DATV Repeater Design for Kent

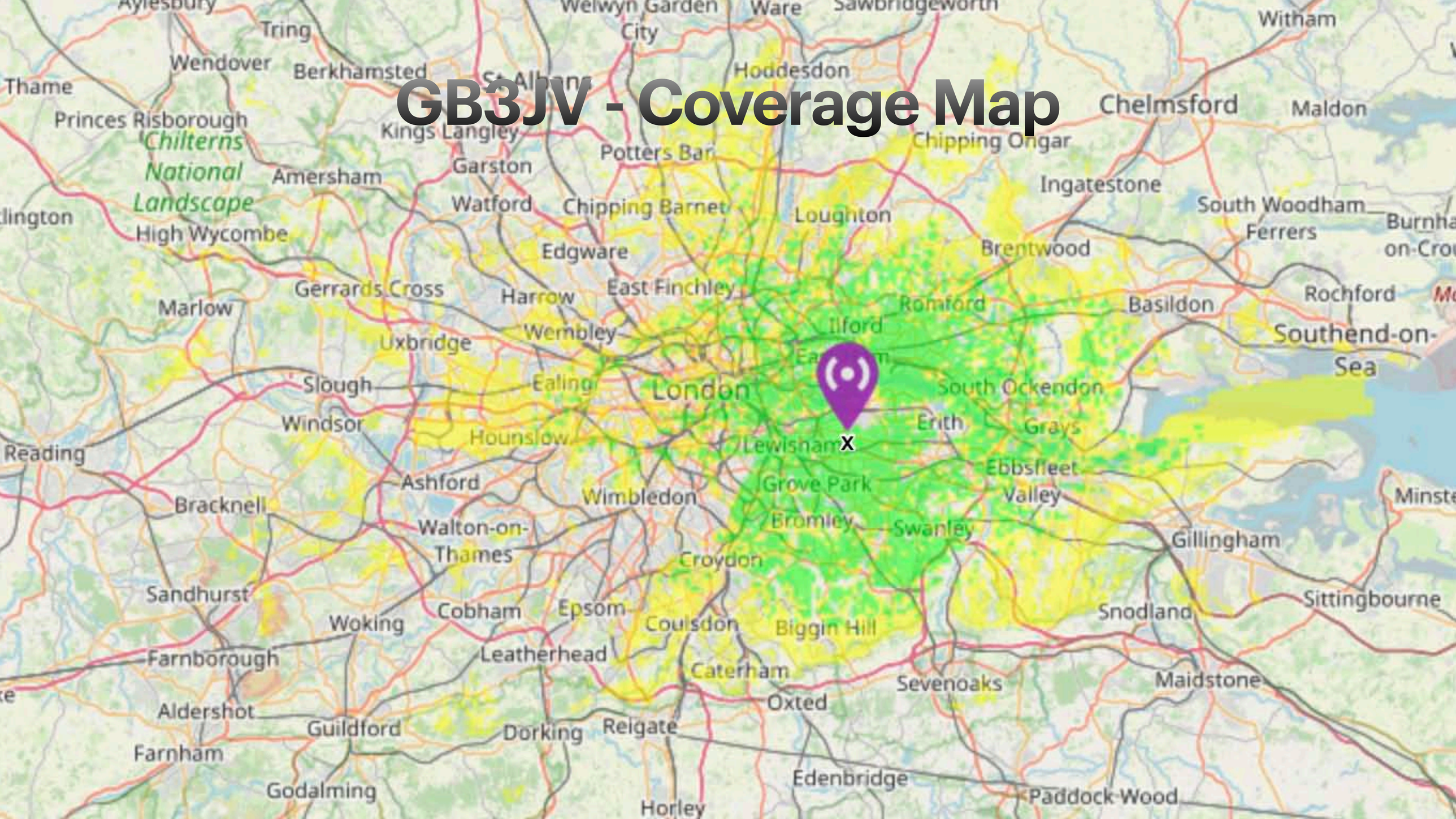
GB3JV, GB3JT & GB3OO

Justin D. Cockett, G8YTZ - October 2025

gb3jv.co.uk update

- Sadly, we lost the site we've used for 6 years earlier this year
- Objective is to cover South East, East London and NW Kent a strong signal on the existing 3.404GHz allocation
- We are hoping to agree access to a new site for 2026, but we're holding out for the very best solution
- In the meantime the repeater has undergone several upgrades to help ensure continuing maintainability
- For now the repeater is operational supporting inbound and outbound streaming

