INSTRUCTIONS

QF SERIES AUDIO FILTERS

Your audio filter was fully tested before shipment. Please study the instructions below to obtain best results. If you require parts not supplied, please obtain these at a local radio store since we do not stock them.

A. INITIAL HOOKUP

Model QF-1. Plug the QF-1 into your receivers phone jack. Obtain an adaptor if size not compatible. Connect any impedance speaker or any high-impedance phone to output jack. To avoid hum or distortion with low-impedance phones, which are overly sensitive, use a series resistor. (See D. In Case of Trouble.) The QF-1 input may also be connected to the receiver speaker terminals. Be sure that the the cable shield (connected to the QF-1 chassis) is connected to the grounded speaker terminal. Otherwise, hum may be picked up. Note: This is rare, but a few types of CB radios and some Barlow Wadley radios require a resistor across their speaker or phone output; otherwise their audio outputs are not biased properly when connected to the QF-1 input. Try a resistor in the range of 10 to 100Ω. Connecting the QF-1 output to a source of voltage (e.g. a radios speaker output or power supply) can quickly burn out the filter, not covered by the warranty. (In-out switches, if added, may do this.) Never connect anything but a passive load (spkr., phones, another amps. input) to the filter output. Note: The filter input is protected by a 1000 volt capacitor and may be connected to virtually any source.

B. FAMILIARIZATION

An audio filter has an effect roughly analogous to a tone control on a Hi-Fi set, i.e. it filters signals you tune in on your receiver and selects or rejects frequencies you desire. Of course your filters response is much sharper and more flexible than a simple tone control to cope with Shortwave signals. There are three adjustments:

1. Function Select Switch.

This switch selects (left to right) a peak, notch, or lowpass response. The peak (bandpass) function passes a narrow band of frequencies, while the notch function rejects a narrow band of frequencies. The peak or notch frequency is set by turning the frequency control. The lowpass function rejects high-frequency signals above the frequency set on the frequency control.

2. Selectivity Control (Pot). This control adjusts the width of the notch and bandpass response, and also affects the lowpass rolloff and notch depth. Bandwidths from as small as 40-50 HZ to essentially flat are available. The notch and peak widths are smallest with full rotation, but the notch depth decreases with more rotation (full clockwise=max. rotation). This control should not normally be rotated more than 60% except in "peak." Full rotation decreases notch depth and may lead to ringing in "lowpass."

3. Frequency Control (Pot). This control moves the peak, notch, and lowpass frequencies from approx. 250 Hz to 2500 Hz. This spans the entire range of useful communications frequencies. "Clockwise" rotation selects lower frequencies.

Note: Volume coming out of the filter is adjusted with your receivers audio control. Note that the filter retains its full selectivity regardless of source, load, or slight overdrive, i.e. no "impedance matching" is required.

C. USEFUL ADJUSTMENTS

Your filter is best adjusted by ear to match the prevailing conditions. Because of its numerous adjustments, you'll find that if it can't pull the signal out, nothing can. However, a few hours practice will be needed to learn its operation. The following table will aid you:

