# MFJ-205
# Antenna Resistance Analyzer™


The MFJ-205 Antenna Resistance Analyzer™ lets you determine the feedpoint resistance of your antenna at its resonant frequency. It provides the same information as a conventional RF resistance bridge but is simpler and more convenient to use. The MFJ-205 also determines your antenna's resonant frequency and has a built in frequency generator with a frequency out jack.

## INSTRUCTION MANUAL

CAUTION: Read All Instructions Before Operating Equipment


# MFJ ENTERPRISES, INC.
P.O. BOX 494, MISSISSIPPI STATE, MS 39762, USA


VERSION 1

# 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 of 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 **$7.00** covering postage and handling.

3. MFJ Enterprises, Inc. will supply replacement charges free of charge for any MFJ product under warranty upon request. A dated proof of purchase and a **$5.00** 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 (601) 323-5969.

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 charges will be shipped COD to the owner.

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., 921A Louisville 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.

12. This warranty gives you specific rights, and you may also have other rights which vary from state to state.

# MFJ-205 Antenna Resistance Analyzer™

Thank you for purchasing the MFJ-205 Antenna Resistance Analyzer™. This unit lets you determine the feedpoint resistance of your antenna at its resonant frequency. It provides the same information as a conventional RF resistance bridge but is simpler and more convenient to use. The MFJ-205 also determines your antenna's resonant frequency and has a built in frequency generator with a frequency out jack. The MFJ-205 covers all ham bands from 10 meters to 160 meters. The frequency may slightly vary from what is marked on the front panel. The approximate frequencies are:

| | | | |
|---|---|---|---|
| BAND A | 1.75 - 2.90 | MHz | covers 160 meters |
| BAND B | 3.20 - 5.30 | MHz | covers 80 meters |
| BAND C | 6.50 - 11.00 | MHz | covers 40, 30 meters |
| BAND D | 12.00 - 20.00 | MHz | covers 20, 17 meters |
| BAND E | 18.00 - 30.00 | MHz | covers 15, 12, 10 meters |

The MFJ-205 requires the optional MFJ-1312B power supply adapter or a nine-volt transistor battery. A 9 to 12 volt DC power supply may also be used by connecting a 2.1 mm plug to the cable with the positive wire connected to the center pin and the ground wire connected to the shield.

**CAUTION: Always use an ALKALINE nine-volt battery with this unit. Never use ordinary carbon-zinc batteries.**

To install a nine volt battery, remove the screws holding the cover onto the case. Insert the battery into the battery holder. Tuck the battery snap wires out of the way so they do not interfere with the tuning capacitor rotation. Re-install the cover and screws. The dial calibration is only approximate and is for reference only. A frequency counter can be connected to the FREQ. OUT jack (RCA phono) to get a more accurate reading of the frequency. As an alternative to a frequency counter, you can zero beat the output with an HF receiver. See section III.

## Using The MFJ-205 Antenna Resistance Analyzer™

### I. Finding the resonant frequency of your antenna.

1. To check the resonant frequency of your antenna, connect the antenna with a PL-259 connector to the ANTENNA connector on the MFJ-205. If you are using coax as your feedline, connect the coax directly to the SO-239 (UHF) connector marked ANTENNA. The MFJ-205 is designed for unbalanced coax fed antennas.

2. Set the BAND switch to the band for which your antenna is designed.

3. Adjust the TUNE control throughout its range for minimum meter deflection.

4. Read the approximate frequency off the TUNE scale. This is your resonant frequency.

**NOTE:** For accuracy, use a frequency counter attached to the FREQ. OUT jack on the MFJ-205 or zero-beat against the receiver. See section III.

## II. Measuring the feed point resistance of your antenna at resonance.

1. Find the resonant frequency for a band as in step I.

2. Read the resistance off the meter. This is your approximate feed point resistance at the resonant frequency of your antenna.

**NOTE:** The MFJ-205 can tell you whether your antenna elements are too short or too long. If you find the antenna's resonant frequency is too low the elements are too long. If the resonant frequency is higher than you want the elements are too short. If you are adjusting an antenna for the first time, it is recommended you start with elements a little too long, then shorten to resonance.

## III. How To Zero-Beat The MFJ-205 Against A Receiver

The FREQ. OUT jack on the MFJ-205 has a sine wave output which can be used to accurately check the frequency at which the MFJ-205 is working.

To zero-beat the MFJ-205 against the receiver, loosely couple a wire from the RCA jack (Freq. Out) to the antenna jack on your radio. First, try a small length of wire from the FREQ. OUT jack of the Resistance Analyzer. Just leave it dangling free, not touching the ANTENNA input of the receiver. Place the end of the wire near the receiver input but do not connect to the input unless you simply cannot hear the signal at all in the receiver. The output of the Resistance Analyzer is high. Damage to some radios may occur with a direct connection, so you assume all risk involved in making a direct connection to your radio.

Turn the radio on and tune near the frequency in question. For example, if you found your 40 meter dipole resonates near 7.2 MHz on the TUNE scale, set the radio for 7.1 MHz. Turn the RF and audio down because the signal coming out of the MFJ-205 is pretty strong. Put the radio in the CW mode. If you have a BFO adjustment on your radio, be sure to set the BFO to ON and to 0 (zero).

Adjust the radio's frequency control until you start hearing a tone in the radio's speaker. As you turn the frequency control, the frequency will start at a very high pitch, then decreases to zero pitch. The point where the tone goes to zero Hertz is the "zero beat". That means the MFJ-205's frequency is set to the exact frequency of the radio.

Now make a note of where the dial is set to on the MFJ-205 so you can re-set the frequency if you accidentally bump the TUNE control.

## IV. Using the MFJ-205 as a frequency generator

The MFJ-205 can be also used as a signal generator. Connect a cable to the FREQ.OUT jack to the a signal input. Again, for precision use a frequency counter and not the front panel to set the frequency.