# **VARA HF 4.3 QUICK GUIDE**

Rev, December 29th 2020

## VARA LICENSE

The VARA license is valid for the callsign and his 15 suffixes: CALLSIGN, CALLSIGN-1, CALLSIGN-2.....CALLSIGN-15 and CALLSIGN-T, CALLSIGN-R and CALLSIGN-X.

There is not hardware restrictions. You can use your VARA license in several computers. In the case of Gateway operation, no license is necessary to get full speed.

The registration Key is inserted in VARA Setup menu:

| 👍 VARA Setup    |                     |                   | × |
|-----------------|---------------------|-------------------|---|
| TCP Ports:      | VARA License        |                   |   |
| Command<br>8300 | Callsign:<br>PA3GJM | Registration Key: |   |
| Data<br>8301    | Callsign:           | Registration Key: | - |
|                 | Callsign            | Registration Key: | - |
| Retries:        | Callsign:           | Registration Key: |   |
|                 | Close               |                   |   |

## VARA Folder & TCP Ports

By default, VARA is installed in C:\VARA folder. Winlink Express will open VARA automatically in that path, using the 8300 TCP port.

However, if you use different applications simultaneously with VARA: VARA Chat, BPQ, Winlink Express, VARA Terminal... you will need to create different VARA folders, and use different TCP ports for each application.

| Command D           | ata               |
|---------------------|-------------------|
| 8300                | 8301              |
| VADALisansa         |                   |
| - VARA License:     | 8                 |
|                     |                   |
| Callsign:           | Registration Key: |
| Callsign:<br>EA5HVK | Registration Key: |

## VARA HF MODES

VARA HF has three operation modes: VARA HF Narrow (500Hz), VARA HF Standard (2300Hz) and VARA HF Tactical (2750Hz).

**VARA HF Tactical** was designed for the Army Forces and other professional EMCOMM organizations which use **Tactical HF Rigs** for the operations. But it can be used with some Ham rigs, mainly with the **Icom IC-7300**.

VARA HF Standard is compatible with all the Ham Radio HF rigs

VARA HF Narrow was designed for the bands limited to 500Hz

|       |             |          |                         |                |             | VARA     | HF v4.3.0            |                |             |          |       |                |
|-------|-------------|----------|-------------------------|----------------|-------------|----------|----------------------|----------------|-------------|----------|-------|----------------|
|       | VA          | tical)   | VARA HF 2300 (Standard) |                |             |          | VARA HF 500 (Narrow) |                |             |          |       |                |
| Level | Symbol Rate | Carriers | Mod.                    | Net Rate (bps) | Symbol Rate | Carriers | Mod.                 | Net Rate (bps) | Symbol Rate | Carriers | Mod.  | Net Rate (bps) |
| 1     | 23          | 40       | FSK                     | 18             | 23          | 32       | FSK                  | 18             | 23          | 11       | FSK   | 18             |
| 2     | 47          | 20       | FSK                     | 41             | 47          | 16       | FSK                  | 41             | 47          | 11       | FSK   | 41             |
| 3     | 47          | 20       | FSK                     | 82             | 47          | 16       | FSK                  | 82             | 47          | 11       | FSK   | 61             |
| 4     | 94          | 20       | FSK                     | 175            | 94          | 16       | FSK                  | 175            | 94          | 2        | BPSK  | 88             |
| 5     | 94          | 3        | 4PSK                    | 270            | 94          | 3        | 4PSK                 | 270            | 94          | 2        | 4PSK  | 177            |
| 6     | 94          | 4        | 4PSK                    | 363            | 94          | 4        | 4PSK                 | 363            | 94          | 3        | 4PSK  | 270            |
| 7     | 94          | 6        | 4PSK                    | 549            | 94          | 6        | 4PSK                 | 549            | 42          | 11       | 4PSK  | 441            |
| 8     | 94          | 8        | 4PSK                    | 735            | 94          | 8        | 4PSK                 | 735            | 42          | 11       | 4PSK  | 588            |
| 9     | 94          | 10       | 4PSK                    | 922            | 94          | 10       | 4PSK                 | 922            | 42          | 11       | 4PSK  | 705            |
| 10    | 94          | 13       | 4PSK                    | 1203           | 42          | 49       | 4PSK                 | 2011           | 42          | 11       | 8PSK  | 884            |
| 11    | 42          | 59       | 4PSK                    | 2423           | 42          | 49       | 4PSK                 | 2682           | 42          | 11       | 8PSK  | 1060           |
| 12    | 42          | 59       | 4PSK                    | 3230           | 42          | 49       | 4PSK                 | 3219           | 42          | 11       | 16QAM | 1286           |
| 13    | 42          | 59       | 4PSK                    | 3877           | 42          | 49       | 8PSK                 | 4025           | 42          | 11       | 32QAM | 1543           |
| 14    | 42          | 59       | 8PSK                    | 4848           | 42          | 49       | 8PSK                 | 4830           | ( ) ( )     |          | 8     | 92             |
| 15    | 42          | 59       | 8PSK                    | 5817           | 42          | 49       | 16QAM                | 5872           |             |          |       |                |
| 16    | 42          | 59       | 16QAM                   | 7074           | 42          | 49       | 32QAM                | 7050           |             |          |       |                |
| 17    | 42          | 59       | 32QAM                   | 8489           |             |          | 10.                  | 45 - C         | 5           |          |       |                |

