



## What is WINLINK

**Winlink Global Radio Email®** is a network of amateur radio and authorized government stations that provide worldwide radio email using radio pathways where the internet is not present. The system is built, operated and administered entirely by licensed "Ham" volunteers.

***It supports email with attachments, position reporting, weather and information bulletins, and is well-known for its role in interoperable emergency and disaster relief communications.***

It is capable of operating completely without the internet, automatically--using smart-network radio relays.

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



## How Can We Use Winlink?

Winlink can be used much like a standard email system, with some pros and cons.

Con: can't be used to send large attachments or images - it takes a long time!

Pro: can be used to send plain text, lists, small attachments, small zip files.

Con: need to be within range of a node or have internet access.

Pro: Winlink has a large number of FORMS for emergency communications.

# Where can I get WINLINK?

WINLINK Website: <https://winlink.org/>

- No cost, but there is a registration “nag” to remind you to support the project
- Registration (optional) - \$24
- Accounts are created within the software, not on the website!
- Account requirements:
  - A valid amateur radio license, or
  - a license from a participating government service or agency.
  - Ship station, marine or general radiotelephone licenses **DO NOT** qualify.

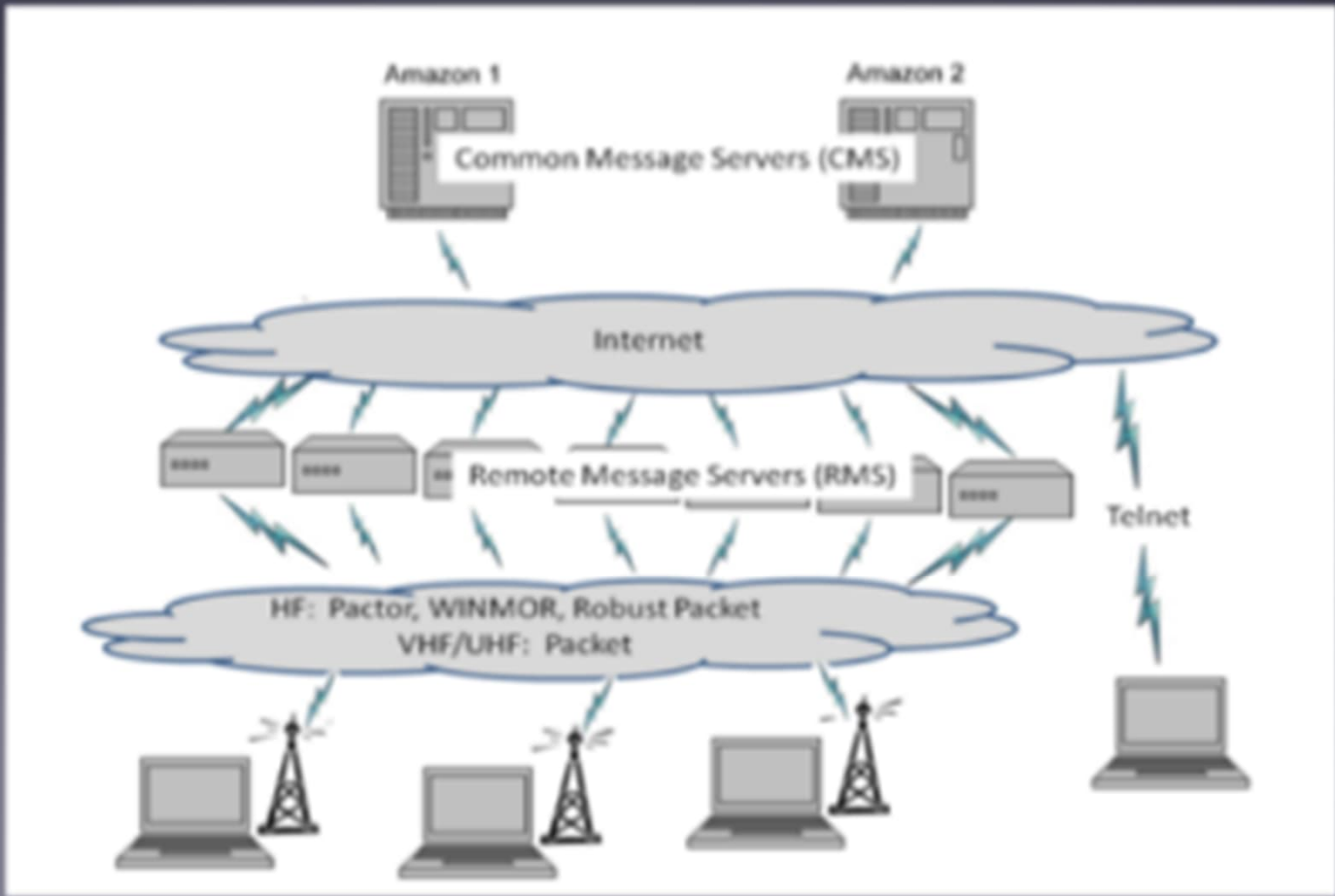
# WINLINK Delivery Modes

WINLINK delivers email in the following ways:

- “Store and Forward” using best route, including Internet
- P2P - peer to peer - direct between stations
- RF only - “Store and Forward” without using the Internet

# Winlink Architecture (Conventional Mode)

- CMS
- RMS (gateway)
- Client (you)



# Radio to Computer Interface

In order to use Winlink, you will need a computer controlled interface:

1. Sound Card type - Signalink, RigBlaster, DigiRig, homebrew
  - Inexpensive ~ \$100 or less
  - Flexible - can be adapted to many brands and models of radio
  - Plug-n-play (mostly)
  - Homebrew - USB Sound card and interfacing cable
2. Hardware packet TNC - PakRatt-232, Kantronics, etc...
  - Inexpensive (HAM fests) to expensive (New)
  - Older hardware, offloads communications from PC
  - Uses Serial ports (9 or 25 pin) - USB adapters can be purchased
  - Adapting to radio can be more difficult, uses Mic port.



