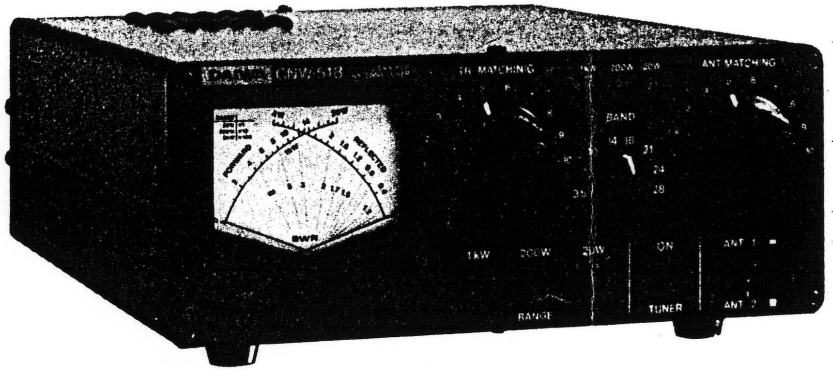
INSTRUCTION MANUAL
ANTENNA TUNER
MODEL CNW-518



■ SPECIFICATIONS :

SWR/Power Meter Circuitry:

1) Frequency Coverage : 3.5–30MHz
2) Input/Output Impedance : 50 ohm
3) SWR Detection Sensitivity : 5W Min.
4) SWR/Measurement : 1 – Infinite
5) Power Range : Forward Power 20/200W/1000W
   Reflected Power 4/40W/200W
6) Tolerance : ±10% at Full scale

■ TUNER CIRCUITRY :

1) Band : 3.5, 7, 10, 14, 18, 21, 24, 28 MHz (8 Band)
2) Output Impedance : 3.5MHz 15–170 ohm (Unbalanced)
   7–28MHz 15–250 ohm (Unbalanced)
3) Power Rating : 1kW CW continuous one minute
4) Insertion Loss : Less than 0.5dB.
   (Connecting to 50 ohm load resistance)

■ PREPARATIONS I

The CNW-518 contains tuner circuitry and SWR and power meter circuitry.
The switch for 'SWR/Power meter operation' being independent of 'Tuner Circuit' is on front panel. "ON" or "OFF" (switchable)
Therefore, we explain operation method each of : –
'SWR/Power meter circuitry' only and 'SWR/Power meter circuitry with Tuner circuitry'.

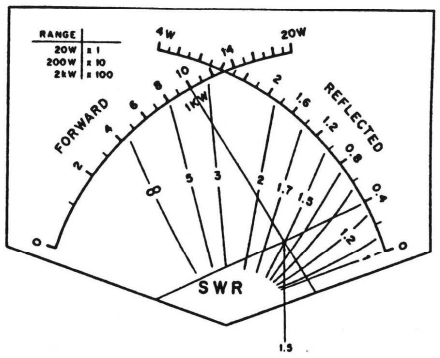
(For SWR & Power meter is used Independently)

1) Use only 50 ohm coaxial line for connections. This will maintain the accuracy of the meter.
2) Set the tuner switch to "OFF" on the front panel.
3) Set 'Power Range' switch to 1000W, 200W or 20W which required.

OPERATION :

1) Forward power watts measurement :
   'FORWARD' scale on fig-1 indicates forward power in accordance with transmitting power.
2) Reflected power measurement :
   'REFLECTED' scale on 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

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

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

Pf : Forward Power
Pr : Reflected Power

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.

■ PREPARATION II

(For operation of SWR/Power Meter with Tuner)

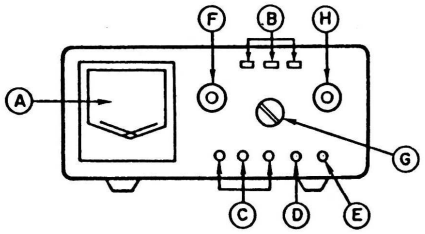
1) Set the 'Tuner switch' to 'ON' on the front panel.

