

CW und WSJT-X EME
auf 47.088 MHz –
geht doch !

Manfred Plötz **DL7YC**

Stationsausrüstung DL7YC

2400 mm Spiegel – Prime Focus

Oberflächengenauigkeit RMS 0.2mm.....0.3 mm



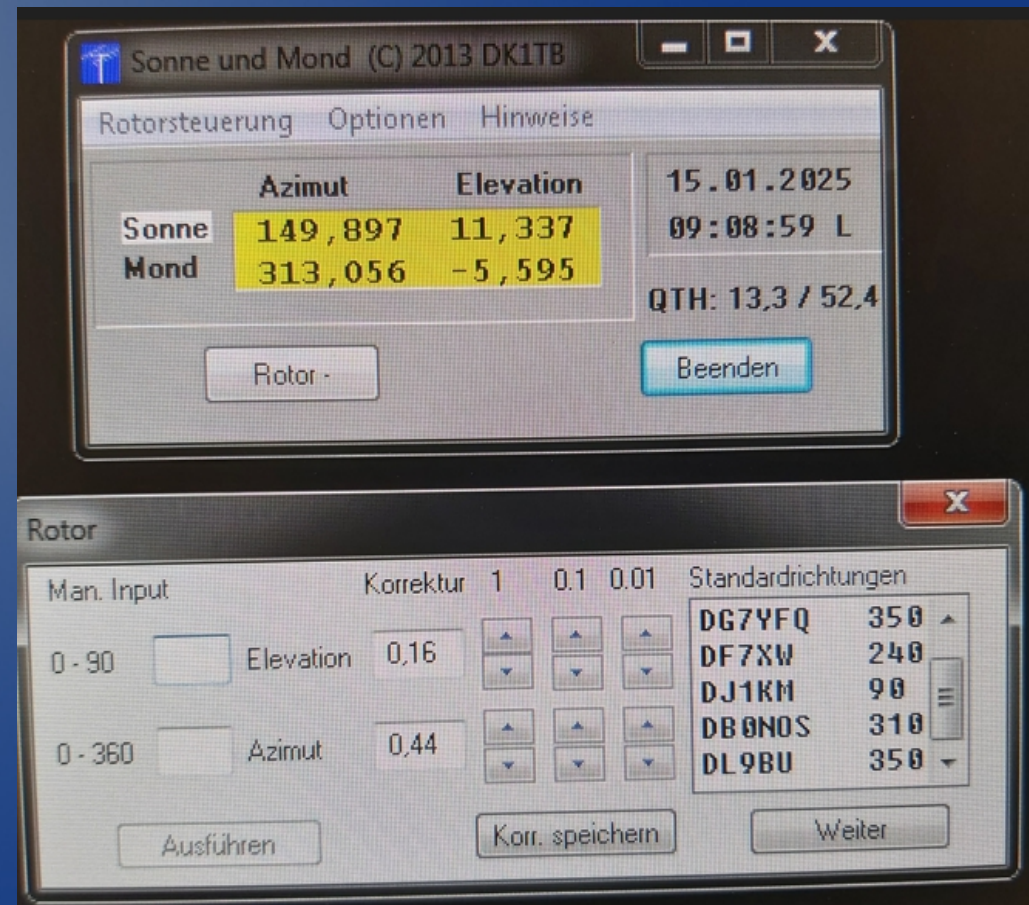
Stationsausrüstung DL7YC

Optimiertes Scalar-Feed f/D 0.385 von CT1DMK



EGIS Rotor und SuM tracking

* EGIS Rotor 180 / 60 Grad / SuM (SatPC32)



Visuelle Kontrolle und Justierung

Bei optischer Sicht des Mondes: Kamerakontrolle



Überwachung der Antennen-Position mittels Moon-Noise-Meter

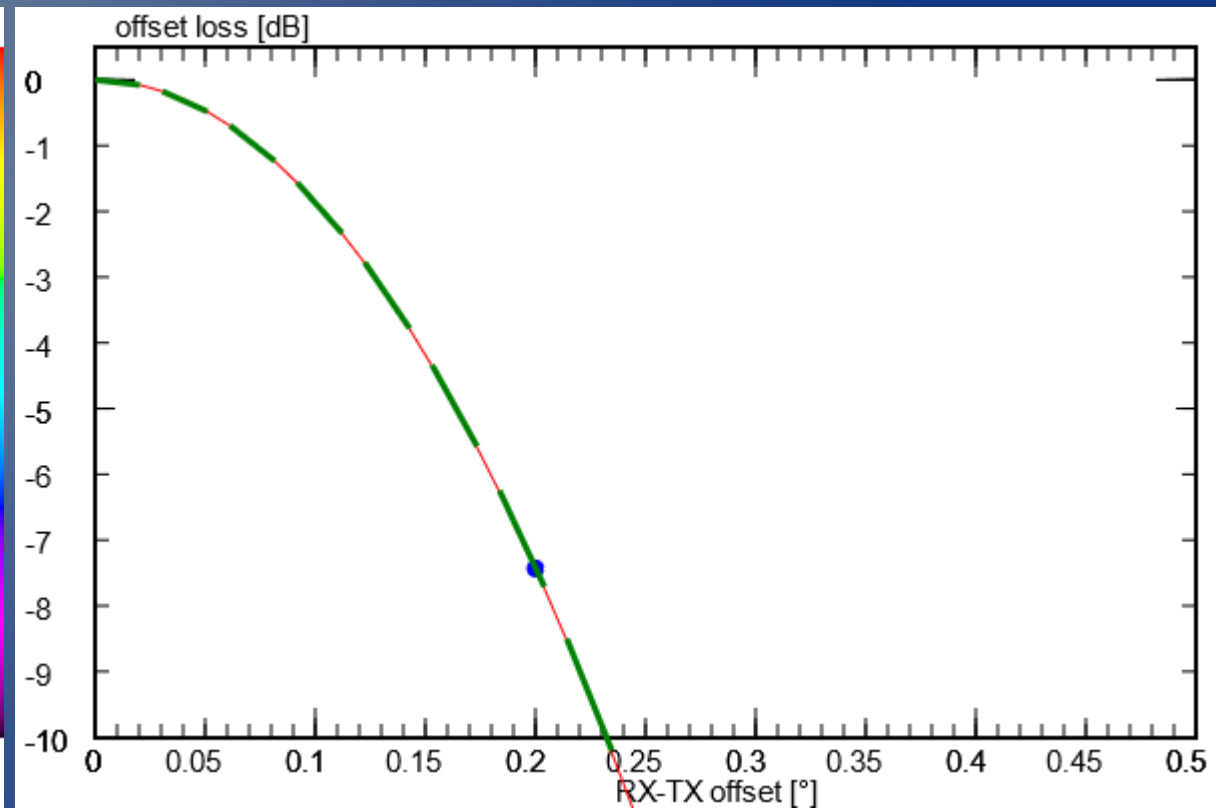
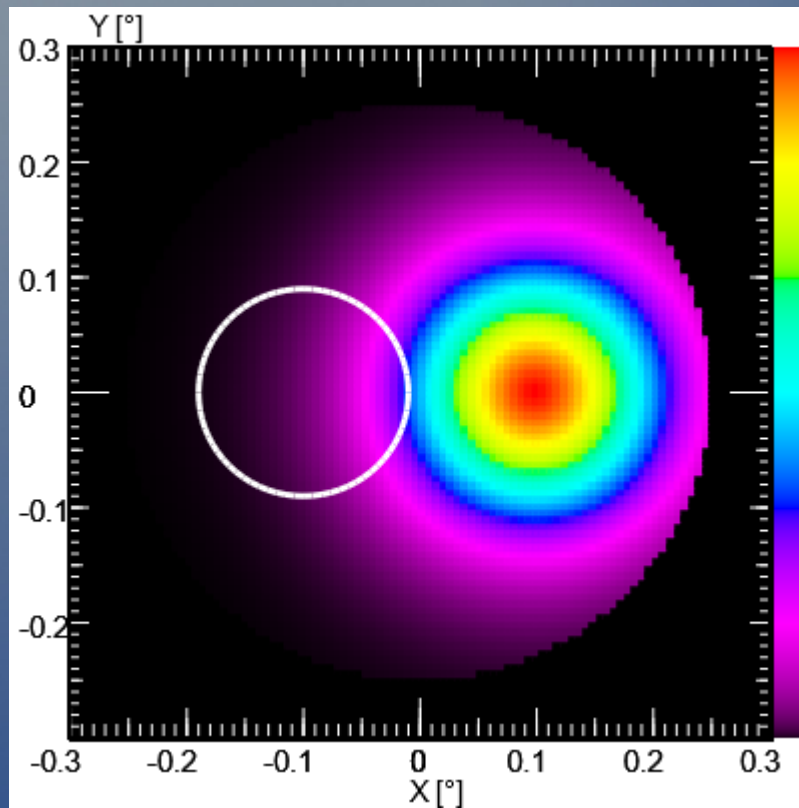
Stabilisierung des Spiegels

