

# Davis

## NEWSLETTER

December 1995, Issue 05

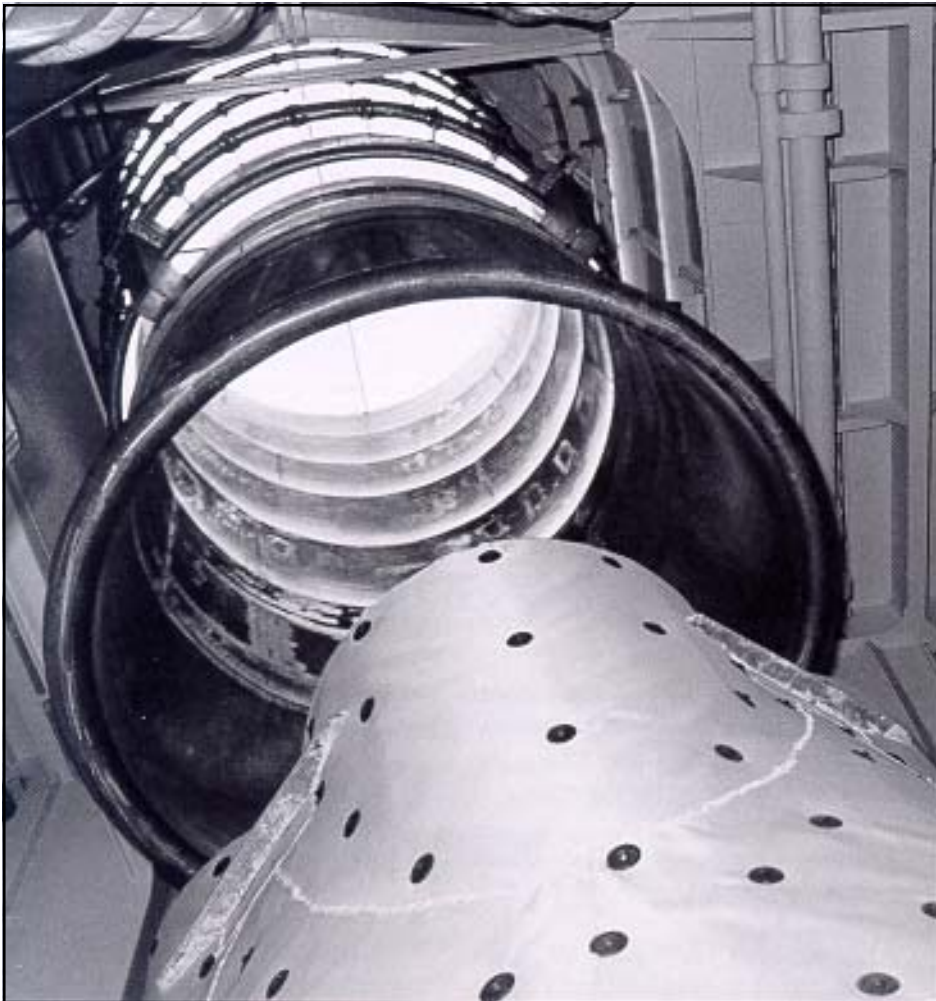
### FOURTH SHIPSET DELIVERED TO HDW

The fourth and last shipset of Infrared Signature Suppression (IRSS) systems was delivered to Howaldtswerke-Deutsche Werft (HDW) in June 1994. This contract was noted (Issue 02) when the first shipset was delivered to Blohm & Voss (Germany) for the Hellenic Navy MEKO 200 Frigate.

The lead ship, the Ydra, was built in Germany by Blohm & Voss and

launched in June 1991. The following three frigates will be built in Greek Shipyards.

The IRSS system, designated the Eductor/Diffuser system, is similar to that installed on the Canadian Tribal Class Destroyers. Sea Trials conducted on the Ydra confirmed the system performed as required and significantly reduced the ship's IR signature.



Eductor/Diffuser Installed on MEKO 200

### Focus

June, 1995, marked our 20<sup>th</sup> year of operation, and as the saying goes, it is hard to believe that it has gone by so quickly. We have made some significant achievements during that time, and early next year, we will review some of our most memorable projects in an Anniversary Newsletter.

Our defence products continue to be the core of our business, and there are strong indications that they will be the basis for our future growth.

