

Montgomery Amateur Radio Club
Rockville, Maryland

Getting Started with Winlink on HF

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October 19, 2022

introduction

- over two years ago, I saw a need for Winlink training
 - started a project to collect radio Winlink settings
 - collected over [30 HF and VHF radio Winlink settings](#)
 - presentation is what I learned on getting started

- previous presentation: Getting Started with Winlink on **VHF**

note: this presentation is for Windows 10 only

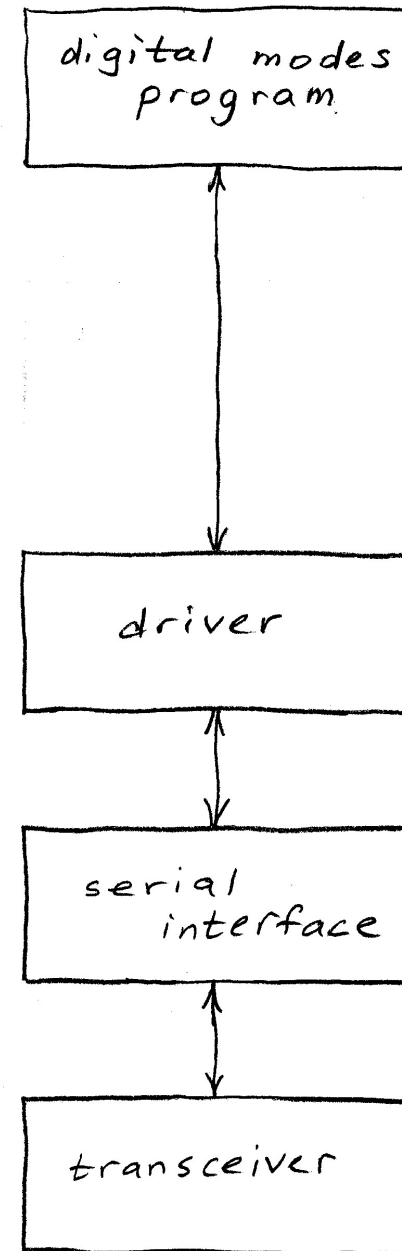
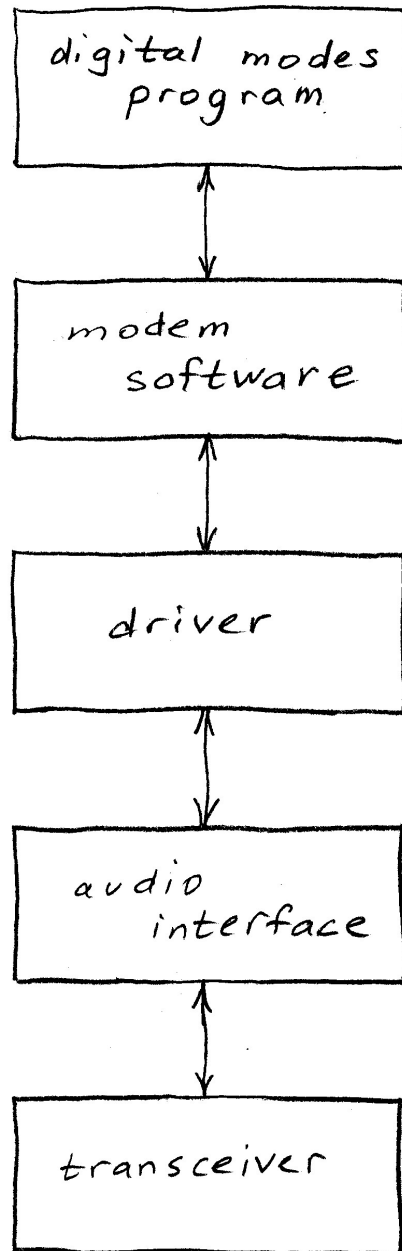
overview

- setting up an audio device
 - example: up a Signalink USB with built-in PTT
- setting up VARA HF software modem
- computer radio control device
- setting up Winlink Express
 - example: setting up an Icom IC-706MkIIIG using Signalink USB
- local HF communications
 - near vertical incidence skywave (NVIS)
 - inverted vee NVIS antenna
- demonstration: exchanging messages via Winlink email gateway

objective

- to set up basic working Winlink HF station to exchange messages using the WB3KAS and W1AW Winlink gateways

conceptual model



setting up an audio device

- transceivers are audio devices!
 - audio device is interface between radio and modem software
 - binary data is converted to audio and back again
 - least distortion desired
 - reduce RF Gain to reduce background noise
 - turn off Automatic Gain Control (AGC) on receive
 - little or no Automatic Level Control (ALC) on transmit
 - turn off receive filters
- audio device is often called an external USB “sound card”
- Windows settings are generally the same for external or built-in audio devices

example: setting up a Signalink USB audio device

Signalink USB audio interface with built-in **VOX PTT**

TX: half

RX: half

DLY: minimum

cable: specific for radio

[Signalink™ USB Product Guide](#)

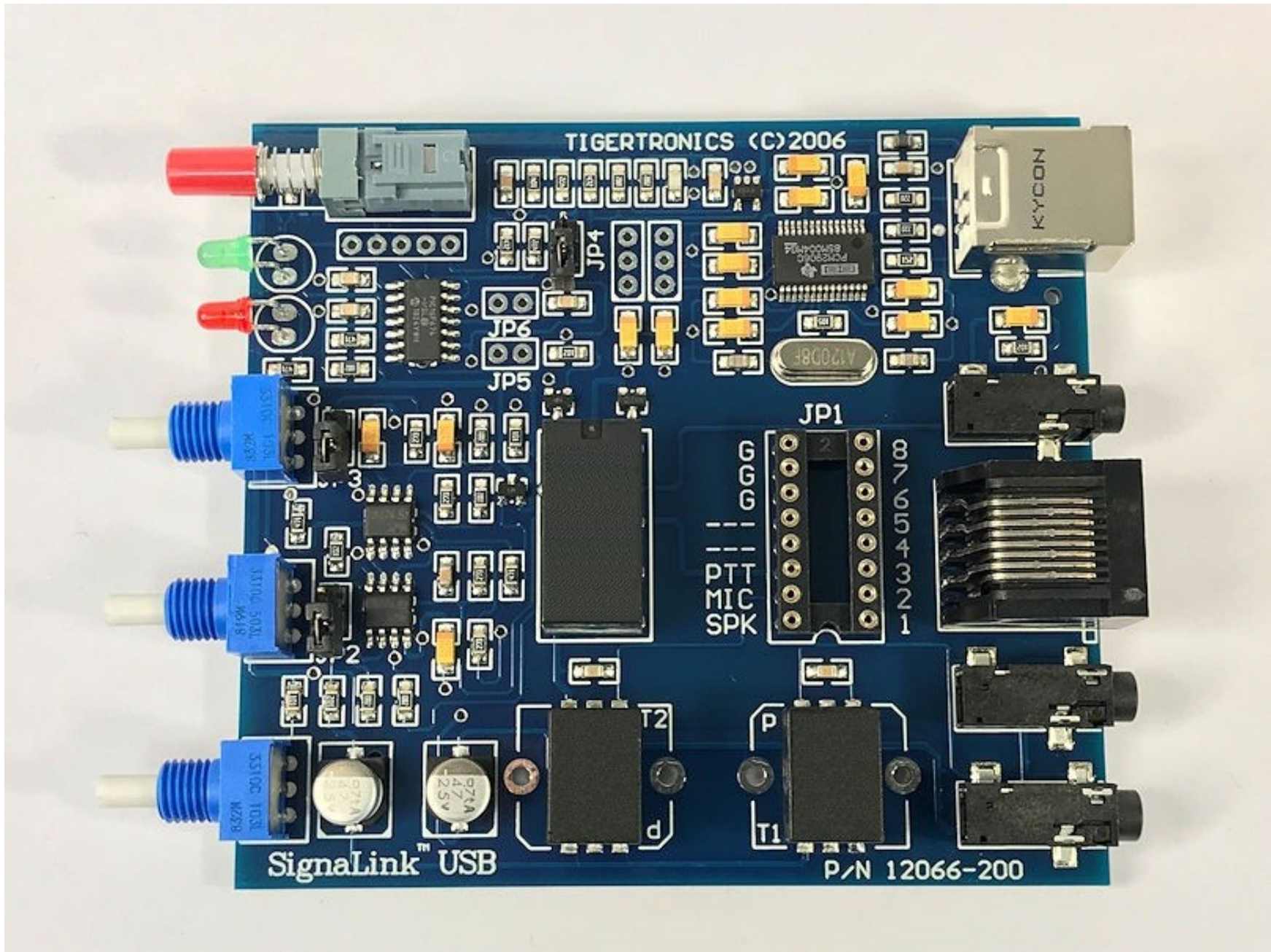
header module: corresponding jumper wires or header

[Signalink Jumper Settings & Wiring Information](#)

- these Signalink settings are generally the same for most HF radios

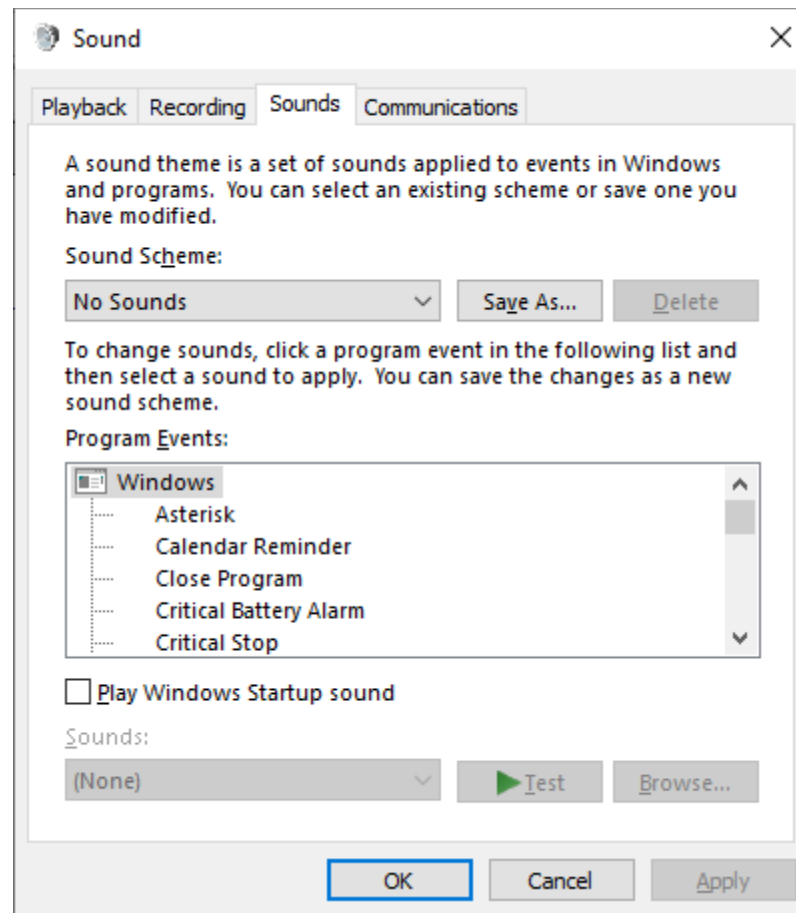


https://shop.tigertronics.com/Signalink-USB_c2.htm



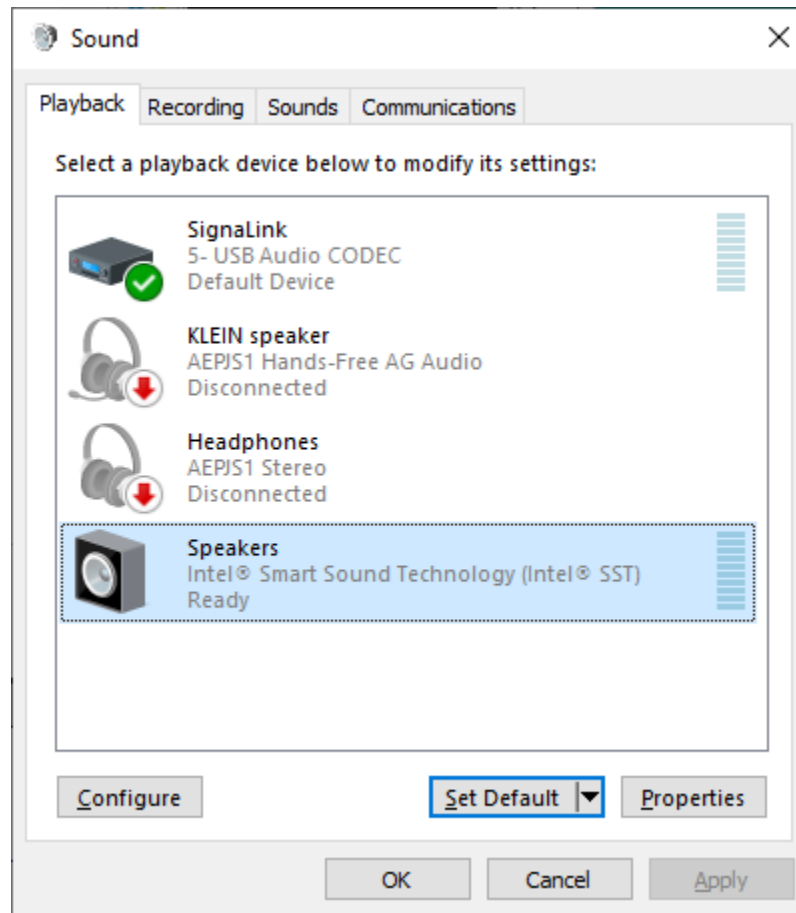
built with two black BOURNS audio isolation transformers

