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24 and 47 GHz EME

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2008 EME Conference
Florence, Italy

Outline

- 24 and 47 GHz at W5LUA – past and future
- New activity on 24 GHz
- Activity on 47 GHz?
- Higher?

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First 24 GHz EME QSO

W5LUA

VE4MA

First QSO took place on August 18, 2001
Stations also making QSOs within a few years of this early time period included RW3BP, VE7CLD, AA6IW, OK1UWA

24 GHz 3M Dish with Back Structure at W5LUA

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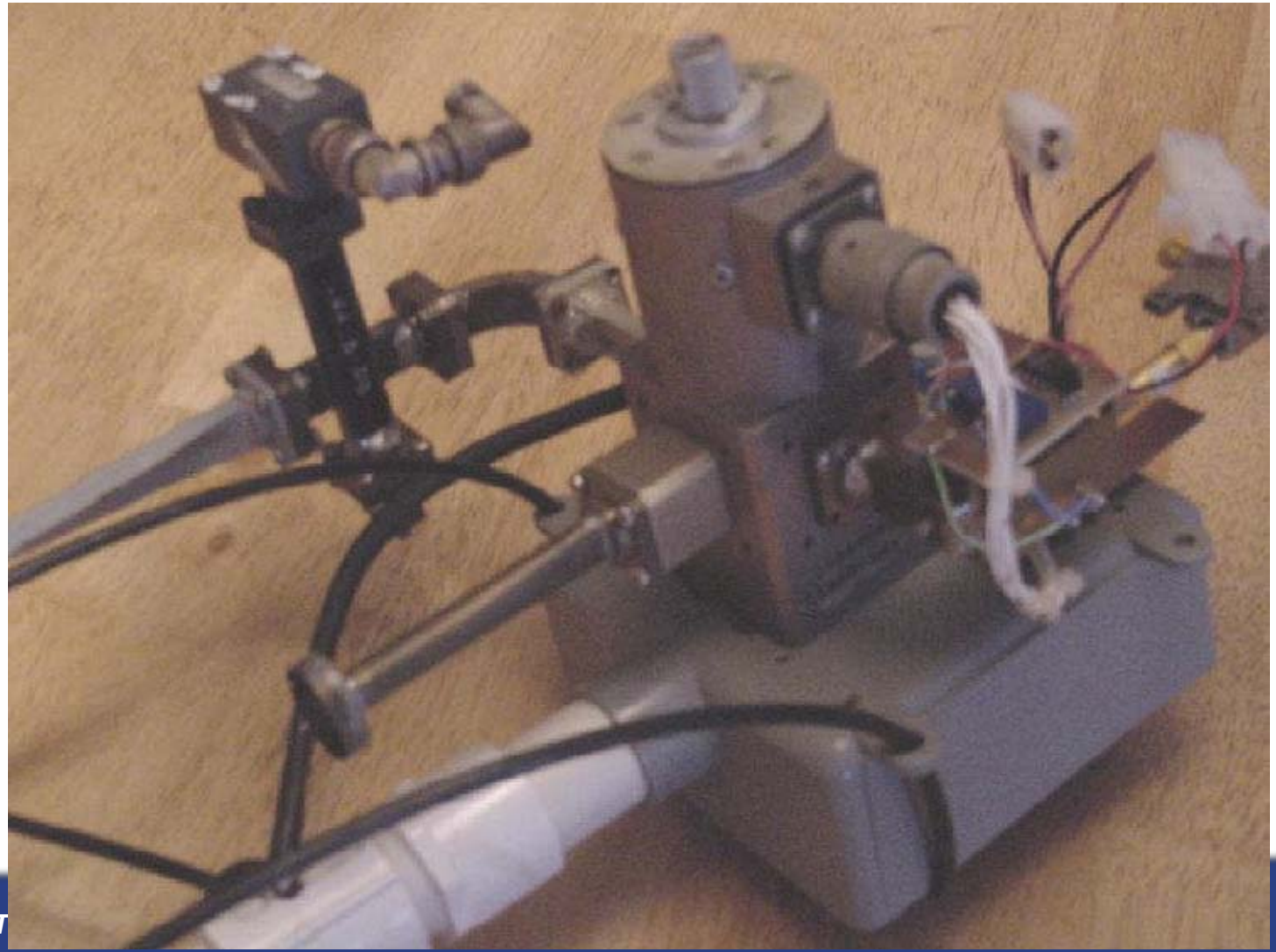
W5LUA 24 GHz Feed System



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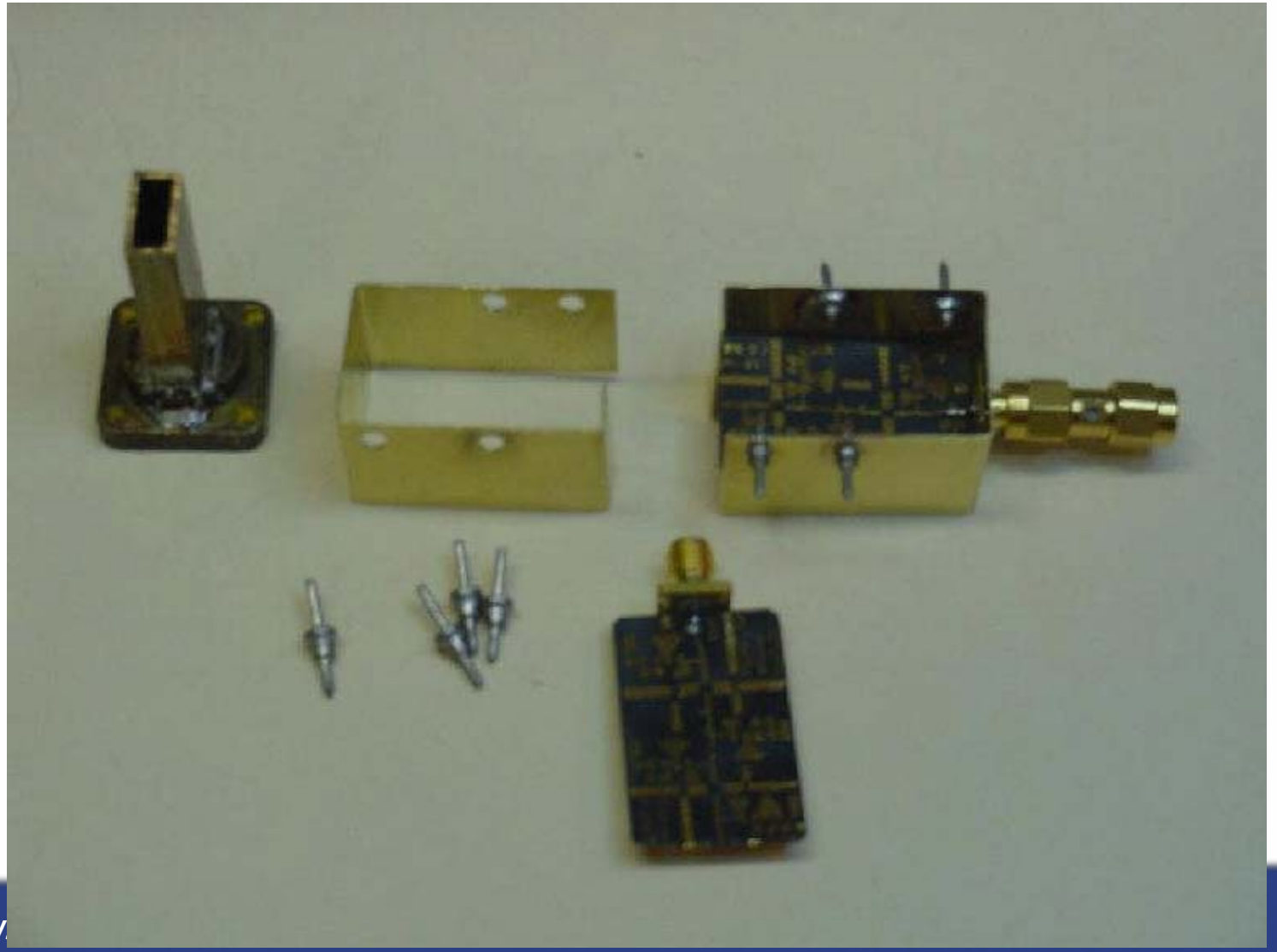
Homebrew 24 GHz LNAs



Retuning TWTs for 24 GHz

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- More conventional Helix TWTs have better chance of going up in frequency
- Normally a drop in helix voltage will improve performance at higher frequency
- Waveguide tuning can also enhance performance
- Magnets can provide surprising results!

