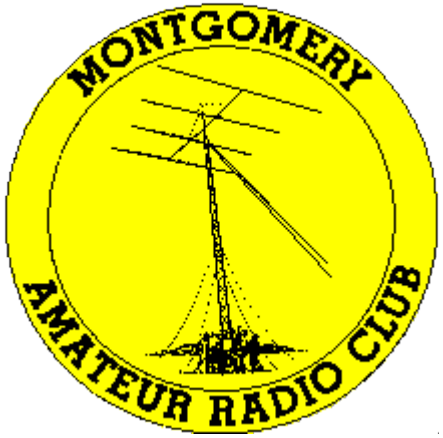


Montgomery Amateur Radio Club

Rockville, Maryland

Getting Started with Winlink on HF

David, W2LNX

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

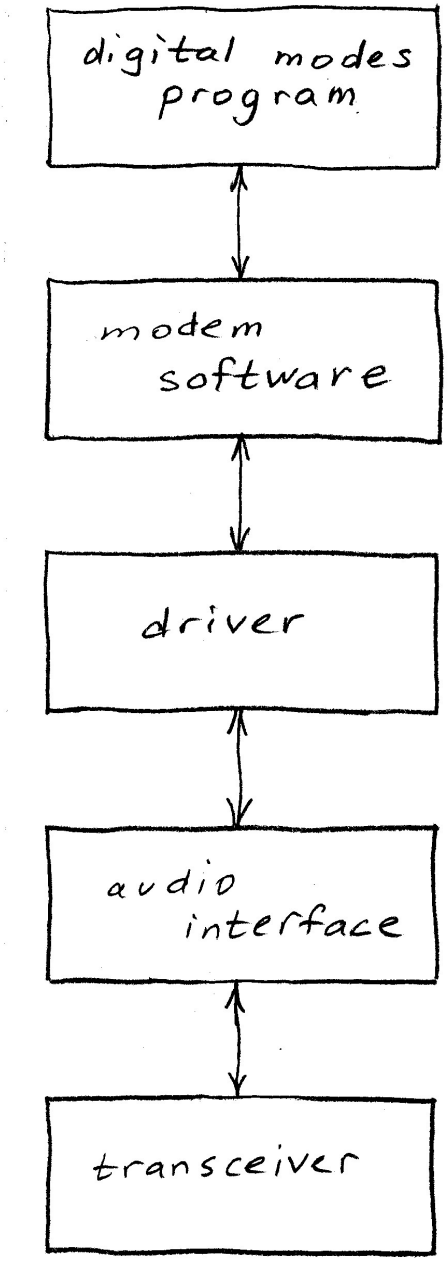
overview

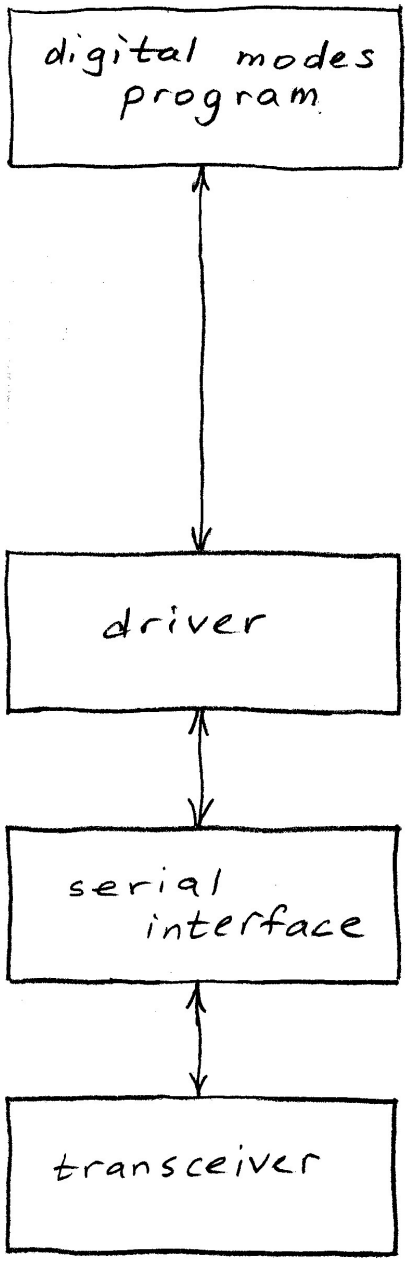
- setting up an audio device
    - example: up a SignaLink USB with built-in PTT
- setting up VARA HF software modem
- computer radio control device
- setting up Winlink Express
    - example: setting up an Icom IC-706MkIIG using SignaLink USB
- local HF communications
    - near vertical incidence skywave (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

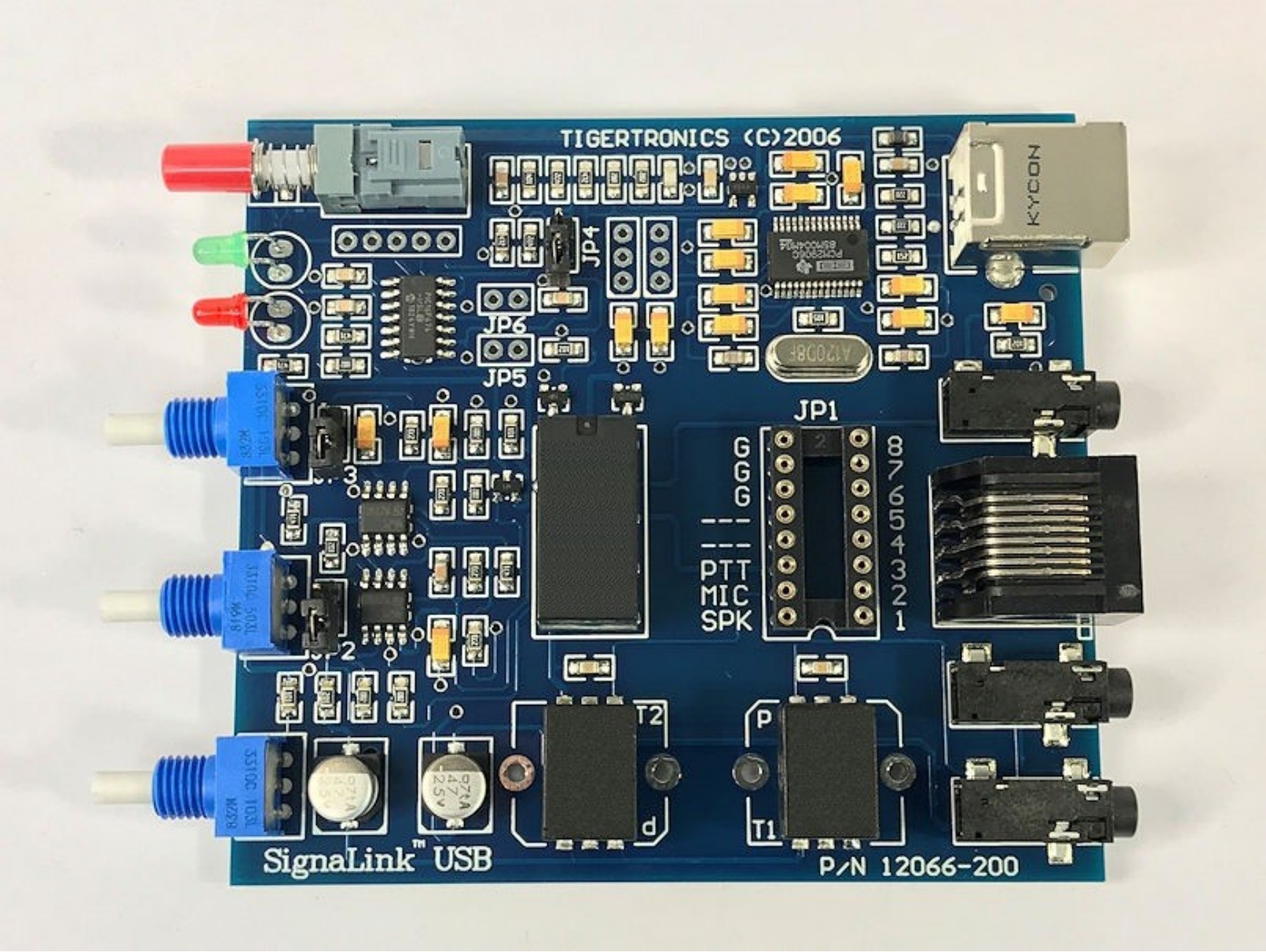
SignaLink™ USB Product Guide

header module: corresponding jumper wires or header

SignaLink Jumper Settings & Wiring Information

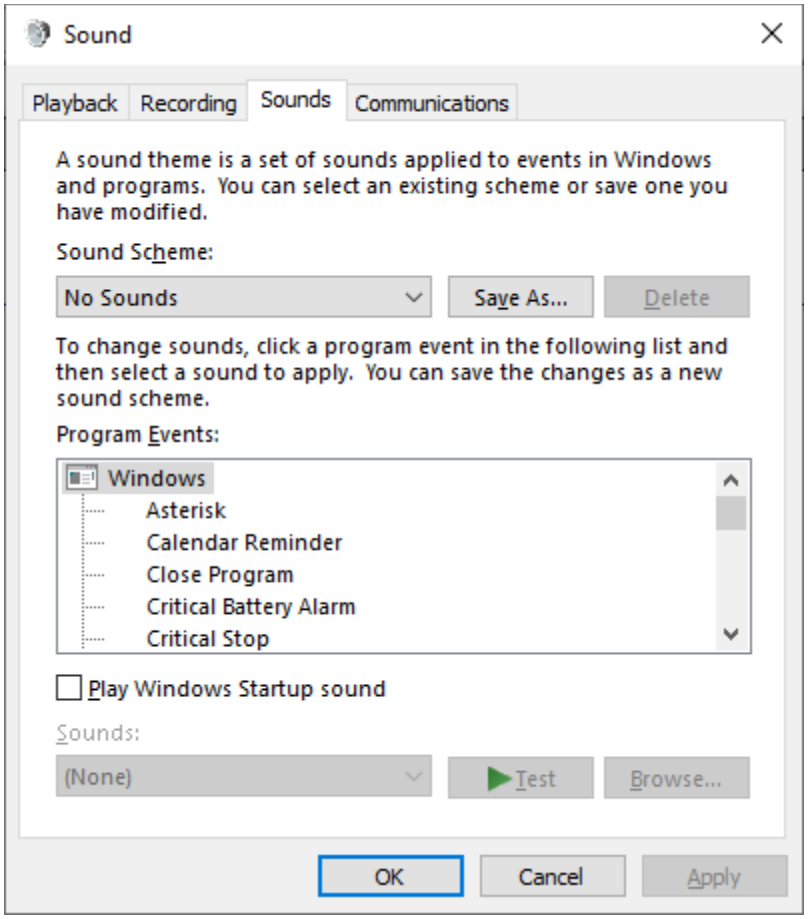
- these SignaLink settings are generally the same for most HF radios

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



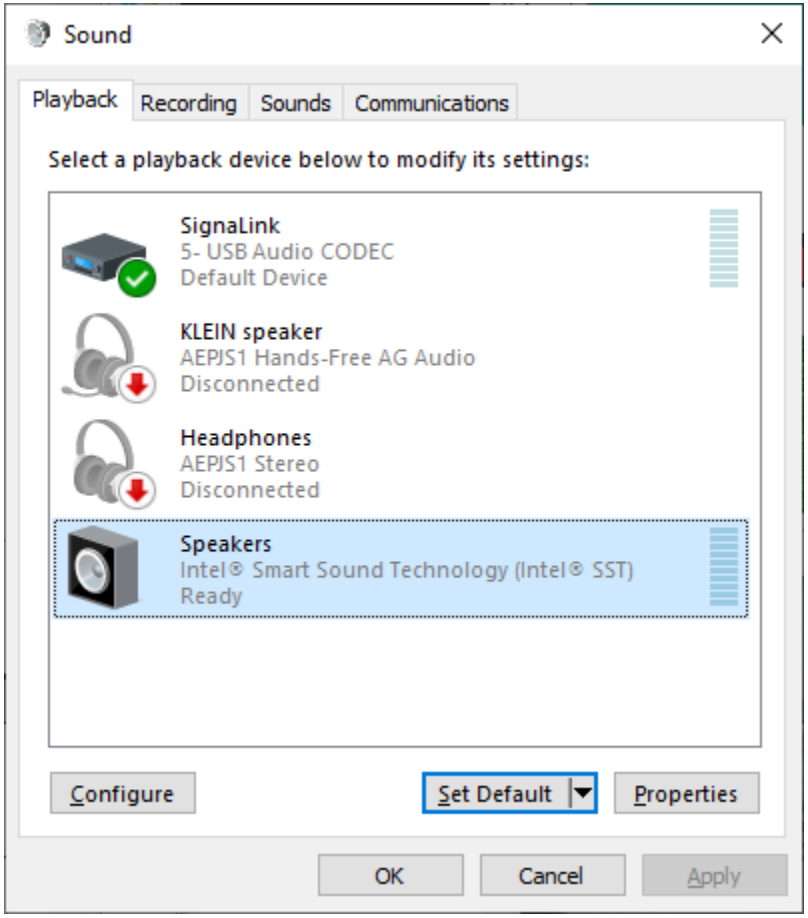
built with two black BOURNS audio isolation transformers

