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From Canada (VE) 2 the World (DX)

CT-17B-7DM USB/Bluetooth ICOM CI-V HUB.

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VE2DX CT17B User manual

| Date | Name | Comments | Revision |
|--------------------------------|-------|---|----------|
| 20 July 2020 | VE2DX | Release first version | 01.01.00 |
| 25 January 2021 | VE2DX | Added IC-705 Section | 01.02.00 |
| 31 January 2021 | VE2DX | Clarified LED reaction to pairing on PC | 01.03.00 |
| 1 June 2022 | VE2DX | Converted to 7DM version | 01.05.00 |
| 10 th October 2023 | VE2DX | Retouched | 01.06.00 |
| 18 th November 2023 | VE2DX | Minor changes | 02.01.00 |

Introduction:

Hello and congratulations on your purchase of the **VE2DX ICOM CT-17B-7DM Bluetooth CI-V HUB**. The **CT-17B-7DM** is basically an ICOM protocol (Called CI-V) distribution unit that lets you link together multiple ICOM and non ICOM Radios and/or devices supporting the ICOM CI-V protocol via CI-V Buss, USB, and/or Bluetooth. And can also be used to link via Bluetooth your IC-705 to your generic CI-V Radios or non-ICOM CI-V devices.

Technical information:

The CT17B-7DM is powered via the USB connector.

The CI-V protocol is a very simple ASCII protocol that can run at different speeds, obviously all devices being used together **MUST** run at the same speed, the speed on your computer can vary as you wish to make your application react faster, but the CI-V bus and the ICOM or Non-ICOM device must always be set to 9600 bauds the speed translation and buffering is handled by the CT-17B-7DM.

On the Hardware side the CI-V is based on a very simple TTL (0 - +5VDC) hardware. It is a duplex hardware protocol, meaning that the RX and TX are merged together on the same communication line.

The ICOM CT-17 was the original ICOM manufactured unit in the late 70s and early 80s. It was made with 4 CI-V ports and a DB25 interface for the computer, it also needed an external 12VDC power source. It made for major evolutions with PCs of Ham Radio station automations.



Description:

The **CT-17B series** is an evolution of the original ICOM CT-17, it comes in multiple variations with 5, 6, 10, 11 and 12 ports. There are two major variants;

- **CT17B Five ports family**



Early image of 2020 Version

The 5 ports units made up of the **CT-17B-5**, is a 5 port CI-V unit, CT-17B-6USB a 5 CI-V ports CI-V and 1 port USB, and the CT-17B-6BT which is basically the same except it communicates via Bluetooth and the CT17B-7DM has 5 CI-V ports, 1 X USB port, and 1 X Bluetooth port.



Early image of 2020 Version

- **CT17B Ten ports family**

The 10 ports-based **CT-17B** family made up of the **CT-17B-10** a 10 ports CI-V only hub, the **CT-17B-11USB** made of the 10 ports CI-V hub with an added USB port and finally the **CT-17B-12DualUSB** a **CT-17B-10** with two USB ports.



Early image of 2020 Version

Interesting fact about all the 10 CI-V port units (**CT-17B-10**, **CT-17B-11USB**, **CT-17B-12DualUSB**) they have a Jumper under the unit (JP1). This JP1 Jumper is used to split (if the user wants to!) the unit into two separate – 5 units.



Early image of 2020 Version

Thus, if **JP1** is IN on a **CT-17B-11USB** it as ALL 11 ports talking to each other. With **JP1 OUT** then the unit is turned into a **CT-17B-5** and a **CT-17B-6USB** into a single case and all CI-V communications made on one side of the **CT-17B** are distinct from the others.

This new feature makes the CT-17B even more flexible.

- **CT17B RFI protection**

One very important factor with our design was RFI, Ham radio stations have to deal with RFI often, and we wanted to help with our design, to do so we isolated every port with proper RFI filtering. This will NOT block EVERYTHING, but it should prevent most common issues.

And with the CT17B-6BT and CT17B-7DM having the option to Bluetooth link your station to your PC this COMPLETELY isolates the RF from the PC side of the shack!