VTU-6191 14 GHz TWT

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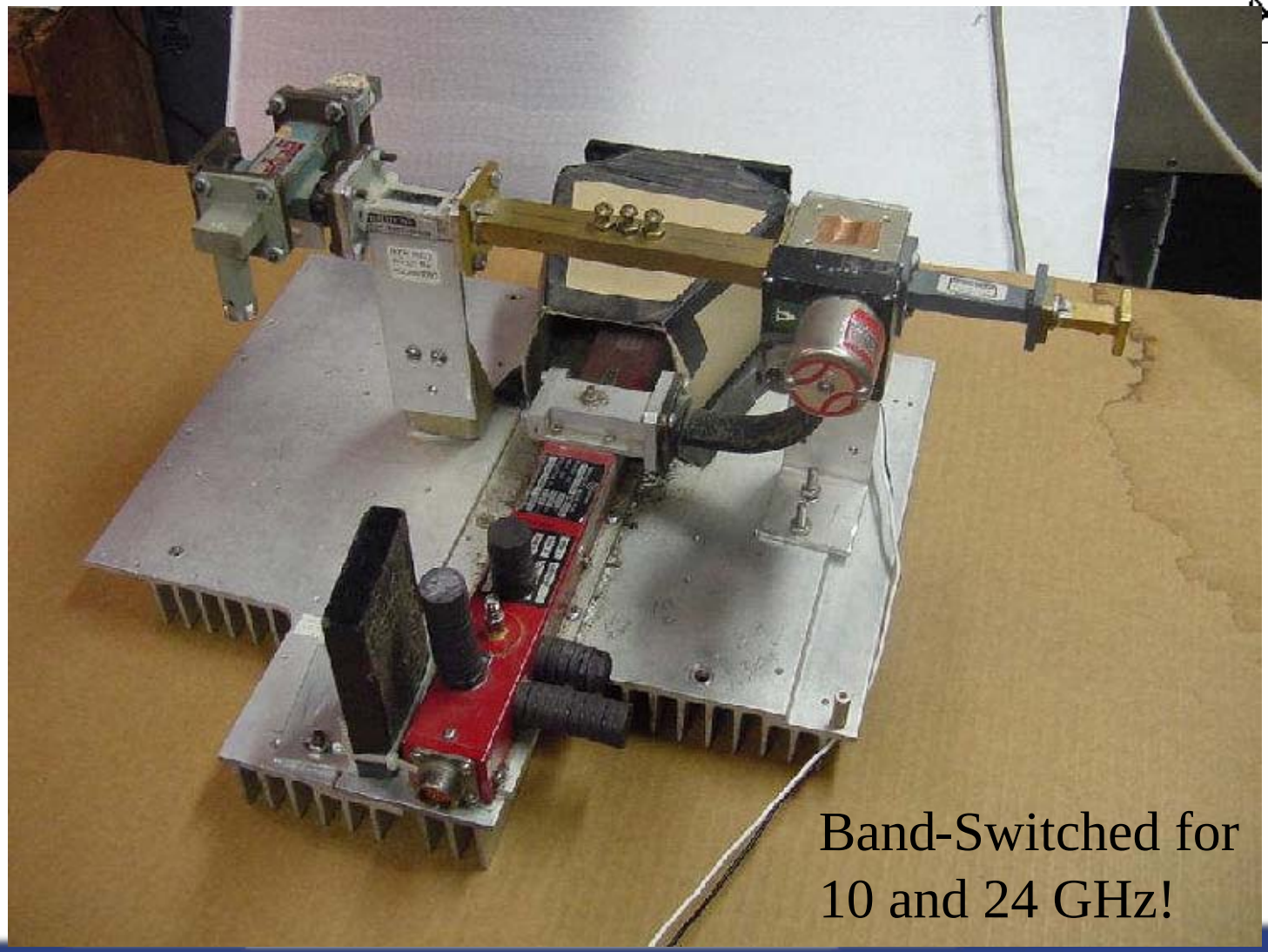

First 24 GHz Echoes at W5LUA
March 7, 2001

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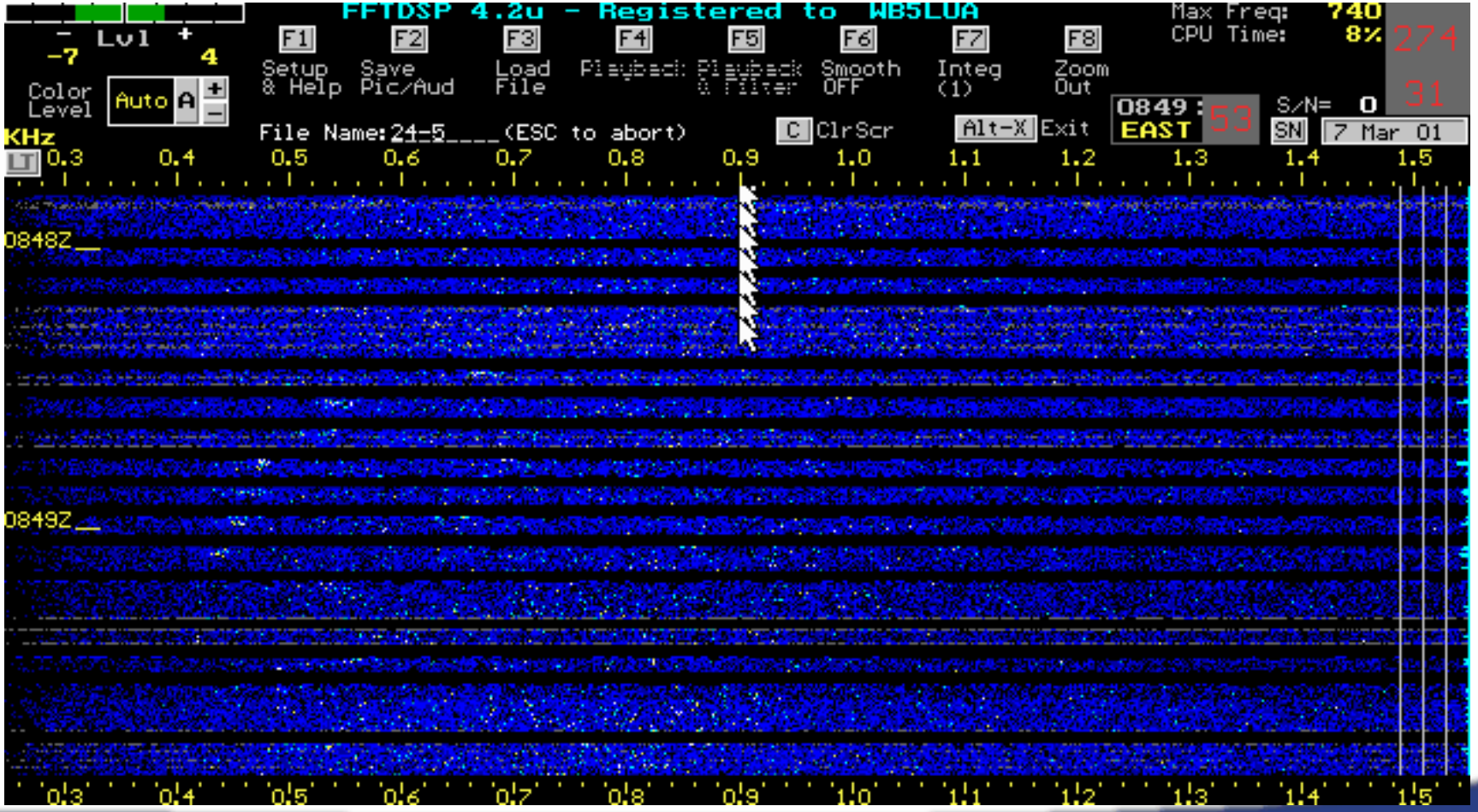

