INSTRUCTION MANUAL

ANTENNA TUNER

MODEL CNW-727

■SPECIFICATIONS :

SWR/Power Meter Circuitry :

1) Frequency Coverage : 140 – 150 MHz
   : 430 – 440 MHz
2) Input Impedance : 50 Ohm.
3) SWR Detection Sensitivity : 5W Min.
4) SWR Measurement : 1 : 1 – Infinite
5) Power Range : Forward Power 20/200W
   : Reflected Power 6/60W
6) Tolerance : ±15% at Full Scale.

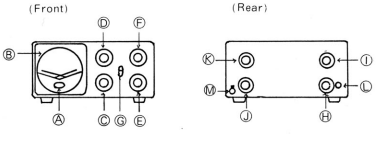
■TUNER CIRCUITRY :

1) Frequency : 140 – 150 MHz.
   : 430 – 440 MHz.
2) Output Impedance : 15 – 150 Ohm Unbalanced.
3) Power Rating : 200W CW(144MHz BAND)
   : 150W CW(430MHz BAND)
4) Insertion Loss : Less than 0.5dB.
   (Connecting to 50ohm load resistance)

■OTHERS :

1) Input/Output Connectors : SO-239.
2) Dimensions : 165(W)×75(H)×97(D) m/m
3) Net Weight : 1 Kg. Approximately

■CONTROLS :



The CNW-727 is a high quality antenna tuner with an advanced art which features precise measurements of SWR and power for antenna tests.

(FRONT PANEL)

Ⓐ Power Range Selector : Set to required power range.
Ⓑ Meter (Cross Needles Type) : Indicating SWR. Forward & Reflected Power simultaneously.
Ⓒ Ⓓ TR Matching : Tuning-knob for capacitor of input side (Transmitter side. VC-1)
Ⓔ Ⓕ ANT Matching : Tuning-knob for capacitor of output side (Antenna side. VC-2)
Ⓖ BAND Switch : Set to required frequency.

(REAR PANEL)

Ⓗ Ⓘ Input Connector : Connect to transceiver or transmitter by 50 ohm coaxial cable.
Ⓙ Ⓚ Antenna Output : Connect to dummy load or antenna by 50 ohm coaxial cable.
Ⓛ DC Jack : Connect to 13.8VDC Source (for Indicator-Lamp)
Ⓜ GND(Ground) : Connecl to the earth by thick wire.

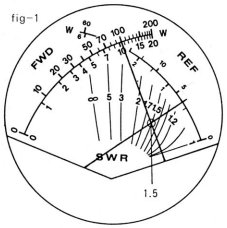
■PREPARATIONS :

1) Use only 50 ohm coaxial line for connections. This will maintain the accuracy of the meter.
2) For accurate power measurements, use 50 ohm dummy load.
3) Connect antenna or dummy to the Antenna Output by 50 ohm coaxial cable.
4) Connect Input connector on rear side to transceiver by 50 ohm coaxial cable.

OPERATION :

1) Forward power watts measurement :
   'FWD' scale on fig-1 indicates forward power in accordance with transmitting power.
2) Reflected power measurement :
   'REF' scale in fig-1 indicates reflected power in accordance with matching of antenna system.
3) Effective radiated power measurement :
   To measure effective radiated power by subtracting Reflected power from Forward power.
4) SWR Measurement.

fig-1



Mathematical verification :

$$SWR = \frac{\sqrt{Pf} + \sqrt{Pr}}{\sqrt{Pf} - \sqrt{Pr}}$$

$$SWR = \frac{\sqrt{100} + \sqrt{4}}{\sqrt{100} - \sqrt{4}} \doteqdot \frac{10 + 2}{10 - 2} = \frac{12}{8} = 1.5$$

Pf : Forward Power (FWD)
Pr : Reflected Power (REF)

See fig-1 The meter indicates Forward power 100W and Reflected Power 4W. At the crossing point of the two meter needles, the indication is SWR 1.5.

5) Set the 'Power range switch' to '200W'. Adjust the transmitting power approximately 10W.
6) Keep transmitting, decrease the SWR by tuning of VC-1 and VC-2 alternately.
7) Increase the transmitting power to normal operated output after SWR gets tuned around 1 : 1.0.
8) Repeat the tuning of 6), 7).

■CAUTION ! ! ! !

1) Do not transmit without antenna connecting.
2) It is no problem of operation when SWR is less than 1 : 1.5 and it is no necessary of re-tuning in same band even SWR may change around 1 : 1.5.
3) Set 'Power' range to high range firstly even if output power is low. Change to suitable 'Power' range for transmitting power after SWR is adjusted approx. 1 : 1.0.
4) Connect to satisfactory ground earth with 'GND' terminal on rear panel. (effective against BCI or TVI problems)
5) Do not give the mechanical vibration and shock because the meter movements are highly sensitive.
6) Measuring power with a poorly matched antenna or disconnecting the output the bridge while operating will certainly damage the meter and tuner circuitry.