CONDITION	USEFUL ADJUSTMENTS
Desired CW Signal	Peak. Adjust selectivity near full Clockwise (CW). Peak desired station using frequency control. Use as much selectivity rotation as required for conditions. Note that maximum selectivity produces the highest gain at the peak.
SSB, AM, CB, FM, or broadcast station. No hetrodyne or whistle.	Lowpass. Rotate selectivity 10% CW or as far as possible without producing audible ringing (not critical). Turn frequency control for desired rejection of high frequencies. Note: greater than 50% rotation makes signals bassy, because important voice frequencies are rejected.
Hetrodyne, whistle, TV oscillator radiation (buzzing noise), or code station interfering with desired signal. Also for CB beats.	Notch. Rotate selectivity 40% or more. Adjust frequency control to reject undesired signal. Large selectivity rotations yield the narrowest and shallowest notch; also the hardest to tune. Therefore, rotate selectivity no more than required to avoid rejecting the desired signal. Note: to help find the correct rejection frequency, it may help to momentarily switch to peak, peak the interference, then switch back to notch. The peaked signal is then rejected. A slight frequency touchup may help since peak and notch frequencies may not track perfectly.
SSB, AM, CB, FM or broadcast station.	Under some conditions the following may also be useful: 1. Peak. Selectivity 20% to 60% rotated. Frequency adjusted for best clarity. Sometimes very useful. 2. Notch. Selectivity 0% to 30% rotated. Frequency 0% to 20% rotated. Produces an extremely sharp cutoff of high frequencies. If a hetrodyne appears, you can quickly turn controls as above. Preferred by many CB and 160, 80, and 40 meter operators for voice reception.
Weak CW	An AC voltmeter or scope across the speaker or phones is a big aid in peaking an extremely weak signal, especially if he fades below the noise occasionally. Also, you can pick up 10 db or so in moonbounce if you use PDI, a pen recorder, and send at 3-4 WPM! See below.
Strong signal	A "flat" response is obtained in: 1) Lowpass. Selectivity 10%. Frequency 0%. 2) Notch. Select. 100% Freq. 0%. 3) Peak. Select. 0%. Freq. 40%.

Other notes:

Full selectivity in peak is obtained only over the normal code reception range of 250 to 1300 Hz. Use less than 80% selectivity at high frequencies. Full selectivity in lowpass produces an effect similar to peak, but is not recommended because of reduced rejection of low frequencies. For use at a specific frequency above 1300HZ, align the filter at the desired frequency for best results. (see below)

MOST-USEFUL SELECTIVITY POSITIONS:

