ham-radio-out-there

Remote and portable ops

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Agenda

- Remote ops
- Portable ops

Remote ops

Remote ops: Whys and wherefores

- Fun
- Technical challenges
- Promoting the hobby
- Emergencies?

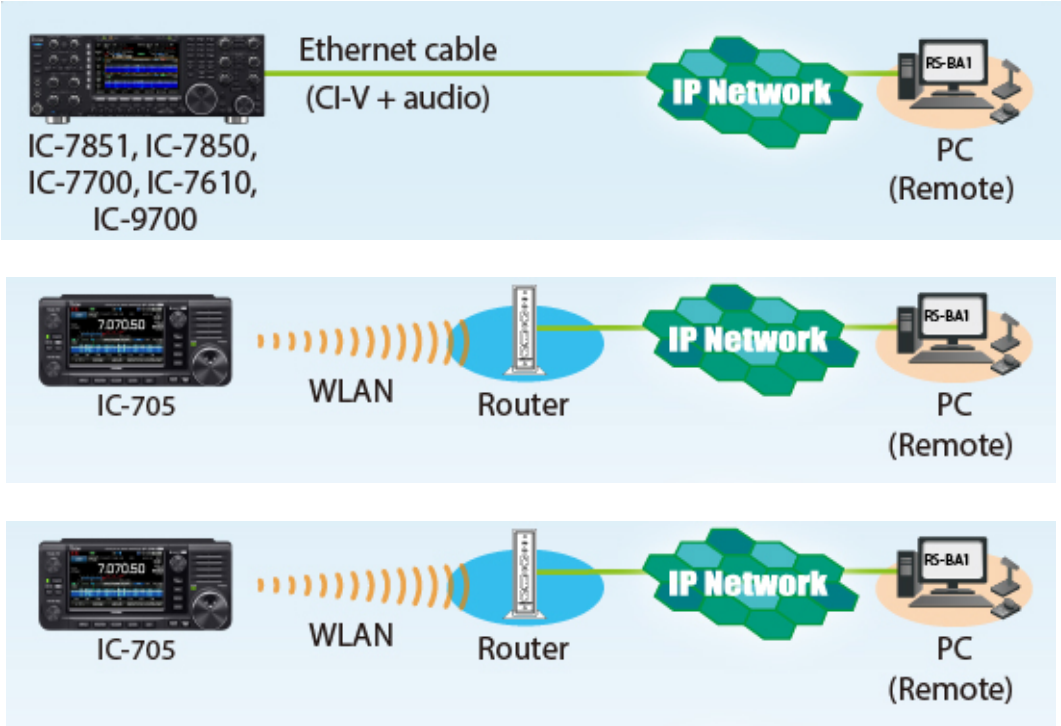
Background

- Gear here, you there
- Two paths
  - Your gear (+ interface device)
  - Someone else’s gear

Technical challenges

- Rig control (band/frequency/mode/filters/PTT)
- Audio in/out
- Latency
  - TCP/IP designed for “packet-ized” communication

Connecting to the radio



https://www.icomamerica.com/en/products/amateur/hf/rsba1/default.aspx

Subscription services

- Remote Ham Radio (RHR): https://www.remotehamradio.com/
  - $99/year (or $20/mo) + airtime ($/min)
- Runs in web browser
- DEMO

1 hr/wk for better equipped station

```
hrs_wk <- 1
fee_yr <- 99
dollars_hr <- 0.59*60
wks_yr <- 52
(rhr_yr <- fee_yr + wks_yr*hrs_wk*dollars_hr)
```

```
## [1] 1939.8
```

3 hrs/wk for a lesser-equipped station

```
hrs_wk <- 3
fee_yr <- 99
dollars_hr <- 0.09*60
wks_yr <- 52
(rhr_yr <- fee_yr + wks_yr*hrs_wk*dollars_hr)
```

