Alachua County ARES®/NFARC
2023 FIELD DAY
JUNE 24/25, 2023

After Action Report/Improvement Plan

Expanded Version for Exercise Planners

WRITTEN JUNE 2023

APPROVED, JULY 12, 2023

HANDLING INSTRUCTIONS

1. Points of Contact:

Alachua County ARES®:

Name:	Gordon Gibby MD, Asst. Emergency Coordinator
FCC License:	KX4Z
SHARES License:	NCS521

FOR PUBLIC RELEASE

Region 3 MARC Unit and our Facility-

CONTENTS

Our visitor reception area, Freedom Center. Welcome desk with many types of brochures, left. Far right - GeoChron display of live connections. Front right, display table with videos to watch, Morse code keys and examples of circuits we have designed and built. Entry to the main operating room is through the rear double doors.

EXECUTIVE SUMMARY

The Amateur Radio Emergency Service (ARES®) typically organizes at the County Level and upward. In Alachua County, multiple amateur radio clubs support the ARES® mission, including the Gainesville Amateur Radio Society, the North Florida Amateur Radio Club, and the Alachua County EOC Radio Club.

FIELD DAY is a long-standing American Radio Relay League activity, always carried out on the 4th full weekend of June, designed to test field preparation of amateur radio for service to the nation as mentioned in FCC Part 97.1.

This is the 4th year that the North Florida Amateur Radio Club/ARES(r) group has carried out a Field Day effort. This year we moved to a new facility, a backup location for the EOC, the Freedom Center of the Alachua County Veterans' Memorial Park.

We increased the size of our effort from 2F to 4F and added over 80% to our score, hitting a new high of 1,269 total contacts. We achieved dramatic new success in digital modes including FT4 and FT8, reaching over 1,000 contacts, and also in voice (101 contacts) and in CW (159 contacts). We judged that a lot of our training is paying off, and that the radio maturity index of our group is growing.

Significant Advances as a Result of this Field Day Effort:

- Increased interoperability with key communications asset and people -- the Region 3 MARC Unit & support personnel.
- Continued wide range of volunteers involved in Field Day - inclusion of more peripheral volunteers.
- Validation of the refurbished 5 kW diesel generator.
- Greater utilization of the CW mode during the Field Day by our normal cadre of volunteers--significant improvements in capabilities[1]
- 100% success at MESH-microwave networking
- 100% success at GPS-based NTP server.
- Significantly improved efficiency of contact operation with an astounding 80% improved over even the 2022 performance.
- Acquisition and fielding of significantly more computing assets.[2]
- Excellent validation of the usefulness of the sloping vertical 7MHz-28MHz off center fed dipole.
- Far better logistical deployment of grounding and lightning arrestor systems

1 Morse Code has an approximate 17dB advantage over voice communications; in compromised situations this can be make or break.

2 Privately acquired refurbished Windows 10 laptops perfectly suited to deployed situations.

Major Strengths

- Significant outreach to the ham radio community via various projects helped the group attract several new qualified operators.
- Superb coordination with the MARC unit.
- Tear down was speedily and efficiently completed, with a lot less dehydration!
- FT8/FT4 automated logging success
- MESH Networking and NTP server complete success.
- Success at even same-band operations with better grasp of receiver protection strategies.
- Significantly decreased interaction between antennas based on the MARC unit tower due to improved separation.
- Much greater success of our innate membership at both voice and CW.
- Far greater lightning protection this year and much improved grounding system.
- Streamlined solar power charging experience[3]

Primary Areas for Improvement

- Fix the issues we had with switching from N3FJP CW, to WSJT-X & competitions for the port and Winkeyer.
- Better scheduling of releases of even further slimmed down IAP and bite-size pieces for getting done -- along with Quizzes to asses how our preparations are going
- Attempt antenna-multiplexer design to simplify antenna installation, if >50 dB can be obtained
- Continue separation of antennas & receiver gain management, which allow same-band operation (impossible with most filters)
- Reduce effort on less-productive visitor engagement and GOTA station
- Increase effort on local signage, which appears more successful than news media
- Potentially increase effort on more effective outreach such as programs at Cub or Boy Scout meetings / Merit badge proctoring, rather than attempting to invite them to "our" events.

3 Special thanks to Reid Tillery and Lorilyn Roberts for each bringing very well designed 100W solar power charging systems.

Summary

Our effort this year was **phenomenally more successful than even last year**, at a more spacious and indoor facility.

We made 80% more contacts than last year, reaching 1269 total contacts. Every mode of communications saw improvements in our skill levels. We were much less dependent on outside experts for CW (although we much appreciated them!) and we also saw dramatic improvement in voice performance. Our digital performance was excellent and reached over 1,000 contacts by that method alone.

Setup and tear down took longer than we preferred due to the provision of EIGHT antennas, but we left the facility in excellent shape and even helped save an unconscious motorist in a car crash in our parking lot.

THIS DOCUMENT

This document is prepared to help the group improve its emergency communications, deployment abilities, and to assist those who will be planning the next year's event. As a consequence, it is lengthy and detailed as to what were our methods, what were our results, and how they compared to our previous Exercises.

Most groups have a variety of participants, ranging from those who are planners, "movers and shakers" and ranging toward those who, for reasons of limitations, other responsibilities, or disinterest, are only peripherally involved (at this particular time). This document is primarily addressed toward the former, rather than the latter group.

For those with more limited time for review, the most important sections are probably Section 3 (Analysis of Objectives/Results), and Appendix A (Improvement Plan)

SECTION 1: EXERCISE OVERVIEW

Exercise Name	**Field Day 2023**
Exercise Dates	24-25 JUN 2023
Scope	Full-scale exercise at the Alachua County EOC Alternate Location, Veterans' Memorial Park. Field Day is an American Radio Relay League (ARRL) sponsored national event.
Mission Area(s)	Response
Core Capabilities	Operational Communication, [4] Planning, Information Sharing, Public Information, and Community Resilience[5]
Objectives	1. Safety for All 2. Have fun and LEARN 3. Hone your skills at all things RADIO
Threat or Hazard	No threat or hazard. The goal is to contact as many other stations as possible and to learn to operate radio gears in abnormal situations and less than optimal conditions [6]
Scenario	No specific scenario
Sponsor	American Radio Relay League (ARRL)
Participating Organizations	Field Day is a US/Canada-wide event. This AAR reports on the specific details of NF4AC. NF4AC is the call sign of the Alachua County ARES Volunteers who support the Alachua County EOC. The Alachua County Fire Department / Region 3 MARC Unit joined NF4AC during Field Day.
Point of Contact	Gordon Gibby, MD, DocVacuumTubes@gmail.com

4 https://www.fema.gov/sites/default/files/2020-07/fema_ESF_2_Communications.pdf
5 https://www.fema.gov/emergency-managers/national-preparedness/mission-core-capabilities
6 http://www.arrl.org/files/file/FieldDay/2021/2_1-%20FD%20Flier%20-%20What%20is%20FD%20generic.pdf

Event Planning Team

Gordon L. Gibby KX4Z
Leland Gallup AA3YB
David Huckstep W4JIR
Wendell Wright KN4TWS

Number of Participants

1. David Huckstep W4JIR
2. Wendell Wright KN4TWS
3. Kevin Rulapaugh KE4NVI
4. Patrick Benson K0OO
5. Steve Panaghi KC2ASY
6. Leland Gallup AA3YB
7. Gordon Gibby KX4Z
8. Dan D'Andrea KF4OVJ
9. Craig Fugate KK4INZ
10. Jeff Capehart W4UFL
11. Lorilyn Roberts KO4LBS
12. Mike Hasselbeck WB2FKO
13. Earl McDow K4ZSW
14. Ron Lewis KN4ZUJ
15. Susan Halbert KG4VWI
16. Eric Pleace KO4ZSD
17. Rosemary Jones KI4QBZ
18. Jim Bledsoe KI4KEA
19. Craig White KO4ZRZ
20. Reid Tillery K9RFT

SECTION 2: EVENT DESIGN SUMMARY

Event Purpose and Design[7]

For scores of years, the American Radio Relay League has sponsored an annual “Field Day”” event/contest on the 4th weekend of June, encouraging individuals and groups to practice emergency type communications in the setting of an amateur radio communications contest. The scoring is a combination of points for desirable planning and operations activities, plus points for every connection made (“contact”) to other participants at distant sites with successful bidirectional transfer of a simple message, giving the type of operation at each end, and the assigned “section” in the ARRL organization.

For this group, the exchange they had to transmit and receive acknowledgment for, was

4F NFL because they ran 4 transmitters at an existing (alternate) EOC site (Category F) and are in the North Florida ARRL section.

Callsign utilized was **NF4AC** which is the callsign of the Alachua EOC Radio Club. Since they were operating as a Class 4F EOC-based station they deemed it more appropriate this year and the last to use NF4AC (EOC Radio Club) callsign rather than NF4RC (North Florida Amateur Radio Club).

They used their alternate club's callsign **NF4RC** for the “Get-On-The-Air-Station” (GOTA) - per the rules, available for amateurs licensed within the previous year, or generally inactive.

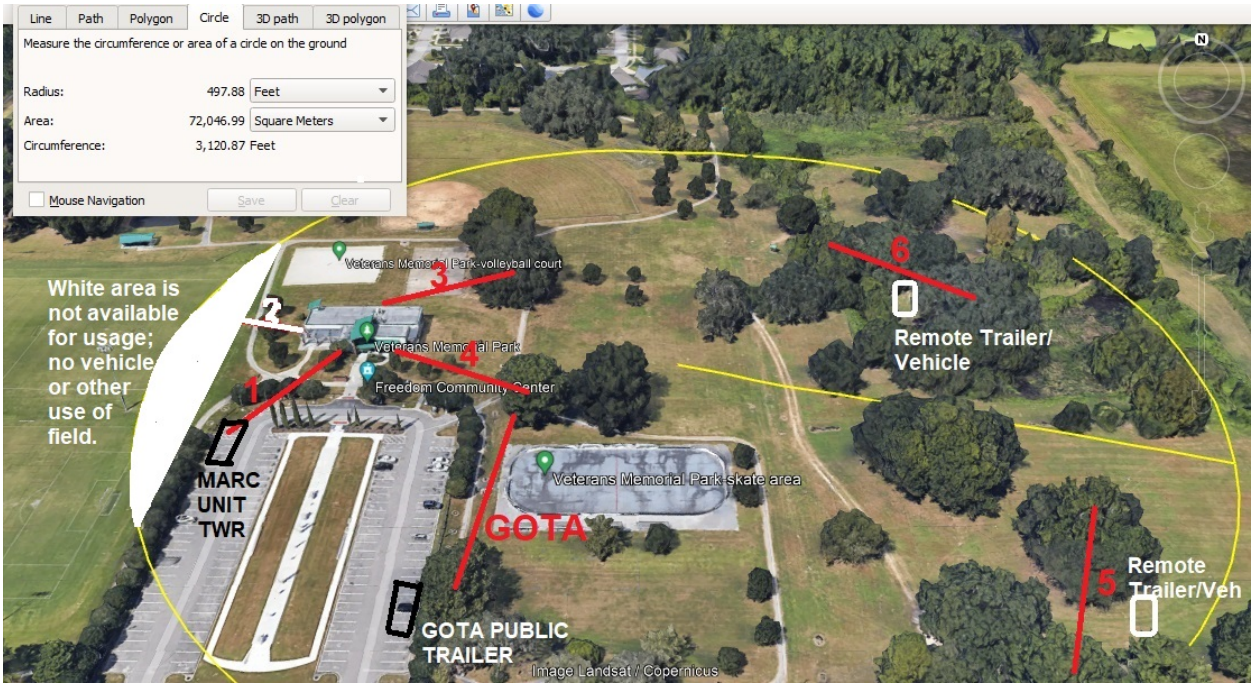
Incident Command System / Leadership

As they did in previous Field Day exercises, they organized their effort using Incident Command System principles, and primarily using a very elongated ICS-201 form. Volunteers were recruited by Gordon Gibby and others. Previous leaders from last year often acted as "Deputy" officers this year to assist new leadership.

