

**Exhibit 2: Site 2 - Request to Modify WD2XKJ to add Camden, Arkansas**

File Number: 0092-EX-ML-2009

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**Exhibit 2: Demonstrating compliance with Section 8.3.28 of the NTIA Manual – Use of Fixed Devices That Re-Radiate Signals Received from the Global Positioning System**

Additional Site 2: Camden, Arkansas 33-37-09.4 N, 092-45-32.6 W

Raytheon Missile Systems sets forth below information to demonstrate that this request to modify WD2XKJ is in compliance with the requirements of Section 8.3.28 of the NTIA Manual for the use of devices that re-radiate signals received from the Global Positioning System. The information is presented point by point, in response to the requirements in the NTIA manual. Any questions about the proposed use, installation, or operation should be addressed to Anne Linton, 202-530-8583 or Tom Fagan at 520-794-0227.

**NTIA Criteria:**

1. *Individual authorization is for indoor use only, and is required for each device at a specific site:*

Raytheon Missile Systems (“RMS” or “Raytheon”) is applying to modify its experimental license WD2XKJ to use GPS re-radiation technology at its facility in Camden Arkansas. The proposed use of re-radiation equipment will be inside the plant facility for use by RMS in its capacity as a government contractor and producer of products that rely on precision navigation.

2. *Applications for frequency assignment shall be applied for as an “XT” station class with a note indicated that the device is to be used as an “Experimental RNSS Test Equipment for the purpose of testing GPS Receivers” and describing how the device will be used.*

RMS has filed this application through the FCC’s experimental licensing system, requesting permission to add this additional location. The purpose of the experiment is to allow reception of GPS signals in the manufacturing area of the Camden, Arkansas facility to test the GPS receivers on missiles and see if they are operational.

3. *Approved applications for frequency assignment will be entered in the GMF.*

RMS requests the assistance of the FCC and NTIA to ensure that this frequency assignment is entered into the government master file.

4. *The maximum length of the assignment will be two years, with possible renewal.*

RMS is requesting that this location be added to the existing authorization for the duration of that authorization.

5. *The area of potential interference to GPS reception has to be under the control of the user.*

The Camden location is wholly controlled by RMS. The building where the installation will take place is on a campus with controlled access that is wholly under the control of RMS. Further, the building is a secure facility with security protections to safeguard RMS proprietary business matters and government security protection measures in place. The general public cannot enter the building without clearing extensive security.

6. *The maximum equivalent isotropically radiated power (EIRP) must be such that the calculated emissions are no greater than -140dBm/24MHz as received by an isotropic antenna at a distance of 100 feet (30 meters) from the building where the test is being conducted. The calculations showing compliance with this requirement must be provided with the application for frequency assignment and should be based on free space propagation with no allowance for additional attenuation (e.g., building attenuation).*

RMS is submitting the required calculations as part of a link budget at the end of this exhibit. Further, RMS is submitting diagrams showing the testing configuration to further demonstrate that the proposed use of a re-radiation system in this location meets the criteria set forth. See Attachment A, below.

7. *GPS users in the area of potential interference to GPS reception must be notified that GPS information may be impacted for periods of time.*

RMS will post signs at the entrance to the area of operation at the Camden facility where the GPS re-radiation unit is installed that the system is installed and in use. The sign will include information on how to reach the stop buzzer point of contact.

8. *The use is limited to activity for the purpose of testing RNSS equipment/systems.*

