

MFJ-722 INSTRUCTIONS

INTRODUCTION¹

The MFJ-722 OPTIMIZER consists of a tunable notch filter combined with a switch selectable highpass/lowpass filter (SSB) and bandpass (CW) filter. This filtering capability allows you to remove interference from both SSB and CW signals thereby optimizing the desired signal.

INSTALLATION

1. Connect any 9-18 VDC, 300 ma power supply to the POWER jack on the rear of the MFJ722. An optional AC adapter (MFJ-1312B) is available from MFJ Enterprises, Inc. Use a 2.1 mm Coaxial plug with the Center pin positive. A 12 VDC, 300 ma power supply is required for maximum audio power output.
 2. Connect a 4 to 16 ohm speaker to the SPEAKER jack or connect a set of mono or stereo headphones to the PHONE jack on the rear of the MFJ-722.
3. Connect a shielded lead, with the proper connector, from the external speaker or headphone jack of your receiver or transceiver to the INPUT jack on the rear of the MFJ-722. The INPUT jack accepts an RCA phono plug.

CONTROLS

ON-OFF/BYPASS SWITCH:

When depressed, power is applied to the circuit as indicated by the front panel LED. When out, power is removed from the circuit and the input signal is switched directly to the SPEAKER and PHONE jacks. The filter circuit is bypassed.

NOTCH:

Varies the frequency of the notch filter section from 300 Hz to 3000 Hz.

SELECTIVITY:

NOTCH-Only the notch filter in the MFJ-722 affects the signal in this switch position.
NOTE: The notch filter is operable in all other SELECTIVITY switch positions except BYPASS.

SSB MODE:

HP- The notch filter is followed by a highpass filter which passes all frequencies above 375 Hz. Frequencies below 375 Hz are rejected at the rate of 12 db/octave. This position greatly reduces 60 Hz and 120 Hz and hum and other frequency noise and interference.

2.5- The HP filter is followed by a lowpass filter that rejects frequencies above 2.5 KHz.

2.0- The 2.5 KHz filter is followed by another lowpass filter to give a cutoff frequency of 2.0 KHz.

1.5- The 2.0 KHz filter is followed by another lowpass filter to give a cutoff frequency of 1.5 KHz.

CW MODE:

The center frequency of the CW filters is approximately 750 Hz. The signal level peaks when you tune the signal to this tone. Low Q stages are used for minimum ringing.

180- A single stage, 2 pole active bandpass filter is selected with a 3 db bandwidth of approximately 180 Hz. This position is useful for light QRM levels.

150- A two-stage active filter is selected. This position is useful for moderate to heavy QRM levels.

110- The steeper skirts of three active bandpass filter stages are selected. This position is useful for moderate to heavy QRM levels.

80- Four active filter stages are selected for a very narrow bandwidth and very steep skirts. You must be careful to tune slowly while switching to this position. Slight retuning may be needed due to drifting of your receiver and/or the transmitting station. This position is useful for heavy QRM levels.

BYPASS:

All filter sections of the MFJ-722 are bypassed and the signal is fed directly to the amplifier circuit. The circuit is designed to supply a signal to the output which is virtually the same as the unfiltered input.

REAR PANEL CONTROLS

NOTCH BANDWIDTH:

This control allows adjustment of the bandwidth of the notch filter section only. This control is recessed and a screwdriver is necessary for adjustment. As the control is turned clockwise, as viewed from the rear, bandwidth decreases. Narrow bandwidth tuning is easy but removes a larger slice of signal.

