

Building a 6 Band Microwave Station

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Project Goals

- Add 6 Amateur Bands: 902, 1296, 2304, 3456, 5760, and 10368 MHz to existing 4 band VHF/UHF station
- Fixed station utilizing existing 40' tower
- Model after N6NB's 10 band rover stations
- Medium power on each band: 20W to 30W
- Short feedlines to antennas
- 10 MHz Reference for frequency stability
- Fast band switching

Project Plan

- Transverters on all bands with common 144 MHz IF and 1-5W drive
- Power amplifiers to achieve 20W – 30 W goal
- Sequencer switching on PTT to protect microwave receivers
- 10 MHz reference using GPSDO
- IF, 10 MHz and PTT band switching
- Mount all components in weatherproof case on tower



Equipment List

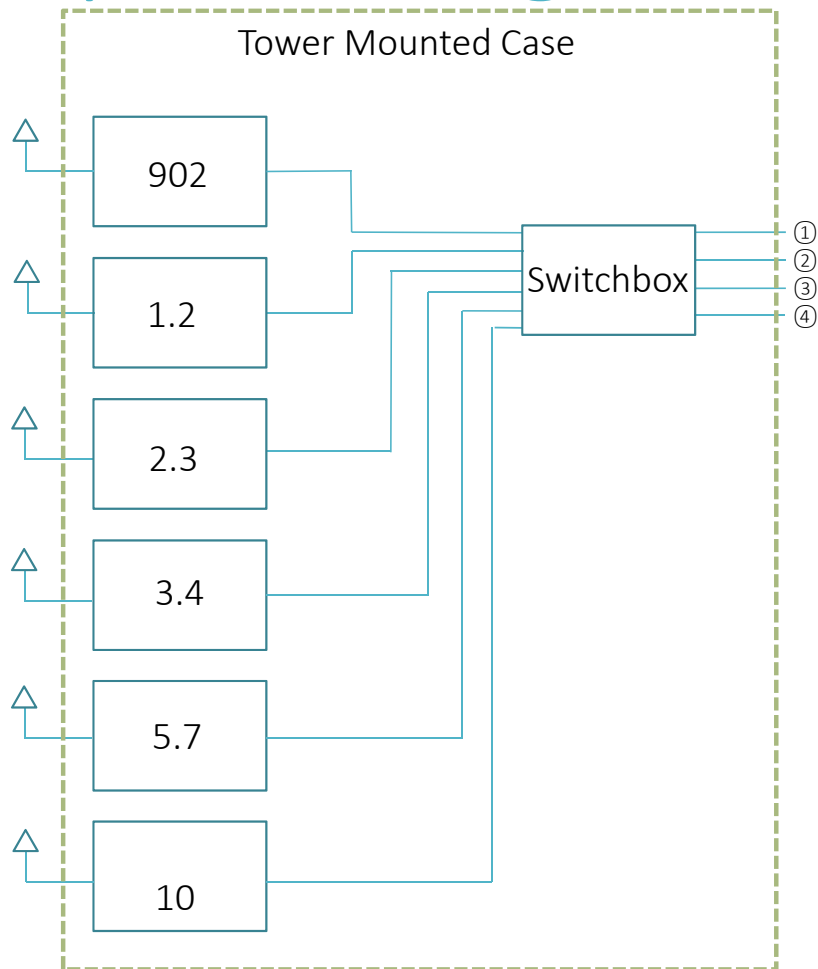
- DB6NT (Kuhne) Transverters & Power Amps for 1296 – 10368 MHz
 - 12V DC power
 - 10 MHz external reference input
 - 144 MHz IF (P.in 1-5w)
 - Compact size
 - High quality
- DEMI transverter for 902 MHz, 10W (no PA)
- Kuhne SEQ-3 sequencers used on bands with PA
- SMA relays: 2 6-position to switch IF and 10 MHz ref to the 6 transverters
- Leo Bodnar Ltd GPSDO 10 MHz reference Oscillator