setting up Windows Signalink audio device



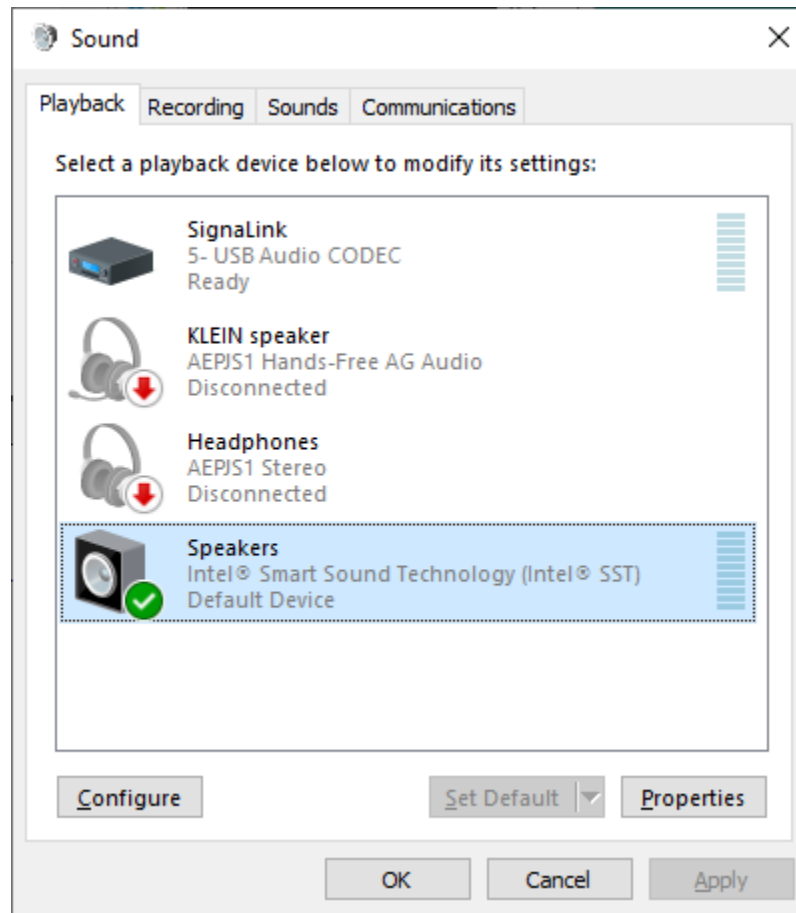
turn off Windows sounds

- this is **important** if you forget to do the next steps

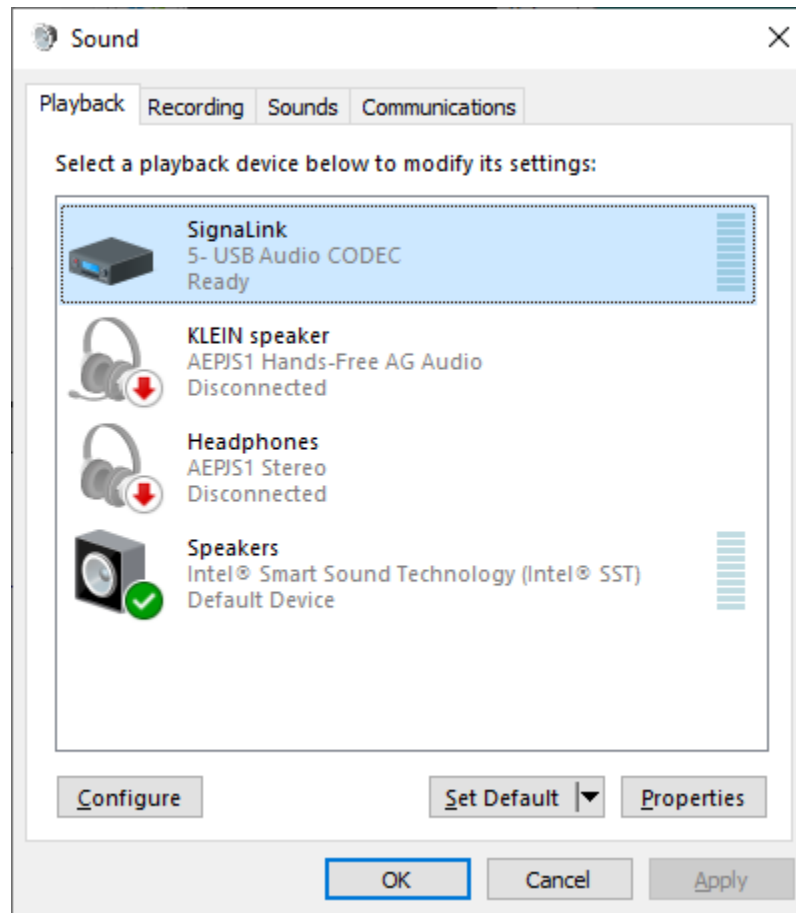


set default audio device

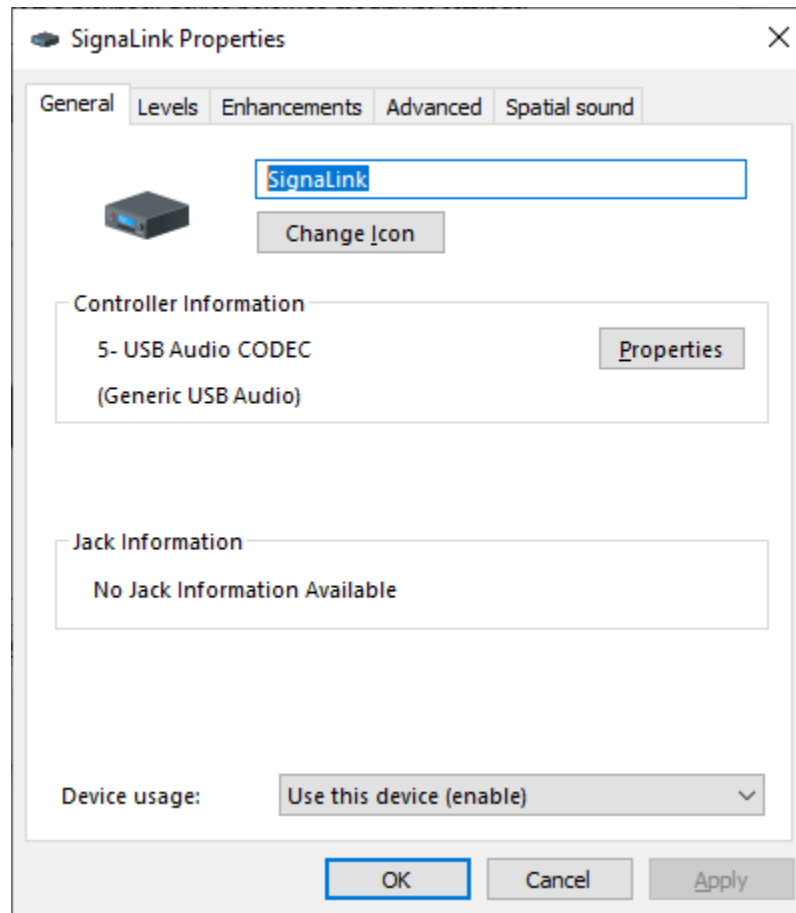
- settings are generally the same for all radio audio interface devices



