

# MFJ

## USB Radio Interface

*Model MFJ-1204*



### INSTRUCTION MANUAL

CAUTION: Read All Instructions Before Operating Equipment

# MFJ ENTERPRISES, INC.

300 Industrial Park Road  
Starkville, MS 39759 USA  
Tel: 662-323-5869 Fax: 662-323-6551

**Introduction:** The MFJ-1204 puts you in touch with Ham Radio's digital revolution without complex wiring or setup procedures. In fact, the MFJ-1204 is easier to set up and use than any other USB-interface on the market. All you need is an existing radio, a computer, some free downloadable software, and your MFJ-1204.

**MFJ-1204 Features:**

- [ ] Full USB connectivity
- [ ] Powered by USB port, no power adapter needed.
- [ ] Dedicated on-board sound card
- [ ] Quick plug-and-play Windows connectivity
- [ ] Only two adjustable controls to operate
- [ ] Works with all digital modes
- [ ] Dozens of free downloadable programs available
- [ ] Innovative PTT detector circuitry eliminates tricky VOX delay adjustments
- [ ] Order "plug-and-play" for your radio -- no jumpers to set or connectors to wire
- [ ] Order separate cables to use your MFJ-1204 with other radios
- [ ] Perfect for base station, portable, or go-kit emergency operation

**Connecting to your Radio:** When you order the MFJ-1204 and specify a particular radio, it will come with all interface jumper wires pre-installed along with the correct interface cable and connector. The MFJ-1204 part number suffix specifies which configuration is the right choice for your transceiver (see the following table on the next page):

| MFJ-1204 With Cable Included | Cable Only Part Number | Cable Termination                | Radio                                                                                      | Jumper Dia. |
|------------------------------|------------------------|----------------------------------|--------------------------------------------------------------------------------------------|-------------|
| MFJ-1204P4                   | MFJ-5704P              | 4-pin round Mic connector        | Any with 4-pin connector                                                                   | P           |
| MFJ-1204P8                   | MFJ-5708P              | 8-pin round Mic connector        | IC-728, 735, 738, 746-pro, 751<br>756-Pro, 761, 765, 775, 781                              | A           |
| MFJ-1204J11                  | MFJ-5711J              | RJ-11 6-pin modular connector    | Any with RJ-11 Mic jack                                                                    | G           |
| MFJ-1204J45                  | MFJ-5745J              | RJ-45 8-pin modular connector    | IC-706 (Mic port)                                                                          | B           |
| MFJ-1204D5                   | MFJ-5705D              | 5-pin DIN, TenTec Data/Acc       | Argo-V, Jupiter, Omni-VII<br>Pegasis                                                       | F           |
| MFJ-1204D8                   | MFJ-5708D              | 8-pin DIN (Data/Acc)             | Any with 8-pin DIN port                                                                    | M           |
| MFJ-1204D13I                 | MFJ-5713DI             | 13-pin DIN, Icom Data/Acc        | IC-706, 716, 7000, 7200, 7300<br>7410, 9100                                                | D           |
| MFJ-1204D13K1                | MFJ-5713DK1            | 13-pin DIN, Kenwood Data/Acc     | TS-140, 450S, 850, 870, 950<br>570D, 590S, 660, 2000                                       | E1          |
| MFJ-1204D13K2                | MFJ5713DK2             | 13-pin DIN, Kenwood Data/Acc     | TS-440, 690                                                                                | E2          |
| MFJ-1204D13K3                | MFJ-5713DK3            | 13-pin DIN, Kenwood Data/Acc     | TS-940                                                                                     | E3          |
| MFJ-1204MD6                  | MFJ-5706MD             | 6-pin mini-DIN, Yaesu, Icom      | FT-100, 817, 687, 897, 950, 991<br>IC-706, 746, 7000, 7400<br>Any with 6-pin mini-DIN Data | C           |
| MFJ-1204K3                   | MFJ-5700K3             | Elecraft Audio I/O and PTT jacks | Elecraft K3                                                                                | I           |
| MFJ-1204KX3                  | MFJ-5700KX3            | Elecraft KX3 Mic, phone jacks    | Elecraft KX3                                                                               | H           |
| MFJ-1204K                    | MFJ-5700K              | Baofeng, Wouxun, Kenwood HTs     | Chinese HTs, UV-5R etc                                                                     | K           |
| MFJ-1204R                    | MFJ-5700R              | Yaesu HTs                        | Yaesu, FT-50R, VX-8GR                                                                      | L           |
| MFJ-1204UT                   | MFJ-5700UT             | Unterminated                     | No connector, no jumpers<br>installed                                                      | J           |

