THE SUN COOKER DISH ON 6 AND 3 CM EME

TENERIFE EME CONFERENCE 2026

HARKE SMITS, PA0HRK

MAY 29-30, 2026

THE SUN COOKER DISH: A CHEAP, WELL PERFORMING DISH!

- A lot has been written on the application at 23 cm (Refer to KA1GT website).
- Others have done a lot of modelling and optimization at this band.
- I was triggered by (quote from KA1GT website):

"**The result was a sun noise Y-factor reading of around 11dB"** *At 3 cm!*

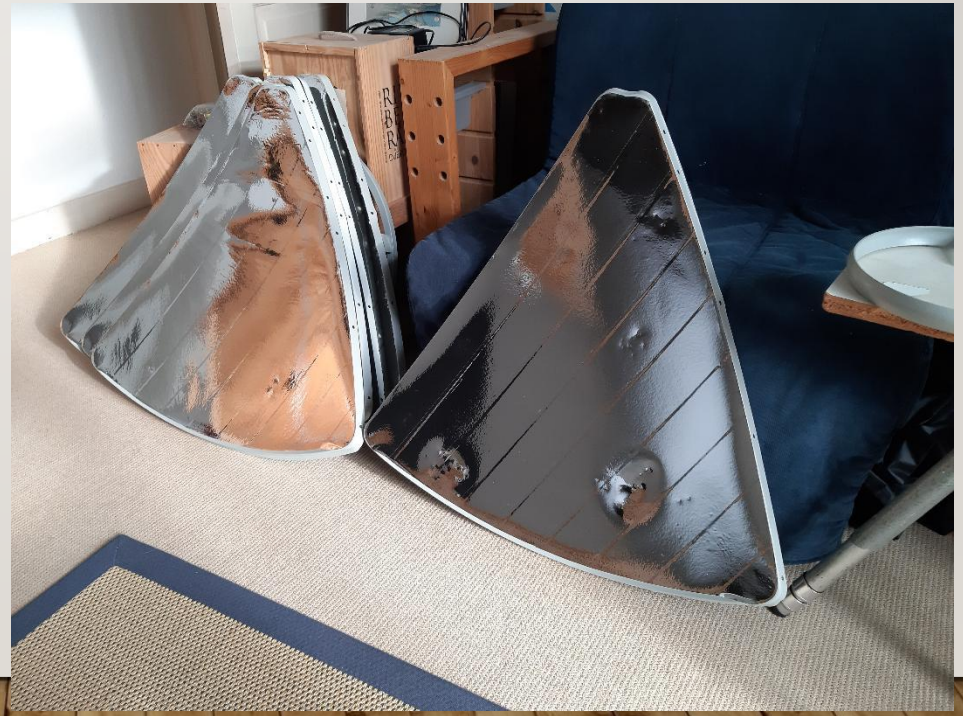
- And:

"…. the 1.5m dish will be accurately profiled for 6cm, 9cm, 13cm and 23cm and so can be used on any of those bands"

So I wanted to have one…….

PROCUREMENT OF THE DISH

- Easy in US, difficult in Europe? Third purchase: success!
- More expensive, long shipping time, some transport damage



THE FIRST TESTS.....

(IN SPRING TIME THIS YEAR, AS THE DISH ARRIVED LATE AUTUMN)