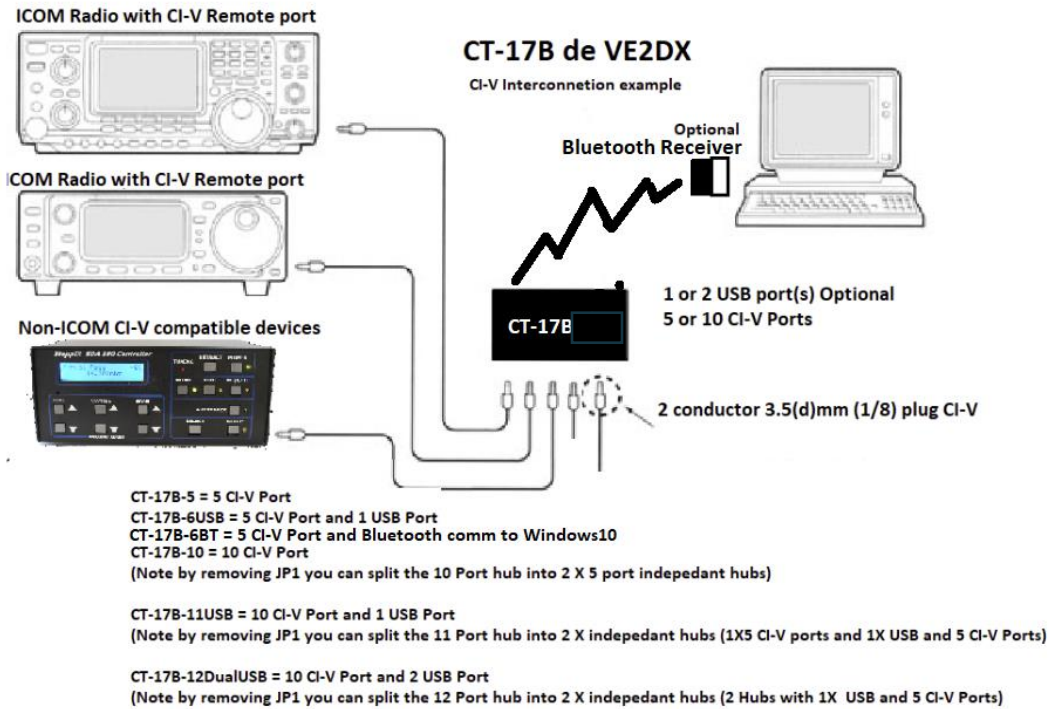
- **CT17B 3D SLA Printed enclosures**

One of the nice things about our design is the 3D SLA printed enclosures, this helped us turn around on the fly adjust our design like the added JP1 on the 10 ports units. another change we made last minute was adding **magnets** to the back of the enclosure that will help the end user with the flexibility of attaching the **CT-17B** on the radio itself.



New 2023 3D printed enclosure.

