



FRIST SINGAPORE STATION ON Q0-100

By gV1HY

17/12/2020

SARTS Online Meeting

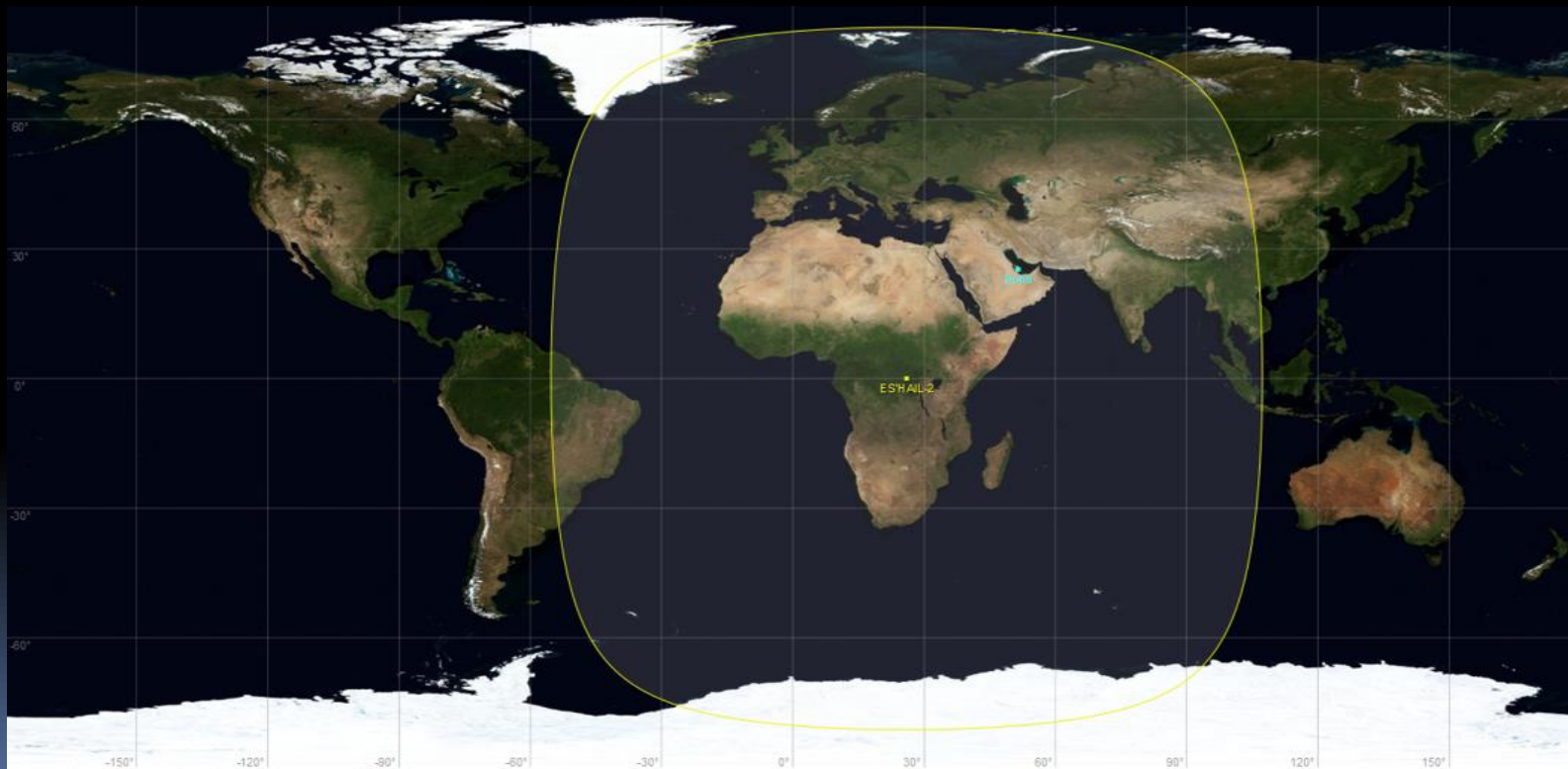
About QO-100/Es'hail-2

- Launched in Dec 2018 from US
- Owned by Qatar, amateur radio payload by AMSAT-DL
- Geostationary orbit (26 E)
- Primary payload: broadcast, communication in Africa
- Secondary payload: 2 amateur radio transponders