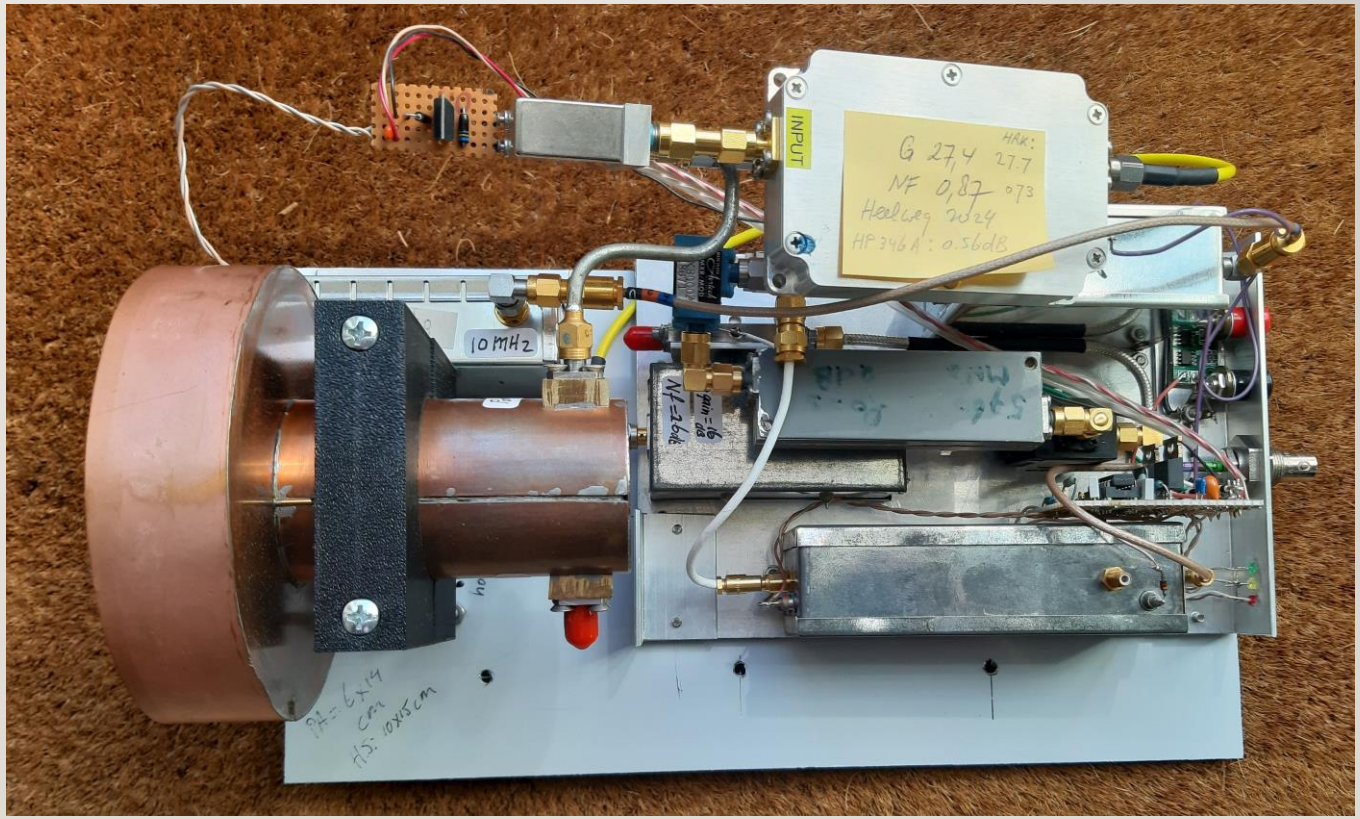
Tea Time:
At 1000 W/m^2
Heat power:
2250 Watts
Water boils quickly!

DISH MOUNTED ON EXISTING TRIPOD
(AND THE FOIL REMOVED)

- Az-El system is from 23/13 cm stressed dish.
- Rod carries the 23/13 cm feed
- Now carries the 6 cm transverter
- Az/El motor control by Beaglebone antenna controller (PA0HRK/Python)
- Note 1: system rests indoors and is carried on balcony when operating, very much weather dependent…..And moon phase…..
- Note 2: no attempt to repair dents
- Note 3: rather small moon window

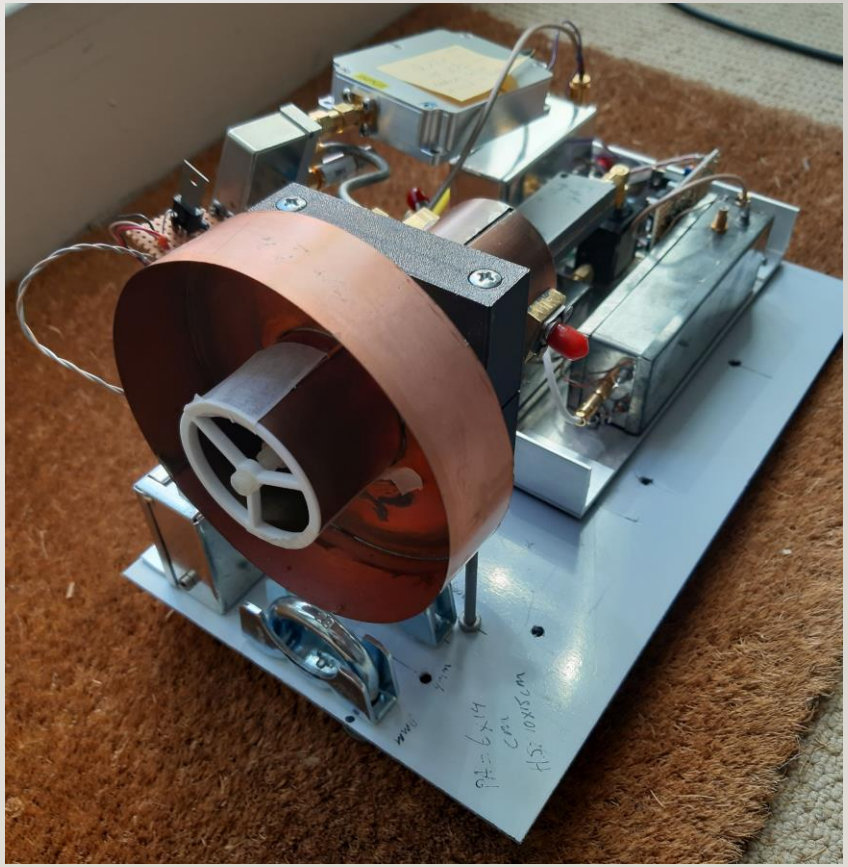
6 CM TRANSVERTER, RX ONLY
(IF: 144 MHZ)

