

MODIFICATIONS TO THE YAESU FT100B

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The following is a list of modifications which I have made to a Yaesu FT-100B transceiver, as has been my policy with previous modifications to commercial equipment there are no external changes or additional controls fitted. This isn't always the easiest way but saves a good piece of commercial gear from unnecessary disfigurement and helps to retain a higher resale value.

INTERNAL SPEAKER

Most FT-100Bs sold locally were fitted with an internal "X" bracket to reinforce the transceiver when used mobile. By carefully removing this bracket and shaping a baffle plate from aluminium to fit on to it a small speaker was mounted over the driver tuning controls between the PA cage and the front panel and the "X" bracket replaced. Make sure that the speaker can be removed if need be to peak the driver coils and the receiver front end. This modification proved very worthwhile, especially for portable and mobile operation and the existing holes in the top of the case give quite acceptable quality audio. The addition of a small jack on the rear panel allows use of an external speaker and automatic switching of the internal speaker when an external one is used. To play it safe and prevent RF feedback bypass the leads to the external speaker with a 0.01 uF.

ACCESSORY SOCKET

The existing nine pin socket on the rear panel was modified along the same lines as FT-101 accessory socket. The filament circuit to the driver stage was left intact but the filament supply to the PA stage was re-wired so that a link was required on the nine pin plug to complete the circuit. The existing wiring to the socket was removed (except the provision for switching external amps, etc.) and terminated inside the transceiver on a tag strip. Next 150 volts, 300 volts, 500 volts and the bias rail were brought to the socket for use with an external transverter if required. A low level RF output was provided by connecting a 10 pF 500 volt capacitor to one 6JM6 grid and to a small coaxial connector behind the PA.

USING PTT DURING VOX OPERATION

The circuit was modified to that shown in Figure 1, this allows the PTT switch to hold VOX on if required.

CW/TUNE MONITOR, BREAK-IN CW

The FT-100B was certainly not designed with the CW operator in mind, the lack of a keying monitor makes CW very awkward and an external monitor requires switching when SSB or AM is used. To operate