GB3JV - Coverage Map



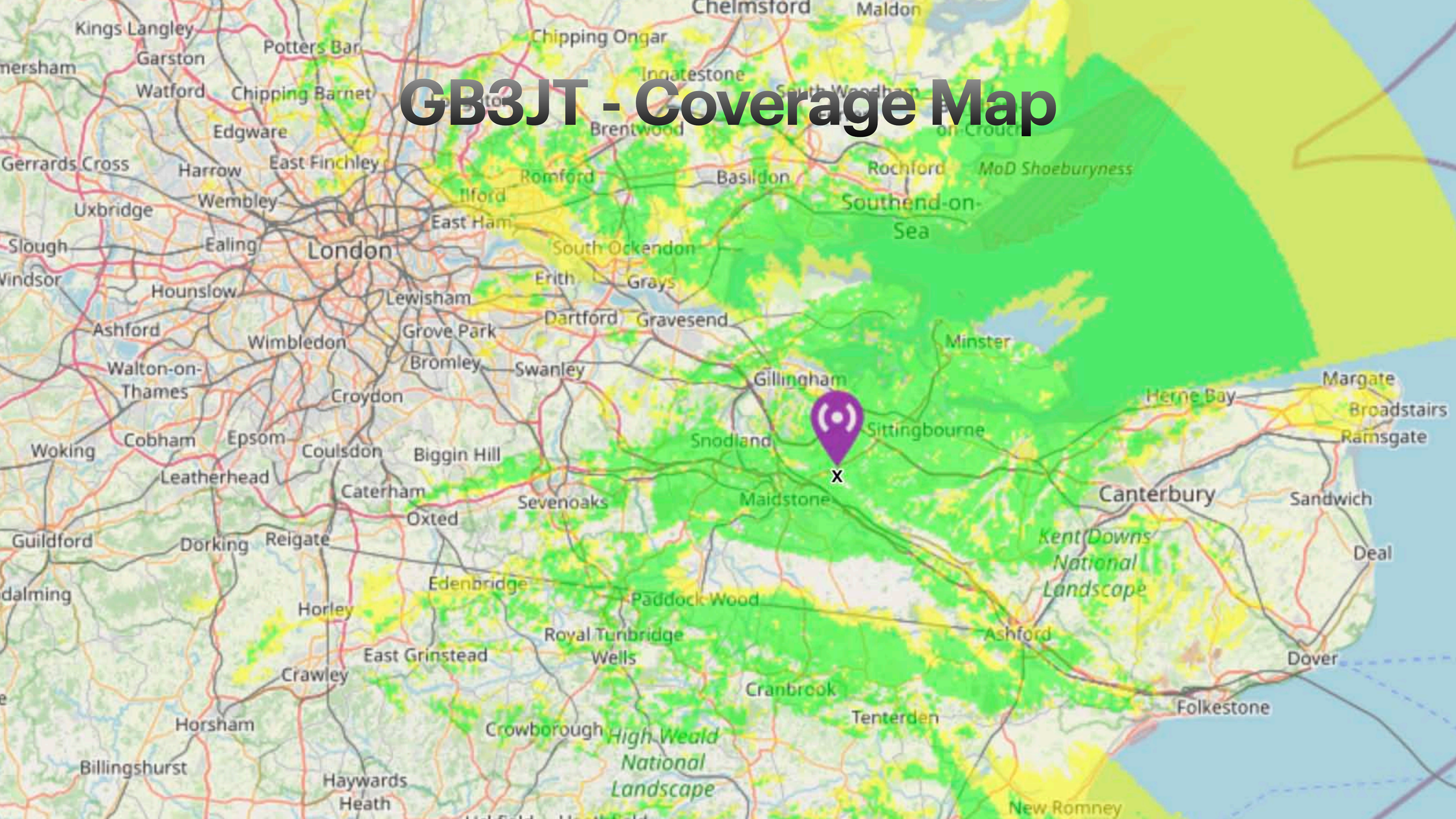
gb3jt.co.uk - overview

- The repeater, previously located in Hastings is being relocated to Detling Hill, Kent
- The tower is 150’ high, the Tx antenna will be mounted close to the top.
- A brand-new, high specification all-digital repeater has been built based on the very successful and reliable GB3JV design, but with some notable updates and improvements.

