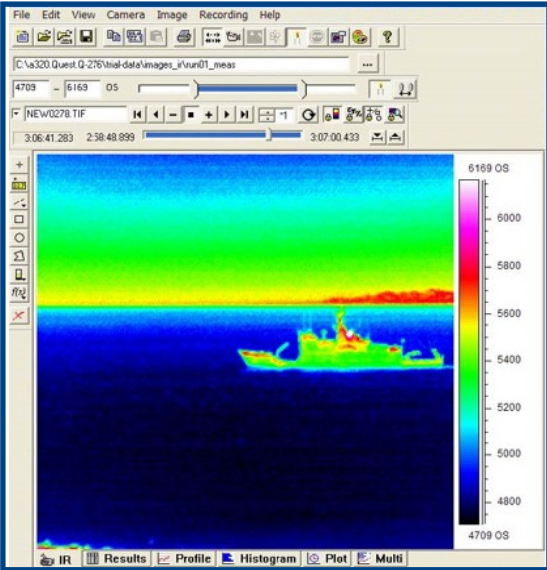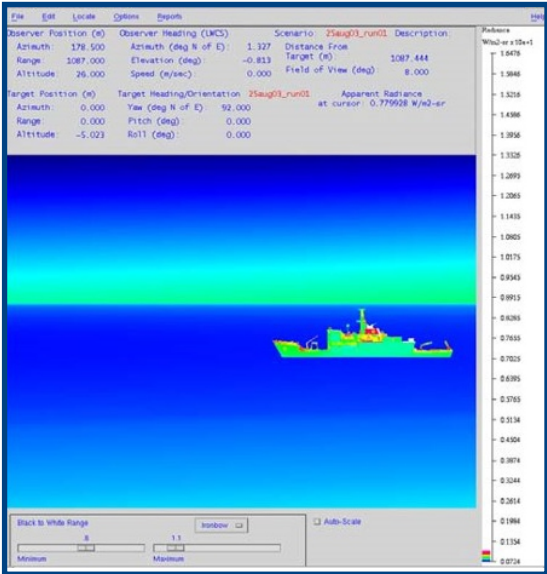# Naval Infrared Stealth Technology

Davis supplies technology which enables the balanced reduction of all Infrared (IR) signature sources on a naval ship. Engine exhaust IR signature suppressors (IRSS) are supplied for both vertical and side exhaust configurations. The Active Hull Cooling (AHC) system automatically minimizes ship skin IR signature in the current environment.

Stack IR Suppression Systems (IRSS)

