MFJ

MFJ Multi-Band CW Transceiver

Model MFJ-9200

INSTRUCTION MANUAL

CAUTION: Read All Instructions Before Operating Equipment

MFJ ENTERPRISES, INC.

<u>DISCLAIMER</u>

INTRODUCTION

The MFJ-9200 is a bold new addition to MFJ's legendary QRP transceiver line, delivering unmatched 6-band CW performance in a compact pocket-sized package. QRP radios have always been small in size, but thanks to direct-digital synthesis and microprocessor technology, the MFJ-9200 represents a quantum leap over traditional designs with an unprecedented number of features at an affordable price.

The MFJ-9200 covers 80 through 15 Meters with computer-modeled plug-in filter modules that yield no-compromise receiver performance and QRP+ transmit power on every band. There's also built-in iambic keying with a manual-key sensor, a programmable CQ message, and seamless QSK T/R switching. DDS frequency control delivers rock-solid VFO stability, precise 100-Hz readout, and eight memory channels per band. Plus, you get a choice of three main-dial tuning rates and RIT with 10-Hz tuning resolution. Other features include selectable IF-bandwidth for monitoring SSB or CW, a 20-dB front-end attenuator for overload protection, and a switched backlight for the LCD display. There's also plenty of receiver overlap for monitoring time signals and international short wave broadcasting. The MFJ-9200 runs on any power source between 8 and 15 VDC and draws 40 mA on receive with the display backlight turned off -- perfect for prolonged off-the-grid adventures. Best of all, the MFJ-9200 is the smallest and lightest backpack transceiver currently available.

In order to take full advantage of the MFJ-9200's many operating features, please read this manual carefully before attempting to set up and operate your QRP station. The MFJ-9200's microprocessor controls are surprisingly simple and intuitive to operate with only a minimum of familiarization. Nevertheless, as with any electronic device, failing to follow the prescribed set-up and operating instructions could result in permanent damage. Once you become familiar with basic setup and operating procedures, feel free to use the *Quick Menu* in the back of the manual as a refresher.

Important Warning: Before attempting to operate your MFJ-9200 on air, please read through the entire manual. Failing to adhere to prescribed setup and operating recommendations could result in permanent damage to your radio!

SPECIFICATIONS

Frequency Control: DDS, 60-MHz reference frequency
VFO Tuning Steps: 100-Hz, 1-kHz, and 100-kHz
RIT Step: 10-Hz
VFO Memories: 8 per band
VFO Display: LCD, 802-pixel, switched backlight
VFO Display Frequency Resolution:
      100-Hz, 10-Hz   with RIT activated
Operating Modes:
      Transmit - A1 (CW), Receive - A1, A3J (LSB or
      USB)
CW Offset: ~700 Hz
T/R Switching: Full QSK
Frequency Coverage, MHz:

Band	80-M	40-M	30-M	20-M	17-M	15-M
Receive **(MHz)**	3.24 -4.9	5.9- 7.5	9.4- 12.1	13.5 - 15.8	17.4- 19.1	18.5 - 22.0
Transmit **(MHz)**	3.5- 4.0	7.0- 7.3	10.1 - 10.15	14.0 - 14.35	18.068- 18.168	21.0 - 21.45

Receiver MDS: 0.1-uV, all bands
AGC Threshold: 3 to 5-uV, all bands
Bandwidth: Selectable, 600-Hz CW, 2.5-Hz SSB
Audio Output: 100-mW, 8-Ohm load, stereo plug
Receiver Current Drain:
      ~40-mA no backlight, ~80 mA with backlight
Transmitter Keying:
      Iambic with straight-key sensing, Auto-CQ memory
Speed Range: 3-45 WPM
Transmitter Power:
      5-W or better, all bands, at 12.6 Volts
Harmonic and spur suppression:
      -50 dB or better, all operating voltages
Typical Transmit Current: 0.9-A at 10-V, 1.2-A at 14-V
**Supply Voltage:** 8-15 VDC at 1.5A
Dimensions: 4.8"x3.15"x1.34", 120x80x34-mm
**Weight:** 7.4 oz, 200 gm

