



VERSA Beam Antenna Controller INSTRUCTION MANUAL



Please keep this manual after you read for maintenance purpose

Rev3.01

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1. INTRODUCTION

Thank you for choosing KA1 as one of your antennas. We are sure KA1 will make your DXing more competitive as well as enjoyable.

You can adjust elements length by the controller in your shack which means you can adjust not only SWR but also F/B ratio and gain of the antenna.

Please read this manual carefully to understand how KA1 works and how to use it.

KA1 is much heavier than ordinary Yagi antenna that has the same number of elements. It also has some sharp parts which may hurt you if you touch them roughly. Please be careful when you construct it or do maintenance.

CAUTION

Do not use AC adaptor or cable that doesn't come with KA1.

Before installing KA1 on the tower, please make and confirm Adjustable Element Unit (AEU) working on the ground.

Pull off the DC plug from the controller when you attach or remove the Amphenol connector.

While in operation (elements are not fully out or home, in between), push HOME button to get all the elements home position if you pull off the DC plug. Otherwise KA1 may lose the accurate position. This should happen when you experience black out.

* In case you don't use VERSA Beam Antenna for long or you need to fix it, follow the procedure a) and b) written below.

- a) First retract all element to HOME position by pressing HOME and SET.
- b) After a) remove DC plug from your controller.

3. ADJUSTABLE ELEMENT UNIT (AEU)

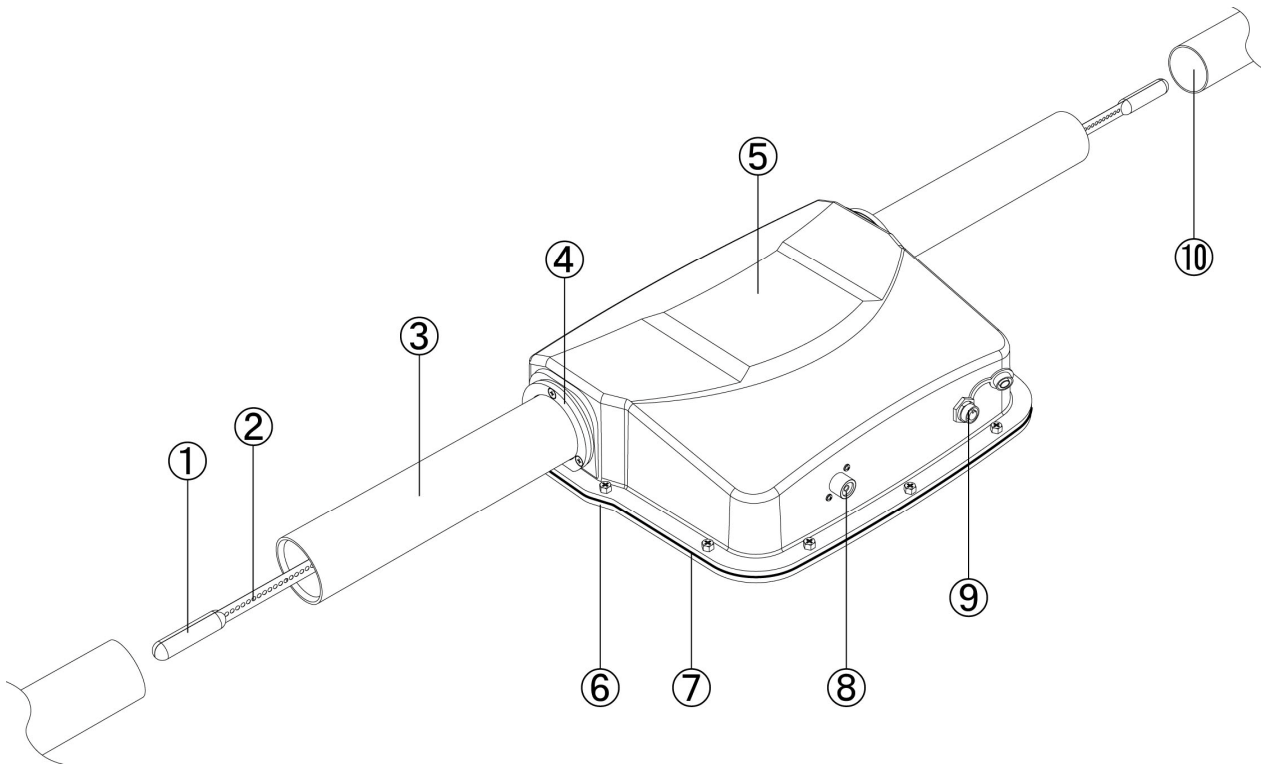


Figure 1

- ① Element Top
- ② Element
- ③ Supporting Rubber
- ④ Rubber Holder
- ⑤ Element Housing
- ⑥ Housing Cover
- ⑦ Housing Gasket
- ⑧ Coaxial Connector (only AEU for driven element)
- ⑨ Control Cable Connector
- ⑩ Glass Fiber Tubing

Note: We named the unit assembled with ① to ⑨ listed above AEU.

4. Controller Front Panel Buttons and Functions

■ Button Names

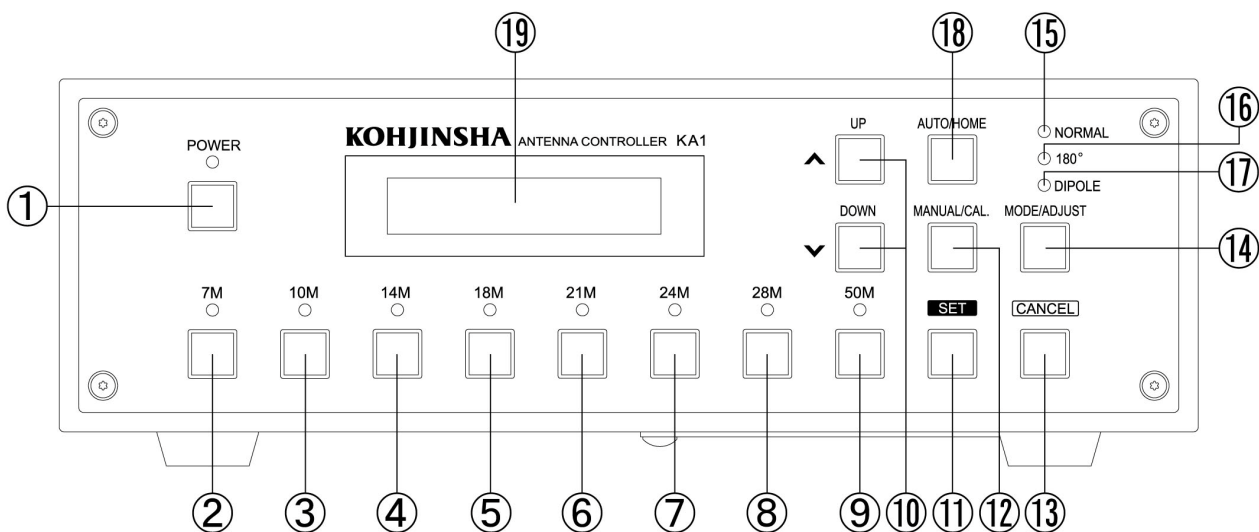


Figure 2

① POWER

Press to power ON. LED comes to light on.

Press and hold to power OFF.

This function is disabled during the elements in motion.

One of the band LEDs comes on light when you turn power off to let you know what band position the elements have been at.

While the controller power is off, in order to apply the brake on the stepping motor small amount of electric current is running. That makes the controller a bit warm. It is not a problem or failure.

In case of power outage or something happen like that, by turning on the power VERSA antenna itself retracts all element to HOME position, and then extends elements to the original position where it was before the power turned off accidentally.

②~⑨ BAND

Elements move to the each band position that is selected by these buttons.

(②7MHz ③10MHz buttons don't work for Model 203/204/205/206)

⑩ UP/DOWN

Adjustment (moving segments within the band or fine tuning of factory set element length)

Selection of settings.

⑪ SET

Set button for settings works like ENTER.

⑫ MANUAL/CAL.

* MANUAL: For you to adjust manually.

* CAL: CALIBRATION (Press and Hold); Elements moves to HOME position once and then extend to the set frequency position.

⑬ CANCEL

Cancel the immediate command selection.

⑭ MODE/ADJUST

* MODE: Switch between each mode. NORMAL, 180° ,DIPOLE

* JUST (Press and Hold): Element fine Tuning.

⑮ NORMAL

For normal operation.

⑯ 180° (Reverse)

Switching the beam direction to opposite side. In this mode all the KA1 models work as 3 element Yagi.

⑰ DIPOLE

KA1 has gain on both side (front and back) working like a dipole, however it has some gain.

⑱ AUTO/HOME

* AUTO: Coordinate with your transceiver frequency.

* HOME (Press and Hold): All the elements are wound up to the home position.

⑲ LCD

Displays antenna settings, frequency, and MODE.

〈Example LCD display〉

Manual	
17m	18.100MHz



Manual	066
15m	21.050MHz

Your VERSA antenna is set
for 18MHz band.