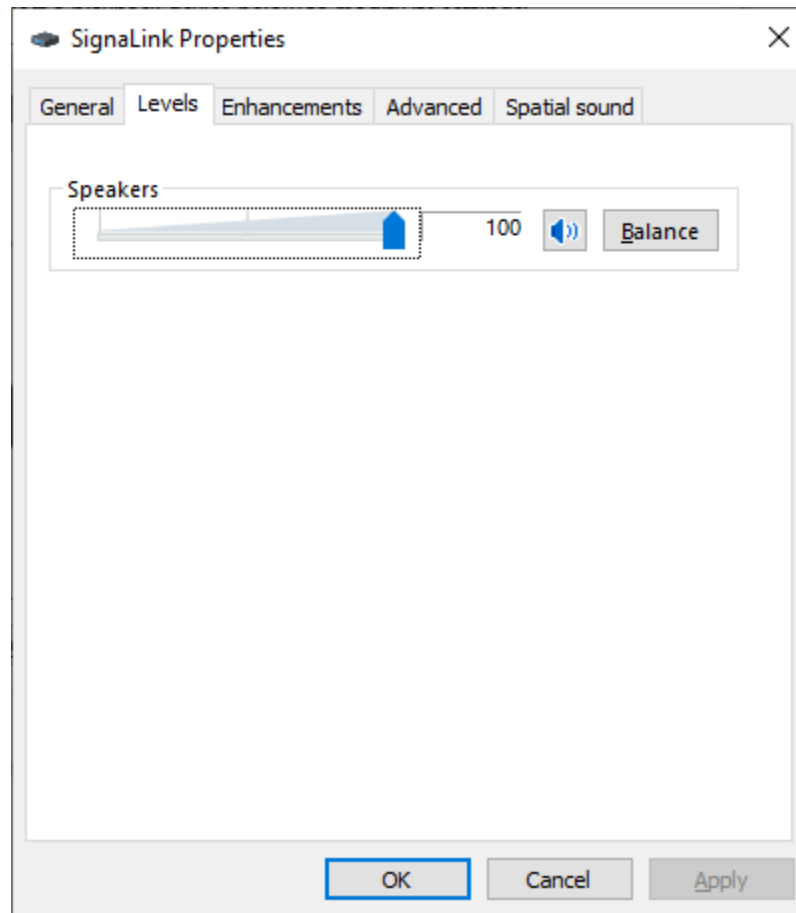
correct default audio device



select Properties of Signalink device

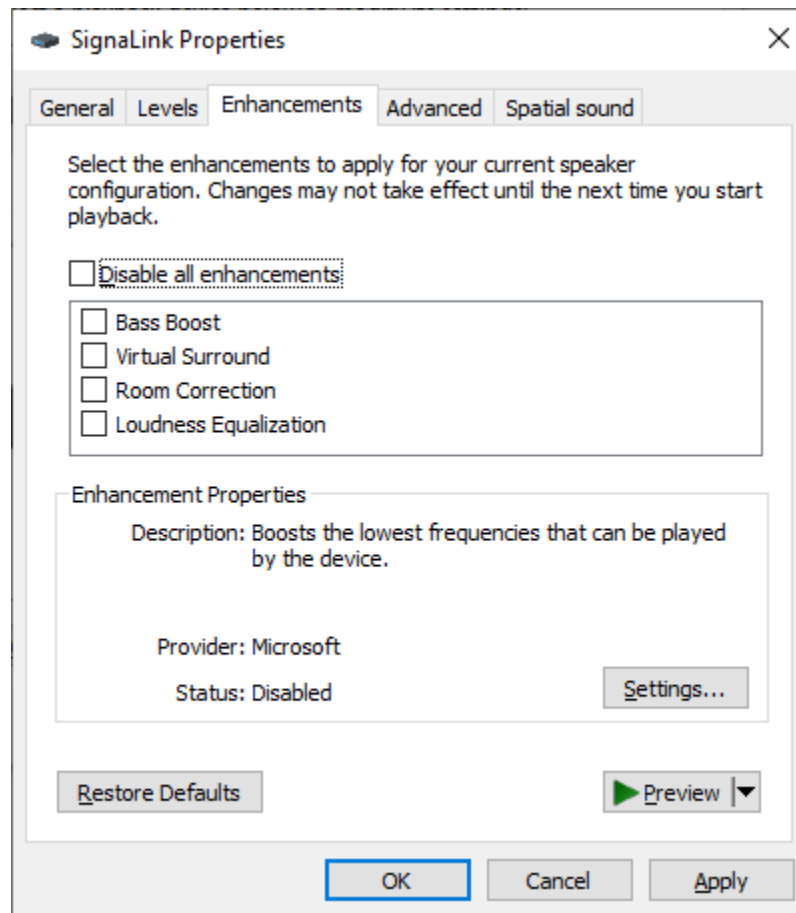


rename as SignalLink as needed

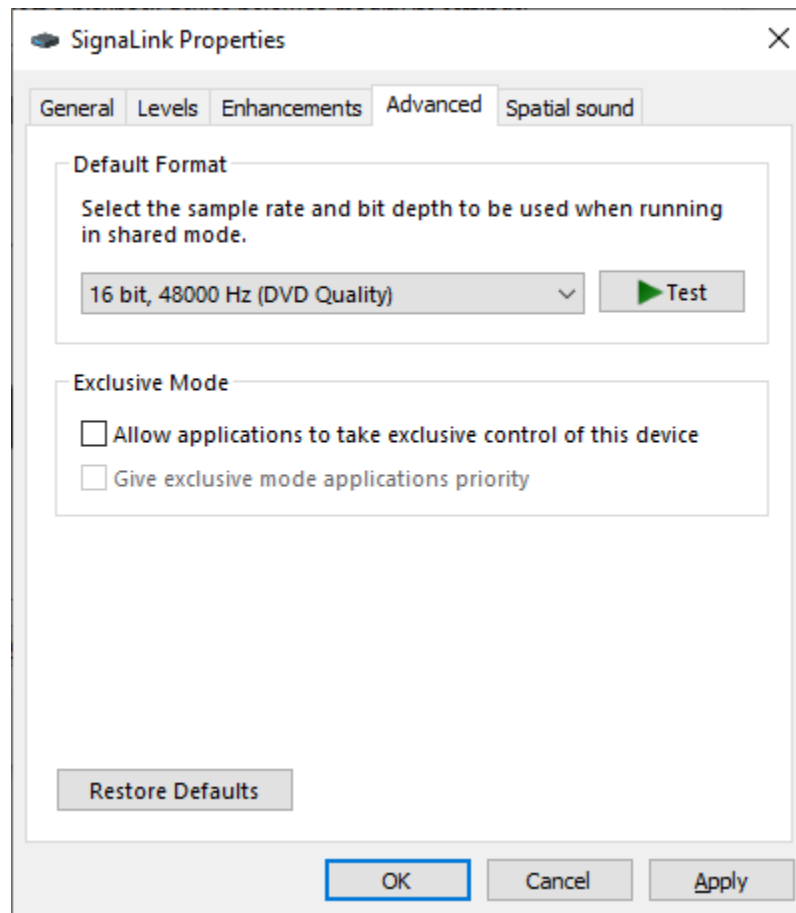


set output level to maximum

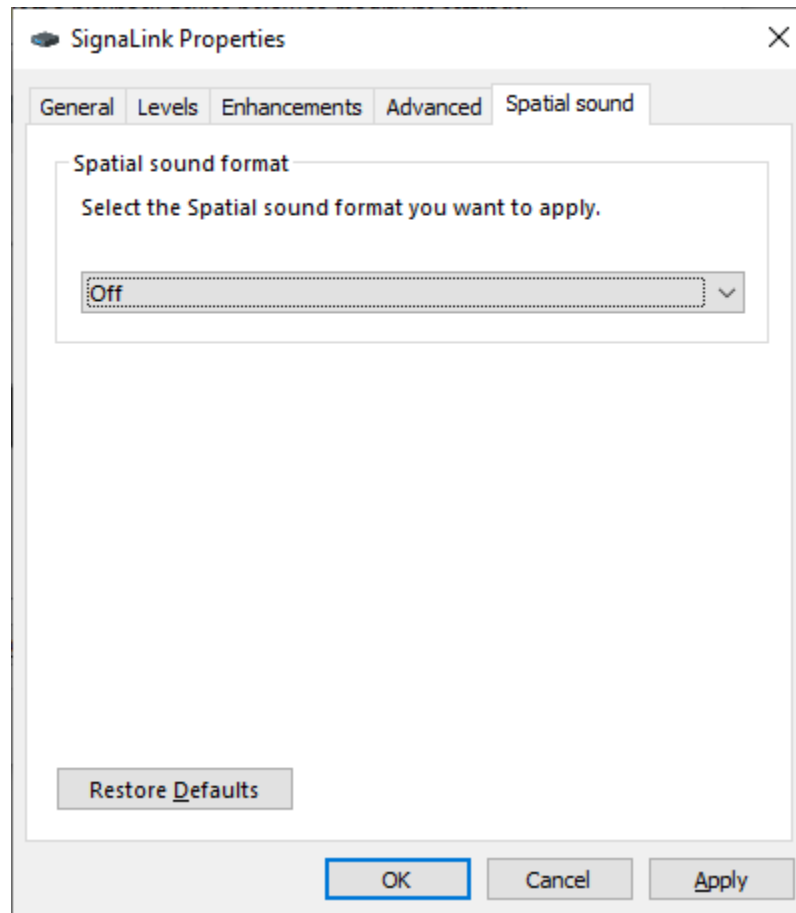
- needed to drive Signalink PTT



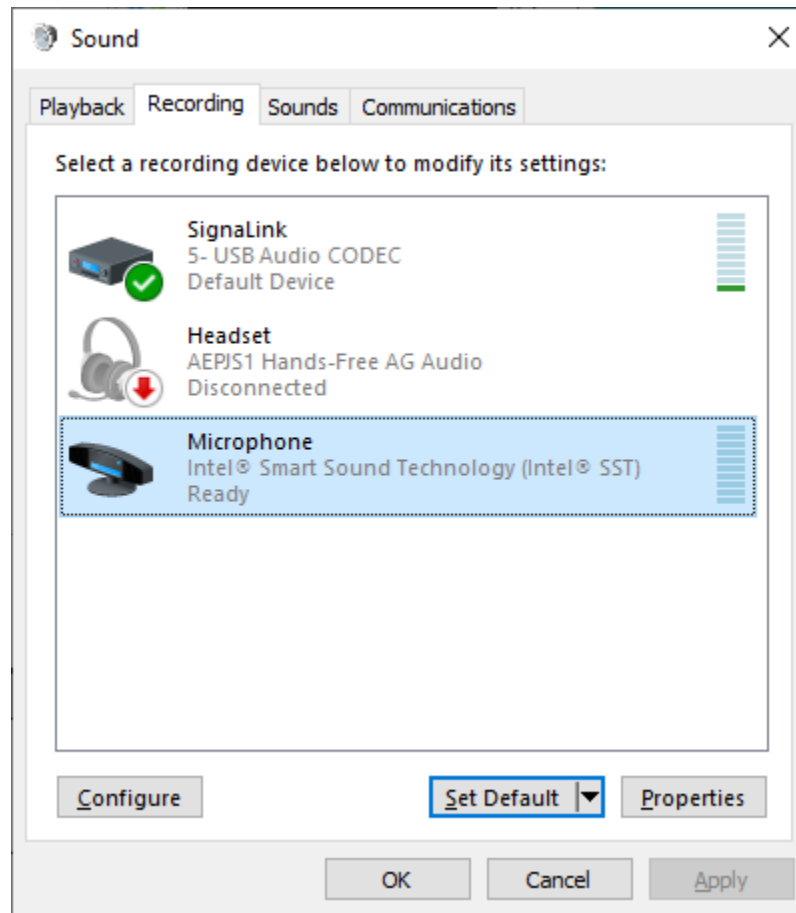
no enhancements



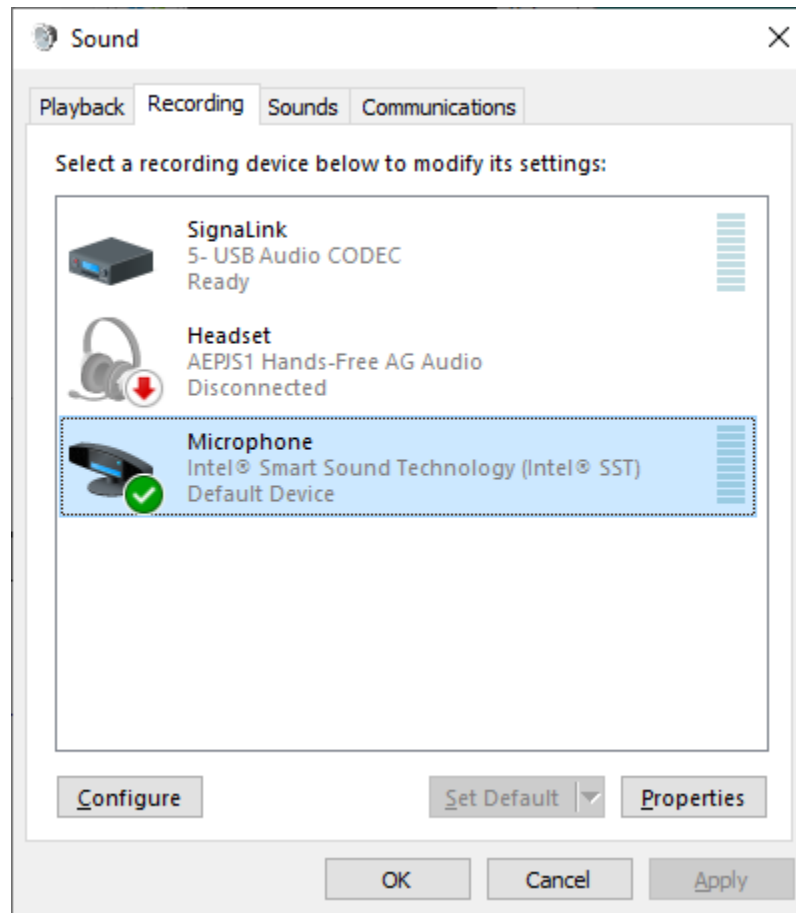
set to highest audio quality



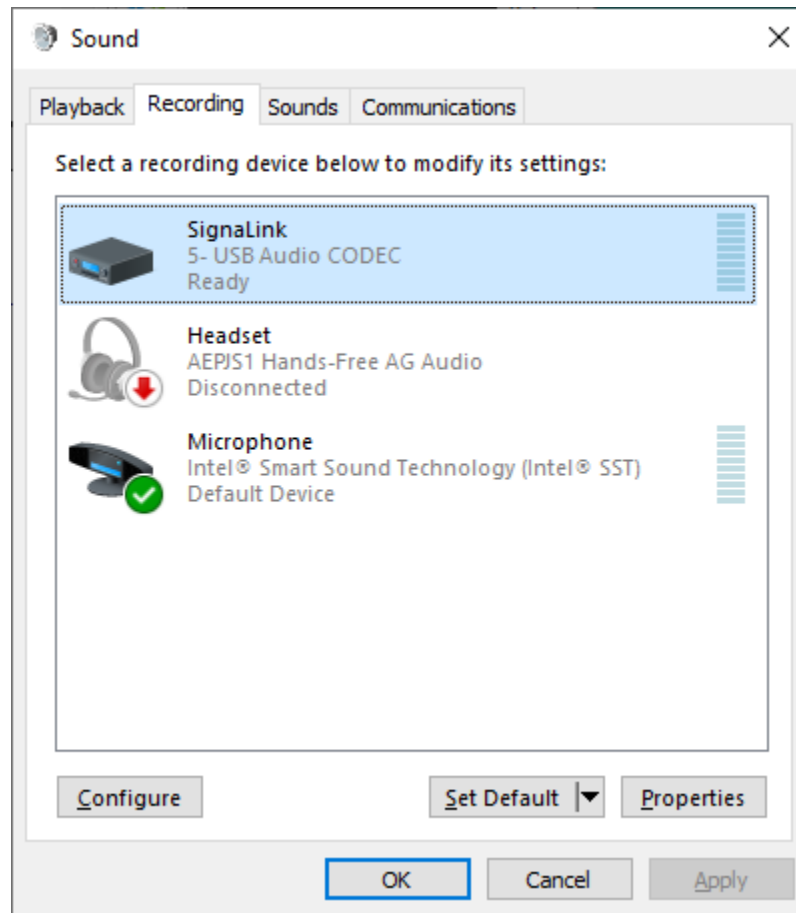
disable spatial sound



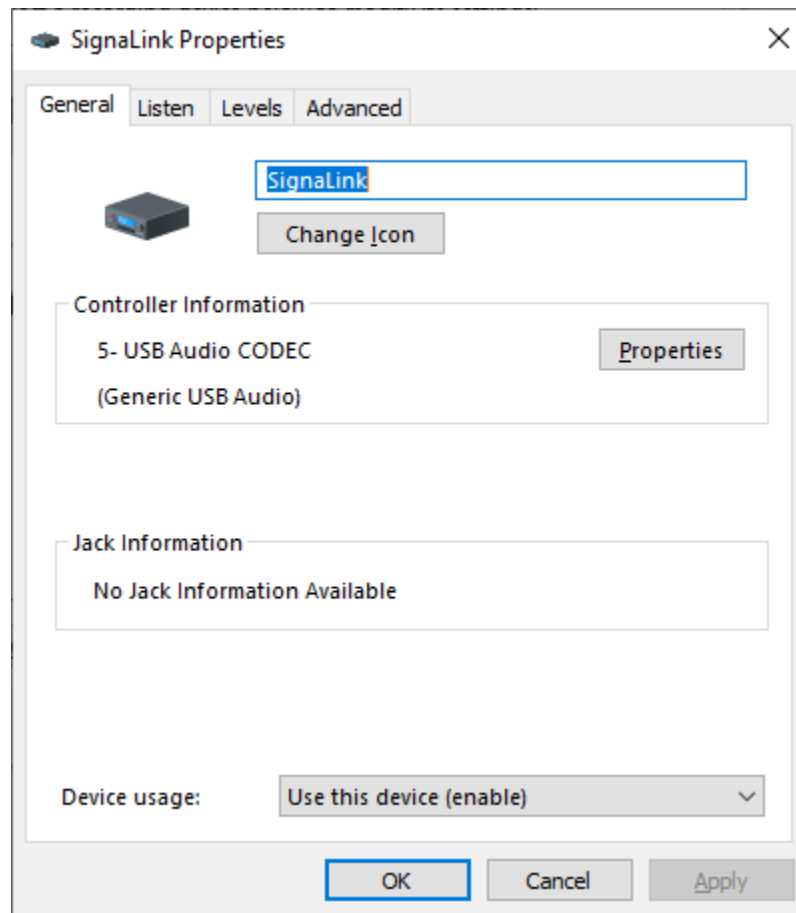
set default audio device



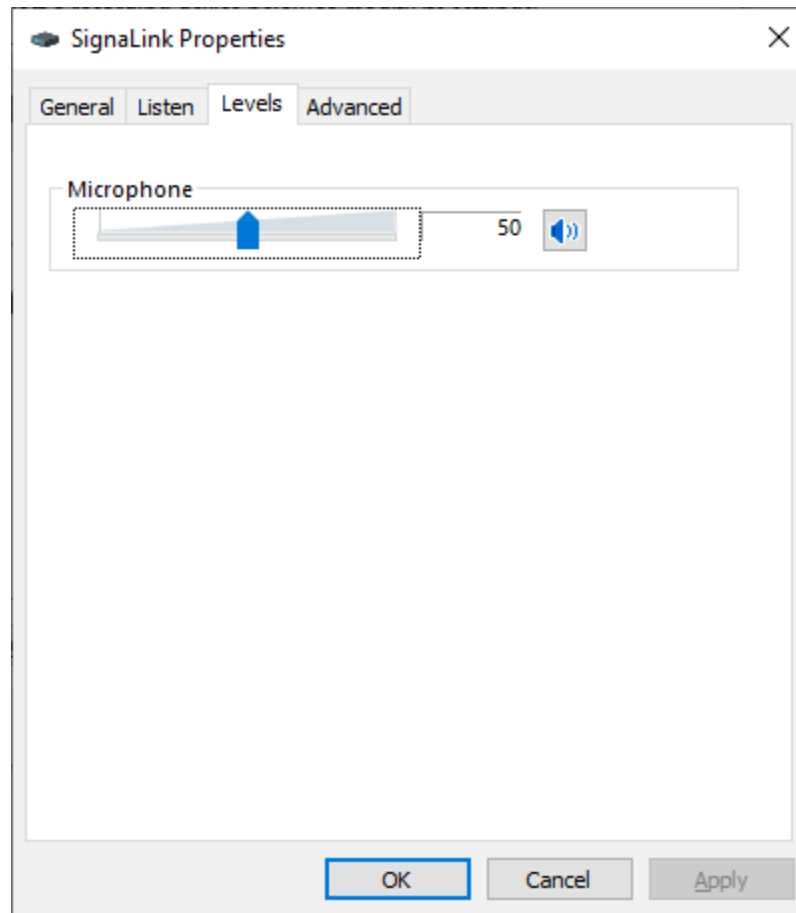
correct default audio device



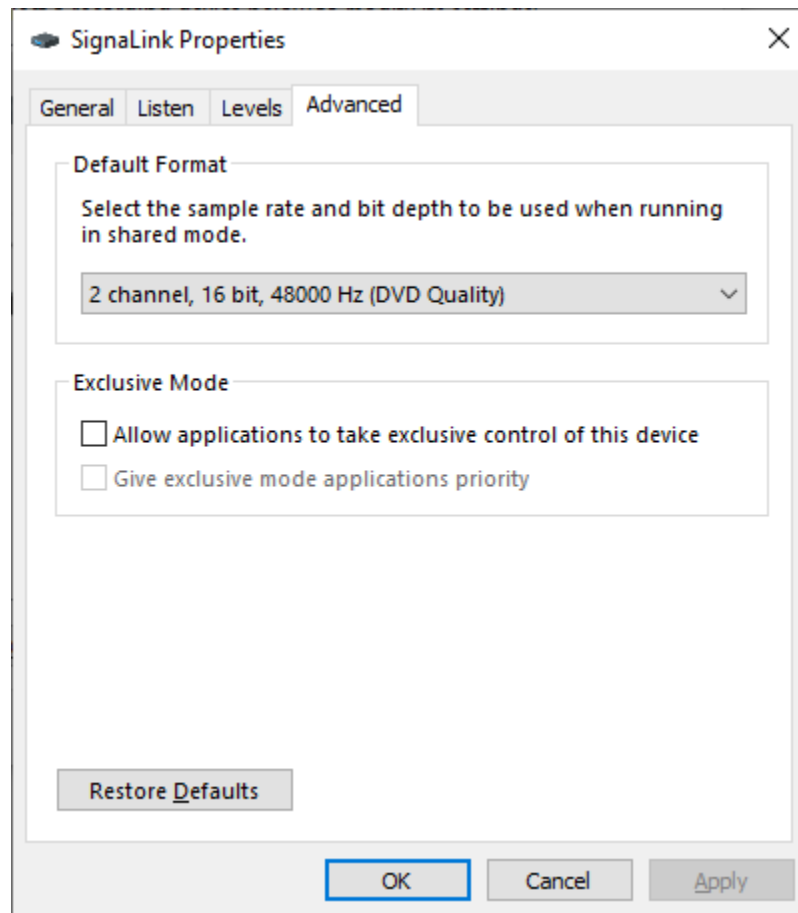
select Properties of Signalink device



rename as Signalink as needed



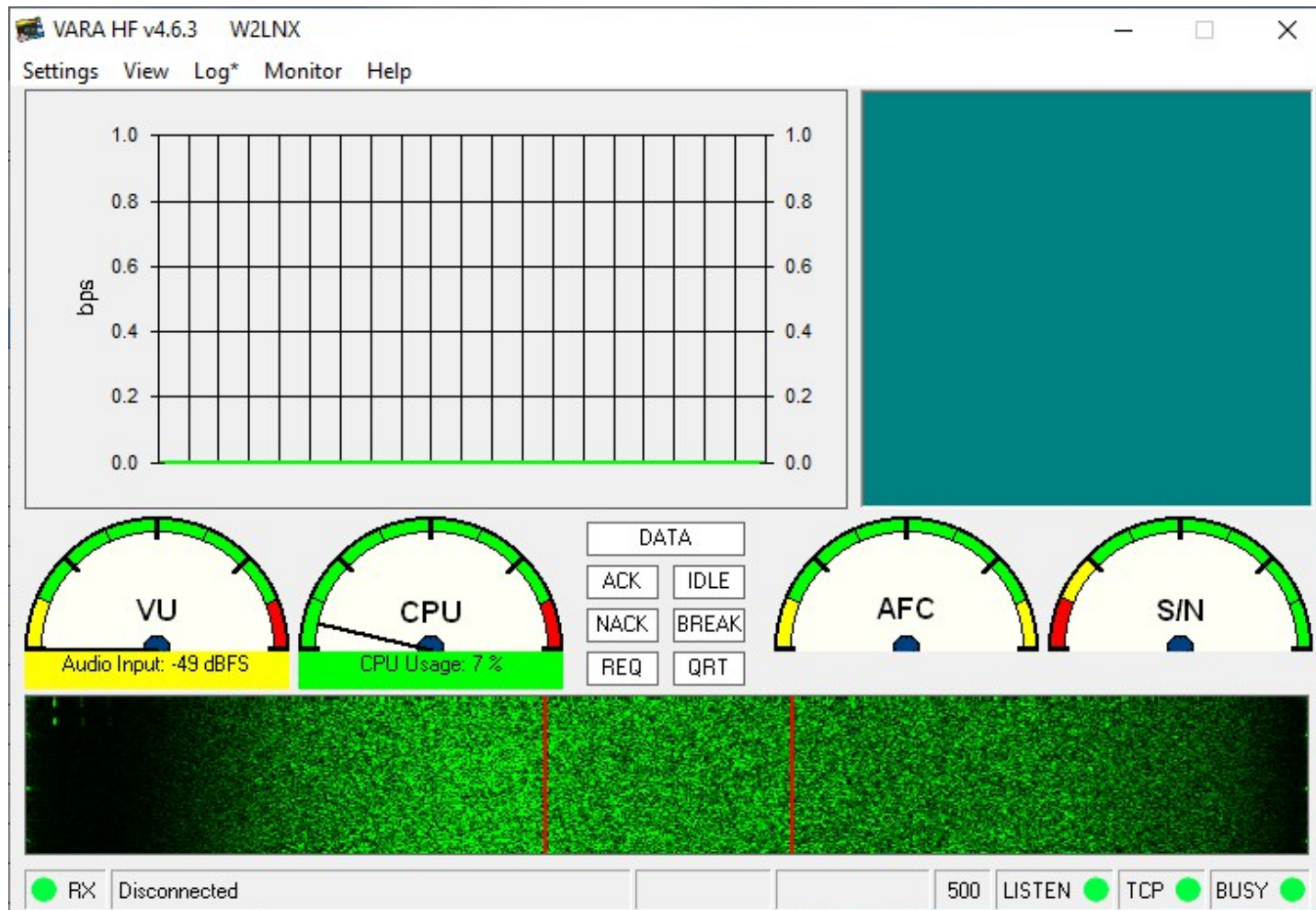
set initial input level



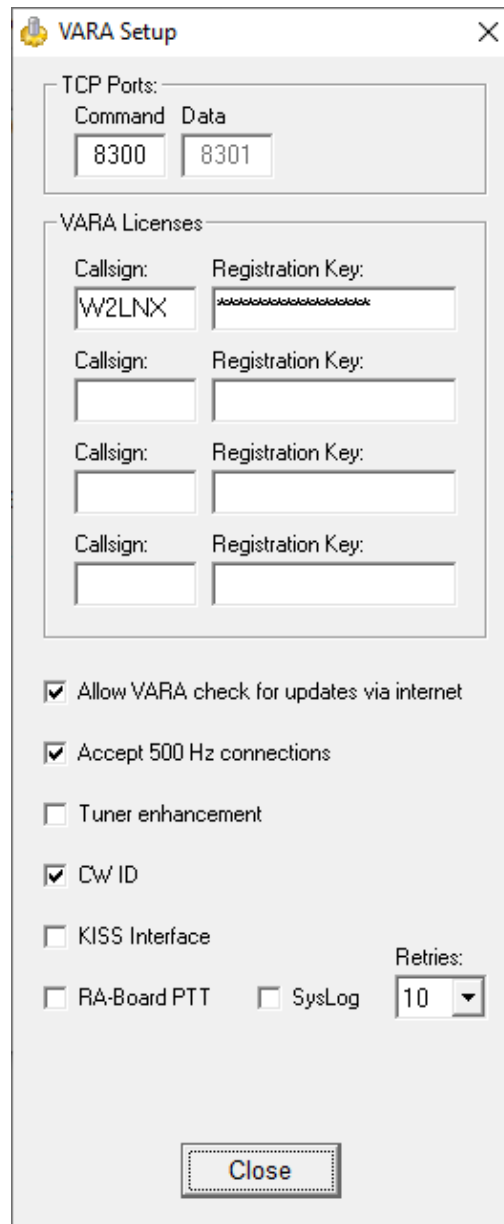
set to highest audio quality

setting up VARA HF modem

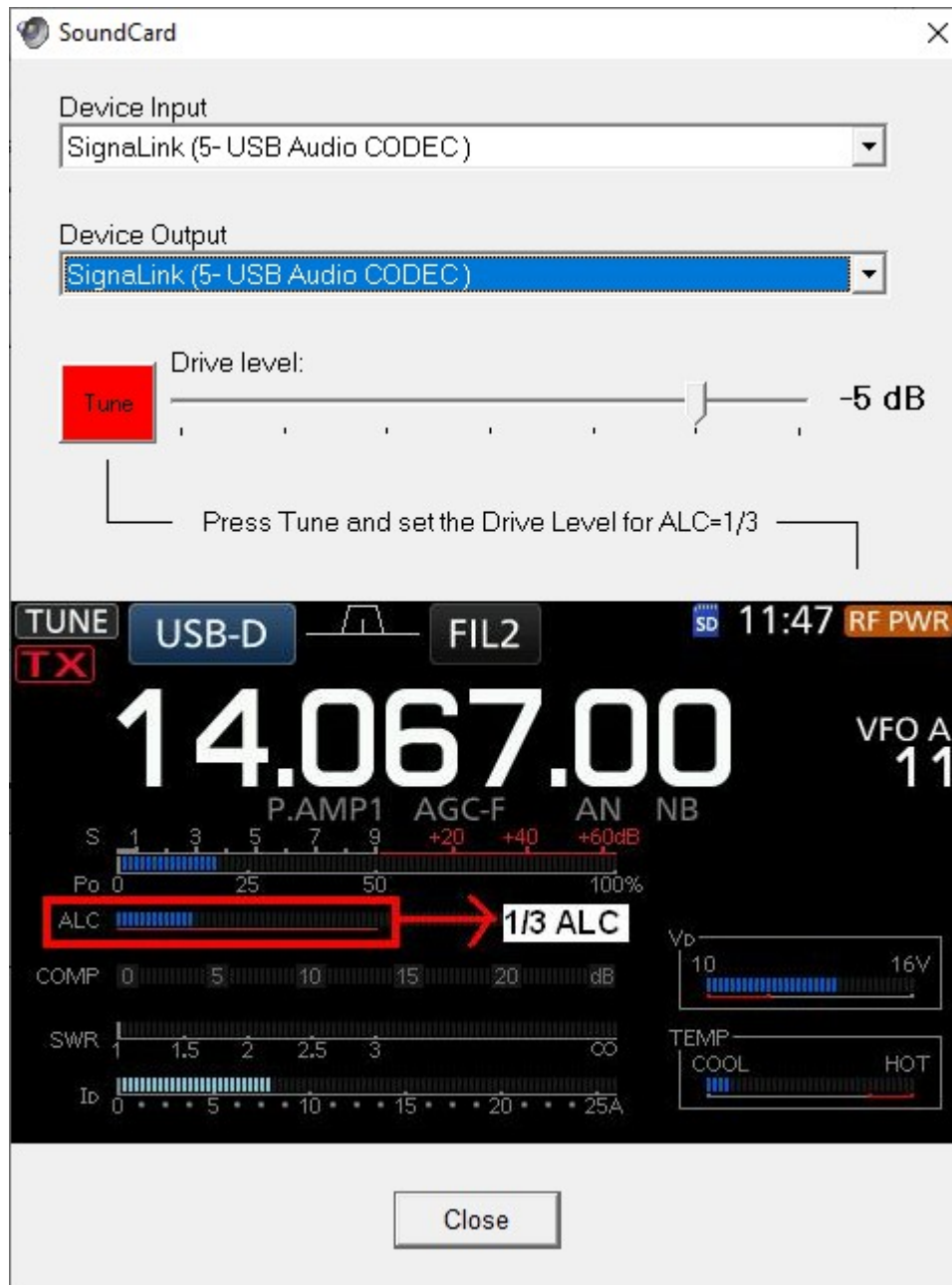
- developed by Jose Alberto Nieto Ros, EA5HVK
- download VARA HF software modem
<https://rosmodem.wordpress.com/>
- recommend buying registration key for full speed
<file:///C:/VARA/Buy.html>



select Settings menu list



enter your VARA registration code as needed
allow incoming 500 Hz connections



select Signalink audio device

computer radio control

- used by Winlink HF to set frequency, mode and PTT
- serial device seen by Windows on a COM port
 - COM port speed is obtained from a radio menu setting
- serial device is specific to Icom, Kenwood and Yaesu
 - generally same for different models from same manufacturer
 - external serial external or internal interface
- manual – good way to get started
 - mode is upper side band (USB) on all bands
 - dial frequency = center frequency - 1.5 kHz

- Icom – Communications Interface V (CI-V)
 - binary half-duplex request-response protocol
 - connect to CI-V 3.5 mm jack
 - CT-17 level converter from RS-232C serial to digital logic serial
 - each radio model has a unique CI-V addresses
 - obtained from a radio menu setting
- Kenwood – Computer Control Commands
 - **ASCII** half-duplex request-response protocol
 - connect to RS-232C DE-9 male 9-pin connector
 - FlexRadio uses Kenwood TS-2000 computer control commands

- Yaesu – Computer Aided Transceiver (CAT) System
 - binary half-duplex request-response protocol
 - connect to RS-232C DE-9 male 9-pin connector
 - or connect to 8-pin mini-DIN connector
 - CT-62 level converter from RS-232C serial to digital logic serial

Winlink system

- provides global email on VHF and HF remote gateways over ham radio
 - Live System Information with maps and station lists
<https://www.winlink.org/RMSChannels>
- supports direct station-to-station peer-to-peer message exchange
- used for emergency communication drills by local ham radio volunteers

setting up Winlink

- download Winlink Express client

<https://www.winlink.org/>

- set up Winlink user account with your callsign

<https://winlink.org/user>

- voluntary Winlink registration – turns off reminder

<https://arsfi.org/express.aspx>

Winlink Express 1.7.2.0 - W2LNX

W2LNX Settings Message Attachments Move To: Saved Items Delete Open Session: Vara HF Winlink Logs Help

No active session.

System Folders	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
Inbox (0 unread)	2022/10/15 21:20	95710W2ENMMN	3856	WB3KAS	WB3KAS	W2LNX	FW: 214- 4th Quarter 2022 MDC Section Hospital Drill - Milf
Read Items (741)	2022/10/15 21:15	4DV16SROJXC4	15128	WB3KAS	WB3KAS	W2LNX	Fw: Laurel Hospital ICS214
Outbox (0)	2022/10/12 14:35	MGI975NEDA3A	3121	WB2U	WB2U	WP4QZH	Winlink Check in Net - WB2U - Home Gaithersburg MD
Sent Items (468)	2022/10/12 14:28	IUKPWBBZHCQD	2731	WB2U	WB2U	WP4QZH	Winlink Wednesday Puerto Rico Info Form - Winlink Wedne
Saved Items (0)	2022/10/12 14:07	PPLRB09AT1XR	331	WB2U	WB2U	KN4LQN	Winlink Wednesday Check-In
Deleted Items (8)	2022/10/12 13:06	7BM7QDUKS3H2	3238	N3XL	MDCWINLINK	AA3WS...	MDC Section Winlink Check-in Report - October 2022
