INSTRUCTION MANUALS

*** Model SWR POWER METER ***

Model is SWR & POWER Meter with Directional Coupler installed and its character is to measure the wide frequency range precisely by very easy operation. For SWR measurement, it uses Directional Coupler, comparing the power supplied to and reflected from antenna and the independent SWR meter indicates the measurement. For power measurement, the power meter indicates the travelling wave power detected by Directional Coupler and its frequency range is determined by the figure of Variable Resistor which is for sensitivity adjustment, Model is a through line power meter in its construction, so RF amount is not directly detected from co-ax line. Accordingly, there is very little loss connecting it between transmitter and antenna circuit and QSO is available as it is connected.

SPECIFICATIONS

Measuring method	Directional Coupler	
Maximum handling power	1 KW	
SWR indication	1 : 1~10 : 1	
Frequency Range	3.5-150 MHz	
Circuit Impedance	50 ohm	
Measuring Accuracy	RF Power	±20%
	SWR	± 5 %
Connecter	SO-239	
Meter Sensitivity	SWR Meter	300μA F.S.D.
	POWER Meter	300μA F.S.D.
Dimensions	120(W)×50(H)×65(D)mm.	
Weight	450g.	

OPERATION

*** Connection of Model ***

1. Turn off the output power of transmitter. Disconnect the co-ax cable which leads to antenna from transmitter.
2. Connect the antenna terminal of transmitter and the "XMTR" connecter of Model with 50 ohm co-ax cable. This co-ax cable is preferably short, and should be less than 1 meter long.
3. Connect the co-ax cable which leads to the antenna to the "ANT" connecter of Model . When any antenna tuner is set between transmitter and antenna, connect Model between transmitter and antenna tuner. In this case, any type of feeder is acceptable between antenna tuner and antenna.

*** SWR Measurement ***

1. Turn transmitter on, under the condition that Model is correctly connected.
2. POWER Meter and SWR Meter swing at the same time. Adjust the center knob so that the left side POWER Meter indicates "100/50". This position is "SET." You can now read SWR figure on the right side SWR Meter directly.
3. The indication of SWR Meter shows the ratio of the travelling wave power from transmitter and the reflected wave power from antenna circuit, so the higher inidcation of SWR Meter, the larger reflected wave power. The reflected wave power is not delivered to antenna and it is more preferable that its power is less. If SWR Meter indicates less than 1.3, the condition is good. The table below shows the ratio of the travelling wave power and the reflected wave power against the SWR figure.

SWR	W(REF)/W(FOR)%	SWR	W(RFF)/W(FOR)%
1.1	0.227	1.5	4.00
1.2	0.827	2.0	11.1
1.3	1.71	2.5	18.4
1.4	2.78	3.0	25.0

4. In case of Antenna tuner is set between Model and antenna, adjust Antenna Coupler to make SWR figure as small as possible.

5. The relationship between the minimum input power and freqency range in order to measure SWR by Model is as follows.

Frequency (MHz)	The Minimum Input Power (watts)
3.5	15
7	7.5
14	4
21—28	2
50—150	1

*** RF Power Measurement ***

1. Connect correctly Model transmitter and antenna.
2. Sensitivity of directional coupler depends on frequency so that requires to calibrate the center adjusting knob on each frequencies.
   The standard calibration points are shown below.

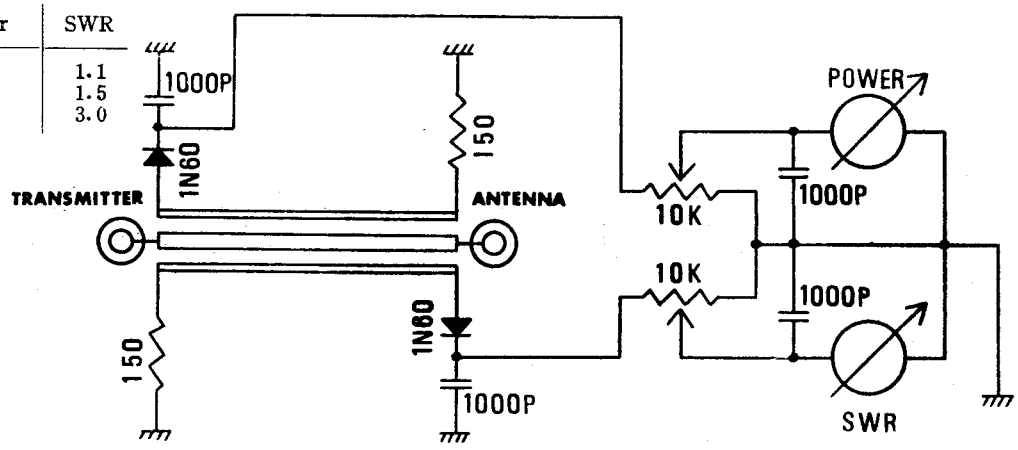
Frequency	100W	50 W
3.5MHz	5.6	7.0
7	5.4	6.7
14	2.6	3.3
21	2.2	2.5
28	1.9	2.2
50	1.8	2.0
150	1.6	1.8

3. Turn on the output of transmitter. POWER Meter swings and its indication shows the power when it's calibrated. POWER Meter is scaled for 50 watts and 100 watts, divide it by 10 for 10 watts and 5 watts scale.
4. POWER Meter indicates the travelling wave power, so the correct output power cannot be measured if SWR is too high. Measure after you confirm the SWR figure less than 1.5.
5. SWR measurement cannot be done when you measure RF power.

*** CAUTION ***

1. Never disconnect the the connecter of Model leading to antenna when transmitter is on. Model may be burned and spoiled.
2. Sometimes abnormal voltage is found at a certain place of the feeder when transmitter and antenna circuit are mismatching. Do not connect Model in such a case. The safety limit of Model from the view point of transmitting power and SWR figure is shown in the table below. Cut off the output power of transmitter immediately and do not use Model when the shown figure is exceded.

Transmitting Power	SWR
1kW	1.1
500W	1.5
300W	3.0



SCHEMATIC OF MODEL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