

S53WW

TKOC

Everything you always wanted to know about but were afraid to ask

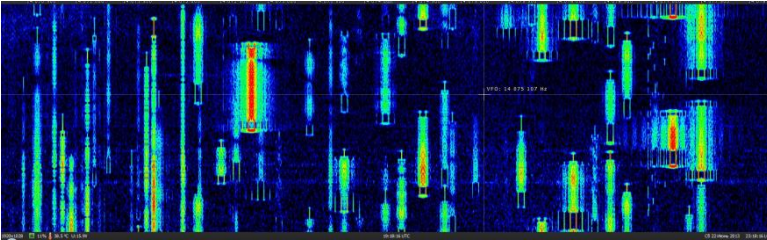
Poreč 2022

07.10.2022

TK0C GOAL – to make more QSOs than anybody else?



Time



Frequency



Coverage

S5500
Team Lead



Where do we go next?

S53MM

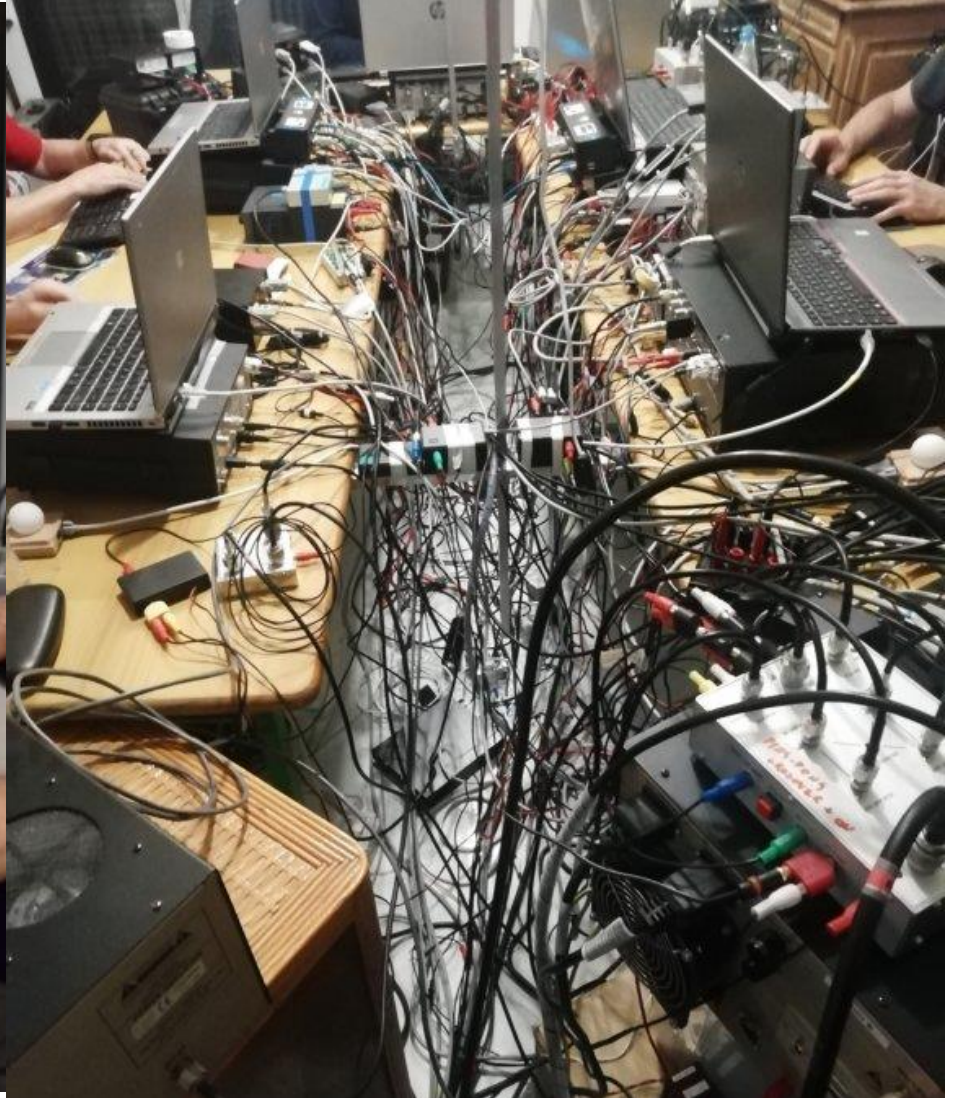


Let's win!

S53RM



These wires drive me crazy!



S53CC



Let's have fun 😊!

S53ZO



(Let's have fun 😊!)²

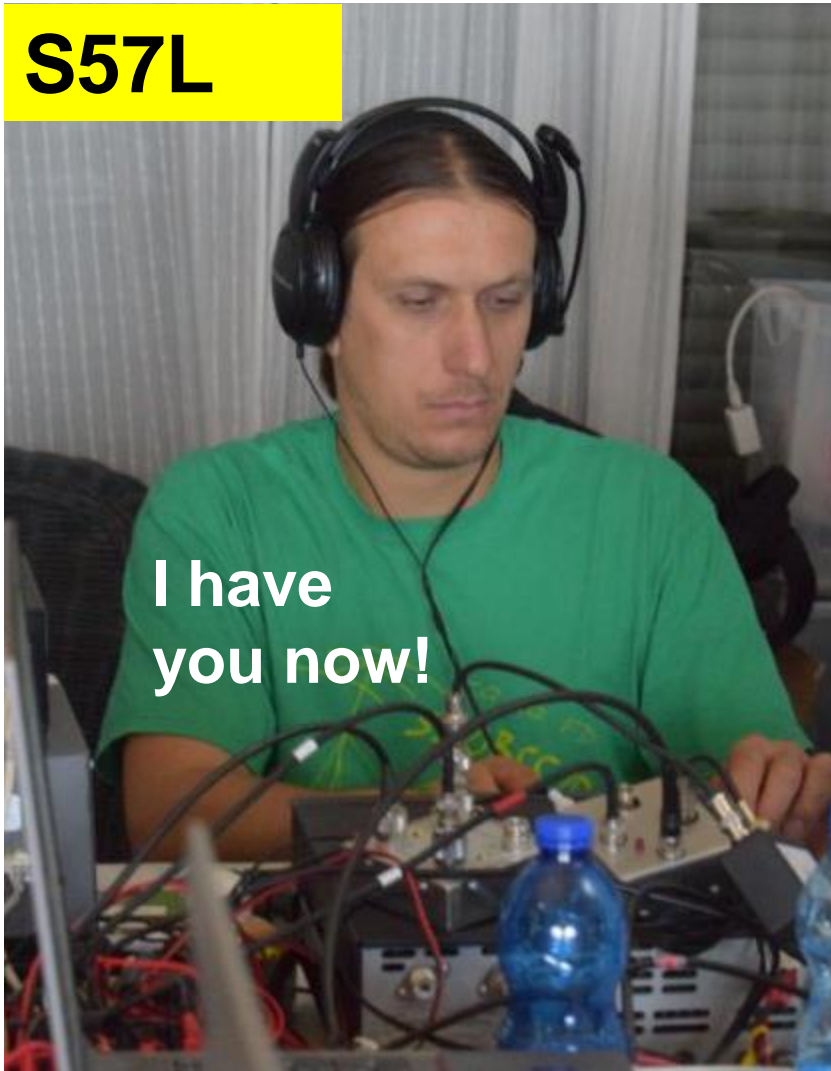
S57K

**Water
sucks,
beer rules!**

S57AL

Let's beat them all!

S57L



**I have
you now!**

S53F



**Where
are those
Japs?**

S53BB



Calm down, no hurry!



HAM radio forever!

