MFJ

USB Radio Interface

Model MFJ-1204

INSTRUCTION MANUAL

CAUTION: Read All Instructions Before Operating Equipment

MFJ ENTERPRISES, INC.

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 VOX delay
[ ] Uses widely available interface cables for most popular radios
[ ] Low cost, small size, light weight
[ ] Perfect for base station, portable operation, or "go-kit" use

Overview: You'll begin setup by looking up the jumper settings for your radio (in the manual, on line, or with radio cable instructions). Then, you'll remove the MFJ-1204 cover and install the jumpers as illustrated (it only takes a minute). *Note that you MUST install the jumpers first, before connecting the interface to your computer and radio.*

Once jumpers are installed, the interface's signal cable connects to any free USB port on your computer to obtain power and establish a two-way signal path. Your computer should be turned on and booted up before this connection is made. To complete the setup, install the prescribed radio interface cable between the Radio port (J-45 connector on rear panel) and the mating jack on your transceiver. Step-by-step instructions are provided for set procedures.

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 program, the MFJ-1204's built-in sound card and your PC will handle the rest!

MFJ offers patch cables to fit most popular radios, and these cables are also interchangeable with cables manufactured by SignalLink-USB (and possibly others). Just purchase the correct one for your transceiver, plug in, and go.

Setting Jumpers:

Setting jumpers is a "one-time" procedure that interconnects your particular radio to the MFJ-1204. If possible, use the jumper wires provided (#24 solid or solder-tinned wire works best). Avoid larger wires that could damage the pin cups. These jumpers route ground, PTT, transmit audio and receive audio to the appropriate wires in the interface cable. To set jumpers:
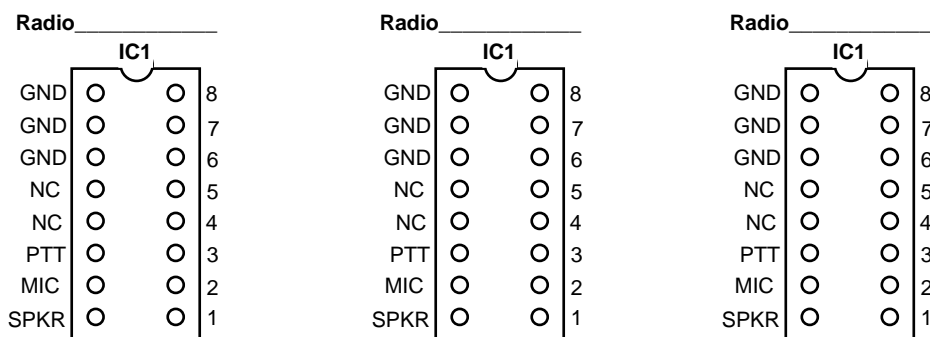
[ ] Remove the two phillips-head screws securing the MFJ-1204 cover.
[ ] Remove the cover and set it aside.
[ ] Locate the 16-pin IC socket directly in front of the J-45 jack.
[ ] Note the labeling on the pc board for each of the socket connections.

To reduce the possibility of error, we recommend drawing out the required jumper routings ahead of time on the template provided below (extra templates also provided in case you change radios at a later time).

Note that this document is a *preliminary manual* for the MFJ-1204, so not all jumper routings have been complied at this time. However, some setups are shown in the back and continually updated setups may be found on MFJ's website and on the Tigertronics Signalink site (jumper settings and interface cables are interchangeable). Settings may also be provided on instruction sheets that come with pre-wired interface cables.

To begin jumper setup:

[ ] Draw in the jumper settings for your particular radio.

Radio_____   Radio_____   Radio_____

	IC1				IC1				IC1	
GND	O	O	8	GND	O	O	8	GND	O	O	8
GND	O	O	7	GND	O	O	7	GND	O	O	7
GND	O	O	6	GND	O	O	6	GND	O	O	6
NC	O	O	5	NC	O	O	5	NC	O	O	5
NC	O	O	4	NC	O	O	4	NC	O	O	4
PTT	O	O	3	PTT	O	O	3	PTT	O	O	3
MIC	O	O	2	MIC	O	O	2	MIC	O	O	2
SPKR	O	O	1	SPKR	O	O	1	SPKR	O	O	1

[ ] Following your diagram, carefully install the jumpers at IC1.
[ ] Double check your installation to ensure it is 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.

Connecting to Your Computer

Important Note: *Do not connect the MFJ-1204 to your computer until the prescribed set of jumper wires have been 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 you pc before continuing.

Important Warning: *If you don't initiate a* ***Restart*** *before continuing, some Windows machines may become unresponsive.* Also, note that driver installation is a one-time event *for each USB port used.* If you change USB ports, the soundcard will repeat the setup sequence and you'll need to ***Restart*** again.

Selecting a Download Program: Literally dozens of downloadable shareware communication programs are available for running a wide range of digital modes. Many are quite inclusive, offering a selection of several modes -- and some may work better for you than others. While MFJ doesn't recommend any particular choice as the best to try, *HamScope* is well established, popular, and covers several communication modes.

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

Receive Audio Level: The interface's receive audio control is fairly uncritical and relatively easy to set. When copying signals off-air, simply adjust it for the most reliable on-screen display of incoming signals. If your receiver has built-in audio EQ, we recommend setting it for flat response (±0 dB).

Be sure to leave the Transmit audio level at minimum (fully CCW) and don't attempt to transmit while setting up the receive 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 the program's documentation for tune-up specifics). When setting up, start with the Transmit 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 the following tips:

[ ] In addition to RF output, always monitor ALC level and *set the interface Transmit level below the threshold of ALC action.* The ALC meter should not deflect during digital transmissions.

