Application for Conventional Experimental Authority

Produced by Care Weather Technologies, Inc. for the Ground and High-Altitude Testing of its Experimental Radar and Communications Systems

Narrative Description

CAREWEATHER

Revision History and Signatures

Revision	Notes	Produced By	Date
A	First Version	Patrick Walton CEO, Care Weather Veery Mission Manager	08/14/26

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DESCRIPTION OF PROPOSED EXPERIMENTATION

Pursuant to Sections 5.54, 5.61, and 5.64 of the rules of the Federal Communication Commission ("Commission")[1], Care Weather Technologies ("Care Weather") respectfully requests conventional experimental authority for a period of two years to perform ground and high-altitude testing of experimental communication and radar remote sensing systems in preparation for their later use on low-Earth orbit satellites. To test communication, data transmission, and radar capabilities across the system, operations will use the following frequency allocations:

● VHF Downlink:	137.825–138 MHz
● VHF Uplink:	148–149.900 MHz
● UHF Uplink & Downlink:	401–402 MHz
● S-Band Uplink:	2025–2110 MHz
● S-Band Downlink:	2200–2290 MHz
● C-Band Radio Downlink:	5250–5255 MHz
● C-Band Radar Transmit & Receive:	5250–5350 MHz
● X-Band Radio Downlink:	8025–8400 MHz

Experimental authority will enable Care Weather to make significant progress in its mission to address critical gaps in U.S. weather capabilities. Lessons from ground and high-altitude tests enabled by this authority will advance Care Weather's capability in transmitting data from its satellites and lay the foundation for Care Weather's wind-sensing radars (scatterometers). Further ensuring the reliability and performance of these radio and radar systems is crucial before investing in Care Weather's full vision for a weather sensing satellite

[1] *See* 47 C.F.R. §§ 5.54, 5.61, and 5.64.

constellation capable of 10X more frequent mapping of global sea winds. This constellation will significantly improve global weather forecasting, maritime safety, and hurricane monitoring, which will help mitigate the dramatically rising cost of extreme weather to American infrastructure. A timely grant of the requested experimental authority would therefore strongly serve the public interest and contribute to advancements in weather monitoring and prediction in a professional and efficient manner.

I. Background

Of all the satellite datasets incorporated into coupled air-sea numerical weather forecasts, Ocean Surface Vector Winds (OSVW) measured by scatterometers have an outsized impact in improving forecast accuracy.[2] Unfortunately, these measurements are one of the least available by quantity of measurements.

In the 1980s and 1990s, the United States led the world in satellite scatterometer development and operation with the NSCAT and SeaWinds scatterometers. While recent dramatic growth in hurricane damages has underscored the need for improved weather forecasting, the U.S. has fallen behind in scatterometry, decommissioning its last scatterometer in 2016. The United States has become fully reliant on foreign governments for this critical dataset. The development and operation of new scatterometer systems is a priority for national security, weather and maritime safety, and for U.S. leadership in space and weather forecasting. Many

[2] See "Impact per observation" in Giovanna De Chiara, et al. "On the impact of scatterometer winds in coupled and uncoupled DAS: preliminary results." International Ocean Vector Winds Science Team Meeting. 2017.

follow-on missions have been proposed, but all have been too costly for limited national Earth science budgets.

Care Weather's mission is to reinstate U.S. leadership in scatterometry by significantly increasing the amount of cost-effective and functional scatterometers. More frequent refresh of Ocean Surface Vector Winds (OSVW) leads to more accurate weather predictions around the globe. Ground and high-altitude testing of Care Weather's radios will take the company one step closer towards meeting the TT&C and data downlink requirements of its scatterometer system, enabling the company to provide rapid access to hourly data of OSVW with earlier warnings for hurricanes and other forms of extreme weather.

II. Discussion

A. VHF Radio

Operating in the 137.825–138 MHz band for downlink and the 148–149.9 MHz band for uplink, this system provides telemetry, tracking, and control (TT&C). Non-directional antennas are used for this band.

B. UHF Radio

Operating in the 401–402 MHz band for uplink and downlink, this system provides backup TT&C. Non-directional antennas are used for this band.

C. S-band Radio

Operating in the 2025–2110 MHz band for uplink and the 2200–2290 MHz band for downlink, this system handles high-rate TT&C and payload data transmission. A patch antenna (5 dBi gain) is used for this band.

