

CHEROKEE AMATEUR RADIO SOCIETY



Away-From-Shack Computer Options

and Considerations, Examples, and a lot of Stuff to Think About



Away-From-Shack Computer Options

...and some other fun computery things to think about, and do!

Jason Turnage – KO4NDP – August 12, 2023



What do you want to do with a ham computer out in the field?

Top Ham-Related Computer Tasks

- QSO Logging
- Contesting Data Modes (FT8)
- Spotting Yourself (and hunt other spots)
 - via internet/web - ie, POTA/SOTA websites
- QRZ Lookups

(No coincidence that this looks like a run of the mill POTA... in fact we'll just call this "The POTA Scenario")

Heavy Duty Computer Tasks

- Data Modes
 - JS8Call/Olivia/VarAC/etc
 - WinLink (email...or spot yourself with no internet!)
 - SSTV
 - Send/receive Files
- WSPR (yes... this is a data mode, I know...)
- APRS (transmit, receive, digipeater... also for spotting, and yes, also a data mode...)

Listening Computer Tasks

- SDR (or SWL Listening, but on a computer)
- Satellite Receiving (NOAA weather, ISS images)

Community Info/Unattended Computer Tasks

- Weather station (and other IOT type stuff, APRS)
- ADB-S (community airplane tracking)
- Kiosk and dashboards (GeoChron/HamClock/NodeRed/etc)
 - contesting dashboards
 - HF propagation display

... Computer Tasks ... even more ...

- D-Rats
- Radio Programming (CHIRP)
- Satellite prediction/tracking
- Rig Control
- Rotor (beams) / Antenna (screwdriver) control
- DX Cluster
- A “more involved” foxhunt :)



Computer-Needing Scenarios

Club Outing Scenario (FD, QSO Party, etc)

Typical needs:

- Logging
- Data Modes
- Connectivity if using networked logging
- Internet - PSK Reporter, weather checker (probably true for all scenarios)

Considerations:

- Probably using mains AC Power for computing, generator AC for radio
- Go big as you're willing to carry (though not far)
- Room to spread out

Club Outing (FD, QSO Party, etc)

Icom 7300

MS Surface (running n3fjp)

Keyboard/Mouse

Powered Headphone Splitter&Phones

Antique APC surge protector

Heil desktop fan



(sorry no photo attribution)

Club Outing (FD, QSO Party, etc)

Icom 7300

Unknown small laptop (running n3fjp)

Mouse

Side monitor

Shelf

Powered Headphone Splitter&Phones

2 desk fans

1500w Band Pass Filter

(sorry no photo attribution)



The POTA Scenario (picnic table)

Typical computing needs:

- Logging
- Spotting (yourself & hunting other P2Ps)
- Data Modes (FT8, sometimes JS8Call)
- QRZ Lookups

The POTA Scenario (picnic table)

Considerations:

- Inputs needed - keyboard (either physical or on-screen a must)
- Can spread out with a picnic table (larger laptop fine)
- Probably not going far from your car/camper, so “minimal weight” is a convenience and not a necessity
- “Transport kit” also a convenience and not a necessity
- Likely won't have AC power, will need enough battery power to run a sufficient amount of time
- A larger screen is nice for running FT8, so a laptop is a plus
- Being able to spot yourself (via internet) is unbelievably handy for getting the job done. Hunting too.
- Hotspot internet is nice for Spotting, GridTracker, QRZ Lookups, and time sync (if no GPS)

The POTA Scenario (picnic table)

Courtesy: Chad KY4KP

Icom 7300

Dell Latitude Rugged Series

Discrete Hotspot

(Power not shown)



The POTA Scenario (... continued)

Courtesy: Bruce K4OTX

Evolve III Maestro Ebook

Mouse

FT891

LDG Z100A Tuner

Power Box



The POTA Scenario (... continued)

Courtesy: Jason KO4NDP

Logging + Spotting only

Xiegu G90 + Power in box

LG Tablet

Phone for hotspot

Paddles for CW

Earbuds

Scout for company



The POTA Scenario (... continued)

Courtesy: Jason KO4NDP

Logging + Spotting + FT8

Xiegu G90 + Power in box

LG Tablet

Dell Laptop

USB Hub

USB Sound card & cables for Audio&CAT

Phone for hotspot

Paddles for CW

Earbuds



The SOTA Scenarios

Typical computing needs:

- Logging
- Data Modes (FT8, sometimes JS8Call)
- ~~Spotting~~
- ~~QRZ Lookups~~

Similar to POTA, really. Though SOTA folks don't usually do any of this.