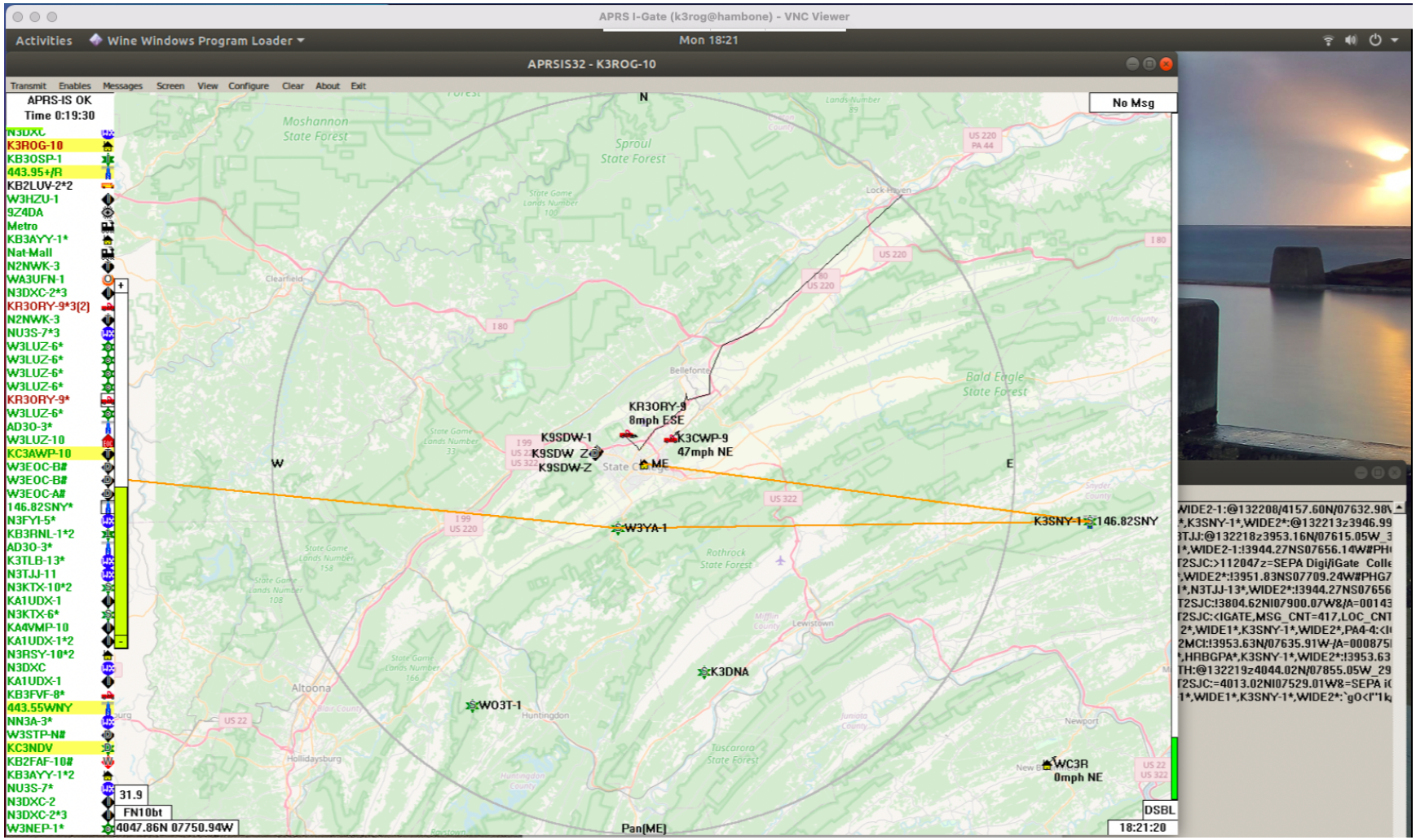
```
## [1] 941.4
```

WebSDR

- WebSDR http://websdr.org/
- Free!
- Receive only
- DEMO http://websdr.k3fef.com:8901

Your gear

- VNC-based
  - K3ROG-10 APRS iGate
  - Old Mac Mini running Ubuntu 19, APRSISCE32 under Wine (thanks N3ABF!)


