# W4CAR Spring Shenanigans 2024

Shenandoah to Tidewater Communications Plan

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# 1 Objective

Each station will establish communications with each other as scheduled (at a minimum) in order to facilitate field objectives and provide mutual support.

| **EVENT DETAILS** | |
|---|---|
| **Name:** W4CAR Spring Shenanigans 2024 | |
| **Date: 4**/19/2024 – 4/21/2024 | |
| **Time:** Continuous | |
| **Station Locations:**<br><br>**Shenandoah, VA - Lewis Campground**<br>Lat/Long: 38.43718, -78.47800<br>UTM: 17S 0720120E 4257335N<br>Maidenhead Locator: FM08sk<br><br>- W3DRB, Dave<br>- KG4WOJ, Jim<br>- K4WPW, Eric<br><br>**Northwest River Park, Chesapeake, VA**<br>Lat/Long: 36.58499, -76.15773<br>UTM: 18S 0396431E 4049459N<br>Maidenhead Locator: FM16wo<br><br>- WM4ST, Mike<br>- KN4ZXF, Mike<br>- KB4GM, Gary<br>- N0CALL, Aaron (GMRS)<br>- KQ4AIP, Don<br>- KJ4YKG, Duane<br>- K4GDA, Gary<br><br>**Merchants Millpond, NC**<br>Lat/Long: 36.43695, -76.69944<br>UTM: 18S 0347677E 4033756N<br>Maidenhead Locator: FM16pk<br><br>- K4LBL, Bryan | **Objective:**<br><br>Establish communications between all stations.<br><br>**FM08sk – FM16wo:**<br>**Distance:** 180 mi **Bearing:** 134° (315°)<br><br>**FM08sk – FM16pk:**<br>**Distance:** 168mi **Bearing:** 145° (325°)<br><br>**FM16wo – FM16pk:**<br>**Distance:** 34mi **Bearing:** 71° (251°) |

# 2 Message Exchange

Each station shall exchange their current temperature in degrees Fahrenheit regardless of the communication method used. The receiving station must acknowledge receipt.

# 3 HF P.A.C.E. Plan

Communications will be established starting with the Primary mode on/at the frequencies and times listed in the charts below.

- If communications are successfully established, conduct the message exchange (defined above). Once the message has been exchanged, operators are free to move to the next method in the plan (at the listed time), try another station, or QRT.
- If communications fail, move to the next method at the listed time. Repeat until communications are successfully established. If none of these methods are successful, please carefully document any challenges and troubleshooting for the After Action Report.

## 3.1 Primary

SSB phone will be used for the primary communications channel. If there is QRM or the schedule is missed, wait 5 minutes and move to the next frequency.

| **19APR24** | | | |
|---|---|---|---|
| **Time (UTC)** | **Time (Local)** | **Frequency** | **Mode** |
| 2100Z | 1600L | 7.275 MHz | LSB Voice |
| 2105Z | 1605L | 7.270 MHz | LSB Voice |
| 2110Z | 1610L | 7.265 MHz | LSB Voice |

| **20APR24** | | | |
|---|---|---|---|
| **Time (UTC)** | **Time (Local)** | **Frequency** | **Mode** |
| 1600Z | 1100L | 7.275 MHz | LSB Voice |
| 1605Z | 1105L | 7.270 MHz | LSB Voice |
| 1610Z | 1110L | 7.265 MHz | LSB Voice |
| 2100Z | 1600L | 7.275 MHz | LSB Voice |
| 2105Z | 1605L | 7.270 MHz | LSB Voice |
| 2110Z | 1610L | 7.265 MHz | LSB Voice |

| **21APR24** | | | |
|---|---|---|---|
| **Time (UTC)** | **Time (Local)** | **Frequency** | **Mode** |
| 1500Z | 1000L | 7.275 MHz | LSB Voice |
| 1505Z | 1005L | 7.270 MHz | LSB Voice |

| | | | |
|---|---|---|---|
| 1510Z | 1010L | 7.265 MHz | LSB Voice |

## 3.2 Alternate

VarAC shall be used as an alternate for real-time keyboard-to-keyboard chat. The default 40m calling frequency should be used.