# MASTERSCOMMUNICATIONS.COM include a hardware ptt

## Custom Products from Masters Communications

### Digital Radio Adapters

#### *The DRA Series for Digital Data Applications.*

##### Quick Description - What are they?

- DRAs are affordable wide-bandwidth radio optimized sound cards.
- They are available Assembled & Tested or as a Project Kit.
- They connect amateur (two-way) radios to a computer or host.
- They work with many digital data programs like VARA & SoundModem.
- They work with all versions of AllStar Link like our RA's.
- Standard DRAs are available with or without a plastic or metal case.
- Standard DRA (Metal-SC) Cases are available in blue or black.
- The 3D printed plastic cases are available in several colors.
- High Performance DRA-100's are available in black or silver.
- Metal cases for the Standard DRA's & DRA-100's are all aluminum / totally shielded.
- Assembled & Tested units are FCC Part 15 Class B Certified.
- A "[RATPAC](#)" [YouTube Presentation](#) on DRA Sound Cards and accessories by Dan Marler K7REX



# SOFTWARE FOR THE INTERFACE

- SOUNDMODEM 1200 baud packet
- VARA HF up to 7,000 baud
- VARAFM up to 25,210 baud
- DIREWOLF 1,200 baud packet
- ARDOP hf included in Winlink but not very popular currently
- Commercial tnc's up to Pactor4

# WINLINK EMAIL OVERVIEW

The screenshot displays the Winlink Express 1.7.17.0 - KA9CAR interface. The window title is "Winlink Express 1.7.17.0 - KA9CAR". The menu bar includes "KASCAR", "Settings", "Message", "Attachments", "Move To: Saved Items", "Delete", "Open Session: Vara FM Winlink", "Logs", and "Help".

The main window is titled "In Vara FM Winlink session." and contains a table of messages. The table has columns for Date/Time, Message ID, Size, Source, Sender, Recipient, and Subject. The messages are as follows:

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2024/07/12 15:12	AODNKEYEMXGY	12818	SERVICE	SERVICE	KASCAR	Test Message
2024/07/08 20:51	CBVYC93TMF7N	4549	SERVICE	SERVICE	KASCAR	Test Message
2024/07/08 20:45	TVOAUS8CTMVZ	4559	SERVICE	SERVICE	KASCAR	Test Message
2024/07/05 01:22	3P2FRQWQC930	12793	SERVICE	SERVICE	KASCAR	Test Message
2024/07/05 01:15	VD9TYF7EVFVO	12797	SERVICE	SERVICE	KASCAR	Test Message
2024/07/05 01:05	XIXEE7JXMU2G	12843	SERVICE	SERVICE	KASCAR	Test Message
2024/07/04 21:03	N2SCUW1XBY7N	12779	SERVICE	SERVICE	KASCAR	Test Message
2024/07/04 20:23	LAN7528MUJEA	12773	SERVICE	SERVICE	KASCAR	Test Message
2024/07/04 17:10	58IKHZZ9XN6H	12794	SERVICE	SERVICE	KASCAR	Test Message
2024/07/04 17:00	3DOKP3KZY80I	4544	SERVICE	SERVICE	KASCAR	Test Message
2024/07/03 19:26	3WHBNAH58BCO	636	SYSTEM	SERVICE	KASCAR	Approval Needed for Message [APRVLMD
2024/07/02 01:36	4HIA1W1G1RGL	834	SMTP	SMTP:wb9ylp@cc	KASCAR	//w12k
2024/07/01 22:54	HFTRIEIMIG17	4553	SERVICE	SERVICE	KASCAR	Test Message
2024/07/01 22:21	2ZJBP9MDOYP	4542	SERVICE	SERVICE	KASCAR	Test Message
2024/07/01 15:43	46TOT9RYHC9C	4544	SERVICE	SERVICE	KASCAR	Test Message

The selected message (Message ID: 4HIA1W1G1RGL) is displayed in the bottom pane. The message details are as follows:

Message ID: 4HIA1W1G1RGL  
 Date: 2024/07/02 01:36 (UTC)  
 From: wb9ylp@comcast.net  
 To: KASCAR  
 Source: SMTP  
 Downloaded-from: RMS:K9IQP  
 Subject: //w12k

Great!

Unfortunately Selected Kenwood 9600bd sometimes needs as much as 4V to drive it to full deviation as it bypasses filtering AND amplification stages. Most soundcards will clip at 3 ish volts.

You are somewhat far away and I've noticed a marked degradation 6-12dB in VHF signal strength over the last year as the Antenna and cabling are fairly waterlogged [25-30X/0 near as we figure] SO, check your logs and see who has the best SNR to connect to for speed check. We hope to have a new 4pole and 11/2 hardline @250'+ lifted this summer.

You can use your SDR dongle RX to check Deviation but as Occupied bandwidth [2x Dev] Set it for 10-12KHz at the 6dB points if you have enough drive to get that; remember the Data/PKT channels are all 20KHz Spaced...

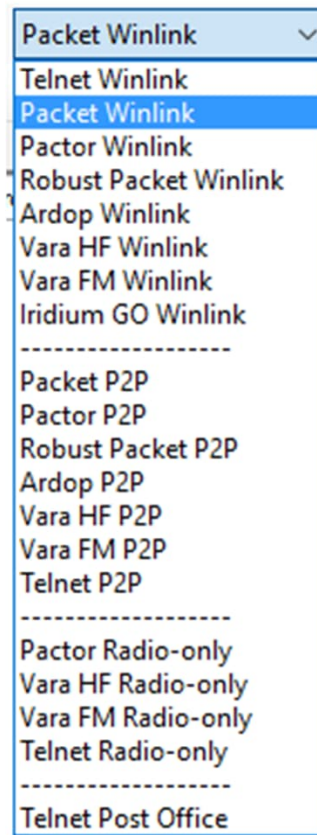
Good seeing you Blast past on the log! I'm stalled at 2KB/s with the current setup...

