# Dossier: PHASE FOUR, INC.

## SBIR Award Details

**Award Title:** N/A

**Amount:** $1,783,628.00

**Award Date:** 2023-09-12

**Branch:** USAF

## AI-Generated Intelligence Summary

**Company Overview:**

PHASE FOUR, INC. is a developer and manufacturer of radio-frequency (RF) plasma propulsion systems for small satellites. Their core mission is to enable cost-effective, high-performance in-space propulsion for a range of satellite applications, including LEO constellation deployment, precise orbit maintenance, and deorbiting. They aim to solve the limitations of traditional chemical and electric propulsion systems which can be either too expensive, complex, or have limited performance for small satellites. Their unique value proposition is a simplified, compact, and lower-cost RF thruster that can deliver significant mission capability improvements for small satellites compared to cold gas or resistojets, while still providing comparable performance (thrust, Isp) to traditional electric propulsion systems.

**Technology Focus:**

* RF Thruster Technology:\*\* PHASE FOUR develops and manufactures Maxwell and Alta RF thrusters. Maxwell is a compact, lower-power RF thruster, while Alta is designed for higher-power, more demanding mission profiles. Both use RF to ionize a propellant gas (typically Xenon or Krypton) and generate thrust. Maxwell operates at power levels from 20W to 200W and offers a specific impulse (Isp) ranging from 500 to 1500 seconds. Alta can operate at up to 500W.
* Integrated Propulsion Systems:\*\* Beyond just the thruster, Phase Four delivers integrated propulsion systems including propellant tanks, power processing units (PPUs), and control software, providing a complete solution for satellite integrators.

**Recent Developments & Traction:**

* June 2023: Contracted by the U.S. Space Force to Develop Rapidly Deployable Space Mobility Systems:\*\* Phase Four was awarded a contract for the development of advanced propulsion capabilities. The value and specific terms of the contract are not publicly available.
* December 2022: Awarded Phase III SBIR:\*\* The company secured a Phase III Small Business Innovation Research (SBIR) award related to their propulsion technology. Further details regarding the funding amount or specific project were not detailed publicly.
* December 2021: Maxwell Block 1 Flight Heritage:\*\* Successfully demonstrated on-orbit performance of the Maxwell Block 1 RF thruster. Several flight missions have been completed successfully, accumulating significant on-orbit operating time.

**Leadership & Team:**

* Beau Jarvis (CEO):\*\* Experienced aerospace executive with a background in management and business development within the space industry. Previous roles have involved driving growth and strategic initiatives.
* Uri Shumlak (Co-founder & CTO):\*\* Extensive academic background in plasma physics and fusion energy. Leader of the company's technology development efforts.
* Simon Halpern (President):\*\* Previously at Google[X], bringing experience in rapid prototyping and novel technology development to the space sector.

**Competitive Landscape:**

* Accion Systems:\*\* Develops miniaturized electrospray propulsion systems. Accion's technology offers very high thrust density but can be more complex and require specialized propellants. Phase Four differentiates through its use of simpler, more readily available propellants (Xenon, Krypton) and a lower-cost, easier-to-integrate RF architecture.
* Benchmark Space Systems:\*\* Offers a variety of chemical and electric propulsion systems for small satellites. Phase Four offers a balance between performance and simplicity which differentiates it from more complex EP systems or the limited ISP offered by chemical thrusters.

**Sources:**

1. [https://phasefour.io/](https://phasefour.io/)

2. [https://www.usaf.mil/News/Article/3430200/space-force-awards-contracts-for-rapidly-deployable-space-mobility-systems/](https://www.usaf.mil/News/Article/3430200/space-force-awards-contracts-for-rapidly-deployable-space-mobility-systems/)

3. [https://www.parabolicarc.com/2022/12/21/smallsat-awards-phase-iii-sbir-funding/](https://www.parabolicarc.com/2022/12/21/smallsat-awards-phase-iii-sbir-funding/)

4. [https://spacenews.com/phase-four-demonstrates-electric-propulsion-system-on-orbital-transfer-vehicle/](https://spacenews.com/phase-four-demonstrates-electric-propulsion-system-on-orbital-transfer-vehicle/)