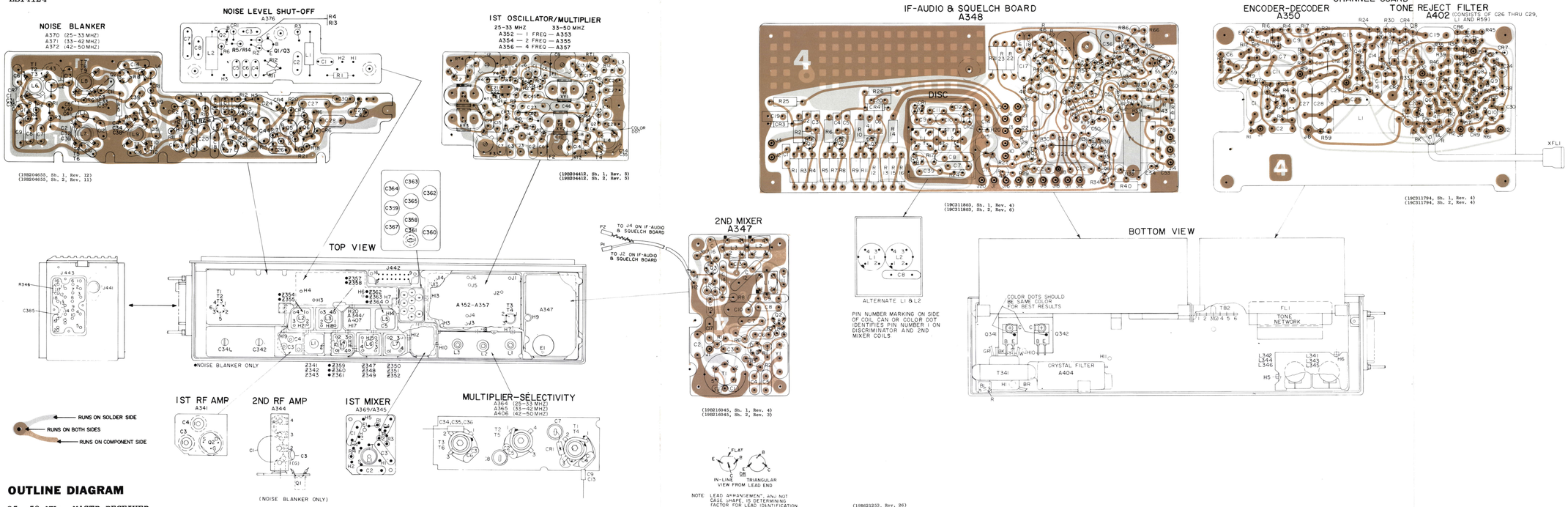


OUTLINE DIAGRAM

25—50 MHz, MASTR RECEIVER
MODELS 4ER39C68-85

PARTS LIST

LBI4134G

25-50 MHz RECEIVER
MODELS 4ER39C68 - 4ER39C85

SYMBOL	GE PART NO.	DESCRIPTION
A341		RF AMPLIFIER ASSEMBLY 19B204772G3
		- - - - - - - - - - - CAPACITORS - - - - - - - - - -
C3 and C4	5493392P7	Ceramic, feed-thru: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C9 and C10	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - - - - INDUCTORS - - - - - - - -
L1	7491382P101	Coil, RF: 100 µh ±10%, 4 ohms DC res max; sim to Delevan 3500 Series.
		- - - - - - - - - - TRANSISTORS - - - - - - - -
Q2*	19A116960P1	N Type, field effect; sim to Type 2N4416.
		In 19E500873G4 of REV P & earlier: In 19E500873G5, G6 of REV M & earlier:
	19A115953P1	N channel, field effect.
		- - - - - - - - - - RESISTORS - - - - - - - - -
R10	3R152P470J	Composition: 47 ohms ±5%, 1/4 w.
R11 and R12	3R152P101J	Composition: 100 ohms ±5%, 1/4 w.
		- - - - - - - - - - - SOCKETS - - - - - - - - - - -
XQ2	5490277P5	Transistor, phen: 3 contacts; sim to Alcon 1213LL2.
A344		RF AMPLIFIER 19B204770G1
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C1	5494481P14	Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C3*	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added to 19E500873G4 by REV M. Added to 19E500873G5, G6 by REV L.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV. Deleted in 19E500873G4 by REV M. Deleted in 19E500873G5, G6 by REV L.
		In 19E500873G4 of REV G & earlier: In 19E500873G5, G6 of REV F & earlier:
	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA.
		- - - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1	19A115342P1	Silicon, NPN.
		- - - - - - - - - - - RESISTORS - - - - - - - - - - -
R1*	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
		In 19E500873G4 of REV L & earlier: In 19E500873G5, G6 of REV K & earlier:
	3R152P510J	Composition: 51 ohms ±5%, 1/4 w.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7487424P19	Miniature, phen: 3 terminals.
A347		SECOND MIXER 19B216119G1
		- - - - - - - - - - - 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.
C4 and C5	5490008P35	Silver mica: 220 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
C6	5490008P9	Silver mica: 18 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-15.
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.
C11	5496219P40	Ceramic disc: 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C12	5496219P369	Ceramic disc: 180 pf ±5%, 500 VDCW, temp coef -150 PPM.
C13	5496219P40	Ceramic disc: 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C14	19A116656P220J2	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.
		- - - - - - - - - JACKS AND RECEPTACLES - - - - -
J1	4033513P4	Contact, electrical; sim to Bead Chain L93-3.
		- - - - - - - - - - - INDUCTORS - - - - - - - - -
L1	19C311181G3	Coil. Includes:
	4038368P1	Tuning slug.
L2 and L3	19A115711P1	Transformer, freq: 455 KHz; sim to Automatic Mfg EX12670.
		- - - - - - - - - - - - PLUGS - - - - - - - - - - -
P1	4029840P2	Contact, electrical: sim to Amp 42827-2.
P2	4029840P1	Contact, electrical: sim to AMP 41854.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115889P1	Silicon, NPN.
Q2	19A115245P1	Silicon, NPN.
Q3	19A115123P1	Silicon, NPN.
		- - - - - - - - - - - RESISTORS - - - - - - - - -
R1 and R2	3R77P103K	Composition: 10K ohms ±10%, 1/2 w.
R3	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R4	3R152P333K	Composition: 33K ohms ±10%, 1/4 w.
R5	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R6	3R77P332K	Composition: 3.3K ohms ±10%, 1/2 w.
R7	3R77P123K	Composition: 12K ohms ±10%, 1/2 w.
R8	3R77P622J	Composition: 6.2K ohms ±5%, 1/2 w.
R9	3R77P302J	Composition: 3K ohms ±5%, 1/2 w.
R10	3R77P202J	Composition: 2K ohms ±5%, 1/2 w.
R11	3R77P201J	Composition: 200 ohms ±5%, 1/2 w.
		- - - - - - - - - - - TRANSFORMERS - - - - - - - -
T1		COIL ASSEMBLY 19B216120G1
		- - - - - - - - - - - CAPACITORS - - - - - - - -
C1	19C301540P261	Ceramic disc: 82 pf ±5%, 200 VDCW, temp coef -80 PPM.
	5491798P3	Tuning slug.
		- - - - - - - - - - - CRYSTALS - - - - - - - - - -
Y1	19A110192P3	Quartz: freq 4845 KHz ±100 Hz at 25°C, temp range -30°C to +75°C.
A348		IF AUDIO AND SQUELCH 19D413129G1
		- - - - - - - - - - - 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%, 500 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.
C22	19A116080P108	Polyester: 0.15 µf ±10%, 50 VDCW.
C23	19A116080P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C25	5496267P6	Tantalum: 33 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
C26*	19A116080P110	Polyester: 0.33 µf ±10%, 50 VDCW.
		In REV E-M:
	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
		In REV D and earlier:
	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C27*	5496267P2	Tantalum: 47 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
		In REV B and earlier:
	5496267P6	Tantalum: 33 µf ±20%, 10 VDCW; sim to Sprague Type 150D.
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.
		In REV B and earlier:
	19B209243P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C37	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C39	19A116080P1	Polyester: 0.01 µf ±20%, 50 VDCW.
C40*	5496267P29	Tantalum: 0.68 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
		In REV K & earlier:
	5496267P28	Tantalum: 0.47 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C41	5490008P129	Silver mica: 120 pf ±10%, 500 VDCW; sim to Electro Motive Type DM-15.
C50	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C51	19A116655P22	Ceramic disc: 2700 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C52	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
C53 and C54	5496267P213	Tantalum: 2.2 µf ±10%, 20 VDCW; sim to Sprague Type 150D.
C55	5496267P14	Tantalum: 15 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1 and CR2	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR3* and CR4*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		In REV F & earlier:
	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA.
CR5 and CR6	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - 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. Includes:
	7486872P7	Tuning slug.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q4	19A115123P1	Silicon, NPN.
Q5*	19A115889P1	Silicon, NPN.
		In REV N & earlier:
	19A115123P1	Silicon, NPN.
Q6	19A115123P1	Silicon, NPN.
Q7	19A115300P4	Silicon, NPN.
Q8	19A115123P1	Silicon, NPN.
Q9	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q10*	19A116774P1	Silicon, NPN; sim to Type 2N5210.
		In REV G and earlier:
	19A115123P1	Silicon, NPN.
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R77P102K	Composition: 1K ohms ±10%, 1/2 w.
R2	3R77P153J	Composition: 15K ohms ±5%, 1/2 w.
R3	3R77P823K	Composition: 82K ohms ±10%, 1/2 w.
R4	3R77P472K	Composition: 4.7K ohms ±10%, 1/2 w.
R5	3R77P102K	Composition: 1K ohms ±10%, 1/2 w.
R6	3R77P153J	Composition: 15K ohms ±5%, 1/2 w.
R7	3R77P823K	Composition: 82K ohms ±10%, 1/2 w.
R8	3R77P472K	Composition: 4.7K ohms ±10%, 1/2 w.
R9	3R77P102K	Composition: 1K ohms ±10%, 1/2 w.
R10	3R77P153J	Composition: 15K ohms ±5%, 1/2 w.
R11	3R77P823K	Composition: 82K ohms ±10%, 1/2 w.
R12	3R77P472K	Composition: 4.7K ohms ±10%, 1/2 w.
R13	3R77P272K	Composition: 2.7K ohms ±10%, 1/2 w.
R14	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R15	3R77P333J	Composition: 33K 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: 51K ohms ±5%, 1/4 w.
R20	3R152P472J	Composition: 4.7K ohms ±5%, 1/4 w.
R21 and R22	3R77P362J	Composition: 3.6K ohms ±5%, 1/2 w.
R23	3R77P104K	Composition: 100K ohms ±10%, 1/2 w.
R24	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R25 and R26	3R77P103K	Composition: 10K ohms ±10%, 1/2 w.
R27 and R28	3R77P753J	Composition: 75K ohms ±5%, 1/2 w.
R29	3R77P182J	Composition: 1.8K ohms ±5%, 1/2 w.
R30*	3R77P821J	Composition: 820 ohms ±5%, 1/2 w.
		In REV C & earlier:
	3R77P102J	Composition: 1K ohms ±5%, 1/2 w.
R31	3R77P821J	Composition: 820 ohms ±5%, 1/2 w.
R33	3R77P912J	Composition: 9.1K ohms ±5%, 1/2 w.
R34	3R77P332K	Composition: 3.3K ohms ±10%, 1/2 w.
R35	3R77P330K	Composition: 33 ohms ±10%, 1/2 w.
