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Steps To The Moon:
SSPA, Winlink, GPS, Trailer
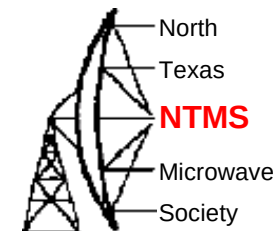
Dave McCoy N5RJX

May 1, 2020

Recap

- The overall plan is to make something like this Verizon trailer as a portable ham shack with an 23 cm EME capability
- Expect other bands/modes can be included as a bonus by sharing electrical power, radios, etc

Progress

- W6PQL 23 cm Solid State Power Amplifier Kit PCB
- Spotting Solution - Winlink on Raspberry PI
- Ublox High Precision Differential GPS
- Trailer

W6PQL Power Amp Kit
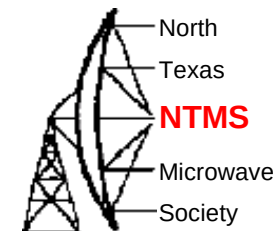
- Obtained kit with LDMOS chip pre-soldered
- Parts seem good quality
  - Heat Spreader is 3/8 copper plate!
- Installed PCB components
  - Input and Output boards
- Documentation is good. High res photos on website.
  - Make sure steps agree with both the photo and the schematic
- I mixed up the 24 pf capacitors. The 200v go on the input PCB and the 300v on the output PCB. That's why they were in separate bags!
  - Gained valuable practice reworking surface mounts
- Next steps: put spreader on heat sink, PCBs on spreader and solder to LDMOS chip

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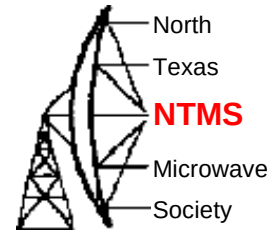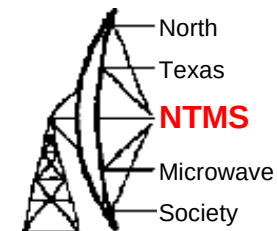# W6PQL 23 cm Power Amp
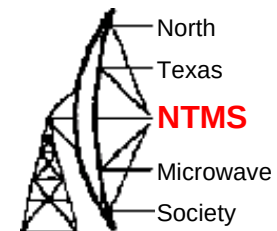
PA PCBs

Some Additional Components

Planning to put PA inside

- Look at LDF4-50A cable attenuation
  - 23 cm 2.5db/100ft, 0.5db/20ft 12% loss
- Inside the trailer should be ok
  - Vent hot air outside - dryer vent ?
- Feed will be big and heavy even w/o PA

Spotting Solution – Winlink

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- Winlink
  - Developed for emergency communications
  - E-Mail client using VHF, HF, internet – send & recv
  - Server list readily available and well documented
  - Also features a position report with short message
    - Shows on website's map. Could indicate operating times and frequency.
  - Tested at 25 km by VHF and 500 km with HF
  - Maps of Reports, VHF servers, HF servers
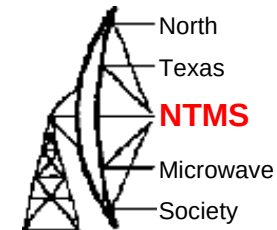 - Had to configure several programs for Linux

