

# INSTRUCTION MANUAL

## CNW-518



**DAIWA INDUSTRY CO., LTD.**

Model CNW-518

All-in-one Antenna Tuner.

### Specifications

SWR/Power meter circuitry:

- 1) Frequency Coverage: 1.8-30MHz
- 2) Input/output impedance: 50 ohm
- 3) SWR detection sensitivity: 5W Min.
- 4) SWR measurement: 1:1 -- infinity
- 5) Power range:

Forward Power 20/200/2000W

Reflected power 4/40/400W

- 6) Tolerance:  $\pm 10\%$  at full scale

Tuner circuitry:

- 1) Frequency: 3.5 7 10 14 18 21 24 28 MHz (8 bands)

- 2) Input/output impedance

Input impedance: 50 ohm unbalanced

Output impedance: 3.5 MHz 25-100 ohm (Unbalanced)

7-28 MHz 10 - 250 ohm ( " )

- 3) Power rating:

CW(Less than 50% duty) ..... 1 kW

SSTV, RTTY ..... 500 W continuous 10 minutes.

AM ..... 250 W continuous 10 minutes.  
(when 100% modulation)

\*The SWR of tuner should be tuned below 1.5:1

Please keep the output power till the specification of the tuner.

- 4) Insertion Loss: less than 0.5 dB

(Connecting to 50 ohm pure resistance load)

Sundry:

- 1) Input output connectors: SO-239
- 2) Dimensions: 225 (W) x 90 (H) x 245 (D) mm
- 3) Net weight: Approximately 3.8 kg

The CNW-518 is a high quality antenna tuner with an unique feature which eliminates tedious measurements of SWR and power during antenna test.

Controls: (FRONT PANEL)

- A) Power Range Selector: Set to required power range.
- B) Meter (Cross Needles type): Indicating SWR, Forward & Reflected power simultaneously.
- C) Range Indicator: LED lights up indicating power range.
- D) Tuner Switch: "ON" SWR and power meter circuitry is connected with tuning circuitry. "OFF" SWR and power meter circuitry operates independently.
- E) Antenna Selector: Change-over switch for two antennas.
- F) TR Matching: Tuning knob for input capacitor. (Transmitter side, VC-1)
- G) Band change-over switch: Change-over switch for operating band.
- H) ANT Matching: Tuning knob for output capacitor. (Antenna side, VC-2).

(REAR PANEL)

- I) Output Connectors: Connect with 50 ohm coaxial cable to dummy load or antenna.
- J) Input connector: Connect with 50 ohm coaxial cable to transmitter.
- K) GND (Ground): Connect with thick wire to earth ground.
- L) DC socket for LED light-up.

(Front panel)



(Rear panel)



The CNW-518 is equipped with tuner circuitry as well as SWR and power meter circuitry.

The switch for independent operation of the Tuner circuit is located on the front panel. We will illustrate the methods of operation for both the independent use of SWR/Power meter circuitry and the simultaneous use of SWR/Power meter and the Tunercircuit.

PREPARATIONS: (for SWR & power meter is used independently)

1. Do not use CNW-518 beyond frequency range of 1.8-30. MHz. Insertion loss will increase when used beyond these frequencies.
2. Use only 50 ohm coaxial line for connections. This will maintain the accuracy of the meter.
3. For accurate power measurements, use 50 ohm pure resistance dummy load.
4. Connect antennas or dummy to ANT1 or 2 connectors by 50 ohm coaxial cable
5. Connect to Input connector on rear side and transceiver by 50 ohm coaxial cable.
6. Turn off the "TUNER" switch on the front panel.
7. Set "ANT SELECTOR" switch to "ANTENNA" or "DUMMY".

OPERATION:

1. Forward power measurement: "Forward Power Watts" scale on fig.-1 indicates forward power in according to transmitting power.
2. Reflected power measurement: "REFLECTED POWER WATTS" scale in fig.-1 indicates reflected power in accordance with matching of antenna system.
3. Effective radiated power measurement: To measure effective radiated power, subtract reflected power from Forward power (apparent loss is only produced by impedance mismatch and does not include cable loss).

"See fig.-1 the meter indicates Forward power 10W and Reflected power 0.4W."

$$10W - 0.4W = 9.6W \text{ Effective radiated power}$$

4. SWR measurement . . . Ref-fig-1

Forward power watts scale indicates 10W and reflected power watts scale indicates 0.4W. 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. Connections are same as independent operation of SWR/power meter.
2. Push the "Tuner" switch to ON on the front panel.
3. Set the "BAND" change-over switch to required frequency band on the front panel.