R36	3R77P681J	Composition: 680 ohms ±5%, 1/2 w.
R38	3R77P752J	Composition: 7.5K ohms ±5%, 1/2 w.
R39	3R77P820J	Composition: 82 ohms ±5%, 1/2 w.
R40*	3R77P221J	Composition: 220 ohms ±5%, 1/2 w.
		In REV H & earlier:
	3R77P241J	Composition: 240 ohms ±5%, 1/2 w.
R41	3R152P240J	Composition: 24 ohms ±5%, 1/4 w.
R42	3R77P200J	Composition: 20 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 ±10%, 2 w; sim to IRC Type BWH.
R45	3R77P123J	Composition: 12K ohms ±5%, 1/2 w.
R46	3R77P913J	Composition: 91K ohms ±5%, 1/2 w.
R48*	19A116278P249	Metal film: 3.1K ohms ±2%, 1/2 w.
		In REV A & earlier:
	3R77P302J	Composition: 3K ohms ±5%, 1/2 w.
R49	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R50	3R77P222J	Composition: 2.2K ohms ±5%, 1/2 w.
R51	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R52	3R77P682J	Composition: 6.8K ohms ±5%, 1/2 w.
R53*	3R77P223J	Composition: 22K ohms ±5%, 1/2 w.
		In REV E & earlier:
	3R77P303J	Composition: 30K ohms ±5%, 1/2 w.
		In REV B & earlier:
	3R77P473J	Composition: 47K ohms ±5%, 1/2 w.
R54	3R77P822J	Composition: 8.2K ohms ±5%, 1/2 w.
R55	3R77P103K	Composition: 10K ohms ±10%, 1/2 w.
R56*	3R77P224J	Composition: 0.22 megohms ±5%, 1/2 w. Deleted by REV R.
R57	3R77P103K	Composition: 10K ohms ±10%, 1/2 w.
R58	3R77P181K	Composition: 180 ohms ±10%, 1/2 w.
R59	3R77P393K	Composition: 39K ohms ±10%, 1/2 w.
R60 and R61	3R77P103K	Composition: 10K ohms ±10%, 1/2 w.
R64*	3R77P120J	Composition: 12 ohms ±5%, 1/2 w.
		In REV B & earlier:
	3R77P180J	Composition: 18 ohms ±5%, 1/2 w.
R66	3R77P472K	Composition: 4.7K ohms ±10%, 1/2 w.
R77	3R152P153J	Composition: 15K ohms ±5%, 1/4 w.
R78*	3R77P200J	Composition: 20 ohms ±5%, 1/2 w.
		In REV C & earlier:
	3R77P100J	Composition: 10 ohms ±5%, 1/2 w.
R79	3R152P393J	Composition: 39K ohms ±5%, 1/4 w.
R80*	3R152P272J	Composition: 2.7K ohms ±5%, 1/4 w.
		In REV L & earlier:
	3R152P432J	Composition: 4.3K ohms ±5%, 1/4 w.
R81	3R152P472J	Composition: 4.7K ohms ±5%, 1/4 w.
R82	3R77P273J	Composition: 27K ohms ±5%, 1/2 w.
R85*	3R152P102J	Composition: 1K ohms ±5%, 1/4 w. Added by REV K. Deleted by REV L.
R86*	3R77P204J	Composition: 200K ohms ±5%, 1/2 w. Added by REV R.
		- - - - - - - - - - - THERMISTORS - - - - - - - -
RT1	5490828P41	Thermistor: 30 ohms ±10%, color code black/white; sim to Carborundum B1211J-4.
RT2 and RT3	5490828P9	Thermistor: 10K ohms ±10%, color code yellow; sim to Carborundum 551J-8.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - -
T1	19A116040P1	Audio freq: 300-4000 Hz, Pri. Condition A: 325 ohms ±5% imp, Condition B: 315 ohms ±5% imp, Sec: 480 ohms imp.
A350		ENCODER/DECODER 4EK16A10 19C311797G1
		- - - - - - - - - - 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.
C5	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C6	19A116080P205	Polyester: 0.047 µf ±5%, 50 VDCW.
C7	19A116080P207	Polyester: 0.1 µf ±5%, 50 VDCW.
C8	19A116080P205	Polyester: 0.047 µf ±5%, 50 VDCW.
C9	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C10	19A116080P207	Polyester: 0.1 µf ±5%, 50 VDCW.
C11	19A116080P109	Polyester: 0.22 µf ±10%, 50 VDCW.
C12	19A116080P207	Polyester: 0.1 µf ±5%, 50 VDCW.
C13	19A116080P9	Polyester: 0.22 µf ±20%, 50 VDCW.
C14	19A116080P7	Polyester: 0.1 µf ±20%, 50 VDCW.
C15	5496267P1	Tantalum: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C16	19A116080P5	Polyester: 0.047 µf ±20%, 50 VDCW.
C17	5496267P417	Tantalum: 1.0 µf ±5%, 35 VDCW; sim to Sprague Type 150D.
C18	5496267P1	Tantalum: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C19	19A116080P109	Polyester: 0.047 µf ±10%, 50 VDCW.
C20	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C21	5496267P9	Tantalum: 3.3 µf ±20%, 15 VDCW; sim to Sprague Type 150D.
C22	5496267P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
C23	5496267P13	Tantalum: 2.2 µf ±20%, 20 VDCW; sim to Sprague Type 150D.
C24	5496267P1	Tantalum: 6.8 µf ±20%, 6 VDCW; sim to Sprague Type 150D.
C25	5496267P18	Tantalum: 6.8 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
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.
		In REV B & earlier:
	19B209243P107	Polyester: 0.1 µf ±10%, 50 VDCW.
C30	5496267P17	Tantalum: 1.0 µf ±20%, 35 VDCW; sim to Sprague Type 150D.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1 and CR2	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR3 and CR4	5494922P1	Silicon; sim to Type 1N456.
CR5	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR6	4036887P3	Silicon, Zener: 500 mW, 3.8 v. nominal.
CR7 thru CR9	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		- - - - - - - - - - - FILTERS - - - - - - - - -
FL1		TONE FREQUENCY NETWORK 19B205280
	19B205280G1	71.9 Hz
	19B205280G2	77.0 Hz
	19B205280G3	82.5 Hz
	19B205280G4	88.5 Hz
	19B205280G5	94.8 Hz
	19B205280G6	100.0 Hz
	19B205280G7	103.5 Hz
	19B205280G8	107.2 Hz
	19B205280G9	110.9 Hz
	19B205280G10	114.8 Hz
	19B205280G11	118.8 Hz
	19B205280G12	123.0 Hz
	19B205280G13	127.3 Hz
	19B205280G14	131.8 Hz
	19B205280G15	136.5 Hz
	19B205280G16	141.3 Hz
	19B205280G17	146.2 Hz
	19B205280G18	151.4 Hz
	19B205280G19	156.7 Hz
	19B205280G20	162.2 Hz
	19B205280G21	167.9 Hz
	19B205280G22	173.8 Hz
	19B205280G23	179.9 Hz
	19B205280G24	186.2 Hz
	19B205280G25	192.8 Hz
	19B205280G26	203.5 Hz
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J1 thru J8	4033513P4	Contact, electrical; sim to Bead Chain L93-3.
		- - - - - - - - - - - INDUCTORS - - - - - - - - -
L1	19A115690P1	Coil, RF: 880 mh ±5%, sim to Artted AC5672.
		- - - - - - - - - - TRANSISTORS - - - - - - -
Q1	19A115123P1	Silicon, NPN.
Q2	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q3 and Q4	19A115123P1	Silicon, NPN.
Q5 thru Q8	19A115362P1	Silicon, NPN; sim to Type 2N2925.
Q9 and Q10	19A115123P1	Silicon, NPN.
		- - - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R77P682K	Composition: 6.8K ohms ±10%, 1/2 w.
R2	3R77P683J	Composition: 68K ohms ±5%, 1/2 w.
R3	3R77P822J	Composition: 8.2K ohms ±5%, 1/2 w.
R4	3R77P152J	Composition: 1.5K ohms ±5%, 1/2 w.
R5	3R77P682K	Composition: 6.8K ohms ±10%, 1/2 w.
R6	3R77P201J	Composition: 200 ohms ±5%, 1/2 w.
R7	19A116278P305	Metal film: 11K ohms ±2%, 1/2 w.
R8	3R77P562J	Composition: 5.6K ohms ±5%, 1/2 w.
		In REV A & earlier:
	3R152P622J	Composition: 6.2K ohms ±5%, 1/4 w.
R9	19A116278P305	Metal film: 11K ohms ±2%, 1/2 w.
R10	3R77P512J	Composition: 5.1K ohms ±5%, 1/2 w.
R11	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R12	3R77P822J	Composition: 8.2K ohms ±5%, 1/2 w.
R13	3R77P153J	Composition: 15K ohms ±5%, 1/2 w.
R14	3R77P133J	Composition: 13K ohms ±5%, 1/2 w.
R15	3R77P510J	Composition: 51 ohms ±5%, 1/2 w.
R16	3R77P153J	Composition: 15K ohms ±5%, 1/2 w.
R17	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R18	3R77P622J	Composition: 6.2K ohms ±5%, 1/2 w.
R19	3R77P123J	Composition: 12K ohms ±5%, 1/2 w.
R20	3R77P223J	Composition: 22K ohms ±5%, 1/2 w.
R21	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R22	3R77P301J	Composition: 300 ohms ±5%, 1/2 w.
R23	3R77P223J	Composition: 22K ohms ±5%, 1/2 w.
R24	3R77P433J	Composition: 43K ohms ±5%, 1/2 w.
R25	3R77P133J	Composition: 13K ohms ±5%, 1/2 w.
R26	3R77P123J	Composition: 12K ohms ±5%, 1/2 w.
R27	3R77P151J	Composition: 150 ohms ±5%, 1/2 w.
R28	3R77P562J	Composition: 5.6K ohms ±5%, 1/2 w.
R29	3R77P513J	Composition: 51K ohms ±5%, 1/2 w.
R30	3R77P334J	Composition: 330K ohms ±5%, 1/2 w.
R31	3R77P104J	Composition: 100K ohms ±5%, 1/2 w.
R32	3R77P822J	Composition: 8.2K ohms ±5%, 1/2 w.
R33	19A116278P333	Metal film: 26.7K ohms ±2%, 1/2 w.
R34	19A116278P233	Metal film: 2.15K ohms ±2%, 1/2 w.
R35	19A116278P365	Metal film: 46.4K ohms ±2%, 1/2 w.
R36	19A116278P301	Metal film: 10K ohms ±2%, 1/2 w.
R37	19A116278P65	Metal film: 46.4 ohms ±2%, 1/2 w.
R38	3R77P204J	Composition: 200K ohms ±5%, 1/2 w.
R39	19A116278P385	Metal film: 75K ohms ±2%, 1/2 w.
R40	19A116278P329	Metal film: 19K ohms ±2%, 1/2 w.
R41	19A116278P285	Metal film: 7.5K ohms ±2%, 1/2 w.
R42	19A116278P412	Metal film: 130K ohms ±2%, 1/2 w.
R43	19A116278P269	Metal film: 5.1K ohms ±2%, 1/2 w.
R44	19A116278P117	Metal film: 147 ohms ±2%, 1/2 w.
R45 and R46	3R77P102J	Composition: 1K ohms ±5%, 1/2 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	3R77P822J	Composition: 8.2K ohms ±5%, 1/2 w.