| 19APR24 | | | |
|---|---|---|---|
| **Time (UTC)** | **Time (Local)** | **Frequency** | **Mode** |
| 2130Z | 1630L | 7.105 MHz | VarAC |
| 2135Z | 1635L | 7.105 MHz | VarAC |
| 2140Z | 1640L | 7.105 MHz | VarAC |

| 20APR24 | | | |
|---|---|---|---|
| **Time (UTC)** | **Time (Local)** | **Frequency** | **Mode** |
| 1630Z | 1130L | 7.105 MHz | VarAC |
| 1635Z | 1135L | 7.105 MHz | VarAC |
| 1640Z | 1140L | 7.105 MHz | VarAC |
| 2130Z | 1630L | 7.105 MHz | VarAC |
| 2135Z | 1635L | 7.105 MHz | VarAC |
| 2140Z | 1640L | 7.105 MHz | VarAC |

| 21APR24 | | | |
|---|---|---|---|
| **Time (UTC)** | **Time (Local)** | **Frequency** | **Mode** |
| 1530Z | 1030L | 7.105 MHz | VarAC |
| 1535Z | 1035L | 7.105 MHz | VarAC |
| 1540Z | 1040L | 7.105 MHz | VarAC |

## 3.3 Contingency

Winlink Email shall be used as a contingency. Each station shall use whatever RMS Gateway is most appropriate for their location.

In addition to the weather report, each station shall include any operating challenges they may be experiencing.

## 3.4 Emergency

APRS shall be used as an emergency method of communication if available. Limit the exchange to just the current temperature in degrees Fahrenheit.

Recommended APRS Path (for FM08sk): WIDE1-1, WIDE2-1

SSIDs:

| FM08sk | FM16wo | FM16pk |
|---|---|---|
| W3DRB-7 | WM4ST-7 | K4LBL-7 |
| KG4WOJ-7 | KN4ZXF-7 | |
| K4WPW-7 | KQ4AIP-7 | |
| | KB4GM-7 | |
| | | |

# 4 Shenandoah Local Communications P.A.C.E. Plan

The below communications methods will be used and monitored while in the park. Additionally, the "Wilderness Protocol" will be observed - **all non-emergency/routine traffic must be held for five minutes at the top of each hour**. This will allow safety personnel monitoring communications to easily any hear weak signals from stations that may be reporting actual emergencies. Once this window has passed, non-emergency/routine traffic may resume.

**If at any time an actual emergency is heard, all non-emergency/routine traffic must be held until further notice.**

## 4.1 Primary

VHF Simplex – 146.550

## 4.2 Alternate

VHF repeater system:

- WA4TFZ - Crozet, Bucks Elbow Mountain (9.13 miles South of Dundo)
  - Frequency: 146.895
  - Offset: -0.6
  - Tone: 151.4
- K4MRA - Harrisonburg, Massanutten Peak (11.29 miles NNW of Dundo)
  - Frequency: 145.130
  - Offset: -0.6
  - Tone: 131.8
  - C4FM capable
- KC8MTV - Waynesboro, Bear Den Mountain (12.43 miles SSW of Dundo)
  - Frequency: 145.290
  - Offset: -0.6
  - Tone: 131.8
  - C4FM capable
- W4PNT - Waynesboro , Bear Den Mountain (12.66 miles SSW of Dundo)
  - Frequency: 147.075
  - Offset: +0.6
  - Tone: 131.8

### 4.3 Contingency

APRS – Use the table above (section 3.4) for a list of SSIDs.

Recommended APRS Path (for FM08sk): WIDE1-1, WIDE2-1

### 4.4 Emergency

In the event of an actual emergency, use whatever communications method is available. This may be a cell phone, satellite communicator, or anything else that can quickly and clearly communicate the emergency to first responders.

## 5 Approach

### 5.1 Antenna Selection

As this is a learning experience for many club members, stations may iterate through several combinations of transceivers, antennas, and other equipment.

NOTE: Propagation predictions were generated using the VOACAP tool, assuming resonant dipoles deployed at 5m Height Above Average Terrain (HAAT) with 10 watts of power (SSB).