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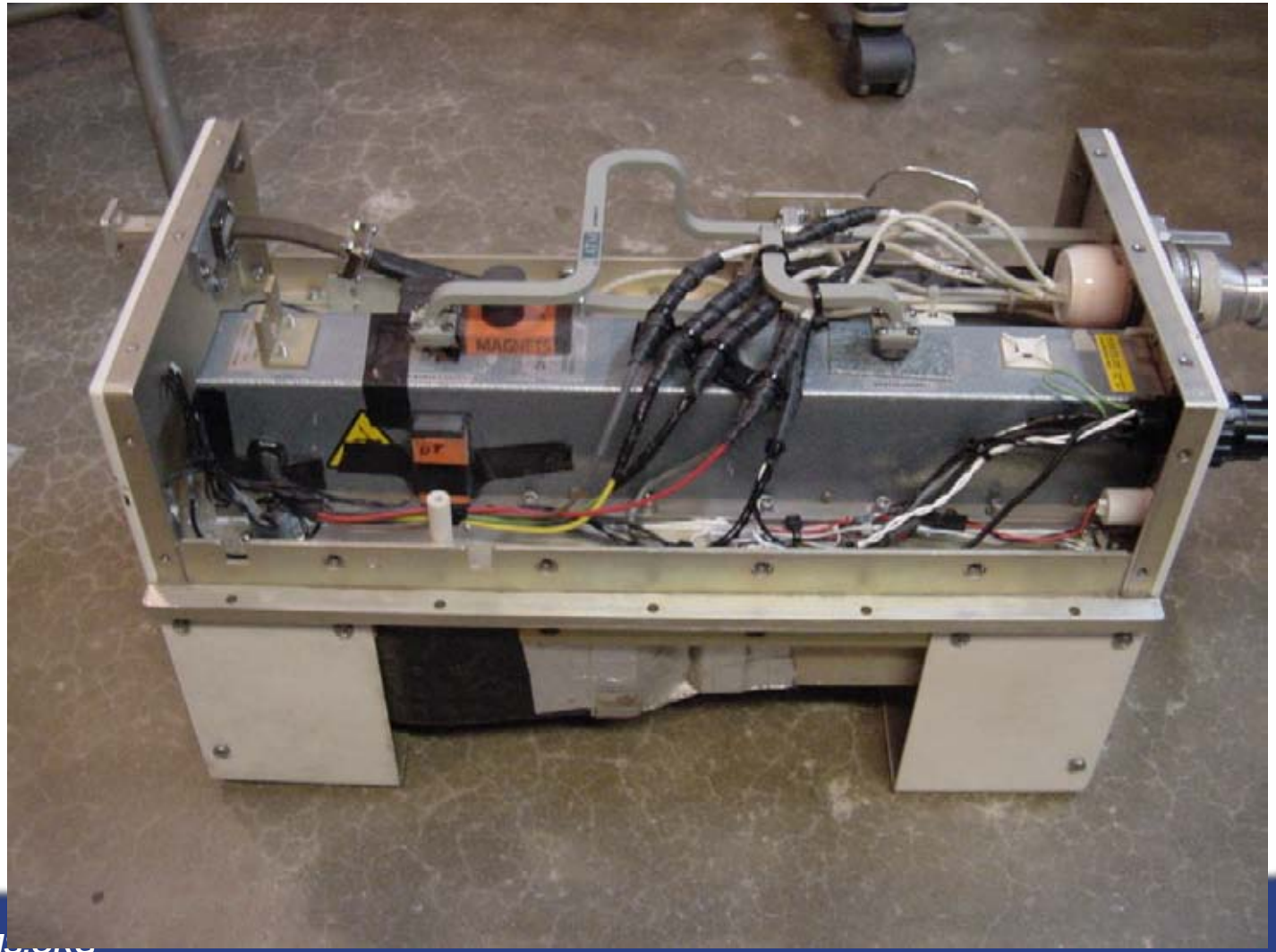
TH-3864C TWT



Varian VPW-2931 TWT Power Supply

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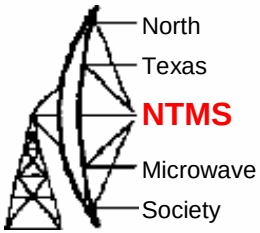
Stations making QSOs on 24 GHz EME



- Early VE4MA, W5LUA, RW3BP, VE7CLD, AA6IW, OK1UWA on 24192 MHz
- Activity has migrated from 24192.1 MHz to 24048.1 MHz
- Present activity includes VE4MA, W5LUA, G4NNS, LX1DB, DK7LJ, DF1OI, OK1KIR, PA0EHG
- Others include DL7YC, IQ4DF, DK3UC