The SOTA Scenarios

Considerations:

- No AC power, will need enough battery power to run a lengthier time
- Hiking (and even climbing) a considerable distance. Minimal size and weight a must. Compromises must be met: much smaller radio, no keyboard, small screen.
- “Transport kit” a necessity
- Internet not typical. Spotting is a luxury.

The SOTA Scenarios (1 of 2)

Fraser, The Radio Rover

QRP Labs QDX

Raspberry Pi

Tablet (for FT8 and logging)

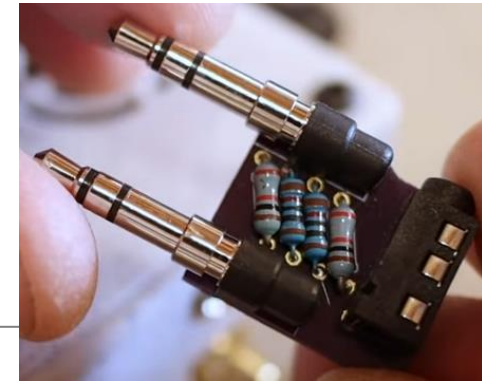
Phone (for GPS to the Pi)

https://www.youtube.com/watch?v=84c21Yef_MY

(QDX from QRP labs DX from Coyles of Muick)



The SOTA Scenarios (2 of 2)



Adam K6ARK

(tr)uSDX

Android phone (FT8CN App)

Custom cable he designed to handle going from speaker out level to mic in, in both directions

<https://www.youtube.com/watch?v=OX8Knu0yh6M>

(Ultra-portable FT-8 Ops | (tr)uSDX + Android app + Audio Adapter = Awesomeness!)



The Rover Scenario



K2EZ

KC700Y



WOJT



The Rover Scenario

Typical Needs:

- Logging & optional QRZ Lookups
- FT8

Considerations:

- 12V provided (though be wary of the source, may want to clean it and boost it)
- 120V inverter available to charge while not radio'ing
- May be noisy (both in sound and RF from alternator)
- Space may be cramped

The Rover Scenario



DJ1AA



N7PHY

The “Super High-tech Tools: Fun!” Scenario

What kind of room will Bill have in a “Prepper Go-Box?” after medic, sleeping, survival, comms, water, and rations?

What kind of computing does Bill need in a “Prepper Go-Box?”

What kind of computing can Bill fit in a “Prepper Go-Box?”

The “Super High-tech Tools: Fun!” Scenario

Typical (?) computing needs:

- Data Modes (Winlink, KB-to-KB, JS8Call “Microblogging”)
 - Emergency Alerts, weather changes, threats, coordination
 - Survivor reports
 - Scientific Research sharing, to rebuild society, human cloning experiment results
 - Navigation, mapping
 - Recording information for future generations, if any
 - Zombie sighting reports
 - Sharing survival tips - "How to Outrun a Zombie in High Heels" or "The Art of Conversing with Mutant Squirrels."
(thank you ChatGPT...)

The “Super High-tech Tools: Fun!” Scenario

Considerations:

- Probably needs to be packed in a way that’s easily transportable but also durable. Think ammo tin, small rugged case, or small metal trash can.
- Does weight matter? You’ll have it on your back as you escape a zombie horde, so yes.
- Internet is a thing in history books.
- Primarily data modes, a keyboard & mouse would be useful (but something easily transportable)
- AC power will be intermittent thanks to the EMP, and the zombies we found love eating power lines.