PEAK: CW: 30-100%
SSB: 10- 60%

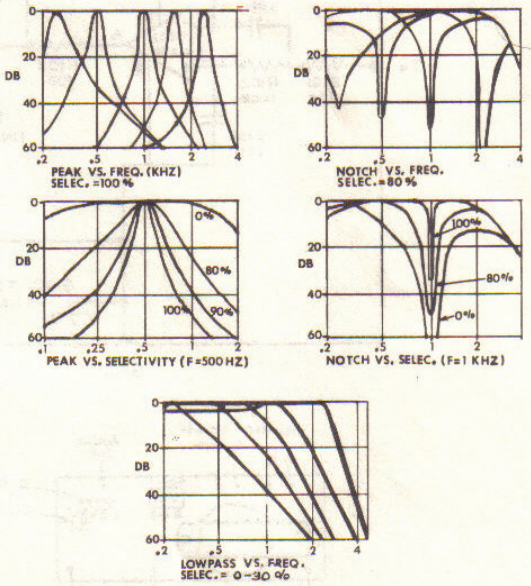
NOTCH : WHISTLE: 40-90%

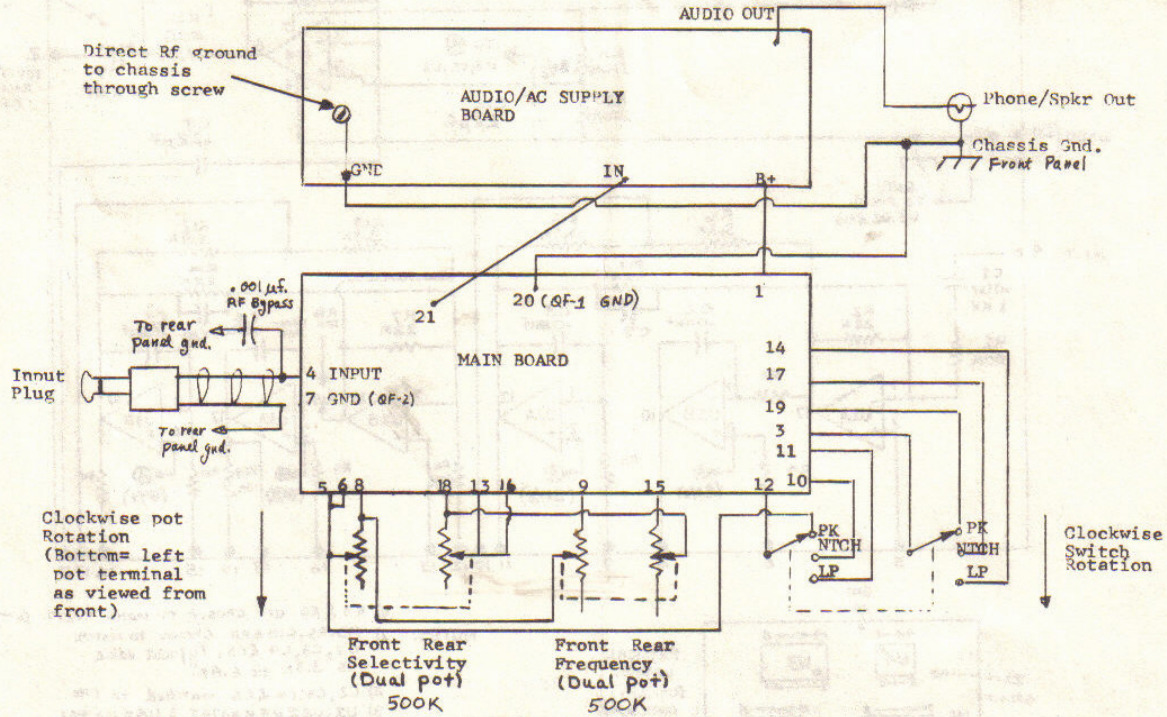
LOWPASS: 10-20%

This is just a summary. See Section C for details.

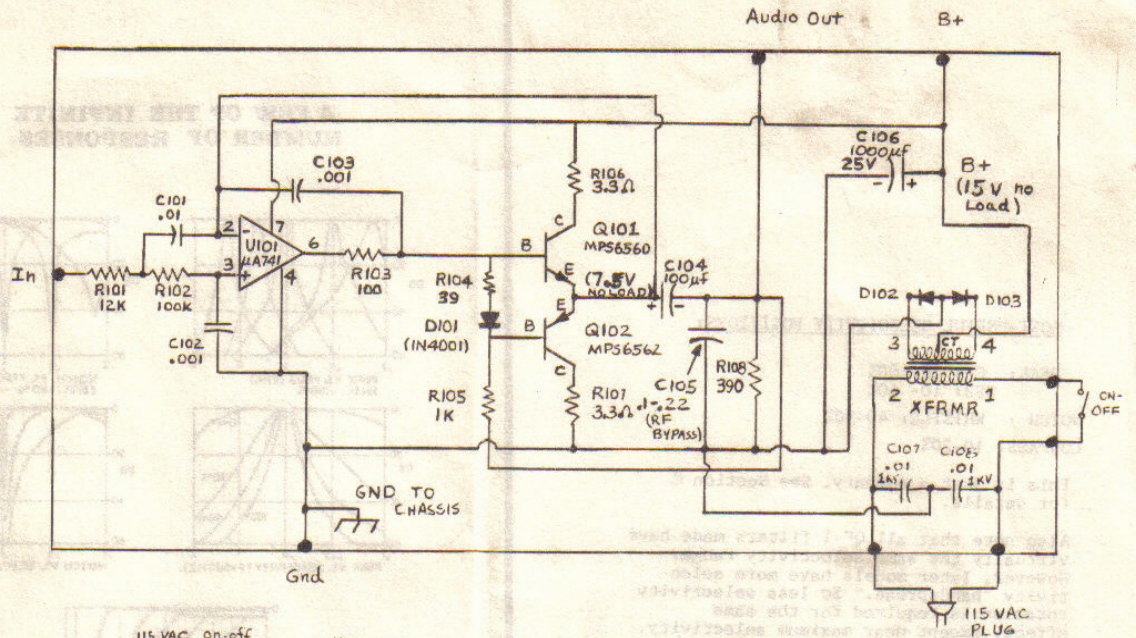
Also note that all QF-1 filters made have virtually the same selectivity range. However, later models have more selectivity "bandspread." So less selectivity rotation is required for the same effect, except near maximum selectivity.