setting up Windows SignaLink audio device



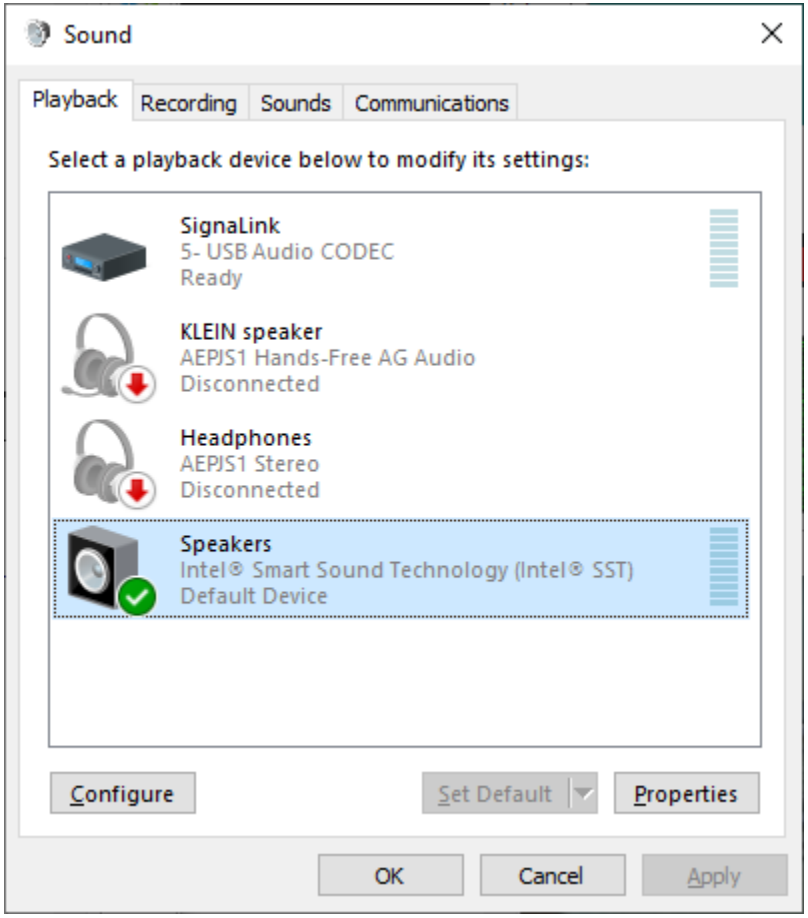
turn off Windows sounds

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

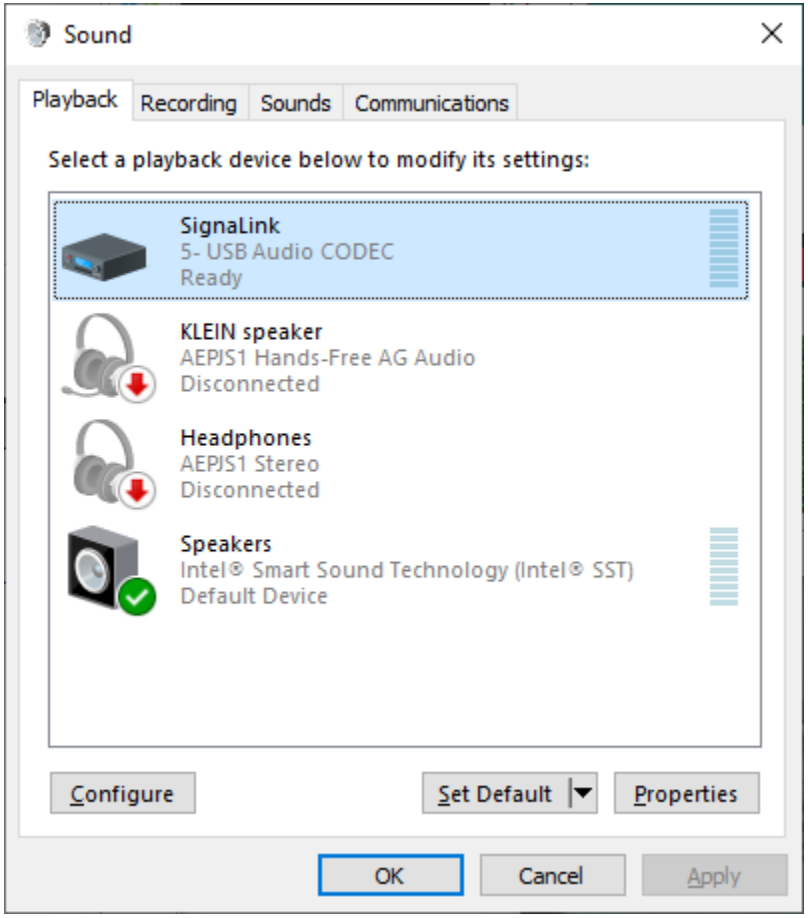


set default audio device

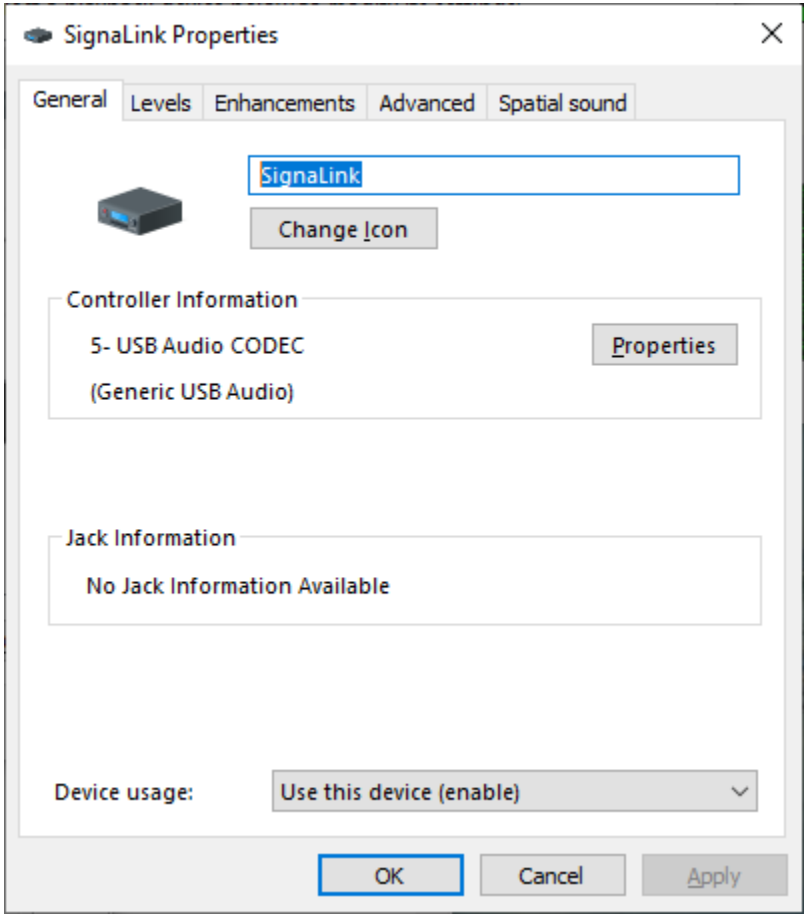
- settings are generally the same for all radio audio interface devices



