



VS 1500 A Transmatch DESCRIPTION AND FEATURES

The Barker & Williamson VS 1500A Transmatch is designed to match virtually any receiver, transmitter or transceiver in the 160 to 30 MHz range (1.8 to 30 MHz) with up to 1500 watts RF power to almost any antenna, including dipoles, inverted vees, verticals, mobile whips, beams, random wires and others, fed by coax cable, balanced lines or a single wire. A 1:4 balun is built in for connection to balanced lines. The circuit uses the series-parallel capacitor connection (SPC) for improved harmonic attenuation.

The LOAD SELECT switch, on the front panel, provides switching to one of two coax fed antennas direct or through the tuners, a balanced line or wire antenna. The DUMMY LOAD and BYPASS positions allow switching to a dummy load and a direct connected coax antenna. In the DUMMY LOAD, BYPASS COAX, TUNER OUT or COAX 2/TUNER OUT positions, the tuner is bypassed.

The wattmeter of the VS 1500A is always in the circuit and is connected directly to the TRANSMITTER connector on the back panel. To read the transmitter output power, set the wattmeter switch to FOR 300W or FOR 3KW and read the forward power on the respective scale. To read the reverse power, set the wattmeter switch to REV 300 W and read the reverse power on the 300W scale.

SPECIFICATIONS

Input Impedance	50 to 75 ohms unbalanced
Output Impedance	15 to 500 ohms unbalanced coaxial up to 500 ohms balanced feed 10 to 1000 ohms single ended feed (wire antenna)
Frequency Range	1.8 to 30 MHz continuously
Power Handling	1500 watts continuous
Dimensions	11-1/4" W x 5-3/4" H x 13-1/2" D (21.2 x 14.6 x 34.3 cm) (including dials)
Weight	6-1/2 lb (3kg)



BARKER & WILLIAMSON

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BARKER & WILLIAMSON VS 1500A TRANSMATCH INSTRUCTIONS

1.0 INSTALLATION

1.1 Install the VS 1500A between the transmitter and the antenna(s). Connect a coax cable (RG-8 or equivalent recommended) between the transmitter and the coax connector marked TRANSMITTER on the back panel.

1.2 One or two coax fed antennas may be connected to the coax connectors marked COAX 1 and COAX 2.

NOTE: Coax 1 and Coax 2 antennas can be connected directly to the transmitter by setting the LOAD SELECT switch to COAX 1/TUNER OUT or COAX 2/TUNER OUT.

1.3 A random wire antenna may be connected to the binding post marked WIRE. The random wire should be at least 50 feet long, placed as high as possible and as clear of surrounding objects as possible. Make sure that the random wire antenna does not come in contact with any metal and that the VS 1500A is well grounded to the transmitter. A binding post, marked GROUND, is provided for the ground connection.

1.4 A balanced line fed antenna may be connected to the binding posts marked BAL ANT. This couples the VS 1500A to the balanced line through a 1:4 balun. (It is not necessary to bridge the BAL ANT and WIRE binding posts.)

1.5 Set the LOAD SELECT switch to WIRE or BAL ANT when using a random wire or balanced line fed antenna, respectively.

1.6 A dummy load antenna may be connected to the connector marked BYPASS and a dummy load to the connector marked DUMMY. The LOAD SELECT switch on the BYPASS or DUMMY LOAD positions will bypass the tuner and allow the VS 1500A to be used as a wattmeter only.

CAUTION: Do not use the VS 1500A for over 1500 watts of RF output power, even in the BYPASS or COAX/TUNER OUT positions. Do not operate the LOAD SELECT switch or INDUCTANCE control while transmitting.

2.0 OPERATION

2.1 The INDUCTANCE control on the VS 1500A presents a minimum inductance at 0 and a maximum inductance at  277. Less inductance is needed at high frequencies for the same impedance. The ANTENNA and TRANSMITTER controls both present a maximum capacitance at 100.

2.2 For optimum operation of the VS 1500A, the transmitter must be tuned to present a 50 ohm output impedance for the frequency band in operation. Tune the transmitter as follows:

2.2.1 Connect a 50 ohm load to the DUMMY LOAD connector. An antenna can be used instead, but it is good practice to use a 50 ohm load to prevent possible interference to others.

2.2.2 Set the LOAD SELECT switch to the DUMMY LOAD position. The VS 1500A now operates as a wattmeter.


2.2.3 Follow the transmitter tuning procedure for maximum output.

2.2.4 Reduce the transmitter power output to 10-15W.

2.3 After properly tuning the transmitter, set the LOAD SELECT switch to the desired antenna and tune the VS 1500A for minimum reverse power as described below. Do not retune the transmitter.