(Cont'd on Page 16)

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

MODEL NO.	FREQ. RANGE	NO FREQ.	CHAN. GUARD
4ER39C68	25–33 MHZ	1	
4ER39C69	33–42 MHZ.	1	
4ER39C70	42–50 MHZ	1	
4ER39C71	25–33 MHZ	2	
4ER39C72	33–42 MHZ	2	
4ER39C73	42–50 MHZ	2	
4ER39C74	25–33 MHZ	4	
4ER39C75	33–42 MHZ	4	
4ER39C76	42–50 MHZ	4	
4ER39C77	25–33 MHZ	1	X
4ER39C78	33–42 MHZ	1	X
4ER39C79	42–50 MHZ	1	X
4ER39C80	25–33 MHZ	2	X
4ER39C81	33–42 MHZ	2	X
4ER39C82	42–50 MHZ	2	X
4ER39C83	25–33 MHZ	4	X
4ER39C84	33–42 MHZ	4	X
4ER39C85	42–50 MHZ	4	X

REV. LTR. BLOCK

		REV.
	PL19E500873G4	R
	PL19E500873G5	N
	PL19E500873G6	P
A347	PL19B216119G1	A
A350	4EK16A10	D
A348	PL19D413129G1	R
A402	PL19C311797G2	B
	PL19C303540G1	F
	PL19C303540G2	F
	PL19C303540G3	F

REV. LTR BLOCK

		REV.
A352	PL19B204419G13	C
A353	PL19B204419G1C	C
A354	PL19B204419G14	A
A355	PL19B204419G17	A
A356	PL19B204419G15	A
A357	PL19B204419G18	A

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).

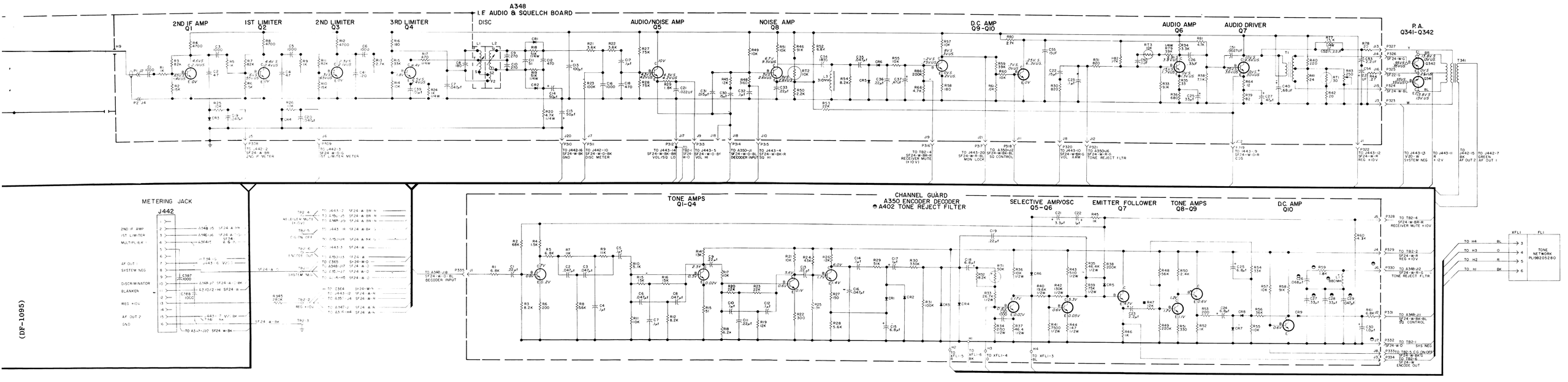
US= SQUELCH CONTROL FULLY CLOCKWISE WITH A ONE MILLIVOLT MODULATED SIGNAL (UNSQUELCHED) AND 5 WATT AUDIO OUTPUT.

