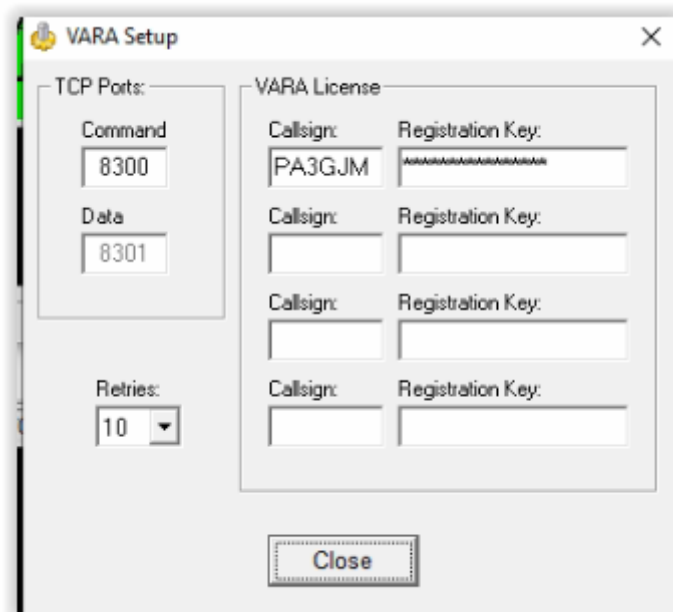


# VARA HF 4.7 QUICK GUIDE

Rev, June 19th 2023

## VARA LICENSE

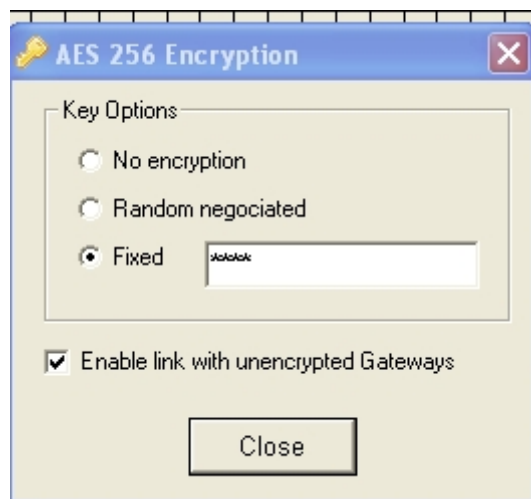
The VARA license is valid for the callsign and his 15 suffixes: CALLSIGN, CALLSIGN-1, CALLSIGN-2.....CALLSIGN-15 and CALLSIGN-T, CALLSIGN-R and CALLSIGN-X. You can use your VARA license in several computers. The registration Key is inserted in the VARA Setup menu:



If you need a second VARA License (SHARES, CFARS, etc...) It cost \$55 (save \$14)

## AES 256 ENCRYPTION

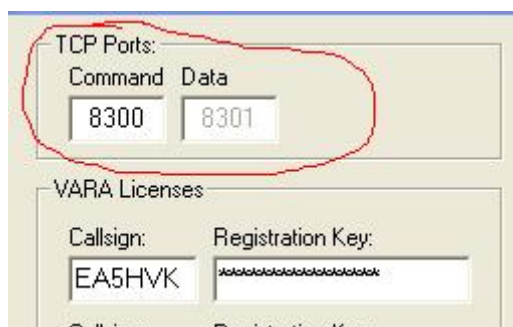
The AES 256 Encryption menu for secure comms is available in VARA. You need a special call sign (Police, government agencies, Army, etc...) to have access to this menu.



## 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.



The screenshot shows a configuration window for VARA. The 'TCP Ports' section has two input fields: 'Command' with the value '8300' and 'Data' with the value '8301'. These fields are circled in red. Below this is the 'VARA Licenses' section, which includes 'Callsign:' with the value 'EA5HVK' and 'Registration Key:' with a masked key 'XXXXXXXXXXXXXXXXXXXX'.

## 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

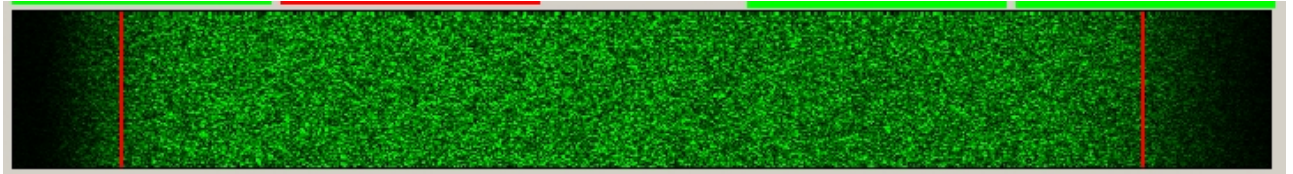
**VARA HF Narrow** was designed for the bands limited to 500Hz

