

MFJ-945C VERSA TUNER II INSTRUCTIONS

Thank you very much for purchasing the MFJ-945C VERSA TUNER II.

GENERAL INFORMATION

The MFJ-945C Versa Tuner 11 is designed to match virtually any transmitter (up to 300 watts RF power output) to almost any antenna. This includes dipoles, inverted vees, random wires, verticals, mobile whips, beams, and others fed by coax lines or single wire from 160 thru 10 meters. A 1:4 balun is built in for balanced lines. The MFJ-945C will monitor either SWR or RF transmitter power in two ranges, 30W or 300W

THE SWR/WATT METER

The SWR meter is sensitive down to approximately 5 watts RF output. The SWR reading will not be accurate for a transmitter power of less than 5 watts. To read RF transmitter output power, simply push the FWD/REF button in and set the SENS/POWER control to either 30 or 300. At position 30, the meter will read a maximum of 30 watts. At position 300, the meter will read a maximum of 300 watts.

To read SWR, depress the FWD/REF button and turn the SENS/POWER control for a full scale deflection of the meter. Release the FWD/REF button for the SWR reading. NOTE: The scale sensitivity must be reset for each power level to obtain an accurate reading.

To read reflected power set the FWD/REF button to REF (button out) and the SENS/POWER control to either 30 or 300.

INSTALLATION

1. Install the MFJ-945C between the transmitter and the antenna. A coax line is connected between the transmitter and the SO-239 coax connector marked TRANSMITTER on the tuner.
2. Coax fed antenna must be connected to the SO-239 marked COAX.
3. Random wire antenna must be connected to the five-way binding post marked WIRE. The random wire should be long, high, and as clear of surrounding objects as possible. ***Do not ground the random wire antenna and make sure that the tuner is well grounded to the transmitter.*** A five-way binding post, marked GND, is provided for ground connections. The wire antenna should be a quarter wave length or longer at operating frequency.

4. Balanced line fed antenna must be connected to the two five-way binding posts marked **BALANCED LINE**, and a Jumper wire connected from the left **BALANCED LINE** binding post to the **WIRE** binding post as indicated by the dotted line on the rear of the tuner. This couples the MFJ-945C to the balanced line through a 1:4 balun. **NOTE:** Either a balanced line or random wire antenna can be connected at one time. If a random wire antenna is used, make sure that there is not a jumper wire between **WIRE** and **BALANCED LINE**.

5. If mobile operation is desired, an optional mobile mounting bracket may be purchased from MFJ Enterprises, Inc. The mobile mounting bracket may be installed by first mounting the bracket to the selected location. Two #10-32 X 1/2" screws, two #10 lock washers, and two #10 nuts are provided. Second, slide the MFJ-945c into the bracket and secure it with the four #6 X 3/8" sheet-metal screws also provided. Use one of the four flat washers provided between the bracket and the bottom of the tuner for each of the four #6 sheet-metal screws. **NOTE:** Do not over-tighten the sheet screws.

USING THE MFJ-945C

The **INDUCTANCE** switch, on the MFJ-945C presents a minimum of inductance at position A and a maximum of inductance at position L. Less inductance is needed at high frequencies than at low frequencies for the same impedance. The **TRANSMITTER** and **ANTENNA** controls both present a maximum of capacitance at position 6.

For optimum operation of the MFJ-945C, the transmitter must be tuned for a 50 Ohm Output impedance for the frequency band in operation. The transmitter can be tuned for 50 ohm output impedance by connecting a 50 ohm dummy load at the transmitter output.

After properly tuning your transmitter, install the MFJ-945C as described in "INSTALLATION". Do not readjust the transmitter setting after loading it to the 50 ohm load.

Use the following procedure to tune the MFJ-945C for minimum SWR.