The “Super High-tech Tools: Fun!” Scenario

The Tech Prepper

QDX

3K mAh power pack

Panasonic Toughpad

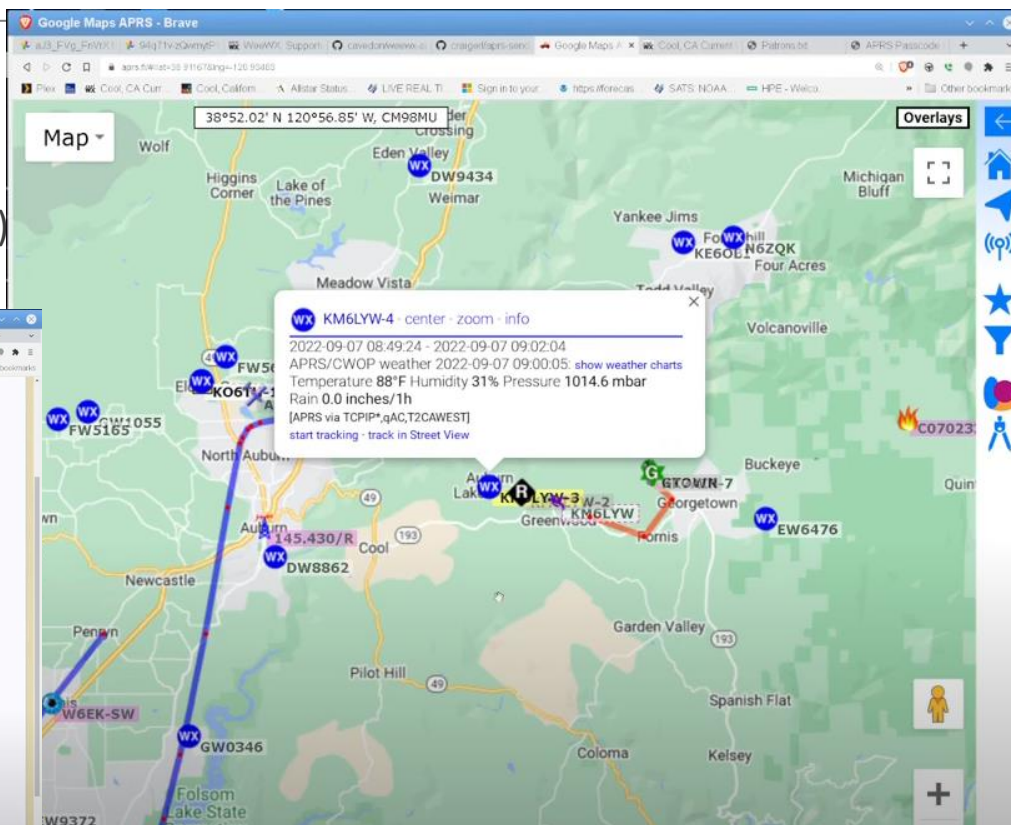
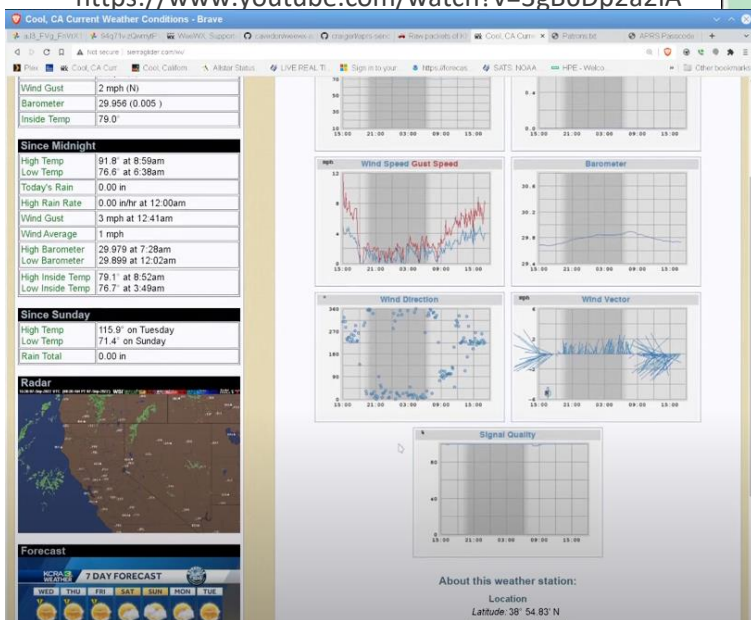


Weather Station APRS Scenario

KM6LYW Radio

(Put your weather station on the air!)