Construction Plan

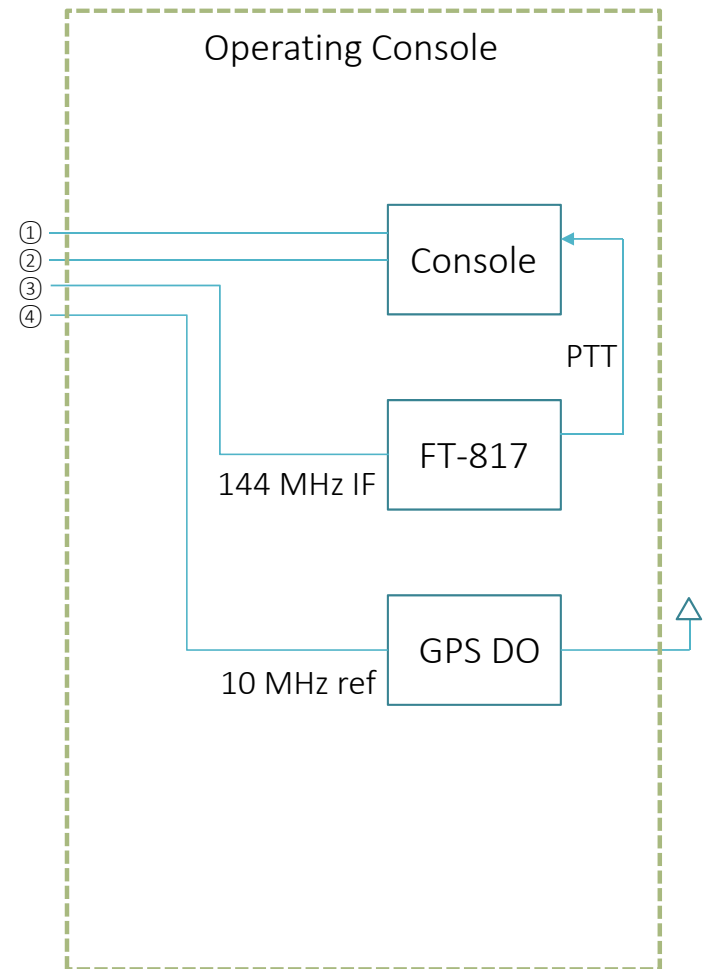
- Use weatherproof equipment case (Nanuk 940) to house tower mounted equipment
- Mount transverters and PAs on aluminum plates (stack xvtrs above PAs)
- Build IF, 10MHz, PTT relay switch box
- Build switch box console with power, band switching and metering



