



Cherokee County ARES Application of Technologies Fieldday 2024- VARAC

22 June 2024

W1JKU-ROB



Purpose

The purpose of this presentation is to cover the most-common technologies we leverage within ARES. Provide you an overview of these items so that you have a better appreciation of the tool, how we may leverage that tool, and allow you to increase the assets in your toolbox.

In the end, we are communicators. We need to leverage the appropriate tool to accomplish the mission and deliver the message as required.

Modes have been identified in this presentation if they are a Priority for Cherokee ARES, or being Tested by Cherokee ARES.



References

- [Cherokee County ARES Operations Manual](#)
- [ARRL ARES – Field Resource Manual](#)
- [Field Operating Guides, including AUXFOG](#)
- [GA ARES Website](#)
- [hamradioschool.com](#)



Welcome

Welcome to the Cherokee County, Georgia Amateur Radio Emergency Service®

- While amateur radio is a hobby, we encourage you to participate in our weekly nets, various drills/exercises throughout the year, and be prepared to answer the call from our community when emergency communications are needed.
- We are NOT storm-chasers, nor are we First-Responders.
- We are a dedicated group of amateur radio operators that follow the chain of command.
- We deploy only when requested by our served agency, and only when approved by your Emergency Coordinator of Cherokee County, or one of the delegated Assistant Emergency Coordinators.
- We encourage you to participate and give back to your community and remain prepared to answer the call to service when requested.



Mission

Cherokee County ARES supports our primary served agency, Cherokee County EMA- Emergency Management Agency and when requested other agencies in our area or NW GA District.

We annually support the following activities:

1. [Field Day along with our Club-WX4CAR.ORG](http://WX4CAR.ORG)
2. [The Georgia Death Race \(PT Bravo and Nimblewill Gap\)](#)
3. [The Georgia Jewel](#)
4. [NW GA District ARES](#)
5. **The Annual ARRL Simulated Emergency Test (SET)**
6. As needed [SKYWARN](#) nets



ARES Organization

The American Radio Relay League's Amateur Radio Emergency Service is divided into four levels, national, section, district and local.

- There are 71 sections in the USA.
- The Georgia section is broken into 8 districts that are illustrated below
- Our group is part of the Georgia Section, Northwest District.
- Each of Georgia's 159 counties has an Emergency Coordinator.



Georgia Section Northwest District

Bartow
Catoosa
Chattooga
Cherokee
Dade
Fannin
Floyd
Gilmer
Gordon
Murray
Pickens
Polk
Walker
Whitfield



Technology and Methods

- Phone/Voice (Simplex, Duplex "Repeaters", HF)
- Phone/Voice via DSTAR (REF30B)
- Winlink (Telnet, Packet, VARA-HF, VARA-FM, ARDOP, P2P, Radio-Only)
- DRATS
- APRS
- FLDIGI (MT63-1KS)
- VARAC
- JS8CALL



Phone/Voice (Simplex, Duplex, HF)



Phone/Voice (Simplex, Duplex, HF)

- We must be able to Listen and Talk Real-Time with other stations.
- You must get comfortable with clicking the TX button on your radio and letting your voice be heard, while following proper radio procedures.
- Your radio needs to be loaded with our Frequencies from our [ICS-217](#) that covers all Simplex, Duplex (Repeaters), and HF we leverage in Cherokee County, Northwest GA, and State ARES.
- **For Directed NETS, You must listen to Net Control, following all instructions from NET Control. NET Control is in Charge!!!**



Phone/Voice (Simplex, Duplex, HF)

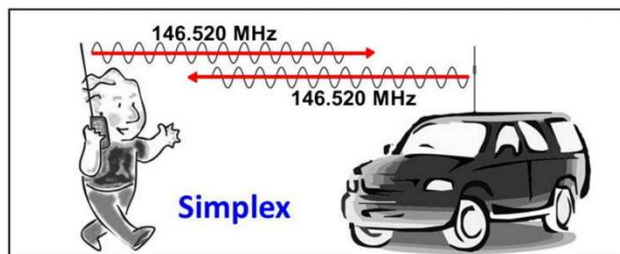
Simplex- Radio to Radio without the Aid of a Repeater.

What is Simplex?

- In the amateur radio context, *simplex operation* means the radio stations are communicating with each other directly, on the same frequency. Both stations take turns transmitting and receiving on the same frequency with no repeater or other device in between.

Why Simplex?

- Repeater may be offline due to power issues, interference, infrastructure issues, etc.
- We may be operating close by, where we do not need a repeater to communicate.





Phone/Voice (Simplex, Duplex, HF)

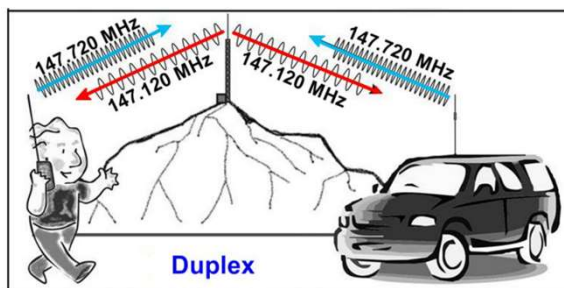
Duplex- Radio to Radio with the Aid of a Repeater.

