24 GHz EME – 6 Months Later

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Aurora 2002

24 GHz EME – 6 Months Later

- **Dishes Used**
- **Preamp Requirements**
- **TWTs & Power Supplies**
- **Feed Systems**
- **Operating Results**

2 EME Dishes at VE4MA

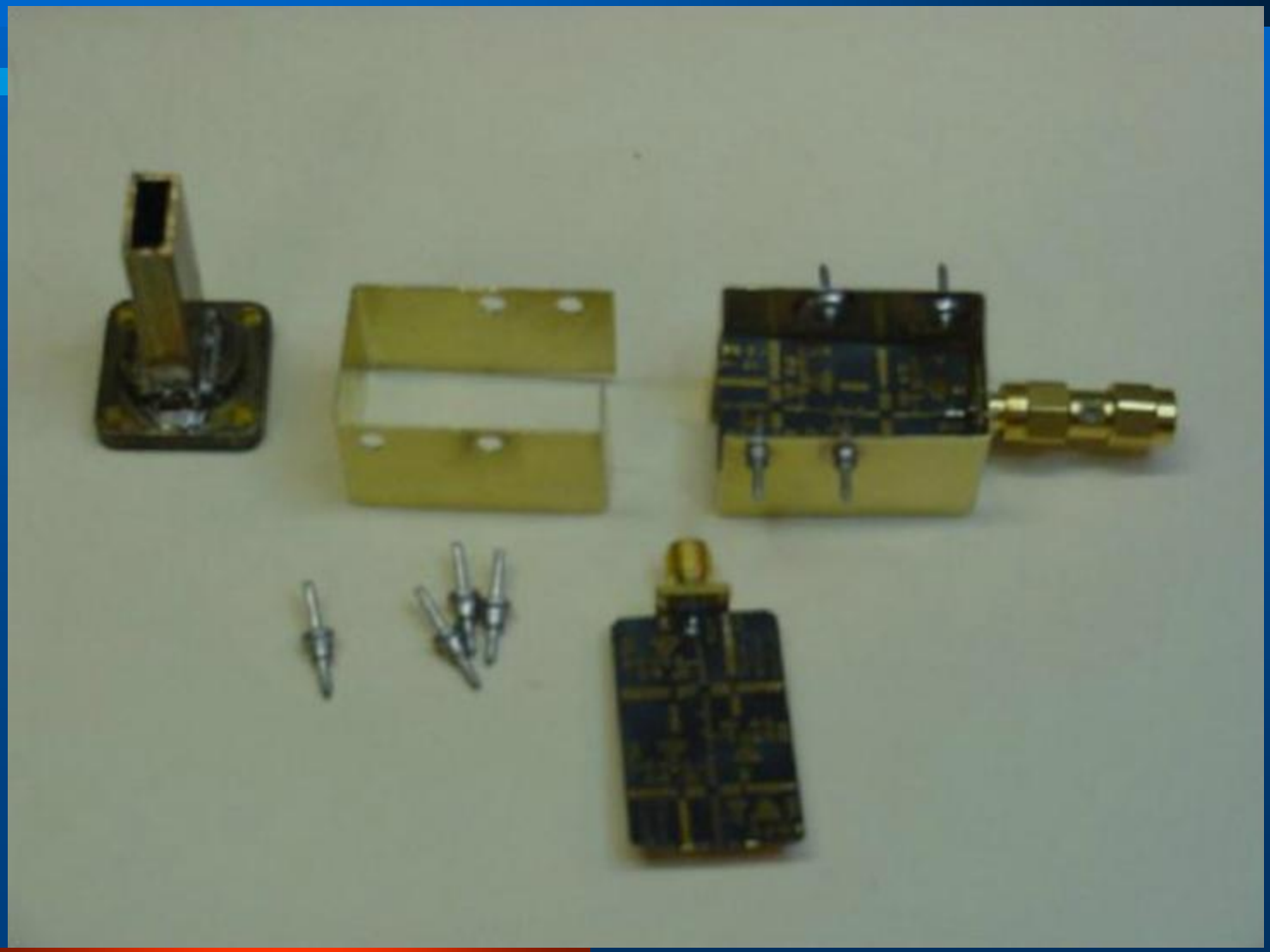
2.7 Metre Dish at VE4MA