Davis supplies passive and active IRSS devices for cooling the engine exhaust plume and uptake metal. The systems can achieve plume temperature reduction to below 200°C. Variable geometry systems can be utilized to achieve a zero engine fuel penalty during non-threat situations.
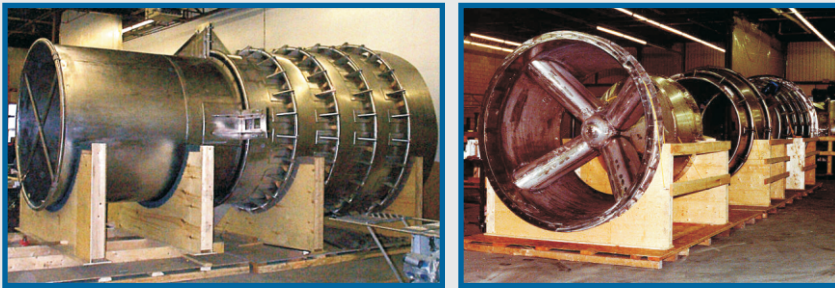
Top Left: Mixing Tube and Diffuser of Eductor/Diffuser;
Bottom Left: Entraining Diffuser;
Right: DRES-Ball.
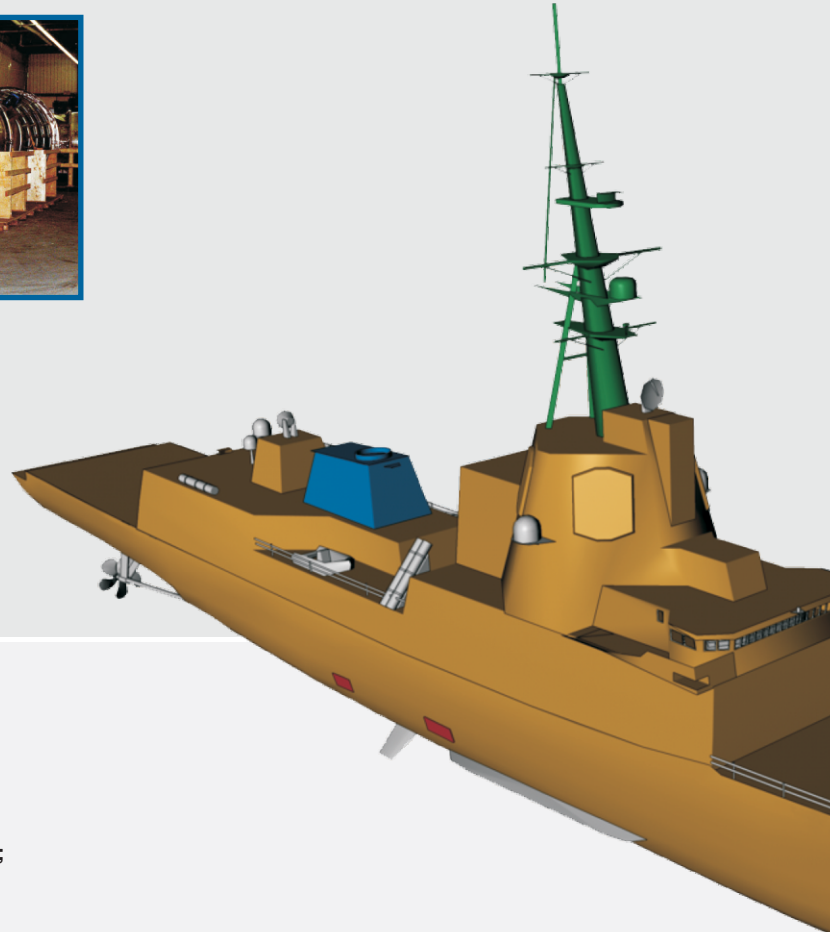
Left: Sea Water Injection (SWI) system;
Middle: Exit-end view of horizontal exhaust system;
**Right: Engine-side view of horizontal exhaust system.**

Davis supplies complete horizontal exhaust systems which include: isolation valves; silencers; drains; seals; a sea water injection (SWI) system; control panel; hull penetration fairings; and ducting. The controller interfaces to the ship machinery control system. The systems are made from material which is highly robust to thermal cycling, vibration, and shock, and can be operated with or without the SWI system activated.

Side Exhaust Systems

Full coverage ship hull and superstructure skin cooling is achieved with both standard and custom designed Davis water sprinklers. Water flow to the sprinklers is automatically controlled in order to minimize the ship signature in the current environmental conditions.
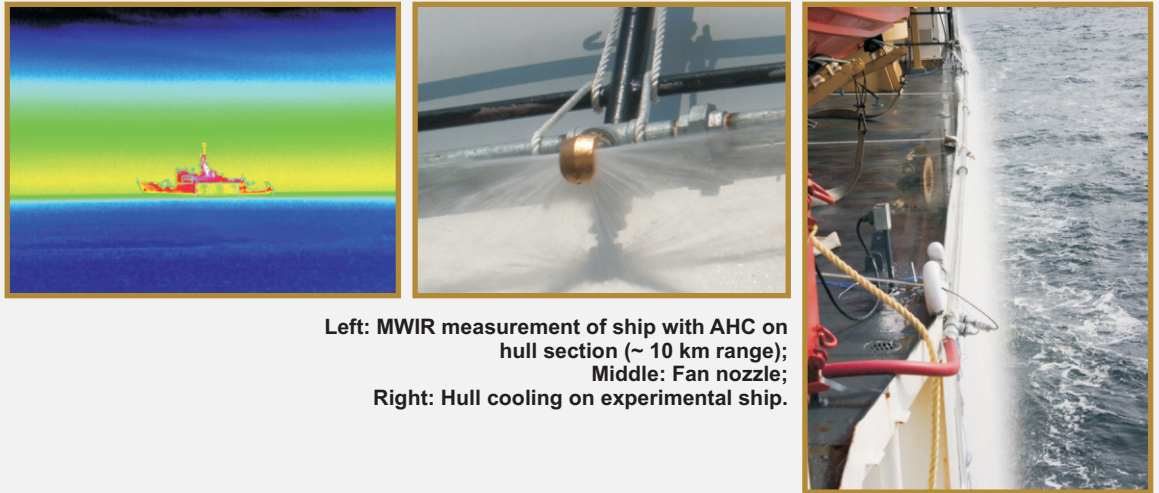