3M Dish at LX1DB

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Combining Power at LX1DB

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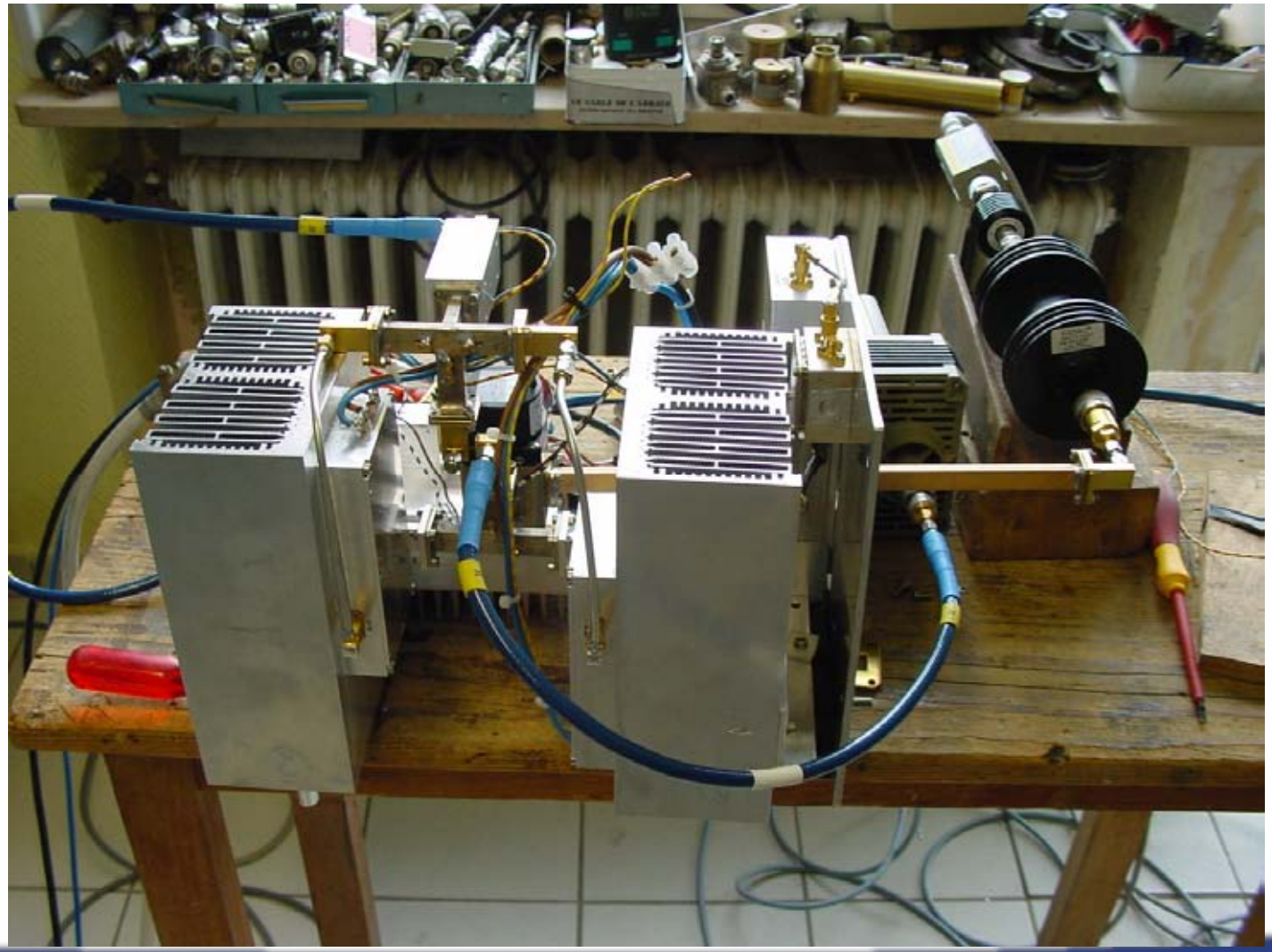

2.4M Offset Fed Dish with sub reflector, 40W RW1127 @ DF1OI

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W5LUA 2.4M Offset Fed Dish with youngest grandson

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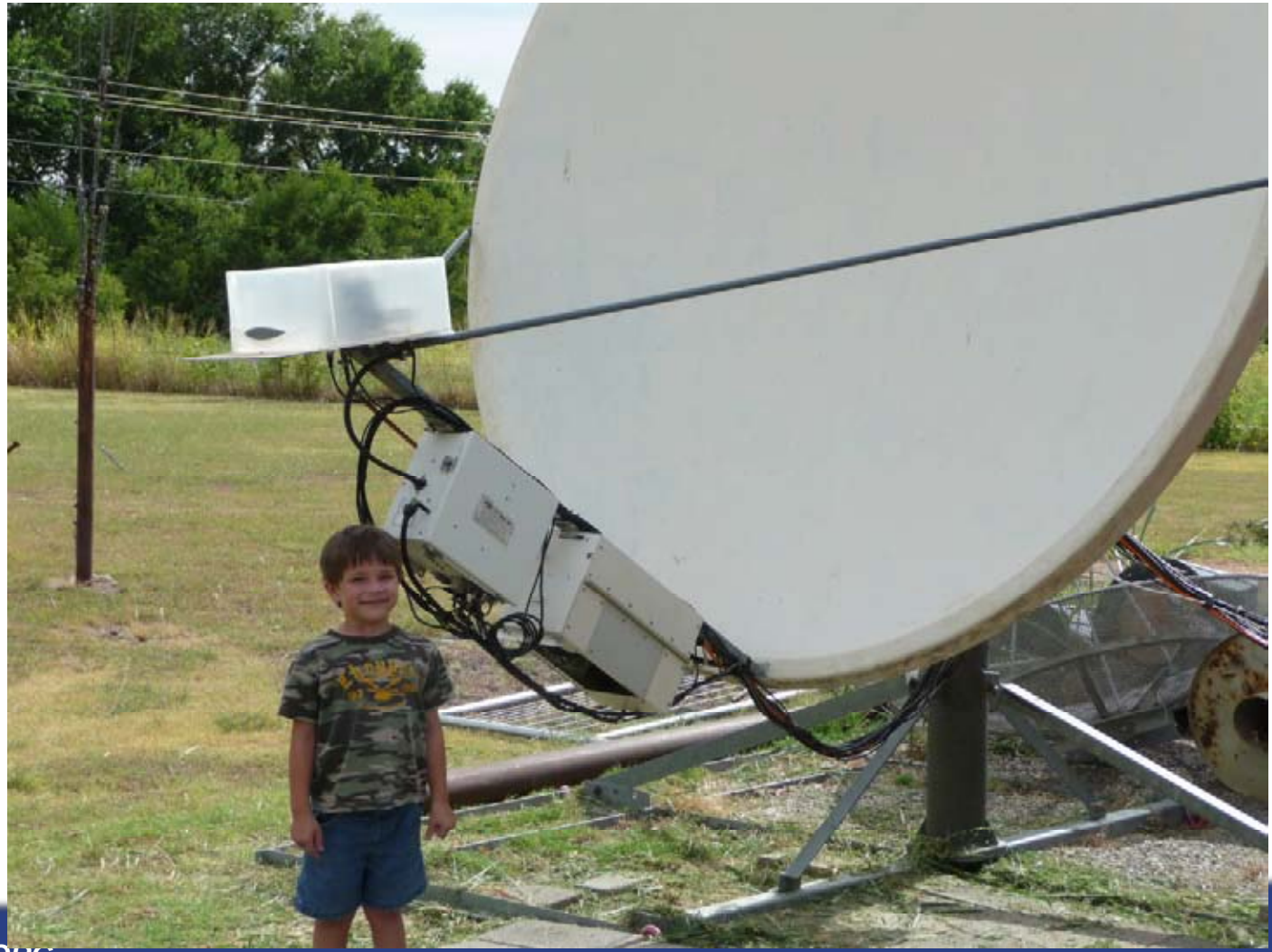

W5LUA 2.4M Offset Fed Dish with 24 GHz XVTR at Feed

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WR-42 Relay, 24 GHz LNA and 24 GHz W1GHZ Feedhorn