Coverage map

From gV:
269.7 Azimuth
4.5 Elevation



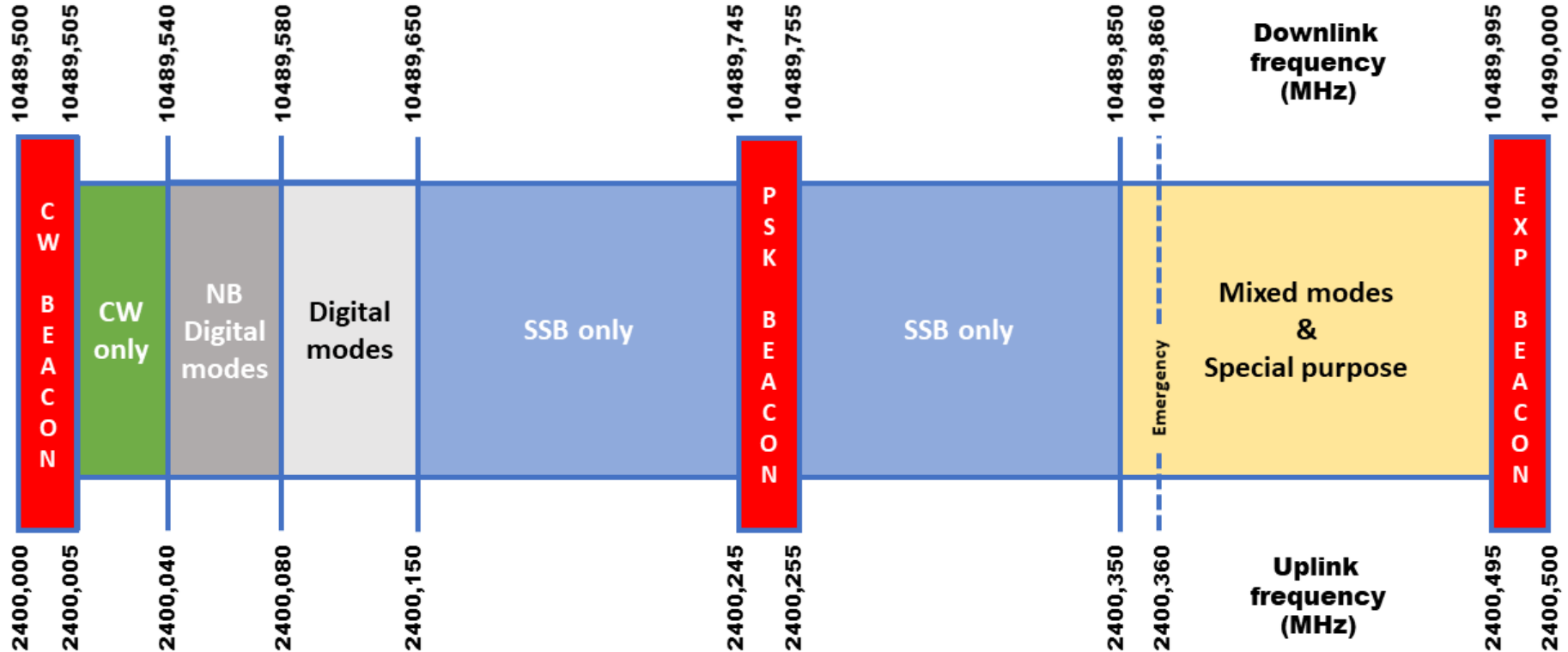


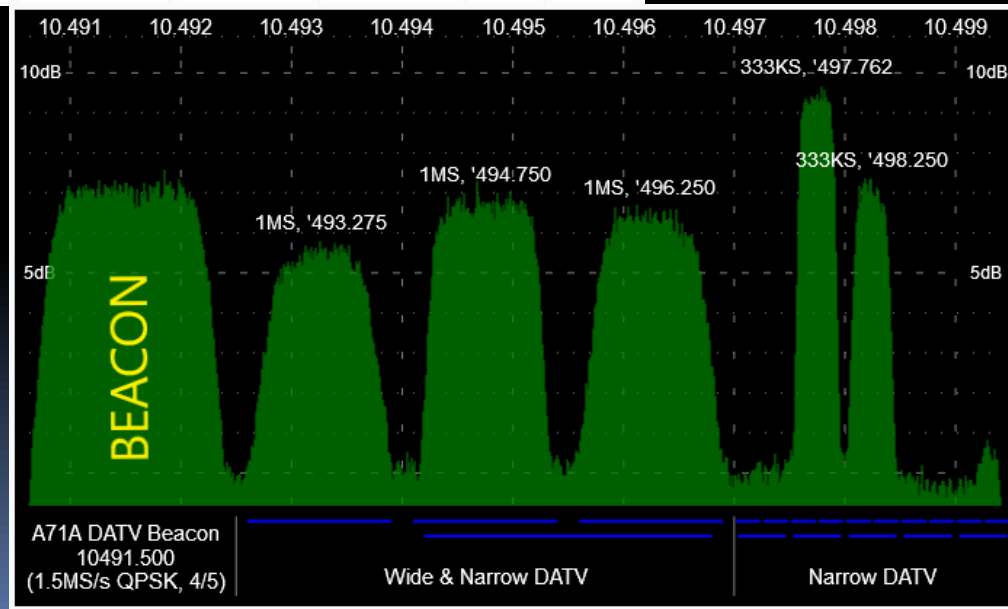
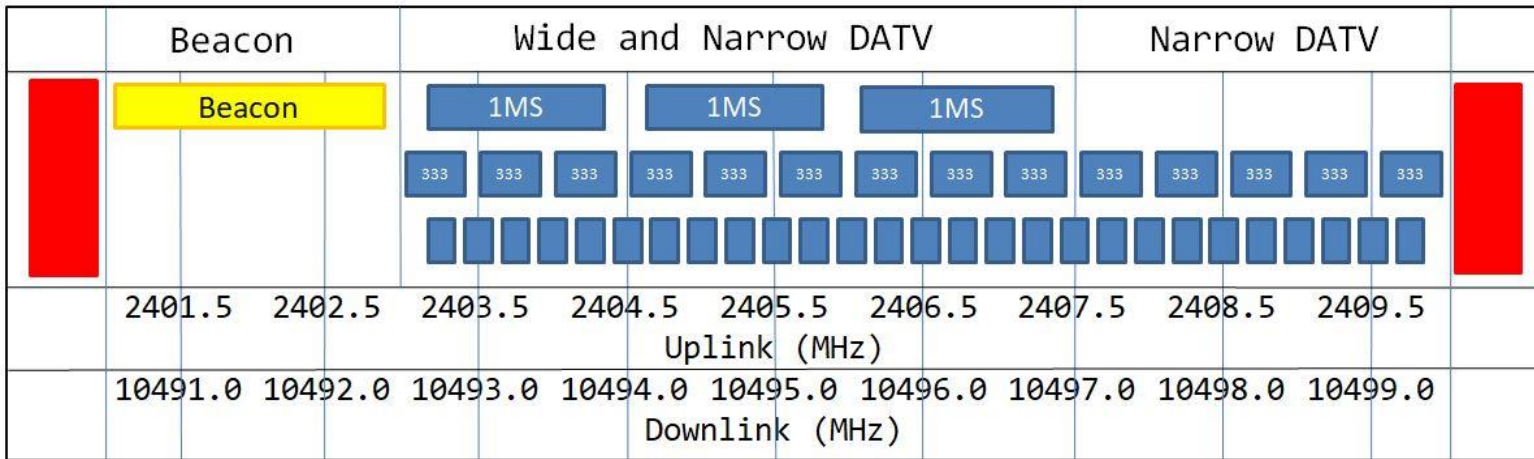
Transponder

- NB (500 kHz, Linear non-inverting)
 - Uplink: 2400.000 - 2400.500 MHz
 - Downlink: 10489.500 - 10490.000 MHz
 - CW, SSB, Digital, etc.
-
- WB (8 MHz)
 - Uplink: 2401.500 - 2409.500 MHz
 - Downlink: 10491.000 - 10499.000 MHz
 - DATV
- 

