

MFJ

2-Meter Amplifier

Model MFJ-8802



INSTRUCTION MANUAL

CAUTION: Read All Instructions Before Operating Equipment

MFJ ENTERPRISES, INC.

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DISCLAIMER

Information in this manual is designed for **user purposes only** and is **not** intended to supersede information contained in customer regulations, technical manuals/documents, positional handbooks, or other official publications. The copy of this manual provided to the customer will **not** be updated to reflect current data.

Customers using this manual should report errors or omissions, recommendations for improvements, or other comments to MFJ Enterprises, 300 Industrial Park Road, Starkville, MS 39759. Phone: (662) 323-5869; FAX: (662) 323-6551. Business hours: M-F 8-4:30 CST.

MFJ 2-Meter Linear Amplifier

Introduction: The MFJ-8802 is a back-to-basics multi-mode 150-Watt VHF linear power amplifier for 2-Meters. A pair of high-tech Mitsubishi 12-volt FETs deliver high gain and stability with excellent linearity. Buffered T/R switching will interface with virtually any multi-mode transceiver amplifier keying circuit. Drive requirement is 5 Watts for full output, making it compatible with low-power multimode radios such as the FT-817, KX-3, other QRP SDRs, and most popular 2-Meter transverters. A simple input-attenuator may be added to accommodate 10-to-25 Watt radios. SWR load-fault circuitry protects output transistors from severely mismatched loads. By keeping circuitry simple, the MFJ-8802 is designed to deliver a potent transmit-signal boost at a truly affordable price.

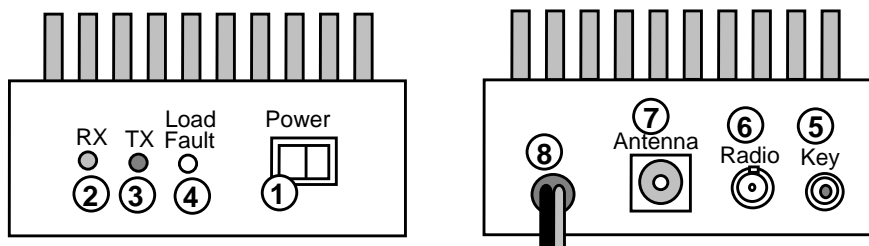
Specifications:

<u>Input:</u>	5 Watts (10/25 Watts with optional attenuator).
<u>Output:</u>	150 Watts PEP SSB/CW, 140-Watts FM*
<u>Harmonics:</u>	> 60 dBc
<u>Input SWR:</u>	<1.5:1
<u>Antenna SWR:</u>	2:1 or less
<u>Keying:</u>	Logic-low or ground contact.
<u>Power:</u>	13.8-Volts at 25 Amps
<u>Size:</u>	5" x 6" x 3"
<u>Weight:</u>	3 lbs.

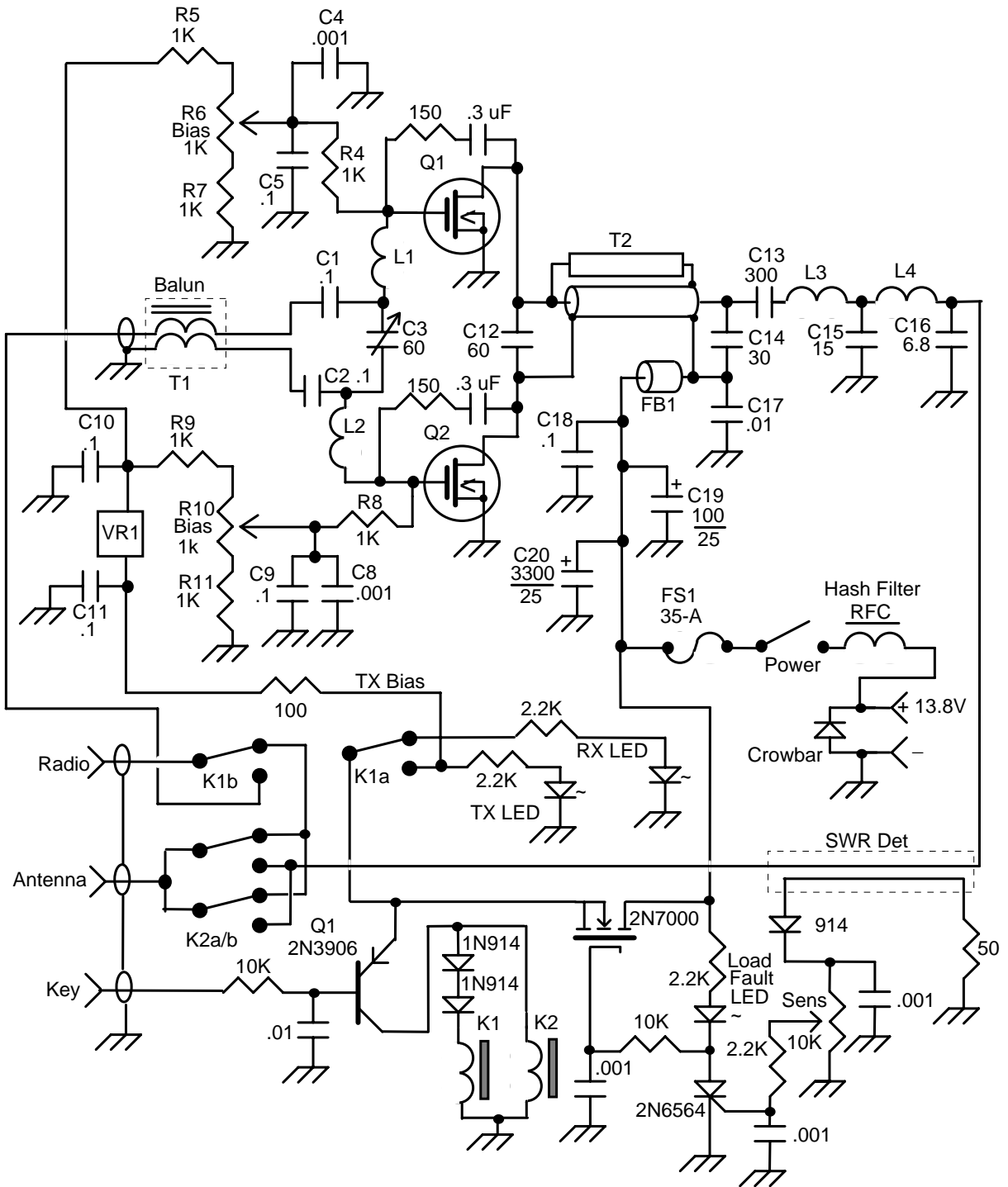
*Heat-sink fan required for extended FM transmissions or key-down digital modes.