7 Much of the material of this AARIP repeats standard information nicely summarized by Brett Wallace NH2KW in the 2021 AARIP

Documentation Unit Leaders: Gordon Gibby
Logistics Section Chief: Wendell Wright
Antenna Unit Leaders: Kevin Rulapaugh, David Huckstep, Craig Fugate
Satellite Unit Leader: Ron Lewis
Microwave Unit Leaders: Earl McDow, Susan Halbert, Jeff Capehart
Logging Computer Unit Leader: Earl McDow
Solar Charging Unit Leaders: Lorilyn Roberts, Reid Tillery, Rosemary Jones
Sustenance Unit Leader: Rosemary Jones

Layout Constraint



Approximate 1000-foot diameter circle enclosing all operations and antennas of the event

By national Field Day Rules, the entire operation had to be carried out within a 1000-foot diameter circle. Satellite maps were used to guarantee compliance with this rule.

The Incident Action Plan (IAP) included:

- Full explanation of the event and the location and equipment for each station.
- Satellite pictures to show placement.
- Time-scripted tasks to accomplish not only planning, but also a zoom dress rehearsal, media notification, the full-scale event, documentation and submission.
- Extensive use of links to more-detailed documents addressing specific issues of operations or setup.
- List of assets required for positioning

  The Full Incident Action Plan is available at:

  https://qsl.net/nf4rc/2023/ICS201GLG2023.pdf

Antenna Plans

There were multiple constraints on antenna placement:

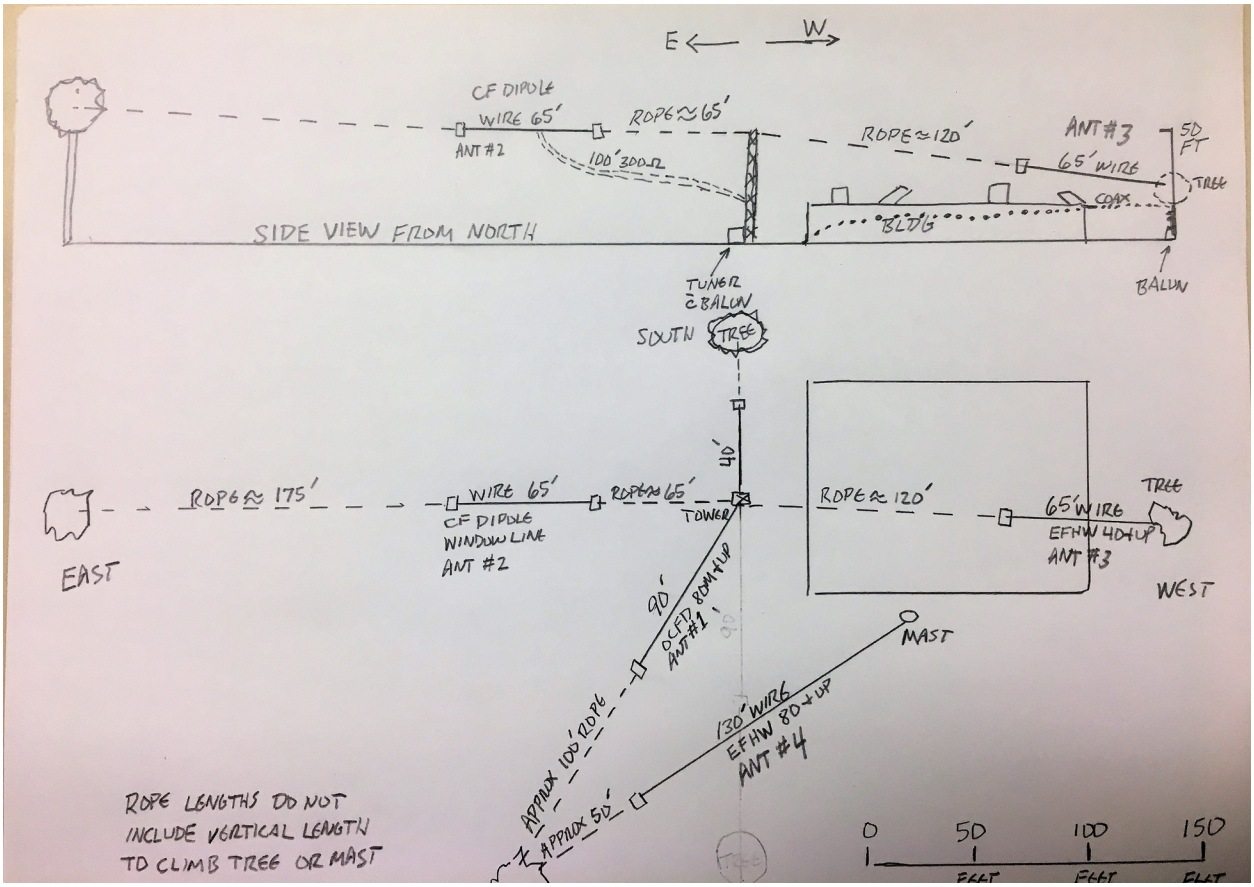
(a) avoid bystander (public) contact with the antenna or coaxial cable, e.g. trip hazards or burn hazards (RF energy cannot electrocute)

(b) Avoid encroachment on soccer fields to the west

(c) Avoid encroachment on basketball fields to the north

(d) MARC tower at 50 feet for center high point; use trees as other end to keep out of reach of public and maximize signal radiation

We planned for four HF antennas at the Freedom Center, using rope spacers to push them outward from the MARC tower to increase isolation between antennas, and then the fifth antenna at the GOTA trailer/HF#4 station, at a significant distance to provide further physical separation.



Side and top view of four planned antennas at the Freedom Center. Note that South is to the top, west is to the right; this view corresponds to the satellite image of the venue previously displayed.

The planned antenna for the GOTA/HF#4 was initially an end-fed half wave horizontal antenna, but upon review of the large oak tree adjacent to the likely positioning of the GOTA Trailer, a sloping vertical 65-foot off center fed dipole appeared possible and would give us better low-angle radiation and possibly lower interaction with the largely horizontal HF antennas of the Freedom Center.

ANTENNA COUPLING

Importance

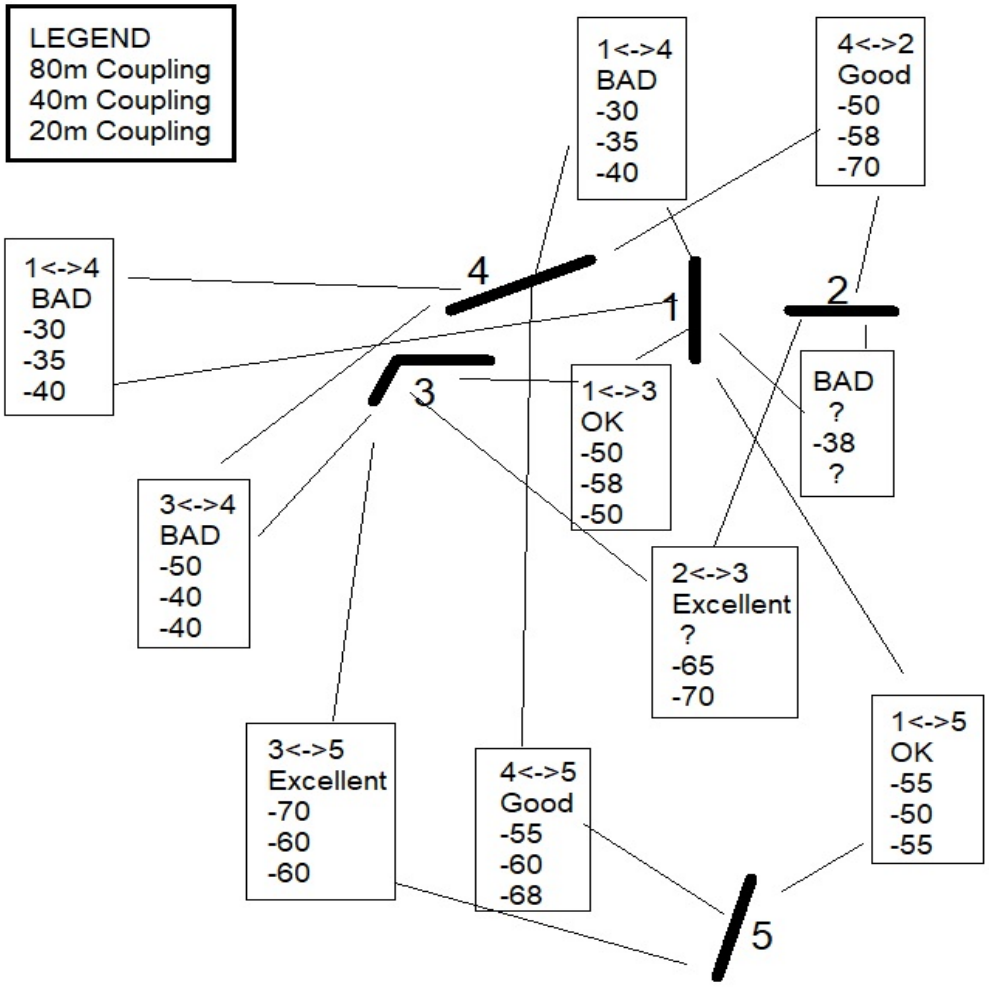
Antenna coupling considerations are a make-or-break issue for high performance multiple transmitter base operations in Field Day or in disaster communications base stations.

Powerful transmitters and sensitive receivers connected to antennas that are relatively close are a prescription for (a) receiver damage or at least (b) inability to operate normal reception. Our ICOM 7300 includes some bandpass filtering between bands, and some internal protection systems, but these are not perfect. A detailed analysis of the ICOM 7300 filtering, and the required antenna separation required to avoid damage, and to allow operation, is presented at: https://qsl.net/nf4rc/2023/FieldDay2023/HFAntennaInteractions.pdf

We judged that AT LEAST 30dB isolation was required to reduce the chance of DAMAGE and that 40 db or 50dB was considered the requirement for likely good performance.

MEASUREMENT

In order to plan our Field Day, at our DRESS REHEARSAL, measurements were made between permutations of different antennas that had been constructed as close as possible to the actual Field Day antennas. This was done literally by bringing coaxial cables from each pair of antennas to a spectrum analyzer (Siglent). For Antenna #5, this required 200 feet of coaxial cable. The results are tabulated in our internal documentation, but this diagram illustrates the coupling measured on 80, 40 and 20 meter bands. Typically, the coupling becomes less and less at higher frequencies, possibly because the physical distance between antennas becomes a larger number of wavelengths, and thus the much stronger near-field electromagnetics (that decline at $1/r^4$) decline and are replaced by far-field electromagnetics, (that decline at $1/ r^2$)



ANTENNA INTERACTIONS ILLUSTRATION
Interactions are in dB; data are from the Dress Rehearsal Simulated Antennas

These studies suggested that filter (bandpass) cans would very likely be required for most combinations of antennas located at the Freedom Center, but that in some circumstances, operations at the GOTA/HF#4 trailer could be conducted even on the same band as operations at the Freedom Center (particularly if Antenna #3 or #4 were used by the Freedom Center). **"Same band" operations occurred in 8 out of 22 total hours of operation; these operations REQUIRE ANTENNA SEPARATION.**

Practical Confirmation

At one point observed by the author, operation on 40 meters was commenced on HF#1 and immediately all other stations at the Freedom Center were seeing Morse Code on their receivers, no matter what band they were on! This is obviously direct overload of the receivers by an overpowering signal coupled to their receiving antenna; the bandpass filtering of the vulnerable receivers is inadequate and their A/D converters are being overloaded by the extremely strong incoming signal even though it has no relation to the tuned frequency of the receiver.