S57C

S57VW



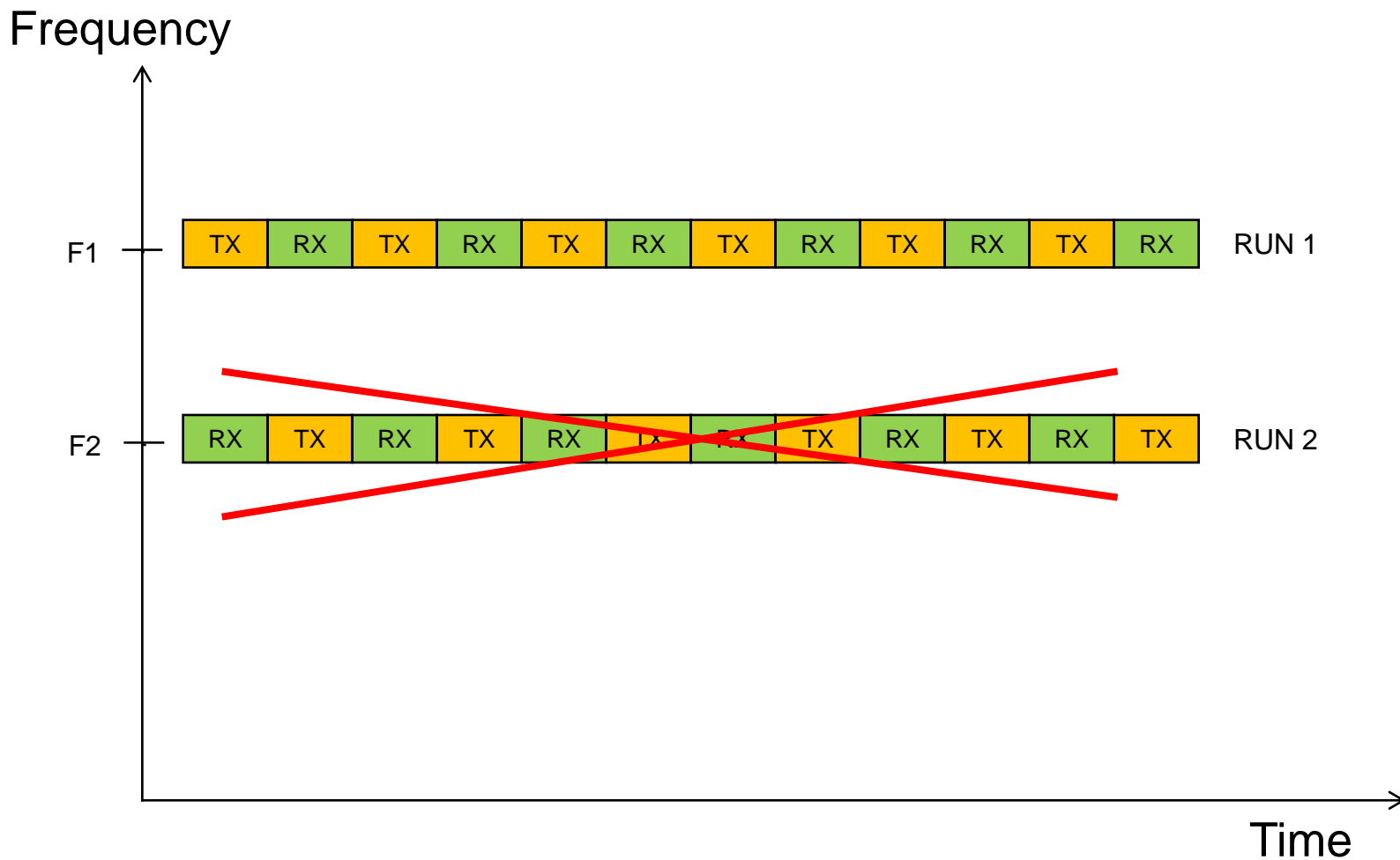
TK0C Chef!

KISS!

S53WW

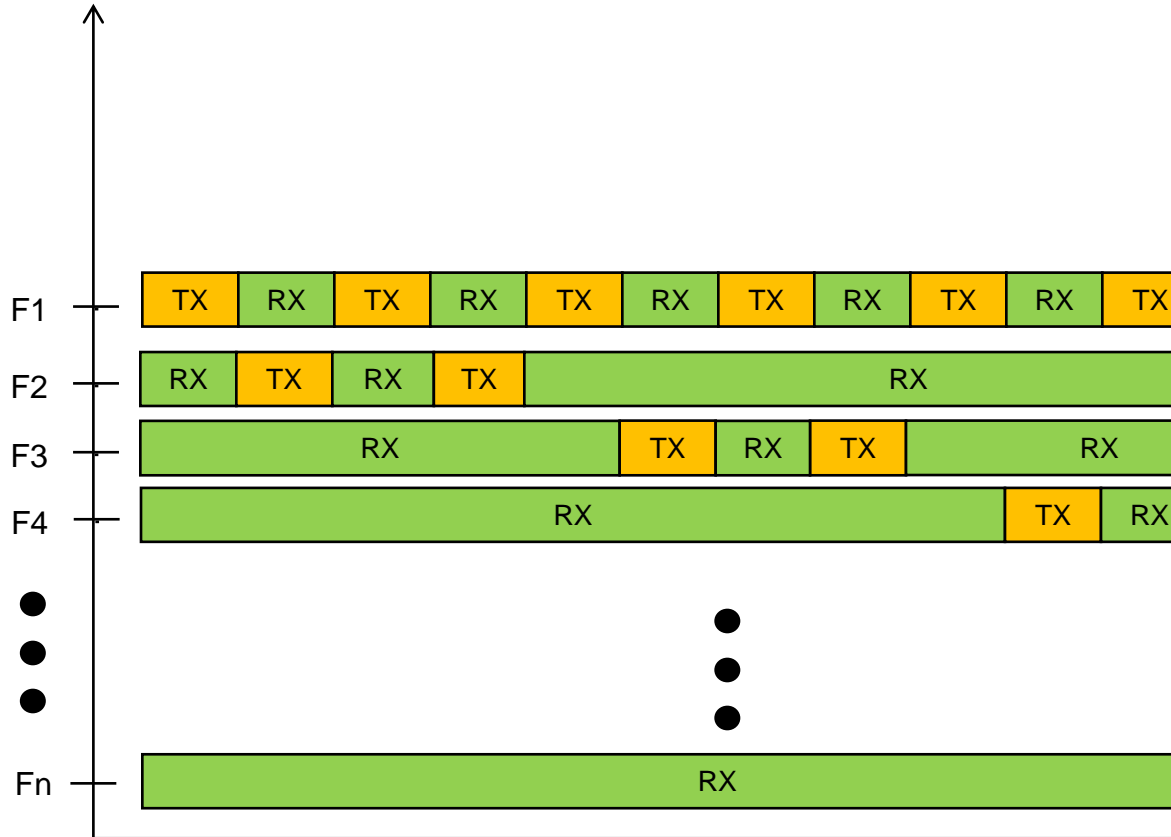


Frequency-time domain

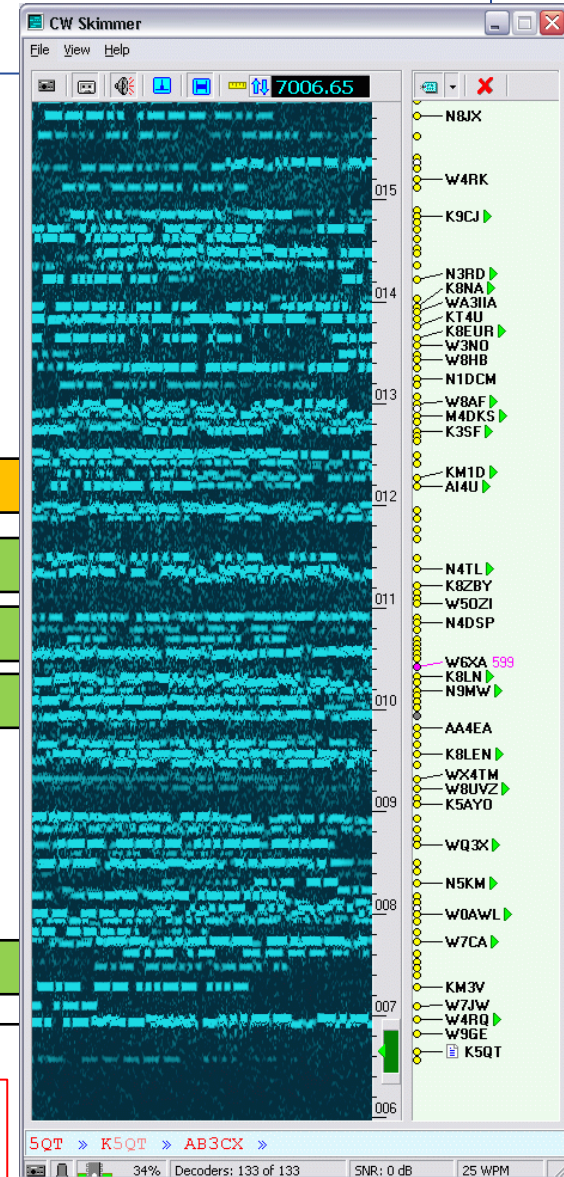


Frequency-time domain

Frequency



60kHz of band and 3 signals in 1kHz → 180 frequency channels
 → **1 RUN + 179 INBAND stations**



How much QSOs can be done, then?