System Diagram



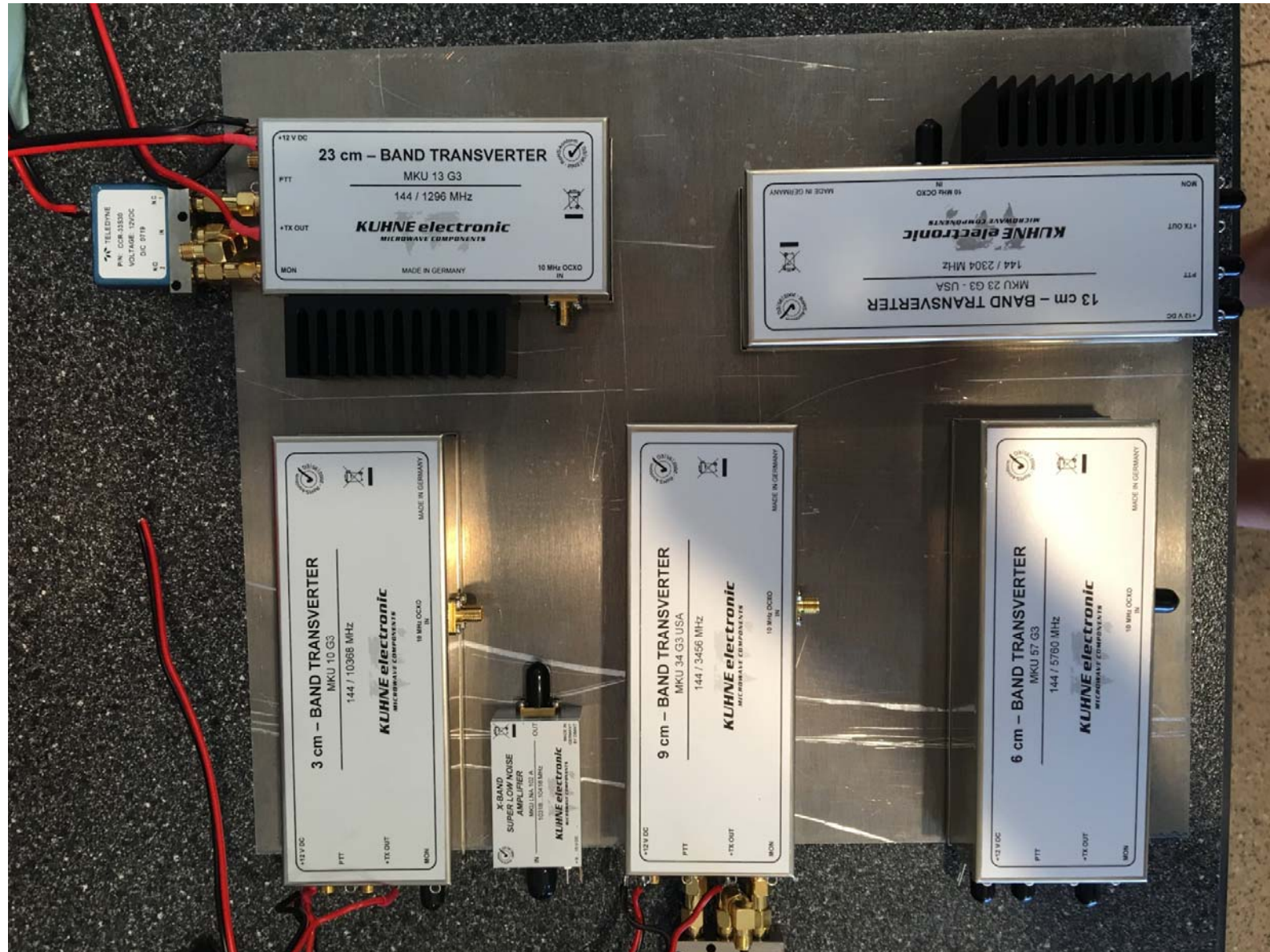
- ① Bandswitching and PTT (8 cond)
- ② 12 VDC (8 cond)
- ③ 144 MHz IF (RG8X)
- ④ 10 MHz ref (RG8X)