The solutions are:

a) Stop ALL preamplification of the vulnerable receivers. Preamplification merely makes it easier to overload the receiver's systems

b) Add bandpass filers to reduce the intensity of the undesired signal (on a different band) reaching the input the receiver

c) If necessary, add ATTENUATION. (The Icom 7300 offers 20dB attenuation as a front panel push-button option by "holding" the Preamp button.

In our case, removing preamplification and adding bandpass filters appeared to bring about a resolution.

Operational Confirmation

Subsequent to this event, I observed that stations were routinely utilizing our provided bandpass filters, with provide 10-30+ dB of rejection of undesired input bands.

Longest-operation by David Huckstep W4JIR

FCC REQUIRED RF EXPOSURE CALCULATIONS

RF Exposure Calculations were carried out and recorded here: https://qsl.net/nf4rc/2023/FieldDay2023/ElectromagneticExposure.pdf and are also presented in an Appendix

Emergency Power

ARRL Field Day rules allow for bonus points if emergency power is used for all transmitters throughout the event. However, for EOC-based stations where generator backup power is usually available, the requirement is relaxed to merely requiring testing of the backup generator during the field day period. In this case, emergency power connections have been provided on the Freedom Center suitable for any trailer-mounted generator to connect and provide power. The MARC unit includes such a generator. We tested the MARC unit generator during the Field Day weekend, meeting this requirement.

Solar Power

This year we utilized solar power charging systems from:

- Reid Tillery
- Lorilyn Roberts

and were able to charge two 23-Ahr LIFEPO4 batteries that had been carefully discharged for the purpose. We were then able to make 6 contacts easily on digital modes, meeting the requirement for natural power.

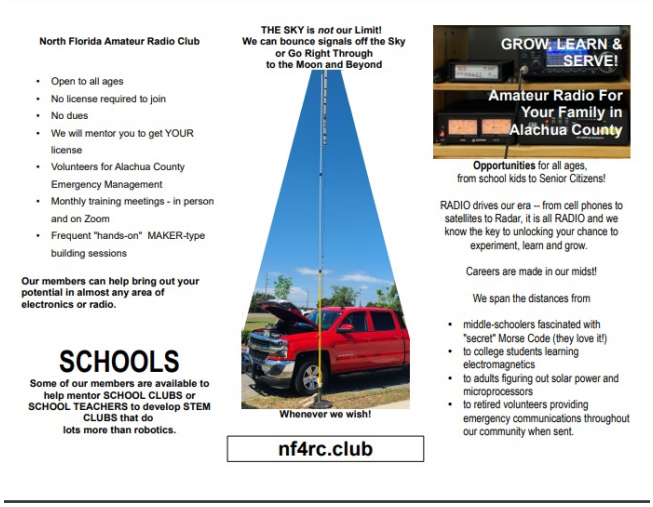
Actions, Strategies, and Tactics [8]

Timeline Summary - Significant Events

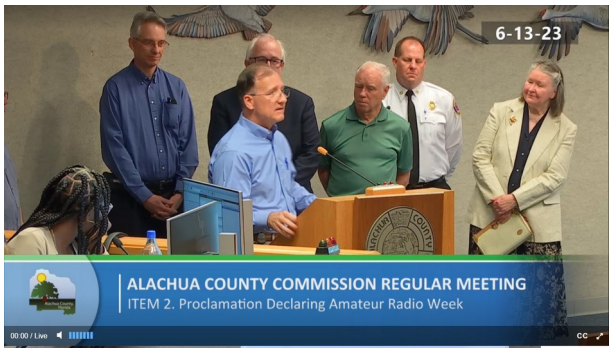
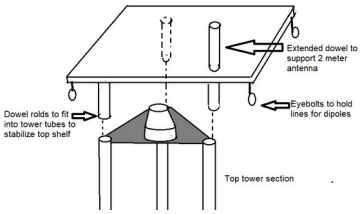
Participants often were overwhelmed by the volume of development discussions that went on during the planning phase of the event. Some of this was related to the fact that dramatic new improvements and ideas were being developed and required significant discussion to bring to success. **Participants sometimes don't understand all of the development work that is going on, and for which significant discusses of possible solutions and discovered problems are required.** *However, making these details available allows the interested participant to become more involved in the development of the exercise.* This timeline shows that the development of the Exercise proceeded over 7 months.

No.	Date	Item
1	Nov 7 2022	Dalton Herding of Alachua County EM begins the process of inquiring about the use of the Freedom Center.
2	Nov 30, 2022	The Freedom Center is reserved for our use. In addition, the MARC unit is assigned to us.
3	Dec 31, 2022	Leland Gallup and Gordon Gibby have walked the property and come up with initial proposed plans for internal discussion.
4	Mar 20 2023	Google Form available to register to operate at 2023 Field Day https://docs.google.com/forms/d/e/1FAIpQLSfonqRZ_nZQ8ITRA8ZPsUBErKDvh8AvePSwL-g8C270pRgIqg/viewform
5	Mar 22, 2023	Listed on the ARRL Field Day Locator https://www.arrl.org/field-day-locator
6	Apr 4, 2023	Ham Radio Week Proclamation is set up for Alachua County, to be passed and presented in early June to our group. (Jim Bledsoe effort)
7	Apr 13, 2023	Gibby receives a WINKEYER for enhanced CW performance. This item had been "out of stock" for months.
8	Apr 14, 2023	Different colors of paracord begin arriving to allow us to color code the lines that will be on the MARC tower
9		Jim Bledsoe has the first working (windows based) NTP

8 These are taken from the 2020 IAP. Unfortunately, these objectives were not carefully reviewed in the planning for this year's event, but are generally still applicable.

		server--provides a document explaining how to create https://qsl.net/nf4rc/2022/GPSNTP.pdf
10	Apr 16, 2023	Work begins on Antenna #2
11	Apr 18, 2023	EOC HF Station (HF-1) is installed in Stewart's donated Go-Box by David Huckstep 
12	Apr 20, 2023	Members of the team are purchasing headsets for the Field Day.
13	Apr 23, 2023	New Brochure for Field Day 
14	May 1, 2023	Work begins on a new BANNER for our Field Day

		
15	May 2, 2023	Antenna #5 is all wrapped up.
16	May 5, 2023	All FIVE HF antennas have now been constructed and wound up for travel on extension cord reels 
17	May 7, 2023	Enough $$ have been raised for Stewart to begin constructing the Antenna Trailer Mount
18	May 15, 2023	Our new Banner arrives and looks good.
19	May 29, 2023	Work begins on business cards for our group
20	May 31, 2023	At the LabNLunch we practiced recording canned scripts for VOICE contacts into ICOM 7300's with good success.
21	Jun 3, 2023	After determining that each brochure may cost $1 in ink, Earl indicates he has "spare ink" and will make 175 copies! A large number remain and can be utilized in later years.
22	June 10, 2023	Laminated placards for GOTA station and Visitor Desk are completed. (There were of ultimately of little use.)
23	June 12, 2023	Plastic boxes to protect the public from the EFHW baluns are obtained. Plans are made for the DRESS REHEARSAL pulleys at the top of the Antenna Trailer that Stewart has WORKING
24	June 12, 2023	The idea of a potluck / catered meal develops for Sunday Lunch -- and Rosemary steps forward to organize it all!! Hooray!
25	June 13, 2023	Reception of the HAM RADIO WEEK Proclamation from Alachua County

		
26	June 16, 2023	The plywood "top hat" gets built for the antenna tower 
27	June 16, 2023	DRESS REHEARSAL ANTENNA INSTALLATION -- Started at about 6 PM went to 9 PM, Success Measurements of interactions are done about 11 PM in the darkness by LED lights.
28	June 17, 2023	DRESS REHEARSAL RADIOS -- gets completely rain-stormed out. Limited practice with those present on various modes and recognition that there are still significant confusion over advanced efficiency tactics.
29	June 19, 2023	Diesel Generator gets mounted on the mast trailer. AC wiring gets cleaned up, and fuel system worked over 

		5 kW diesel generator mounted on trailer
30	June 21, 2023	Message pads for the public to send Winlink message are created. (This was a total bust, never used.)
31	June 22, 2023	Discovered Wendell's antenna tuner is non-functional. Leland steps forward with a replacement; a process that took many hours.
32	June 23, 2023	FIELD DAY ANTENNA INSTALLATION
33	June 24, 2023	FIELD DAY RADIO INSTALLATION AND COMMENCEMENT

Lorilyn Roberts KO4LBS, one of our CW ops!

EQUIPMENT Year Over Year

YEAR SUBJECT	2023	2022	2021	2020
Radios	Five ICOM 7300's	ICOM 7300 + test of Huckstep 7300 Go Box ICOM 7300 Elecraft K3	ICOM 7300 ICOM 7300	ICOM 7300 ICOM 746 Pro
Amplifiers	N/A this year	N/A this year	SB-200 x 2 derated to 150 W	SB-200 x 2 derated to 150 W
Antennas	#1 - 135 foot OCFD from MARC unit #2 -- 58' random center fed window line, slid 65' east #3 - 65' EFHW slid 120' west #4 135' EFHW north of building #5 65' vertical in oak tree approx 150 yds south of main building	160 M OCF, Backup 80M end fed (never used)	160M OCF with long end raised substantially to 50+ feet Backup 80M End-Fed Half Wave with wire raised to approx. 40 feet	160M OCF with long end dropping approx. 12-25 feet No backup
Computers	Approximately 10 Windows 10 computers + Raspberry Pi 2 NTP server	Donated HP EliteBook running both logging and WSJT-X Wireless mouse	Donated HP EliteBook running both logging and WSJT-X, 2 screens, donated monitor Wireless mouse	EOC laptop & loaner laptop Wireless mice
Power systems	MARC Unit for available backup power;	Using EOC wall power for station 1.	Using EOC wall power for Station 1	Using 2kW sine-wave inverter driven by 3 parallel 12V 100Ahr batteries and

YEAR SUBJECT	**2023**	**2022**	**2021**	**2020**
	Newly refurbished 5kW PRAMAC Diesel Generator for Trailer	MARC Unit 10 kW Generator Gordon's conventional 3.4 kW gas generator	Earl Sloan's 240V 5KW 2-leg generator, assisted by Gibby 3400-watt conventional 120V generator. No inverter generator No RFI filter; generators approx. 100 feet away.	75A Power Pole connectors Switching between Champion inverter 4 kw and conventional 120V generator on utility trailer using RFI filter. Generators approx. 25 feet away
Trailer(s)	Gibby 24-foot for GOTA/Station 4	Gibby 24-foot Dave Fox popup camper with AC Amy Woods 26-foot Bret Wallace Winnebago (6m) Brett Wallace Sprinter for GOTA station	Brett Wallace Winnebago	None
Free VHF Transceiver	ICOM 7300	FT991 running 6-meter FT8 to 6 meter ground plane top of MARC unit tower	ICOM 7300 running 6 meters FT8, with homebrew vertical on basketball support	Not really pursued

YEAR SUBJECT	**2023**	**2022**	**2021**	**2020**
Winlink Emails	From Huckstep Go Kit via 2 meter antenna @ 50 feet	From EOC 2meter digital station using antennas at 60 feet to local Gainesville RMS	From EOC 2meter digital station using antennas at 60 feet to local Gainesville RMS	Using mesh link to cell-phone hot-spot provided mesh RMS Gateway (very complicated)
Incident Command Post	Main room, occasionally utilized	New for this year, 10x10 canopy with tables, chairs, computers and fans (VHF radio)		
Meal Support	Saturday - Sandwiches & more / Rosemary Sunday - Full Buffet / Rosemary. Huge success!	Saturday - Sonny's FULL LUNCHEON by Emily on Sunday	FULL LUNCHEON by Emily both days	Not really planned

EQUIPMENT & INFRASTRUCTURE IMPROVEMENTS MADE AS A RESULT OF 2023 FIELD DAY		
1	New Tower Trailer	
2	Hundreds of feet of high quality coaxial cable purchased privately	We estimated >700 feet of coaxial cable would be required for our antennas.
3	Improved high quality ground / lightning protection systems	
4	5.5 kW Diesel Generator has been refurbished and stationed on a trailer.	
5	Five ready-to-go antennas rolled onto	

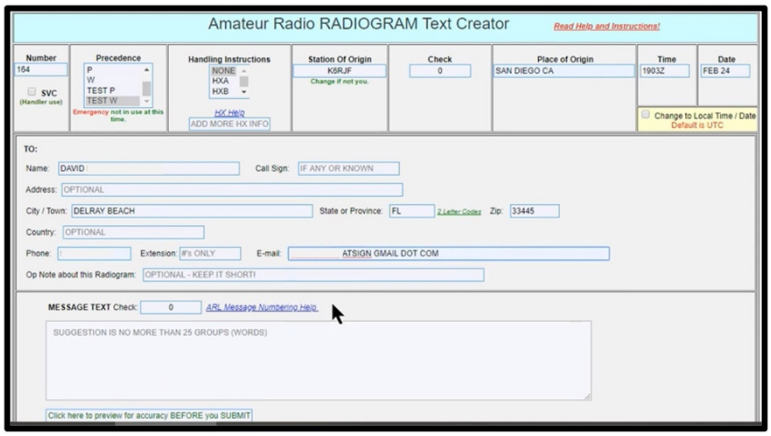
	extension wire holders.	