### 5.2 Radio Selection

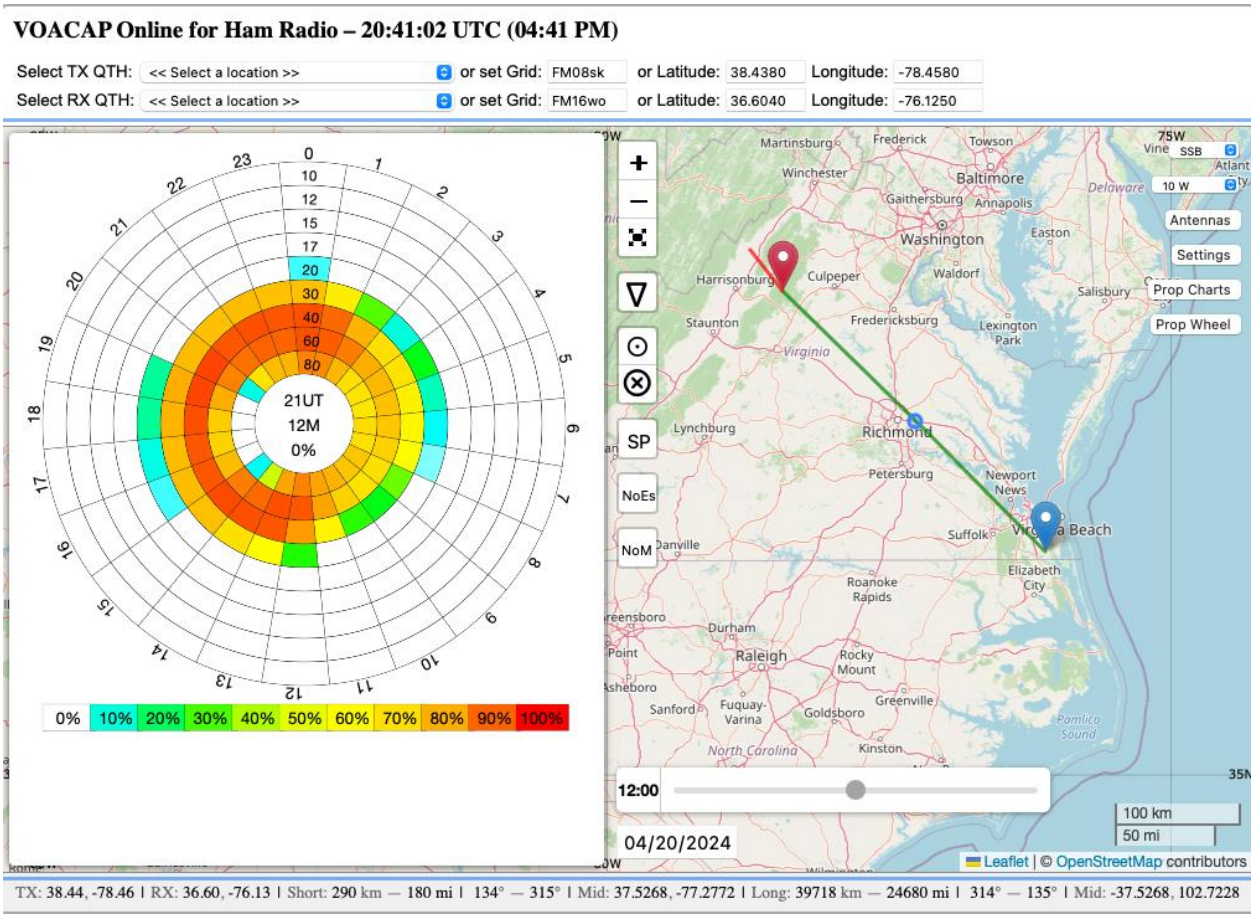
As this is a learning experience for many club members, stations may iterate through several combinations of transceivers, antennas, and other equipment.

### 5.3 Band & Frequency Selection

The VOCAP HF prediction tool (https://www.voacap.com/hf/) was used to determine the most appropriate band (40m) and time of day (1300Z through 0100Z). The following settings were used:

- Mode: SSB
- Power: 10w
- Antennas: dipole at 5m HAAT

(chart below)




# 6 References

The following pages contain quick references that may be useful to have in the field.

## The Considerate Operator's Frequency Guide

The following frequencies are generally recognized for certain modes or activities (all frequencies are in MHz) during normal conditions. These are not regulations and occasionally a high level of activity, such as during a period of emergency response, DXpedition or contest, may result in stations operating outside these frequency ranges.