What is Duplex?

- In the amateur radio context, *duplex operation* means the radio stations transmit on one frequency, a repeater intercepts that signal, may increase power of signal, and send signal out on a different receive frequency.

Why Duplex?

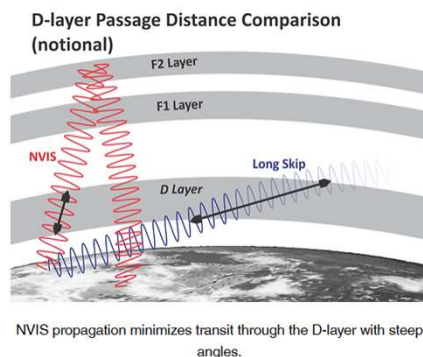
- Leverage a Repeater on high-ground (Mountain or Elevated Antenna) that has ability to increase signal coverage to more personnel that normally would not have been able to communicate in simplex mode due to terrain, distance, or power.



Phone/Voice (Simplex, Duplex, HF)

HF- Radio to Radio using HF 6 Meters – 80 Meters

- With HF we can communicate further than Simplex or Duplex (VHF/UHF).
- With the proper antenna (NVIS), we have the ability to talk within our District, Region, State, 50 – 600 miles.
- With non-NVIS Antenna, we have ability to talk around the World.
- We typically use NVIS Antennas for 40Meters through 80 Meters for ARES.

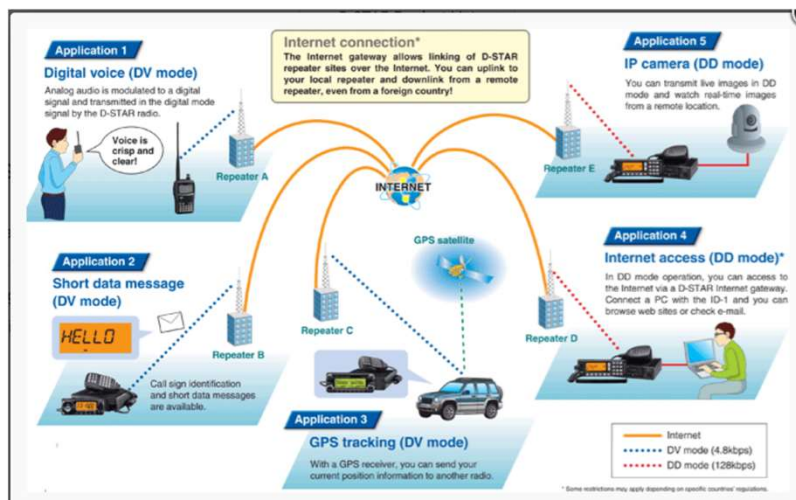


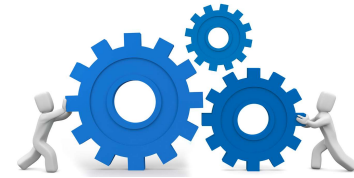
Phone/Voice via DSTAR (REF030B)

- DSTAR Repeaters link to other DSTAR repeaters via the Internet.
- DSTAR Repeaters give you the ability to communicate thorough the State, Country, and the World.
- At the State Level DSTAR is used very frequently for State Nets, Hospital Nets, etc.
- DSTAR is not pushed at the Cherokee County Level as we have other tools to communicate within the county without asking each of you to buy additional DSTAR Capable radios and Hotspots. **BUT DSTAR is a valuable GA ARES Tool.**
- DSTAR Reflectors used by ARES:
 - REF030B is typically used for GA AREES
 - REF030C is used for RAGCHEW around the World
 - REF030D is used for DRATS

Phone/Voice via DSTAR (REF030B)

- K9APD is in process of standing up a DSTAR Repeater on Pine-Log. This would allow you, if you had a DSTAR Capable radio, of taking advantage of DSTAR over RF.
- You can also link your DSTAR Capable radio to a DSTAR Hotspot allowing you to connect to any Ratflector or DSTAR capable repeater of your choosing.





Phone/Voice (Simplex, Duplex, HF, DSTAR)

IMPLEMENTATION

- A. Cherokee ARES NET Primary WX4AUX Repeater, Alternate KG4VUB Repeater, 3rd Alternate WA4EOC Repeater.
- B. Cherokee ARES Simplex 147.585 and 439.600 (We use for NETS, FieldDay, GA DeathRace, GA Jewel, and anytime we want a local talk-about Frequency)
- C. NWGA ARES NET Primary: KC4QAS Repeater, Alternate 144.830-K4SJR)
- D. NWGA ARES Simplex: 145.595 & 147.955
- E. NWGA ARES: 10M-28.430 USB and 6M- 50.130 USB
- F. AUXCOM/MARS/Regional Coverage: 60M USB (Find available Channel)
 - Channel 1: 5330.5 kHz
 - Channel 2: 5346.5 kHz
 - Channel 3: 5357.0 kHz
 - Channel 4: 5371.5 kHz
 - Channel 5: 5403.5 kHz
- G. GA ARES NET HF 80M (Evening)- 3.975 LSB & 40M (Day)- 7.2875 LSB (+/-) Find available Freq
- H. GA ARES DSTAR NET REF030B