Drafts (0)	2022/10/11 13:10	UX1AV80G278X	3955	KN4LQN	KN4LQN	SMTP:kn4lqn@a...	Winlink Wednesday Reminder (#318)
Personal Folders	2022/10/11 12:45	S0E5XOSJXGT6	2287	WB2U	WB2U	MDCWINLINK	Winlink Check in Net - WB2U - ASBURY METHODIST VIL
Global Folders	2022/10/10 20:27	GYTQDMGG9N...	1384	N3XL	N3XL	AA3WS...	Reminder: MDC Section Winlink Check-in Exercise, Tuesd
Contacts	2022/10/10 17:51	S55DWQPI45PZ	101353	SMTP	SMTP:david.bem...	W2LNX	Fwd: testing TM-V71A
AC3JM	2022/10/08 20:56	QGRWTTZHSD...	211	K3JSJ	K3JSJ	W2LNX	Greetings
AC3N	2022/10/07 20:01	DHWTUY79HB...	2182	SMTP	SMTP:david.bem...	W2LNX	demonstrating IC-706MkIIIG to Tom, W3TDH
AC3N@ARRL.NET	2022/10/07 12:23	W3XT90AZCNHD	454	SMTP	SMTP:awprotigal...	W2LNX	Re: fourth Quarter 2022 MDC Section Hospital Drill
AC8ZU	2022/10/07 11:20	9YIKKX7HJSGA	430	SMTP	SMTP:mforrence...	W2LNX	Re: fourth Quarter 2022 MDC Section Hospital Drill
AD3F	2022/10/07 05:47	T9ZXQ2VP133K	441	SMTP	SMTP:r davidson...	W2LNX	Re: fourth Quarter 2022 MDC Section Hospital Drill
ALEKSANDRA.ROHDE@GMAIL.COM	2022/10/07 02:20	CJECY59LJWKP	450	SMTP	SMTP:ersmar@v...	W2LNX	Re: fourth Quarter 2022 MDC Section Hospital Drill
AWPROTIGAL@GMAIL.COM	2022/10/07 02:12	3XXB5B3R3Y83	322	KB3EOF	KB3EOF	W2LNX	fourth Quarter 2022 MDC Section Hospital Drill

Message ID: 95710W2ENMMN
 Date: 2022/10/15 21:20
 From: WB3KAS
 To: W2LNX
 Source: WB3KAS
 Downloaded-from: Telnet:cms.winlink.org
 Location: 38.72917N, 76.87500W
 Subject: FW: 214- 4th Quarter 2022 MDC Section Hospital Drill - Milford-10/06/2022 - 10/0

Hi; it's me again.

Take a look at both attachments. Both have the same ver, Ver 17, but they print different on my HP printer. The one from the first message cannot print wholly on one page, while Milford's does.

Any clue why this is. I notice in Block 7 is a line about spread sheet. Would this be the reason we get a long or short page?

Thanks for the time

click on Settings

select Winlink Express Setup... and then Preferences...

Winlink Express Properties [X]

Call Signs

My Callsign: My Password:
 (Case sensitive)

Callsign suffix (optional): (Used for country code)

Password recovery e-mail:
 (Non-Winlink e-mail address where lost password will be sent when requested)

Auxiliary Callsigns and Tactical Addresses

My Grid Square:

Winlink Express registration key:

Service Codes

(Use PUBLIC for ham call signs. Separate multiple service codes by spaces.)
 If you change service codes, you must update the list of channels.

Contact Information (Optional)

Name:
 Street address 1:
 Street address 2:
 City:
 State/Province:
 Country:
 Postal code:
 Web Site URL (optional):
 Phone number:
 Non-Winlink e-mail:

Additional information (optional):

Recalculate HF path quality if SFI changes more than:

Keep logs for weeks. Keep deleted messages for days.

Display list of pending incoming messages prior to download
 Warn about connections to stations holding messages
 Allow diagnostic information to be sent to the Winlink Development Team
 Automatically install field-test (beta) versions of Winlink Express

enter your password, registration key and location

Preferences

Message Reading Options

Viewing seconds before marking message read:

Automatically move read items to Read Items folder

Message review before downloading

Display list of pending incoming messages prior to download

Message acknowledgement options

Default to requesting message receipts

Automatically send message receipts when requested

Automatically send message receipts for all messages

Ignore message receipt requests on incoming messages

Message sending options

Automatically add contact entry for each destination address

Disallow editing or altering messages you send

Line wrapping

Wrap print lines after this many characters:

Distance Units

km Miles

Update Cancel

add contacts automatically

Winlink Express 1.7.1.0 - W2LNX

W2LNX Settings Message Attachments Move To: Saved Items Delete Open Session: Vara HF Winlink Logs Help

No active session.