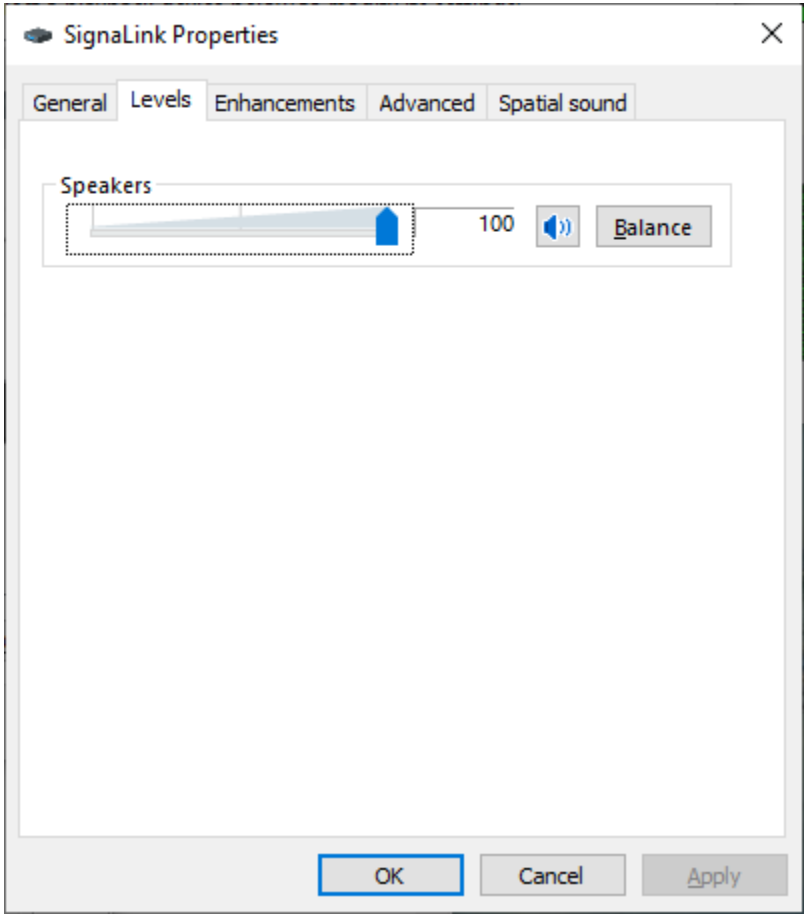
correct default audio device



select Properties of SignaLink device

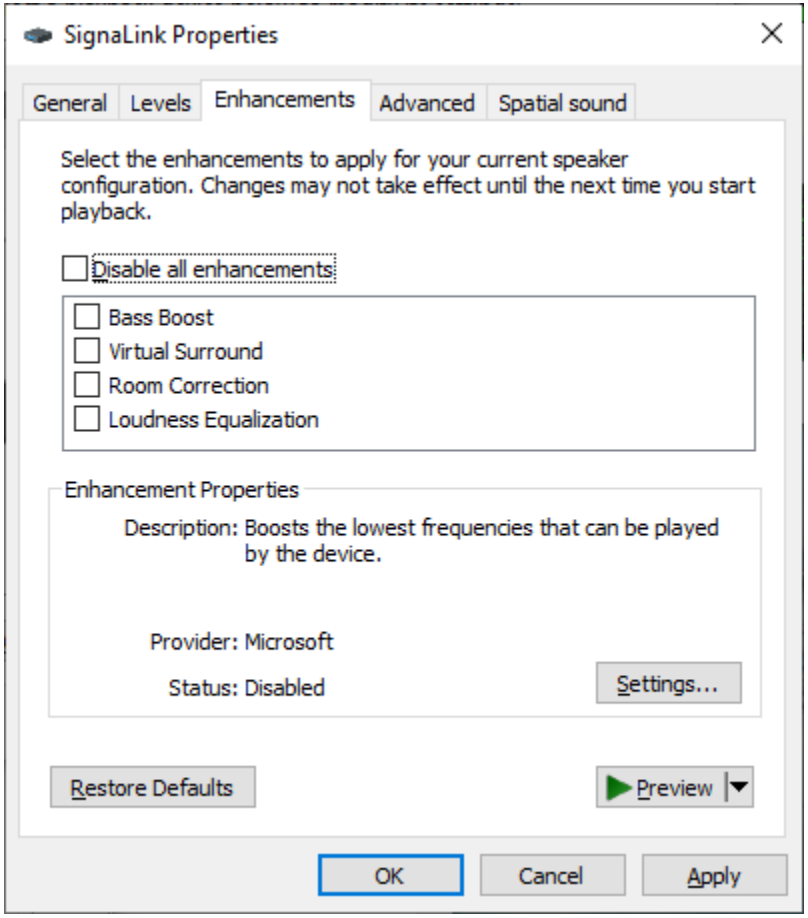


rename as SignaLink as needed

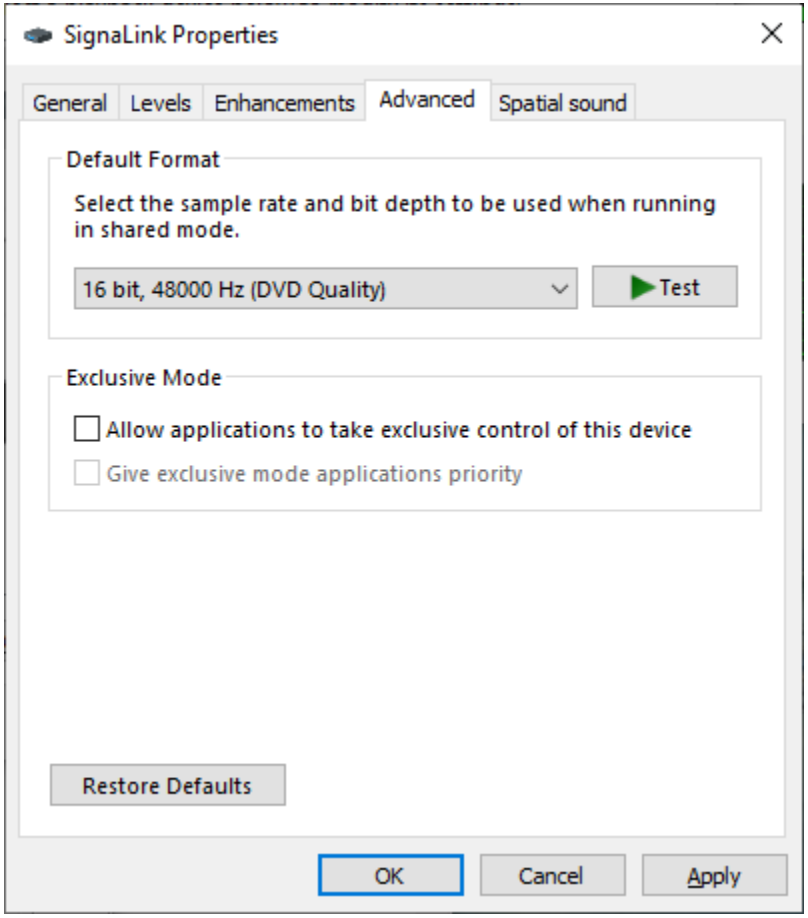


set output level to maximum

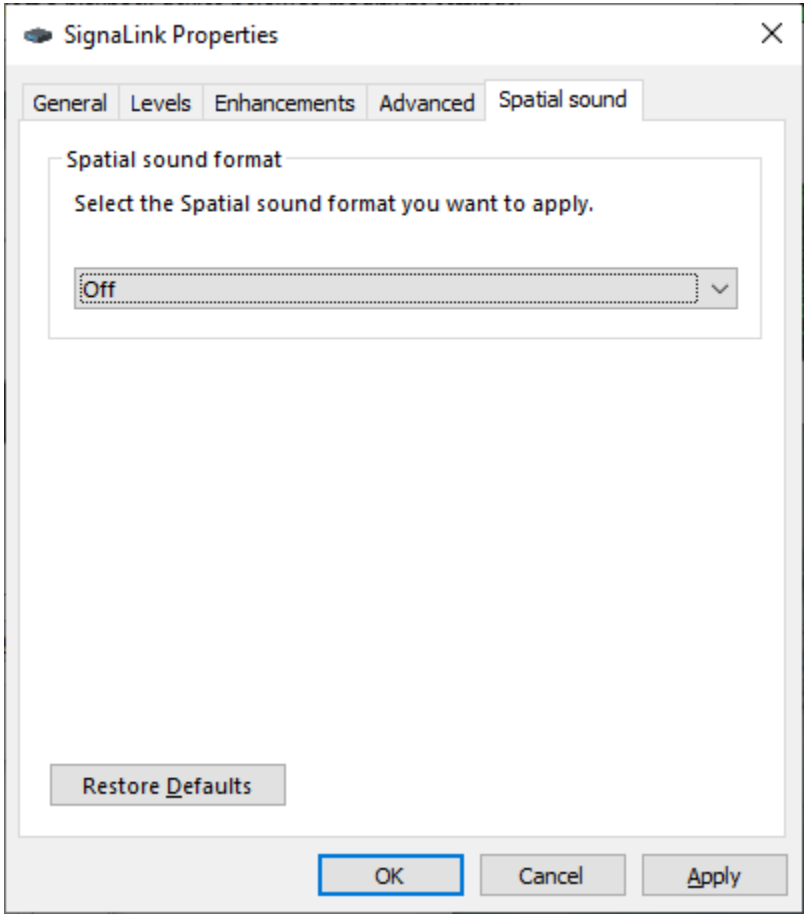
- needed to drive SignaLink PTT



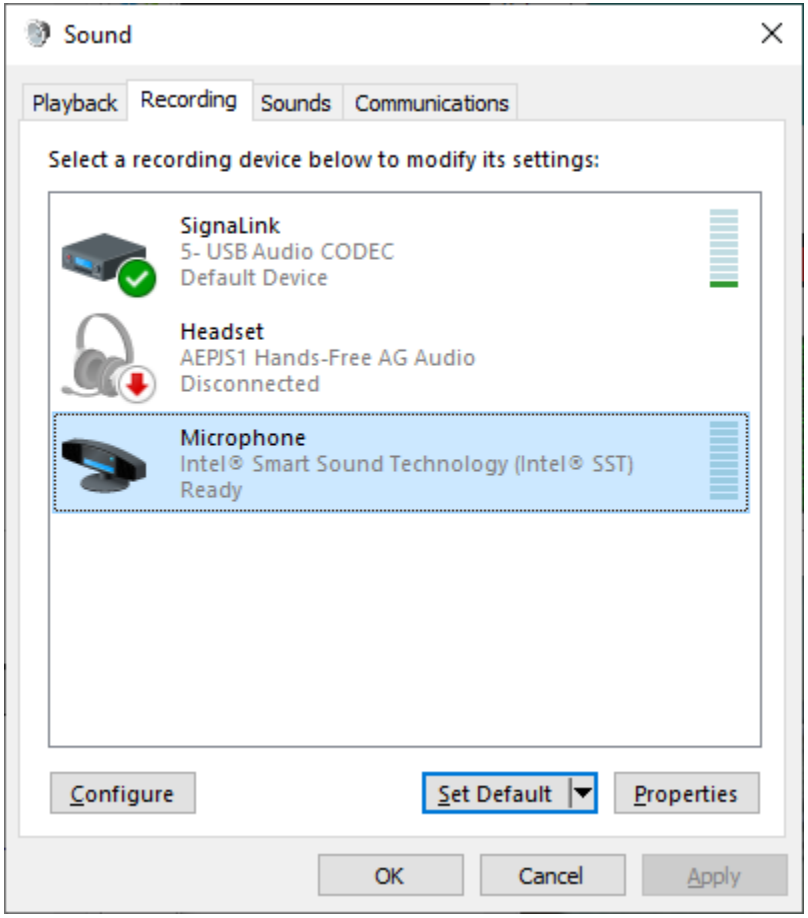
no enhancements



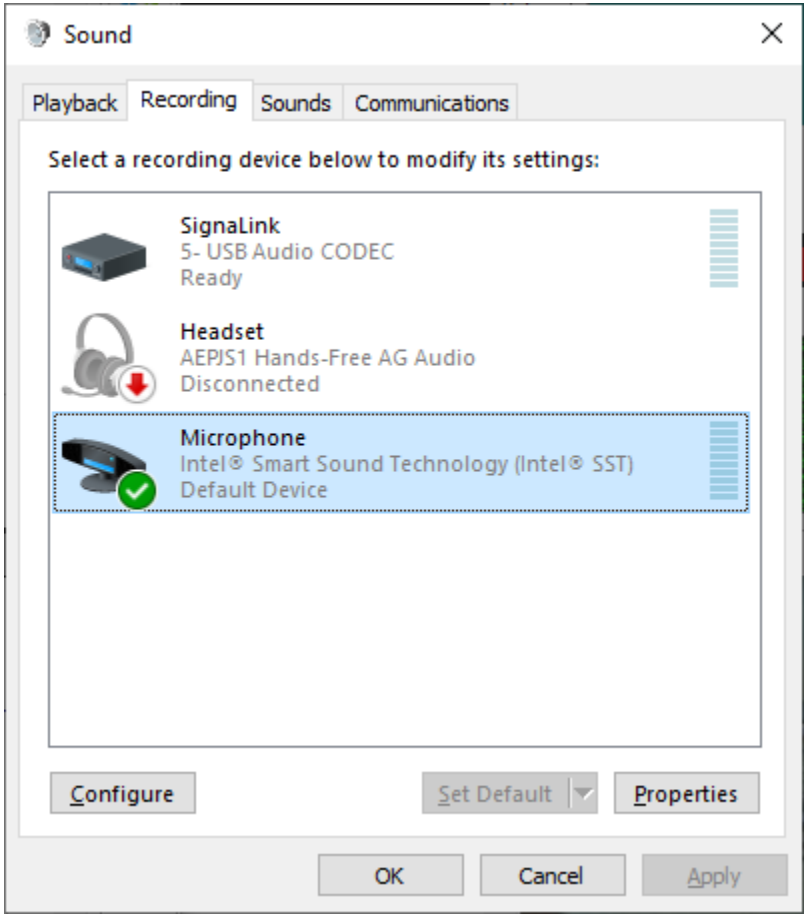
set to highest audio quality



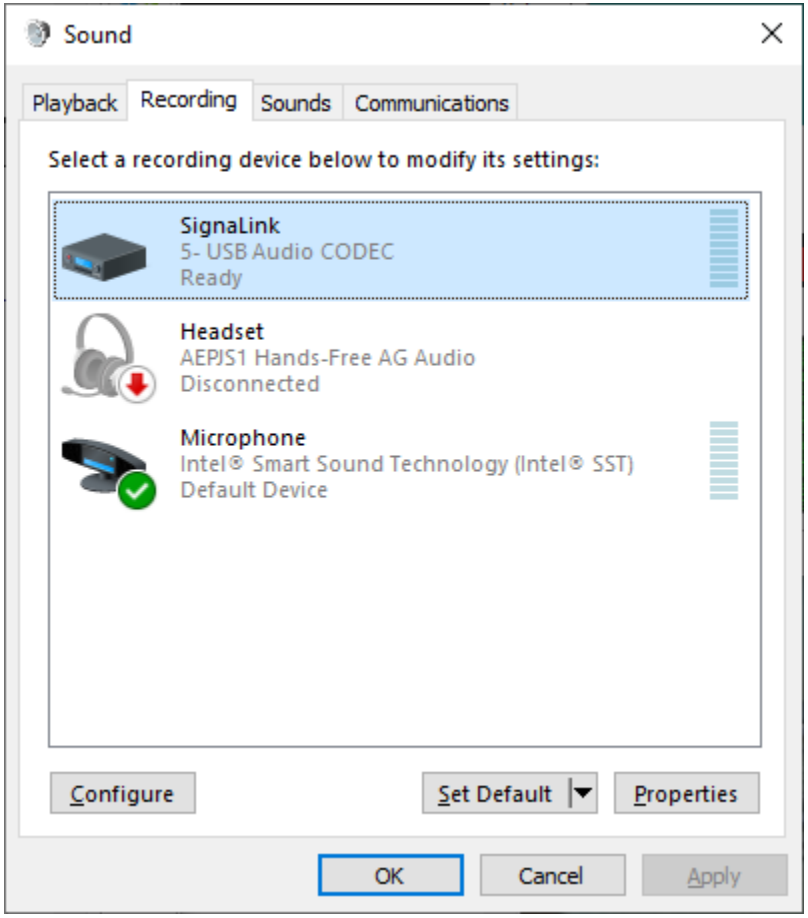
disable spatial sound



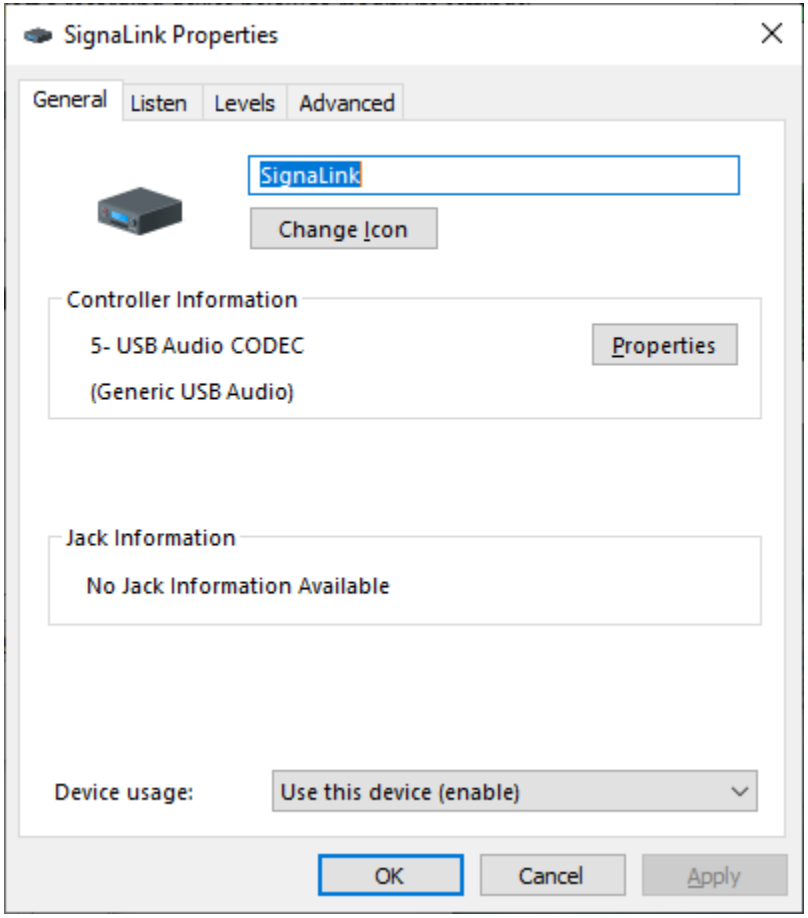
set default audio device



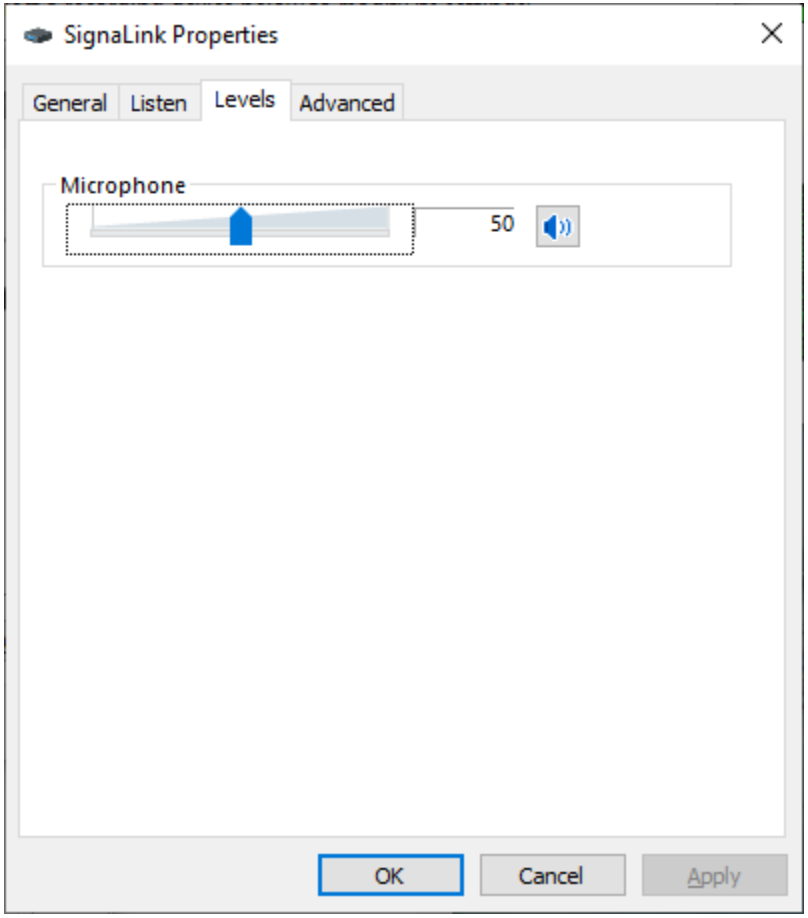
correct default audio device



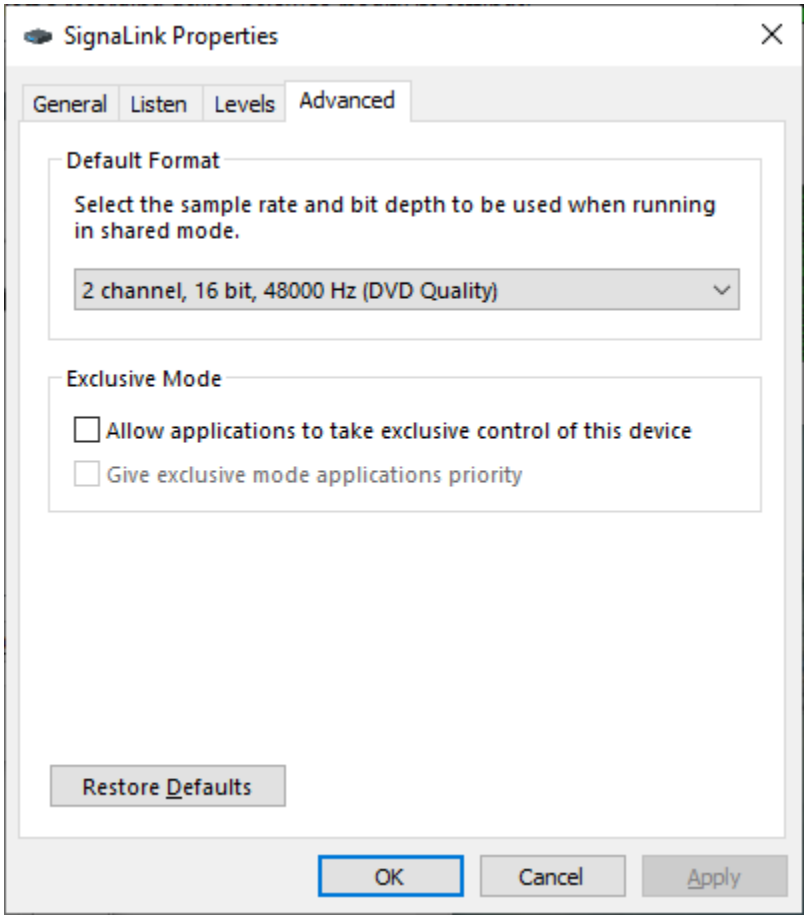
select Properties of SignaLink device



rename as SignaLink as needed



set initial input level



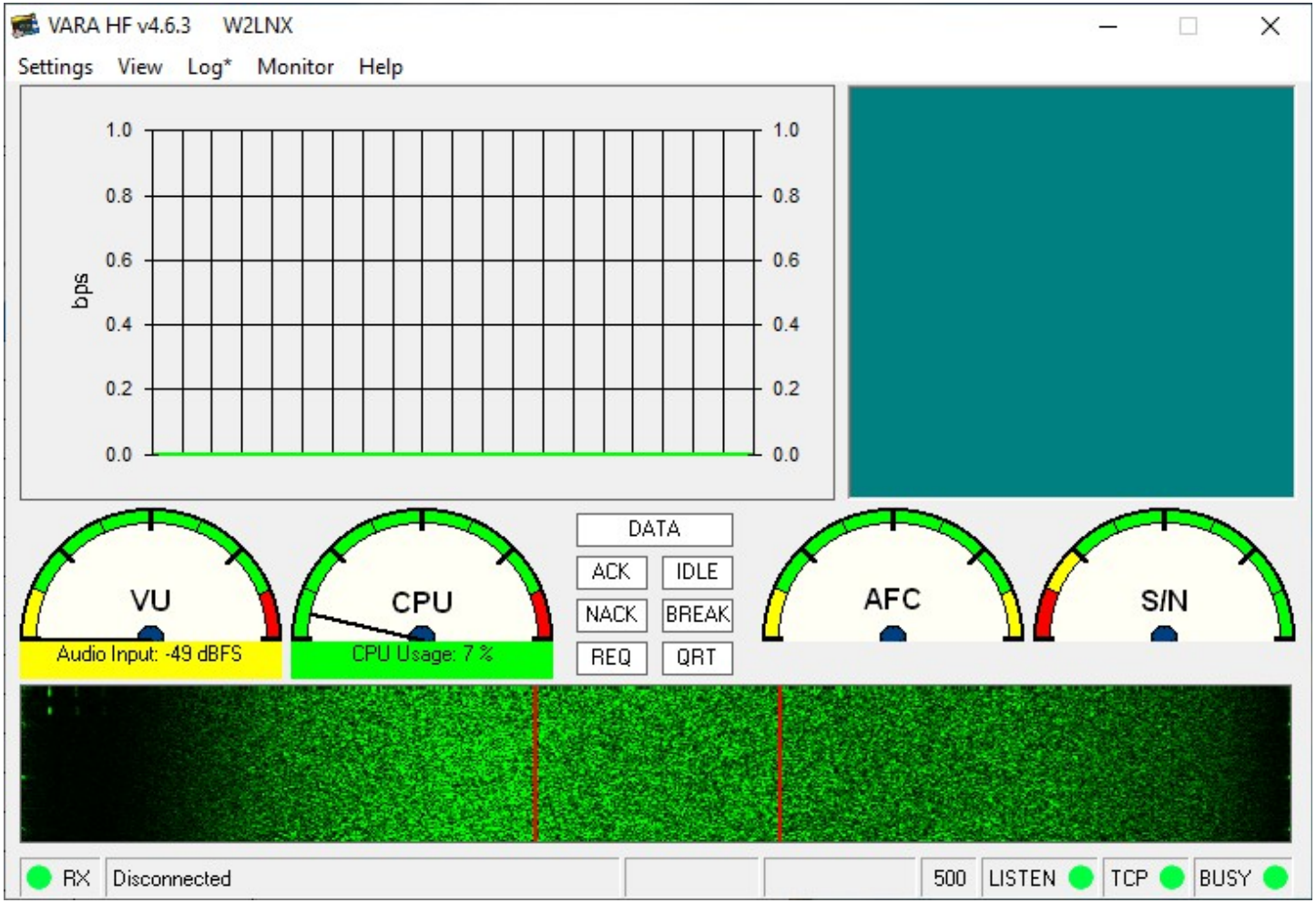
set to highest audio quality

setting up VARA HF modem

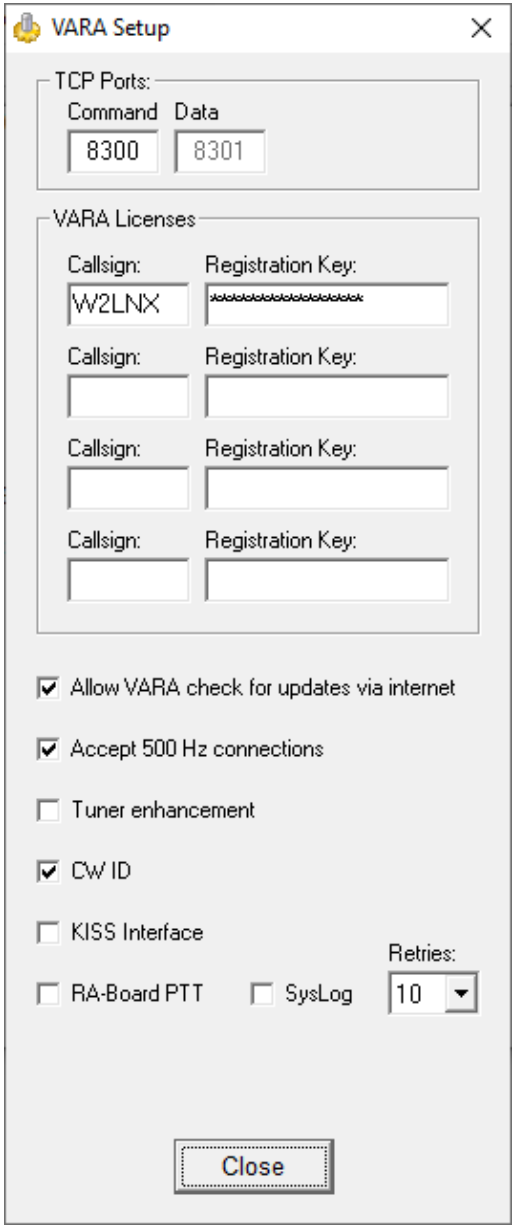
- developed by Jose Alberto Nieto Ros, EA5HVK
- download VARA HF software modem