- (1) Set the **TRANSMITTER** and **ANTENNA** controls to 3.5 (the capacitors are half opened).
- (2) Rotate the **INDUCTANCE** control until maximum noise is obtained in receiving mode.
- (3) With the **FWD/REF** switch pushed in and the **SENS/POWER** control set at 30, set the transmitter to the tune position or low power setting and transmit.
- (4) Turn the **SENS/POWER** control clockwise until a full-scale deflection is obtained. If a full-scale deflection cannot be obtained, increase the output power from the transmitter.
- (5) Let the **FWD/REF** switch out for the **SWR** reading.
- (6) If the **SWR** is not 1:1 then tune the MFJ-945C for minimum **SWR**.
- (7) While transmitting and with the **INDUCTANCE** control set the same as for Step 2, alternately adjust the **TRANSMITTER** and **ANTENNA** controls for a minimum **SWR**. Since the **TRANSMITTER** and **ANTENNA** controls interact, the two controls can best be adjusted by turning the **TRANSMITTER** control at a small increment at a time and then rotating the **ANTENNA** control for the minimum **SWR**. Repeat this until a minimum **SWR** is obtained.
- (8) If a **SWR** reading of 1:1 is not achieved, increase or decrease the **INDUCTANCE** control one position and repeat Step 7. **CAUTION** if arcing between capacitor plates occurred, increase or decrease the **INDUCTANCE** control one position and repeat Step 7. **NOTE:** if a

SWR of 1:1 cannot be achieved at this point, repeat Step 7 for each INDUCTANCE control position. Again, do this in the tune mode or at low transmitter power.

(9) After a minimum SWR is achieved, readjust the SWR sensitivity by pushing the FWD/REF switch in and adjust for a full-scale deflection. Let out for the SWR reading. The Transmitter power may now be increased up to 300W. The SWR sensitivity must reset Again after full power is applied. The TRANSMITTER and ANTENNA Controls may need Fine adjustment if the SWR is not 1:1 at high power. NOTE: On 160 M band excessive Heating or arcing may occur. Reduce the transmitter output power until it stops.

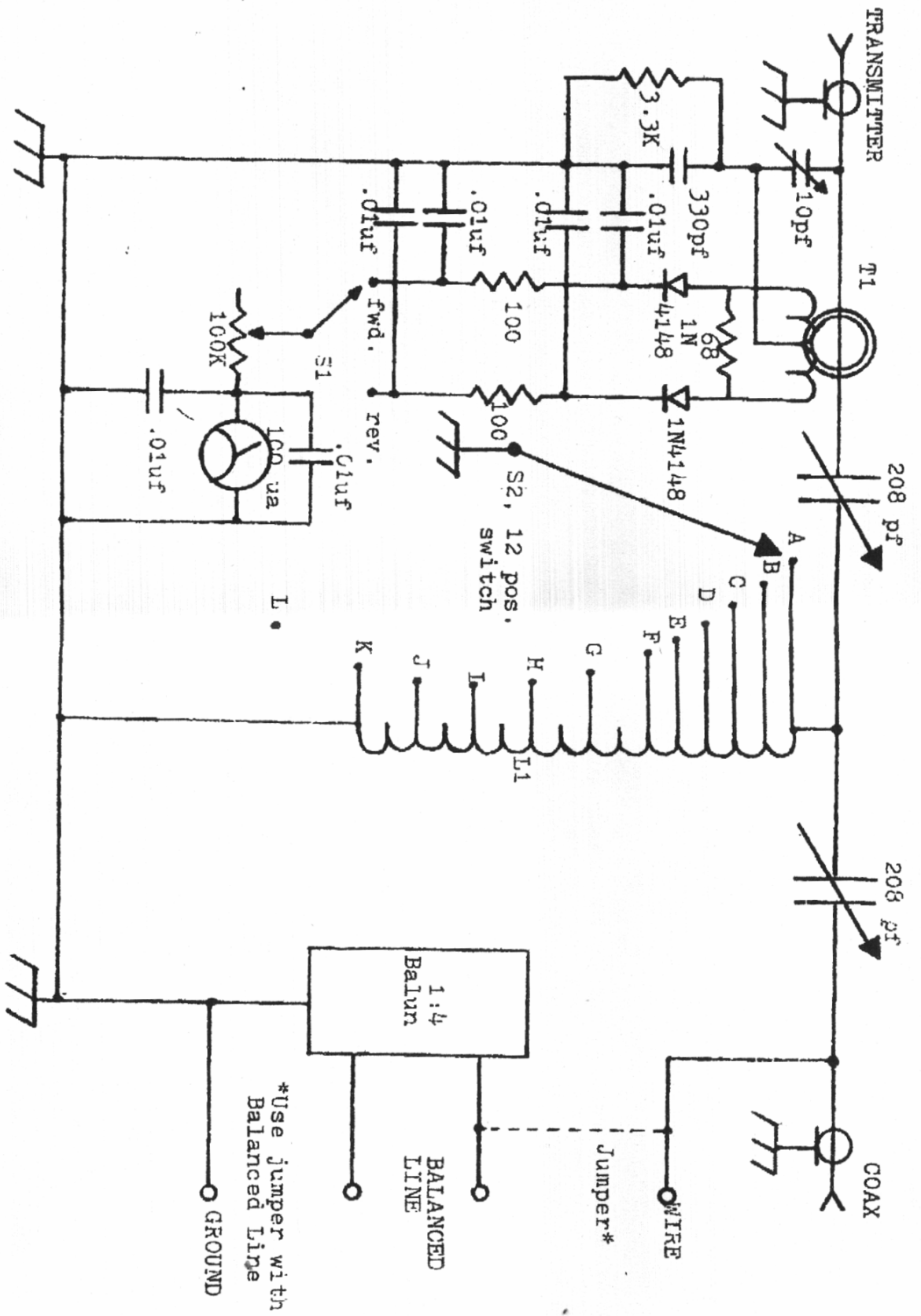
(10) To read the transmitter output power, push the SWR/WATT control in and set it to either 30 or 300.

