



# News

CANADIAN NAVAL TECHNICAL HISTORY ASSOCIATION

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## CNTHA Celebrates Five Years “in Business”

It's hard to believe that our first newsletter was published in March 1997. In one sense, we have been very successful: most people associated with the naval community are aware of our existence and our mandate. This clearly was one of our objectives in establishing the newsletter five years ago. Also, through this publicity our collection of written material has grown, although perhaps not as much as we might have hoped. We still could use more personal reminiscences and views of those who have participated in this fascinating business. Most of us are too humble to believe that we can contribute, but our stories may be fascinating to others. Give it a try.

I have been greatly encouraged by some very determined organization and work that flowed from our committee meeting last November, when Rolfe Monteith inspired a small team to tackle the industrial side of our naval heritage. Headed by Don Jones, a keen group consisting of Doug Hearnshaw, Colin Brown, Jim Williams, Gord Moyer and Rolfe himself, has been mapping out a large-scale “seascape” of the industrial story, against which information can be gathered and sorted. Not surprisingly, it looks a lot like a summary of our ship programs and the equipment de-

velopments that accompanied them. The group is now looking for means to make people who were on the industrial side aware of our project so that they may contribute to it. If you or someone you know might be able to help, please put them in touch with Don and his group.

Our newsletter and its excellent companion, the *Maritime Engineering Journal*, are free to those who have an interest in our endeavour. If you know of any former colleagues or industry people who wish to receive the newsletter, please have them contact us and we'll be glad to add them to our distribution list.

— *RAdm (ret.) Mike Saker,  
 Chairman CNTHA*



## Tribal Class Update and Modernization Project

Scope of work:

- Platform design from concept through detail design.
- Naval architecture and structural design.
- Engineering design of auxiliary systems and outfit and furnishing.
- Integration into the ship of the combat system.
- Detailed design and preparation of strip-out and production drawings.
- Procurement, set-to-work and test and trials of the ship.
- Implementation of the work into the ship.



## TRUMP Engineering Deliverables

- 14,075 new and revised drawings.
- 2,275 SDRL reports.
- 251 equipment/subsystems.
- 668 line item spares.
- More than 1,225,000 person-hours of engineering.



# Technology and the Tribal Class Update and Modernization Project

Article by Cdr Tony Cond

It became apparent by the late 1970s that the Canadian naval fleet would need considerably better area air-defence capability to deal with the threat of long-range Soviet cruise missiles and aircraft. It was also clear that the Canadian fleet would have to operate over a much wider area of the globe. This meant that better shipboard command, control and communication facilities would be required to support Canadian task groups on long deployment.

To achieve these badly needed improvements the navy embarked on the Tribal Class Update and Modernization Project (TRUMP). Between 1987 and 1995 the four DDH-280s were outfitted with a capable array of improved weapon and fire-control systems. In addition to the major improvements to the combat systems, the ships also benefitted from a new cruise engine and gearbox, hull strengthening and a water displacement fuel system. Perhaps the most obvious change was the loss of the distinctive twin “bunny ear” funnels as part of the superstructure modifications for ship signature reduction. At the end of the day, the *Iroquois*-class ships could be expected to equal or surpass any similar sized allied ship in terms of air-defence firepower, flexibility and survivability.

TRUMP was an impressive overhaul, with benefits that went far beyond the *Iroquois* class. The combination of the technological advances associated with the TRUMP

modifications and the manner in which the prime contractor, Litton Systems Canada Ltd., subcontracted portions of the work served to develop a wide base of Canadian industrial expertise in modern warship engineering support. Nowhere was this more ground-



DDH-280 *Iroquois* before the TRUMP refit

breaking than in the specialized area of integrated naval electronics.

Leading the way were four TRUMP fits that still warrant special attention today — the CANEWS electronic warfare system, and a trio of systems for shipboard integrated communications, processing & display, and machinery control. All four of these systems were conceived and formulated by Canadian naval engineers and developed by Canadian industry.

The *Shipboard Integrated Communication System* (SHINCOM) first produced by Leigh Instruments, then SPAR and finally DRS Technologies, provided greater performance and flexibility to all ship's communication networks. It used advanced digital technology and microprocessor controlled terminals to give a user-friendly, fully integrated, combat survivable system solution for the ship's tactical, interior, exterior and secure communication circuits. Today,

the newest version of SHINCOM (not yet fitted) is based on commercial off-the-shelf technology, and will use a central software base to provide redundant switching, “dual-homed” terminals and interoperability for joint operations to ensure continuous communications into the next decade.

The *Shipboard Integrated Processing and Display System* (SHINPADS) updated the CCS-280 command and control system with a distributed and fully integrated system. The software was supplied by Sperry Computer Systems of Winni-



*Iroquois* after her TRUMP refit

peg, while the tactical display equipment was supplied by Computing Devices Company of Ottawa. SHINPADS remains the backbone of the CPF combat system, integrating all sensors and weapons.

