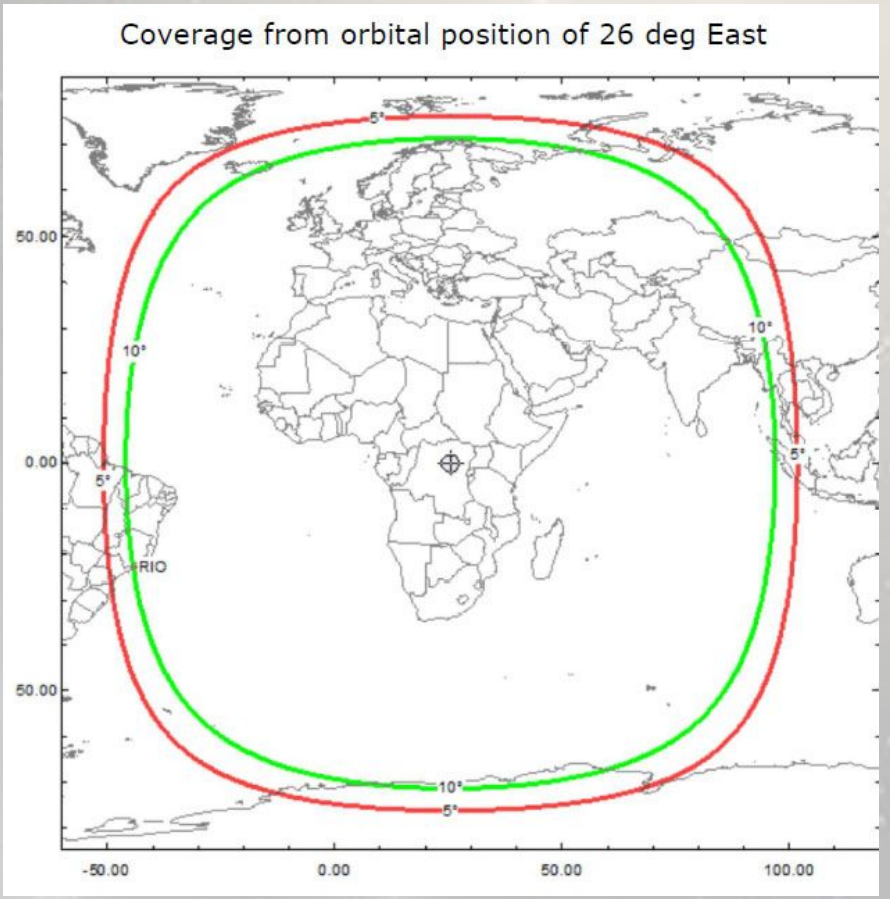
QATAR-OSCAR 100
Es'Hailsat 2

Il primo satellite geostazionario amatoriale

Quando è stata l'ultima volta che hai fatto qualcosa di nuovo?

