

# ZM4T, Projects 2019/2020

ZL3IO, Holger Hannemann

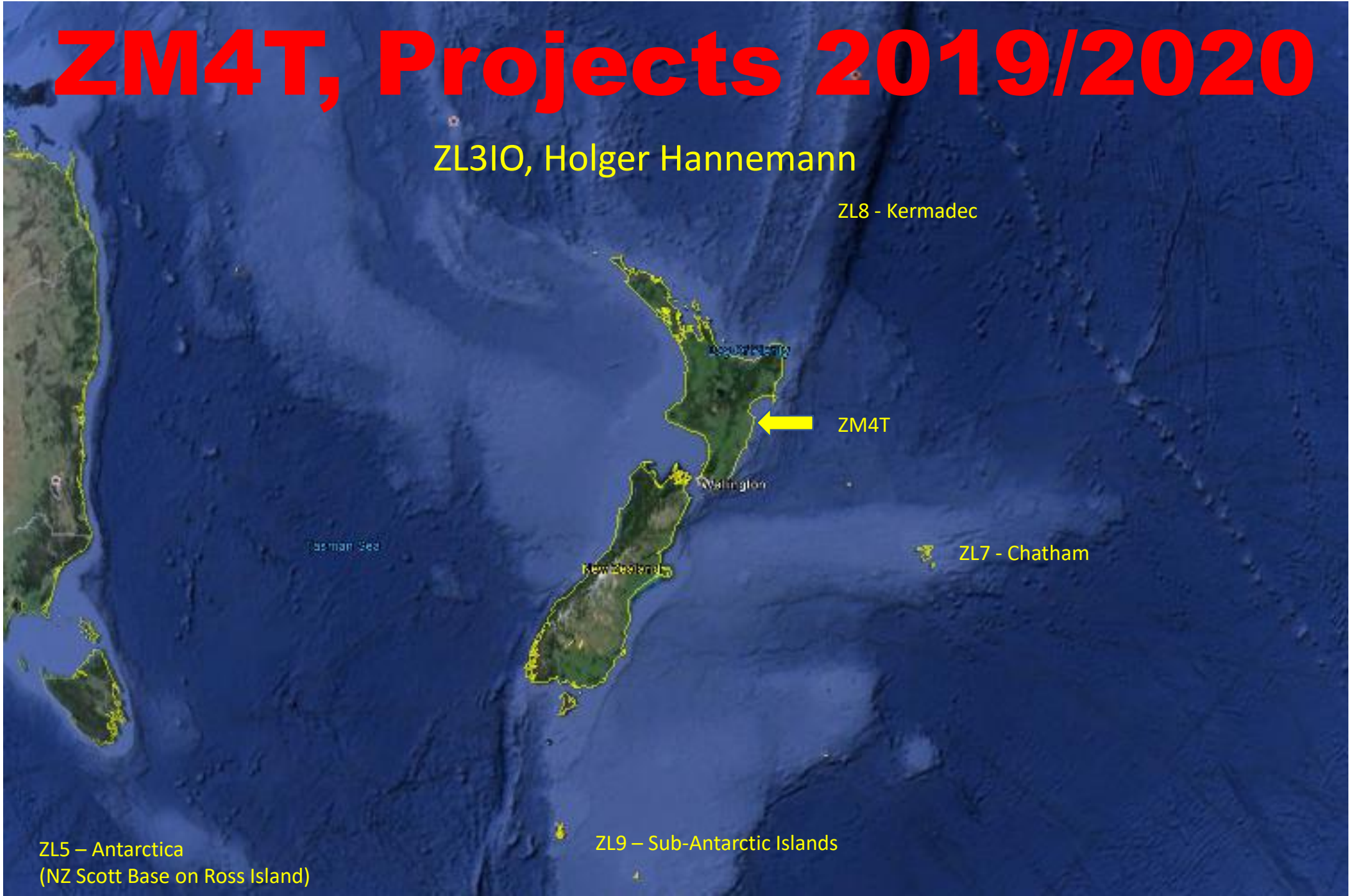
ZL8 - Kermadec

ZM4T

ZL7 - Chatham

ZL5 – Antarctica  
(NZ Scott Base on Ross Island)