  https://rosmodem.wordpress.com/
- recommend buying registration key for full speed

  file:///C:/VARA/Buy.html

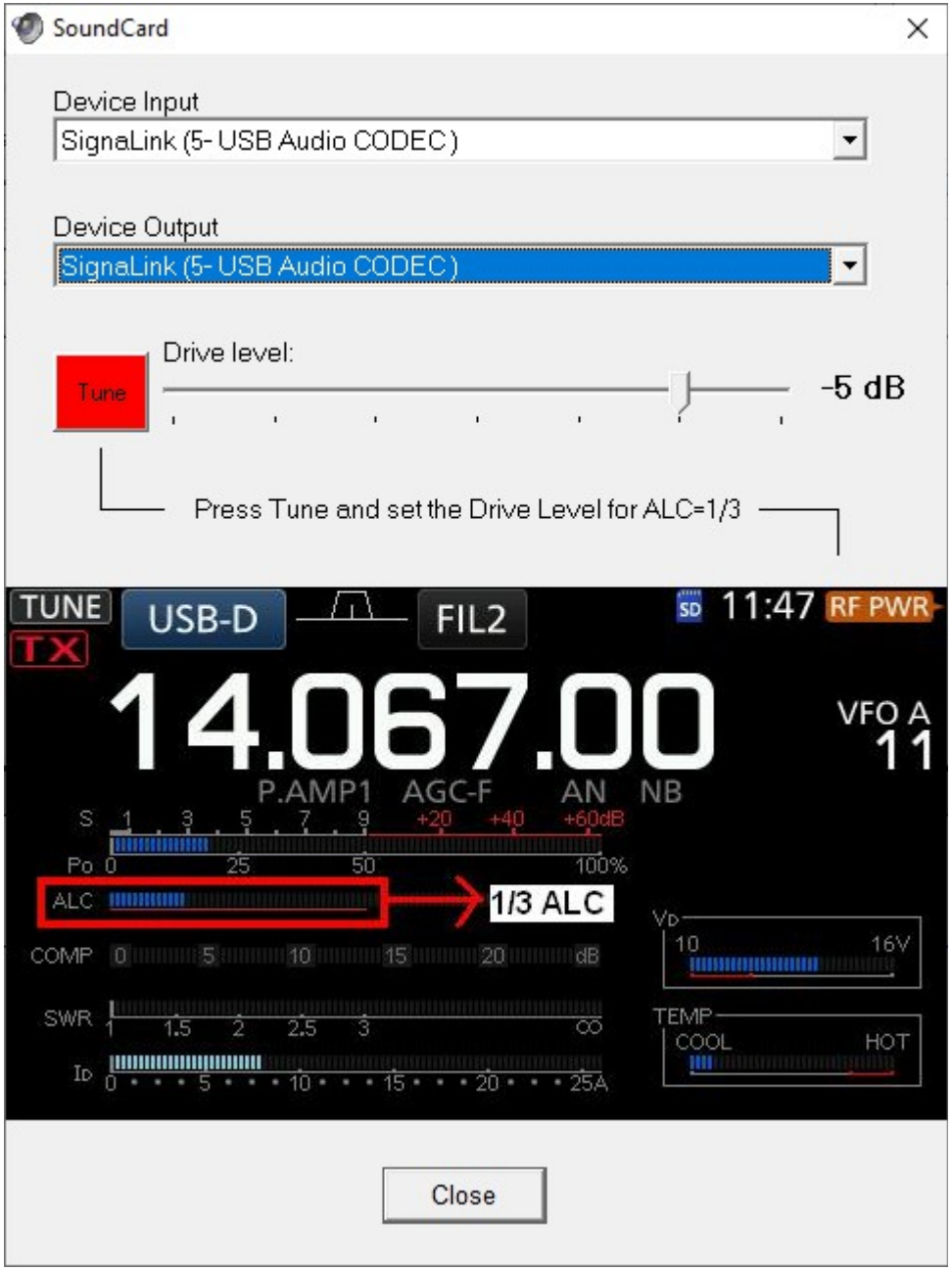


select Settings menu list



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

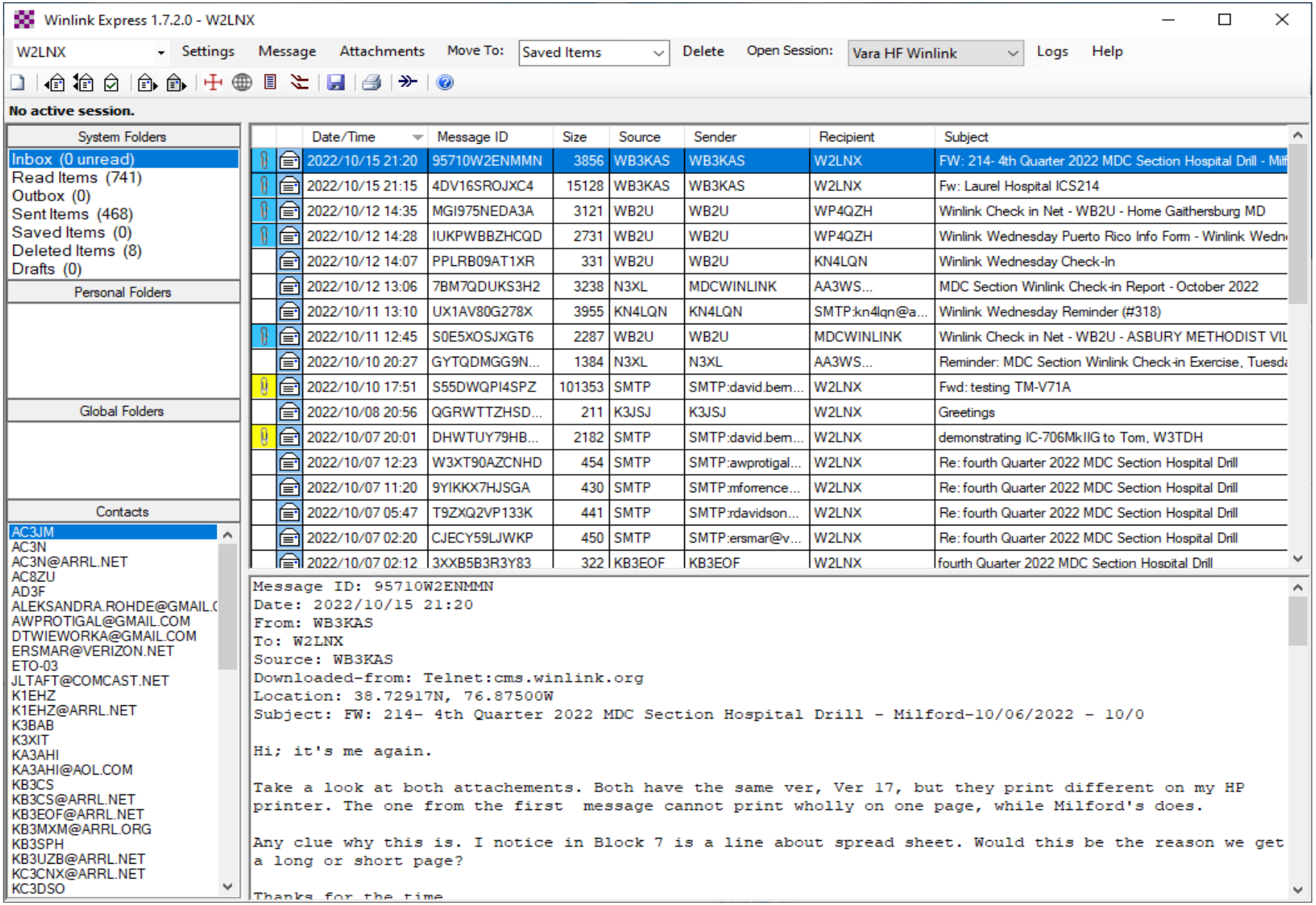
  https://www.winlink.org/

- set up Winlink user account with your callsign

  https://winlink.org/user

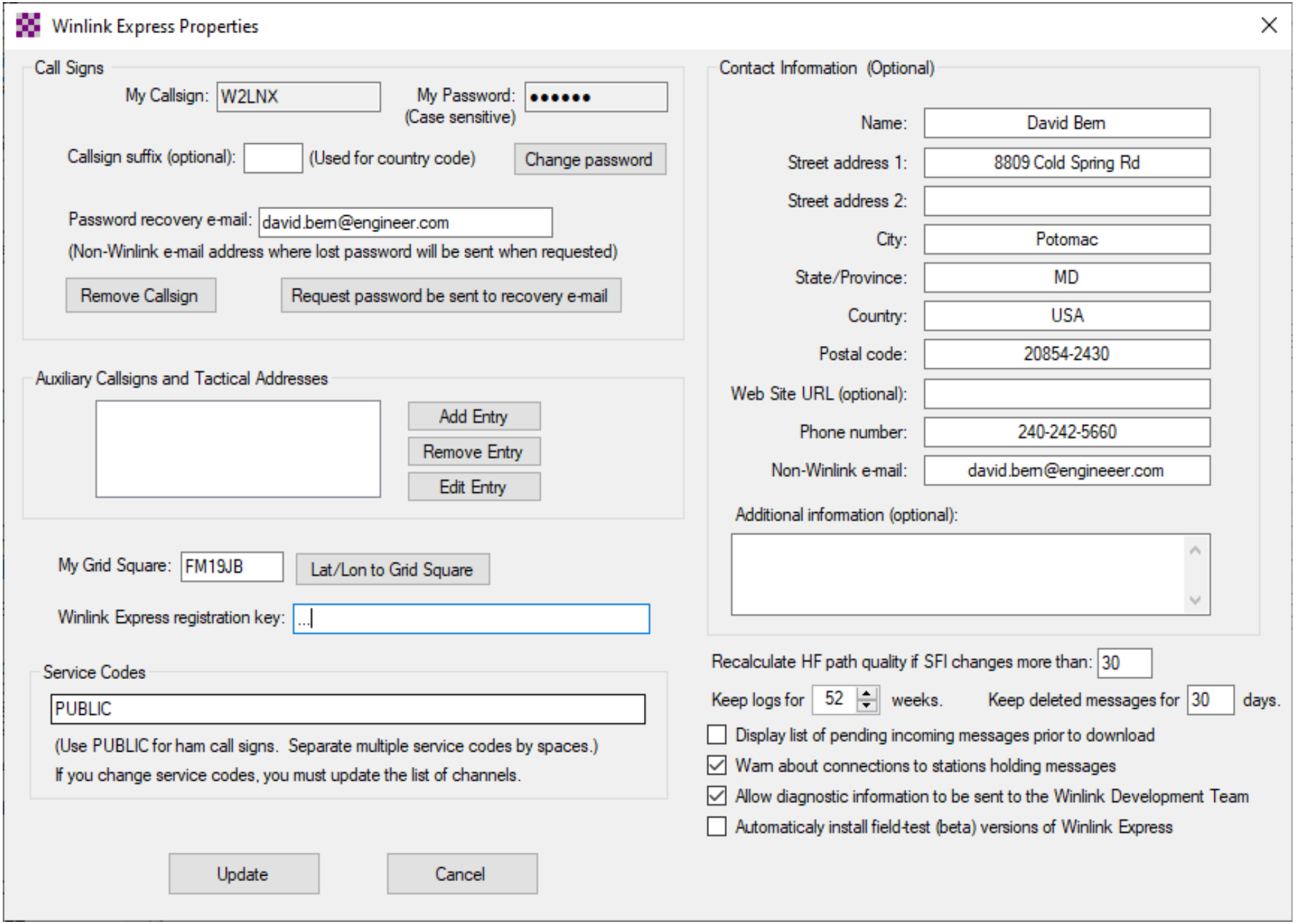
- voluntary Winlink registration – turns off reminder