ARI Roma,
20 Febbraio 2019
IK0USO Marcelo Teruel
IZ0MJE Stefano Sinagra

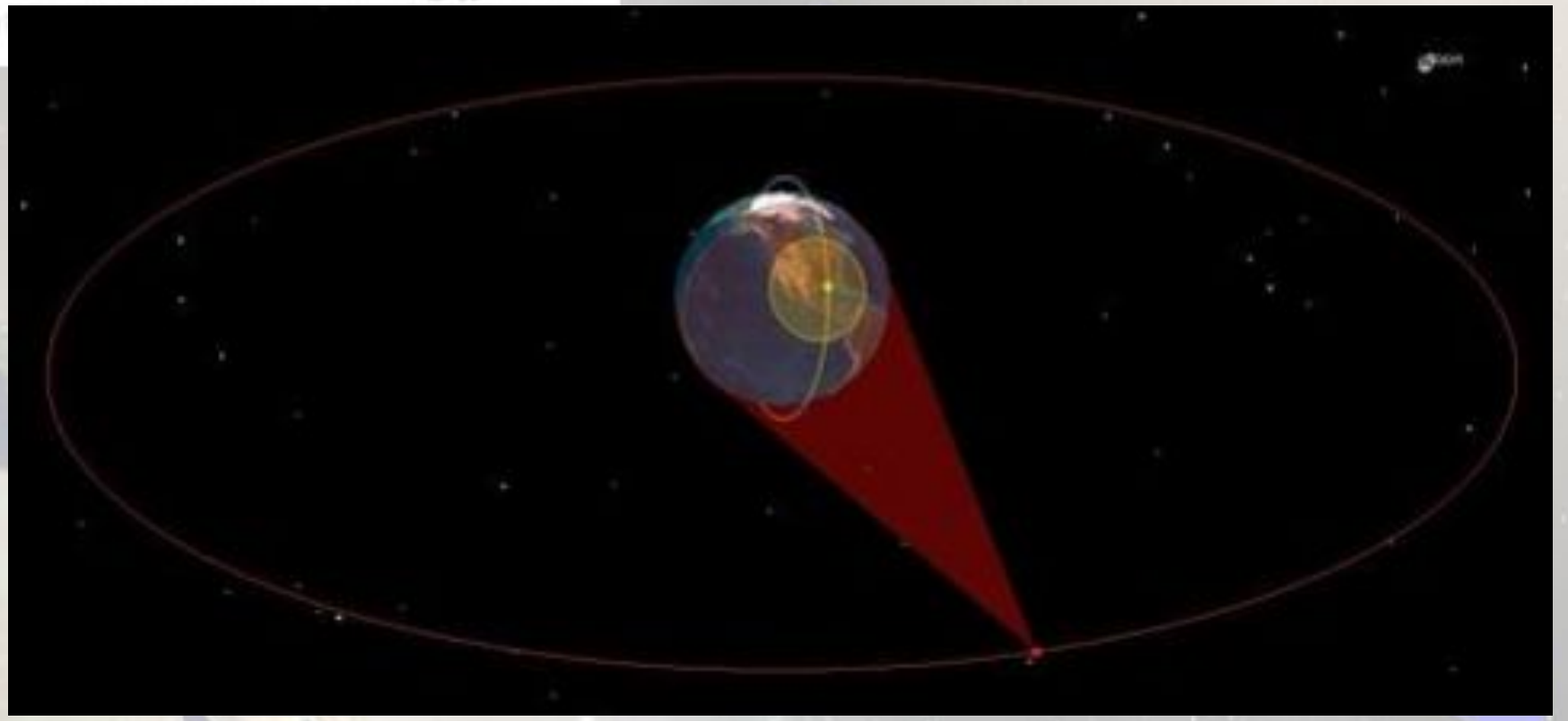
IL SATELLITE



- Costruito dalla Mitsubishi per conto della ***Qatar Amateur Radio Society***
- Lanciato nel Novembre 2018
- Orbita geostazionaria (1)
  - 36’000 Km dalla Terra: un bel DX in banda UHF/SHF (2)
  - appare fermo > no effetto doppler
  - Copertura di circa ⅓ del mondo abitato
- Attivato nel Febbraio 2019
- **2 transponder radioamatoriali a bordo**
  - banda stretta (SSB, CW, digi)
  - banda larga (D-ATV)

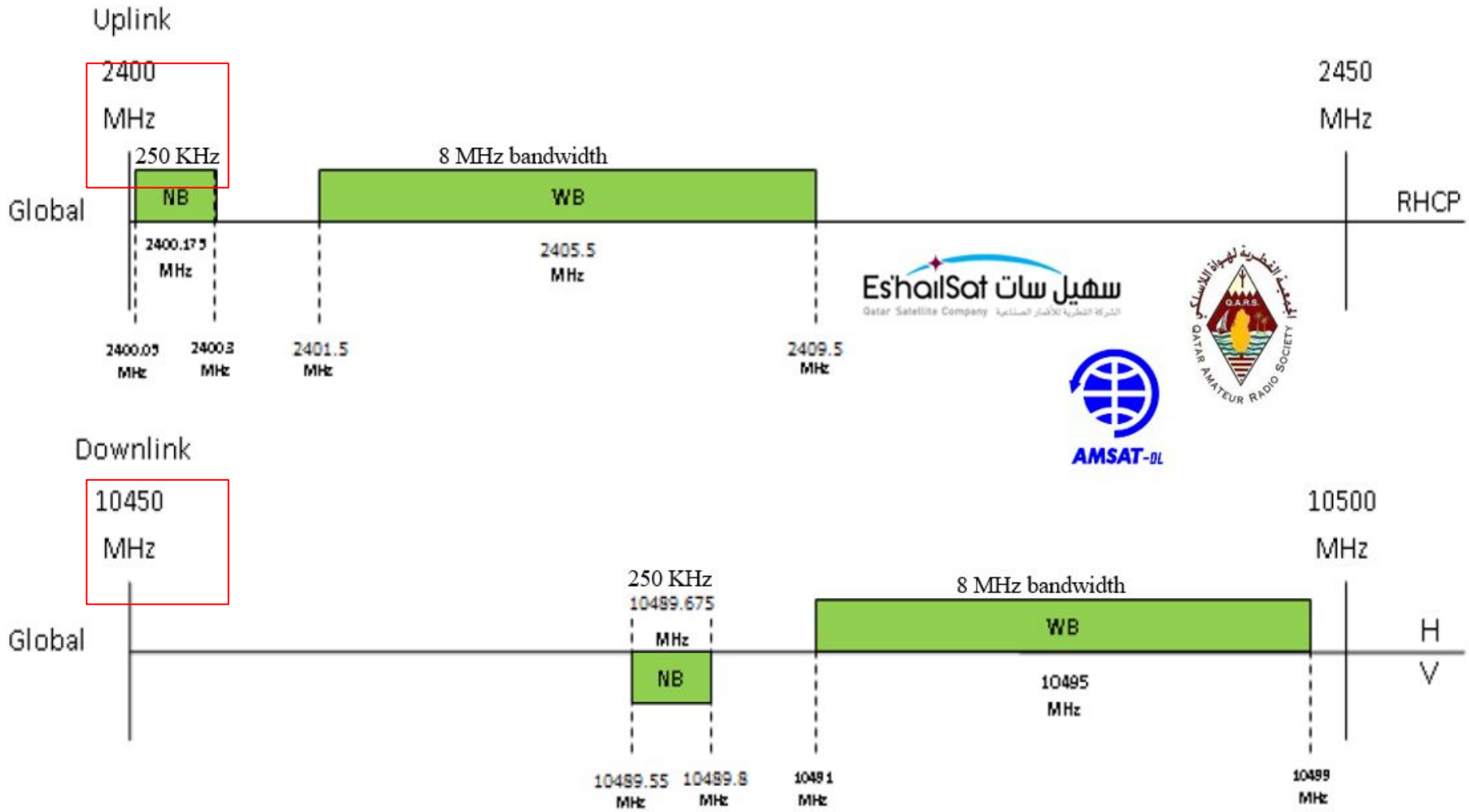
(1) https://it.wikipedia.org/wiki/Orbita_geostazionaria
(2) Circonferenza 40’000Km circa

