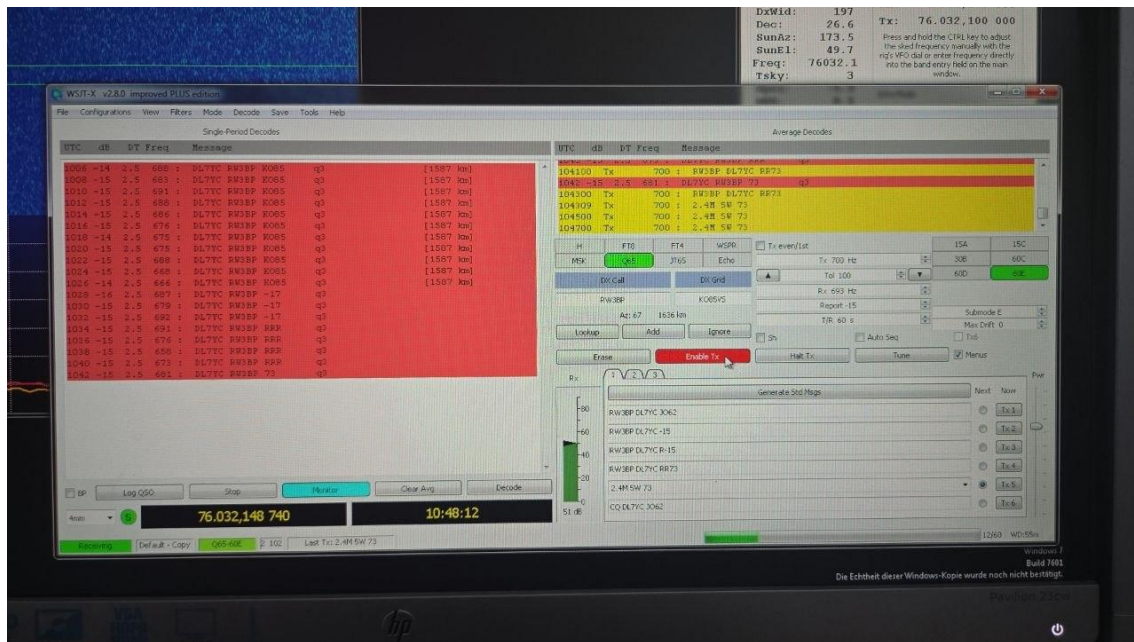


The First Lunar Reflection Communication at 76 GHz

The first ever EME QSO at 76 GHz took place on April 22, 2026, between RW3BP (KO85) and DL7YC (JO62).

The transmission mode used was Q65-60E, during which “single decode” reports of -14/-15 and -17 were exchanged, respectively.



WSJT-X v3.0.0 improved PLUS edition

File Configurations View Filters Mode Decode Save Tools Help

Single-Period Decodes

UTC	dB	DT	Freq	Message
1027	-17	2.6	793	: RW3BP DL7YC JO62 q3
1029	-17	2.6	788	: RW3BP DL7YC JO62 q3
1031	-16	2.6	803	: RW3BP DL7YC R-15 q3
1033	-16	2.6	797	: RW3BP DL7YC R-15 q3

Average Decodes

UTC	dB	DT	Freq	Message
102800	Tx		700	: DL7YC RW3BP -17
1029	-17	2.6	788	: RW3BP DL7YC JO62 q3
103000	Tx		700	: DL7YC RW3BP -17
1031	-16	2.6	803	: RW3BP DL7YC R-15 q3
1031	-17	2.6	790	: RW3BP DL7YC JO62 q3*
103200	Tx		700	: DL7YC RW3BP -17
1033	-16	2.6	797	: RW3BP DL7YC R-15 q3
103400	Tx		700	: DL7YC RW3BP RRR
1035	-17	2.6	794	: RW3BP DL7YC R-15 q3*
103600	Tx		700	: DL7YC RW3BP RRR
1037	-17	2.6	792	: RW3BP DL7YC R-15 q3*
103800	Tx		700	: DL7YC RW3BP RRR
104000	Tx		700	: DL7YC RW3BP RRR
1041	-17	2.6	789	: RW3BP DL7YC RR73 q3*
104200	Tx		700	: DL7YC RW3BP 73
104418	Tx		700	: CQ RW3BP KO85
104436	Tx		700	: DL7YC RW3BP 73
104612	Tx		700	: DL7YC RW3BP 73