OPERATION:

- 1) Set the "POWER" range switch to "HIGH".
- Peak your transmitter output at 10 watts (approx.)
- 2) Decrease the SWR by tuning of VC-1 and VC-2 alternately.
- 3) Peak your transmitter at normal output power when the best match has been achieved.

The filter effect of CNW-518 (freq: at 7 MHz setting )

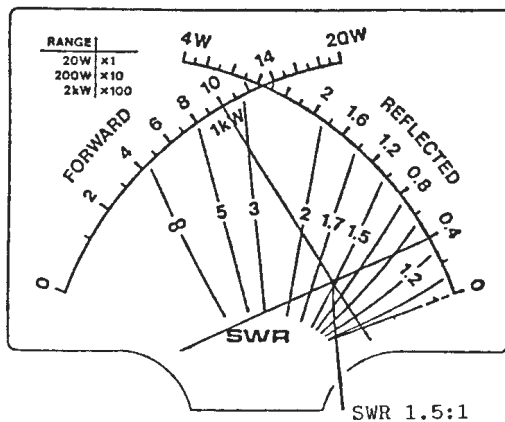
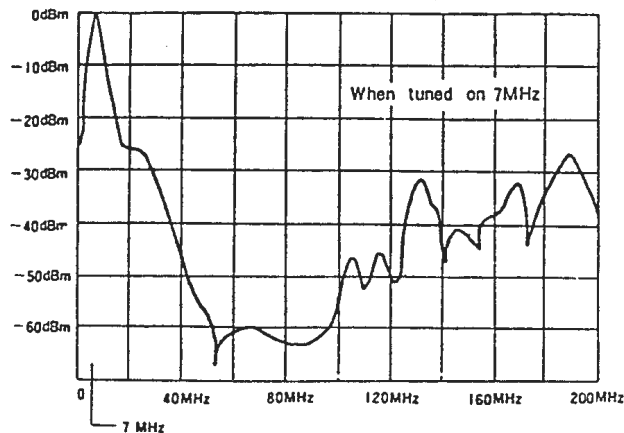


Fig-1 Meter scale

CAUTION !

Please "OFF" the linear amplifier when tuning.

\*The final tube(s) or transistor(s) of transceiver, or variable capacitors of the tuner might be damaged by high voltage when tuning be done with high power.

Adjustment with low power (below 100W) is recommended.

- 1) Do not change "Band" switch or "ANTENNA" change-over switch or "TUNER ON/OFF" switch when transmitting.  
Do not transmit without an antenna.
- 2) Efficient operation is obtained when the SWR is below 1:1.5. It is not necessary to re-tune in same band even when SWR is approximately 1:1.5 to 1: 2.0.
- 3) The final tube(s) or transistor(s) will be damaged during long tuning periods. Quick tuning is required.
- 4) 75 ohm vs 300 ohm or 50 ohm vs 200 ohm balun is required, for operation with balanced type antenna or feeder.
- 5) Set "POWER" range to high range first even when the output power is low. Change to the appropriate "POWER" range for transmitting when SWR is adjusted approx. 1:1.0.
- 6) Connect to satisfactory earth ground with "GND" terminal on rear panel (effective for BCI or TVI problems).
- 7) Avoid mechanical vibration and shock because the meter movements are highly sensitive.
- 8) Measuring power with a poorly matched antenna or disconnecting the output of the bridge while operating may damage the meter.

Indicator LED.

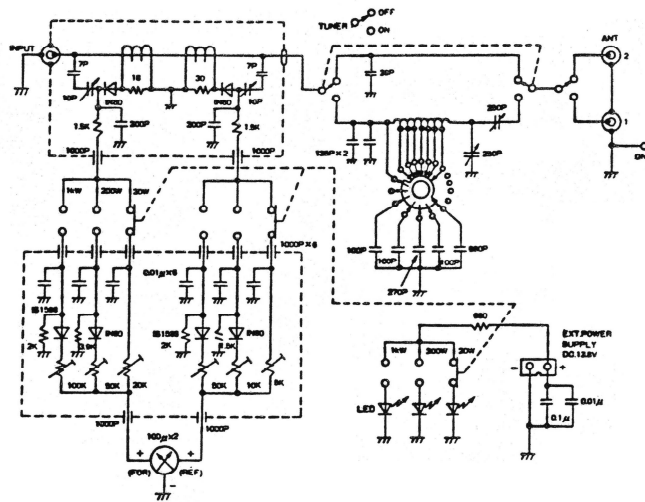
LEDs are located on front panel for power range indication.

LED is lighted by DC 13.8V.

Check points when SWR cannot be reduced.

Adjust the Length of antenna elements when SWR can not be lowered by adjustment of matching section.

## CNW-518 Schematic Diagram



Specifications or circuit might be changed Without notice.