If you own an Icom 746-Pro, you would purchase the MFJ-1204 model with a P8 suffix. This package provides everything you need to start operating right away.

**Changing Radios:** Suppose, at some future time, you sell your IC-746-Pro and acquire a new Icom-7300. You can transfer the MFJ-1204 to your new radio simply by checking the chart, ordering a MFJ-5713DI cable, and changing the jumper configuration to mirror Diagram D.

**Connecting to the Computer:** Once you're patched in to your radio, you can connect the MFJ-1204 USB signal cable to any free USB port on your PC to obtain power and establish a two-way signal path. Your computer should be turned on and booted up *before this connection is made*.

**Important Note:** *Do not connect the MFJ-1204 to your computer until the prescribed set of jumper wires are installed, the computer is turned on, and its operating system has fully booted up. Also, close any applications that are open and running before plugging in the interface.*

When you plug in the USB interface cable, the computer will signal that one or more new devices have been connected. The interface sound card will then automatically begin loading the following drivers:

*USB Composite Device  
USB PnP Sound Device  
USB Human Interface Device*

Installation typically takes less than a minute to complete. After the drivers have loaded, select **Restart** and reboot your pc before continuing.

***Important Warning: If you don't restart before continuing, some Windows operating systems (such as Vista) may hang up. Always restart right after installing.***

**Choosing a USB Port:** Driver installation is a one-time event *for each USB port you select*. If you change USB ports, the soundcard will repeat the setup sequence and you'll need to **restart** again. It's generally more convenient to delegate one specific USB port to your MFJ-1204 and stick with it.

**Communication Modes:** The MFJ-1204 supports virtually every data and digital-voice mode in use today. With the appropriate software downloads, you can transmit and receive traditional modes such as CW, RTTY, SSTV, AMTOR, PSK31, and EchoLink. Or, you can explore newer modes like MT-63, WINMOR, WSPR, and WSJT-X. If your radio can pass the signal and your computer can run the downloaded communication program, the MFJ-1204's built-in sound card and your PC should handle the rest!

**Selecting a Download Program:** Literally dozens of downloadable shareware communication programs are available. Many are quite inclusive, offering a selection of several modes, while others are highly specialized. It's also true that some simply work better than others. While MFJ doesn't endorse or recommend any particular program, many operators say *HamScope* is well established and covers several popular communication modes, so it might be a good place to start your exploration into the world of digital radio.

**Selecting the USB Soundcard:** Most communication programs will require you to select a sound card as part of their setup procedure. **Select *USB Sound***. This choice directs your computer to access the sound card built into the MFJ-1204 rather than the resident card installed in your computer.

**Receive Audio Level:** The MFJ-1204 **Receive Audio** control is uncritical and relatively easy to set up. When copying signals off-air, simply adjust for the most reliable on-screen display of the incoming signal. If your receiver has built-in audio EQ, set it for flat frequency response ( $\pm 0$  dB) for best results. Also, be sure

to set the **Transmit Audio** level at minimum (fully CCW) and don't attempt to transmit while setting up the Receive Audio control.