VARA HF v4.3.0												
VARA HF 2750 (Tactical)					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				
15	42	59	8PSK	5817	42	49	16QAM	5872				
16	42	59	16QAM	7074	42	49	32QAM	7050				
17	42	59	32QAM	8489								

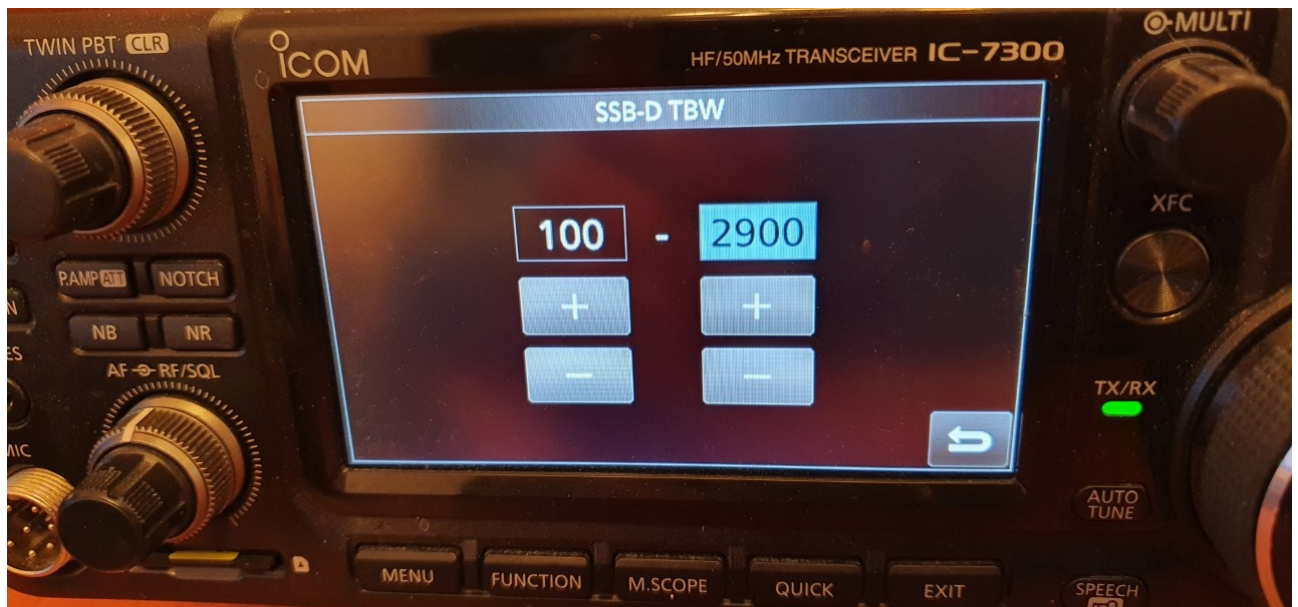
## RIG SETTINGS

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

Center Frequency (KHz)		USB Dial: 10130		<a href="http://www.winlink.org/RMSChannels">http://www.winlink.org/RMSChannels</a>									
		B/W	Start Hour	Stop Hour	P3/4	P1/2	W	A	Vara	Rp	Dwell (sec)	Callsign	Service Code
1	10131,500	W	0	23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7	EA5HVK	PUBLIC
2	0,000	W	0	23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	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:*