  https://arsfi.org/express.aspx

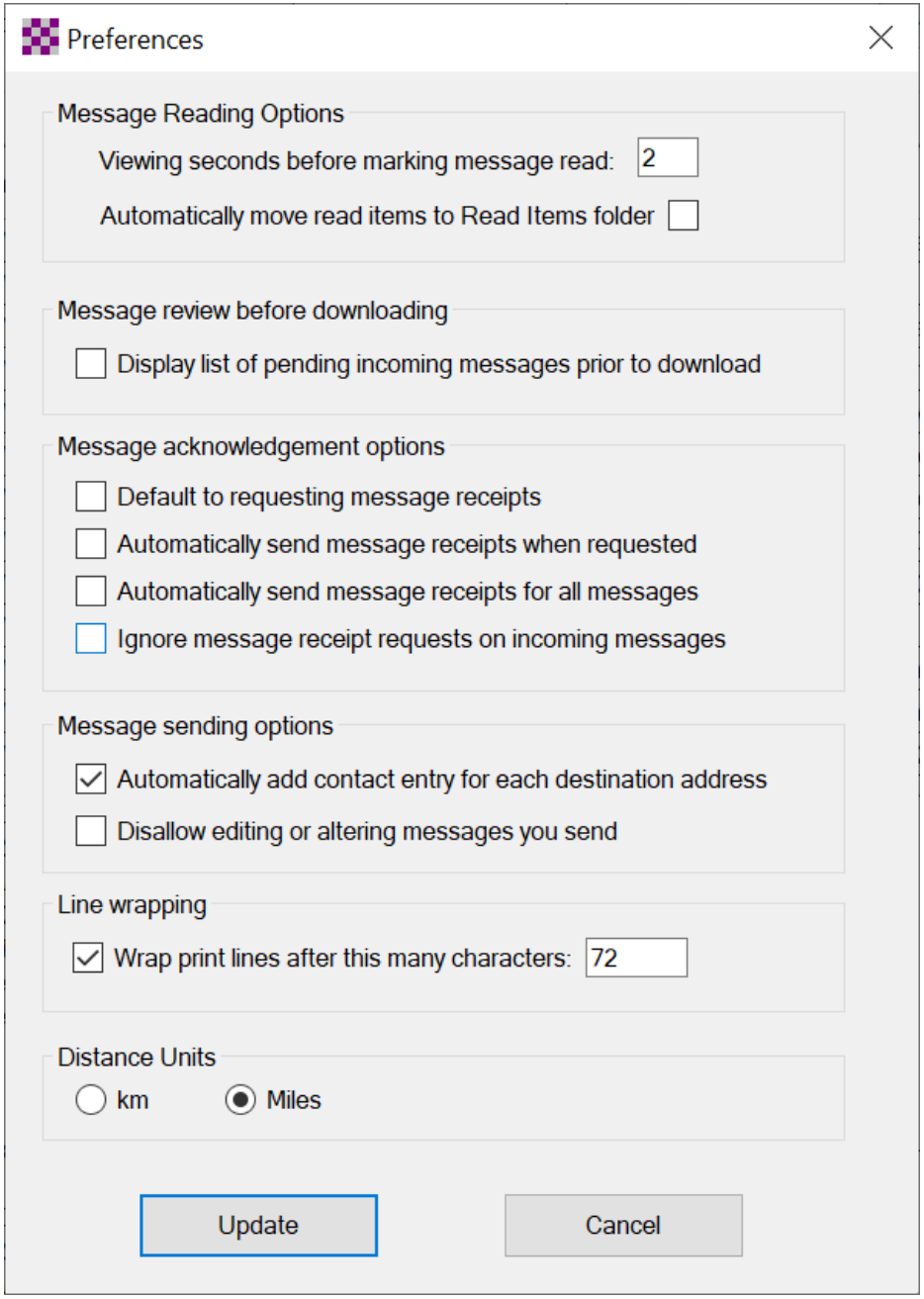


click on Settings

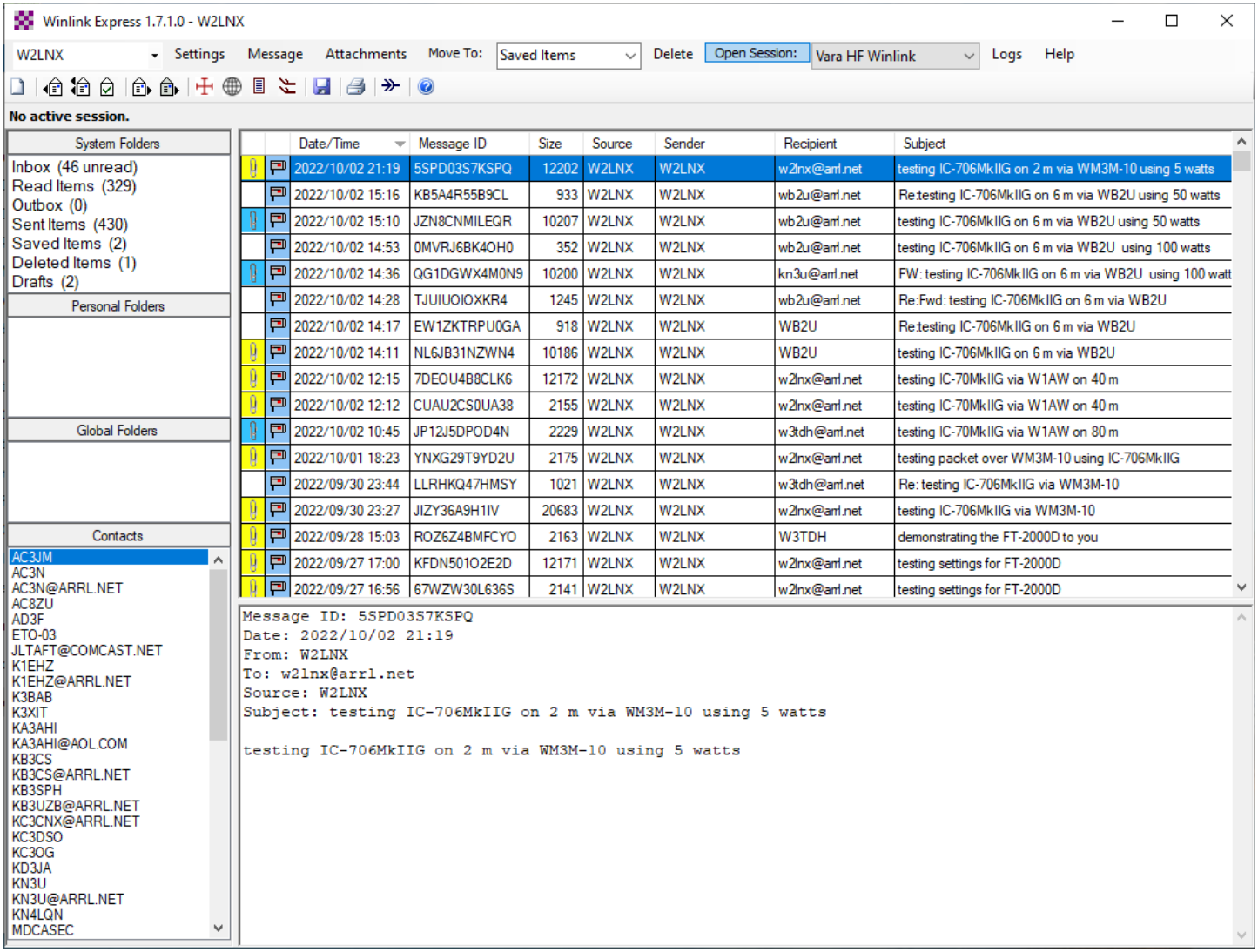
select Winlink Express Setup... and then Preferences...



enter your password, registration key and location

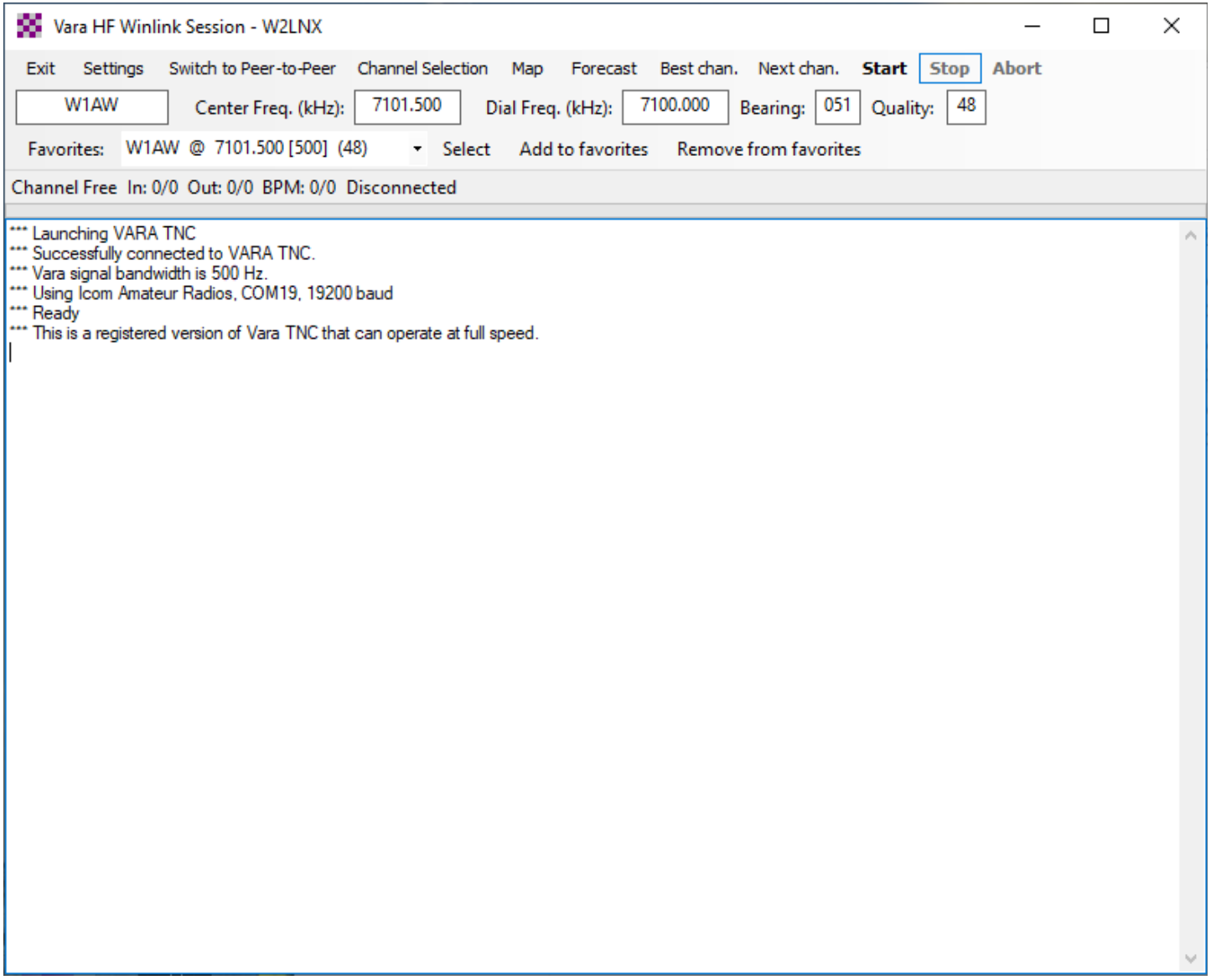


add contacts automatically



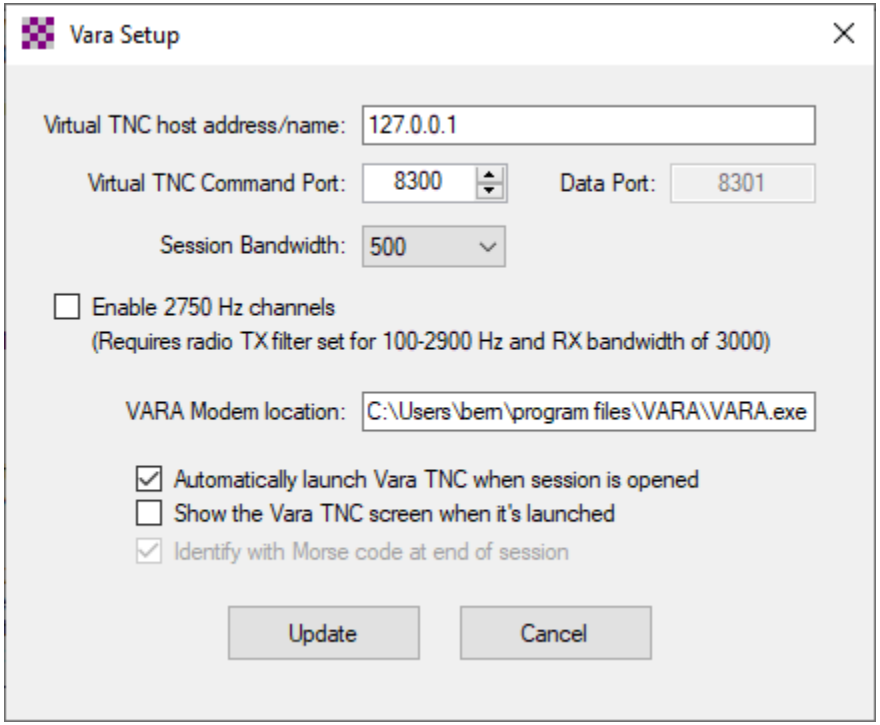
open VARA HF session

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



click on Settings menu

select Vara 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-706MkIIG using a SignaLink USB

IC-706MkIIG:

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

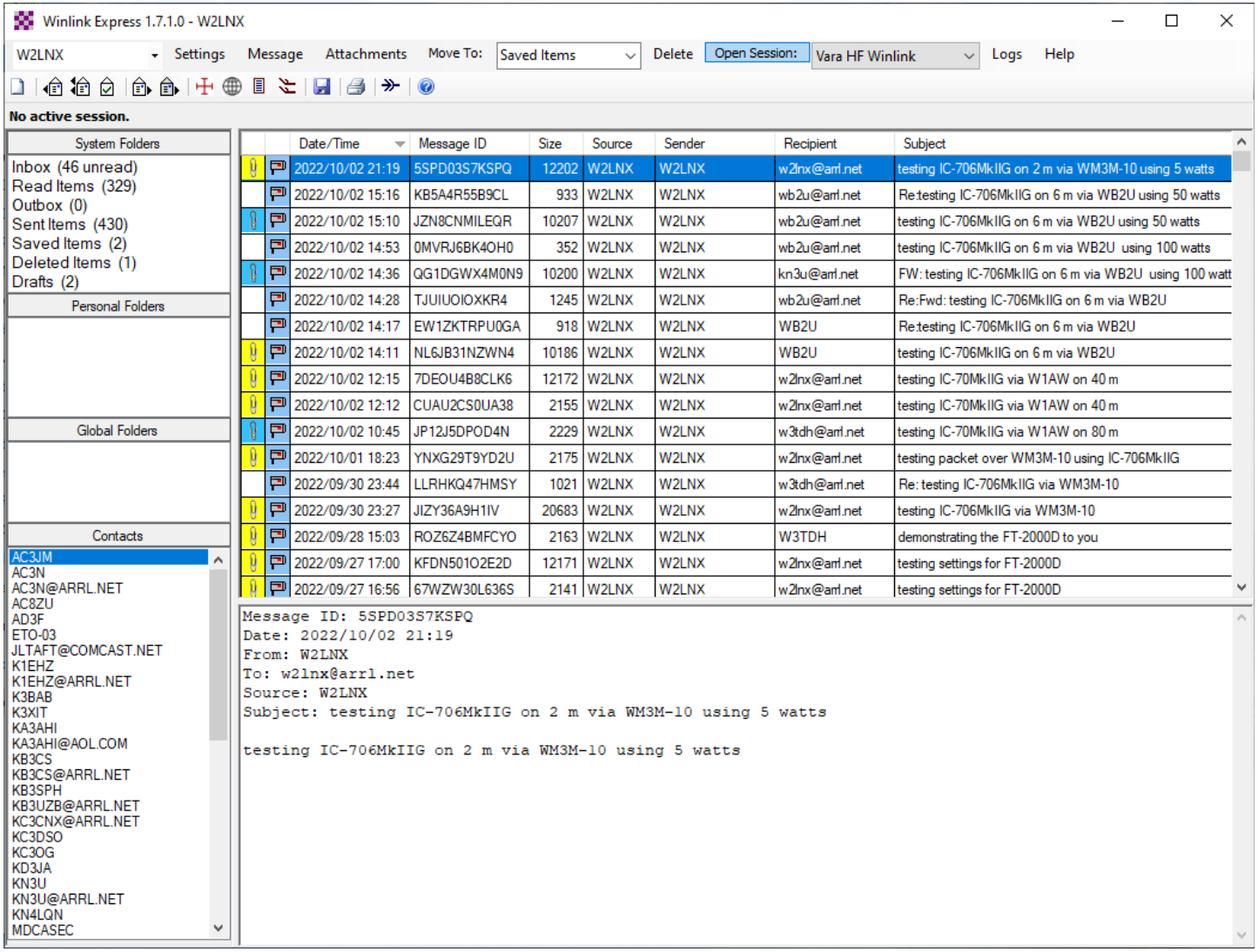
cable: SLCAB6PM

frequency control cable:

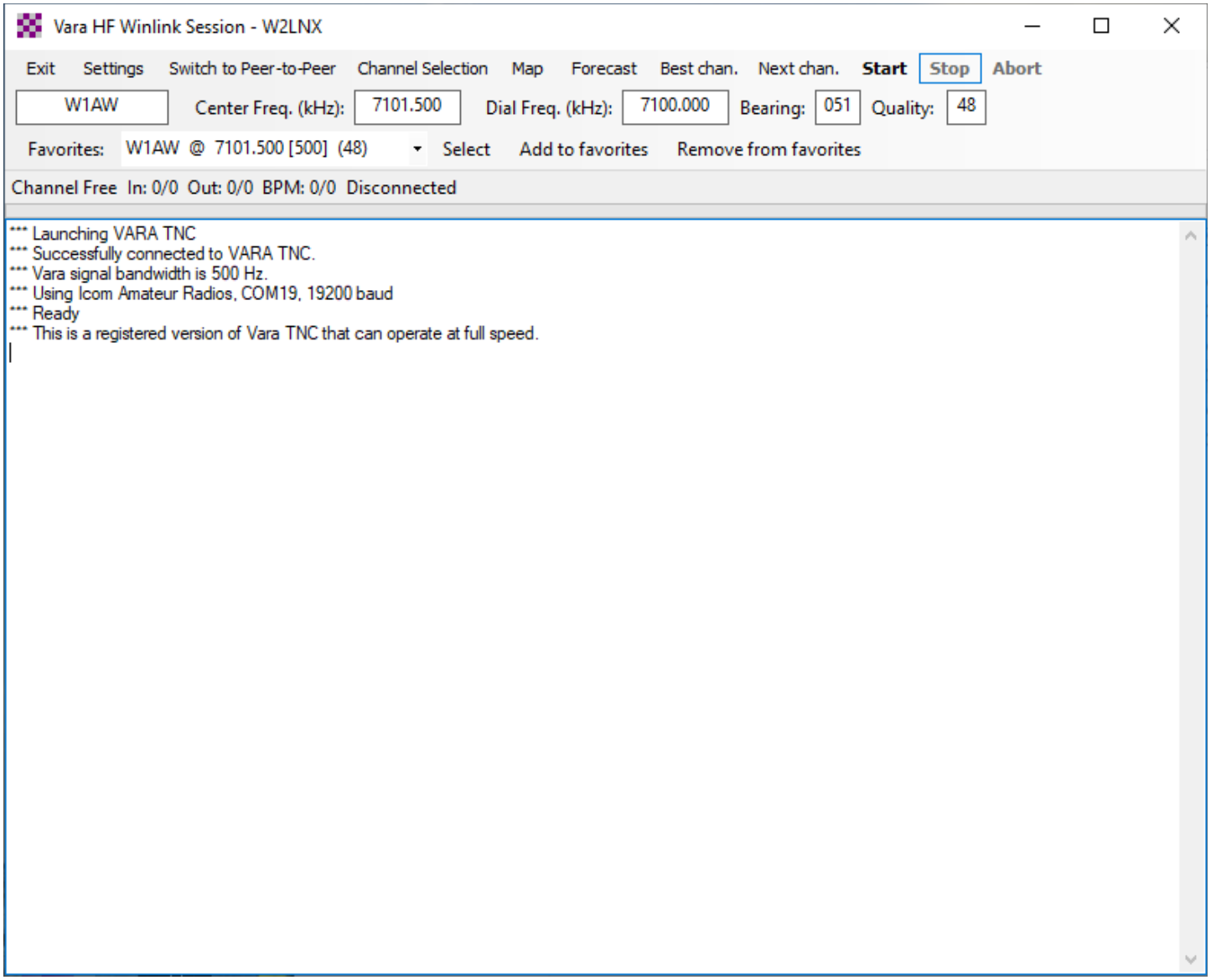
Valley Enterprises CT-17 USB FTDI CI-V Cat Control Cable