Um das Zahnrad-Spiel des EGIS-Rotors zu unterdrücken, wird der Spiegel zum Gartenzaun verspannt



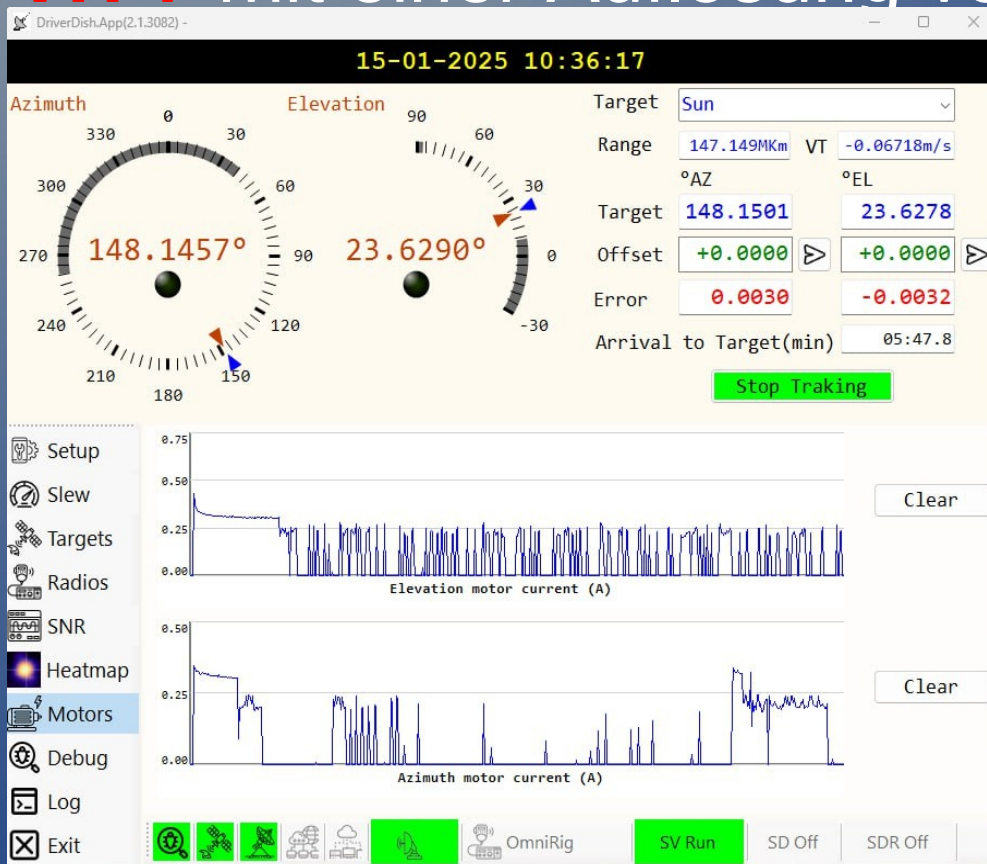
Abhilfe: Verbesserte Nachführmechanik „Dual Sleeve Drive“ SVH-7 mit einer Auflösung von < 0.05 Grad

Loss durch „false“ Tracking



Dual-Slewing-Drive – was ist das ?

Statt des EGIS Rotors wird das „Dual Slewing Drive“
SVH-7 mit einer Auflösung von < 0.05 Grad eingesetzt



EA3HMJ-Tracking-Software-Suite/DriverDish



EA3HMJ Tracking Software Suite

Program that is responsible for requesting data from the ephemeris server and communicating with ControllerDish.

1 Contributor 0 Issues 0 Stars 0 Forks



Die von **EA3HMJ** entwickelte Steuer-Platine und die eingesetzte Software erlauben höchste Genauigkeit

Dual-Slewing-Drive SVH7



Niedrige System-Rauschtemperatur

Ausführung aller entsprechenden Teile in WR 22
Vorverstärker nach **RW3BP**, ungekühlt NF < 1.30dB

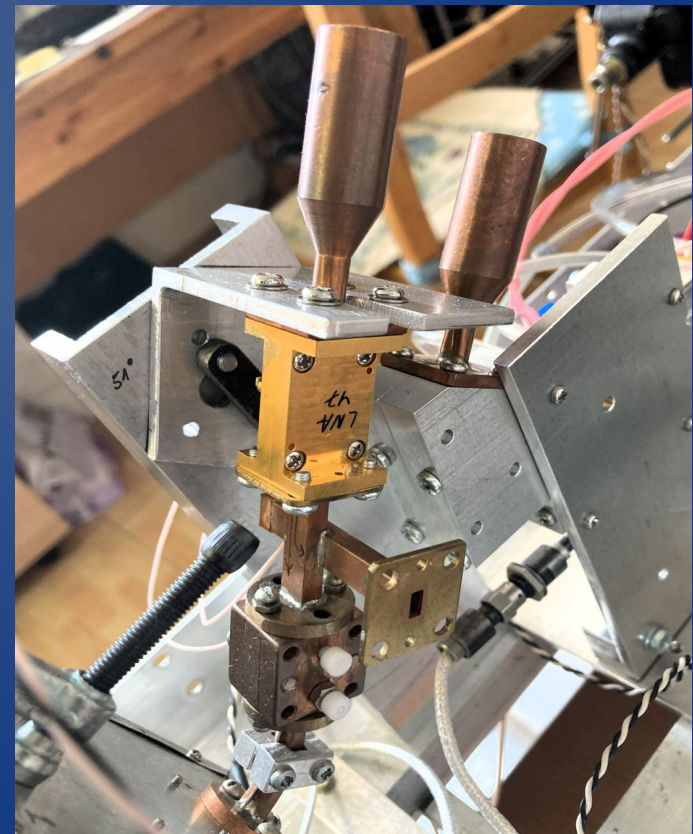
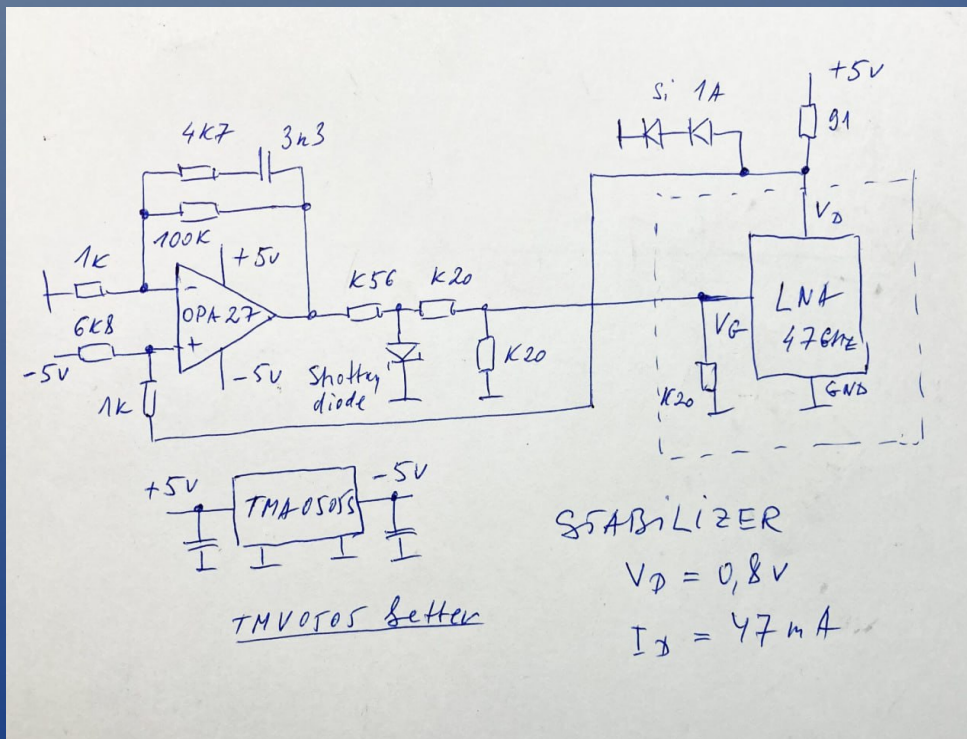
MMIC : MACOM CGY2122XUH