2.7 Metre Dish at VE4MA

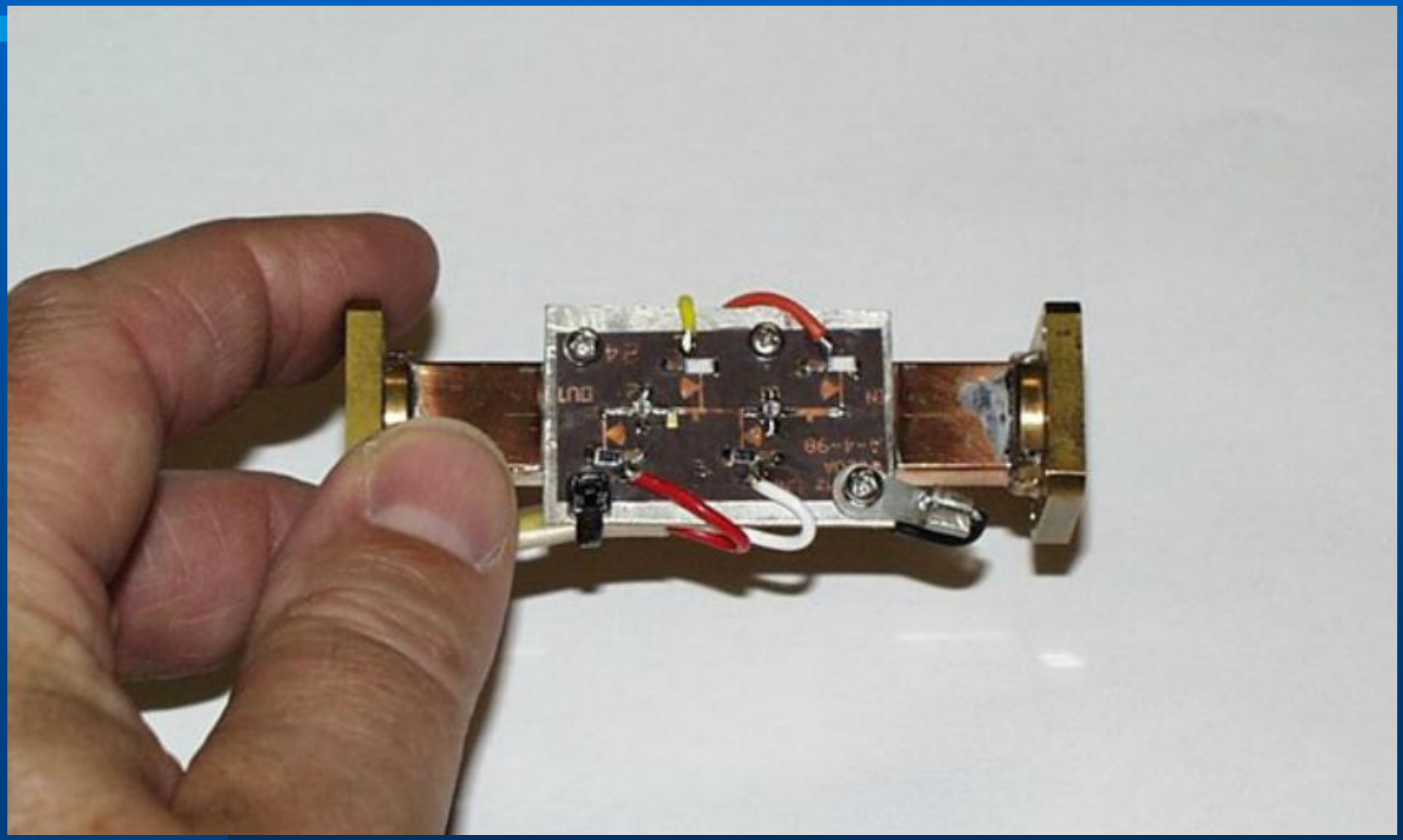
3 Meter Dish at W5LUA

3 Metre Dish with Back Structure

Homebrew 24 GHz LNAs



Homebrew 24 GHz LNAs



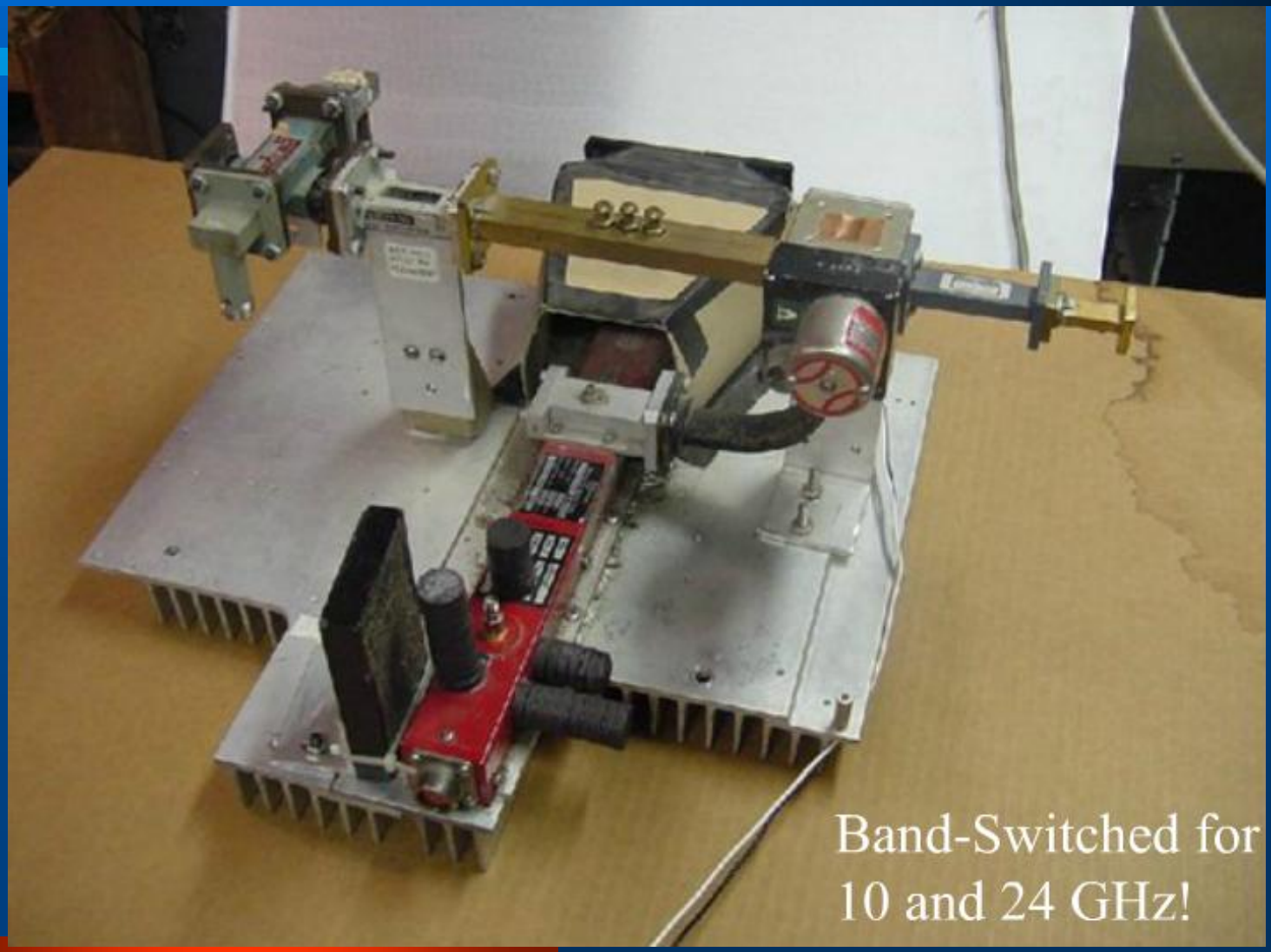
Retuning TWTs for 24 GHz

- **Helix TWTs can be Pushed 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!**