- ● LOW SPLIT 25-33 MHZ
- ▲ MID SPLIT 33-42 MHZ
- ◓ HIGH SPLIT 42-50 MHZ
- ■ VALUE OF R47 IS DETERMINED BY TEST (SEE TEST SPEC 19A127182).
- ◒ THESE ARE ONLY PARTS PRESENT ON A402.
- * C342 1.80-8.3 IN HIGH SPLIT ONLY

SCHEMATIC DIAGRAM

25—50 MHz MASTR RECEIVER
MODELS 4ER39C68-85

(19R621226, Rev. 47)



(DF-1095)

(19B621226, Rev. 4J)

SCHEMATIC DIAGRAM

25—50 MHz MASTR RECEIVER
MODELS 4ER39C68-85

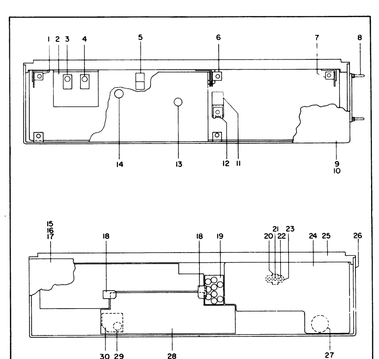
(Cont'd from Page 13) (LBI4134)

SYMBOL	GE PART NO.	DESCRIPTION
R47B	3R77P912J	Composition: 9.1K ohms ±5%, 1/2 w.
R47C	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R47D	3R77P113J	Composition: 11K ohms ±5%, 1/2 w.
R47E	3R77P123J	Composition: 12K ohms ±5%, 1/2 w.
R47F	3R77P133J	Composition: 13K ohms ±5%, 1/2 w.
R47G	3R77P153J	Composition: 15K ohms ±5%, 1/2 w.
R47H	3R77P752J	Composition: 7.5K ohms ±5%, 1/2 w.
R48	3R77P563J	Composition: 56K ohms ±5%, 1/2 w.
R49	3R77P224J	Composition: 220K ohms ±5%, 1/2 w.
R50	3R77P242J	Composition: 2.4K ohms ±5%, 1/2 w.
R51	3R77P331J	Composition: 330 ohms ±5%, 1/2 w.
R52	3R77P102J	Composition: 1K ohms ±5%, 1/2 w.
R53	3R77P201J	Composition: 200 ohms ±5%, 1/2 w.
R54	3R77P333J	Composition: 33K ohms ±5%, 1/2 w.
R55	3R77P103J	Composition: 10K ohms ±5%, 1/2 w.
R56	3R77P363J	Composition: 36K ohms ±5%, 1/2 w.
R57	3R77P103K	Composition: 10K ohms ±10%, 1/2 w.
R58	3R77P913J	Composition: 91K ohms ±5%, 1/2 w.
R59*	3R77P182J	Composition: 1.8K ohms ±5%, 1/2 w.
		In REV C & earlier:
	3R152P432J	Composition: 4.3K ohms ±5%, 1/4 w.
R60	3R77P432J	Composition: 4.3K ohms ±5%, 1/2 w.
R61	3R77P682K	Composition: 6.8K ohms ±10%, 1/4 w.
		- - - - - - - - - - THERMISTORS - - - - - - - - -
RT1	5490828P22	Thermistor: 50K ohms ±10%, color code yellow; sim to Carborundum Type 763H-J4.
		- - - - - - - - - - - - SOCKETS - - - - - - - - -
XFL1	19A121920G3	Reed, mica-filled phen: 7 pins rated at 1 amp at 500 VRMS with 4-1/2 inches of cable.
A352 thru A357		FIRST OSCILLATOR ASSEMBLY A352 19B204419G13 A353 19B204419G16 A354 19B204419G14 A355 19B204419G17 A356 19B204419G15 A357 19B204419G18
		- - - - - - - - - - - CAPACITORS - - - - - - - -
C1 thru C4	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C5 thru C8	5496219P751	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -750 PPM.
C9 thru C12	5491271P106	Variable, subminiature: approx 2.1-12.7 pf, 750 v peak; sim to EF Johnson 189.
C13 thru C16	5496219P40	Ceramic disc: 9 pf ±0.25 pf, 500 VDCW, temp coef 0 PPM.
C17 thru C20	19C300685P93	Ceramic disc: 5 pf ±0.1 pf, 500 VDCW, temp coef 0 PPM.
C21	5496219P771	Ceramic disc: 220 pf ±5%, 500 VDCW, temp coef -750 PPM.
C22	5496219P773	Ceramic disc: 270 pf ±5%, 500 VDCW, temp coef -750 PPM.
C23	5494481P114	Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C26 thru C28	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C31	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C45	5490008P35	Silver mica: 220 pf ±5%, 500 VDCW.
C46	5496219P563	Ceramic disc: 100 pf ±5%, 500 VDCW, temp coef -330 PPM.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1 thru CR4	19A115603P1	Silicon.
		- - - - - - JACKS AND RECEPTACLES - - - - - -
J1 thru J6	4033513P4	Contact, electrical: sim to Bead Chain L93-3.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L2 and L3	7488079P16	Choke, RF: 10 μh ±10% ind at 640 ma, 0.6 ohm DC res; sim to Jeffers 4421-7K.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q1 and Q2	19A115330P1	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1 thru R4	3R152P562J	Composition: 5.6K ohms ±5%, 1/4 w.
R5 thru R8	3R152P104K	Composition: 0.1 megohm ±10%, 1/4 w.
R9	3R152P153J	Composition: 15K ohms ±5%, 1/4 w.
R10	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R11 and R12	3R152P102J	Composition: 1K ohms ±5%, 1/4 w.
R14	3R152P103J	Composition: 10K ohms ±5%, 1/4 w.
R15	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R19	3R152P360J	Composition: 36 ohms ±5%, 1/4 w.
R21	3R152P750J	Composition: 75 ohms ±5%, 1/4 w.
		- - - - - - - - - - THERMISTORS - - - - - - - - - -
RT1 thru RT4	19B209284P5	Disc: 43 ohms res nominal at 25°C, color code green.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - -
T3 and T4		COIL ASSEMBLY T3 19B205416G1 T4 19B205416G2
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C34	5496218P253	Ceramic disc: 39 pf ±5%, 500 VDCW, temp coef -80 PPM.
C35	5496218P249	Ceramic disc: 27 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - - - INDUCTORS - - - - - - - - - -
L4	19A121464P2	Coil.
	5491798P5	Tuning slug.
		- - - - - - - - - - - SOCKETS - - - - - - - - -
XY1 thru XY4		Refer to Mecanical Parts (RC1692).
		- - - - - - - - - - - CRYSTALS - - - - - - - - - - -
		NOTE: When reordering give GE Part No. and specify exact freq needed.
		25-42 MHz crystal freq = $\frac{(OF + 5.30\ MHz)}{3}$
		42-50 MHz crystal freq = $\frac{(OF - 5.30\ MHz)}{3}$
Y1 thru Y4	19B206576P1	Quartz: freq range 10086.666 to 12766.666 KHz, temp range -30°C to +85°C. (25-33 MHz).
Y1 thru Y4	19B206576P2	Quartz: freq range 12766.667 to 15766.666 KHz, temp range -30°C to +85°C. (33-42 MHz).
Y1 thru Y4	19B206576P3	Quartz: freq range 12233.333 to 16233.333 KHz, temp range -30°C to +85°C. (42-54 MHz).
A364, A365 and A406		MULTIPLIER SELECTIVITY ASSEMBLY A364 19B205326G6 A365 19B205326G7 A406 19B205326G8
		- - - - - - - - - - - CAPACITORS - - - - - - - - -
C1 and C2	5496218P252	Ceramic disc: 36 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P251	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef -80 PPM.
C4 and C5	5496218P248	Ceramic disc: 24 pf ±5%, 500 VDCW, temp coef -80 PPM.
C6	5496218P247	Ceramic disc: 22 pf ±5%, 500 VDCW, temp coef -80 PPM.
C7 and C8	5493392P107	Ceramic, stand off: 1000 pf +100% -0%, 500 VDCW; sim to Allen-Bradley Type SS5D.
C9	5491601P123	Phenolic: 1.5 pf ±5%, 500 VDCW.
C10	5491601P117	Phenolic: 0.68 pf ±5%, 500 VDCW.
C11	5491601P118	Phenolic: 0.75 pf ±5%, 500 VDCW.
C13	5491601P137	Phenolic: 0.91 pf ±5%, 500 VDCW.
C14	5491601P114	Phenolic: 0.51 pf ±5%, 500 VDCW.
C15	5491601P115	Phenolic: 0.56 pf ±5%, 500 VDCW.
C34 and C35	5491601P127	Phenolic: 2.4 pf ±5%, 500 VDCW.
C36	5491601P126	Phenolic: 2.2 pf ±5%, 500 VDCW.
		- - - - - - - - - DIODES AND RECTIFIERS - - - - -