When you press 21M BAND button,
LCD shows above information.

The upper right number is time to
finish motion. 066 means 6.6
seconds. The number will disappear
after stopping motion.

4. Detail Functions of Front Panel Controls

■4-1 ①POWER Button

Press the POWER button to power on the controller. Then Model Number, Software Version, ROM Version, and Available Frequencies are shown.

The previous settings and the band will be shown some seconds later.

Refer to Figure 3 and 4. (Figure 3 shows the KA1-406 display)

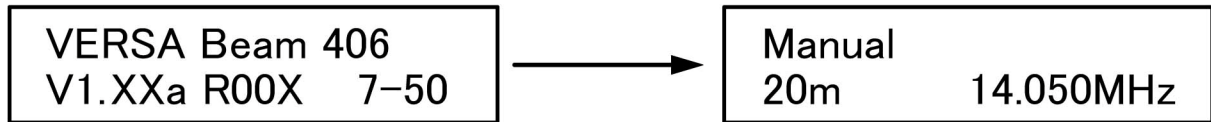


Figure 3:

Right after turning on the power.

This is shown only for some seconds,
then switch to Figure 4 looking.

seconds to switch to Figure 4

looking.

Figure 4

This shows the previous operation
mode was Manual, and the band was
14MHz.

■4-2 BAND Buttons ②~⑨

*NORMAL Mode(⑮LED is on)

When one of BAND Buttons is pressed, elements will move to the displayed frequency position.

While the elements are moving, the MODE LED is flashing. The LED stops flashing and comes to light on when the elements stop at the position.

The band and frequency are shown on the LCD. There are two options of showing this information. Read the following description carefully.

□Band & Frequency Display (While Manual Mode is selected.)

Band and Frequency are displayed on the LCD shown like below.

7M/14M/21M/28M bands are divided into 3 segments.

Each pressing of BAND Button switches the segment.

- ② 7M : 40m 7.000MHz / 40m 7.040MHz / 40m 7.120MHz
- ③ 10M : 30m 10.100MHz
- ④ 14M : 20m 14.050MHz / 20m 14.150MHz / 20m 14.250MHz
- ⑤ 18M : 17m 18.100MHz /
- ⑥ 21M : 15m 21.050MHz / 15m 21.200MHz / 20m 21.350MHz
- ⑦ 24M : 12m 24.950MHz
- ⑧ 28M : 10m 28.000MHz / 10m 28.500MHz / 10m 29.000MHz
- ⑨ 50M : 6m 50.100MHz

*②7MHz band and ③10MHz band are not available for Model 203/204/205/206.

□Freq Region Display (While Manual Mode is selected)

- ② 7M : 7.000-7.039MHz / 7.040-7.079MHz / 7.120-7.159MHz
- ③ 10M : 10.100-10.149MHz
- ④ 14M : 14.050-14.099MHz / 14.150-14.199MHz / 14.250-14.299MHz
- ⑤ 18M : 18.100-18.149MHz
- ⑥ 21M : 21.050-21.099MHz / 21.200-21.249MHz / 21.350-21.399MHz
- ⑦ 24M : 24.950-24.999MHz
- ⑧ 28M : 28.000-28.049MHz / 28.500-28.549MHz / 29.000-29.049MHz
- ⑨ 50M : 50.100-50.149MHz

*②7MHz band and ③10MHz band are not available for Model 203/204/205/206

□Freq Region Display (While Auto Mode is selected)

KA1 controller shows the same frequency as your transceiver shows.

Example: If your transceiver frequency 「14.195MHz, you see the same number like 「14.195MHz」 on the LCD.

*How to Change Frequency Display Format

Go to 「User Mode」 to switch frequency display format. We would like you to read 8-2 for more detail.

- ① Press and Hold the POWER button to turn off the power.
→②Press and holding the 7M button, press POWER button.
→ “ User mode” is displayed on LCD (Figure 5), and then some seconds later LCD shows the information like in Figure 6.

KOHJINSHA KA-1
User mode

Figure 5:

The LCD shows as above, and then change to as Figure 6.



00: Exciter Type
000: KJS/ICOM

Figure 6:

Press ⑩UP or DOWN until you see [05: Display Type].

05: Display Type
000: Band & Freq

Figure 7:

Press ⑮AUTO/HOME. AUTO/HOME button toggles from [000: Band&Freq] to [001: Freq Region]. Press SET button to determine.



Write Complete
xxxxxxxxxx

Figure 8:

The controller is shut down automatically some seconds after you see the above.
You need to restart to activate the User

*You can fine tune the element length for each band.(②7MHz~⑨50MHz)

⑩You can move one segment to another in the same band by UP・DOWN button.

You can also change element length from the factory default and save the new settings in the controller with ⑭ADJUST on a band.

You can try to fine tune because it is easy to go back to the factory default settings on any band.

See next AUTO・MANUAL mode function.

*AUTO • MANUAL mode function

You can obtain factory default setting status by press and hold the BAND button. If you do this operation in certain segment of a band, other segments in the same band will get to factory default.

See Figure 9 and 10

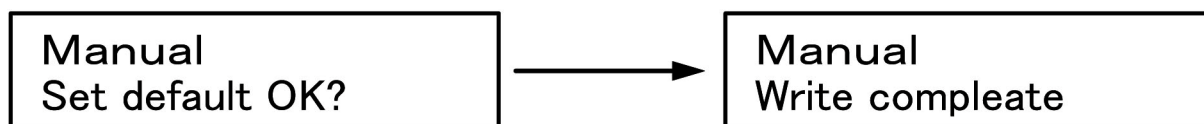


Figure 9:

In Manual mode.

[Set default OK?] blinks on and off.

Press ⑪SET button.

Figure 10:

Showing the message while the settings are going back to default. The mode LED that you have selected is flashing on and off while the elements are in motion.

■4-3 ⑩UP • DOWN button

*UP • DOWN button is used for selecting commands, choosing segments, and adjusting frequency.

■4-4 ⑪SET button

*SET button determines the selected command or status.

*You can confirm model number, software version, and ROM version by press and hold this button. (See Figure 3)

■4-5 ⑫MANUAL/CAL.(CALIBRATION) button

*MANUAL button

This button is used to adjust element length manually.

You can fine tune the antenna resonant frequency by ⑩UP • DOWN button.

In order to get back to factory default you need to press and hold the BAND button of which you want to make the setting factory default. LCD displays as below.

→Set default OK? blinking→⑪SET→Write complete →factory default element length

*Note The above operation deletes the previously set data.

*CAL. (CALIBRATION)button (Press and Hold)

You can start calibration on any band and in either MANUAL or AUTO mode. You will see Figure 11 by press and hold CAL button. Press ⑪SET button while [Push SET] is blinking. Then you will see Figure 12.

The controller is set to factory default, which means the antenna was once calibrated under certain condition in the factory.

We would like you to do [Calibration] once you removed power supply from the controller or after experiencing power outage.



Figure 11:

Press and hold CAL button brings the above message.

Push SET is blinking. Press ⑪SET to determine.



Figure 12:

Push SET disappears.

While one of MODE LEDs is blinking on and off, the elements are in motion. Elements go back to home position and then extend to the set position.

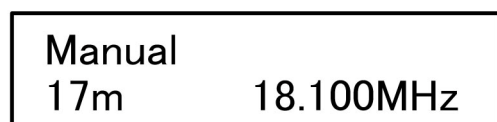


Figure 13:

(In case of 18.100MHz is selected) Once all the elements are retracted (going back to home position in the AEU), elements will start extending to the correct length for the selected band (segment). One of MODE LEDs turns to on from blinking tells you finishing the calibration process.

■4-6 ⑬CANCEL button

You can cancel the immediate operation by pressing this button.

■ 4-7 ⑭MODE/ADJUST button

*MODE

Switching NORMAL, 180° , and DIPOLE.

Each time pressing this button the MODE LED blinks. During blinking elements are moving in the glass-fiber poles. When the elements are set to the length for the selected band, the LED turns on from blinking.

*ADJUST (Press and hold)

You can fine tune element length.

Press and hold while either AUTO or MANUAL mode is selected.

Figure 14 will be shown. Press SET, and then you can choose AEU (D1, D2, D3, D4 (directors), Ra (radiator), All (all elements)) that you want to adjust length with ⑩UP or DOWN button. Press ⑪.SET to determine which element length should be adjusted.

Each pressing ⑩UP or DOWN button let the element extend or rewind 5mm. If you press and hold the button, the element keeps moving until you release the button.

Press ⑪.SET to set and save the setting. You see Write complete in LCD display.

*You can go back to the normal operation by pressing ⑬.CANCEL button to abort Adjust status.

After you adjust an element, you can repeat the same procedure to adjust another element.

See Figure 14, Figure 15, Figure 16, and Figure 17

*All

You can adjust all the elements by one operation at the same time.

See Figure 18

*Note:

If you see [Max Length] in LCD display, the element length value you were going to obtain have exceeded the physical element length.



Figure 14:

[Push SET] is blinking.