Nothing in the rules recognizes a net's, group's or any individual's special privilege to any specific frequency. Section 97.101(b) of the Rules states that "Each station licensee and each control operator must cooperate in selecting transmitting channels and in making the most effective use of the amateur service frequencies. No frequency will be assigned for the exclusive use of any station." No one "owns" a frequency.

It's good practice — and plain old common sense — for any operator, regardless of mode, to check to see if the frequency is in use prior to engaging operation. If you are there first, other operators should make an effort to protect you from interference to the extent possible, given that 100% interference-free operation is an unrealistic expectation in today's congested bands.

| *Frequencies* | *Modes/Activities* |
|---|---|
| 1.800-2.000 | CW |
| 1.800-1.810 | Digital Modes |
| 1.810 | CW QRP calling frequency |
| 1.843-2.000 | SSB, SSTV and other wideband modes |
| 1.910 | SSB QRP |
| 1.995-2.000 | Experimental |
| 1.999-2.000 | Beacons |
| | |
| 3.500-3.510 | CW DX window |
| 3.560 | QRP CW calling frequency |
| 3.570-3.600 | RTTY/Data |
| 3.585-3.600 | Automatically controlled data stations |
| 3.590 | RTTY/Data DX |
| 3.790-3.800 | DX window |
| 3.845 | SSTV |
| 3.885 | AM calling frequency |
| 3.985 | QRP SSB calling frequency |
| | |
| 7.030 | QRP CW calling frequency |
| 7.040 | RTTY/Data DX |
| 7.070-7.125 | RTTY/Data |
| 7.100-7.105 | Automatically controlled data stations |
| 7.171 | SSTV |
| 7.173 | D-SSTV |
| 7.285 | QRP SSB calling frequency |
| 7.290 | AM calling frequency |
| | |
| 10.130-10.140 | RTTY/Data |
| 10.140-10.150 | Automatically controlled data stations |
| | |
| 14.060 | QRP CW calling frequency |
| 14.070-14.095 | RTTY/Data |
| 14.095-14.0995 | Automatically controlled data stations |
| 14.100 | IBP/NCDXF beacons |
| 14.1005-14.112 | Automatically controlled data stations |
| 14.230 | SSTV |

| *Frequencies* | *Modes/Activities* |
|---|---|
| 14.233 | D-SSTV |
| 14.236 | Digital Voice |
| 14.285 | QRP SSB calling frequency |
| 14.286 | AM calling frequency |
| | |
| 18.100-18.105 | RTTY/Data |
| 18.105-18.110 | Automatically controlled data stations |
| 18.110 | IBP/NCDXF beacons |
| 18.162.5 | Digital Voice |
| | |
| 21.060 | QRP CW calling frequency |
| 21.070-21.110 | RTTY/Data |
| 21.090-21.100 | Automatically controlled data stations |
| 21.150 | IBP/NCDXF beacons |
| 21.340 | SSTV |
| 21.385 | QRP SSB calling frequency |
| | |
| 24.920-24.925 | RTTY/Data |
| 24.925-24.930 | Automatically controlled data stations |
| 24.930 | IBP/NCDXF beacons |
| | |
| 28.060 | QRP CW calling frequency |
| 28.070-28.120 | RTTY/Data |
| 28.120-28.189 | Automatically controlled data stations |
| 28.190-28.225 | Beacons |
| 28.200 | IBP/NCDXF beacons |
| 28.385 | QRP SSB calling frequency |
| 28.680 | SSTV |
| 29.000-29.200 | AM |
| 29.300-29.510 | Satellite downlinks |
| 29.520-29.580 | Repeater inputs |
| 29.600 | FM simplex |
| 29.620-29.680 | Repeater outputs |

ARRL band plans for frequencies above 28.300 MHz are shown in *The ARRL Repeater Directory* and on **www.arrl.org**.

# US Amateur Radio Bands

**US AMATEUR POWER LIMITS — FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications. (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.**

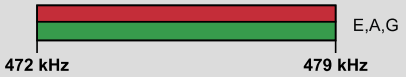
ARRL The national association for AMATEUR RADIO®

Amateurs wishing to operate on either 2,200 or 630 meters must first register with the Utilities Technology Council online at **https://utc.org/plc-database-amateur-notification-process/.** You need only register once for each band.

