



RECEPCIÓN DE NAVES Y SONDAS ESPACIALES.

DSN para principiantes

¿QUÉ RECIBIR?

Sondas planetarias

Mars Reconnaissance Orbiter.
Tianwen-I (Marte)

Sondas Solares

Stereo-A
Solar Orbiter

Sondas Lunares

LRO

Telescopios

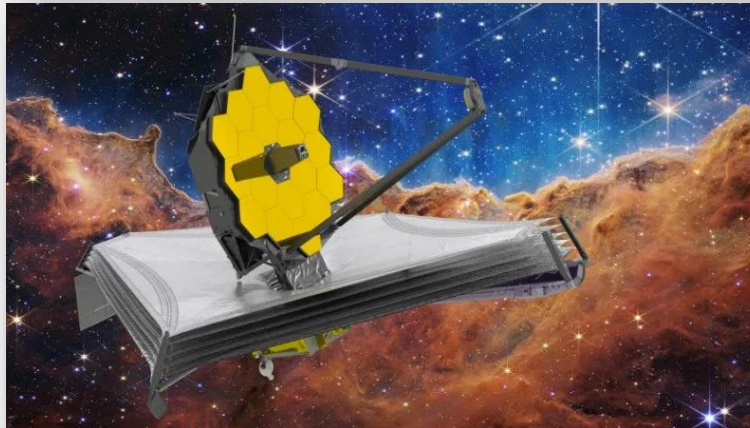
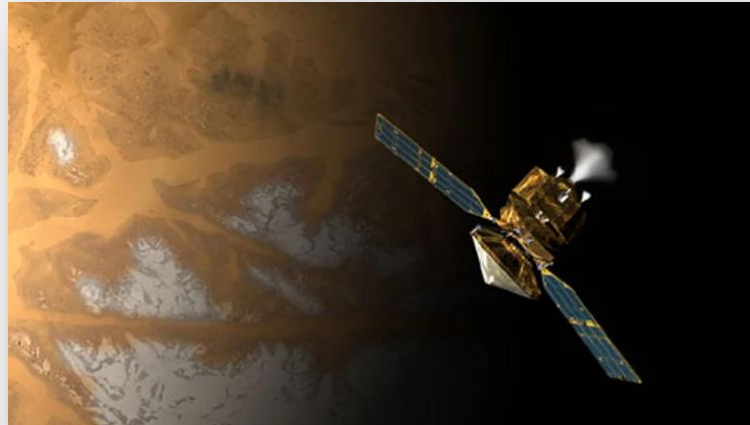
James Webb JWST

Sondas de impacto

Osiris Rex (Bennu)

Naves tripuladas (FUTURO)

Artemis 2 y 3



DONDE RECIBIRLAS: FRECUENCIA

Band Designation	Deep Space Bands (for spacecraft greater than 2 million km from Earth)		Near Earth Bands (for spacecraft less than 2 million km from Earth)	
	Uplink (Earth to space)	Downlink (space to Earth)	Uplink (Earth to space)	Downlink (space to Earth)
S-band	2110–2120*	2290–2300	2025–2110	2200–2290
X-band	7145–7190	8400–8450	7190–7235	8450–8500
K-band	**	**	**	25500–27000
Ka-band	34200–34700	31800–32300	**	**

* Deep Space S-band is not available at Madrid tracking stations due to a conflict with IMT-2000 users, per agreement between NASA and Secretaria de Estado de Telecomunicaciones para la Sociedad de la Informacion (SETSI), January 2001”

