

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.

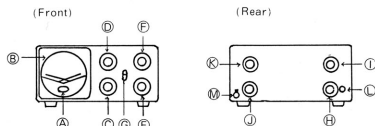
TUNER CIRCUITRY :

- 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) mm
- 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)

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

(REAR PANEL)

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

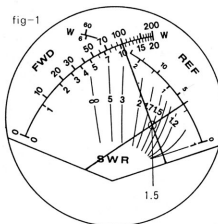
PREPARATIONS :

- 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 :

$$SWR = \frac{\sqrt{P_f} + \sqrt{P_r}}{\sqrt{P_f} - \sqrt{P_r}}$$

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

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.