Winlink

Winlink

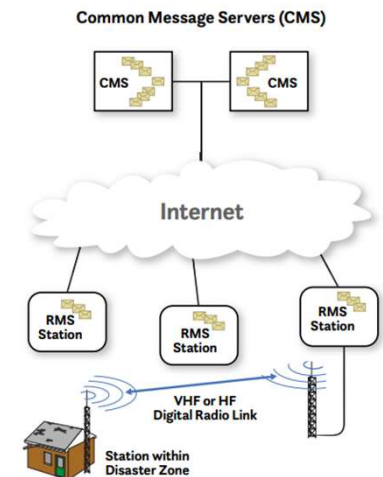


Winlink is an application that allows Amateur Radio Operators to send Non-Encrypted Emails over the Internet or over RF using your radio.

Winlink support multiple modes of RF Capability including:

- Packet, VARA-FM, VARA-HF, ARDOP, P2P, & Radio Only
 - All modes except P2P and Radio Only relies on the Internet/CMS Servers for sending and receiving emails with the RMS Station you connect to.
 - The CMS Servers are used to store your email in the cloud. This allows you to send/receive your email regardless if you use TELNET-INTERNET or connect to one of the many RMS Stations over RF. The RMS Station must be connected to the internet.

**** If the RMS Station lose internet, you cannot send or received standard Winlink messages via that station. You must find another station and consider getting outside of your region...**





Winlink

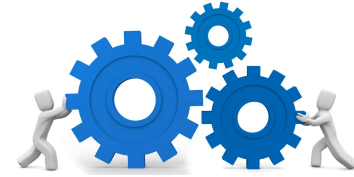
2. P2P/Radio-Only

- P2P allows two stations that are online at the same time & on the same frequency & they have radio-line of site to each other, to transmit/receive emails without using the internet.
- Radio Only allows two stations to send/receive emails without the use of the Internet and without both stations having to be online at the same time. This is a great vehicle if you have HF Capability, but you must setup 3 MPS- Message Pickup Stations in Advance before you can take advantage of this feature.

3. Key Winlink Features:

- A. Built in ICS and Miscellaneous Forms
- B. Automatic Updates for Application, Forms, and RMS stations for RF Communications
- C. Ability to send SMS/Text Messages

Winlink



IMPLEMENTATION

- A. Weekly Cherokee ARES Winlink Exercise by 8pm on Monday, send Winlink Check-In form to CCARES-NET.
- B. Weekly NWGA ARES Winlink Exercise by 8pm on Tuesday, send requested form to W4NWG.
- C. Weekly GA ARES Winlink Exercises send on Sundays between 00:01 and 16:00 to GAARES-NET.
- D. Practice sending Radio-Only message once you configured your MPS Stations. Send to W1JKU or KO4IFY as we practice this mode weekly.
- E. Keep Eye out for NWGA P2P Exercises as this is conducted on a regular basis.
- F. If you're not a Winlink user, please consider adding this tool to your toolkit!, this is a critical tool for Cherokee ARES and easy to install and configure.

DRATS



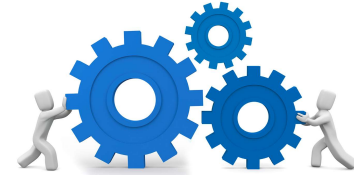
DRATS

Windows Based Application that allows for Amateur Radio Operators to perform Keyboard to Keyboard real-time chatting over the Internet. While RF Capability does exist, it is not widely used due to complexity and instability.

- We utilize the NWGA RATFLECTOR (NWGAARES.RATFLECTOR.COM) on Channel CCARES
- DSTAR has several ICS Forms built in and a few additional advanced features. Our primary use for Cherokee ARES is the simple Chat function.

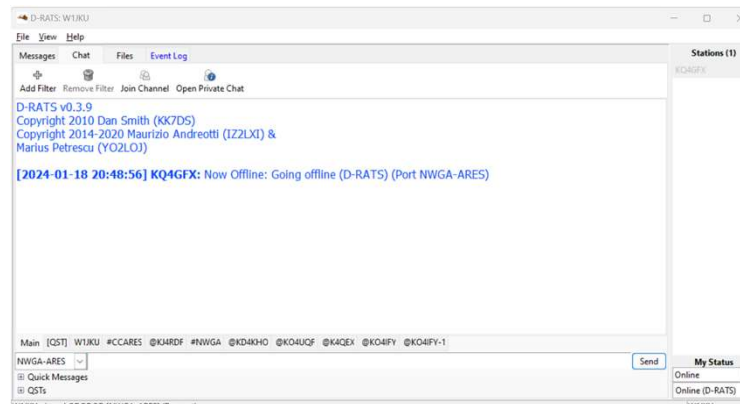


DRATS



IMPLEMENTATION

- A. Cherokee County utilizes DRATS on virtually every net we perform utilizing the internet and the NWGA ARES Ratflector (nwgaares.Ratflector.com) and Channel **CCARES** to perform **CHAT**.
- B. This is a great tool for communications between NCS and all other personnel.
- C. If you're not a DRATS user, please consider adding this tool to your toolkit!, this is a critical tool for Cherokee ARES.