ZL9 – Sub-Antarctic Islands



# ZM4T, History

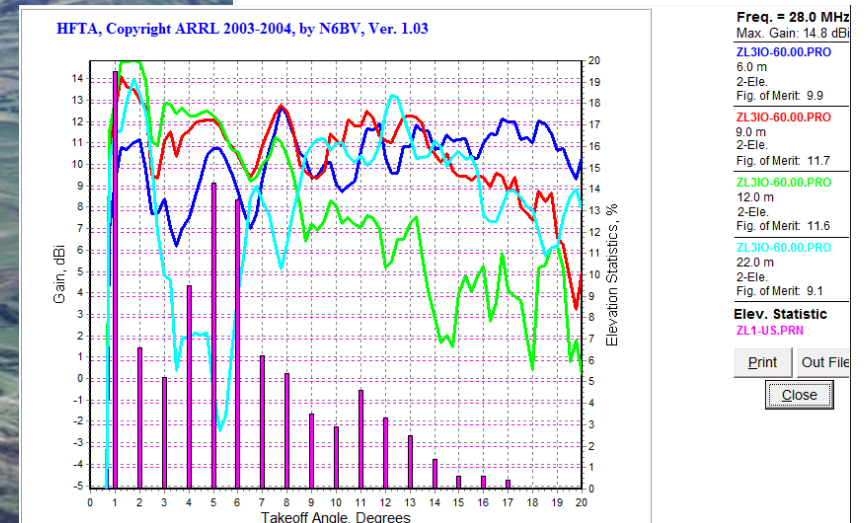
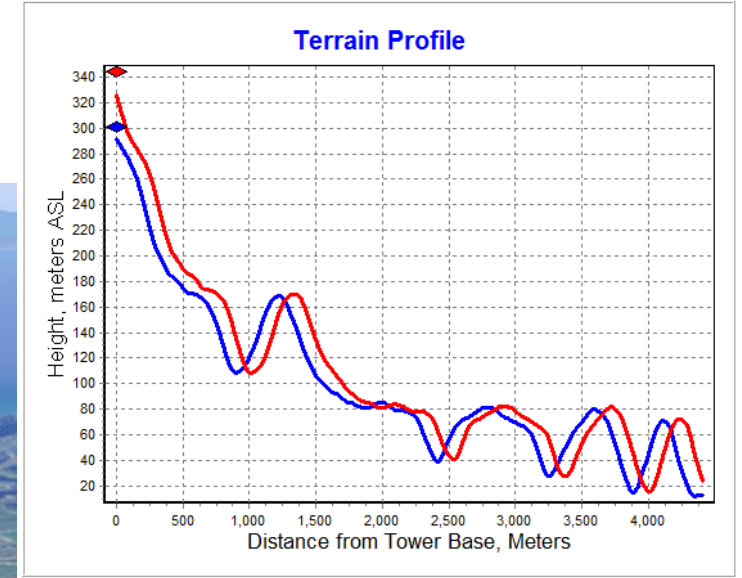
- Founded 2008 as ZM2M by local group (ZL2AL/2ST/IFB/LF/MY/DX/WG/CC/RVW)
- Call changed since WWDX CW 2009 to ZM4T
- Location was North of Napier on a farm side in field day style
- since 2013 / 2014 from ZL3IO site





# ZM4T @ ZL3IO

- QTH 1000 ft asl, towers of max 60 ft.,
- Biggest challenge: WIND



# ZM4T, Targets / Ziele

- Targets/Ziele:
  - Remote Access (radio & antenna switching)
  - Tower & antennas for SA/EU long path
  - Prepare automation for 2 x SO2R positions

# ZM4T, changes & extensions 2019/2020

- Remote Access:
  - Change from K3 & KPA500 to FLEX-6600 & RF-kit PA
  - Web based antenna switching (ethernet relays box to control stack matches and 4 square controller & software)
- Tower & antennas for SA/EU long path
  - installation of former Napier airport tower on upper platform
  - antennas: 3L 40m, 3L 20m, 5L 15m,xL 10m
  - feedlines 600 Ohm (>120 m) & 1 : 12 baluns
- Change automation from M/2 or 1 x SO2R to 2 x SO2R positions