For example, in October, 1995, we delivered our first 200 amp ASG system for the U.S. Navy for the Seawolf (see page 5). Since this system has been specified on all new surface ship construction for the U.S.N., we are planning on this product providing a substantial base load for many years in the future.

At the same time, we are pursuing new business opportunities in the commercial area that we hope will provide some diversification. Our new License Agreement with Chinook (see page 3) is illustrative of one of these new ventures.

Rolly Davis, P.Eng.  
President

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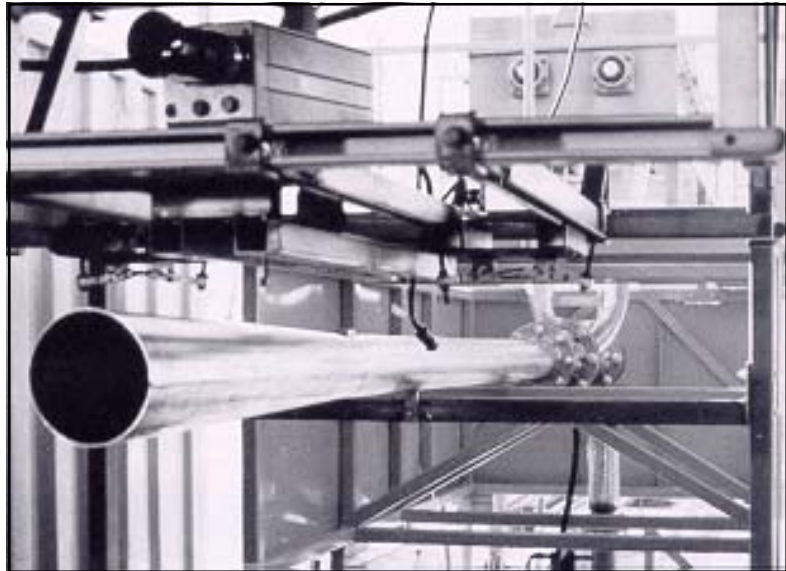
## HAILSTORM SIMULATOR DELIVERED TO PRATT & WHITNEY CANADA

In April of this year, DAVIS delivered a "hailgun" to Pratt and Whitney Canada (P&WC), designed to simulate a hailstorm which could be encountered by an aircraft engine.

The regulatory bodies (Transport Canada and the Federal Aviation Administration) have attributed a certain number of reported turbine engine power loss events, forced landings and accidents in the industry, to operation in severe rain or hail.

P&WC intends to certify all new turbine engines in accordance with the requirement of the new Section 33.78 of FAR Part 33 - Water and Hail Ingestion.

In order to implement these certification tests, it was necessary to have a device which could subject the engine to the conditions it would encounter while flying through a hailstorm.



Hailgun End View

To achieve this simulation, DAVIS designed a "hailgun" which has the

capability of delivering a stream of 16mm diameter "hailstones" to the engine inlet

*continued on page 3*

## BRIEF UPDATES

### Wave Generators

- In December 1995 DAVIS will inspect the first module of the segmented wave generator for the Korea Research Institute for Ships and Ocean Engineering (KRISO). The project has been stalled since 1992 and is now scheduled for completion in late 1996.
- DAVIS is currently bidding on new jobs in France (DCN) and Taiwan.

### IRSS

- DAVIS recently won an international bid to provide transfer of technology and software to the Indian Navy in the field of IR Signature Management.
- At a recent Research Study Group (RSG-5) meeting in Washington, D.C., it was announced the NTCS/ SHIPIR software had been selected as a common baseline tool for NATO IR ship signature modelling.
- DAVIS is working closely with NAVSEA in examining the feasibility of implementing our IR signature Suppression System on the new LPD-17, the next generation amphibious ship.
- The flight testing of the new DAVIS IR suppressors for the Bell 212/ 412 is scheduled for April 1996.

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## DAVIS ENTERS ENERGY CONSERVATION MARKET

DAVIS is pleased to announce an agreement with Chinook Phi-Beta Corporation to manufacture and market their energy efficient heating, cooling and dehumidification products. These products have been developed to meet both economic and environmental concerns.

