Building a “SUPER ROVER”

Terry Price - W8ZN

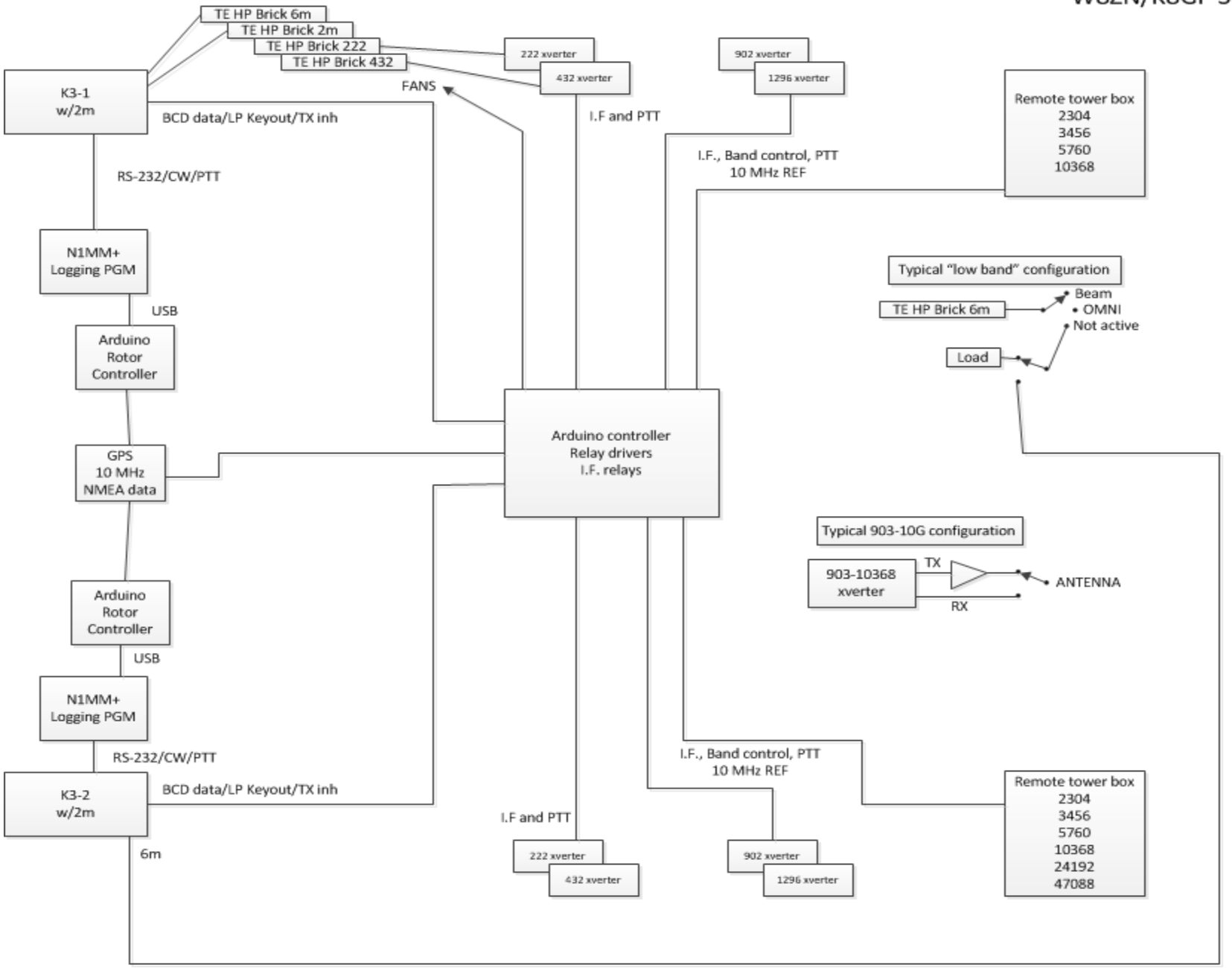

NO
PARKING

- Since 1985 I've helped, or built, rovers for more than a dozen hams
- First was my dad, W8MGJ (sk), in his 1974 Ford F-100 for 50 MHz through 2304 MHz. He activated EM78/79/88/89 for the WD8ISK multi-op contest effort in the 80's
- Brian, ND3F, and I broke 1 million points in the 90's under the old rover rules in my Dodge van
- Last was for Rich, N3UW, using a new Ford Transit Connect van for 50 MHz thru 10 GHz
- With K8GP not as active as before, Andy, K1RA, and I decided to be a little more serious in roving