Transverters

Initial layout of 5 Kuhne
transverters: 1.2 to 10 GHz

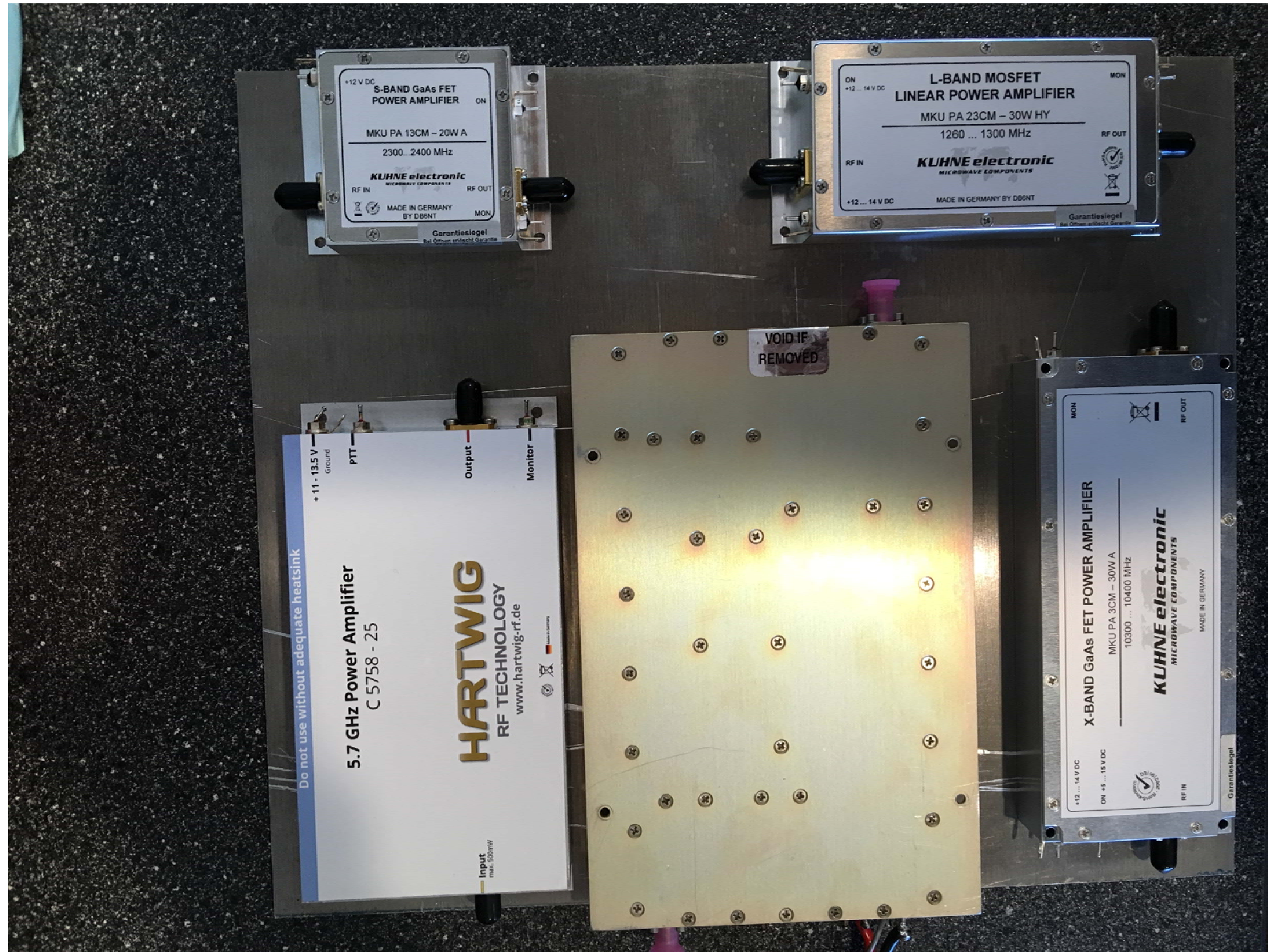
DEMI 902 MHz transverter
to be mounted on separate
bracket



Power Amps (PA)