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W5LUA Shack with SDRs

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SDR-1000 on 24 GHz EME

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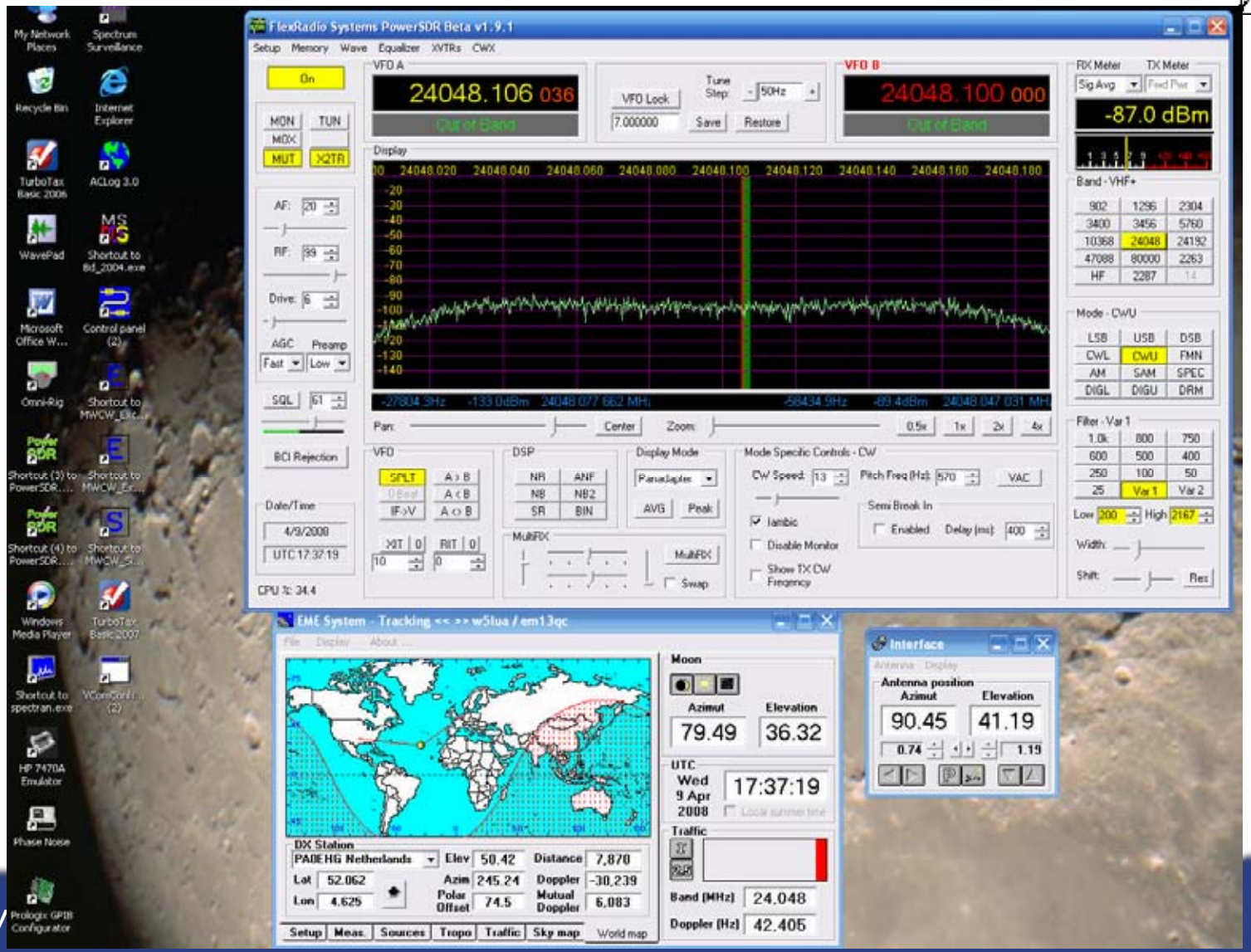

47 GHz EME

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- First QSOs took place in the January/February 2005 time frame between RW3BP and AD6FP and W5LUA
- Later in 2005, additional QSOs took place between VE4MA and AD6FP and RW3BP
- No activity since 2005
- RW3BP software instrumental in providing needed S/N on receive

W5LUA 47 GHz XVTR at Feed of 2.4M Offset Fed Dish

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Hughes 32 Watt TWT for 45 GHz

Arcing Problems with TWT

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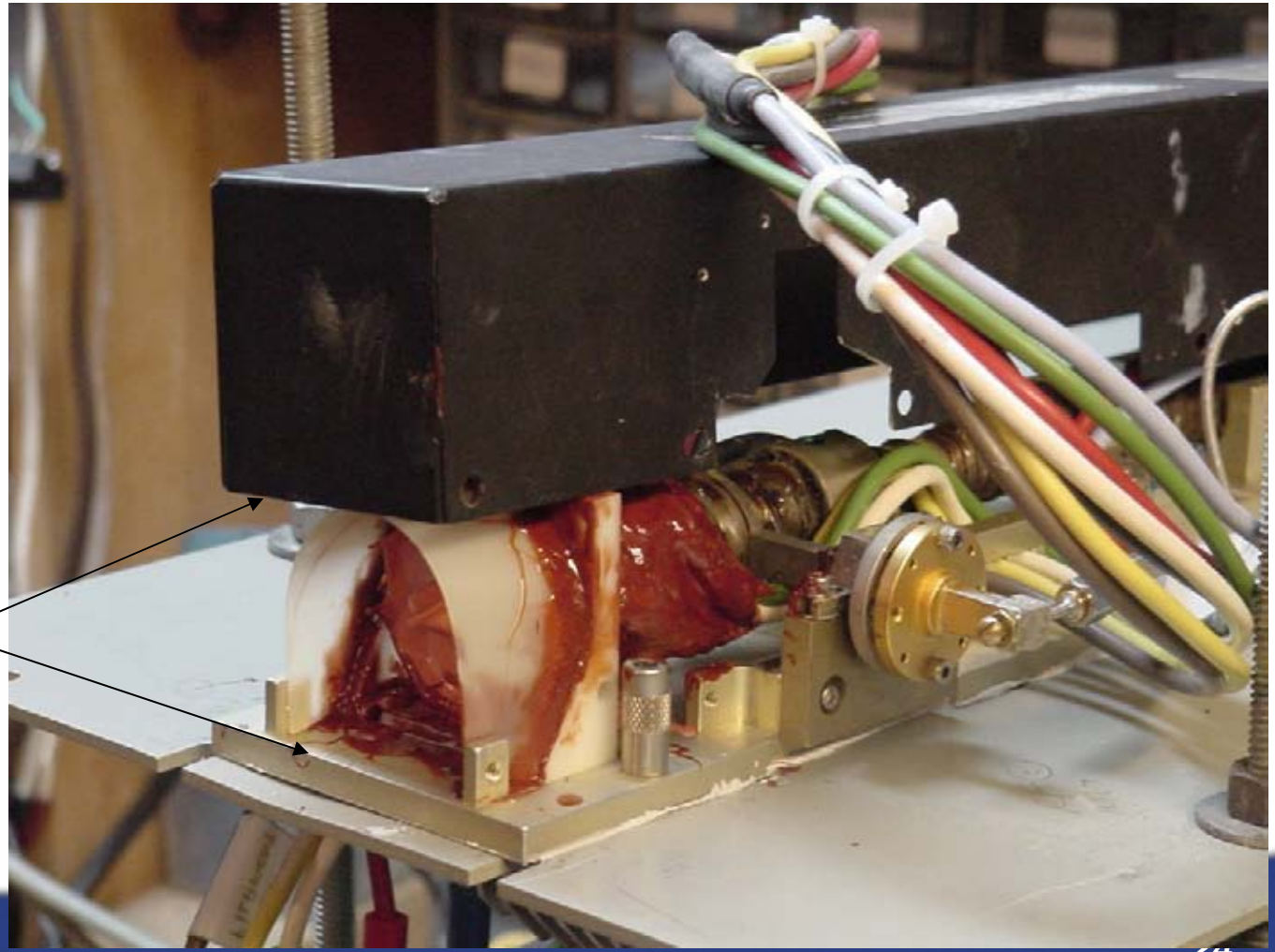