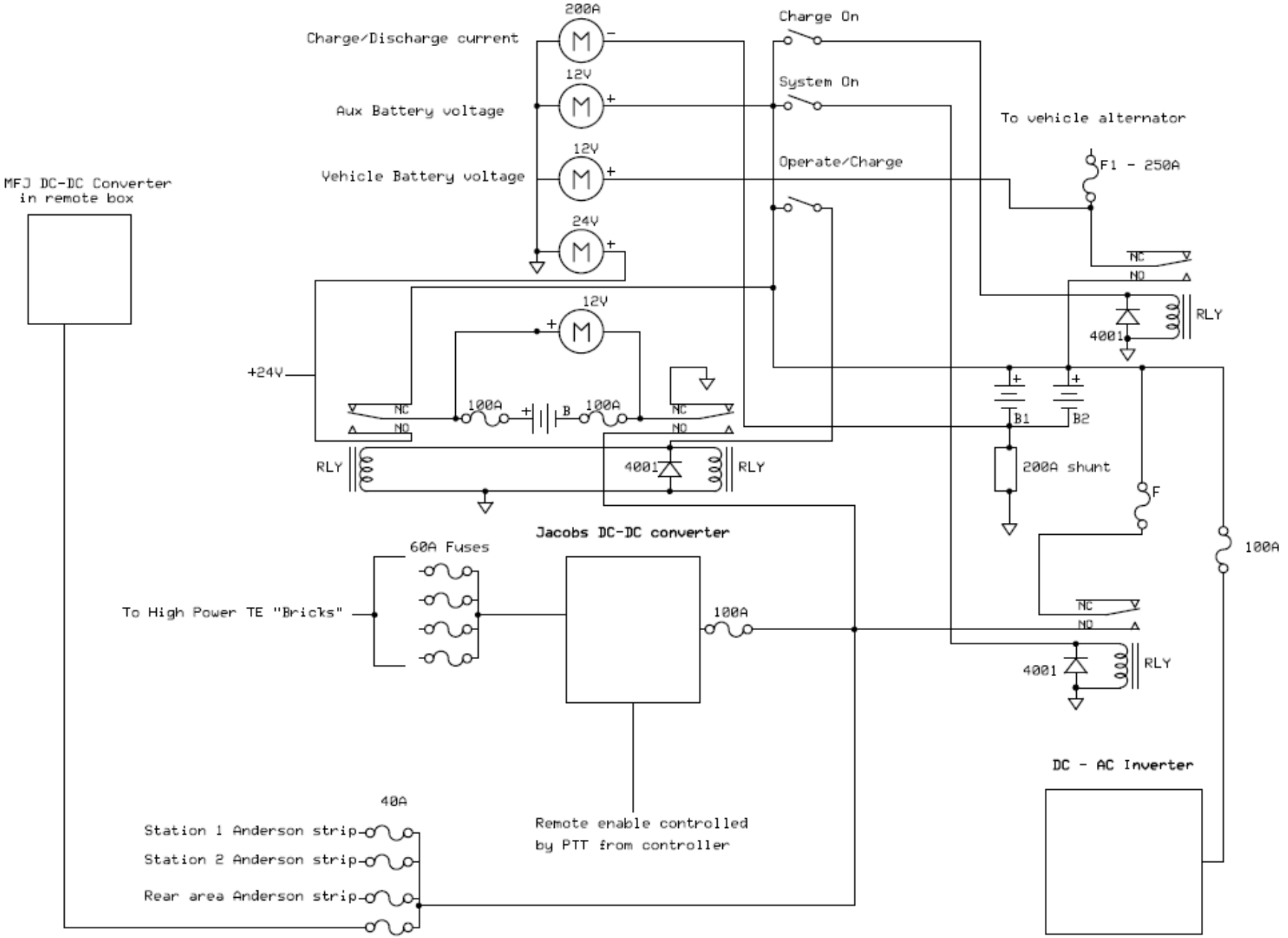
- After using N3UW's rover for three contests in a row, Andy and I started with a clean slate to design the most robust and most capable rover we could think of
- Acquired a 1994 Dodge B250 van owned by a commercial FM broadcast station – semi customized
- Included were 50 foot and 30 foot pneumatic masts, although the 30 footer turned out to be ruined from freezing
- Obtained another 30 foot pneumatic mast from a friend