Amps to be mounted on 2nd aluminum plate

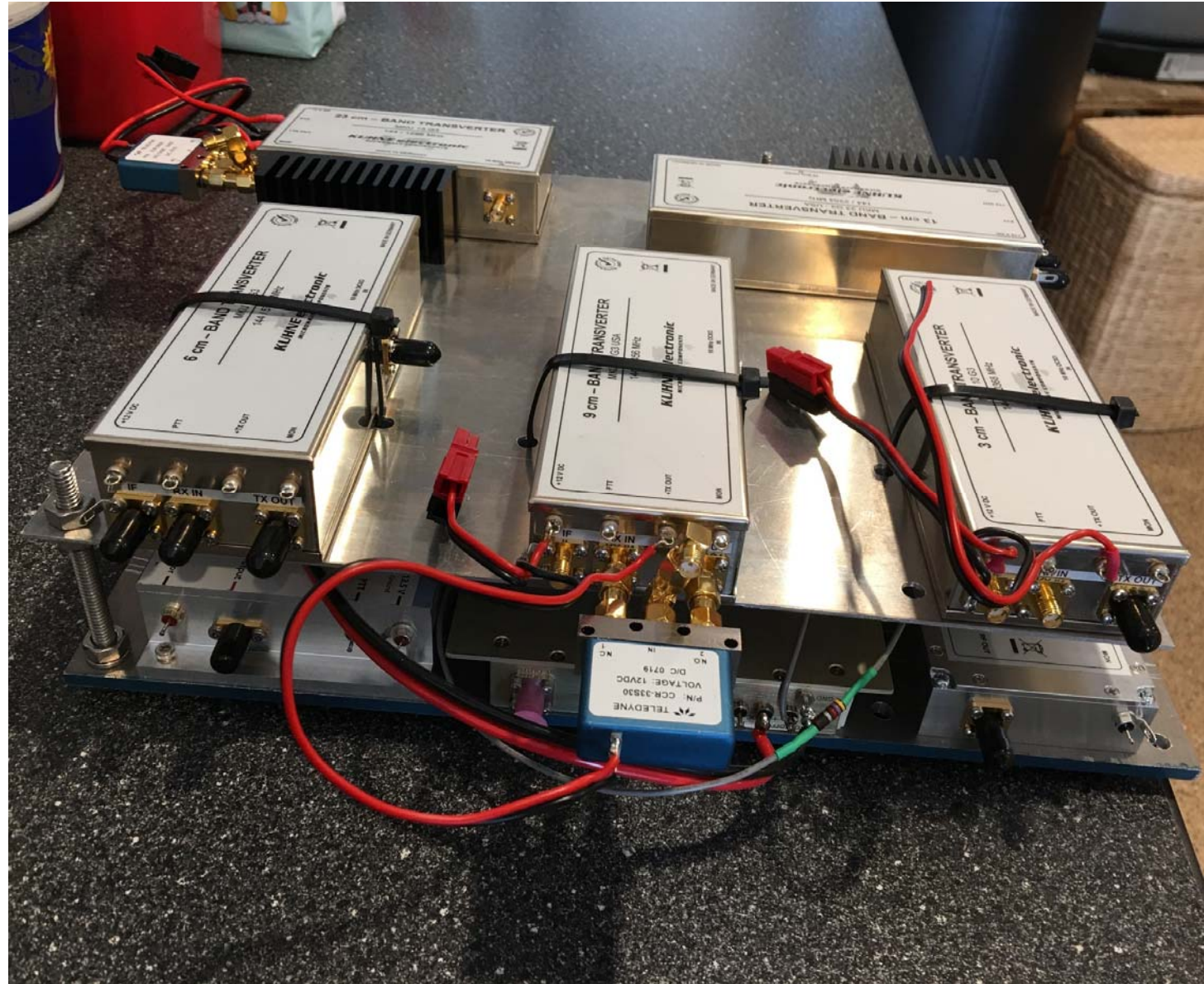
1296	30W
2304	20W
3456	20W
5760	25W
10368	30W