The *Shipboard Integrated Machinery Control System* (SHINMACS) replaced the old pneumatic and hybrid analogue/digital system with a distributed digital system developed by CAE Limited. The system permitted a wide variety of machinery to be controlled from specially designed computer displays, thereby facilitating better maintenance, equipment health monitoring and crew training.

The *Canadian Electronic Warfare System* (CANNEWS) provided long-range detection, classification, and tracking of electromagnetic emissions. The CANNEWS project, which resulted in one of the most capable

EW suites in the world, was made possible by extensive research and development carried out by several DND agencies. This technology has since been transferred to industry for development and production. In fact, both CANNEWS and SHINMACS became successful candidates for export sales, the benefits of which continue not only to serve Canada’s marine technology development, but to satisfy international naval design requirements as well.

The trend in naval technical innovation so prevalent during the DDH-280 and TRUMP programs continues to be a major factor in the success of our naval fleet. Now, as then, behind every technical advance were the people who steadfastly gave their best for the navy — the military personnel serving in the navy’s technical branch, the civilian marine engineers employed in the defence department, and the

large body of retired naval engineers and technicians who continue to contribute productively to Canada’s defence through second careers in the public service and the marine and electronics industries. The considerable investment which the navy makes to train and develop its engineers is thus rarely lost on retirement as people’s valuable engineering expertise becomes part of the strength of Canada’s small, but capable naval defence industrial base.



*Cdr Cond is a project director with the Directorate of Science and Technology Maritime in Ottawa. This article is excerpted from his paper, “A Century of Canadian Marine Technology Development,” prepared for his Bachelor of Military Arts and Science program at RMC.*

## Naval Architectural Challenges

- trim and stability
- hull girder strength
- new VLS system
- new IR suppression
- new cruise engine
- new machinery control system
- new WDFS system
- modified gearbox
- new fire-detection system
- new smoke evacuation system
- new CIWS
- new main gun
- new 1000-kW electrical power generator



## Water Displaced Fuel System

- 78% of the ship’s 650 tonnes of fuel converted to a water displaced configuration.
- Tank boundaries of these fuel chains heavily reinforced to withstand higher operating pressures.
- Internal structure modified to ensure optimal flow of both fuel and water throughout the tanks.
- Extensive stripping system installed to prevent water from damaging the ship’s machinery, and fuel from polluting the water surrounding the ship.



# The Canadian Naval Defence Industrial Base Project

## About the CNTHA

The Canadian Naval Technical History Association is a volunteer organization working in support of the Directorate of History and Heritage (DHH) to preserve our country's naval technical history. Interested persons may become members of the CNTHA by contacting DHH.

A prime purpose of the CNTHA is to make its information available to researchers and others. The Collection may be viewed at the Directorate of History and Heritage, 2429 Holly Lane (near the intersection of Heron and Walkley Roads) in Ottawa.

DHH is open to the public every Tuesday and Wednesday 8:30-4:30. Staff are on hand to retrieve the information you request and to help in any way. Photocopy facilities are available on a self-serve basis. Copies of the index to the Collection may be obtained by writing to DHH.



In November 2001 a Canadian Naval Defence Industrial Base (CANDIB) Project, under the chairmanship of Rolfe Monteith, was set up as a subgroup of the CNTHA. Present members of the project team are: Don Jones (vice-chairman), Colin Brown, Gord Moyer, Douglas Hearnshaw (Society of Naval Architects and Marine Engineers), and Jim Williams (former president of MIL Systems).

The mission statement for the project is: "to describe the development of the Canadian industrial base as it evolved in support of warship construction and naval equipment programs between 1930 and 2000, and to record the relationship between the military requirement and the industrial response during that period."

The project team is interested in contacting people who may have served in any capacity associated with naval shipbuilding and/or equipment design and manufacture. This would include senior managers in DND, contract managers in Defence Design Production (Department of Supply and Services) or DND, shipyard and

equipment firm project managers, principal naval overseer staffs, DND systems and desk officers, DND and civilian R&D project teams, etc.

If you are interested in participating in this information gathering process, please contact Colin Brown <colinr.brown@sympatico.ca>, with a copy to Douglas Hearnshaw <dhearnshaw@trytel.com>, or by mail to C.R. Brown, 470 Hillcrest Ave., Ottawa, ON, K2A 2M7. We need to know your name and address, whether you were with the RCN, DND or a company (please include the company's name), your rank and/or position on retirement, projects in which you were involved, and when and in what capacity. Please include names of co-workers who might also be good sources of information.

This might be the last chance to obtain and record useful information on this topic. Your participation in this endeavour would be of significant value in presenting a view from the industry side. – **Mike Saker, Chairman CNTHA**



This scene is one of a series of naval theme paintings produced for Lamb's. (Courtesy the Maritime Command Museum in Halifax.)