180 QSO/h average rate for RUN

→ 180 QSO/h rate for INBAND (same amount of time available!!!)

~~**MS:** $360 \times 48 = 17\text{k}$ QSOs (there is always one band open)~~

~~**M2:** $2 \times \text{MS} = 34\text{k}$ QSOs (there are always two bands open)~~

~~**MM:** $6 \times \text{MS} / 2 = 51\text{k}$ QSOs (each band is open for half a day)~~

Does not work in practice ... all stations calling CQ would have to change the band every hour 😊

How much QSOs can be done, then?

180 QSO/h average rate for RUN

→ 180 QSO/4h for INBAND (every 4h conditions change, new stations available)

MS: $180 \times 48 + 25\% = 11\text{k}$ QSOs

M2: $2 \times \text{MS} = 22\text{k}$ QSOs

MM: $6 \times \text{MS} / 2 = 33\text{k}$ QSOs

How do we stand today (CQ WW DX CW)

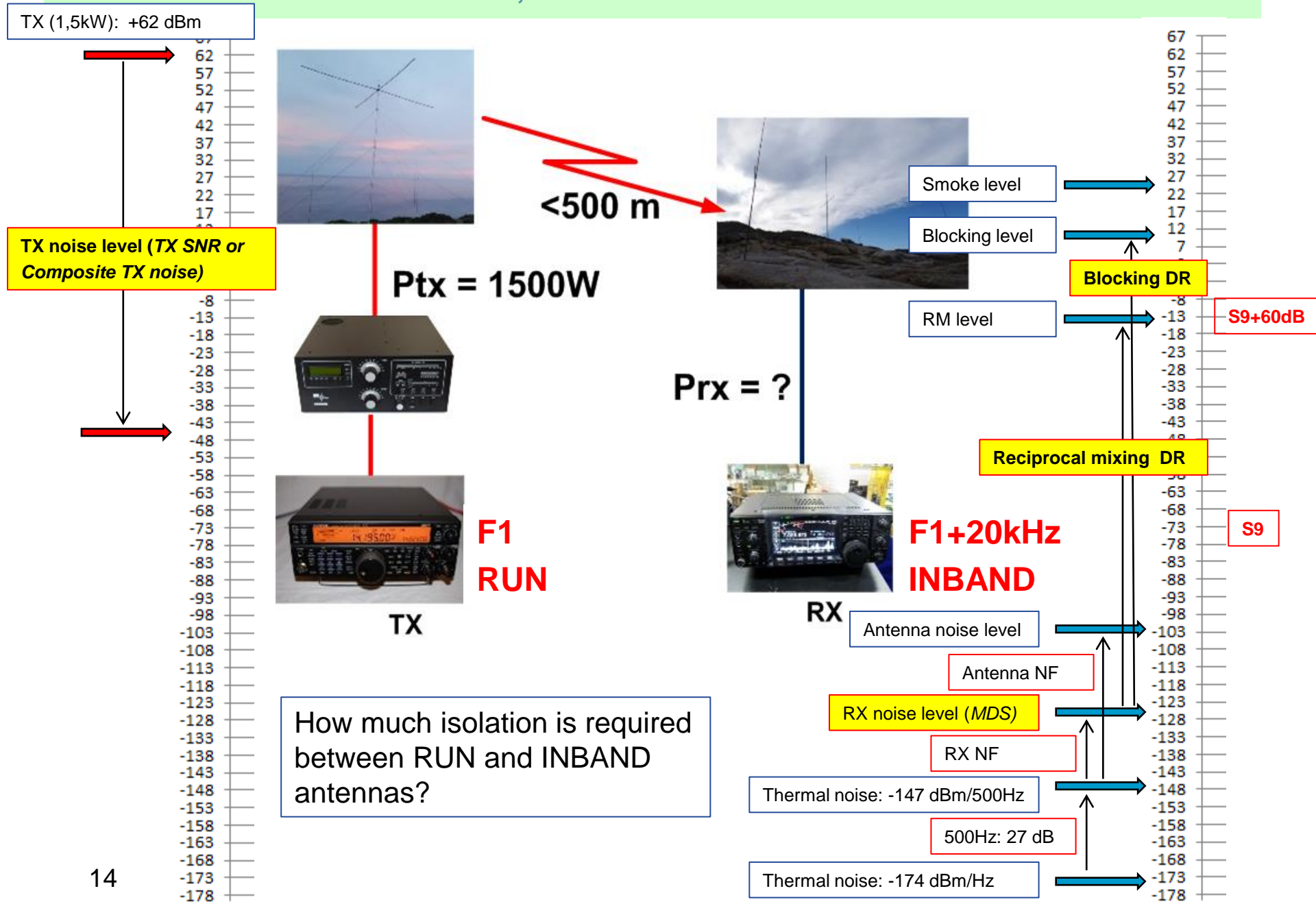
| | World | EU | | | |
|----|-----------------------------|----------------------------|---------|---------|----------|
| MS | 11k2 (EF8R in 2017) | 9k5 (TK0C in 2019) | INB 23% | | |
| M2 | 14k8 (D4C in 2015) | 12k9 (TK0C in 2017) | INB 20% | 1,3x MS | 1,35x MS |
| MM | 23k5 (CN2AA in 2014) | 17k3 (TK0C in 2021) | INB 15% | 2,1x MS | 1,8x MS |

Preconditions:

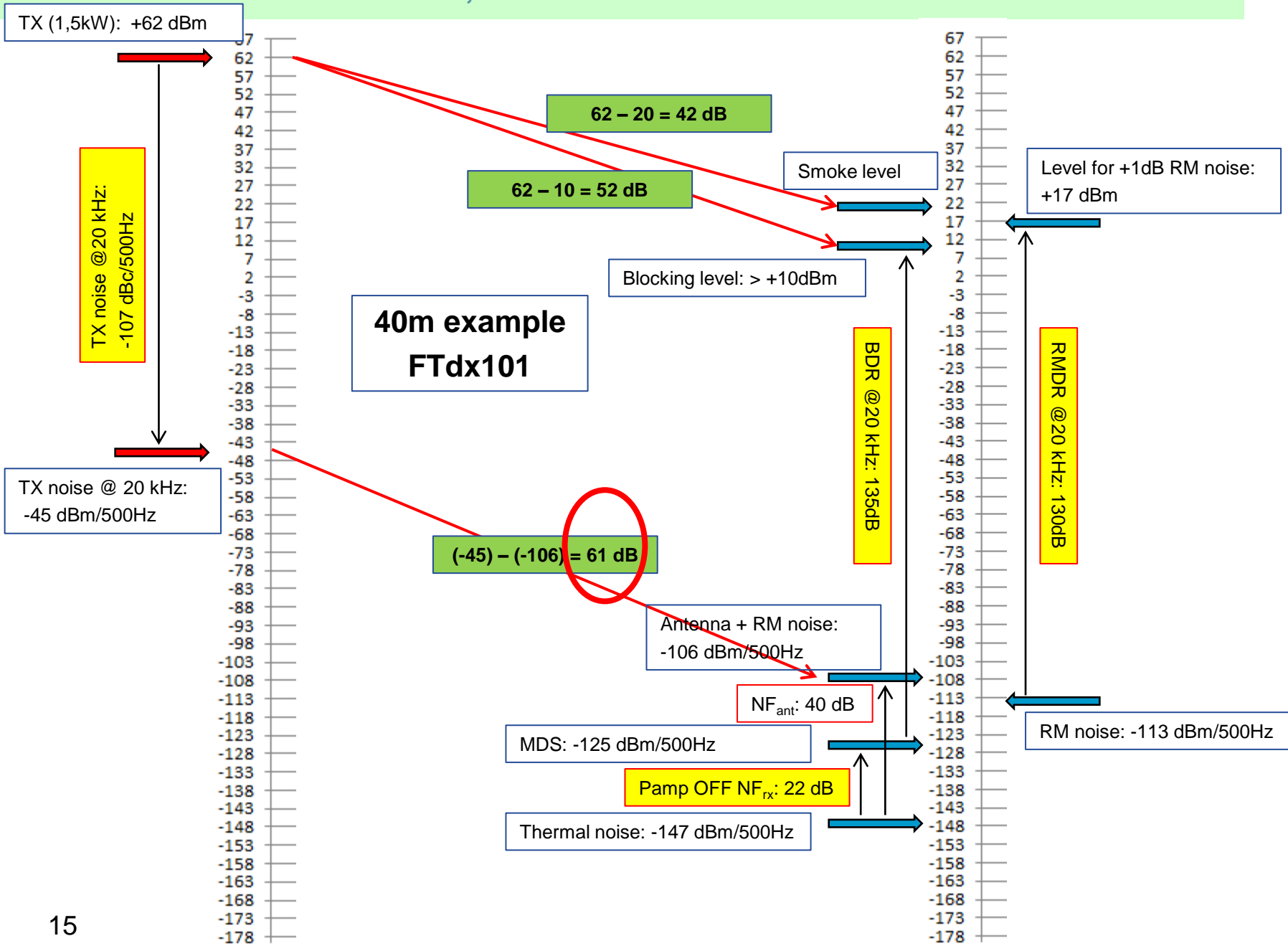
- Solid propagation on all bands
- Excellent participation
- Enough stations calling CQ
- **Very good INB antennas!**