Arc's here when lid is down

TWT Power Supply

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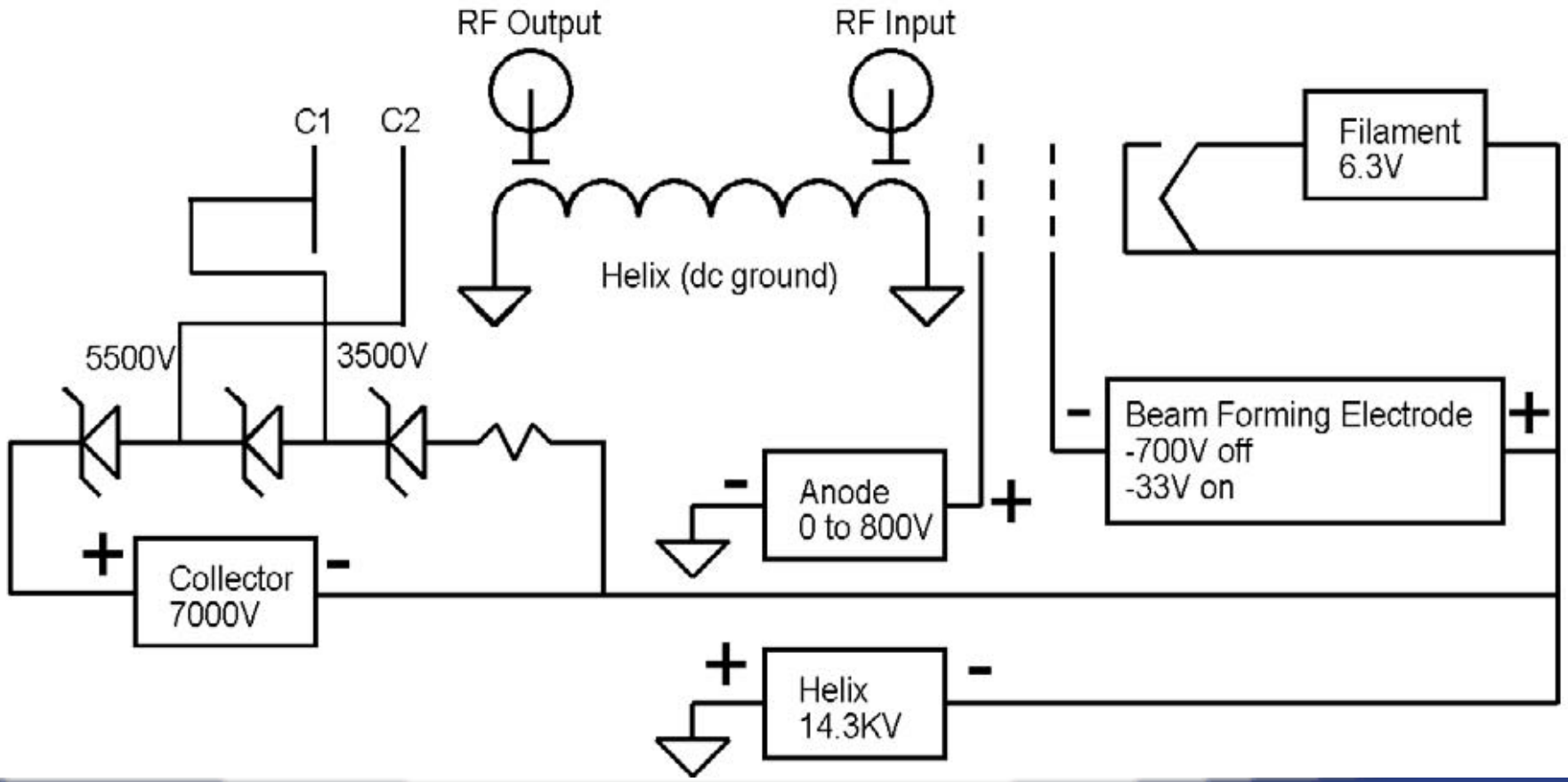

Using Zener Diodes to Set Correct Collector Voltages

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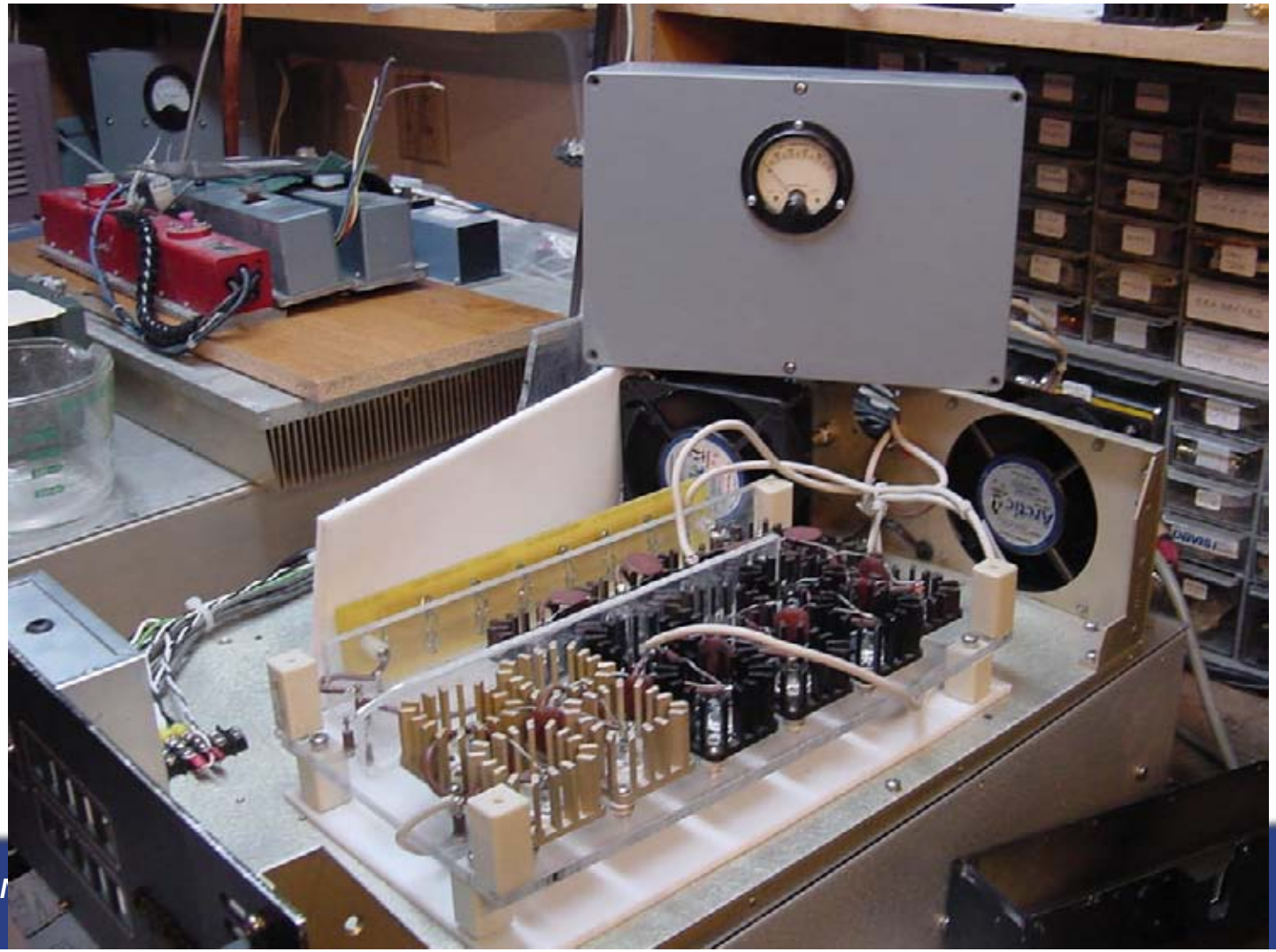