Press ⑪ SET to select what AEU to adjust.

Figure 15 shows you selected [Ra].



Figure 15:

You will see [SET] blink if you press ⑩ UP or DOWN to adjust element.



Figure 16 :

Press ⑪ SET to set and finish adjustment.

[Write Complete] will stop blinking.

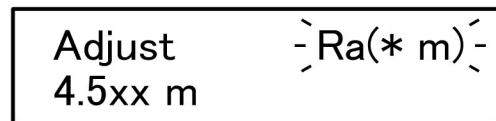


Figure 17:

After Figure 16 process, you will see AEU name (in this example it is Radiator) start blinking again.

If you want to adjust another element, use ⑩ UP or DOWN to choose it.



Figure 18

Figure 18:

shows appearance of LCD display when you adjust all the elements at the same time.

Procedure is as same as described above for each element adjustment.

We recommend to do Adjust procedure if you think SWR is high after Calibration.

*Note:

We recommend customizing element length by adjusting elements if SWR is comparatively high at your location.

NORMAL mode adjustment works only for NORMAL mode. You may need to take the same procedure for each mode(180° , Dipole).

■ 4-8 ⑮ NORMAL mode

*Regular Yagi antenna mode

KA1 works as regular Yagi antenna.

■ 4-9 ⑯ 180° (Reverse) mode

*Front and back switch from Normal mode.

Any type of KA1 works as 3 element Yagi antenna.

■ 4-10 ⑰ DIPOLE mode

*KA1 has dipole like pattern on both front and back

KA1 has a little gain over dipole antenna.

■ 4-11 ⑱ AUTO/HOME button

*AUTO button

Press AUTO button to make the controller to follow your transceiver frequency.

Note: Because KA1 controller is designed to follow the transmitting frequency (Main VFO frequency for ICOM radio), KA1 doesn't follow the receiving frequency during SPLIT mode operation. KA1 controller follows only receiving frequency of some transceivers that don't have transmitting frequency output like TS950/850.

*HOME button (Press and hold)

Pressing HOME button all the elements are retracted to the reels in AEU. We call this status home position.

We strongly recommend retracting elements to home position during lighting storm. Then please remove control cable and DC plug from the controller. If you stack another or other antennas over KA1, you can reduce the effect of KA1 over other antennas minimum by retracting elements.

Press ⑪ SET button when Figure 19 is shown, and you will see Figure 20. Mode LED is blinking while elements are in motion in the glass fiber poles. When all the elements are retracted, LED turns on from blinking.

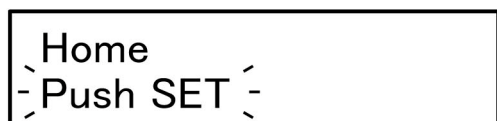


Figure 19:HOME

[Push SET] blinks.

Press ⑪SET button to set.



Figure 20:

When all the elements are retracted, the above message comes on LCD display. After showing this message the power will be shut off automatically.

*While selected mode LED is blinking, elements are in motion.

*Figure 20 shows the example of 6

*HOME operation and HOME sensor

After HOME operation is done and HOME sensor detects the element is retracted in an AEU, the AEU number will be show on the upper left corner of LCD display. Then the power will be shut off.

The numbers at upper right corner of LCD display shown as Figure 20 are connector numbers in junction box.

Displayed numbers for each model are shown below.

LCD表示番号	1	2	3	4	5	6
ジャンクションボード コネクタ番号	Motor-1	Motor-2	Motor-3	Motor-4	Motor-5	Motor-6
KA1-203	Ra	Ref	D	-	-	-
KA1-204	Ra	Ref	D1	D2	-	-
KA1-205	Ra	Ref	D1	D2	D3	-
KA1-206	Ra	Ref	D1	D2	D3	D4
KA1-403	Ra	Ref	D	-	-	-
KA1-404	Ra	Ref	D1	D2	-	-
KA1-405	Ra	Ref	D1	D2	D3	-
KA1-405S	Ra	Ref2	Ref1	D1	D2	-
KA1-406	Ra	Ref2	Ref1	D1	D2	D3

* Ra/Radiator, Ref/Reflector, D/Director

5. Rear Panel and Connectors

■ The Name of the Connectors on the Rear Panel.

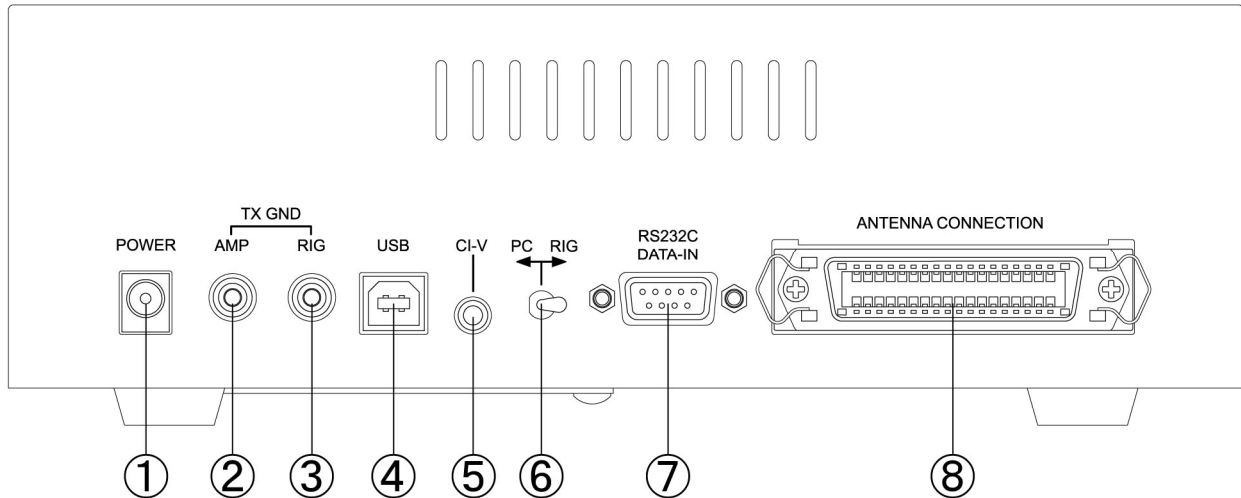


Figure 21

① POWER :

For AC adaptor plug. We strongly recommend you to use AC adaptor that comes with KA1.

***NOTE** During operation if you accidentally removed power from the controller, you should need to HOME operation (press and hold HOME and press SET) for elements to get to home position once. Otherwise the CPU in the controller may miscalculate the length.

② AMP :

RCA female for linear amplifier control.

③ RIG :

RCA female for your transceiver TX GND output. TX GND is connected to ground during transmitting.

*② and ③ are connected inside of the controller normally. Only when elements are in motion, they are cut off to prevent KA1 from being damaged. This function should also work to protect your linear amplifier.

④ USB Interface:

USB Type-B terminal to connect with your computer.

Driver software is automatically installed for Windows XP and later. But you may need to install manually for earlier version of Windows and for some Windows 7.

⑤ CI-V Interface :

3.5mm mono mini jack. (2P)

This works as same as [REMOTE] of ICOM equipment. You need to use this interface to use ICOM transceivers or KOHJINSHA linear amplifiers.

⑥ PC⇄RIG :

This toggle switch lets you choose either computer or transceiver to control VERSA Beam antenna.

⑦ RS-232C Interface :

Use RS232C straight cable to connect transceiver or computer that has RS232C interface. Be sure to lock the connector after connection.

⑧ ANTENNA CONNECTION :

For Amphenol 36 pin connector supplied with control cable. Be sure to lock the connector after connection.

*NOTE

Please confirm the AC adaptor is removed from the controller when you make this connection.

6. Before Start Using KA1

■6-1 Check and Adjust SWR at Factory Default Setting

Use antenna SWR analyzer or KOHJINSHA KP-1 Power meter to measure SWR.

■6-2 Calibration

The controller is set to factory default. Factory default setting is the best setting in certain condition. You may need to customize settings in order for KA1 to fit your antenna circumstances.

Please confirm the initial display that tells you KA1 is at HOME position. Look at upper right corner of LCD display. You should see 123 for 3 element, 1234 for 4 element, 12345 for 5 element, and 123456 for 6 element.

Confirm MANUAL mode is selected, and then press 28MHz button to extend the elements to 28MHz length.

NORMAL LED blinks until extending stops. LED stops blinking and keeps light on. Press and hold MANUAL/CAL button and press SET to go to calibration.

Element numbers are shown when elements are retracted to HOME position. And then elements will extend to the 28MHz length. LED stop blinking and keep light on when calibration is done.

(28MHz calibration should finish within 30 seconds.)



Figure 22:

Press and hold MANUAL/CAL button make [Push SET] blink. Press SET button to start retracting

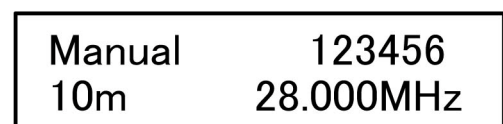


Figure 23:

When retraction completes, LCD showing is like Figure 23. for some seconds, and disappear.