Technical Training @ Field Day

TIME / LOCATION	TOPIC	INSTRUCTOR
1030 MARC UNIT	Purpose, use & capabilities of the MARC Unit	District Fire Chief Kevin Rulapaugh KE4NVI NCS180
1115 Main Operating Room	Disaster Outbound H&W Traffic Management Write radiograms to get the BONUS POINTS	Gordon Gibby
1145-12:30	Review of Public Tours / Welcome Station	OPERATIONS CHIEF

MARC Unit Chief Rulapaugh delivers explanatory talk of the unit's Mission and Capabilities

Radiograms were created and distributed



Radiogram Text Creator

8 R NF4AC 28 GAINESVILLE FL JUN 26
ARC THAMES W4CPD
P DOT O DOT BOX 961
MILTON FL 32572
850 889 3767
ARC DOT THAMES ATSIGN SRCARES DOT ORG
OP NOTE DELIVER AS EMAIL
BT
ARRL FIELD DAY SEC MESSAGE
DOT ALACHUA COUNTY EOC ARES
RADIO CLUB DOT 26 PARTICIPANTS
X LOCATION ALACHUA COUNTY SHERRIFS
OFFICE GAINESVILLE X 10 ARES
OPS DOT 73
BT
LELAND GALLUP AA3YB ALACHUA AEC
AR

Radiogram in Message Format

10 Radiograms were originated and in addition, 1 special message sent to the Section Manager. These went out over VHF VARA data WINLINK to W4DFU-12 on 144.990 without a digipeater.

Operating Positions inside the Freedom Center

GOTA Station/ HF#4 with truck as sound barrier to partially block diesel generator. Trailer is intentionally angled in the space to provide additional sound deadening. Operation outside under the awning was problematic because computer displays were not sunlight readable.

Antennas at dusk

SECTION 3: ANALYSIS OF OBJECTIVES / RESULTS

Aligning exercise objectives and core capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned core capabilities, and performance ratings for each core capability as observed during the exercise and determined by the evaluation team.

Objective	Core Capability	Performed without Challenges (P)	Performed with Some Challenges (S)	Performed with Major Challenges (M)	Unable to be Performed (U)
1. Safety for All	Community Resilience		**S**[9]		
2. Have fun and LEARN	Operational Coordination; Operational Communications	**P**			
3. Hone your skills at all things RADIO	Operational Coordination; Operational Communications	**P**			

Ratings Definitions:

- Performed without Challenges (P): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.
- Performed with Some Challenges (S): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.
- Performed with Major Challenges (M): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s), but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks for the public or for emergency workers; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.
- Unable to be Performed (U): The targets and critical tasks associated with the core capability were not performed in a manner that achieved the objective(s).

Table 1. Summary of Core Capability Performance

9 One member experience an overuse flare-up of an arthritis condition that prevented further involvement

OBJECTIVE 1: SAFETY FOR ALL
CORE CAPABILITIES: COMMUNITY RESILIENCE

Strengths

Strength 1: *Significant planning efforts led to a fairly efficient setup, attempting to minimize the work or re-work required.*

Strength 2: *Careful attention to keeping wires and cables away from the public and covered in insulating boxes or jackets avoided any RF burns or electrical contact.*

Strength 3: *Excellent provision of water and ice, and the availability of air conditioning provided chances for over-worked volunteers to cool off.*

Areas for Improvement

Area for Improvement: *A significant number of our final volunteers were not part of the setup or Dress Rehearsal, making the load a bit heavier on those who shouldered all of the setup etc. This may be unavoidable.*

Area for Improvement: *The number and complexity of our antennas that had to be emplaced, the complexity of the grounding and cabling systems, is still significant and* ***a burden for many of our older volunteers****. It is possible that a multiplexer system could ease this task.*

Area for Improvement: *The disparity of the effort expended to provide education to the public, and the number of citizens partaking of the opportunities was quite noticeable. As a result we should probably dial back our outreach efforts to reduce workload on our volunteers.*

OBJECTIVE 2: HAVE FUN AND LEARN!

CORE CAPABILITIES: OPERATIONAL COORDINATION, OPERATIONAL COMMUNICATIONS

Strengths

Strength 1: *Our teams worked hard but reported* ***comraderie and teamwork as high points of the effort*** *and generally were having a lot of fun.*

Strength 2: *Having most of the operations occurring literally side-by-side in the main room of the Freedom Center made for great problem solving and mentoring and comraderie. Highly appreciated by many.*

Strength 3: *It was very obvious during Dress Rehearsal setup, and during actual Field Day setup, that very significant learning was happening regarding antennas, cabling, matching systems, grounding and lightning arrestor systems.*

Strength 4: *Operators reported significant inter-participant mentoring at many times, leading to far better performance of different operators as time went on in the Exercise.*

Strength 5: *As our predictions indicated, there were indeed overload of various receivers and our participants learned effective techniques to conquer these problems using modest-cost receivers and simple choices and external implements. These skills make our operators more effective in a multi-transmitter environment.*

Areas for Improvement

Area for Improvement 1: *Increase engagement of peripheral volunteers in all phases of our educational process.*

Area for Improvement 2: *Continue to increase skill sets at our operators in more unusual operation modes such as FT4, CW, RTTY.*

Analysis: *The primary mission of the Alachua County ARES (R) Volunteers, when serving as volunteers to the Emergency Management Department of Alachua County, is to serve as directed to augment communications that need backup or assistance. This supports continuity of governance and continuity of operations. This exercise demonstrated that the volunteers can come together and work through a 24-hour operational period without the need for infrastructure support, verifying that communication lifelines can be maintained after a major incident or disaster.*

OBJECTIVE 3: HONE YOUR SKILLS AT ALL THINGS RADIO

CORE CAPABILITIES: OPERATIONAL COMMUNICATIONS

Strengths

Strength 1: *This exercise demonstrated that the Alachua County ARES(R) Volunteers can respond to an incident and maintain communications that is not reliant on the internet, cellular service, or any infrastructure.*

Strength 2: *This exercise demonstrated that the Alachua County ARES(R) Volunteers can power communications with gasoline, diesel, and solar generators.*

Strength 3: *This exercise demonstrated the interoperability of the Alachua County ARES(R) Volunteers with the Alachua County Fire MARC unit, with much better coordination and planning as well as execution.*

Strength 4: *Our operators demonstrated* ***year-over-year improved skills at almost every aspect of radio communications****. Antenna setup and design were the best we have had. Equipment installation and computer setup were the fastest and best we have ever had. Voice, CW and Data skills achieved the highest rates we have ever had. Operators who had been previously discouraged, were routinely making very respectable rates of connections. Solutions to interaction problems developed and were grasped by many volunteers.*

Areas for Improvement

Area for Improvement: *As the Alachua County ARES® Volunteers continue to show competency; further integration with the local government needs to increase.*

Area for Improvement: *There is a need to better match the volume of planning materials and updates to available time and comprehension of our volunteers.*

HOUR BY HOUR ANALYSIS

LEGEND FOR MODES			
FT4	FT8	CW	PHONE

(The SUFFIX of the operator callsign is presented inside the block; the position gives the frequency band, and the color gives the communications technique.)

6 Meters	THUNDERSTORM	FKO	FKO	FKO		FKO	FKO	
10 Meters			Z/GOTA					
15 Meters		JIR	JIR	JIR	JIR	JIR	JIR	JIR
20 Meters							TWS	OJV
20 Meters		TWS	TWS	TWS	Z	TWS/ZUJ	NVI	NVI
40 Meters		Z		UFL	UFL			
80/75 M								
100 Q/hr								
80 Q/hr								
60 Q/hr			55					50
40 Q/hr				43	43		42	
20 Q/Hr		23				28		
TIME LOC	2 PM	2:40 pm	3 PM	4 PM	5PM	6PM	7 PM	8 PM
SAME[10] BAND							SAME BAND(1)	SAME BAND(2)

10 "Same Band" refers to operations where two stations were transmitting and receiving on the same amateur band, and hence generally cannot be separated by traditional lumped constant LC filters because their frequencies are separated by only a tiny fraction. These operations cannot be supported by triplexer or bandpass filters, and require actual physical antenna separation + atttenuators.

NOTE how the intensity of contacts grows toward midnight. This may be partially due to more and more groups getting their stations to work and people getting more familiar with the Field Day contact routine, as well as time reaching 8PM on the west coast.

6								
10								
15								
20	OJV		OJV	OJV	OJV			
20	NVI	ASY	ASY	ASY	ASY(FT4)/ TWS(FT8)	TWS	TWS	TWS
40	LBS	LBS	OO	OO\\\		JIR	JIR	JIR///
40				///JIR	JIR			\\\JIR
80	JIR	JIR	JIR	JIR///	OO	OO	OO	OO
100 Q/HR				**90**				
80		**83**	**82**		**70**			
60	**66**							
40						**39**	**42**	
20								27
TIME LOC	**9PM**	**10PM**	**11PM**	**MN**	**1AM**	**2AM**	**3AM**	**4AM**
SAME BAND	SAME BAND(3)		SAME BAND(4)	SAME BAND(5)	SAME BAND(6)			