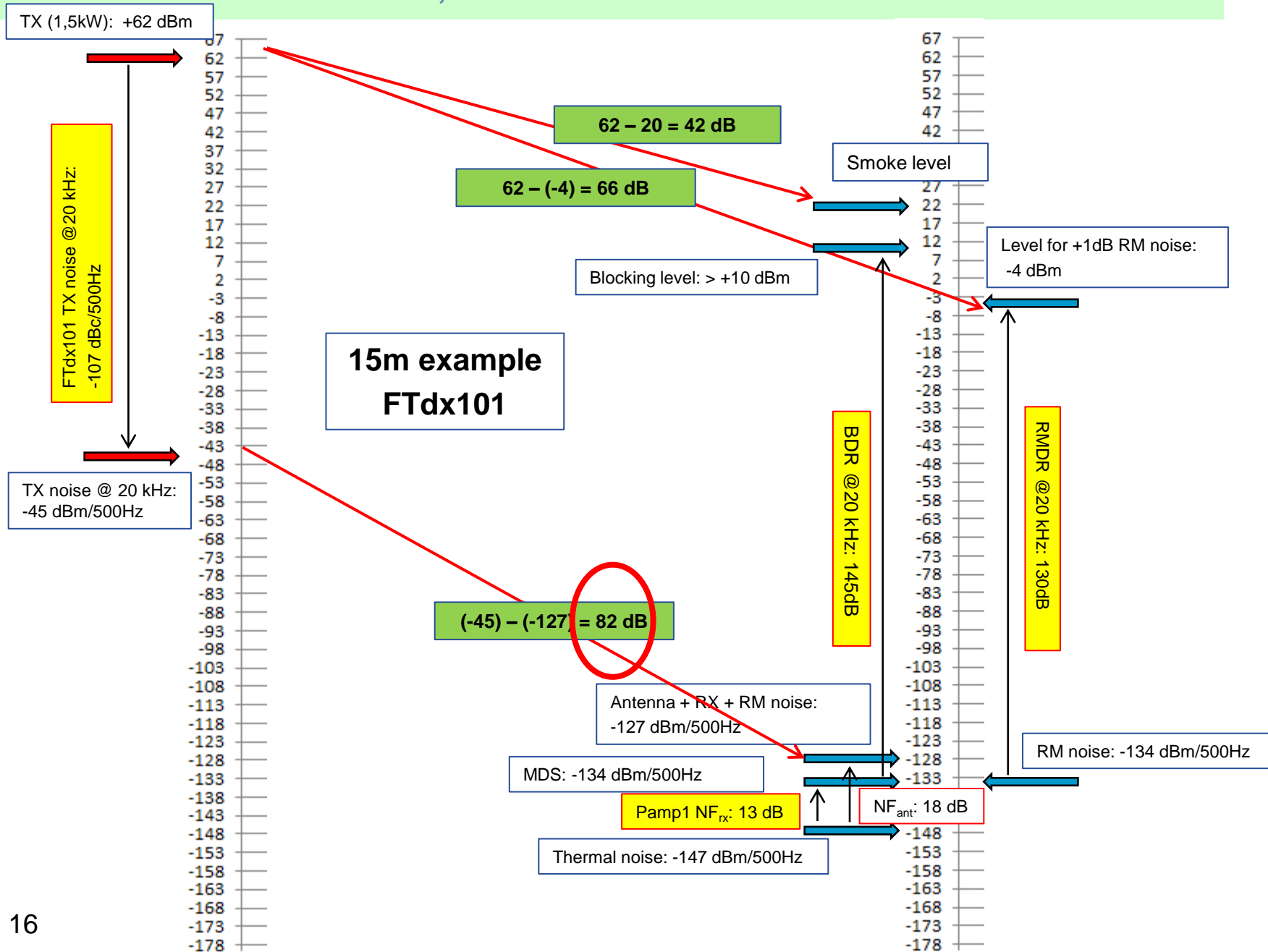
Solar cycle:

- **maximum in 2014**
- **minimum in 2020**



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Required isolation (FTdx101) for <3dB noise increase @tk0c

| MHz | <i>NFant</i> (dB) | > dB | <i>FSL @500m</i> (dB) | <i>Gap</i> (dB) |
|-----|-------------------|------|-----------------------|-----------------|
| 1,8 | 53 | 49 | 32 | 17 |
| 3,5 | 45 | 57 | 37 | 20 |
| 7 | 40 | 62 | 43 | 19 |
| 14 | 25 | 77 | 50 | 27 |
| 21 | 18 | 84 | 53 | 31 |
| 28 | 14 | 88 | 55 | 33 |

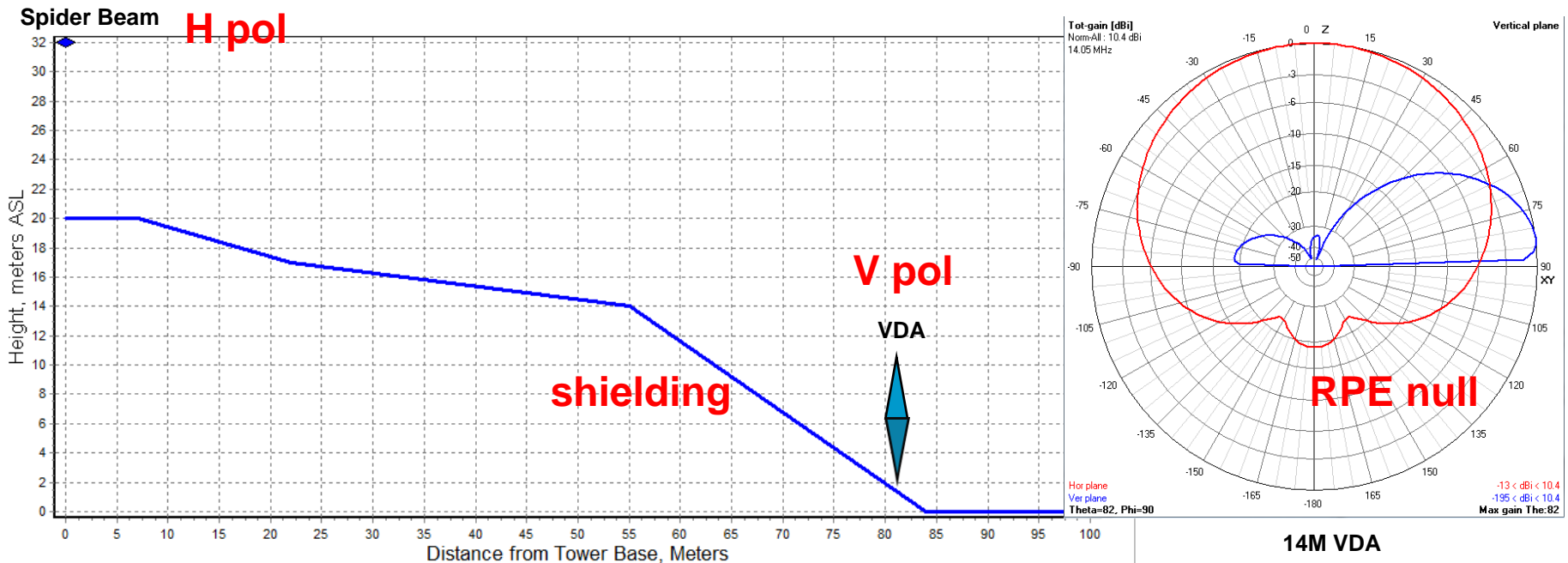
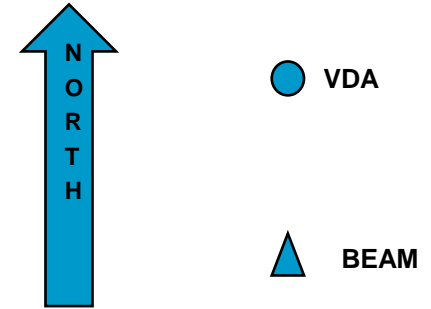
6dB less at half the distance!