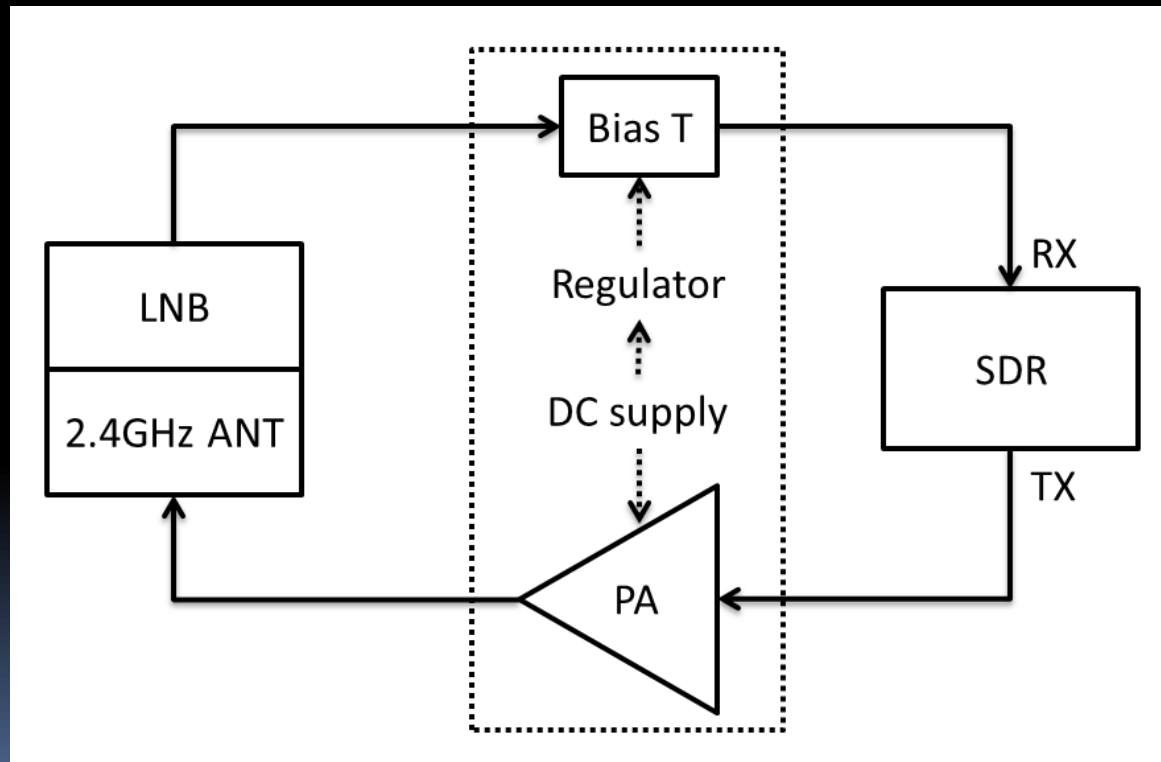
AMSAT QO-100 / P4A

NB Transponder Bandplan





Block diagram



SDR

- LimeSDR
- 100kHz-3.8GHz
- 61.44MHz bandwidth
- Full-duplex



LNB

- Ku band satellite tv receiver
- 9.75GHz LO
- 740MHz IF
- Require 12V power
- Frequency drift