DONDE RECIBIRLAS: POSICIÓN

<https://ssd.jpl.nasa.gov/horizons/app.html>

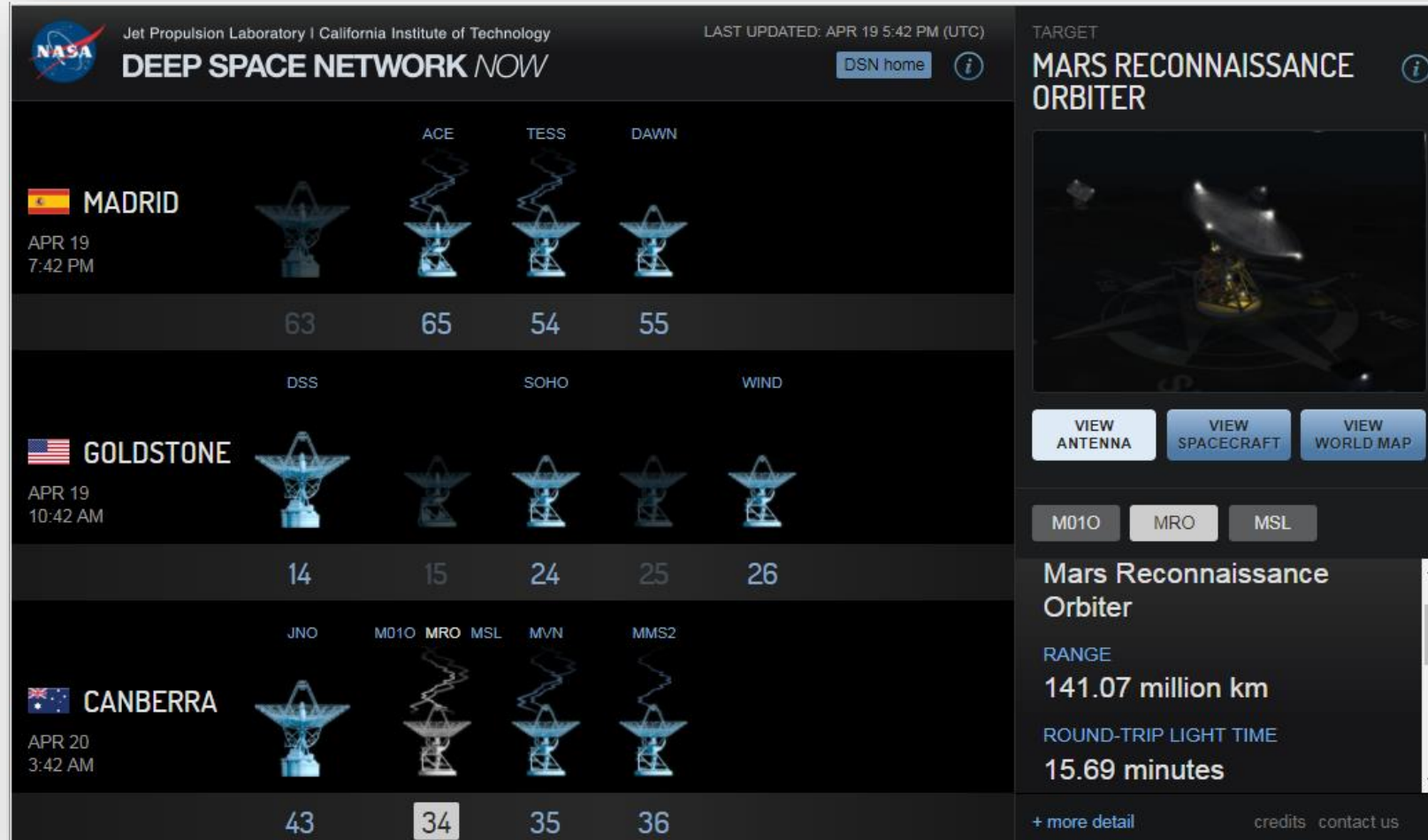
The screenshot shows the NASA Jet Propulsion Laboratory Horizons System web application. The header includes the NASA logo and the text "Jet Propulsion Laboratory California Institute of Technology". Below the header, there is a navigation bar with links: Home, Tools, Horizons System. A yellow banner states: "We are looking for an experienced IT professional or interested in supporting our mission of providing high quality orbital data for solar-system objects. Issued: 2023-02-03". The main section is titled "Horizons System" and contains a sub-header "Horizons Web Application". Below this, there is a "Save/Load Settings..." button and a form with five numbered settings: 1. Ephemeris Type: Observer Table (dropdown menu); 2. Target Body: Voyager 1 (spacecraft) (with an Edit button); 3. Observer Location: Madrid Spain (3°42'00.0"W, 40°25'59.9"N) (with an Edit button); 4. Time Specification: Start=2023-03-01 UT, Stop=2023-03-02, Step=1 (hours) (with an Edit button); 5. Table Settings: custom (with an Edit button). At the bottom, there is a green "Generate Ephemeris" button and a note: "After specifying settings above (items 1 to 5), generate an ephemeris by pressing the 'Generate Ephemeris' button below. If you plan to use one of the 'batch' m".

Date_{UT}_HR:MN		Azi_{(a-app)}	Elev	delta	deldot	1-way_down_LT	

\$\$SOE							
2023-Mar-04 00:00	m	73.363162	-0.676945	159.218252952248	-7.9339885	1324.17783162	
2023-Mar-04 01:00	m	82.947924	10.516017	159.218061898528	-7.9414012	1324.17624267	
2023-Mar-04 02:00	m	92.605828	21.942320	159.217870952533	-7.9250993	1324.17465463	
2023-Mar-04 03:00	m	103.219148	33.269307	159.217680673761	-7.8862770	1324.17307213	
2023-Mar-04 04:00	m	116.094116	44.045737	159.217491574142	-7.8276708	1324.17149943	
2023-Mar-04 05:00	m	133.340226	53.474916	159.217304082982	-7.7533717	1324.16994012	
2023-Mar-04 06:00	N	157.580449	60.024840	159.217118517573	-7.6685455	1324.16839681	
2023-Mar-04 07:00	*	187.809591	61.507217	159.216935061466	-7.5790781	1324.16687106	
2023-Mar-04 08:00	*	215.661675	57.207349	159.216753751919	-7.4911729	1324.16536315	
2023-Mar-04 09:00	*	236.094547	48.950203	159.216574477365	-7.4109251	1324.16387217	
2023-Mar-04 10:00	*	250.806193	38.705174	159.216396985072	-7.3439045	1324.16239601	
2023-Mar-04 11:00	*	262.333870	27.579919	159.216220898487	-7.2947737	1324.16093154	
2023-Mar-04 12:00	*	272.335707	16.157498	159.216045743052	-7.2669688	1324.15947482	
2023-Mar-04 13:00	*	281.861067	4.809850	159.215870978746	-7.2624636	1324.15802135	
2023-Mar-04 14:00	*	291.687240	-6.141304	159.215696037104	-7.2816346	1324.15656641	
2023-Mar-04 15:00	*	302.513094	-16.327993	159.215520360189	-7.3232353	1324.15510534	
2023-Mar-04 16:00	*m	315.029080	-25.257177	159.215343438842	-7.3844814	1324.15363393	
2023-Mar-04 17:00	*m	329.807370	-32.252220	159.215164847589	-7.4612418	1324.15214864	
2023-Mar-04 18:00	*m	346.893723	-36.491400	159.214984273817	-7.5483212	1324.15064685	
2023-Mar-04 19:00	Nm	5.278358	-37.276573	159.214801539210	-7.6398167	1324.14912709	
2023-Mar-04 20:00	m	23.113959	-34.456414	159.214616611990	-7.7295220	1324.14758910	
2023-Mar-04 21:00	m	38.928933	-28.540712	159.214429609115	-7.8113525	1324.14603384	
2023-Mar-04 22:00	m	52.362730	-20.346964	159.214240788282	-7.8797623	1324.14446347	
2023-Mar-04 23:00	m	63.830411	-10.629397	159.214050530296	-7.9301243	1324.14288114	
2023-Mar-05 00:00	m	74.000205	0.044534	159.213859312988	-7.9590473	1324.14129084	
\$\$EOE							

