



Ad Astra Rocket Company
141 West Bay Area Blvd.
Webster, TX 77598
USA: 281-526-0500
Costa Rica: 506-2666-9272
European Office: 0049-6192-902591
Frankfurt, Germany.
www.adastrarocket.com

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AD ASTRA ROCKET COMPANY WINS TWO NASA CONTRACTS FOR VASIMR® TECHNOLOGY DEVELOPMENT

[Webster, Texas – for immediate release] – Ad Astra Rocket Company (Ad Astra) and the National Aeronautics and Space Administration (NASA) have signed two separate contracts to continue the maturation of the VASIMR® rocket technology. The VASIMR® engine is a high-power electric propulsion system under development by Ad Astra.

The two contracts address Ad Astra's two new design innovations to the high-power radio frequency (RF) power subsystem of the engine. These components efficiently deliver the electrical energy to the VASIMR® plasma in the form of electromagnetic waves. The two innovations involve both materials and manufacturing advances that greatly increase the ability of these components to manage the high temperatures of the engine core.

In the first contract, awarded in late June of this year, Ad Astra will take an improved 2nd-stage RF coupler from the conceptualization stage, completed under a 2022 NASA contract, to full-scale manufacturing. After manufacturing, the new RF coupler will be integrated and tested in the VX-200SS™ VASIMR® prototype.

Responsible for delivering (coupling) the energy to the plasma as electromagnetic waves, the RF coupler is a critical component of the engine that lies deep inside the rocket core. The component must be rugged, lightweight, and be able to operate in vacuum at temperatures of several hundred °C while sustaining operating voltages of several thousand volts without arcing.

In the second contract, awarded this month, Ad Astra will test an innovative design of the high-current segment of the RF transmission line that delivers the power to the 2nd-stage RF Coupler. Like the coupler itself, the high-current segment of the transmission line also operates in the harsh environment of the rocket core. The design innovation featured in this component improves its thermal management, increasing overall efficiency

and reducing weight.

The VASIMR® engine has two of these couplers, one for each of the two stages. However, the focus of these two contracts will be on the second stage, the so-called, "Heater" stage, which delivers the largest fraction of the power to the plasma. Nonetheless, these design improvements will be relevant to the engine's 1st-stage, the "Ionizer" stage as well, systemically enhancing the operational envelope of the entire engine.

With these design improvements, Ad Astra looks to increase the thermal steady-state power of the VASIMR® VX200SS™ prototype from its record-setting 80 kW to greater than 100 kW, at Technology Readiness Level (TRL) 5, a goal expected for mid-2024. Achieving this goal will set the stage for transitioning the VASIMR® to TRL-6, an engine capable of being field tested in space.

"We are proud to be working with NASA in the final steps of our VASIMR® technology maturation program," said Dr. Franklin Chang Díaz, Ad Astra's Chairman and CEO. "It has been a long journey from the early proof-of-concept years to a technology near the threshold of space testing. We look forward to jointly advancing to flight readiness," he added.

ABOUT THE TECHNOLOGY

Short for Variable Specific Impulse Magnetoplasma Rocket, VASIMR® works with plasma, an electrically charged gas that can be heated to extreme temperatures by radio waves and controlled and guided by strong magnetic fields. The magnetic field also insulates nearby structures so exhaust temperatures well beyond the melting point of materials can be achieved. In rocket propulsion, the higher the temperature of the exhaust gases, the higher their velocity and the higher the fuel efficiency. Plasma rockets feature exhaust velocities far above those achievable by their chemical cousins, so their fuel consumption is extremely low.

ABOUT AD ASTRA

A US Delaware corporation established in 2005, Ad Astra Rocket Company is the developer of the

VASIMR® engine, an advanced plasma space propulsion system aimed at the emerging in-space transportation market. Ad Astra also owns and operates supporting research and development subsidiaries in the US and Costa Rica. Through its subsidiaries, the company also develops earthbound high technology applications in renewable energy, advanced manufacturing and applied physics. Ad Astra has its main laboratory and corporate headquarters at 141 W. Bay Area Boulevard in Webster, Texas, USA, about four miles from the NASA Johnson Space Center.