PORTABLE MW EME 9 - 6 - 3 cm

XVII International EME Conference Venice August 19th . 21st 2016

ZDENEK SAMEK – OK1DFC







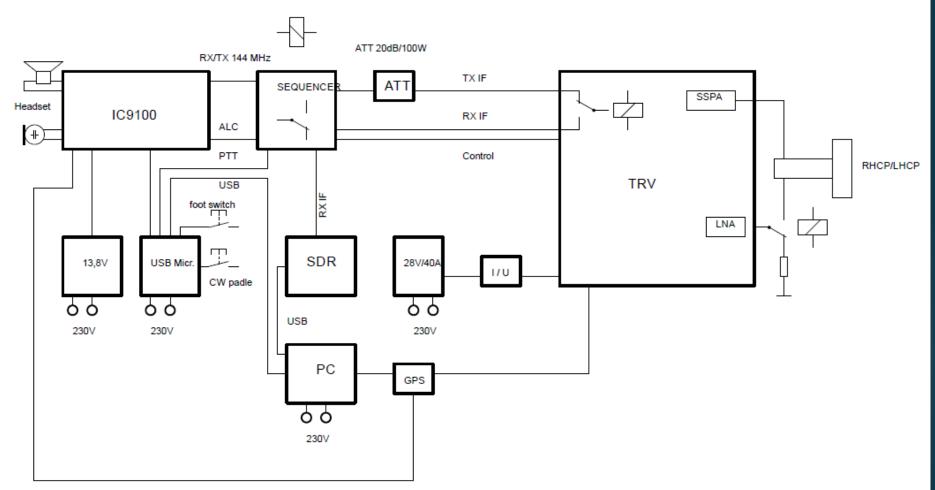
SP6JLW mini EME meeting & BBQ Microwave portable EME is on the limit of possibilities!

Mainly size, stability and quality of antenna is limited parameter of successful traffic

So, what we need?

- First accept that problem does not exist, just only challenge
- We will need something where to install antenna and control it in AZ and EL.
- Control antenna in real time and position
- Choice right antenna
- TRV with PLL LO and IF TRX with PLL LO
- SW and accessories as GPS, SDR etc. Make a QSO is just fun after that.....

Schematic Diagram



Azimuth and Elevation



- Stability
- Easy to build
- Construction simple as
 possible
- Zero back slash in AZ and EL





Control

OE5JFLDF1SRF1EHN

I have choice OE5JFL because options like this:

- No PC requested
- Automatic time and location due to GPS module developed by Alex HB9DRI
- Engine speed control for azimuth and elevation
- Automatic correction of antenna position trough one button

Antenna - Mesh dish



3,2m is usable for 432, 1296, 2320 MHz. 3400 MHz has problem with surface accuracy and 1,8m solid dish giving almost same result



Antenna - Solid Dish



180cm dish for satellite reception F/D 0,38 Very good usable for 9cm - 6cm and 3cm





