FreqShow pc board/kit Assembly/Operating Notes. Ver 1.0 2/10/06
Please read before assembling your kit.

You may want to install the lower components (resistors) first and install the higher ones last. That gives the most time for the board to lie flat while you are trying to solder it. You will need to bend the resistor leads fairly close to the body of the resistors to fit the hole spacing used.

The 4.7 uF and 47 uF capacitors are polarized, and must be installed correctly. The square pad is the **positive** end, and is also marked with a + sign nearby. The negative side of the capacitor itself is marked with a – sign.

Make sure that the notch on the chip is next to the square pad (pin 1) before soldering.

If you are soldering the comparator yourself, please handle it carefully with a pair of fine tweezers, and watch out for static, as it is a CMOS part. You may want to apply a small amount of solder to one of the comparator pads on the pc bd, then melt it and place the comparator down onto all of its pads. Let the solder cool. Get the comparator centered properly on its pads before soldering the remaining leads, even if it requires re-heating the one lead that is holding it. The lead with the solder should hold the comparator in place while you carefully solder the other leads. Finally, re-solder the lead that you soldered first. Do not hold the iron on the comparator leads for more than a few seconds at a time. Apply solder sparingly to the comparator leads. They won't need much.

The kit does not need the comparator in order to work. Without it, the input signal will have to be a square or pulse waveform with about 3V pk-pk amplitude.

If the comparator is installed, do not install R9, 560 ohms. If the comparator is not installed, do not install R6, R5, R7, and C7, and install a 560 ohm resistor as R8.

When installing the crystal, keep it slightly away from the top side of the PC board, so it won't touch any traces. One way to do this is to cut a small strip of thin cardboard, about 3/16" wide, and place it between the two leads of the crystal, between the crystal and the board, to lift the crystal up a little while it is being soldered. After soldering, pull the cardboard out.

The BAT48 diodes are Schottky types, with low forward voltage. They must be used for D1 and D2, or the LCD step-up will not generate enough voltage when the batteries are low.

Using the Frequency Display:

The input capacitor, C10, is rated for 50 volts DC. Input signals with a higher DC offset than this could damage this capacitor.

If the comparator is installed, the input signal amplitude should be at least 100 mV RMS and can be as high as 5V RMS. Sinewave, or squarewave inputs should work OK.

If the comparator is not installed, the input amplitude should be set to about 3V pk-pk. Squarewave or pulse waveforms should be used.

Voltage and current:

Typical operating current for the GFD board is between 1.5 and 5 mA, depending on applied battery voltage. In power down mode, with the comparator installed, the current should be about 34 uA. With no comparator installed, the current should be less than 1 uA. If you want to use an AC adapter instead of batteries, please make sure that the DC output of the adapter is between 3 and 4.5 volts. Some adapters are not regulated, and put out much more than their rated voltage at low currents. Anything over about 5.25 volts could damage the PIC chip. Please make sure that you have the polarity correct before connecting any power source to the pc bd. Incorrect polarity will probably damage the comparator and/or the PIC chip and perhaps some other components.

Resistor color bands:

560 Ohms	green blue brown gold
10K Ohms	brown black orange gold
47K Ohms	yellow violet orange gold
560K Ohms	green blue yellow gold
680K Ohms	blue gray yellow gold
820K Ohms	gray red yellow gold
1M Ohms	brown black green gold

Capacitor Marking:

15 pf caps may be marked 15, 15J or 150
22 pf caps may be marked 22, 22J or 220
0.1 uF caps may be marked “104”

And finally, to quote Heathkit:

Always use rosin core, radio type solder (60:40 or 50-50 tin lead content) for all of the soldering in this kit. The warranty will be void for any kit in which acid core solder or paste has been used.