The Ground Source Heat Pump product line was developed to

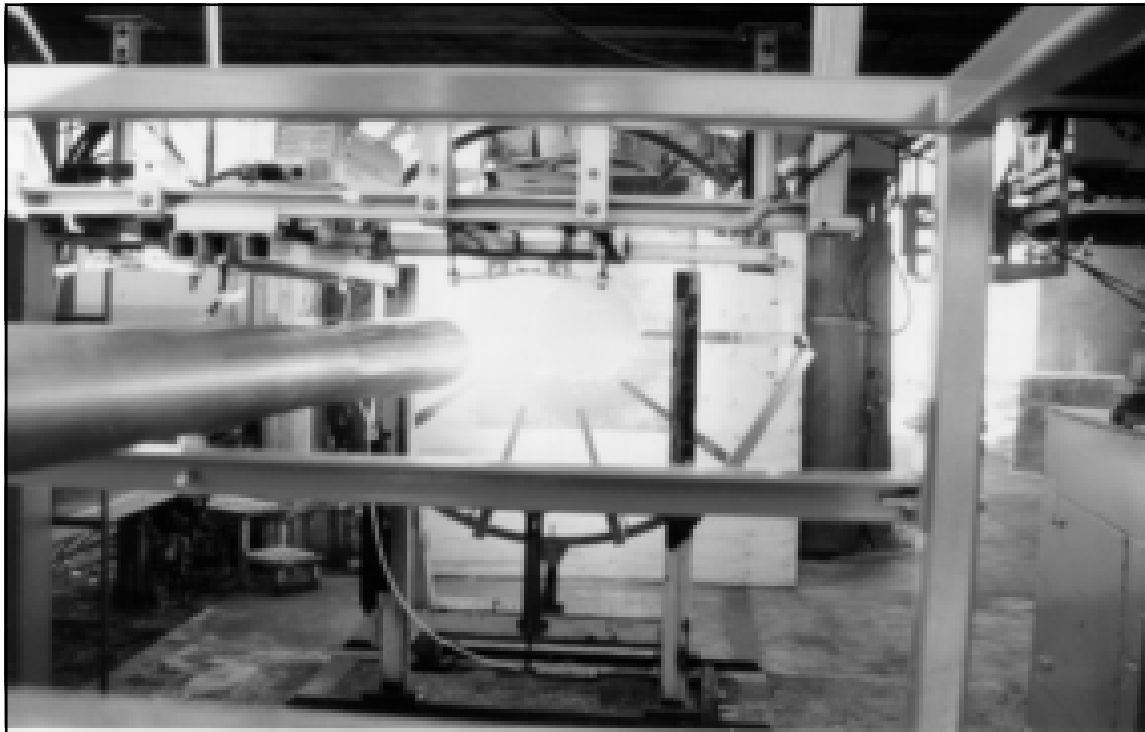
capitalize on the energy available in the Earth. For every watt of electrical energy used by the equipment, 3.8 watts of energy can be “pumped” from the Earth to the conditioned space, or vice versa.

This multiplier effect not only saves money but also reduces CO<sub>2</sub> emissions over competing methods of heating and cooling. The Indoor Pool Dehumidification product line

uses heat pump technology to efficiently “pump” the energy released in the dehumidification process, back into the pool to warm the water. Alternately, the energy can be used to heat or cool the space.

These new lines of energy efficient products will complement DAVIS’ involvement with Energy Management Control Systems.

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Test Firing of the Hailgun

### Hailstorm Simulator

*continued from page 2*

speeds ranging from 180 knots (330 kph) to 400 knots (740 kph). The density of this stream can vary from 500 to 1400 hailstones per second.

As can be imagined, since there was no precedent, the design process was

extremely demanding, and was initiated with a 1/4 scale model which used plastic balls to simulate the hailstones. Due to the complex aerodynamics of the gun, several design iterations were required before the required performance was achieved.

To date, P&WC has successfully utilized the hailgun test facility to perform certification tests on two new engines. DAVIS is now talking with other aircraft engine manufacturers about the potential for meeting their specific requirements.

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## ACTIVE SHAFT GROUNDING (ASG) SYSTEM

Since first announcing the ASG system as a new DAVIS product (Issue 01), the system has received significant attention from both the U.S. and U.K., as well as the Canadian Navy.

The Canadian Navy initiated its procurement of the ASG system in 1994. In March 1995, DAVIS delivered eight (8) units to DND, and we are currently in production of seven (7) additional units for delivery in March 1996.