**Transmit Audio Level:** Make sure your transceiver is operating into a low-SWR antenna or dummy load before proceeding. Most communication programs offer a **TUNE** function to provide a reference tone for setting transmit levels. Check your program's documentation for tune-up specifics. When setting up, start with the **Transmit Audio** control at *minimum* and bring it up slowly to avoid overdriving. Your signal must be as linear as possible when transmitting digital signals, so consider these setup tips:

[ ] In addition to RF output, always monitor the transmit ALC level and set **Transmit Audio** to a point just *below the threshold of ALC action*. The ALC meter should not deflect while transmitting.

[ ] Be sure to turn off RF any speech processing and/or audio compression. Also, if the radio has built-in transmit EQ, set it up for flat frequency response ( $\pm 0$  dB).

[ ] Most transmitter PAs exhibit gain compression as they approach maximum output. Limiting output to 70% of maximum -- or even a little less -- almost always improves your transmitter's linearity while having little or no impact on signal strength.

[ ] Never use your radio's **Power Output** control to set a power level. Turn it all the way up and use the MFJ-1204 **Transmit Audio** control to set the output level. Most radios use ALC voltage to turn down power output and it degrades transmitter linearity.

[ ] Finally, some digital modes such as RTTY require your transmitter to deliver maximum output power, which can cause the PA stage to overheat. Always follow the manufacturer's guidelines for power output when using high-duty-cycle transmit modes.

**Re-Setting Jumpers:** When resetting jumpers for a new radio, either reuse the existing wires or use #24 tinned solid wire (larger wire could damage pin cups). Do not allow wires to short.

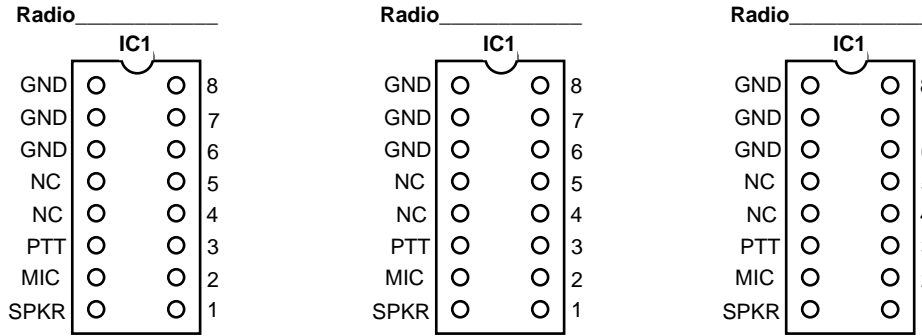
[ ] Remove the two phillips-head screws securing the MFJ-1204 cover.

[ ] Remove the cover and set it aside.

[ ] Locate the 16-pin IC socket directly in front of the RJ-45 jack.

[ ] Note the labeling on the pc board for each of the jumper socket connections.

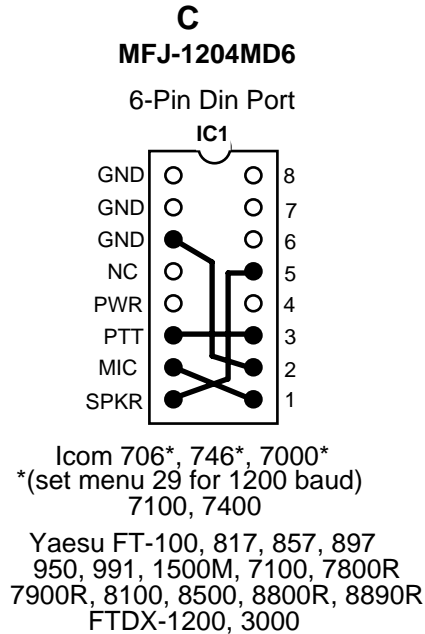
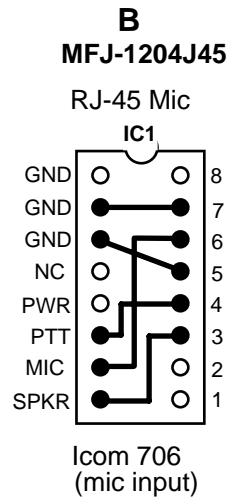
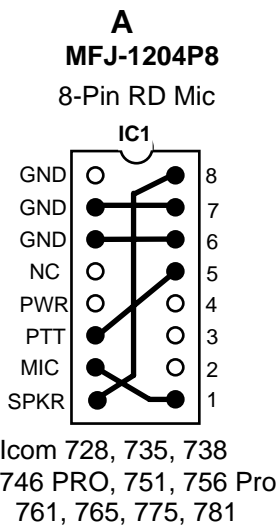
[ ] To reduce the chance of error, pre-plot your wire routing using one of the following templates:

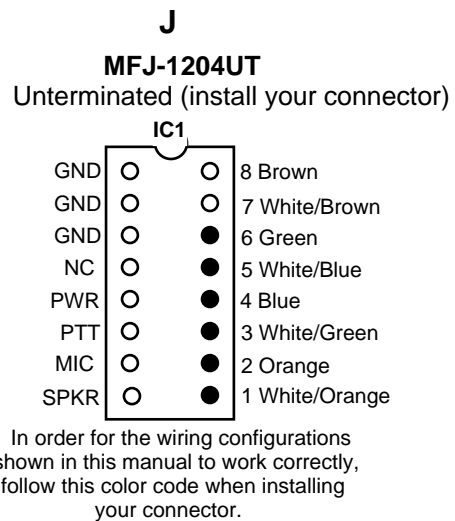
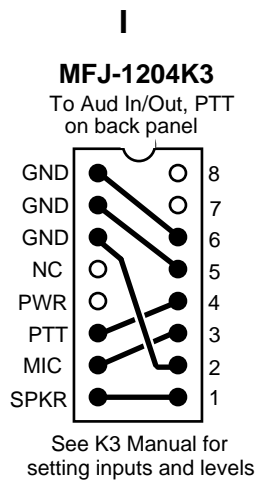
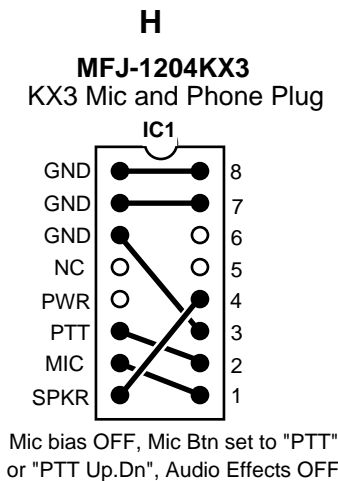
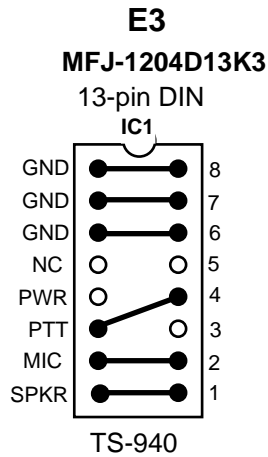
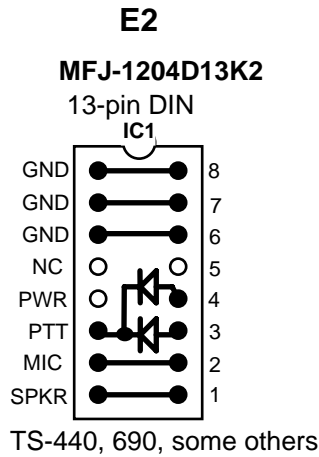
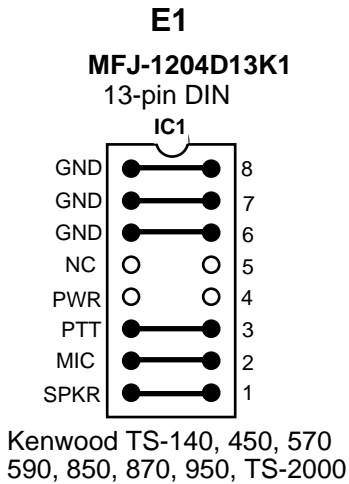
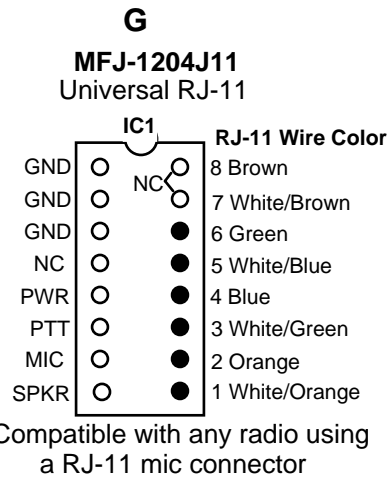
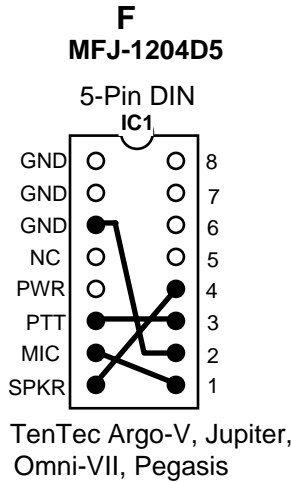
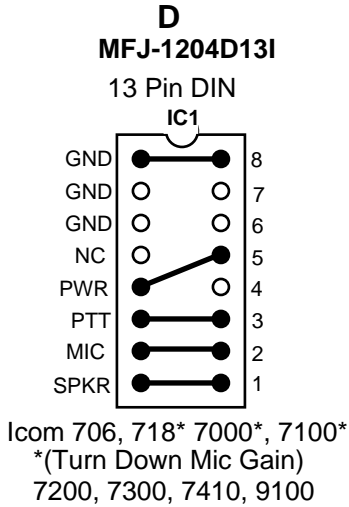


