KM5PO 47 GHz
Rover build
April 8, 2023

Components

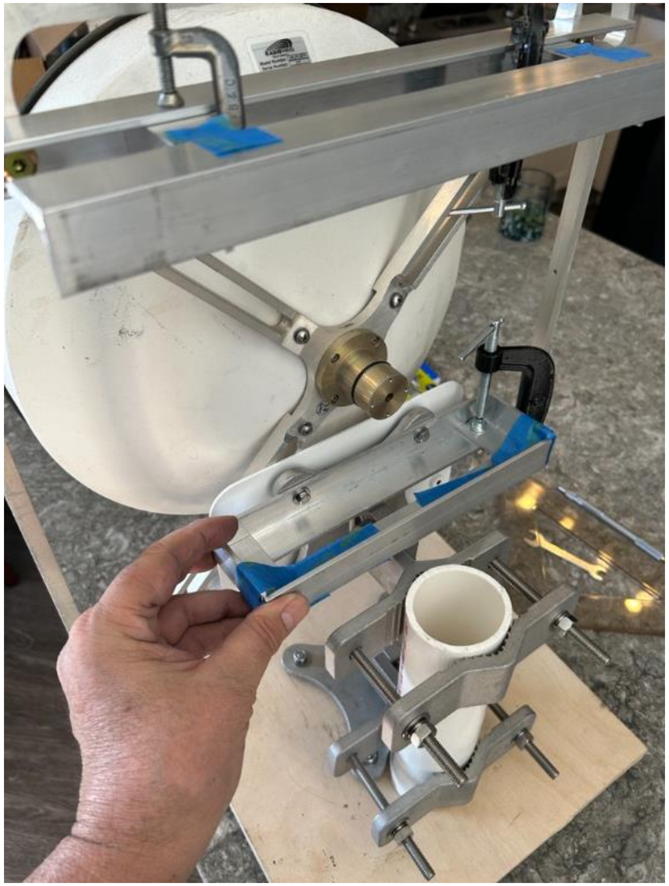
- DB6NT 47 (G2) GHz transverter
  - NF = 6.25 dB, Gain = 32.5 dB
  - RF output = 80 mw = + 19 dBm
- DB6NT MKU LO 8-13 PLL-2
  - GPSDO locked
- Radiowaves HPLP1-38TN 13” 38GHz dish
  - Fed by 1” piece of WR-19 and UG-387/U flange
- No LNA or PA yet
- Arduino controlled sequencer and waveguide “switch”
- Solenoid driven plate carrier moves XVRT/LO from TX to RX position against microswitch end points