Connections and Controls:

1. Power Switch: Applies DC to amplifier circuitry.
2. RX LED: Lights when unit is in receive (bypass) mode.
3. TX LED: Lights when unit is keyed in transmit mode.
4. Load Fault LED: Lights when SWR protection circuit shuts amplifier down.
5. Key Line: RCA female, ground or logic-low input activates transmit mode.
6. Radio Input: BNC female, exciter input line from transceiver.
7. Antenna: UHF female, connects amplifier output to antenna or load.
8. Power Line: Polarized Power-Pole or Molex pigtail available.



Schematic Diagram:



Circuit Description:

Balun T1 splits the phase of the input signal for push-pull operation. Tuned L-network (C2, L1, L2) matches the exciter's 50-Ohm input to the composite load presented by the gates of Q1 and Q2. VR1 provides a regulated bias source for Q1 and Q2 and trimpots R5, R9 set I_{dq} individually. T2 with C6,C8 transform output of Q1, Q2 to up 50-ohms. A half-wave low-pass filter L3,L4 suppresses harmonics. Two 150-Ohm resistors provide negative feedback to enhance linearity and stabilizes input impedance. Five watts drive typically yields 140 watts key-down output. Spurious emissions meet the -60 dBc FCC requirement (part 97.307e). Because MOS-FETs are not prone to thermal runaway, no bias compensation has been provided. Heat-sink temperature should be monitored periodically during prolonged SSB and CW operation, and a muffin fan is required for FM and other high duty-cycle modes. The load-fault protection circuit's strip-line detector drives a thyristor to cut power to T/R switching when SWR exceeds 2.5:1. The load-fault circuit remains latched off until the problem is identified and the main power switch is cycled. A hash filter on the DC line suppresses unwanted RF noise that may occur when using marginally filtered switching supplies.

Important Operating Precautions:

1. **Always** connect a 50-Ohm load or antenna exhibiting 2:1 SWR or better before applying power and keying the amplifier.
2. **Do not** exceed 5-Watts drive unless an appropriate attenuator has been configured inside the amplifier. Also, never use the exciter's RF-output control to reduce amplifier drive to 5 Watts -- its ALC circuitry cannot react fast enough to suppress momentary spikes that can damage the FET gates.
3. **Always** install a fan or other convective air source to cool the heat sink when transmitting on FM, AM, FSK, AFSK, or high duty-cycle digital modes.
4. **Never** exceed 14.5 volts when powering the amplifier.
5. **Do not** attempt to amplify signals without first connecting a key line between your exciter and amplifier*.

*Transmitting through the amplifier with no key-line connection will not damage the radio or amplifier -- the exciter signal simply passes through to the antenna un-amplified. An accessory RF-detection board with adjustable sensitivity may be used in conjunction with transceivers lacking external amplifier keying.

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.

12-MONTH LIMITED 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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