CR1	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA.
		- - - - - - - - - - - INDUCTORS - - - - - - - -
L1		(Part of T1 and T4).
L2		(Part of T2 and T5).
L3		(Part of T3 and T6).
		- - - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P473K	Composition: 47K ohms ±10%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - -
T1	19B205325G2	Coil, includes:
	5491798P4	Tuning slug.
T2 and T3	19B205325G1	Coil, includes:
	5491798P4	Tuning slug.
T4	19B205325G2	Coil, includes:
	5491798P4	Tuning slub.
T5 and T6	19B205325G1	Coil, includes:
	5491798P4	Tuning slug.
A369		FIRST MIXER ASSEMBLY 19B216867G2
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496218P258	Ceramic disc: 62 pf ±5%, 500 VDCW, temp coef -80 PPM.
C2 and C3	5494481P127	Ceramic disc: 2700 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C4	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C5	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C6	19A116114P2020	Ceramic disc: 6 pf ±5%, 1000 VDCW, temp coef -80 PPM.
		- - - - - - - - - - INDUCTORS - - - - - - - - -
L1	19B216880G1	Coil.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1*	19A116960P1	N Type, field effect; sim to Type 2N4416.
		In G4 of REV P & earlier: In G5 & G6 of REV M & earlier:
	19A115953P1	N Channel, field effect.
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P513J	Composition: 51K ohms ±5%, 1/4 w.
R2	3R152P332K	Composition: 3.3K ohms ±10%, 1/4 w.
R3 and R4	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
A370 thru A372		NOISE BLANKER A370 19C303540G1 A371 19C303540G2 A372 19C303540G3
		- - - - - - - - - - - CAPACITORS - - - - - - - - - -
C5	5491601P28	Phenolic: 2.7 pf ±10%, 500 VDCW.
C6*	7491827P102	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C. Added by REV E.
C7* and C8*	7491827P102	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C.
		In REV D & earlier:
	7491827P2	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C.
C9*	7491827P106	Ceramic disc: .025 μf +80% -20%, 50 VDCW; sim to Sprague Type 29C.
		In REV D & earlier:
	7491827P3	Ceramic disc: .025 μf +80% -20%, 50 VDCW; sim to Sprague Type 29C.
C10* and C11*	7491827P102	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C. Added by REV E.
C12* and C13*	7491827P102	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C.
		In REV D & earlier:
	7491827P2	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C.
C14*	7491827P106	Ceramic disc: .025 μf +80% -20%, 50 VDCW; sim to Sprague Type 29C.
		In REV D & earlier:
	7491827P3	Ceramic disc: .025 μf +80% -20%, 50 VDCW; sim to Sprague Type 29C.
C15* and C16*	7491827P102	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C. Added by REV E.
C17*	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. Deleted by REV C. Added by REV D.
C18	5496219P55	Ceramic disc: 47 pf ±5%, 500 VDCW, temp coef 0 PPM.
C19	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C20	19A116080P7	Polyester: 0.1 μf ±20%, 50 VDCW.
C21*	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap. Deleted by REV C. Added by REV D.
C22	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C23	5496219P51	Ceramic disc: 33 pf ±5%, 500 VDCW, temp coef 0 PPM.
C24	19A116080P5	Polyester: .047 μf ±20%, 50 VDCW.
C25	19A116080P7	Polyester: 0.1 μf ±20%, 50 VDCW.
C26	5494481P112	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C27	4029003P8	Silver mica: 1000 pf ±5%, 500 VDCW; sim to Electro Motive Type DM-20.
C28	19A116080P7	Polyester: 0.1 μf ±20%, 50 VDCW.
C29*	7491827P102	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C.
		In REV E & earlier:
	5494481P114	Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C30	19A116080P1	Polyester: .01 μf ±20%, 50 VDCW.
C39	19A116080P1	Polyester: .01 μf ±20%, 50 VDCW.
C40	5491601P23	Phenolic: 1.5 pf ±10%, 500 VDCW.
C41	5491601P22	Phenolic: 1.2 pf ±10%, 500 VDCW.
C42*	7491827P102	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C.
		In REV E & earlier:
	5494481P116	Ceramic disc: 3000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C43	7491827P102	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C.
C44	19A116080P7	Polyester: 0.1 μf ±20%, 50 VDCW.
		- - - - - - - - - DIODES AND RECTIFIERS - - - - -
CR1	19A115775P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR2*	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA. Deleted by REV C. Added by REV D.
CR3*	19A115775P1	Silicon, fast recovery, 225 mA, 50 PIV.
		In REV C:
	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		In REV B & earlier:
	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA.
CR4	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA.
CR5	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
CR6* and CR7*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		In REV B & earlier:
	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA.
		- - - - - - - - - - - INDUCTORS - - - - - - - - - -
L1 thru L5	7488079P17	Choke, RF: 12.0 μh ±10%, 1.00 ohms DC res max; sim to Jeffers 4421-8K.
		- - - - - - - - - - TRANSISTORS - - - - - - - - - -
Q1 thru Q3	19A115342P1	Silicon, NPN.
Q4*	19A115779P1	Silicon, PNP; sim to Type 2N3251.
		In REV D & earlier:
	19A115768P1	Silicon, PNP.
Q5 thru Q7	19A115706P1	Silicon, PNP.
		- - - - - - - - - - - RESISTORS - - - - - - - -
R1	3R152P682K	Composition: 6.8K ohms ±10%, 1/4 w.
R2	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R3	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R4	3R152P391K	Composition: 390 ohms ±10%, 1/4 w.
R5	3R152P682K	Composition: 6.8K ohms ±10%, 1/4 w.
R6	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R7	3R152P511J	Composition: 510 ohms ±5%, 1/4 w.
R8	3R152P391K	Composition: 390 ohms ±10%, 1/4 w.
R9	3R152P432J	Composition: 4.3K ohms ±5%, 1/4 w.
R10	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R11	3R152P562K	Composition: 5.6K ohms ±10%, 1/4 w.
R12*	3R152P822J	Composition: 8.2K ohms ±5%, 1/4 w.
		In REV D & earlier:
	3R152P822K	Composition: 8.2K ohms ±10%, 1/4 w.
R13*	3R152P104J	Composition: 0.1 megohm ±5%, 1/4 w.
		In REV D & earlier:
	3R152P104K	Composition: 0.1 megohms ±10%, 1/4 w.
R14	3R152P203J	Composition: 20K ohms ±5%, 1/4 w.
R15	3R152P332K	Composition: 3.3K ohms ±10%, 1/4 w.