LEO e GEO



La diversa distanza dalla Terra, oltre che sull' “impronta” al suolo ha ovviamente implicazioni su potenze necessarie, guadagno e puntamento delle antenne e costi operativi.

BANDPLAN



Xpdr	U/L FREQUENCY (MHz)				D/L FREQUENCY (MHz)				LO	BW
No	Pol	Begin	Center	End	Pol	Begin	Center	End	(MHz)	(MHz)
NB	RHCP	2400.05	2400.175	2400.3	V	10489.55	10489.675	10489.8	8089.5	0.25
WB	RHCP	2401.5	2405.5	2409.5	H	10491	10495	10499	8089.5	8

BANDPLAN
(banda stretta)

Uplink [MHz]	Downlink [MHz]	available Bandwidth [kHz]	Notes
	10489,550 – 10489,555	do not transmit	Lower Beacon, 400 Bit/s BPSK or CW
2400,055 – 2400,100	10489,555 – 10489,600	45	CW Only
2400,100 – 2400,120	10489,600 – 10489,620	20	narrowband digimodes (500 Hz max. BW)
2400,120 – 2400,140	10489,620 – 10489,640	20	digimodes (2700 Hz max. BW)
2400,140 – 2400,190	10489,640 – 10489,690	50	mixed modes (2700 Hz max. BW)
2400,190 – 2400,295	10489,640 – 10489,795	105	SSB only
	10489,795 – 10489,800	do not transmit	Upper Beacon, 400 Bit/s BPSK or CW

- Bandplan raccomandato. FM non consentita.
- Non trasmettere al di fuori dell'intervallo delimitato dai due beacon.
- In caso di uplink troppo potente un sistema automatico (LEILA 2) inserirà un tono a sirena sul segnale di downlink corrispondente. In tal caso la potenza va ridotta immediatamente.