## **RIG SETTINGS**

Open filters from 0-3000Hz, even in the case of VARA 500. VARA uses a specific internal filter for VARA 2300 or 500, which is not visible in the waterfall.

In the waterfall, VARA signal covers the space between the red lines, so ideally, your rig filter should exceed this threshold, like in this picture:



In the case of VARA HF Tactical, you need open the TX filter from 100-2900 Hz. This is only possible in the Icom IC-7300.



## VARA GATEWAYS CENTER FREQUENCY

Center Frequency = USB dial + 1500Hz

| USB Dial: 10130 |           |     |            |           |      |      |   | <u>http</u> | ://www.wii | nlink.org/RM | <u>ISChannels</u> |              |
|-----------------|-----------|-----|------------|-----------|------|------|---|-------------|------------|--------------|-------------------|--------------|
|                 | (KHz)     | BW  | Start Hour | Stop Hour | P3/4 | P1/2 | W | А           | Vara Rp    | Dwell (sec)  | Callsign          | Service Code |
| 1               | 10131,500 | W 🗸 | 0 😂        | 23 😂      |      |      |   |             |            | 7            | EA5HVK            | PUBLIC       |
| 2               | 0,000     | W 🗸 | 0 😂        | 23 😂      |      |      |   |             |            | 0            | EA5HVK            | PUBLIC       |

## WINDOWS DEFENDER

Some antivirus, like Windows Defender, give a false positive in VARA.exe file, removing the file even without asking you. I recommend to add an exclusion to C:\VARA folder.

How Add an exclusion to Windows Security:

Go to Start > Settings > Update & Security > Windows Security > Virus & thread protection.

Under Virus & threat protection settings, select Manage settings, and then under Exclusions, select Add or remove exclusions. Select Add an exclusion, and then select C:\VARA folder

## WIN10 POWER & SLEEP SETTINGS

To avoid a possible VARA locked-up with Win10, go to /Settings/System/Power & Sleep, and set the Screen and Sleep option to "**NEVER**".

| Settings                |   |
|-------------------------|---|
| 命 Home                  | Power & sleep                           |
| Find a setting $P$      | Screen                                  |
| System                  | When plugged in, turn off after         |
| 🖵 Display               |   |
| বগ) Sound               | Sleep                                   |
| Notifications & actions | When plugged in, PC goes to sleep after |
| J Focus assist          | Never                                   |
| O Power & sleep         |   |

## **TUNE BUTTON**

The **TUNE button** plays a test tone, useful for the power/ALC settings. Using the **drive level** slider, you can adjust the audio level out. Your **ALC** meter should be about 1/3 or 1/2 of scale.



## **VU METER**

The VU meter measures the input audio level in the soundcard. Avoid the Red Zone.



For adjusting the RX Audio level, use the Windows Recording Audio Slider (Recording→Properties).