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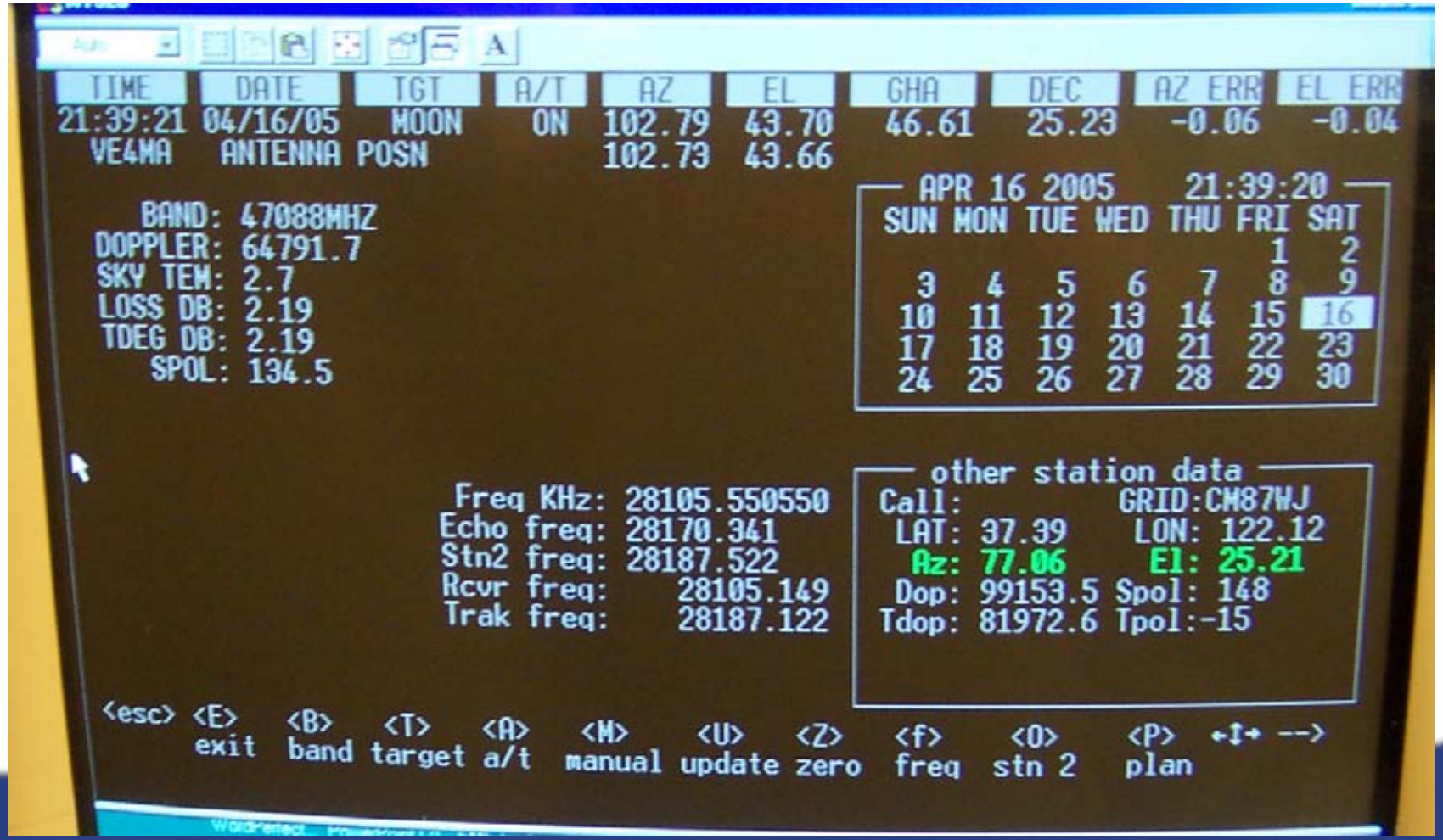
Doppler Calculation & RX Tuning



Receiving RW3BP at W5LUA

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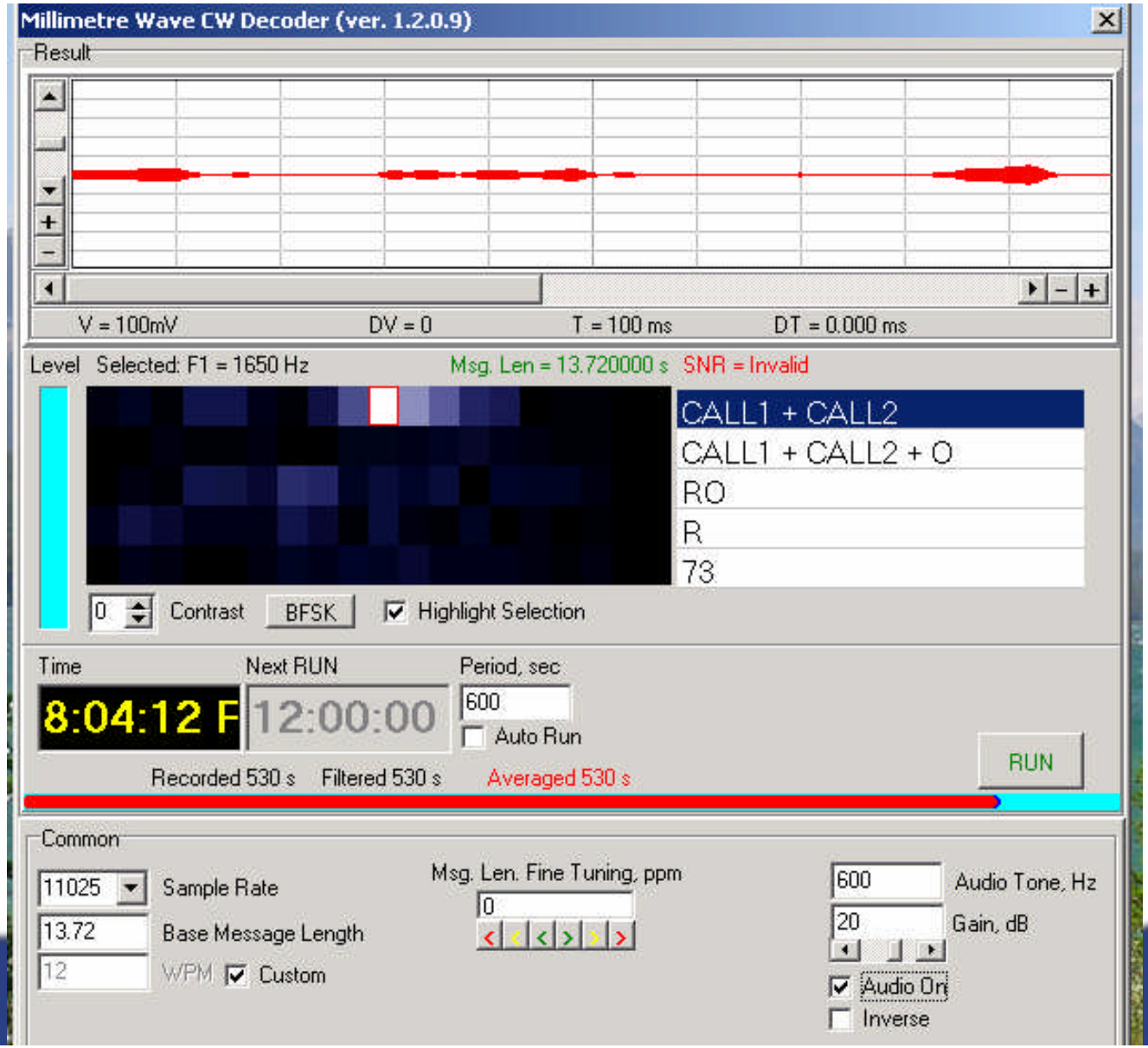