DONDE RECIBIRLAS: POSICIÓN

<https://eyes.nasa.gov/dsn/dsn.html>



SETUP BÁSICO: BANDA S

Receptor que cubra de 2.2 a 2.3GHz

SDR: Pluto, Hackrf, Bladerf, Ettus, etc..

SDR + conversor: airspy, rtl-sdr, etc..

Analógico: Aor AR5000A, Icom R8600, etc..

Analógico + conversor: Icom R7000/7100/8500/9000, PCR1000/2500, etc...

Plato 60cms o superior en tripode

Iluminado por lata de aceitunas con monopolo, Patch para QO100 resintonizada.

Amplificador de bajo ruido

Idealmente menos de 2dB. Aconsejable pero no imprescindible.

LRO 2.2GHZ GUADARRAMA 2015 AOR AR5000+SDRIQ PLATO 60CM



<https://www.youtube.com/watch?v=XJzGVGeIXlg>

SETUP BÁSICO: BANDA X

Conversor de 8.4 a 8.5GHz

Módulos chinos, surplus de uW, o Kuhne Electronics

Receptor usado como IF del conversor

SDR: Pluto, Hackrf, Bladerf, Ettus, airspy, rtl-sdr, etc..

Analógico: Aor AR5000A, Icom R7000/7100/8500/8600/9000, etc..

Con CAT, resolución de 10Hz o mejor y salida de IF en 10.7MHz

Plato 1mt o superior motorizado

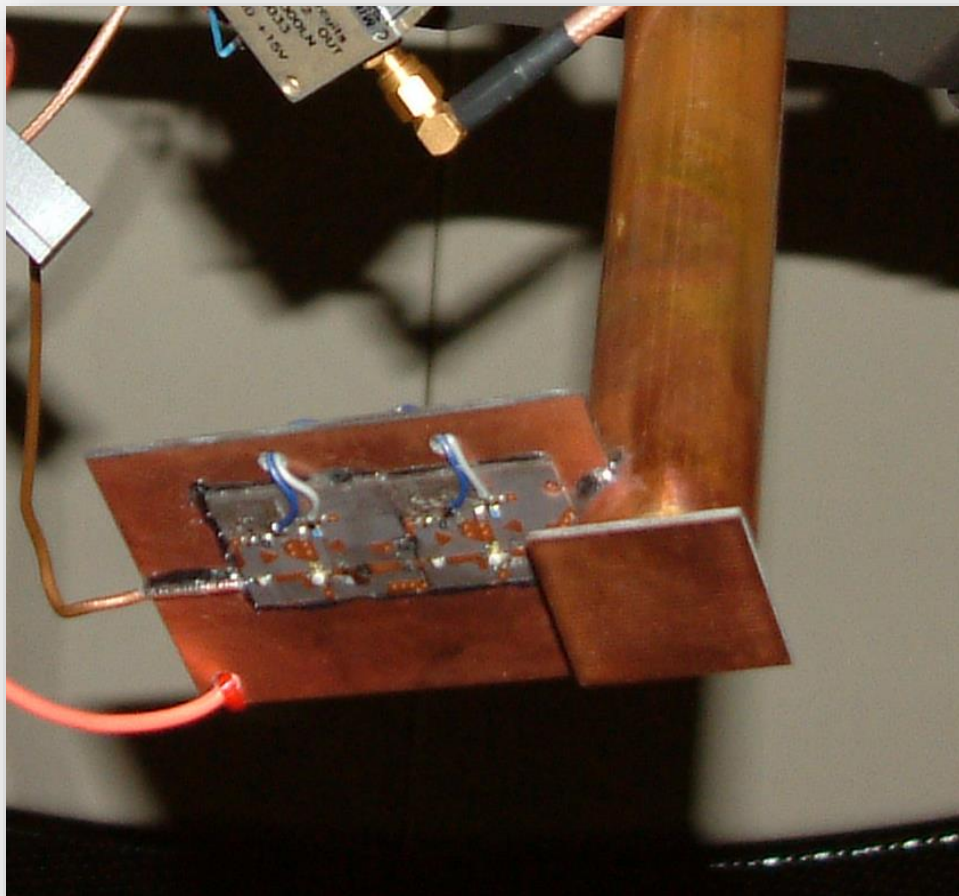
Iluminador con fontanería, la polarización circular añade 3dB de mejora.