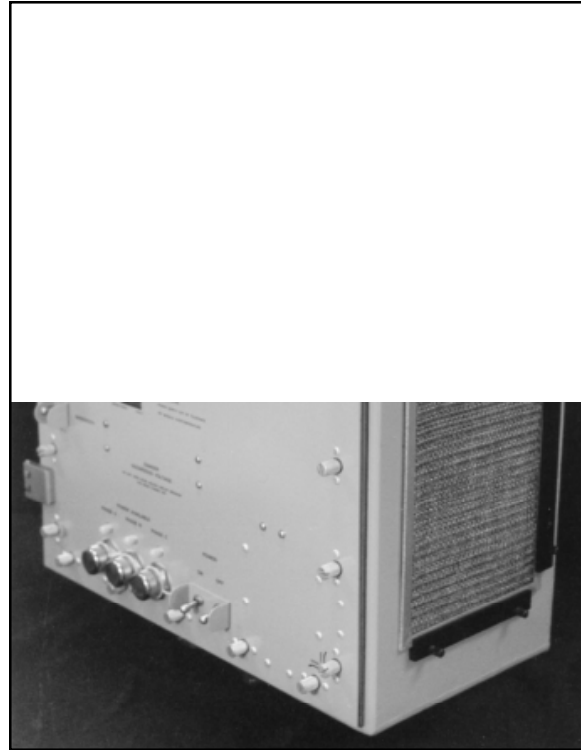
It is anticipated that this production rate will begin to fall off after 1997 when most of the Canadian fleet will have been fitted with the system.

The U.S. Navy has specified the 200 Amp Electronics Grounding Unit (EGU) on all new ship construction, as well as the new Seawolf (see article on page 5).

The first ship program that will fit the unit is Flight II-A of the DDG-51. This program is planned to proceed at three ships per year, and the initial contracts were awarded in 1994. We expect to receive the initial orders for those ships in 1997.

Other ship programs that are imminent are the Amphibious Transport (LPD-17) and the Nimitz Aircraft Carrier (CVN-76).

The Royal Navy is fitting the ASG system to their nuclear submarine fleet. DAVIS delivered ten systems to our U.K. partner Vickers Shipbuilding and Engineering Limited in 1994, and subsequently the Royal Navy ordered an additional five



ASG Box

units from VSEL in 1995. The ASG system is currently being trialed on the Duke Class (Type 23) Frigate and it is anticipated that the Royal Navy will begin to retrofit that class in 1996.

As the Extra Low Frequency Electric mine threat and the ASG countermeasure become known to other countries, we see a growing demand for the technology. This has been most

apparent in NATO countries due to their information exchange agreements.

As can be seen from the above summary, the ASG system has proven to be a very successful product for DAVIS, and a good example of the benefits to be derived by cooperative development between DND and Canadian industry.

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## DAVIS ON THE INTERNET

DAVIS has now joined the internet. In the very near future we will be opening a home page on the World Wide Web (<http://www.davis-eng.on.ca>) where anyone can visit to retrieve information on DAVIS and its products. We are planning short summaries on our products and

consulting services as well as more in-depth technical papers in the areas of Active Shaft Grounding, Infrared Signature Suppression, and the Naval Threat Countermeasures Simulator. There will also be an E-mail form for requesting further information.