LO: PLL at 5616 MHz, stabilized by 10 MHz OCXO
LNA: DU3T, Nf = 0.87 dB
The 6 cm filter was given to me 40 years ago by my late friend Marcel, PA0MGA, so I had to use it one day.



A CLOSER LOOK AT THE FEED

F/D of dish is 0.38, diameter 150 cm
Focus at about 57 cm.
Feedhorn is Kumar (SM6FHZ), alas wg too short, so printed Merc star is used to hold S12/S21 disk.
S11 = -19.8 dB, S22 = -29 dB, S21 = -22 dB; in test, not in situ. (Port 1 = TX)
Disk is nut….. Suspended with nylon screw.

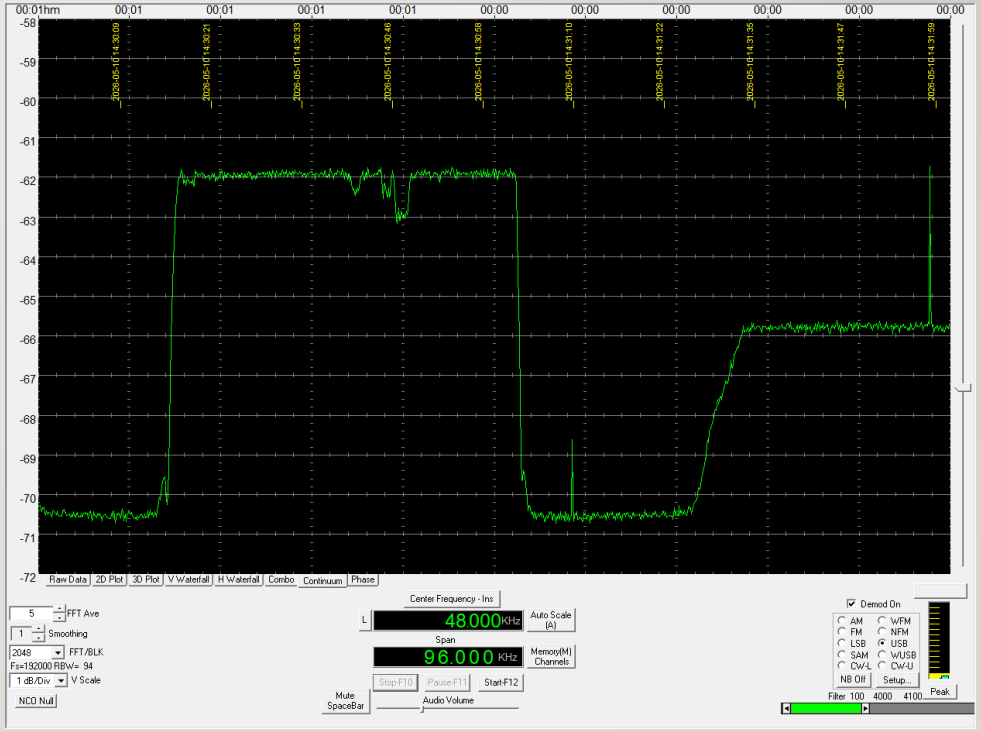


A BIT MORE SERIOUS: 6 CM SUN NOISE

The 6 cm transverter: RX only.
System needs calibration at the sun, each time after set-up. Then moon tracking is possible.