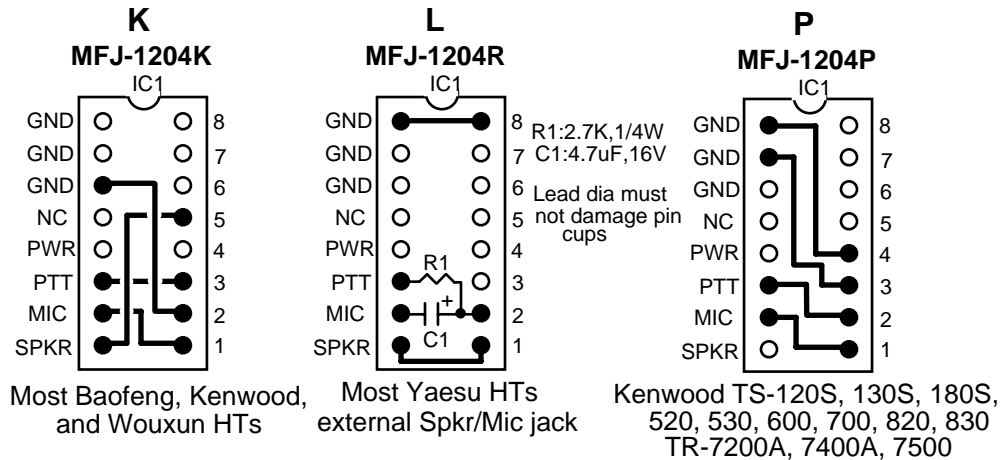
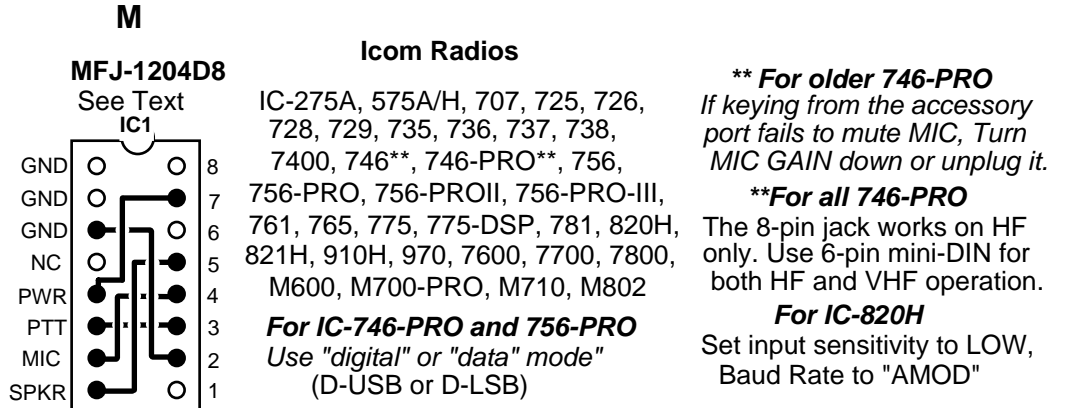
- [ ] Following your diagram, carefully install the jumpers at IC1.
- [ ] Before proceeding, double check your routings to ensure they are correct.
- [ ] Reinstall and secure the MFJ-1204 cover.