R16	3R152P102K	Composition: 1K ohms ±10%, 1/4 w.
R17	3R152P183K	Composition: 18K ohms ±10%, 1/4 w.
R18	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R19 and R20	3R152P102K	Composition: 1K ohms ±10%, 1/4 w.
R21	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
R22*	3R152P102K	Composition: 1K ohms ±10%, 1/4 w. Deleted by REV C. Added by REV D.
R26	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
		- - - - - - - - - - TRANSFORMERS - - - - - - - - -
T1 thru T3		COIL ASSEMBLY T1 19B204694G1 T2 19B204694G2 T3 19B204694G3
		- - - - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496218P62	Ceramic disc: 91 pf ±5%, 500 VDCW, temp coef 0 PPM.
C6*	19B209170P2	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C. Deleted by REV E.
C31	5496218P256	Ceramic disc: 51 pf ±5%, 500 VDCW, temp coef -80 PPM.
C35	5496218P49	Ceramic disc: 27 pf ±5%, 500 VDCW, temp coef 0 PPM.
		- - - - - - - - - - - INDUCTORS - - - - - - - - - -
L6	19A121393P1	Coil.
L11	19A115046P263	Coil.
	5491798P4	Tuning slug. (Used in T1 and T2).
	5491798P5	Tuning slug. (Used in T3).
T4 thru T6		COIL ASSEMBLY T4 19B204695G1 T5 19B204695G2 T6 19B204695G3
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C2	5496218P61	Ceramic disc: 82 pf ±5%, 500 VDCW, temp coef 0 PPM.
C10*	19B209170P2	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C. Deleted by REV E.
C32	5496218P55	Ceramic disc: 47 pf ±5%, 500 VDCW, temp coef 0 PPM.
C36	5496218P46	Ceramic disc: 20 pf ±5%, 500 VDCW, temp coef 0 PPM.
		- - - - - - - - - - - INDUCTORS - - - - - - - - -
L7	19A121394P1	Coil.
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R23	3R152P752J	Composition: 7.5K ohms ±5%, 1/4 w.
	5491798P4	Tuning slug. (Used in T4 and T5).
	5491798P5	Tuning slug. (Used in T6).
T7 thru T9		COIL ASSEMBLY T7 19B204696G1 T8 19B204696G2 T9 19B204696G3
		- - - - - - - - - - - CAPACITORS - - - - - - - -
C3	5496218P62	Ceramic disc: 91 pf ±5%, 500 VDCW, temp coef 0 PPM.
C11*	19B209170P2	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C. Deleted by REV E.
C33	5496218P256	Ceramic disc: 51 pf ±5%, 500 VDCW, temp coef -80 PPM.
C37	5496218P48	Ceramic disc: 24 pf ±5%, 500 VDCW, temp coef 0 PPM.
		- - - - - - - - - - - INDUCTORS - - - - - - - - - - -
L8	19A121395P1	Coil.
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R24	3R152P752J	Composition: 7.5K ohms ±5%, 1/4 w.
	5491798P4	Tuning slug. (Used in T7 and T8).
	5491798P5	Tuning slug. (Used in T9).
T10 thru T12		COIL ASSEMBLY T10 19B204697G1 T11 19B204697G2 T12 19B204697G3
		- - - - - - - - - - - CAPACITORS - - - - - - - - - -
C4	5496218P63	Ceramic disc: 100 pf ±5%, 500 VDCW, temp coef 0 PPM.
C15* and C16*	19B209170P2	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C. Deleted by REV E.
C34	5496218P58	Ceramic disc: 62 pf ±5%, 500 VDCW, temp coef 0 PPM.
C38	5496218P49	Ceramic disc: 27 pf ±5%, 500 VDCW, temp coef 0 PPM.
		- - - - - - - - - - - INDUCTORS - - - - - - - - - -
L9	19A121396P1	Coil.
L10	19A115046P263	Coil.
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R25	3R152P822K	Composition: 8.2K ohms ±10%, 1/4 w.
	5491798P5	Tuning slug. (Used in T12).
	5491798P4	Tuning slug. (Used in T10 and T11).
A376		LEVEL SHUT-OFF SWITCH 19C303985G1
		- - - - - - - - - - - CAPACITORS - - - - - - - -
C1	5496219P237	Ceramic disc: 6 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
C2	19A116080P1	Polyester: .01 μf ±20%, 50 VDCW.
C3	5494481P111	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
C4	7491827P2	Ceramic disc: .01 μf +80% -30%, 50 VDCW; sim to Sprague Type 19C.
C5 and C6	19A116080P5	Polyester: .047 μf ±20%, 50 VDCW.
C7	7774750P11	Ceramic disc: .005 μf +100% -0%, 500 VDCW.
C8	19A116080P3	Polyester: .022 μf ±20%, 50 VDCW.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV.
		In 19E500873G4 of REV G & earlier: In 19E500873G5, G6 of REV F & earlier:
	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA.
		- - - - - - - - - - - INDUCTORS - - - - - - - - - -
L1	19B209456P127	Coil, RF: 39 μh ±10%, 1.9 ohms DC res max; sim to Arco-Speer 155-390K.
L2	7488079P48	Choke, RF: 27 μh ±10%, 1.40 ohms DC res max; sim to Jeffers 4422-9K.
		- - - - - - - - - - - TRANSISTORS - - - - - - - -
Q1*	19A115245P1	Silicon, NPN. Deleted by REV A.
Q2	19A115123P1	Silicon, NPN.
Q3*	19A115440P1	Silicon, NPN. Added by REV A.
		- - - - - - - - - - - RESISTORS - - - - - - - - - -
R1	3R152P102K	Composition: 1K ohms ±10%, 1/4 w.
R2	3R152P123K	Composition: 12K ohms ±10%, 1/4 w.
R3	3R152P392J	Composition: 3.9K ohms ±5%, 1/4 w.
R4*	3R152P562K	Composition: 5.6K ohms ±10%, 1/4 w. Deleted by REV A.
R5*	3R152P202J	Composition: 2K ohms ±5%, 1/4 w. Deleted by REV A.
R6	3R152P562K	Composition: 5.6K ohms ±10%, 1/4 w.
R11 and R12	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R13*	3R152P202J	Composition: 2K ohms ±5%, 1/4 w. Added by REV A.
R14*	3R152P102J	Composition: 1K ohms ±5%, 1/4 w. Added by REV A.
A402		TONE REJECT FILTER 19C311797G2
		- - - - - - - - - - - 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.
		Earlier than REV A:
	19B209243P107	Polyester: 0.1 μf ±10%, 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: 1.8K ohms ±5%, 1/4 w.
		In REV A & earlier:
	3R152P432J	Composition: 4.3K ohms ±5%, 1/4 w.
A404		CRYSTAL FILTER 19B204616G10
		- - - - - - - - - - - FILTERS - - - - - - - - - -
FL5	19B206692G1	Bandpass.
		- - - - - - - - - - - RESISTORS - - - - - - - - -
R8	3R152P103K	Composition: 10K ohms ±10%, 1/4 w.
R14*	3R152P752K	Composition: 7.5K ohms ±10%, 1/4 w. Deleted in 19E500873G4 by REV K. Deleted in 19E500873G5, G6 by REV J.
A406		(See A364 and A365)
A407*		RF AMPLIFIER 19B204770G2 (Added to 19E500873G4 by REV G)
		- - - - - - - - - - CAPACITORS - - - - - - - - -
C2	7774750P11	Ceramic disc: .005 μf +100% -0%, 500 VDCW.
C3*	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added by REV M.
		- - - - - - - DIODES AND RECTIFIERS - - - - - -
CR1*	19A115250P1	Silicon, fast recovery, 225 mA, 50 PIV. Deleted by REV M.
		In 19E500873G4 of REV G & earlier: In 19E500873G5, G6 of REV F & earlier:
	4038056P1	Germanium, fast recovery, Reverse 20 volts, Fwd current 40 mA.
		- - - - - - - - - - TRANSISTORS - - - - - - - - -
Q1	19A115342P1	Silicon, NPN.