SUN NOISE: HOT-COLD MEASUREMENTS

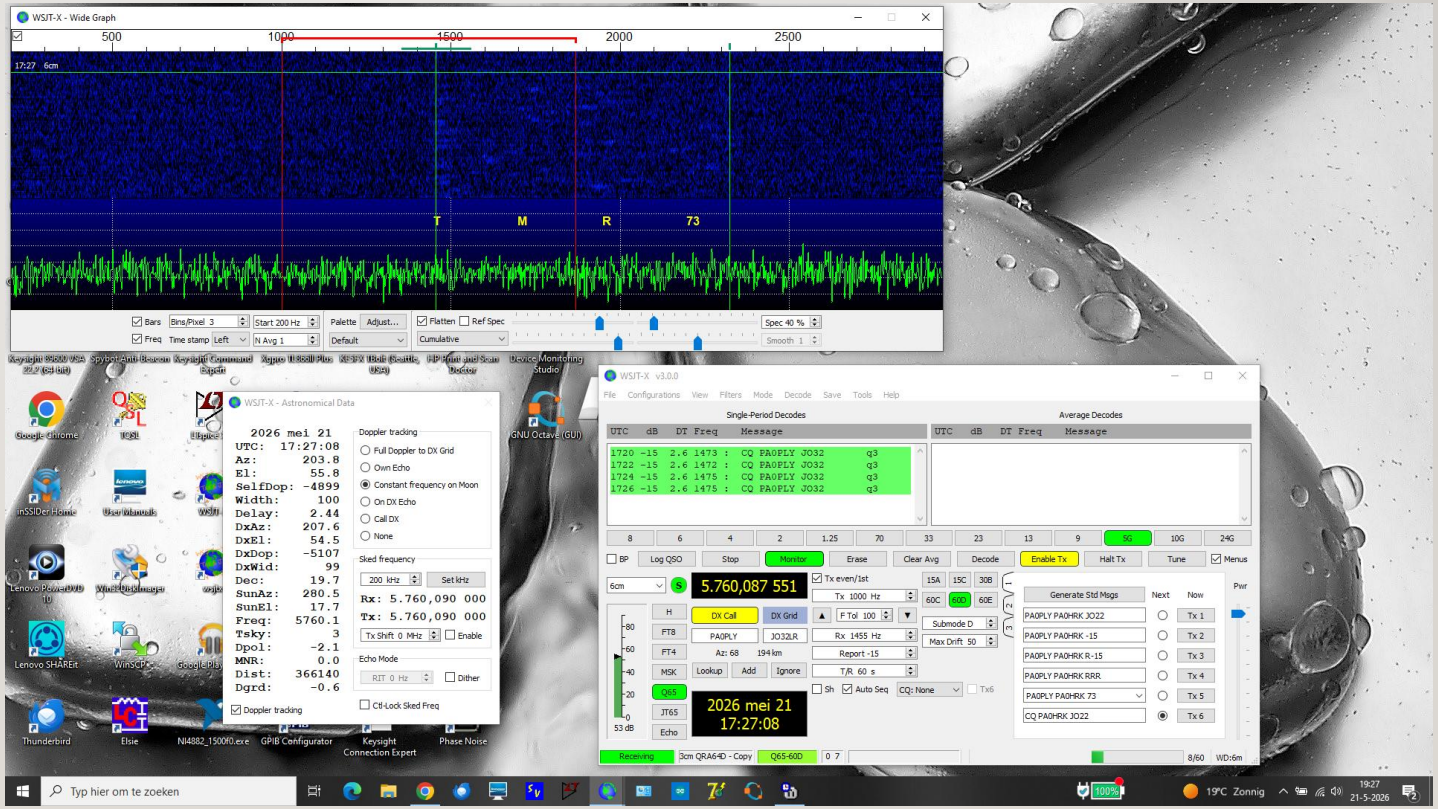
Sun Noise: Hot-Cold: 8.3 dB
Including adapters and isolation relay, all SMA
VK3UM predicts 8.8 dB
And Park position
Spikes in some directions……
FunCube Dongle and SpectraVue
Moon Noise about 0.2 dB



FIRST RX TEST WITH JAN, PA0PLY

2026-05-21

FDM-DUO directly at 144 MHz via ”transverter”
The first decodes to test RX before installing the SSPA
His signal: - 15 dB
TNX Jan!