RICEZIONE DOWNLINK NB TRANSPONDER

PARABOLA > LNB PLL > T-BIAS > SDR / SCANNER @ 739 MHz

PARABOLA > LNB PLL (modificato)+ T-BIAS + RX @ 435Mhz

739 MHz

12V

Es'hailSat سهيل سات
Qatar Satellite Company

LNB - PLL

OCTAGON

Startseite » Produkte » LNB » Optima-Serie » OCTAGON OPTIMA LNB Single OSLO PLL

OCTAGON OPTIMA LNB Single OSLO PLL

OCTAGON OPTIMA LNB Twin Slim OTLSO PLL

INVERTO
IDLB-SNL410
PREMU-OPN

SYNCRO SY0630001VC

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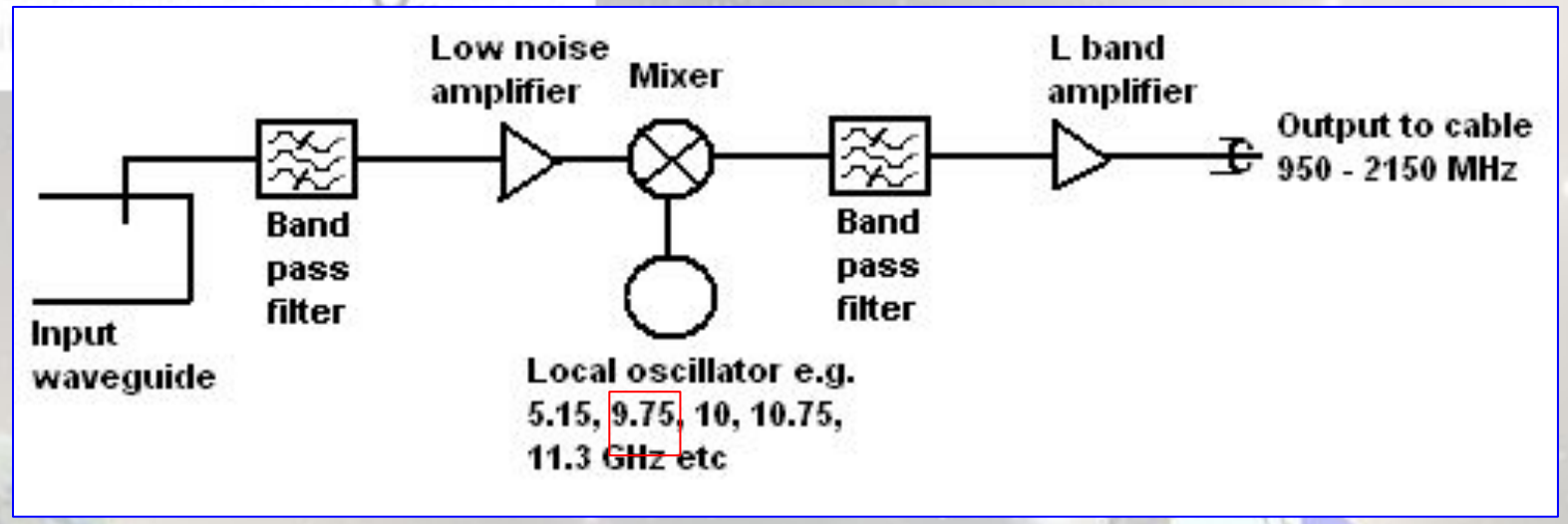
LNB TV SAT

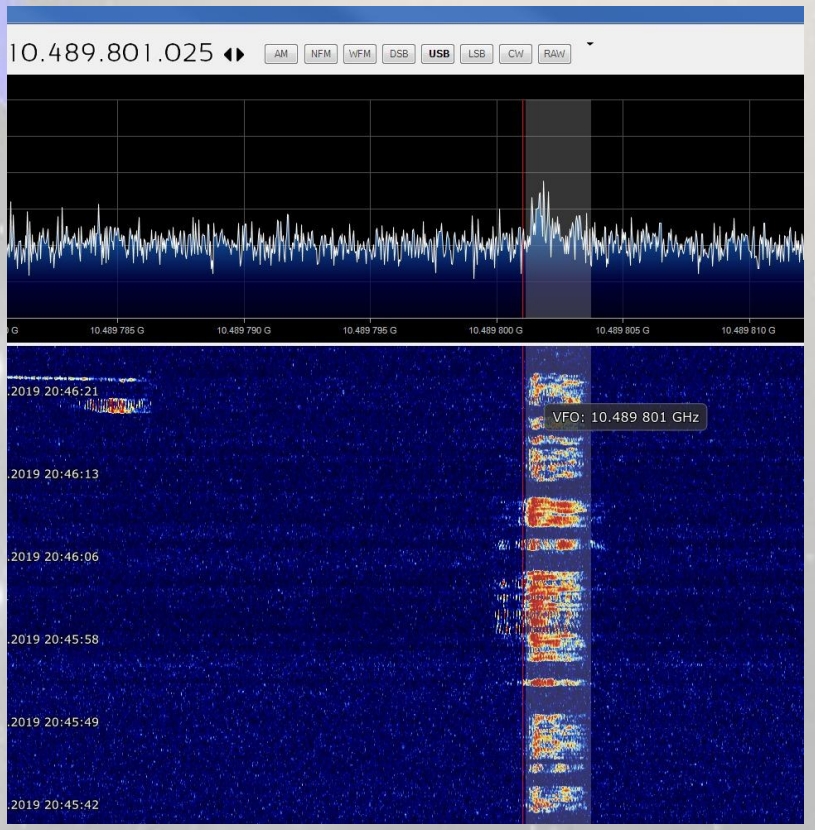


O.L 9,750 GHz o 10,600 GHz

10,489 - 9,750 = 739 MHz
10,489 - 10,185 = 435 MHz

La tensione di alimentazione comanda la polarizzazione (12-18V)
Un tono a 22kHz comanda la scelta dell'O.L.