Amplificador de bajo ruido

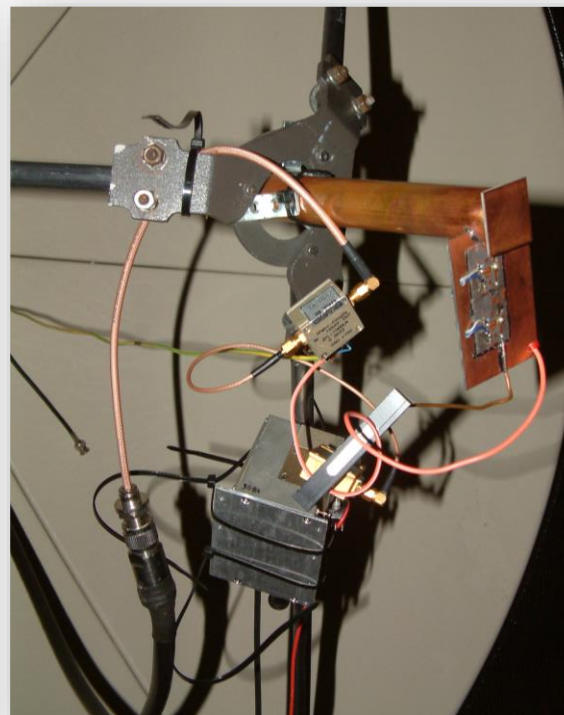
Idealmente menos de 1dB de NF. Imprescindible menos de 3dB.

HARDWARE BANDA X VIEJA ESCUELA (2005)

LNB BANDA Ku convertido en LNA



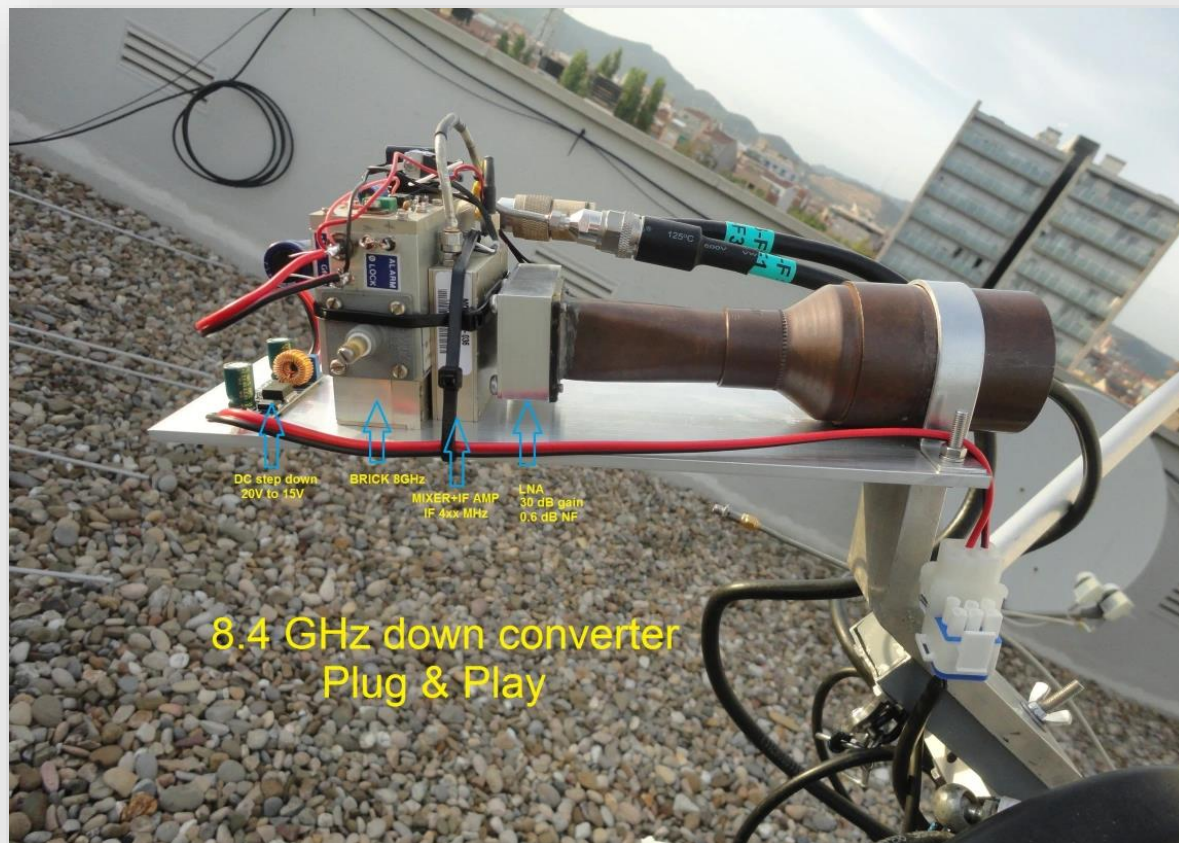
1er TEST!