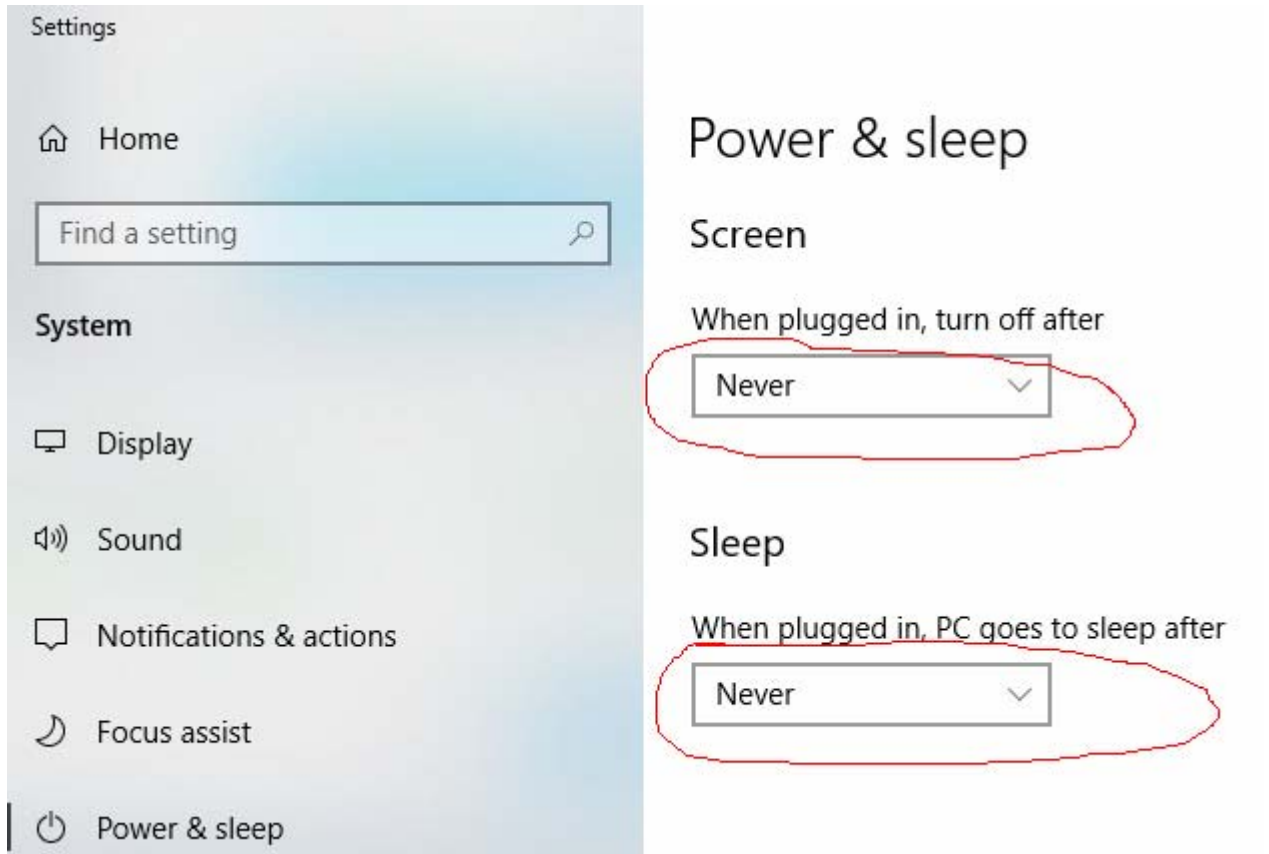
*Go to Start > Settings > Update & Security > Windows Security > Virus & thread protection.*