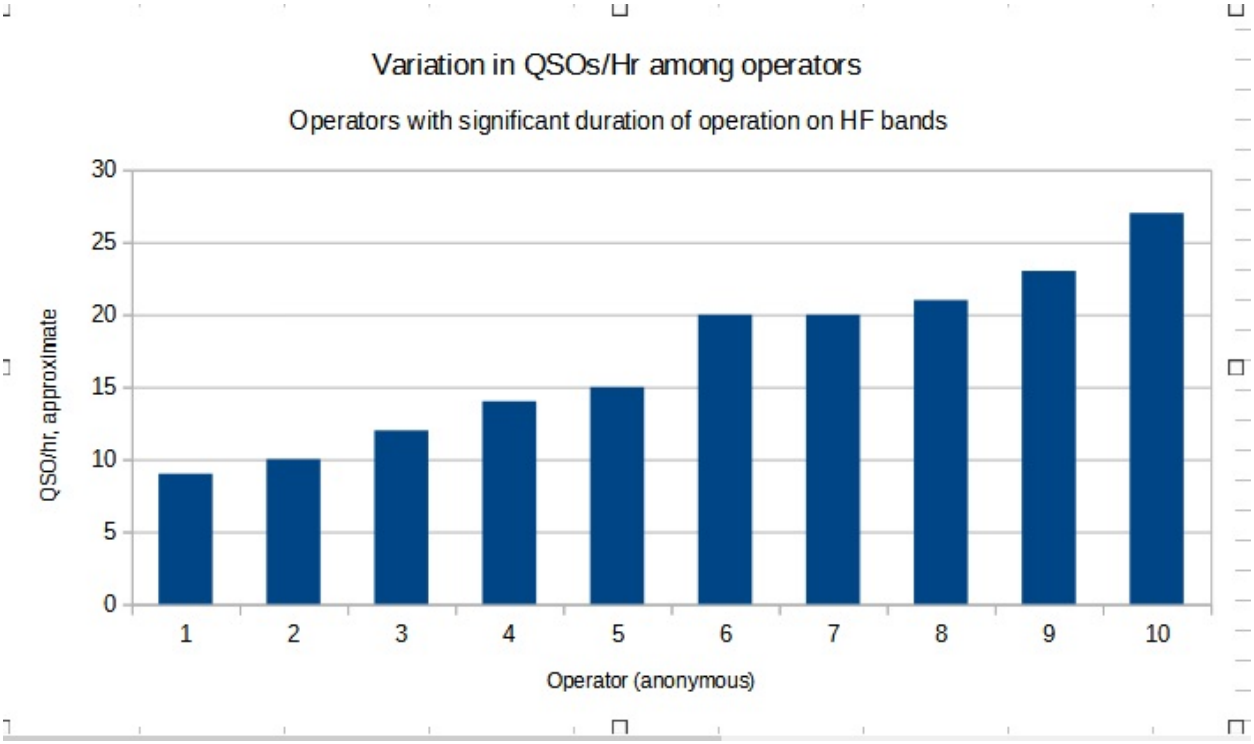
Note how the intensity of contacts wanes dramatically at 9PM on the west coast (1 AM here)

NOTE: 80 meter operations commenced at 9PM (just after sundown) and continued until 7AM (just after daybreak). Thus there were 10 hours of 80 meters operation, illustrating the importance of this low band.

6			FKO	YB	INZ	INZ	INZ	INZ
10					YB	YB	TWS	TWS
15					OO	OO	OO	OO
20			YB	NVI/YB				
20	TWS	YB	Z	Z	NVI	NVI	NVI	NVI
40								
40	JIR	JIR	JIR	JIR	JIR/8/4		UFL	
80		OO						
80	Z							
100 Q/HR								
80				**78**		**76**	**80**	
60		**55**	**62**		**50**			
40	**47**							
20								28
TIME LOC	**5AM**	**6AM**	7AM	8AM	9AM	10AM	11AM	NOON
SAME BAND			SAME BAND(7)	SAME BAND(8)				

Note how contact rates build up again as the sun rises on the east coast and more participants join back in.

OPERATOR QSO/HR



Our operator QSOs/Hour is a ***very approximate measurement*** computed by gross count of the hours reported for each operator and dividing this into the total QSOs for that operator. Our operators are NOT very inter-competitive and don't really care generally whether they log QSOs under their name or a colleague's name! They work generally for the TEAM and are willing to accept available sub-optimal bands or modes as needed for the team outcome.

As a consequence, these data are presented anonymously. Inspection of the data suggests that the newer operators with lesser overall experience were making 10-15 QSO/hour and that the more experienced operators (with a few Field Days and many hours under their belts) were making roughly 20 QSO/hr with some variation due to some bands being "hotter" than others. Generally we saw significantly higher rates for shorter periods of time by FT4 operators and in some cases, for CW operators. These data suggest that maximizing our proficiency at FT4 and CW will reap higher QSO/hr rates. However, in order to scoop up as many possible contacts, ***we have to be able to harvest other modes and lesser-performing bands, so the team-oriented performance of our operators is likely near optimum.***

Note how there is only a factor of two difference basically between our most experienced (or lucky) operators and newer operators.

NF4AC's Contest Summary Report for ARRL-FIELD-DAY

COMPARISON YEAR OVER YEAR

Item	2023	2022	2021	2020
Class	4F	2F	2F	2F
Total Contacts	1269	702	513	249
Total Points	6,342	4,172	3,290	2,322
Operators / Contacts[11]	Operator Contacts **W4JIR 376** **KN4TWS 169** **KE4NVI 146** K0OO 113 KC2ASY 94 AA3YB 92 KX4Z 82 KF4OJV 69 KK4INZ 43 W4UFL 26 KO4LBS 24 WB2FKO 13 KN4ZUJ 12 KG4VWI 9 GOTA STATION Alex 2 14 operators + 1 GOTA (visitor)	Operator Contacts **NN4DF 209** **KF4OJV 70** **KN4TWS 70** W4JIR 56 WB2FKO 47 KX4Z 46 KG4VWI 34 WA4AMY 33 KK4INZ 25 "W4XYZ" 24 KI4QBZ 13 N4IU 11 KE4NVI 9 NH2KW 8 KG5FHU 4 KO4JWC 4 KO4LBS 2 GOTA STATION Eric Pleace Duke Bailes W4XYZ	Operator Contacts **KN4TWS 57** **KX4Z 95** **AA3YB 30** W4JIR 55 KO4IDO 86 KK4INZ 61 K9RFT 30 NH2KW 20 WB2FKO 20 KI4OXD 20 KV4RL 12 K1CE 8 KG5FHU 8 W1GLV 7 KN4POZ 4 Total = 15	Operator Contacts **KN4TWS 62** **KX4Z 60** **AA3YB 59** W4UFL 18 K4DF 16 KN4WIQ 13 W4JIR 11 K4ZSW 8 KM4EVZ 1 Total = 9
CONTACTS (non GOTA)	1269	665	513	249
CW	153	231	22	0
PHONE	101	13	16	12
DIGITAL	1,015	421	475	237

The group's estimated operating time was from 2 PM - 1PM with 45 minutes out for the initial thunderstorm

11 These numbers are only approximate because many operators don't insert their name/initials at the start of their operation, and many contacts are also mentored, etc. So just an approximation

ARRL Field Day Submission

YOU CAN DO THIS FROM HOME IF YOU OPERATE FROM HOME AND ATTRIBUTE POINTS TO ALACHUA EOC RADIO CLUB NF4AC. HOWEVER WE ENCOURAGE TEAMWORK **IN PERSON**

Submission web site: https://field-day.arrl.org/fdentry.php
"To submit your entry for Field Day, you'll need both the data that describes your entry and any required bonus point documentation. Although the bonus point documentation can be submitted at a later time, it's recommended that you submit both at the same time.
Data Entry. You'll need all of the info that describes your entry:

- •Call used and GOTA station call
- •Entry class, number of participants, list of operators
- •Power source and multiplier
- •Claimed bonus points
- •QSO totals by band and mode
- •GOTA operators and QSO totals

Upload Documents. If you elect to upload required documents at this time, you'll need files for the following:

- •Cabrillo log or list of stations worked by band/mode (dupe sheet)[12]
- •Required documentation for bonus points**"**

```
Call Used: NF4AC     GOTA Station Call: NF4RC     ARRL/RAC Section: NFL
Class: 4F
Participants: 17     Club/Group Name: Alachua EOC Radio Club
Power Source(s): Generator, Commercial, Solar
Power Multiplier: 2X
Preliminary Total Score: 6,342

Bonus Points:
  100% emergency power                              400
      [No document required]
  Media Publicity                                   100
      - File [PublicityBonusPointDocumentation.pdf] previously uploaded
  Public location                                   100
      [No document required]
  Public information table                          100
      - File [PublicInformationTableBonusPoints.pdf] previously uploaded
  Formal message to ARRL SM/SEC                     100
      - File [SectionManagerMessage.pdf] previously uploaded
  W1AW Field Day message                            100
      - File [W1AWFieldDayBulletinBonusPoints.pdf] previously uploaded
  Formal messages handled (10 x 10, max of 100)     100
      - File [MessageHandlingBonusPoints.pdf] previously uploaded
  Natural power QSOs completed                      100
```

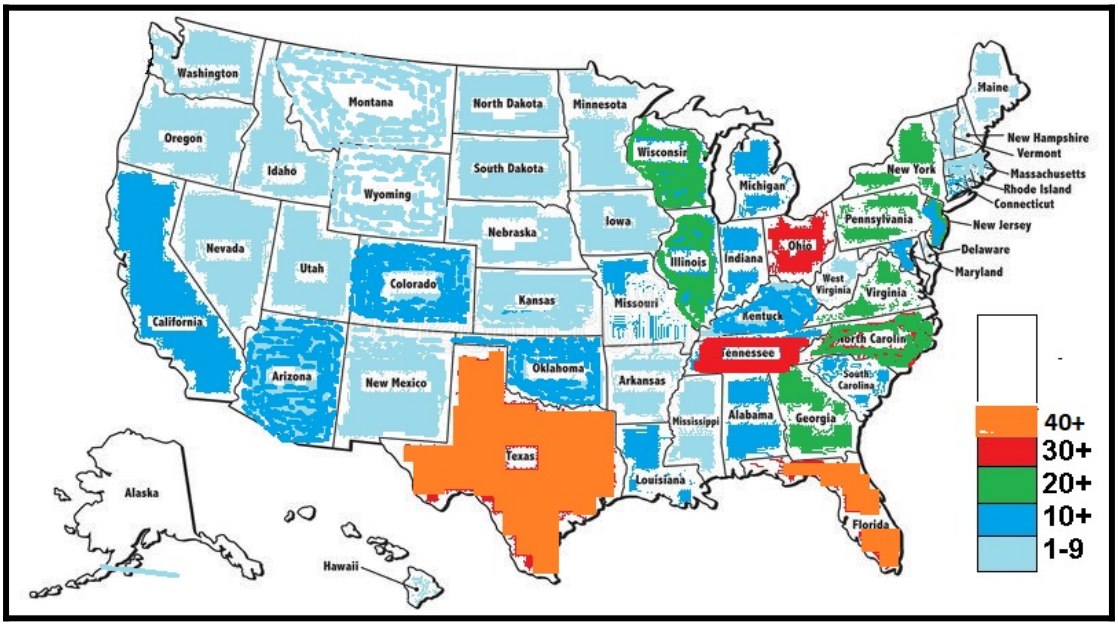
12 When using N3FJP, click FILE | Write Cabrillo (Contest Submittal) File. Then select: "Write DUPE File, Calculate Band Totals and Submit" The system will create a .dup file that you then upload when the Web submission system asks.

```
      - File [AlternatePowerBonusPoints.pdf] previously uploaded
  Site visit by invited served agency              100
      [No document required]
  Educational activity                             100
      [No document required]
  Social media                                     100i
      [No document required]
  GOTA Station                                      10
      [No document required]

  Entry submitted via web                           50
Total bonus points                                1,460

Score Summary: (File [NF4AC.dup] previously uploaded)
                   CW  Digital  Phone  Total
   Total QSOs     153   1017     101
 Total Points     306   2034     101   2441   Claimed Score = (QSO points x
power mult) = 4,882
Submitted by: Gordon Gibby, KX4Z   docvacuumtubes@gmail.com


Band/Mode QSO Breakdown:
               CW          Digital      Phone
            QSOs Pwr(W)  QSOs Pwr(W)  QSOs Pwr(W)
      160m
       80m    40   100    135   100     0   100
       40m    66   100    196   100    22   100
       20m    47   100    439   100    79   100
       15m               121   100
       10m                62   100
        6m                62   100
        2m
       222
       432
     Other
 Satellite
      GOTA                 2   100
     TOTAL   153         1017          101

GOTA Bonus: No GOTA Coach
Name/Call                                 QSOs  Bonus Points
Alex Wynn/Gordon Gibby, NF4RC(NF4AC)       2        10
```

TOP THREE ACES	
David Huckstep W4JIR	376
Wendell Wright KN4TWS	169
Kevin Rulapaugh KE4NVI	146