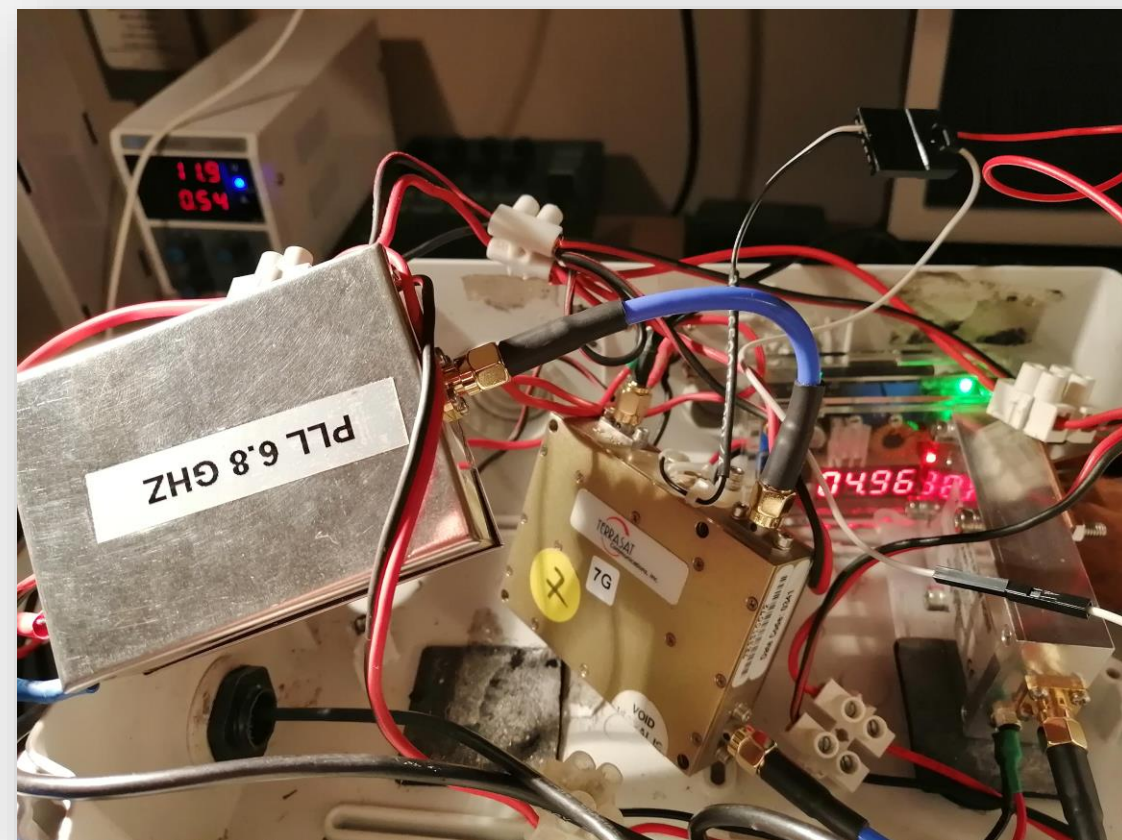
LO 8GHz + MIXER + AMP IF



HARDWARE BANDA X SURPLUS MICROONDAS

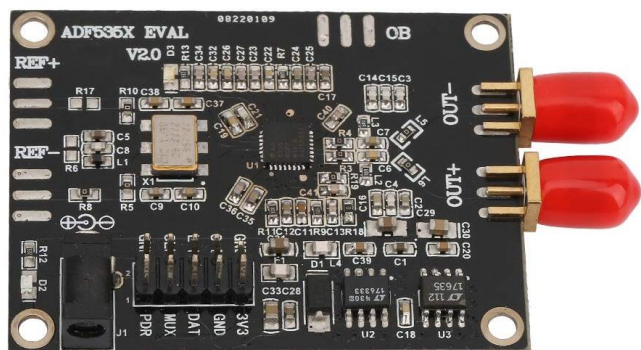


EA3HMJ



EA1IW

HARDWARE BANDA X MODULOS CHINOS



ADF5355 de 54MHz a 13.1GHz

TGCHR Store



工作频率 : 2-18GHz
18dB增益典型值
+5V单电源供电

LNA QM-LNA0218T

DYKB-mezclador pasivo de SIM-153

Passive Mixer

SIM-153 3.4G-15GHz

SIM-14 3.7G-10GHz



HARDWARE BANDA X KU LNC 8085 C PRO2



HARDWARE BANDA X ILUMINADORES

DUAL MODE EN POLARIZACIÓN LINEAL con o sin POLOARIZADOR CIRCULAR



<http://www.g3pho.free-online.co.uk/microwaves/horn.htm>

SEGUIMIENTO: SOFTWARE

DSN - JPL Horizons

Setup Refresh Rate Horizons Web

RA 08:52:44.47 DEC +17:29:26.6

Jet Propulsion Laboratory
California Institute of Technology

STEREO-A

Azimuth **262.23°** Elevation **33.06°**

View file

Range-Rate -1.9669654

Presets

JUNO	7
STEREO-A	8
STEREO-B	9
4	10
5	Sun
6	Moon

Omni-Rig

RX **1253.791278** Mode **FM** VFO - Status **On-line**

Mode: LSB USB FM AM CW CWR DIG DIGR

VFO: A B A-B B-A

Use OmniRig ☒ Configure

Rig ☒ #1 ☐ #2

To Radio **1,253,791,278**

Frequency (Hz) 8,403,736,140

LO (Hz) 7,150,000,000

RX (Hz) 1,253,736,140

Doppler (Hz) 55,138

RX Corrected (Hz) 1,253,791,278

Press <ESC> to Quit

PSTROTATOR + OMNI-RIG

RIG 1 RIG 2 About

Rig type NONE

Port COM 1

Baud rate 9600

Data bits 8

Parity None

Stop bits 1

RTS High

DTR High

Poll int., ms 500

Timeout, ms 4000

OK Cancel

PstRotator - Registered to YO3DMU v16.58

Communication Setup Tracker RA/DEC GeoSats Maps My Maps Google Maps APRS EME DSN View Show Preset Help

AZ **223.9** **151** **GO**

UTC **17:17:57**

SP **STOP** **P** **PARK**

Mode ☒ Manual ☐ Tracking

QRZ

EL **44.4** **21** **GO**

QRB km

QTH Locator

GO to Locator

Hot A Hot B

BD 0 90

UTC

Presets

1	7
2	8
3	9
4	10
5	11
6	12

DXCC

DX Local Time: ?