(11) A SWR of 1:1 can occur from more than one set of control settings on the MFJ-945C when a SWR of 1:1 is obtained, be sure to check the transmitter power and make sure that the transmitter power is relatively high. If the transmitter power has decrease substantially, try another INDUCTANCE control setting and repeat Step 7.

(12) When using the MFJ-945C for receiving only, tune the MFJ-945C as described in Step 1 and Step 2.

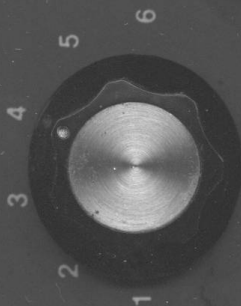
ADDITIONAL NOTES

The SENS/POWER control is factory calibrated for the 300W range. Do not reset the knob or this control. However, due to component tolerance when precision reading is desired, the 30W range can be recalibrated as follows: Push in the FWD/REF switch. Set the SENS/POWER control to 300, note the power on the 300W scale, and then rotate the control clockwise to read the same power level on the 30W scale. Mark the control setting for the recalibrated 30W range.

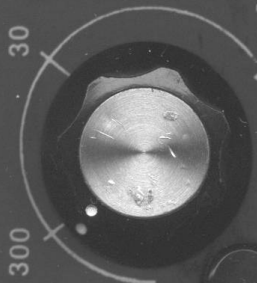


MFJ-945C CIRCUIT DIAGRAM

TRANSMITTER



SENS./POWER

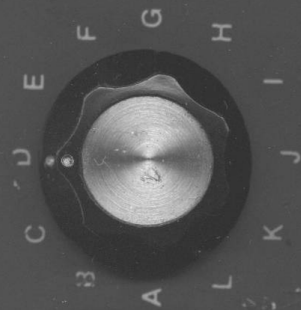


FWD

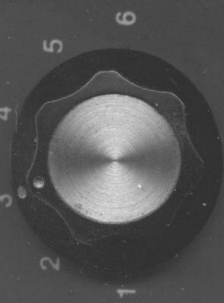
REF



INDUCTANCE



ANTENNA



MFJ VERSA TUNER II
MODEL MFJ-945C

TRANSMITTER

STARKVILLE,
MS, U.S.A.

BALANCED LINE

GROUND

WIRE

COAX

MFJ
ENTERPRISES