gb3jt.co.uk - progress update

- Repeater build is 80% Complete receivers, controller, software, network all completed.
- RF Sections are under final construction and expected to be complete in November
- Rx Antennas have been delivered, Tx Antenna is in transit and expected to be delivered early next week, the RX antennas have already been delivered
- Aiming for go-live Q4 2025

GB3JT - Coverage Map



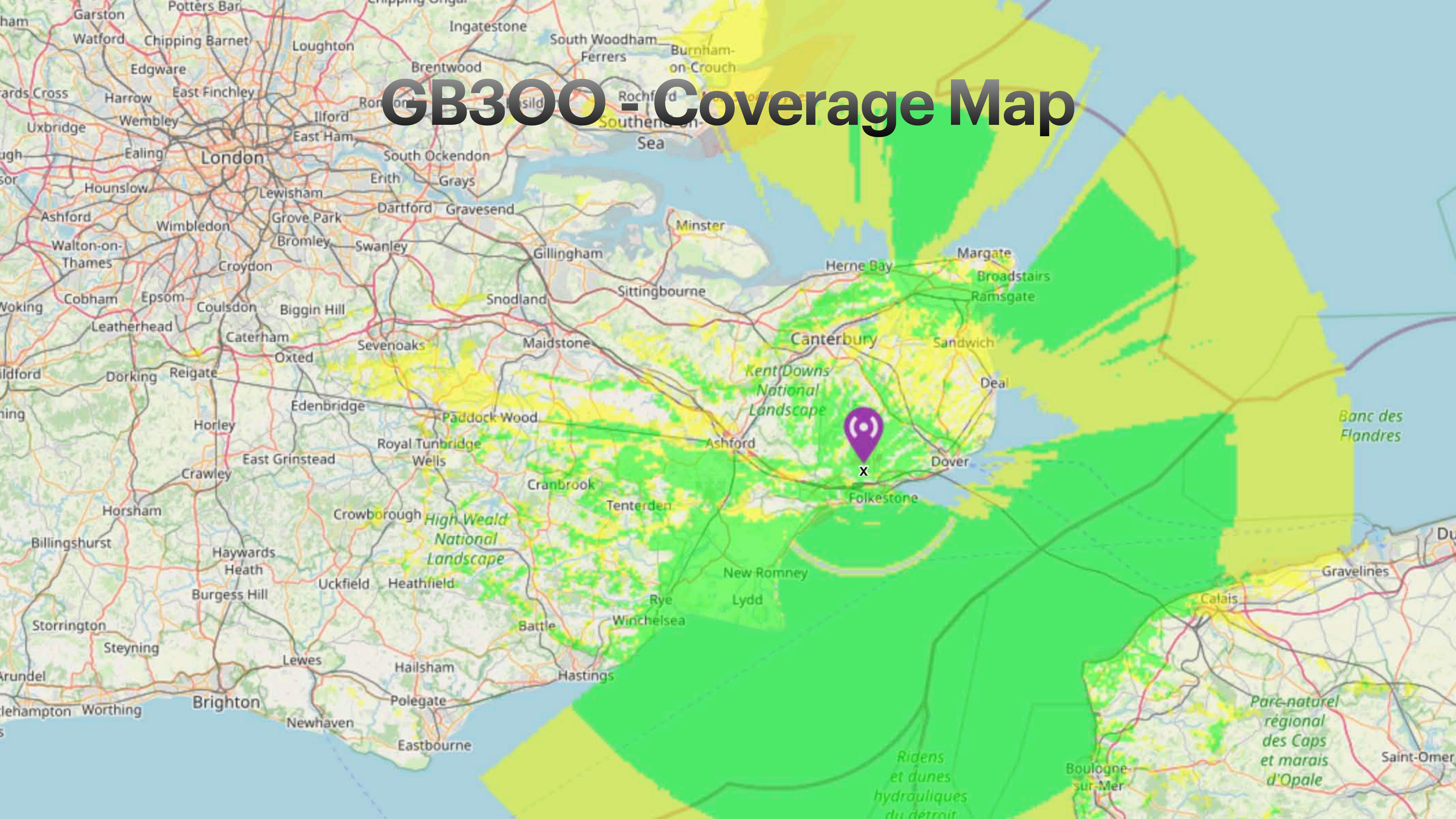
gb3oo.co.uk - overview

- An ex-Kent Ambulance site located near Paddlesworth, Kent which is the second highest point in Kent (after Wrotham) 3 miles NW of Folkestone.
- Tx antenna is going close to the top of the 100’ tower, but within the lighting conductor “cone”!
- The repeater design is an exact copy of the GB3OO repeater, down to the last screw!

gb3oo.co.uk - progress update

- Repeater build is 80% Complete. Receivers, Controller, Software network all completed
- RF Sections are under construction and expected to be complete in December
- TX Antenna is under construction, delivery expected in December, Rx Antennas already delivered
- Aiming for go-live Q1 2026, but we are ahead of schedule

