

Caos Capital
Application for Special Temporary Authorization

STA Application Narrative

This application (“Application”) is submitted on behalf of Caos Capital (“Caos”) requesting Experimental Special Temporary Authority (“STA”) to operate facilities in the 222-225 MHz band as specified in the Application during the period of April 1, 2025 to April 30, 2025.

Caos respectfully submits that the public interest would be served by granting this STA request. Caos has been developing a radar system to protect against unmanned aerial systems (“UAS”) in accordance with several other experimental conventional licenses and STAs that the FCC has granted to date. Caos has been invited by the United States Marine Corps and the Marine Corps Warfighting Laboratory to conduct a tactical demonstration of their radar system during a USMC exercise called Weapons and Tactics Instructor Course (WTI) 2-25 at Marine Corps Air Station (MCAS) Yuma and surrounding ranges including, but not limited to the Barry M. Goldwater Range, West (R2301W) and Barry M. Goldwater Range, East (R2301E), the San Clemente Island Range Complex (W291E), the National Training Center (R2508), and Barstow-Dagget Airport. The tactical demonstration will last from April 1, 2025 until April 30, 2025 and take place in the vicinity of Yuma, Arizona, San Clemente Island, California, and Barstow, California. This STA seeks authorization to operate at the Ft. Irwin National Training Center site location. Caos intends to conduct its demonstration from April 1, 2025 to April 30, 2025. The operations proposed in this Application are supported by United States Marine Corps and the Marine Corps Warfighting Laboratory.

Technical Specifications:

1) Frequencies Desired: Caos requests authorization to operate in 222 - 225 MHz band, as specified in the Application. The specified frequencies were intentionally selected to eliminate any conflicts with spectrum allocated for aeronautical purposes, requiring pre-coordination with the Federal Aviation Administration.

2) Transmit and Effective Radiated Power Levels: The unit to be tested will operate with power levels ranging from 1 watt to a maximum average of 300 watts, and a momentary peak of 1kW.

Caos intends to continue using an Ettus software-defined radio, along with commercially available, off-the-shelf RF components, including (i) an amplifier (creating up to 10 kW, or 70 dBm, EIRP using the 10 dBi gain antenna), (ii) bandpass filters, and (iii) a TV-style VHF antenna with a 70-degree wide main beam.

3) Modulation and Emissions: The unit is capable of operating with either frequency or phase modulation. The Application specifies emission designators for both frequency and phase modulations.

4) Antenna Information: The antenna will be mounted in a manner that will not require prior approval under FAA or FCC rules and regulations. This STA seeks authorization to operate at the Ft. Irwin National Training Center site listed below:

Site: 35°16'46"N; 116°38'24"W (Ft. Irwin National Training Center)

a) Width of beam in degrees at the half-power point for the site and orientation:

- Beam width: +/- 30° from centerline (60° total width)
- Beam height: +/- 15° from centerline (30° total height)
- Site orientation:
- Horizontal: 120° (+/- 30°)
- Vertical: 5° above horizon (+/- 15°)

b) The Antenna Gain is 11 dBi in the main beam

c) The Azimuth Direction is 120 degrees true.

5) Operations: Caos will conduct the proposed tests with no more than one (1) unit operating at a time. The unit will operate with up to a 30% duty cycle, and transmissions will be no more than 300 μ s long. It is expected that the testing of the unit will be no more than 3 hours per day, at intervening periods during the STA period.

6) Radiation Hazard Analysis: Caos has confirmed that the proposed operations will comply with the FCC's RF exposure guidelines with respect to the prototype antennas and test station transmissions, for uncontrolled (general population) and controlled (occupational) environments, as specified by Section 1.1310 of the Commission's rules.

In particular, the testing will occur inside military range complexes, with restricted access only to authorized personnel. The transmitting antenna will only operate within designated exercise sites inside the National Training Center ranges. No part of the main beam will hit any area where the general population or occupational workers will be located. The transmissions will be for very short periods of time, no more than 300 μ s pulse, and a 30% duty cycle, for no more than a few seconds at a time.

Hence, any transmissions will not occur in proximity to and will comply with the exposure limits with respect to the general population. All Caos personnel operating and maintaining the equipment will be trained on proper handling of the equipment to mitigate radiofrequency exposure. Furthermore, all transmissions will be positively controlled by Caos personnel during testing who will be able to cease transmissions at any time.

Interference Mitigation:

Caos is well aware of its obligations under Part 5 of the Commission's rules to avoid interference to co-channel licensees in non-experimental services, and will take all necessary steps to ensure compliance with this obligation. Should interference occur, Caos will take immediate steps to resolve the interference, including discontinuing operations if necessary.

Caos has also conducted geosearches in the FCC's ULS database, as instructed by FCC personnel. As demonstrated in the following attached exhibit, there are no active licenses within 50 kilometers of the requested test site.

In addition, the following factors will help mitigate any interference issues:

1. Each test will be limited in time and location to protect other spectrum users.
2. Emissions will be active for very short durations no longer than a few seconds at a time. During a test, emissions will be activated periodically and will not be continuous.
3. The site is approximately 31 miles from the nearest civilian airport, Barstow-Dagget Airport. The airport will have the stop buzzer information provided below.
4. A waiver of the Station ID requirements of Section 5.115(a) of the Commission's rules is requested.

Stop Buzzer:

The following will be available by wireless telephone and will act as the "stop buzzer" if any issues arise during testing:

- Primary: Bo Marr – Mobile: 310-487-5016;
- Secondary: Daniel Thompson – Mobile: 405-388-0692.



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Specified Search

Latitude=**'35-16-46 N'** Longitude=**'116-38-24 W'** Radius = **50 Kilometers**

Status = **Active**

Frequency Upper Band >= **225**

Frequency Assigned <= **222**

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