CONNECTIONS

Power Source: Use any well-filtered DC power supply or battery pack with output in the 8-15 VDC range and capable of 1.5-Amps or more. *DO NOT connect the MFJ-9200 to a source exceeding 15 VDC or permanent damage may result.*

Power Connection: Use a standard 2.1-mm concentric power plug with plus (+) connected to the center and ground (-) connected to the outer sleeve. The MFJ-9200 has a built-in series diode to protect against accidental reverse-polarity connection, but we also strongly recommend *fusing the plus (+) lead of your power source at 2-A* to provide over-current protection in the event of an accidental short or component failure.


2-A Fuse **2.1-mm Plug**
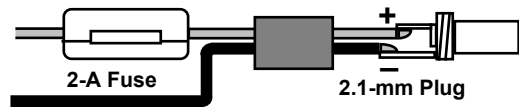
Antenna: The antenna jack accepts a standard BNC male connector or BNC-to-UHF adapter, as required. Connect any coax-fed resonant antennas with SWR measuring under 2:1 directly to the radio. Antennas exhibiting higher SWR or using balanced feeders should be matched to 50-Ohm unbalanced line using an external antenna tuner (ATU). Never intentionally transmit into high-SWR loads, as extreme mismatch may cause the radio to emit out-of-band signals exceeding FCC guidelines. A prolonged high-SWR condition may also damage internal components.

Headphones: Use any 8 to 32-Ohm stereo headset outfitted with a 3.5-mm stereo plug. Note that the radio's audio output circuit *is not wired to accept monaural plugs.* Connecting phones or a speaker wired with a monaural plug will shunt the audio signal to ground. To obtain monaural output, use a 3.5-mm stereo plug and leave the ring disconnected.
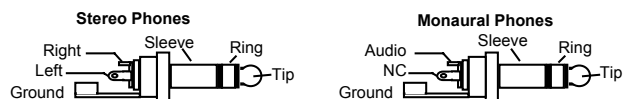

Paddle or Straight-key Wiring: Configure paddles with a 3.5-mm stereo plug. Connect the dot contact to the tip, dash contact to the ring, and ground to the sleeve. Configure manual keys using a monaural plug with the contactor connected to the tip. If using a stereo plug with a manual key, connect both the ring and sleeve to ground.
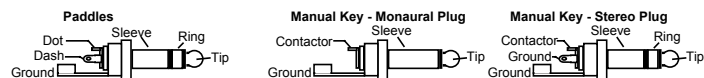
TRANSCEIVER OPERATION

Installing Band Modules: Prior to powering up, identify and install the filter module for the band you intend to use. The band is marked on the filter pc board. To access plug-in headers for the module, remove the two knurled screws securing the radio's case and slide off the back.
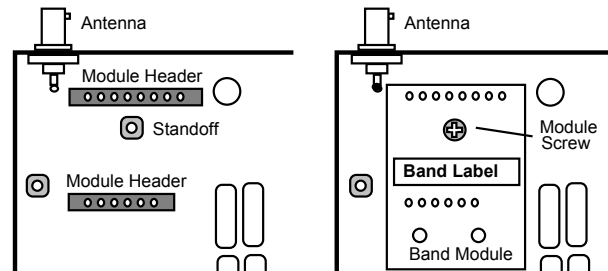
The band-module headers are located directly below the BNC antenna connector. Line up the module and install it component-side down, as shown. Fasten in place using the module retention screw and reinstall the case. *Note that the retention screw should always be used to ensure firm seating and good grounding.* Also, note that a filter module must be installed for the DDS to recognize a band of operation.

Key Detection: The MFJ-9200 features a key-detection circuit. The sensing circuit initializes *each time the radio is powered up*. If paddles are connected or if no key is installed, the keyer initializes in *Automatic Mode* and sends the letter **A** in code. If a straight key is installed when the radio is powered up, the keyer senses *Manual Mode* and sends the letter **M**.