Mechanical parts important for axe stability of dish



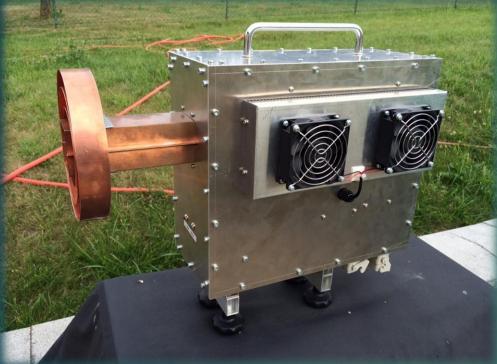


Test in 3cm band. Looking for maximum of Sun noise

TRVs



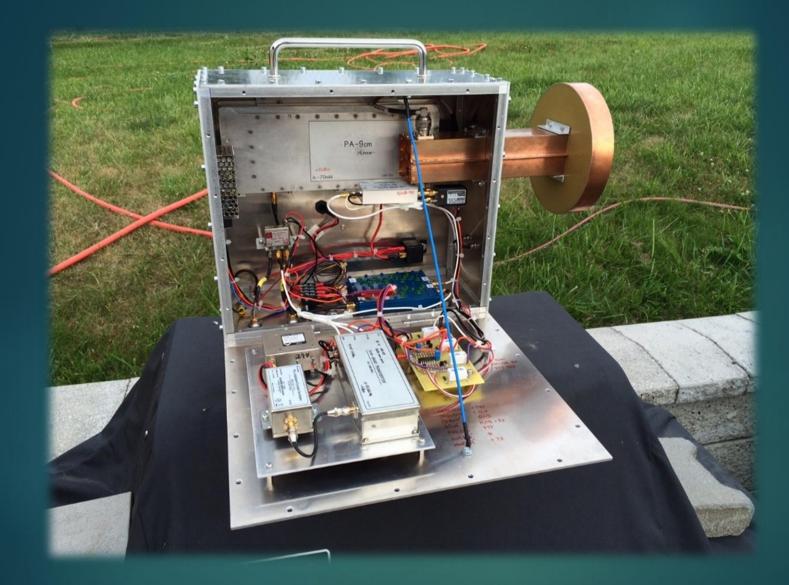
3400 MHz



- 100W RF
- 0,7dB N/F DB6NT
- Septum feed OK1DFC and Chaparral ring



Opened TRV



HB9Q EME 3400 MHz

PA3DZL EME 3400 MHz

OK1KIR RS 3400 MHz

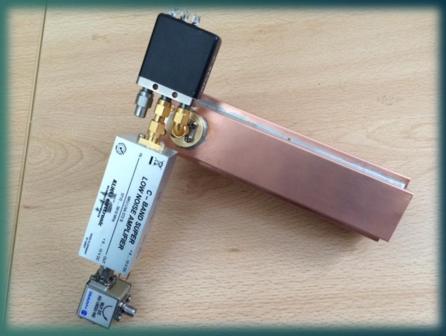
5760 MHz



- 100W RF DB6NT
- 0,9dB N/F DB6NT
- Septum feed OK1DFC

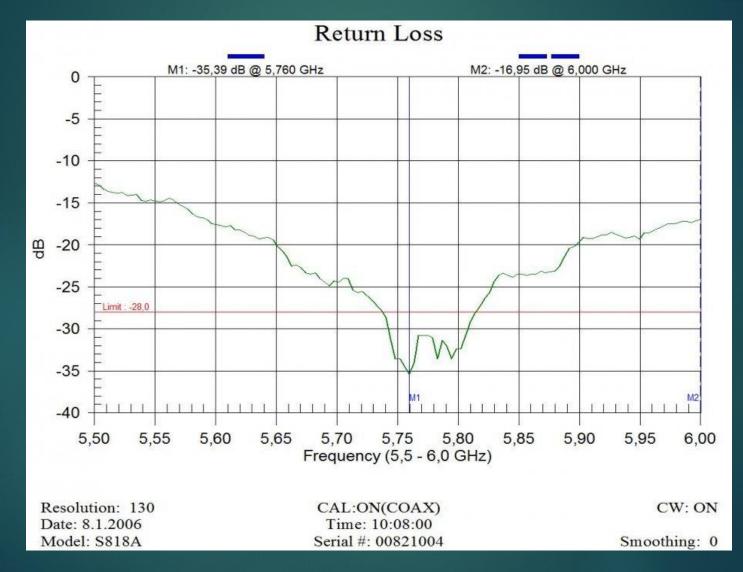


5760 MHz



- Feed and VLNA detail
- Internal construction

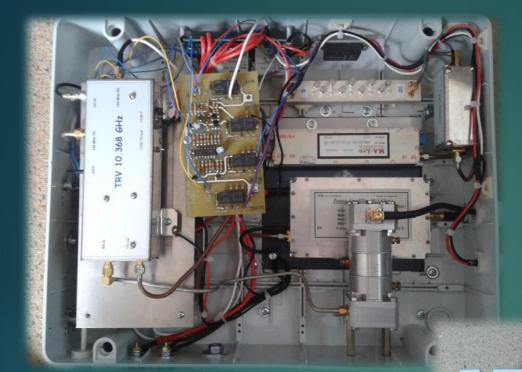
6cm FEED SWR measuring



10368 MHz



- 31W RF SSPA DL2AM - 50W in progress
- 0,8dB N/F LNA DB6NT
- Linear feed



Previous construction in PVC box, problems with RF ingress.

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EME Transvertor 10.368 GHz - 145 MHz 32 W RF - 0.8 dB NF