Niedrige System-Rauschtemperatur

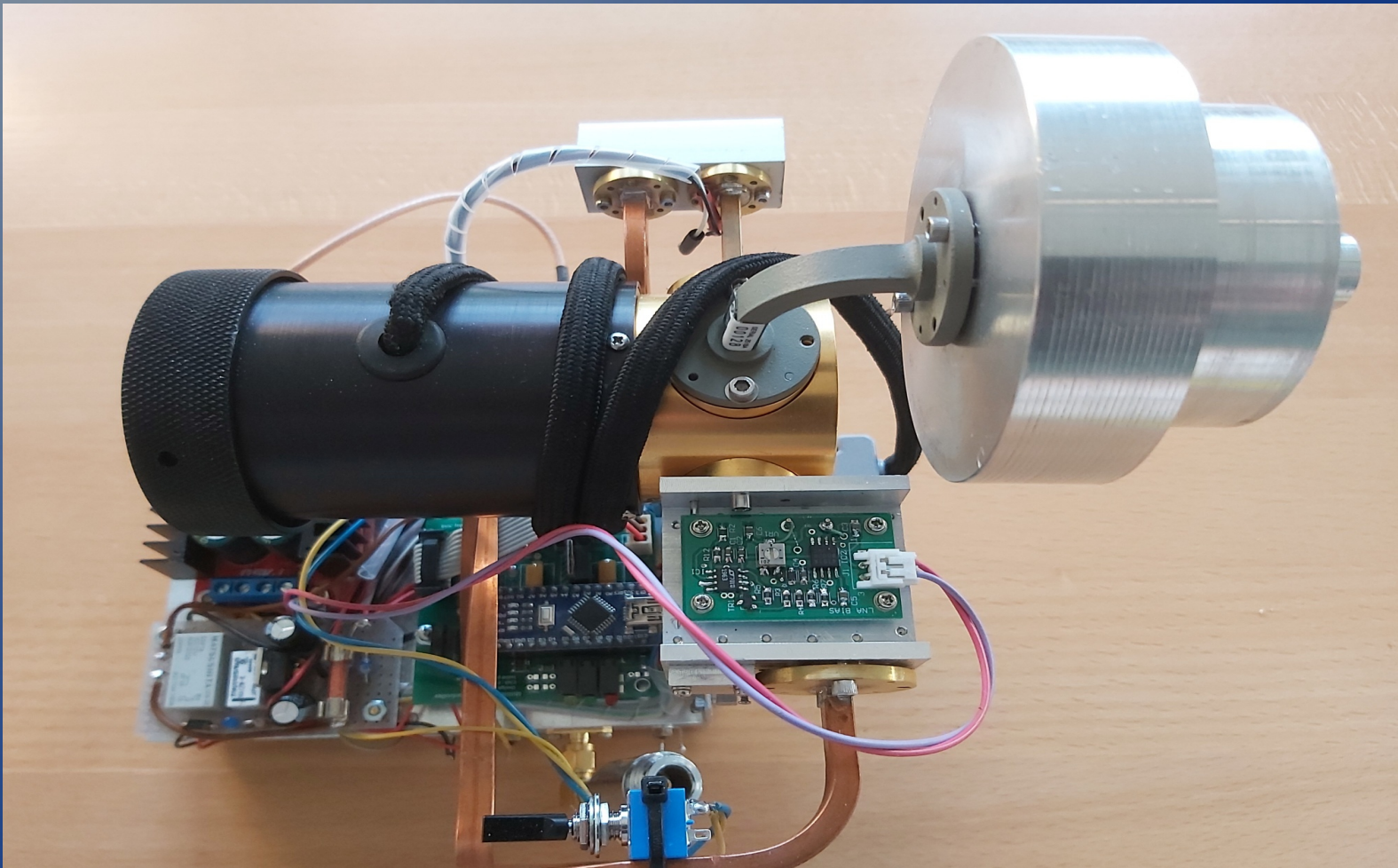
Ausführung aller entsprechenden Teile in WR 22
Vorverstärker nach **RW3BP**, ungekühlt NF <1.30dB