Figure 23 shows for 6 element model.

* At this point let's measure SWR on 28MHz band.

Please make sure the controller frequency is the same as the transceiver frequency before measuring SWR.

For example : Transceiver 28.300→Controller 28.300

*Note

When you measure SWR,

Get your tower the highest if your tower is a crank up tower.

Do not do it on the day of heavy rain, snow, or windy.

Choose the antenna direction to keep elements as far away as possible from trees, wires, or buildings. If the element tip is too close to those obstacles, you may not be able to obtain good SWR.

Please make sure SWR is low enough on the other bands, too.

Please put SWR numbers that are obtained in the regular conditions for future reference.

BAND	周波数	NORMAL	180°	DP
7M	7.100MHz			
10M	10.125MHz			
14M	14.150MHz			
18M	18.120MHz			
21M	21.200MHz			
24M	24.950MHz			
28M	28.300MHz			
50M	50.100MHz			

* SWR adjustment procedure is explained in the next section.

We strongly recommend retracting all the elements during typhoon (hurricane), thunder storm, heavy rain, or blizzard. We also recommend you to do calibration again after severe weather is gone.

If you do calibration on a certain band, other bands are calibrated automatically. The Higher the band you calibrate, the shorter the time you need.

You can set automatic calibration after power on by USER setting. It is recommended to set this setting because element length may change a little by strong wind or shock by something.

* This table shows approximate time to complete calibration on each band.

BAND	7M	10M	14M	18M	21M	24M	28M	50M
Duration	80Sec	80Sec	60Sec	50Sec	40Sec	35Sec	30Sec	20Sec

The duration is for retracting to home position and extending to the band length. (It takes about a half of above number to extend for the band from home position.)

■6-3 How to Adjust VSWR and Save the Setting

SWR may not be the best at your antenna site because there should be some things that may affect your antenna at your antenna site.

If you cannot get good SWR by calibration, use [Adjust] function to adjust element length. After adjustment you need to save the setting in the controller.

How to Adjust 1.

①: Choose MANUAL mode. Go to the band that you want to adjust. Press UP or DOWN to move frequency in the same band in order to find the best SWR point (the lowest point).

②: Pressing UP makes the frequency higher.(Element length gets shorter.)

③: Pressing DOWN makes the frequency lower. (Element length gets longer)

④: If you find the spot whose SWR is below 1.5 and the best for the band, read the frequency.

⑤: Make the transceiver frequency and the controller frequency the same. Go to Adjust mode. See Figure 18. Select All. Use UP or DOWN until you get the same SWR(best) that you obtained in process ① to ④. Press SET.

You won't lose GAIN or Front to Back ratio because all the elements moves with coordinating the factory default data if you choose [All].

How to Adjust 2.

In case you couldn't have good result by following How to Adjust 1, we would like you to try this.

①: Choose MANUAL mode, and select a band which you want to adjust. Set your transceiver frequency as same frequency as the controller shows. Go to Adjust mode.

②: See Figure 16. Use UP or DOWN button to adjust the radiator length until you find the best spot. Press SET.

If you think you did adjustment too much, return to factory default. You need to repeat above process on each band. You need to do the same process for 180° and DP mode.

*Note:

If you adjust reflector and directors to pursue better SWR point, you may lose the antenna gain and good F/B ratio.

If you would like to fine-tune reflector and directors, ask you local station that is located within 5 Km (3 miles) from your station to transmit test signals. You need to check not only gain, or F/B ratio, but also SWR.

Our factory test frequencies are listed below.

7.100, 10.125, 14.150, 18.100, 21.200, 24.950, 28.300, 50.100MHz

■6-4 Rain Mode and Snow Mode

The resonant frequency may move lower under rainy or snowy weather. You can use Rain Mode or Snow Mode to adjust the resonant frequency. You can adjust it manually, too. However, it should be much easier and faster to use Rain Mode or Snow Mode that can be set in advance.

How to use Rain Mode and Snow Mode

At any frequency position the controller switches from normal mode to Rain Mode by pressing (not press and hold, just press) SET button. From Rain Mode one press of SET button let the controller work as Snow Mode. In both cases you can see “R” for Rain Mode, “S” for Snow Mode in LCD display. The amount of frequency shift should be set for both Rain and Snow Mode beforehand.

Manual		Manual	
17m.R	18.100MHz	17m.S	18.100MHz

Figure 24: Display example of Rain mode / Snow mode.

*Note

Press CANCEL button to go back to normal mode (sunshine mode). “R” or “S” disappears.

How to Set Amount of Shift Frequency

No amateur radio stations should have the same place. Furthermore any antenna doesn't have the same location. Therefore each user has to set the amount of shift frequency at each location.

Move elements manually to get to the best SWR point, and measure how much frequency shift occurs on every band in each atmosphere..

You can use either User Mode or Rain Mode(Snow Mode) status for this purpose.

①How to set in User Mode.

Turn off the power of VERSA controller. Press both 7M button and POWER button at the same time to get into User Mode.(See 8-2)

Pressing UP button several times until 10. "RainShift" shows up.

You can set frequency shift amount in 10~17 for Rain Mode shift and 20~27 for Snow Mode shift for each bands. Use AUTO/HOME and MANU/CAL buttons to select shift amount. Once you finish selecting shift amount, press SET button, then controller automatically start writing data. The power will also be off automatically after the job is done.

14:15m	RainShift
002:	56.0 [KHz]

Figure 25: Example A

Setting 15m Rain Mode shift frequency at #14.

21:30m	SnowShift
001:	13.5 [KHz]

Figure 26: Example B

Setting 30m Snow Mode shift frequency at at #21.

②Setting from the Rain or Snow Mode status.

Select the mode you want to set. In the selected mode press and hold the SET button, and then LCD display shows setting screen. Use UP/DOWN button to get the proper shift amount. After setting is done, press AUTO/HOME or MANU/CAL to go back to regular operation.

15m	RainShift
002:	56.0 [KHz]

30m	SnowShift
001:	13.5 [KHz]

Figure 27: Example C

■6-5 How to Check All Elements Move Properly

As described in 5-11 you can see element numbers on LCD when elements are retracted, and get to HOME position. If you see all the element numbers, AEU's work properly.

If you want to check while you are using KA1, go to Adjust mode and press and hold UP or DOWN button to move elements. If you see SWR change, you can tell AEU's work okay. Be sure to press CANCEL to get back to the last position.

Adjust
[Push SET]

Figure 28: Adjust

[Push SET] is blinking.

Press ⑪SET to see an AEU name blink.

Press ⑪SET to determine what AEU to check.



Adjust Ra(*m)
7.0xx m [SET]

Figure 29:

[SET] blinks if you press ⑩UP・DOWN to adjust elements. After you confirm AEU's work all right, press CANCEL.

■6-6 Remote Operation

If you turn off all the AC power supply, the DC power used for braking step motor is also turned off. Without brake antenna elements may be moved by wind or something.

We recommend to set USER mode [07:AUTO CAL] [001] for your controller to start with automatic calibration.

*Note:

If the elements are retracted to HOME position, automatic calibration won't start.

■6-7 What You Should Keep in Mind When You Measure SWR

When you measure SWR,.....

Make your tower the highest if your tower is a crank up tower.

Do not do it on the day of heavy rain, snow, or windy.

Choose the antenna direction to keep elements as far away as possible from trees, wires, or buildings. If the element end part is too close to those obstacles, you may not be able to obtain good SWR.

You may not be able to measure accurate SWR if there are linear amplifier, and/or antenna switch, and/or filters in between antenna and SWR meter. We recommend remove those equipments when you measure SWR..

■6-8 Frequency Segment Width

Because some bands work with loading coil, low SWR(maybe below 1.5) range is narrower. To avoid operating with high SWR you can change the moving step width to a half of the original.

6-8-1:How to Change Stepping Frequency Segment Width for Regular VERSA Antenna (7MHz)

In AUTO or MANUAL mode you can get 20KHz step by pressing and holding the DOWN button.(Figure 30 to 31) Pressing and holding UP button make the controller to original 40KHz step mode.

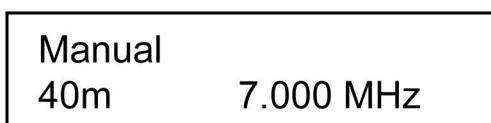


Figure 30: regular 40KHz Step

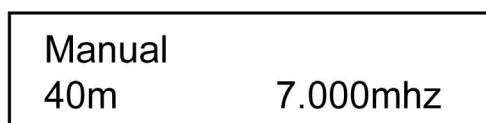


Figure 31: 20KHz Step

■MHz: means 40KHz step

■mhz: means 20KHz step

6-8-2:Lite Model (203L • 403L)

VERSA Lite works as same as described above for regular VERSA antenna. You can set up using as same procedure as regular VERSA antenna. Refer Figure 30 to 31.

■7MHz: 20KHz⇒10KHz step

■10MHz/14MHz: 40KHz⇒20KHz step

*Note:

If you press and hold DOWN button outside of amateur band, you see “mhz” in the display. However stepping frequency range doesn't change. It is fixed as 50KHz step.

