# FCC SPECIAL TEMPORARY AUTHORITY SUPPORTING EXHIBIT

## Temporary Operation of Private 5G Standalone gNodeB — Exercise BOLDQUEST, Alpena, Michigan

| Field | Submission information |
|---|---|
| FCC FRN | 0038302717 |
| FCC application file number | 1334-EX-ST-2026 |
| Applicant | Col Oliver Bartels, Chief Clinical Information Officer, UK Ministry of Defence |
| Applicant contact | Oliver.Bartels759@mod.gov.uk \| +44 7801 140369 |
| Applicant postal address | Rhine House, DMS Whittington, LICHFIELD, Staffordshire, WS14 9PY, UK |
| Entity / organisation | UK Ministry of Defence |
| Event | Exercise BOLDQUEST, US Joint Staff J6 Coalition Interoperability Demonstration event |
| Location | Combat Readiness Training Center, Alpena, Michigan, United States |
| Requested operating period | 26 August 2026 to 9 September 2026 |
| Equipment | Deployable 5G Standalone gNodeB supporting up to 10 Samsung Android user devices |
| Operation type | Temporary, non-commercial, exercise-based technical and operational testing |

## 1. Request and Duration

The applicant requests Special Temporary Authority to operate a private 5G Standalone gNodeB during Exercise BOLDQUEST at the Combat Readiness Training Center, Alpena, Michigan. The proposed operating period is 26 August 2026 to 9 September 2026. Operation is requested only for the temporary exercise activity and is not intended to provide commercial service or to substitute for a permanent license.

## 2. Purpose and Public Interest

Exercise BOLDQUEST is a US Joint Staff J6-sponsored Coalition Interoperability event. The proposed 5G Standalone deployment will support Medical communication testing by connecting up to 10 Samsung Android devices to a secure private network simulating a forward deployment. The network will support clinical and command-and-control data flows during the exercise.

Grant of the requested authority would serve the public interest by enabling testing intended to improve digital communications for operational medical users and to support NATO interoperability. The testing will help evaluate resilient communications for settings where secure, rapidly deployable networks are required.

## 3. Equipment and Network Configuration

The proposed transmitter is a deployable 5G Standalone gNodeB configured as a private network for exercise use. The test configuration uses 5G NR OFDM, single component carrier operation, with operation limited to the declared exercise area and to the parameters set out in this exhibit.

| Parameter | Proposed value / basis |
|---|---|
| Signal type | 5G NR OFDM, single component carrier |
| Nominal channel bandwidth | 20 MHz configured bandwidth for each proposed carrier; occupied bandwidth less than configured bandwidth |
| Base-station conducted output power | 33 dBm average conducted output power at base-station RF output port |
| PAPR used for peak calculation | 8.5 dB PAPR; calculated peak envelope power 41.5 dBm before feeder loss |
| RF feeder | 8 m Ecoflex 15 coaxial cable; loss calculated from typical attenuation table at 20 deg C by linear interpolation |
| Antenna | Poynting OMNI-496, N-Type female, vertical linear polarisation, SISO |
| Antenna gain | 8 dBi across 3300-4200 MHz band, excluding cable loss |
| TDD split | 7:3 downlink/uplink split. Power, EIRP and MPE figures are not reduced for duty cycle. |

## 4. Frequencies, Emissions and Operating Bandwidth

| Item | NR band | Centre frequency | Discrete RF range | Configured / occupied bandwidth | Modulation / access | Emission designator |
|---|---|---|---|---|---|---|
| 1 | n77 / n78 | 3460 MHz (3.460 GHz) | 3450-3470 MHz | 20 MHz configured; OBW < 20 MHz | 5G NR OFDM | 20M0W7W |
| 2 | n77 | 3979 MHz (3.979 GHz) | 3969-3989 MHz | 20 MHz configured; OBW < 20 MHz | 5G NR OFDM | 20M0W7W |

## 5. Power and EIRP

| Item | Centre frequency | Bandwidth | 8 m cable loss | Average power at antenna feed | Peak envelope power at antenna feed | Antenna gain | Average EIRP |
|---|---|---|---|---|---|---|---|
| 1 | 3460 MHz | 20 MHz | 1.59 dB | 31.41 dBm / 1.385 W | 39.91 dBm / 9.805 W | 8.0 dBi | 39.41 dBm / 8.739 W |
| 2 | 3979 MHz | 20 MHz | 1.72 dB | 31.28 dBm / 1.342 W | 39.78 dBm / 9.501 W | 8.0 dBi | 39.28 dBm / 8.467 W |

## 6. Interference Mitigation and Emissions Control

Operation will be restricted to the declared exercise area. The transmitter will remain disabled until the containment method, test boundary and exclusion zone are confirmed by the responsible on-site authority.