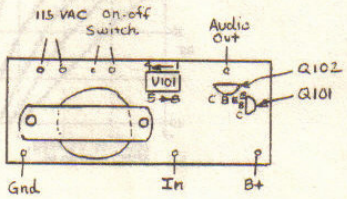
A FEW OF THE INFINITE NUMBER OF RESPONSES



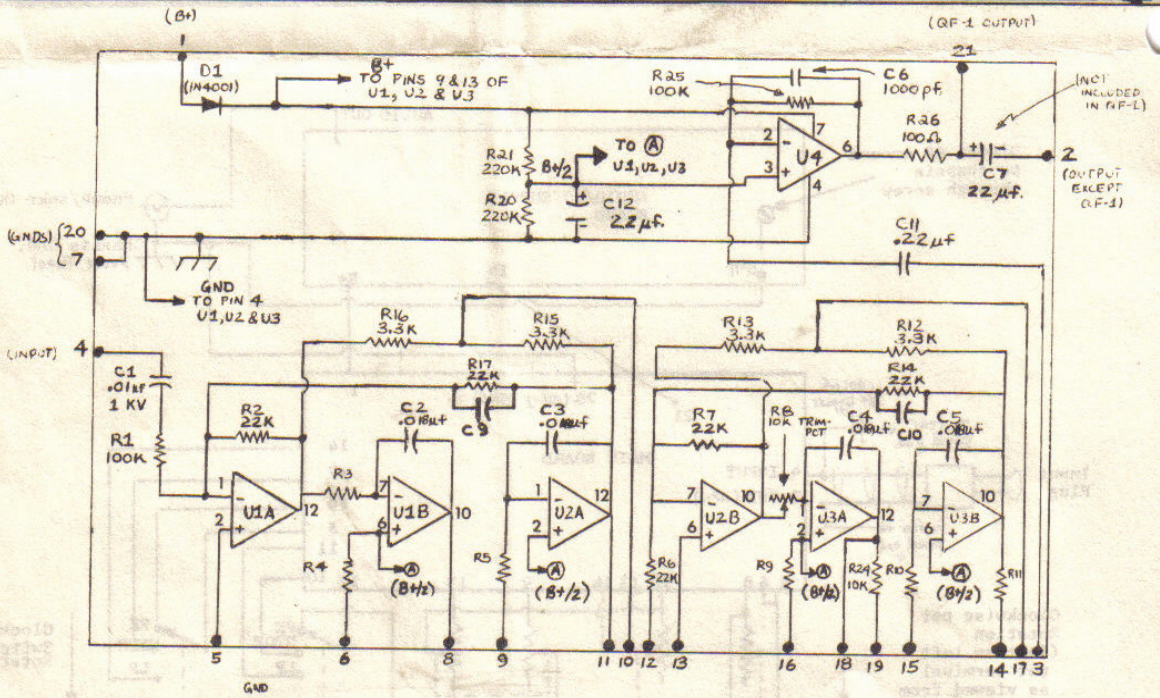


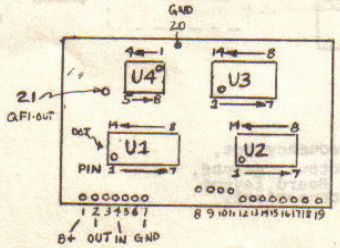
QF-1 Board Hookup. Note: Wiring to selectivity pot, frequency pot, and switch is identical for QF-2. For QF-2 input, output, ground, and B+, see figs. 1 to 3. For both models, see Main Board layout drawing to identify physical position of numbered connections.





QF-1 FILTER
AUDIO PWR AMP/AC SUPPLY BOARD





PHYSICAL LAYOUT. (CIRCLES = INPUT/OUTPUT CONNECTION LOCATION)

NOTES:
0) R4 & R9 are chosen to match select. pot.
1) R3, R5, R10 & R11 Chosen to match C2, C3, C4 & C5. Typical value is 3.3K to 6.8K.
2) C2, C3, C4 & C5 matched to 1%.
3) U1, U2 & U3 = µA747 ; U4 = µA741

QF FILTER
MAIN BOARD
SCHEMATIC/LAYOUT DRAWING