APRS I-Gate (k3rog@hambone) - VNC Viewer
Activities
Wine Windows Program Loader
Mon 18:21
APRSIS32 - K3ROG-10
Transmit Enables Messages Screen View Configure Clear About Exit
APRS-IS OK
Time 0:19:30
No Msg
N
W
E
Moshannon State Forest
Sproul State Forest
Bald Eagle State Forest
Rothrock State Forest
Tuscarora State Forest
Altoona
Huntingdon
Hollidaysburg
Lewistown
Newport
Clearfield
Bellefonte
K3ROG-10
KB3OSP-1
443.95+/R
KB2LUV-2*2
W3HZU-1
9Z4DA
Metro
KB3AYY-1*
Nat-Mall
N2NWK-3
WA3UFN-1
N3DXC-2*3
KR3ORY-9*3(2)
N2NWK-3
NU3S-7*3
W3LUZ-6*
W3LUZ-6*
W3LUZ-6*
W3LUZ-6*
KR3ORY-9*
W3LUZ-6*
AD3O-3*
W3LUZ-10
KC3AWP-10
W3EOC-B#
W3EOC-B#
W3EOC-A#
146.82SNY*
N3FYI-5*
KB3RNL-1*2
AD3O-3*
K3TLB-13*
N3TJJ-11
N3KTX-10*2
KA1UDX-1
N3KTX-6*
KA4VMP-10
KA1UDX-1*2
N3RSY-10*2
N3DXC
KA1UDX-1
KB3FVF-8*
443.55WNY
NN3A-3*
W3STP-N#
KC3NDV
KB2FAF-10#
KB3AYY-1*2
NU3S-7*
N3DXC-2
N3DXC-2*3
W3NEP-1*
KR3ORY-9
8mph ESE
K9SDW-1
K9SDW-Z
K9SDW-Z
K3CWP-9
47mph NE
ME
W3YA-1
K3SNY-1
146.82SNY
K3DNA
W03T-1
WC3R
0mph NE
31.9
FN10bt
4047.86N 07750.94W
Pan[ME]
DSBL
18:21:20

Raspberry Pi-based

- RemoteTx https://remotetx.net
- RigPi: http://rigpi.net/ station server
- Universal Ham Radio Remote: https://github.com/F4HTB/Universal_HamRadio_Remote_

RemoteTx https://remotetx.net

- Computer
  - Raspberry Pi (3B+ or 4)
- Radio
  - Elecraft K3, KX2, KX3 (HF only)
  - Yaesu 991
  - Icom IC-7100 (w/ VHF and UHF), 7200, 7300, 7610

RemoteTx (https://remotetx.net)

- Sofware
  - Custom RPi image
- Subscription service $40 (6-mos) or $70/year
- DEMO

RigPi

- Raspberry Pi (3B+ or 4)
  - You provide or buy RigPi Station Server (RSS) from MFJ
- One-time charge for software ($30), but paid upgrades
- CAT control via browers; audio via 3rd party app (Mumble)
- Works with multiple rigs
- DEMO

Third party software

- ICOM RS-BA1-V2: https://www.icomamerica.com/en/products/amateur/hf/r
  - Windows only
  - $159.99 from DX Engineering
- wfview (https://wfview.org)
  - ICOM IC-705, 7300, 7610, R8600, 7850, 9700 (+ some older rigs)
  - Free & open source
  - Windows, Mac, Linux

FlexRadio

- SmartSDR and Smartlink (for FlexRadio)
- Windows 10/11, Mac OS, iOS
- DEMO

- Full control of radio, waterfall
- Easy set-up (largely plug-n-play)
- Can run digital modes (e.g. FT8) within app itself
- Works over wifi or even cell networks
- Mac OS and iOS apps pricey

K3ROG take

- SmartSDR is awesome–but you must have a FlexRadio
- RemoteTx is easy & fun–but only if you have one of the supported radios and don’t mind the subscription model
- RigPi–supports broadest range of rigs
  - A little harder to configure, but one-time cost
  - Selling my RigPi Station Server v1 (Pi, case, + interface boards)

- Remote Ham Radio–let someone else have the headaches–get your feet wet or good for HOAs
- wfview–but only for ICOM rigs

Questions??

Portable ops

With help from

- Eric W3EDP
- Brett W3SWL
- Gene AM3AJ
- Dean K3IWI

Why portable?

- Fun
- (Sometimes) better operating conditions
- Technical/physical challenges
- Event support, emergency prep
- Jump on the NPOTA, SOTA, POTA, WMPLOTA, RaDAR bandwagon

Considerations

- Logistics & weather
- Bands, Frequencies, modes, & RF Power
- Rigs(s)
- Power
- Antennas
- Logging

Logistics & weather

- Driving to op site or hiking/biking?
- How long a stay?
- Shelter or none?