73 DE MAIT

Matt Squire  
 NM1S, 2nd Radiotelegraph

The left pane shows "System Folders" (Inbox (0 unread), Sent Items (21), Outbox (0), Saved Items (0), Deleted Items (0), Drafts (0)), "Personal Folders", "Global Folders", and "Contacts". The "Contacts" list includes various email addresses and call signs such as ACRWT, ARCCENTRAL, ATOZ@DLS.NET, C-SCHAEFER@SBCGLOBAL.NET, DACHRISTENSEN@MCHEMRYCOUNTYIL.GOV, DIALHOME-RADIO@YAHOO.COM, DYFI\_REPORTS\_AUTOMATED@USGS.GOV, ETO-05, ETO-BK, HMS-LLC@MACSTEWART.NET, JDEWEY@MC.NET, JDEWEYKASCAR@GMAIL.COM, JIM@N7US.NET, K0ISP, K9ECF, K9ECF@ARRL.NET, K9ESV, K9FHH, K9J, K9IQP, K9MGS, K9NGL, K9SCAR, K9SCAR@ARRL.NET, K9MGS, K9PCY, K9EZZ, K9EZZ@ARRL.NET, K9YMD, KC9HBB, KD9BBB, and KD9USA.

# MANY WAYS TO CONNECT TO WINLINK



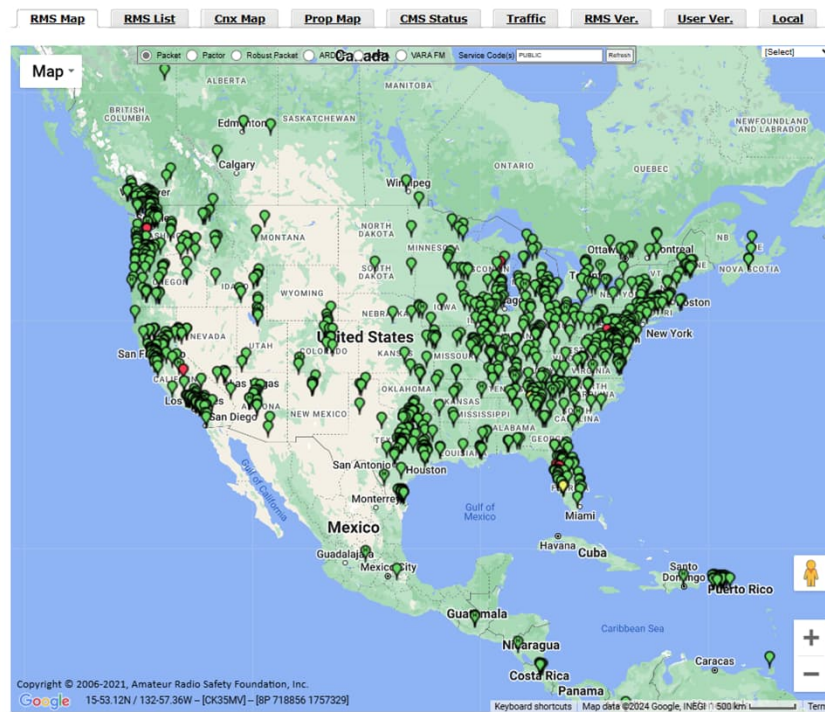
# Winlink Forms

Winlink has a multitude of forms for communications.

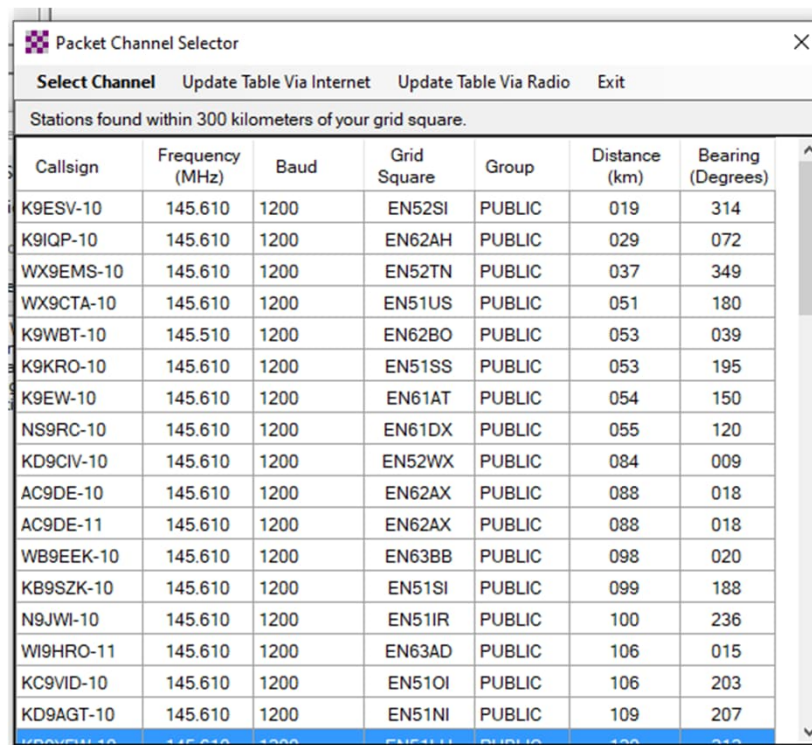
1. Start a new message
2. At the top of the new message window, Select Template (ex: Radiogram)
3. A web browser window opens with fillable fields
4. Fill out your form and click submit.
5. The browser window clears and you are sent back to the message.
6. Click Post to Outbox to queue it for sending.

