

SPECIFICATION AND INSTRUCTION SHEET
FOR THE MATADOR TEN CHANNEL SIMUL. TRANSMITTER

INTRODUCTION:

The Matador is a high quality, efficient and reliable multi-channel simultaneous tone transmitter. It is a precision instrument, fully production engineered and thoroughly tested.

The Matador is a completely transistorized transmitter using efficient mesa transistors in the RF section. Modern circuitry eliminates the need for a loading coil as found on most transistorized transmitting antennas. The output power compares with most transmitters using tubes. The tone generators use toroids for tone stabilization and provide stable modulation in excess of 95%.

GENERAL REMARKS :

Federal Communications Commission Regulations (Part 19, Citizen's Radio Band, Revised 9/23/58) require that the frequency of the radio energy radiated be within 0.01% of the specified operating frequency for transmitters with less than 3 watts input. The Matador contains a crystal controlled third overtone oscillator operating at the radiated frequency. The crystal is an overtone type cut to 0.005% tolerance and meets military specifications. In addition, each crystal is checked in the Matador circuit to insure output specification compliance. The crystal is stamped with the oscillator's output frequency. The transmitter's oscillator is amplified by a separate transistor. Thus, the Matador is a MOPA type of transmitter fully meeting all FCC stability and frequency requirements

License Requirements:

In order to lawfully operate the Matador, like all Citizen's Radio Band transmitters, the user must obtain an examination-free permit from the Secretary, FCC, Washington 25, D.C. The permit, Form # 505, is a simple questionnaire requiring no radio technical knowledge.

ASSEMBLY:

Remove the back from the Matador case and visually inspect the unit to be certain no damage is apparent from shipping. Make certain the crystal is seated in its socket (on the front side of the printed circuit in upper right hand corner.) Install one 6 volt lantern battery (with screw terminals) connecting the black lead to the negative terminals. Do not use more than 6 volts as damage could occur.

OPERATION:

With the switch in the off position press the test button. The meter should indicate approximately 6, which is the battery voltage tested under load. Move the switch to the ON position. With the antenna installed the meter should move up scale and remain at a given point. This indicates that RF is present at the antenna. Now depress a tone key which will cause a slight deflection in the meter reading indicating that the set is modulation. The RF meter will vary with different antenna lengths and also when you touch the antenna, this is normal. No damage or malfunction will occur when operating with the antenna removed or depressed.

TUNING:

The Matador is pretuned at the factory and comes ready for operation with possibly only slight tone adjustments necessary. The RF oscillator adjustments are sealed with colored lacquer and FCC Regulations Part 19 amended should be read before tampering with these adjustments. The RF Amplifier (see diagram) can be tuned using a field strength meter. Simply adjust for maximum field strength with the antenna fully extended. Keep one hand on the transmitter case and use a plastic screw driver to make this adjustment. The RF amplifier is tuned at the factory and if the transmitter should fail this adjustment will not be at fault. The back cover will have no effect on the tuning; therefore, a tuning hole is unnecessary.

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The tones are variable over a limited range and these adjustments are located on the printed circuit of the transmitter. They are marked to match the stick positions on the front panel. The two sticks on the left side will work simultaneously with the two sticks on the right. Controls other than those marked on the panel can be used by connecting to the matching relays. DO NOT TRY TO TUNE A STICK POSITION TO A RELAY NOT INTENDED FOR THIS POSITION.

To tune the channels have the receiver wired to its batteries and energized. Operate the transmitter with no antenna and the back removed. Turn the transmitter on and key any one channel. While holding this channel on, move the transmitter away from the receiver approximately 3 feet. (This will vary and if you have the transmitter too close it may block the receiver such that it will fail to function. This is caused by oscillator radiation that is not modulated.) Check all channels for single operation and make adjustments if necessary. After all channels operate with the correct key position tune for simultaneous operation. To do this, hold any one channel on the left side (looking at the front of the transmitter) and key the right channels one at a time adjusting them as you progress. Repeat the procedure holding any one of the right channels, keying and tuning the left channels one at a time. Check all channels for simultaneous operation and refine adjustments if necessary. The two adjacent reeds on the receiver (D Trim L Rudder) may beat at a low frequency when keyed together. This is normal and these two channels should be avoided for simultaneous operation. After the channel tuning, replace the back cover holding it in place with the metal screws provided. A final check can be made with the antenna removed and the back cover in place. Using the receiver operation should be possible at a distance of one foot with the top of the transmitter pointed at the receiver antenna.