GB3OO - Coverage Map

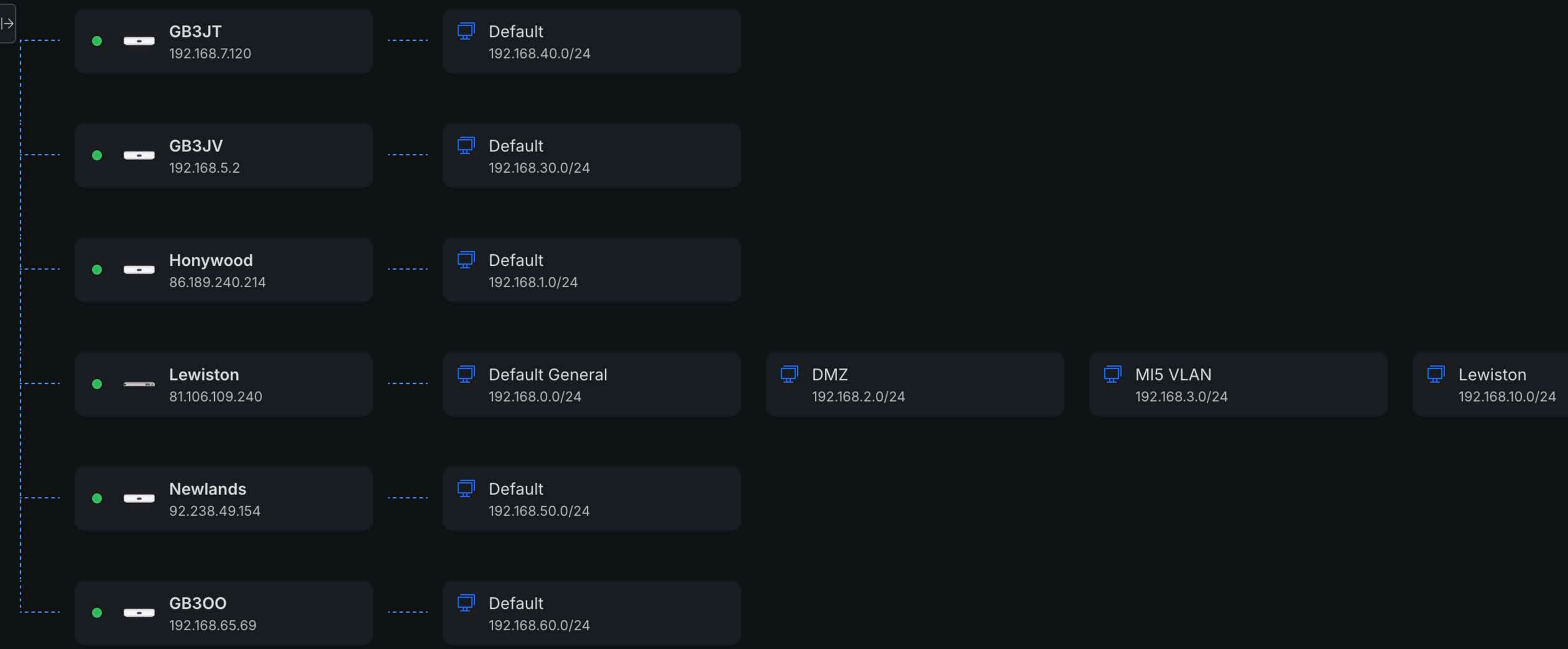



Controller Rack
SPD
FUSED

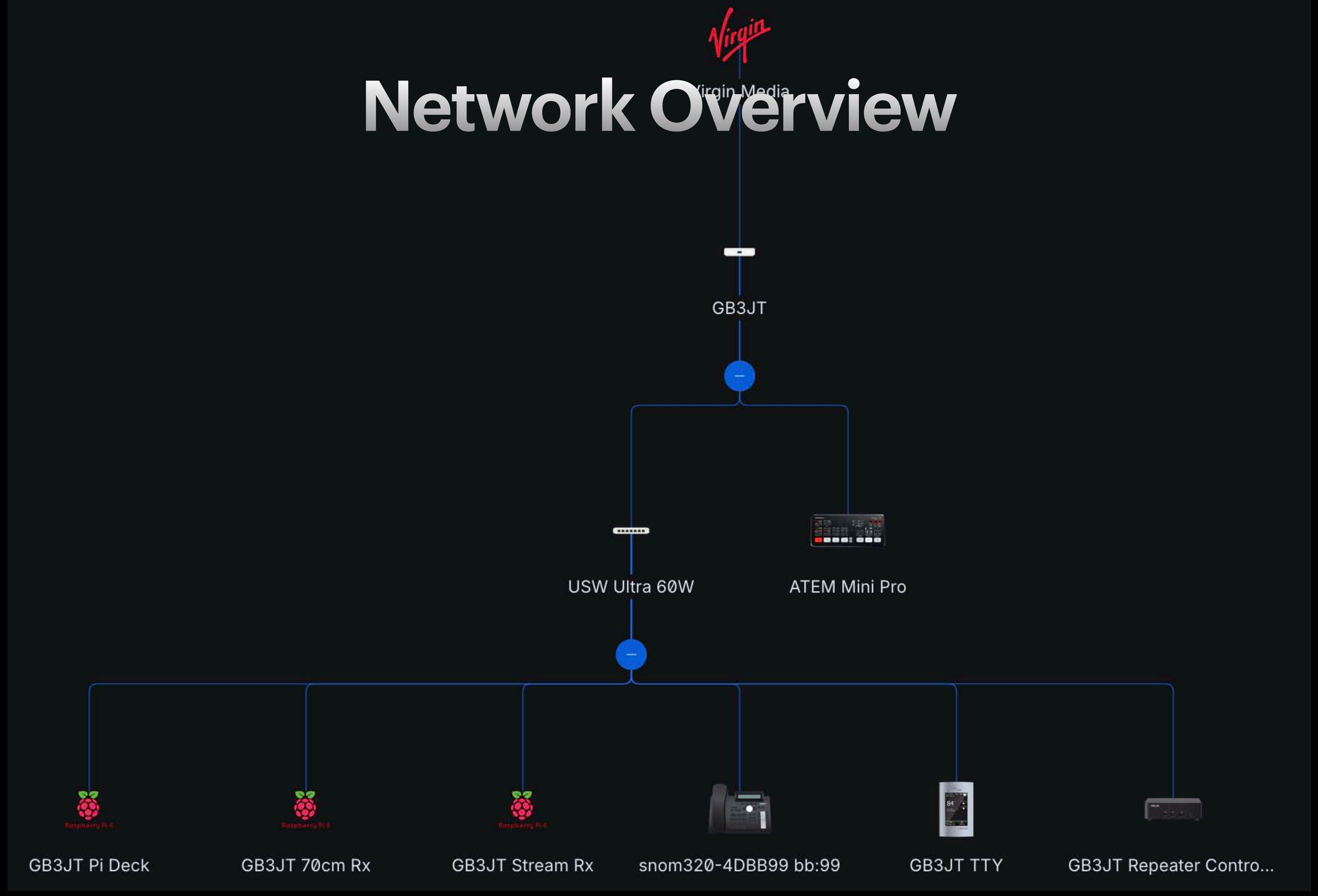
Technical Overview - Network

- All the repeaters are networked using SD WAN technology and “Unifi” hardware
- VPN access to each repeater means that most maintenance tasks can be performed remotely
- A Modbus TCP/RTU device provides a remote dashboard allowing remote shutdown and performance alerting & monitoring
- The entire repeater is supported by a UPS to isolate the electronics against any short power surges or outages

Network Overview



Network Overview



Network Overview - Telephony!

Technical Overview - Receivers

- RF and stream receivers - modified Ryde with minitiouner
- 70cm Rx chain; “Big Wheel” Antenna - interdigital filter - pre-amplifier - SAW filter - minitiouner
- Stream receiver - modified Ryde
- 2m “Talkback” receiver QYT KT-WP12 (CTCSS 103.5Hz)
- 2m Rx chain; Diamond X30 - interdigital filter - pre-amplifier - SAW filter
- Allowance in the design for a 2nd stream receiver to support networking of the three repeaters.

Technical Overview - Controller

- Video switching, transitions, DOGS, lower thirds, PiP and output streaming all supported by a Blackmagic Design ATEM Mini Pro
- Media player is based on G0GUY's "PiDeck". The "PiDeck" supports API integration to the ATEM and "Companion"