*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*

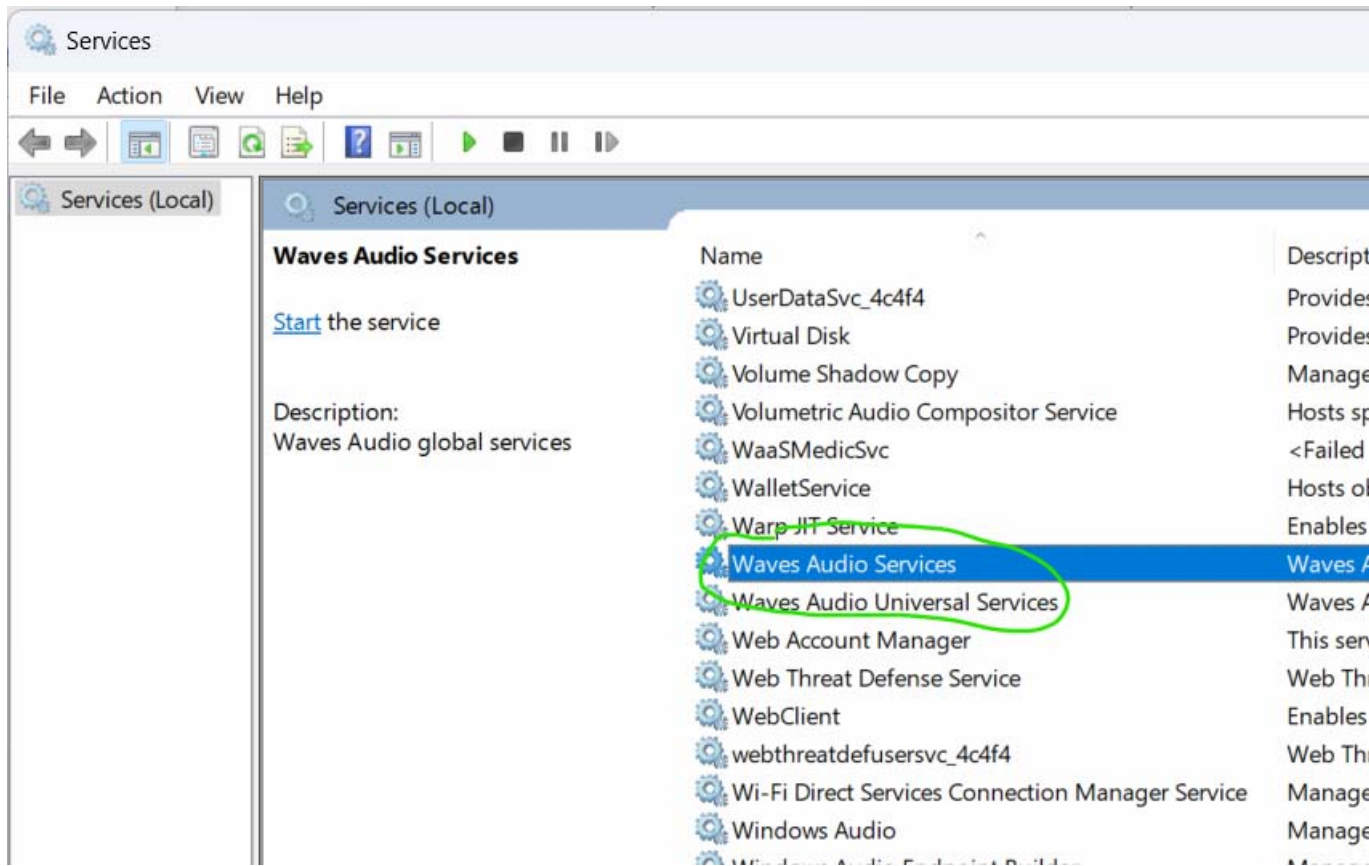
## WIN10 POWER & SLEEP SETTINGS

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



## WINDOWS 11

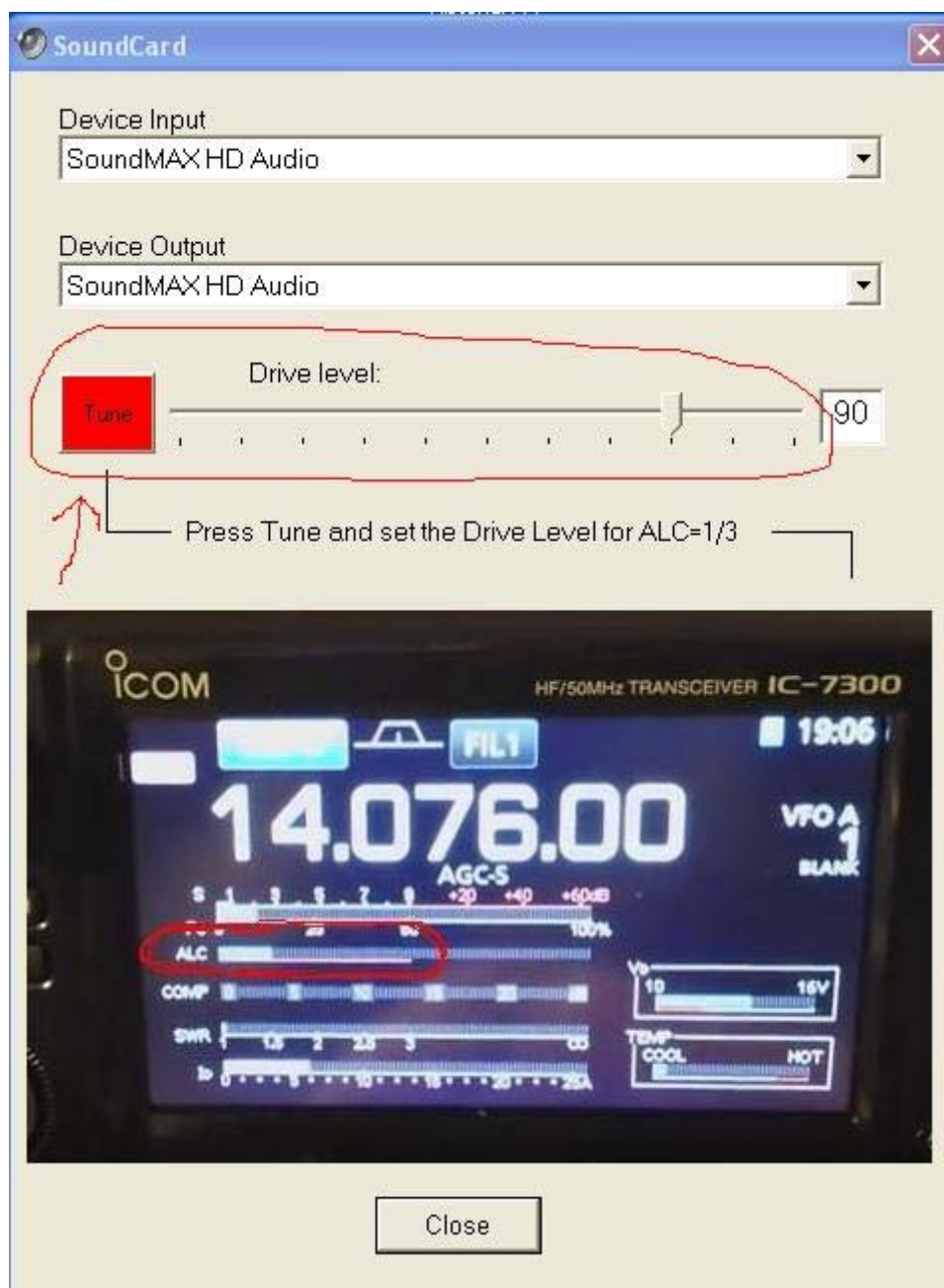
Disable the two Services: Wave Audio Services and Wave Audio Universal Services, which are used to reduce background noises. These services destroy the VARA signals.