# PACKET RMS STATIONS THIS AFTERNOON

## Live System Information



# VHF PACKET RMS NEAR CRYSTAL LAKE



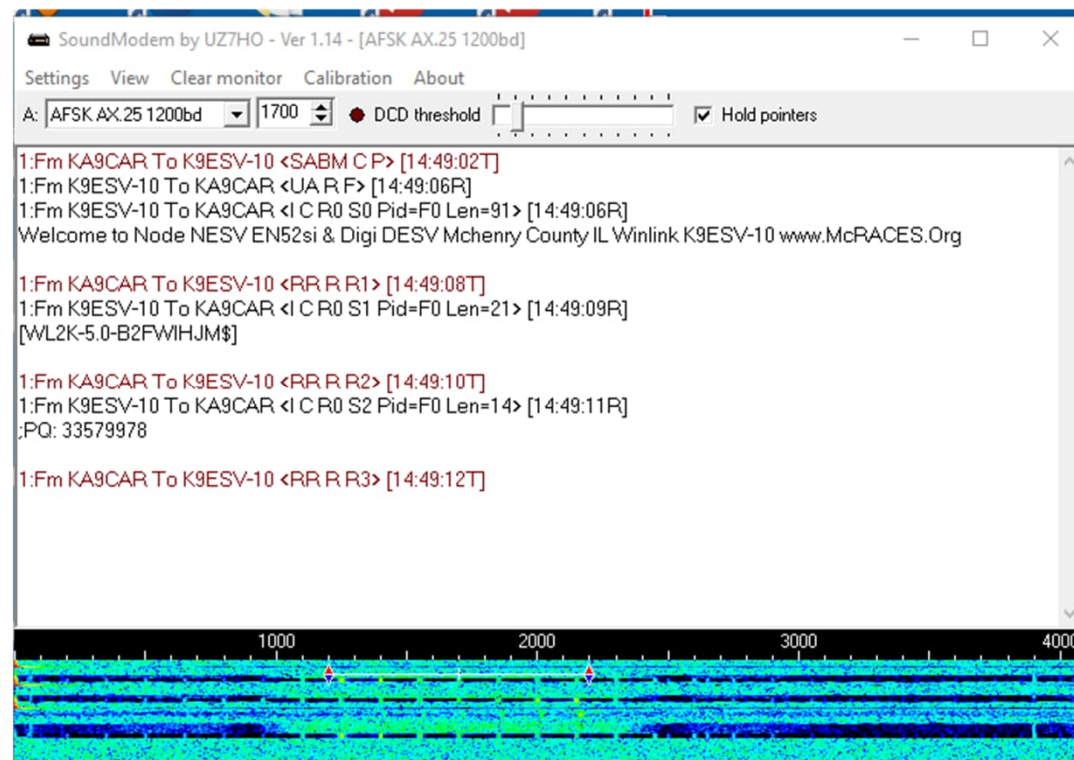
Packet Channel Selector

Select Channel Update Table Via Internet Update Table Via Radio Exit

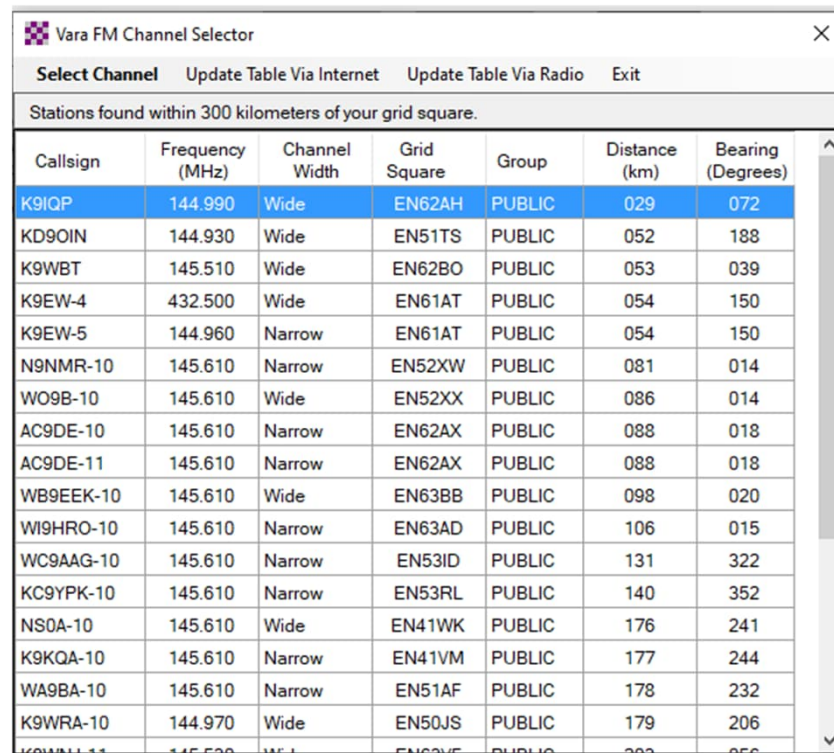
Stations found within 300 kilometers of your grid square.

Callsign	Frequency (MHz)	Baud	Grid Square	Group	Distance (km)	Bearing (Degrees)
K9ESV-10	145.610	1200	EN52SI	PUBLIC	019	314
K9IQP-10	145.610	1200	EN62AH	PUBLIC	029	072
WX9EMS-10	145.610	1200	EN52TN	PUBLIC	037	349
WX9CTA-10	145.610	1200	EN51US	PUBLIC	051	180
K9WBT-10	145.510	1200	EN62BO	PUBLIC	053	039
K9KRO-10	145.610	1200	EN51SS	PUBLIC	053	195
K9EW-10	145.610	1200	EN61AT	PUBLIC	054	150
NS9RC-10	145.610	1200	EN61DX	PUBLIC	055	120
KD9CIV-10	145.610	1200	EN52WX	PUBLIC	084	009
AC9DE-10	145.610	1200	EN62AX	PUBLIC	088	018
AC9DE-11	145.610	1200	EN62AX	PUBLIC	088	018
WB9EEK-10	145.610	1200	EN63BB	PUBLIC	098	020
KB9SZK-10	145.610	1200	EN51SI	PUBLIC	099	188
N9JWI-10	145.610	1200	EN51IR	PUBLIC	100	236
WI9HRO-11	145.610	1200	EN63AD	PUBLIC	106	015
KC9VID-10	145.610	1200	EN51OI	PUBLIC	106	203
KD9AGT-10	145.610	1200	EN51NI	PUBLIC	109	207

# PACKET RECEIVE SIGNAL QUALITY



# VARA FM NEAR CRYSTAL LAKE



Vara FM Channel Selector

Select Channel Update Table Via Internet Update Table Via Radio Exit

Stations found within 300 kilometers of your grid square.