Important Note: The radio's default is *Automatic Mode*. If a manual key is plugged in *after the radio is powered up*, the radio will transmit a continuous string of dashes until the key is unplugged or the radio is rebooted. This condition occurs because the keyer misinterprets the manual key's monaural plug as a ring-to-sleeve contact closure. To correct it, simply switch the power off and turn it back on again to re-initialize the keyer.

Power On: After connecting a power source, antenna, headphones and key, you're ready to begin. It may prove helpful to have your radio set up and connected to a dummy load when going through this portion of the manual so you can check out each function without causing on-air interference. Using the **POWER** switch located on the front panel, power up the radio and set **VOLUME** for a comfortable listening level.

Boot Screen: During power-up, the LCD screen displays the selected band. Example: [**Band-20m**]. Also, the keyer side-tone sends the letter **A** or **M** in code to identify the type of key that is plugged in.

Operating Screen: After two seconds, the boot screen switches to an operating screen that displays the following information:

(1.) Upper-left: Shows IF bandwidth [**CW**] or [**LSB**]/[**USB**] (depends on band in use). Every four seconds, this readout momentarily switches to show power supply voltage. Example: [**12.6**].

(2.) Upper-right: Shows VFO status. A [**V**] means the tunable VFO is active and [**M**] indicates the *Memory Mode* is selected (see **MEM-VFO**). The adjacent number [**1-8**] shows the current memory channel. When power is applied, the radio comes up in *Memory Mode* [**M**].

(3.) Lower Line: Shows the radio's active operating frequency for the VFO or memory channel. Resolution is normally 100-Hz, but diverts to 10-Hz when the RIT is activated.

Band Error: If no filter module has been installed, the display will flash [**BAND-???**] to alert you that a module needs to be installed.

Transmit Error: If the transmitter is keyed *while the VFO is tuned outside the amateur band*, the top line of the display flashes [**TX ERROR**] and transmission is blocked.

Push-Button Controls: Front-panel switches control most transceiver functions. There are five red pushbuttons plus a momentary push-in switch built into the **TUNE** knob. Four switches activate more than one function and require two types of user input. The *primary* switch-input is a momentary press. The *secondary* switch-input is a two-second press and hold. The manual instructions are *"tap"* for a short input and *"depress"* for a long input.

MEM-VFO Switch: To toggle between VFO and MEMORY, *tap* the **MEM-VFO** switch.

In *Memory* mode, [**M**] is displayed and the **TUNE** knob is used to scroll through the channels. The radio normally boots up in memory mode.

In *VFO* mode, [**V**] appears on the display and the **TUNE** knob changes operating frequency. Note that the number of the most recently selected memory channel [**1-8**] is displayed in both the *VFO* and *Memory* modes (many synthesized radios and HTs use a similar VFO/Memory setup).

To load a VFO Frequency into Memory (VFO→Mem):

[ ] *Tap* **MEM-VFO** to [**M**] and rotate **TUNE** to select a desired *memory channel* [**1-8**].
[ ] *Tap* **MEM-VFO** to [**V**] and rotate **TUNE** for the exact frequency you wish to store.
[ ] *Depress* **MEM-VFO** to move the VFO frequency into memory. [**Save**] confirms completion.

To retrieve a Frequency from Memory (Mem→VFO):

[ ] Tap **MEM-VFO** to [**M**] and rotate **TUNE** to select the *memory channel* you wish to recall [**1-8**].
[ ] Tap **MEM-VFO** to [**V**] to transfer it into *VFO mode.* You may now tune up or down the band.
[ ] To update the original stored frequency with a new frequency, depress **MEM-VFO**. [**Save**] will flash on the display to confirm completion. If you don't save a new frequency, the original entry will be retained in memory.

TUNE Switch: The **TUNE** knob has a momentary press-down switch for selecting tuning steps.

[ ] To toggle between 100-Hz and 1-kHz tuning steps, *tap* **TUNE.** The frequency display momentarily underlines the tuning increment you select [_].