If making a cable for an unlisted radio, refer to its operating manual to determine the appropriate jack and pin-out configuration to use.

**Rerouting An Existing Jumper Setup:** Find the model number of your new radio by checking the listings on the diagrams below. The new jumper settings, the required MFJ interface-cable number, and your radio's connector type are shown.







**Special Installation Notes:**

[ ] **Kenwood Radios:** Kenwood radios use 3 different configurations. The connections shown in diagram E1 works for most Kenwood models. However, for the TS-440 or 690, a diode module (supplied with the DK cable) connects from PTT to pins 3 and 4 (see diagram E2, MFJ-5713DK2). If you have a TS-940, move the PTT jumper from pin 3 to pin 4 per (see diagram E3, MFJ-5713DK3). When inserting the 13-pin DIN plug, note the position of the key. If forced, these plugs can be inserted upside down.

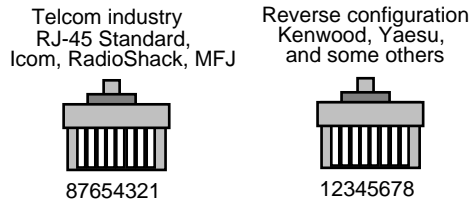
[ ] **MFJ-5713DI** works with Icom radios IC-703, all 706 series and 718. However, when using the **IC-706** or **IC706MKII** on VHF, you'll need to change the PTT jumper from pin 3 to pin 4. For the **IC-706MKIIG**, leave the PTT jumper connected to pin 3, but go into Menu-30 and select **OFF**.

[ ] **Elecraft KX3:** The **MFJ-5700KX3** cable comes terminated with two RTTS connectors that plug into the radio's **MIC** and **SPKR** jacks. It also comes with a



pre-configured jumper module. Be sure both RTTS plugs are fully inserted and the **MIC BIAS** is turned **OFF**. Also, set **MIC BTN** to either **PTT** or **PTT UP-DN**. Finally, cancel any speech processing and eq emphasis.

[ ] **RJ-45 Mic Connectors:** Note that Icom, RadioShack, and MFJ follow telcom industry pin numbering standards -- while Kenwood, Yaesu, and some other radio manufacturers use a reverse order (see below):



All jumper settings shown in this manual have been corrected to compensate for the reversed pin order used by those manufacturers.