MMIC : MACOM CGY2122XUH



Stationsausrüstung DL7YC

47 GHz Transverter **DB6NT** – WR22 Hohlleiter Schalter

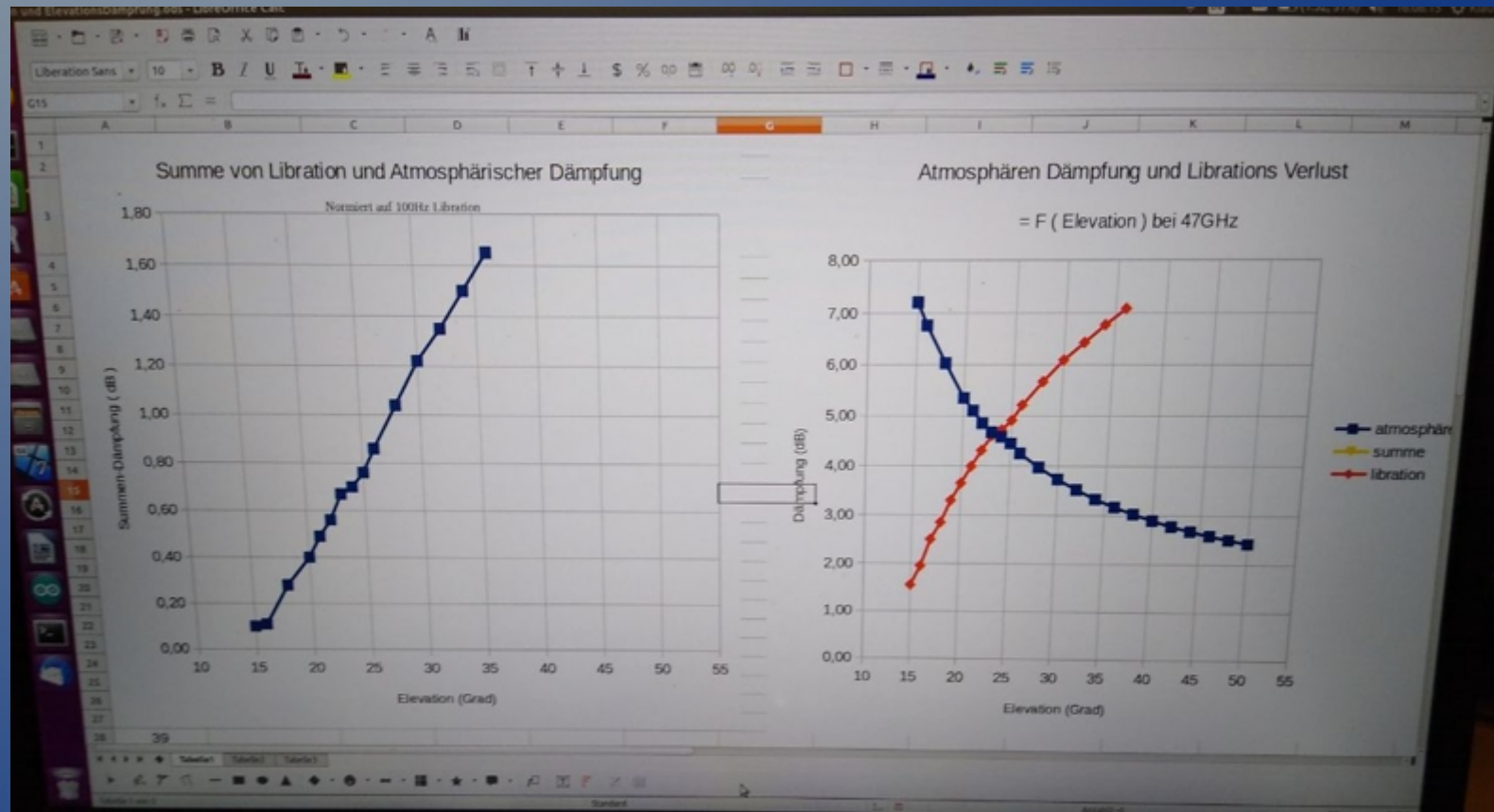


Stationsausrüstung DL7YC

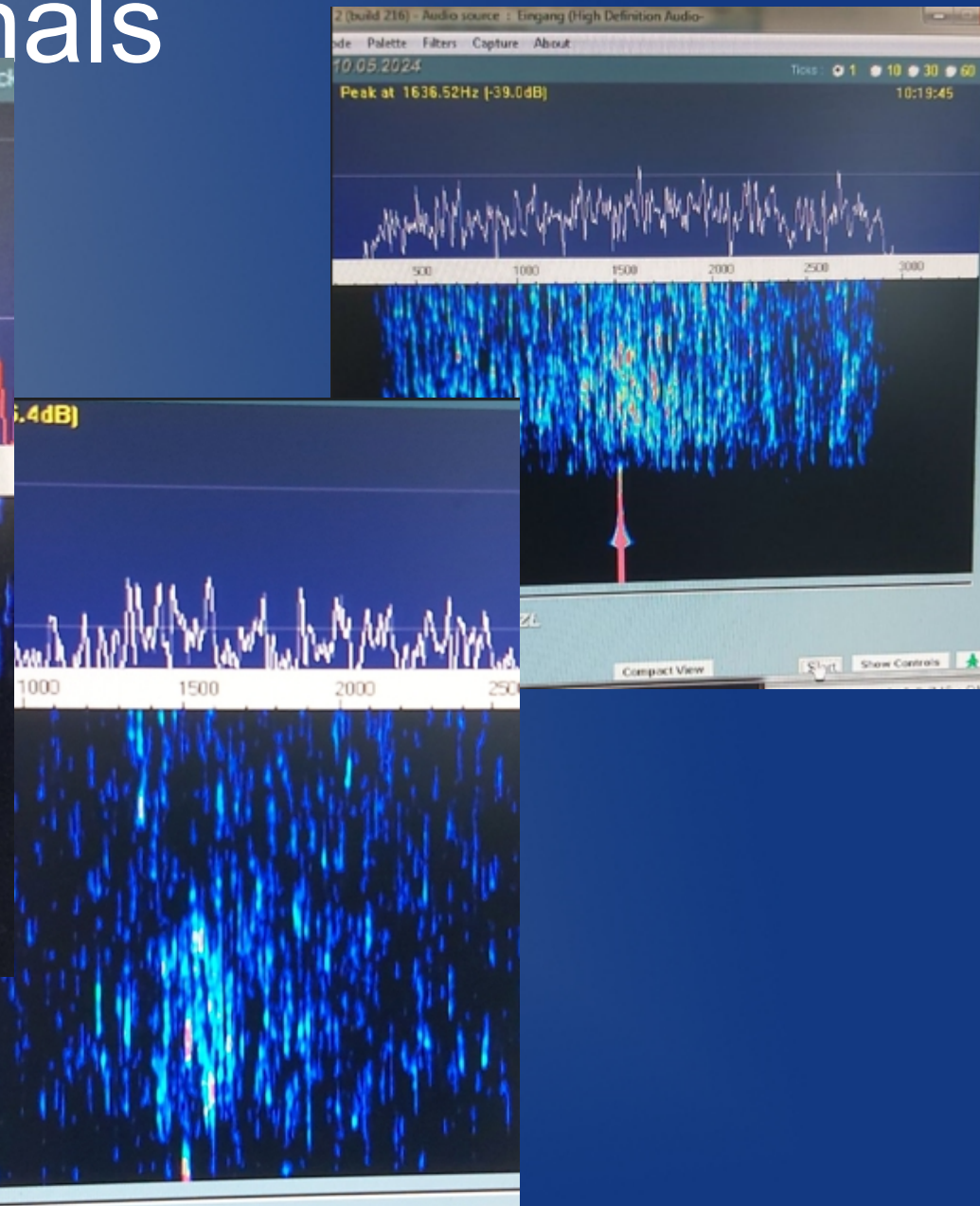
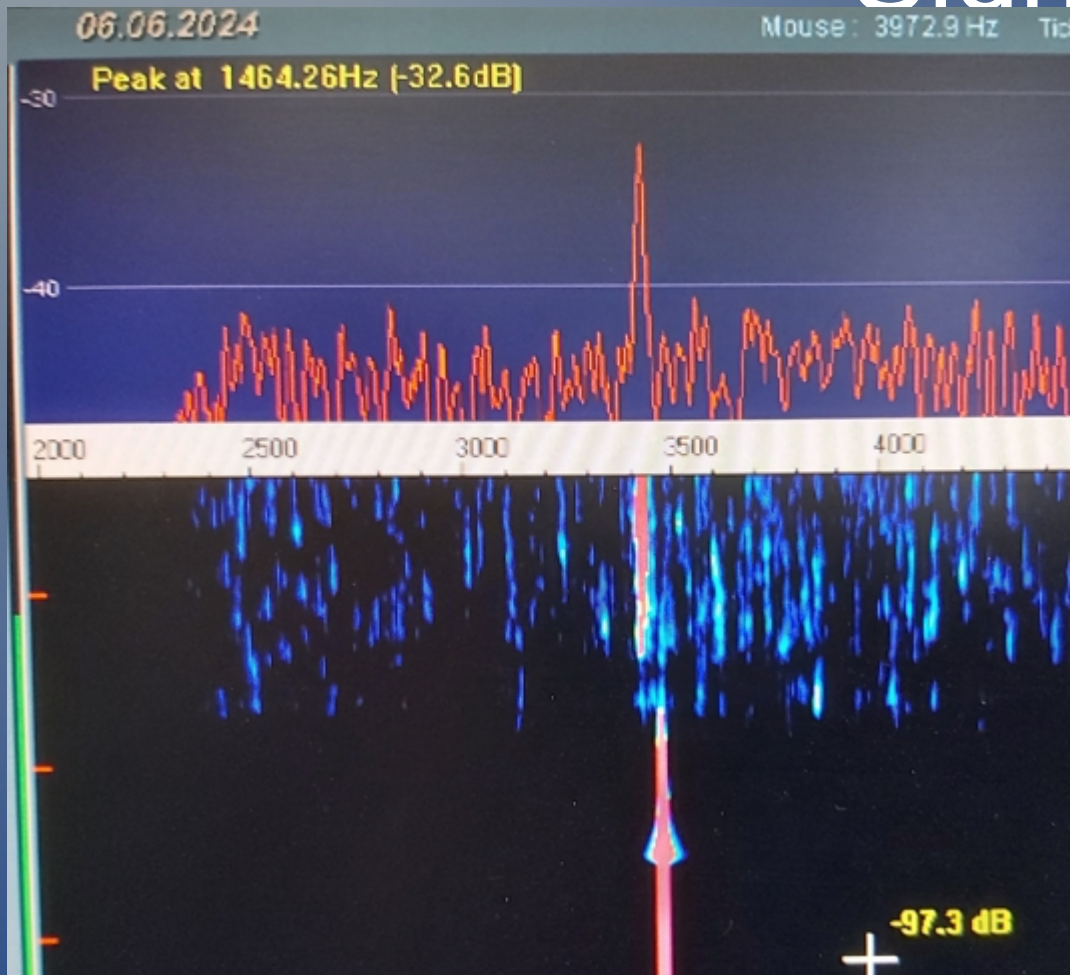
Hughes 46 GHz TWTA – 42 Watt HF output



Atmosphärische Dämpfung und Absorption



Libration – Verbreiterung des Signals



Einstellungen in WSJT-X

Call und **Locator** der zu
EMPFANGENEN Gegenstation

Frequenz 47.088,100 Mhz

Mode: Q 65...Submode E

CFOM constant frequency on moon

Ftol: < 200 Hz / 300Hz

Max drift: 0 Hz

Report: -10.....-23 dB

DL7YC ruft W5LUA Q65-60E

Single-Period Decodes

UTC	dB	DT	Freq	Message
1712	-16	2.9	685	: W5LUA DL7YC JO62 q3
1714	-15	2.9	663	: W5LUA DL7YC JO62 q3
1716	-15	3.0	662	: W5LUA DL7YC JO62 q3
1718	-16	3.0	670	: W5LUA DL7YC JO62 q3

Average Decodes

UTC	dB	DT	Freq	Message
1712	-16	2.9	685	: W5LUA DL7YC JO62 q3
1714	-15	2.9	663	: W5LUA DL7YC JO62 q3
1714	-18	2.9	675	: W5LUA DL7YC JO62 q32
1716	-15	3.0	662	: W5LUA DL7YC JO62 q3
1716	-18	2.9	657	: W5LUA DL7YC JO62 q33
1718	-16	3.0	670	: W5LUA DL7YC JO62 q3
1718	-19	3.0	672	: W5LUA DL7YC JO62 q34
1720	-19	2.9	652	: W5LUA DL7YC JO62 q35

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

6mm ☒ 47,088.200 000 ☒ Tx even/1st Tx 700 Hz F Tol 100 Submode E Max Drift 0

DX Call DX Grid DL7YC JO62PK Az: 36 8358 km Report -15

Generate Std Msgs Next Now Pwr

DL7YC W5LUA EM13	☐	Tx 1
DL7YC W5LUA -15	☐	Tx 2
DL7YC W5LUA R-15	☐	Tx 3

CT1BYM hört DL7YC calling

WSJT-X v2.6.1 by K1JT et al.

