

equipped with specialized manufacturing equipment, is considered one of North America's best. Custom thick and thin film hybrids are now being manufactured to the new and more demanding Military Standard 1772. These include power hybrids and assemblies with leadless chip carriers surface mounted on multilayer ceramic motherboards.

Hybrids manufactured by Garrett are used in missile guidance systems, inertial navigation systems, radar systems and other electronic equipment on a variety of military and commercial aircraft, as well as in US Government electronic security systems.

Peripheral Vision Display: The PVD is a subliminal attitude change indicator for cockpit work-load reduction and pilot disorientation prevention. It operates on the principle that orientation information is sensed primarily by a person's peripheral vision system and is processed subconsciously by dedicated areas of the brain. The system is now in production for military applications.

Advanced Systems and Subcontract Manufacturing Service: Garrett Canada's 30 years experience in the design, development and manufacture of a wide range of aerospace and aerospace related products provides a sound base for the production of state-of-the-art major defense and communication systems. This experience, supported by a modern up-to-date facility, is also being offered for subcontract manufacturing.

The Advanced Systems capability provided by Garrett Canada has been recognized and proven in the NATO arena through the company's participation in a number of multi-national collaborative programs. Programs beginning with R&D and design, through the system integration and development of comprehensive benefits programs, to complete life cycle support and world-wide marketing.

Currently, Garrett Canada is addressing the feasibility, design and development of control actuation systems, power supplies, weapons computers and specialized test equipment for several NATO requirements. In addition to Garrett Canada's participation in the NATO ASRAAM program, the company is teamed in a multi-national consortium to address the NATO requirement for Modular Stand-Off Weapon (MSOW). This company is also a consortia team member for the NATO Anti-Air Weapons System (NAAWS), 155mm autonomous Precision Guided Munitions (APGM) and the NATO Area Defence Weapon.

Garrett Canada has contributed in a number of NATO working groups in the pre-feasibility studies for NATO LAMS/MFR and the Area Defense Weapon (ADW). The company supplies components and assemblies for numerous other defence projects which include the British Aerospace Rapier, GBU-15 glide bomb, ASRAAM, and Chapparral.

The Subcontract Manufacturing services include build-to-print, assembly and testing of sub-assemblies, assembly and testing of electronic systems, and employment of Garrett Canada's highly experienced manufacturing groups, including aerospace standard assurance and computer aided test facilities, to help customers meet demanding delivery schedules. This service backed up by a high-technology team, employing computer aided design and manufacturing techniques provides the best cooperation in major procurement programs.

AVERAGE WORK FORCE: Total - 1200

GROSS SALES: 1986 - \$104.0M
1987 - \$101.4M

PLANT SIZE: Administration Building - 64,000 Sq Ft
Engineering Facility - 33,000 Sq Ft
Main Production Plant - 75,000 Sq Ft
Microcircuit Plant - 21,000 Sq Ft
Customer Support Plant - 34,000 Sq Ft
Illuminated Panels Facility - 21,000 Sq Ft

EXPERIENCE: Garrett Canada customers are world-wide and include both the commercial and military sectors.

KEYWORDS: ATC Communications System; Avionics; Beacons; Build-To-Print; Cockpit Displays; Communications; Crash Position

Indicator; Digital Electronics; EMI; Emergency Locator Beacons; Environmental Control; Environmental Instruments; Hybrid Circuits; ILS; Illuminated Panels; Lighted Panels; Measurement & Control Systems; Missile Control Systems; PC Board Design & Fabrication; Peripheral Vision Display; Power Supplies; R&O (Avionics); RF Communications; Radio Communication Gear; Regulators (Hi/Lo Voltage); Software Services; Solid State Devices; Subcontract Manufacturing; Systems Integration; TEMPEST; Test Instrumentation; Testing/Test Equipment; Thick Film Hybrid Microcircuits; Thin Film Hybrid Microcircuits; Voltage Transformers.

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GasTOPS Ltd

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HISTORY: GasTOPS Ltd is a Canadian owned company founded in 1979. Capitalization of the company has been through initial investments and retained earnings, and its growth has been steady since operations began.

CAPABILITY: GasTOPS Ltd is primarily involved in the design and development of subsystems and support systems for gas turbine based propulsion systems. The company is organized around projects which emphasize R&D. Projects have been concentrated in the fields of engine health monitoring, engine control systems, engine test data systems, and propulsion system simulations. A substantial amount of this development involves computers and software, and the company offers services in these fields to its customers. In the last several years, the customer base has been almost exclusively military - both naval and airborne.

AVERAGE WORK FORCE: PhDs - 3
Engineers - 30
Others - 10

GROSS SALES: 1986 - \$2.0M
1987 - \$2.8M

PLANT SIZE: 15,000 Sq Ft (including 2500 sq ft model shop)

EQUIPMENT: Complete mechanical model shop, electronics test equipment, and in-house computer systems and software including MICROVAX-II and PDP 11/23.

EXPERIENCE: Present customers include engine manufacturers, control system manufacturers, and various departments in the Canadian Government including the Navy and the Air Force. GasTOPS Ltd is an R&D company devoted to engineering development of prototypes. Cooperative projects with manufacturers are preferred.

KEYWORDS: Automatic Data Acquisition systems; Control Systems; Data Acquisition; Demonstrator Consoles; Engine Health Monitoring; Engineering Services; Expert Systems; Gas Path Analysis; Gas Turbine Engines (R&D); Inflight Engine Monitoring; Software Development.

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