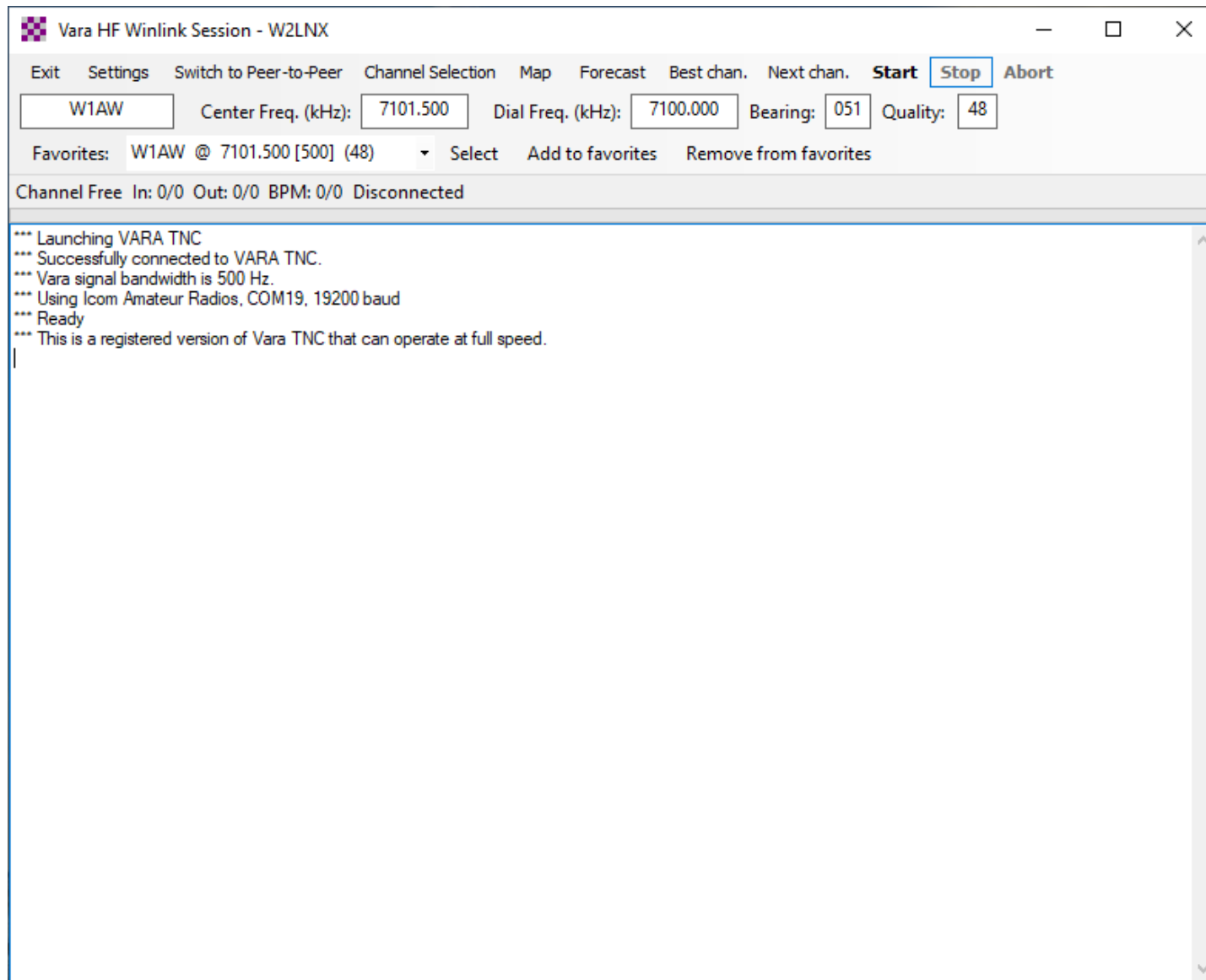
System Folders	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
Inbox (46 unread)	2022/10/02 21:19	5SPD03S7KSPQ	12202	W2LNX	W2LNX	w2lnx@arrl.net	testing IC-706MkIIIG on 2 m via WM3M-10 using 5 watts
Read Items (329)	2022/10/02 15:16	KB5A4R55B9CL	933	W2LNX	W2LNX	wb2u@arrl.net	Re:testing IC-706MkIIIG on 6 m via WB2U using 50 watts
Outbox (0)	2022/10/02 15:10	JZN8CNMILEQR	10207	W2LNX	W2LNX	wb2u@arrl.net	testing IC-706MkIIIG on 6 m via WB2U using 50 watts
Sent Items (430)	2022/10/02 14:53	0MVRJ6BK4OH0	352	W2LNX	W2LNX	wb2u@arrl.net	testing IC-706MkIIIG on 6 m via WB2U using 100 watts
Saved Items (2)	2022/10/02 14:36	QG1DGWX4M0N9	10200	W2LNX	W2LNX	kn3u@arrl.net	FW: testing IC-706MkIIIG on 6 m via WB2U using 100 watts
Deleted Items (1)	2022/10/02 14:28	TJUUIOIOXKR4	1245	W2LNX	W2LNX	wb2u@arrl.net	Re:Fwd: testing IC-706MkIIIG on 6 m via WB2U
Deleted Items (1)	2022/10/02 14:17	EW1ZKTRPU0GA	918	W2LNX	W2LNX	WB2U	Re:testing IC-706MkIIIG on 6 m via WB2U
Drafts (2)	2022/10/02 14:11	NL6JB31NZWN4	10186	W2LNX	W2LNX	WB2U	testing IC-706MkIIIG on 6 m via WB2U
Personal Folders	2022/10/02 12:15	7DEOU4B8CLK6	12172	W2LNX	W2LNX	w2lnx@arrl.net	testing IC-70MkIIIG via W1AW on 40 m
Global Folders	2022/10/02 12:12	CUAU2CS0UA38	2155	W2LNX	W2LNX	w2lnx@arrl.net	testing IC-70MkIIIG via W1AW on 40 m
Contacts	2022/10/02 10:45	JP12J5DPOD4N	2229	W2LNX	W2LNX	w3tdh@arrl.net	testing IC-70MkIIIG via W1AW on 80 m
AC3JM	2022/10/01 18:23	YNXG29T9YD2U	2175	W2LNX	W2LNX	w2lnx@arrl.net	testing packet over WM3M-10 using IC-706MkIIIG
AC3N	2022/09/30 23:44	LLRHHQ47HMSY	1021	W2LNX	W2LNX	w3tdh@arrl.net	Re: testing IC-706MkIIIG via WM3M-10
AC3N@ARRL.NET	2022/09/30 23:27	JIZY36A9H1IV	20683	W2LNX	W2LNX	w2lnx@arrl.net	testing IC-706MkIIIG via WM3M-10
AC8ZU	2022/09/28 15:03	ROZ6Z4BMFCYO	2163	W2LNX	W2LNX	W3TDDH	demonstrating the FT-2000D to you
AD3F	2022/09/27 17:00	KFDN50102E2D	12171	W2LNX	W2LNX	w2lnx@arrl.net	testing settings for FT-2000D
ETO-03	2022/09/27 16:56	67WZV30L636S	2141	W2LNX	W2LNX	w2lnx@arrl.net	testing settings for FT-2000D

Message ID: 5SPD03S7KSPQ
 Date: 2022/10/02 21:19
 From: W2LNX
 To: w2lnx@arrl.net
 Source: W2LNX
 Subject: testing IC-706MkIIIG on 2 m via WM3M-10 using 5 watts

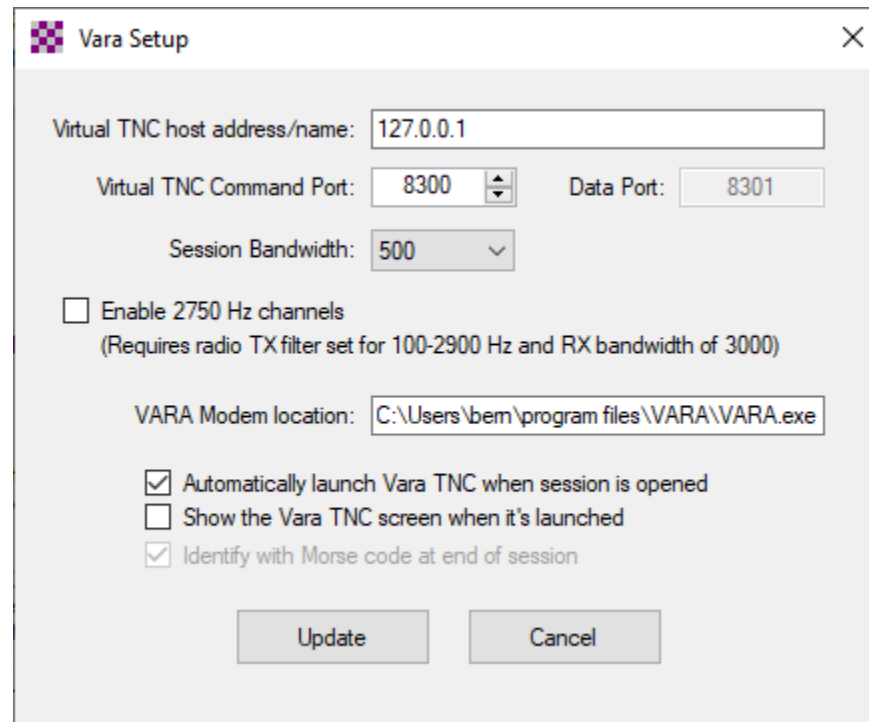
testing IC-706MkIIIG on 2 m via WM3M-10 using 5 watts

open VARA HF session

- **Open Session:** is a button to click on after selecting session type



click on Settings menu
select Vará TNC Setup



enter path name of VARA HF program as needed
set transmission bandwidth to **500 Hz**

- 500 Hz is recommended on HF bands to be a good neighbor
 - less likely to be interfered by a transmission you do not hear
- 2300 Hz can be used on uncrowded bands
- 2750 Hz is not permitted under Part 97 rules

example: setting up an Icom IC-706MkIIIG using a Signalink USB

IC-706MkIIIG:

mode: upper side-band (USB)

power: 100 watts

RF/SQL: adjust to reduce background noise

Signalink USB:

TX: 12 o'clock

RX: 12 o'clock

DLY: minimum

JP3: on

header module: SLMOD6PM

cable: SLCAB6PM

frequency control cable:

Valley Enterprises CT-17 USB FTDI CI-V Cat Control Cable

or

RT Systems USB-RTS01 Programming Cable

Winlink Express 1.7.1.0 - W2LNX

W2LNX Settings Message Attachments Move To: Saved Items Delete Open Session: Vara HF Winlink Logs Help

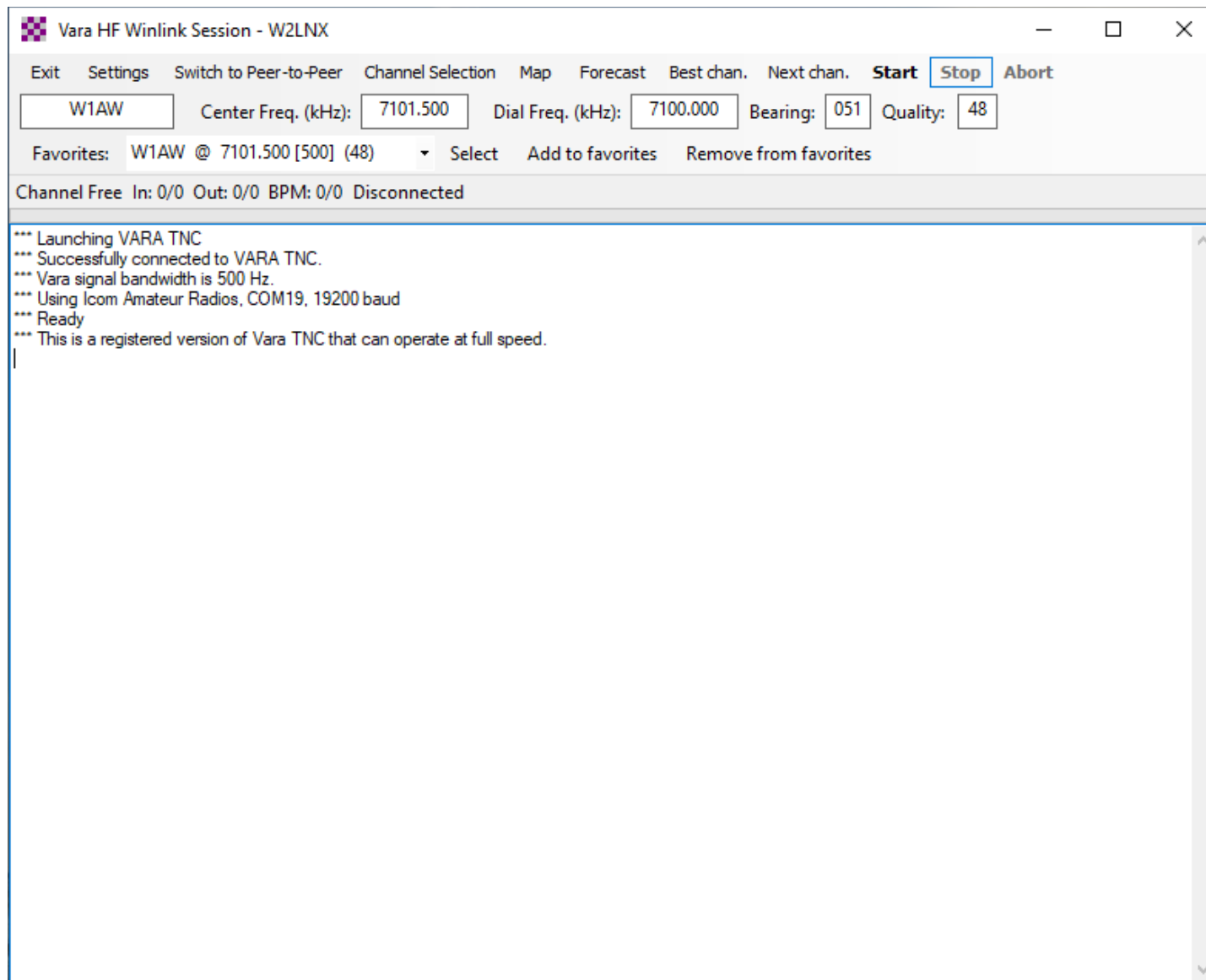
No active session.

System Folders	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
Inbox (46 unread)	2022/10/02 21:19	5SPD03S7KSPQ	12202	W2LNX	W2LNX	w2lnx@arrl.net	testing IC-706MkIIG on 2 m via WM3M-10 using 5 watts
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Outbox (0)	2022/10/02 15:10	JZN8CNMILEQR	10207	W2LNX	W2LNX	wb2u@arrl.net	testing IC-706MkIIG on 6 m via WB2U using 50 watts
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Saved Items (2)	2022/10/02 14:36	QG1DGVX4M0N9	10200	W2LNX	W2LNX	kn3u@arrl.net	FW: testing IC-706MkIIG on 6 m via WB2U using 100 watts
Deleted Items (1)	2022/10/02 14:28	TJUUIOIOXKR4	1245	W2LNX	W2LNX	wb2u@arrl.net	Re:Fwd: testing IC-706MkIIG on 6 m via WB2U
Drafts (2)	2022/10/02 14:17	EW1ZKTRPU0GA	918	W2LNX	W2LNX	WB2U	Re:testing IC-706MkIIG on 6 m via WB2U
Personal Folders	2022/10/02 14:11	NL6JB31NZWN4	10186	W2LNX	W2LNX	WB2U	testing IC-706MkIIG on 6 m via WB2U
Global Folders	2022/10/02 12:15	7DEOU4B8CLK6	12172	W2LNX	W2LNX	w2lnx@arrl.net	testing IC-70MkIIG via W1AW on 40 m
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AC3JM	2022/10/02 10:45	JP12J5DPOD4N	2229	W2LNX	W2LNX	w3tdh@arrl.net	testing IC-70MkIIG via W1AW on 80 m
AC3N	2022/10/01 18:23	YNXG29T9YD2U	2175	W2LNX	W2LNX	w2lnx@arrl.net	testing packet over WM3M-10 using IC-706MkIIG
AC3N@ARRL.NET	2022/09/30 23:44	LLRHQK47HMSY	1021	W2LNX	W2LNX	w3tdh@arrl.net	Re: testing IC-706MkIIG via WM3M-10
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JLTAFT@COMCAST.NET	2022/09/27 16:56	67WZW30L636S	2141	W2LNX	W2LNX	w2lnx@arrl.net	testing settings for FT-2000D

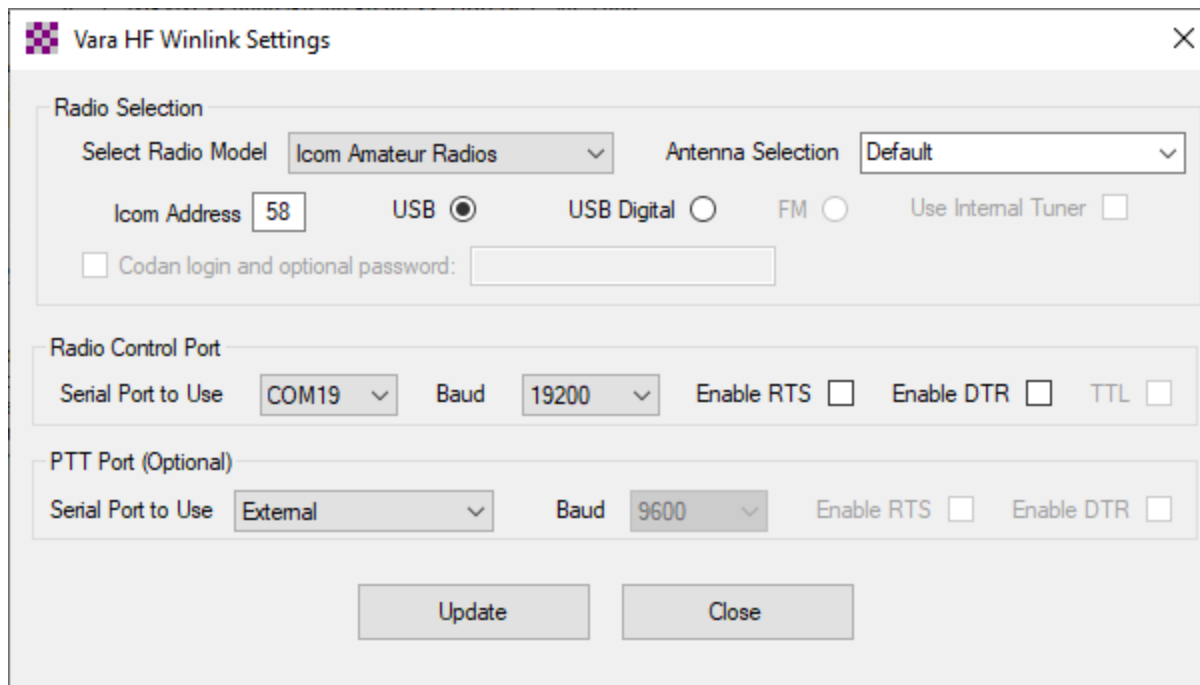
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testing IC-706MkIIG on 2 m via WM3M-10 using 5 watts