Winlink – Position Map
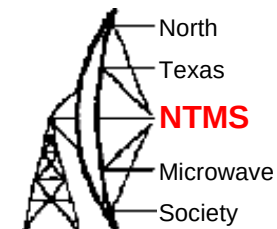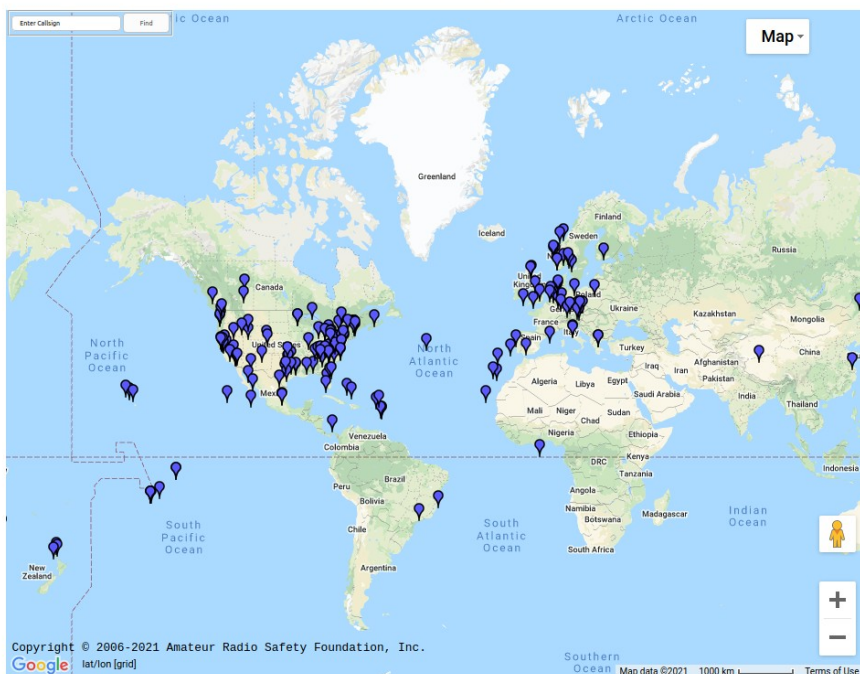
- Map on www.winlink.org
- Daily mobile station status
- Position & Message
- Sent from client software, Pat - Linux
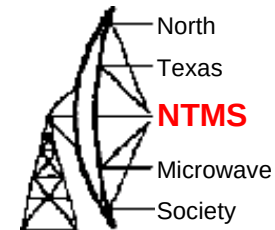
Winlink VHF Packet Stations