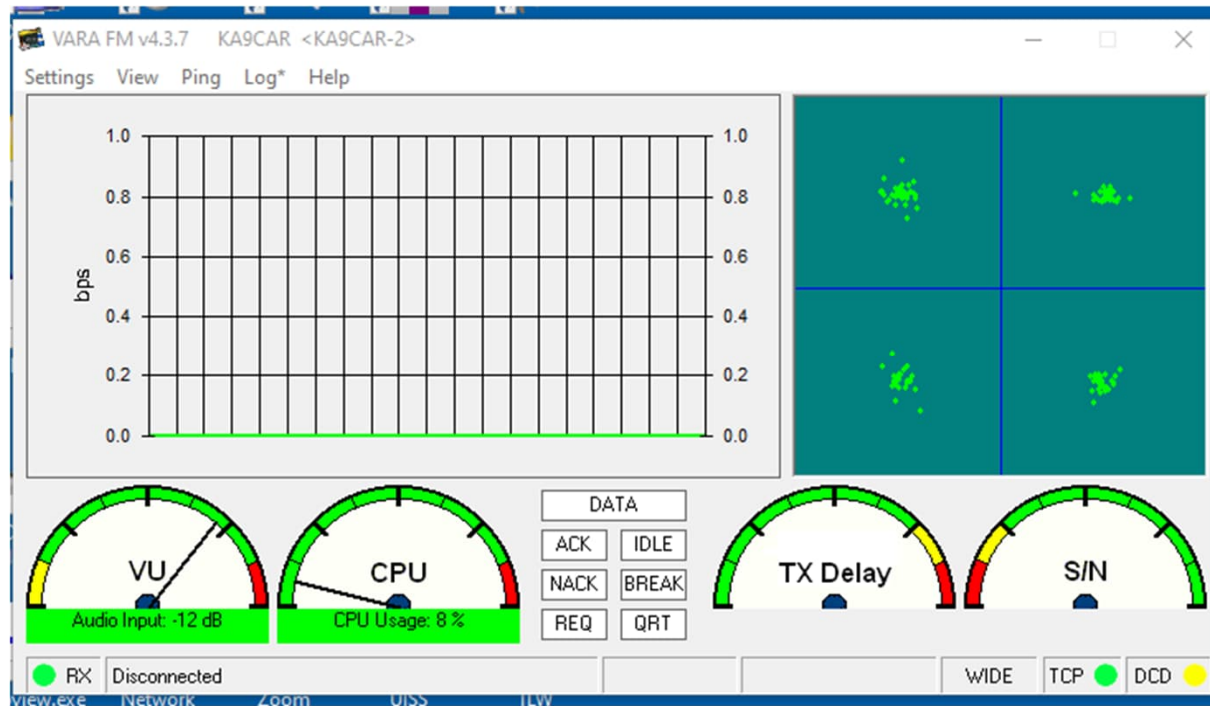
Callsign	Frequency (MHz)	Channel Width	Grid Square	Group	Distance (km)	Bearing (Degrees)
K9IQP	144.990	Wide	EN62AH	PUBLIC	029	072
KD9OIN	144.930	Wide	EN51TS	PUBLIC	052	188
K9WBT	145.510	Wide	EN62BO	PUBLIC	053	039
K9EW-4	432.500	Wide	EN61AT	PUBLIC	054	150
K9EW-5	144.960	Narrow	EN61AT	PUBLIC	054	150
N9NMR-10	145.610	Narrow	EN52XW	PUBLIC	081	014
WO9B-10	145.610	Wide	EN52XX	PUBLIC	086	014
AC9DE-10	145.610	Narrow	EN62AX	PUBLIC	088	018
AC9DE-11	145.610	Narrow	EN62AX	PUBLIC	088	018
WB9EEK-10	145.610	Wide	EN63BB	PUBLIC	098	020
WI9HRO-10	145.610	Narrow	EN63AD	PUBLIC	106	015
WC9AAG-10	145.610	Narrow	EN53ID	PUBLIC	131	322
KC9YPK-10	145.610	Narrow	EN53RL	PUBLIC	140	352
NS0A-10	145.610	Wide	EN41WK	PUBLIC	176	241
K9KQA-10	145.610	Narrow	EN41VM	PUBLIC	177	244
WA9BA-10	145.610	Narrow	EN51AF	PUBLIC	178	232
K9WRA-10	144.970	Wide	EN50JS	PUBLIC	179	206
K9WRA-11	145.520	Wide	EN50JS	PUBLIC	179	206