or

RT Systems USB-RTS01 Programming Cable

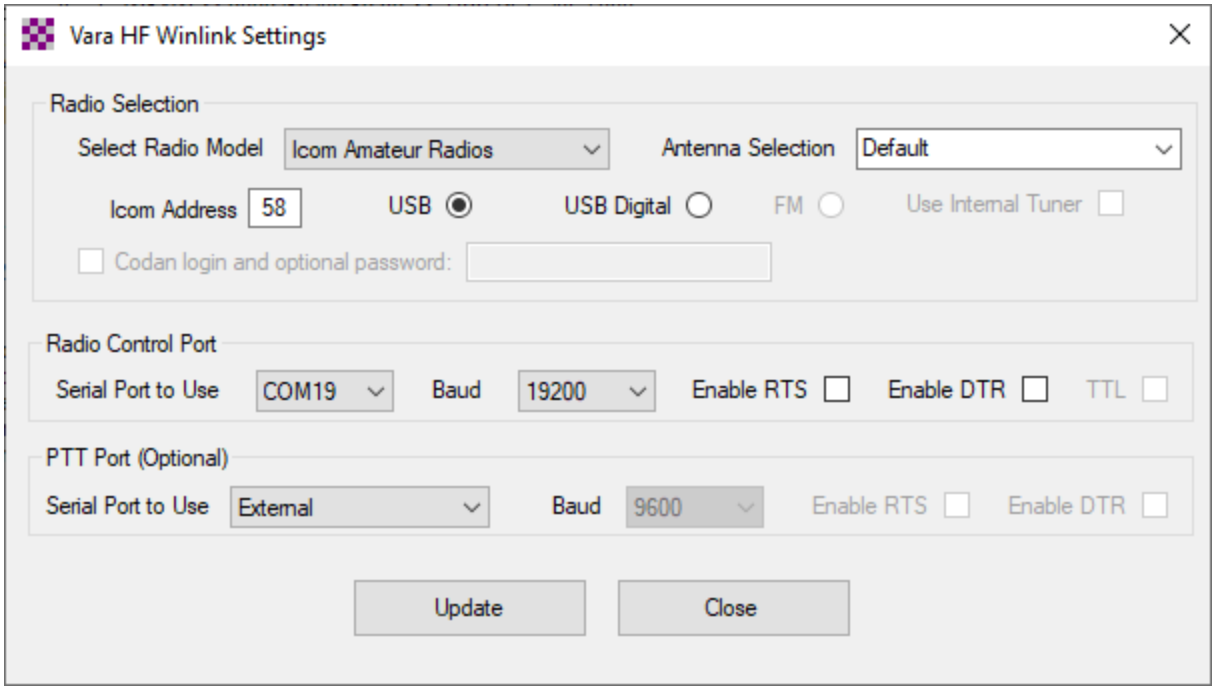


open VARA HF session



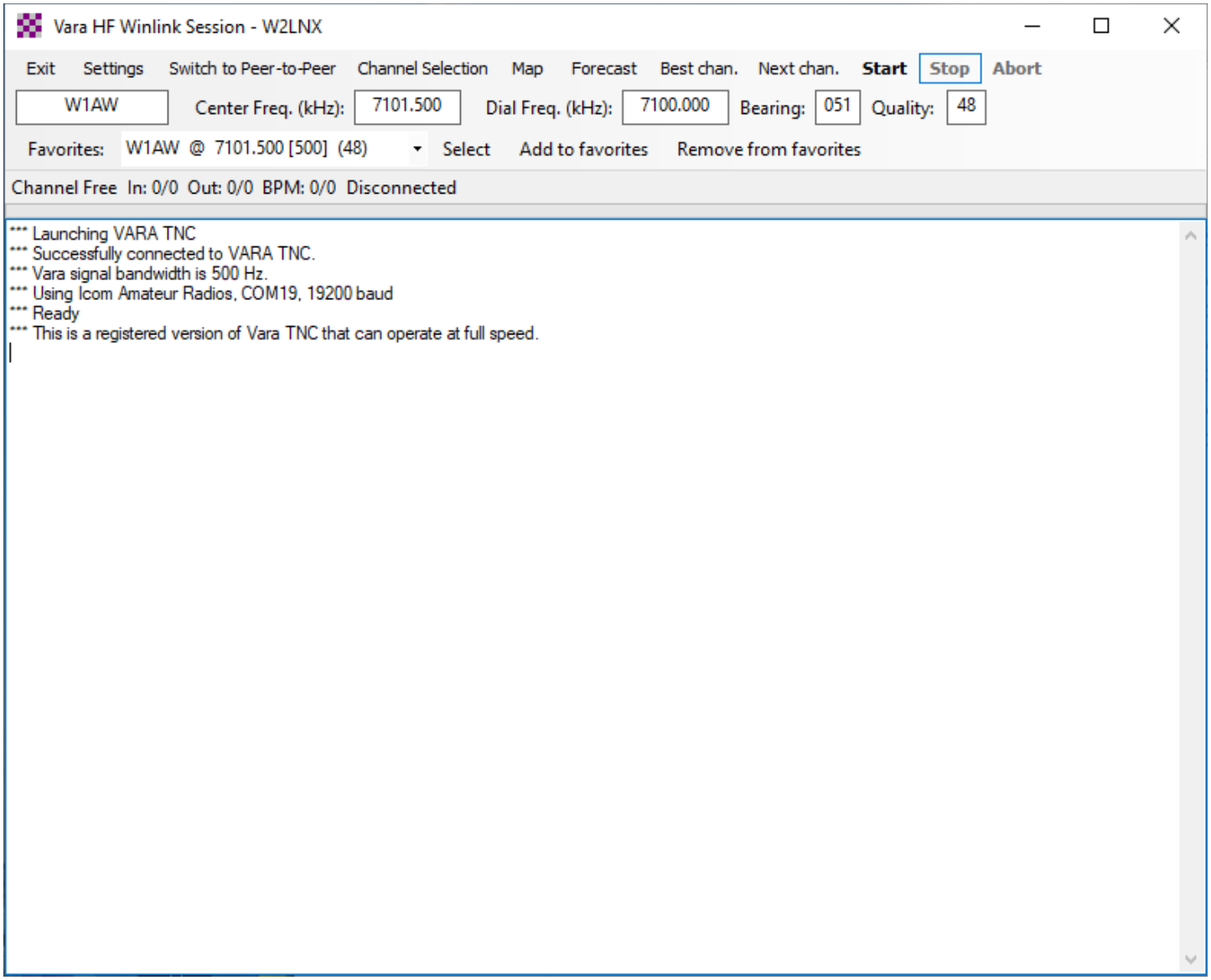
click on Settings menu

select Radio Setup

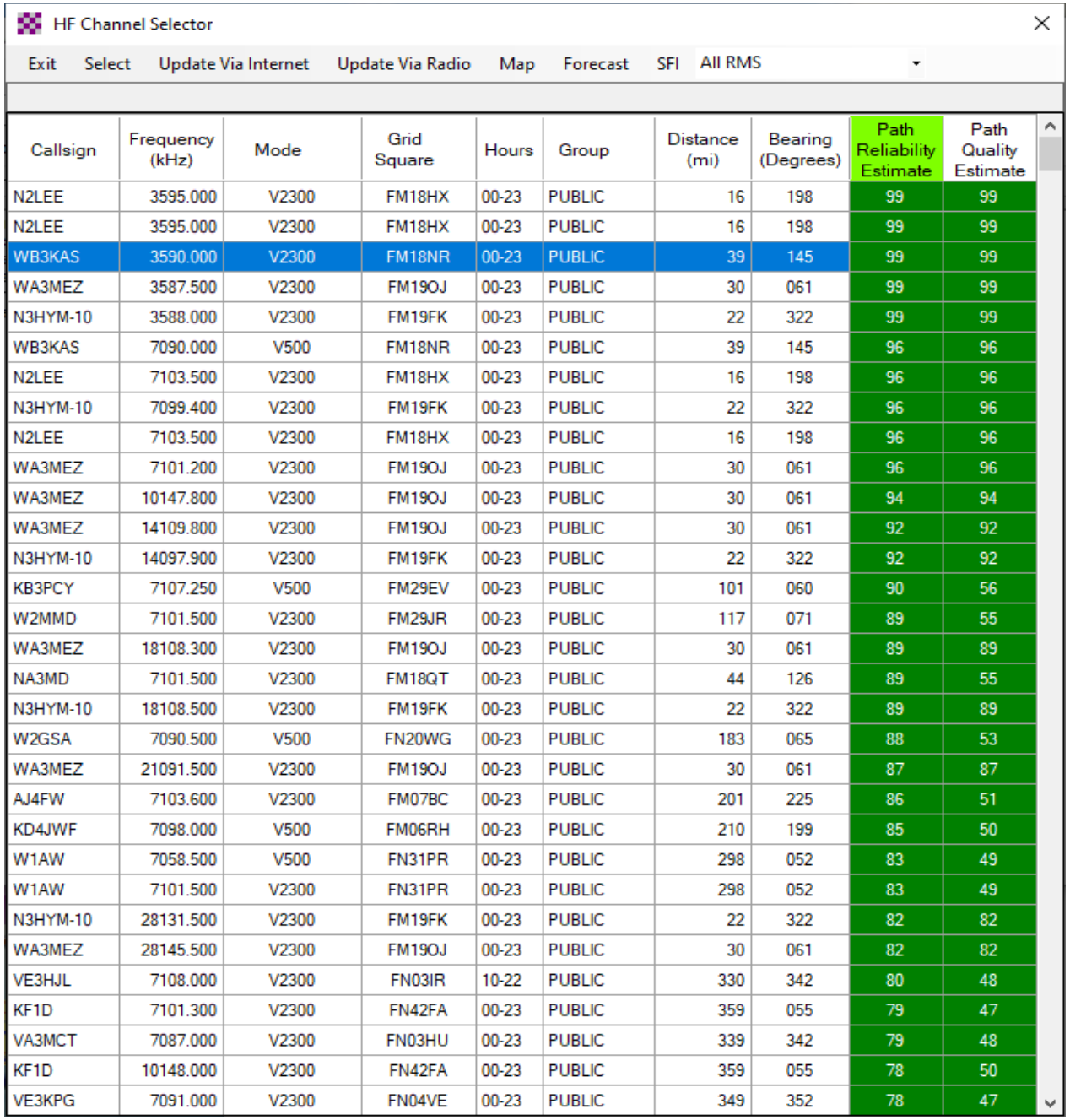


enter settings in VARA HF Winlink Settings

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

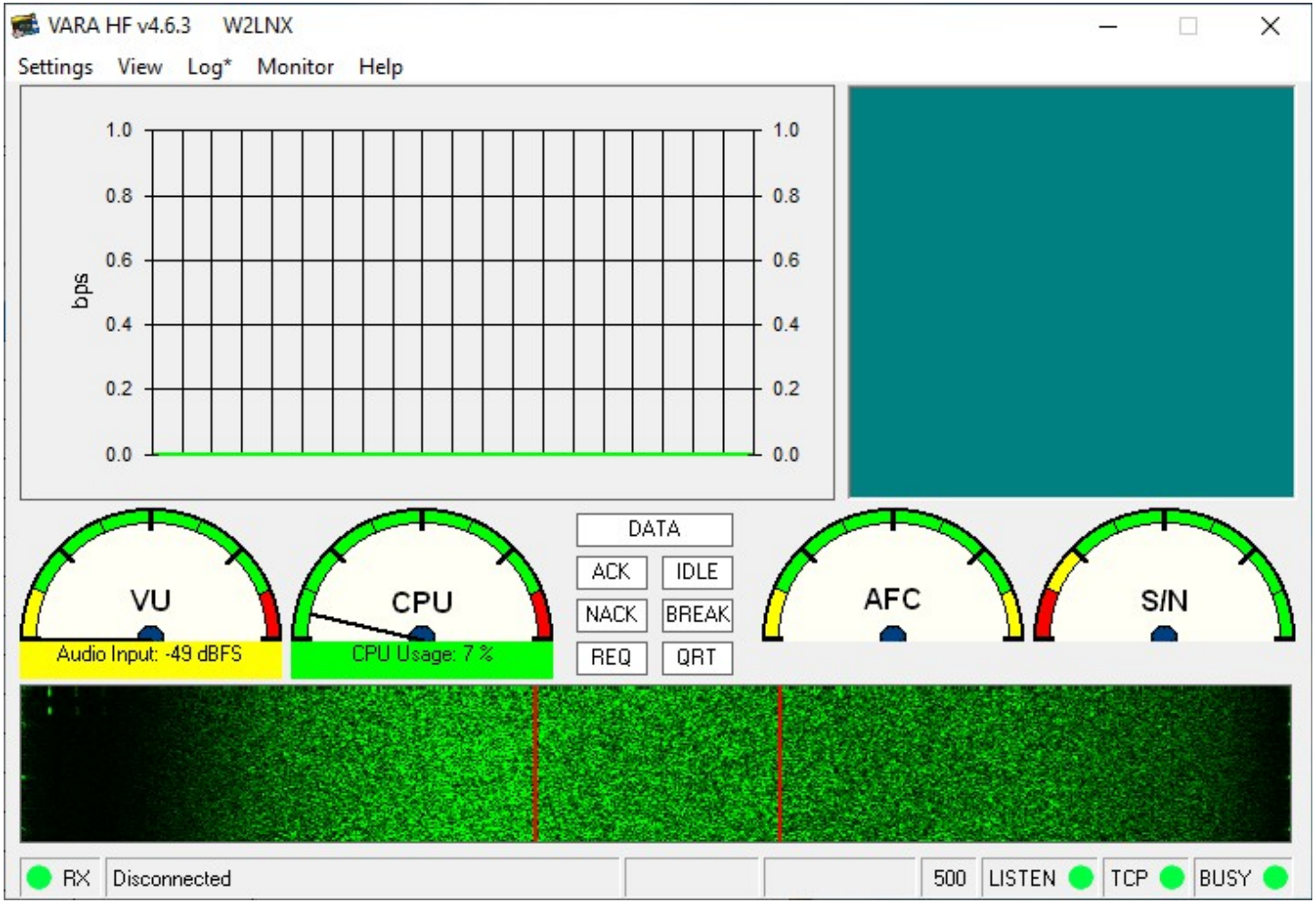


click on Channel Select



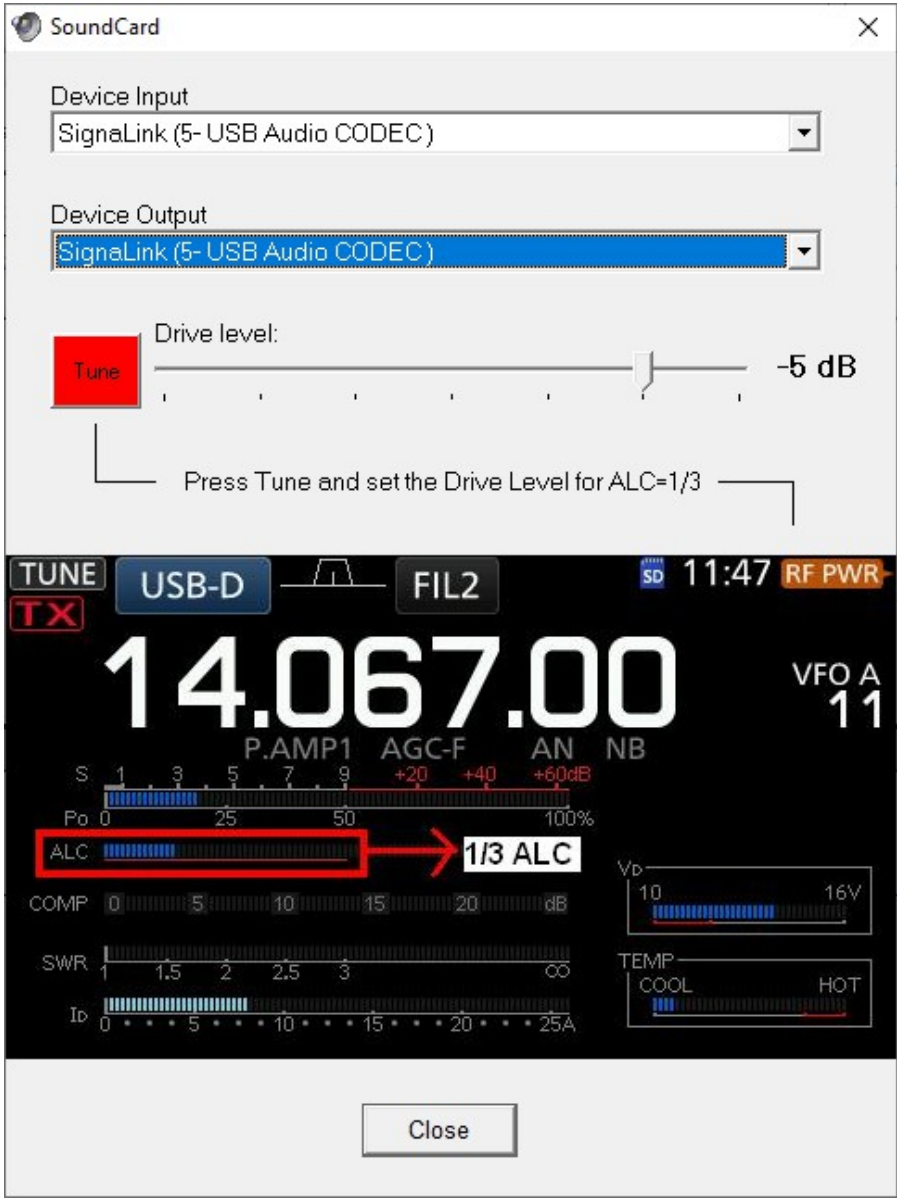
Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
N2LEE	3595.000	V2300	FM18HX	00-23	PUBLIC	16	198	99	99
N2LEE	3595.000	V2300	FM18HX	00-23	PUBLIC	16	198	99	99
WB3KAS	3590.000	V2300	FM18NR	00-23	PUBLIC	39	145	99	99
WA3MEZ	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