Install the antenna and screw only hand tight onto the stud provided in the transmitter.

The Matador is now ready to use and will operate all tone receivers manufactured by F & M Electronics. No commitment is made regarding operation with receivers of other manufactures.

Specifications:

Type: Hand-held; easily carried and transported.

Antenna: Telescoping 58 inch chrome, removable. Antenna is fixed tuned for maximum efficiency.

Circuit components: Precision engineered printed circuitry

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OPERATING TYPE: The Matador is an amplitude modulated, crystal controlled, Class "C" station with an input power of approximately .5 watts.

Power Requirements: 6 volts 100 to 140 MA Typical with no modulation.

Stability: Better than FCC requirements under all conditions of temperature, battery, voltage and antenna loading.

Frequency: The Matador is designed for operation on any of the following Citizen's Radio Band frequencies allocated by the FCC. 26.995 mc, 27.045 mc, 27.095 mc, 27.145 mc, 27.195 mc, and 27.255 mc. Operating frequencies may be changed simply by changing crystals. No retuning is required. Extra crystals are available on any of the above frequencies at \$4.95.

Modulation: The Matador is amplitude modulated approximately 95%.

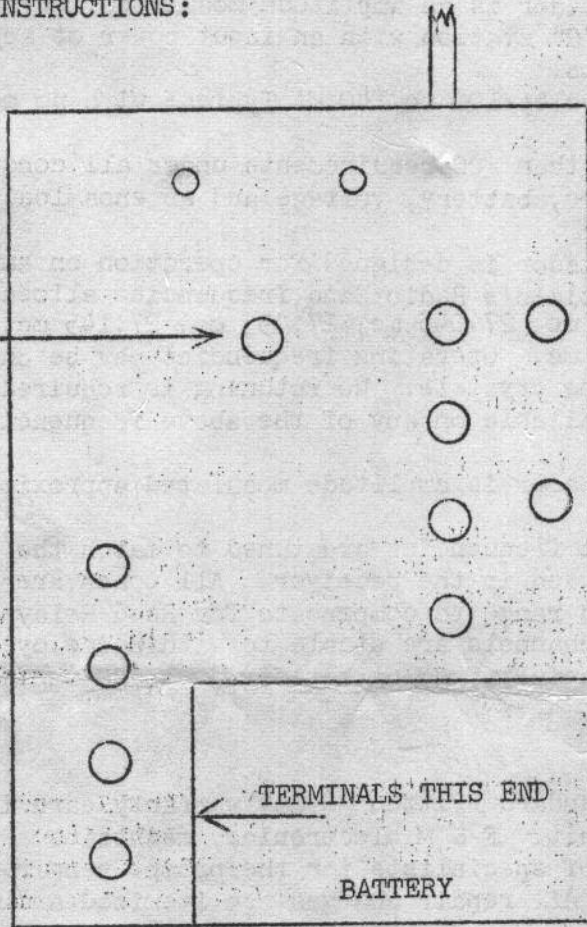
Audio Frequency: Channel frequencies are tuned to match the frequency of the reeds used in the receiver. All tones are variable over a limited range to compensate for Reed Relay differences. Audio channels are stable to within one cycle per second over useful range of battery voltages and temperature.

Warranty and Repair Service:

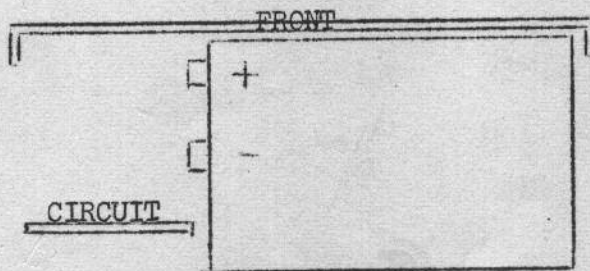
Our standard written 30-day warranty card is enclosed with each unit. F & M Electronics, maintains a fully trained staff of specialists for the prompt repair of F & M Equipment. All repair charges are itemized and nominally priced.