Patch antenna

- Dual feed path antenna for 2.4GHz
- Common design by foreign ham



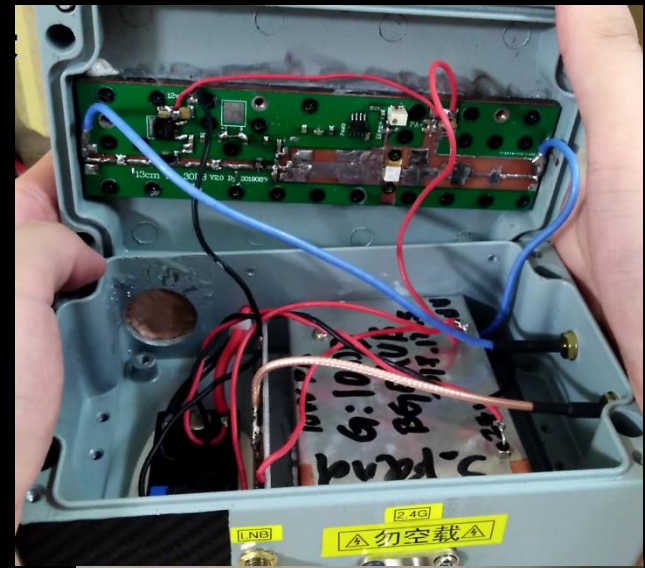
Parabolic Dish

- 1.2m diameter
- Off-axis feed



RF Amplifier

- By BGoAUB
- 24V input
- 12V regulator
- Rx bias T
- Tx PA: 30dB + ~10dB
- Output ~20W

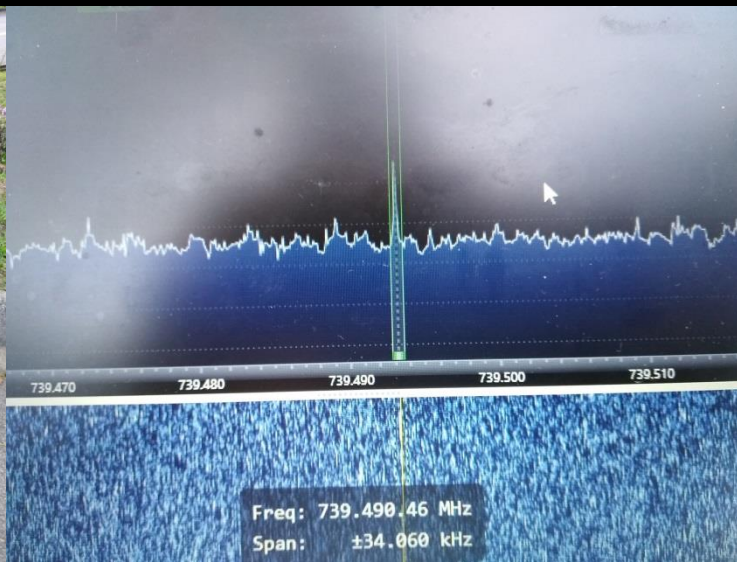


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Coverage test

- Receive using LNB direct pointing
- Audible CW beacon with ~5dB SNR



Actual test

- Manual dish pointing
- Successful received beacon with SNR >20dB



QSO on QO-100

- First QSO from Singapore via QO-100 was made on 20/1/2020 16:15z 9V1HY <-> BGoAUB
- QSO exchange: Call, RST, Handle, Grid
- Huge pileup, use split
- SSB only for now



A person wearing glasses and a headset is shown in a dark room, likely a control room or office. They are looking at a computer monitor which displays a software interface with various data fields and graphs. The person is holding a document or a tablet in front of them. The overall lighting is very low, with the primary light source being the computer screen.


9V1HY QO-100 operation 20 Jan 2020

- Demonstration to NUS professors and students
- Guest OP Emmanuel F5LIT





QSO statistics

- 230 QSOs between 20/1/2020 to 17/4/2020
 - 39 DXCC worked
 - 34 DXCC confirmed
 - 76 Grid confirmed
 - 4 continents
 - Furthest QSO: Brazil
- 



QO-100 Satellite Distance Record



QO-100 (NB) on 08-Feb-2020 at 11:47 UTC


Distance: 16,809 km.

9V1HY in Singapore (OJ11vh) \leftrightarrow PR8ZX in Brazil (GI64gl)

If you wish to claim a new record, see: <https://www.amsat.org/satellite-distance-records/>



Future improvement

- Improve Tx power
 - Make the dish more portable
 - CW & Data modes operation
 - More operation opportunities
- 



Thank you!

Q & A

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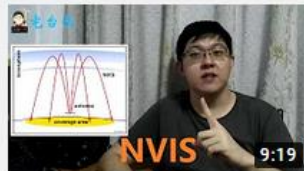
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