APRS



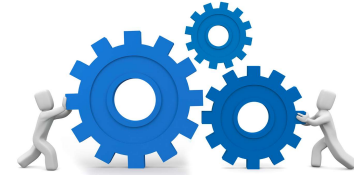
APRS

- **Automatic Packet Reporting System (APRS)** is an [amateur radio](#)-based system for real time digital communications of information of immediate value in the local area.
- Data can include object [Global Positioning System](#) (GPS) coordinates, [weather station](#) telemetry, text messages, announcements, queries, and other [telemetry](#).
- APRS data can be displayed on a map, which can show stations, objects, tracks of moving objects, weather stations, search and rescue data, and direction finding data.
- APRS can be used to obtain Weather reports

APRS

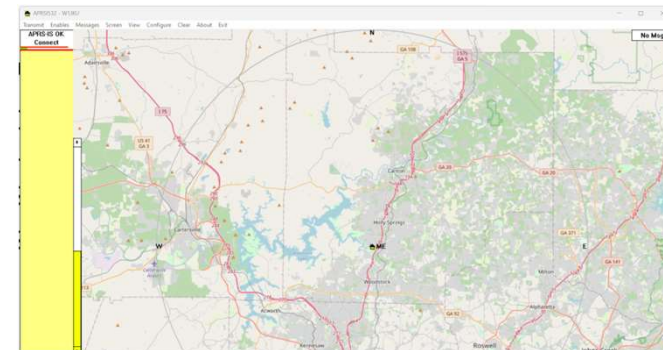
- APRS can be used over the Internet.
- APRS can be used over RF using Packet Frequency: 144.390.
- Applications to perform APRS:
 - APRSIS32
 - YAAC
 - <http://aprs.fi> (Used for monitoring from your webbrowser)

APRS



IMPLEMENTATION

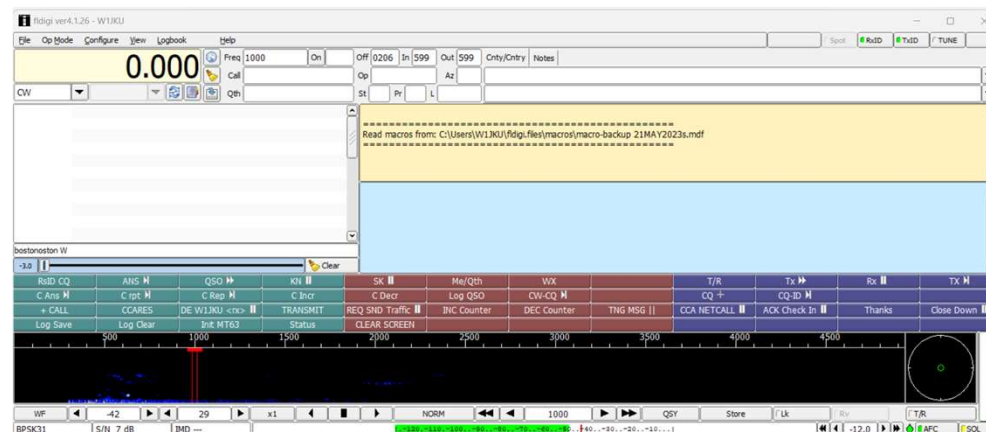
- A. Cherokee County utilizes APRS to communicate short messages to our teams. Look for messages from W1JKU, WA4EOC, and or our other AEC's/ members.
- B. Send Keyboard to Keyboard Messages to another station.
- C. See Map of where users are, overlaid with terrain and weather map.
- D. When Deploying great tool to show real-time status and location.



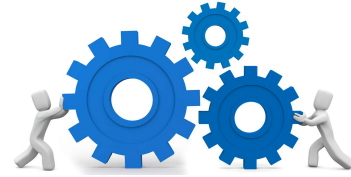
FLDIGI

FLDIGI (MT63-1KS)

- FLDGI is an application that allows Keyboard to Keyboard communication across multiple modes. Can also be used to listen/decode CW.
- FLDGI allows ICS Forms to be sent over RF.
- FLDGI can be used to download Weather Maps over RF.



FLDIGI (MT63-1KS)



IMPLEMENTATION

- A. Cherokee ARES does not leverage this mode within the county due to complexity for our users, but you are encouraged to learn and support GA ARES.
- B. GA ARES use FLDIGI at the State Level with Mode MT63-1KS. FLDIGI exercise every Sunday at 16:00hours if your interested in learning and practicing.
- C. Using FLDGI Mode CW, you can capture the Field Day Bulletin!