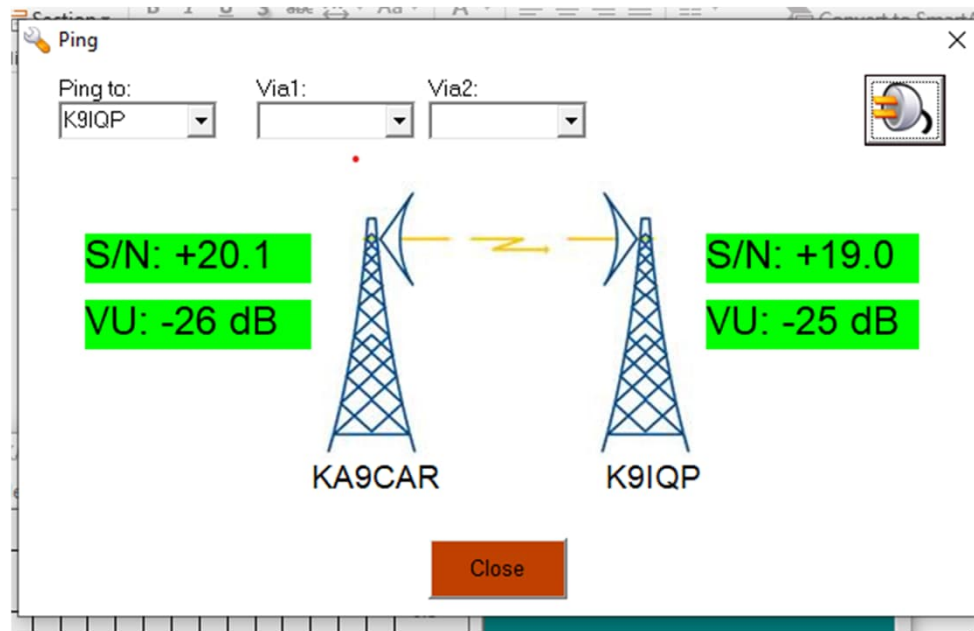
**VARA FM v4.0.0**  
**Speed Levels**

Level	VARA FM WIDE				VARA FM NARROW			
	Symbol Rate	Carriers	Mod.	Net Rate (bps)	Symbol Rate	Carriers	Mod.	Net Rate (bps)
1	42	14	4PSK	566	42	14	4PSK	549
2	42	29	4PSK	1188	42	29	4PSK	1181
3	42	58	4PSK	2390	42	58	4PSK	2390
4	42	98	4PSK	4040	42	58	4PSK	3188
5	42	98	4PSK	5387	42	58	8QAM	4252
6	42	98	8QAM	7185	42	58	16QAM	5668
7	42	98	16QAM	9580	42	58	32QAM	7087
8	42	116	16QAM	11340	42	58	64QAM	8505
9	42	116	32QAM	14144	42	58	64QAM	9567
10	42	116	64QAM	16932	42	58	128QAM	11162
11	42	116	64QAM	19003	42	58	256QAM	12750
12	42	116	128QAM	22102				
13	42	116	256QAM	25210				

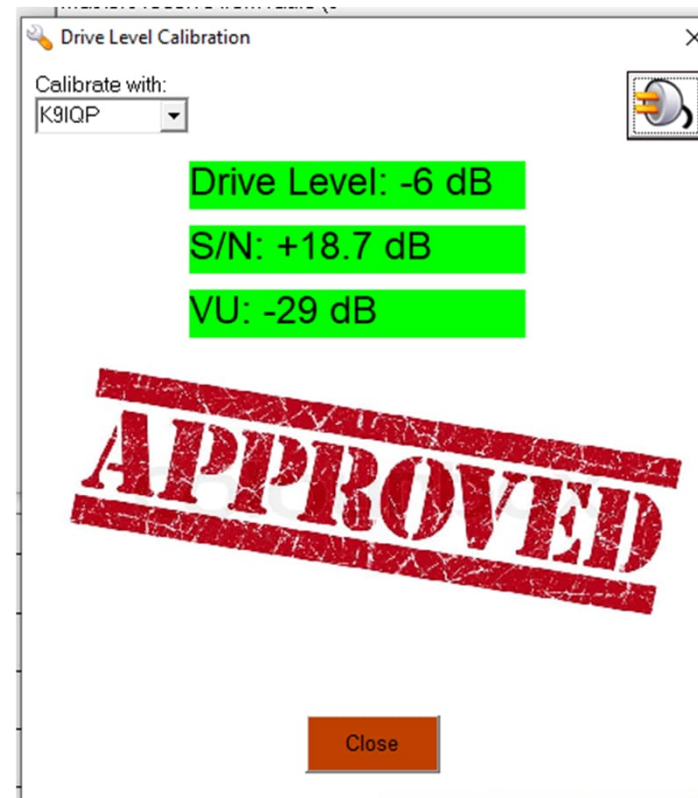
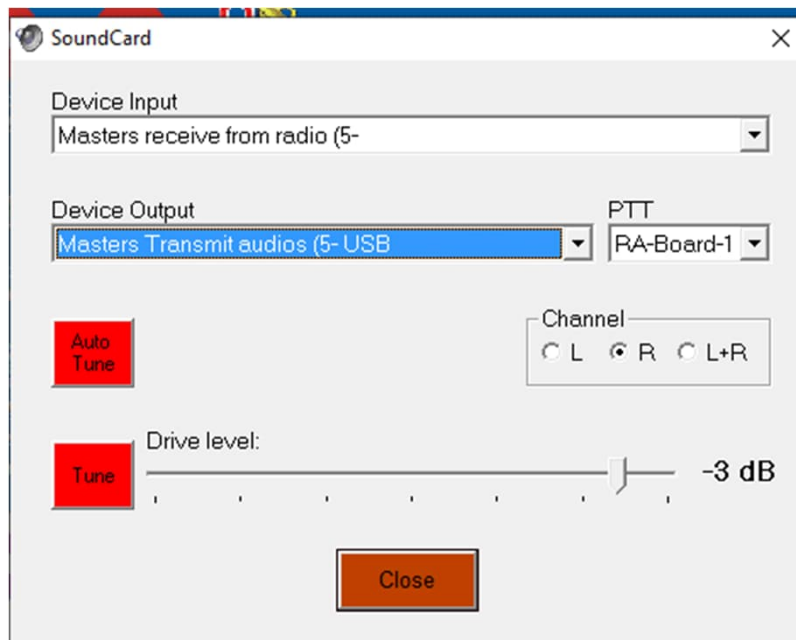
# VARA VHF FM SIGNAL QUALITY