Left: MWIR measurement of ship with AHC on hull section (~ 10 km range);
Middle: Fan nozzle;
Right: Hull cooling on experimental ship.
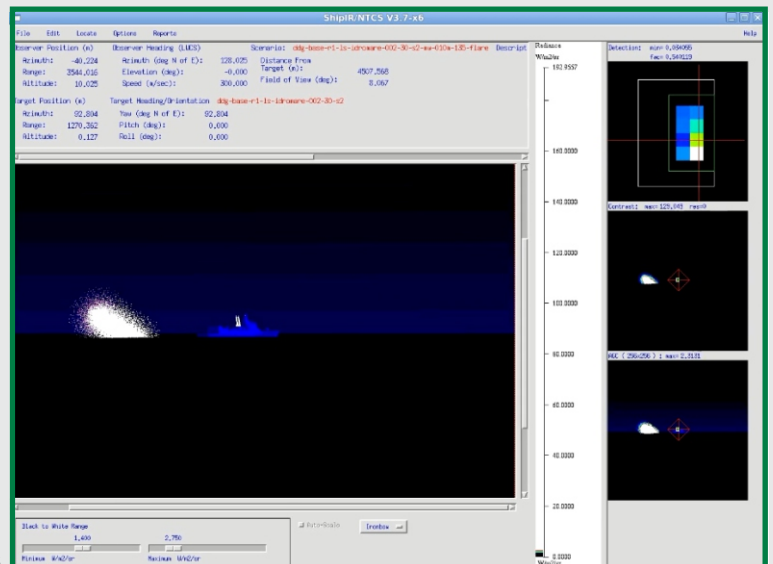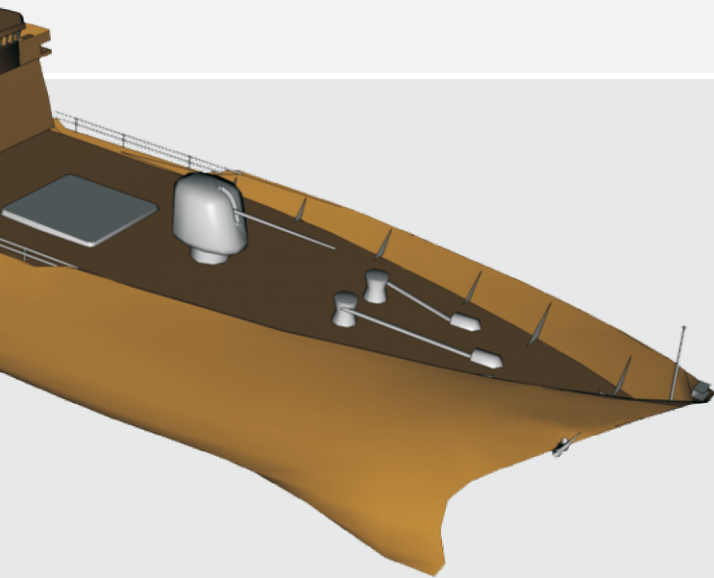
Right: NTCS

The Davis ShipIR/NTCS desktop software is the only NATO standard and USN accredited simulation tool for infrared target and engagement modeling in the marine environment. Naval platforms are modeled through the input of 3D geometry and the application of surface properties and thermal boundary conditions. The code has validated models for the engine exhaust plume, multi-bounce reflections, sea state, and atmospheric effects. The IR engagement uses a self-contained automatic track gate algorithm or users can specify their own customer seeker algorithms. The ship flare has been modeled and validated against infrared measurements of real flares. The code has been commercially available since 1993.