RASPBERRY PI



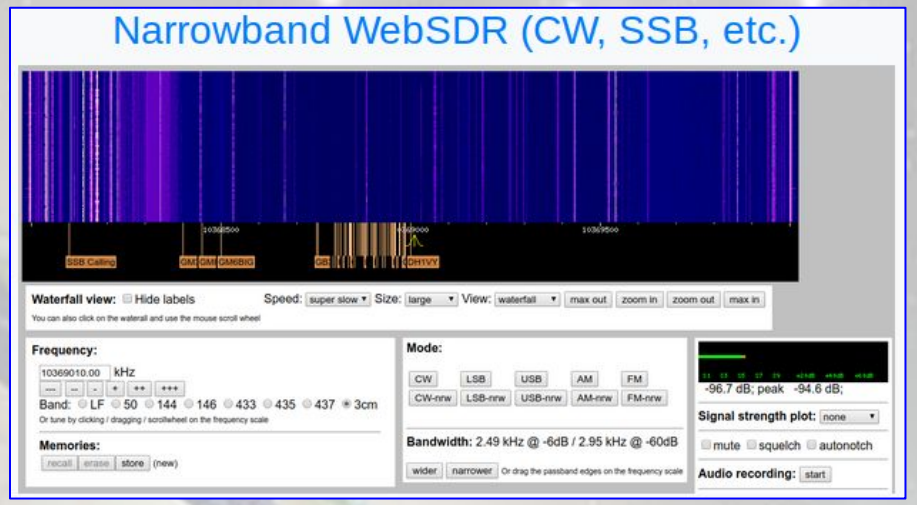
RICEZIONE DOWNLINK WB TRANSPONDER

PARABOLA > LNB PLL > CONVERTER > RX SAT (DVB-S2)

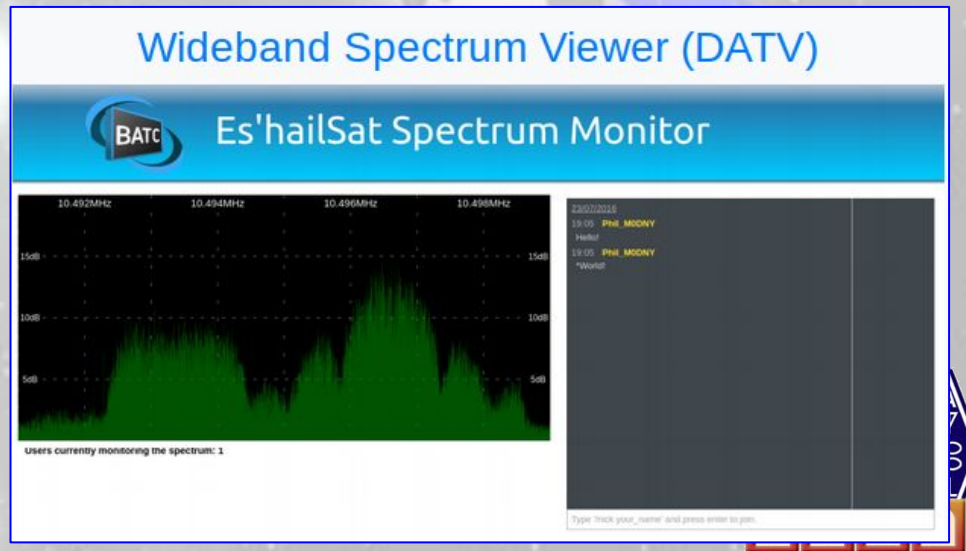
PARABOLA > LNB PLL (modificato) > RXSAT (DVB-S2)

SUP-2400

WEB RECEIVERS
...PER I PIU' PIGRI...



