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A VFO for the Heath HW 18-3

Even more fun on 160M

In my recent article on the Heathkit HW 18-3, it was pointed out that a VFO would be a very nice addition to this excellent 160 meter SSB transceiver. I used the LMO in the SB 100 with such good results that I decided it would be real nice to build a VFO of some sort right into the HW 18-3.

The pictures show the results. The one with the digital dial is real nice if you insist on direct reading of the frequency. This is not easy and the dial is not cheap. The other dial makes a very neat looking installation with a minimum of cost. Everything that is needed for \$3.00. The only drawback is that this method uses the clarifier capacitor and linear readout is impossible. A tuning table or graph can be made that will be accurate to a half khz. To get a good band spread, a 22 picofarad capacitor is used in series with the clarifier capacitor as shown in the wiring diagram. This allows the rig to be tuned over any 100 khz segment. Since the whole set must be retuned for anything else, this was considered the best way.

The added capacitors were all mica. I used what I had but 500 volt would be suitable. The original capacitors were not removed and the new ones were soldered directly to the foil side of the board. 100 picofarad capacitor is (or was) c 211 that was in series with clarifier capacitor.

The coil is 15 turns of No. 28 wire on a Miller nylon slug tuned coil form. Any material is OK for the coil. I do not recommend nylon for anyone doing much experimental



This inexpensive digital dial readout is nice.

work as they melt very easily. The slug is used to bring the VFO into the operating range and this makes it easy to adjust. I reamed one of the holes in the subpanel you put the screwdriver through to tighten the slide switches in place.

Once all the parts are installed, it is a simple matter to adjust the slug to receive (and transmit) on the lowest frequency to be used. If you have a frequency meter such as a BC 211 or a Navy LM, then you have no problem. You can either feed in a signal from 1800 khz to 2000 khz or, better yet, listen for the oscillator in the freq meter. I say this because at 1800 khz range you are working with the 5th harmonic and may pick the wrong one. There is no question in the 5 mhz range as this is the second harmonic