- Designed for 12 bands, 50 MHz thru 47 GHz, plus an IC706 for HF and 6m FM and a TM742 for 144, 222 and 440 FM
- Both stations based on Elecraft K3's
- Both stations can access the lower 10 bands via an Arduino controller designed by me and software designed and written by Andy using BCD data from the K3's
- Lower 4 bands have both beams and omni's for operating while in motion
- Two 4D series Interstate® 12 volt marine batteries in parallel yielding almost 800ah!, and an Everstart® marine battery in series for 24 volt equipment
- 2kW very quiet generator for extended - stay operations

W8ZN/K8GP Super Rover



K8GP/W8ZN Super Rover Power Distribution



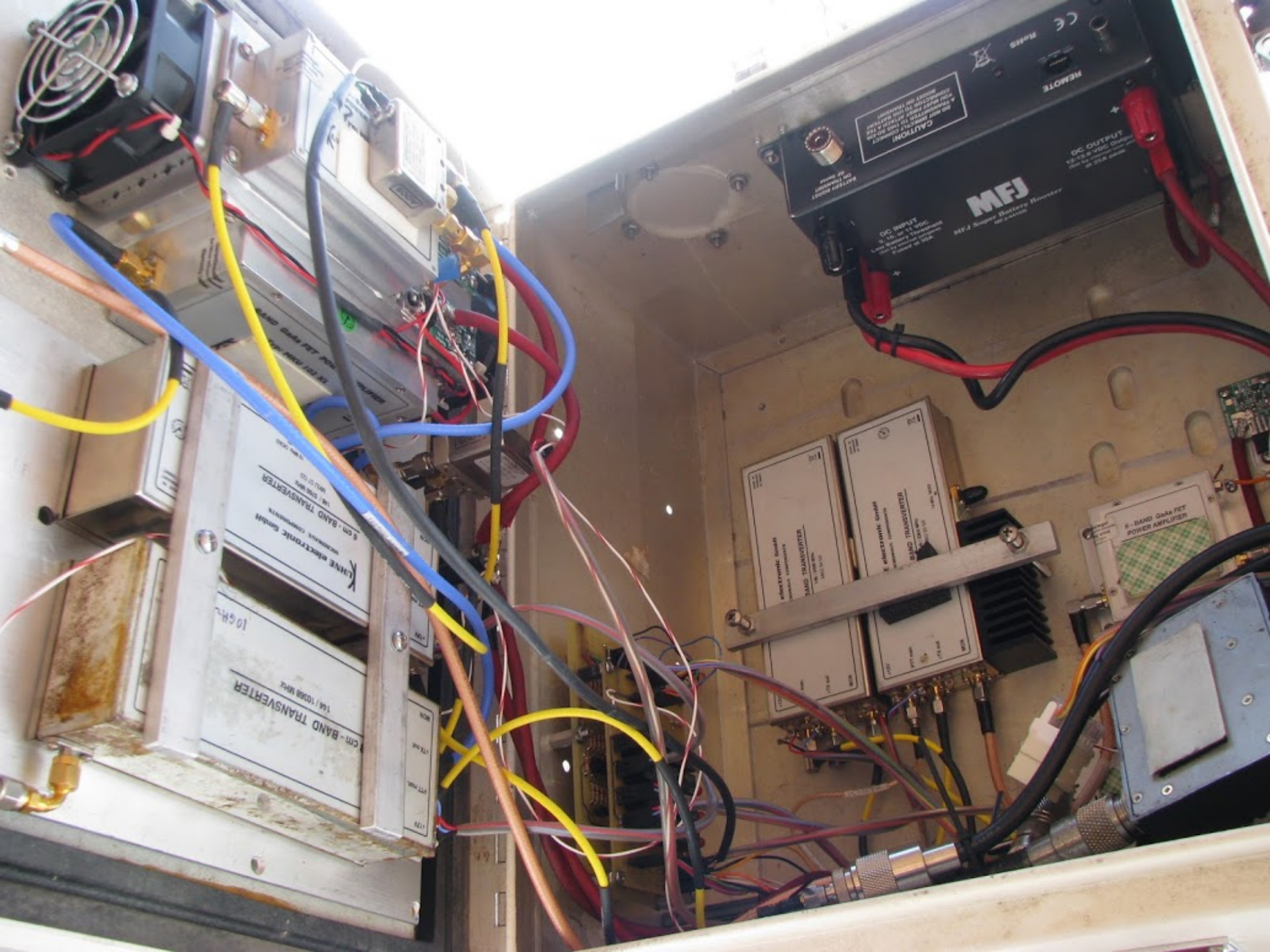
The lap of luxury!