<https://www.youtube.com/watch?v=3gB6Dp2a2IA>





Hardware & Software Considerations

Windows or Linux

Do you just hate Windows and everything it stands for?

How comfortable are you at the command line?

How much time are you willing to put toward tracking down problems?

Or do you prefer stuff just working? And way more software available?

Maker?

How comfortable are you at building things?

Is the “drive part of the destination” in your radio journey?

Ok with troubleshooting?

Ok with failing and starting over?

Or would you rather buy, and get the job done?

Supplying Run Power, and Charging

If you're on shore power (aka 120V AC) this doesn't really matter

A battery may get you through X amount of run time

If you want to run for longer, you'll eventually need to charge up

So plan accordingly. You may need to calculate your power needs





Hardware/Setup Options

Gaming Tower

● Cons

- May not be able to power it sufficiently, bring your entire solar farm
- Still need a monitor and keyboard
- Heavy
- Expensive, might want to keep it out of the mud.

● Pros

- Easy to connect to radio
- Will look cool
- Will be able to run Minecraft at the park with ray tracing and all the textures enabled.
- May provide heating on a cold morning



Idle: 90w, Normal: 200w, In Use: 250-300w

A standard Laptop

● Cons

- Power hungry, charging may be an issue away from shore power (most are 19V DC, and high watts)
- Desk space hog. Better than PC+keyboard, not as compact as tablet with touchscreen
- Expensive
- Large(-ish) for long hauls (hiking)

● Pros

- Easy to connect to radio
- Large screen, high resolution
- Powerful enough to run anything
- Virtually unlimited storage



Screen off: 14w, Idle: 23w

In idle, brightness Low: 17w, brightness High: 23w

FT8: ~50w

FT8 + Youtube full screen on 2nd HDMI monitor: 70-90w

A compact Laptop (Evolve III Maestro Ebook)

● Cons

- More desk space than tablet, but not unreasonable

● Pros <> Cons

- Large(-ish) for long hauls (hiking)
- Smaller screen than full size laptop, may get harder to fit more windows

● Pros

- Will run on battery longer than full size laptop, not as long as other methods
- Easier to power and charge (12V models)
- Inexpensive
- Easy to connect to radio
- Still powerful enough to run anything
- Plenty of storage



Roll over image to zoom in

EVOLVE III Maestro E Book 11.6" 4GB 64GB eMMC Celeron N3450 1.1GHz Win10P, Dark Gray
Brand: Evolve
4.0 ★★★★★ 189 ratings | 55 answered questions

\$124³³
Pay ~~\$124.33~~ \$120.84 after using available Amazon Visa rewards points.

Not eligible for Amazon Prime. Available with free Prime shipping from other sellers on Amazon.

Brand	Evolve
Model Name	Custom/No Brand III Maestro E Book
Screen Size	11.6 Inches
Color	Gray
Hard Disk Size	64 GB
CPU Model	Celeron N3450
Ram Memory	4 GB

See more

About this item

- 11.6-Inch (1366 X 768) Ips Display
- Intel Celeron N3450 Processor (Quad-Core, 1.1GHz, 2Mb Cache)
- 4Gb Ddr4 System Memory
- Integrated Intel Hd Graphics 500
- Connectivity Technology : Hdmi
- Wireless Comm Standard : 802_11_Ac
- System Ram Type: Ddr4_Sdram
- Included Components: Evolve Iii Maestro 11.6" Laptop Computer, Power Cord

See more product details

Buy new: **\$124³³**

FREE delivery July 25 - 27.
Details

Deliver to Jason - Canton 30115

In Stock

Qty: 1

Add to Cart

Buy Now

Payment: Secure transaction
Ships from: W Wonder
Sold by: W Wonder
Returns: Eligible for Return, Refund or Replacement within 30 days of receipt