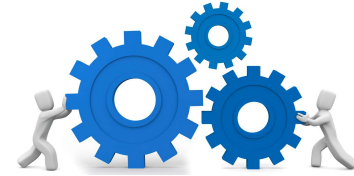
VARAC

VARAC



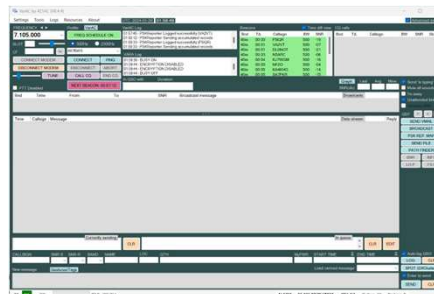
- VARAC is a free Chatting Application that can be used over VARA-HF, or VARA-FM allowing users to communicate with other Armature Radio Operators leveraging the Vara protocol using RF.
- VARAC is designed to be used without any Internet Backbone, pure RF between stations.
- VARAC can be used with VARA-FM or VARA-HF
- VARAC Supports **Broadcasts**. Broadcasts is a feature allows an operator to send a 91byte message to a Specific Station or "**ALL**" stations on Frequency. This is a primary method of being able to deliver short messages to multiple stations at the same time that you cannot do in a one-on-one standard Vara-Chat. Broadcasts is a feature we will leverage on our Cherokee-ARES NETS to allow mass RF communication between all listening members running VARAC at the same time.
- VARAC Supports **VMAIL**. VMAIL is a feature allows composing and sending larger messages or can be store as an offline message on your machine that is picked up and received by the recipient when they are online.

VARAC



IMPLEMENTATION

- A. Cherokee ARES will use VARA-FM when using this mode.
- B. Prior to the NET all stations with VARAC capability can set their station to point to our Cherokee ARES Repeater and manually send a **Beacon** to let all other stations know they are on Frequency with VARAC capability. Again, this is the same Frequency used by the Voice NET.
- C. During NET, NET Control may make a Net Call giving additional instructions that VARAC users may re-Beacon.
- D. When NET Control has digital traffic it would like to Broadcast via VARAC to all Listening stations on Frequency, then Net Control would make a NET Call to alert stations that Digital traffic is about to be sent so if you must make a quick change to your rig to put in Digital Mode briefly, you can.
- E. VARA-FM, on the RIG Control Settings within VARAC, check the box “Skip slot selector” as we DO NOT want to change frequencies on our repeater or other published Simplex Freqs we use for Cherokee ARES.



VARAC Installation

- <https://www.varac-hamradio.com/download> (V9.1 as of 15June2024)

VarAC Windows Installer prerequisites

(For a ZIP package for Linux/Windows/Mac/Pi package, [click here](#))

Windows 8.1 and above

(some hams reported that Win7 also works)

.NET framework 4.X or above

[VARA-HF 4.8.7](#) or higher / [VARA-FM 4.3.7](#)

Optional: FLRig / OmniRig (V1.2 only)

1280 X 800 screen resolution or higher & 10MB of disk space.

Being open to engaging in real conversations with ham radio operators, rather than just exchanging reports as in FT8 🌈