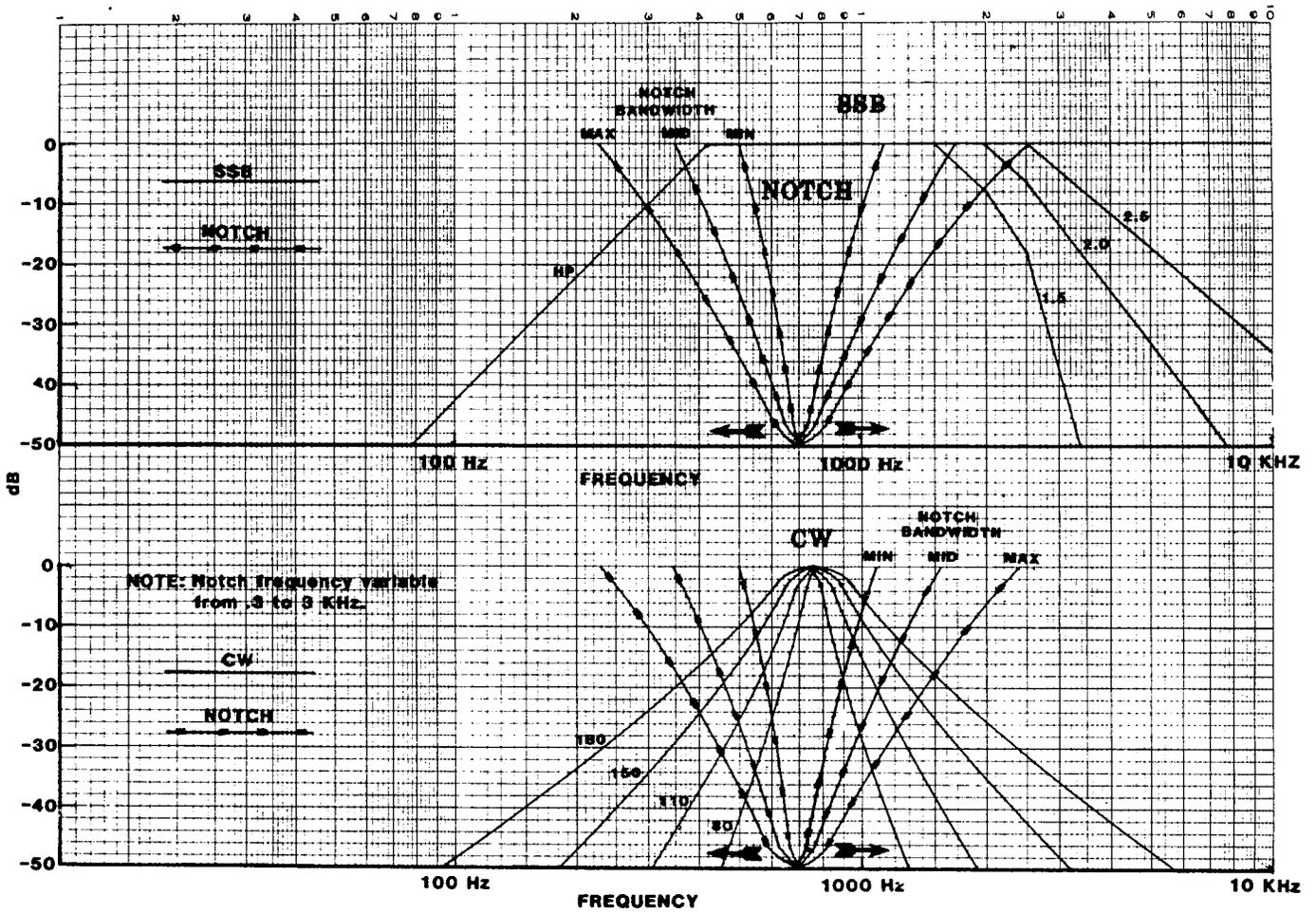
GENERAL OPERATIONS:

After connection as described in the INSTALLATION section, the MFJ-722 is ready for use. The notch filter in the MFJ-722 is useful for removing interfering signals near the desired signal such as heterodynes, stations tuning up on your QSO, or CW signals near frequency. Care should be taken that the NOTCH BANDWIDTH control is not set to high or too low. If set too low, the bandwidth is so large the notch filter appears inoperable. If set too high, the bandwidth is so narrow that the NOTCH tuning is very critical and the notch frequency is hard to locate. The BANDWIDTH control is factory set to approximately mid-position. This is recommended until you become familiar with its effect. To use the notch filter only, set the SELECTIVITY switch to the NOTCH position. After tuning in the desired signal on your receiver, adjust the NOTCH control to attenuate unwanted signals near the tuned signal.