2.3.1 Present the inductance control as shown in the table below.

TYPICAL INDUCTANCE SETTINGS

Meters	Frequency (MHz)	Inductance
160	1.8	 277
80	3.75	107
40	7.15	53
30	10.125	37
20	14.175	26
17	18.0	18
16	21.225	13
12	24.0	12
10	28.050	9

2.3.2 Tune in a weak but readable station, then rotate the INDUCTANCE control until maximum signal is obtained.

2.3.3 With the wattmeter switch set to FOR 200W, reduce the CARRIER control on the transmitter or set the transmitter to the TUNE position so as to provide 10-20 watts RF output.

2.3.4 Set the wattmeter switch to REV for the reverse power reading. See the chart below which relates percent reflected power and SWR.

PERCENT REFLECTED POWER/SWR CHART

Percent Reflection	SWR
5%	1.01
10%	1.02
20%	1.04
30%	1.05
40%	1.07
50%	1.10
60%	1.13
65%	1.15

% Reflection = $\frac{\text{Reverse Power}}{\text{Forward Power}} \times 100$



2.3.5. If the meter reading is greater than 0 (0-SWT of 1) or flat, tune the VS 1500A for a minimum reading as outlined in the next step.

2.3.6. While transmitting with the INDUCTANCE control set as in step 2.3.2, alternately adjust the TRANSMITTER and ANTENNA controls for a minimum reading with the wattmeter switch set to REV. Since these two controls interact, they can best be adjusted by turning the TRANSMITTER control in small increments, each time turning the ANTENNA control for the minimum reverse power. Repeat as necessary until a minimum reading is obtained.

2.3.7. Set the wattmeter switch to FOR 30W. If the reading is reduced considerably from that in step 2.3.5, increase the power output to 15-20W and repeat step 2.3.6. When the REV reading is minimum with little or no reduction in the FOR reading, proceed to step 2.3.8.

2.3.8. If a reading of 2 in the REV mode is not obtained, increase or decrease the INDUCTANCE control in small increments and repeat step 2.3.6 for each INDUCTANCE control position. Again, do this at a low CARRIER control setting or in the TUNE mode of the transmitter.

2.3.9. After a 0 or minimum reading is obtained, set the wattmeter switch to FOR 3KW and increase the transmitter power to its maximum or 1500 watts, whichever is less.

2.3.10. Recheck the reverse power reading. The ANTENNA and TRANSMITTER controls may need fine adjustments if the REV reading is not 0 at the higher power.

NOTE: Below 2 MHz (180M), excessive heating or arcing may occur, due to the high voltage present when tuned in this band. Reduce the transmitter output power as necessary to stop this condition.

2.3.11. A reverse power reading of 0 can occur from more than one combination of control settings on the VS 1500A. When a reading of 0 is obtained, be sure to check the transmitter power and make sure that it is relatively high. If the transmitter power has decreased substantially, try another INDUCTANCE control setting and repeat step 2.3.6.

2.3.12. When using the VS 1500A for receiving only, tune as in steps 2.3.1 and 2.3.2.

3.0 ABRIDGED OPERATING INSTRUCTIONS

3.1. Preset the TRANSMITTER and ANTENNA controls as shown in the table on the opposite page.

3.2. Tune the receiver to a weak signal.

3.3. Rotate the INDUCTANCE, TRANSMITTER and ANTENNA controls for maximum received signal.

3.4. Tune the transmitter to a clear frequency. Set the wattmeter switch to FOR 30W and adjust the transmitter output to approximately 20 watts.

3.5. Set the wattmeter switch to REV and tune the TRANSMITTER and ANTENNA controls for a minimum reading. If necessary, increase or decrease the INDUCTANCE control one turn and repeat.

3.6. Set the wattmeter switch to FOR 3KW and increase the transmitter output to its maximum or 1500 watts, whichever is less.