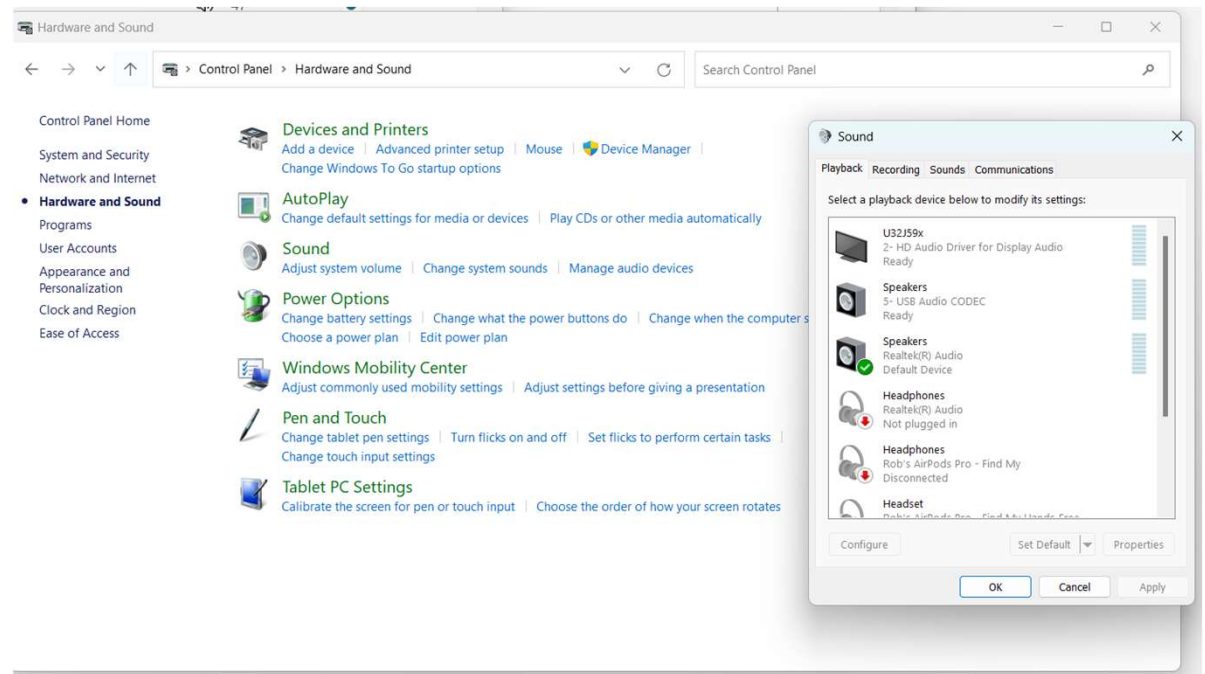
Caution

Check your Windows Sound Defaults. Ensure you do not have your Radio, Signalink, or TNC configured as the default Sound

From Control Panel Hardware and **Sound**, click **Sound**.

Then Check to ensure your CODEC is not set as the default under Playback or Recording!!!

**** Else you will send Windows Sounds Over your radio versus local speaker**



Install Comment

- Install VARAC twice, into different folders:
- Folder A- VARAC-FM
- Folder B- VARAC-HF

This will allow you to set each one up correctly, so at start it will be ready to run with VARA-FM or VARA-HF

Pointers

1. Settings- Rig Control

Configure PTT and Cat Configuration.

For VARAC-FM, set Frequency Control to: None

**** So VARC will use the Repeater offset and Tone and not reconfigure your FM Channel**

The screenshot shows the 'Settings' window with the 'RIG' tab selected. The 'PTT Configuration' section has 'CAT' selected with 'Icom IC-7100' in the dropdown, and buttons for 'TEST', 'PTT ON', and 'PTT OFF'. The 'CAT Configuration' section has 'COM Port' selected, with fields for Port (COM4), Baud (9600), Parity (None), DataBits (8), StopBits (1), Host (127.0.0.1), and Port (60000). The 'Frequency Control' section has 'None' selected for CAT, with options for 'Load last frequency', 'Read frequency every' (2 seconds), 'Antenna tuner' (OFF), and 'FM-D' (7105000). There are also sections for 'FLRig', 'DTR/RTS', 'Hamlib (RigctlId)', and 'OmniRig'. At the bottom, there is a 'CAT Test Error Log' section and a 'DOWNLOAD latest CAT command file' link. A 'SAVE AND EXIT' button is located at the bottom right.

Settings

RIG Logging Vara QSO CQ/Beacon DX Cluster GPS Misc.

PTT Configuration

☒ CAT Icom IC-7100

☐ OmniRig ☐ FLRig ☐ DTR/RTS

☐ Hamlib ☐ None

TEST PTT ON PTT OFF

CAT Configuration

☒ COM Port ☐ TCP

Port COM4

Baud 9600

Parity None

DataBits 8 DTR L

StopBits 1 RTS L

Host 127.0.0.1

Port 60000

Frequency Control

☐ CAT Icom IC-7100

☐ OmniRig ☐ FLRig ☒ None ☐ Hamlib

☐ Load last frequency Offset Hz (?) 0

☐ Read frequency every 2 seconds

Antenna tuner OFF (?)

FM-D 7105000 TEST

FLRig

Host localhost

Port 12345

DTR/RTS

Port

Type DTR

Hamlib (RigctlId)

Host localhost

Port 4532

OmniRig

Rig# 1

VFO A+B

CAT Test Error Log (?) I'm having trouble with CAT

DOWNLOAD latest CAT command file

SAVE AND EXIT

Pointers

2-Settings- Canned Messages

Allow you to set and configure default messages, you can use as needed

Append <SND><DSC> to Canned message to auto send and disconnect when selecting message. Avoids you from having to press Send after selecting message.

Canned messages

Welcome message (?) 0/50

Tags

<CALL>	My Callsign	<HCALL>	OM Callsign	<RIG>	My RIG
<NAME>	My Name	<HNAME>	OM Name	<ANT>	My Antenna
<QTH>	My QTH	<HQTH>	OM QTH	<PWR>	My TX power
<LOC>	My Locator	<HLOC>	OM Locator	<SND>	Send message
<ICE>	Ice breaker info: age, profession, hobbies			<DISC>	Disconnect