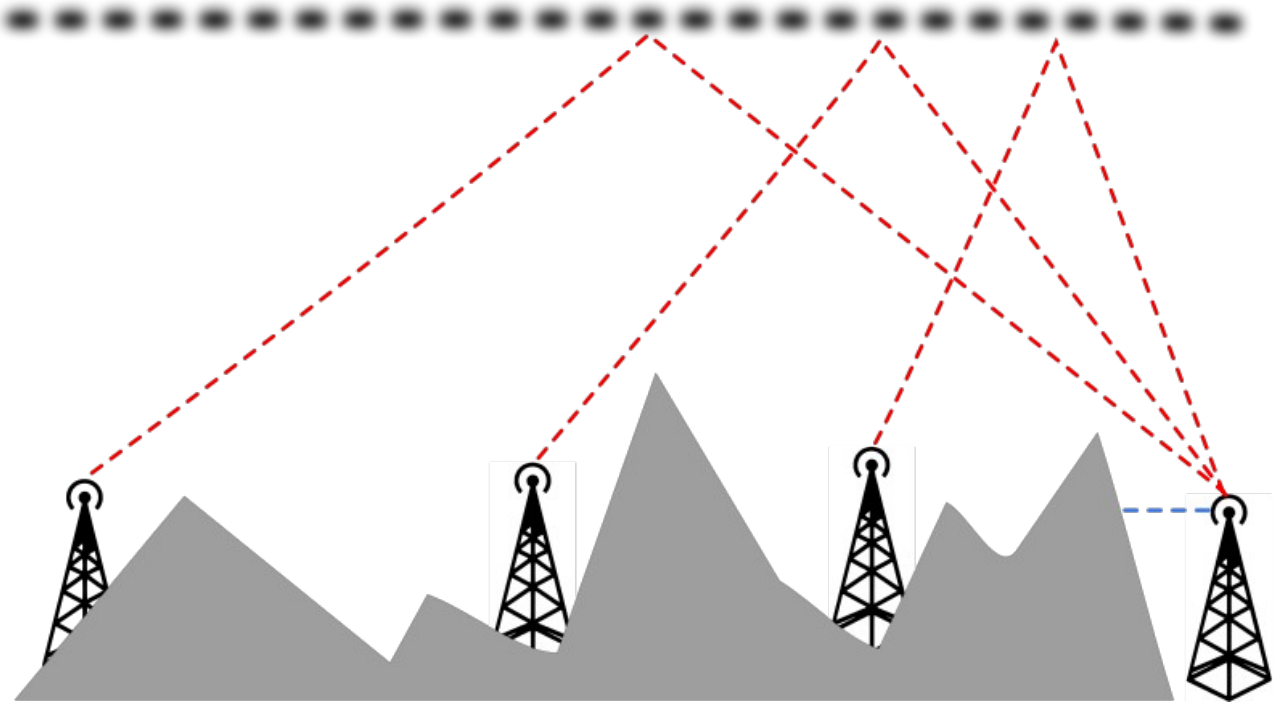
select SoundCard...



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

- rule of thumb for older radios and current radios

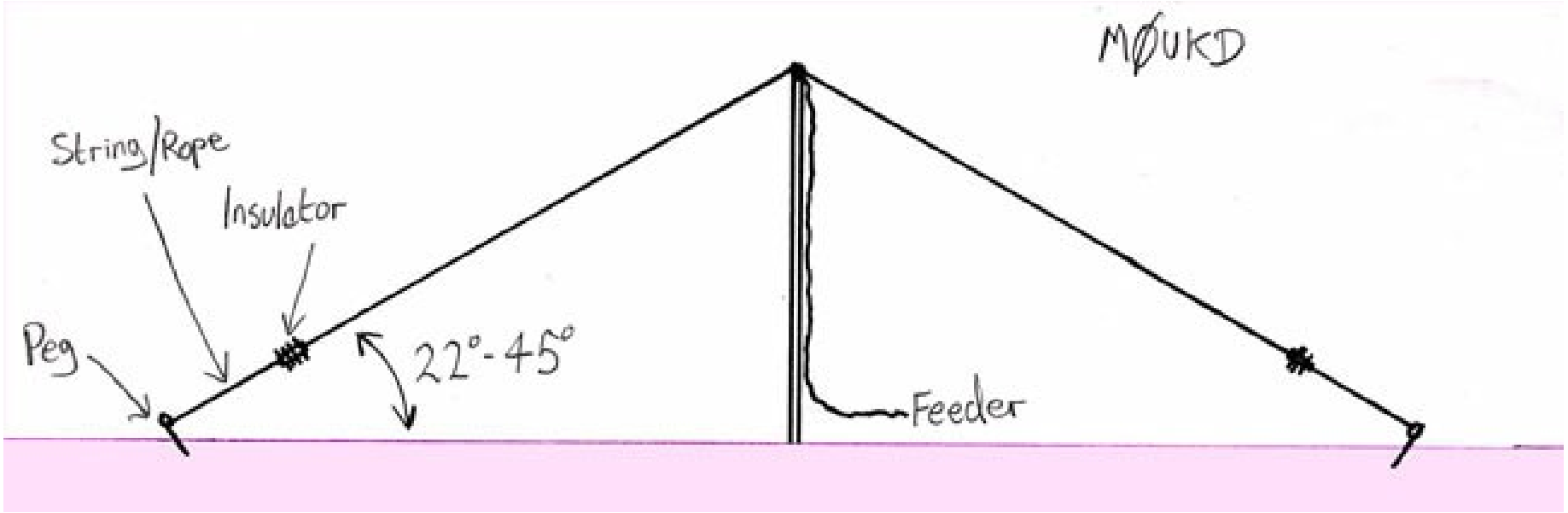
near vertical incidence skywave



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

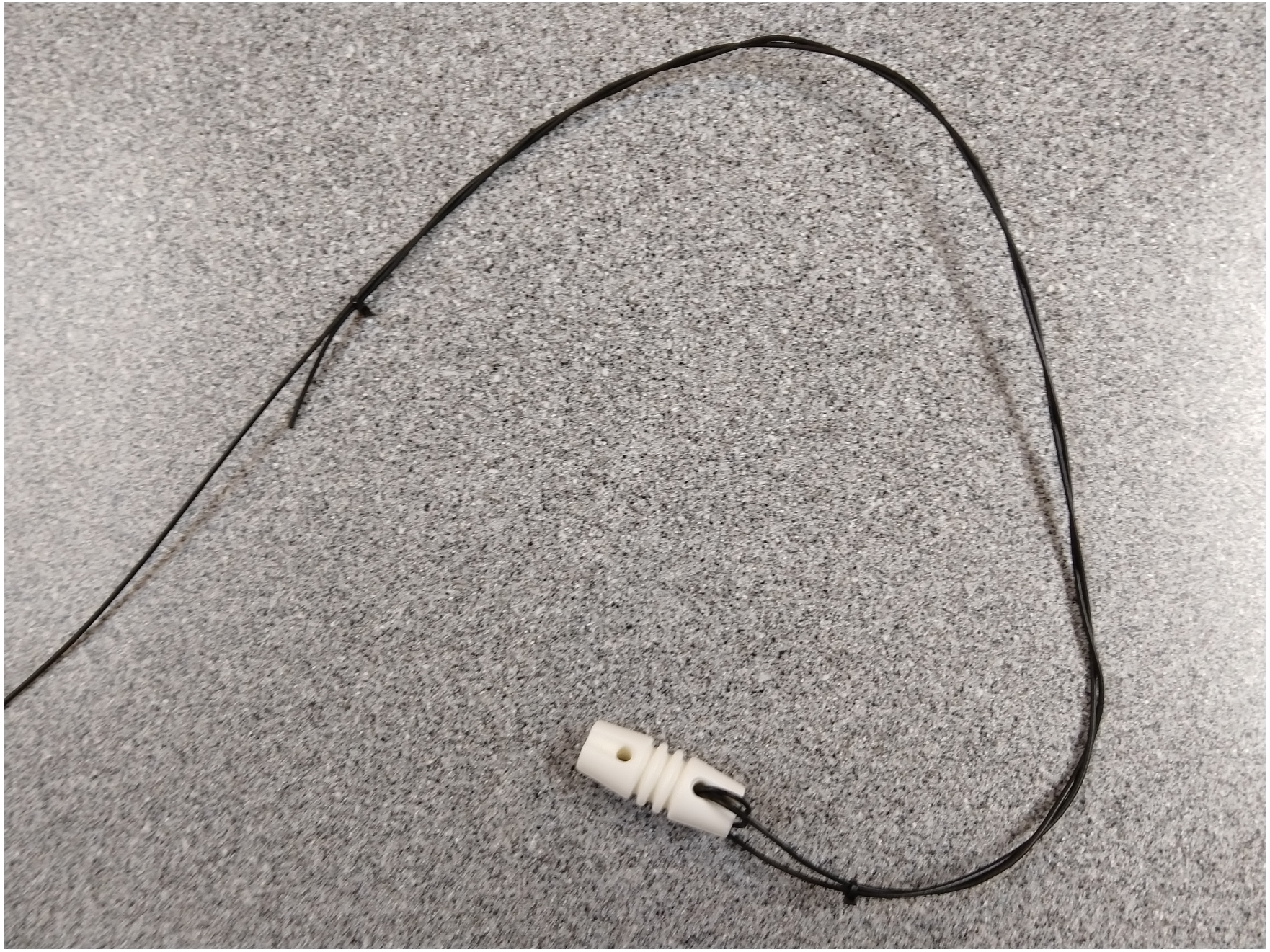
flagpole tire mount – driver mirror aimed down

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

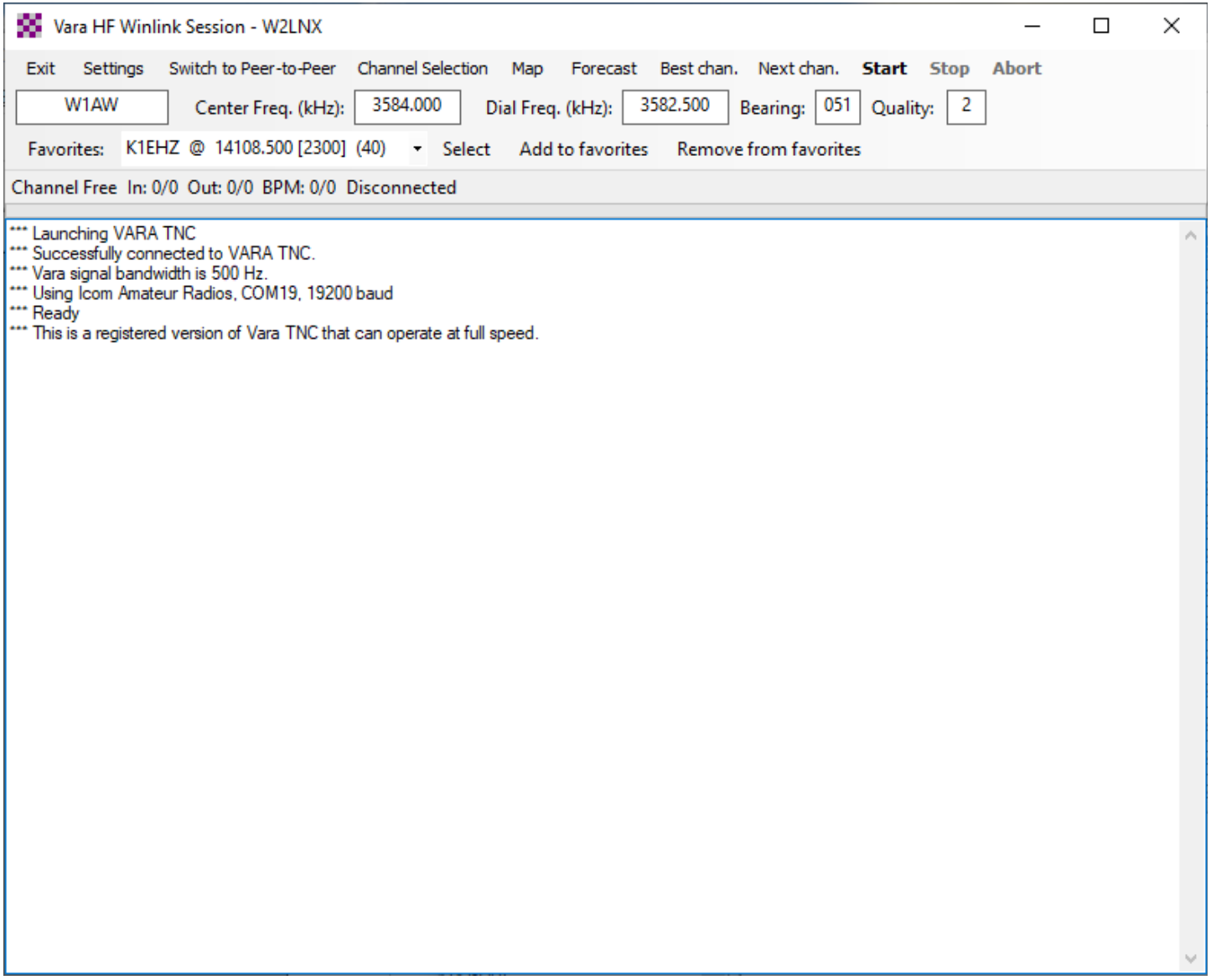
antenna on bobbin

bobbin made from two shallow carry-out food containers

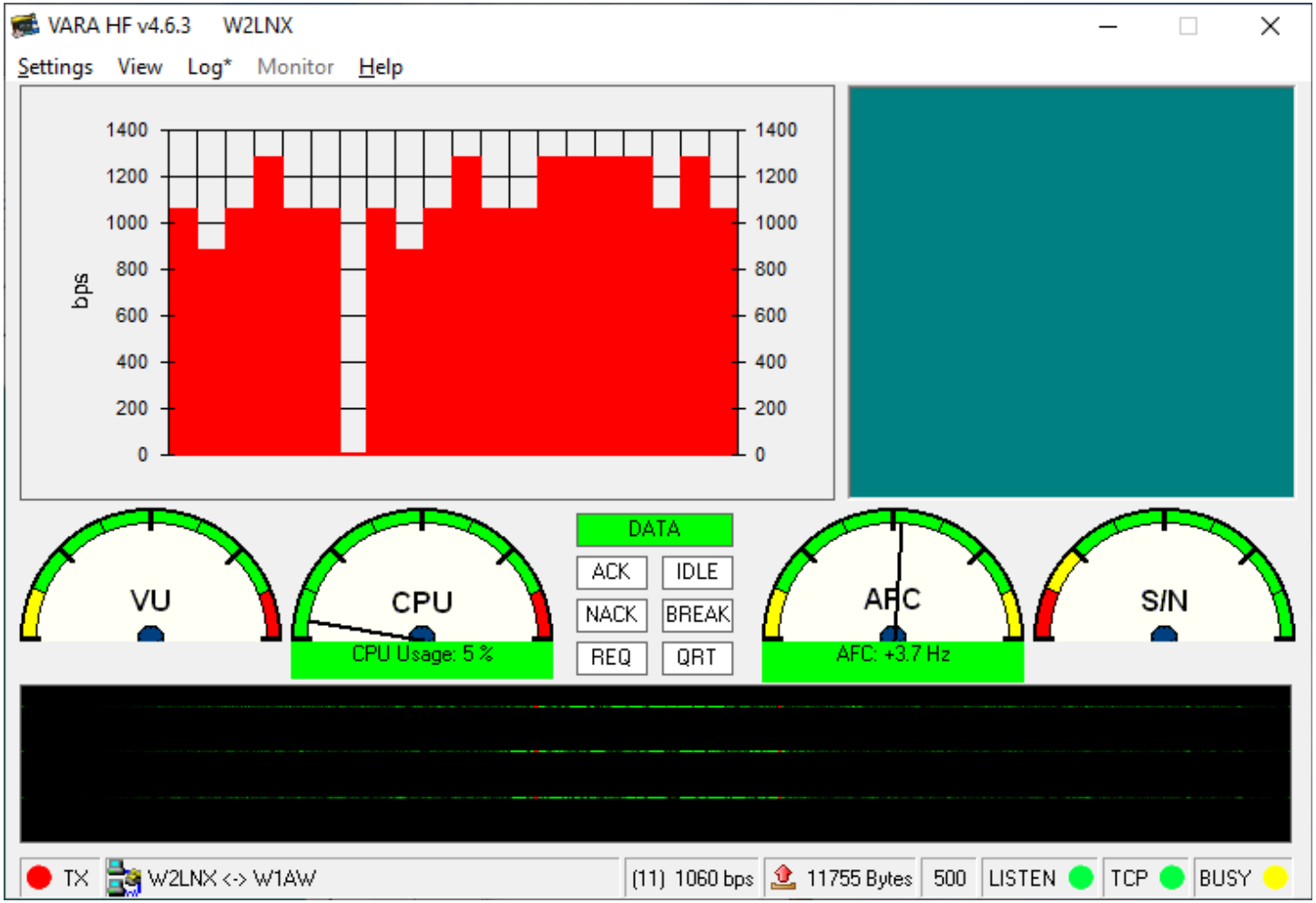
exchanging Winlink messages via WB3KAS and W1AW using 5 watts