< RIC. BANDA STRETTA
https://eshail.batc.org.uk/nb/



RIC. BANDA LARGA >
https://eshail.batc.org.uk/wb/
(senza demodulazione)

UPLINK (NB)

System Design: Ground Segment

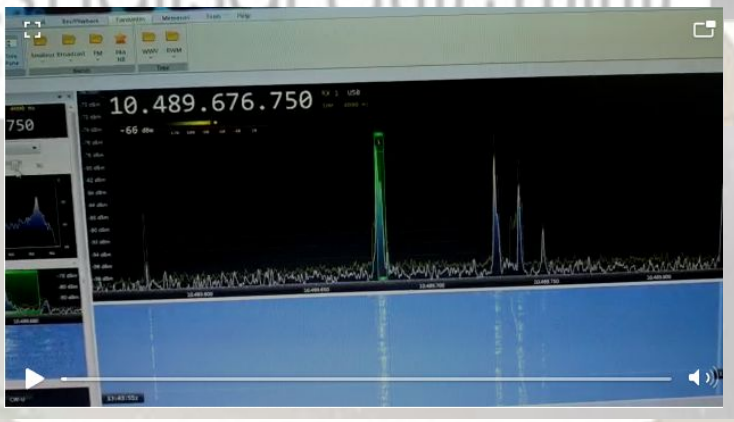
- Target user segment:
  - 89 cm dishes in rainy areas at EOC, like Brazil
  - 60 cm around coverage peak.
  - 75 cm dishes elsewhere.
  - 10 W BUCs
- Initial link budgets with worst case satellite performance.

Uplink (EOC, SFD = -106 dBW/m2)			Downlink (EOC)		
Freq	2.4	GHz	Freq	10.5	GHz
Dish size	0.75	m	TWTA output power	100	W
Ant gain	23.64	dBi	OBO	6	dB
HPA Output Power	10	W	On-board losses	1.5	dB
Uplink path losses	1.5	dB	S/C Ant. Gain	17	dBi
Ground EIRP	32.14	dBW	S/C EIRP	29.5	dBW
			Power sharing	50	channels
			S/C EIRP per channel	12.5	dBW
Earth-S/C distance	41126	Km			
Free Space Loss	192.3	dB	Free Space Loss	205.1	dB
95% availability att	0.12	dB	95% availability att	0.55	dB
S/C G/T	-12	dB/K	Ground Sta. G/T	13.98	dB/K
C/N0	56.3	dBHz	C/N0	49.4	dBHz
Channel Bw	2.5	KHz	Channel Bw	2.5	KHz
C/N per user (PEP)	22.3	dB	C/N per user (Avg.)	15.4	dB

MDS reale in CW: 30 dBm + 7,5 dB = 37,5 dBm / 7,5W ERP / 7 dBW

QSO in SSB con 32 dBm + 11 dB = 43 dBm / 17,4W ERP / 13 dBW

UPLINK - IN PRATICA



Rocco Ik8xld

Il transponder del Satellite Geo ha una sensibilità altissima. QSO appena effettuato con I8UZA. Solo trv sglabs e parabola da 80

15:46

Vale iz5ilx

500 mw ellca 25 elementi RHCP

16:54

TEST QRP

16:55

+39 347 904 9024 ~MAURO (IK1WVQ)