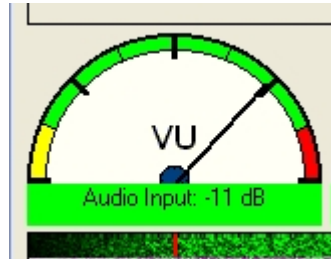
## TUNE BUTTON

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.

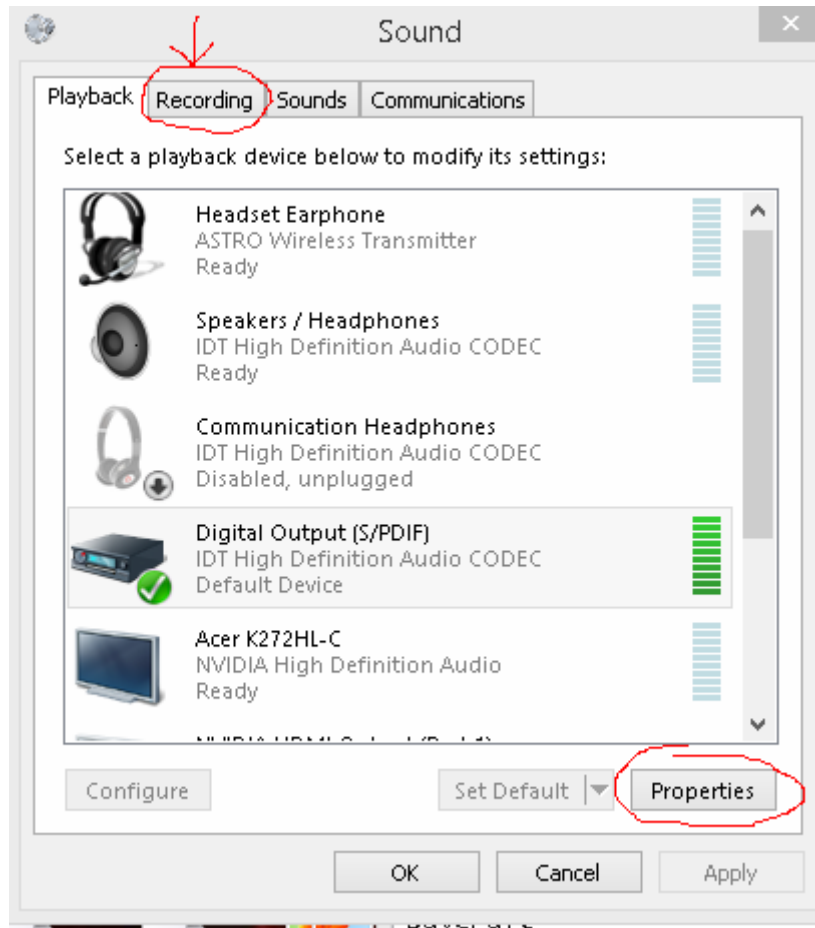


## VU METER

The VU meter measures the input audio level (db Full Scale) in the soundcard. **Avoid the Red Zone.**



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





## Setup Options

- ☒ Allow VARA check for updates via internet
- ☐ Accept 500 Hz connections
- ☐ Tuner enhancement
- ☐ CW ID
- ☐ RA-Board PTT

### 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 incoming connections on VARA HF 500, even if your station has not selected 500 mode. If you are already using VARA 500, this option is not necessary. I recommend disabling it to reduce the CPU usage.