•

| ۲ |               | Sound   | ×   |
|---|---------------|---|-----|
| P | layback Re    | cording Sounds Communications   |     |
|   | Select a play | yback device below to modify its settings:  |     |
|   |               | Headset Earphone<br>ASTRO Wireless Transmitter<br>Ready                                   | ^   |
|   | ۲             | Speakers / Headphones<br>IDT High Definition Audio CODEC<br>Ready                         |     |
|   | $Q_{\bullet}$ | <b>Communication Headphones</b><br>IDT High Definition Audio CODEC<br>Disabled, unplugged |     |
|   |               | Digital Output (S/PDIF)<br>IDT High Definition Audio CODEC<br>Default Device              |     |
|   |               | Acer K272HL-C<br>NVIDIA High Definition Audio<br>Ready                                    |     |
|   | Configure     | e Set Default   | 25  |
|   |               | OK Cancel App   | bly |
| - |               | - Bayerare  |     |

### **Setup Options**



#### Allow VARA check for updates via internet

VARA will connect with a VARA server to check if a new version is available.

#### Accept 500 Hz connections

Your VARA Gateways accept incomming connections on VARA HF 500, even if your station has not selected 500 mode. I recommend disable this option, as the 500Hz mode is slower than Wide modes.

#### Tuner enhancement

Select Tuner enhancement in your VARA HF Gateway only if you have problems with your ATU scanning bands. This option requires 2 additional retries by client users.

#### <u>CW ID</u>

For USA calls, the CW ID is forced. The rest of the world can enable/disable it

#### RA Board PTT

Select RA Board PTT if you are using a RA-Board interface with VARA HF. Then, in Winlink Express Port PTT select "External"

## **SmartSDR**

A feature of SDR transceivers is the high latency caused by VAC (Virtual audio cables). This latency is about 470 ms as minimum. In case of connection between two SDR's, the latency is double: 2x470=940ms minimum.

For EMMCOM, I recommend to use conventional Radios (0 latency), to have a better throughput performance.

VARA supports a single SDR connected to a conventional radio station, but it does not support the connection between two SDR's.

Here a typical configuration for SDR's:

In Filters Option set Digital to the left (minimum latency)

| 📓 Radio | Setup   |       |        |              |      |           | —    | $\times$ |
|---------|---------|-------|--------|--------------|------|-----------|------|----------|
| Radio   | Network | GPS   | ΤХ     | Phone/CW     | RX   | Filters   | XVTR |          |
|         | C       | 38    | 01     | F            | LE   | X-6       | 700  |          |
| [       |         |       |        | Filter Optio | ons  |           |      |          |
|         |         | Low L | atency | /            | Shar | p Filters |      |          |
|         | Voice   |       | -      |              | -    | •         | Auto |          |
|         | CW:     |       | -      |              | -    | •         | Auto |          |
|         | Digita  | d: (  |        |              | _    |           | Auto |          |
| L       |         |       |        |              |      |           |      |          |
|         |         |       |        |              |      |           |      |          |
|         |         |       |        |              |      |           |      |          |
|         |         |       |        |              |      |           |      |          |
|         |         |       |        |              |      |           |      |          |
|         |         |       |        |              |      |           |      |          |

Select **DIGU** and **3.0K** wideband:

| S ANT1 A | 11 3.0K | SPLI    | ТХ 🛆      |
|----------|---------|---------|-----------|
|          |         | 4.109   | 9.000     |
|          | 5 7 6   | +20 +40 | <b>S6</b> |
| 📕 📢 📕 I  | DSP DI  | GU X/RI | T DAX     |
| DIGU 🔻   | USB     | CW      | AM        |
| 100      | 300     | 600     | 1.0K      |
| 1.5K     | 2.0K    | 3.0K    | 6.0K      |

## Winlink Radio Setup Configuration:

| 😵 Vara HF Winlink Sett                         | ings ×  |
|--|---|
| Radio Selection                                |   |
| Select Radio Model                             | Flex radios         Antenna Selection         Default         V |
| Icom Address 0                                 | USB O USB Digital  FM O Use Internal Tuner                      |
| Codan login and                                | optionl password:   |
| Radio Control Port<br>Serial Port to Use C     | COM29 V Baud 9600 V Enable RTS V Enable DTR V TTL               |
| PTT Port (Optional)<br>Serial Port to Use Flex | → Baud 9600 → Enable RTS → Enable DTR →                         |
|  | Update Close  |