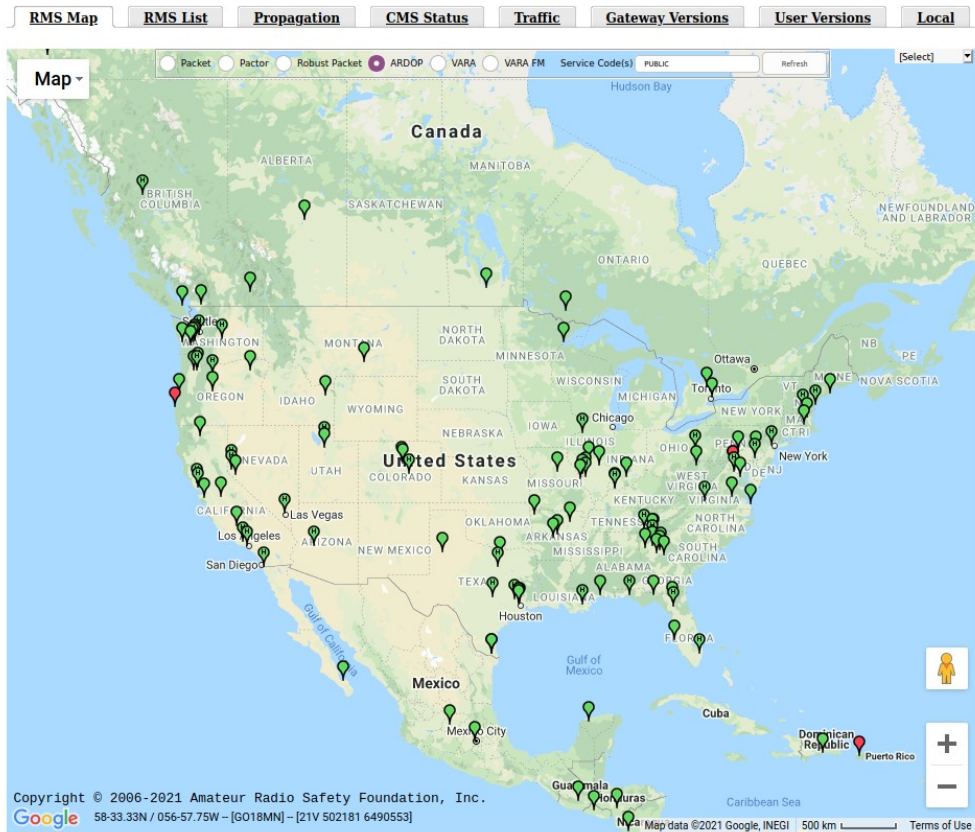
Live System Information
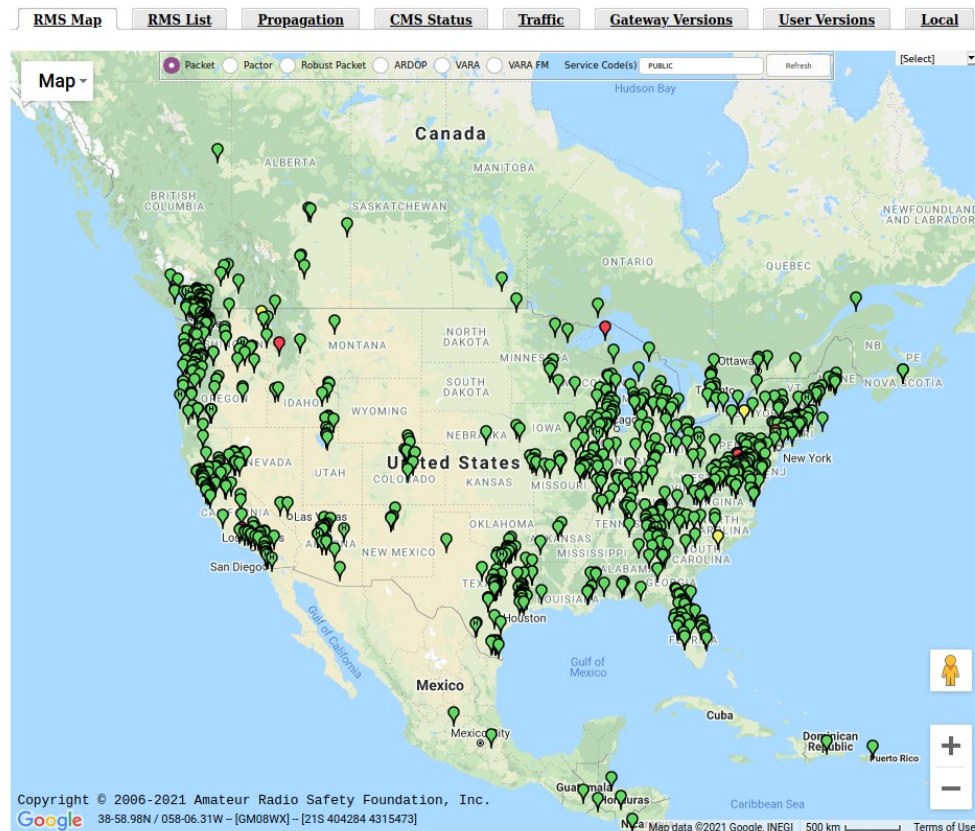
- Almost all are 2 meter, 1200 baud packet
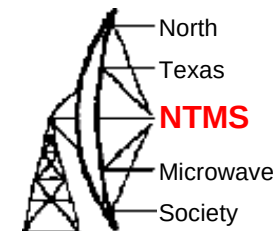
- Email is call@winlink.org
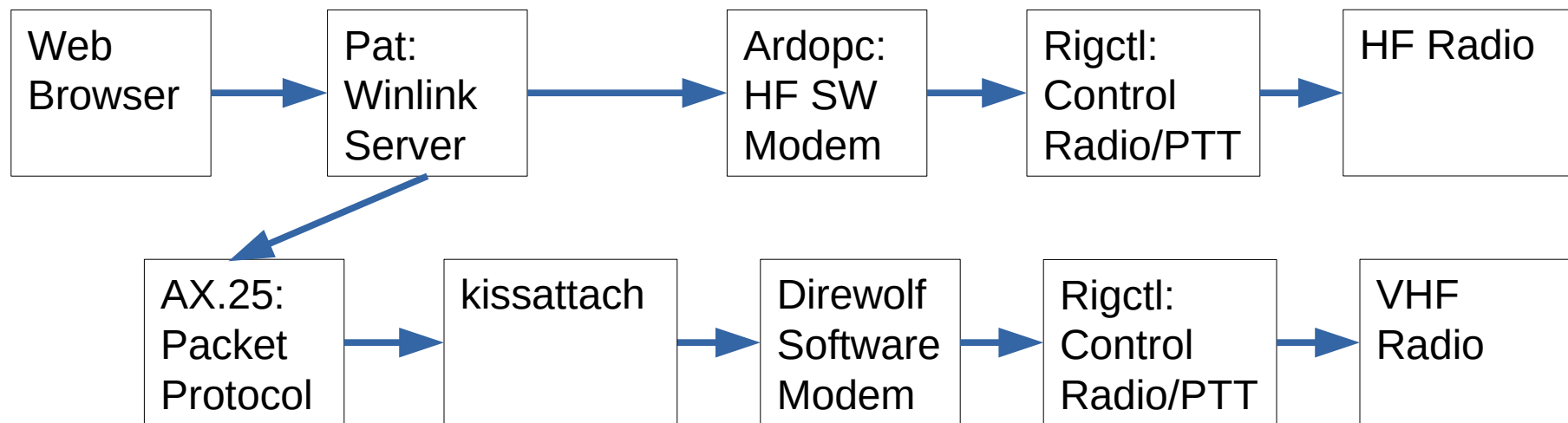
Winlink HF Servers