File Configurations View Mode Decode Save Tools Help

Single-Period Decodes

UTC	dB	DT	Freq	Message
1746	-17	2.7	654	: CQ DL7YC JO62 q1 EU
1758	-20	2.7	607	: W5LUA DL7YC JO62 q0
1818	-17	2.7	635	: W5LUA DL7YC JO62 q0

Average Decodes

UTC	dB	DT	Freq	Message
1806	-20	2.7	627	: W5LUA DL7YC JO62 q04
1816	-18	2.7	645	: W5LUA DL7YC JO62 q02

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

6mm ☒ 47,088.029 685 ☒ Tx even/1st Tx 700 Hz F Tol 1000 Submode E

H DX Call DX Grid

Generate Std Msgs Next Now Pwr

DL7YC UR3VKE KN69	☐	Tx 1
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W5LUA ruft DC7KY monitored DL7YC

WSJT-X v2.1.2 by K1JT

File Configurations View Mode Decode Save Tools Help

Single-Period Decodes

UTC	dB	DT	Freq	Message
0134	-22	4.6	932	\$#
0134	-22	5.7	941	\$*
0134	-22	4.3	956	\$#
0134	-21	2.0	908	\$#
0134	-22	3.5	947	\$#
0134	-21	-0.8	952	\$*
0134	-22	3.3	910	\$#
0134	-23	-0.8	954	\$*
0134	-22	-0.3	963	\$#
0134	-22	2.4	952	\$* DC7KY W5LUA EM13
0134	-22	4.1	930	\$*
0134	-22	2.4	945	\$* DC7KY W5LUA EM13
0134	-22	-1.3	993	\$*
0134	-23	2.5	945	\$* DC7KY W5LUA EM13
0134	-22	1.4	947	\$#
0134	-21	2.5	941	\$*
0134	-22	0.1	984	\$*
0134	-23	0.8	921	\$#
0134	-22	5.9	967	\$#
0134	-22	2.3	925	\$*
0134	-23	-0.1	903	\$#

Average Decodes

UTC	dB	DT	Freq	Message
0134	-22	4.3	956	\$#
0134	-22	3.5	947	\$#
0134	-21	-0.8	952	\$*
0134	-23	-0.8	954	\$*
0134	-22	-0.3	963	\$#
0134	-22	2.4	952	\$* DC7KY W5LUA EM13
0134	-22	2.4	945	\$* DC7KY W5LUA EM13
0134	-23	2.5	945	\$* DC7KY W5LUA EM13
0134	-22	1.4	947	\$#

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

☐ Tx even/1st

DL7YC im QSO mit DC7KY

The screenshot displays the WSJT-X v2.6.0-rc1 software interface, which is used for digital voice communication. The main window is titled "WSJT-X v2.6.0-rc1 by K1JT, G4WJS, K9AN, and IV3NWX". It features a menu bar (File, Configurations, View, Mode, Decode, Save, Tools, Help) and a toolbar with buttons for Log QSO, Stop, Monitor, Erase, Clear Avg, Decode, Enable Tx, Halt Tx, and Tune. The interface is divided into several sections:

- Single-Period Decodes:** A table showing received messages. The columns are UTC, dB, DT, Freq, and Message. The messages are from DC7KY to DL7YC JO62, with a Q3 signal report.
- Average Decodes:** A table showing transmitted messages. The columns are UTC, dB, DT, Freq, and Message. The messages are from DL7YC to DC7KY, with a -14 signal report.
- Control Panel:** A central area with various controls. It includes a frequency display showing 47.088.072 772, a mode selector set to 6m, and a call sign display showing DL7YC. There are also buttons for DX Call, DX Grid, and a status display showing the date and time: 2022 Jul 05 19:53:18.
- Generate Std Msgs:** A section on the right with a list of standard messages and buttons for Tx 1 through Tx 6.

The interface is running on a Windows operating system, as indicated by the taskbar at the bottom showing the "EHE_Controller_EGIS" application.

DL7YC im QSO mit DC7KY

WSJT-X v2.6.0-rc1 by K1JT, G4WJS, K9AN, and IV3NWF

File Configurations View Mode Decode Save Tools Help

Single-Period Decodes

UTC	dB	DT	Freq	Message
1918	-14	2.6	655	: DC7KY DL7YC JO62 q3
1920	-15	2.6	650	: DC7KY DL7YC JO62 q3
1922	-15	2.6	680	: DC7KY DL7YC JO62 q3
1924	-15	2.6	650	: DC7KY DL7YC JO62 q3
1926	-15	2.6	650	: DC7KY DL7YC JO62 q3
1928	-15	2.5	650	: DC7KY DL7YC JO62 q3
1930	-16	2.5	710	: DC7KY DL7YC JO62 q3
1932	-16	2.5	702	: DC7KY DL7YC JO62 q3

Average Decodes

UTC	dB	DT	Freq	Message
1924	-15	2.6	650	: DC7KY DL7YC JO62 q3
1925	Tx		700	: DL7YC DC7KY -14
1926	-15	2.6	650	: DC7KY DL7YC JO62 q3
1927	Tx		700	: DL7YC DC7KY -14
1928	-15	2.5	650	: DC7KY DL7YC JO62 q3
1929	Tx		700	: DL7YC DC7KY -14
1930	-16	2.5	710	: DC7KY DL7YC JO62 q3
1931	Tx		700	: DL7YC DC7KY -14
1932	-16	2.5	702	: DC7KY DL7YC JO62 q3
1933	Tx		700	: DL7YC DC7KY -14

Log QSO Stop Monitor Erase Clear Avg Decode Enable Tx Halt Tx Tune Menus

6min 47.088.074 755 Tx every 1st

Tx 700 Hz F Tol 50 Submode E

Rx 700 Hz Max Drift 0

Report -14 T/R 60 s

Sh Auto Seq Call 1st Tx6

DX Call DX Grid

DL7YC JO62Q3

Az: 180 9 km

Lookup Add

2022 Jul 05 19:34:00

Receiving Q65-60E Last Tx: DL7YC DC7KY -14 23 7

Generate Std Msgs

Next	Now	Pwr
DL7YC DC7KY JO62	☐	Tx 1
DL7YC DC7KY -14	☒	Tx 2
DL7YC DC7KY R-14	☐	Tx 3
@1500 (RRR)	☐	Tx 4
@1750 (73)	☐	Tx 5
@1000 (TUNE)	☐	Tx 6

0/60 WD:94m

no_test_audio_jpegger Vs01.exe

DL7YC im QSO mit VE4MA in Q65-60E

WSJT-X v2.6.1 by K1JT et al.

Single-Period Decodes									
UTC	dB	DT	Freq	Message					UTC
1630	-17	3.2	711	:	DL7YC	VE4MA	R-14	q2	1630
1632	-17	3.2	746	:	DL7YC	VE4MA	R-14	q0	1632
1634	-17	3.3	726	:	DL7YC	VE4MA	RR73	q0	1633
1634	-17	3.3	725	:	DL7YC	VE4MA	RR73	q0	1634
1636	-17	3.2	707	:	DL7YC	VE4MA	73	q0	1635
1636	-17	3.2	707	:	DL7YC	VE4MA	73	q0	1634
1638	-16	3.2	697	:	DL7YC	VE4MA	73	q3	1635
									1636
									1636
									1638
									1639

1641	-13	2.9	581	:	VE4MA	DL7YC	RR73	q3
1643	-14	2.9	616	:	VE4MA	DL7YC	RR73	q3
1645	-15	2.9	663	:	VE4MA	DL7YC	RR73	q3
1636	-18	3.3	761	:	DL7YC	VE4MA	73	q3

DL7YC im QSO mit VE4MA in Q65-60E

WSJT-X v2.6.1 by K1JT et al.