Add a Protection Plan:

- 2-Year Protection for **\$30.99**
- Tech Unlimited – 30% OFF ONE MONTH COUPON - Protect Many Devices with 1 Plan (Renews Monthly Until Cancelled) for **\$16.99/month**

Save with Used - Very Good

\$110⁰⁰

prime

A Mini-PC (Wo-We)

- **Cons**

- A lot of tinkering, trying things out.
- More power required than R-Pi and similar options

- **Pros <> Cons**

- Either bring your own monitor, or VNC

- **Pros**

- 12V DC!!!!
- Tiny footprint
- Lightweight
- Inexpensive
- Easy to connect to radio (esp Windows)
- Full computer with full computer specs, powerful enough to run anything
- Virtually unlimited storage, and upgradable beyond that



Mini PC Windows 10 Pro, AMD A9 9400 (up to 3.2 Ghz), 8GB RAM 128GB SSD, Micro Desktop Computers with Dual 4K HDMI, 2.4G/5G, WiFi Bluetooth 4.0 Type-C USB 3.0 Windows

Brand: ATOPNUC

4.0 ★★★★★ 149 ratings | 37 answered questions

-32% \$79⁰⁰

Typical price: \$115.99

✓prime Two-Day

FREE Returns

Exclusive Prime price

Pay ~~\$79.00~~ \$75.51 after using available Amazon Visa rewards points.

Size: A9-9400 8GB+128GB / Windows 10 Pro

A9-9400 8GB+128GB /
Ubuntu
\$79.00
✓prime

A9-9400 8GB+128GB /
Windows 10 Pro
\$79.00
✓prime

N4020 4GB+128GB /
Ubuntu
\$85.99
✓prime

N4020 4GB+128GB /
Windows 10 Pro
\$79.99
✓prime



wowe Mini PC with AMD Excavator A9-9400 up to 3.2GHz, 8G DDR4, 128G SSD, Windows 10, adeon R5 Series Supports 4K@30Hz HD Dual Display,2* HDMI 2.0,Dual Band WiFi, Gigabit Ethernet, USB 3.1

Brand: wowe

3.9 ★★★★★ 55 ratings | 24 answered questions

-18% \$97⁹⁹

List Price: \$119.99

FREE Returns

Pay ~~\$97.99~~ \$94.50 after using available Amazon Visa rewards points.

Size: A9-9400 8GB+128GB

Ryzen 7 3750H 8GB+256GB
\$249.99
✓prime

A9-9400 8GB+128GB
\$97.99

A compact SoC (Inovato Quadra)

- **Cons**

- A lot of tinkering, trying things out.
- Not as ham-app-ready as Pi's and Windows options
- Not as powerful as Pi4 or Mini PC options, CPU aggressive apps like WSJTX (FT8 decodes) may lag

- **Pros <> Cons**

- 5V, so may have to buck down from 12V
- Either bring your own monitor, or VNC

- **Pros**

- Tiny footprint
- Lightweight
- Lowest cost option
- Unlike a Pi, comes with everything you need to get started (case, power, hdmi cable)
- Built in storage (not a huge amount, and only expandable via USB)
- Easier than RPi to setup and configure initially (OS is pre-flashed - Their own HAM Apps! Build-a-Pi alternative)



Quadra
\$34.95 USD



Quadra Upgrade Kit
\$15.00 USD

Barebones - Raspberry Pi

● Cons

- Gotten more expensive
- Less powerful than Mini PC options
- Board only; Still need case, power (kit options available)
- No built in storage, USB and/or MicroSD storage available but more difficult

● Pros <> Cons

- 5V, so may have to buck down from 12V
- Pi4 is powerful enough to run ham apps
- Bring your own monitor and input devices (or VNC)

● Pros

- One of the smallest footprints
- Lightest option
- Inexpensive
- Lots of ham apps available now for the Pi



