

MFJ

DigiLINK™ USB Radio Interface MFJ-1205



INSTRUCTION MANUAL

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MFJ Enterprises, Inc.

300 Industrial Park Rd. Starkville, MS 39759

P: (662) 323-5869

F: (662) 323-6551

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Phone: (662) 323-5869

Fax: (662) 323-6551

Business hours: M-F 8:00 AM - 4:30 PM CST.

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1 THE MFJ-1205

1.1 INTRODUCTION

The MFJ-1205 *USB Radio Interface* enlists you in Ham Radio's ongoing Digital Revolution. Now easier than ever to use, the MFJ-1205 simplifies setup with a single, detachable USB cable. Two front-mounted LEDs give you the device's status instantly, and auxiliary input and output jacks let you monitor your audio, even if you have to use your headphone port for a connection. Building on the success of its predecessor, the MFJ-1204, the MFJ-1205 retains the convenient form factor, yet removes the permanently-attached USB cable. Now the unit can easily be stored for transport.



Figure 1: The MFJ-1205 *USB Radio Interface*

1.2 FEATURES

The MFJ-1205 is a significant leap forward for MFJ's digital products. Some of the features include

- USB 2.0 audio and power
- On-board audio device
- Plug-and-play connectivity
- Internal PTT

Perhaps of greatest importance, the MFJ-1205 has the exact same audio response characteristics as the popular SignaLink USB. The MFJ-1205 outputs PSK (Figure 2a), RTTY (Figure 2b),

CONTESTIA (Figure 2c), and even military-standard M110A waveforms (Figure 2d) identically to the SignaLink, meaning you do not have to choose between quality and affordability!