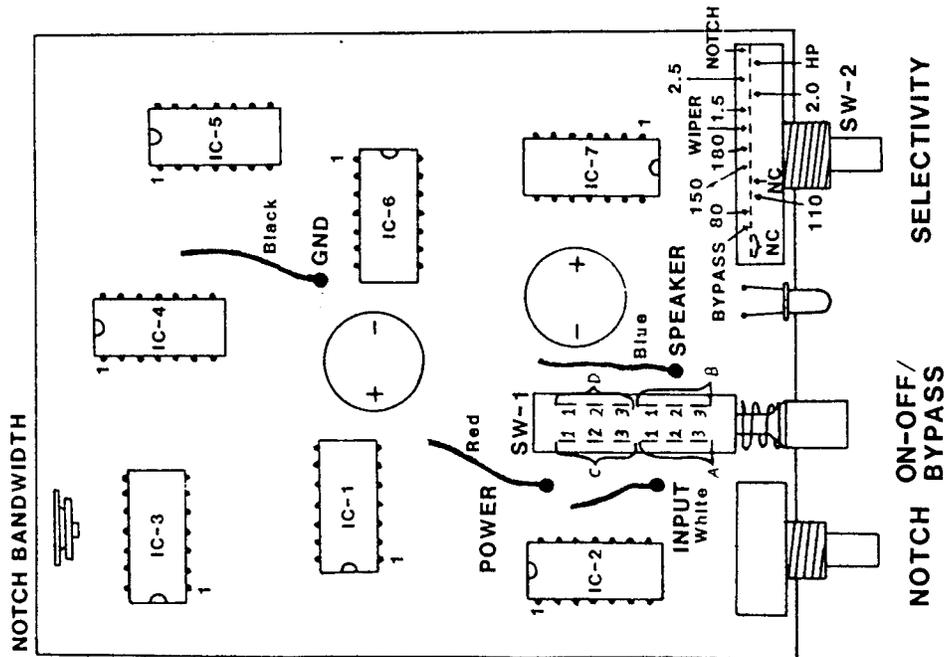
The SSB positions of the SELECTIVITY switch optimizes the desired signal by attenuating unwanted high or low frequencies. In the HP position, frequencies below approximately 375 Hz are attenuated reducing interference such as 60 Hz and 120 Hz hum. In the 2.5, 2.0, and 1.5 position, a lowpass filter is activated in addition to the highpass filter. The range of frequencies passed to the

speaker or headphones is progressively narrower as the switch is changed from 2.5 to 2.0 to 1.5. Only those frequencies above *the HP* cutoff frequency of 375 Hz and below the selected lowpass cutoff frequency are passed.