# ZM4T, station layout end of 2018

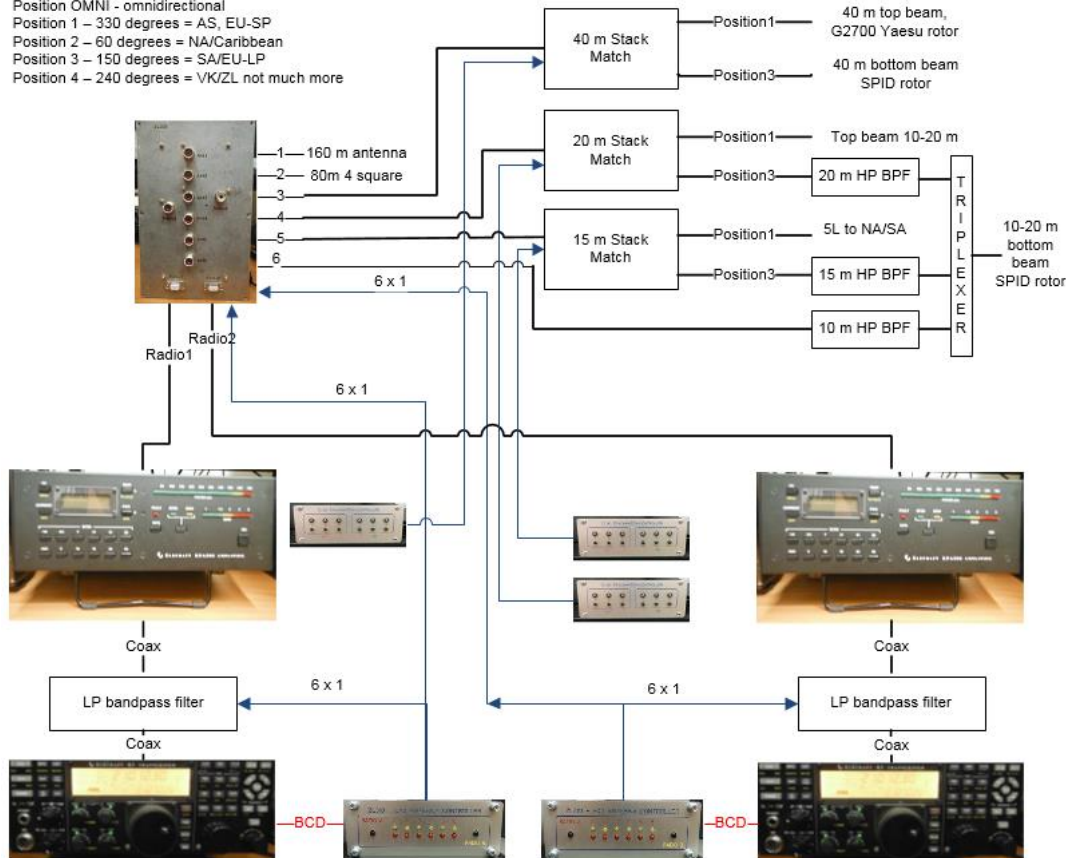


80 m 4 square with DX engineering coupler  
 Position OMNI - omnidirectional  
 Position 1 - 330 degrees = AS, EU-SP  
 Position 2 - 60 degrees = NA/Caribbean  
 Position 3 - 150 degrees = SA/EU-LP  
 Position 4 - 240 degrees = VK/ZL not much more



Top beam with Yaesu rotor  
 10-4/15-3/20-3 - 1 coax  
 40-2 - 1 coax

Bottom beam with SPID rotor  
 10-4/15-3/20-3 - 1 coax  
 40-2 - 1 coax



Radios:

2 x K3 & KPA500

Antennas:

160 - Vertical

80 - 4 square

40 - 2L + 2L

20 - 3L + 3L

15 - 5L + 3L

10 - 4L + 4L

Automation:

LP BPF between K3 & KPA500

2 x 6 antenna switch

4 x stack match

HP BPF (1 kW for 10/15/20m)

1 x HP triplexer (1 kW)