1A: Sov Mil Order of Malta
1S: Spratly Islands
3A: Monaco
3B: Agalega & St. Brandon
3B: Mauritius
3B: Rodriguez Island
3C: Equatorial Guinea

Call

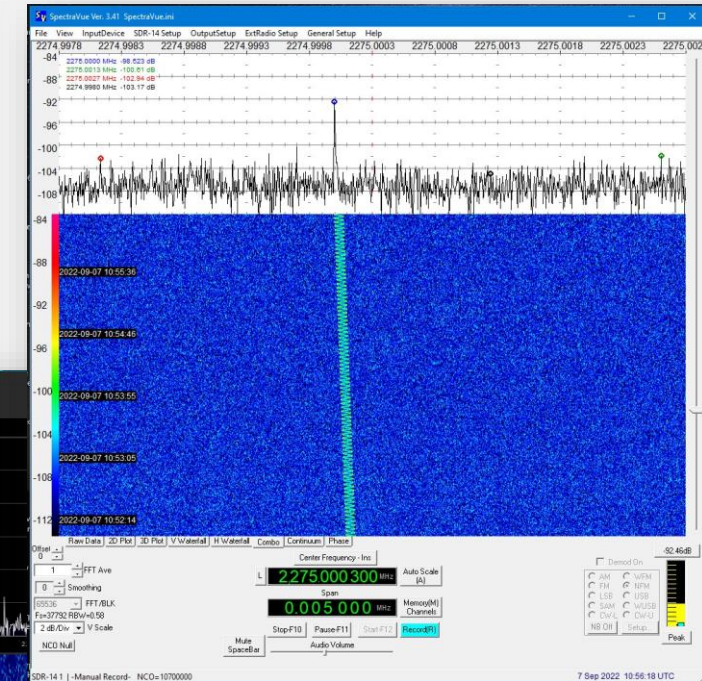
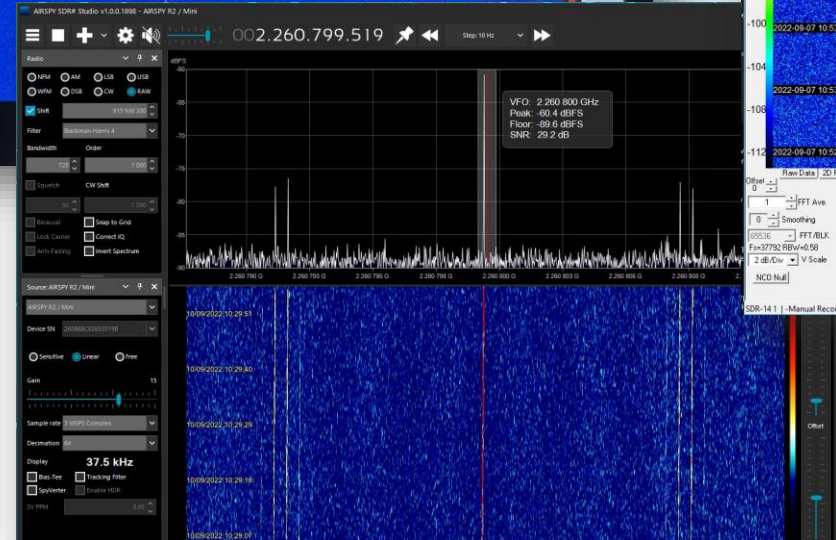
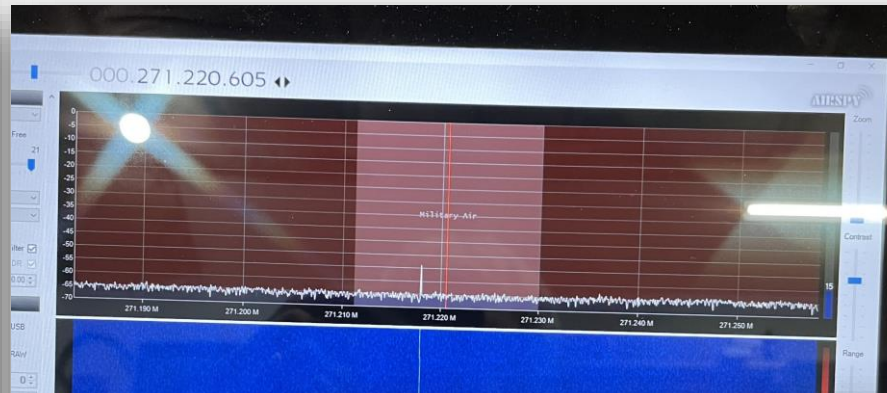
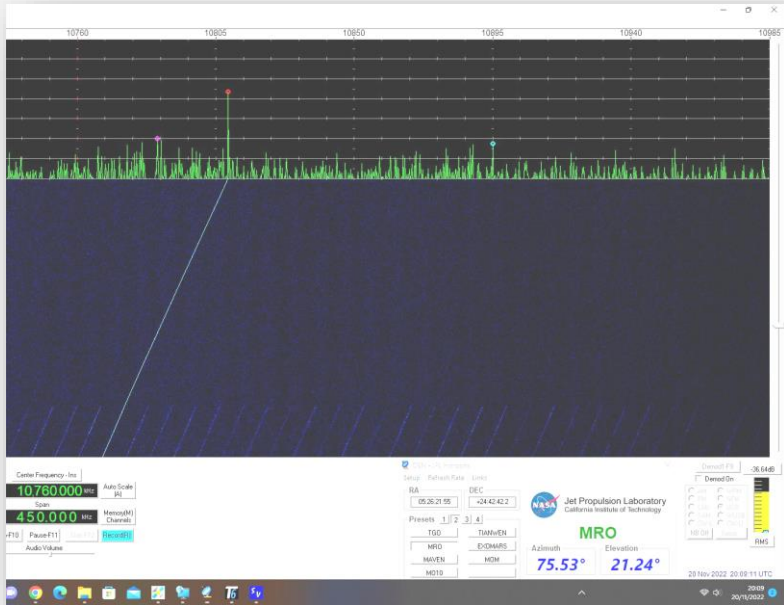
GO to DXCC