Retuning TWTs for 24 GHz

- **Coupled Cavity TWTs not broad-band**

VTU-6191 14 GHz TWT

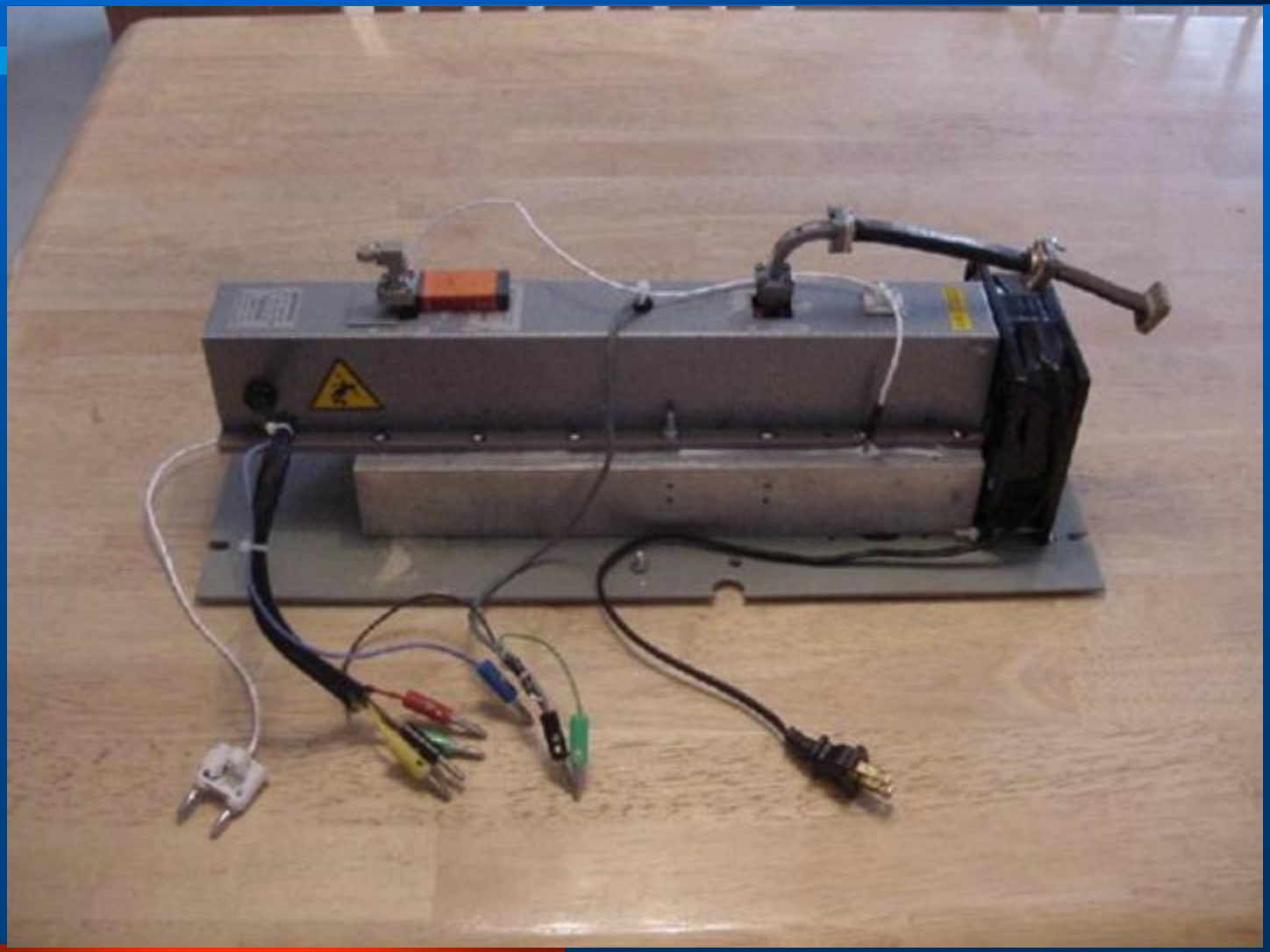


24 GHz Transverter, VTU-6191 TWT and Power Supply at Dish

First 24 GHz Echoes at W5LUA

- **Andrew 3 Meter Dish with Back Structure**
- **2.25 dB Noise Figure at Feed Produced with Agilent PHEMT Devices**
- **18 Watts at Feed Produced with Optimized VTU-6191 TWT**
- **Sun Noise 12.5 dB, Moon Noise 1.3 dB**
- **March 7, 2001 – Winter / Spring**
- **Only took 4 years of work !**

TH-3864C TWT …More Power!



