

HAMTRONICS® T51 VHF FM EXCITER MODULE INSTRUCTIONS

FUNCTIONAL DESCRIPTION.

The T51 is a single channel fm exciter designed to provide 2 Watts output on the 28, 50, 144, or 220 MHz ham bands or adjacent commercial bands. Refer to catalog for complete specifications.

A WORD ABOUT CONSTRUCTION.

If you are unfamiliar with this type of kit, it is important to note that instructions are more on the order of a good magazine article than a complete step-by-step assembly manual. This saves you time and boredom; but it requires that you read over explanatory material several times and follow the schematic and parts location diagrams to be sure you understand the techniques involved in completing the kit.

CONSTRUCTION.

- a. Install socket pins E1-E3 and the crystal sockets. Cut them from the metal carrier strip. Install from top of board, and rock them while pressing into holes. They will snap in place when fully seated. Solder lightly on copper side of board to avoid wicking solder up into top side of pins.
- b. Install three potentiometers.
- c. Install transistors as shown. RF power transistors should be flat against board, and plastic transistors should be as low as possible (about 1/8 inch or less).
- d. Install phono jack J1. If center contact pops out, push it back in place. Be sure to solder all 4 lugs.

Install 4 variable capacitors, orienting as shown so rotors are connected to ground.
- f. Install electrolytic capacitors, observing polarity and seating as low as possible.
- g. Install ceramic disc and tubular capacitors. Refer to parts list for frequency sensitive parts. It may be necessary to form some capacitor leads to fit holes in board. Keep leads as short as possible.

Note: Disc capacitors with values of 100 pF and over are marked in pF with two significant figures and a multiplier similar to resistors. Any letter should be disregarded, as it is not a part of the value. Eg., 101 = 100 pF, 102 = 1000 pF (.001 uF), 103 = 10,000 pF (.01 uF), 221 = 220 pF, etc.

- h. Install resistors and diodes, observing polarity on diodes. Note that there are 2 kinds of diodes. On vertical parts, form top lead directly over for shortest leads. The circle on the location diagram indicates where the body of the part should be.
- i. Use pieces of bus wire or resistor/capacitor clippings to install two jumpers on board.
- j. Wind air wound coils L8-L12 as indicated on parts list, and solder in place with bottom of coils 1/16 inch above board. In lower frequency units, where insulated magnet wire is used, wire is solder-strip type. Be sure to use proper size wire as specified. Use a 1/8 inch diameter rod, such as a drill bit, as a forming tool which to wind coils. After winding coils and spacing turns as specified, bend remaining (pigtail) leads at right angles to reach holes in board. (The board is set up to accommodate the largest coils required for the lowest band for which it was designed; so

for higher bands, coil windings are shorter than the space between holes.) Bend leads over against copper side of board and trim short. Then, solder with hot iron to melt insulation. If you prefer, you may scrape insulation from ends of leads before mounting coil on board.

- k. Install ferrite beads Z1-Z9 by stringing on bus wire as shown.

l. Z10 and Z11 are made by threading ferrite beads with 2-1/2 turns of #26 magnet wire like a toroid. Insert wire through hole in bead, bend around once and insert through bead hole a second time. Then, bend around again and insert through hole a third time. Draw wire tight. Insert leads in board, bend over against copper land areas, trim leads, and solder with hot iron to melt insulation.
- m. Install slug tuned coils as shown. Install coil shields. Make sure they are fully seated, and solder both lugs. (Do not bend lugs over.) Install slugs in coils, and center them in the coils. CAUTION: Be sure to use a proper slug fitting tuning tool. Improper or worn tools can break slugs.
- n. Solder short lengths of bus wire or lead clippings in the two holes along the location for the metal shield strip. Leave about 1/8 inch of lead above the board. Position metal shield strip as shown. Tack solder it to the two wire leads and the side of L2 shield. Use solder sparingly for best appearance.
- o. Slide heatsinks on power transistors Q10 and Q11 and position open segment as shown. Since they are connected to collectors, it is important to avoid shorting to adjacent parts. If heatsinks become loose from repeated handling, remove, tighten, and re-install them.
- p. Check over all components and solder connections before proceeding.

CRYSTALS.

The T51 uses 32 pF parallel resonant, .0015% tolerance, HC-25/u fundamental crystals in the 9.0-13.5 MHz range (usually around 12 MHz for the popular bands). The crystal frequency is determined by dividing the channel frequency by 3 for 10 meters, by 4 for 6 meters, by 12 for 2 meters, or by 15 for 220 MHz. Plug the appropriate crystal into the socket pins provided on the board. If an A14-T Multichannel Adapter is used, refer to instructions packed with that module.

POWER.

Operating power required is +13.6 Vdc at 500 mA. A well regulated power supply should be used. Positive and negative power leads should be connected to the Exciter board at E1 and E3.

ALIGNMENT.

Equipment needed for alignment is a vtvm, a 50 ohm 5 Watt rf dummy load, a relative output meter, and a regulated 13.6 Vdc power supply with a 0-500 mA meter internally or externally connected in the supply line.

The slug tuned coils in the Exciter should always be adjusted with the proper plastic tuning tool. A loosely fitting or rounded tool may crack the slugs. The variable capacitors should be adjusted with a small, metal blade screwdriver, or preferably an insulated tuning tool with a small metal blade. All adjustments should be set to the center of their ranges before power is applied except