SEGUIMIENTO: ROTORES



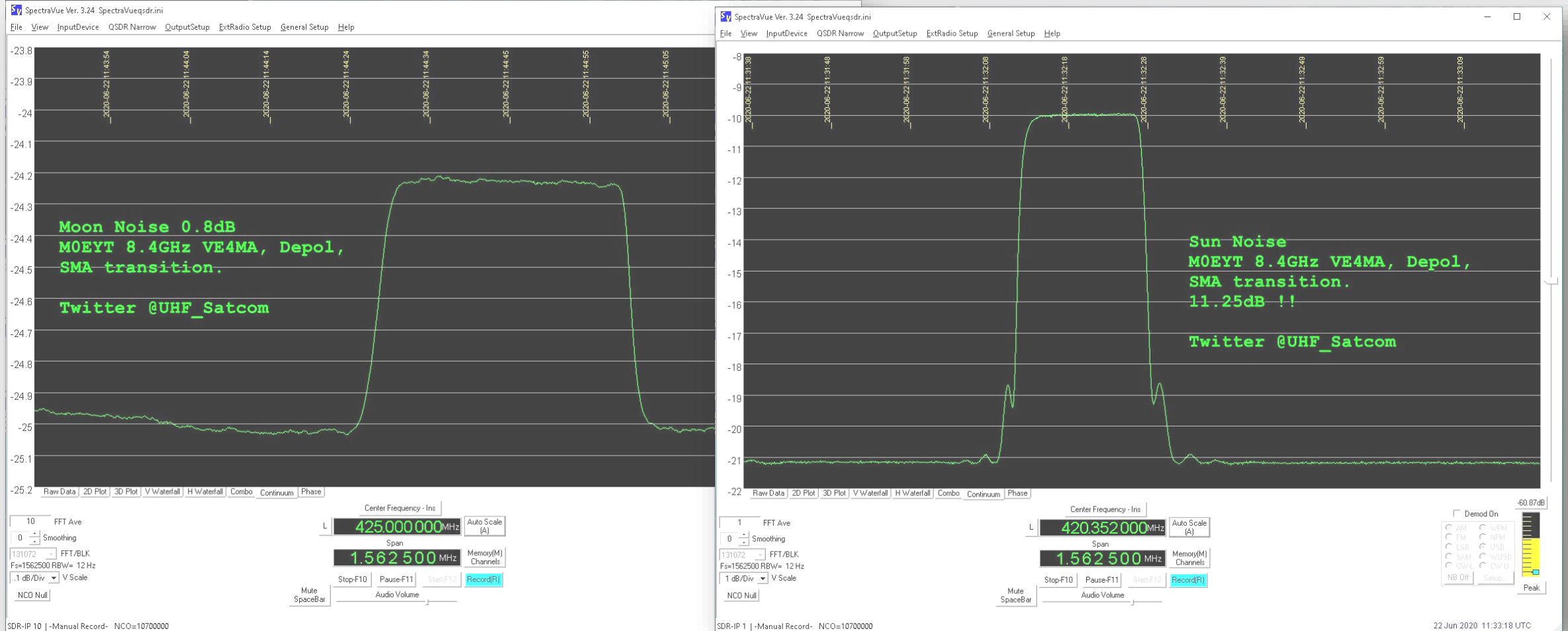
SOFTWARE PROCESADO/VISUALIZACIÓN

REQUISITO: FFT con resolución de 3Hz o menor (velocidad muestreo / tamaño FFT)



Spectravue, SDR#, SDR++, SDRConsole, Baudline, GQRX, SigDigger, Matab, etc..