The antenna is an omnidirectional, vertically polarised Poynting OMNI-496 operating in the 3300-4200 MHz range with 8 dBi gain for the EIRP calculation. Because the antenna is not directional, interference mitigation will rely on RF containment, physical separation, minimum necessary power, limited-duration testing, site boundary control and immediate shutdown capability. The antenna will be located to outside of the airfield-controlled perimeter, adjacent to Buidling 601, no more than 2m off the ground

gNodeB testing has been performed up to the 3rd harmonic using UKAS-traceable calibrated equipment. Hard clipping filters have been applied, and no 2nd or 3rd harmonic noise was observed during the described testing. Additional testing to the 5th harmonic is planned using calibrated Keysight instrumentation, with H2-H5 harmonic levels to be measured prior to the event.

| Control | Commitment |
|---|---|
| Operating area | Operation limited to declared exercise/test area at Alpena CRTC |
| Power control | Operate at minimum necessary power for the test objective |
| Antenna control | Antenna location and exclusion area controlled by the test team |
| Emission control | Band-pass / filtering measures used as part of the test configuration |
| Shutdown contact | John Schafer, Joint Staff Spectrum Managerr john.c.schafer10.ctr@mail.mil; Cell: (402) 290-5646<br><br>Col Oliver Bartels, Oliver.Bartels759@mod.gov.uk, +44 7801 140369; |

## 7. RF Exposure Assessment

The transmitter operates in the 3.4-4.175 GHz radio-frequency range. This is non-ionising RF electromagnetic energy. The safety assessment is therefore based on FCC Maximum Permissible Exposure limits for RF exposure.

For 1500-100000 MHz, the general population / uncontrolled MPE limit is 1.0 mW/cm2 averaged over 30 minutes. The occupational / controlled MPE limit is 5.0 mW/cm2 averaged over 6 minutes. The proposed carriers are above 1500 MHz, so these fixed power-density limits apply for MPE screening.

Power density has been screened using the conservative isotropic far-field equation: power density = EIRP divided by 4 x pi x distance squared. Maximum average EIRP is used because MPE is a time-averaged exposure assessment. The 7:3 TDD split is not used to reduce the distances below; the values remain conservative worst-case screening distances.

| Carrier | Bandwidth | Worst-case avg EIRP without BPF | Avg EIRP with BPF | General public MPE distance | Occupational MPE distance | Operational exclusion distance |
|---|---|---|---|---|---|---|
| 3460 MHz | 20 MHz | 8.738 W | 8.039 W | 0.27 m | 0.12 m | 1.0 m minimum |
| 3979 MHz | 20 MHz | 8.472 W | 7.798 W | 0.26 m | 0.12 m | 1.0 m minimum |

The calculated worst-case public/uncontrolled MPE distance is approximately 0.27 m from the antenna. A conservative 1.0 m minimum RF exclusion distance will be applied around the transmitting antenna during operation.

## 8. Site Location

The proposed mast location is 3CRJ+VG, Alpena, MI 49707, United States. Coordinates: 45.092537358701406, -83.5677858347068.

