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# CB to 10

## -- part V:

# converting the Hy-Gain 670B

As a result of the recent dump of 23 channel Citizens Band radios on the market in anticipation of a big push for the new 40 channel units, there are many 23 channel units at real bargain prices. I paid $40.00 for the one I purchased, a Hy-Gain 670B (Hy-range I). The radio that I bought lends itself very handily to conversion to the 10 meter ham band. The Hy-range I is a 23 channel, synthesized, 4 Watt output, AM radio. If you choose another type radio make sure you get one that uses crystals, not phase locked loop. The newer types with the synthesizer lend themselves to conversion better than the older types that use one crystal for transmit and one for receive. With the newer units you get a lot more useable channels for a lot less cost.

Looking at the schematic that came with the radio, I located the bandswitch and the oscillator crystals were next to it. The Hy-Gain schematic has a chart that shows the crystals required to synthesize the unit. What you want to do is to change the smallest number of crystals possible due to the cost factor. I decided to use the 4 crystals in the 14 MHz oscillator section and leave the 23 MHz section alone as it contains 6 crystals. It may be possible to change only the offset oscillator crystals, in this case, 11.275 and 11.730 MHz. I did not try this as I believed that the coils in the front end of the receiver and in the transmitter would probably tune the proper range without modification. This proved correct. The i-f section may or may not tune. I'll leave that to someone else to try together with the chance of blowing the price of a couple of crystals.

| Channel | 11 Meters | 10 Meters | 23 MHz | Old 14 MHz | New 17 MHz |
|---|---|---|---|---|---|
| 1 | 26.965 | 29.000 | 23.290 | 14.950 | 17.440 |
| 2 | 26.975 | 29.010 | 23.290 | 14.960 | 17.450 |
| 3 | 26.985 | 29.020 | 23.290 | 14.970 | 17.460 |
| 4 | 27.005 | 29.040 | 23.290 | 14.990 | 17.480 |
| 5 | 27.015 | 29.050 | 23.340 | 14.950 | 17.440 |
| 6 | 27.025 | 29.060 | 23.340 | 14.960 | 17.450 |
| 7 | 27.035 | 29.070 | 23.340 | 14.970 | 17.460 |
| 8 | 27.055 | 29.090 | 23.340 | 14.990 | 17.480 |
| 9 | 27.065 | 29.100 | 23.390 | 14.950 | 17.440 |
| 10 | 27.075 | 29.110 | 23.390 | 14.960 | 17.450 |
| 11 | 27.085 | 29.120 | 23.390 | 14.970 | 17.460 |
| 12 | 27.105 | 29.140 | 23.390 | 14.990 | 17.480 |
| 13 | 27.115 | 29.150 | 23.440 | 14.950 | 17.440 |
| 14 | 27.125 | 29.160 | 23.440 | 14.960 | 17.450 |
| 15 | 27.135 | 29.170 | 23.440 | 14.970 | 17.460 |
| 16 | 27.155 | 29.190 | 23.440 | 14.990 | 17.480 |
| 17 | 27.165 | 29.200 | 23.490 | 14.950 | 17.440 |
| 18 | 27.175 | 29.210 | 23.490 | 14.960 | 17.450 |
| 19 | 27.185 | 29.220 | 23.490 | 14.970 | 17.460 |
| 20 | 27.205 | 29.240 | 23.490 | 14.990 | 17.480 |
| 21 | 27.215 | 29.250 | 23.540 | 14.950 | 17.440 |
| 22 | 27.225 | 29.260 | 23.540 | 14.960 | 17.450 |
| 23 | 27.255 | 29.290 | 23.540 | 14.990 | 17.480 |

*Fig. 1.*

The crystal needed for the Hy-Gain is determined as follows: Channel 1 is to be 29.000 MHz. The 23 MHz oscillator frequency is subtracted from 29.000 MHz. Then the offset oscillator frequency of 11.730 MHz is added to that figure giving the required frequency, in this case 17.440 MHz.

With one crystal then, I set my radio up on 6 channels which came out this way:

Channel 1 . . . 29.000 MHz
Channel 5 . . . 29.050 MHz
Channel 9 . . . 29.100 MHz
Channel 13 . . . 29.150 MHz
Channel 18 . . . 29.210 MHz
Channel 22 . . . 29.260 MHz

I felt that 6 channels were enough to start off with. The other channels will no longer transmit after the coils have been retuned, thus any possibility of transmission of unwanted frequencies will be avoided in case the channel selector happens to get off on a channel that is not set up on 10 meters.

In order to make it simple to keep track of what frequencies are combining to form the desired frequencies, I made up a chart giving all of the frequencies involved.

When you order a crystal, be sure and give all the in-

formation on your radio along with the frequency wanted. The Hy-Gain takes a 4342743 CS 26C 47 pF (International Crystal Co.).

### Conversion

After taking the covers off, locate the 14 MHz oscillator section. This is the 4 crystals grouped together with their designation printed on the chassis. Locate X7 (14.950 MHz) and unsolder. Replace it with the 17.440 MHz crystal. Tune L2 and L3 down two full turns. Also tune L4 and L5 down two full turns. By now you should be seeing some output on a wattmeter or use the meter on the front of the radio. Tune the pre-drivers, driver and rf power amplifier for maximum output, in my case I easily got 6 Watts. It is important to tune L2 and L3, L4 and L5 in or down in the coil so that the synthesizer will end up with the sum (40.730 MHz) rather than the difference as I did at first.