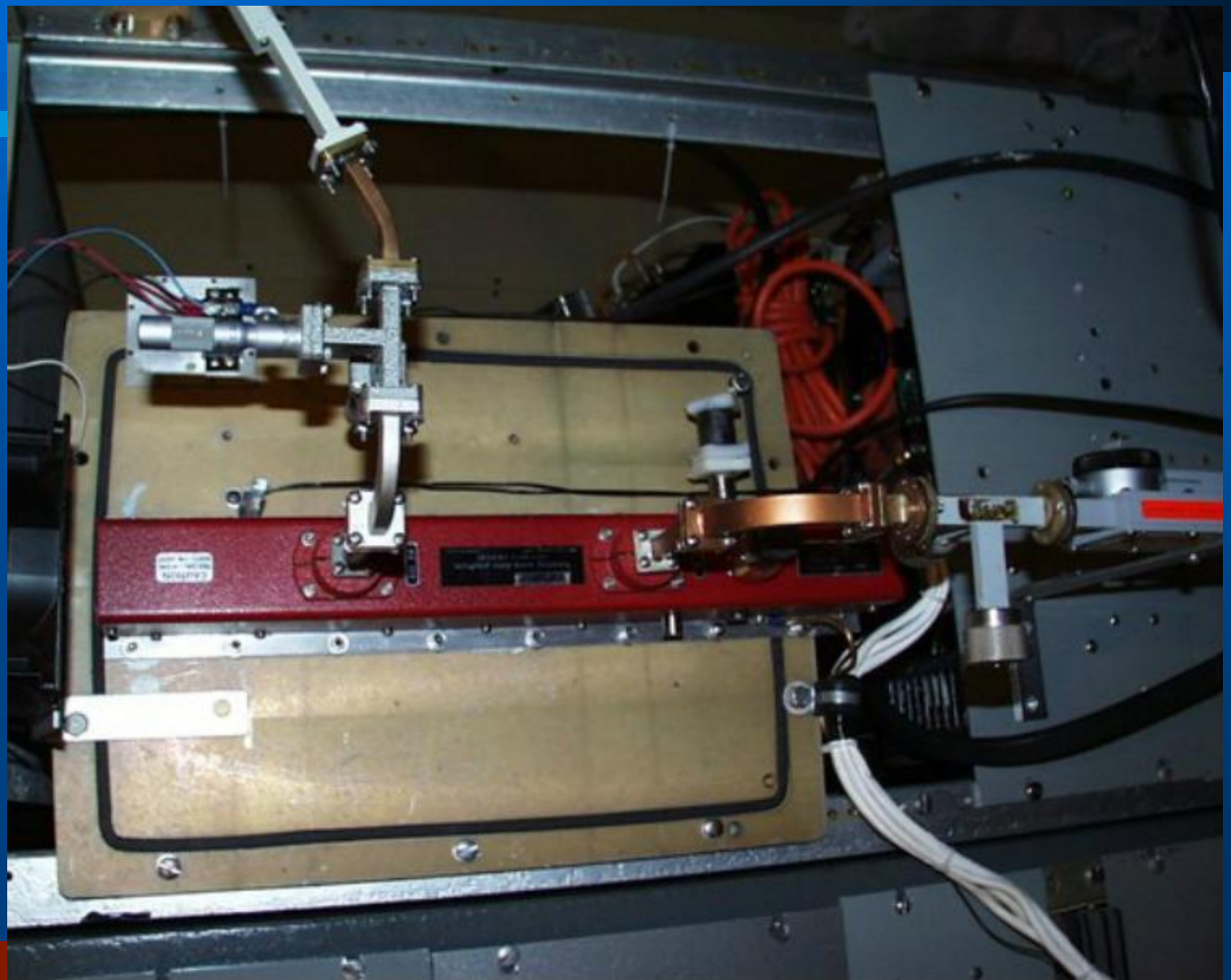
Varian VPW-2931 TWT Power Supply

High Voltage Test Bench

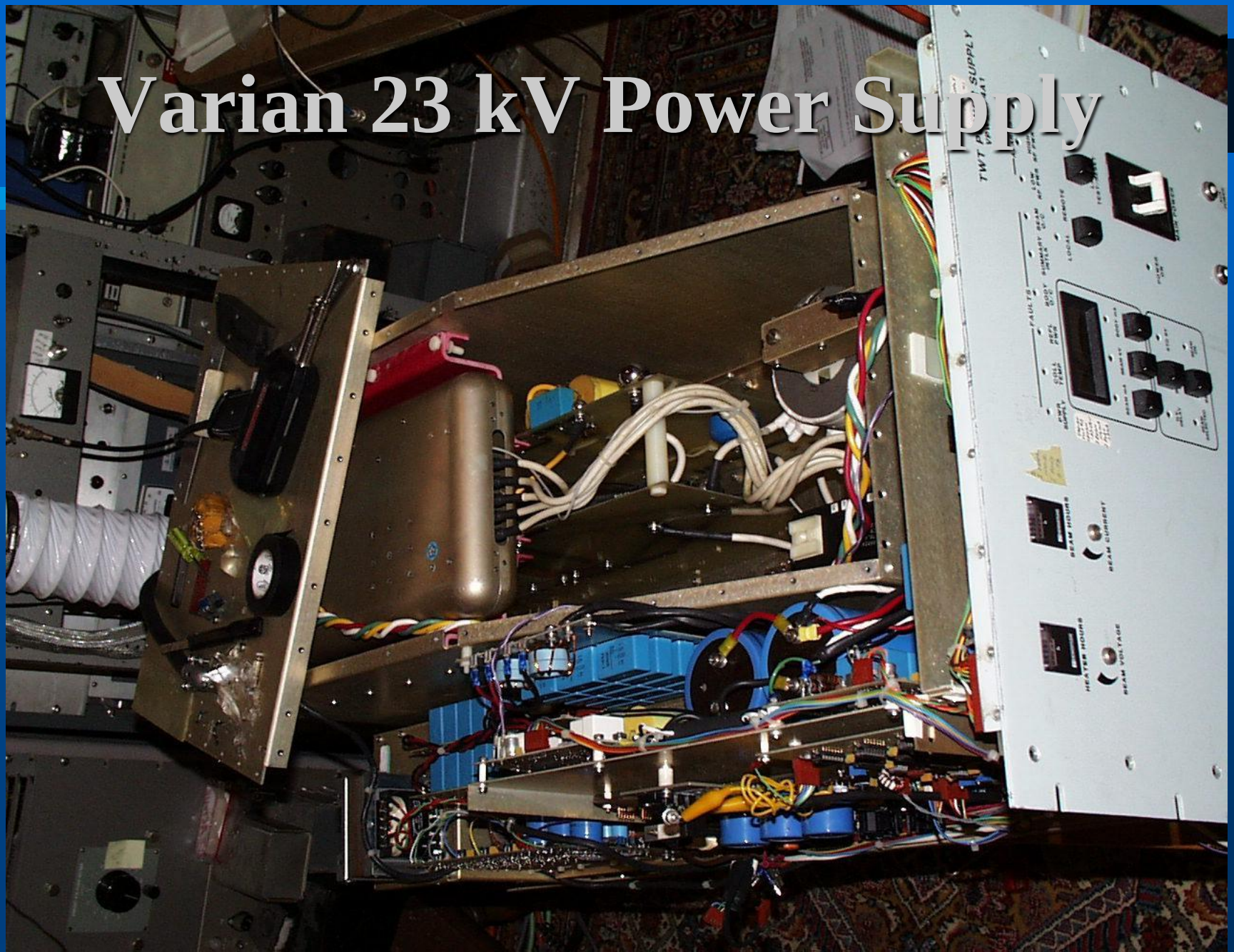
TH-3864C TWT Mounted Behind 3 Meter Dish

