



# INTERNATIONAL RADIO

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## FT-1000MP Background Noise Reduction, Sensitivity Improvement Modification

### INTRODUCTION

The FT-1000MP is an outstanding performer with excellent design. A number of users have, however, noticed background noise or hiss in the MP audio output. This noise is coming from the 8.215 MHz and 455 kHz IF stages. The front end gain is low and the RF noise cannot override the IF noise.

This mod kit adds a few dB gain after the 70.455 MHz IF amplifier and before the mixer to the 8.215 MHz filters. The gain at the lower frequency IFs is then reduced through a menu item, and the net result is a noticeable reduction in the annoying IF hiss and a reduction in the noise floor of the receiver of 3 or 4 dB. The net result is a more sensitive receiver which has a better, more pleasing sound.

The mod kit is supplied completely assembled. The installation consists of plugging in a small board which will snap onto standoffs installed in the MP Audio board. Measured performance is as follows:

Noise floor unmodified, tuned mode, 40 meters, 500 Hz filters	-128 dBm
tuned mode, modified	-132
Noise floor unmodified, flat mode, 40 meters, 500 Hz filters	-135
flat mode, modified	-137
Dynamic range improvement	1 to 2 dB

A BONUS mod is included which improves the sound of the main receiver audio on CW.

### INSTALLATION INSTRUCTIONS

**Warning:** *The FT-1000MP contains components which may be damaged by static discharge. Precautions must be taken to eliminate any static electricity buildup between the operator and the radio before any of the internal circuits are touched. If you are not familiar with the proper techniques for this, consult the Radio Amateur's Handbook.*

1. Remove the AC line cord from the transceiver.
2. Remove the bottom cover.
3. On the Audio Board, locate the outlined area labeled AF-FIL in the board quadrant nearest the center of the radio and the rear panel.
4. Locate the two holes at diagonally opposite corners of the outlined area.
5. Using a nut driver or pliers, press two board mounting standoffs (supplied) into the holes. Use care to not overstress the pc board. A rocking motion is most effective.

International Radio ©1998. Modifications are done at your own risk; seek help if you are not qualified. International Radio assumes no responsibility for any damages or injuries resulting from the improper installation of this modification kit.

- \_\_6. Slip the assembled MP mod board onto the connectors in the radio and gently press the board down until the standoffs snap into the mounting holes. Thread the nylon nuts onto the standoffs.
- \_\_7. Locate the IF cable plugged into J2003 on the left center part of the IF board and pull it out.
- \_\_8. Feed the cable under the wires between the IF and Audio boards, and insert it into the coax jack marked IN on the MP mod board.
- \_\_9. Slip one end of the cable supplied with the kit into the coax jack marked OUT on the MP mod board.
- \_\_10. Slip the other end of the supplied cable into J2003 on the IF board.
- \_\_11. Replace the cover and set the radio right side up.
- \_\_12. Replace the AC line cord.
- \_\_13. While holding the FAST and LOCK switches in, turn on the power.
- \_\_14. Locate menu item 9-1 (by pressing FAST and ENTER simultaneously) and reduce the setting by one or two increments.

This completes the installation. You will notice that you will hear more front end noise and less hiss. The radio will sound much more "lively".

#### **BONUS: MAIN RECEIVER AF FILTER MODIFICATION (Thanks, K9AN)**

Both the main and sub receivers have an active low pass filter in the audio chain. These filters are in use when the DSP is off. The pass band characteristic of the main receiver filter is flat to about 1500 Hz, and the sub receiver filter peaks around 700 Hz up to + 2.5 dB. The sub receiver filter has a substantially lower response to the noise components above 1000 Hz. This makes it a bit more pleasing to listen to. The addition of one capacitor to the main receiver filter can provide a similar audio response and cut the high frequency hiss by 10 to 15 dB.

The Yaesu schematics show these filters as being the same. In some of the MPs the filter values are not what the schematic shows and there is a difference between the main and sub receiver filters. The components involved are shown in the table below:

#### **LPF Values**

Component	Schematic	Actual	After "Bonus" Modification
R3018	15K	12k	No change
R3019	15K	12k	No change
C3015	0.033 $\mu$ F	0.015 $\mu$ F	0.062 $\mu$ F
C3026	0.0047 $\mu$ F	0.0068 $\mu$ F	No change

If your radio has values indicated by "Actual" above, the addition of a 0.047 capacitor (supplied) across C3015 will improve the audio as described. C3015 is located on the AF board in the central area, near the rear panel. The capacitor can be added from the top of the board if care is used.

#### **PARTS LIST**

Assembled PC Board  
 Cable  
 Two Board Mounts with nuts  
 Bonus Mod.           .047  $\mu$ F capacitor

## Instructions for the FT-1000MP Mark V only.

The male connector used in the FT-1000MP to power the Inrad mod has been left off of the Mark V audio board. In order to power the Inrad mod, two #22 wires, each about 1" long, must be inserted into the pad holes as shown. These wires should be formed to stand straight and vertical to the audio board after insertion. The wire insulation should be removed after soldering. Next the plastic board stand offs should be inserted in the holes provided. Then the Inrad mod can be lowered to the audio board so that the #22 wires go into the proper holes in the mod connector. No soldering to the mod is required as the wires are acting as connector pins. After the mod is snapped in place the excess #22 wire should be trimmed off.

**NOTE: Use care that the wires are not pushed too far through the pad holes, as they may contact the chassis of the radio and short the +5 volts.**