Bands, frequencies, modes, & RF Power

- Time of day
- CW, SSB, digital
- RF power
  - QRP, <= 5W
  - QRP+, <= 15-20W
  - QRO, 100W

Rigs

- VHF/UHF
  - HT or mobile
- HF
  - Elecraft KX2 or KX3 (QRP/QRP+), can add VHF to KX3
  - ICOM IC-705 (includes VHF/UHF; QRP/QRP+)
  - Yaesu FT-818 (QRP) or FT-891 (100W)

- HF
  - Xiegu 5105, G90
  - Lab599 Discovery TX-500
  - CW-only like QCX+ 40
  - KM3AJ’s IC-7100 setup

Rig	List Price
Elecraft KX2	$899.95
Elecraft KX3	$1,249.95
ICOM IC-705	$1,299.95
Yaesu FT-818	$649.95
Yaesu FT-891	$639.95
Xiegu G90	$449.95
Xiegu x5150	$599.00
Lab599 Discovery TX-500	$899.95
QCX+	$55.00

Power

- Rig internal battery
- External battery
  - $LiFePO_4$ pricey, but lightweight & small
- Solar panel + charge controller
  - Roll/fold-up panels
- Generator

Antennas & masts

- Trees or no trees
- “Stake-able” ground or no (e.g. N3M)
- Multiband vs. monoband
- Resonant vs. non-resonant

W3SWL set-up

Logistics & weather

- “Pickup truck” portable

Bands, frequencies, modes & RF power

- Daytime ops (20m/40m, 80m sometimes)
- Digital (FT8, JS8Call, PSK31, Winlink)
- SSB
- 20-50W sweet spot