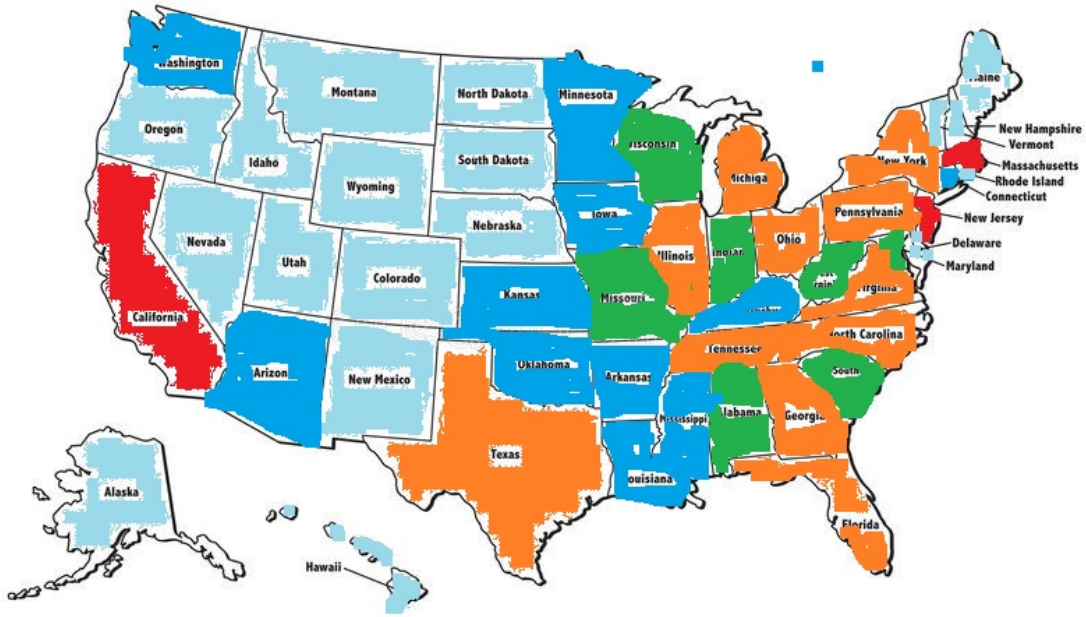
STATES WORKED / No. Contacts:

2022



2023 Results, same color scheme

Now we fill in the entire United States- considerably better coverage of the far west



TIME AND FUEL ESTIMATES

ESTIMATED FUEL USAGE			
MARC Unit	0		
Diesel Generator	8 gal		
VOL HOURS ESTIMATED			
Multiple site prep	Only 1 site planned this year.	4 vol hours	
County Comm. Presentation	Preparation	10 vol hours	Presentation on county TV/ streaming
Preparation	Equip. Creation	10 vol hours	Computer updates, installation
	Training Events	8 vol hrs	Tech Nite
	NTP server creation	5 vol hrs	
-	Antenna creation	20 vol hrs	
	Bandpass filters	10 vol hrs	Lab N Lunch + additional
	Promotions Creation	5 hrs	Banner, message pads, business cards, placards
Dress Rehearsal	8 persons on antennas x 3 8 persons x 4 hours training	24 hrs antenna setup 32 hrs training	2-day effort
Tower Raising	Friday effort	48 hrs antenna setup	6 persons x 8 hrs (8 antennas) This could be reduced with multiplexer antenna systems
Field Day Event		45 hrs equip setup 13 hrs training 70 hrs operating 36 hrs tear down	
Documentation/ Review	Field Day Submission	3 vol hrs.	
AARIP	Draft Creation	6 vol hrs	
AAR Review	July Meeting	18 x 1/2 hrs. = 9	

		vol hrs.	
TOTAL		**353 vol hrs.**	

VISITORS TO SITE

- 13 Visitors or groups of visitors
- 8 signed up for a class (1 of those mentioned "November")
- 1 person succeeded in making 2 GOTA contacts
- 5 listed "walked by at park" [These may well have had a "signs" component]
- 2 listed "friend"
- 1 listed "County email"
- 1 explicitly listed "signs"

The visitors' list has been typed up and sent out to various Chiefs

MODE SPECIFIC LEARNING POINTS

SPECIFIC TECHNIQUE LEARNING POINTS		
CW	An especially clipped and streamlined communications technique was known in advance by our team. We had one WINKEYER and very effectively used Function Keys and canned text. For the first time, Gordon felt very comfortable "running CQ" on 20 meters and achieved strings of contacts often. The paradigm that Gordon followed looked like this: CQ FD NF4AC NF4AC FD *K4AAA* K4AAA 4F NFL BK *R 1A TN* QSL TU QRZ NF4AC FD See: CW portion of https://qsl.net/nf4rc/2023/NetworkingCheatSheet.pdf	The ability to copy 25 wpm+ callsign with RUfzxp made for a much nicer time. FAR less stress

PHONE	Dan D'Andrea and Wendell Wright--and possibly others-- were extremely dogged and far more successful than our past efforts. See: Phone portion of https://qsl.net/nf4rc/2023/NetworkingCheatSheet.pdf	
Digital	We were far more effective at FT4 this year on standard frequencies and jumped back and forth between FT4 and FT8. Trained operators tended to maintain rates in the low 20's for long periods of time. Having a 4F operation allowed for rates up to 90 QSO/hr this year.	Their easiest and most productive technique for MOST volunteers.

Safety isolation of the End Fed Half Wave Balun inside a plastic box hanging above head height on a tree.

SECTION 4: CONCLUSION

Our team scored far higher this year, 80% above last year's already much improved effort.

We put up more antennas by far, and we did so with specific intent to create >30-40 dB physical isolation wherever possible. Our antenna setup was more arduous than desired and we may pursue tri- quad- or pentaplexer solutions next year.

Our data crew were FAR more successful, rapidly adopting FT4, as well as old standby FT8. We did not operate any other data modes.

Our voice crew were way more successful this year but still struggled.

Our CW crew experienced significant personal satisfaction at achieving the ability to hold a frequency at times and "run CQ" and build impressive strings of contacts very rapidly -- so rapidly that it was noticeable to data operators. We hope to build on this next year.

We conquered the MESH and NTP timing problems, but did not (during the event) solve new problems with WINKEYER/N3FJP connections. Hopefully we'll figure that out also.

Wendell's tagging system was a HUGE success for us. Much easier to identify the owner of coax and other gear. Our team purchased hundreds of feet of expensive high quality coaxial cable that will last a long, long time.

We also developed many other new radio assets, including getting the EOC HF station into a go-box, and getting a new tower trailer, and getting a 5kW diesel generator of our own, on a trailer.

And best of all, our participants reported excellent cooperation and comraderie. Equipment is nice, but PEOPLE in our team are where it is at!

We look forward to building even further on these radio skills that we are developing.

How 2023 Field Day Exercise Improved ARES Volunteer Response Capabilities	
No.	Item
1	Far better public and governmental awareness of their volunteer group, its size, and capabilities. Resulted to better integration and interoperability with other response systems.
2	Experience and knowledge transferred bidirectionally with the MARC Unit.

3	Better inter personal relationships among the volunteers, learning how to work together in stressful situations.
4	Far better technical grasp of operating multiple powerful radio systems in proximity of a base camp.
5	Acquisition of diesel power generation equipment.
6	Much better understanding of how to create isolation between antennas.
7	Testing and better preparation of vehicular / travel trailer assets.
8	Testing and validation/improvement of much more rapidly deployable antenna assets.
9	Acquisition of wider range of coaxial cable (transmission line) assets in preparation.
10	Better operational skills for many participants.

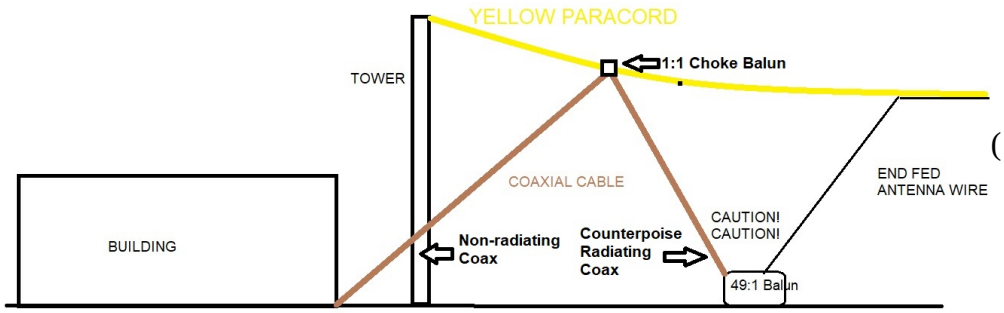
WORKING ON ANTENNAS!
Wendell Wright KN4TWS, Leland Gallup AA3YB, Lorilyn Roberts KO4LBS

APPENDIX A
IMPROVEMENT PLAN

2023 IMPROVEMENT PLAN

No.	Item	Comment / Assignment / Completion
1	Winkeyer Problems Investigate why WINKEYER kept closing and Function Keys not working for N3FJP CW scripts on HF-1	SOLVED: lack of "saving" the configuration in N3FJP CW setup caused this; verified by tests on HF-1 after discovering the solution via Google. The behavior of N3FJP with Winkeyer is somewhat unusual and has been documented in https://qsl.net/nf4rc/2023/FieldDay2023/CWContactSuggestions.pdf
2.	Computer Configurations Issues More training on computer configuration & setups	Suggests OPERATIONS & Earl hold sessions throughout the year; Winter Field Day might also help with this. Earl indicates very willing to help!
3	Computer Configurations Issues Block diagram of how to switch between CW & WSJT-X (each wants control of the 7300 port!)	Gordon will work on this
4	CW Paddles More emphasis on the 1/4" versus 1/8" connectors required of paddles to go into 7300 versus WINKEYER[13] Operators may wish to have converters or have their entire setup ready to connect to 7300.	(Was documented in "CW Suggestions")
5	Avoid need for External Tuner If Possible Discuss whether Antenna #2 can be changed to an END FED HALF WAVE. There are some public-contact risks as well as feedline radiation concerns to be discussed: One possible implementation:	

13 Documented in our CW Suggestions Document: https://qsl.net/nf4rc/2023/FieldDay2023/CWContactSuggestions.pdf but not recognized by everyone

	 Probably requires placing a **1:1 choke Balun** where the coax is suspended from the messenger line, or the impact of physical separation will be lost by common mode radiation and pickup) a) separation provided by moving the end feed approx 65 feet from tower b) coax-to-antenna separation (to reduce common mode currents) provided by angling coax and antenna wire each 45 degrees in opposite directions c) avoiding risk to public by running both antenna wire and coax at 45 degrees to a high wire, so that within a few feet, each is above 7 feet d) avoiding risk to the public by caution tape around the area and plastic box enclosing the Balun	
6	CHAIRS Borrow some bigger, very comfortable chairs for longer operations	
7	Dual Monitors Provide dual monitors for at least four positions, to make data operations easier	Gordon brought 2 and Earl indicates he has another 2!
8	Larger PIO team Lorilyn volunteers to assist on the PIO team	Hooray!!
9	Additional computer training a) Provide a Tech Nite dealing with computer issues b) Provide a test station at either the EOC or at a dress rehearsal at a time when people can come and spend several hours working out computer learning issues c) Provide a Quiz designed to help participants learn where they may have important blind spots in the computer interfacing skills needed	
10	REDUCE paperwork reading#1	E.g. Revisions of plan come out only on

