MFJ-949C VERSA TUNER II

MODEL MFJ-949C

OWNER'S MANUAL

CAUTION: Read All Instructions Before Operating Equipment.

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MFJ-949C DELUXE VERSA TUNER II INSTRUCTIONS

GENERAL INFORMATION

The MFJ-949C is designed to match virtually any transmitter to almost any antenna, including dipoles, inverted vees, verticals, mobile whips, beams, random wires, and others fed by coax lines, balanced lines, or a single wire. A 1:4 balun is built in for connection to balanced lines. An sntenna selector switch provides versatile antenna selection. A 50 ohm dummy load is built in for easy transmitter tuning. The MFJ-949C will handle up to 300 watts of RF output power from the transmitter from 160 through 10 meters. The MFJ-949C employs a cross needle meter so forward power, reflected power, and SWR can be read simultaneously.

THE SWR/WATTMETER

The meter on the MFJ-949C can be used with the tuner or by itself. To use the meter without the tuner, set the ANTENNA SELECTOR to Coax 1 Direct or Coax 2 Direct. The MFJ-949C utilizes a cross needle meter so FORWARD power, REFLECTED power, and SWR can be simultaneously. The range for both FORWARD and REFLECTED power is either 30 watts or 300 watts. It will read SWR of 1.1 to 5.

To read transmitter RF output power, set the desired range of either 30 watts or 300 watts. Transmit a steady carrier and read the FORWARD power on the FORWARD scale and the REFLECTED power on the REFLECTED scale. SWR is indicated by the crossing point of the two needles. While transmitting, read SWR from the SWR line nearest the crossing point. The meter lamp can be power by a 12V DC source. Use a 2.5mm plug with the tip of the plug connected to the positive.

THE ANTENNA SELECTOR

The ANTENNA SELECTOR switch alows selecting two coax antennas either direct of through the tuner, a balanced line atnenna or wire antenna or a built-in 50 ohm dummy load. The 50 ohm dummy load is rated at 300 watts. CAUTION: DO NOT continously key for more than 2 minutes at a time. DO NOT operate the antenna switch while transmitting. DO NOT use the MFJ-949C for over 300 watts of RF output power, even in the Direct Coax or Dummy Load positions.

INSTALLATION

1. Install the MFJ-949C between the transmitter and the antennas. A coax line is connected to the transmitter and the SO-239 coax connector marked TRANSMITTER on the tuner.

2. One or two coax fed antenna may be connected to the SO-239 coax connectors marked Coax 1 and Coax 2. NOTE: Coax 1 and Coax 2 antennas can be connected directly to the transmitter and by-passing the tuner by setting ANT. Selector to Coax 1 Direct or Coax 2 Direct, respectively.

3. A random wire antenna may 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. For optimum operation, length of random wire antenna should be quarter wave or longer of the operating frequency. Do not ground the random wire antenna. Make sure that the tuner is well grounded to the transmitter. A five-way binding post marked GROUND is provided for ground connection.

4. A balanced line fed antenna may be connected to the two five-way binding posts marked BALANCED LINE. A jumper wire from the WIRE binding post, as indicated by a dotted line on the MFJ-949C, should be connected to one of the post of the BALANCED LINE. This couples the MFJ-949C 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.

USING THE MFJ-949C

The INDUCTOR switch on the MFJ-949C represents a minimum of inductance at positionA and a maximum of inductance at position L. Less inductance is needed at high frequencies than at low frequencies for the same impedence. The TRANSMITTER and ANTENNA controls both represent a maximum of capacitance at position 6. For optimum operation of the MFJ-949C, the transmitter must be tuned for a 50 ohm output impedence for the frequency band in operation. Set ANT. SELECTOR switch to Dummy Load for tuning up the transmitter.
NOTE: Always tune the transmitter at a low output power.

After properly tuning the transmitter, set Antenna Selector to the desired antenna and tune the tuner for a minimum SWR as descirbed below. DO NOT readjust the transmitter loading control setting after loading it to the 50 ohm load.

1. Set the TRANSMITTER and ANTENNA controls to 3.5 (The capacitors are half-opened).

2. Rotate the INDUCTOR control until maximum noise is obtained with your transceiver in the receiving mode.

3. While transmitting and with the INDUCTOR control set the same as for step 2, alternately adjust the TRANSMITTER and ANTENNA controls for a minimum SWR. Since the TRANS-