[ ] To select *100-kHz* tuning steps for rapid QSY between band segments, *depress* the **TUNE** knob. After shifting band segments, *depress* **TUNE** again to restore normal fine-tuning.

RIT-MODE Switch: Activates RIT function, plus controls bandwidth and sideband selection.

[ ] To use incremental tuning**,** *tap* **RIT** to toggle it on and off. When active, the frequency display shifts to 10-Hz resolution and a dash symbol [**-**] appears to the right of the last digit. The dash symbol [**-**] signifies zero RIT shift. Rotate **TUNE** clockwise to move above zero-shift and note that an up-arrow [↑] appears on display. When tuning below zero shift, [↓] appears. To restore zero-shift, tune opposite the arrow until the dash reappears [**-**]. The normal RIT tuning step is 10 Hz.

[ ] To select bandwidth, d*epress* **MODE** to toggle between narrow [**CW**] and wide [**LSB** or **USB**]. The processor selects the appropriate sideband designation, depending on the band.

ATT Switch: *Tap* to toggle the attenuator on or off. Receive attenuation is approximately 20 dB.

BL Switch: *Tap* to toggle the display's *backlight* on or off. Off conserves power when operating on batteries.

CALL Switch: Initiates an automatic CQ. Also selects several keyer setup functions. Keyer setup functions require connecting a set of paddles to the radio.

[ ] Call CQ: *Tap* **CALL**. The keyer will automatically transmit a complete CQ sequence, inserting the call letters that have been programmed into memory.

[ ] Adjust Keyer Speed: *Depress and hold* **CALL** until you hear the letter **S** played back in code. Release **CALL,** and within five seconds, *press and hold the DOT paddle to increase speed* or *press and hold the DASH paddle to decrease speed.* The sidetone provides audible feedback as the speed changes. When a comfortable rate is found, *tap* **CALL** once to exit. The letter **E** confirms completion of the programming sequence.

[ ] Enter Your Call into CQ Memory: *Depress and hold* **CALL** until you hear the letter **I** (which will follow **S** by a few seconds)**.** When you hear **I**, release the **CALL** button and send your call letters in normal fashion using the paddles. When finished, *tap* **CALL** once to exit.

[ ] Test Carrier: *Depress and hold* **CALL** until you hear the letter **T** (follows **S** and **I**). When you hear **T**, release the **CALL** button and press the *DASH* paddle to initiate a continuous carrier. Press the *DOT* paddle to turn it off. To escape from *Transmit Carrier* mode, *tap* the **CALL** button. The letter **E** will confirm your exit. The *Test Carrier* function allows you to lock the key down when using paddles to take SWR readings or make tuner adjustments.

## TRANSCEIVER CARE AND MAINTENANCE

The MFJ-9200 has no internal "user" adjustment and is designed to be maintenance free. To preserve the finish, avoid using harsh chemical cleaners on the cabinet or on plastic parts. When backpacking or boating, keep the radio dry by sealing it in a Baggie or Pelican case during transport. If it should become wet, remove the back of the case and allow all circuitry to dry out for an extended period before powering up. Do not power up if you observe condensation in the LCD window, and avoid heating at high temperature to accelerate drying. Better to seal it in a container with a desiccant capsule to draw the moisture out at room temperature.

TECHNICAL ASSISTANCE

If you have a problem with your radio, first check all external plugs and cables for shorts or opens and confirm that your antenna is working properly with low SWR. Also, check the operating voltage of the power supply or battery pack and review the radio's various functions to confirm that you haven't inadvertently reset a critical operating parameter. If the problem persists, you may call MFJ Technical Services at 662-323-0549 or the MFJ Factory at 662-323-5869. Have your unit, the manual, and all pertinent information about your station handy so you can answer any questions the technician may ask.

You may also send questions by mail to MFJ Enterprises, Inc., 300 Industrial Park Road, Starkville, MS, 39759 or e-mail *techinfo@mfjenterprises.com.* Be sure to include a complete description of the problem and an exact description of your operating setup and conditions.