demonstration

☞ `video:` send and receive messages via the WB3KAS Winlink gateway

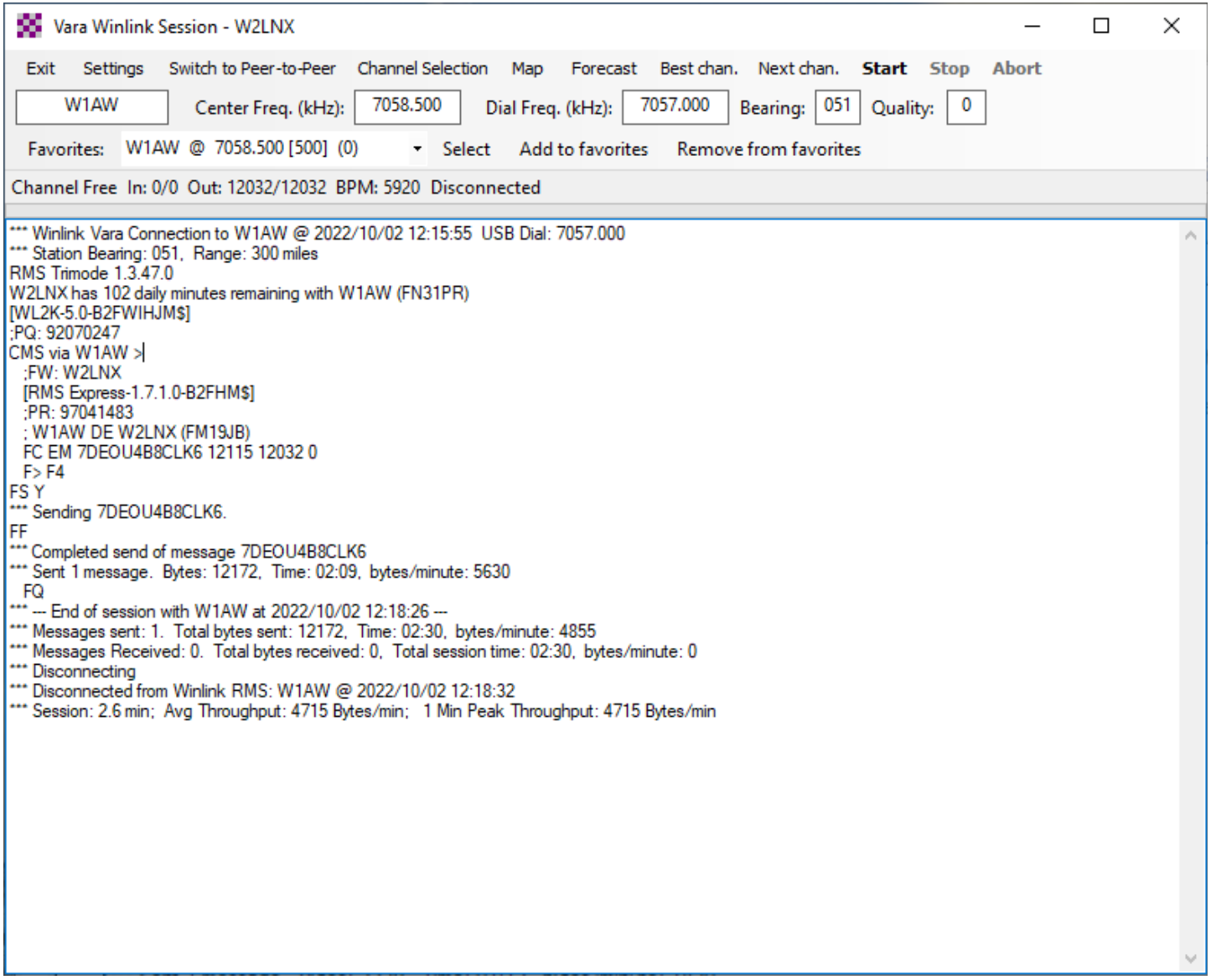


press Start to send message with file attachment

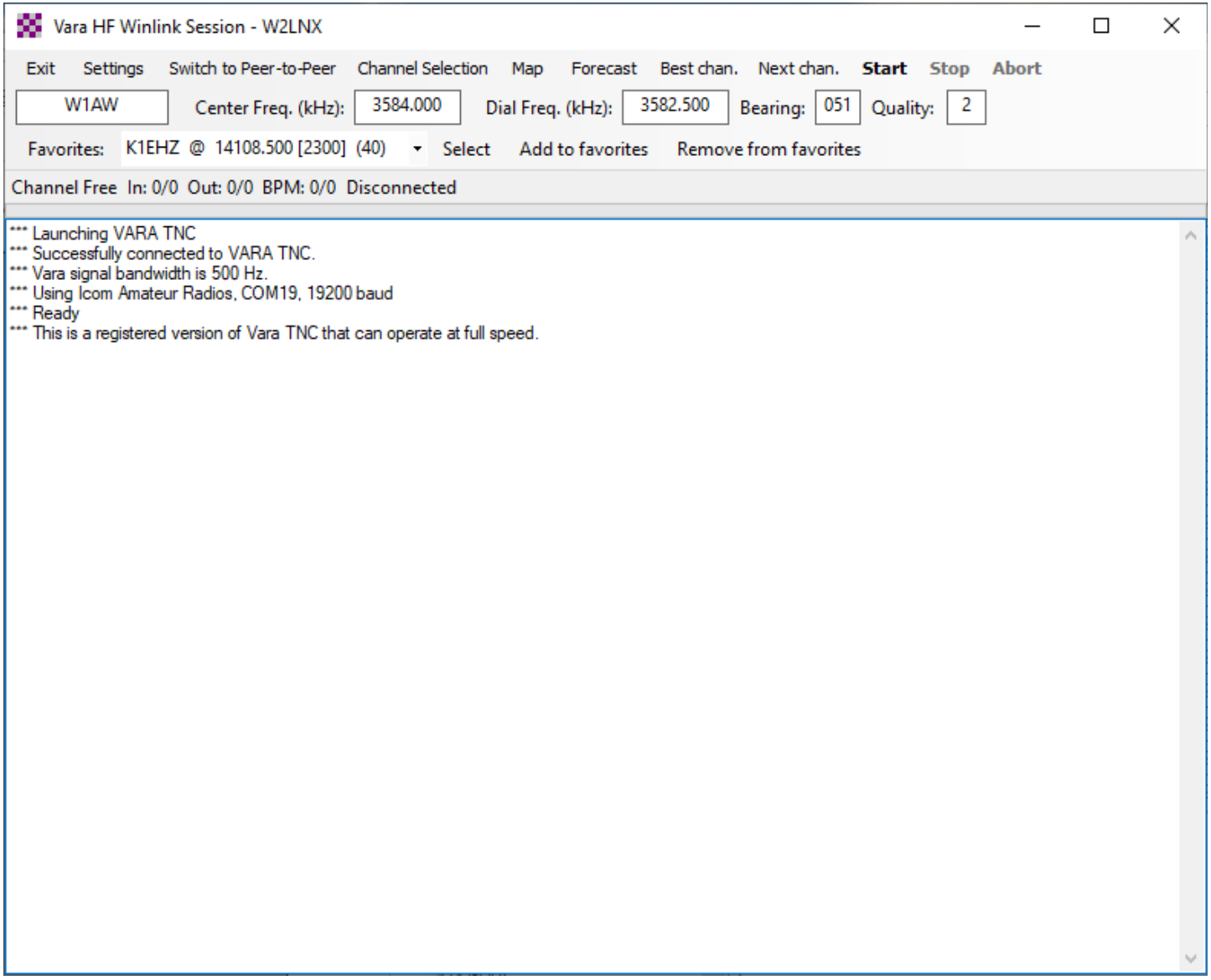


VARA HF displays transmission rate in red

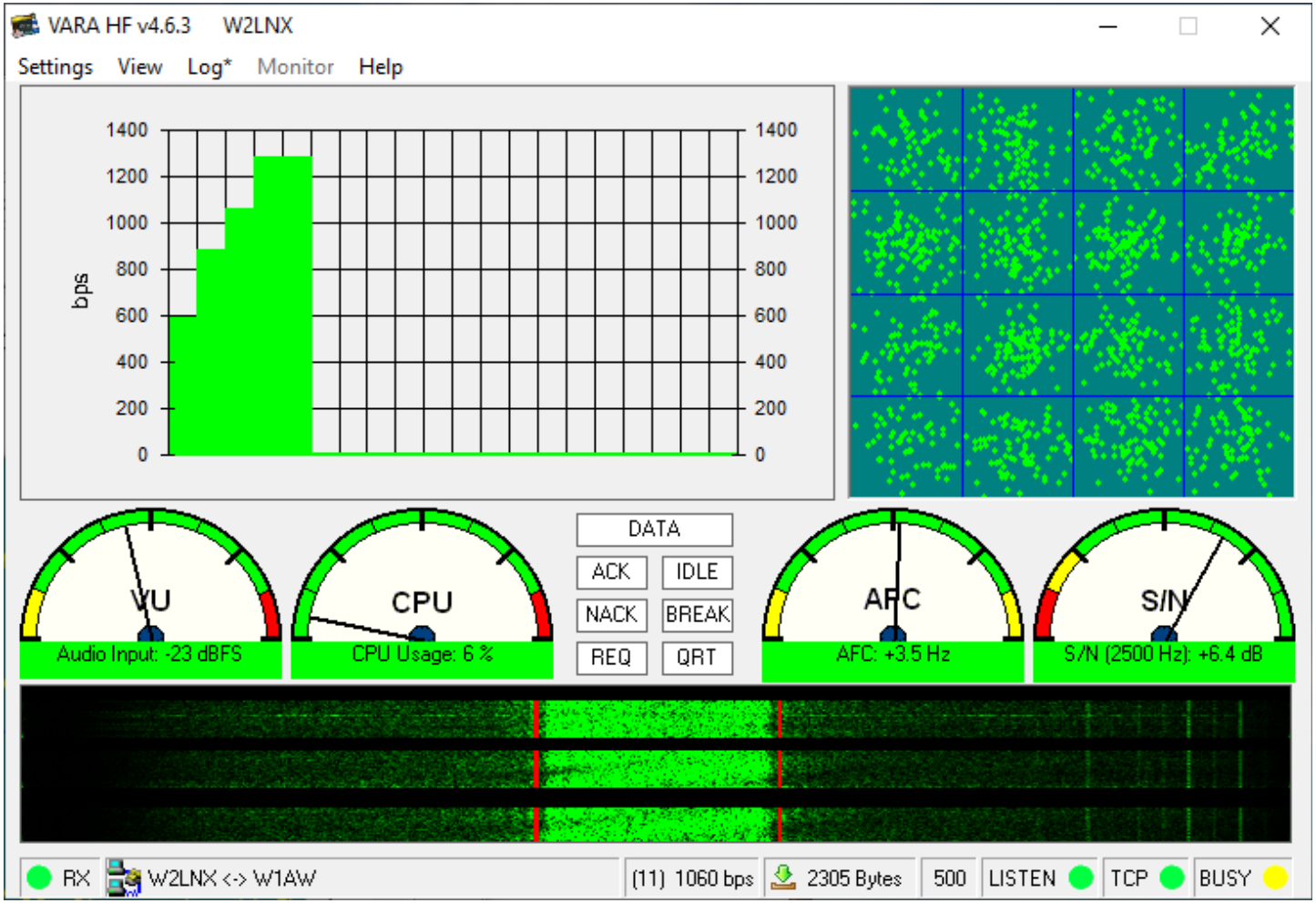
- the transmission rate is more than twice the bandwidth



log of finished transmission

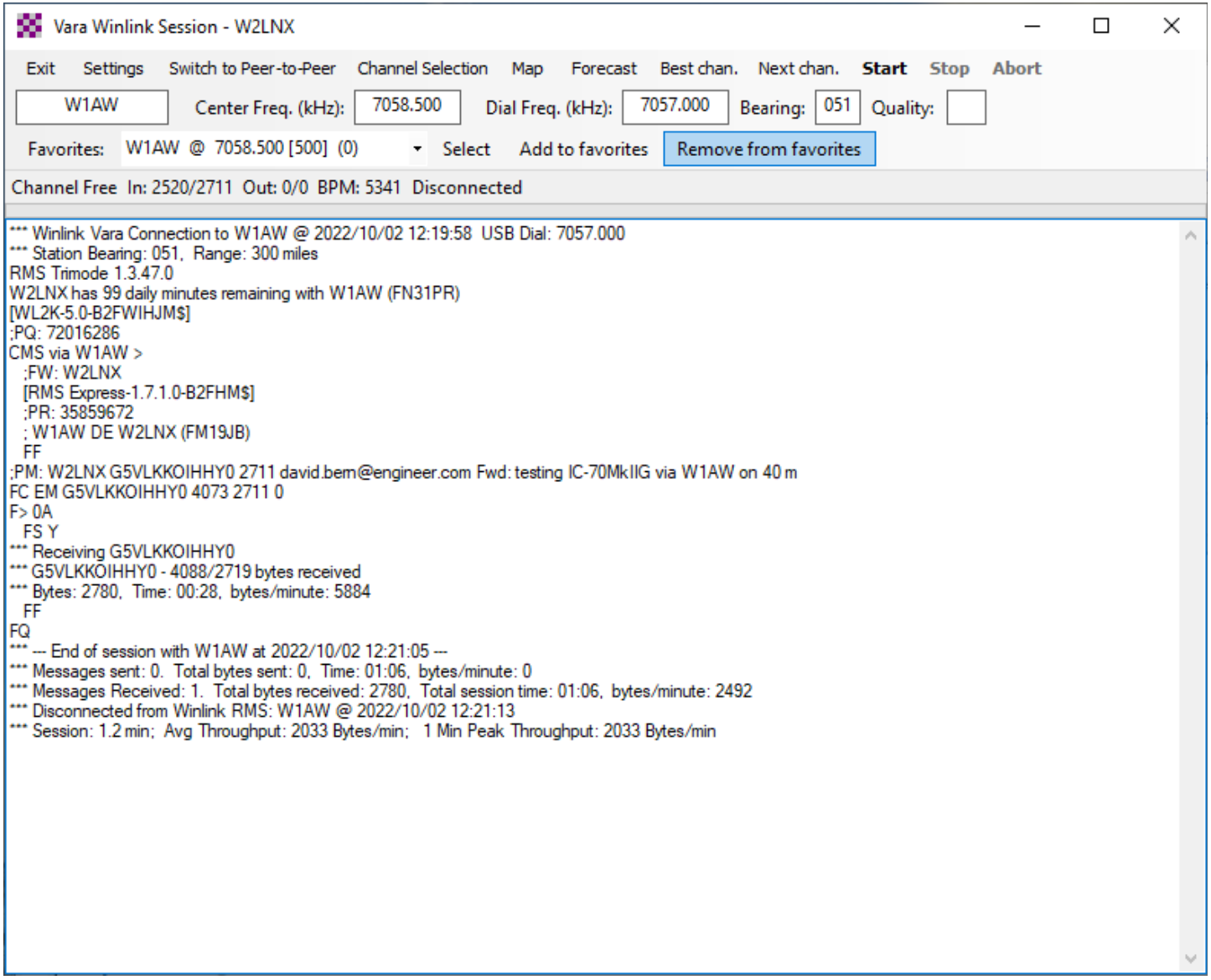


press Start to receive message with file attachment



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

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ask for assistance!