APUNTAMIENTO CALIBRACIÓN CON EL SOL O LUNA



QUIEN LAS ESTÁ RECIBIENDO

Luis EA5DOM, plato offset de 2.4mts

Jose EA3HMJ, plato offset de 1.8mts

Antonio EA1IW, plato offset de 1.8mts / offset 85cm

Miguel CT1BYM, plato foco centrado 3mts

Antonio EA4LE, plato offset 80cms

Sergio EA3EMG, plato offset 1.5mts

Nacho EA1LO, plato foto primario 1.8mts

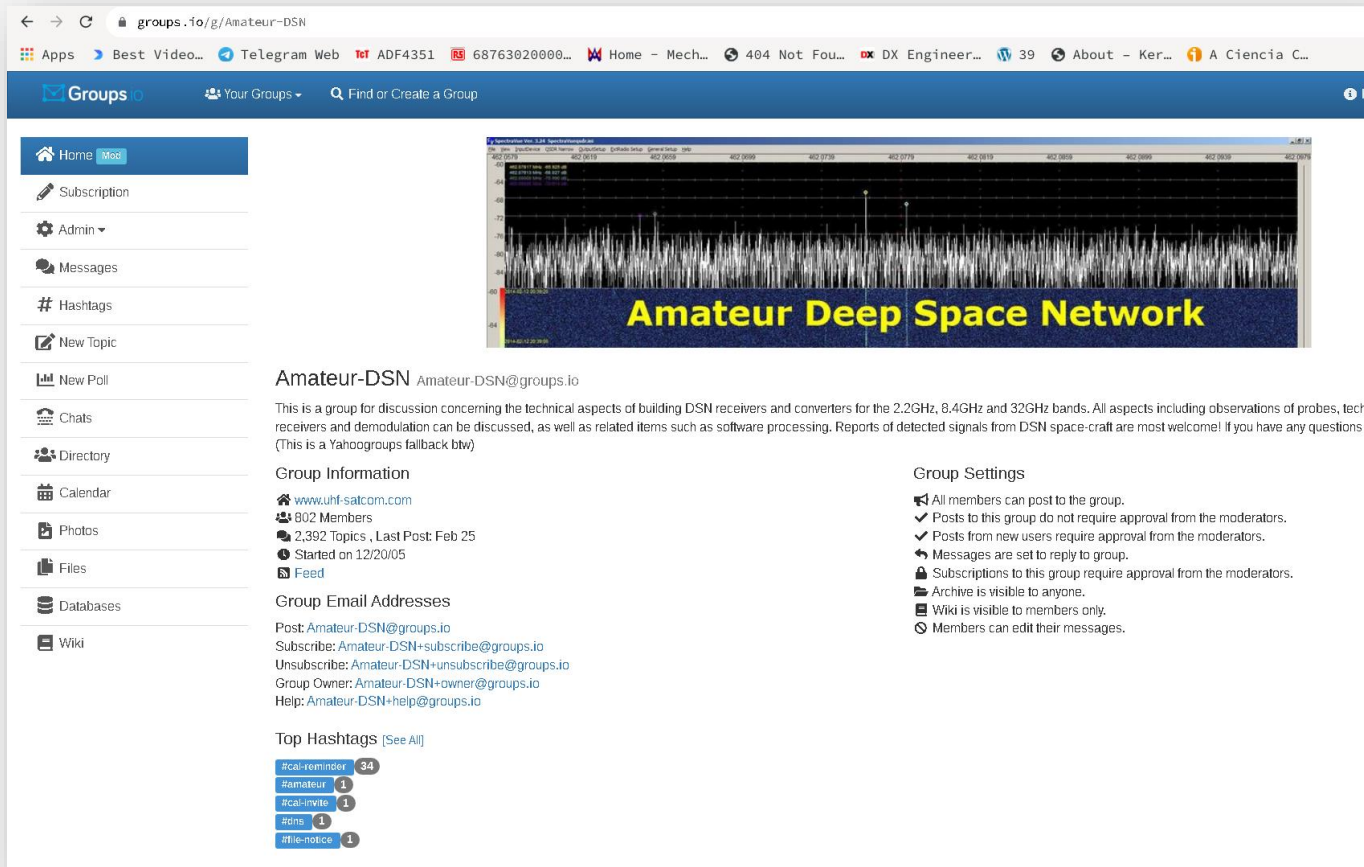
Iban EB3FRN, plato offset 2.4mts / prime focus 1mt

¿ Me dejo a alguien? ¿Quién más?



INFO ADICIONAL

<https://groups.io/g/Amateur-DSN>



Amateur-DSN Amateur-DSN@groups.io

This is a group for discussion concerning the technical aspects of building DSN receivers and converters for the 2.2GHz, 8.4GHz and 32GHz bands. All aspects including observations of probes, technical receivers and demodulation can be discussed, as well as related items such as software processing. Reports of detected signals from DSN space-craft are most welcome! If you have any questions or comments, please post them here. (This is a Yahoo!groups fallback btw)

Group Information

- www.uhf-satcom.com
- 802 Members
- 2,392 Topics, Last Post: Feb 25
- Started on 12/20/05
- Feed

Group Email Addresses

Post: Amateur-DSN@groups.io
Subscribe: Amateur-DSN+subscribe@groups.io
Unsubscribe: Amateur-DSN+unsubscribe@groups.io
Group Owner: Amateur-DSN+owner@groups.io
Help: Amateur-DSN+help@groups.io

Group Settings

- All members can post to the group.
- Posts to this group do not require approval from the moderators.
- Posts from new users require approval from the moderators.
- Messages are set to reply to group.
- Subscriptions to this group require approval from the moderators.
- Archive is visible to anyone.
- Wiki is visible to members only.
- Members can edit their messages.

Top Hashtags [See All]

- #cal-reminder 34
- #amateur 1
- #cal-invite 1
- #ans 1
- #file-notice 1

https://twitter.com/uhf_satcom

<https://twitter.com/coastal8049>

<https://twitter.com/df2mz>

<https://twitter.com/amsatdl>

<https://twitter.com/nascom1>

https://twitter.com/supertrack_it

https://twitter.com/usa_satcom

<https://twitter.com/aang254>

<https://twitter.com/ea4gpz>

<https://twitter.com/ct1bym>

<https://twitter.com/ea3hmi>

<https://twitter.com/ea1iw>

<https://twitter.com/ea4le>

<https://twitter.com/ea3emg>

GRACIAS POR VUESTRA ATENCIÓN

¿Alguna pregunta?