home made controllers for BCD-decimal decoder & stack match



# ZM4T, station layout end of 2020

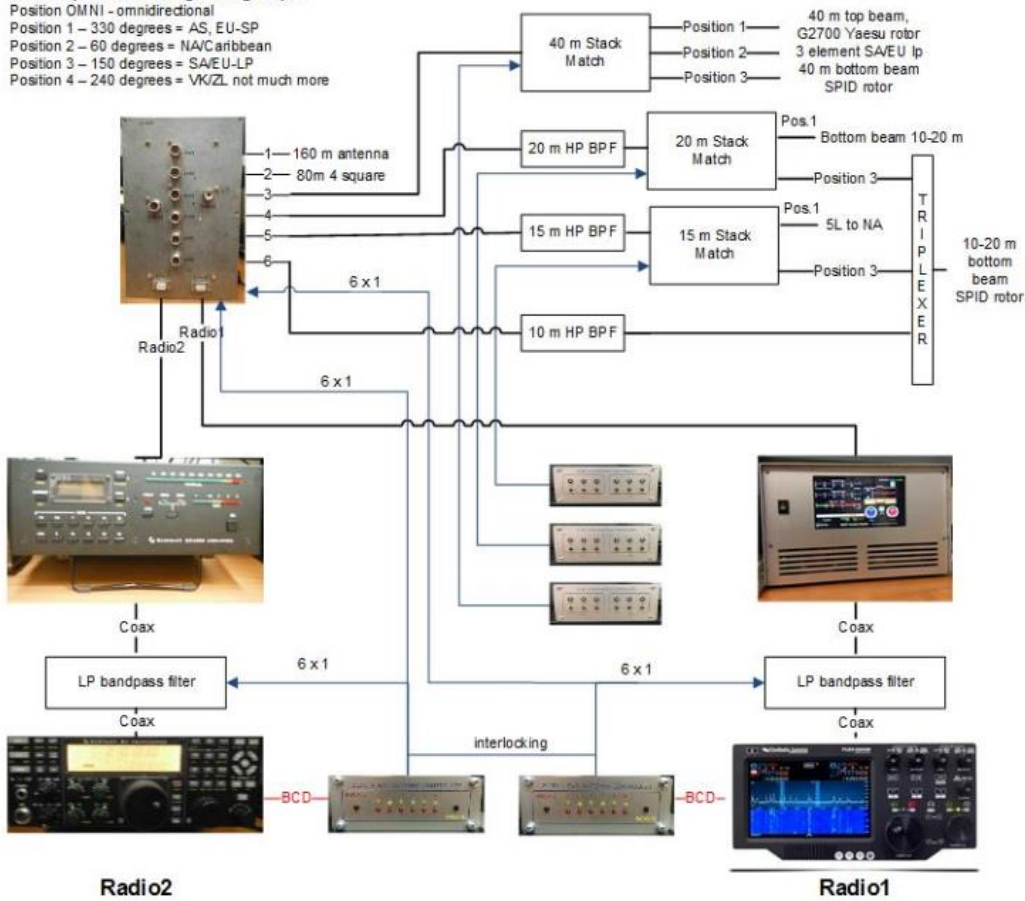


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 40-2 - 1 coax



## Radios:

1 x FLEX-6600M & RF 2k+

1 x K3 & KPA500

## Antennas:

160 - Dipole

80 - 4 square

40 - 3L + 2L + 2L

20 - 3L + 3L + 3L

15 - 5L + 3L + 3L

10 - 4L + 4L + 4L

## Automation:

LP BPF between K3 & KPA500

2 x 6 antenna switch

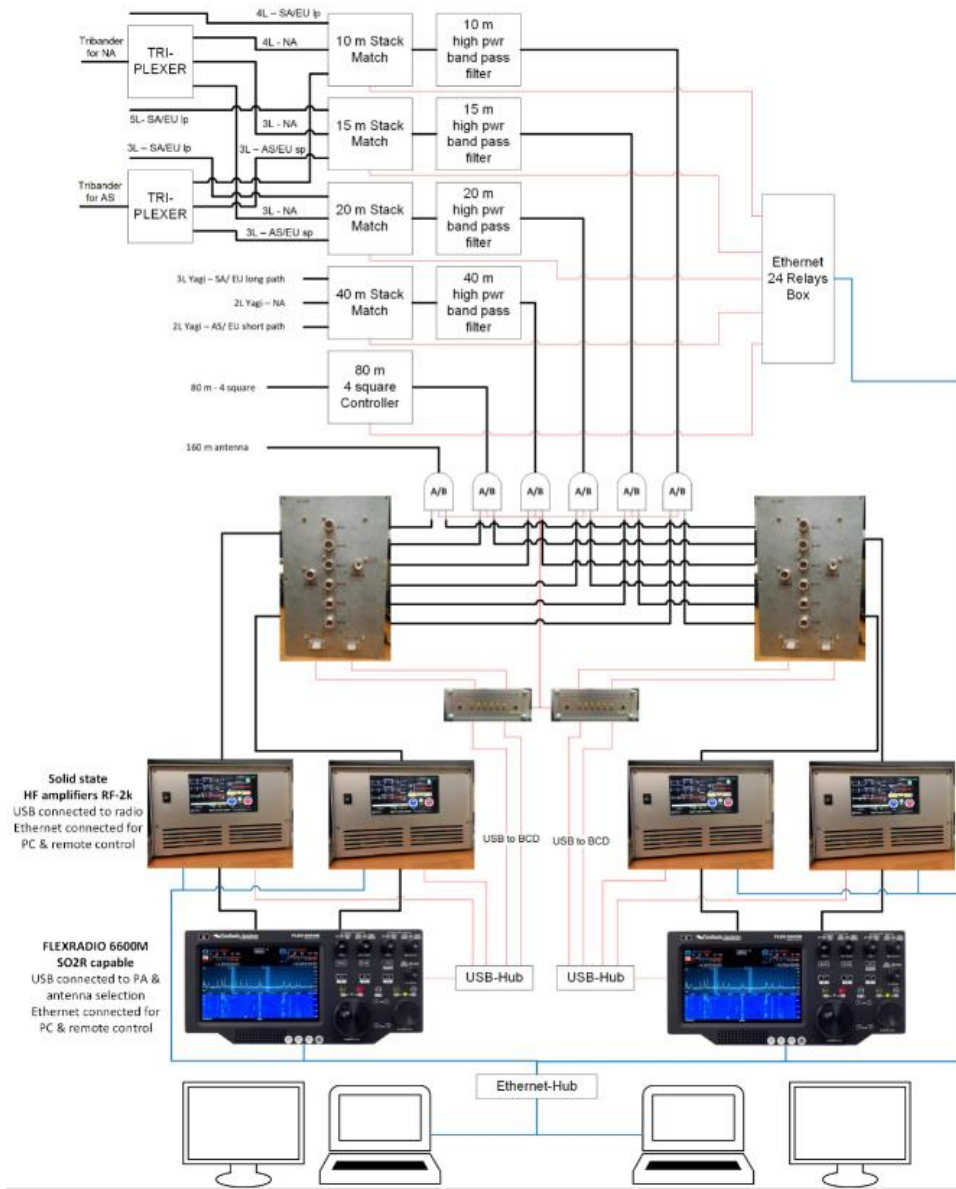
4 x stack match

HP BPF (1 kW for 10/15/20m)

1 x HP triplexer (1 kW)

home made controllers for BCD-decimal decoder & stack match

# ZM4T, future station layout



## Radios:

2 x FLEX-6600M & 4 amps

## Antennas:

160 – Dipole/vertical

80 – 4 square

40 – 3L + 2L + 2L

20 – 3L + 3L + 3L

15 – 5L + 3L + 3L

10 – 4L + 4L + 4L

## Automation:

2 antenna switches 2 x 6

6 x A/B separator switches

4 x stack match

HP BPF (1 kW for 10/15/20/40 m)

2 x HP triplexer (1 kW)

home made controllers for BCD-decimal decoder

Ethernet 24 relays box



# ZM4T, Tower three project (Oct 2019)



Tower:

- 3 inch steel tube segments with philistrane guy wires, 15 m high
- installed on upper platform with down sloping terrain to SA/EU Ip
- Thanks to Marek, OK1MV & the youth team that came for the CQ WWDX SSB contest for help! Marek is professional tower climber for Telecoms.



# ZM4T, CQ WWDX SSB 2019, M/2 Youth team



| Call | Year | Cty | Zn | Category  | Score     | QSOs  | Zn  | Cty | Hours | 160M      | 80M       | 40M       | 20M       | 15M    | 10M |
|------|------|-----|----|-----------|-----------|-------|-----|-----|-------|-----------|-----------|-----------|-----------|--------|-----|
| ZM4T | 2019 | ZL  | 32 | MULTI-TWO | 2,441,064 | 2,300 | 111 | 275 | 43.4  | 333/27/54 | 874/31/98 | 478/30/86 | 582/17/32 | 33/6/5 |     |

