



AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL®

# AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL

616 E 34th Street North, Wichita, KS 67219  
Telephone: (316) 821-9516 Fax: (316) 838-0015

## EXPERIMENTAL LICENSE or SPECIAL TEMPORARY AUTHORITY

All requests for frequency coordination by AFTRCC are subject to the Coordination Terms and Conditions. A [MEMORANDUM](#) describing the purpose and duration of the license, the make and model of all transmitters and transmitting antennas and their Geographical Coordinates, the desired frequency and all of its associated emissions, **MUST** accompany a completed and signed copy of this form. [A copy of the FCC license application should be included with the memorandum whenever possible.](#)

**NOTE: PROPRIETARY DATA/CLASSIFIED INFORMATION SHOULD NOT BE SUBMITTED.**

***If the applicant received this form in response to a coordination request, it must be completed, signed and returned per the included instructions before AFTRCC can continue processing the request.***

Date of Request:	1/27/2021	Identity Control No.	
Name of Applicant:	UP Aerospace Inc.	Address:	469 Mockingbird Court Highlands Ranch, CO 80129
Phone Number:	(720) 596-4430	Email:	Jay@ReactiveTechnologies.com
Coordination Site(s):	Truth or Consequences, NM Highland Ranch, CO	Dates of Operations:	5/1/2021                      12/31/2021
Requested Bands:	<input type="checkbox"/> HF Band (2851.0-21931.0 kHz) <input type="checkbox"/> L-Band (1435-1525 MHz)	<input type="checkbox"/> VHF Band (123.125-123.575 MHz) <input checked="" type="checkbox"/> S-Band (2360-2395 MHz)	<input type="checkbox"/> C-Band (5091-5150 MHz)

### COORDINATION TERMS AND CONDITIONS

AFTRCC provides recommendations to the Federal Communications Commission (FCC) for non-government use of flight test voice and telemetry frequencies. AFTRCC's role is strictly advisory; in all cases the FCC makes the decision whether to issue a license.

Applicants are advised that no representations or warranties, express or implied, are made as to the interference-free nature of any given frequency or frequencies which AFTRCC coordinates, or as to whether any given frequency recommendation is best suited for the Applicant's purposes.

Applicants should also be aware that frequencies coordinated by AFTRCC are shared with other users; no one user is entitled to exclusive use of a frequency in any given area. Multiple users may be, and often are, licensed or have government assignments for use of the same frequencies. Hence, notwithstanding FCC issuance of a license to the Applicant, transmission or any given frequency may be subject to day-to-day, hour-by-hour scheduling with Government Area Frequency Coordinators (AFCs) or other agencies.

In return for AFTRCC's processing of the Applicant's request, the Applicant agrees to release and hold harmless AFTRCC, its officers, directors, agents, representatives, and member companies (and their respective officers, directors, employees, owners, and agents) from and against any and all claims, losses, liabilities, damages or expenses which may arise now or in the future as a result of the Applicant's acceptance of AFTRCC's recommendation, or its use of the recommended frequency(ies).

Information supplied in support of a coordination request represents part of the FCC application process. Accordingly, this information is considered public record material.

Signature:  By checking the signature box, the applicant confirms that they are the duly authorized official named below; and that they accept and acknowledge the above limitations and conditions.

Print Name: Jay Francis (603) 429-0377

Title: Engineer (consulting for UP Aerospace)

Date: 1/27/2021

UP Aerospace Inc. is requesting coordination of telemetry frequencies to be used in a sounding rocket launch between May and December of 2021.

Pre-launch system integration testing includes powering on the telemetry transmitter along with all other avionics and payload systems to verify interoperability. These tests would be performed at our Highlands Ranch, CO facility and are tentatively scheduled for mid-May. The duration of telemetry transmitter tests would be an hour or less. These tests may be required to repeat up to four times per day over a two-day period during the integration testing.

The launch will take place at Spaceport America in Truth or Consequences, NM with a tentative schedule of early August. The vehicle is expected to reach an apogee of approximately 100 km, and will be recovered within White Sands Missile Range, NM. During the week prior to launch, the telemetry system will need to be tested while the vehicle is on the launch pad. The duration of telemetry transmitter tests would be an hour or less. These tests may be required to repeat up to twice a day. On day of launch, starting approximately 2 hours prior to the opening of the launch window, the telemetry system will be operational. Once the vehicle is launched, the flight time is approximately 15 minutes. The telemetry system is designed to power down approximately 45 minutes after launch.

As possible with any launch campaign, and even more so with the current pandemic, there is a high probability that pre-launch integration and actual launch dates will need to be adjusted. We are requesting a window of operation between May 1 and December 31, 2021 that should provide enough flexibility given the uncertainties.