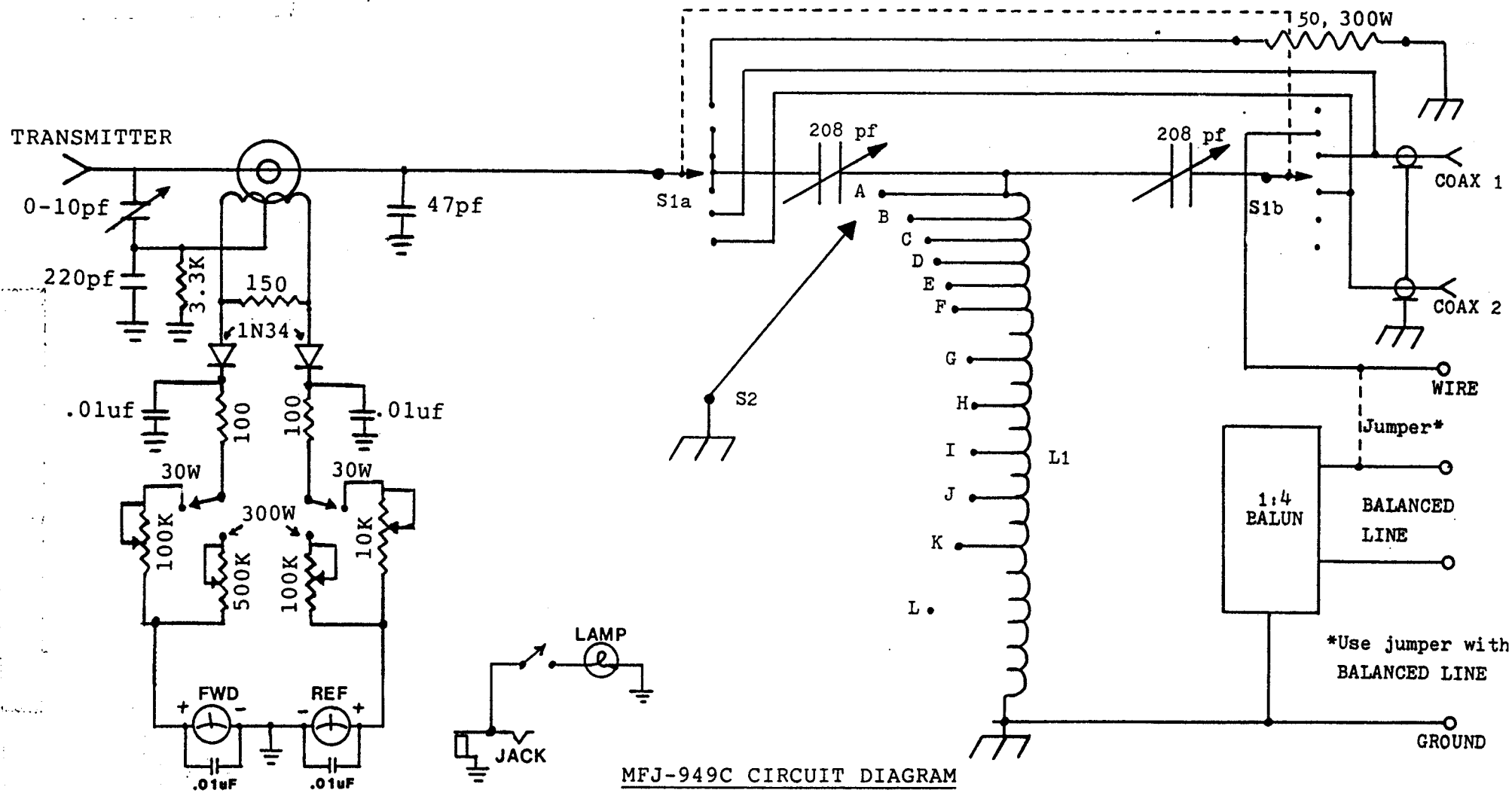
3. MITTER and ANTENNA controls interact, the two controls can best be adjusted by turning the TRANSMITTER control a small increment at a time and the rotating the ANTENNA control for the minimum SWR. Repeat this until a minimum SWR is obtained.

4. If a SWR reading of 1:1 is not achieved, increase or decrease the INDUCTOR control on position and repeat Step 3. CAUTION: If arcing between capacitor plates occurs, increase or decrease the INDUCTOR control one position and repeat Step 3. NOTE: If a SWR 1:1 cannot be achieved at this point, repeat Step 3 for each INDUCTOR control position. Again, do this in the tune mode or at a low transmitter power.

5. After a minimum SWR is achieved, the transmitter power may now be increased up to 300 watts. This tuner will reduce the SWR of most antenna systems to nearly 1:1 . However in some cases a 1:1 SWR may not be achievable. If this happens, try increasing or decreasing length of antenna. Note that a 1.5:1 SWR results only in 4% reflected power and 11% reflected power with a SWR of 2:1.

6. A SWR of 1:1 can occur from more than one set of control settings on the MFJ-949C. 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 decreased substantially, try another INDUCTOR control setting and repeat Step 3.

7. When using the MFJ-949C for receiving only, tune the MFJ-949C as described in Step 1 and Step2.



MFJ-949C CIRCUIT DIAGRAM