

SUCCESS STORY

TOPIC NUMBER: N06-125

SBIR INVESTMENT: \$1,432,613

PHASE III FUNDING: \$6,808,321



L BAND SOLID STATE HIGH POWER AMPLIFIER

North Star Scientific Corporation developed a lightweight and small-volume L-band solid-state amplifier for communication networking systems on Navy airborne platforms.

North Star Scientific Corporation

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THE CHALLENGE

Navy aircraft must be equipped with communication networking systems to meet the demand of exchanging large volumes of information between users. Since space is limited on aircraft, the challenge was to develop a lightweight and small volume L-band solid-state power amplifier for aircraft platforms, specifically the E-2C/D.

THE TECHNOLOGY

North Star Scientific Corporation (NSS) designed, fabricated, tested and delivered an L-band solid-state high-power amplifier (HPA) for airborne platforms. NSS' HPA was smaller, lighter and more efficient than the legacy Joint Tactical Information Distribution System (JTIDS) power amplifier and required no modification to the aircraft's electrical or cooling systems.

THE TRANSITION

Transition occurred via a NAVAIR Phase II.5 and multiple Phase III contracts. NSS partnered with Viasat Corporation to develop electromagnetic compatibility (EMC) protection features and other key components the Multi-functional Information Distribution System (MIDS) Joint Tactical Radio System (JTRS) interface required for transition. Because of investment in the technology by PMA-231, the Link-16 HPA received EMC certification to be part of the MIDS JTRS configuration on board the E-2D aircraft in October 2020. In January 2021, PMA 231 procured 42 MIDS JTRS Link 16 compatible HPAs for the E-2D aircraft. PMA-231 fielded the L-16 HPA in E-2C aircraft in 2022.

THE NAVAL BENEFIT

Growing network centric warfare needs place ever increasing demands on airborne platforms requiring upgraded avionics communications systems to meet these demands. This is especially true on the E-2D aircraft where limited space requires the replacement or redesign of existing systems to reduce size, volume and overall footprint while maintaining capability. The developed Link-16 HPA addresses component availability issues, obsolescence, and has reduced volume and weight compared to the legacy JTIDS HPA. The development of this HPA also met key integration milestones supporting E-2D Link-16 crypto modernization.

THE FUTURE

NSS' radar and communications equipment operates in a range of platforms, including the E-2C Hawkeye, P-3 Orion, the Littoral Combat Ship (LCS), and unmanned vehicles. NSS is leveraging the work done on the high-power amplifier for airborne platforms to develop MIDS JTRS radio frequency amplifier (RFA) modernization to meet fleet requirements. NSS' technology is addressing obsolescence issues and improves the overall size, weight and power (SWaP) characteristics of MIDS RFA. Additionally, NSS is investigating the capabilities of the Tactical Targeting Network Technology (TTNT) high power amplifier (THPA) which can be used on different platforms, as well as a TTNT EP Applique for the TTNT system, which is a waveform technology that delivers an ad-hoc network for high bandwidth, low latency communication.