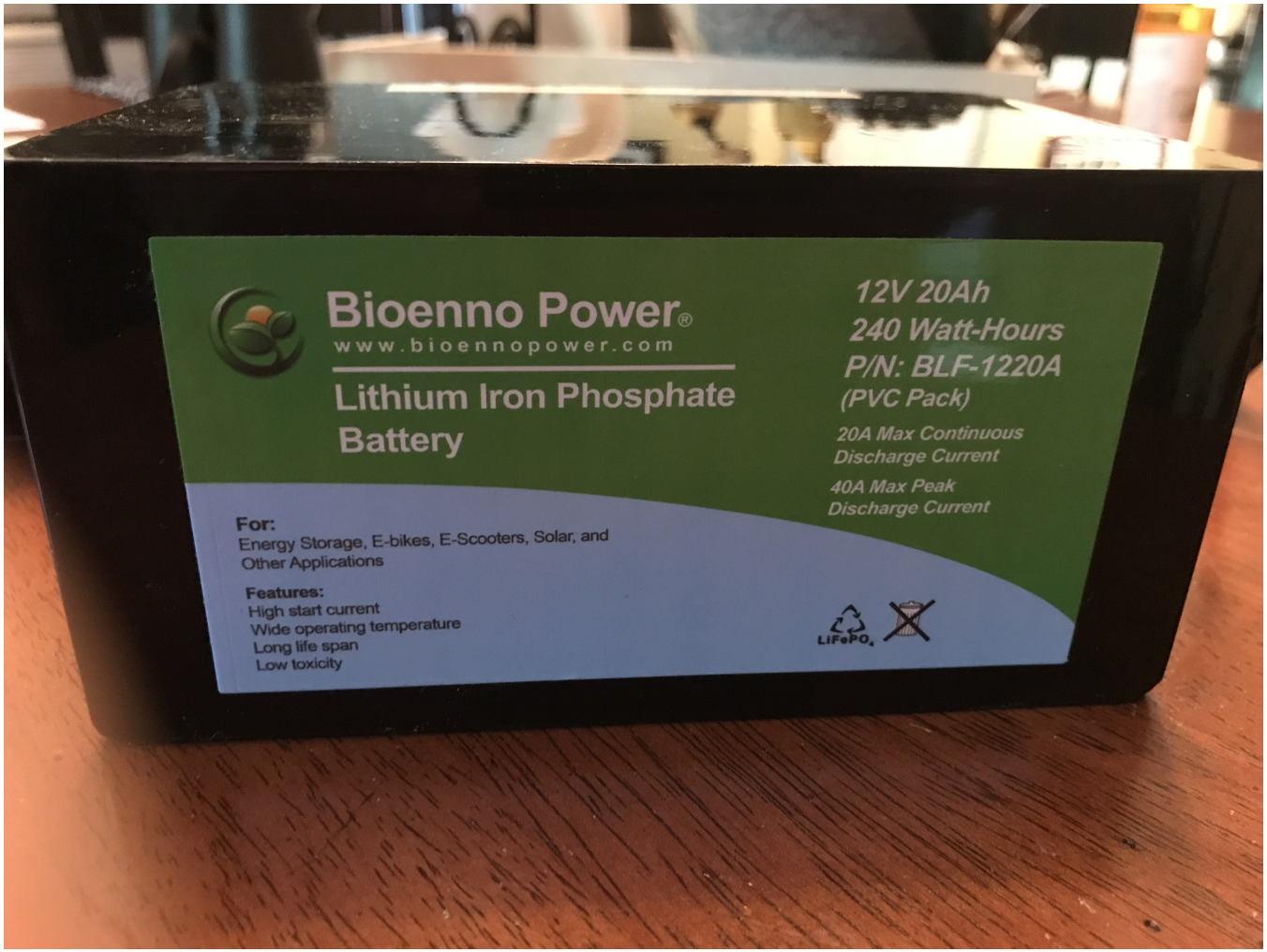
Rigs

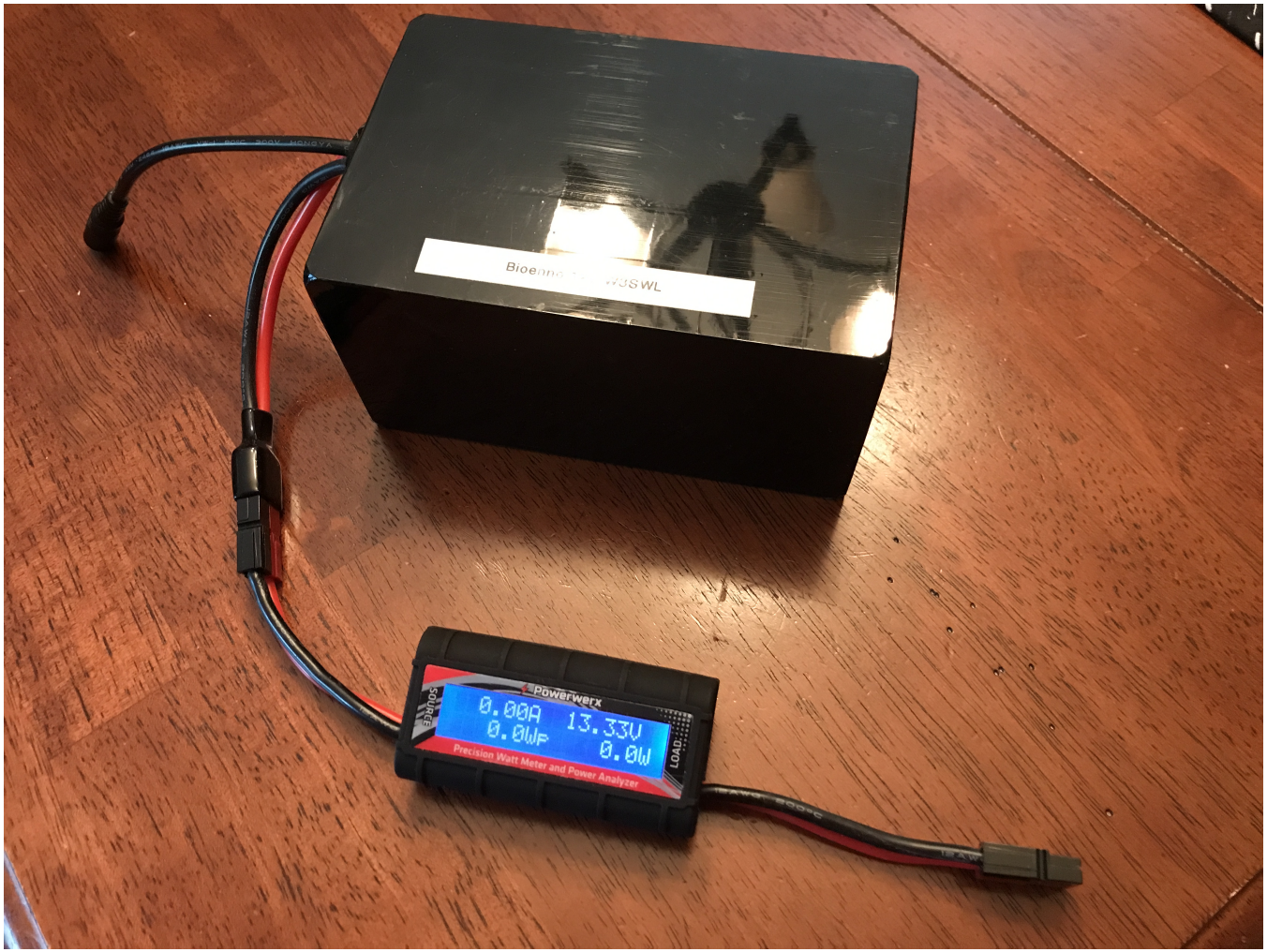
- Xiegu G90
  - Price, waterfall, QRP+ (20W), built-in wide range (>3:1) ATU
- Icom IC-7300