For the receiver section, the coils to be tuned down two turns are L10 and L11. L12, L13, and L14 go only about one turn down. Using an external signal source on 29.000 MHz, apply a signal until the S-meter gives an indication, then peak the coils for maximum. The final sensitivity was as good as the manufacturer's specifications on the 27 MHz band.

The possibilities are numerous that these converted units can be put to. Inexpensive walkie-talkies can be converted. How about hidden transmitter hunts? CB antennas can be easily converted by reducing the length a couple of inches. The radio only draws about 100 mils when in a squelched condition, so it could be left on in order to catch band openings or local calls. So how about it fellows? Let's use all that space on 10 meters! Will be monitoring Channel 1 ... (29.000 MHz) ... see you on 10! ■

# World's Smallest Continuity Tester

## -- it's almost minute

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Using a rubber-type two-pronged plug, the few components that make up this tester are mounted inside the plug. The hole in the end of the plug through which the cord enters is used for the NE-2 neon bulb.

Two small holes opposite each other are made near the base of the plug for the probe wires to extend, and the two 100k, ½ Watt resistors within the plug cavity, being in series with the probe cords, prevent shock. A piece of 5/8 inch i.d. aluminum tubing ½ inch long, placed over the bulb end of the plug, with a 5/8 inch o.d. clear plastic lens pressed into the tube, protects the bulb and enhances the appearance of the miniscule tester. Make the probe wires long enough to suit your needs. ■

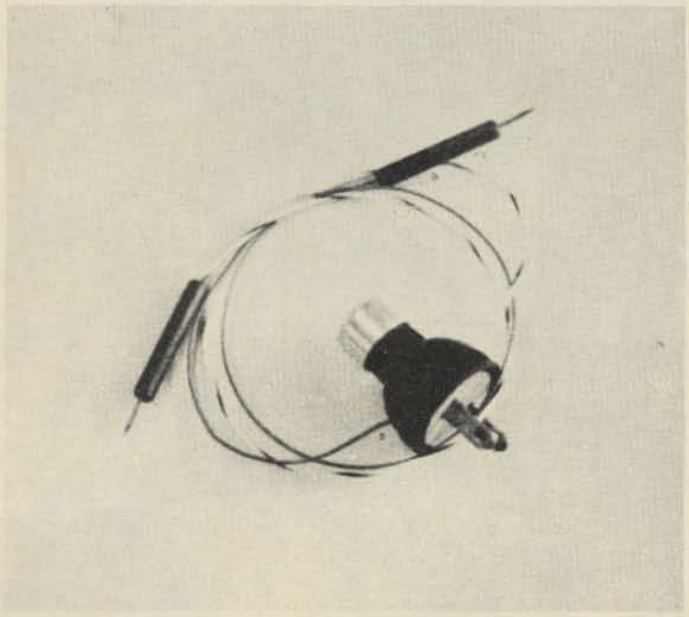

*Fig. 1.*

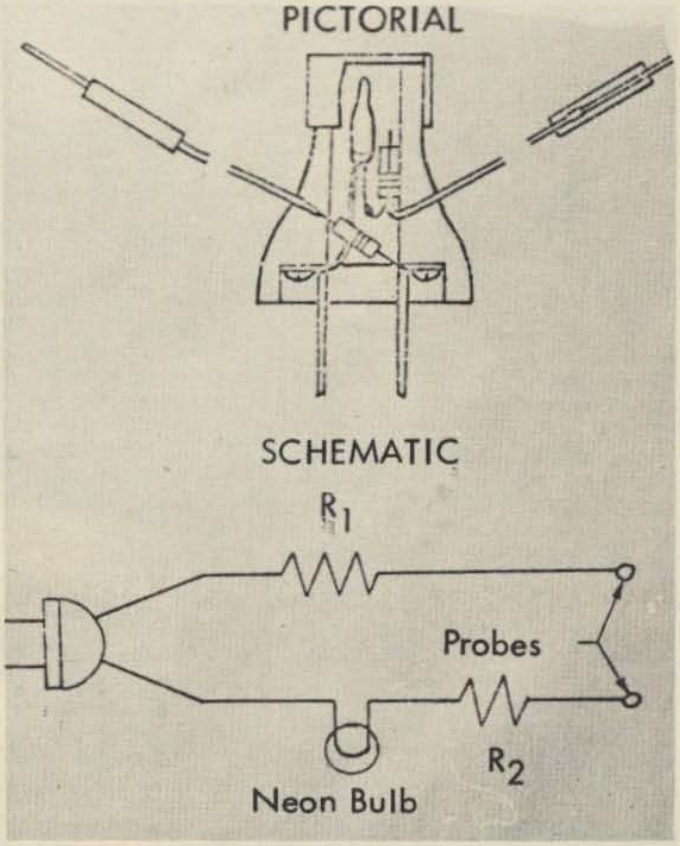


*Fig. 2.*