

## **INTRODUCTION**

Thank you for purchasing the MFJ-751B Tunable CW Audio Filter. The MFJ-751B consists of a four stage, switch selectable band pass CW filter, using selected components that will make “cleaning up” CW signals effortless and easy. Featuring razor sharp selectivity with extremely steep sided skirts and a Tunable Notch, makes even the weakest signal stand out. Also, the MFJ-751B has a built-in 1 watt audio amplifier that will easily drive headphones or an external speaker. With the MFJ-751B you “bring up” any hard to hear signal out of a “band pile up” for easy listening, or get rid of unwanted, annoying signals. The MFJ-751B also features a headphone output that will allow the use of standard mono headphones. The MFJ-751B is powered from any 9-18 volt DC power supply.

## **OPERATING INSTRUCTIONS**

You may use the MFJ-751B with any communications receiver or scanner. You can also use the MFJ-751B with a ham-radio transceiver. The MFJ-751B requires a 9-18 volt DC source.

There are a few items that you will need to operate the MFJ-751B. We have provided a list of these items below for your convenience.

- Communications Receiver, scanner, or Ham Radio transceiver with proper cables.
- 9-18 volt DC power supply
- External speaker with a 3.5mm mono plug
- Mono Headphones with 1/4" phone plug. (optional)

### **Receiver or Scanner Operation:**

As mentioned in the above, you can use the MFJ-751B with a communications receiver or scanner. A BFO, or Beat Frequency Oscillator, or a Fine Tuning control will assist you in fine tuning the received signals.

1. The filter requires audio from the external speaker or headphones output of the receiver or scanner. Apply the audio signal to the **INPUT** jack on the back of the unit. The **INPUT** jack is a RCA phono jack, which requires an RCA phono plug. The center pin of the RCA phono is positive, while the outer shell is ground.
2. Connect the **POSITIVE** lead of the external speaker to the **TIP** of a 3.5mm mono plug. Connect the **NEGATIVE** lead of the external speaker

to the SLEEVE of the 3.5mm mono plug. Plug the 3.5mm mono plug into the **EXT SPEAKER** jack on the back of the unit.

3. Connect the POSITIVE power supply lead to the CENTER conductor of a 2.1mm coaxial DC plug. Connect the NEGATIVE power supply lead to the outer SLEEVE of the 2.1mm coaxial DC plug. Before plugging in the power to the MFJ-751B, set **POWER** switch to the **OFF** position (out). If you choose to use a pair of headphones, then *DO NOT* plug the headphones into the filter until the **POWER** switch is set to the **ON** position (in).
4. Turn the receiver volume all the way down, then set the **POWER** switch to the **ON** position (in). Set **NOTCH/PEAK** switch to the **NOTCH** position (in). Now turn the receiver up slightly so you can hear the received signals on the external speaker or headphones. The signal you are listening to is the "filtered" signal. Using the tuning knob on the radio, tune in a signal you want to listen to. Then use the **FREQUENCY** and **SELECTIVITY** controls to clean up any unwanted or annoying interference.

The maximum filter settings are when the **FREQUENCY** and **SELECTIVITY** controls are set fully clockwise. This is the highest "Q" setting for the filter. Note that at maximum selectivity you may experience a "ringing" effect; this is normal. The most usable setting for the **SELECTIVITY** control is when it is about 10-15% less than the maximum setting.

The **PEAK/NOTCH** switch is a dual function switch. The IN position is **NOTCH**, while the OUT position is **PEAK**. How you use the MFJ-751B dictates what position this switch will be in. Placing the switch in the **PEAK** position allows you "peak" desired signals; bringing them up where they are more readable and out of the SSB noise. Using the filter with the switch in the **NOTCH** position allows you to actually notch or null out nearby signals and interference.

Use the **FREQUENCY** control to "peak up" desired signals while the **NOTCH/PEAK** switch is in the **PEAK** position. While the **NOTCH/PEAK** switch is in the **NOTCH** position, the **FREQUENCY** control can be used to "notch" or "null" unwanted interference.