160 80 60 40 30 20 17 15 12 10 6 2 70

☐ BP Log QSO Stop Monitor Erase Clear Avg Decode **Enable Tx** Halt Tx Tune ☒ Menus

4mm **76 032.112 741** ☒ Tx even/1st

Tx 700 Hz F Tol 100 Rx 789 Hz Report -17 T/R 60 s ☐ Sh ☒ Auto Seq CQ: None ☐ Tx6

15A 15C 30B 60C 60D **60E** Submode E Max Drift 0

Generate Std Msgs Next Now

DL7YC RW3BP KO85 ☐ Tx 1

DL7YC RW3BP -17 ☐ Tx 2

DL7YC RW3BP R-17 ☐ Tx 3

DL7YC RW3BP RRR ☐ Tx 4

DL7YC RW3BP 73 ☐ Tx 5

CQ RW3BP KO85 ☒ Tx 6

Q65-60E 56 80 Last Tx: DL7YC RW3BP 73 0/60 WD:60m

DL7YC, Manfred, uses a 2.4 m prime-focus parabolic dish with an f/D ratio of 0.385, equipped with an optimized feed for 76 GHz, designed to minimize spillover and maximize efficiency.





The low-noise amplifier (LNA) is located directly behind the feed, avoiding waveguide losses ahead of the preamplifier.

Noise figure: 2.4–2.5 dB

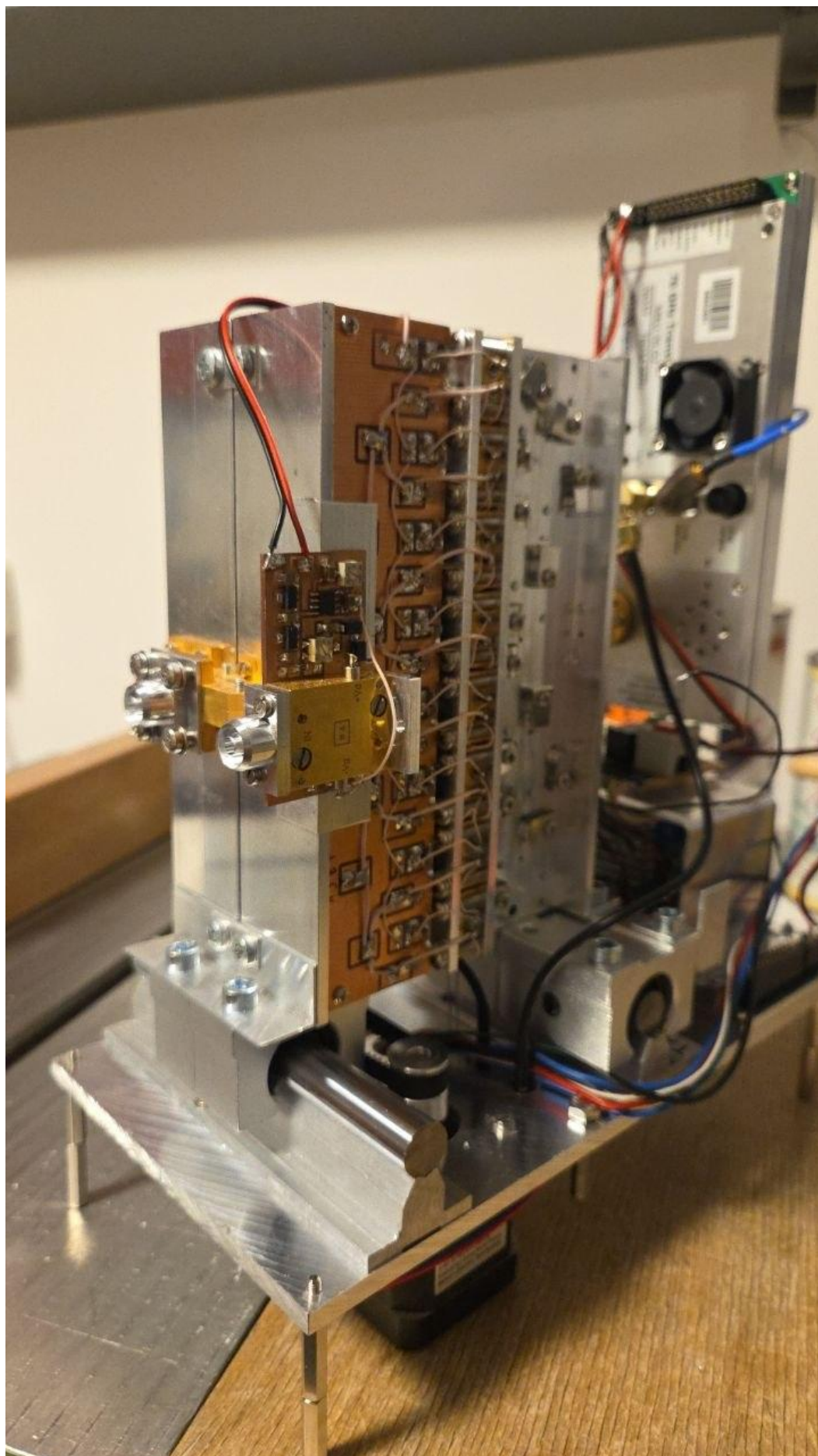
Highly stable frequency reference (GPS-disciplined OCXO)