Canned message #1	<NAME> <QTH>	Name	MY INFO	Shortcut key: F1
Canned message #2	My working conditions: <RIG>	Name	RIG	Shortcut key: F2
Canned message #3	73's and all the best! DE <CALL> Disconnecting...<SND><DISC>	Name	73s	Shortcut key: F3
Canned message #4		Name	QSO Truck	Shortcut key: F4
Canned message #5	---I)	Name	Thumb	Shortcut key: F5
Canned message #6		Name		Shortcut key: F6
Canned message #7		Name		Shortcut key: F7
Canned message #8	Send Email to W1JKU@ARRL.NET with message "VARAC Challenge 10JUNE2024". Thank you! <SND><DISC>	Name	Send Email	Shortcut key: F8
Canned message #9		Name		Shortcut key: F9
Canned message #10		Name		Shortcut key: F10
Canned message #11		Name		Shortcut key: F11
Canned message #12		Name		Shortcut key: F12

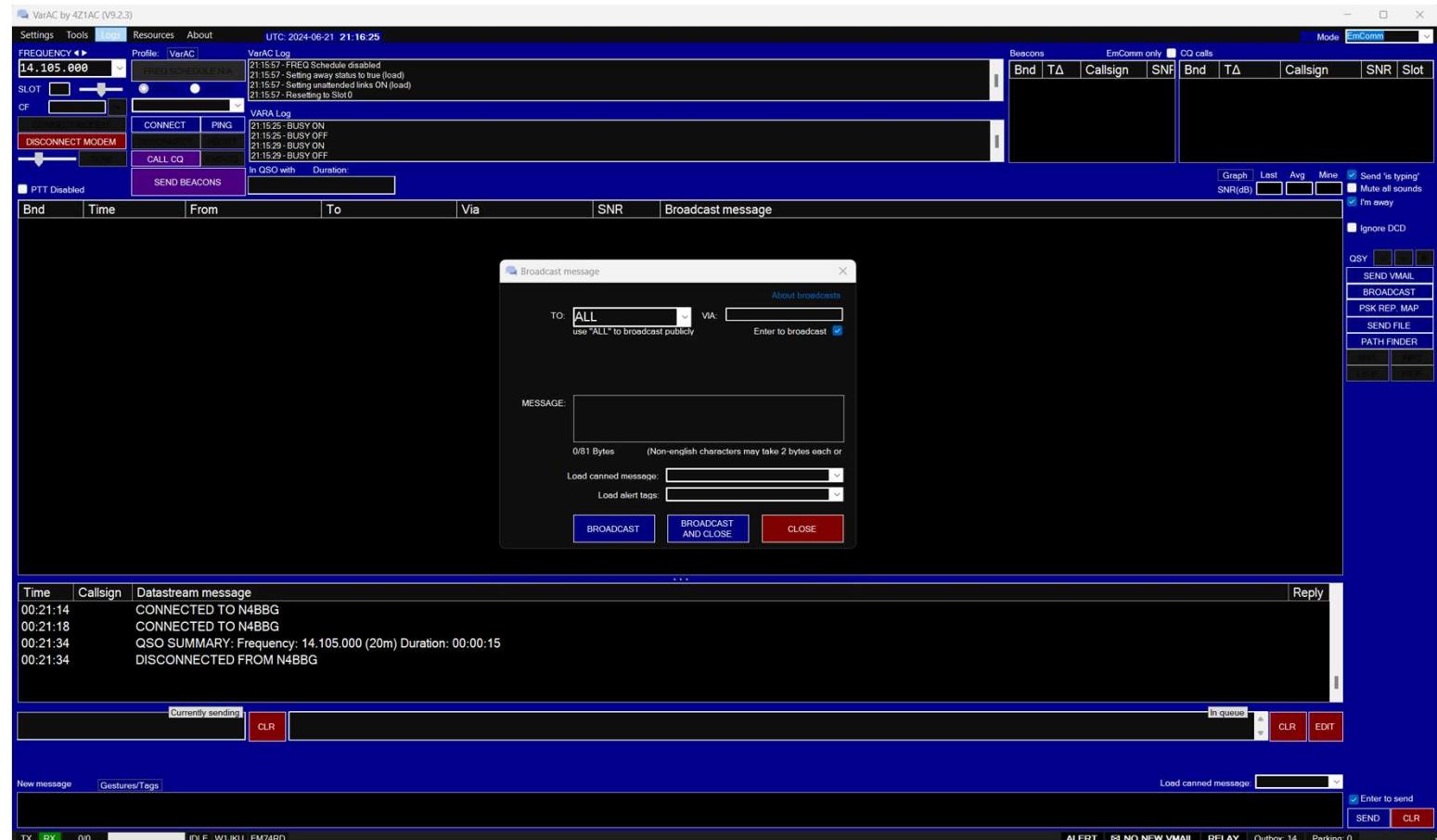
SAVE AND CLOSE

Broadcast

Click Broadcast button
to send a message to all
stations

Type Message or use
Dropdown for 'Load
canned message'

Click Broadcast to Tx



Advanced- Edit VARAC_Cat_Commands.ini

Instruct Radio to automatically go into Digital Mode when Transmitting and return out of Digital Mode when done

1. Find File in directory you installed/configured VARAC-FM
2. Scroll down to you find your Radio
3. Edit PTTOn and add the ModeFM_D Command to put radio in FM-D mode prior to transmitting.
4. Edit PTTOff and add the ModeFM Command to instruct Radio to go back to FM Mode after transmitting
5. Save File
6. Restart and Test VARAC-FM