Raspberry Pi 4 Model B - 8 GB RAM

Product ID: 4564

\$75.00

There are multiple versions of this item. Please select one from the options below:

1GB	Out of stock
2GB	Out of stock
4GB	Out of stock
8GB	\$75.00

In stock

Max per customer: 1

1	Add to Cart
---	--------------------

Also include 1 x Official Raspberry Pi 4 Case Fan and Heatsink (\$5.00)

Also include 1 x Official Raspberry Pi Foundation Raspberry Pi 4 Case - Red White (\$6.00)

Raspberry Pi - even more barebones

- 1GHz quad-core, 64-bit ARM Cortex-A53 CPU
- VideoCore IV GPU
- 512MB LPDDR2 DRAM
- 802.11b/g/n wireless LAN
- Bluetooth 4.2 / Bluetooth Low Energy (BLE)
- MicroSD card slot
- Mini HDMI and USB 2.0 OTG ports
- Micro USB power
- HAT-compatible 40-pin header
- CSI camera connector

Raspberry Pi Zero 2 W

★★★★★ (1 review) [Write a Review](#)

\$15.00



Pi Integrated Kit - Raspberry Pi On Steroids!

- 4GB Pi 4 integrated into Raspberry Pi400 keyboard
- 16GB microSD card, pre-programmed with Raspberry Pi OS
- Raspberry Pi power supply
- Raspberry Pi mouse
- Micro-HDMI to HDMI-A cable
- Official Raspberry Pi Beginner's Guide



Raspberry Pi 400 - Complete Kit

★★★★★ (2 reviews) Write a Review

\$100.00



<https://www.raspberrypi.com/products/raspberry-pi-400/?variant=raspberry-pi-400-us-kit>

Raspberry Pi Kit - Watch out...

- Kit vs Unit
 - Kit - Mouse, PS, HDMI cable, SD Card w Pi OS, Beginner Guide
- Regional variants (Keyboard layout & PS)
 - Make sure you get a “US” kit
- Approved resellers
 - <https://www.raspberrypi.com/products/raspberry-pi-400/?variant=raspberrypi-400-us-kit>

Raspberry Pi 400 - Complete Kit - US Keyboard Layout

Raspberry Pi 400 - Complete Kit

★★★★★ (2 reviews) Write a Review

\$100.00

PI 400 **UK** KIT ENGLISH VERSION



Raspberry Pi 400 All-in-One Quad-Core 64 Bit 4GB Ram Dual Band WiFi Bluetooth 5.0 BLE Dual 4K Output Complete Personal Computer Kit Built Into A Compact Keyboard – You just Need to add a Monitor!

Brand: Raspberry Pi
4.7 ★★★★★ 567 ratings | 55 answered questions

\$169⁹⁹

FREE Returns

Pay \$169.99 \$146.31 after using available Amazon Visa rewards points.

May be available at a lower price from other sellers, potentially without free Prime shipping.

\$169⁹⁹
FREE Returns
FREE Prime delivery August 11 - 17
Deliver to Jason - Canton 30115
In Stock
Add to Cart
Buy Now
Payment: Secure transaction
Ships from: Amazon
Sold by: STEADYGAMER
Returns: Eligible for Return, Refund or

Raspberry Pi 400 Unit - US
Brand: Raspberry Pi
4.0 ★★★★★ 157 ratings
13 answered questions

-26% \$95⁶⁶

List Price: \$129.99

prime Two-Day
FREE Returns

\$95⁶⁶
prime Two-Day
FREE Returns
FREE delivery Wednesday, August 9.
Order within 4 hrs 37 mins
Deliver to Jason - Canton 30115
Only 9 left in stock - order soon



Dedicated Digital - DigiPi

- **Cons**
 - Computing only, still need IO - though it serves UI via browser (VNC not needed)
 - Very dedicated
 - Maker-oriented
- **Pros <> Cons**
 - 5V
- **Pros**
 - Low cost
 - Extremely compact
 - Negligible power