G90
HF TRANSCEIVER
XIEGU
VOX
ATT
PRE
PAR
SPL
PWR
Precision Watt Meter and Power Analyzer

Rig power

- 20 Ah $LiFePO_4$
- Honda Ridgeline has 110v 150-400 watt AC in-bed power outlet as backup


Bioenno Power®
www.bioennopower.com
Lithium Iron Phosphate Battery
12V 20Ah
240 Watt-Hours
P/N: BLF-1220A
(PVC Pack)
20A Max Continuous Discharge Current
40A Max Peak Discharge Current
For:
Energy Storage, E-bikes, E-Scooters, Solar, and Other Applications
Features:
High start current
Wide operating temperature
Long life span
Low toxicity
LiFePO4


Powerwerx
0.00A 13.33V
0.0WP 0.0W
Precision Watt Meter and Power Analyzer
SOURCE
LOAD

Antennas

- 20m home-brew vertical w/radials
  - 16’ fiberglass fishing pole bungeed to a tie-down in the truck bed
- Wolf River Coils “Silver Bullet Mini” 40-6m vertical
  - radials on a tripod in the truck bed: https://www.wolfrivercoils.com/SBmini.html

Computer for digital modes

- Old: Dell Inspiron
- New: Apple M1 Macbook Air (18hr battery life)
  - Runs fldigi, WSJT-X, JS8Call, Winlink via native apps