MATADOR INSTRUCTIONS:

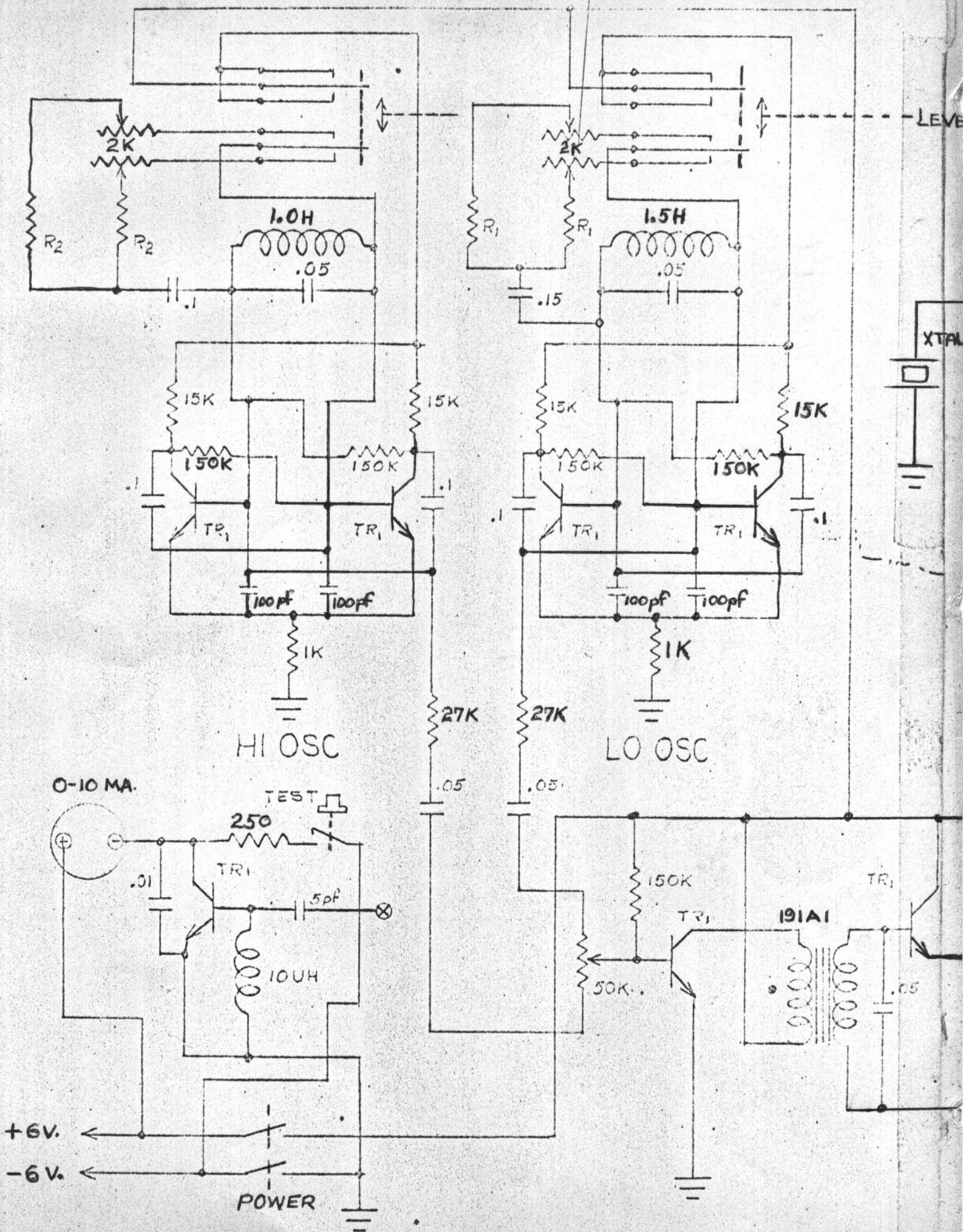
DO NOT TURN
MODULATION
BALANCE



CAUTION: OBSERVE BATTERY POLARITY. SERIOUS DAMAGE WILL RESULT FROM REVERSED VOLTAGE.