80 Watt 32-38 GHz TWT

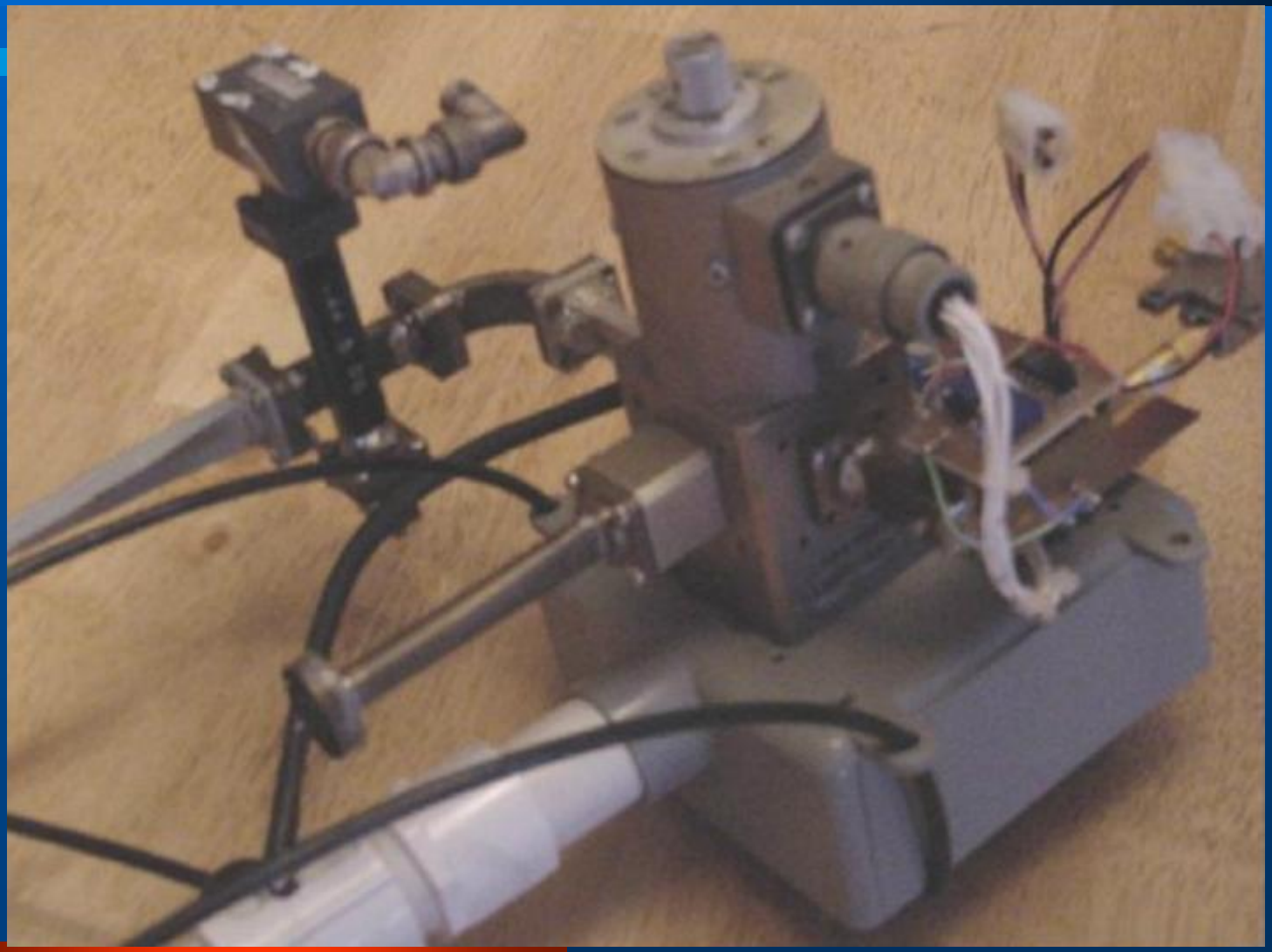
80 Watt TWT at 24 GHz



Varian 23 kV Power Supply

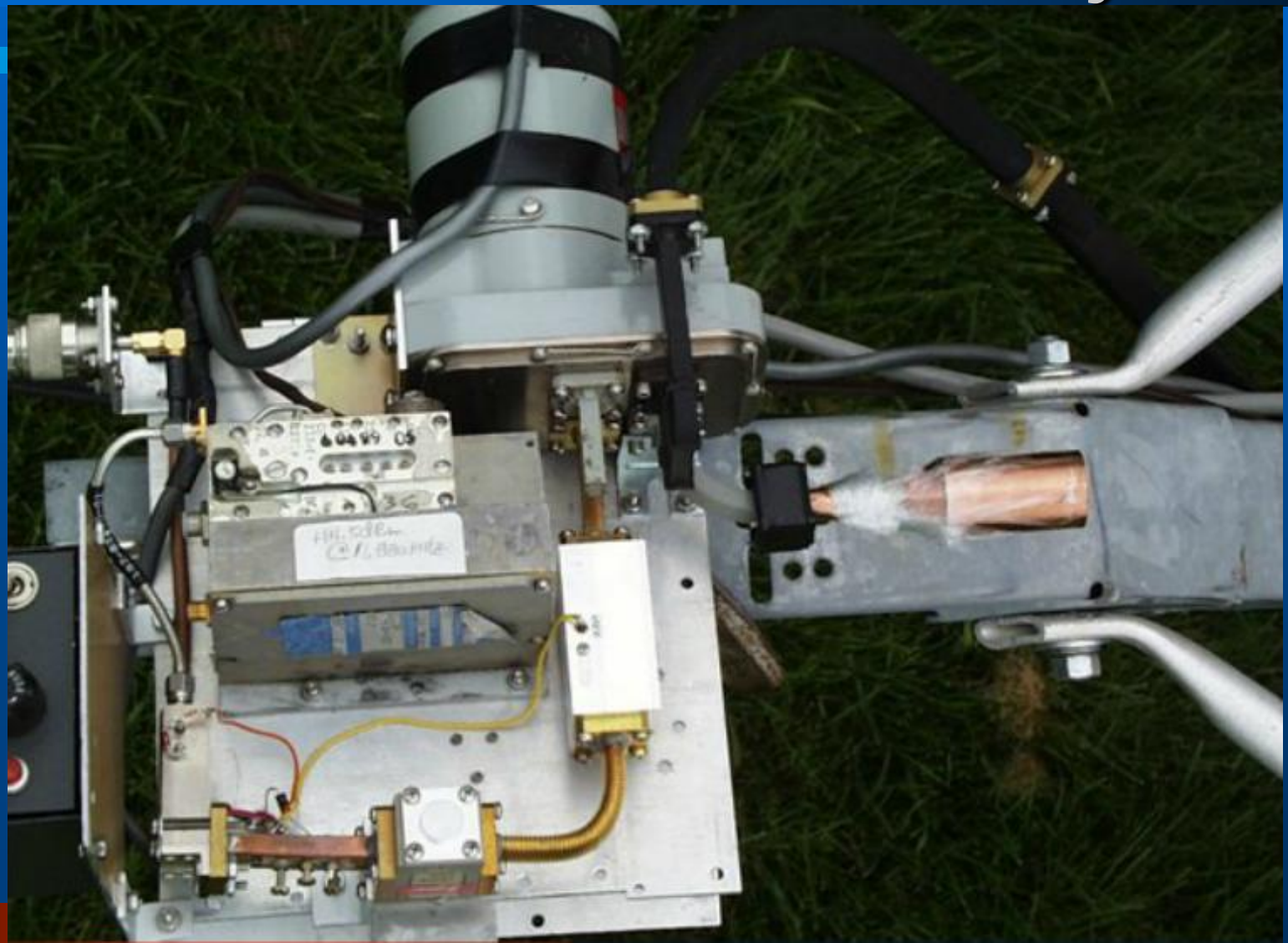


W5LUA Feed /WG Switch / LNA



VE4MA Offset Dish Feed System

VE4MA Offset Dish Feed System



Present Station at VE4MA

- **Prodelin 2.7 m Offset Dish**
- **1.55 dB NF DB6NT Preamp at Feed**
- **110 Watts (70 Watts at Feed) Produced with “Optimized” NEC LD-7235A TWT**
- **Sun Noise 15.0 dB**
- **Moon Noise 2.3 dB Winter/ 1.2-1.8 dB Summer**

The Station at W5LUA

- 3 m Andrew Dish with Back Structure
- 1.75 dB NF HB Preamp
- 80 Watts at Feed with TH3864c TWT
- Moon Noise 0.8 to 1.2 dB Summer

