Thank you for purchasing our products.

For your safety:
Read this manual carefully for proper handling and operation before using.
Keep this manual in a safe place for future reference.

★ Before assembly, please confirm that all parts are included in accordance with the parts list on the following page.

[Features]
- The design allows for it to be operated in a "V type" or "horizontal dipole" configuration. The "V type" configuration can be operated from minimum ground clearance (approx. 3m).
- High-strength and outstanding weather resistance achieved.
- Despite being a HF band antenna, the element design has achieved a balance of high efficiency and a small radius of rotation.
- Easy frequency control made possible through the adoption of a slide adjust design and wide-band balun.

[Specifications]
- Freq.Band : 7,14,21,28 MHz / 4 Band
- Antenna Type:
  - Shortened Trap-type half wave dipole
- Gain : approx. 2.15dBi
- Max Power : 1kW(SSB)
- VSWR : 1.5 or less (at center freq. each band)
- Impedance : 50Ω(Unbalanced)
- Connector : M-Female (SO-239) type
- Mounting Mast Diameter : Φ38~62mm
- Max maximum momentary wind velocity : 35m/sec
- Wind Load area : 0.28(m²)
- Radius of rotation : approx. 5.3m(Horizontal-Shape) approx. 3.8m(V-Shape)
- Horizontal Length : approx. 10.3m(Horizontal-Shape) approx. 7.4m(V-Shape)
- Weight : approx. 5.4kg
- Balun CBL-2500 attached

[Fig.1] Appearance
(V-Shape installation image)

⚠️ Warning
Warnings must be followed carefully to avoid serious bodily injury.

⚠️ Caution
Cautions must be observed to avoid minor injury to yourself or damage to your equipment.

You might be killed or injured if you don’t follow the below instructions.
1. Choose a safe place to erect this antenna, complying with the laws and regulations in your country.
2. Choose a calm, dry day to erect the antenna.
3. Do not erect this antenna while lightning.
4. Do not touch the antenna while transmitting.
5. Do not erect this antenna near any electric wires and street lamps.
6. Make sure to tighten the screws, nuts and bolts securely. Otherwise the antenna falls very easily.
7. Be careful not to drop down any tools or screws when mounting this antenna on a high place.
8. Fix the coax cable securely, otherwise this antenna could be collapsed by heavy wind.
**Parts List**

<table>
<thead>
<tr>
<th>Part name</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mounting Plate</td>
<td>1</td>
</tr>
<tr>
<td>2. CBL-2500 Balun (※1)</td>
<td>1</td>
</tr>
<tr>
<td>3. Feeder Line (shaped terminals on both ends)</td>
<td>2</td>
</tr>
<tr>
<td>4. 14, 21, 28 MHz Trap Element</td>
<td>2sets</td>
</tr>
<tr>
<td>5. 7 MHz Tuning Element (Left) φ10×1750 (※2)</td>
<td>1</td>
</tr>
<tr>
<td>6. 7 MHz Tuning Element (Right) φ10×1500 (※2)</td>
<td>1</td>
</tr>
<tr>
<td>7. Element Pipe (Thick)</td>
<td>2</td>
</tr>
<tr>
<td>8. M6 Square U-Bolt (Thick)</td>
<td>2</td>
</tr>
<tr>
<td>9. M5 Square U-Bolt (Thin) for fixing CBL-2500</td>
<td>1</td>
</tr>
<tr>
<td>10. Resin Separator</td>
<td>4</td>
</tr>
<tr>
<td>11. U-Bolt(M6)</td>
<td>4</td>
</tr>
<tr>
<td>12. M6 Spring Washer</td>
<td>8</td>
</tr>
<tr>
<td>13. M6 Hexagonal Nut</td>
<td>16</td>
</tr>
<tr>
<td>14. M8 Spring Washer</td>
<td>4</td>
</tr>
<tr>
<td>15. M8 Hexagonal Nut</td>
<td>8</td>
</tr>
<tr>
<td>16. Pan Head Screw M4×30</td>
<td>8</td>
</tr>
<tr>
<td>17. Hexagonal Bolt M4×15</td>
<td>2</td>
</tr>
<tr>
<td>18. Spring Washer for M4</td>
<td>12</td>
</tr>
<tr>
<td>19. M4 Hexagonal Nut</td>
<td>12</td>
</tr>
<tr>
<td>20. Spring Washer for M5</td>
<td>2</td>
</tr>
<tr>
<td>21. M5 Hexagonal Nut</td>
<td>2</td>
</tr>
</tbody>
</table>

※1. 2pcs. M4×8 SEMS screws have been pre-installed in the CBL-2500 terminal.

※2. As the pipe length differs between left and right, please be careful not to install them in reverse.