Antenna gains and RPE to be added!

?????

Need to deploy all 4 „isolation tuning knobs“:

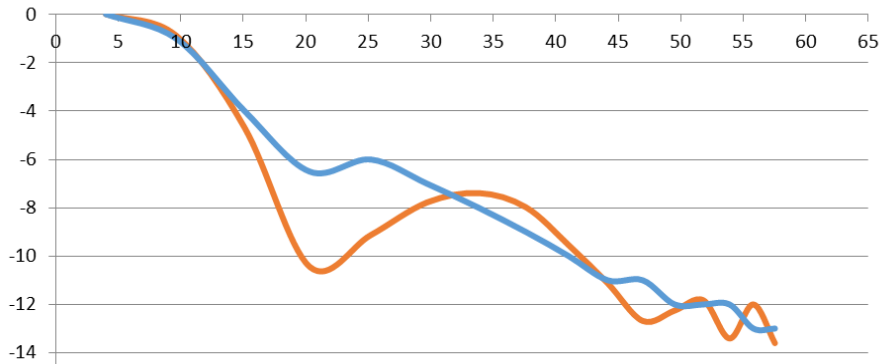
- polarization (~10...20dB)
- radiation pattern nulling (~0...15dB)
- shielding by the terrain (~0...6dB)
- optimal placement



VDA - THE inband antenna:

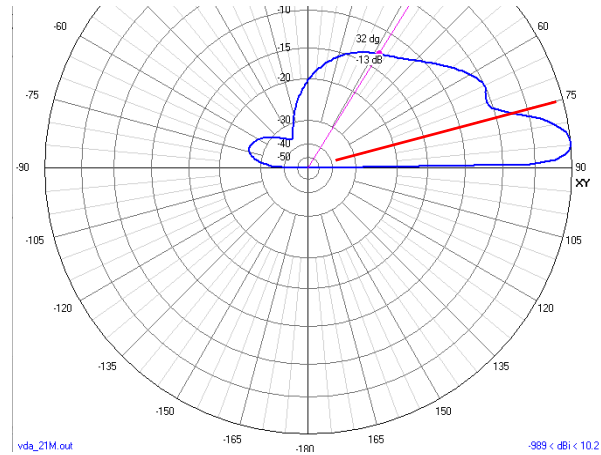
Bottom end 2m above the sea level, 4m from the shore

VDA 15m

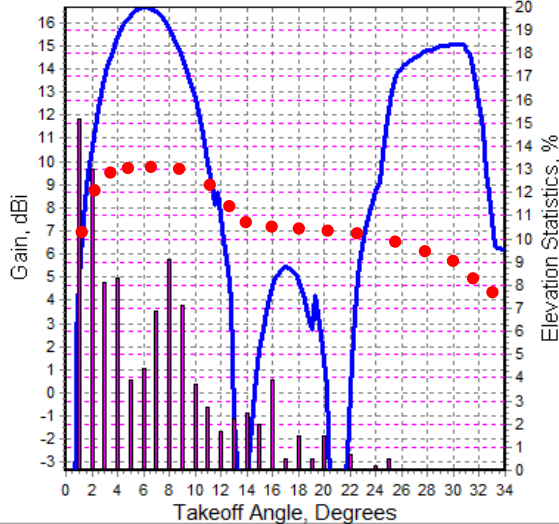


Tot-gain [dBi]
NormAll: 10.2 dBi
21.1 MHz

Bottom end 2m above the sea level,
4m from the shore

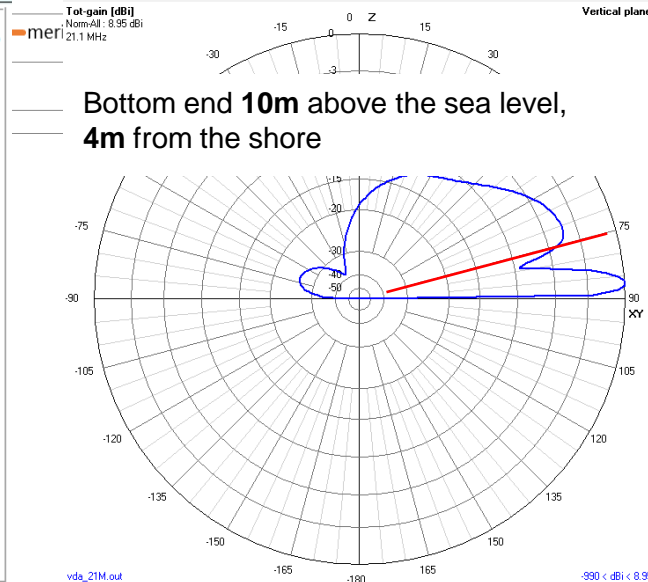


HFTA, Copyright ARRL 2003-2004, by N6BV, Ver. 1.03



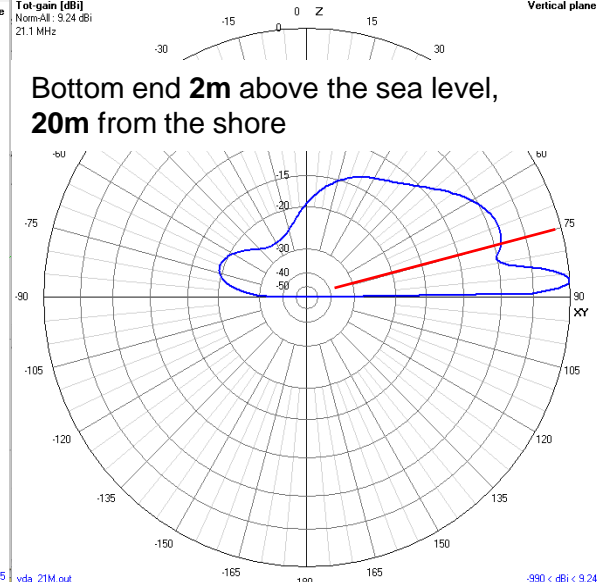
Tot-gain [dBi]
NormAll: 8.95 dBi
21.1 MHz