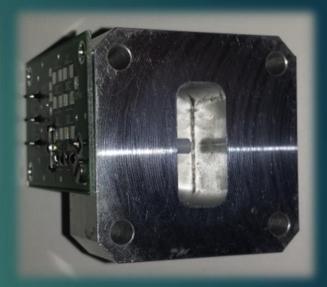


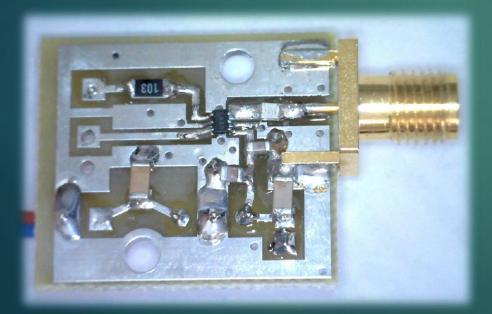
New TRV in Alu box and RF detection

RF detection

Previous solution with diodes BAT15







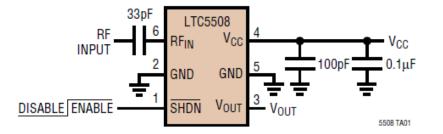
New detection with W1GHZ design



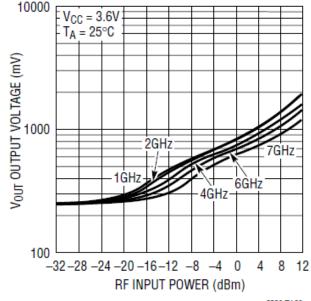
RF detection LTC5508

TYPICAL APPLICATION

300MHz to 7GHz RF Power Detector

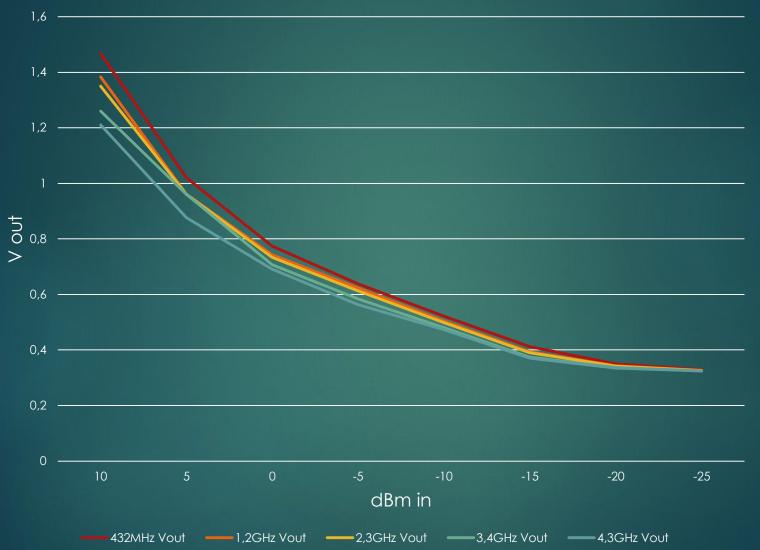


Output Voltage vs RF Input Power



5508 TA02

LTC 5508 RF detection - Cv 6,3pF



IC9100 and Sequencer



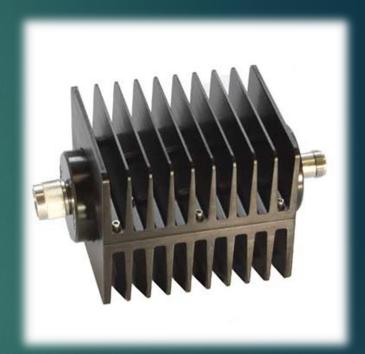
IF unit

Previous - IC756 PROII - 28MHz

- Necessary to have other small 2m TRV
- Not so good SDR part

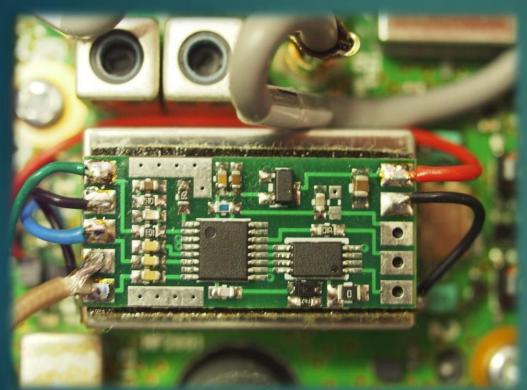
<u>Now - IC9100 - 144 - 432 - 1296 MHz direct</u> <u>MW are goes trough TRVs</u>

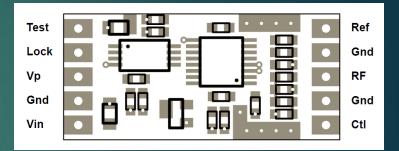
- Internal TCXO 3ppm
- Possible to lock with 10 MHz GPS normal
- 20dB ATT because maximum RF power for accidently connected TRV or RF peeks with full RF is only **1W maximum !!!**



IC9100 a PLL LO GPS

Solution by David VK3HZ





Thanks to this PLL system I was in the sked with Charlie G3WDG only -12Hz from sked QRG on 10368 MHz !!!