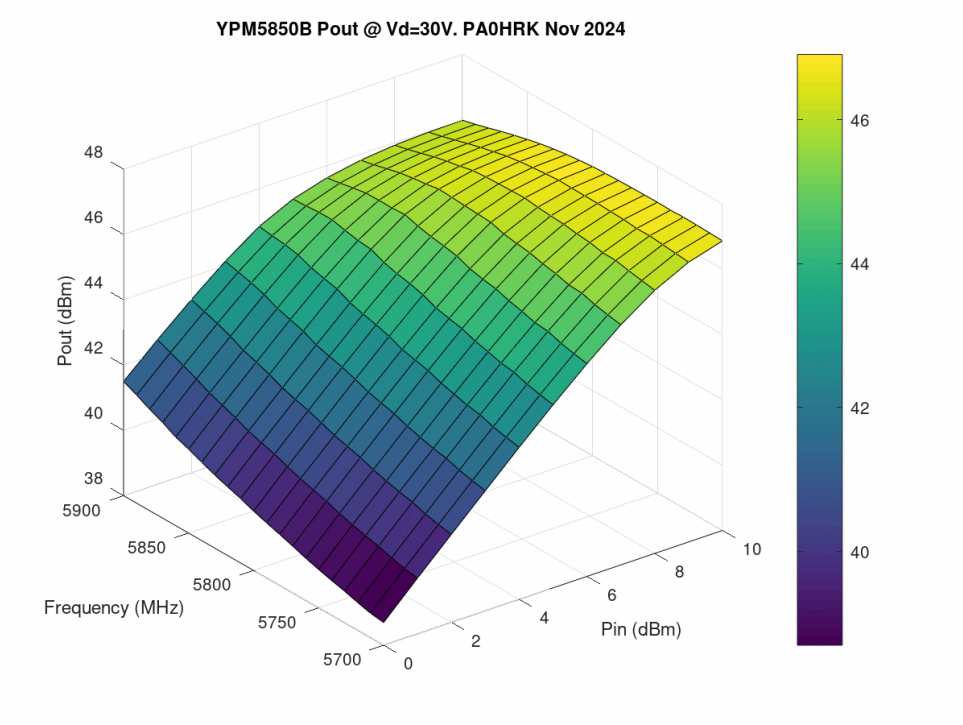


OPERATING POSITION

THE POWER AMPLIFIER (SZHUASHI)

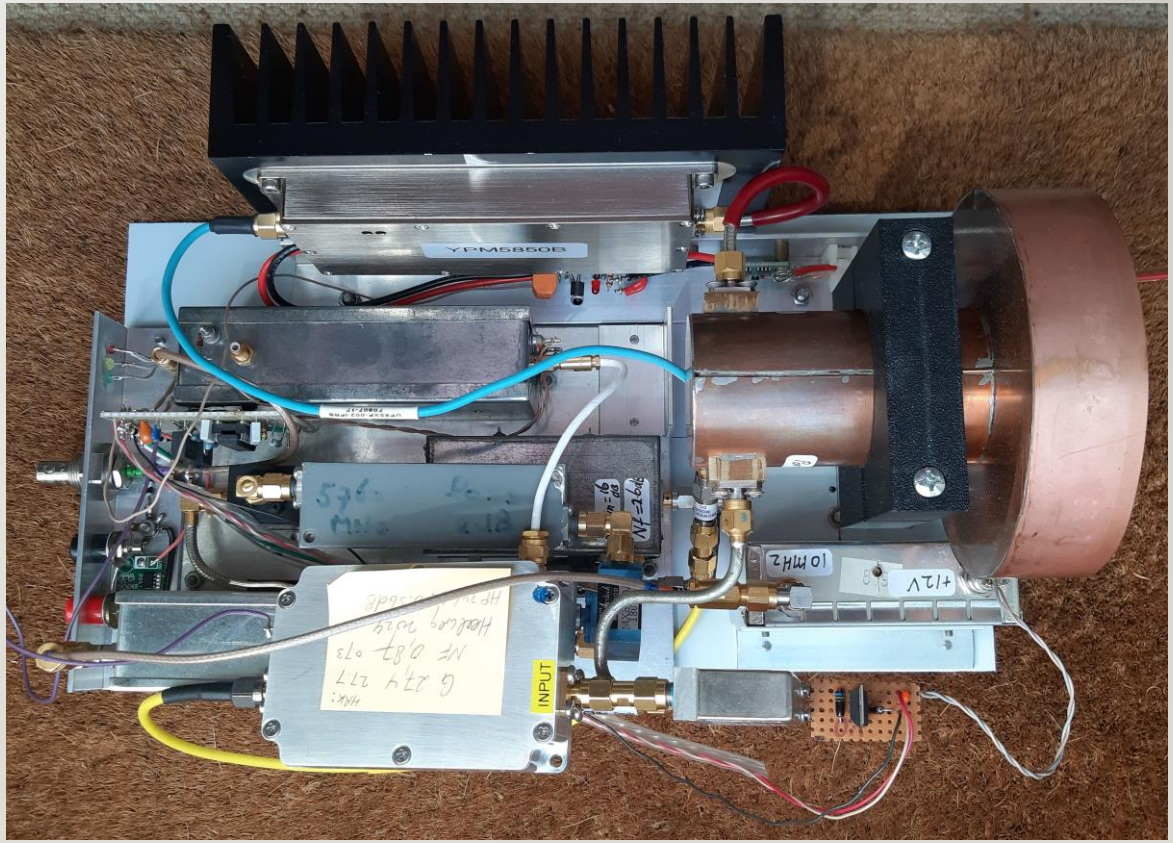
Output Power: 50 Watts, at 30 V and 3.7 A.
Gain: 38 dB
GaN technology, used for FPV drone control and…… jamming.
Must kill jammer!
Some instability with non 50 ohm loads have been reported?
SZHUASHI now sells similar models with different names
Ref: Dubus 4/2024 by PA0HRK

