

# SUCCESS STORY

**TOPIC NUMBER: N121-076**

**SBIR INVESTMENT: \$899,964**

**PHASE III FUNDING: \$63,834,740**



## ADDING COMMUNICATIONS MODE CAPABILITY IN THE PERISCOPE DETECTION RADAR (PDR)

*3 Phoenix (now Ultra) developed and is manufacturing a new surface fleet radar to replace legacy systems for the Navy that provides the warfighter the means to navigate and communicate more effectively at sea.*

**Ultra**

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## THE CHALLENGE

Effective communications and data sharing are critical for anti-submarine warfare (ASW) force protection and situational awareness. The data links that carry this information must have low latency and high reliability. However, encountering communications-denied environments is not uncommon, where normally relied-upon channels of communications are compromised or denied in some way. The Navy's interest is in affordable, lightweight, robust ASW communications mode in periscope detection radar (PDR) to expand legacy systems capabilities especially when satellite access is unavailable.

## THE TECHNOLOGY

Since Ultra is the supplier of the SPS-74, the baseline platform for this technology, they have the skills, background and technical expertise to design and implement next generation technologies compatible with legacy systems which can also be applied to other radars. The result is the Next Generation Surface Search Radar (NGSSR)—a navigational radar that leverages all the latest developments in digital technology, provides a higher resolution than ever before and produces a clear picture from both a tactical and navigational perspective, leading to better situational awareness for the warfighter.

## THE TRANSITION

The AN/SPS-74(V)1 Advanced Development Model (ADM) Radar Data Processor (RDP) subsystem was developed by 3 Phoenix/Ultra via a \$27M Phase III contract sponsored by PEO IWS for the development and production of the new NGSSR qualification systems. One year later, the company was awarded a modification to that contract, \$42M, from the Naval Surface Warfare Center (NSWC), Port Hueneme Division, Virginia Beach Detachment. The first qualification unit was delivered in February 2021. The NGSSR will replace all variants of the current AN/SPS-67, AN/SPS-73, BridgeMaster E series and commercial-off-the-shelf radar systems. The first 32 production units are on order and are expected to be delivered by late 2021.

## THE NAVAL BENEFIT

The new system performs surface search, periscope detection, and navigational functions. It also offers ship defense against surface and limited low altitude air threats. One of the biggest benefits from this project and the development of the NGSSR is the upgrade and modernization of the user interface. Prior to this, the displays were not intuitive, and it took time and training to read and assess the incoming data. Now, the system is far more user friendly, e.g., incorporating touchscreens. Now there is less training to operate proficiently and less deciphering of data. The navigator now has the best tools available to safely navigate at sea. In addition to its ease of use, the crew has a better surface picture than ever before, which decreases the possibility of a collision when seas are crowded.

## THE FUTURE

The AN/SPS-74 PDR capability is required for all CVN aircraft carriers. The NGSSR has applicability in the Navy's move toward unmanned systems since it is capable, provides a good data stream and has the ability to be automated. Additional applications of radar communications systems could be developed to drastically reduce the amount of time it takes to receive critical Mine Countermeasures data from unmanned vehicles like the Littoral Combat Ships (LCS) and Remote Minehunting System (RMS). This technology could also be applied to Department of Homeland Security (DHS) border surveillance and security initiatives to disseminate alerts from unmanned border surveillance radar posts.

**"We were able to package all of the SBIR wins that Ultra Electronics has achieved over the years and put those together to deliver a modern and much more capable navigation radar to the Navy, with higher resolution, a more fine-tuned picture and upgraded user interface."**

Steven Wert, PAMP - Rotating Radars, PEO IWS 2.0