- Switching system to place all batteries in parallel for charging
- 350A alternator upgrade for van
- #0 welding cable for all primary DC cables from alternator to batteries in rear
- Control panel for monitoring all voltages, charge and discharge currents
- Jacobs Electronics 100A DC-DC converter to provide stable 14 VDC to TE systems high power amps
- MFJ DC-DC converter in remote microwave box to provide stable 13.8v to all microwave gear
- LOTS of fuses and fire extinguishers!!

INVERTER
432 Beam
222 Beam
144 Beam
50 Beam
222
GND
CHARGE

- Currently using 42’ pneumatic mast and 23’ military crank-up pneumatic mast has three sections blocked to limit height to 30ft.
- GPS to provide 10 MHz reference source for PLL’s and NMEA data for rotor/direction
- Dual section Bird® couplers 50-1.2G
- 9913F7 coax 50-432 and LMR600 902/1.2
- High intensity LED lights on each array for night work
- Two networked Dell® laptops running N1MM+ and Total Recorder for receive audio recording
- Anderson Power Pole® outlets at each operating position and in rear
- Comet duplexers for combining 2m I.F. with 10 MHz reference to remote tower box

Cozy station 1


MFJ
REMOTE
DC OUTPUT
DC INPUT
CAUTION!
5 - BAND GaAs FET POWER AMPLIFIER
BAND TRANSVERTER

Status and control panel

Ready to roll

902 MHz thru 10 GHz

3 foot loopers in January, 12 foot loopers other times

- **Primary stations layout**
  - **50 – 432 MHz K1RA operator**
    - **50 – K3/TE Systems 0552G + 5 element beam**
    - **144 – K3/K144xv/TE Systems 1452G + FO12/144-6**
    - **222 – K3/DEMI transverter/TE Systems 2252G + FO16/222-10**
    - **432 – K3/DEMI transverter/TE Systems 4450G + FO25/432-15**
  - **902 – 47 GHz W8ZN operator**
    - **902 – K3/DEMI transverter/150w + 11/19/33 element looper**
    - **1.2 – K3/DEMI transverter/W6PQL 150w + 14/25/45 element looper**
    - **2.3 – K3/K144XV/DB6NT transverter/25W 45/76 element looper**
    - **3.4 - K3/K144XV/DB6NT transverter/20W 45/9112 element looper**
    - **5.7 - K3/K144XV/DB6NT transverter/15W 2’ dish dual band feed**
    - **10G - K3/K144XV/DB6NT transverter/10W 2’ dish dual band feed**
    - **24G - K3/K144XV/DB6NT transverter/5w 18” dish**
    - **47G - K3/K144XV/DB6NT transverter/500mw 12” dish**

- **Secondary stations layout**
  - **50 – 432 MHz W8ZN operator**
    - **50 – K3/100w + Halo**
    - **144 – K3/K144xv/80w +144-6**
    - **222 – K3/DEMI transverter/TE Systems 2210G + Omni loop/222-10**
    - **432 – K3/DEMI transverter/60w + Omni loop/432-15**
  - **902 – 10 GHz K1RA operator**
    - **902 – K3/DEMI transverter/15w + 11 element looper**
    - **1.2 – K3/DB6NT transverter/15w + 14 element looper**
    - **2.3 – K3/K144XV/DB6NT transverter/10W 25 element looper**
    - **3.4 - K3/K144XV/DB6NT transverter/4W 45 element looper**
    - **5.7 - K3/K144XV/DB6NT transverter/4W 2’ dish dual band feed**
    - **10G - K3/K144XV/DB6NT transverter/2W 2’ dish dual band feed**

Get on the air and make some noise!!!