OUTPUT POWER VERSUS INPUT POWER

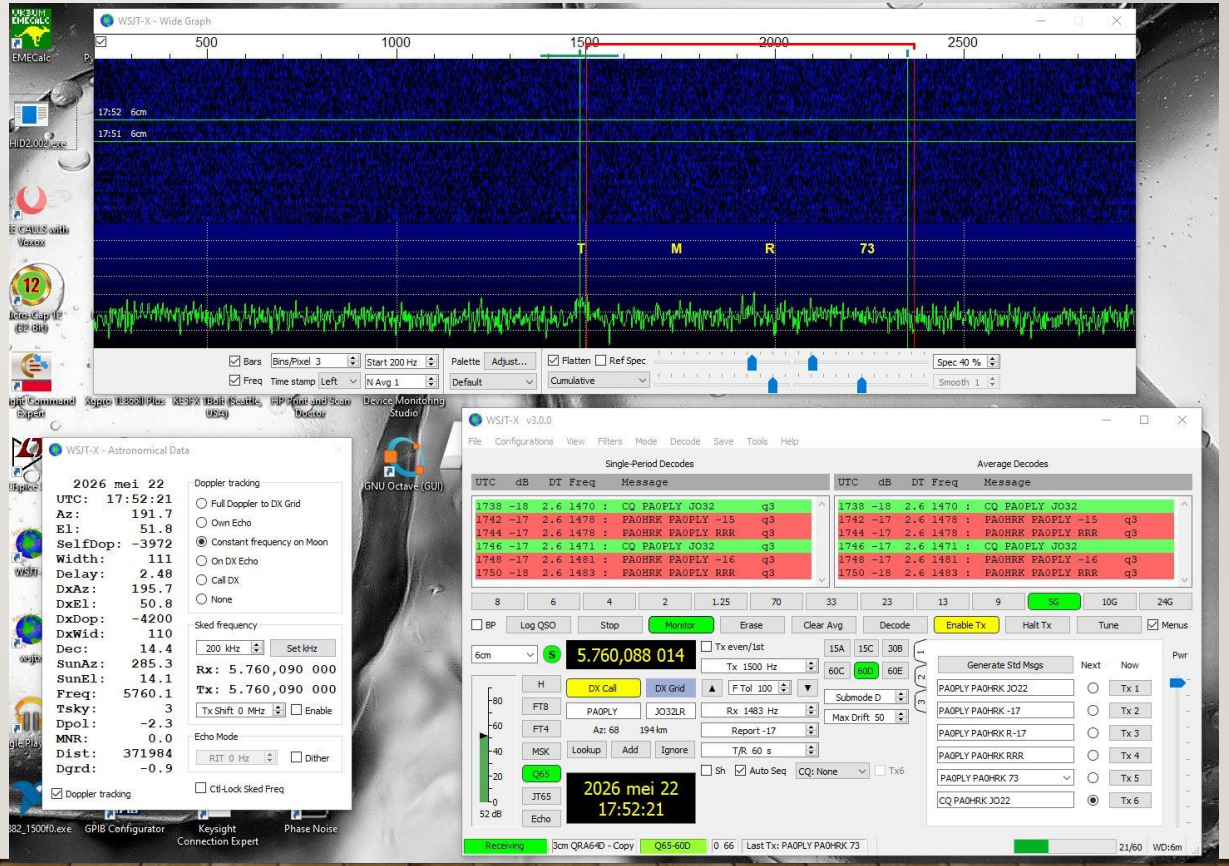


THE 6CM MASTHEAD SECTION….
SSPA INSTALLED

Here the SSPA is installed.