# QUICK CHECK OF SIGNAL QUALITY

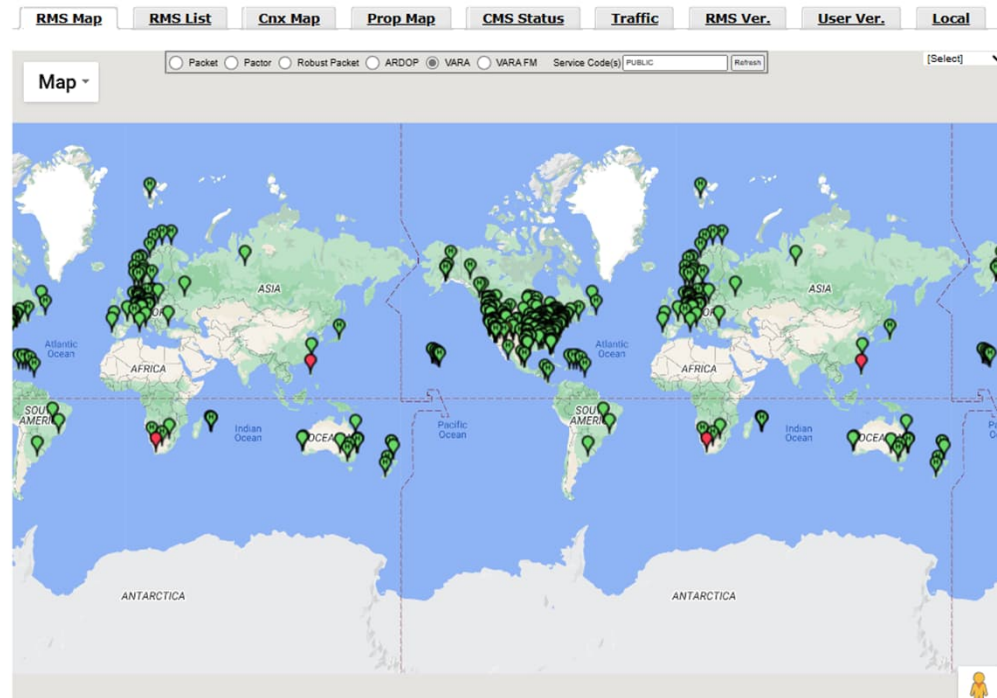


# SETTING TX AND RX LEVELS



# VARA HF THIS AFTERNOON

## Live System Information



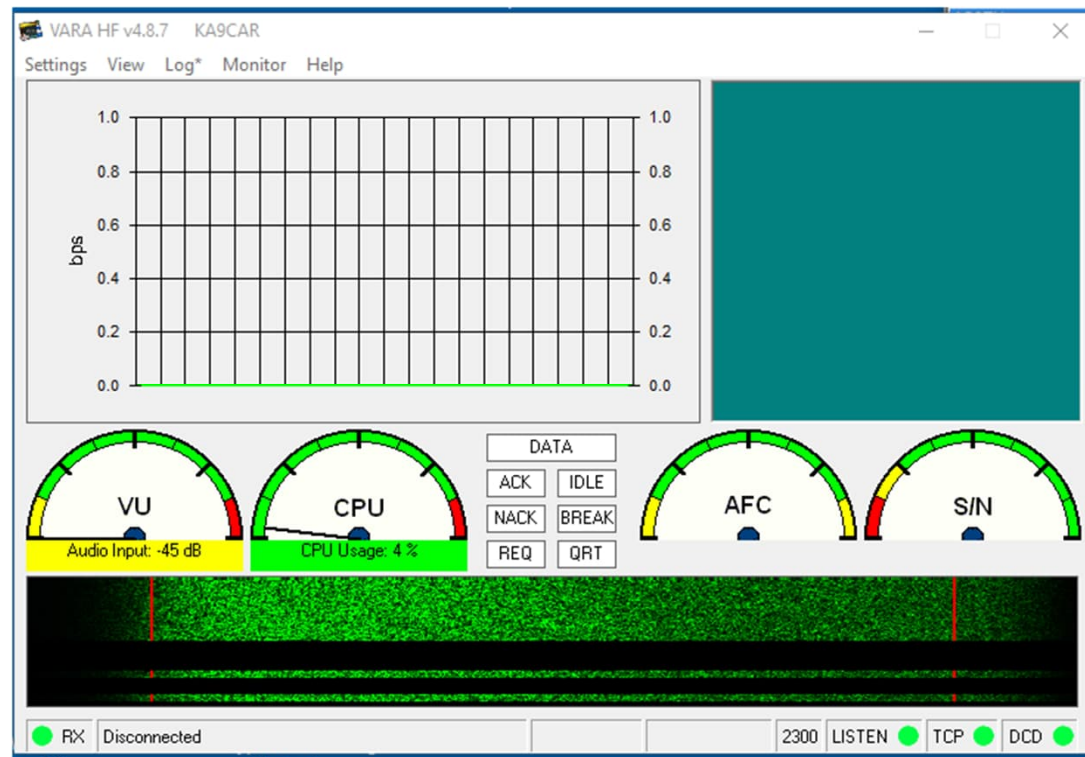
# VARA HF CHOICES

HF Channel Selector									
Select Channel Update Via Internet Update Via Radio Map Forecast SFI Exit All RMS									
Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (km)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
KD9OIN	3596.500	V2300	EN51TS	00-23	PUBLIC	52	188	99	99
KD9OIN	7103.500	V2300	EN51TS	00-23	PUBLIC	52	188	96	96
KD9UDL	7103.300	V2750	EN62AB	00-23	PUBLIC	33	125	96	96
KD9UDL	7102.000	V2750	EN62AB	00-23	PUBLIC	33	125	96	96
KD9UDL	10147.000	V2750	EN62AB	12-03	PUBLIC	33	125	94	94
KD9UDL	14101.900	V2750	EN62AB	12-03	PUBLIC	33	125	92	92
KD9UDL	21091.500	V2750	EN62AB	12-03	PUBLIC	33	125	87	87
KB8AY	7101.500	V2750	EN82CI	00-23	PUBLIC	370	086	59	43
NS0A	10147.200	V2750	EN41VL	00-23	PUBLIC	179	243	57	43
NS0A	7103.500	V2750	EN41VL	00-23	PUBLIC	179	243	57	42
K9WRA	10146.300	V2300	EN50JS	00-23	PUBLIC	179	206	57	43
NU9R	7098.200	V500	EN60ED	00-23	PUBLIC	238	166	56	42
K9WRA	7103.800	V2300	EN50JS	00-23	PUBLIC	179	206	56	42
W6IDS	10131.500	V500	EM79NV	14-23	PUBLIC	385	131	56	42
W9OTR	10145.500	V500	EM68SR	00-23	PUBLIC	418	158	55	42
VE3WLR	10134.000	V2750	FN04DI	00-23	PUBLIC	732	068	55	42
K1JST	14105.000	V2750	FN41EO	00-23	PUBLIC	1377	087	55	42
KD7UHR	10146.400	V2750	EM58BQ	00-23	PUBLIC	416	199	54	41
W6IDS	7084.500	V500	EM79NV	00-23	PUBLIC	385	131	54	41
KC0TPS	10145.900	V2300	EM48VN	00-23	PUBLIC	439	202	54	41
WW2MI	7103.600	V2750	EN82KR	00-23	PUBLIC	426	081	54	41
VA3EOA	10148.000	V500	EN48ES	00-23	PUBLIC	771	341	54	42
KD5EOC	14105.500	V2300	EM13KF	00-23	PUBLIC	1264	221	53	41
W6IDS	7061.500	V500	EM79NV	00-23	PUBLIC	385	131	53	41
KA2FNK	10147.000	V2300	EM29PA	00-23	PUBLIC	648	239	53	41

**VARA HF v4.0.0**  
**Speed Levels**

Level	VARA HF 2300				VARA HF 500			
	Symbol Rate	Carriers	Mod.	Net Rate (bps)	Symbol Rate	Carriers	Mod.	Net Rate (bps)
1	23	32	FSK	18	23	11	FSK	18