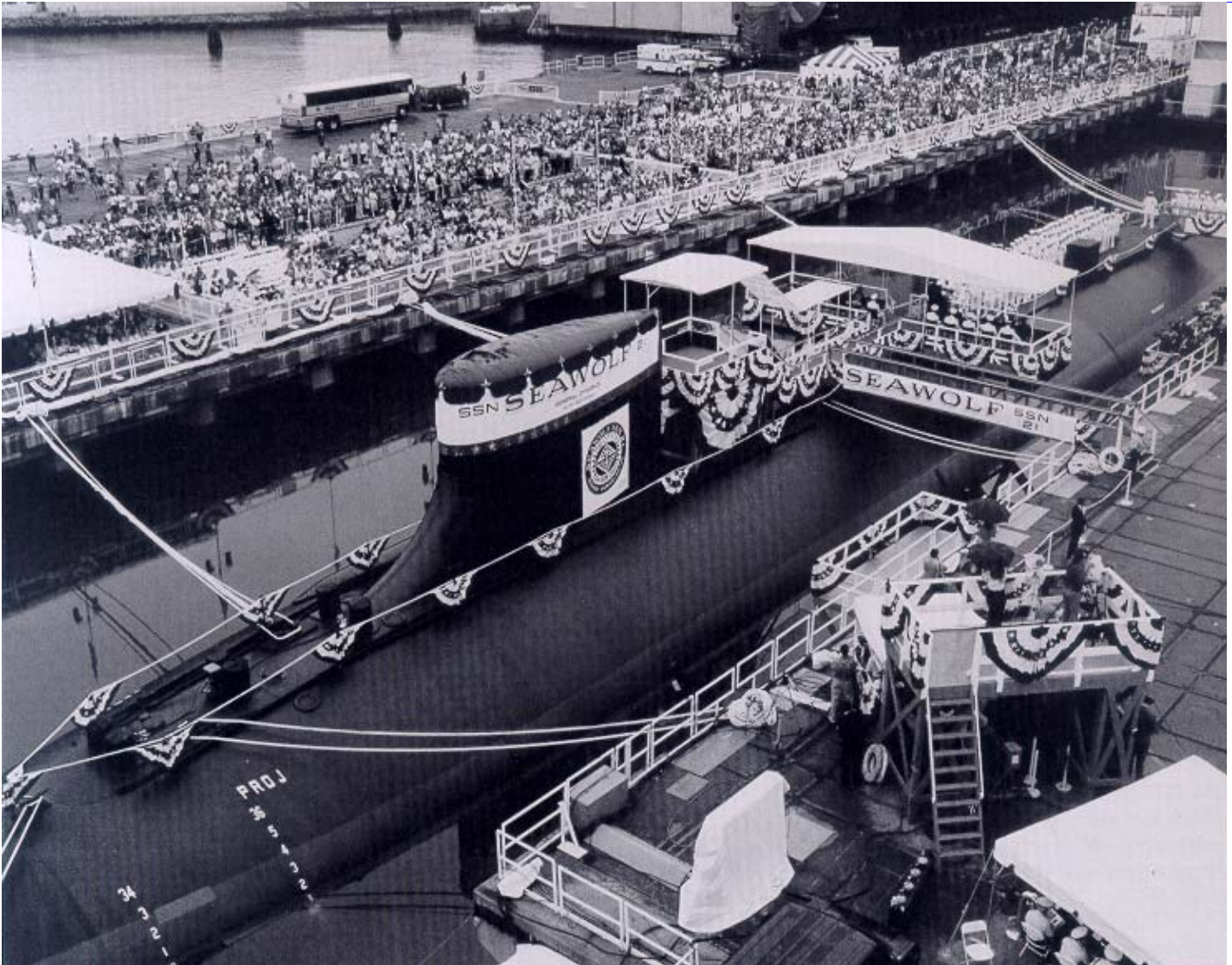
Anyone at DAVIS can be reached by sending E-mail to:

[anyone@davis-eng.on.ca](mailto:anyone@davis-eng.on.ca)

General inquiries can be sent to:

[marketing@davis-eng.on.ca](mailto:marketing@davis-eng.on.ca)

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Official Launch of the Seawolf (SSN-21)

## ASG SYSTEM DELIVERED FOR THE FIRST SEAWOLF (SSN-21)

After a long and arduous design, build and qualification process, DAVIS delivered the first 200 Amp Active Shaft Grounding system to the Electric Boat Division of General Dynamics in October 1995.

This is the first 200 Amp system, designated the Electronics Grounding

Unit (EGU) by the U.S. Navy, that has been produced. It has been fitted to the first Seawolf attack submarine, which was launched in July 1995.

The Seawolf is the U.S. Navy's newest attack submarine and will have the highest tactical speed of any U.S. submarine. The Seawolf program has

been the subject of ongoing controversy in the U.S. since it has been the target of large defence budget cuts.

DAVIS is now completing the product of EGU No. 2 for the second Seawolf, which will be delivered in early 1996. The third unit will be delivered in late 1996.

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## KARLSKRONAVARVET AB TO ACQUIRE THE NTCS IR SOFTWARE

Karlskronavarvet AB (KkrV) has designed, developed and constructed naval vessels since 1679. This Swedish shipyard is located in Karlskrona, about 400 km south of Stockholm on Sweden's southeast coast.