D. C-band Radio

Operating in the 5250–5255 MHz band for downlink, this system transfers high-rate remote sensing data. It shares a patch array antenna (17.7 dBi gain) with the radar payload.

E. C-Band Radar

Operating in the 5250–5350 MHz band, the radar system transmits pulses to measure surface reflectance. It uses a patch array antenna (17.7 dBi gain) to transmit radar pulses, and measure the echoes.

F. X-band Radio

Operating in the 8025–8400 MHz band for downlink, this system transfers high-rate remote sensing data. It uses a Care Weather-manufactured patch array antenna (15 dBi gain) and operates in a transmit-only configuration, sending data directly to the ground station dish antenna.

G. Multiband SDR

A multiband Software Defined Radio (SDR) operates as a mobile transceiver station across VHF, UHF, S, C, and X bands. It serves as the primary mobile transmit terminal for VHF (148–149.9 MHz), UHF (401–402 MHz), and S-band (2025–2110 MHz), as well as the receive terminal for VHF (148-149.9 MHz), UHF (401-402 MHz), S (2200-2290 MHz), C (5250-5255 MHz), and X-band (8025-8400 MHz) downlinks. Antenna systems include a 1.8 m parabolic dish (28.5 dBi S-band gain) alongside a 3.2 m

VHF Yagi antenna (12 dBi gain) and a 1.6 m UHF Yagi antenna (13 dBi gain) mounted on a 360° azimuth / 90° elevation positioner.

III. Testing Plan

Care Weather plans to evaluate the experimental system through separate radar and multiband communications test campaigns:

I. Radar System Testing[3]

A. The C-band radar antenna is mounted less than 6 m AGL to reflect signals off nearby terrain or transmit directly to a local receiver, verifying core scatterometer functions.

B. The radar payload is flown to ~30 km (~100,000 ft) AGL on an unmanned free balloon per 14 CFR Part 101 to measure surface backscatter in a configuration with orbit-like geometry.

II. Multiband Communications System Testing[4]

A. The VHF, UHF, S-, C-, and X-band payload antennas operate in a ground-to-ground configuration from one ground terminal to another (both under 6 m AGL) to verify RF link performance and handshakes.

B. High-Altitude Balloon Test: The radio systems are flown to ~30 km (~100,000 ft) AGL per 14 CFR Part 101 to test dynamic tracking and long-range data links with the ground station.

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[3] *See* Attachment 1 Radar Test Configuration
[4] *See* Attachment 2 Communication Test Configuration

IV. Public Interest Considerations

Ground and high-altitude balloon testing are an integral part of Care Weather's technology development plan and ultimate goal of developing and operating low-cost, miniaturized, satellite scatterometers that increase ocean surface vector wind measurements exponentially to enhance weather forecasting for the protection of lives and livelihoods. Care Weather has partnered with and has received support from a range of U.S. government agencies and affiliated academic institutions, including the National Science Foundation, NASA, NOAA, the Space Force, the Air Force, the U.S. Forest Service, and the University of Utah, as well as U.S. international partners, including the U.K. Meteorological Office.[5] Granting this experimental license directly enables critical performance under active federal contracts, including USSF-24[6], NASA-25[7], and NOAA-25. Thus, there is a strong public interest in conducting this scatterometer technology testing.

V. Points of Contact

Care Weather remains the primary point of contact that can terminate *all* transmissions.

Primary contact who can terminate ALL transmissions.

Point of Contact Name: Patrick Walton
Organization Name: Care Weather Technologies

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[5] *See* Attachment 3 Letters of Support.

[6] U.S. Dep't of Def., VEERY: Flat-Panel Scatterometer for Hourly Ocean Surface Vector Winds, Contract No. FA254125CB017 (Dec. 3, 2024),https://www.usaspending.gov/award/CONT_AWD_FA254125CB017_9700_-NONE-_-NONE-.

[7] Nat'l Aeronautics & Space Admin., Phase III - Constellation of Nanosatellite Radars for Near-Hourly, Global Ocean Surface Vector Winds, Contract No. 80NSSC26C0070 (July 14, 2025), https://www.usaspending.gov/award/CONT_AWD_80NSSC26C0070_8000_-NONE-_-NONE-.

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Secondary contact who can terminate ALL transmissions.

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VI. Conclusion

In view of the foregoing, Care Weather respectfully requests a conventional experimental license to operate its experimental radar and communication systems in the aforementioned bands for a period of two years in accordance with the specifications described herein.