CAT port:

| Edit CAT Port  |           | ×                 |
|----------------|-----------|-------------------|
| Namo           |           |                   |
| Name:          |           |                   |
| Port Protocol: | CAT       | ~                 |
| Port Type:     | Serial    | ТСР               |
| Serial Port:   | FlexVSP   | Existing          |
| Client COM:    | COM29     | ~                 |
| VFO A Slice:   | Α         | ~                 |
| Auto Switch TX | Slice:    | Enabled           |
| Split Mode:    | SO2R (nor | mal) <sup>v</sup> |
|                | Cancel    | Save              |

# VARA Souncard menu: (Use the Drive Level slider to adjust the ALC)

| SoundCard  | ×                          |
|--|----------------------------|
| Device Input<br>DAX Audio RX 1 (FlexRadio Syste  | -                          |
| Device Output<br>DAX Audio TX (FlexBadio Systems | <b>•</b>                   |
| Tune   | — -5 dB                    |
| Press Tune and set the Drive Level for ALC=1/3   |                            |
| FLU HF/SOMH2 TRANSCEIVER                         | C-7300<br>19:06  <br>VFO A |
|  | 22<br>20<br>20             |
| Close  |                            |

### DAX Control



## **PowerSDR**

To reduce the latency, set the DSP Buffer size to 512.

| 🗱 Power                     | SDR Se                             | tup                  |                          |  |                                |                                |                         |   |       |   |
|-----------------------------|------------------------------------|----------------------|--------------------------|--|--------------------------------|--------------------------------|-------------------------|---|-------|---|
| General<br>Options          | Audio<br>Image                     | Display<br>Reject    | DSP<br>Keyer             | Transmit                                 | PA Settings                    | Appearance                     | Keyboard                | CAT Control                             | Tests | 7 |
| Taps:<br>Delay<br>Gain:     | 64<br>8<br>16                      | < × ×                | Taps:<br>Delay:<br>Gain: | 64 <b>3</b><br>8 <b>3</b><br>32 <b>3</b> | Pho<br>RX:<br>TX:<br>CW<br>RX: | 1024 V<br>1024 V<br>1024 V     | Noise<br>Three<br>Three | shold: 20 🔹<br>Blanker 2<br>shold: 15 📚 |       |   |
| ✓ U:<br>T><br>FM D:<br>3000 | e Peak I<br>( Meter E<br>eviation: | Readings<br>)SP Valu | es                       |  | TX:<br>Digi<br>RX:<br>TX:      | 1024 v<br>ta<br>512 v<br>512 v | Blk                     | ow<br>harris 💌                          |       |   |
| React Do                    | xabase-                            | - Impo               | et-D-ot-ob               | 290 <del></del>                          | Export-D-ataba                 | ×                              | -0K                     | Gamed                                   | Apply |   |

## VARA APPLICATIONS

Currently, VARA have been incorporated to BPQ32, RMS express, RMS Trimode, RMS packet, VARA Chat, VARA Terminal and vARIM. The communication between VARA and these external applications is done using two TCP ports (8300, 8301 by default).

I recommend you to create a different VARA folder for every application, using different TCP ports.

For example:Winlink ExpressC:\VARA(TCP 8300-8301)VARA ChatC:\VARA2(TCP 8310-8311)VARA TerminalC:\VARA3(TCP 8320-8321)etc....



## **LINUX**

For using VARA under Linux S.O go to this link:

http://k6eta.com/linux/installing-rms-express-on-linux-with-wine

For using VARA in a Raspberry Pi with Win10 go to this link:

https://www.tomshardware.com/how-to/install-windows-10-raspberry-pi

For more information, ask to Rafael PU2UIT, or Steve K6ETA . rafael@riseup.net steve@sfischerdesign.com

## **TECHNICAL SUPPORT**

If you have problems or doubts with the installation, write to nietoros@hotmail.com

Jose, EA5HVK nietoros@hotmail.com