You can also use a pair of mono headphones with a 1/4" mono plug attached. Connect your headphones to the **HEADPHONES** jack on the rear panel.

## **THEORY OF OPERATION AND SPECIFICATIONS**

### **Operation:**

The MFJ-751B uses two TL084 operational amplifier integrated circuits to form a tunable audio filter designed to clarify and remove interfering signals from both voice and digital signals. The Peak and Notch functions are variable, giving the user full control of the filter bandwidth and frequency settings. This not only allows you to remove interference, but also to enhance desired signals.

The filter also has an LM380 Audio Amplifier which can drive an 8 ohm speaker or headphones.

### **Specifications:**

Bandwidth: ..... Variable from 40 Hz to nearly flat

Center Frequency:..... Variable from 300-3000 Hz.

Notch Depth: ..... Approximately 70dB

Power Required: ..... 9-18 volts DC @ 300mA

PCB Dimensions: ..... 4.000" x 4.700" printed circuit board.

## **TECHNICAL ASSISTANCE**

If you have any problem with this unit first check the appropriate section of this manual. If the manual does not reference your problem or your problem is not solved by reading the manual you may call *MFJ Technical Service* at **662-323-0549** or the *MFJ Factory* at **662-323-5869**. You will be best helped if you have your unit, manual and all information on your station handy so you can answer any questions the technicians may ask.

You can also send questions by mail to MFJ Enterprises, Inc., 300 Industrial Park Road, Starkville, MS 39759; by Facsimile to 662-323-6551; or by email to [techinfo@mfjenterprises.com](mailto:techinfo@mfjenterprises.com). Send a complete description of your problem, an explanation of exactly how you are using your unit, and a complete description of your station.

**PARTS LIST**

<b>Qty</b>	<b>Description</b>	<b>Reference</b>
1	2.7 ohm resistor (red-violet-gold)	R35
1	5.1 ohm, 1/2 watt resistor (green-brown-gold)	R32
1	68 ohm resistor; 1/2 watt (blue-gray-black)	R36
3	470 ohm resistor (yellow-violet-brown)	R10, R28, R29
1	2.2K ohm resistor (red-red-red)	R11
4	4.7K ohm resistor (yellow-violet-red)	R5, R6, R7, R8
2	4.7K ohm resistor (yellow-violet-red)	R18, R33
4	10K ohm resistor (brown-black-orange)	R1, R9, R12, R13
3	10K ohm resistor (brown-black-orange)	R19, R20, R23
3	10K ohm resistor (brown-black-orange)	R30, R31, R34
2	24K ohm resistor (red-yellow-orange)	R3, R22
3	100K ohm resistor (brown-black-yellow)	R2, R14, R15
2	100K ohm resistor (brown-black-yellow)	R17, R21
1	130K ohm resistor (brown-orange-yellow)	R4
1	240K ohm resistor (red-yellow-yellow)	R16
4	.1uF disc ceramic capacitor (104, 104Z)	C1, C3, C16, C17
3	.01uF disc ceramic capacitor (103, 103Z)	C2, C4, C15
4	1000pF polystyrene capacitors (1000J)	C5, C6, C7, C8
1	100uF electrolytic capacitor	C12
2	470uF electrolytic capacitor	C11, C14
1	10uF electrolytic capacitor (radial leads)	C13
2	10uF electrolytic capacitor (axial leads)	C9, C10
2	TL084 quad operational amplifiers	U2, U3
1	LM380 2 watt audio amplifier	U1
1	10K ohm horizontal trimpot (10K)	R25
1	500K ohm horizontal trimpot (500K)	R24
2	500K Dual Linear potentiometer	R26, R27
2	2-pole 2-position push button switch	SW1, SW2
1	RCA phono jack	J4
1	1/4" stereo phone jack	J5
1	3.5mm stereo jack	J2
1	2.1mm coaxial DC jack	J3

**SCHEMATIC**