PLL GPS 10MHz









SW and accessories

- SDR 14
- Signalhound
- PC with good RAM
- GPS for PC clock control
- GPS 10 MHz for PLL LOs
- JT SW JT65C JT4F 10 GHz etc.
- WSJT-X automatic Doppler correction
- SDR HD
- MicroHam USB interface

🚮 GPS Time and	Test					×
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SDR



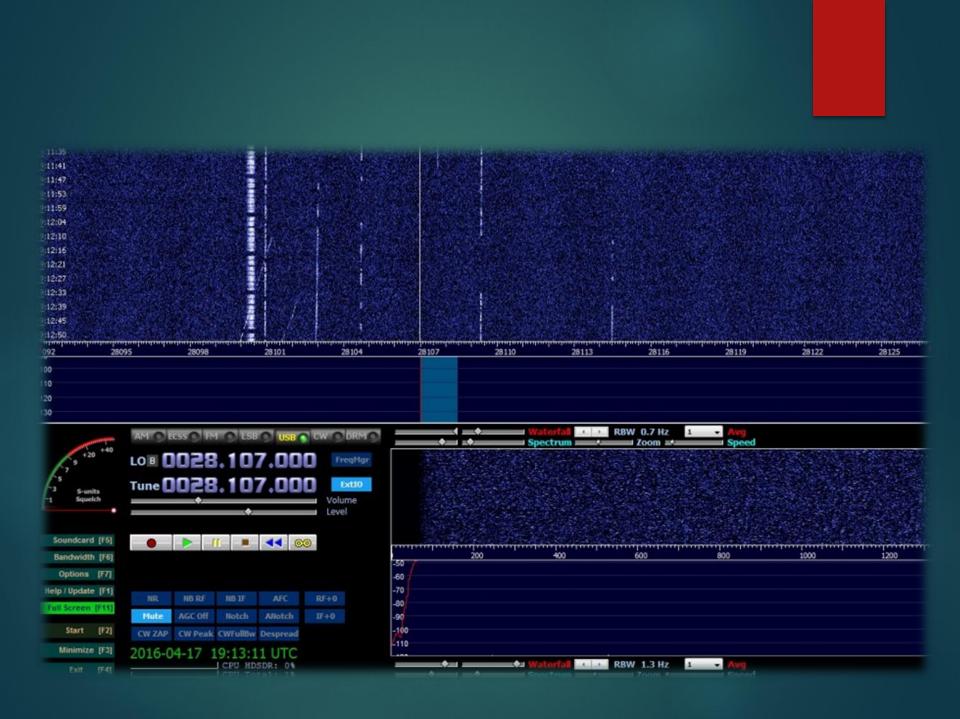


Signalhound 10Hz-4,4GHz



Spectrum analyzer and tracking generator

- Possible to lock with GPS 10 MHz
- Tracking works also as a CW generator
- Possible to use as a SDR RX up to 9cm



Sun noise 10 GHz



12 Oct 2014 8:30:56 UTC

Moon noise between RX/TX on 10 GHz

Spectral	ue Ver. 3.39 Spe	ectraVue.ini											– 0 ×
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No Doppler correction WSJT 10

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With Doppler correction WSJT - X

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CW 10 GHz

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12 Oct 2014 22:40:02 UTC









My first EME 6cm QSO with HB9Q

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	HB9Q OKSEME RRR		С Тх4
2016 Aug 12	-14 HB9Q OK5EME 73		C Tx5
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1.0000 1.0000 JT4F Freeze DF:-328 Rx noise: 0 dB T/R F	eriod: 60 s		Receiving

Other EME 6cm QSO with UA3PTW

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Gen Msgs Auto is OFF @2000 1.0000 1.0000 JT4F Freeze DF:-143 Rx noise: -1 dB T/R Period: 60 s	C Tx6

EME 3cm QSO with UA4HTS

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2016 Aug 12 16:57:14		<u>Rpt:</u> -12	UA4HTS OK5EME 7	3	- c	Tx <u>5</u>
10.57.14	Dsec 0.0	Gen Msgs	CQ OK5EME JO80		•	Tx <u>6</u>
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EME 3cm QSO with OK1KIR

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						Tx2
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2016 Aug 12			-	8		Tx <u>3</u>
	156 km Dsec 0.0	Tx First	@1500 (RRR)	18	•	Tx <u>3</u> Tx <u>4</u>

EME 3cm QSO with OK1KIR



Thank you for your attention and see you via Moon during next DX pedition to