File Configurations View Mode Decode Save Tools Help

Single-Period Decodes

UTC	dB	DT	Freq	Message
1630	-17	3.2	711	: DL7YC VE4MA R-14 q2
1632	-17	3.2	746	: DL7YC VE4MA R-14 q0
1634	-17	3.3	726	: DL7YC VE4MA RR73 q0
1634	-17	3.3	725	: DL7YC VE4MA RR73 q0
1636	-17	3.2	707	: DL7YC VE4MA 73 q0
1636	-17	3.2	707	: DL7YC VE4MA 73 q0
1638	-16	3.2	697	: DL7YC VE4MA 73 q3
1640	-18	3.2	737	: DL7YC VE4MA 73 q3
1642	-17	3.2	717	: DL7YC VE4MA 73 q3
1644	-16	3.2	712	: DL7YC VE4MA 73 q3

Average Decodes

UTC	dB	DT	Freq	Message
1630	-17	3.2	711	: DL7YC VE4MA R-14 q2
1632	-17	3.2	746	: DL7YC VE4MA R-14 q0
1633	Tx		700	: DL0SHF DL7YC R-19
1634	-17	3.3	726	: DL7YC VE4MA RR73 q0
1635	Tx		700	: DL0SHF DL7YC R-19
1634	-17	3.3	725	: DL7YC VE4MA RR73 q0
1635	Tx		700	: DL0SHF DL7YC RR73
1636	-17	3.2	707	: DL7YC VE4MA 73 q0
1636	-17	3.2	707	: DL7YC VE4MA 73 q0
1638	-16	3.2	697	: DL7YC VE4MA 73 q3
1639	Tx		700	: VE4MA DL7YC 7
1640	-18	3.2	737	: DL7YC VE4MA 73 q3
1641	Tx		700	: VE4MA DL7YC 7
1641	Tx		700	: VE4MA DL7YC RR73
1642	-17	3.2	717	: DL7YC VE4MA 73 q3
1643	Tx		700	: VE4MA DL7YC RR73
1644	-16	3.2	712	: DL7YC VE4MA 73 q3
1645	Tx		700	: VE4MA DL7YC RR73

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

6mm S **47.088,040 060** ☐ Tx even/1st Tx 700 Hz

Generate Std Msgs Next Now Pwr

DL7YC im QSO mit RW3BP in Q65-60E

WSJT-X v2.7.0-rc5 by K1JT et al.

File Configurations View Mode Decode Save Tools Help

Single-Period Decodes

UTC	dB	DT	Freq	Message
0652	-15	2.8	693	: CQ DL7YC JO62 q1 EU
0654	-14	2.8	702	: CQ DL7YC JO62 q1 EU
0656	-14	2.9	670	: CQ DL7YC JO62 q1 EU
0658	-14	2.8	692	: CQ DL7YC JO62 q0 EU
0702	-14	2.8	680	: RW3BP DL7YC JO62 q0
0705	-15	2.6	717	: DL7YC RW3BP KO85 q3
0707	-15	2.6	727	: DL7YC RW3BP -11 q3
0709	-16	2.6	737	: DL7YC RW3BP RRR q3
0711	-16	2.6	728	: DL7YC RW3BP 73 q3

Average Decodes

UTC	dB	DT	Freq	Message
0652	-15	2.8	693	: CQ DL7YC JO62 q1 EU
0654	-14	2.8	702	: CQ DL7YC JO62 q1 EU
0658	-14	2.8	692	: CQ DL7YC JO62 q0 EU
0705	-15	2.6	717	: DL7YC RW3BP KO85 q3
0707	-15	2.6	727	: DL7YC RW3BP -11 q3
0708	-15	2.9	668	: RW3BP DL7YC JO62 q03
0709	-16	2.6	737	: DL7YC RW3BP RRR q3
0711	-16	2.6	728	: DL7YC RW3BP 73 q3