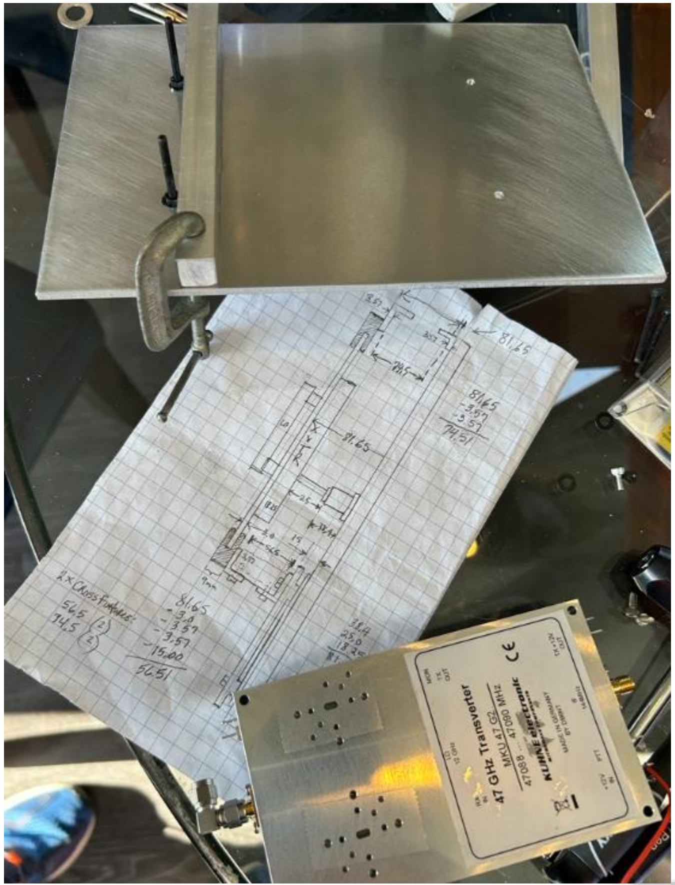
Build it

- Waveguide switch I wanted seems not obtainable
- Dish came with an aluminum frame around it
- Dish to base hardware came from Jim Turpin surplus
- Requirements
  - Sturdy aligned cage behind feed point of dish with fine adjustment
    - Face of transverter must maintain alignment parallel to feed entry plane
    - Face of transverter must maintain alignment perpendicular to waveguide stub
  - Solenoid controlled carrier plate to hold XVTR/LO
    - Must “ride” smoothly in groove at bottom edge (lube with white lithium grease)
  - Arduino controlled transmit/receive operation
    - PTT switch = analog input
    - Travel limit microswitches = analog input
    - Solenoid needs power on/off & normal/reverse DC polarity (multiple relays on digital output)