- **CT-17B-7DM Interconnection diagram**

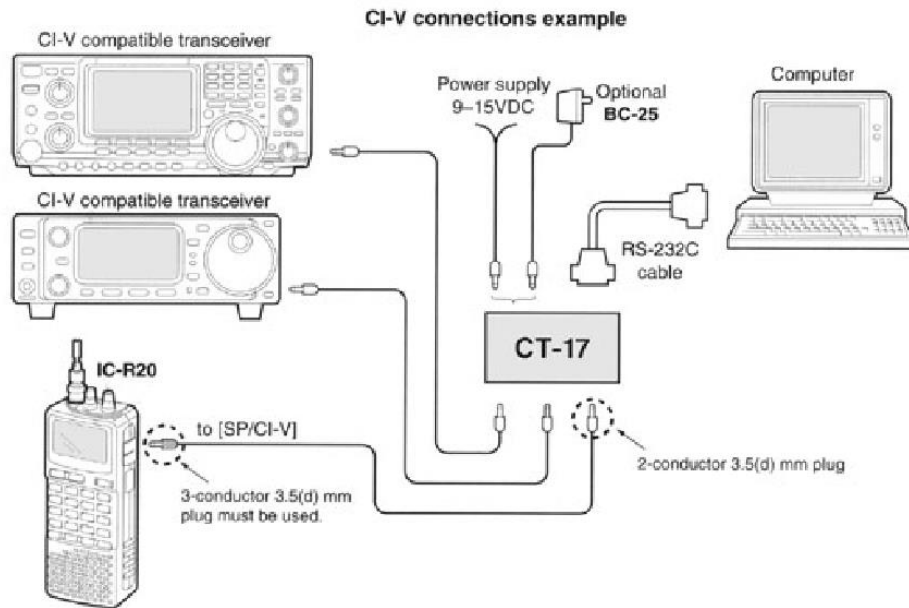


- **CT-17B-7DM Interconnection to IC-705 diagram**



In this last diagram the PC could also be connected DIRECTLY to the CT17B-7DM via USB.

- ICOMs CT-17 Interconnection diagram



Setting up the CT17B

• CT-17B CI-V Port to Windows10

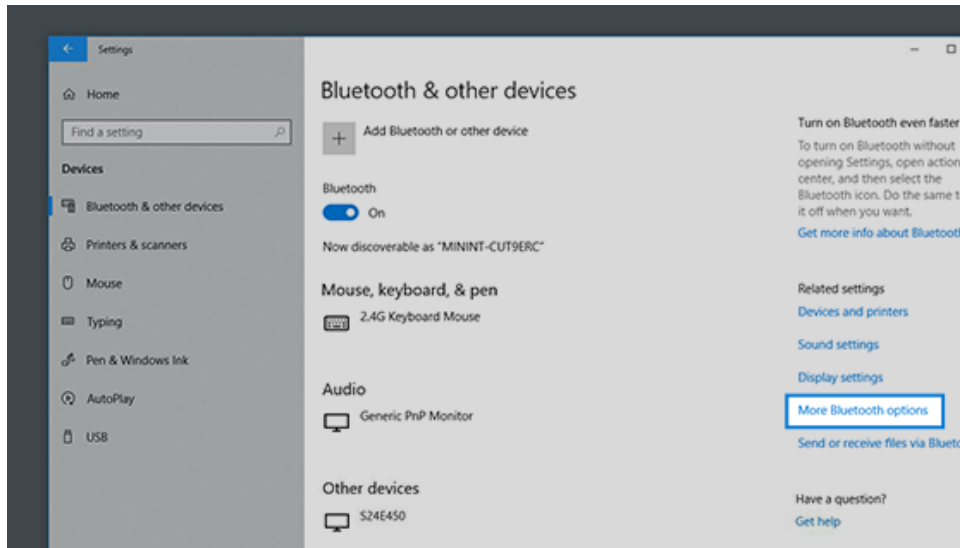


Warning

Before plugging in ANY devices CI-V or USB port, you MUST make certain that all equipment and power sources are turn OFF.

(Radios, Power supplies, accessories, PC, etc...)

- 1- Turn off all your ICOM radios, non-ICOM CI-V compatible devices and Power supply's.
 - 2- Plug a mono 1/8 audio cable from the ICOM REMOTE connector on the back of the radio to the **CT-17B** Hub.
 - 3- Making certain all devices and radios are turned off, do the same from the back of all your devices to the **CT-17B**, Plugging it into the PROPER CI-V port (on most ICOM radios this is identified as REMOTE).
 - 4- **Before plugging in your CT-17B-7DM Bluetooth, you need to understand that for COMPLETE radio isolation you should NOT be using your PC USB ports to power the CT-17B-7DM Bluetooth if your intent is to isolate the PC and RF of your shack via the CT17B-7DM Bluetooth link. Instead, you should be using a 12VDC to USB 5VDC low noise converter and use the station 12VDC power source or use a simple AC to USB transformer, do note that these can be RF Noisy!**
 - 4b- Power on your CT-17B-7DM.
 - 4c- look on the CI-V port side of the CT17B-6BT you will see a BLUE PAIRING LED and a RED POWER LED. **The RED POWER LED should be ON, If Not check your power source.**
- Note: there are 3 LEDs on the newer CT17B-7DM devices, the Power LED on the left of the device, The Yellow CI-V LED is in the center and the BLUE Bluetooth PAIRING LED is on the LEFT side.**
- 5- On your Windows10 command line type "BLUETOOTH", windows 10 should offer you the Bluetooth section of the Parameters panel.