7. USER MODE Settings

■ 7-1 What You Can Do with USER Mode

Starting with USER Mode you can set following functions.

*00:Exciter Type

Choose a transceiver you use with KA1. There are transceivers made by major ham manufactures that are memorized in the controller.

*01:Baud Rate

Select the baud rate that will be used to communicate with your transceiver.

*02:Stop bit

You can select 1 Stop bit or 2 Stop bit.

*03:Logging Soft

KA1 controller is design to work with some logging programs. Select one of them for your system.

*04:ICOM RX ADRS

If needed, choose one of the addresses that are mapped for ICOM equipments.

*05:FreqDisp Form

Choose your favorite display format from [Band&Freq] or [Freq Region].

*06:Tracking Delay

KA1 elements move in accordance with your transceiver VFO frequency being driven by step motors every 50 KHz (400series: every 40 KHz on 7MHz)

You hear step motor noise at the above moment. The noise is so small that can be ignored. However, if a target station is just on the border 50 KHz, the noise may bother you whenever you move across the frequency.

In above case you can set delay time for the step motor to start moving.

000 :0[sec] 、 001 :3[sec]、 002 :6[sec]、
003 :9[sec]、 004 :12[sec]、 005 :15[sec]

*07:Auto CAL

You can choose No Auto CAL or Auto CAL that calibration will be done automatically when you turn on the main AC or controller power.

*LCD display and its function

000: No Auto CAL No automatic calibration

001: Auto CAL Calibration starts when main AC power is supplied.

*08:Auto Home

KA1 is designed to retract elements when the transceiver frequency is out of KA1 covering frequency. Here is an example. If you select below 14MHz band with 200 series or if you select below 7MHz band with 400 series, KA1 retracts all the elements to home position by this setting.

*LCD display and its function

000: Not Auto HOME No automatic retraction

001: Auto HOME Automatic retraction

* 10~17:Rain Mode, 20~27:Snow Mode. How to Set up Frequency

Shift in the Rain&Snow Mode

You can setup frequency shift amount in the Rain or Snow mode.
You can follow the same procedure that is described in the regular VERSA antenna section of this manual.

Please read below for more detail.

*7-4 Rain Mode and Snow Mode

Page 22, 23

*8-2 Start Your Controller with User Mode

Page 28

*10-2, 10-3, 10-4 in 10. Connecting with Transceiver and Computer

Page 36 to Page 39

■7-2 Start Your Controller with User Mode

See Figure 32

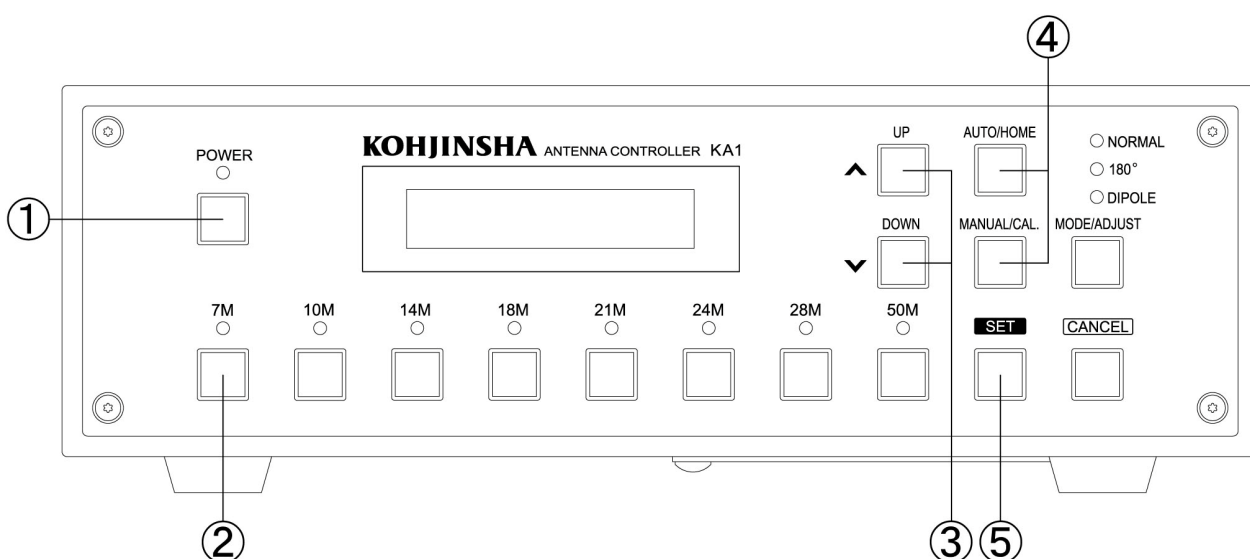


Figure 32

Press and hold ①POWER to turn off the controller.

→With Pressing and holding ②7M button, press ①POWER button.

→[Figure 33 left] is shown on LCD for a while and then [Figure 33 right] appears.

See Figure 33



Figure 33

Each time pressing ③UP/DOWN button the display switches like [Baud Rate], [Stop Bit], and etc.

In order to select your transceiver model, press ④ AUTO/HOME or MANUAL/CAL when you see [Exciter Type] on the LCD display.(Don' t press ⑤SET yet.)

Following above operation you need to set up [Baud Rate] and others. After you set up all the settings here, press ⑤SET.

You will see [Write Complete] on the LCD display. The power will be shut off automatically.

8. Factory Default

■ Please follow the procedure written below to get back to factory default settings

See Figure 34

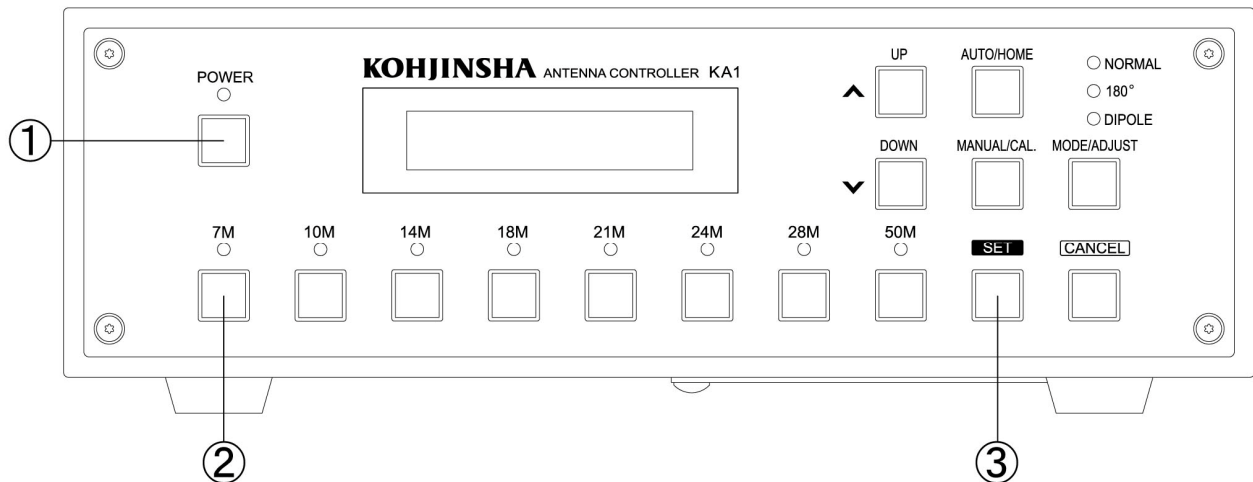


Figure 34

Note:

1: All the elements should be retracted at home position before factory default operation. See 5-1 1 ⑱ AUTO/HOME button. See Page 15

2: In order to get the factory default element length press and hold each BAND button.

Press and hold ①POWER to turn off the power.

→Press and holding ②7M button press ①POWER button.

→Figure 35 [User mode] appears and then Figure 36 is shown.

Pressing ②7M button press ③SET button at Figure 36 state.

Figure 37 appears while controller is getting back to factory default setting.

When factory default is set, you see Figure 38. The power is automatically shut off.

Press POWER button to turn power on Figure 39 will be shown.

If you see Figure 39, the controller is set to factory default.

See Figure 35 to Figure 39

KOHJINSHA KA-1
User mode

Figure 35:

After [User mode] screen is displayed,
Figure 30 appears.



00: Exciter Type
000: KJS/ICOM

Figure 36:

Press and holding ②7M button press
and hold ③SET button when you see
this screen.

Now Writing
Pls Wait, xxxxx

Figure 37:

This is showing the software is getting
back to factory default settings. When
the five digit counter becomes 0, the
controller setting is factory default.



Write Complete
Please Power OFF

Figure 38:

When the work is done, you see
this screen. The power is shut off
automatically.

Home 123456
Element Home

Figure 39:

Press ①POWER button to restart the
controller, then this screen appears.

Now the software is set as factory
default.

*Figure 39 shows for 6 element model.