(Cont'd on Page 17)

(Cont'd from Page 16) (LBI4134)

SYMBOL	GE PART NO.	DESCRIPTION
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1*	3R152P203J	Composition: 2K ohms ±5%, 1/4 w.
		In REV L & earlier:
	3R152P510J	Composition: 51 ohms ±5%, 1/4 w.
		- - - - - - - - - TERMINAL BOARDS - - - - - - - - -
TB1	7487424P19	Miniature, phen: 3 terminals.
		CHASSIS AND RF ASSEMBLY 19ES00873G4 19ES00873G5 19ES00873G6
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C358 thru C365	5493392P7	Ceramic feed-thru: 1000 pf +100%-0%, 500 VDCW; sim to Allen-Bradley Type FA5C.
C367 and C368	5493392P7	Ceramic, feed-thru: 1000 pf +100%-0%, 500 VDCW; sim to Allen Bradley Type FA5C.
C372	5491601P107	Phenolic: 0.27 pf ±5%, 500 VDCW.
C373	5491601P114	Phenolic: 0.51 pf ±5%, 500 VDCW.
C378	5491601P110	Phenolic: 0.36 pf ±5%, 500 VDCW.
C379	5491601P114	Phenolic: 0.51 pf ±5%, 500 VDCW.
C380	5491601P115	Phenolic: 0.56 pf ±5%, 500 VDCW.
C381	5491601P114	Phenolic: 0.51 pf ±5%, 500 VDCW.
C382	5491601P110	Phenolic: 0.36 pf ±5%, 500 VDCW.
C385	7774750P4	Ceramic disc: .001 pf +100% -0%, 500 VDCW.
C386	5491601P116	Phenolic: 0.62 pf ±5%, 500 VDCW.
C387 and C388	5494481P12	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1*	19A116062P2	Thyrector. Deleted in 19ES00873G4 by REV J. Deleted in 19ES00873G5, G6 by REV N.
		- - - - - - - JACKS AND RECEPTACLES - - - - - - -
J442	19B205689G2	Connector: 18 contacts rated at 5 amps min at 1000 VDC max.
J443	19C303428G1	Connector: 20 pin contacts.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L341 thru L346		COIL ASSEMBLY L341 19B204820G5 L342 19B204820G6 L343 19B204820G1 L344 19B204820G2 L345 19B204820G3 L346 19B204820G4
		- - - - - - - - - - CAPACITORS - - - - - - - - - -
C341	19B209159P3	Variable, subminiature: approx 1.70-6.9 pf, 750 v peak; sim to EF Johnson 189.
C342*	19B209159P4	Variable, air, sub-miniature: 1.80-8.30 pf, 650 v peak; sim to EF Johnson 189.
		In 19ES00873G6 of REV N & earlier:
	19B209159P3	Variable, air, sub-miniature: 1.70-6.9 pf, 750 v peak; sim to EF Johnson 189.
		- - - - - - - - INDICATING DEVICES - - - - - -
DS301	19B209067P1	Lamp, glow: 0.3 ma; sim to GE NE-27.
		- - - - - - - - - - PLUGS - - - - - - - - - -
P301 thru P311	4029840P2	Contact, electrical; sim to Amp 42827-.
P312	4029840P3	Contact, electrical; sim to Amp 42101-2.
P313	4029840P2	Contact, electrical; sim to Amp 42827-2.
P315 thru P317	4029840P2	Contact, electrical; sim to Amp 42827-2.
P319 and P320	4029840P2	Contact, electrical; sim to Amp 42827-2.
P322	4029840P2	Contact, electrical; sim to Amp 42827-2.
P323	4029840P1	Contact, electrical; sim to Amp 41854.
P324 thru P326	4029840P2	Contact, electrical; sim to Amp 42827-2.
P327	4029840P1	Contact, electrical; sim to Amp 41854.
		- - - - - - - - - TRANSISTORS - - - - - - - - -
Q341* and Q342*	19A116741P1	Silicon, NPN.
		In 19ES00873G4 of REV K & earlier: In 19ES00873G5, G6 of REV J & earlier:
	19A116203P2	Silicon, NPN.
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R341	3R152P822K	Composition: 8.2K ohms ±10%, 1/4 w.
R342*	3R152P622J	Composition: 6.2K ohms ±5%, 1/4 w.
		In 19ES00873G4 of REV M. In 19ES00873G5, G6 of REV L.
	3R152P472J	Composition: 4.7K ohms ±5%, 1/4 w.
		In 19ES00873G4 REV L & earlier: In 19ES00873G5, G6 REV K & earlier:
	3R152P222K	Composition: 2.2K ohms ±10%, 1/4 w.
R343 and R344	3R152P101K	Composition: 100 ohms ±10%, 1/4 w.
R345	19A116278P444	Metal film: 280K ohms ±2%, 1/2 w.
R346	3R78P390K	Composition: 39 ohms ±10%, 1 w.
		- - - - - - - - - TRANSFORMERS - - - - - - - -
T341	19A116041P2	Audio freq: 300 to 4000 Hz,±0.5 dB, Pri: 23.5 ohms cmp, at 50 mA, Sec 1: 3.5 ohms cmp at 1 KHz, Sec 2: 10.15 ±0.10 VRMS.
		- - - - - - - - TERMINAL BOARDS - - - - - - - -
TB1	7487424P26	Miniature, phen: 6 terminals.
		- - - - - - - - - - CABLES - - - - - - - - - -
W441	19B205634G2	Coaxial: approx 5 inches long.
		- - - - - - - - TUNED CIRCUITS - - - - - - - -
Z341 thru Z343		COIL ASSEMBLY Z341 19B204786G4 Z342 19B204786G5 Z343 19B204786G6
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496218P254	Ceramic disc: 43 pf ±5%, 500 VDCW, temp coef -80 PPM.
C2	5496218P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
C4	5494481P14	Ceramic disc: 2000 pf ±10%, 500 VDCW; sim to RMC Type JF Discap.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L1		(Part of Coil Assembly).
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798P1	Tuning slug. (Used in Z341).
	5491798P4	Tuning slug. (Used in Z342).
	5491798P5	Tuning slug. (Used in Z343).
Z347 thru Z349		COIL ASSEMBLY Z347 19B204767G1 Z348 19B204767G2 Z349 19B204767G3
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496218P254	Ceramic disc: 43 pf ±5%, 500 VDCW, temp coef -80 PPM.
C2	5496218P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L6		(Part of Coil Assembly).
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798P1	Tuning slug. (Used in Z347).
	5491798P4	Tuning slug. (Used in Z348).
	5491798P5	Tuning slug. (Used in Z349).
Z350 thru Z352		COIL ASSEMBLY Z350 19B204784G8 Z351 19B204784G9 Z352 19B204784G10
		- - - - - - - - - CAPACITORS - - - - - - - - -
C7 and C8	5496218P248	Ceramic disc: 24 pf ±5%, 500 VDCW, temp coef -80 PPM.
C9	5496218P244	Ceramic disc: 15 pf ±5%, 500 VDCW, temp coef -80 PPM.
C12	5496218P241	Ceramic disc: 10 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
C13	5496218P237	Ceramic disc: 6 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
C14	5496218P236	Ceramic disc: 5 pf ±0.25 pf, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L7		(Part of Coil Assembly).
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798P1	Tuning slug. (Used in Z350).
	5491798P4	Tuning slug. (Used in Z351).
	5491798P5	Tuning slug. (Used in Z352).
Z354 and Z355		COIL ASSEMBLY Z354 19B204767G4 Z355 19B204767G5
		- - - - - - - - - CAPACITORS - - - - - - - - -
C2	5496218P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
C4 and C5	5494481P12	Ceramic disc: 1000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1*	19A115250P1	Silicon, fast recovery, 225 ma, 50 PIV.
		In 19ES00873G4 of REV G & earlier: In 19ES00873G5, G6 of REV F & earlier:
	7777146P3	Germanium.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L2		(Part of Coil Assembly).
		- - - - - - - - - RESISTORS - - - - - - - - -
R1	3R152P333K	Composition: 33K ohms ±10%, 1/4 w.
R2	3R152P183K	Composition: 18K ohms ±10%, 1/4 w.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	5491798P5	Tuning slug. (Used in Z355).
	5491798P4	Tuning slug. (Used in Z354).
Z357 and Z358		COIL ASSEMBLY Z357 19B204783G2 Z358 19B204783G3
		- - - - - - - - - CAPACITORS - - - - - - - - -
C2	5496218P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L3		(Part of Coil Assembly).
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798P4	Tuning slug. (Used in Z357).
	5491798P5	Tuning slug. (Used in Z358).
Z359 thru Z361		COIL ASSEMBLY Z359* 19B204785G4 (in REV P) 19B204785G1 (in REV N and earlier) Z360 19B204785G2 Z361 19B204785G3
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496218P254	Ceramic disc: 43 pf ±5%, 500 VDCW, temp coef -80 PPM.
C2	5496218P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
C4	5494481P14	Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C5	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap.
		- - - - - - - DIODES AND RECTIFIERS - - - - - - -
CR1	19A116052P1	Hot carrier: Fwd. drop .350 volts max.
		- - - - - - - - - INDUCTORS - - - - - - - - -
L4		(Part of Coil Assembly).
		- - - - - - - - MISCELLANEOUS - - - - - - - -
	5491798P1	Tuning slug. (Used in Z359- before REV P).
	5491798P4	Tuning slug. (Used in Z360).
	5491798P5	Tuning slug. (Used in Z361).
Z362 thru Z364		COIL ASSEMBLY Z362 19B204787G1 Z363 19B204787G2 Z364 19B204787G3
		- - - - - - - - - CAPACITORS - - - - - - - - -
C1	5496218P254	Ceramic disc: 43 pf ±5%, 500 VDCW, temp coef -80 PPM.
C2	5496218P250	Ceramic disc: 30 pf ±5%, 500 VDCW, temp coef -80 PPM.
C3	5496218P245	Ceramic disc: 18 pf ±5%, 500 VDCW, temp coef -80 PPM.
C4	5494481P14	Ceramic disc: 2000 pf ±10%, 1000 VDCW; sim to RMC Type JF Discap.
C5*	5494481P11	Ceramic disc: 1000 pf ±20%, 1000 VDCW; sim to RMC Type JF Discap. Added to 19ES00873G4 by REV N. Added to 19ES00873G5, G6 by REV L.
		- - - - - - - - DIODES AND RECTIFIERS - - - - - - - -
CR1*	4038642P1	Germanium. Added to 19ES00873G4 by REV M. Added to 19ES00873G5, G6 by REV L.
		- - - - - - - - - - INDUCTORS - - - - - - - - - -
L5		(Part of Coil Assembly).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1*	3R152P202J	Composition: 2K ohms ±5%, 1/4 w.
		In 19ES00873G4 of REV L & earlier: In 19ES00873G5, G6 of REV K & earlier:
	3R152P431J	Composition: 430 ohms ±5%, 1/4 w.
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	5491798P1	Tuning slug. (Used in Z362).
	5491798P4	Tuning slug. (Used in Z363).
	5491798P5	Tuning slug. (Used in Z364)
		HARNESS ASSEMBLY 19ES00873G14 (Includes C385, C387, C388, J442, J443, P301-P304, P307-P313, P315-P317, P319, P320, P322-P327, R345, R346, T341).
		CHANNEL GUARD MODIFICATION KIT 19A127178G1 (Used with A350)
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19B216176G1	Harness (Encoder/Decoder). Includes:
P314	4029840P2	Contact, electrical; sim to Amp 42827-2.
P318	4029840P2	Contact, electrical; sim to Amp 42827-2.
P321	4029840P2	Contact, electrical; sim to Amp 42827-2.
P328 thru P335	4029840P2	Contact, electrical; sim to Amp 42827-2.
		CHANNEL GUARD MODIFICATION KIT 19A127178G2 (Used with A402)
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
	19B216177G1	Harness (Tone Reject Filter). Includes:
P321	4029840P2	Contact, electrical; sim to Amp 42827-2.
P330	4029840P2	Contact, electrical; sim to Amp 42827-2.
P332	4029840P2	Contact, electrical; sim to Amp 42827-2.
		MECHANICAL PARTS (SEE RC1692)
1	19B204583G3	Hinge.
2	19B216727P1	Support. (Used with Q341 & Q342).
3	19A116023P2	Plate, insulated. (Used with Q341 & Q342).
4	19A115222P3	Insulator, bushing. (Used with Q341 & Q342).
5	4029851P6	Clip, loop.
6	19B204583G1	Hinge.
7	19B204583G2	Hinge.
8	19A121676P1	Guide pin.
9	19C303396G4	Bottom cover. (Station)
10	19C303385G1	Bottom cover. (Mobile)
11	19A121297P1	Angle.
12	7160861P4	Nut, sheet spring: sim to Tinnerman C6452-8Z-6?. (Used to secure cover).
13	4036555P1	Insulator, washer: nylon. (Used with Q7 on A348).
14	403526?P2	Button, plug. (Used with A348, A350 and A402).
15	19C303485G3	Top cover. (Station, except Repeaters and VW).
16	19C303676G2	Top cover. (Station, Repeaters and VW only).
17	19C303385P2	Top cover. (Mobile)
18	4029851P3	Clip, loop.
19	19A121383P1	Support.
20	4033089P1	Clip. (Part of XY1-XY4).
21	19B200525P9	Rivet. (Part of XY1-XY4).
22	19A115793P1	Contact. (Part of XY1-XY4).
23	4039307P1	Crystal socket. (Part of XY1-XY4).
24	19C303547P1	Cover.
25	19C317344P3	Heat sink.
26	19C303389G1	Chassis.
27	4034252P5	Can (Used with T1 on A347).
28	19B204672P1	Cover.
29	7162414P1	Retainer, transistor. (Used with Q1 on A341).
30	19B204917P1	Support.