- Repeater Controller functions are performed by Bitfocus "Companion" open source software running on the site Win11 NUC PC
- Remote control actions via the public web portal control panel
- Also running on the W11 NUC PC is VLC, this performs the audio announcement functions

Technical Overview - Modified Ryde - 1

- In a “standard” Ryde receiver the “lock” indication causes a GPIO pin to go low, in the GB3JV/JT/OO implementation we import the urllib library in linux to send a command to the Bitfocus “Companion” software which in turn triggers a Blackmagic ATEM transition macro to select the appropriate input
- At the same time the ATEM “Session Recording” begins, the recordings are then available to members who are members of the web site
- When lock is lost another web-hook is sent to “Companion” to return the repeater to the media player and end the session recording
- The possibility exists to send web-hooks to the other networked repeaters, so if one repeater is in use, they will all show that input, that’s planned as a later enhancement

Technical Overview - Auto Logbook function

- When valid RF signal is received, some additional Ryde code:
  - Populates the qrz.com logbook with an entry that includes, mode, signal strength, station ID and MER
  - An additional SLACK notification is sent to the user group showing the user’s call-sign
  - Bitfocus Companion also sends a link to the SLACK group with a link to the stream URL
  - Received web-streams only send the latter notification, not the call-sign

Steps to add the Auto Logbook to any Ryde

- Create a qrz.com logbook entry from your main page (requires a QRZ API subscription)
- On the repeater logbook settings page copy your API key (you'll need this to configure the new webhook.py file that you'll be adding to your Ryde)
- Back on the repeater logbook page you will see at the bottom some code to add this logbook as an iframe to your repeater's web site.
- Create a free SLACK account and application with an inbound web-hook, copy this unique web-hook (instructions on the SLACK website). Add members of your repeater's user group who will receive an invite to join the channel

Steps to add the Auto Logbook to any Ryde

- On the Ryde receiver add the webhook.py file to the ryde/rydeplayer/ folder:
  - On line 29 add your SLACK web-hook URL
  - On line 89 change the callsign of the repeater to yours
  - On line 127 change the callsign of the repeater to yours
  - On line 134 paste your qrz.com API key
- In your ryde/rydeplayer/states/playback.py file enter a new line below the existing import statement at the top of the file “import urllib.request”
- Reboot and test!

Practical Demonstrations Follow

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