

R34, which should be set to full clockwise. Note that the variable capacitors have a small arrow stamped in the metal rotor plate. Mid-range occurs with the arrow pointing to one side or the other. Maximum capacitance occurs with the arrow pointing to the round end.

JTE: Following are some ground rules to help avoid trouble. Always adhere to these guidelines.

1. Do not operate without a 50 ohm load.
 2. Do not exceed 2 Watts output (350-450 mA total current drain). Reduce setting of power control R34 slightly if necessary to limit drive level.
 3. If unit oscillates or otherwise draws excessive current for some reason and reducing drive will not reduce current, immediately turn off power source and correct problem. Evidence of oscillation would be full output without drive (crystal removed) or output changing abruptly when tuning gradually.
 4. Always follow alignment procedure exactly. Do not re-peak all controls for maximum output; each tuning stage has its own best monitoring test point.
 5. RF power transistors Q10 and Q11 run hot at full drive, but not so hot that you can't touch the heatsinks quickly without being burned. The transistors should be cold with crystal removed from socket. Never run the unit without heatsinks in place.
1. Connect 50 ohm dummy load to phono jack J1 through some form of relative output meter.
 2. Turn off power supply. Connect it to B+ pad E1 and ground pad E3 on the Exciter board. OBSERVE POLARITY. A 500 mA meter or suitable equivalent should be connected in the B+ line to monitor current drawn by the Exciter. This is important to indicate potential trouble before it can overheat power transistors.
 3. Turn on power supply, and adjust for + 13.6 Vdc output. Use vtvm to check regulated voltage. You should measure +8 to +10 Vdc at the left lead of R1B.

JOTE: Vtvm indications used as references are typical but may vary widely due to many factors not related to performance, such as type of meter and circuit tolerances.

1. Connect vtvm to TP1 in second multiplier stage. Peak L1 and L2 alternately for maximum indication. Typical reading is about 1 to +3 Vdc.
2. Connect vtvm to TP2. Alternately adjust L3 and L4 for maximum. Typical reading is about +0.8 to 2.0 Vdc.
3. At this point, you should have a small indication on relative output meter. Alternately peak L5, L6, L7, C47, C49, and C50 for maximum output. If relative output meter is not sensitive enough to aid in peaking L5-L7, a vtvm and rf probe connected to base of Q10 can be used for rough tuning or a nearby receiver can be used if tuned to same channel. Use output meter for final peaking of all these adjustments, except do not re-peak L1-L4 unless doing so at appropriate test points.

At full drive, the total current drawn by the Exciter module should be 350 to 450 mA. Under no circumstances should the current be allowed to exceed 500 mA. Adjust POWER control R34 to limit drive to 2 Watts or less (not more than 450-500 mA). If needed, control can be set for any lower level. Although unit is rated at 2 Watts continuous in free air, it is wise to use no higher level than necessary to drive your PA. This is especially true if unit is to be housed in a tight enclosure and operated continuously in repeater service. Limiting power level can provide an extra margin of reliability in such demanding applications.

Note that full 2W output will not be possible with less than 13.6V B+. Power output falls rapidly as B+ is reduced. This does not necessarily mean that the unit cannot be used, however, since it is hard to distinguish even a 2:1 reduction in power on the air.

After tuning the Exciter into a known good 50 ohm dummy load, it should not be retuned when later connected to the antenna or linear amplifier. Of course, the antenna or pa should present a good 50 ohm load to the Exciter.

MICROPHONE AND AUDIO ADJUSTMENTS.

The T50 Exciter is designed to use with a low impedance dynamic microphone (500-1000 ohms). The microphone should be connected with shielded cable to avoid pickup. Mic. connections are made to E2 and E3 on the pc board.

To adjust deviation, start by setting pots R1 to maximum and R15 to midrange. Apply B+, and speak into microphone normally. Observe deviation meter on receiver or listen to audio with receiver squelch set tight. Set peak deviation control R15 for sufficient modulation, but not so high as to cause over deviation as indicated by distortion, carrier deviation meter swing on peaks, squelch pumping, etc.

The setting of mic. gain control R1 is a refinement not found on many exciters. It allows for gain adjustment to match your particular microphone or other audio input device. It should be set to provide sufficient audio for full modulation on voice peaks but low enough to remove background noise when not speaking and low enough to prevent excessive clipping effects (distortion) which normally result from overdriving the limiter.

REPEATER AUDIO INPUT.

In repeater service or other cases where high level audio is available, the audio can be connected after the microphone amplifier by connecting at E4 and E5 (resistor leads) as shown in diagrams. A dc blocking capacitor must be provided externally in the audio line (like C6). Nominal input level is 700 mVrms. The microphone amplifier can still be used for local microphone if microphone has muting switch.

OUT OF BAND OPERATION.

If the unit is to be used on a frequency outside the normal ham band for which the unit was designed, capacitor values in tuned circuits can be changed where necessary. If a tuning slug tends to be out of the coil as a tuning peak is approached, less capacitance is required; and more capacitance is required if the slug tends to be fully engaged in the coil winding.

HIGH STABILITY OPTION.

The standard exciter is designed for stable frequency operation in a room temperature environment, and it also provides fairly good frequency stability over wider temperature ranges. To hold commercial grade tolerance of 5 ppm over a -10° C to +60° C range, use the best grade commercial crystals, such as International HA-5 type, and change C14-C17 to dipped mica capacitors.

MOUNTING.

The four mounting holes provided in the corners of the board can be used in conjunction with screws and spacers to mount the board in any cabinet or panel arrangement. See catalog for pc board mounting kits. There is no need for a shielded cabinet except in repeater or duplex service.