THE FIRST 6CM QSO WAS MADE ON 2026-05-22 WITH PA0PLY (THANKS JAN! AGAIN)



MORE 6 CM QSO'S FOLLOWED
(INITIALS SO FAR)

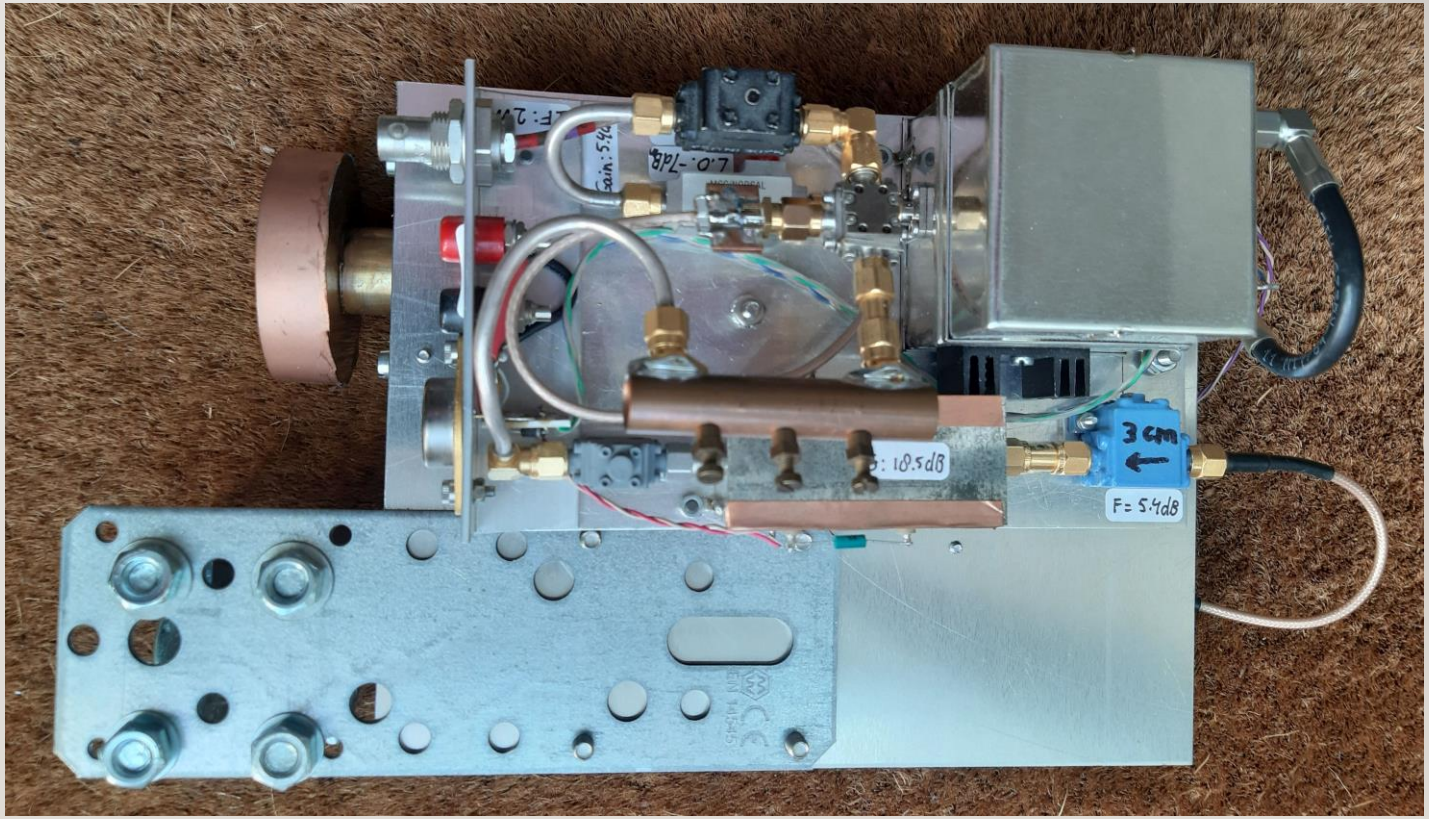
- PA0PLY
- OH3LWP
- OZ1LPR
- ON5TA
- PA3DZL
- PA0BAT

Signal reports: -15-17, echo: -23 dB.