open VARA HF session

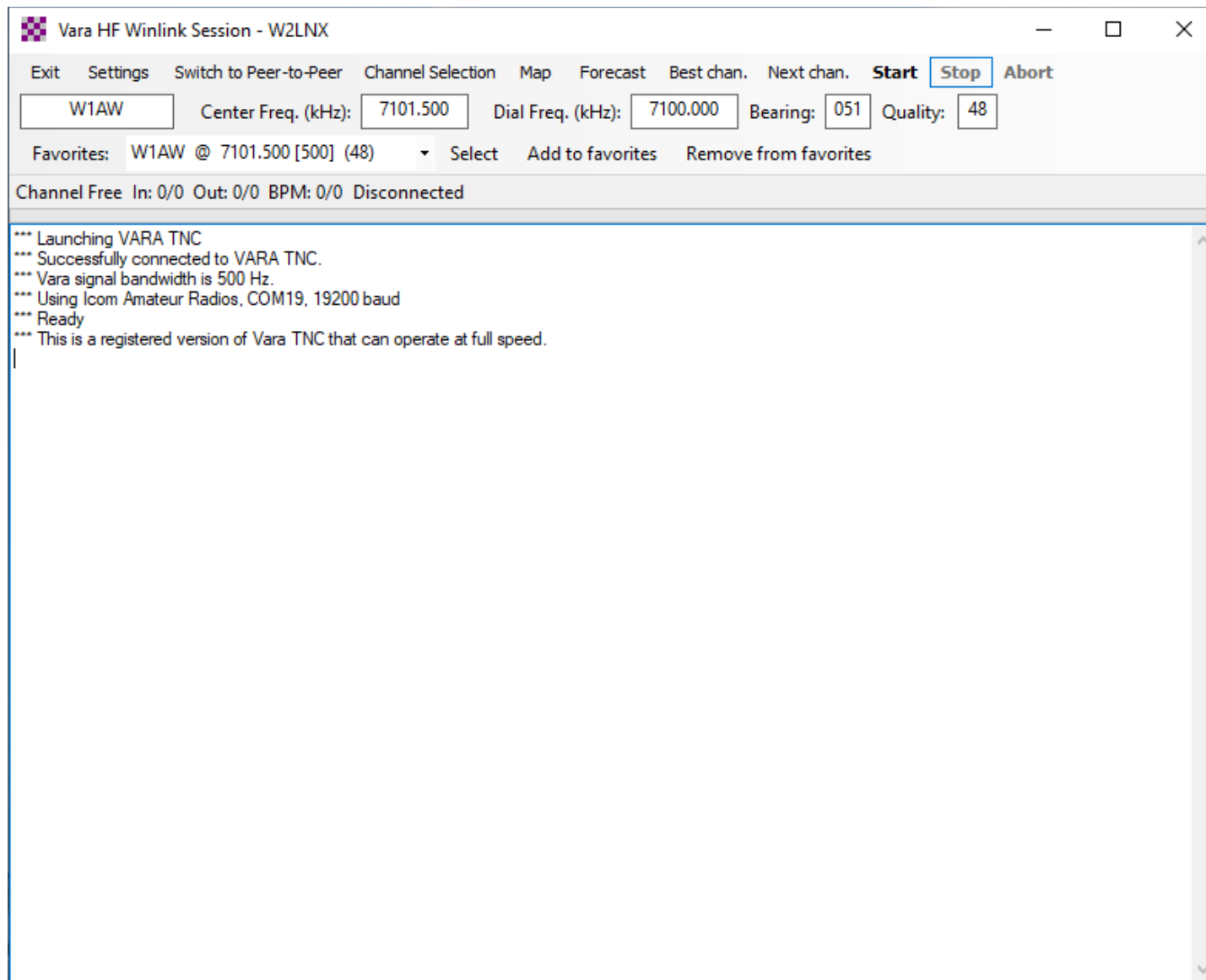


click on Settings menu
select Radio Setup



enter settings in VARA HF Winlink Settings

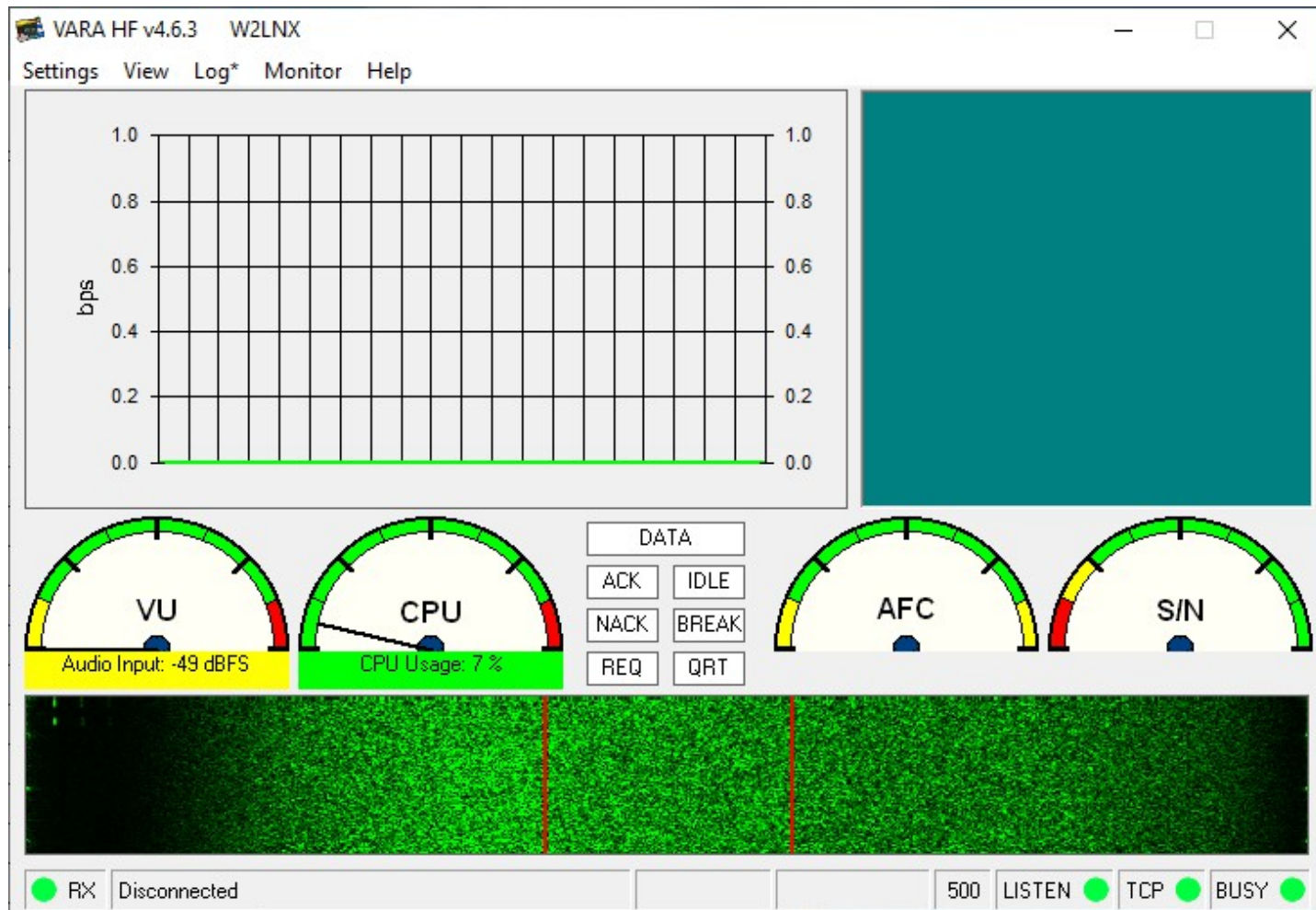
- CI-V address is used for Icom radios instead of model name
- PTT is performed by the Signalink



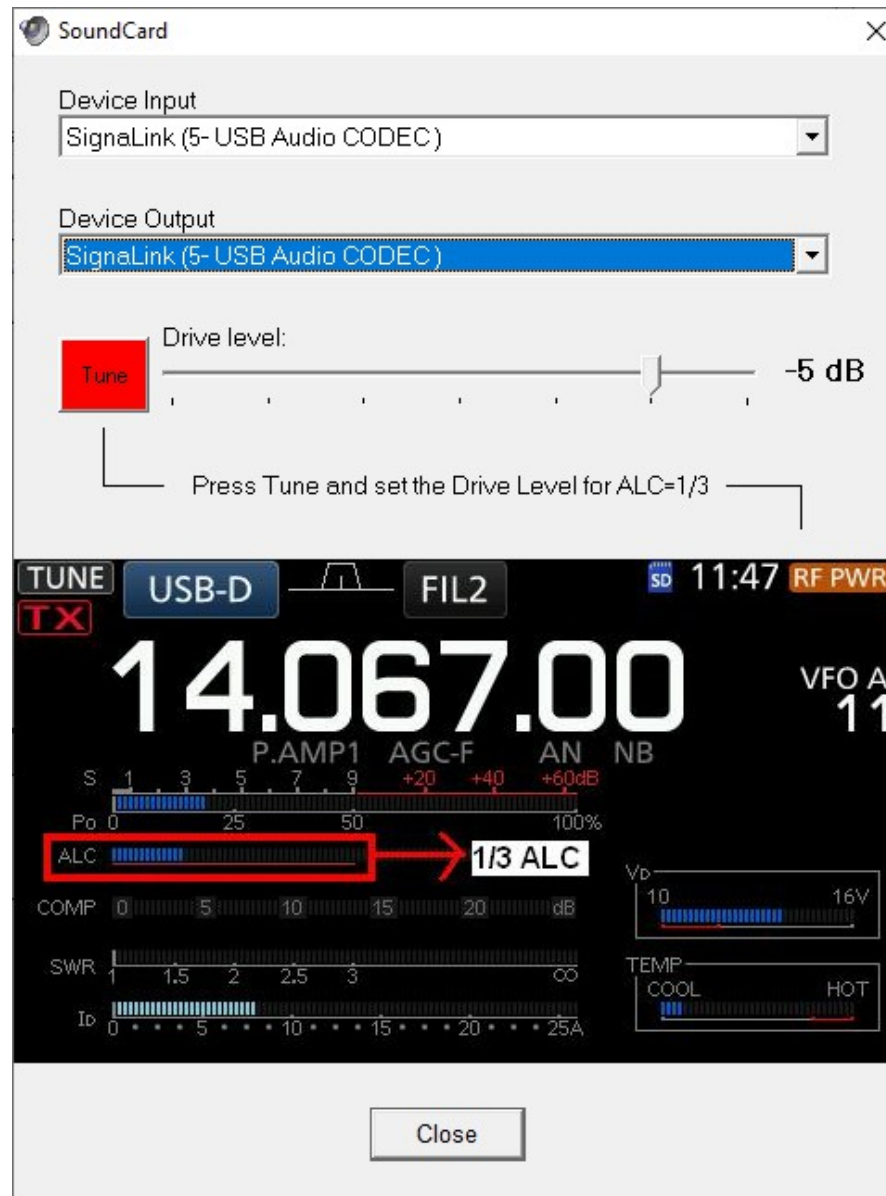
click on Channel Select

HF Channel Selector									
Exit Select Update Via Internet Update Via Radio Map Forecast SFI All RMS									
Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
N2LEE	3595.000	V2300	FM18HX	00-23	PUBLIC	16	198	99	99
N2LEE	3595.000	V2300	FM18HX	00-23	PUBLIC	16	198	99	99
WB3KAS	3590.000	V2300	FM18NR	00-23	PUBLIC	39	145	99	99
WA3MEZ	3587.500	V2300	FM19OJ	00-23	PUBLIC	30	061	99	99
N3HYM-10	3588.000	V2300	FM19FK	00-23	PUBLIC	22	322	99	99
WB3KAS	7090.000	V500	FM18NR	00-23	PUBLIC	39	145	96	96
N2LEE	7103.500	V2300	FM18HX	00-23	PUBLIC	16	198	96	96
N3HYM-10	7099.400	V2300	FM19FK	00-23	PUBLIC	22	322	96	96
N2LEE	7103.500	V2300	FM18HX	00-23	PUBLIC	16	198	96	96
WA3MEZ	7101.200	V2300	FM19OJ	00-23	PUBLIC	30	061	96	96
WA3MEZ	10147.800	V2300	FM19OJ	00-23	PUBLIC	30	061	94	94
WA3MEZ	14109.800	V2300	FM19OJ	00-23	PUBLIC	30	061	92	92
N3HYM-10	14097.900	V2300	FM19FK	00-23	PUBLIC	22	322	92	92
KB3PCY	7107.250	V500	FM29EV	00-23	PUBLIC	101	060	90	56
W2MMD	7101.500	V2300	FM29JR	00-23	PUBLIC	117	071	89	55
WA3MEZ	18108.300	V2300	FM19OJ	00-23	PUBLIC	30	061	89	89
NA3MD	7101.500	V2300	FM18QT	00-23	PUBLIC	44	126	89	55
N3HYM-10	18108.500	V2300	FM19FK	00-23	PUBLIC	22	322	89	89
W2GSA	7090.500	V500	FN20WG	00-23	PUBLIC	183	065	88	53
WA3MEZ	21091.500	V2300	FM19OJ	00-23	PUBLIC	30	061	87	87
AJ4FW	7103.600	V2300	FM07BC	00-23	PUBLIC	201	225	86	51
KD4JWF	7098.000	V500	FM06RH	00-23	PUBLIC	210	199	85	50
W1AW	7058.500	V500	FN31PR	00-23	PUBLIC	298	052	83	49
W1AW	7101.500	V2300	FN31PR	00-23	PUBLIC	298	052	83	49
N3HYM-10	28131.500	V2300	FM19FK	00-23	PUBLIC	22	322	82	82
WA3MEZ	28145.500	V2300	FM19OJ	00-23	PUBLIC	30	061	82	82
VE3HJL	7108.000	V2300	FN03IR	10-22	PUBLIC	330	342	80	48
KF1D	7101.300	V2300	FN42FA	00-23	PUBLIC	359	055	79	47
VA3MCT	7087.000	V2300	FN03HU	00-23	PUBLIC	339	342	79	48
KF1D	10148.000	V2300	FN42FA	00-23	PUBLIC	359	055	78	50
VE3KPG	7091.000	V2300	FN04VE	00-23	PUBLIC	349	352	78	47

click on Path Reliability Estimate to sort



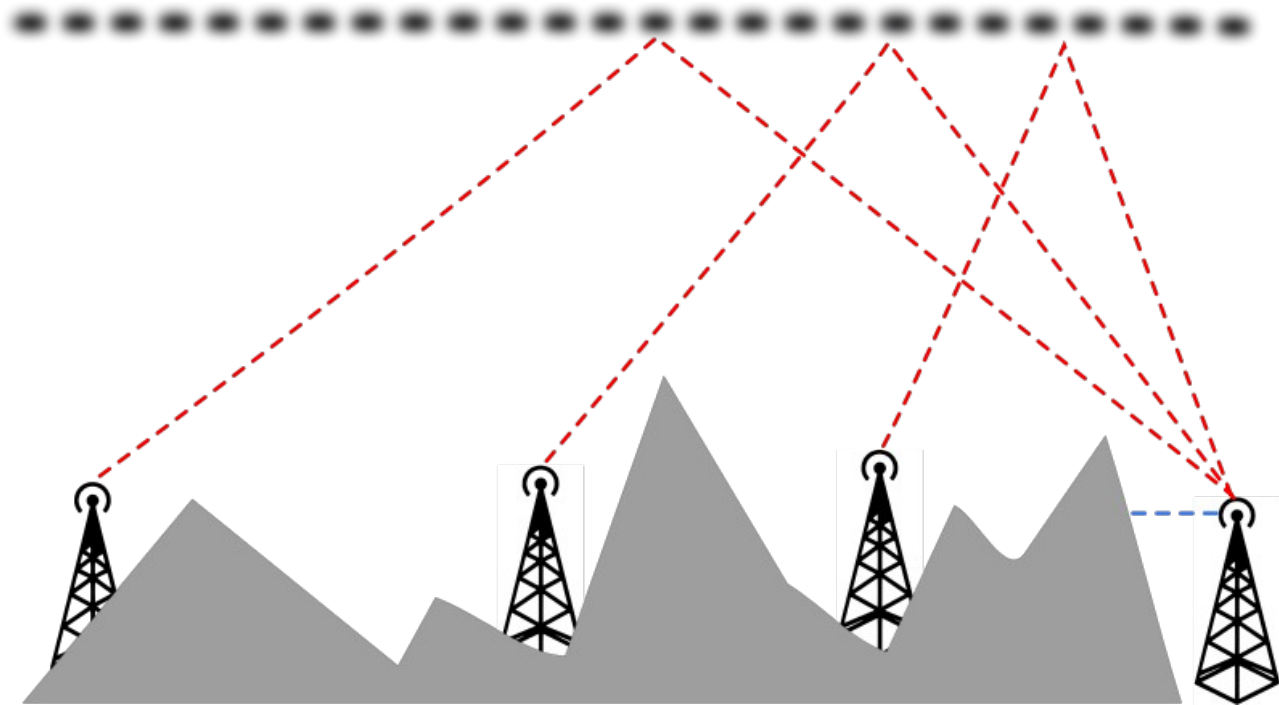
click on Settings menu list
select SoundCard...