RW3BP Sending 73's to W5LUA

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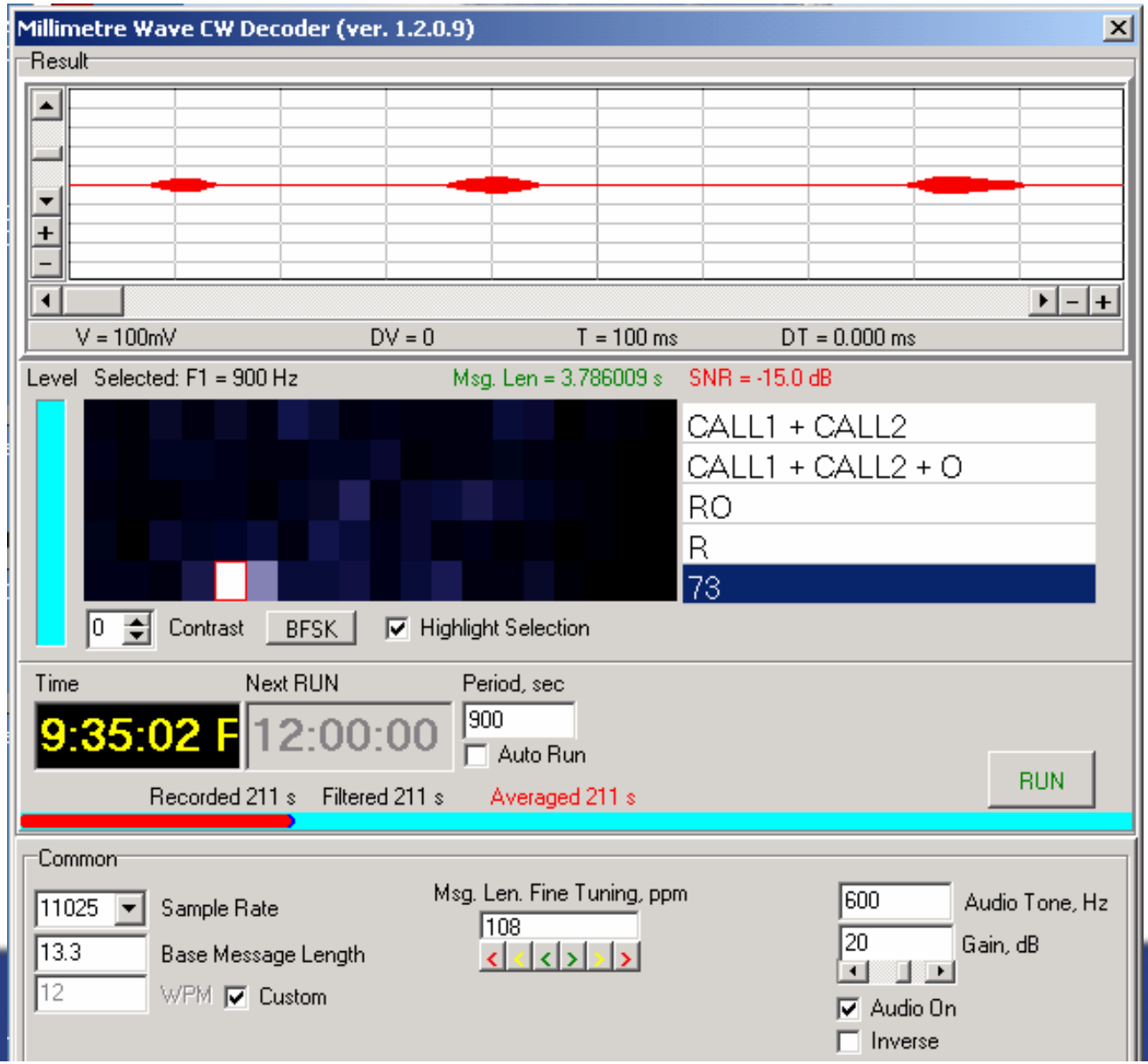

What's Next?

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RW3BP at 77.5 GHz

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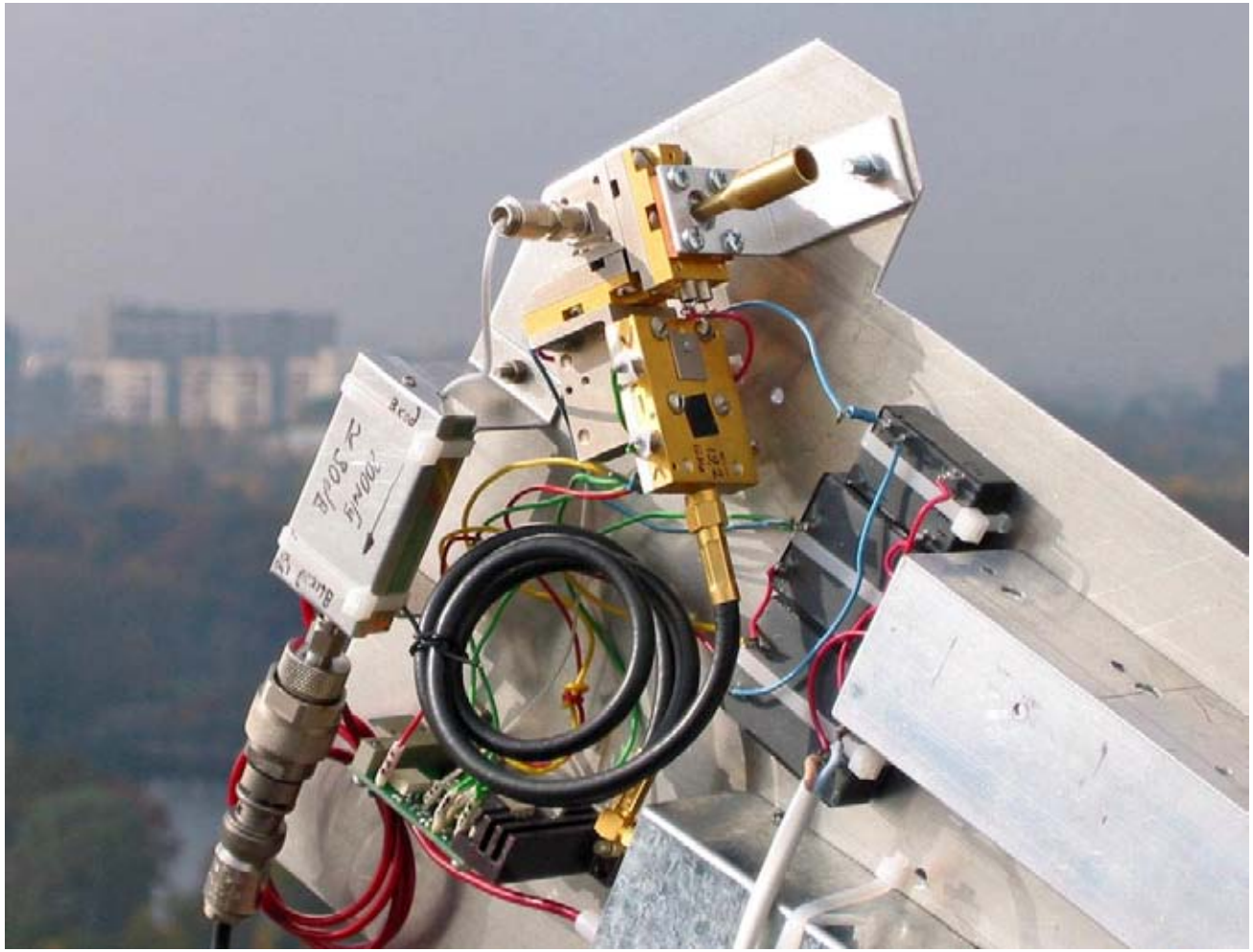

NF=6.6dB DSB
2.4M Offset Fed Dish
Sun Noise 5.8 dB
Moon Noise 0.5dB

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Thank You

Powerpoint Slides will be available at www.ntms.org

73
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