IR Engagement Simulation (ShipIR/NTCS)
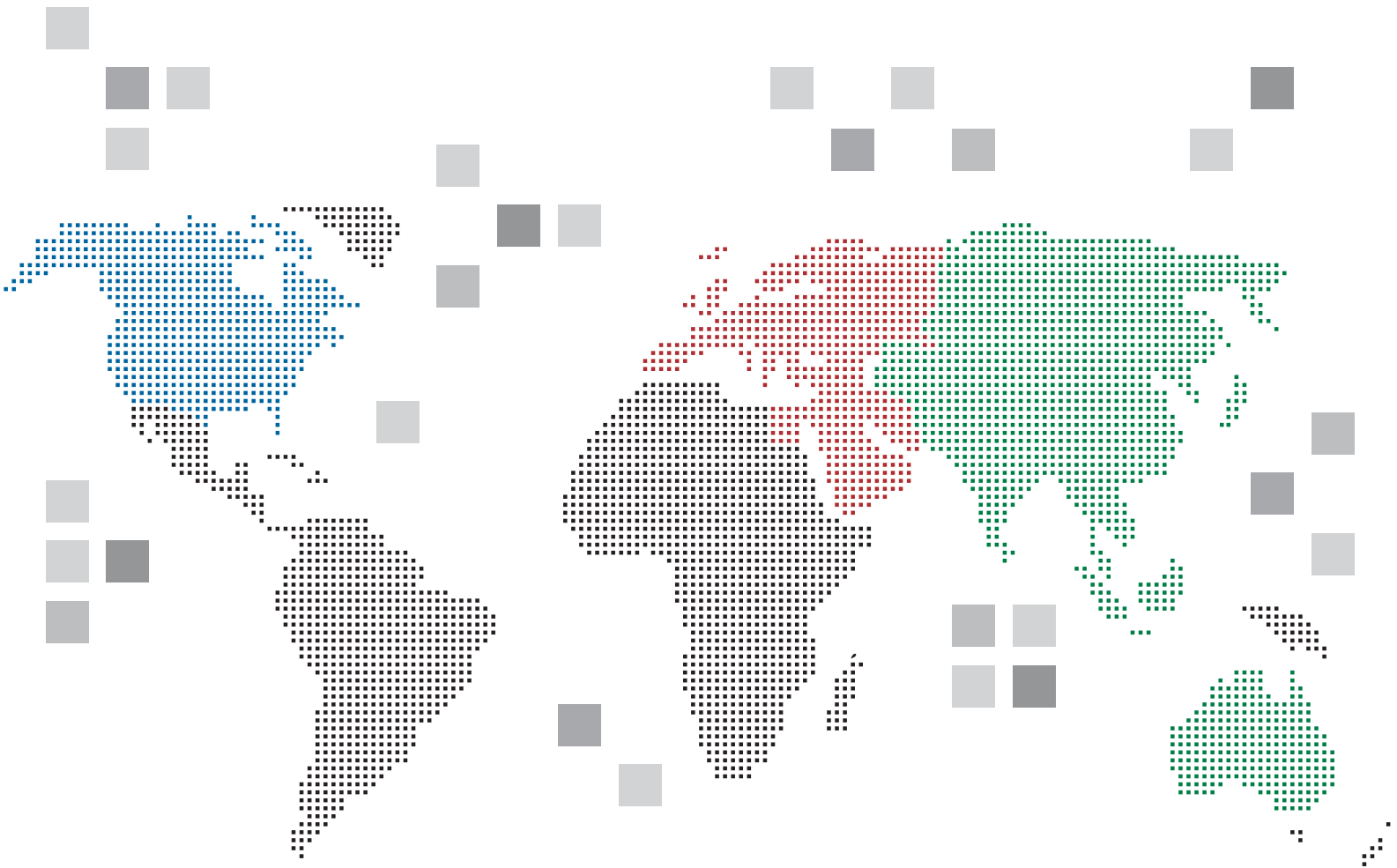
North America	Europe & Middle East	Asia
CPF (Canada) Tribal Class (TRUMP) (Canada) LHD-8/LHA-6 (United States) Deepwater (USCG)	Type 26 (UK) Type 45 (UK) Absalon (Denmark) Iver Huitfeldt (Demark) Fremm (France/Italy) Horizon (France/Italy) Cavour (Italy) Multirole LHD (Italy) MEKO (Greece) F310 (Norway) Al-Ofouq (Oman) Khareef (Oman) F100 (Spain)	AWD (Australia) Vikrant (India) Asuka(Japan) Delta (Singapore) FFX-I (South Korea) FFX-II (South Korea) KDX-II (South Korea) KDX-III (South Korea) PKX-A (South Korea) PKX-B (South Korea) LPX (South Korea) LST-II (Soth Korea) AOE (Taiwan) DW-3000F (Thailand)

Davis