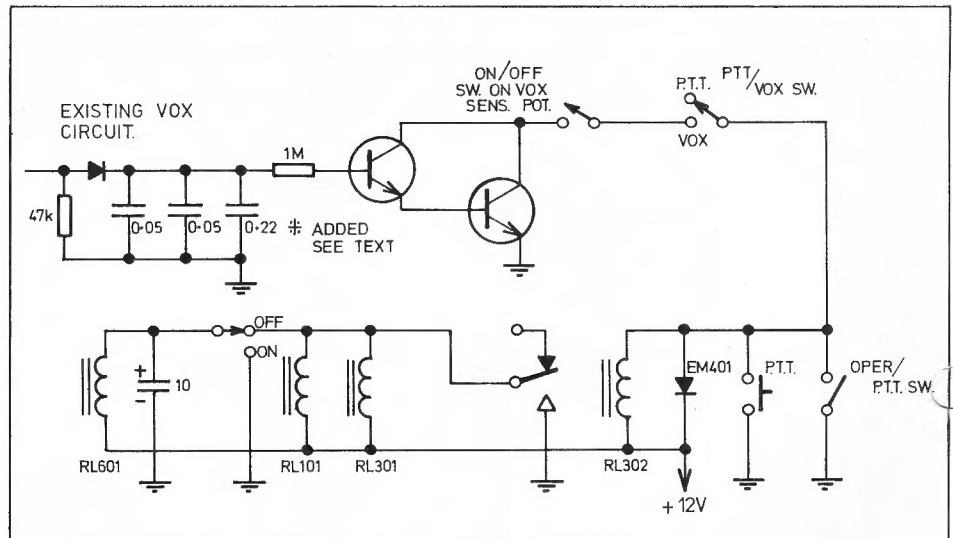


FIGURE 1

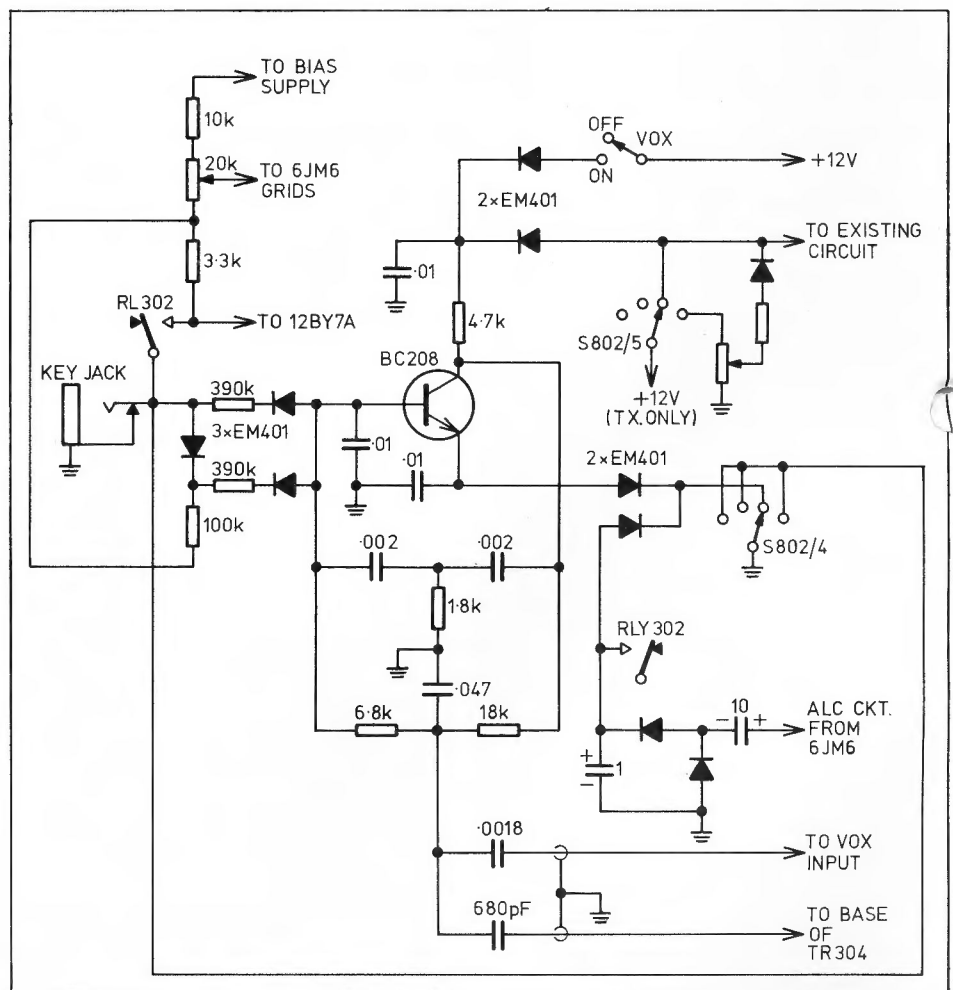


FIGURE 2

on CW the Operate/PTT switch (slider type) have to be placed in the Operate position before keying can be started and then returned to PTT to bring the receiver back on. The alternative is to operate the key with one hand and the microphone PTT switch with the other. Naturally enough the slide switch would have a very short life if CW was the main mode used.

Firstly a keying monitor was added and this proved to be a great improvement over the former system. Further investigation showed that it was possible to use this monitor to trigger the VOX and the final outcome was a workable break-in system. Before attempting to make any modifications I would strongly suggest a very careful study of both the transceiver circuit diagram and the actual circuit components. Unlike the FT-101 which is much neater with its plug-in boards, the FT-100B circuit is more difficult to follow around the looms, switches, relays, etc. Rather than giving a step by step description, I would refer anyone making the modifications to the circuit in Figure 2 and when combined with the original circuit the operating and physical details will be more apparent. Actual layout isn't particularly critical and in my case additional parts were mounted on tag strips. Shield and bypass if necessary the leads going to

the VOX and receiver audio amplifier stages to prevent RF feedback.

A BC208 is used as the audio oscillator. By using existing switches isolated by diodes the 12 volt supply is either cut off or the transistor biased off in all conditions except the CW/TUNE mode. Before doing this modification the circuit must first be changed as shown in Figure 1. The output from the oscillator is fed to the receiver audio stage and the level is preset; when the transmitter is operated in the CW or TUNE mode the bias is removed and the oscillator turned on. In the TUNE position the tone is a handy reminder that the transmitter should only be operated for short periods to prevent damage to the finals. This feature is found in the FT-401 and similar models but is notably lacking in the FT-101 series. One feature should be carefully noted with this modification. If the VOX switch is in the ON position and the plug from the key is removed from the key jack while the transceiver is in the CW-TUNE position on receive, the transceiver will lock on at full input. This may result in damage to the final tubes, especially if the antenna has been disconnected, however under this condition the CW monitor will operate and indicate a transmit condition is occurring thus providing an audible alarm.