### 2,200 Meters (135 kHz)

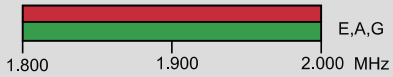

### 630 Meters (472 kHz)

5 W EIRP maximum, except in Alaska within 496 miles of Russia where the power limit is 1 W EIRP.

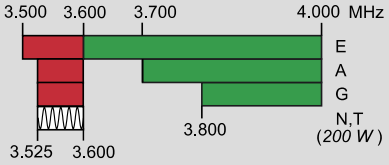



### 160 Meters (1.8 MHz)

Avoid interference to radiolocation operations from 1.900 to 2.000 MHz



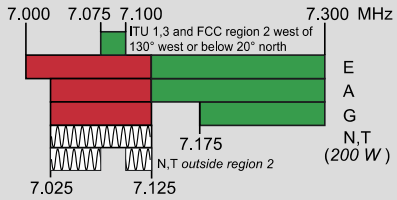

### 80 Meters (3.5 MHz)




### 60 Meters (5.3 MHz)


General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated power (ERP) of 100 W PEP relative to a half-wave dipole. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such as PACTOR III. Only one signal at a time is permitted on any channel.

### 40 Meters (7 MHz)



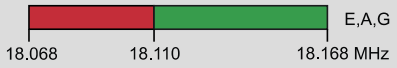

See Sections 97.305(c), 97.307(f)(11) and 97.301(e).These exemptions do not apply to stations in the continental US.

### 30 Meters (10.1 MHz)

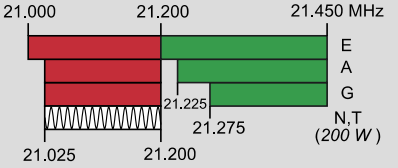
Avoid interference to fixed services outside the US.


### 20 Meters (14 MHz)

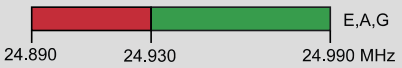

### 17 Meters (18 MHz)



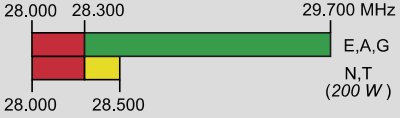

### 15 Meters (21 MHz)



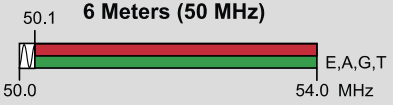

### 12 Meters (24 MHz)



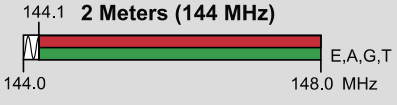

### 10 Meters (28 MHz)



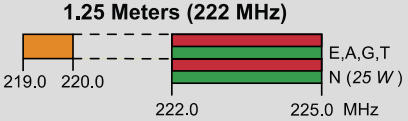

### 6 Meters (50 MHz)




### 2 Meters (144 MHz)




### 1.25 Meters (222 MHz)

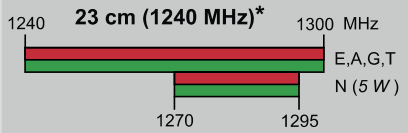



*Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.

### 70 cm (420 MHz)*


### 33 cm (902 MHz)*


### 23 cm (1240 MHz)*




All licensees except Novices are authorized all modes on the following frequencies:

| | | |
|---|---|---|
| 2300-2310 MHz | 10.0-10.5 GHz ‡ | 122.25-123.0 GHz |
| 2390-2450 MHz | 24.0-24.25 GHz | 134-141 GHz |
| 3300-3500 MHz | 47.0-47.2 GHz | 241-250 GHz |
| 5650-5925 MHz | 76.0-81.0 GHz | All above 275 GHz |

‡ No pulse emissions

### KEY

***Note:***
**CW** operation is permitted throughout all amateur bands.

**MCW** is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz.

**Test** transmissions are authorized above 51 MHz, except for 219-220 MHz

- = RTTY and data
- = phone and image
- = CW *only*
- = SSB phone
- = USB phone, CW, RTTY, and data
- = Fixed digital message forwarding systems *only*

**E** = Amateur Extra
**A** = Advanced
**G** = General
**T** = Technician
**N** = Novice

See *ARRLWeb at www.arrl.org* for detailed band plans.

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