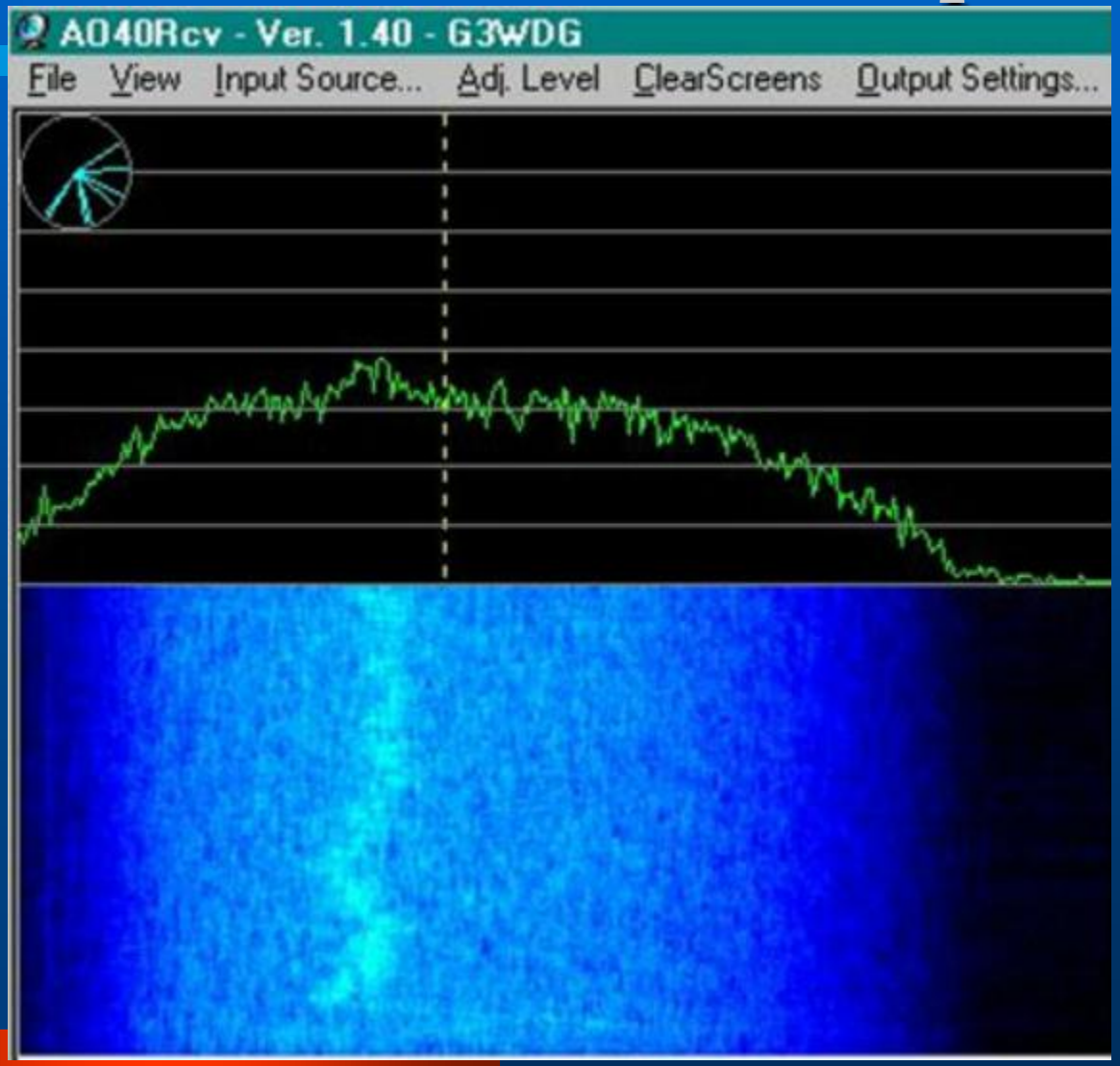
Operating Position at W5LUA

Operating Position at VE4MA

Initial 24 GHz EME QSOs

- **The first 24 GHz EME QSO took place on August 18, 2001 at 1415 GMT**
- **“M” Signal Reports Exchanged Both Way**
- **9 More & Better QSOs Happened This Winter with “O” Reports**
- **QSO Completed with 6 dB Reduction in Power**