2	47	16	FSK	41	47	11	FSK	41
3	47	16	FSK	82	47	11	FSK	61
4	94	16	FSK	175	94	2	BPSK	88
5	94	3	4PSK	270	94	2	4PSK	177
6	94	4	4PSK	363	94	3	4PSK	270
7	94	6	4PSK	549	42	11	4PSK	441
8	94	8	4PSK	735	42	11	4PSK	588
9	94	10	4PSK	922	42	11	4PSK	705
10	42	49	4PSK	2011	42	11	8PSK	884
11	42	49	4PSK	2682	42	11	8PSK	1060
12	42	49	4PSK	3219	42	11	16QAM	1286
13	42	49	8PSK	4025	42	11	32QAM	1543
14	42	49	8PSK	4830				
15	42	49	16QAM	5872				
16	42	49	32QAM	7050				

# VARA HF SIGNAL QUALITY METERS





# ARDOP STATIONS

HF Channel Selector

Select Channel Update Via Internet Update Via Radio Map Forecast SFI Exit All RMS

Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (km)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
WW4MSK	14104.500	2000	EM83DS	00-23	PUBLIC	1021	155	39	37
WA3WLH-10	14108.500	2000	FN20FJ	00-23	PUBLIC	1082	097	40	37
K4PAR-2	14103.800	2000	EM83II	00-23	PUBLIC	1079	154	40	37
WD5EED	10148.500	2000	EM44XT	00-23	PUBLIC	838	191	40	38
K2FAM	14108.800	2000	FN21RA	00-23	PUBLIC	1148	092	42	38
KD0SFY	14094.500	500	DM78OV	00-23	PUBLIC	1438	261	42	38
KD0SFY	14105.500	2000	DM78OV	00-23	PUBLIC	1438	261	42	38
KX8U-10	7106.500	500	EM79TK	00-23	PUBLIC	452	132	42	39
KD5BS	10148.500	2000	EM54BW	00-23	PUBLIC	821	190	42	39
WM4RB	10147.000	2000	EM75ME	00-23	PUBLIC	833	159	43	39
W90TR	7102.500	500	EM68SR	00-23	PUBLIC	418	158	46	39
KB2PCN-8	14109.500	2000	DM88BX	00-23	PUBLIC	1361	260	50	40
W5WK	14102.000	2000	EM12HL	13-23	PUBLIC	1346	219	50	40
N2GWK	10135.000	500	EM77GU	00-23	PUBLIC	543	153	52	41
K4MSU	10147.000	2000	EM56UO	11-03	PUBLIC	625	180	52	41
W6IDS	7061.500	500	EM79NV	00-23	PUBLIC	385	131	53	41
WB9QPM	7102.500	2000	EM59OJ	00-23	PUBLIC	317	188	53	41
W6IDS	7084.500	500	EM79NV	00-23	PUBLIC	385	131	54	41
WW2MI	7103.600	2000	EN82KR	00-23	PUBLIC	426	081	54	41
W90TR	10145.500	500	EM68SR	00-23	PUBLIC	418	158	55	42
NU9R	7098.200	500	EN60ED	00-23	PUBLIC	238	166	56	42
K9WRA	7103.800	2000	EN50JS	00-23	PUBLIC	179	206	56	42
W6IDS	10131.500	500	EM79NV	14-23	PUBLIC	385	131	56	42
K9WRA	10146.300	2000	EN50JS	00-23	PUBLIC	179	206	57	43