Operations

- POTA: Hyner View SP, Bald Eagle SP
- WFD 2019: Prince Gallitzin SP

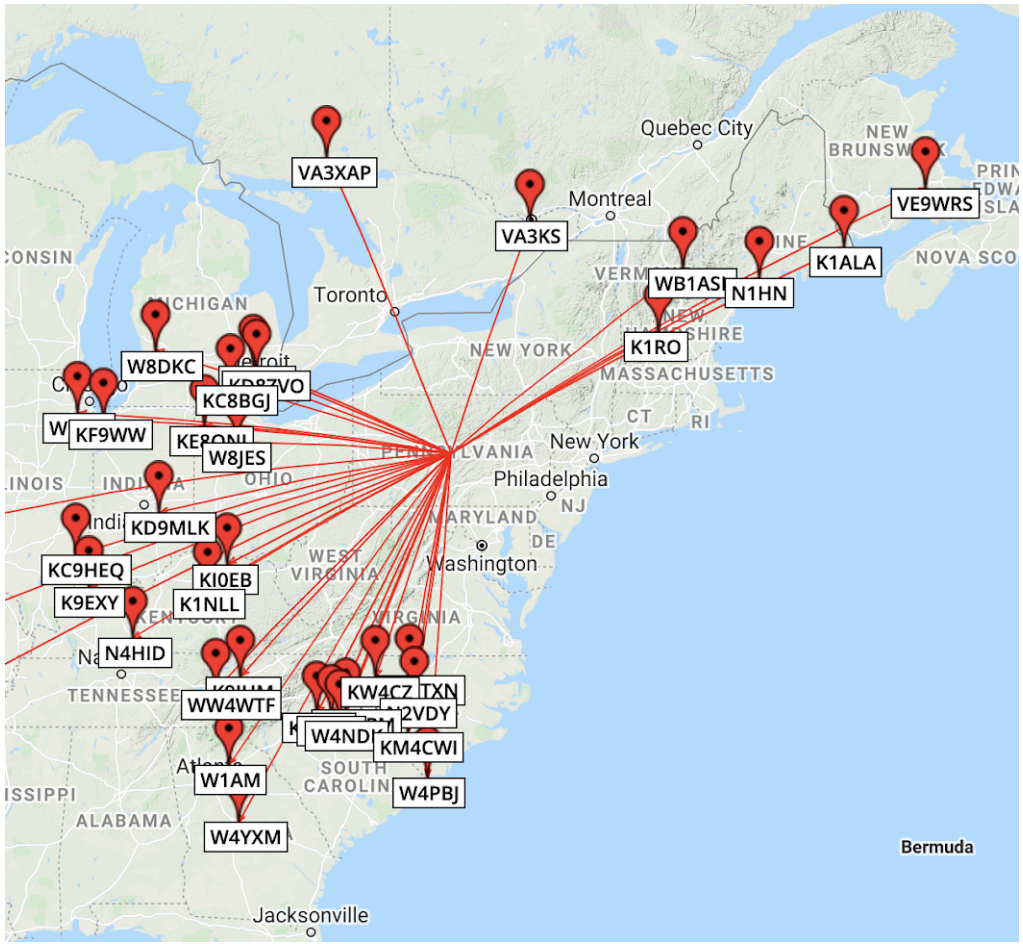
Hyner View SP October 2020

K3RG
Rick

K3IWI

Gear

POTA activations


VA3XAP
VA3KS
VE9WRS
K1ALA
N1HN
WB1ASI
K1RO
W8DKC
KC8BGJ
KF9WW
W8JES
KD9MLK
KC9HEQ
KI0EB
K9EXY
K1NLL
N4HID
WW4WTF
KW4CZ
TXN
2VDY
W4ND
KM4CWI
W1AM
W4PBJ
W4YXM
Quebec City
Montreal
Toronto
New York
Philadelphia
Washington
Jacksonville
Bermuda
NEW YORK
MASSACHUSETTS
CT
RI
NJ
DE
MARYLAND
WEST VIRGINIA
VIRGINIA
SOUTH CAROLINA
TENNESSEE
ALABAMA
OHIO
MICHIGAN
NOVA SCO

K3ROG

Rig(s)

- Old: IC-7100 (now KM3AJ's)
  - Kiddie bench w/ tuner, Raspberry Pi
- New: IC-705 + "booster bench"

Bands, frequencies, modes, & power

- 15m/17m/20m/40m/80m
- SSB, digital
- 5-10W; 50-100W

Military mast + tripod

- 40m/80m NVIS fan dipole
- No need to guy if < 20’
- Speaker tripods if can’t stake (e.g., N3M)
- 6 for $9.95 from Coleman’s
- Mast hub for $63.00 on Ebay
- SHOW & TELL

Chameleon MPAS Lite

- Multiband, but need tuner
- Base-loaded vertical or EFHW
- SHOW & TELL

- K3ROG owns & likes Elecraft T1 ATU

T1 and a 9 Volt Battery (not available at Elecraft)

https://elecraft.com/products/t1-miniature-stand-alone-atu-and-accessories

SOTABeams Band Hopper linked dipole

- SOTABeams mast in hitch mount
- Lightweight antenna, nicely built
- Resonant, but can’t band-hop without adjusting links (alligator clips)
- SHOW & TELL

SOTABeams linked dipole

- Fishing pole mast on ground
- Ebay Example

SB
SOTABEAMS

K3ROG quick takes

- Pricey/good value/heavy-duty/easy to setup/moderately heavy: Chameleon MPAS Lite
- Mid-price/heavy/stable: Mil mast + tripod
- Cheap/lite: Fishing pole mast + dipole/EFHW

What’s your jam?

- It’s a hobby, gosh-darnit!

CW/Digital modes

- QRP rig (IC-705; KX2/3; Xiegu G90) or
- CW-only rig
- Laptop (digital only)

Phone

- QRP rig + amp or
- QRO rig

Resources

- OH8STN blog and YouTube channel
- Ham Radio Crash Course YouTube Channel
- QRPer blog blog
- K6ARK Portable Radio YouTube channel
- K8MRD Radio Stuff YouTube channel

Ideas

- How about a club-sponsored multi-POTA activation marathon?
  - Bald Eagle SP
  - Black Mo SP
  - Rothrock SF
  - Whipple Dam SP
  - Greenwood Furnace SP
  - Poe Valley SP
  - Poe Paddy SP

- Winter Field Day (Jan 29-30, 2022) at Black Mo SP
- “Middle of Nowhere” Special Event (PA geographic center: N3S/W3E)
- How about our own RaDAR activity?
- Field Day 2022 in the field

https://nittany-amateur-radio-club.github.io/presentations/ham-radio-out-there.html