### 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.

### CW ID

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. (In the Winlink Express Port PTT option select "External")

## SmartSDR

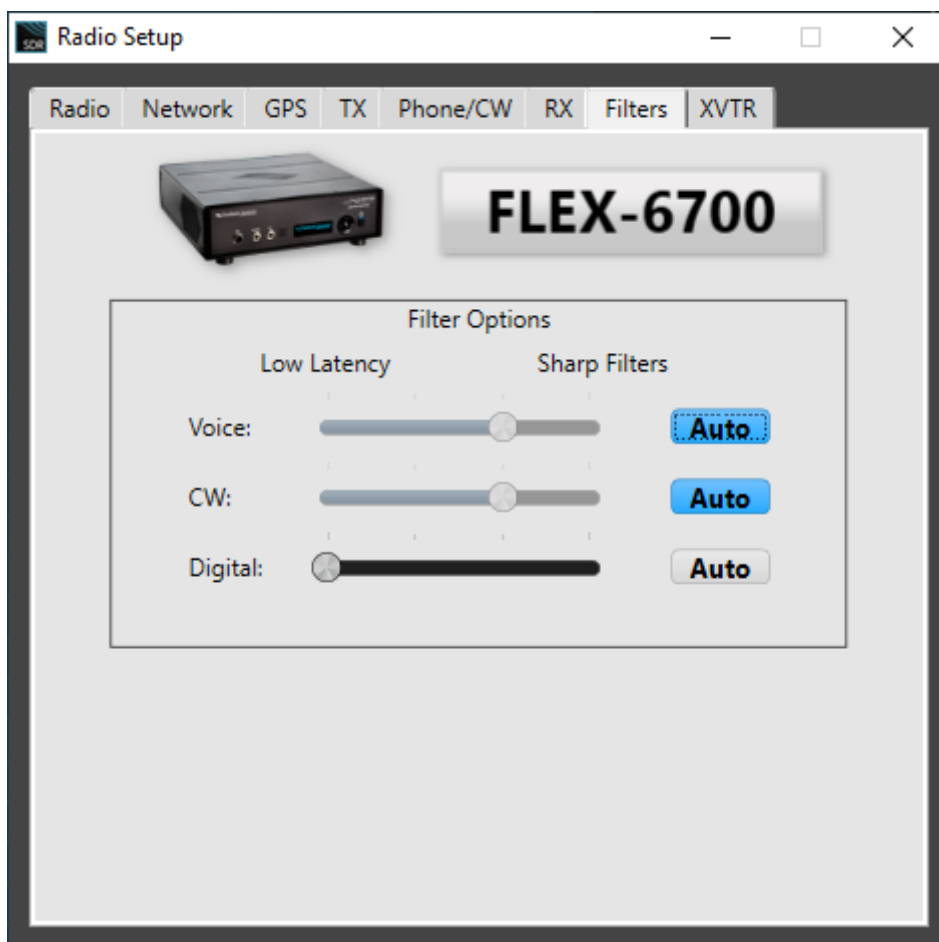
A feature of SDR transceivers is the high latency caused by VAC (Virtual audio cables). This latency is about 470 ms as minimum. In case of connection between two SDR's, the latency is double:  $2 \times 470 = 940$ ms minimum.

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

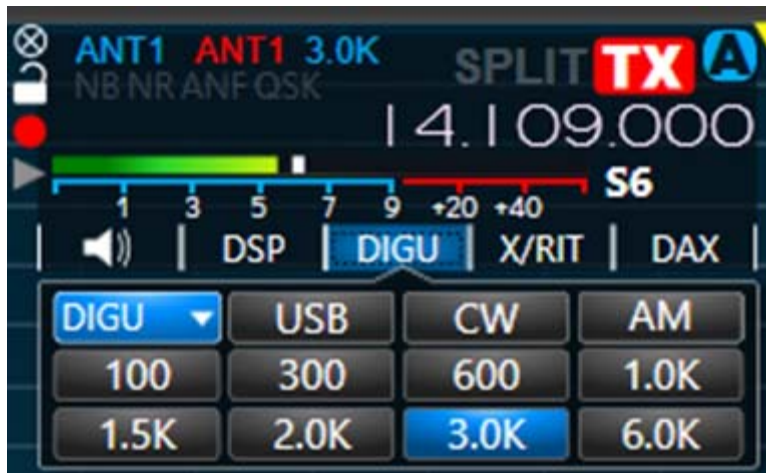
VARA supports a single SDR connected to a conventional radio station, but it does not support the connection between two SDR's.

Here a typical configuration for SDR's:

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



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



Winlink Radio Setup Configuration:

Vara HF Winlink Settings

Radio Selection

Select Radio Model: Flex radios Antenna Selection: Default

Icom Address: 00 USB ☐ USB Digital ☒ FM ☐ Use Internal Tuner ☐

☐ Codan login and optional password:

Radio Control Port

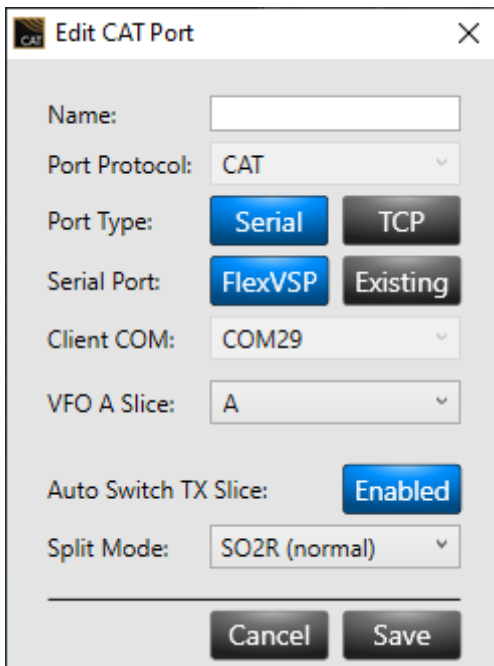
Serial Port to Use: COM29 Baud: 9600 Enable RTS ☒ Enable DTR ☒ TTL ☐

PTT Port (Optional)

Serial Port to Use: Flex Baud: 9600 Enable RTS ☒ Enable DTR ☒

Update Close

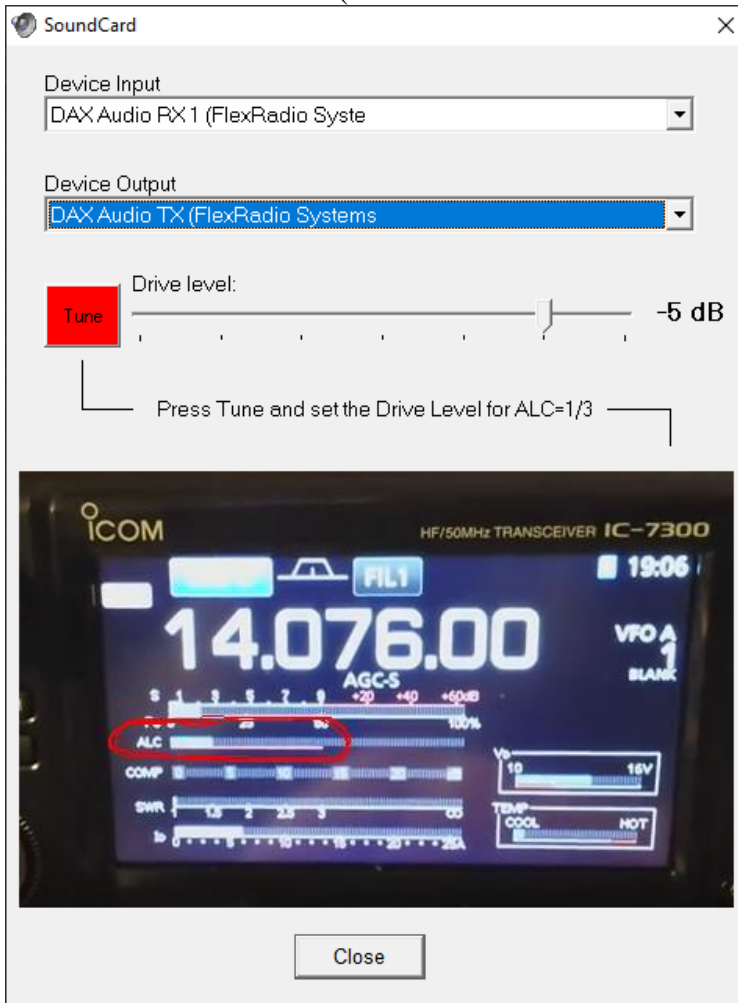
CAT port:



The 'Edit CAT Port' dialog box contains the following fields and controls:

- Name:
- Port Protocol: CAT (dropdown)
- Port Type: Serial (selected), TCP
- Serial Port: FlexVSP (selected), Existing
- Client COM: COM29 (dropdown)
- VFO A Slice: A (dropdown)
- Auto Switch TX Slice: Enabled (button)
- Split Mode: SO2R (normal) (dropdown)
- Buttons: Cancel, Save

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



The 'SoundCard' menu and the IC-7300 display are shown below:

**SoundCard Menu:**


- Device Input: DAX Audio RX 1 (FlexRadio System)
- Device Output: DAX Audio TX (FlexRadio Systems)
- Drive level: -5 dB (slider)
- Buttons: Tune, Close
- Text: Press Tune and set the Drive Level for ALC=1/3

**IC-7300 Display:**

- Frequency: 14.076.00
- AGC-S: +20, +40, +60dB
- ALC: 100% (highlighted with a red circle)
- COMP: 100%
- SWR: 1.5, 2, 2.5, 3, 100%
- VFO A: 1, BLANK
- VOL: 10, 10V
- TEMP: COOL, HOT