MFJ-9200 Quick Reference Menu:
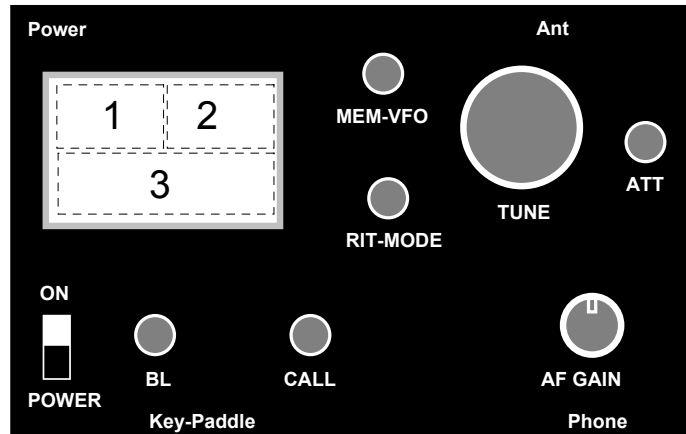
Connections:

Power: 2.1-mm plug, grounded sleeve, positive (+) center, supply 8-15 VDC @ 1.5A.
Antenna: BNC male or BNC-UHF adapter, 50-Ohms unbalanced, SWR 2:1 or less.
Paddle: 3.5-mm plug, dot to tip, dash to ring, ground to sleeve.
Straight Key: Contactor to tip, ground to ring, ground to sleeve (or use a mono plug).
Headphone: 3.5-mm stereo, right channel to tip, left channel to ring, ground to sleeve.

Display Window:

Segment 1: RX Mode [**CW**] or [**USB, LSB**], supply voltage flashes every 4 seconds - Ex [**12.6**]
Segment 2: [**V**] = VFO mode, [**M**] = Memory mode, [**1-8**] = number of memory channel
Segment 3: Frequency Display, 100-Hz readout normal, 10-Hz with RIT.

Control Switch Functions:
MEM-VFO: *Tap* for [**M**] or [**V**]
　　　　Press to enter displayed frequency to memory: **VFO →MEM**

TUNE: *ROTATE* TO TUNE VFO FREQUENCY OR TO SCROLL MEMORY CHANNELS [**1-8**].
　　　TAP TO TOGGLE FINE-TUNE RATE (100 HZ, 1 KHZ).
　　　PRESS TO ENTER OR EXIT FAST TUNE RATE (100 KHZ).

ATT: *TAP* TO TOGGLE 20-DB ATTENUATOR ON OR OFF.

BL: *TAP* TO TOGGLE BACKLIGHT ON OR OFF.

CALL: *TAP* TO CALL AUTO-CQ.

Keyer Functions:
[ ] **SET KEYER SPEED:** *DEPRESS* **CALL** *AND HOLD FOR* **S***,* SET SPEED WITH PADDLES, *TAP* TO EXIT.
[ ] **ENTER CALL IN CQ MEMORY:** *DEPRESS* **CALL** *AND HOLD FOR* **I**, ENTER CALL WITH PADDLES, *TAP* TO EXIT.
[ ] **CARRIER:** *DEPRESS* **CALL** *AND HOLD FOR* **T,** HIT DASH TO ACTIVATE AND DOT TO DEACTIVATE. *TAP* TO EXIT.

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 under warrantee 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. This warranty is NOT void for owners who attempt to repair defective units. Technicalconsultation is available by calling the Service Department at 662-323-0549 or the MFJ Factory at 662-323-5869.
4. This warranty does not apply to kits sold by or manufactured by MFJ Enterprises, Inc.
5. 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.
6. Under no circumstances is MFJ Enterprises, Inc. liable for consequential damages to person or property by the use of any MFJ products.
7. 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.
8. This warranty is given in lieu of any other warranty expressed or implied.
9. 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.
10. All MFJ products to be serviced in-warranty or out-of-warranty should be addressed to:

MFJ Enterprises, Inc.
300 Industrial Park Road
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.
11. This warranty gives you specific rights, and you may also have other rights which vary from state to state.