Build it

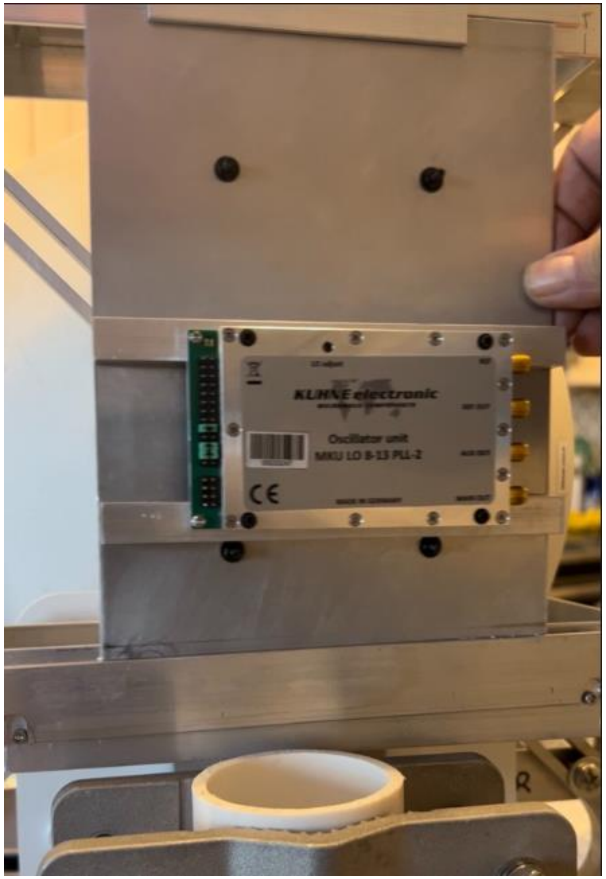
- Cage and carrier plate construction

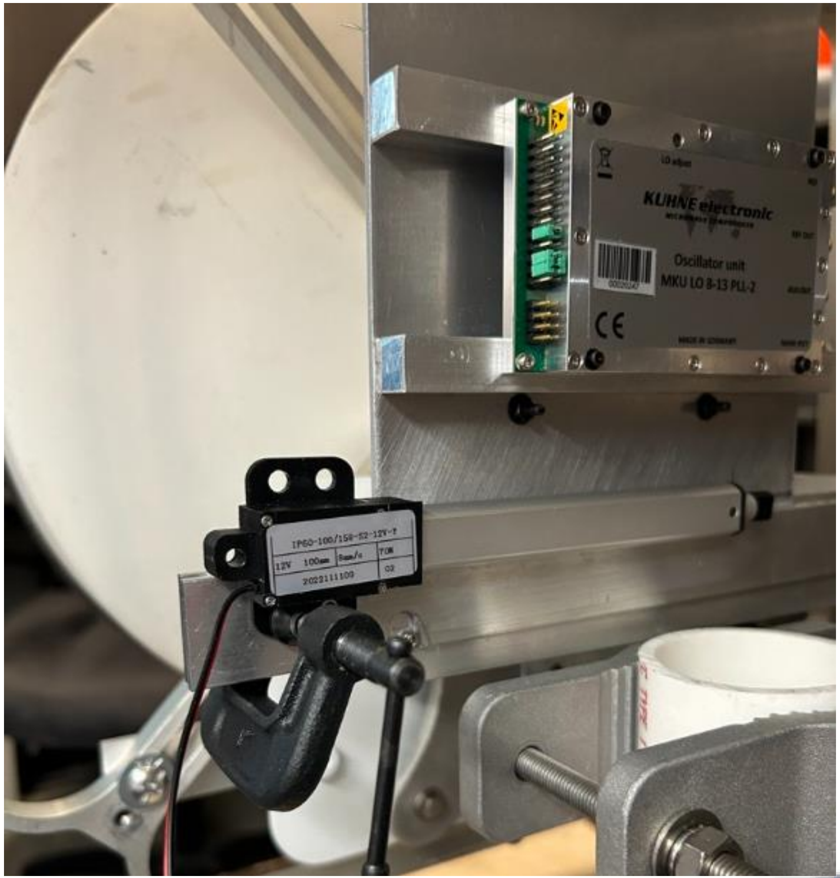



81.65
81.65
-3.57
-3.57
74.51
81.65
2× Cross Fixtures:
56.5 (2)
94.5 (2)
81.65
-3.0
-3.57
-3.57
-15.00
56.51
47 GHz Transverter
MKU 47 G2
47088 ... 47090 MHz
KUHNE electronic
MADE IN GERMANY
RX IN
LO 12 GHz
MON TX OUT
TX +12V OUT
IF 144MHz
PTT
+12V IN

Build it

- Carrier plate captured and riding in groove. Solenoid trial fit.


KUHNE electronic
Oscillator unit
MKU LO 8-13 PLL-2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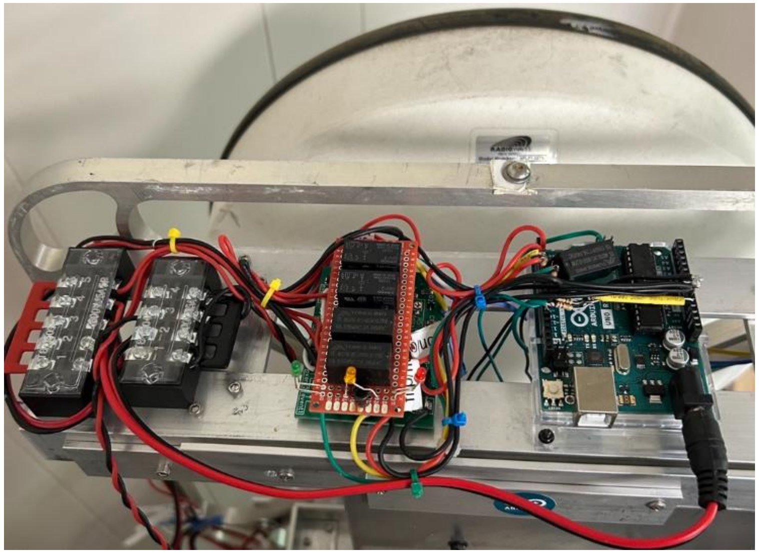
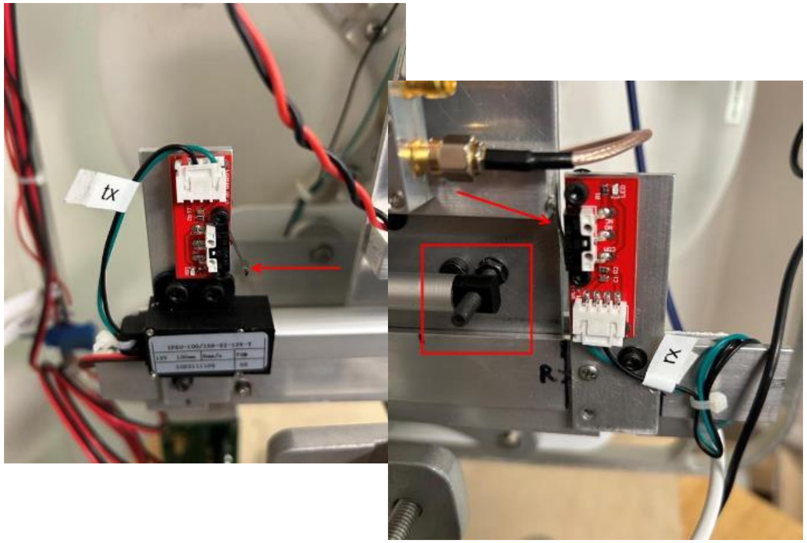
Build it