DigiPi		
TNC & APRS igate	<input type="checkbox"/>	<input type="checkbox"/>
TNC & APRS igate (HF)	<input type="checkbox"/>	<input type="checkbox"/>
APRS Digipeater	<input type="checkbox"/>	<input type="checkbox"/>
Linux Node AX.25	<input type="checkbox"/>	<input type="checkbox"/>
Winlink Email Server	<input type="checkbox"/>	<input type="checkbox"/>
Pat Winlink Email Client	<input type="checkbox"/>	<input type="checkbox"/>
ARDOP Modem	<input type="checkbox"/>	<input type="checkbox"/>
Rig Control Daemon	<input type="checkbox"/>	<input type="checkbox"/>
WSJTX FT8	<input type="checkbox"/>	<input type="checkbox"/>
Slow Scan TV	<input type="checkbox"/>	<input type="checkbox"/>
FLDigi	<input type="checkbox"/>	<input type="checkbox"/>
JS8Call (Pi3/4)	<input type="checkbox"/>	<input type="checkbox"/>

<https://digipi.org/> (KM6LYW)

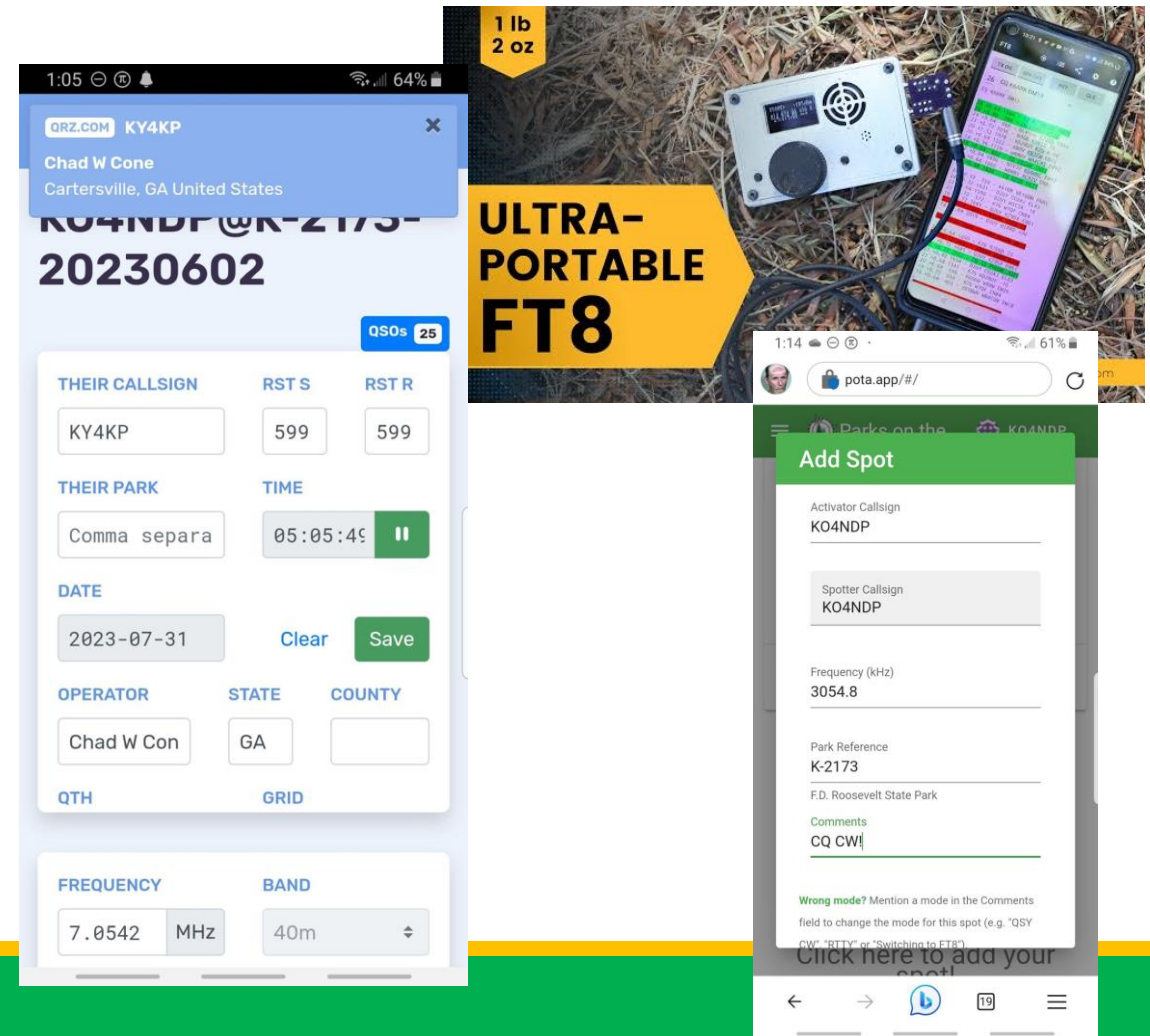
The Bare Necessities - Your Phone!