In addition to the modifications shown in Figure 2 the following minor modifications were also necessary (refer to transceiver circuit). A 1.2 k ohm resistor was connected from the junction of R237, R238 and C232 to earth. Remove the existing link between this point and the junction of R312, R313 and C316. Feed this point from the 12 volt positive rail via 470 ohm resistor. A 0.22 uF capacitor was added to the RC network in the VOX circuit (across the pair of 0.05 capacitors) to increase the hold-in time of the VOX. This may have to be individually adjusted to suit operator's tastes. Less C will make the relay pull in more quickly when the key is first closed but will also drop out again very quickly. More C will increase the time before the relay pulls in due to the increased charge time but will also hold the relay closed after the key is opened until the charge on the C decays.

The VOX circuit is wired through two switches (VOX ON/OFF and SW. POT. ON VOX SENSITIVITY CONTROL), this gives an added safety factor in case the VOX is accidentally left on.

To operate break-in advance the sensitivity potentiometer to mid position or slightly further and the transmitter should key almost as soon as the key is pressed.

ADDITIONAL OPERATING NOTES FOR G3LLL FT200/FT250/TEMPO-ONE RF CLIPPER

J. Holding, G3LLL

The following details may be of help to purchasers of the G3LLL RF clipper.

ALIGNMENT (Note: Some cores may be sealed with wax. If so heat with fine tip of soldering iron before attempting adjustment.)

Tune to calibrator signal at 21.1 MHz with clipper switched in, and peak L103 and L104 for maximum "S" meter reading. Tune carefully across the signal and note any excessive peaks or troughs in the response, and if necessary slightly re-adjust L103 and L104 to even the response out. Re-check the response by tuning to the calibrator signal on the 20 and 80 metre bands. If the response is any less even on these bands reset trap coil L1 (see picture page 20 FT.200 manual) so as to even out the response and prevent any tendency to oscillation on these bands.

CARRIER CRYSTAL FREQUENCIES

Carrier crystal setting is more critical on receive than it is on transmit when using the clipper, and occasionally it may be desirable to adjust TC.101 or TC.102. Set for best receive audio quality with the clipper switched in.

TRYING IT OUT

80 metres is not the ideal band to test clippers on as signals are usually strong. By all means ask for quality reports but only expect a really noticeable improvement in readability when your signals are below strength 5.

TRY THIS WITH THE TECHNICAL EDITORS

OP-AMP TESTER

Ever built up a circuit using one of those new-fangled op. amp. I.C.'s and found that it didn't work? Was it the circuit or that multi-legged bug that was at fault? Perhaps you gave up and still don't know. Well here is the good news. Build this circuit and you can check all 709 or 741 type op. amps. The bad news is that you need to wire in three sockets to accommodate all three package configurations. Ah well, life wasn't meant to be easy.

The circuit was developed by A. R. Owens and published in CQ-TV No. 96, November 1976. The circuit provides indications of the op. amp.'s state of health as follows:

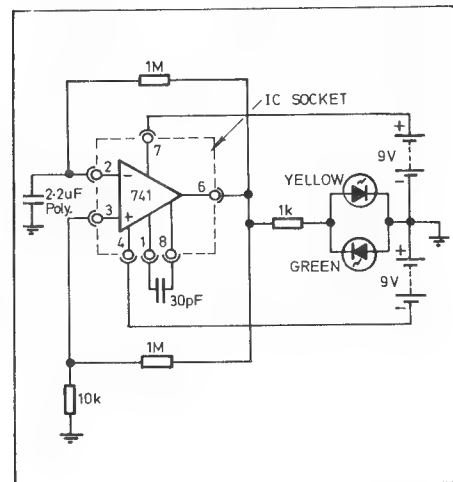


FIGURE 1

Both LED's flash alternately, equal period, 2 second rate — amp. OK.

Both LED's flash alternately, but periods unequal — amp. amplifies but has unequal leakage currents.

One LED lit — input fault.

Neither LED lit — output fault (or battery flat).

No switch is provided as the current drain from the battery is zero until an op. amp. is pushed into the socket.

VK3AFW.