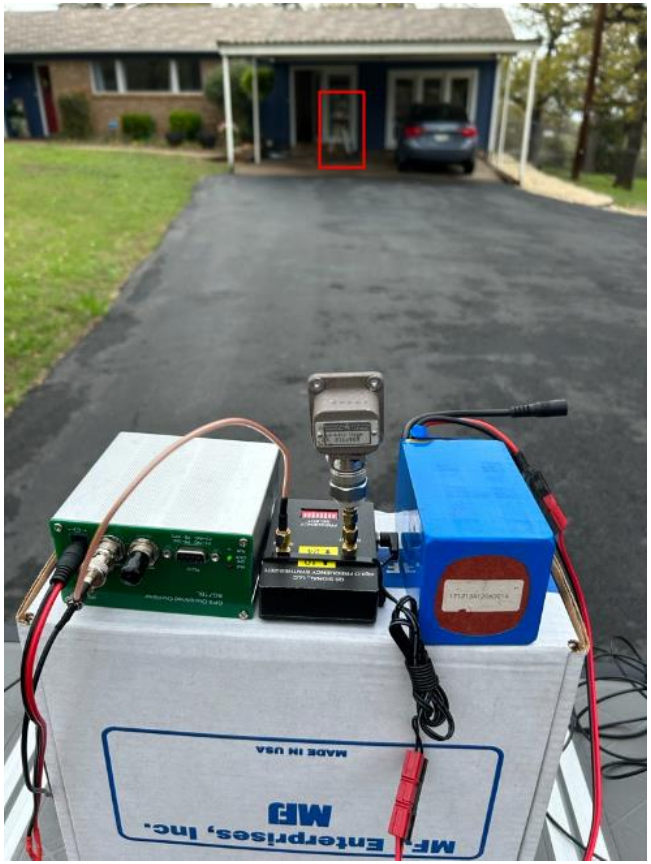
- Control circuitry and Left (TX) – Right (RX) limit switches added





Test it

- WSS is set at 85’ distance from dish



Test it

- LEDs are: Amber=XVTR in transit, Green=Receive, Red=Transmit

KM5PO 47 GHz rover testing part 1 #ghz - YouTube

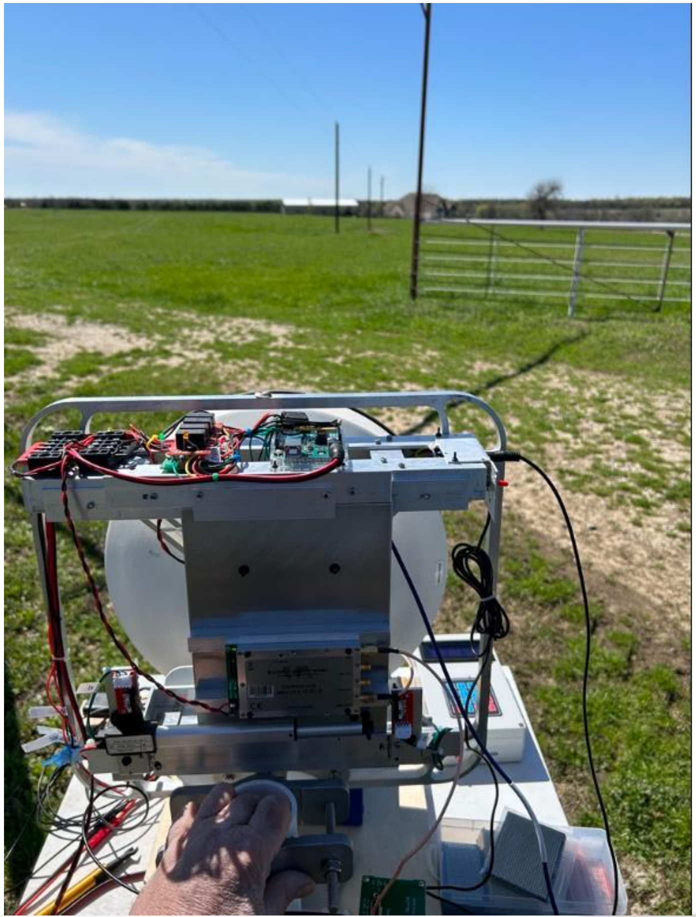
Test it

- Directionality and waveguide stub alignment demonstrated

[KM5PO 47 GHz rover testing part 2 #ghz - YouTube]

Make a contact!

- 47 km on 47 GHz – Al W5LUA to KM5PO signals 459/559



Questions?