Bottom end 10m above the sea level,
4m from the shore

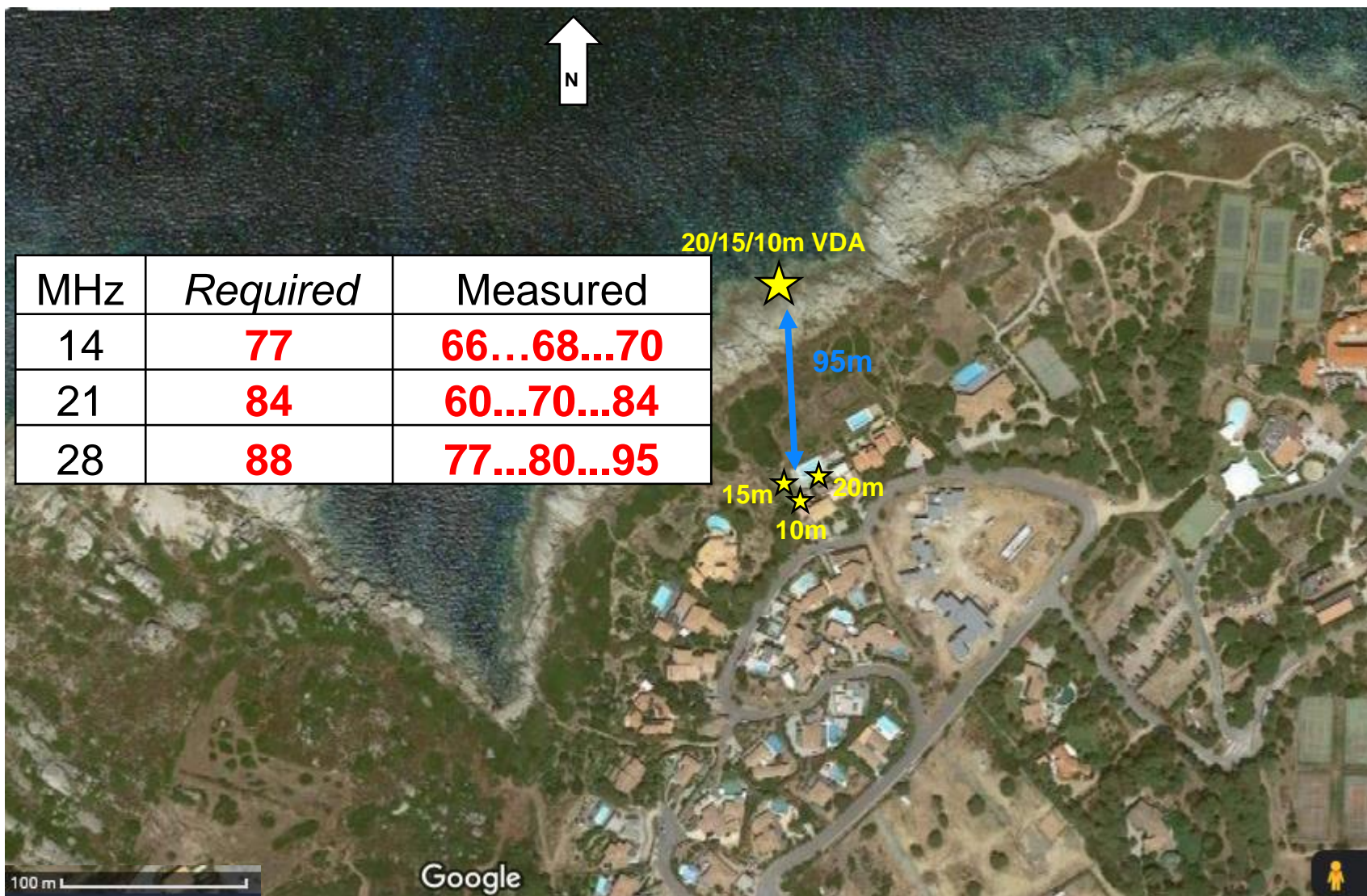


Tot-gain [dBi]
NormAll: 9.24 dBi
21.1 MHz

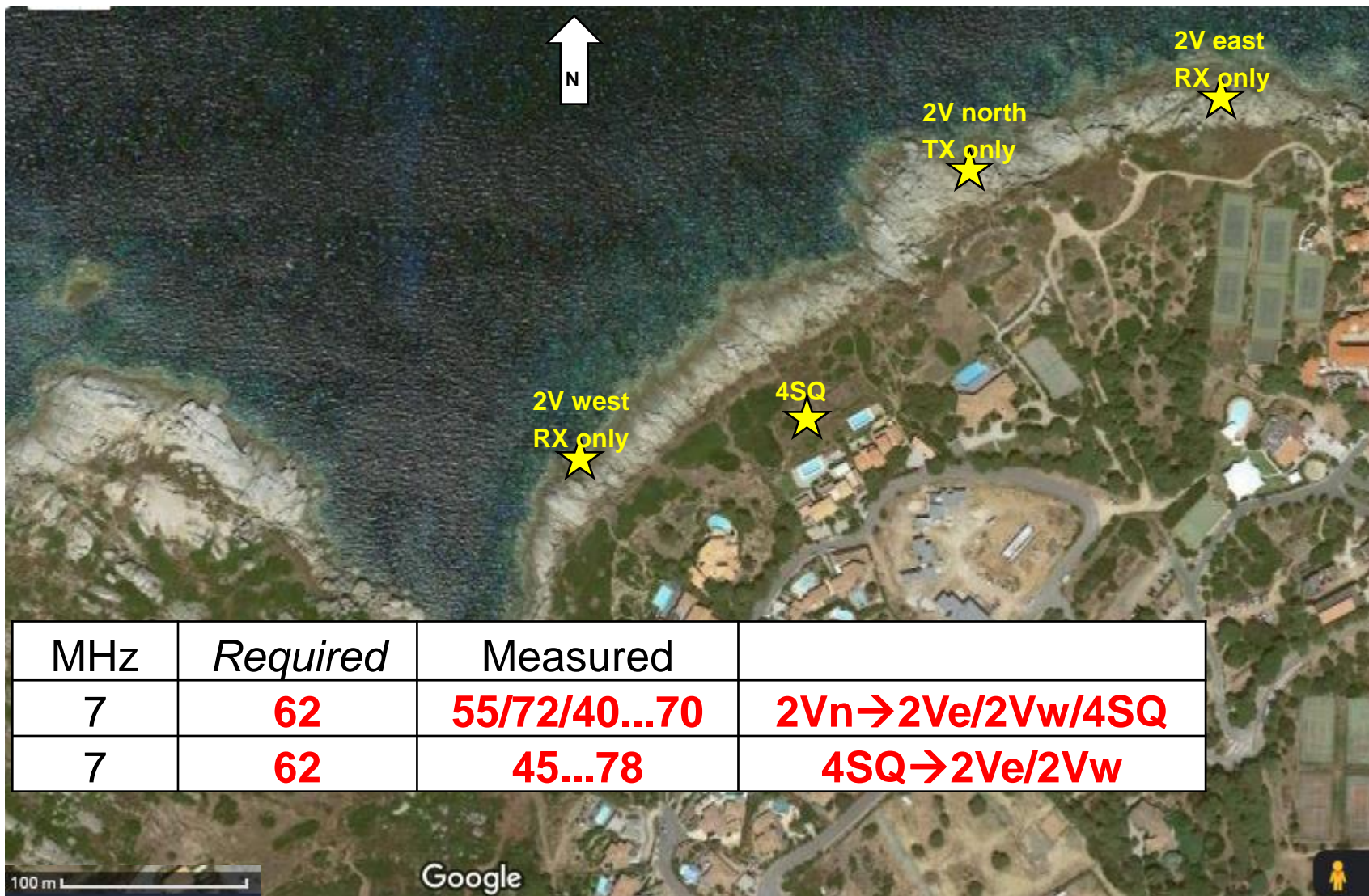
Bottom end 2m above the sea level,
20m from the shore



20, 15, 10m (MM 2021)



40m (MM 2021)