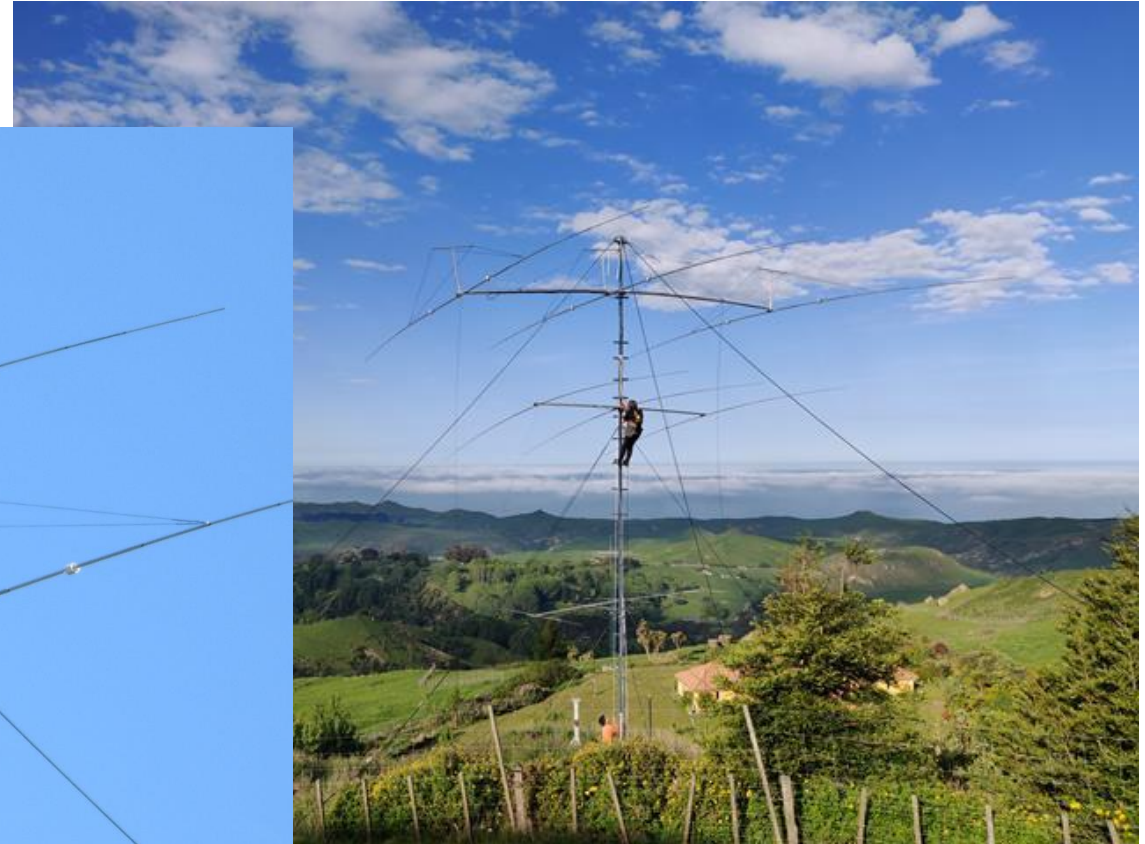


# ZM4T, Tower three project, antennas



## Antennas:

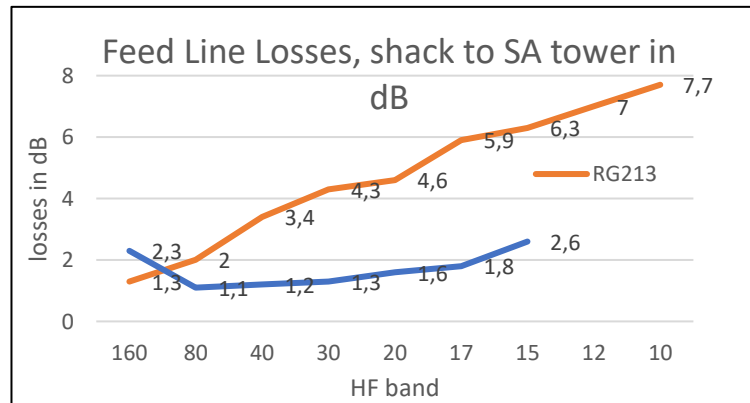
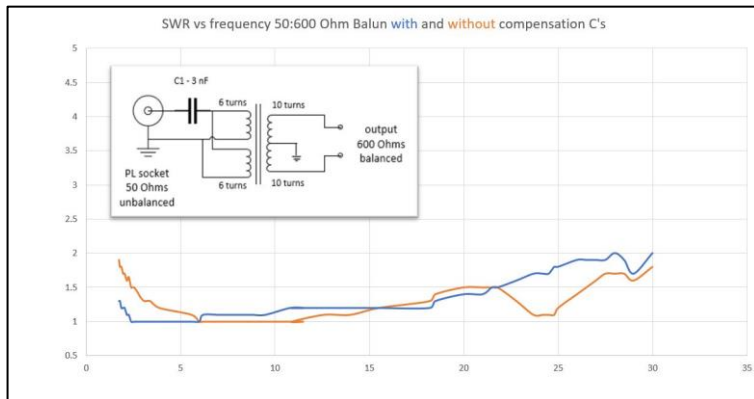
- all antennas are fixed to SA/EU long path
- 3 L 40 m, installed with help by DL5LED – Alex (mountain/ice climber), 40M3 HQL (UA2FZ)
- 3 L 20 m, installed by Jaidyn - ZL4WW & Alec – ZL1HAZ, F12 copy
- 5 L 15 m, installed by ZL4YL & ZL3IO
- 4 L 10 m,