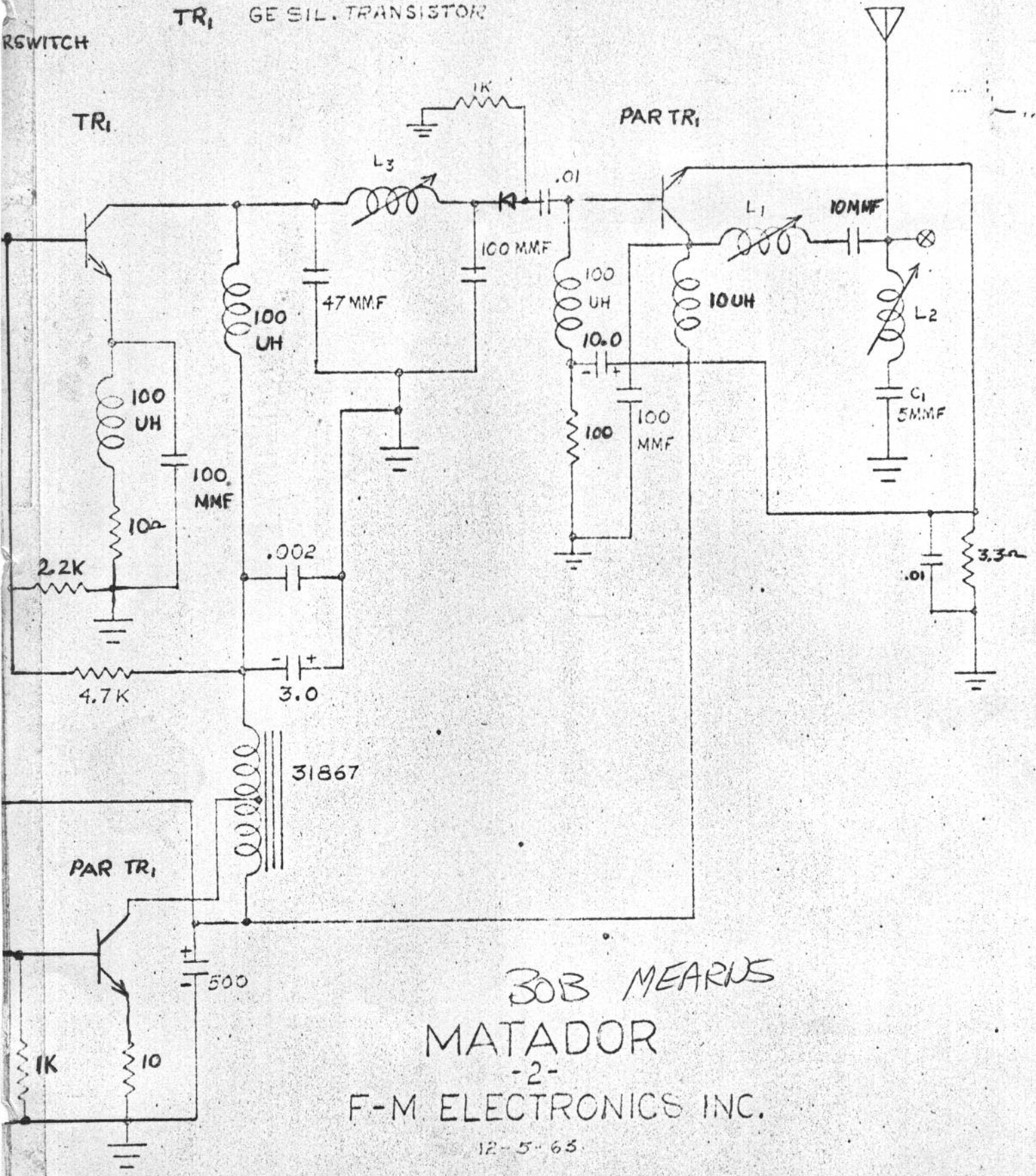


REPLACE BATTERY WHEN VOLTAGE DROPS BELOW 5 VOLTS



R_1, R_2 SELECTED FOR FREQ RANGE
 HI OSC HAS 4 CHANNELS
 LO OSC HAS 6 CHANNELS
 TR_1 GE SIL. TRANSISTOR

RSWITCH



BOB MEARNS
 MATADOR
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 F-M ELECTRONICS INC.

12-5-65