set the audio drive level for little or **no** indication on ALC meter

- rule of thumb for older radios and current radios

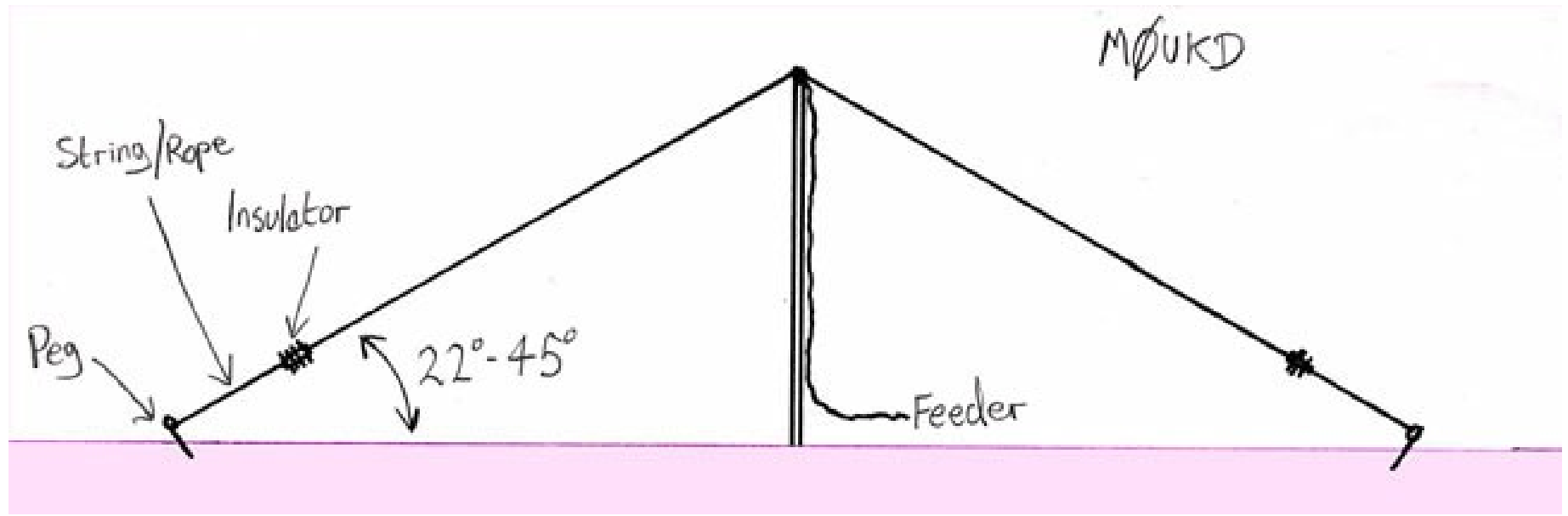
near vertical incidence skywave



credit: Gerolf Ziegenhain

- horizontal antenna quarter wavelength above ground or less
- used for local communications within 400 miles
- used on 80 m (night) and 40 m (day)
- [Real-Time Local NVIS & DX](#)

inverted vee antenna



credit : M0UKD

- modified horizontal dipole
 - compromise antenna easier to set up
- antenna calculators: [M0UKD](#) and [hamuniverse.com](#)

example: 40 m inverted vee antenna

- each leg is 32 feet of 16 gauge antenna wire
- 8 foot rope at each end
- slope is 45 degrees
- MFJ-1917 telescopic 34 foot mast: used 28 feet
- flagpole tire mount
- coax cable: 25 feet LMR-240 + 12 feet RG-8X
- Diamond BU-50 1:1 balun
- anchored by 10 pound weight at each end
- SWR: 1.7:1 at 7.1 MHz measured by graphical antenna analyzer
- can be deployed by one person



40 m inverted vee antenna



flagpole tire mount – driver mirror aimed down



coax cable secured to each mast segment



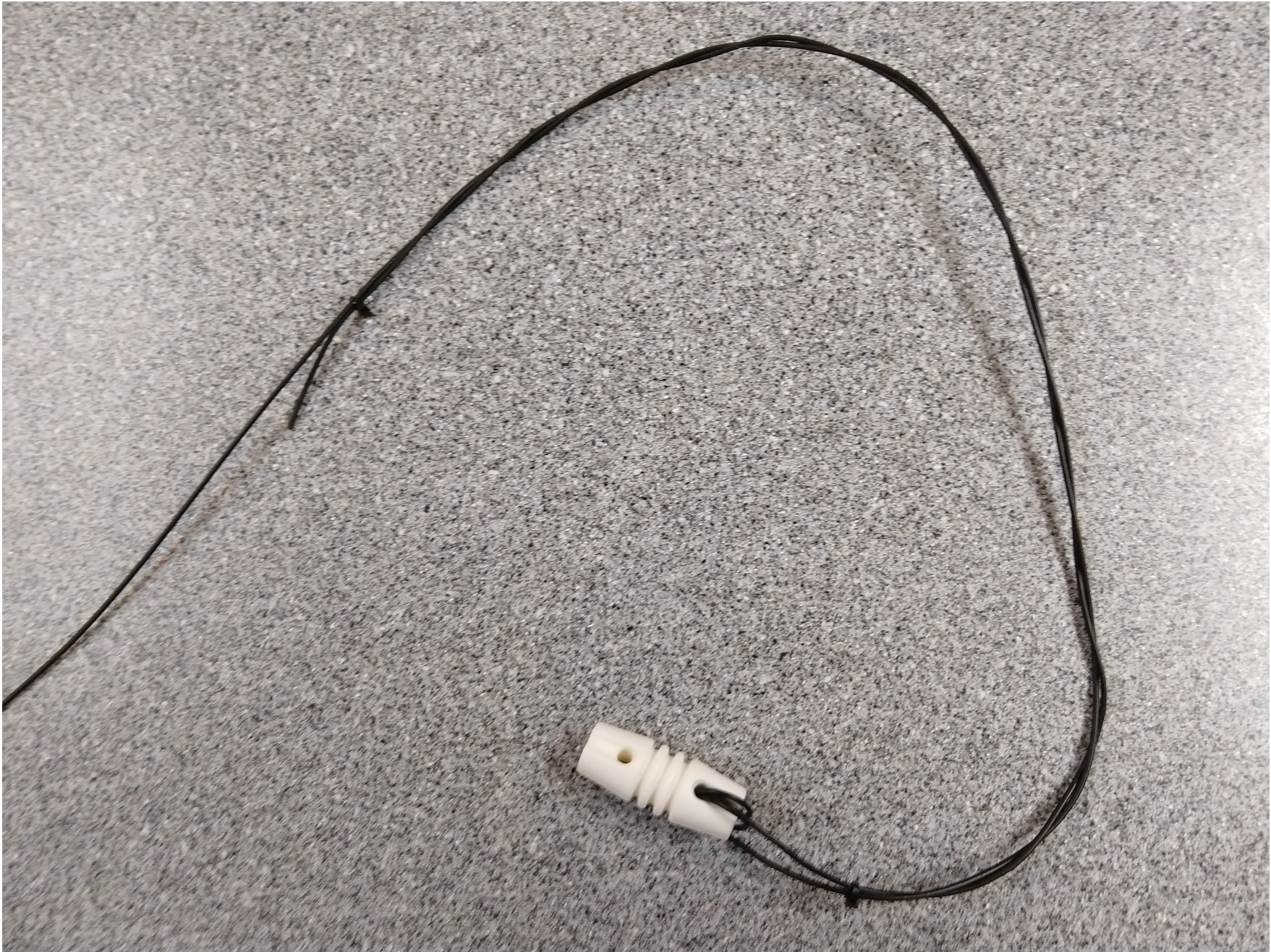
grippy gloves is needed to tighten and loosen mast segments



coax cable with mast ties



reusable 1:1 balun



adjustable antenna ends



gravity anchors at ends instead of stakes



antenna on bobbin



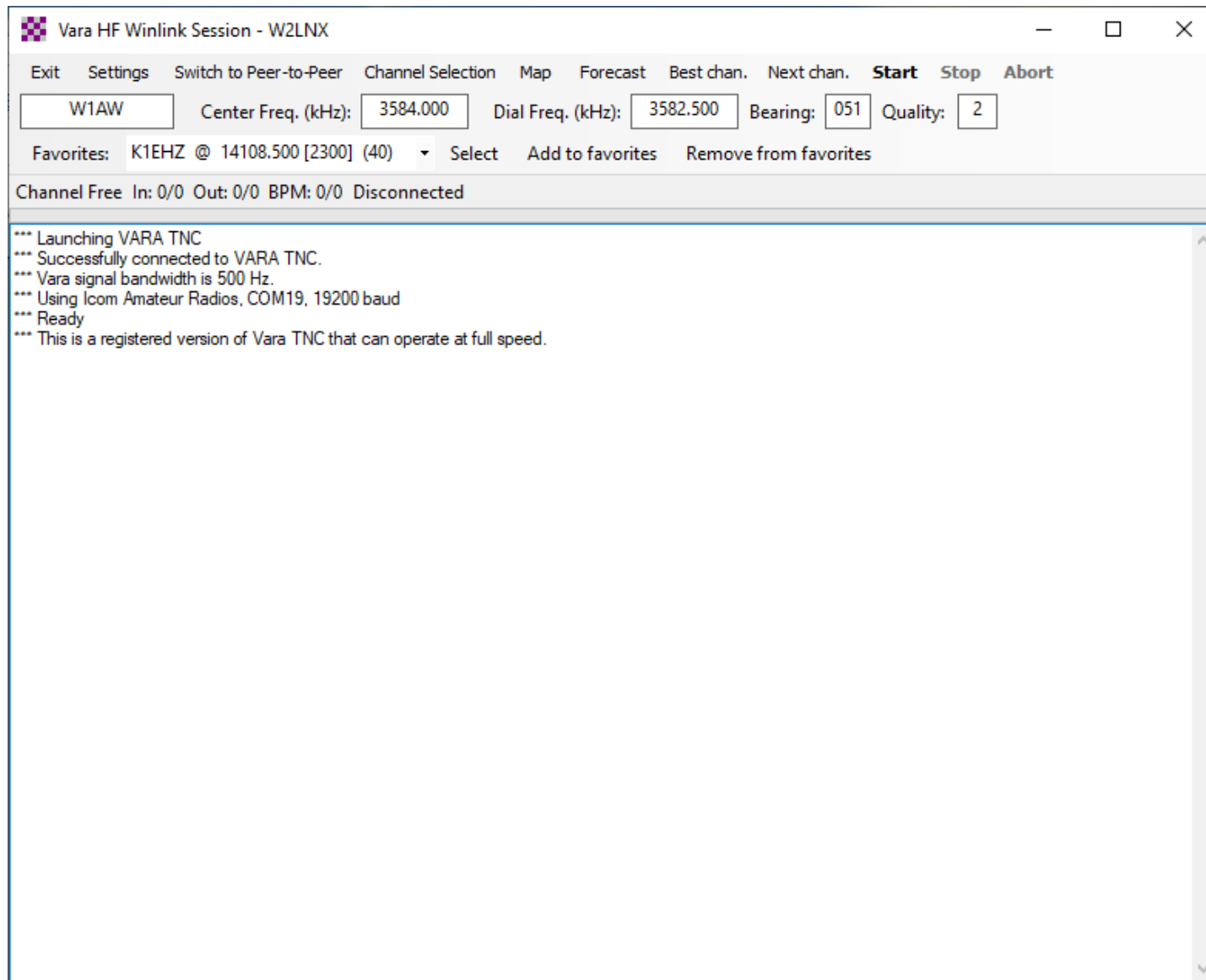
bobbin made from two shallow carry-out food containers



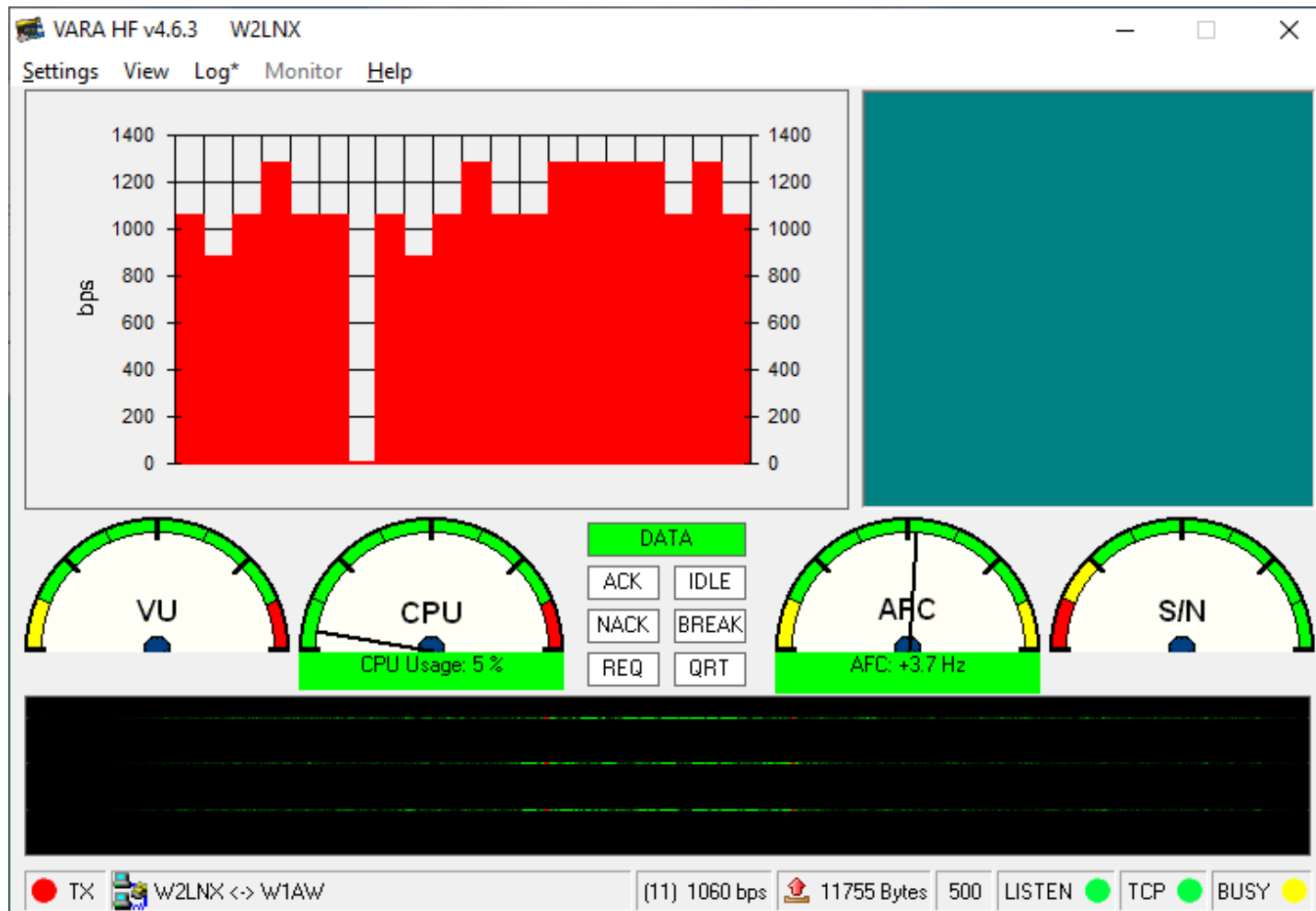
exchanging Winlink messages via WB3KAS and W1AW using 5 watts