5A- Make certain the Bluetooth is ACTIVATED.

5B- Click on the + sign next to “Add Bluetooth or Other Devices”

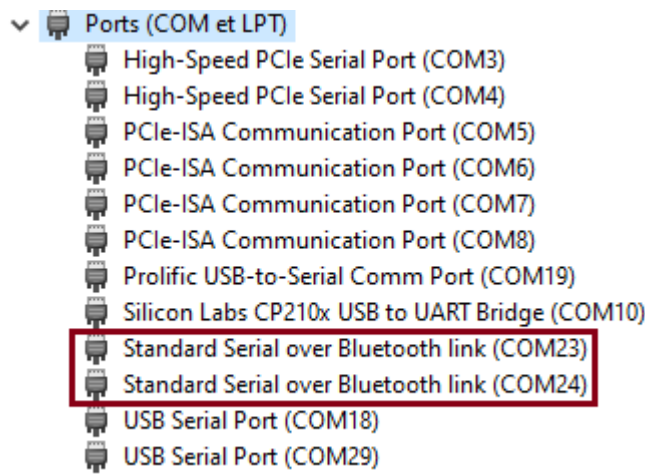
5c- on the next Black screen click on “Bluetooth”.

5d- This step can take a few minutes, you will see an unknow device come up and after a while this device will change name to “VE2DX CT17B-7DM”, select this device and PAIR with it, Windows10 will then ask for a password it is “1234”

6- Open “Control Panel” and select “device manager”

6a- In “Device Manager” expand the “Bluetooth” section. Confirm that you see the VE2DX CT17B-7DM. **If not go back to Section 10.**

7- In “Device Manager” expand “Ports (Com & LPT)” section



NOTE: The COM Port numbers will likely be different

7b- Note that all the existing Com ports and their “COM” names. you will see TWO new com ports

7c- They are identified as “Standard Serial over Bluetooth link”



NOTE: Even after the CT17B-7DM is paired to the PC, the BLUE LED will still be OFF until the application in the PC is LINKED to the Bluetooth Serial port.



WIERD Windows10 VERY CONFUSING info follows!

FOR SOME BIZARRE REASON, Windows 10 when pairing with a Bluetooth serial port will create TWO SERIAL PORTS! An INCOMING serial port (Normally but not always!... the first one!) and an OUTGOING serial port (Normally but not always!... the second one!)

!!!You can only use the OUTGOING serial port!!!

Note: More advance users can use the advance port configuration to change the COM port ID, but you MUST make certain the selected port is not already in use.



Virtual ports used with SDR or other applications like Com0Com can cause port conflict and confusion.

That's it! You're now ready to play, using your radio control or logging application you can now control your equipment.

- CT-17B CI-V Port ICOM IC-705



⚠ Warning ⚠

Before plugin in ANY devices CI-V or USB port, you MUST make certain that all equipment and power sources are turn OFF.

(Radios, Power supplies, accessories, PC, etc...)

- 1- Turn off all your ICOM radios, non-ICOM CI-V compatible devices and Power supply's.
- 2- Plug a mono 1/8 audio cable from the ICOM REMOTE connector on the back of the radio or other OEM CI-V compatible devices to the **CT-17B** Hub.
- 3- Making certain all devices and radios are turned off, do the same from the back of all your devices to the **CT-17B**.
- 4- Before plugging in your CT-17B-7DM Bluetooth, you need to understand that for **COMPLETE** radio isolation you should **NOT** be using your power source as the ICOM IC-705 to power the CT-17B-6BT Bluetooth. Instead, you should be using any low noise Micro-USB Power Supply, you could also use one of your PC USB ports if they are on the same ground as the other CI-V devices.
- 4b- Power on your CT-17B-7DM using a Micro-USB cable to either a power source or a PC.
- 4c- look on the CI-V port side of the CT17B-7DM you will see a red POWER_LED, It should be ON, **if Not check your power source.**



Note: there are 3 LEDs on the newer CT17B-7DM devices, the Power LED on the left of the device and the CI-V Data Yellow LED in the center and the Blue Bluetooth PAIRING LED to the right.

