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.

★ Check all parts are included before assembling, according to the parts list on the next page.

[Features]
- Easily assembled in "V", Ground-Plane or horizontal configuration
- Excellent weather-resistance and heavy-duty antenna
- Easy to adjust frequency with wideband Balun

[Specifications]
- Freq.Band : 7,14,21,28,50MHz / 5 Band
- Antenna Type : Center loading half wave dipole
- Gain : approx. 2.15dBi
- Max Power : 150 W(SSB) (7/14MHz), 220 W(SSB) (21/28MHz)
- VSWR : 1.5 or less (at center freq. each band)
- Impedance : 50Ω
- Connector : M-2 (SO-239) type
- Mounting Mast Diameter : Ø25～62mm
- Max Wind Survival : 30m/sec
- Horizontal Length : approx. 4.0m
- Weight : approx. 2.7kg (each element : approx.0.9kg)

[Fig.1]
Appearance (installation image)

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

⚠️ Caution: Cautions must be observed to avoid minor injury to your self 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 in a high place.
⑧ Fix the coax cable securely, otherwise this antenna could be collapsed by heavy wind.
### Parts List

<table>
<thead>
<tr>
<th>Parts name</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Folding antenna (installed on mast)</td>
<td>1</td>
</tr>
<tr>
<td>Balun CB-L2500 (general)</td>
<td>1</td>
</tr>
<tr>
<td>Feed wire with connector terminal at top</td>
<td>2</td>
</tr>
<tr>
<td>Aluminum element pipe Assy</td>
<td>2</td>
</tr>
<tr>
<td>7MHz element (with spring washers)</td>
<td>2</td>
</tr>
<tr>
<td>21MHz element (with spring washers)</td>
<td>2</td>
</tr>
<tr>
<td>24MHz element (with spring washers)</td>
<td>2</td>
</tr>
<tr>
<td>28MHz element (with spring washers)</td>
<td>2</td>
</tr>
<tr>
<td>50MHz element (with spring washers)</td>
<td>2</td>
</tr>
<tr>
<td>U-Bolt Mount Bracket</td>
<td>2</td>
</tr>
<tr>
<td>Self-fusing tape (100m)</td>
<td>1</td>
</tr>
<tr>
<td>Hexagonal wrench (2mm)</td>
<td>1</td>
</tr>
</tbody>
</table>

### Precautions for Installation

- Always wear a safety hat and a life line when you mount this antenna on a high place, such as a roof top.
- Check if the Cable Connector fits into this antenna.
- Be sure to tighten all screws, nuts and bolts to prevent them from coming loose by vehicle vibration or earthquake.
- Do not erect this antenna near any overhead wires, steel towers, buildings or any other obstacles. Otherwise, SWR could be higher or cause significant performance degradation.
- Waterproofing is highly recommended, especially for long-term use.

### How to assemble

1. Rotate the resin spacers to degrees you want to point this antenna. Refer to fig.6 “Element Retractable Range” on next page.
2. Attach 2 brackets to the other side of Balun CB-L2500, as shown in the left fig. Then, fix it to your mast (25 – 60mm). Be sure to tighten the nuts securely.
3. Attach each element to the aluminum pipe Assy, as shown in fig.4. 7MHz Element should be center, others obliquely attached wherever you like.
4. Attach the assembled elements to the feeding section at the bottom. Refer to the fig.5 on the next page. Be sure to tighten all bolts and nuts securely so that the elements are not bumped.
5. Put 50 coax cable with M-FPL-250 connector (not included) into Balun, as shown in fig.3.
6. Waterproof connectors with the self-fusing tape.

### [Fig.2]
Installation mount bracket

- M6 Hex-nut
- Spring washer for M6
- U-Bolt – x2
- Mount Bracket – x2
- Self-fusing tape

### [Fig.3]
Connectors: balun to cable
- SO-239
- Balun CB-L2500
- PL-259
- 50Ω Coax cable (not included)

### [Fig.4]
Assembly drawing of the elements

- 7MHz element
- 21MHz element
- 28MHz element
- 50MHz element
- Aluminum element pipe Assy

- Put 7MHz Element at the center, other radials wherever you like.
Fig. 5
Fixing the bottom of the elements

The elements should be straightly inserted and fixed with hex fittings.

- With the element obliquely-inserted, the screws are not appropriately locked so that the elements can be bumped.

Fig. 6
Element Rotatable Range
- Rotatable Ranges of A-side and B-side can be alternated if you turn the aluminum plate over.