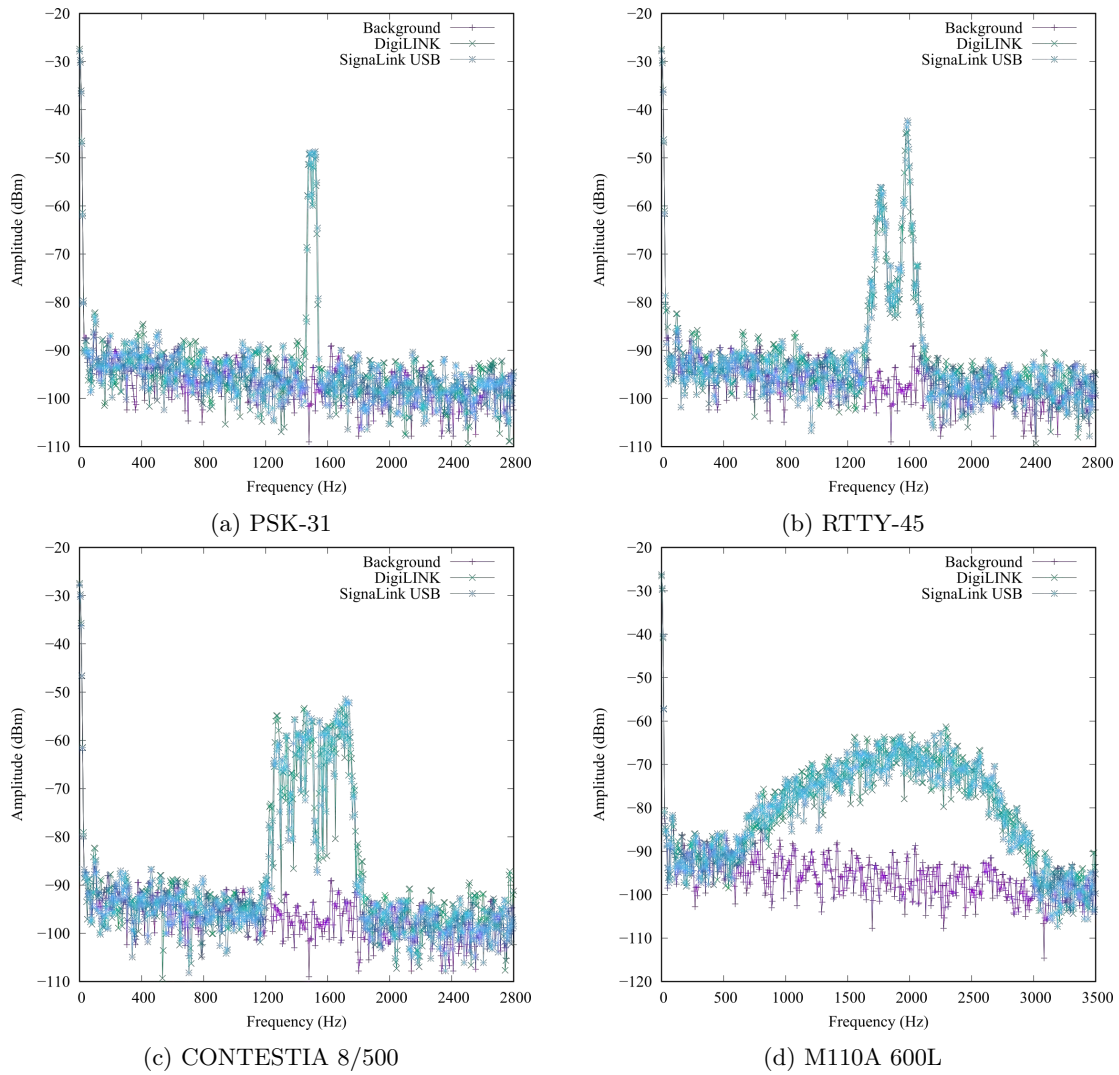


Figure 2: Audio output comparison to SignaLink USB

1.3 CONTROLS & CONNECTIONS



Figure 3: MFJ-2104B Controls & Connections

1. **PTT:** Illuminates when the PTT circuit goes active
2. **STATUS:** Indicates the status of the audio chip
3. **RECEIVE:** Adjust receive audio
4. **TRANSMIT:** Adjust transmit audio
5. **IN:** Auxiliary audio input
6. **OUT:** Auxiliary audio output
7. **RADIO:** Connect to radio
8. **USB:** Connect to computer

2 SYSTEM SETUP & OPERATION

2.1 INSTALLATION

Connecting the MFJ-1205 is incredibly simple. First, plug the unit into any free USB port on your computer. Second, plug the audio cable into the appropriate radio ports. Make sure that your computer has properly mounted the interface, and you're good to go! One of the benefits to using the MFJ-1204 is that if you ever upgrade your radio, you don't have to purchase an entirely new unit. Simply order a new cable and jumper board, swap them out with the old ones, and reconnect! Table 1 lists all of the current jumper board and cable combinations available for the MFJ-1205.

Once connected to your computer, the MFJ-1205 will be recognized and mounted as an audio device. The exact details of this will vary depending on your operating system. Look for "USB Audio Device." During this process the green LED may flash about once per second depending on the OS, but will glow steadily once ready. At this point the MFJ-1205 is ready to be used by your favorite software.