5- Power on your ICOM IC-705.

6- Press Menu button.



7- In the menu page 1 press the SET Button



8- Locate and select the “Bluetooth Set” button.



9- Locate and select the “Pairing/Connect” button.



10- Locate and select “Search Data Device” button.



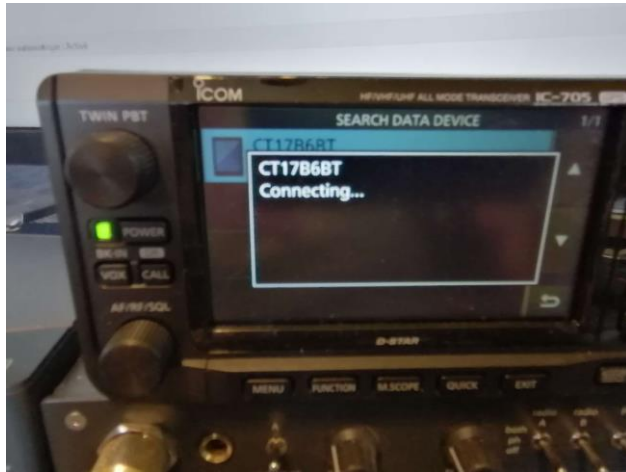
11- You will notice after 30s to 2m, that a new device ided as “VE2DX CT17B-7DM” will come up in your list.



12- Select “VE2DX CT17B-7DM” and answer yes to the “Connect?” question.



13- You will now get a message saying “Connecting...”



14- Your next message will be to enter the "PIN Code" hit OK button, and enter 1234 using the on-screen keyboard,



15- the ICOM IC-705 and VE2DX CT17B-7DM will now get connected.



16- This is the resulting screen.



Note : Now, your Bluetooth Blue Pairing LED in ON Solid.

Note: some images used in this manual show examples using the CT17B-6BT, the results of the CT17B-7DM process will be the same except for the identification of the device!

Now we need to properly configure your IC-705 to echo the CI-V commands via the Bluetooth Data Port.

17- Press Menu button.



18- In the menu page 1 press the SET Button.



19- In the "SET" menu locate the "Connectors" button and press it.



20- In the “Connectors” Menu locate the CI-V button and press it.



21- In the “CI-V” Locate the “CI-V Transceive” button and make certain it is set to ON.



21- now locate the “CI-V USB Echo Back” and make certain it is set to ON.



Note: this last step is important in case you link your ICOM IC-705 to you PC applications via the IC-705 USB Port.

22- Go back to the “SET” menu locate and select the “Bluetooth Set” button.



23- Locate and select the “Data Device Set” button.



24- Select the "SerialPort Function" button.

! This next step is very IMPORTANT !



25- Make certain that the "CI-V (Echo Back OFF)" is selected.



You are done you can now exit the SETUP Menu and start having fun!

Tips

- 1- Multiple ICOM radios can run on the same CI-V Hub and be linked together using the CI-V Transceive option, if CI-V Transceive is enabled then all compatible radios (example 735, 756Pro, etc...) will be linked and change frequencies together.
- 2- The CI-V Transceive option is often needed to be enable on the radio for non-ICOM devices to be able to be link to the radio.
- 3- Some devices like the WX0B bandmaster first generation need to have the CI-V address configure to match the radio being tracked.

▲ IMPORTANT ▲

4- Audio cables being used to link the CT-17B hub to Radios or Non-ICOM devices MUST be mono cable and not stereo. In most installations this does not make any difference, but we did encounter some problems caused by stereo cables were the TTL lines were grounded. The CT-17B is designed to prevent this but not all ICOM and/or NON-ICOM radio or devices are.

73 De Richard VE2DX 😊