*Each number on the upper right of the screen corresponds to each AEU. See
the table of AEU name and Junction Board connector number in 5-11 on
page 16.

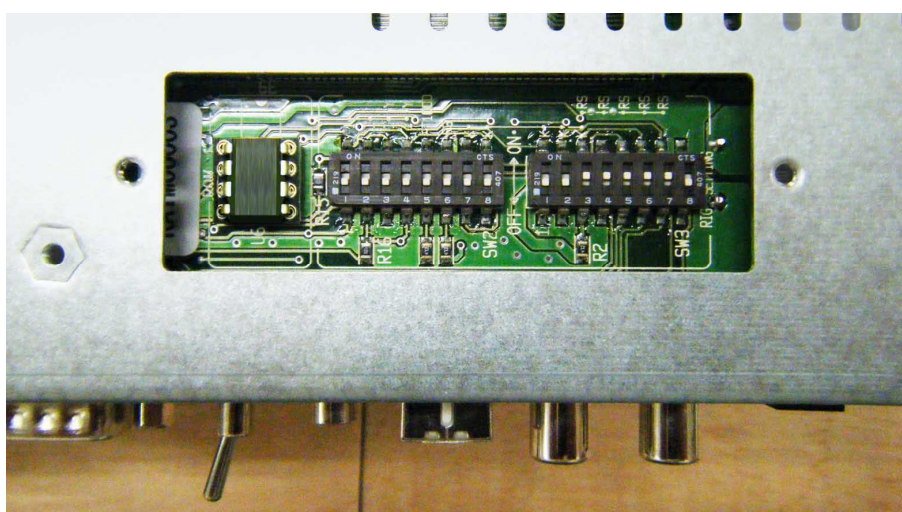
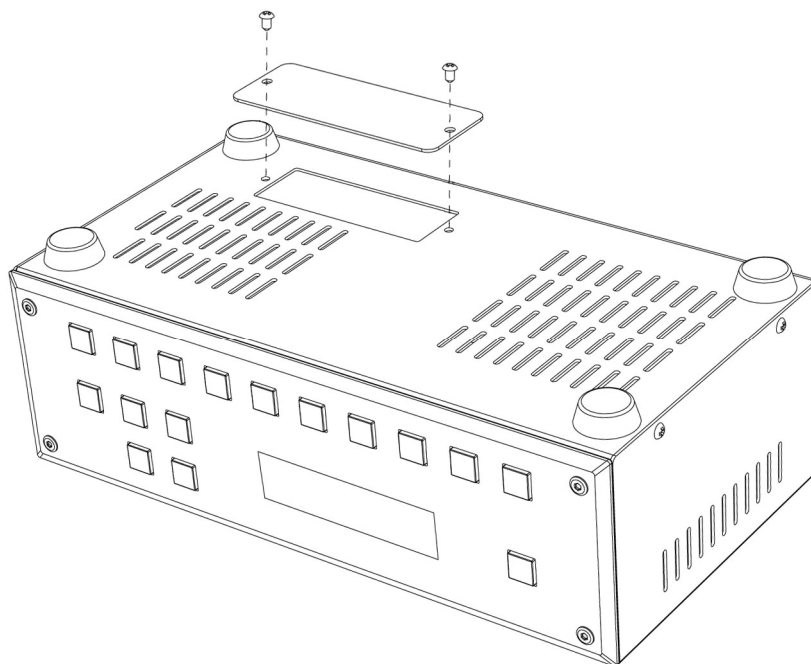
9. Connecting with Transceivers and Computers

■9-1 Jumper Settings for Your Transceiver

At this section you will learn how to set up DIP switches to connect KA-1 with your transceiver and computer.

*Please look at the drawing below. Remove two screws and take off the cover. You will be able to see controller board.

*Note: Be sure to remove power supply from your controller before doing this work.



*DIP switches are lined up as shown in the picture.

*After you finish DIP switch settings, install the cover you removed. Please don't connect power supply before installing the cover.

9-1-1 : YAESU/KENWOOD/JRC/ELECRAFT

Transceivers

①YAESU: FTDX9000/FTDX5000/FT2000/FT1000MP/MK-V
KENWOOD: TS990/TS590/TS2000/TS480/TS870

②YAESU: FT920
ELECRAFT: K2/K3

③JRC: JST145/JST245

*Controller interface
RS232C D-sub 9pin (female)

*Rig interface
①RS232C D-sub 9pin (female)
②RS232C D-sub 9pin (male)
③RS232C D-sub 25pin (male)

*Set DIP switches shown as Figure 40.

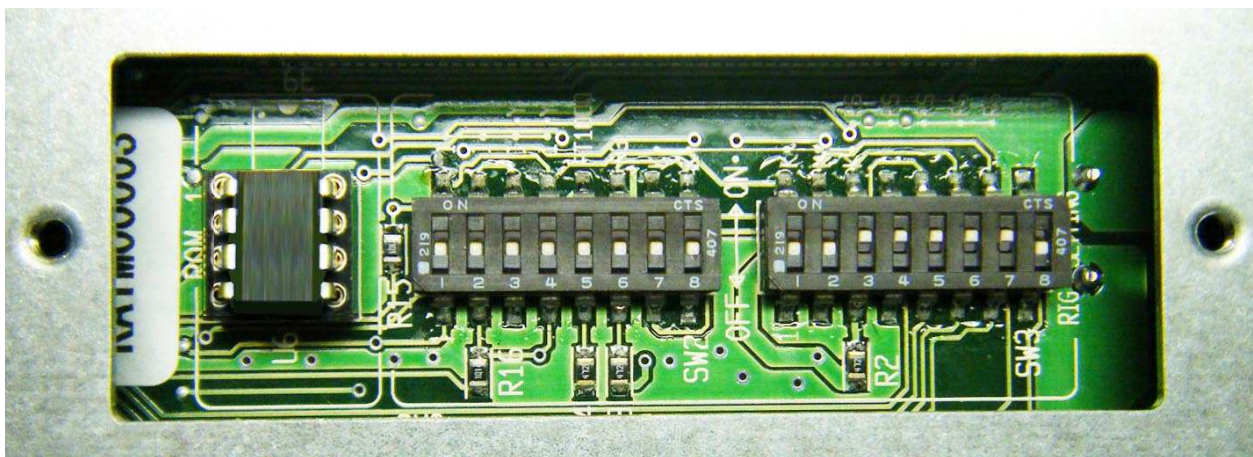


Figure 40

9-1-2: ICOM

*All ICOM transceivers that have CI-V interface.

*Controller interface: CI-V 3.5mm mini-jack (2p)

*Rig interface: REMOTE 3.5mm mini-jack (2p)

*Set DIP switches shown as Figure 35.

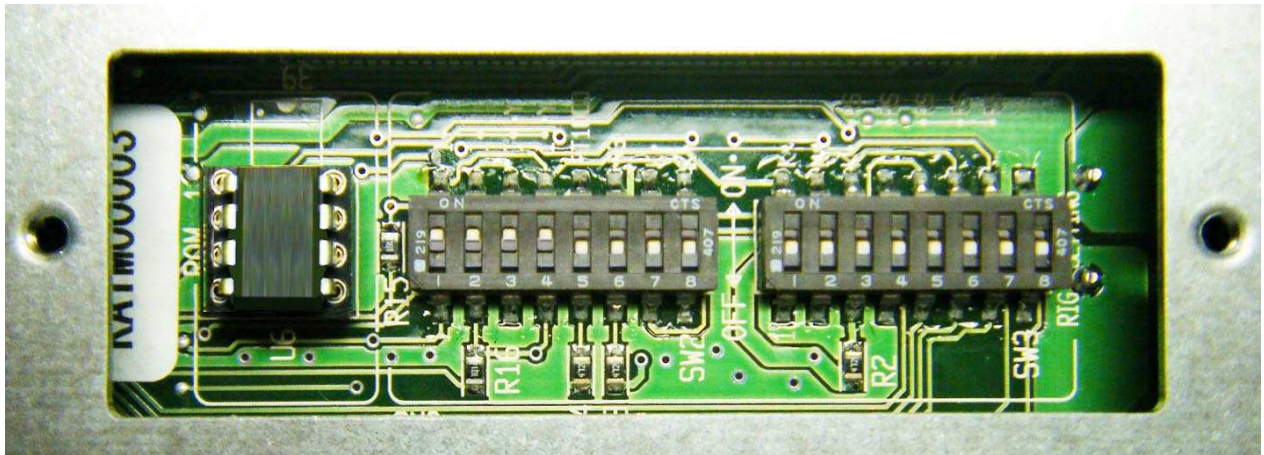


Figure 41

9-1-3: YAESU

*Transceivers FT1000/FT1021

*Controller interface: RS232C D-sub 9pin (female)

*Rig interface: DIN6 pin (male)

*Set DIP switches shown as Figure 42.