---

**Assembling the element**

There are 3 element adjustment sections on each of the left and right elements. The position will differ depending on the radio wave form being used (CW, SSB, FM) and whether it is a horizontal or V type configuration, so please ensure you set the mounting hole position or element length by following the instructions and diagrams mentioned below.

Further, please take note that there are sections where the length differs between the left and right element.

**Within this manual, the left side refers to the element attached to the terminal on the left side when looking at the CBL-2500 from the front.**

---

**Element Assembly Preliminary Instructional Diagrams on the next page**

This section covers the precautions. Please ensure you have read through this.

---

**7MHz Tuning Element**

The length differs between the left and right element.

---

If you loosen this M4 Pan Head Screw, the 7MHz tuning element can be extended or retracted.

---

Element (Thick)

---

Firmly fix the 2 x M4×30 Pan Head Screws with the M4 Spring Washer and Hexagonal Nut.

---

Please do not loosen these points.

---

The explanations shall be given by the number of visible holes.

---

Please assemble the antenna in accordance with the frequency band that you will be using, referring to either any of [L], [M], [H] on the following pages.

---

A drainage hole has been provided for on all traps. Please ensure the hole is at the bottom during installation. (both left and right)

---

Ensure the hole is at the bottom

---

Firmly fix the 2 x M4×30 Pan Head Screws with the M4 Spring Washer and Hexagonal Nut.
Horizontal Installation Setting Size

Please refer to the diagram in [L] when operating CW, [M] when operating SSB and [H] for FM (28 MHz band).

<table>
<thead>
<tr>
<th>1560</th>
<th>Left side element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction of tip</td>
<td></td>
</tr>
<tr>
<td>2 holes are visible</td>
<td></td>
</tr>
<tr>
<td>2 holes visible, the same as the left</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1360</th>
<th>Right side element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction of tip</td>
<td></td>
</tr>
<tr>
<td>2 holes are visible</td>
<td></td>
</tr>
<tr>
<td>2 holes visible, the same as the left</td>
<td></td>
</tr>
</tbody>
</table>

VSWR Characteristics Reference Value

Solid line: Ground Height 20m, Dotted line: Ground Height 5m

<table>
<thead>
<tr>
<th>1580</th>
<th>Left side element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction of tip</td>
<td></td>
</tr>
<tr>
<td>1 hole is visible</td>
<td></td>
</tr>
<tr>
<td>1 hole visible, the same as the left</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1380</th>
<th>Right side element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction of tip</td>
<td></td>
</tr>
<tr>
<td>1 hole is visible</td>
<td></td>
</tr>
<tr>
<td>1 hole visible, the same as the left</td>
<td></td>
</tr>
</tbody>
</table>

VSWR Characteristics Reference Value

Solid line: Ground Height 20m, Dotted line: Ground Height 5m

<table>
<thead>
<tr>
<th>1600</th>
<th>Left side element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction of tip</td>
<td></td>
</tr>
<tr>
<td>No holes are visible</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1400</th>
<th>Right side element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction of tip</td>
<td></td>
</tr>
<tr>
<td>No holes are visible</td>
<td></td>
</tr>
</tbody>
</table>
V type Installation Setting Size

Please refer to the diagram in [L] when operating CW, [M] when operating SSB and [H] for FM (28 MHz band).

VSWR Characteristics Reference Value

- Solid line: Ground Height 20m
- Dotted line: Ground Height 5m

Direction of tip →

- 1640 Left side element
- 1340 Right side element
- 2 holes visible, the same as the left
- 2 holes visible

- 1660 Left side element
- 1360 Right side element
- 1 hole visible, the same as the left
- 1 hole visible

- 1680 Left side element
- 1380 Right side element
- No holes are visible

Direction of tip →

- 7MHz
- 14MHz
- 21MHz
- 28MHz

Simple Assembly Steps
Common to both Horizontal and V Type Configurations
- Assemble each of the left and right Elements.
- Temporarily fix the Spacer to the Mounting Plate with the U-bolt and then insert and mount the Element (Thick) section.
- Fix the Mounting Plate to the Mast Pipe with the 2 x Square U-bolt (Thick) and Nuts.
- Mount the Balun with the Square U-bolt (Thin) and then connect the Feeder Line to the Element.

For Horizontal Installations
Although the assembly instructions are given for one side only in the illustrations, the method of assembly is the same for both sides.

As there is a Position Alignment Groove for the Element (Thick), please align it to that position and fix it in place.

M8 Spring Washers & Hexagonal Nuts
Fix the Nuts using the Double Nut Method

Push the M4x15 Bolt through from the inner side of the Pipe and fix the outer side after inserting a Spring Washer, Nut, Feeder Line Terminal, Spring Washer and Nut, in that order.