> **Vale iz5ilx**
> TEST QRP

ti sto' ricevendo .. debola ma erfettamente comprensibile .. co

Ritwittato da Luciano🇮🇹🇮🇹Gasparini

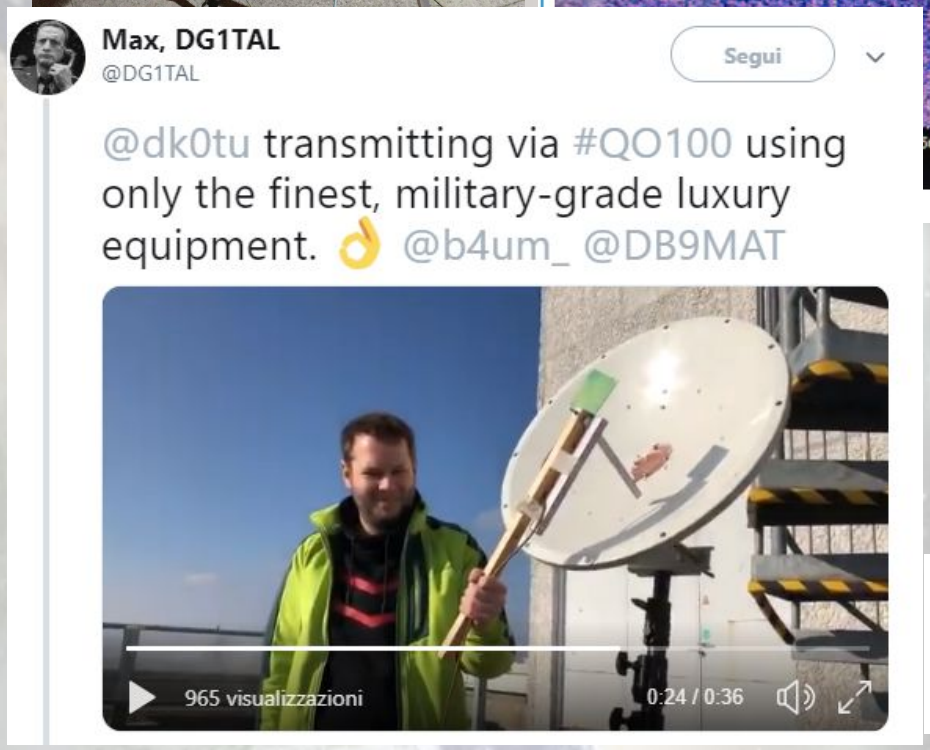
Wouter @pa3weg · 1h

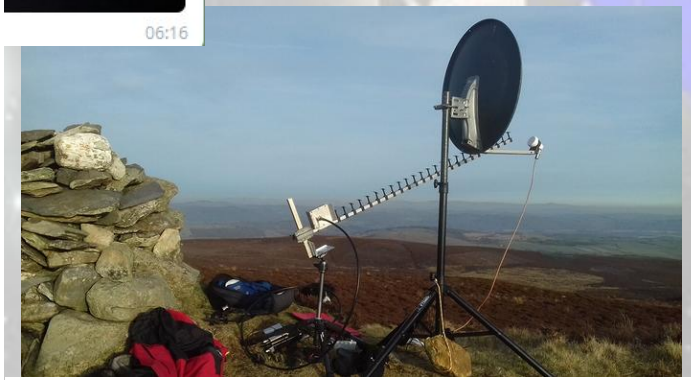
Wow.....just wow! Es'hail 2 is super sensitive and I have just worked the transponder with ~32dBm into a ~ 11dBi quad patch mounted out of my window with battery clamps. From my shack to geo, why not?! Congrats everyone involved! #hamr #Eshail2 @AmsatUK @amsatdl

2 11 54

UPLINK - IN PRATICA

TX: Parabola WI-FI -SDR Adalm PLUTO - amplificatore WI-FI 2W





Nick G0HIK - Portatile
RX: Parabola 80 cm - LNB - SDR
TX: Transverter SG-Labs 2W - Tonna 27 elementi

UPLINK
SOLUZIONI COMMERCIALI

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NEU

MKU UP 2424 A, Oscar Phase 4 Up-Converter

2400 ... 2402 MHz

Eigenständiger Up-Converter für den OSCAR PHASE 4 geostationären Satelliten
144 MHz ZF
Voll fernsteuerbar

20 W

Netto: 671,43 €
799,00 €
inkl. 19% MwSt. zzgl. Versand

KUHNE electronic
MICROWAVE COMPONENTS

Lieferzeit auf Anfrage

Transverter for 13 cm band

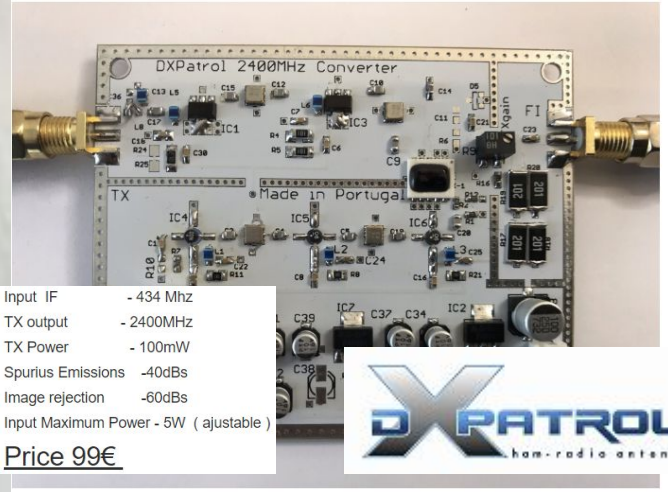
SG Laboratory Ltd

http://www.sg-lab.com/TR2300/tr2300.html

€ 218

New Es´Hail Sat (OSCAR-100) Uplink Converter.

434MHz to 2400MHz Low Cost Up convertor 100mW (or 8W) all mode TX uplink to Satellite



Input IF	- 434 Mhz
TX output	- 2400MHz
TX Power	- 100mW
Spurius Emissions	-40dBs
Image rejection	-60dBs
Input Maximum Power	- 5W (ajustable)

Price 99€

DXPATROL
ham-radio antenas

4 w wifi a banda larga amplificatore wireless router 2.4 ghz fascia di potenza signal booster spedizione gratuita