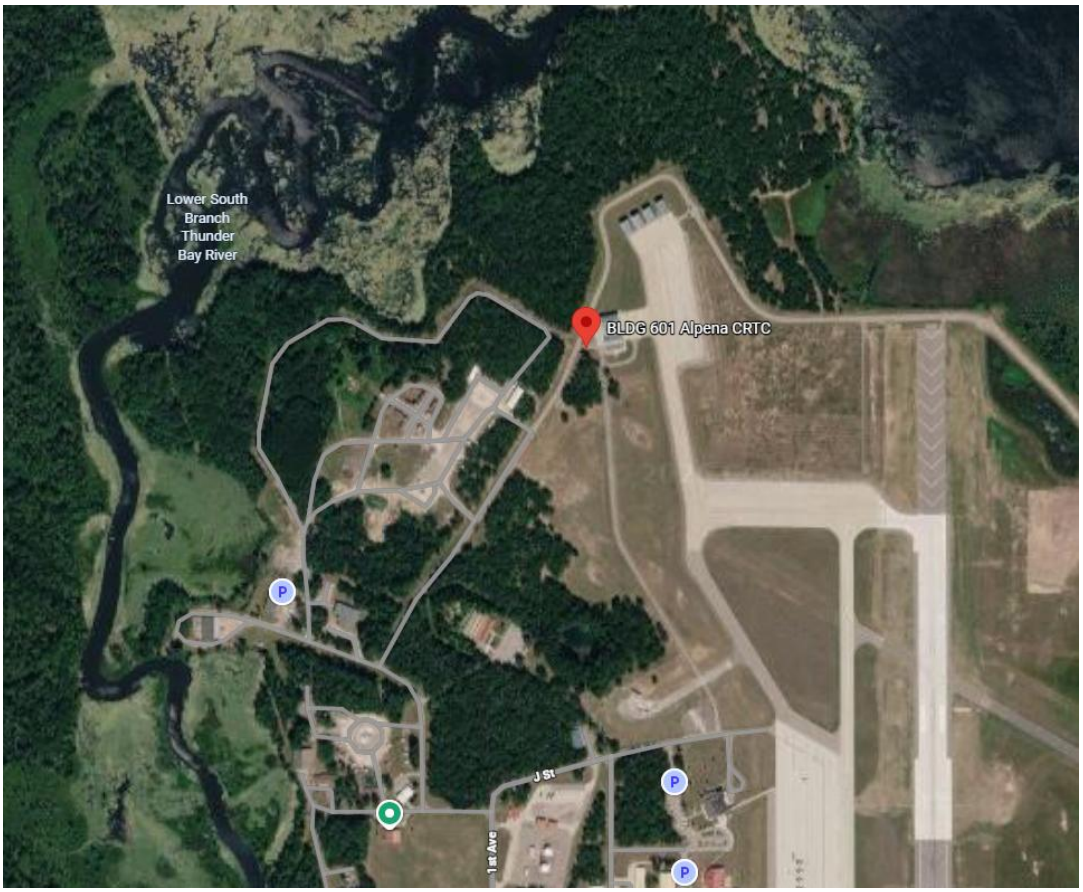


*Figure 1. Proposed mast location at Alpena CRTC.*

## 9. Agri-Valley Spectrum Coordination and Lease Proposal

JET Connectivity, acting in support of the UK Ministry of Defence deployment team, has engaged Agri-Valley Communications to request temporary spectrum access for the Exercise BOLDQUEST private 5G deployment. Agri-Valley responded positively are agreeing a plan to lease 20Mhz of spectrum for the duration of the exercise – either in the Agri-Valley 3.45-3.48 or 3.96-3.98 Ghz slots.

They understand this request is to support an experimental, low-power, fixed-location, private 5G network operating for exercise purposes only. The intended leasing window communicated in the correspondence was 24 August 2026 to 9 September 2026, with proposed transmissions 0700-1900 Monday to Saturday during that period.

The approach is intended to support safe and cooperative spectrum use, with the preferred route being a written agreement or authorisation letter covering the temporary exercise period rather than a complex long-term commercial arrangement.

| Candidate Agri-Valley spectrum block | Proposed use |
|---|---|
| 3450-3480 MHz | Candidate 20 MHz channel for temporary private 5G operation at Alpena CRTC |
| 3960-3980 MHz | Candidate 20 MHz channel for temporary private 5G operation at Alpena CRTC |

| Lease request element | Information provided to Agri-Valley / JET |
|---|---|
| Requested duration | 24 August 2026 to 9 September 2026 |
| Proposed transmit hours | 0700-1900, Monday to Saturday |
| Operating site | Combat Readiness Training Center, Alpena, Michigan |
| Coordinates supplied for lease discussion | 45.092449, -83.568837 |
| Operational footprint | Up to 2km effective range from building 601, CRTC |
| Regulatory context | Secondary lease of civilian spectrum with US Military Spectrum oversight |

| Organisation | Point of contact | Contact details |
|---|---|---|
| Agri-Valley Communications | Hans Eichler, Director of Technology | heichler@avci.net; (989) 551-2471 |
| Agri-Valley Communications | Shelly Gunden, Tech Solutions Manager | sgunden@avci.net; Primary: (989) 453-7190; Secondary: (989) 553-0635 |
| JET Connectivity | Andy Crouch, Consultant & Co-Founder | andy@jet-eng.com; +44 (0) 1252 516943; +44 (0) 7976 634753 |
| US Joint Staff J6 | John Schafer, Deputy Bold Quest C4 Planner & Spectrum Manager | john.c.schafer10.ctr@mail.mil; Cell: (402) 290-5646 |
| UK Ministry of Defence | Col Oliver Bartels OBE, Chief Clinical Information Officer, DMS Digital | Oliver.Bartels759@mod.gov.uk; +44 7801 140369 |

## 10. Coordination and Operating Responsibility

Operational control of the temporary transmitter will remain with the applicant, supported by the UK Ministry of Defence exercise team and JET Technologies. On-site spectrum control and operational authority will be coordinated through the Alpena CRTC Spectrum Manager and Mr John Schafer, Deputy Bold Quest C4 Planner & Spectrum Manager, Joint Staff J6/DDC5I, Joint Fires Integration Division.

Testing will be suspended immediately if directed by the FCC, the Alpena CRTC Spectrum Manager, Mr John Schafer, the site authority, Agri-Valley Communications, or any other authorised spectrum-control authority. Local coordination documentation, including any required coordination with local spectrum stakeholders or carriers, will be supplied separately if required by the FCC or site authority.

## 11. Certification Statement

The applicant certifies that the operation described in this exhibit will be experimental, temporary in nature, limited to the stated exercise purpose, and conducted in accordance with the technical parameters, mitigation measures and RF exposure controls described above.

**Authorised applicant: Col Oliver Bartels, FCC FRN 0038302717**