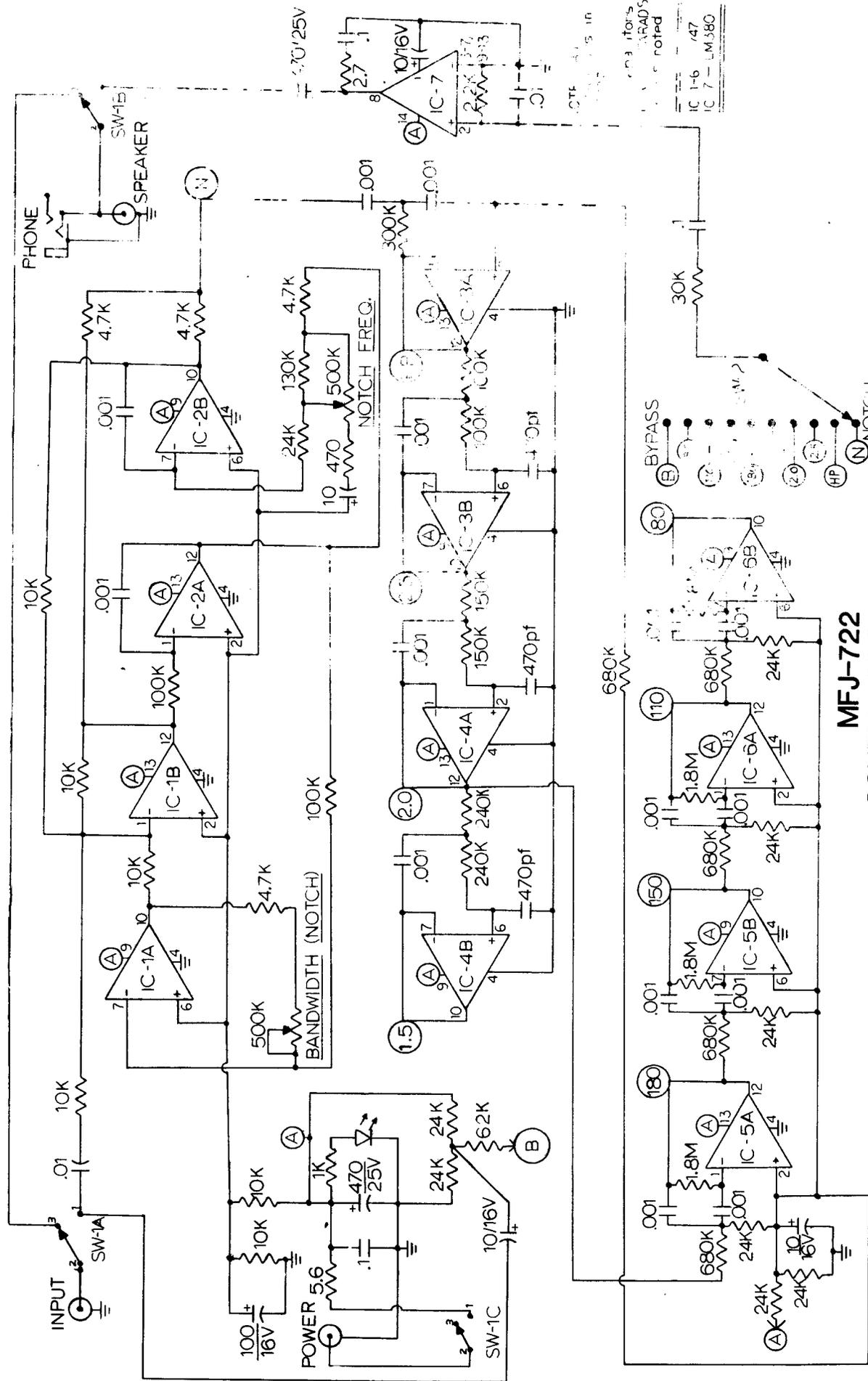
In the CW SELECTIVITY switch positions, bandpass filters of switchable bandwidth are activated. The 3 db bandwidth is as set by the SELECTIVITY switch at either 180 Hz, 150 Hz, 110 Hz, or 80 Hz. At the 80 Hz position, the selectivity is **so great** that you may notice a "talking in a barrel" or slight ringing effect. This **is normal** for this position. NOTE: 1) Be aware that the notch filter is operable at all SELECTIVITY switch settings except BYPASS. If *you* do not desire the notch function while using the SSB **or** CW switch positions, rotate the NOTCH control fully clockwise to minimize the notch filter effect.



MFJ-722 FREQUENCY RESPONSE CURVE



MFJ-722 COMPONENT LOCATION DIAGRAM



MFJ-722
SCHEMATIC DIAGRAM

NOTE: All resistors in ohms are indicated by a trailing zero.
 IC 1-6 - 741
 IC 7 - LM380