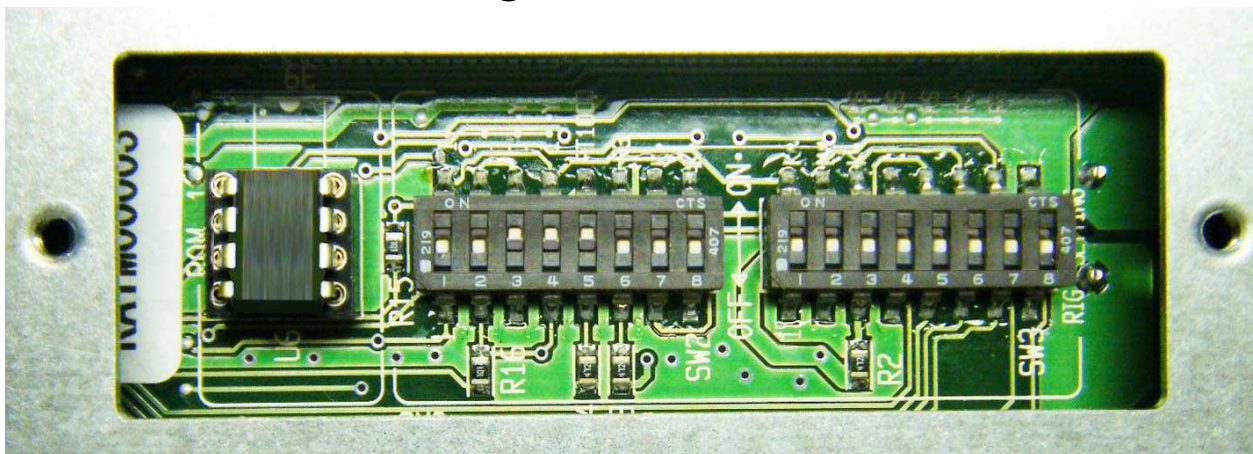


Figure 42.

9-1-4 : KENWOOD

*Transceivers TS950/TS850

*Controller interface: RS232C D-sub9 pin (female)

*Rig interface: DIN6 pin (male)

*Set DIP switches shown as Figure 43.

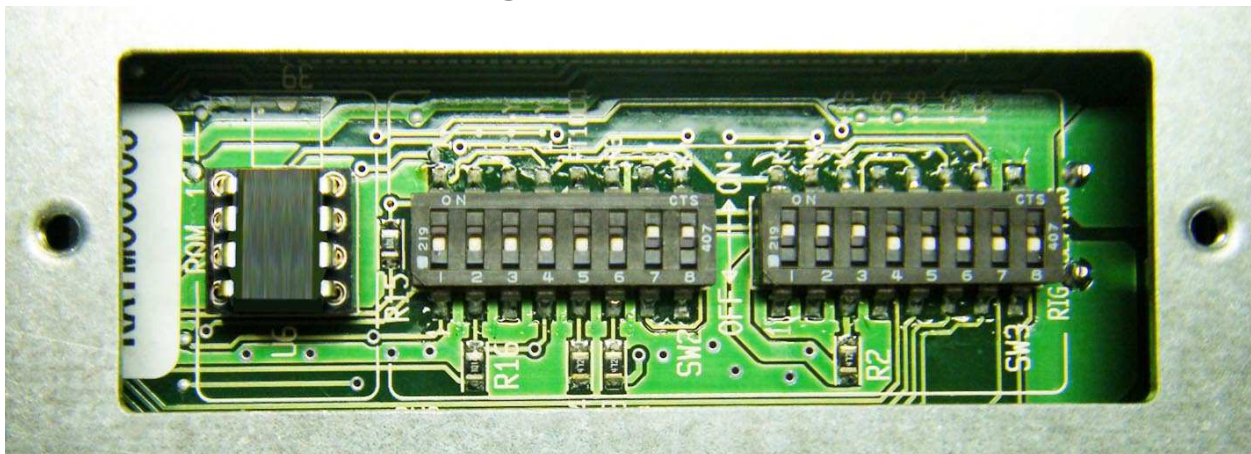


Figure 43

■ 9-2 Setup with Your Computer

Use USB connector to connect your controller with computer. Controller has USB interface on its rear panel.

①: Unless you use logging software , turn the toggle switch(ⓐPC⇌RIG) on the controller rear panel toward [RIG] side BEFORE turning power on.

②: If you use logging software , turn the toggle switch(ⓐPC⇌RIG) on the controller rear panel toward [PC] side BEFORE turning power on. Not only you can control the transceiver and controller from your computer screen but also the computer can import band/mode data from your transceiver.

You won' t be able to set KA1 frequency under this setup from your transceiver unless you have started logging software.

When you use logging software, you may need to work some more procedure. Connect your computer directly with your transceiver like TS990 that has USB interface.

Here is more detail description for each transceiver model.

Make	Rig	Memory Setup	Note
ICOM	All the transceivers with CI-V	Nothing	In case KA1 band or frequency jumps off and gets back to normal while you are tuning the frequency dial using with Logger 32, set the rig CI-V transceiver OFF. You need to run Logger 32 for KA1 to synchronize.
YAESU	FT-1000MKV FT-1000MP FT-1000	Change 03: Logging Soft set up to select your logging software. For HAMLOG select FT1000MP for input setting, and set timer command 5.	Tracking function may get in trouble depending upon how you use your logging software. *Start your logging software and check the CAT indicator is blinking. If the CAT indicator is off, tracking function doesn't work. Data input window should be appeared on the computer screen for CAT operation to be active for HAMLOG.
YAESU	FT DX 9000 FT DX 5000 FT-2000	Change 03: Logging Soft set up to select your logging software. For HAMLOG select FT2000/9000 for input setting, and set timer command 0. For HAMLOG setup you need to select KENWOOD.	Tracking function may not work properly because of logging software setups.
KENWOOD	TS-950 TS-850	Set 00: Exciter Type 007:TS950/850_AI Choose your logging software by selecting setting of 03: Logging Soft	First turn power on your transceiver, and next KA1, and then start your logging software. Please confirm the frequency of the transceiver is shown on controller display. The receiving frequency should be shown.
KENWOOD	TS-990 TS-590 TS-2000 TS-480 TS-870	Set 00: Exciter Type 005:KWD/K2/K3_AI Choose your logging software by selecting setting of 03: Logging Soft	First turn power on your transceiver, and next KA1, and then start your logging software. Please confirm the frequency of the transceiver is shown on controller display. The receiving frequency should be shown.
JRC	JST-145 JST-245	KA1 software is not available for any logging software.	

■ 9-3 Memory Settings for Your Transceiver

All ICOM transceivers ・ KOHJINSHA-----

00:Exciter Type	000:KJS/ICOM
01:Baud Rate	001:1200~016:19200bps(Recommended:9600)
02:Stop bit	01:1 Stop bit

YAESU-----

FT DX 9000 ・ FT DX 5000 ・ FT-2000

00:Exciter Type	016:YAESU AI
01:Baud Rate	004:4800 (Same baud rate as your radio interface)
02:Stop bit	02:2 Stop bit

FTDX 101 ・ FT 991

00:Exciter Type	015:YAESU IF
01:Baud Rate	004:4800 (Same baud rate as your radio interface)
02:Stop bit	02:2 Stop bit

MARK-V FT-1000MP ・ FT-1000MP

00:Exciter Type	001:MK-V 1000MP
01:Baud Rate	004:4800 (Fixed)
02:Stop bit	02:2 Stop bit (Fixed)

FT-1000D ・ FT-1021

00:Exciter Type	010:FT-1000
01:Baud Rate	004:4800 (Fixed)
02:Stop bit	02:2 Stop bit (Fixed)

KENWOOD-----

TS-990 ・ TS-590 ・ TS-2000 ・ TS-480 ・ TS-870 等

00:Exciter Type	005:KWD/K2/K3_AI
01:Baud Rate	004:4800 (Same baud rate as your radio interface)
02:Stop bit	01:1 Stop bit

TS-950 ・ TS-850

00:Exciter Type	006:TS950/850_IF
	007:TS950/850_AI (※1)
01:Baud Rate	004:4800 (Fixed)
02:Stop bit	02:2 Stop bit (Fixed)

(※1) In case the output power is reduced to half for about 16 seconds during transmission, set 007. This may happen for some models of TS-950SDX and TS-850.