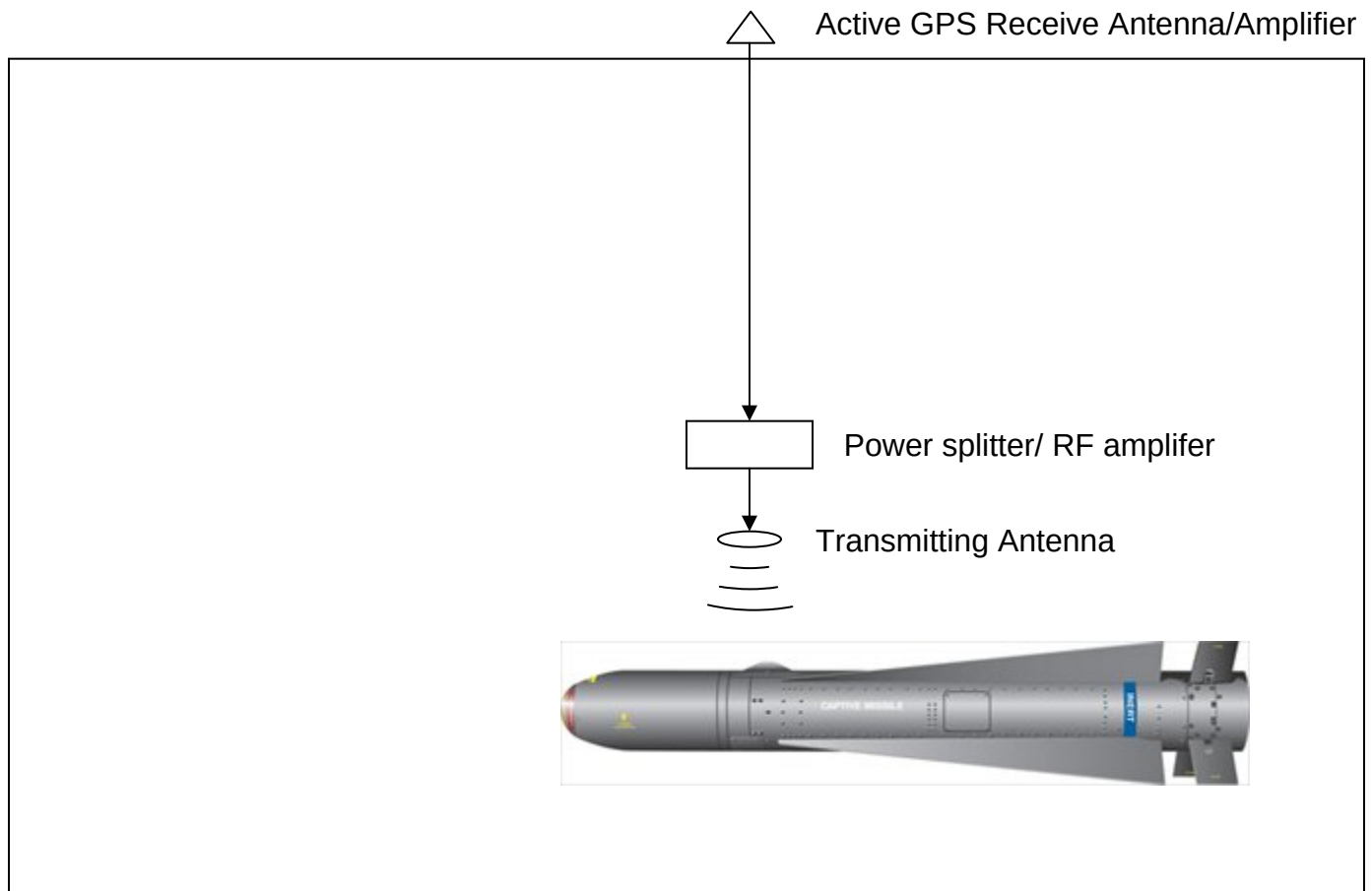
This GPS re-radiation system is not for operational use. The re-radiation installation is to test the GNSS equipment on missiles. It cannot be done outside due to the cost, power, and size of the objects being tested. So, RMS is requesting authorization to install this GPS re-radiation system to test the GPS navigation systems being installed on the missiles in the manufacturing process.

9. *A “Stop Buzzer” point of contact for the authorized device must be identified and available at all times during GPS re-radiation operation of the device under any condition.*

The “Stop Buzzer” point of contact is:

John R. Hendrick, 870.574.5447, Raytheon Missile Systems – Camden, AR

Diagram showing proposed installation:



*Link Budget and Calculations for GPS L1 and GPS L2 showing compliance with Item 6 of NTIA Criteria:*

| Raytheon Missile Systems - Camden, Arkansas GPS Rerad Link Budget                 |          |        |              |       |           |
|-----------------------------------------------------------------------------------|----------|--------|--------------|-------|-----------|
| GPS Signal Analysis                                                               |          |        |              |       |           |
| Frequency - GPS L2                                                                | 1227.6   | MHz    | Signal Level |       |           |
| Wavelength                                                                        | 0.244379 | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                                                            | -130     | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain                                                | 32       | dB     | -98          | 2E-13 | 0.16      |
| GPS RF Amplifier gain                                                             | 29.4     | dB     | -68.6        | 1E-10 | 138.04    |
| GPS RF Attenuator                                                                 | -15      | dB     | -83.6        | 4E-12 | 4.37      |
| LMR400 Coax loss per foot                                                         | -0.067   | dB     |              |       |           |
| Coax Length                                                                       | 31       | feet   |              |       |           |
| Total Coax Loss                                                                   | -2.077   | dB     | -85.68       | 3E-12 | 2.706     |
| GPS Transmitting Antenna Gain                                                     | 0        | dB     | -85.68       | 3E-12 | 2.706     |
| Distance from transmit antenna                                                    | 3        | meters |              |       |           |
| Distance from transmit antenna in feet                                            | 9.84252  | feet   |              |       |           |
| Pathloss to unit under test                                                       | -43.7653 | dB     | -129.4       | 1E-16 | 0.000114  |
| Signal level at unit under test EIRP to ERP                                       |          |        | -131.6       | 7E-17 | 6.95E-05  |
| Distance from transmit antenna in meters                                          | 30.48    | meters |              |       |           |
| Distance from transmit antenna in feet                                            | 100      | feet   |              |       |           |
| Freespace pathloss to 100 ft                                                      | -63.9032 | dB     |              |       |           |
| EIRP Signal level at 100 ft from TX antenna                                       |          |        | -149.6       | 1E-18 | 1.1E-06   |
| ERP Signal level at 100 ft from TX antenna                                        |          |        | -151.7       | 7E-19 | 6.73E-07  |
| <b>NTIA 8.3.28 compliant if EIRP signal level at 100 ft is less than -140 dBm</b> |          |        |              |       |           |
| GPS Signal Analysis                                                               |          |        |              |       |           |
| Frequency - GPS L1                                                                | 1575.42  | MHz    | Signal Level |       |           |
| Wavelength                                                                        | 0.190425 | meters | dBm          | Watts | picoWatts |
| GPS Input Signal Level                                                            | -130     | dBm    | -130         | 1E-16 | 0.0001    |
| GPS Receive Antenna amplifier gain                                                | 32       | dB     | -98          | 2E-13 | 0.16      |
| GPS RF Amplifier gain                                                             | 29.4     | dB     | -68.6        | 1E-10 | 138.04    |
| GPS RF Attenuator                                                                 | -15      | dB     | -83.6        | 4E-12 | 4.37      |
| LMR400 Coax loss per foot                                                         | -0.067   | dB     |              |       |           |
| Coax Length                                                                       | 31       | feet   |              |       |           |
| Total Coax Loss                                                                   | -2.077   | dB     | -85.68       | 3E-12 | 2.706     |
| GPS Transmitting Antenna Gain                                                     | 0        | dB     | -85.68       | 3E-12 | 2.706     |
| Distance from transmit antenna                                                    | 3        | meters |              |       |           |
| Distance from transmit antenna in feet                                            | 9.84252  | feet   |              |       |           |
| Pathloss to unit under test                                                       | -45.9321 | dB     | -131.6       | 7E-17 | 6.9E-05   |
| Signal level at unit under test EIRP to ERP                                       |          |        | -133.7       | 4E-17 | 4.22E-05  |
| Distance from transmit antenna in meters                                          | 30.48    | meters |              |       |           |
| Distance from transmit antenna in feet                                            | 100      | feet   |              |       |           |
| Freespace pathloss to 100 ft                                                      | -66.07   | dB     |              |       |           |
| EIRP Signal Level at 100 ft from TX antenna                                       |          |        | -151.7       | 7E-19 | 6.69E-07  |
| ERP Signal level at 100 ft from TX antenna                                        |          |        | -153.9       | 4E-19 | 4.09E-07  |
| <b>NTIA 8.3.28 compliant if EIRP signal level at 100 ft is less than -140 dBm</b> |          |        |              |       |           |