3.7. Set the wattmeter switch to REV and touch up the TRANSMITTER and ANTENNA controls as necessary.

4.0 ADDITIONAL NOTES AND CAUTIONS

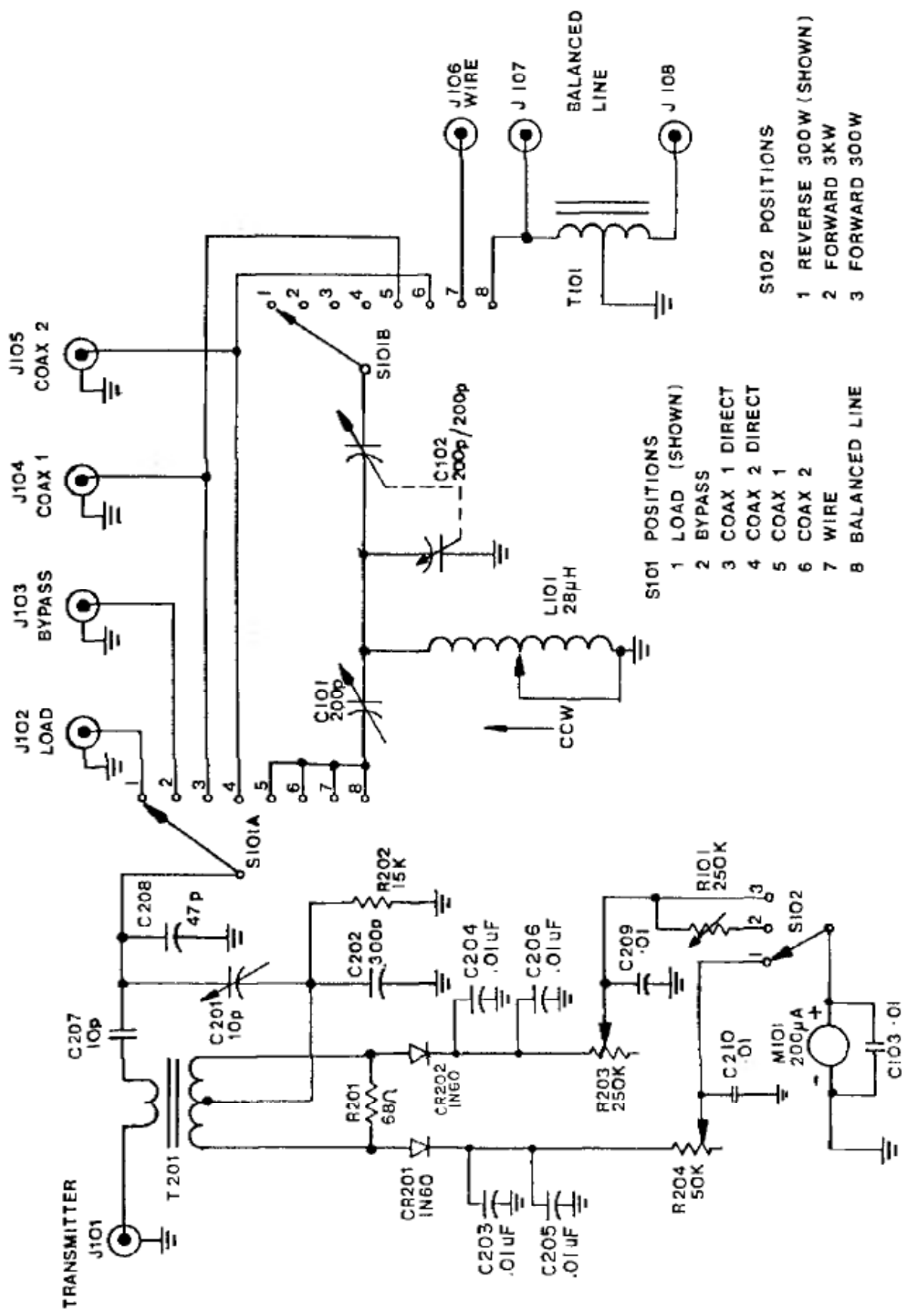
4.1. Do not use the VS 1500A for over 1500W of RF output power even in the BYPASS or COAX OUT positions.

4.2. Do not operate the LOAD SELECT switch while transmitting.

4.3. The VS 1500A has to be completely retuned as above for each frequency band and each antenna. It is a good idea to record the control settings for each band and antenna on a chart to permit quick adjustment when switching bands and/or antennas.

WARRANTY

All goods sold hereunder are warranted to be free from defects in material and workmanship, for a period of one year from date of shipment and this express warranty is in lieu of and excludes all other warranties whether expressed or implied by operation of law or otherwise including any warranty on the merchantability or fitness for a particular purpose. Defective material may be returned to the seller at inspection by the seller and upon receipt of definite shipping instructions by the seller. Goods so returned will be replaced or repaired without charge, but the seller shall not be liable for loss, damage or expense directly or indirectly arising from the use of material or from any other cause, the exclusive remedy against the seller being to require the replacement or repair of defective material. Every claim on account of defective material or workmanship or from any other cause shall be deemed waived by the purchaser unless made in writing prior to the expiry date of the warranty.



S101 POSITIONS

- 1 LOAD (SHOWN)
- 2 BYPASS
- 3 COAX 1 DIRECT
- 4 COAX 2 DIRECT
- 5 COAX 1
- 6 COAX 2
- 7 WIRE
- 8 BALANCED LINE

S102 POSITIONS

- 1 REVERSE 300W (SHOWN)
- 2 FORWARD 3KW
- 3 FORWARD 300W



ANTENNA TUNER VS 1500 A

BARKER & WILLIAMSON