■ OTHERS :

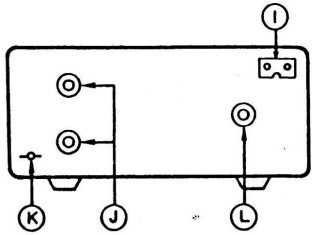
1) Input/Output Connectors : S0–239.
2) Dimensions : 225(W)×90(H)×275(D)m/m
3) Net Weight : 3.8Kg. Approximately

■ CONTROLS

(Front)



(Rear)



The CNW-518 is a high quality antenna tuner with an advanced art which features precise measurements of SWR and power for antenna tests.

(FRONT PANEL)

Ⓐ Meter (Cross Needles Type) : Indicating SWR, Forward & Reflected Power simultaneously.
Ⓑ Range indicator : LED lights up indicating power range.
Ⓒ Power Range Selector : Set to required power range.
Ⓓ Tuner Switch : 'ON' – To function of 'SWR/Power meter circuitry' with 'Tuner circuitry'.
'OFF' – To function of 'SWR/Power meter circuitry' only.
Ⓔ Antenna Selector : Change-Over switch for two antennas.
Ⓕ TR Matching ; Tuning-knob for capacitor of input side (Transmitter side, VC-1).
Ⓖ Band Switch : Set to required frequency band.
Ⓗ ANT Matching : Tuning-knob for capacitor of output side (Antenna side, VC-2).

(REAR PANEL)

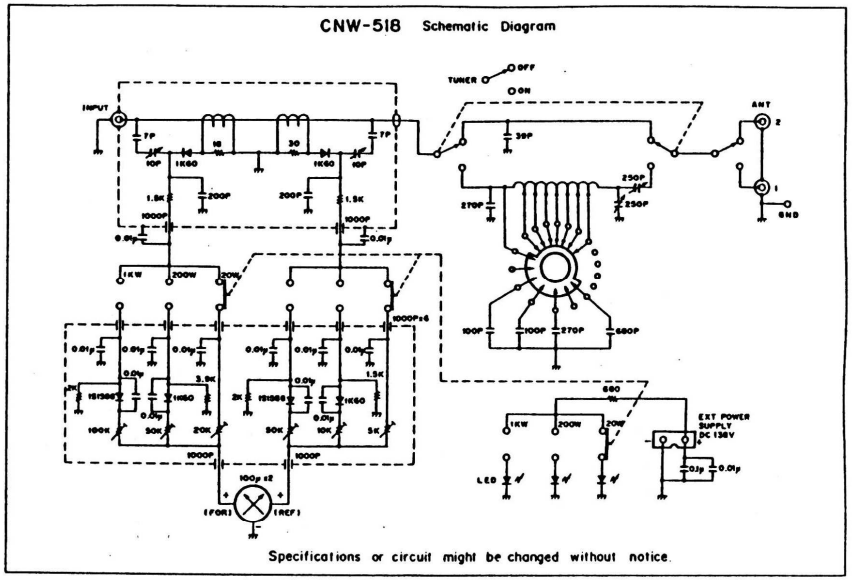
Ⓘ DC Socket : For LED lights-up.
Ⓙ Antenna Output : Connect to dummy load or antenna by 50 ohm coaxial cable.
Ⓚ GND (Ground) : Connect to the earth by thick wire.
Ⓛ Input Connector : Connect to transceiver by 50 ohm Coaxial cable.

OPERATION :

1) Set the 'Power range switch to 200W'. Adjust the transmitting power approximately 10W.
2) Keep transmitting, decrease the SWR by tuning of VC-1 and VC-2 alternately.
3) Increase the transmitting power to normal operated output after SWR gets tuned around 1:1.0.
4) Repeat the tuning of 2) and 3).

Following chart is indicating approx positions of matching knobs, VC-1 or VC-2, for each band under termination by 50 ohm dummy load. Please refer this advance chart for your fine tunning.

BAND	3.5	7	10	14	18	21	24	28
VC-1	4.5	6.0	3.5	7.0	7.0	8.0	7.0	6.0
VC-2	5.0	6.0	6.5	8.0	8.0	8.5	8.5	8.5

■ CAUTION!!!

1) Do not change 'Tuner ON/OFF switch', 'Antenna selector switch' and 'BAND switch' when transmitting. 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 of the bridge while operating will certainly damage the meter and tuner circuitry.