24 GHz EME SWL Reports

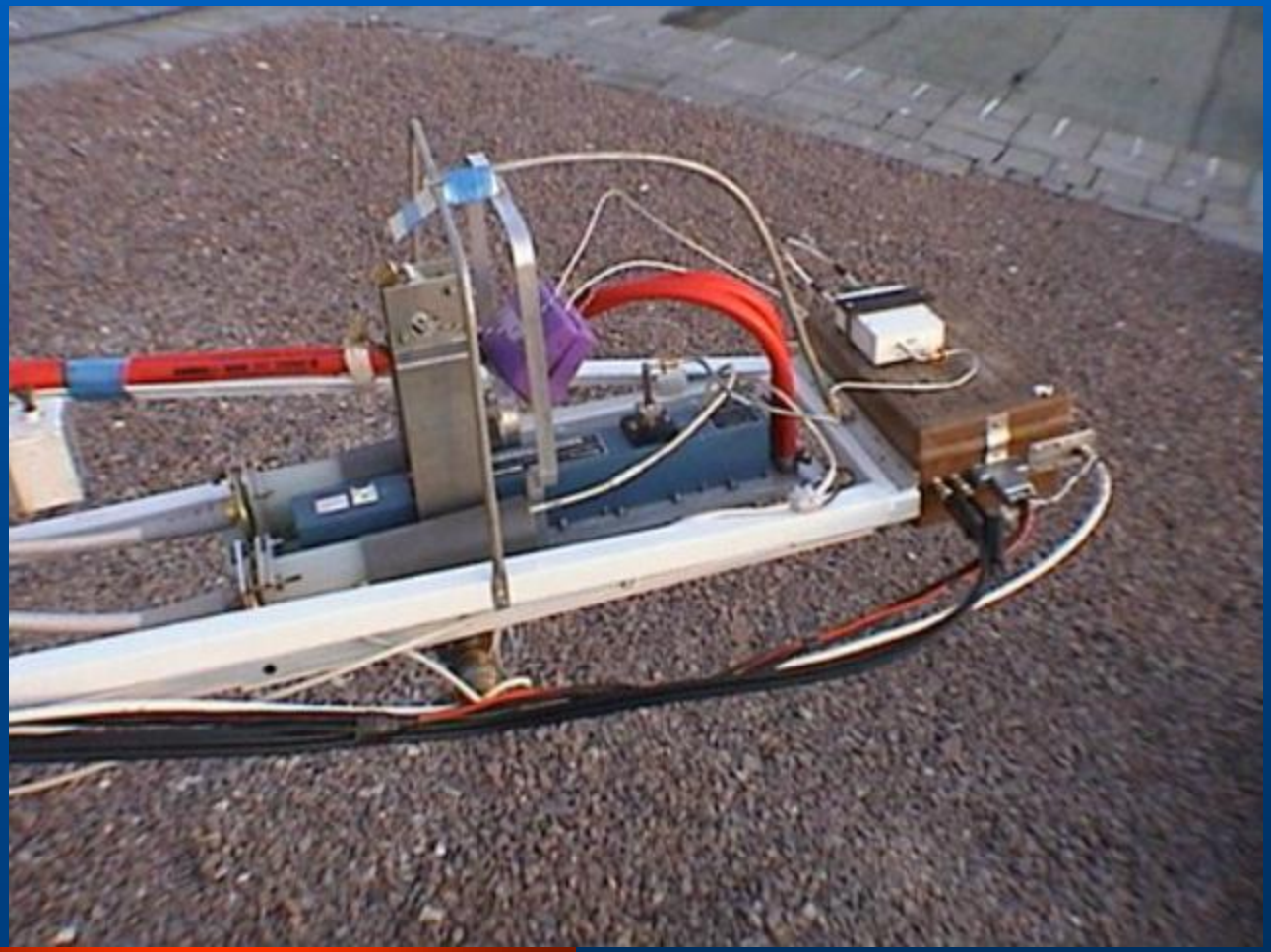


More 24 GHz EME QSOs

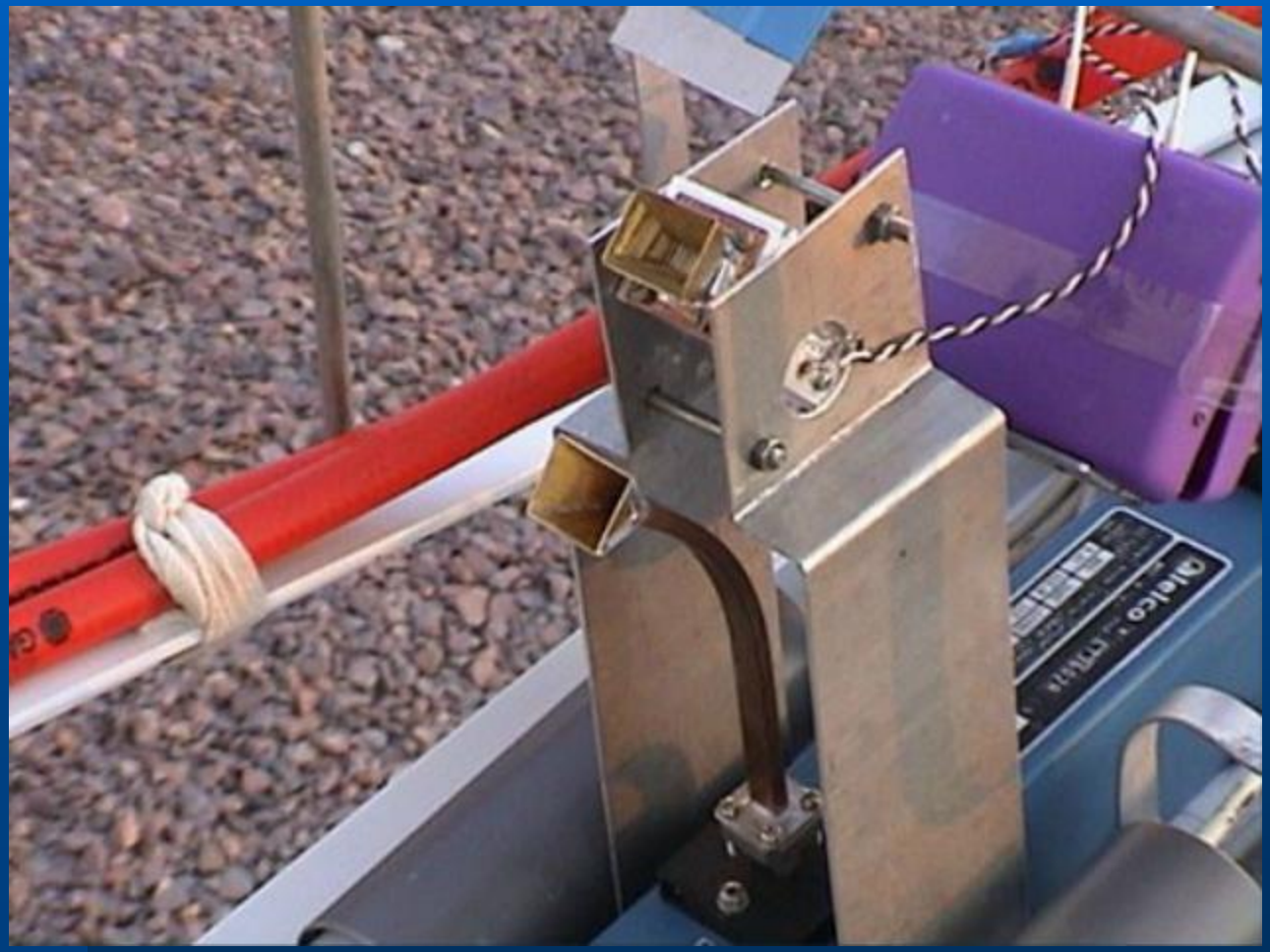
- **24 GHz EME SWL Reports Received from RW3BP, G3LTF, VE7CLD & AA6IW**
- **RW3BP (Russia) ~ 60 W and 3 m Offset Dish QSOs W5LUA and VE4MA April 18/ 20, 2002**
- **RW3BP QSOs AA6IW April 21 ~ 100W 10ft Dish**
- **VE7CLD and AA6IW QSO VE4MA April 21/22 !**

RW3BP 3 m Dish

RW3BP Feed Point



RW3BP Feed Switching



24 GHz EME Summary

- **It has Been a Fun but a LONG & Difficult Journey !**
- **What is Next ……?**
  - **— More QSOs,**
  - **— 24 GHz EME VUCC**
  - **— 47 GHz EME Of Course !**
- **Any Questions?**

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