demonstration

👉 video: send and receive messages via the WB3KAS Winlink gateway

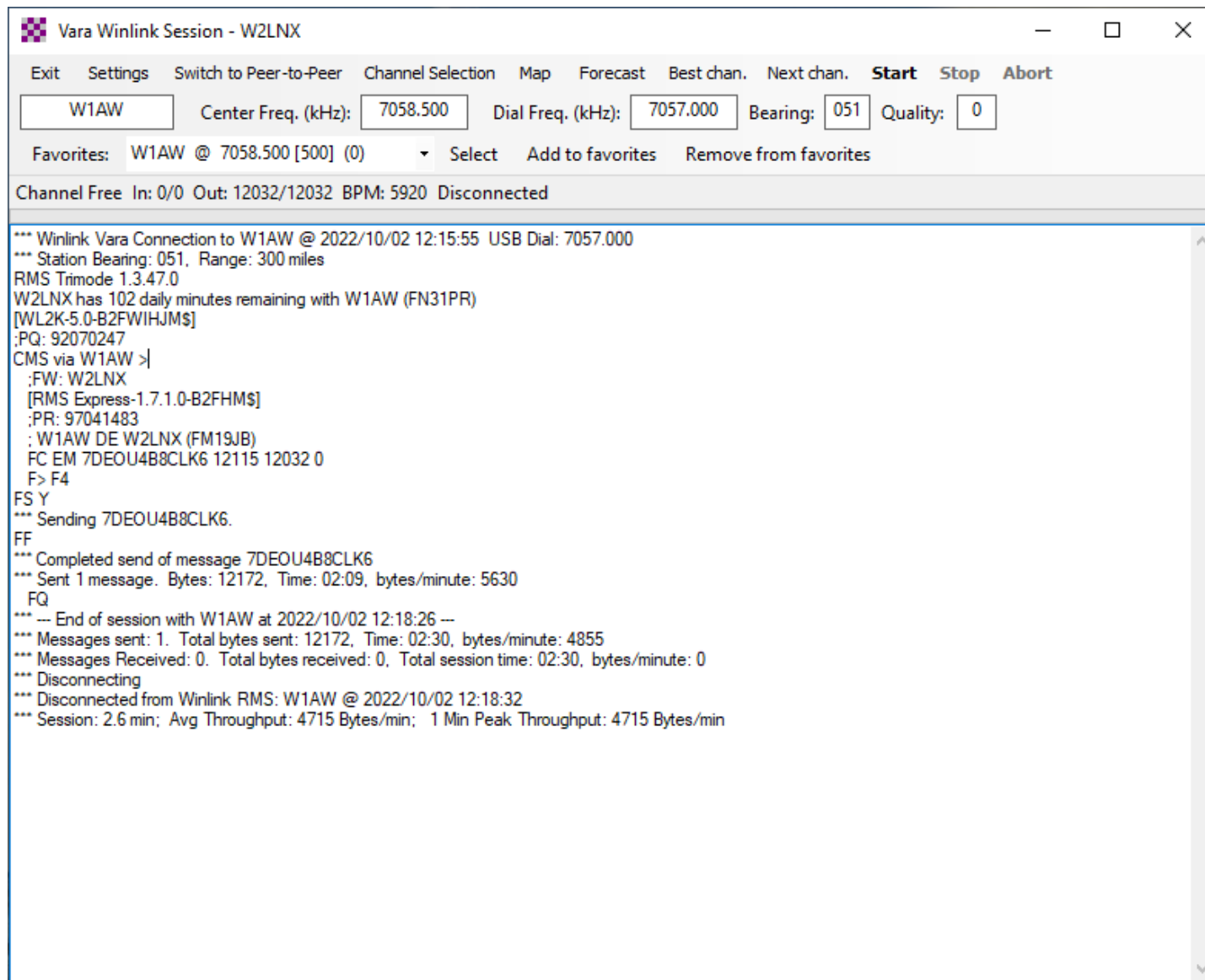


press Start to send message with file attachment

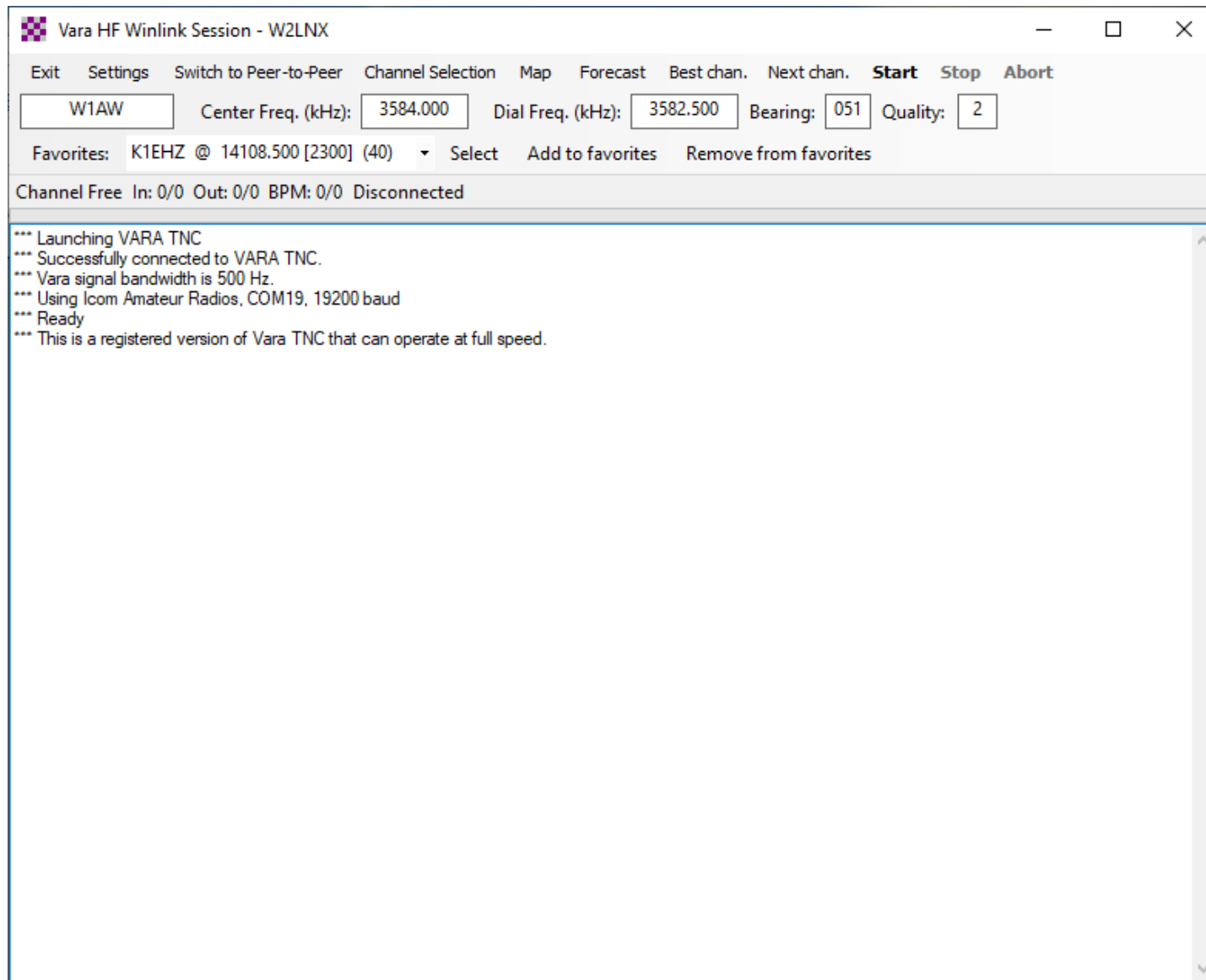


VARA HF displays transmission rate in red

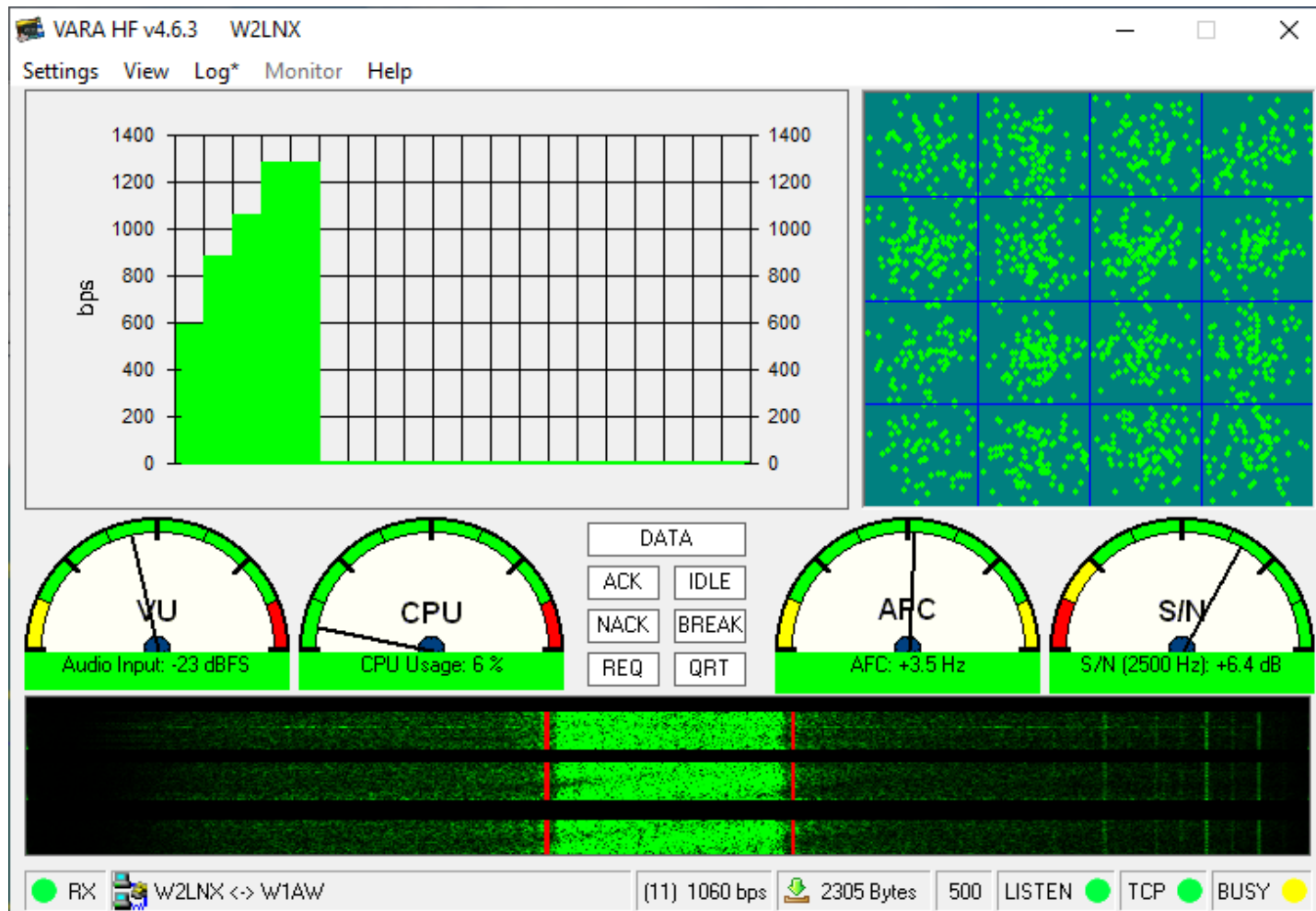
- the transmission rate is more than twice the bandwidth



log of finished transmission

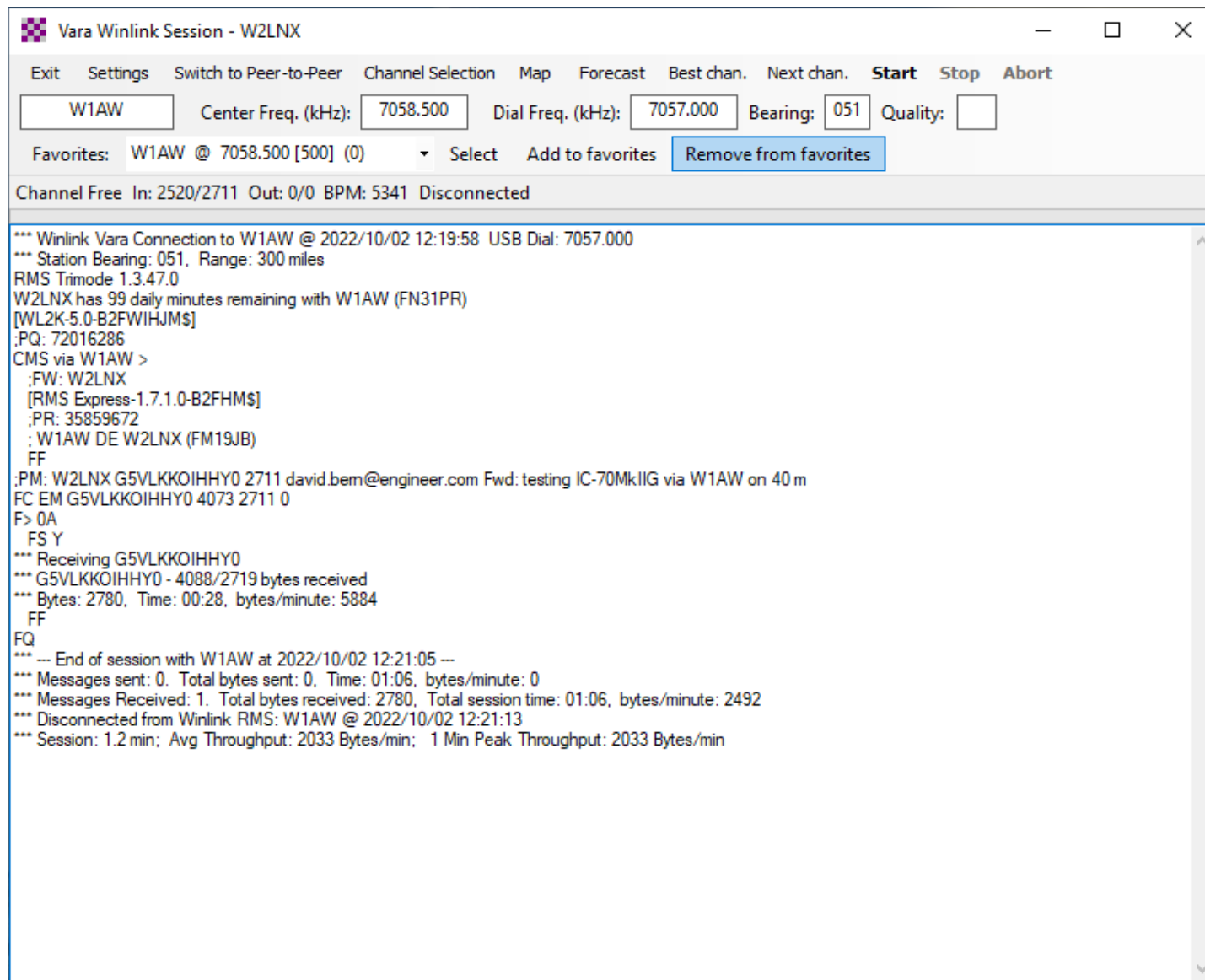


press Start to receive message with file attachment



VARA HF displays transmission rate in green

- the receiving rate is more than twice the bandwidth



log of finished transmission

Winlink practice

- connect to W1AW and WB3KAS on 80 m and 40 m
- find reliable HF Winlink gateways on 80 m and 40 m
- periodic practice exercises
 - [Winlink Wednesday](#)
 - [Winlink Wednesday PR](#) in Spanish and English
 - [EmComm-Training.org](#)
 - join [MCACS](#)
 - join [PG-ARES Listserv](#)

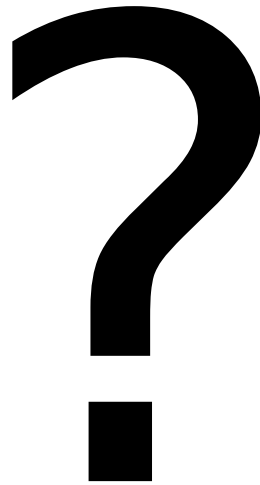
summary

- this presentation is to get you started on Winlink HF
- Windows settings for
 - audio device are essentially the same for external or built-in devices
 - always check settings for correct default audio device
 - naming radio audio device reduces confusion
 - computer radio control are essentially the same for
 - external serial cable or built-in
- easiest way to set up Winlink is to use
 - Signalink USB audio interface with built-in VOX PTT
 - manually setting radio frequency
- need to practice, practice and practice

thank you

- Al, KN3U – my EmComm Elmer
- Jim, WB3KAS – my other EmComm Elmer
- Vic, WB2U – for inspiring us to do Winlink testing

questions



W2LNX@ARRL.NET

ask for assistance!