



## FM-2016A MARS INSTRUCTIONS

The uniqueness of the FM 2016A makes possible the use of certain MARS/CAP frequencies which are outside the range of normal 2 meter FM equipment. The FM 2016A comes equipped for operation between 148 and 148.955 MHz operation. The FM 2016A is also capable of operating on frequency splits of other than  $\pm 600\text{kHz}$  by the unique digital switching of 4 memories. This is provided as a front panel convenience on the mode switch. 1T-2R receives on memory two, and transmits on channel one. 3T-4R operation is similar except the third and fourth memories are used.

1. Out of band frequencies below 144MHz can be programmed also. For operation between 142.6 and 144MHz simply remove power and desolder the yellow wire on the MHz switch. Reapply power on the MHz switch, 147 position will now be 143. Likewise 146 will be 142. Do not be concerned if the LED display is not lit. This will be corrected shortly. Dial the frequencies you need by "feel" and program into the corresponding memory. After programming the frequencies necessary, disconnect power and reconnect the yellow wire on MHz switch.
2. L2 adjustment. If the frequencies you programmed were 143.7 or above this step should not be necessary. This adjustment will relight the displays and adjust the PLL for proper operation. Apply power and set the radio to the lowest frequency used. Connect a DC volt meter to P3 on the synthesizer (top) board. Heat the wax quickly in L2 and adjust L2 for 3.1 volts DC at P3 with a plastic alignment tool. P3 and L2 are located at the right rear of the board. This completes the MARS modification.
3. For use on frequencies between 142 and 142.6 MHz (AF MARS) a slight change is necessary. Remove the case, disconnect power and turn unit over. On the main circuit board directly behind the MHz switch, locate D25. Cut one lead of this diode disabling it. Connect the anode of a switching diode to P34. Solder a wire to the cathode end of the diode. Connect the other end of this wire to P6 on the synthesizer board. P6 is close to the three crystals at the right rear of the board. Now follow instructions in paragraph 1 except add .6MHz to the transmit frequency. For example: 142.155 transmit add .6MHz. This would be 142.755. Program this into memory #1. 143.46 would be the receive frequency and would be programmed directly into memory two.
4. Transmit frequencies 149.000-150.595MHz. Locate D25 described in 3 above. Cut one lead of D25 disabling it. Solder the anode end of a switching diode to P34. Solder a wire to the cathode end. The other end of the wire connects to P7 on the synthesizer board. For example: 150.15 should be the output frequency.  $150.15 - .6 = 149.55$ . This is the PLL frequency and will be programmed into memory. To do this turn radio right side up and locate P22 in the front left corner of the synthesizer board. Apply power and set radio to 148MHz. Connect a temporary jumper from P22 to pin 5 of IC12. The display will indicate 149MHz. Program 149.55 into memory one. Disconnect the jumper and program the desired receive frequency directly into memory two.