[ ] Be sure to turn off RF speech processing and/or audio compression. Also, if the radio has built-in transmit EQ, set it up for flat frequency response (±0 dB).
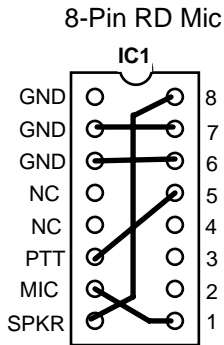
[ ] Most transmitter PAs exhibit gain compression when approaching maximum output. Limiting output to 70% of maximum or even less substantially improves linearity while making negligible difference in received signal strength.

[ ] Never use the radio's Power Output control to set power (use the Transmit control on the interface). Most radios utilize ALC voltage to reduce power and it compromises linearity.
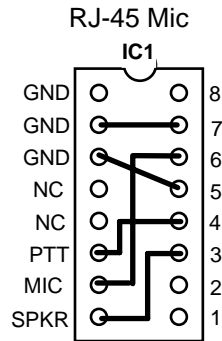
Finally, some digital modes such as RTTY require your transmitter to operate at maximum output power for extended periods. Be sure to reduce output well below maximum or provide supplemental cooling to avoid PA transistors from overheating.

Jumper Setups: These jumper settings are prescribed for the listed HF transceivers. The associated radio cables use the connectors indicated above the pictorials.
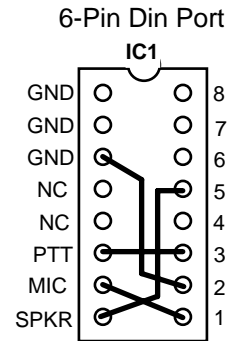
ICOM:

8-Pin RD Mic

IC1

GND	○	○	8
GND	○	○	7
GND	○	○	6
NC	○	○	5
NC	○	○	4
PTT	○	○	3
MIC	○	○	2
SPKR	○	○	1

Icom 728, 728, 735,738
746PRO, 751, 756Pro
761, 765, 775, 781

RJ-45 Mic

IC1

GND	○	○	8
GND	○	○	7
GND	○	○	6
NC	○	○	5
NC	○	○	4
PTT	○	○	3
MIC	○	○	2
SPKR	○	○	1

Icom 706

6-Pin Din Port

IC1

GND	○	○	8
GND	○	○	7
GND	○	○	6
NC	○	○	5
NC	○	○	4
PTT	○	○	3
MIC	○	○	2
SPKR	○	○	1

Icom 706*, 746*, 7000*
7100, 7400
*(set menu 29 for 1200 baud)

ICOM, KENWOOD, TENTEC:

13 Pin DIN

IC1

GND	○	○	8
GND	○	○	7
GND	○	○	6
NC	○	○	5
NC	○	○	4
PTT	○	○	3
MIC	○	○	2
SPKR	○	○	1
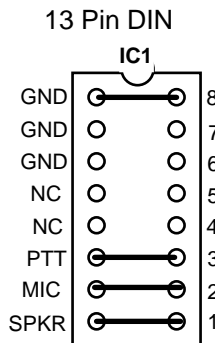
Icom 706, 718* 7000*, 7100*
7200, 7300, 7410, 9100
*(Turn Down Mic Gain)

13-Pin DIN

IC1

GND	○	○	8
GND	○	○	7
GND	○	○	6
NC	○	○	5
NC	○	○	4
PTT	○	○	3
MIC	○	○	2
SPKR	○	○	1
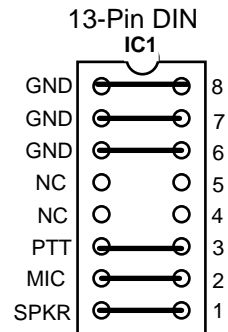
Kenwood TS-140, 450S,
850, 870, 950, 570D, 590S
990, 2000

5-Pin DIN

IC1

GND	○	○	8
GND	○	○	7
GND	○	○	6
NC	○	○	5
NC	○	○	4
PTT	○	○	3
MIC	○	○	2
SPKR	○	○	1
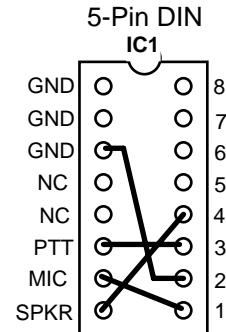
TenTec Argo-V, Jupiter,
Omni-VII, Pegasis

YAESU:

6-Pin Mini-DIN Data Port

IC1

GND	○	○	8
GND	○	○	7
GND	○	○	6
NC	○	○	5
NC	○	○	4
PTT	○	○	3
MIC	○	○	2
SPKR	○	○	1
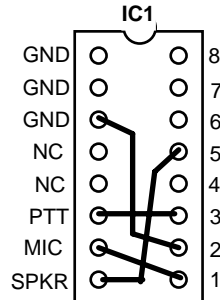
Yaesu FT-100, 817, 857, 897
950, 991, 1500M, 7100, 7800R,
7900R, 8100, 8500, 8800R, 8890R
FTDX-1200, 3000

Check with the MFJ or the SignaLink website for additional settings and operating notes.

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.

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. Also, contact MFJ Technical Support at 662-323-0549 for assistance. Be sure to document the exact nature of the problem so our technicians can provide the most efficient response. You may also contact mfjcustserv@mfjenterprises.com on line with a description of the difficulty.

FULL 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, of 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. This warranty gives you specific rights, and you may also have other rights, which may definitely vary greatly from state to state depending on your location.