Table 1: Jumper Boards and Cables

Board	Cable	Termination	Radios
PA	MFJ-5704P	4-pin Round	Any 4-pin round microphone jack
G	MFJ-5706G	6-pin MiniDIN	Xiegu G-90 & X5105
MD6	MFJ-5706MD	Yaesu & ICOM 6-pin MiniDIN	FT-100, 687, 817, 897, 950, 991 IC-706, 746, 7000, 7400
P8	MFJ-5708P	8-pin Round	IC-728, 735, 738, 746Pro, 751, 756Pro, 761, 765, 775, 781
J11	MFJ-5711J	RJ-11 6-pin Modular	Any RJ-11 microphone jack
J45	MFJ-5745J	RJ-45 8-pin Modular	IC-706 microphone port
D5	MFJ-5705D	Ten-Tec 5-pin DIN	Argo-V, Jupiter/Pegasus, Omni-VII
D8	MFJ-5708D	8-pin DIN	Any 8-pin DIN data port
D13I	MFJ-5713DI	ICOM 13-pin DIN	IC-706, 716, 7000, 7200, 7300, 7410, 9100
D13K1	MFJ-5713DK1	Kenwood 13-pin DIN	TS-140, 450S, 570D, 590S, 66, 850, 870, 950, 2000
D13K2	MFJ-5713DK2	Kenwood 13-pin DIN	TS-440, 690
D13K3	MFJ-5713DK3	Kenwood 13-pin DIN	TS-940
K3	MFJ-5700K3	Elecraft Audio I/O Jacks	Elecraft K3
KX3	MFJ-5700KX3	Elecraft KX3 I/O Jacks	Elecraft KX3
K	MFJ-5700K	Baofeng, Wouxun, & Kenwood	Handytalkies
R	MFJ-5700R	Yaesu	Handytalkies
UT	MFJ-5700UT	Unterminated	No connectors

2.2 DIGITAL-MODE AUDIO ADJUSTMENT

Operating digital modes is very different than operating traditional phone or CW modes. For starters, not every mode works well at all power levels. PSK31, for example, is an excellent low-power mode (<20 W); however, driving PSK31 at 100 W not only can damage most radios (they typically are not built for 100% duty cycle), but it can distort your signal into something undecipherable, create spurious harmonics, *and* increase your bandwidth to the point where you are wiping out everyone else around you. This is the epitome of bad operating, but fortunately it is fairly easy to avoid with a basic understanding of how your radio is generating its signal.

Most analogue HF radios simply inject audio from a digital interface somewhere along the audio input circuit. Radios built before the rise of digital modes often require the audio to be injected at the microphone port, while newer radios typically have an auxiliary input that bypasses some of the initial audio conditioning at the mic for a more stable signal. Regardless of the exact method, the audio is injected onto the same line, and therefore must pass through the ALC circuit on the way to the finals.

Most of us are used to simply adjusting the power control to where we want to be, speaking into the mic, and then adjusting the mic gain to minimize distortion. For digital modes, you want to do something a little different. For less-complex analogue radios (i.e. the ones for which you need an external digital interface) you actually want to open up your power control all of the way and use the audio controls on your interface to adjust transmit power.* The reason for this is to keep the ALC from turning on and distorting your signal. The drawback is that it is easy to undermodulate your signal, increasing your signal-to-noise ratio. Another common method is to set the power to the desired level, then slowly increase the audio volume until the ALC “just barely flickers.” This method makes full use of your dynamic range and will produce the best signal-to-noise ratio; however, it does involve using the ALC as the upper limit, runs the risk of overmodulating your signal, and requires constant fine tuning as you move around the band. Both of these techniques are valid, and the best one to use will depend on your radio and your operating style.

In order to make the audio adjustments easier, the MFJ-1205 has two sets of audio controls. The first is the direct control of the audio chip’s output level through the computer. the second is the pair of potentiometers on the front of the unit. As discussed earlier, we do not want to overdrive the digital audio; however, interfaces such as the MFJ-1205 require a certain audio threshold to engage the PTT circuit. This threshold is met by increasing the volume using the Pi until the PTT LED is solidly on. It is quite likely that this will be too much audio drive for the desired power output; therefore, a 10 k Ω potentiometer has been placed in the output audio circuit. Adjusting this pot will lower the audio drive while still maintainin the level required to activate the PTT circuit.

*Remember that the power of an AM or sideband signal is directly proportional to the volume of the input. This is why shouting at the mic on AM or sideband will get you more power.

3 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 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. Send a complete description of your problem, an explanation of exactly how you are using your unit, and a complete description of your station.

USER NOTES