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

6mm  **47 088,100 000**

80
60
40
20
0
45 dB

H

FT8

FT4

MSK

Q65

JT65

DX Call

RW3BP

Az: 45 3860 km

Lookup

DX Grid

KO85VS

Add

Tx even/1st

Tx 700 Hz

F Tol 200

Rx 700 Hz

Report -15

T/R 60 s

☐ Sh ☒ Auto Seq CQ: None ☐ Tx6

Submode E

Max Drift 0

Generate Std Msgs

Next

Now

RW3BP DL7YC IM68

RW3BP DL7YC -15

RW3BP DL7YC R-15

RW3BP DL7YC RR73

RW3BP DL7YC 73

CQ DL7YC IM68

Tx 1

Tx 2

Tx 3

Tx 4

Tx 5

Tx 6

2024 jul 05

07:35:49

Pwr



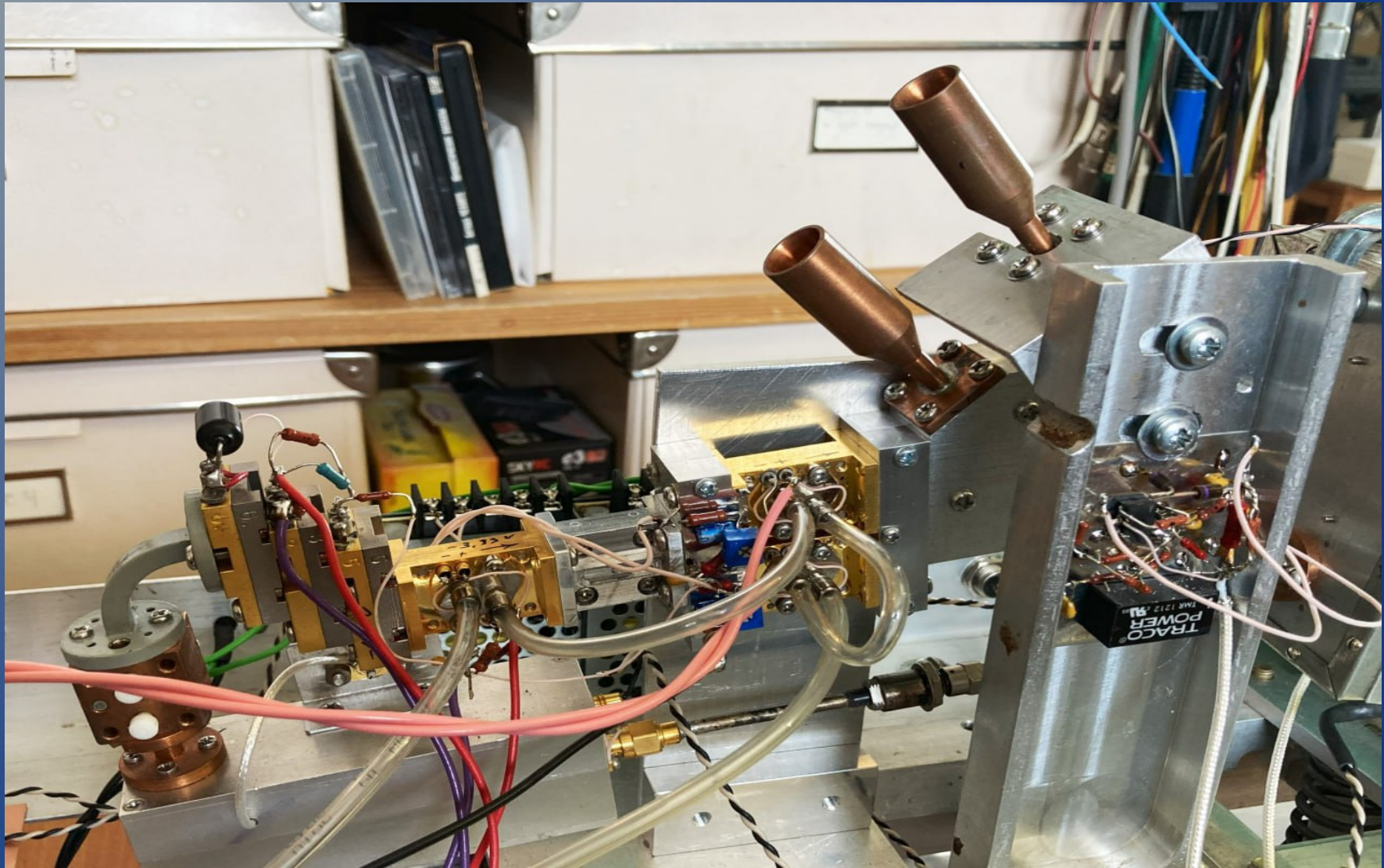
DL7YC im CW-QSO mit RW3BP

Am 28.8.2024 gelang dann zu einer
Zeit mit minimaler Libration das

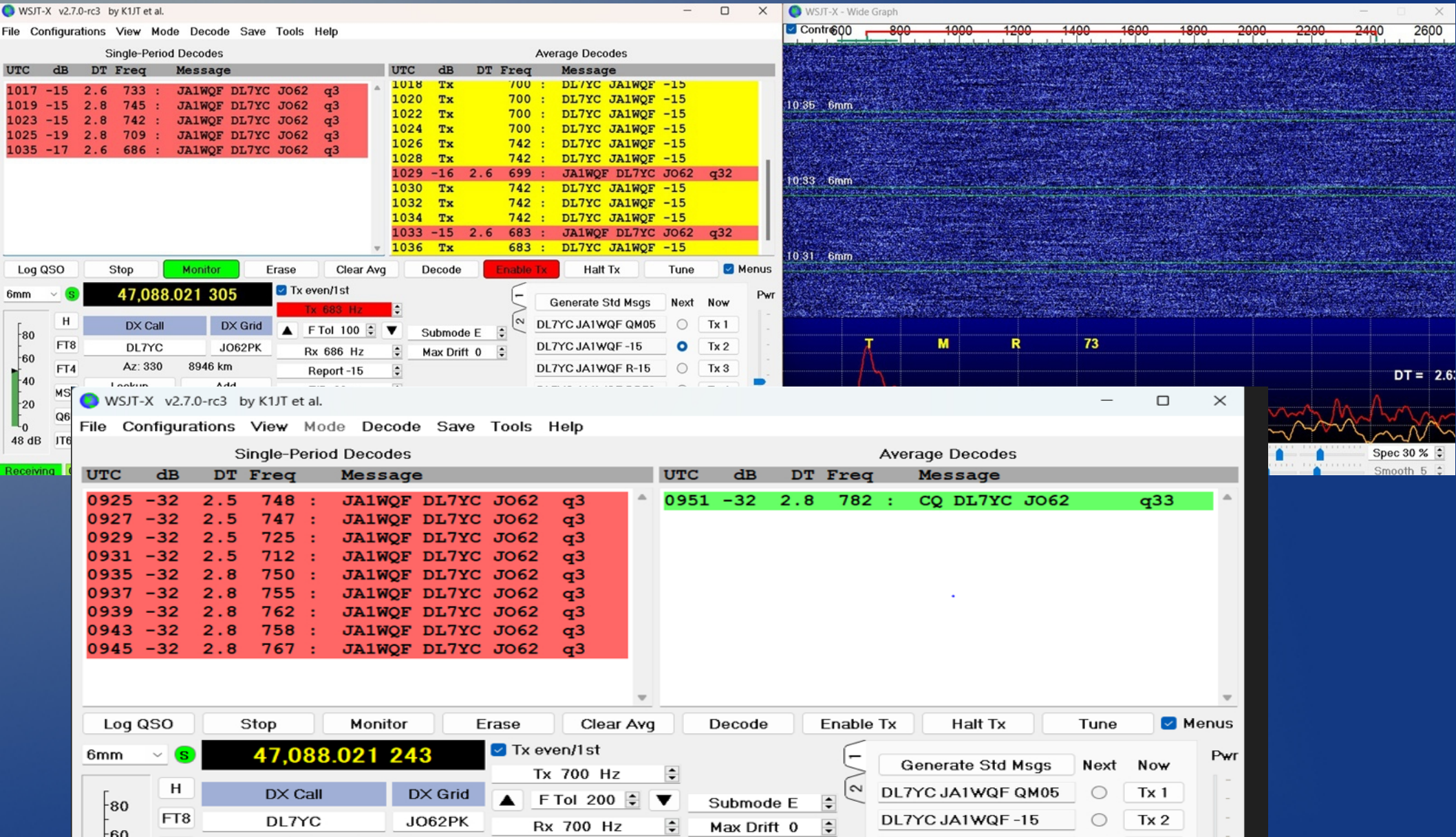
WELTWET erste 47 GHz
EME – CW - QSO
zwischen RW3BP und DL7YC

RST 529 bei DL7YC
RST 539 bei RW3BP

DL7YC im QSO mit RW3BP in Q65-60E



DL7YC ruft JA1WQF in Q65-60E



DL7YC ruft CT1BYM in Q65-60E

WSJT-X - IC-9700 v2.6.0-rc1 by K1JT, G4WJS, K9AN, and IV3NWW

Archivo Configuraciones Ver Modo Decodificar Guardar Herramientas Ayuda

Decodificaciones de un solo período

UTC	dB	DT	Freq	Mensaje
1904	-16	2.8	683	: CT1BYM DL7YC JO62 q3
1912	-16	2.9	685	: CT1BYM DL7YC JO62 q3
1916	-16	2.9	658	: EA3HMJ DL7YC JO62 q3

Promedio de decodificaciones

UTC	dB	DT	Freq	Mensaje
1904	-16	2.8	683	: CT1BYM DL7YC JO62 q3
1908	-18	2.9	688	: CT1BYM DL7YC JO62 q32
1912	-16	2.9	685	: CT1BYM DL7YC JO62 q3
1916	-16	2.9	658	: EA3HMJ DL7YC JO62 q3
1920	-20	2.9	733	: EA3HMJ DL7YC JO62 q32
1940	-21	2.7	703	: EA3HMJ DL7YC -22 q33

Guardar QSO (Q)

Detener (S)

Monitor (M)

Borrar (E)

Borrar media

Decodifica (D)

Activar TX (N)

Detener TX (H)

Tono TX (T)

☒ Menús

6mm  **47.088,063 856**

Indicativo DX

DL7YC

Locator DX

JO62PK

Az: 31 1477 km

Buscar

Agregar

2022 jul. 04 19:57:34

☐ Tx par/1ro

TX 700 Hz

F Tol 100

Submodo E

RX 697 Hz

Max Drift 0

Reporte -15

T/R 60 s

☒ Sh ☐ Secuencia Auto. ☐ 1er decodificado ☐ TX6

Genera Mensajes Estándar

DL7YC EA3HMJ JN11

DL7YC EA3HMJ -15

DL7YC EA3HMJ R-15

@1500 (RRR)

@1750 (73)

@1000 (TUNE)