Mounting Plate

Element (Thick)

Spacer 2 per each side

Feeder Line
Fix the Balun side with the M4x8 SEMS Screws

U-bolt(M6)
2 per each side. Total of 4 used. Fix with an M6 Spring Washer and Hexagonal Nut from the opposite side of the Plate. Fix the Nuts using the Double Nut Method.

Square U-bolt (Thin)
Fix in place with an M5 Spring Washer and Hexagonal Nut

CBL-2500

If you fix the Spacer and U-bolt in place before inserting the Element (Thick), this will make the insertion of the element (Thick) difficult.

Mast Pipe
Installation Diameter: \( \phi 38 \sim 62 \text{mm} \)
For V Type Installations
Although the assembly instructions are given for one side only in the illustrations, the method of assembly is the same for both sides.

M8 Spring Washers & Hexagonal Nuts
Fix the Nuts using the Double Nut Method

Square U-bolt (Thick)
Fix in place with an M8 Spring Spacer and Hexagonal Nut
Fix the Nuts using the Double Nut Method.

If you fix the Spacer and U-bolt in place before inserting the Element (Thick), this will make the insertion of the element (Thick) difficult.

U-bolt(M6)
2 per each side Total of 4 used
Fix with an M6 Spring Washer and Hexagonal Nut from the opposite side of the Plate.
Fix the Nuts using the Double Nut Method.

CBL-2500
Mast Pipe
Installation Diameter:
ϕ38~62mm

Square U-bolt (Thin)
Fix in place with an M5 Spring Washer and Hexagonal Nut

Element (Thick)
As there is a Position Alignment Groove for the Element (Thick), please align it to that position and fix it in place.

Mounting Plate

Push the M4x15 Bolt through from the inner side of the Pipe and fix the outer side after inserting a Spring Washer, Nut, Feeder Line Terminal, Spring Washer and Nut, in that order.

Feeder Line
Fix the Balun side with the M4x8 SEMS Screws
About Tuning the Antenna
※The 3 bands of 1.14/21/28MHz are to be tuned in accordance with the preceding table.
The resonance frequency of the 7 MHz can be fine-tuned by adjusting the projection length of the tuning element tip.

Volume displaced when both ends of the 7MHz tuning element are varied by 1cm: 15 kHz
※2. Please adjust the difference of the left and right tuning element length to 200mm for the horizontal type and 300mm for the V type configuration at all times.

Tendency of change from the position of installation
The resonance frequency will shift downwards if the height of installation above ground level falls or obstructions, such as verandah railings, comes within close proximity. Rate of change: Approx. 10~50 kHz

Caution
The setting value in this manual is one that was taken during our own tests. Please note that there may be cases where the "fo" does not match, even when the tuning element is adjusted to this value, as a result of the variation etc. at the time of manufacture.

[Connecting the connector]
- Connect the 50Ω Coaxial Cable with the M-P connector (sold separately) to the connector on the Balun. Please take note of the type of connector. Refer to the illustration below.
- Please apply waterproof treatment over the connector area using a self-fusing tape. (The self-fusing tape is not included. Please purchase this item separately)

What should I do when this happens?
A poor VSWR reading
◆ Since the VSWR varies in response to the surrounding environment (buildings, height above ground level etc.), please try changing the installation position or the direction of the element. As you will need to loosen the nuts when changing the installation position, please take care not to drop or lose them.
◆ In the case of a direct lightning strike, there is a strong chance that the device has been damaged. If there is any doubt, please carry out a visual inspection of the antenna.
◆ If the resonance frequency has shifted down lower due to wind and rain, snow cover etc., there is a possibility that a VSWR match cannot be obtained. This is a trend that is common to any antenna and is therefore not an abnormality. Please understand that the antenna cannot be used in just any weather/environment. Please use this antenna taking note of the VSWR variance before and during operation.
◆ There is a possibility that there are bands where a match cannot be obtained even with an Auto Antenna Tuner. If that is the case, please consider the use of a Manual Antenna Tuner.
◆ The top element length in this instruction manual is one that was taken during our own tests. Due to the small variations which can occur at the time of manufacture, there may be cases where the optimal value for L is out of alignment. Please ensure you determine where your resonance frequency is located with an SWR analyzer etc. Further, take care when quick scanning during your tests as sometimes it is difficult to find the optimal point since it has been skipped over.

Is it possible to mount one element in a V configuration and the other horizontal?
◆ Unfortunately this installation method had not been considered during the design phase and is therefore not recommended.

【Maintenance】
☆If any unusual situation happens, stop using immediately and ask the local shop you purchased this product.
Confirm if the product works normally before operating.
Be sure to change the parts which have strength poverty or deformation across the ages etc.

Specifications or appearance is subject to change without notice.

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