	Provide new Incident Action plans only on **specified days every two weeks** and have a "**change lis**t" that details "changes" or updates to help participants know what has been improved	1st and 3rd Wednesdays of the month. Extraneous "discussion" of the ongoing projects can be provided in an optional thread that non-interested can "mute" as desired.
11	**<u>REDUCE paperwork reading#2</u>** Move RESOURCE details to a separate document just as PIO duties, OPs duties, CW, Voice, Digital, and Field Day Bulletin, as well as Antennas etc have already been.	This will reduce the top-level IAP to about 5 pages, approximately a high school homework assignment length.
12	REDUCE Paperwork #3: Bite-Sized Tasks Provide bite-sized tasks every week in the months leading up to the Field Day and provide **Assessment Reports** (e.g., by Google Forms) that allow people to gauge their success at the bite-sized task and the group to gauge preparation	This will allow Operations Chief and Logistics Chief to gauge progress much more accurately. **Potential examples** include: • Read FT8 Suggestions • Sign up for desired time slot • Read antenna descriptions • Sign up for niche tasks as desired • Read how to capture ARRL Bulletin • Contact Logistics Chief with items this week • Tag all your items • Read Field Day Rules from ARRL • Purchase buffet tickets at meeting • Read Dimension 4 document • Read N3FJP SSB logging suggestions
13	Reduce lesser-effective outreach efforts *Reduce the effort and time spent on GOTA efforts and on visitor outreach* to allow more focused energy on contacts	Despite significant outreach, we had no scout visitors. Consider a different outreach. Despite outreach, we had no school visitors. Alachua County media outreach resulted in relatively few visitors. Signage and word of mouth were more effective.
14	Bluetooth Unnecessary No further need for the Bluetooth monitoring of radios; this was never	

	needed by docents	
15	Winter Field Day Practice Operate in WINTER FIELD DAY, where voice, cw, and PSK/RTTY are usable modes, and attempt to dramatically reduce antenna requirements through a multiplexer type device; consider operating 3I (3 station, indoor) at the EOC. *Practice the above Paperwork Reduction ideas in this effort.*	See: https://www.winterfieldday.com/rules.php Winter Field Day indoors at the EOC with multiplexers would almost be a zero-setup effort given what we have already built and the pre-existing antennas.
16	Reduce Antenna Setup Effort Pursue tri- quad- or penta-plexor so that we can reduce the effort required to have multiple transmitting antennas[14] A total separation of at least -40dB is required for safety; -50dB minimum for good operation; use of attenuators may be required.	A multiplexer will NOT allow for "same band" operation -- this will still need PHYSICAL ANTENNA SEPARATION of 40db+ -- and was utilized in 8/22 operating hours (over 1/3 of our operating time).
17	Intermediate Coax Lengths Obtain additional 18-25 foot lengths of RG8X coax	Earl indicates he has 350' of RG8X and willing to make plenty of cables!
18	Night Air Conditioning Investigate if we can have some AC at night in the Freedom Center	
19	Unwanted PACC Contest Investigate the unwanted PACC designation in WSJT-X. Provide training how to set and remove contest designations.	
20	Automatic Emergency Defibrillator AED at the site	A 3 day rental might run $150 https://cpr-savers.com/aed-rentals Reid points out AED's can be found in the $1000 range. See: https://www.aed.us/aeds for

14 Note that our calculations that > 50dB separation between stations is required for coexistent operations proved generally correct. Our antennas were generally in the 30-40 dB separation range except for Antenna #5 which was much better isolated. K6KV-type triplexer (e.g. Dunestar) achieve only -26 dB reduction. DXEngineering triplexers are more in the -30 dB reduction. VA6AM designs utilize a combination of LPF,HPF and Bandpass in triplexers with dedicated series-tuned traps to notch out undesired bands--and achieve -30 to -33 dB reductions (still requires additional bandpass filtering to achieve desired -50 dB) Those are available in kit form in r range of $150, as triplexers. VA6AM prefers to use a HPF/LPF "split diplexer" in an attempt to add 40m to the 20/15/10 system. His designs focus of minimum LOSS. HPF/LPF generally have lower loss than bandpass designs. See data at: https://va6am.com/2017/01/25/first-blog-post/

		examples of refurb or other units in this price range. David H. suggests County might loan us one for the event. There are two AED's east on the road of the park; there is another at PUBLIX at Archer Rd. Every minute counts, 10% change in survival, but getting our own AED looks pricey....
21	Practice Logging Database Investigate the process of switching to a new database at the beginning of the Field Day period	There is some nuance to this that we don't yet recognize; HF-4 was still seeing "practice" QSOs in the main database at start time.
22	Time Services Build a 2nd NTP time server	This would give us a backup, and both could be sampled by Dimension4
23	VHF Data Systems Test winlink systems prior to Field Day	We had a bit of a pickle, this year! But we solved it.
24	Sunlight Readable Display(s) for any outdoor stations Sunlight readable displays for a possible GOTA effort or other outdoor operation.	Normal displays 300-400 "nits" (cd/m^2); need 1000 min for sunlight readable. Consider: 7" 2600nit $229 https://www.amazon.com/Desview-Camera-Monitor-Waveform-Vectorscope/dp/B09NNPK3H3 David H. points out that every patrol car has sunlight readable screens and we might be able to borrow a spare unit.
25	Generator Trailer Wiring Extension Flat 4-blade trailer wiring extension for the mast/generator trailer so it can reach Leland (or other) pickup truck wiring	
26	Generator Kill Switch Repair Grease, improve, or replace the gas generator kill switch	
27	Generator Start Key Secure the diesel generator key, and possibly get a duplicate key	
28	Diesel Priming / Fuel Gauge System Add a priming piping (known Navy modification) to the diesel generator fuel piping. If possible, make out of clear TYGON to allow dual function as "gas gauge"	

29	Slingshot Maintenance Annually, purchase replacement slingshot bands	Earl points out his launcher (which is an EXCELLENT one) is readily available!
30	Onsite Printer Consider obtaining an onsite printer	We already have a portable printer of our own at the EOC; might get current inkjet cartridges.
31	Operating Schedule Post copies of the operator schedule	We were busy and this didn't get done.
32	Training Room Mentoring for participants for whom reading the IAP is a stumbling block: Provide a "**training room**" where a separate transceiver can be operated with mentoring if requested, to practice operating in Field Day. A training video may also be helpful.	As Craig pointed out, no matter how condensed we write our plans, or how brilliantly we shorten them, there may still be "walk on" volunteers who haven't reviewed the material.
33	Buffet tickets Use "tickets" @ a nominal cost, such as $3, to help us know who really intends to be part of the buffet -- and Hotwash, and teardown! These can be made available at two meetings prior to the event, and at any Dress Rehearsal and any Antenna Setup Day. After that, foodstuffs can be accurately purchased.	We have been working to eat through the perishables for over a week and still have more to go....purchasers need more information! They did the best they could with what advice they received from Gordon.
34	W1AW ARRL Bulletins Teach techniques to use FLDGI to copy ARRL bulletins via RTTY, PSK, and MFSK-16 and hold practice at this	We only had 3 persons attempt to copy the bulletin this year; this was **no improvement from the prior year and suggests a need for additional training**.
35	Backup Mice for Computers Unexpected all our identical mice would not work! Had to have different vendor type mice for them to work in the same room.	Earl found TWO dead battteries & they seemed to work afterwards. Need to check interference to see if they all work in same room. ADD: BRING EXTRA BATTERIES!!

PREVIOUS PLAN
2022 IMPROVEMENT PLAN RESULTS
(PRESENTED TO DEMONSTRATE THAT WE FULFILL OUR IMPROVEMENT PLANS)

No.	Item	Comments / Assignment/Completion Status
1	Consider filing 3F next year	We went to 4F in 2023

No.	Item	Comments / Assignment/Completion Status
2	Separate the Ubiquity microwave system and WIFI system from the HF Antennas significantly.	We did, and it worked perfectly
3	Continue the U-shaped trailers	(Not applicable to the Veterans' Mem. Park)
4	Continue the Friday setup of MARC antennas	We did, and it was badly needed.
5	Better differentiation between VISITOR sign-in, and PARTICIPANT sign-in.	We did, and it worked.
6	Need a talk in frequency	We tried, but the available volunteer was overloaded.
7	Larger Porta Potty for ADA compliant individuals	Not applicable due to use of Veterans' Mem. Park.
8	Be CERTAIN software from N3FJP, through WSJT-X, through networking is ALL ready to go prior to contest.	We did, and it all worked except for attempts to switch back and forth to CW. There was a glitch of some sort switching to a new database just before 2 PM
9	SEPARATE HF ANTENNAS	We did, and it worked. We literally had people on the SAME BAND fir hours and hours.
10	TIME SYNC Solutions	We built it, published it, and it worked very well.
11	Deeper and written staffing at the VISITOR DESK	We tried and Lorilyn did great work among others, but we were short of people.
12	Deal better with ANTS	Not applicable to Veterans' Mem. Park.
13	Request to hold more EXERCISES	We did, such as the GANN GITMO exercise. We can still use additional people who learn how to Write, Execute and Write-UP exercises.
14	If new radios are added -- be CERTAIN to properly configure and members are oriented to the use of them.	We used 7300's which are available every Wednesday for training; we also held a Dress Rehearsal -- BUT both time and participation were limited.
15	Functional exercise setup for people to practice on and test their systems.	I don't think we did this. It would have helped.
16	Test the networking system across distance with the group's significant sized database.	We completely solved this problem.
17	Better train people to get LIGHTNING	Col. Huckstep took care of this aspect and did

No.	Item	Comments / Assignment/Completion Status
	ARRESTERS connected.	very well.
18	Consider a SET TIME to make 2M local simplex contacts.	We did, but we were too busy and blew right through it.
19	Teach everyone how to file a Field Day Log on the ARRL site.	We did not go through this.
20	Longer ropes were needed to deal with pulleys at 60 feet -- need 120 feet to be able to go "up" and "down" before the antenna is hoisted.	We handled this perfectly and even used different colors.
21	Continue the Health and Welfare training.	We did and it worked well to get us 100 points.
22	Do not use 14G extension cords on Gibby's trailer -- drops too much voltage required 12G or 10G	A 10 Ga. extension cord was purchased and used very effectively with the Diesel Generator and with the Gas 3.4 kW generator.
23	Work toward more DIESEL generators and continue to avoid INVERTERS	We REFURBISHED an Ebay Diesel Generator and now have full access to it.
24	Need more FANS at the welcome station	Not applicable to the Veterans' Memorial Site, but we did as a result bring a standing fan for the GOTA site....which turned out not to be that popular.
25	Make ICE more available	We did, but not that necessary at the Veterans' Memorial site
26	Provide protection against HEAT and MOSQUITOES for the Incident Command Post	We did inside the Veterans' Memorial site and it worked perfectly
27	Continue the GOLF CART	N/A Veterans' Memorial site.
28	Need more pickup trucks able to help tow trailers and equipment to the site!	Success -- Leland and Gordon got everything there right at 7 AM
29	Tighten up the list of required photos for ARRL Submission	We did, but our publicity man got called away to Florida Guard training so the IC had to step in from memory.
30	Needed OPS and LOGISTICS Chief Volunteers PRIOR to the event	We did this year and it was a huge improvement!! However, OPS was a bit overloaded and needed more experience with Google Forms etc.

APPENDIX B
ICS Planning Documentation

see:
https://qsl.net/nf4rc/2023/ICS201GLG2023.pdf

This year we had an identified team of leadership preceding the event. During the event these roles somewhat continued but the "Command Post" was much more loosely applied

Post	Volunteer
Incident Commander	Gordon Gibby KX4Z
PIO	Jim Bledsoe KI4KEA
Operations	Leland Gallup AA3YB
Logistics	Wendell Wright KN4TWS
Networking	Earl McDow K4ZSW
Documentation	Gordon Gibby KX4Z
Solar Power	Reid Tillery K9RFT / Lorilyn Roberts KO4LBS
Sustenance	Rosemary Jones KI4QBS

APPENDIX C

HOTWASH FULL DOCUMENTATION

WHAT WENT WELL – AND OTHERWISE

Discussion conducted at lunchtime immediately after Field Day with those participants present at that time (11 by my count), and additional comments by GLG added.