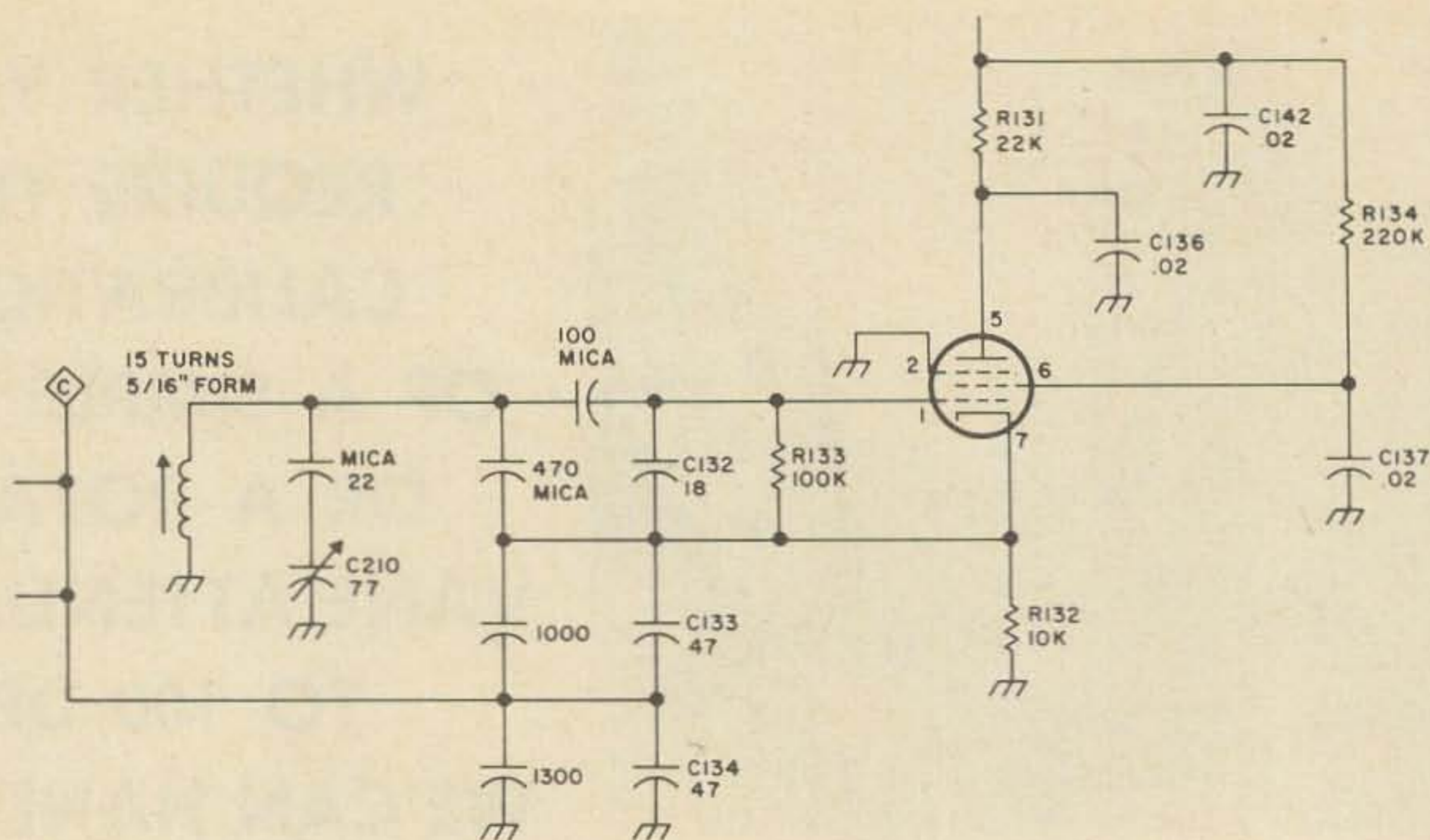


Fig. 1. VFO circuit for HW18-3. Simple. Works.

of the high range of the freq meter. If you use the high range then for 1800 khz the oscillator will be at 5.1935 mhz. At 1900 khz it would be 5.2935. With this information you can easily figure the other settings for the freq meter.

If you do not have a freq meter then you can do fairly well with a broadcast receiver that you can assume is aligned fairly accurately at an IF of 455 khz. Place the receiver close to the antenna of the HW 18-3 and tune in a station as close to 1345 khz as you can. The BC receiver oscillator will be very close to 1800 khz. 1445 khz on the BC receiver gives 1900 khz. In between points can be selected by adding 455 khz to the BC frequency. Of course, if you have a receiver with a 100 khz calibrator then you can use this. Connect the HW 18-3 antenna connect-