## **\*SEE MFJ WEBSITE FOR COMPLETE LIST OF JUMPER DIAGRAMS FOR ALL RADIOS**

### **In Case Of Trouble:**

[ ] **No Power to Interface:** Remove the interface cover. If the sound card is plugged in and receiving power, the red LED on the sound card module will be illuminated. If it is not illuminated, check USB connection at the computer.

[ ] **Communication Program not Working:** Confirm the USB sound card has been selected. Also, use a scope or AC voltmeter to confirm receive audio path is good between the radio and the jumper block.

[ ] **No Transmit, won't key:** Check PTT line from jumper block to transceiver connector for continuity.

[ ] **Low (or no) Output Power, Distorted Transmit Signal:** Check microphone line from jumper block to transceiver connector for continuity. If applicable, check radio's mic gain setting. Also, check Transmit setting on interface.

[ ] **Communication Program won't Load up or run properly:** Confirm that the download program is compatible with your current operating system.

### **TECHNICAL ASSISTANCE**

If you have any problem with this unit first check the appropriate section of this manual. If you are unable to resolve the problem, check the MFJ and Signalink sites for special settings or conditions that may apply to your particular radio. If the manual does not reference your problem or reading the manual does not solve your problem, 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 (FAX) 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.

**NOTES:**

## LIMITED 12-MONTH WARRANTY

MFJ Enterprises, Inc. warrants to the original owner of this product, if manufactured by MFJ Enterprises, Inc. and purchased from an authorized dealer or directly from MFJ Enterprises, Inc. to be free from defects in material and workmanship for a period of 12 months from date of purchase provided the following terms of this warranty are satisfied.

1. The purchaser must retain the dated proof-of-purchase (bill of sale, canceled check, credit card or money order receipt, etc.) describing the product to establish the validity of the warranty claim and submit the original or machine reproduction of such proof of purchase to MFJ Enterprises, Inc. at the time of warranty service. MFJ Enterprises, Inc. shall have the discretion to deny warranty without dated proof-of-purchase. Any evidence of alteration, erasure, or forgery shall be cause to void any and all warranty terms immediately.
2. MFJ Enterprises, Inc. agrees to repair or replace at MFJ's option without charge to the original owner any defective product provided the product is returned postage prepaid to MFJ Enterprises, Inc. with a personal check, cashiers check, or money order for **\$10.00** covering postage and handling.
3. MFJ Enterprises, Inc. will supply replacement parts free of charge for any MFJ product under warranty upon request. A dated proof of purchase and a **\$8.00** personal check, cashiers check, or money order must be provided to cover postage and handling.
4. This warranty is **NOT** void for owners who attempt to repair defective units. Technical consultation is available by calling (662) 323-5869.
5. This warranty does not apply to kits sold by or manufactured by MFJ Enterprises, Inc.
6. Wired and tested PC board products are covered by this warranty provided **only the wired and tested PC board product is returned**. Wired and tested PC boards installed in the owner's cabinet or connected to switches, jacks, or cables, etc. sent to MFJ Enterprises, Inc. will be returned at the owner's expense unrepaired.
7. Under no circumstances is MFJ Enterprises, Inc. liable for consequential damages to person or property by the use of any MFJ products.
8. **Out-of-Warranty Service:** MFJ Enterprises, Inc. will repair any out-of-warranty product provided the unit is shipped prepaid. All repaired units will be shipped COD to the owner. Repair charges will be added to the COD fee unless other arrangements are made.
9. This warranty is given in lieu of any other warranty expressed or implied.
10. MFJ Enterprises, Inc. reserves the right to make changes or improvements in design or manufacture without incurring any obligation to install such changes upon any of the products previously manufactured.
11. All MFJ products to be serviced in-warranty or out-of-warranty should be addressed to **MFJ Enterprises, Inc., 300 Industrial Park Rd, Starkville, Mississippi 39759, USA** and must be accompanied by a letter describing the problem in detail along with a copy of your dated proof-of-purchase and a telephone number.
12. This warranty gives you specific rights, and you may also have other rights, which vary from state to state.

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