KkrV has been committed to the concept of stealth technology in their ship design process for several years, and thus were very interested in DAVIS' unique experience in this field, and have decided

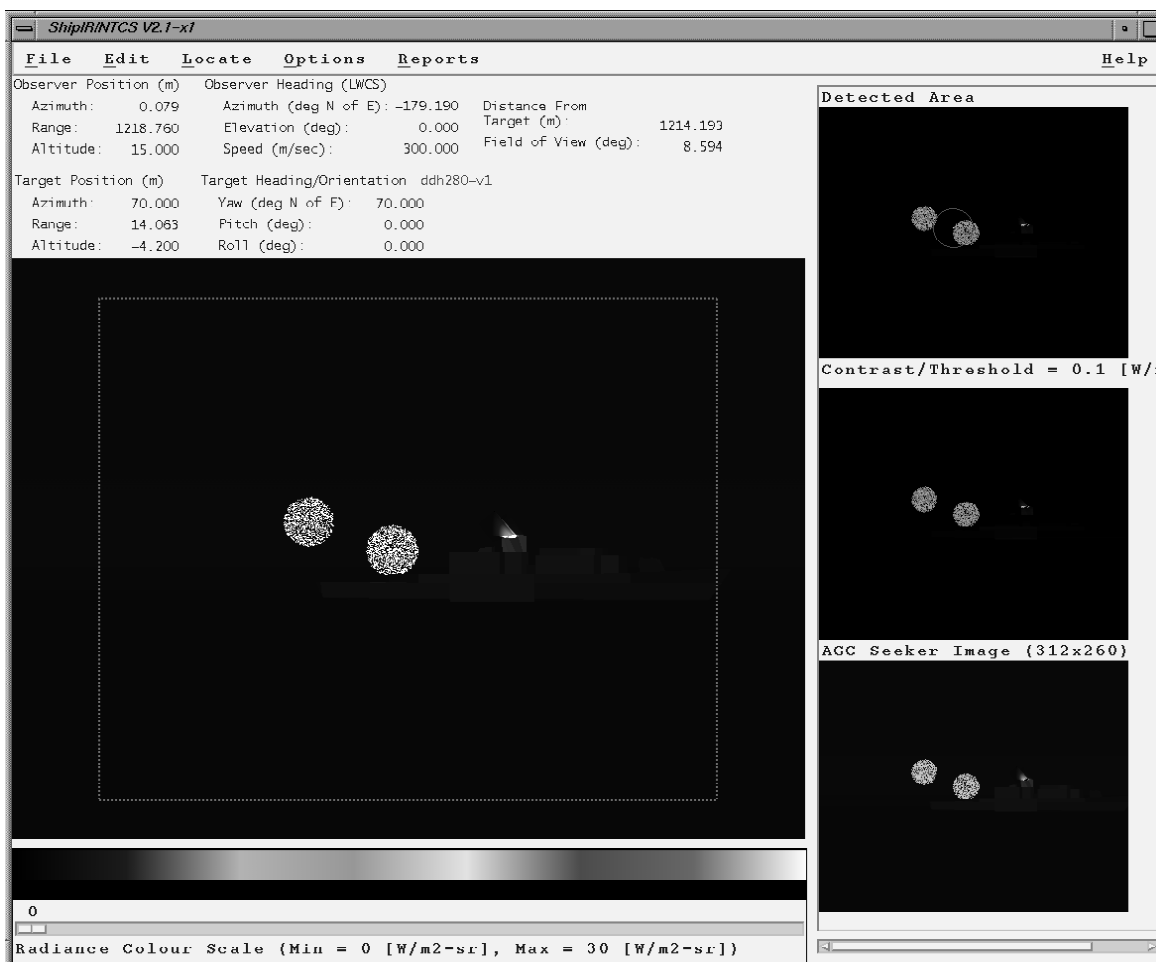
to acquire the Naval Threat Countermeasures Simulator (NTCS).

NTCS is a powerful computer graphics software package for simulating the infrared (IR) signatures of naval warships, as well as IR guided antiship missiles and countermeasures in a realistic engagement.

NTCS is a valuable tool for ship designers in that the IR signature of the

new design can be simulated in detail and the effect of IR suppression techniques can be quantitatively evaluated. By judicious management of the IR signature the survivability of the ship can be significantly improved.

With the commitment of KkrV to stealth technology, their interest in NTCS was natural. DAVIS is now under contract to deliver the NTCS software package to KkrV early in 1996.



NTCS Threat/Target/Countermeasure Engagement

For further information please contact:

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