**Technical Contact:**

Jay Francis  
Consulting Engineer for UP Aerospace Inc.  
Jay@ReactiveTechnologies.com  
(603) 429-0377

**UP Aerospace Contact:**

Jerry Larson  
President, UP Aerospace Inc.  
jerry@upaerospace.com  
(720) 596-4430

**Frequency Requests:**

- a) **PRIMARY:** 2370.5 MHz  
M (dBc) of -65dBc or better at 2368 MHz and 2373 MHz
- b) **SECONDARY:** 2382.5 MHz  
M (dBc) of -65dBc or better at 2380 MHz and 2385 MHz

**S-Band Transmitter**

Manufacturer: Teletronics  
Part Number: TTS-5549-1  
Frequency: 2200.5 to 2399.6 MHz,  
Carrier Stability: +/- 0.002% over -40C to +85C  
Power: 10W  
Harmonics and Spurious Levels: In accordance with latest IRIG specifications  
Modulation: PCM/FM  
Bit Rate: 1Mb/s  
Emission Designator: 1M0F1D

Modulated RF Power Spectrum complies with the IRIG-106 mask  
(per TTS-5549-1 documentation):

$$M \text{ (dBc)} = \text{Max} ( \{K - 100 \log | f - f_c | + 90 \log (R)\}, \{-(55 + 10 \log (P))\} ), | f - f_c | \geq R/m$$

M = power relative to unmodulated carrier (i.e., units of dBc) at frequency f (MHz)

f = frequency in MHz

f<sub>c</sub> = the carrier frequency in MHz

R = the bit rate in Mb/s

P = the rated power output of the UUT, in Watts

For PCM/FM:

K = -28

m = 2

**S-Band Antenna**

Manufacturer: Haigh-Farr  
Part Number: 13585  
Description: Stripline Full Wraparound  
RHCP  
Gain -3.5dBi nominal +/- 3dB (ripple)

**EIRP**

The wraparound antenna is designed to be isotropic with best case gain of approximately 0dBi. At 10W, our EIRP would be 40 dBm.



**System Integration Test Site (ground testing):**

469 Mockingbird Court  
Highlands Ranch, CO 80129

39° 31' 58.2" N 104° 59' 34.0" W

**Launch Site:**

Spaceport America  
Truth or Consequences, NM

32° 56' 24.9" N 106° 54' 23.9" W

Subject: Re: Fwd: WS-21-08 [Non-DoD Source] AFTRCC ICN 1148-21/8687 (UP Aerospace Inc STA/Sounding Rocket Ground Checks/Launch Data-Highlands Ranch, CO/T or C, NM)  
From: Wayne Morris <5600wayne@gmail.com>  
Date: 3/10/21, 4:14 PM  
To: "Jay Francis (Reactive Technologies)" <Jay@reactivetechologies.com>

Nothing all good since dates cover WSMR.  
Wayne

On Mon, Mar 8, 2021 at 1:21 PM Jay Francis (Reactive Technologies) <Jay@reactivetechologies.com> wrote:

Hi Wayne,

We have an additional test session and launch that will occur during the same time frame as our current coordination request (no earlier than May 1st, no later than Dec 31st). It uses the same transmitter and frequencies.

Also, one of the test sessions may happen at Spaceport America instead of the Highlands Ranch CO location (TBD).

What do we need to do (if anything) to update our coordination information? I have not filed anything with the FCC yet.

Thanks,  
Jay Francis  
Reactive Technologies LLC / UP Aerospace Inc.

Wayne Morris wrote on 2/8/2021 11:54 AM:

## **Please note comments and scheduling requirements for WSMR OPS.**

This email is your AFTRCC coordination.

This coordination includes this header information, DOD Area Frequency Coordinator comments and AFTRCC comments. These messages must not be separated.

This coordination is advisory only and not binding on the FCC. Applicants are advised that this coordination does not constitute a judgment that the frequency(ies) is best suited for the applicant's purpose nor that the frequency(ies) is exclusive to the applicant. Flight Test frequencies are shared and may require scheduling with other users.

In return for AFTRCC's processing of the applicant's coordination request, the applicant agrees to release and hold harmless AFTRCC, its officers, directors, agents, members, and representatives from any claims, losses or expenses that may arise from the use of the frequency.

This coordination is not an authorization to transmit. A copy of this coordination must accompany application to the FCC.

Signed:

Wayne Morris  
AFTRCC Telemetry Coordinator  
903-450-5942

**RE: [Non-DoD Source] AFTRCC ICN 1148-21/8687 (UP Aerospace Inc STA/Sounding Rocket Ground Checks/Launch Data-Highlands Ranch, CO) (UNCLASSIFIED)**

Inbox



**USARMY JB San Antonio NETCOM List AFMO AFTRCC Team**  
to me, USARMY, USARMY

7:23 AM (3 hours ago)

**CLASSIFICATION: UNCLASSIFIED**

*AFMO-US&P CONCUR WITH AFTRCC ICN 1148-21/8687 (UP Aerospace Inc STA/Sounding Rocket Ground Checks/Launch Data-Highlands Ranch, CO). COORDINATION NUMBER [AFMO210017//GUILLO-LUIS.G.SANCHEZ10.CIV@MAIL.MIL-210-221-0454//](mailto:AFMO210017//GUILLO-LUIS.G.SANCHEZ10.CIV@MAIL.MIL-210-221-0454//)*

*Note: C024 Comments: DoD database checked and shows no conflicting DoD assignments within 50 mile radius.*

V/R

Guillo

Office:

COM: 210-221-0454

Fax: 2844

----- Forwarded message -----

From: Austin, Gary L CIV USARMY NETCOM (USA) <[gary.l.austin.civ@mail.mil](mailto:gary.l.austin.civ@mail.mil)>

Date: Mon, Feb 8, 2021 at 8:14 AM

Subject: WS-21-08 [Non-DoD Source] AFTRCC ICN 1148-21/8687 (UP Aerospace Inc STA/Sounding Rocket Ground Checks/Launch Data-Highlands Ranch, CO/T or C, NM)

To: Wayne Morris <[5600wayne@gmail.com](mailto:5600wayne@gmail.com)>, USARMY JB San Antonio NETCOM List AFMO AFTRCC Team <[usarmy.jbsa.NETCOM.list.afmo-aftrcc-team@mail.mil](mailto:usarmy.jbsa.NETCOM.list.afmo-aftrcc-team@mail.mil)>, USARMY WSMR IMCOM Central List DODAFAC <[usarmy.wsmr.imcom-central.list.dodafac@mail.mil](mailto:usarmy.wsmr.imcom-central.list.dodafac@mail.mil)>

Wayne,

DoD-AFC WSMR concurs with this STA pending added comments.

Location 2: For DoD WSMR AFC

Truth or Consequences, NM (32-56--24 N 106-54-23 W) Spaceport America

Dates: 2021-08-01 thru 2021-12-31

Coordination comments:

1. 501/XX. M003,SCHED REQD. SEE SUPP DETAILS
2. 501/XX. M018,AR ,YYMMDD,GLA,AFCWSMR CONCUR
3. 520. OPERATIONS MUST BE COORDINATED WITH THE SPACEPORT AMERICA, DIRECTOR OF AEROSPACE OPERATIONS, WHO, IN TURN, WILL COORDINATE OPERATIONS WITH WSMR, THROUGH THE WSMR LIAISON TO THE SPACEPORT.

Coordination control number : WS-21-08

V/R

Gary Austin

NETCOM G-3/5 CUOPS

Spectrum Coordinator, DoD AFC (WSMR)

White Sands Missile Range, NM

Phone - Comm: (575) 678-3311

Alt Phone: (575) 678-5417

Phone - DSN: 258-3311

NIPR: [gary.l.austin.civ@mail.mil](mailto:gary.l.austin.civ@mail.mil)

SIPR: [gary.l.austin.civ@mail.smil.mil](mailto:gary.l.austin.civ@mail.smil.mil)

GROUP E-MAIL: [usarmy.wsmr.imcom-central.list.dodafac@mail.mil](mailto:usarmy.wsmr.imcom-central.list.dodafac@mail.mil)

GROUP E-MAIL SIPR: [usarmy.wsmr.imcom-central.list.dodafac@mail.smil.mil](mailto:usarmy.wsmr.imcom-central.list.dodafac@mail.smil.mil)

-----Original Message-----

From: Wayne Morris [mailto:[5600wayne@gmail.com](mailto:5600wayne@gmail.com)]

Sent: Sunday, February 7, 2021 2:28 PM

To: USARMY JB San Antonio NETCOM List AFMO AFTRCC Team

<[usarmy.jbsa.NETCOM.list.afmo-aftrcc-team@mail.mil](mailto:usarmy.jbsa.NETCOM.list.afmo-aftrcc-team@mail.mil)>; USARMY WSMR IMCOM Central

List DODAFAC <[usarmy.wsmr.imcom-central.list.dodafac@mail.mil](mailto:usarmy.wsmr.imcom-central.list.dodafac@mail.mil)>

Subject: [Non-DoD Source] AFTRCC ICN 1148-21/8687 (UP Aerospace Inc STA/Sounding Rocket Ground Checks/Launch Data-Highlands Ranch, CO/T or C, NM)

AFTRCC concurs with and requests DoD AFMO-US&P and DoD WSMR AFC concurrence/coordination on the following STA request.

Applicant:

UP Aerospace Inc

409 Mockingbird Ct

Highlands Ranch, CO 80129

POC: Jay Francis (603-429-0377)

Frequencies: 2370.5 MHz / 2382.5 MHz

Station Class(es): MOEC/MOEA

Emission: 1M0F1D

Power: 10 watts (40dBm ERP)

Location 1: For DoD AFMO-US&P

Highlands Ranch, CO (39-31-58 N 104-59-34 W)

MIRAD: Fixed

Dates: 2021-05-01 thru 2021-12-31

AFTRCC comments: ground check outs only.

Location 2: For DoD WSMR AFC

Truth or Consequences, NM (32-56--24 N 106-54-23 W) Spaceport America

Dates: 2021-08-01 thru 2021-12-31

AFTRCC comments: Ground check outs, launch of vehicle.

Requester states there will be a requirement for ground checks as well as data transmission during the actual flight (appx 15 minutes) with an apogee of 100 KM with recovery of vehicle within WSMR.

Dates reflective of unanticipated delays, scheduling, etc.

Please reply via return email as to concurrence, non-concurrence, scheduling, and any additional comments.

Signed:

Wayne Morris

AFTRCC Telemetry Coordinator

903-450-5942

Please