A-side
B-side

- Element Rotatable Range
  A-side element: Elevation 0°-90° 30° pitch / 4 directions
  B-side element: Elevation 0°-30° 2 directions

Operating Procedure

- Start tuning VSWR at 7 MHz, then, followed by 14, 21, 28, 50 MHz.

1. Check VSWR with SWR meter etc. SWR should be 1.5 or less.
   Always check VSWR with the minimum power of your SWR meter.

2. Adjust the top element length when the resonant frequency not matching.
   The longer the element is, the resonant freq becomes low.
   The shorter the element is, the resonant freq becomes high.
   When you want to shorten the length more than variable length limit, you can cut the top element. However, please note that the length won't be enough when you adjust the direction to extend.

- Both top elements are the same in length, but you can adjust the one 10mm longer, and the other 10mm shorter.

   Top element length: L

M3/4 screw

3. Start operating if VSWR is normal.
   Correspondence Table for the basic element L length

<table>
<thead>
<tr>
<th>Element Frequency</th>
<th>Basic Length L (mm)</th>
<th>Frequency change per 1cm (MHz/mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7MHz element</td>
<td>360</td>
<td>7.07 MHz</td>
</tr>
<tr>
<td>14MHz element</td>
<td>20</td>
<td>14.2 MHz</td>
</tr>
<tr>
<td>21MHz element</td>
<td>160</td>
<td>21.1 MHz</td>
</tr>
<tr>
<td>28MHz element</td>
<td>80</td>
<td>28.6 MHz</td>
</tr>
<tr>
<td>50MHz element</td>
<td>125</td>
<td>51.2 MHz</td>
</tr>
</tbody>
</table>

Note 1. The frequency change per 1cm is determined by changing 1cm each of both elements.
Note 2. 30MHz band can't be covered by adjusting the top element length only. Cutting element or using the antenna tuner is highly recommended.
- Fine-tune the length of each element ends and/or the angle of the elements, according to installation environment.

-3-
VSFV Reference data

<table>
<thead>
<tr>
<th>VSWR</th>
<th>fo</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>+11 kHz</td>
</tr>
<tr>
<td>1.5</td>
<td>+11 kHz</td>
</tr>
<tr>
<td>1.0</td>
<td>+11 kHz</td>
</tr>
<tr>
<td>-11 kHz</td>
<td>7MHz Band</td>
</tr>
<tr>
<td>-18 kHz</td>
<td>14MHz Band</td>
</tr>
<tr>
<td>-27 kHz</td>
<td>21MHz Band</td>
</tr>
<tr>
<td>-70 kHz</td>
<td>28MHz Band</td>
</tr>
<tr>
<td>-900 kHz</td>
<td>50MHz Band</td>
</tr>
</tbody>
</table>

- Target VSWR is 1.5 or less

Troubleshooting

Q: Why is VSWR high?
Ans: Surrounding environment, such as buildings, obstacles or ground height, etc., can affect VSWR. Try to change the element angle or position. Be sure not to lose or drop the nuts when changing the angle.

Q: Lightning can damage the antenna. Check the antenna after lightning storms.
Ans: Lightning Frequency can be drifted by rain, wind or snow etc. Always check VSWR before and while operation.

Q: 7MHz (or other band) Element can be removed?
Ans: All elements should always be attached while operation. We cannot guarantee that the antenna will perfectly work if any of the elements are removed.

Q: The elements of other products (COMET UHV-5, HV-5, etc.) can be available?
Ans: Do not use other elements for this antenna. Also do not use the elements of CHV-5X for other products, they are for CHV-5X only.

⚠️ Precautions for operation
- Do not touch the antenna while transmitting, or you might be burned.
- Do not touch the antenna or coax cables while lightning. Checking VSWR after lightning is highly recommended.
- Do not use this antenna outside its specification. Failure to follow this will damage the antenna.
- Make sure to adjust the antenna in a way that higher VSWR could reduce the performance degradation.
- Never attempt to fix or modify this antenna by yourself.

[After-Sales Service]
We provide the replacement parts for the damages by unintentional accidents or for deterioration with long-term use. Please ask the local shop you purchased this product.

This product is made under the stringent quality control. Should there be any breakdown in transit, please do not hesitate to contact the shop you purchased this product.

[Care and Maintenance]
If any unusual situation happens, stop using immediately and ask the local shop you purchased this product.

Be sure to change the parts which have shown slight or deformation across the time etc.

Specifications or appearance is subject to change without notice.

2nd Version
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