● Cons

- Very small, poor display for working/typing
- Typing is a pain
- Very few ham app options
- Almost no radio integration
- Not very powerful

● Pros

- You probably have this if nothing else
- Easiest to charge
- LTE/5G Hotspot - internet for your other doodads!



The Bare Necessities - Tablet

- **Cons**

- Typing is a pain
- Very few ham app options
- Almost no radio integration
- Not very powerful

- **Pros <=> Cons**

- Screen size
- VNC options

- **Pros**

- USB is easy to charge
- Optional LTE/5G, otherwise, connect to phone wifi hotspot






Hardware Additions

Side Monitor

- HDMI or USB
- Touchscreen
- Keyboard on screen



 MNN Portable Monitor 15.6inch FHD 1080P Laptop Monitor USB C HDMI Gaming Ultra-Slim IPS Display w/Smart Cover & Speakers,HDR Plug&Play, External Monitor for Laptop PC Phone Mac Xbox PS5/PS4 Switch

Visit the MNN Store
4.7 ★★★★★ 3,062 ratings | 149 answered questions
Amazon's Choice for "travel monitor for laptop"

\$99⁸²

✓prime Overnight
FREE Returns

Coupon: ✓ \$20 coupon applied to one item per order at checkout
Shop items > | Terms

May be available at a lower price from other sellers, potentially without free Prime shipping.

Eligible for Return, Refund or Replacement within 30 days of receipt | Free Amazon tech support included

Size: 15.6 inch

Qty: 1

Add to Cart
Buy Now

Payment: Secure transaction
Ships from: Amazon
Sold by: MNN-
Returns: Eligible for Return, Refund or Replacement within 30 days of receipt
Support: Free Amazon tech support included

Add a Protection Plan:
 4-Year Protection for \$17.99

- Invest in a quality shielded cable

Keyboard/Mouse




- Bluetooth vs USB vs RF (eg Logitech Unifying Receiver 2.4GHz)
- All in one keyboard w/ touchpad
- How valuable are USB ports in your setup?
- Does your computer have Bluetooth built in?


GPS

- Off-line Time Sync
- Positioning


Overall Pick



HiLetgo VK172 G-Mouse USB GPS/GLONASS US
★★★★☆ ~ 504
\$11⁹⁹
✓prime One-Day
FREE delivery **Tomorrow, Aug 10**



Onyehn VK-162 G-Mouse USB GPS Dongle Navigation Module
GPS Receiver for Raspberry Pi Support Google Earth
★★★★☆ ~ 104
\$15⁹⁹
✓prime One-Day
FREE delivery **Tomorrow, Aug 10**



VK-162 G-Mouse USB GPS Dongle Navigation Module
Support Google Earth Window Linux Geekstory
★★★★☆ ~ 314
\$19⁹⁸ Typical: \$20-99
✓prime One-Day
FREE delivery **Tomorrow, Aug 10**



Pair it with the right
radio for your needs

Field Radios

- Yaesu FT891, FT818, FT991A
- ICOM IC705
- Xiegu G90, X5105
- QRP Labs QDX, QMX
- Elecraft KX2
- Kenwood TS-480SAT/HX
- Lab599 Discovery TX-500
- FX-4CR