(DF-1095)

PRODUCTION CHANGES

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

REV. A - 2nd Mixer A347 (19B216119-G1)
Channel Guard Encoder/Decoder Model 4EK16A10 (19C311797-G1)
1st Osc/Mult A354 - A357 (19B204419-G14, 15, 17, 18)

REV. C - 1st Osc/Mult A352 & A353 (19B204419-G13 - G18)
IF-Audio & Squelch A348 (19D413129-G1)

REV. F - Chassis & RF Assembly (19E500873-G4 thru G6)

These revisions incorporated into initial shipment.

REV. B - Channel Guard Encoder/Decoder Model 4EK16A10 (19C311797-G1)

To increase the stop-band attenuation. Changed R8.

REV. C - Channel Guard Encoder/Decoder Model 4EK16A10 (19C311797-G1)
REV. A - Tone Reject Filter (19C311797-G2)

To optimize the frequency response. Changed C29.

REV. D - Channel Guard Encoder/Decoder Model 4EK16A10 (19C311797-G1)
REV. B - Tone Reject Filter (19C311797-G2)

To prevent excessive roll-off at 300 Hertz. Changed R59.

REV. D - IF-Audio & Squelch A348 (19D413129-G1)

To improve frequency response at 3000 Hertz. Changed R30 & R78

REV. G - Chassis & RF Assembly (19E500873-G4)

To improve the blanker performance.
Added A407 and C2 to 2nd RF Amplifier.

IF-Audio & Squelch A348 (19D413129G1)

REV. E - To compensate for vendor change.
Changed C26.

REV. F - To improve squelch action. Changed R53.

REV. G - To improve operation. Changed CR3 and CR4.

REV. H - To improve squelch action at -30°C.
Changed Q10.

REV. H - Chassis & RF Assembly (19E500873G4)

To incorporate silicon diode. Changed CR1.

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

REV. K - To improve tuning. Deleted R14 on crystal filter A404.

REV. L - To incorporate new transistors.
Changed Q341 and Q342.

REV. G - Chassis & RF Assembly (19E500873G5 & G6)

To incorporate silicon diode.
Changed CR1.

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

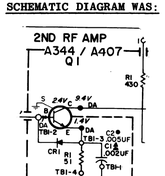
REV. J - To improve tuning.
Deleted R14 on crystal filter A404.

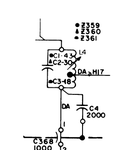
REV. K - To incorporate new transistors.
Changed Q341 and Q342.

REV. L - Chassis & RF Assembly (19E500873G5 & G6)
REV. M - Chassis & RF Assembly (19E500873G4)

To improve blanker performance. Changed R342. Changed R1 and added C5 and CR1 to RF Amplifier A344. Changed R1, Deleted CR1 and added C3 to RF Amplifier A407. Schematic Diagram was:

SCHEMATIC DIAGRAM WAS:





REV. D - Noise Blanker Board (19C303540G1,2 & 3

To improve metering in positive ground system. C21, C17, R22 & CR2.

REV. E - Noise Blanker Board (19C303540G1,G2 & G3)

To improve blanker performance. Changed C6 thru C16, CR3, Q4, R12 and R13.

REV. M - Chassis & RF Assembly (19E500873G5 & G6
REV. N - Chassis & RF Assembly (19E500873G4

To increase RF attenuation for proper blanking. Changed R342.

REV. F - Noise Blanker Board (19C303540G1 & G2

To increase RF attenuation for proper blanking. Changed C42.

REV. J - IF-Audio & Squelch A348 (19D413129G1

To correct PA bias. Changed R40.

REV. K - To improve stability of audio output with no load. Added R85.

REV. L - To improve frequency response at 300 Hz. Deleted R85 and Changed C40.

REV. M - To improve audio quality. Changed R80.

REV. N - To improve frequency response. Changed C26.

REV. P - To improve stability. Changed Q5.

REV. F - Noise Blanker Board (19C303540G3)

To improve blanker restoration.
Changed C29.

REV. P - Chassis & RF Assembly (19E500873G4)

To improve operation. Changed Z359.

REV. R - To incorporate new transistor. Changed Q2.

REV. N - Chassis & RF Assembly (19E500873G5 & G6)

To incorporate new transistor. Changed Q2.

REV. P - Chassis & RF Assembly (19E500873G6)

To improve tuning range of 2nd RF stage.
Changed C342.

REV. R - IF Audio & Squelch A348 (19D413129G1)

To improve Squelch action. Deleted R56 and added R86.

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-4124

DF-1095

MOBILE RADIO DEPARTMENT
GENERAL ELECTRIC COMPANY • LYNCHBURG, VIRGINIA 24502

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