Transverters and PA stack

Testing connections on 1.2 GHz
and 5.7 GHz

Sequencers to be added to top
plate



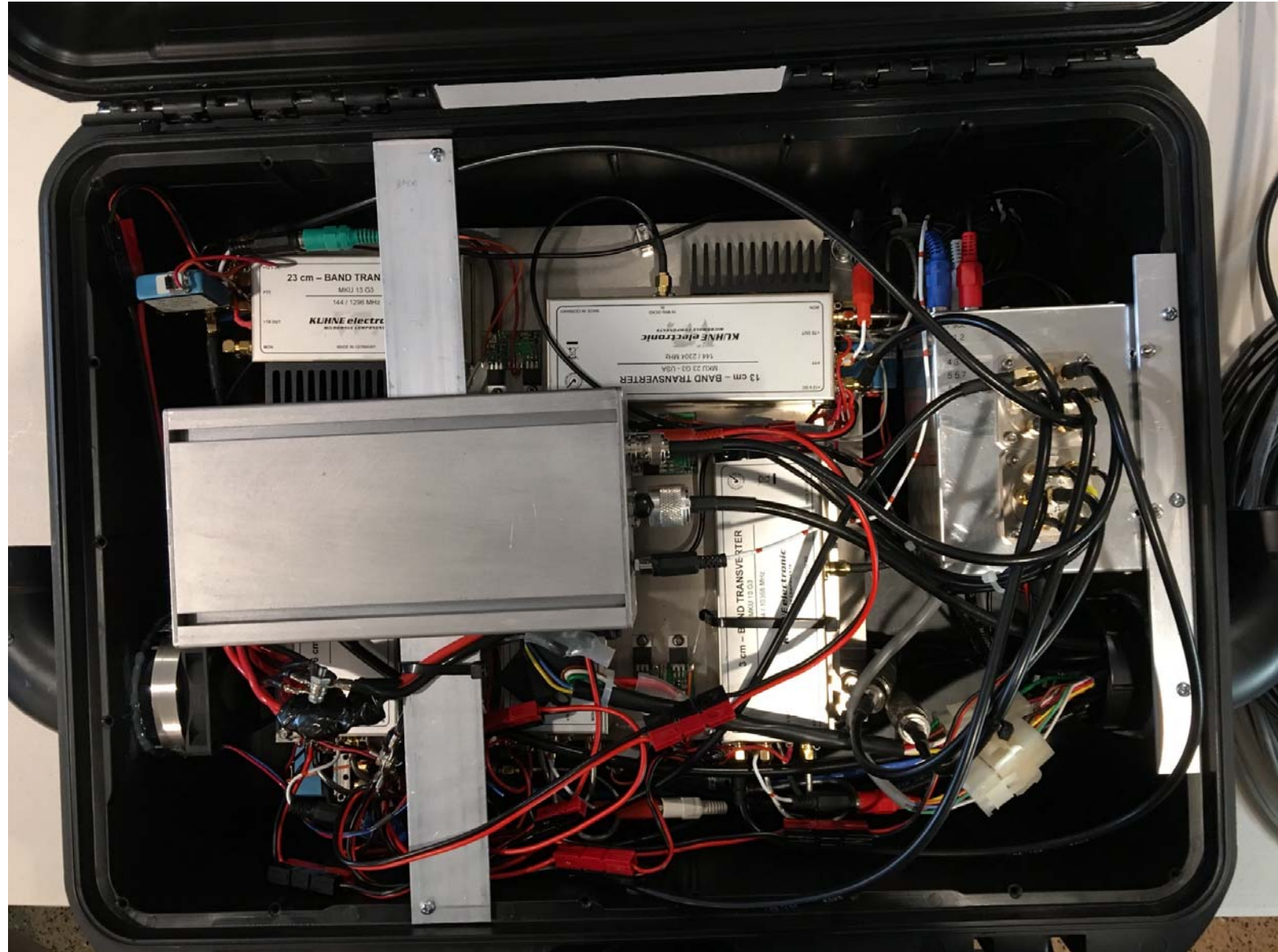
Mounted in case

- PA below each transverter
- Sequencers mounted on plate
- Teledyne SMA TR relays 12 VDC “failsafe”
- Feedlines/control cables to enter case through hole at right
- Exhaust fan to be mounted on left



Wired up

- IF, 10 MHz, PTT switchbox on right
- DEMI 902 MHz transverter mounted above stack
- Feedline, power and control cables enter from right
- Exhaust fan mounted on left



Mounted on temporary mast

- Boom to mast plate used to attach 24" dual feed dish (5.7 and 10 GHz)
- Nanuk case attached to boom using aluminum bracket
- Short yagis for 902, 1.2, 2.3 and 3.4 will attach to 5' boom
- Worked N6NB on all 6 bands, 11mi path S9+
- After a few weeks of testing, station will be moved to 40' tower



Operating position

- Yaesu FT-817ND as IF operating on 144 MHz
- Switch box control with 6 position band switch and voltage and current meter
- 4 cables to mast mount case:
 - 8 cond for 12VDC
 - 8 cond control
 - RG8X 144 MHz IF
 - RG8X 10 MHz reference





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