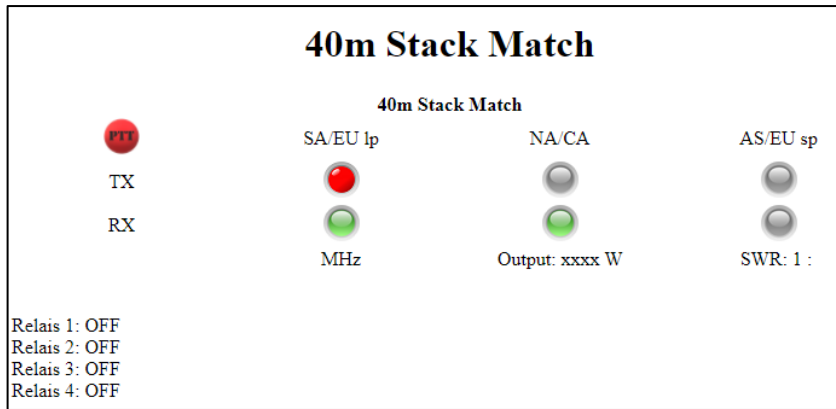


# ZM4T, Tower three project, feedlines

- >120 m distance from radio shack to tower three
- 600 Ohm ladder line & 1 : 12 baluns , winter 2020 project (Jul/Aug)

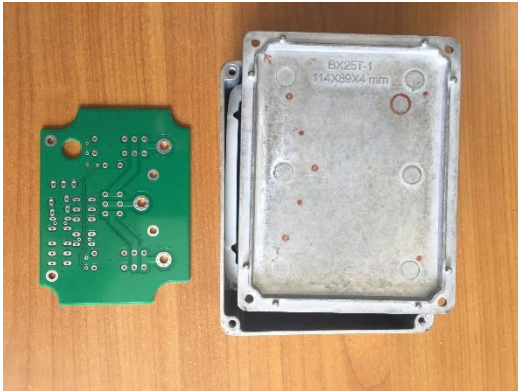


# ZM4T, Remote access



- FLEX-6600M via SmartLink (plug & play)
- RF 2k+ amp via VNC viewer (plug & play)
- No rotators but fixed beams to (330/60/150)<sup>o</sup>
- Stack matches & 4 square control via Devantech dS2824, Ethernet relays box with integrated webserver
- Software (work in progress) webpage using ajax & JS (thanks to support by Birgit - ZL2YL), antenna combinations for TX & RX independent
- N1MM+ software via VPN
- ZL4YL operated a few CW contests from the university hostel in Auckland where she has Wifi access only → latency and lost connection is an issue at times...
- So far we've not tried multi Op contesting
- Manual for software installation and settings at operator end is still work in progress

# ZM4T, change layout to 2 x SO2R operation



- Limited progress due to my illness and related financial situation (no income in 2020)
- Two antenna switches 2 x 6 ready
- Four stack matches ready
- PCB's and all components for A/B separators received
- Open:
  - Another HP triplexer
  - 40 m HP BPF
  - Another FLEX-6600
  - Two more amplifiers



# ZM4T, miscellaneous



- 80m 4 square:  
Extension of the ground system  
→ 1 radial per degree or ~ 400 radials per vertical!  
So far we've around 6 km wire in the ground
- 160 m:  
We lost vertical tower in storm (collateral damage)  
Currently only dipole / Inv V available  
→WIP
- Design of high impedance Quad antennas:  
600 Ohm multiband quads to be used at SA tower to eliminate extra baluns