## DAX Control

**DAX Control Panel v3.1.1...** [Settings]

 FLEX-6700  
N4CZ  
N4CZ

Station: **LATITUDEE5570-1**

**TX Stream**

**TX** Streaming TX Gain: [Slider] -60dB 0

**Mic Stream**

**On** Streaming Mic Record Gain: [Slider] -60dB 0

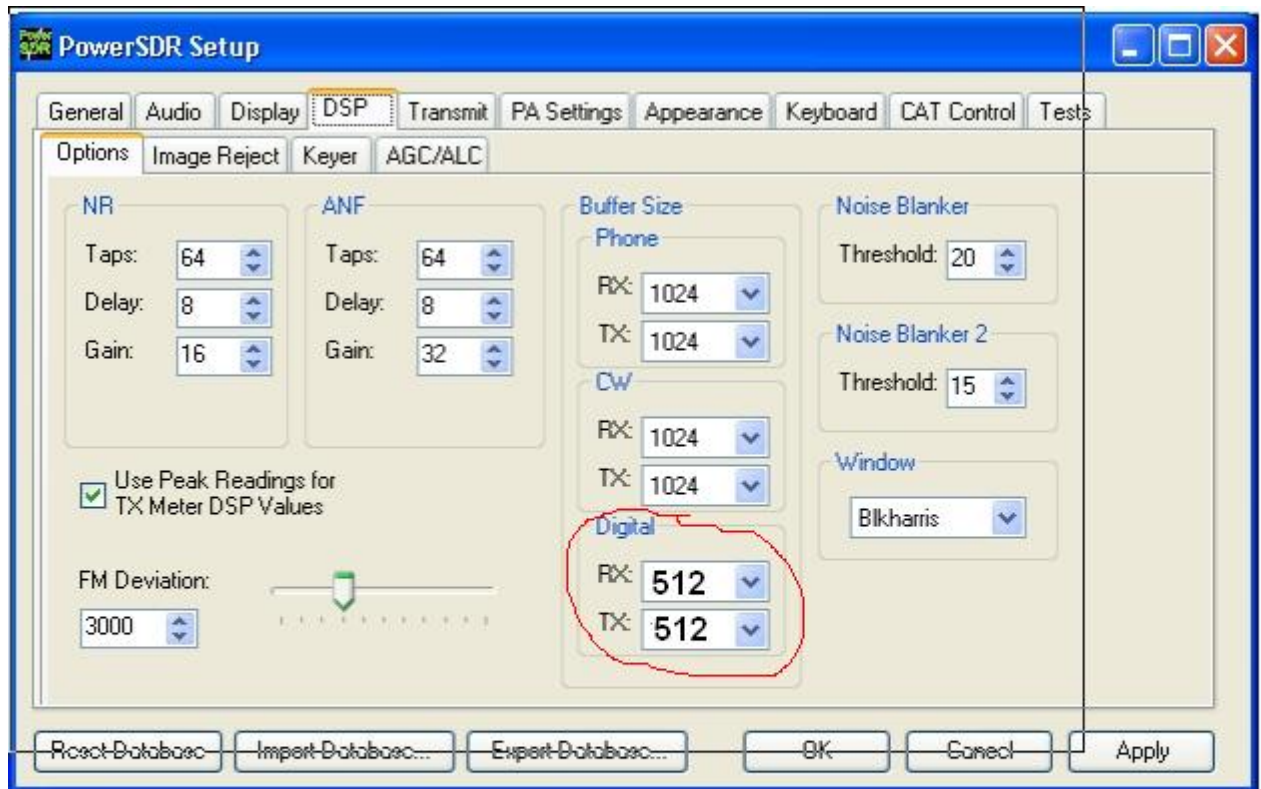
**RX Streams**

Stream	Gain	Gain Range
1 Slice A Streaming	RX Gain: [Slider]	-60dB 0
2 Slice - No Slice	RX Gain: [Slider]	-60dB 0
3 Slice - Off	RX Gain: [Slider]	-60dB 0
4 Slice - Off	RX Gain: [Slider]	-60dB 0
5 Slice - Off	RX Gain: [Slider]	-60dB 0
6 Slice - Off	RX Gain: [Slider]	-60dB 0
7 Slice - Off	RX Gain: [Slider]	-60dB 0
8 Slice - Off	RX Gain: [Slider]	-60dB 0

**IQ Streams**

## PowerSDR

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





## **VARA TCP PORTS**

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

If you are running several VARA's in the same computer, I recommend you to create a different VARA folder for every application, using different TCP ports.

For example:

Winlink Express C:\VARA (TCP 8300-8301)  
VarAC C:\VARA2 (TCP 8310-8311)  
VARA Terminal C:\VARA3 (TCP 8320-8321)  
etc....

## **TECHNICAL SUPPORT**

For more information, write to [nietoros@hotmail.com](mailto:nietoros@hotmail.com)

Jose, EA5HVK  
[nietoros@hotmail.com](mailto:nietoros@hotmail.com)