THE 3CM CONTRAPTION

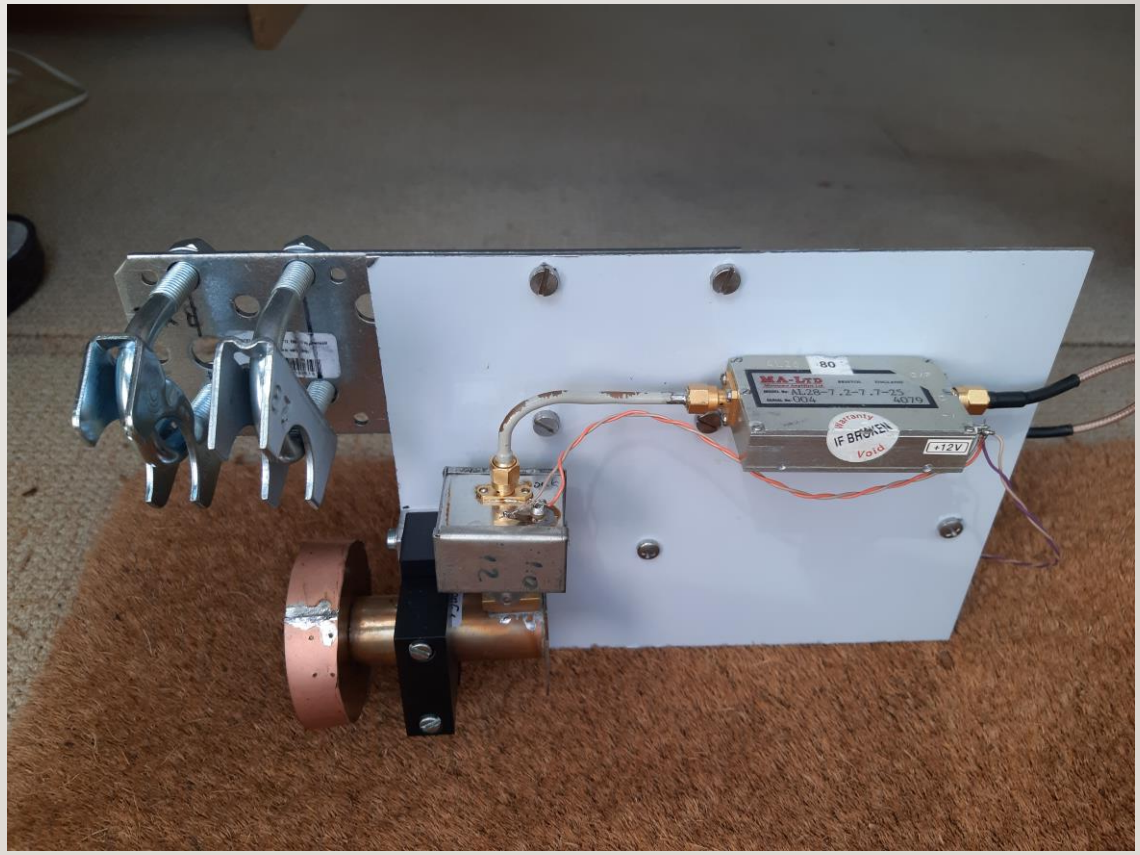
THE TRANSVERTER, IF: 144 MHZ

LO: 10224 MHz, PLL
Ref: 10 MHz OCXO
3 screw pipe section filter
Marki mixer



3 CM
THE FRONT END

Experimental set-up
Kumar feed horn (SM6FHZ, Vpol)
Nf estimated 1.2-1.5 dB
Sun noise: 8.5 dB
VK3UM predicts: 9.9 dB
Moon noise: 0.25 dB
VK3UM: 0.5 dB
Decodes from OZ1LPR (but you don't need much….)
Crude mechanical construction
Vertical offset about 3 degrees



CONCLUSION
(IF ANY)

- It works……
- And…… it was fun!