	WHAT WORKED WELL
1	Rosemary's lunch Saturday; solved the concerns of finding parking spots upon return from a meal out! (Requests more advance decision to do lunch.)
2	Having air conditioning was EXCELLENT and being indoors great at this facility
3	Good facility (no bugs!) and good public access
4	Having (mostly) everyone in the same room, with some antenna separation was good.
5	Can filters
6	Venue
7	Dress Rehearsal was judged a big plus
8	Having standardized transceivers (this time, 7300's) judged to require less training than having various radios
9	Both the logging and the MESH (microwave) systems worked well
10	Having TWO monitors was a big plus when doing digital operations (e.g. FT8/FT4)
11	Craig's GEOCHRON was judged very interesting and attractive for visitors
12	The ROADSIDE SIGNAGE was found to be particularly effective in bringing in visitors (likely more effective than our other PR)
13	Having an entire day (FRIDAY) to set up antennas was necessary. There were just a LOT to set up, what with trees, coax cables, polyphasers, etc. Request to try and simplify if possible [Note: we had five total HF antennas; #2 was likely the least used]

14	Jim Bledsoe's PIO work judged highly successful
15	Door entry [?]
16	Susan's bisean [? illegible]
17	Invite to wildlife people
18	Diesel Generator - worked 30 hrs total, 15 hours at a stretch, used only approx 4 gal / 15 hours running RV trailer, but ? air lock after being stopped in heat of day (took 1 hour rest for it to restart). Thankfully, gas backup generator worked for that period.
19	Having GOTA/HF-4 far away allowed operation of two signals on same band (required attenuator usage)
20	Tower-based antenna pre-planning went well
21	Extension cord roll-up holders worked well when we figured out how best to use them (do not work well for multiple wires not in series)
22	Both slingshots and air-powered slingers worked well (we put up 7 lines in 8 lines in trees in total)
23	MOXON beam worked well lashed to ladder
24	Different colors of paracord for antennas on tower was judged a big improvement.
25	Essential practice, the real rehearsal was considered very important
26	The teamwork and comraderie were judged as excellent
27	Jeff's review of "new for this year" rules was very helpful
28	There was not a posted copy of the operator schedule
29	We had trouble knowing HOW MUCH FOOD to prepare for the "buffet" -- so there was a LOT left over, enough to be a problem.
30	

	WHAT DIDN'T WORK SO WELL-- Comments received
1	Getting the facility was challenging for insurance documentation, working keys, agreements etc.
2	Needed additional shorter coaxial cable jumpers; 18-20 feet requested, perhaps even 25 feet. Forced to use longer than necessary for some connections due to breaks for lightning arresters etc. [Earl volunteers]
3	Fuel [next word illegible]
4	Freedom center wiring issue: same fuse runs refrigerator as some other outlets; can blow fuse easily if other items plugged in, and refrigerator goes off line. Careful!
5	The AC automatically TURNED OFF at night! Unexpected warming of the operator and sleeping areas.
6	Took too long to set up all our gear
7	Perhaps we tackled too much, need more people as part of setup to accomplish everything we did.
8	Too complicated
9	Huge effort went into providing for public visitation and GOTA opportunities, far too few people served, perhaps we should scale back these efforts to match the people who tend to show up?
10	"PACC" contest inexplicably would show up on WSJT-X calls. Unknown cause.
11	WINKEYER was inexplicably "closing" socket access on HF-1 computer.
12	Need AED on premises
13	Difficulties switching between the N3FJP CW setup (function key canned text) and WSJT-X. [Cannot have both having control of ICOM Port and my understanding of this issue is not complete; further investigation required.]
14	Difficulties at very beginning of Field Day trying to switch to a "clean" new database. (Gordon ended up deleting some practice QSO's but it was unclear how the switchover was working.) UPDATE: Earl discovered TWO running copies by accident, once fixed that seemed to work fine.
15	A misunderstanding led to problems getting the 2meter winlink data radio to work correctly.
16	Computer displays at GOTA station were not sunlight readable - washed out. Difficult to move station in/out of the trailer. Operation outside was largely

	abandoned due to these problems. Happily, several visitors were willing to come inside the trailer.
17	Mast/Generator Trailer light-wiring was not long enough to reach Leland's truck (flat four blade extension needed) although it reaches the Suzuki
18	Gas generator kill switch (which shorts the magneto for safety) was intermittent
19	Diesel generator would not immediately restart after bring stopped "hot" (? fuel vapor lock?)
20	Slingshot band broke on first try, spare wasn't in the best of shape (Earl points out his available launcher)
21	NONE of the inexpensive Bluetooth mice that Gordon had purchased worked when in the same room at Field Day! We had to replace them with backup units, almost all of which worked fine. (Investigation suggests due to dead batteries)

The Group was a bit tired and so the next two categories got a very quick treatment, feeling that most of it had been covered in the information above.

	BEST PARTS OF FIELD DAY
1	Rosemary doing lunch and buffet
2	Individual successes experienced at CW
3	"Schedule appropriate"
4	
5	

	WORST PARTS OF FIELD DAY
1	We were so busy that we completely forgot (failed) at the scheduled "VHF SIMPLEX" time
2	
3	

4	
5	

	THINGS YOU WOULD CHANGE
1	More training on computer configuration/setups; need a block diagram of how to switch between CW and WSJT-X (Earl volunteers)
2	More Winkeyer ($159)
3	Know ahead of time how "paddles" connect to various equipment (Winkeyer needs 1/8" stereo; Icom 7300 needs 1/4" stereo for example)
4	Consider changing antenna #2 to an endfed if we are able to put the Balun in a controlled area and then run a vertical wire up to the messenger rope and then horizontal from there (similar to Antenna #3) -- this would avoid the need for the outdoor antenna tuner
5	Get BIG, NICE chairs -- because people need to feel comfortable for hours in them. The plastic chairs at the Freedom Center were judged not as hefty as desired
6	Definitely benefit from having TWO MONITORS for FT8/FT4 work -- makes being able to see the LOG and the WSJT-X software simultaneously much easier. (Earl indicates he has two spare monitors)
7	Need MORE VOLUNTEERS
8	Request to use the Freedom Center again -- facility judged excellent for our work
9	Lorilyn would be happy to work as part of the PIO team
10	Need more computer training. (Earl volunteers!)
11	Suggestion made to limit the number of "change releases" to planning documents
12	Suggestion to have releases of "spoon sized" tasks to be completed, appropriate for a day or a few days, and continue with bite-sized releases throughout the lead-up to the Field Day
13	Suggestion not to have the Resources List as an immediate part of our IAP (perhaps to have it separately) as "most people don't need to see that."
14	Get sunlight readable displays for any attempted outdoor GOTA station
15	

Rather than using the condensed AAR/IP template found on the FEMA preptoolkit for

HSEEP (See: https://preptoolkit.fema.gov/web/hseep-resources) this report follows more closely the previous, more all-inclusive version so that the reader can have a fuller understanding of the entire Exercise, its outcome, and improvements suggested for subsequent exercises of its type. This is in keeping with previous AAR/IP's for Alachua County ARES®/North Florida Amateur Radio Club, such as: our 2021 Field Day AAR/IP (https://qsl.net/nf4rc/2021/AlachuaCountyARES2021FIELDDAYAfterActionReport.pdf) and our 2020 Field Day AAR/IP (https://qsl.net/nf4rc/2020/AlachuaCountyARES2020FIELDDAYAfterActionReport.pdf

APPENDIX D

ANTENNA INTERACTIONS MEASUREMENTS

THESE MEASUREMENTS WERE CARRIED OUT AT THE DRESS REHEARSAL SIMULATION OF ANTENNA SETUP, USING A SIGLENT SPECTRUM ANALYZER. THEY CAN BE EXTREMELY HELPFUL IN PLANNING MULTI-TRANSMITTER ENVIRONMENTS.

RECV ANT-> TRACKING GENERATOR	2 CF WINDOW LINE	3 EFHW 65 FT	4 EFHW 135FT	5 SLOPE VERT
1 OCFD 135FT	**NEAR BAND RISK** 80: ? 40: -38 (untuned) 20: ? (Other bands not measured due to need to tune external tuner)	**OK** 80: -58 dB 40: -50 dB 20: -50 dB	**NEAR BAND DAMAGE** **80: -30 dB** **40: -35 dB** **20: -40 dB**	**OK** 80: -55 dB 40: -50 dB 20: -55 dB
2 CF WINDOW LINE		**EXCELLENT** 80: ? 40: -65 dB 20: -70 dB *Comment: end-to- end dipoles far apart*	**GOOD** 80: -50 dB 40: - 58 dB 20: -70 dB	*not measured*
3 EFHW 65 FT			**NEAR BAND RISK** 80: -50 dB 40: -40 dB 20: -40 dB	**EXCELLENT** 80: -70 dB 40: -60 dB 20: -60 dB
4 EFHW 135FT				**GOOD** 80: -55 dB 40: -60 dB 20: -68 dB

Icom 7300 has internal bandpass filters with the following characteristics:

BPF Insertion Loss

RECEIVER BAND	BPF 160M	BPF 80M	BPF 60M	BPF 40M	BPF 30M	BPF 20M	BPF 17M	BPF 15M	BPF 12M	BPF 10M
160M	1.7 db	15 db	27 db	38 db	46 db	56 db	62 db	67 db	71 db	74 db
80M	24 db	1.4 db	12 db	28 db	40 db	50 db	57 db	61 db	65 db	69 db
60M	41 db	9 db	1.2 db	15 db	25db	37 db	45 db	50 db	55 db	59 db
40M	46 db	19 db	0.9 db	0.9 db	12 db	27 db	39 db	42 db	47 db	51 db
30M	58 db	35 db	26 db	11 db	0.4 db	0.4 db	10 db	21 db	28 db	34 db
20M	58 db	35 db	26 db	11 db	0.4 db	0.4 db	10 db	21 db	28 db	34 db
17M	72 db	54 db	39 db	32 db	17 db	0.5 db	0.5 db	0.5 db	4 db	14 db
15M	72 db	54 db	39 db	32 db	17 db	0.5 db	0.5 db	0.5 db	4 db	14 db
12M	77 db	59 db	49 db	38 db	25 db	11 db	0.5 db	0.9 db	0.2 db	0.2 db
10M	77 db	59 db	49 db	37 db	24 db	10 db	0.5 db	0.9 db	0.2 db	0.2 db

NOTES:

Red text is insertion loss from Elsie simulation minus 2 db

Green text is insertion loss from Elsie simulation

Black text is actual measured insertion using OVF trip points

Chart: W7KEC

APPENDIX E

RF EXPOSURE CALCULATIONS

*Th*is information *is included for completeness.*
Calculations performed via ARRL Exposure Calculator: http://arrl.org/rf-exposure-calculator

BAND	POWER (watts)	SIGNAL (DIGITAL is the worst case)	DUTY CYCLE (Contest operation)	Antenna GAIN	Ground Reflection Included	Minimum Distance Separation (Uncontrolled Environment)[15]	Verdict on our proposed antennas[16]
2M	50	FM	33%	6 dBi	YES	8.6 feet	Antenna will be 20-50 feet above us so exposure is VERY MINIMAL
6M	100	Dig	50%	2.2dBi	YES	9.5 feet	Antenna will be 20-50 feet above us so exposure is VERY MINIMAL
10M	100	Dig	50%	2.2 dBi	YES	8.9 feet	OCFD will be 20-50 feet above ground hence meets this requirement even if operator is standing continuously.
15M	100	Dig	50%	2.2 dBi	YES	6.7 feet	Minimal exposure
20M	100	Dig	50%	2.2 dBi	YES	4.5 feet	Minimal exposure
40M	100	Dig	50%	2.2 dBi	YES	2.2 feet	Minimal exposure
80M	100	Dig	50%	2.2 dBi	YES	1.1 feet	Minimal exposure

15 Uncontrolled Environment is the most demanding and most conservative environment to protect unsuspecting individuals.
16 Conclusions are based on Grassy Field installation of antennas