Elecraft-----

K2 ・ K3

00:Exciter Type	005:KWD/K2/K3_AI
01:Baud Rate	004:4800 (Same baud rate as your radio interface)
02:Stop bit	01:1 Stop bit

JRC-----

JST-245 ・ JST-145

00:Exciter Type	008:JST-145/245
01:Baud Rate	004:4800
02:Stop bit	01:1 Stop bit

■9-4 Memory Setting Table

Setting items	Setting	
00 : Exciter Type	<p>000 : KJS/ICOM 001 : MK-V 1000MP 002 : FT-100 003 : FT-920</p> <p>004 : KWD/K2/K3_IF 005 : KWD/K2/K3_AI * This setting is recommended.</p> <p>006 : TS950/TS850_IF 007 : TS950/TS850_AI * This setting is recommended.</p> <p>008 : JST-145/245 009 : Not Use 010 : FT-1000 011 : FT-767 012 : Not Use 013 : Not Use 014 : Not Use 015 : YAESU IF 016 : YAESU AI 017 : FT-847</p> <p>018 : Stand Alone</p>	<p>All ICOM transceivers *KL-1 FT-1000MP, MARK-V FT-1000MP, FT-100, FT-100D FT-920</p> <p>All the transceivers after KENWOOD TS-870 and ELECRAFT 005 is standard setting, but some logging soft prefer 004.</p> <p>Older KENWOOD model than TS-870 It may happen on TS-950SDX or TS-850 that the output power is reduced to half for about 16 seconds during transmitting. In this case, set 007:TS950/850..AI. However, if you set as above, memory frequency tracking is disabled.</p> <p>JST-145/JST-245 not used FT-1000D, FT-1021 FT-767 not used not used not used FTDX101 FT991 FT2000 FTDX9000 FT5000 FT-847 *Some FT-847 doesn't work. No transceiver is connected</p>
01 : Baud Rate	<p>Setting up communication baud rate with your transceiver</p> <p>You can select from 001:1200bps up to 032:38400bps.</p> <ul style="list-style-type: none"> • YAESU transceivers, TS-950, TS-850 and etc., 004 : 4800 • ICOM 001 : 1200 ~ 016 : 19200 (recommended 008 : 9600) • TS-2000, TS-870, TS-590 and etc., 004 : 4800 ~ 032 : 38400 	

02 : Stop bit	Setting up stop bit ・ YAESU、KENWOOD の 4800BAUD : 02 : 2 stop bit ・ Other than listed above 01 : 1 stop bit
03 : Logging Soft	Select using logging soft or not using logging soft 000 : Not Use 001 : CT/ARCP-2000 002 : Zlog 003 : HAM Log 004 : Logger32 005 : Mixw2 006 : FTC Logger 007 : FTC Logger CT 008 : KWD Limited ・ Without using logging soft (Turn ⑥PC⇄RIG to RIG side.) 000 : Not Use ・ With using logging soft (1) Control your transceiver from your computer (Turn ⑥PC⇄RIG to PC) ICOM → 000:Not Use (You can leave there as Not Use.) YAESU → Set up what logging software you use(001~005) KENWOOD → Set up what logging software you use(001~005) (2) Control your transceiver from VERSA Beam antenna (Turn ⑥PC⇄RIG to RIG) ICOM → 000:Not Use (You can leave there as Not Use.) YAESU → For HAMLOG,ZLOG,Logger32, and Mixw2 006: FTC Logger For CT 007:FTC LoggerCT KENWOOD → 000 : Not Use For HAMLOG,Zlog, and CT Set up 00:Exciter Type 005: KWD/K2/K3_AI or 007:TS950/TS850_AI <u>*Notice</u> If you choose (1) to control your transceiver and VERSA Beam antenna from your computer, you need to activate your logging software. Otherwise VERSA Beam antenna doesn't follow your transceiver frequency. If you choose (2), your logging software can read frequency and mode from your transceiver, but you cannot control your system from your logging software. VERSA Beam antenna works without logging software activated. Unless your logging software works well, you can try like below. For Logger32 and Mixw2 00:Exciter Type 004:KWD/K2/K3_IF or 006:TS950/TS850_IF

	*You cannot use logging software with FT-767.
04 :ICOM CI-V ADR	<p>Several addresses are preset. 000:00~255:ff Choose the address of which your transceiver is allocated. *Choose the same address of which you would like to follow the equipment if you have more than one ICOM radios connected. Otherwise you don't have to do any setups.</p>
05 :FreqDisp Form	<p>000:Band&Freq Displaying [Band&Freq] on LCD *Displaying band as "m" corresponding to the transceiver frequency. If the transceiver frequency gets out of VERSA Beam coverage, "***" will be shown. However frequency is displayed as same as your transceiver frequency.</p> <p>001:Freq Region Displaying [Freq Region] on LCD *Displaying frequency region all the time whatever mode is selected.</p>
06 :Tracking Delay	<p>You can set tracking time with your transceiver 000 :0[sec] 001 :3[sec] 002 :6[sec] 003 :9[sec] 004 :12[sec] 005 :15[sec]</p>
07:Auto CAL	<p>You can select automatic or non automatic calibration. 000:No Auto CAL → No automatic calibration 001:Auto CAL → Calibration starts automatically when your turn on the power.</p>
08:Auto Home	<p>When AUTO MODE is selected, you can choose Auto HOME or No Auto HOME. If you choose Auto HOME, the elements is retracted automatically when the frequency moves outside VERSA Beam antenna coverage.</p> <p>000:No Auto HOME 001:Auto HOME</p>

*If you use Kohjinsha KL-1 linear amplifier with any exciter transceiver, select [000: KJS/ICOM].

10. Trouble Shooting

Symptom	Probable Cause	Suggested Action	Check Page
The controller will not power up after connecting a DC power supply and Pressing [POWER].	Power cable is not connected securely.	Reconnect power cable.	6
Elements don't move.	Each junction cable is not connected securely. Control cable is not connected securely. Wiring in junction box is not connected securely.	Check connections and make sure connection is securely done.	17
Elements aren't Retracted at HOME POSITION	Each junction cable is not connected securely. Control cable is not connected securely. Wiring in junction box is not connected securely.	Check connections and make sure connection is securely done.	17
High SWR	Elements aren't retracted at HOME POSITION Each junction cable is not connected securely. Control cable is not connected securely. Wiring in junction box is not connected securely or connected wrong. Element length is not proper.	Check connections and make sure connection is securely done. Check if connection between junction box and AEU is correct. Perform CALIBRATION.	17 19
No tracings	Wrong connection or unsecured connection with transceiver. Wrong setups	Check connections. Retry setups.	27 33
No beam pattern	DIPOLE Mode is selected	Select NORMAL Mode	6
Reversed beam patter	180° (Reverse) is selected	Select NORMAL mode	6

11. Command Table

	項目	BUTTON	SET BUTTON	Page&Section	Additional Info
1	Power on	Press POWER button	-	P6・P8 5-1	Press and hold POWER button also works
2	Power off	Press and hold POWER button	-	P6	-
3	Antenna band change (When MANUL is selected)	Press band button	-	P6・P8 5-2	-
4	Set AUTO (Controlled with transceiver and/or computer)	Press AUTO/HOME	-	P6・P15 5-11	-
5	Set MANUAL (Working stand alone)	Press MANUAL/CAL.	-	P6・P11 5-5	-
6	Antenna mode change (NORMAL/180 /DIPOLE)	Press MODE/ADJUST	-	P6・P13 5-7 P15 5-8 5-9	-
7	Retract all the elements	Press and hold AUTO/HOM	Press SET	P15・P16	-
8	Element length calibration	Press and hold MANUAL/CAL.	Press SET	P6・P11 5-5	-
9	Manually change element length	Press UP/DOWN	-	P6・P11 5-3	-
10	Element length adjustment	Press and hold MODE/ADJUST	Press SET, and then use UP/DOWN button to choose element to adjust	P13・P14	-
11	Getting factory default on each band	Press and hold particular band button	Press SET	P6・P11	-
12	Start with USER mode	Press POWER button while press and holding 7MHz button	-	P26 8-2	-

13	Change controller settings 00~08	You need to perform 12 first	Press SET	-	-
14	Getting factory default on controller settings 00~08	You need to perform 12 first	Press and hold SET	-	<u>The set value is written in the ROM by press and holding SET</u>
15	Change frequency display mode	You need to perform 12 first	-	P10	0 5 : FreqDisp Form is used to select
16	Check Model number, software version, ROM version, and so on.	Press and hold SET button	-	P11 5-4	Controller should be either AUTO or MANUAL mode.
17	Rain Mode	Press SET button	-	P22	SET button works as toggle switch. Each press switches Rain →Snow→Rain
18	Snow Mode	Press SET button	-	P22	-
19	Back to normal mode (from Rain or Snow mode)	Press CANCEL	-	P22	-
20	Setting up shift amount for Rain Mode (User mode)	Setup in the user mode	-	P23	-
21	Setting up shift amount for Snow Mode (User mode)	Setup in the user mode	-	P23	-
22	Setting up shift amount for Rain Mode (in the Rain Mode)	Press and Hold SET button	-	P23	Use UP/DOWN button to select the one you like
23	Setting up shift amount for Snow Mode (in the Snow Mode)	Press and Hold SET button	-	P23	Use UP/DOWN button to select the one you like

12. Maintenance

Cleaning

The controller case and buttons are likely to become soiled after extended use. Use a neutral detergent and warm water along with a damp cloth to clean the case and front panel.

General Information

VERSA Beam antenna has been factory aligned and tested to satisfy the specification before shipping out. Under normal circumstances, the VERSA Beam antenna should work in accordance with the operation described in this instructions manual.

Service

If it is ever necessary to return VERSA Beam antenna, double check by yourself or consult a Kohjinsha specialist to make sure what part of VERSA Beam antenna is wrong specifically? Then you can avoid shipping whole stuff to our factory.

Contacts

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