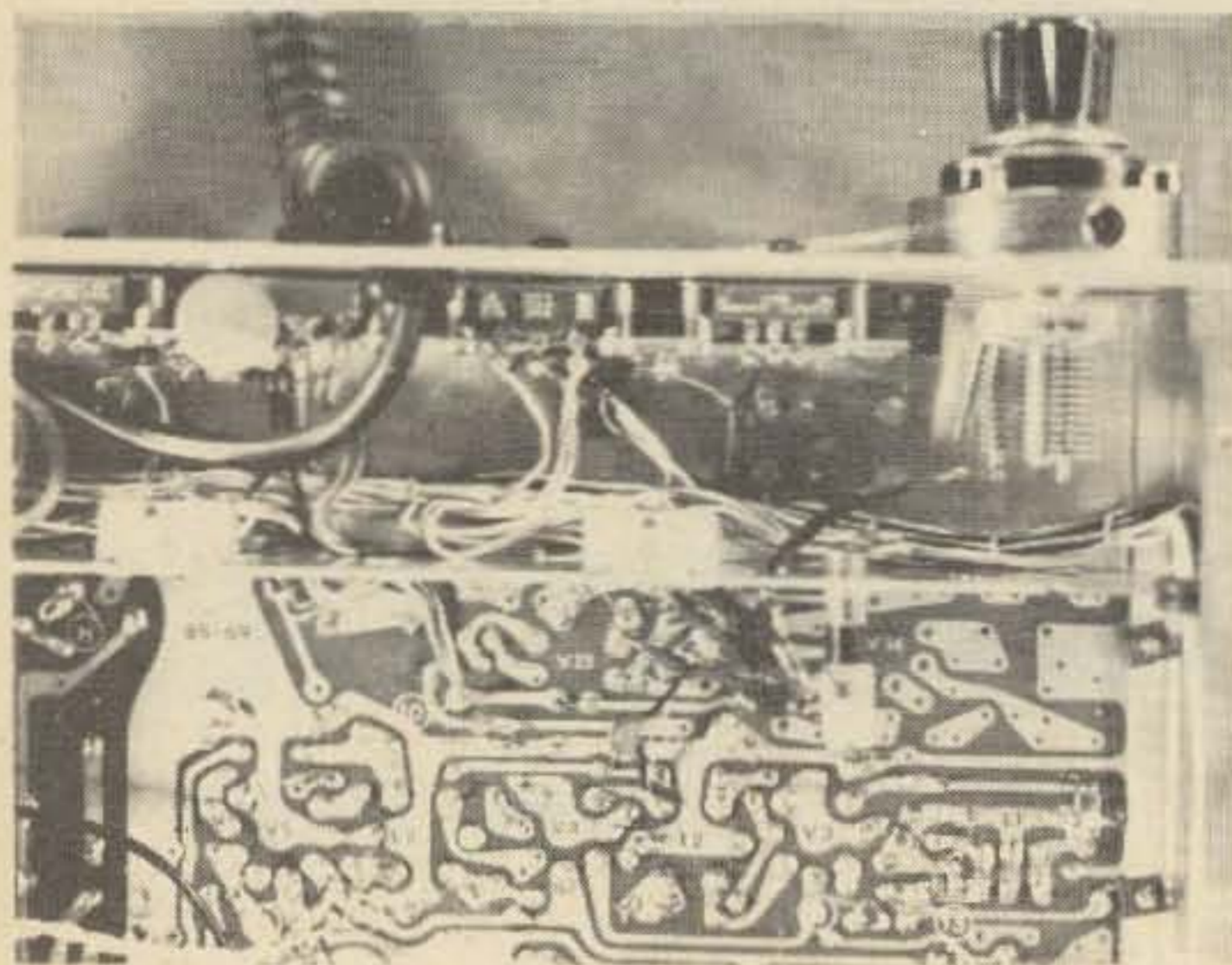
or directly to the receiver antenna post.

The direct read-out dial takes a lot of work to get the values of the capacitors right. The capacitor I used was one from an HW 12 that had a 4 1/2 to 1 planetary drive. Since the capacitor only turns 180 degrees, the dial read-out about 225 digits so that by putting a figure 1 on the case read-out was direct in khz. The big problem is adjusting the capacitors to cover the range exactly. The capacitor used was 47 picofarad with an 8-30 picofarad for final tuning. You've got to juggle back and forth between this and the coil slug to get perfect tracking but it can be done.

The little planetary drive (Lafayette 99 H 6031) works real well and so as not to drill any holes in the panel, a spacer was made 2 inches in diameter with a 1 inch hole about 1/2 inch thick. A thin metal plate was attached to the back with countersink screws. The dial is attached using only the two bottom screws. The spacer and plate are held on by the nut holding the capacitor. A 5/16 inch hole was bored in the bottom of the spacer to get in to tighten the set screw on the shaft.

I am sure that once you have made this addition to the HW 18-3 you will find a whole new world of fun on the "top band."

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VFO installed in HW18-3.

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