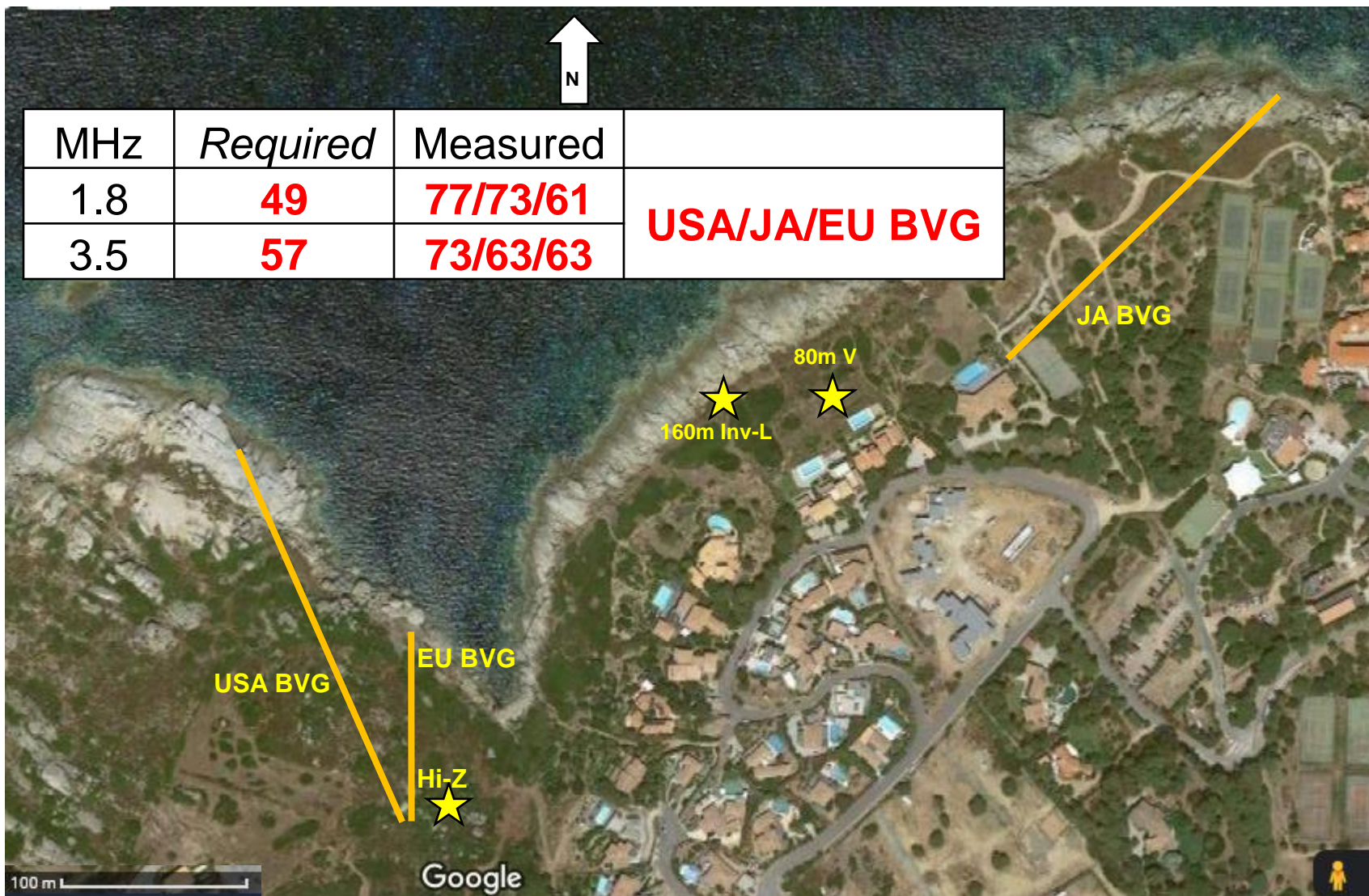


| MHz | Required | Measured | |
|-----|-----------|----------------------|------------------------|
| 7 | 62 | 55/72/40...70 | 2Vn→2Ve/2Vw/4SQ |
| 7 | 62 | 45...78 | 4SQ→2Ve/2Vw |

160 & 80m (MM 2021)



| MHz | Required | Measured | |
|-----|-----------|-----------------|----------------------|
| 1.8 | 49 | 77/73/61 | USA/JA/EU BVG |
| 3.5 | 57 | 73/63/63 | |

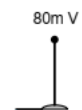


160 & 80m shack setup (MM 2021)

s53ww
Okt2021
tk0c 2021
TRX+PTT



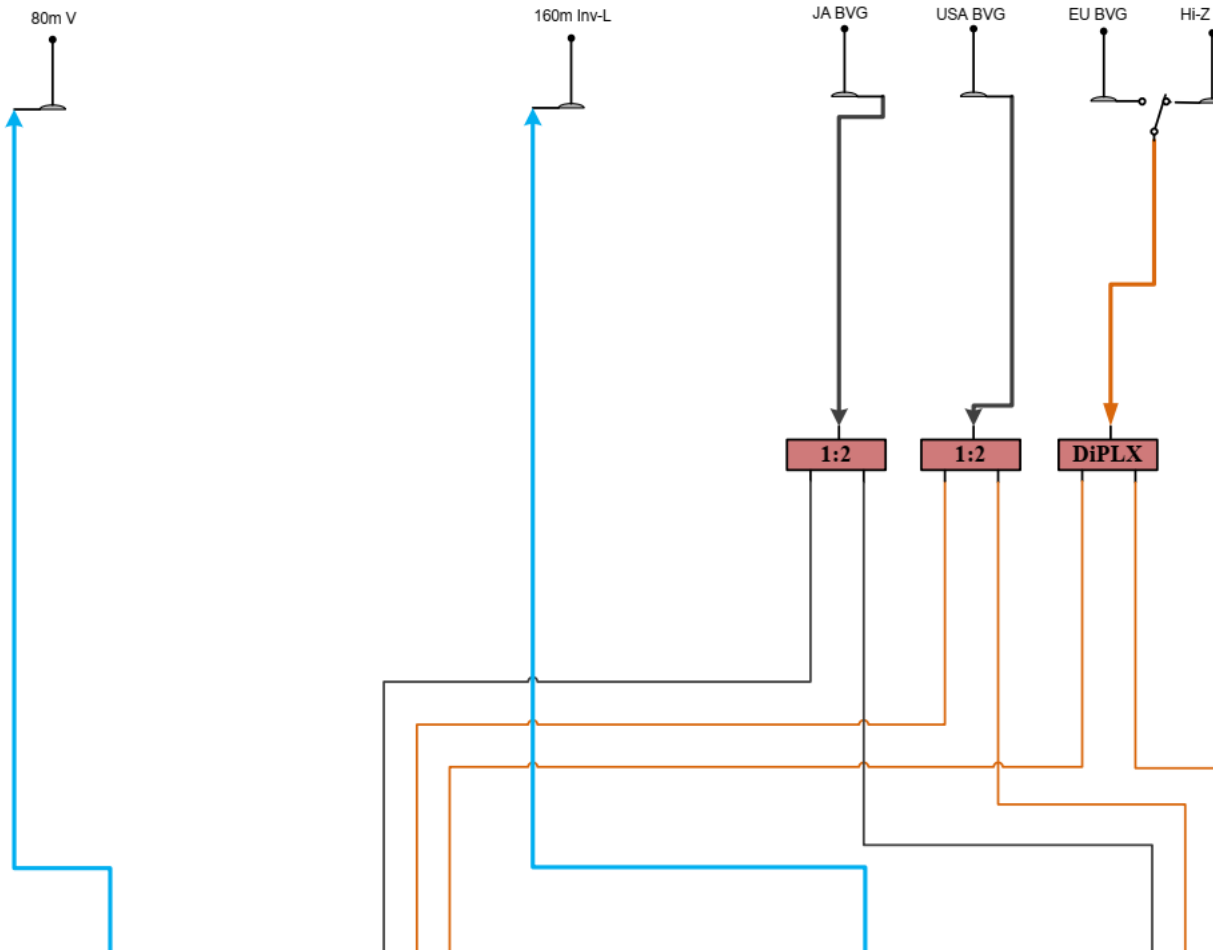
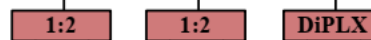
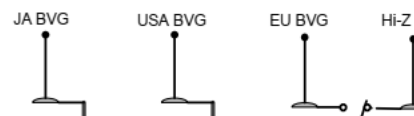
TX ANTENA