Siguiente

Ahora

TX 1

TX 2

TX 3

TX 4

TX 5

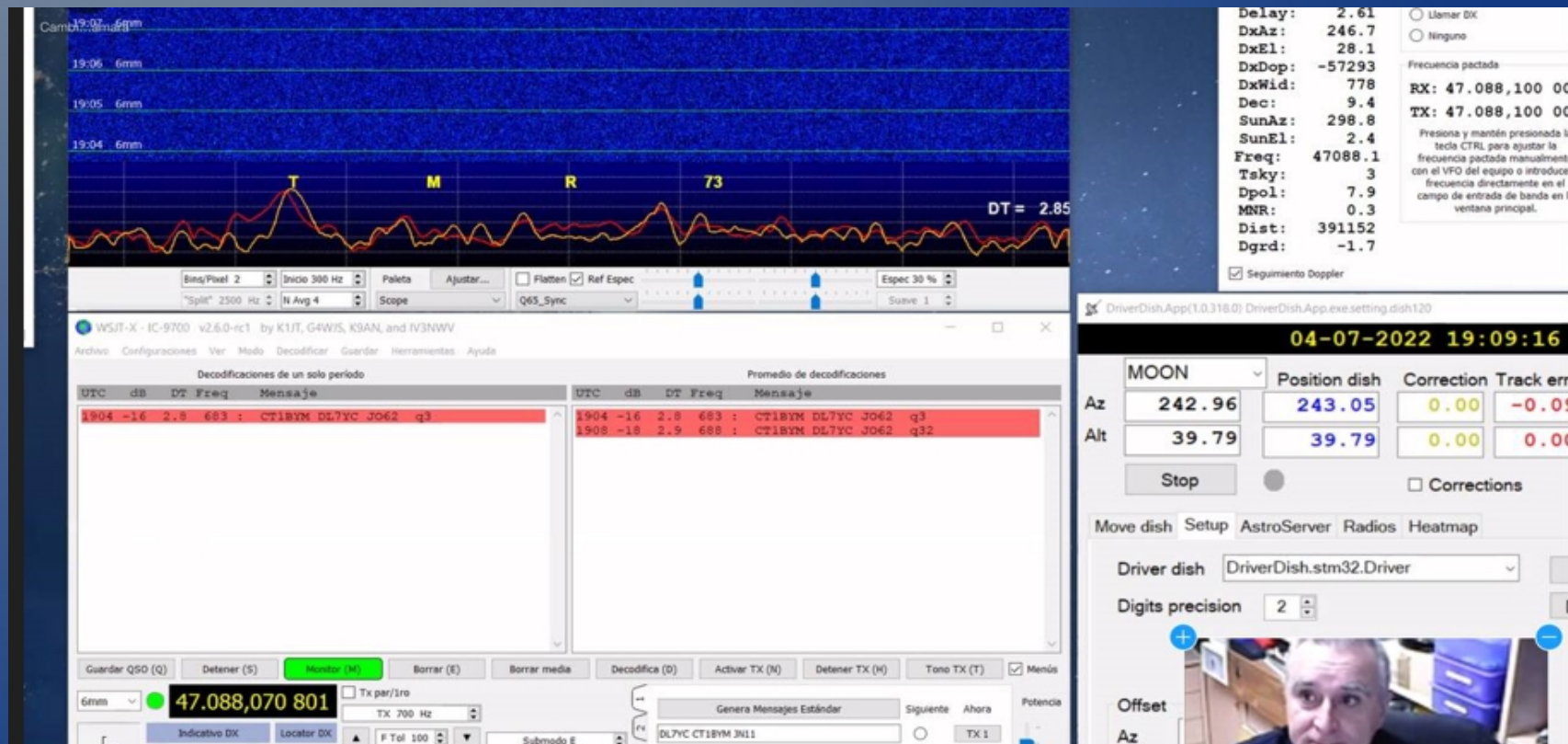
TX 6

Potencia



DL7YC ruft EA3HMJ in Q65-60E

Decodificaciones de un solo período							
UTC	dB	DT	Freq	Mensaje			
1528	-13	2.7	578	:	EA3HMJ	DL7YC	JO62 q3
1530	-13	2.8	588	:	EA3HMJ	DL7YC	JO62 q3
1532	-13	2.7	595	:	EA3HMJ	DL7YC	JO62 q3



DL7YC ruft UR3VKE in Q65-60E

WSJT-X v2.6.1 by K1JT et al.

File Configurations View Mode Decode Save Tools Help

Single-Period Decodes

UTC	dB	DT	Freq	Message
1706	-20	2.7	660	: CQ DL7YC JO62 q3 EU
1708	-19	2.7	665	: CQ DL7YC JO62 q3 EU
1714	-19	2.7	665	: UR3VKE DL7YC JO62 q3

Average Decodes

UTC	dB	DT	Freq	Message
1714	-19	2.7	665	: UR3VKE DL7YC JO62 q3

Log QSO Stop Monitor Erase

6mm **S** 47,088.030 304

H DX Call DX Grid

FT8 DL7YC JO62PK

FT4 Az: 293 1450 km

MSK Lookup Add

Q65 2024 May 10 17:15:34

JT65

Receiving Q65-60E 0 25

SpecJT by K1JT

Options Freq: 3741 DF: 2470 (Hz) BW < | > Spe

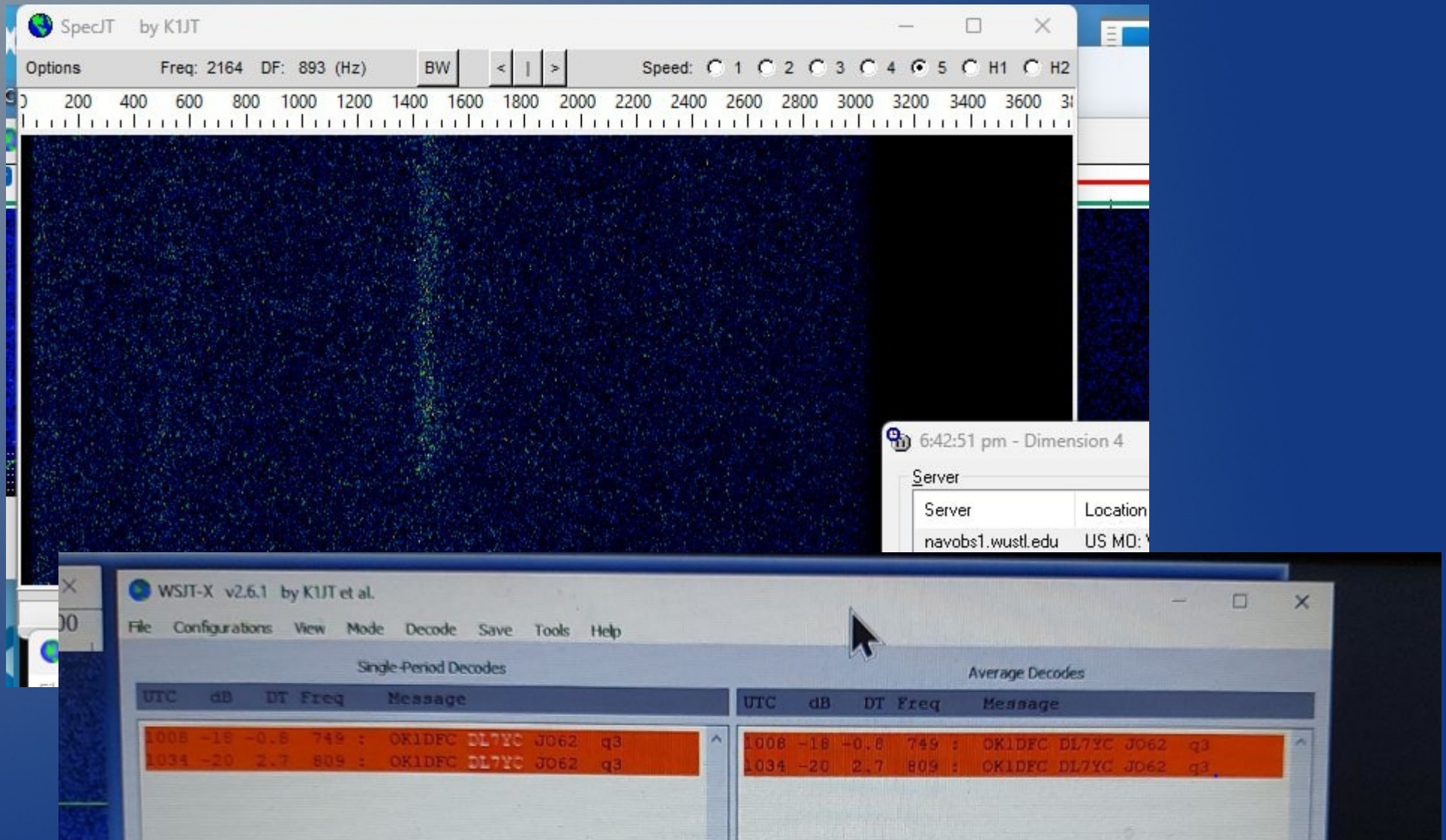
200 400 600 800 1000 1200 1400 1600 1800 2000 2200

15:54

15:54:17

WSJT-X v2.6.1 by K1JT et al.

UR3VKE empfängt ein 1500 Hz Trägersignal – OK1DFC hört mit



DL7YC ruft EA3HMJ in Q65-60E

WSJT-X - IC-9700 v2.6.0-rc1 by K1JT, G4WJ5, K9AN, and IV3NWX

Decodificaciones de un solo periodo

UTC	dB	DT	Freq	Mensaje
1904	-16	2.8	683	CT1BYM DL7YC JO62 q3
1908	-18	2.9	688	CT1BYM DL7YC JO62 q32

Promedio de decodificaciones

UTC	dB	DT	Freq	Mensaje
1904	-16	2.8	683	CT1BYM DL7YC JO62 q3
1908	-18	2.9	688	CT1BYM DL7YC JO62 q32

DriverDishApp(1.0.318.0) DriverDishApp.exe.setting.dish120

04-07-2022 19:09:16

MOON Position dish Correction Track err

Az **242.96** **243.05** **0.00** **-0.09**

Alt **39.79** **39.79** **0.00** **0.00**

Stop ☐ Corrections

Move dish Setup AstroServer Radios Heatmap

Driver dish **DriverDish.stm32.Driver**

Digits precision **2**

Offset

Az

Alt

Jose EA3HMJ

Zusammenfassung

- Spiegel mit **RMS-Wert < 0.25 mm!!!**
- Optimales Feed-Design passend zum f/D
- Sehr rauscharme Vorverstärker / $NF < 1.3\text{dB}$
- Low-Loss RX/TX- WG-Umschalter
- Senderleistung 15 bis 40 **Watt am Feed**
- Tracking-Genauigkeit **0.01 Grad** (Moon-Noise)
- Perfektes Zeitmanagement und Planung

47 GHz EME by DL7YC

DANKE für die Aufmerksamkeit