Guarda titolo originale in inglese

4.9 (19 voti) 45 ordini

Prezzo: € 17,96 / parte

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Qatar Satellite Company

	Helix 13	Helix 13-40	
Gamma di frequenze	2300-2450	2300-2450	MHz
Guadagno Righthand circular	14	16	dB
Spira	21	40	
ROS	1,5	1,5	
Potenza mass.	500	500	Watt
Connettore	N fem.	N fem.	
Diametro Asta mass.	65	65	mm
Lunghezza	0,8	1,25	m
Screen	10	10	cm
Peso	0,7	1,1	Kg
Carico cento	70	110	@ 120km/h, N
Materiale	AlMgSi 0.5, Vite V2A	AlMgSi 0.5, Vite V2A	
Ordine No.	18028	18029	

WiMo Antennen & Elektronik GmbH

Helix-13	125.00 €
Helix-13-40	135.00 €

***Winkler*-Spezialantennen**
Köselitzplatz 2, D - 09456 Annaberg, Telefon: (+49) 03733 27419
e-mail: winklerantennenbau@arcor.de

€40/€50

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Es'hailSat سهيل سات
Qatar Satellite Company

MAXIMUM®
digital technology

MAXIMUM E-85, Super Multifocus 48° Dish, Anthracit colour

FEATURES

- High performance
- Galvanized
- Pressed w/600 Ton
- Gain min. 38.3 dB
- Pole diameter 36 – 60 mm
- Designed in Denmark
- Produced in Taiwan

With up to 8 – 10 LNB's (standard delivered with LNB holder for 5 LNB's)

Back side of dish

Tilt & turn function

Possible combinations:

Ex. 1: 23,2°e – 19,2°e – 15,8°e – 13°e – 5°e - 1°w
Ex. 2: 42°e – 23,5°e – 19,2°e – 13°e – 5°e - 1°w

e = east, w = west

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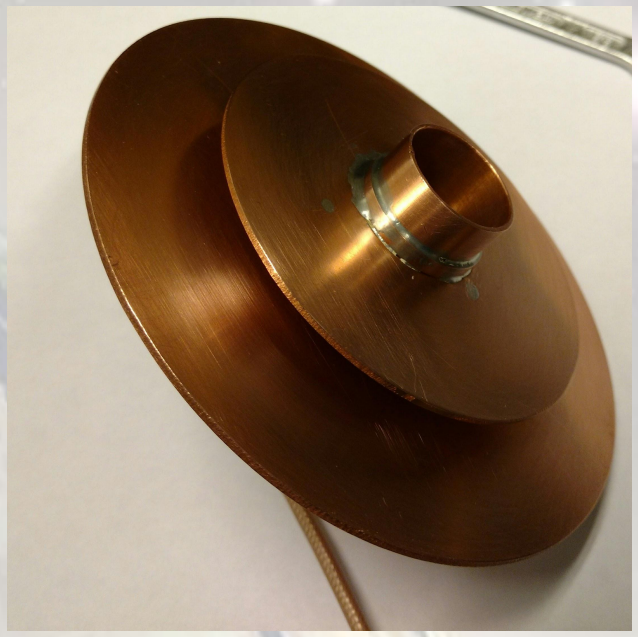

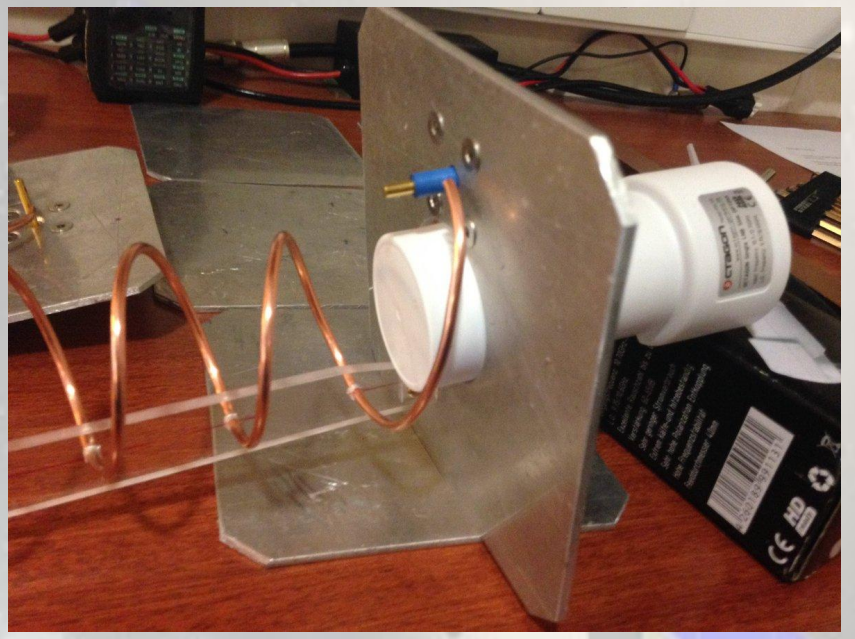

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73 GL CU ON QO100

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