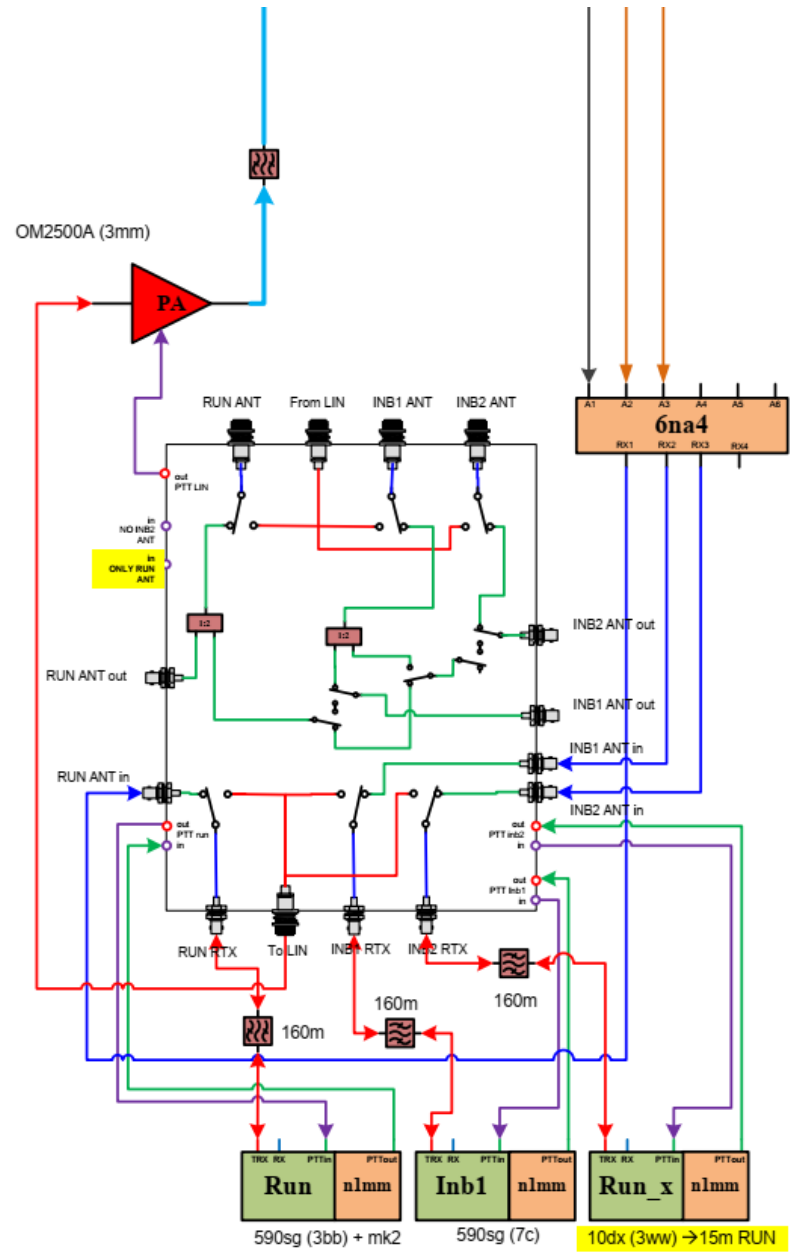
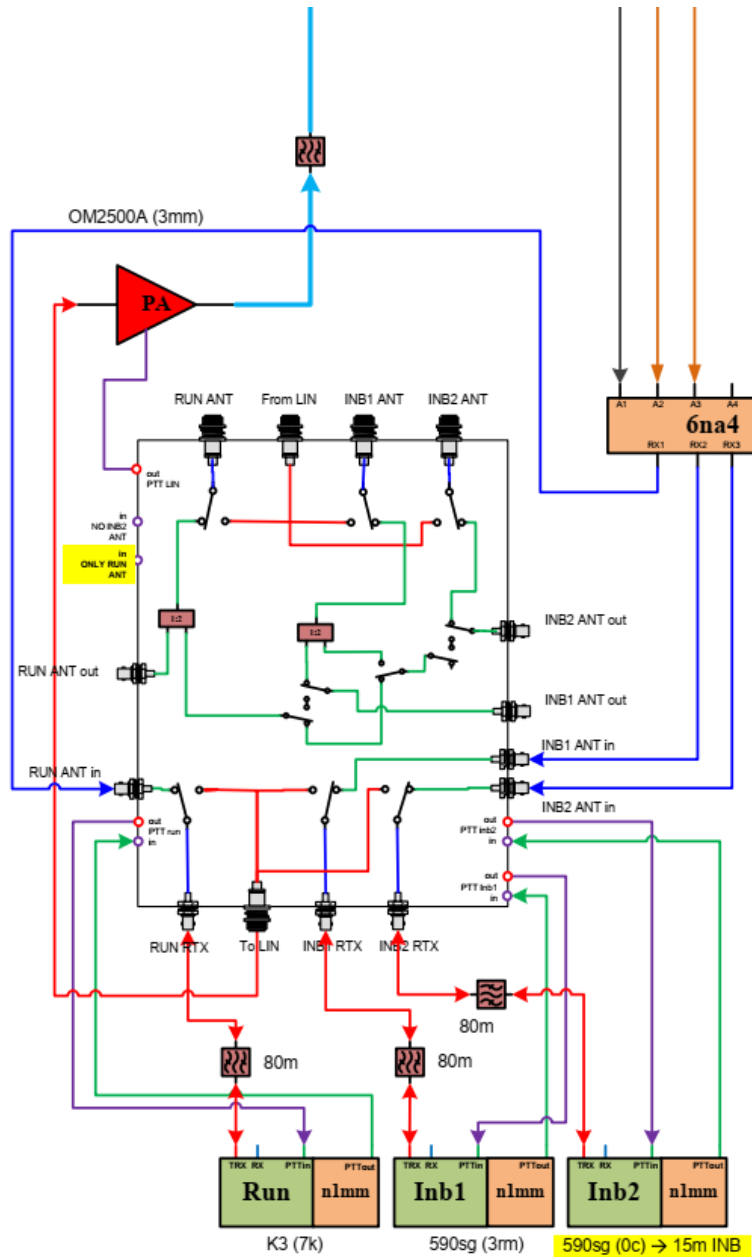
TX ANTENA



RX ANTENNE



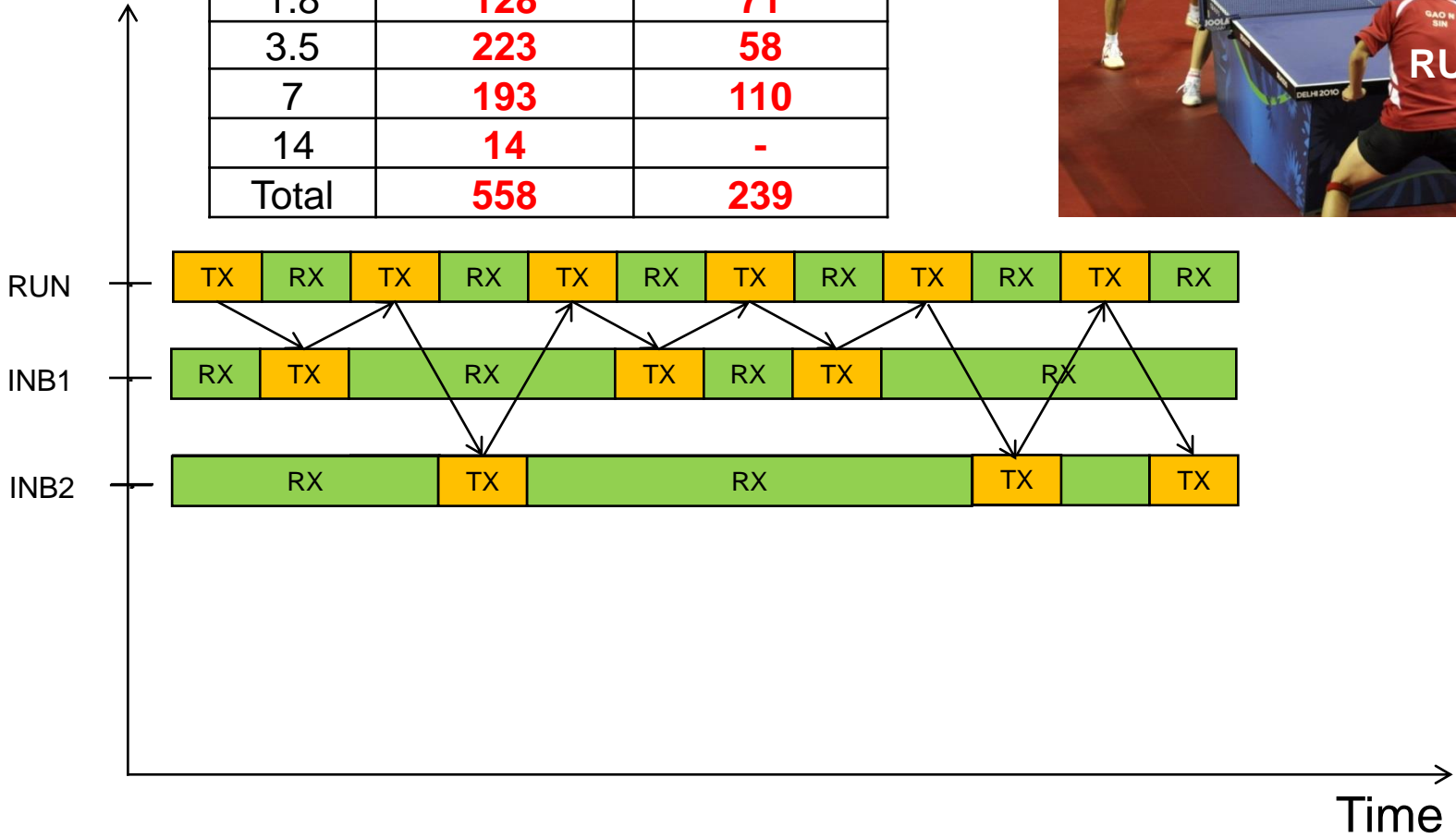
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THE ping-pong mode 😊

TK0C MM 2021 – 1st hour - 797

| MHz | RUN | INB1/INB2 |
|-------|------------|------------|
| 1.8 | 128 | 71 |
| 3.5 | 223 | 58 |
| 7 | 193 | 110 |
| 14 | 14 | - |
| Total | 558 | 239 |



TNX es 73 de
Robi/s53ww
&
TK0C team