Temperature stabilization of the entire RF input stage

The resulting system sensitivity is sufficient to detect signals in the range of only a few dB signal-to-noise ratio.

A 5.0 W solid-state power amplifier (SSPA) is used. The amplifier contains 16 single amplifier with MMIC from gotMic / Sweden.

A unique feature of this operation was that, due to the high losses at 76,032.1 MHz, no waveguide relays were used; instead, separate feeds were employed for receive and transmit, each “slid” into the focal point with a precision of 0.1 mm.

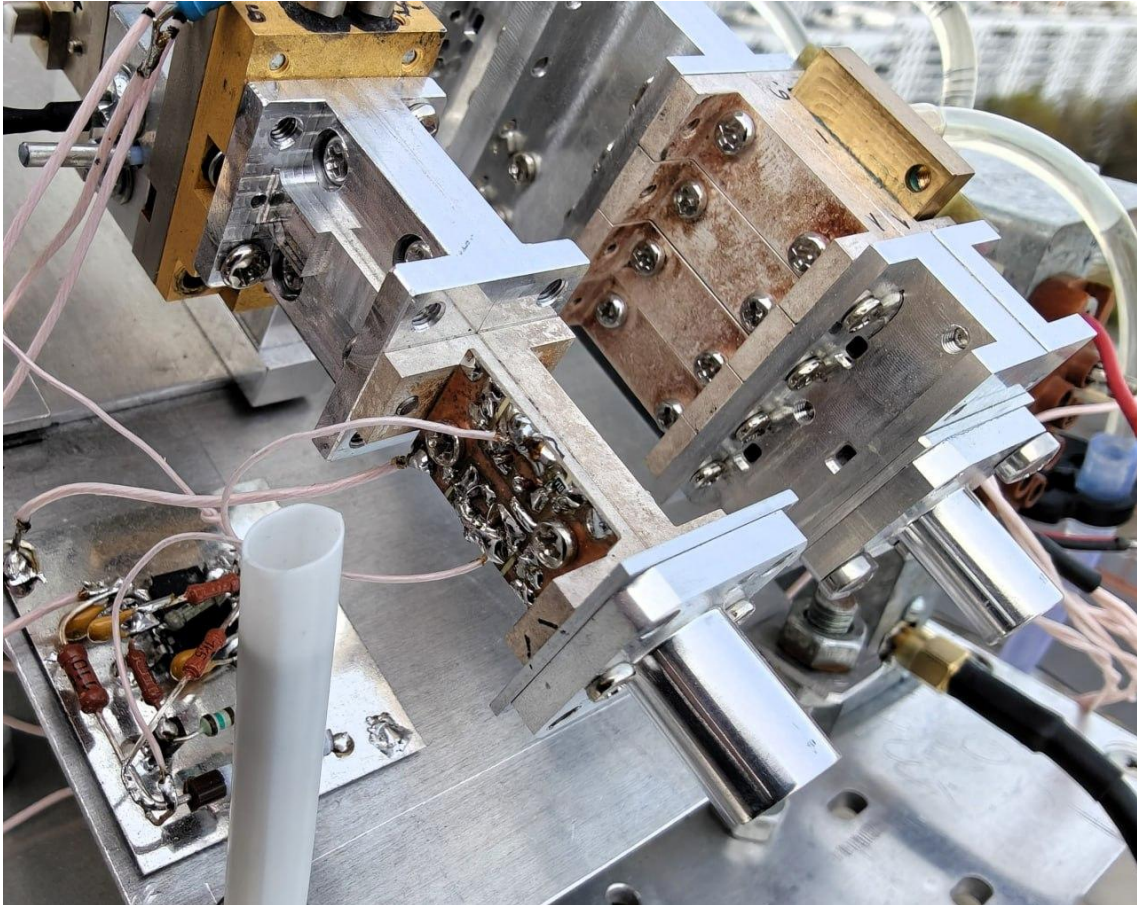


The Rx feed return-wave protection is “automatic” by the “out of focus position” of the RX-feed at TX times. (prime-focus configuration)

RW3BP, Sergei, uses a 2.4 m offset Gregorian dish, driven by a high-efficiency 76 GHz SSPA with an RF output power of 8.1 W.



The LNA is slightly better (2.2dB NF) than the one currently used by Manfred, but very similar in design using OMMIC (now MACOM) MMICs.



Both SSPAs and both LNAs were built by Sergei, who, immediately after the contact, commented:

“Today the weather was excellent for EME. Clear sky and light wind, with a temperature of +12 °C. Most importantly, the humidity was low at 25%. This is very rare in Moscow. It only happens when Arctic air arrives quickly. The 76 GHz band is not 24 GHz, but humidity still has an impact.”

In Berlin, the sky was clear and blue, +13 °C, 1021 hPa.

Further adjustments to the highly precise positioning of DL7YC's Tx feed will be required for upcoming tests. The two-way contact take place after a certain time, when Sergei tried to shift his antenna left and right by 0.1deg at DL7YC's transmissions.

A first shift to the left side by 0.1 deg / than another 0.1 deg results in NOTHING !! Than a 0.1 deg antenna shift to the right (from its original steadily tracked moon position) immediately results in a -17 decode of DL7YC's signal.

What does this mean? The beam from DL7YC at TX times generated a 0.1deg spot, 0.1deg apart from RW3BP original 0.1deg wide spot. Both of them looked at the moon, but at a point differing by 0.1 degrees.

What does it mean technically spoken? When DL7YC's TX feed "travel" into its TX position, there is a 1mm combined position error. This error will be part of further investigations, because laser control before don't show this. Probably due to the mass and the high travel speed of the SSPA/LNA combination (1.7kG) the security end stops will "back bounce" them a bit ??

These and additional technical details are available at:

<https://pa0ehg.com/76ghzperformance.htm>

73 Sergei, RW3BP und Manfred, DL7YC