** Separate commands with a comma with

No extra spaces!

```
[Icom IC-7100]
CmdType=HEX
PTTOn=FEFE88E02600050101FD,FEFE88E01C0001FD
PTTOff=FEFE88E01C0000FD,FEFE88E00605FD
ModeUSB=FEFE88E00601FD
ModeUSB_D=FEFE88E02600010103FD
#For different USB-D filters, Replace ModeUSB_D value with:
#Filter1: FEFE88E02600010101FD
#Filter2: FEFE88E02600010102FD
#Filter3: FEFE88E02600010103FD
ModeFM=FEFE88E00605FD
ModeFM_D=FEFE88E02600050101FD
```

Lets Transmit and Receive!

Hands on--- No More Slides

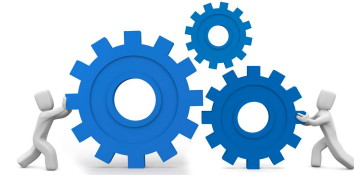
JS8CALL

JS8CALL



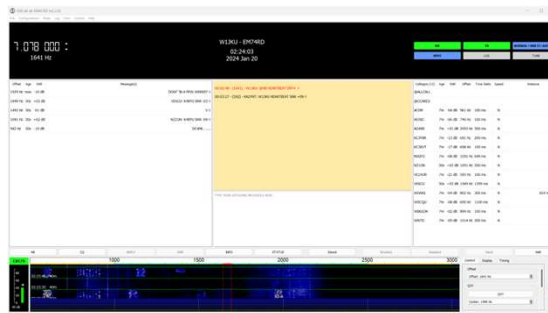
- JSCALL is a free Chatting Application that can be used to communicate with other Armature Radio Operators for weak propagation communications. Unlike FT8, you can actually carry on a QSO very simply with this tool.
- JS8CALL is designed to be used without any Internet Backbone, pure RF between stations.
- JS8CALL can be another good tool to communicate with distant stations and share information.
- Currently GA ARES is not using JS8CALL, but you should consider experimenting with this tool. If we were to lose Internet, cell, and core infrastructure. Getting information into and out of the region will be important. Consider adding this tool to your tool kit.

JS8CALL



IMPLEMENTATION

- When configuring your station, add @CCARES to “Callsign Groups”. This will allow messages to be directed to @CCARES and only those stations that has this configured will receive the message.
- Consider using 20M during day and 40M at night.
- Practice using tool with intent of communicating outside our region to receive or pass traffic.
- Consider using for Field Day, Winter Field Day, and any other opportunity you have...





Training References

1. Phone/Voice
 - A. [Cherokee Basic NET Training 14JAN2023](#)
 - B. [CARS Intro to VHF / UHF and ARES/RACES-FEB 2022](#)
2. Winlink (Telnet, Packet, VARA-HF, VARA-FM, ARDOP, P2P, Radio-Only)
 - A. [W1JKU-CARS Winlink Basics](#)
 - B. [W1JKU-Cherokee ARES-Winlink GPS Mapping and Reporting](#)
 - C. [W1JKU FLDIGI and Winlink Discussion 21May2023](#)
3. DRATS
 - A. Adjust Installation instructions, PDF Below must be updated.
 - B. To Install DRATS go to the DRATS Groups.IO Program Files Page: <https://groups.io/g/d-rats/files/D-RATS%20Program%20Files>
 - C. When installing, do not install or attempt to run from your Windows Desktop or any other Microsoft Assigned Folder. There are known issues and conflicts using Microsoft Assigned Folders including One-Drive Folders. You may have inconsistent behavior. You are best to install to your C: in folder DRATS. Example: C:\DRATS
 - D. [Cherokee ARES DRATS Installation-30MAY2022](#)
4. APRS
 - A. [APRS-YAAC Client](#). This client can be used on Windows/Linux/etc. Click on this hyperlink for details and download. Its a Java based application, personally I like it a little better than APRSIS32. Download and unzip the contents to a folder. In my case I put all the contents in the following folder: "C:\Ham Software\YAAC". Then you can create a shortcut from windows, here is the launch command: "C:\Ham Software\YAAC\YAAC.jar"
 - B. [Cherokee ARES APRS Announcement 3SEP2023](#)
 - C. [W1JKU-APRS Training for NWGA District 6SEPT2022](#)
 - D. [Using APRS to send SMS Messages. See News Page 21DEC2023](#)
5. FLDIGI (MT63-1KS)
 - [W1JKU FLDIGI and Winlink Discussion 21May2023](#)
6. VARAC
 - A. [Training Video](#)
 - B. [W1JKU VARAC Primer 9JAN2024](#)
 - C. [References VARAC for EmComm](#)
7. JS8CALL
 - [JS8Call by KN4CRD](#)



Participate

Give Back to the Community

Have Fun and Advance your Skills



Thank you!