Live System Information

- HF Servers
  - Several bands
  - Several protocols
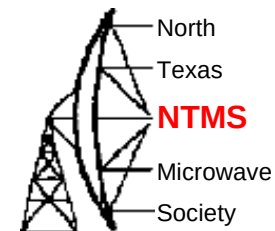- ARDOP - free
- Radio Mail Server - RMS

Winlink on Linux/Raspberry PI

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- Winlink has a shrink-wrapped solution for Windows – intended for EMCOMM
  - Easy to install and use
- Catch on Linux is system configuration of multiple pieces

| Web Browser | → | Pat: Winlink Server | → | Ardopc: HF SW Modem | → | Rigctl: Control Radio/PTT | → | HF Radio |

| AX.25: Packet Protocol | → | kissattach | → | Direwolf Software Modem | → | Rigctl: Control Radio/PTT | → | VHF Radio |

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U-Blox GPS

- Had two days worth of head-banging even after reading the manual
- Went through prior Q&A on the company support site
- To make a very long story short, I not only had the wrong firmware for my sub-model but didn't understand that the base and rover units required DIFFERENT firmware for my sub-model and not for others that are not differential GPS capable
- After sorting that out, then the differential GPS features in the U-Center software started to work as described in the manual
- Eventually got base-rover operations functioning
  - U-center software on windows
- The Linux procedure, which I have yet to try, seems to be save the configuration out of U-center, then using an open source application ubxconfig to apply it to the GPS units

Trailer
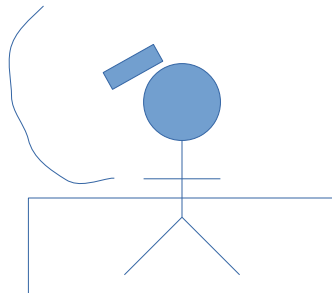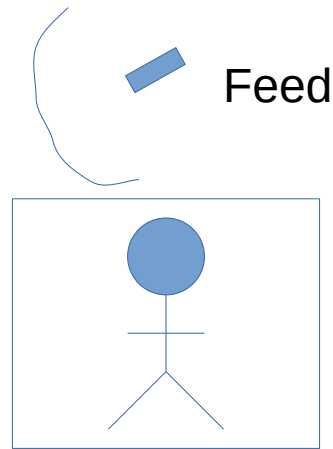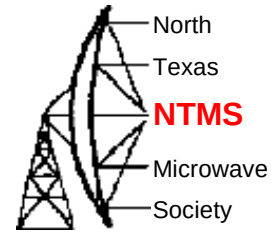
Feed

- Stopped work to rethink upper half
- Resolved the height trade-off
- Realized upper half could help access feed
  - Raise upper half to enter
  - Rotate antenna in elevation
  - Lower upper half
  - Feed at good working height
- Saves bringing step ladder
- Need a top hatch
  - a Moon(bounce) Roof

Trailer – Roof Framing
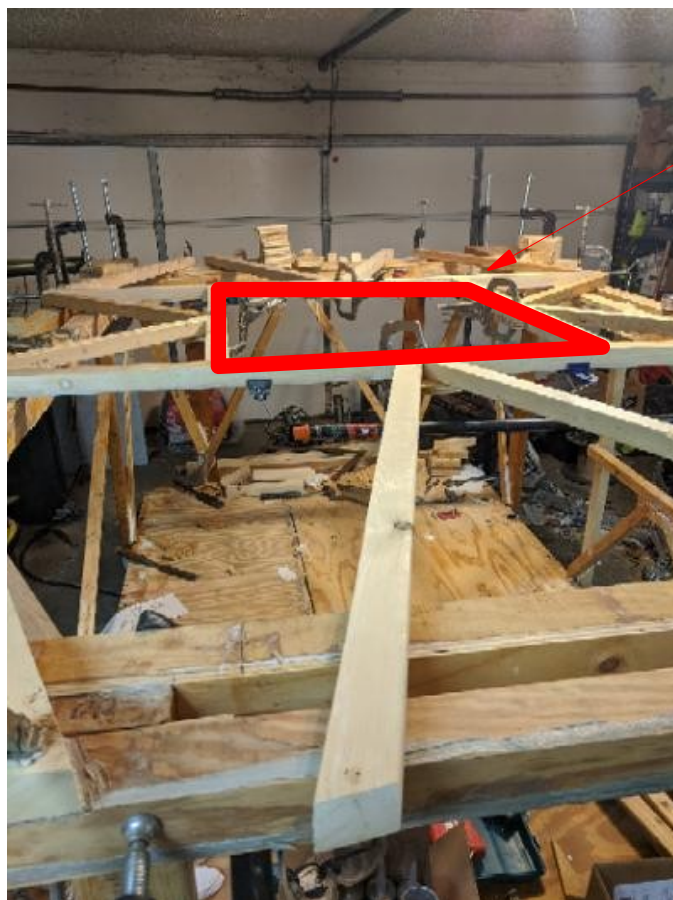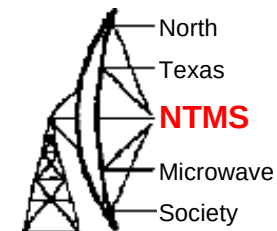
Moonbounce Roof

Feed maintenance

Switch feeds

Roof access w/o ladder

Rethinking earlier spring balancing idea
Weight will change when changing feeds
Thinking about a screw-drive pulling cables
similar to a Coleman pop-up mechanism