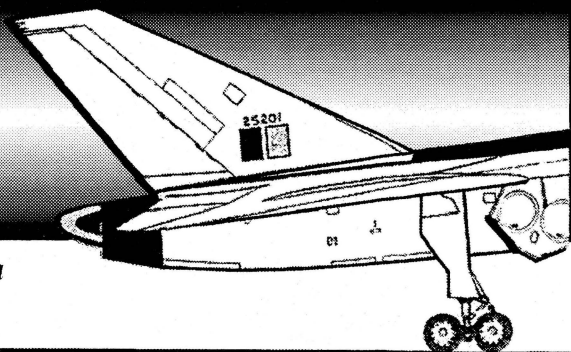


Pre-Flight



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New plant changes Malton's landscape forever....

The Series continued.

Information needs and the Data Centre

The use of modern technology helped Orenda maintain its leading position throughout its history. Information Systems in particular has kept up with the times to provide the information needed when it is needed. In 1966, the computer facility was in a small office located directly behind the old switchboard room, in the northwest corner of the main plant.

Founded 1989

AHFC

Aerospace Heritage Foundation of Canada



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President's Message

Once again I had the pleasure of attending the Annual Inspection of 845 Avro Arrow Squadron, Royal Canadian Air Cadets at the Hershey Centre, Mississauga and presented the 2012 James C. Floyd and Janusz Zurakowski Awards. The "James C. Floyd Award" went to Flight Corporal John Hutchinson and the "Janusz Zurakowski Trophy" went to Flight Sergeant Ben McKenna. We wish them well in the future endeavours. Well done!

I am sorry to announce the passing of James Herbert (Bert) Scott. Bert was one of our founding members and was always there to assist the Foundation in all of our activities. Bert will be sadly missed.

Frank Harvey

New plant ... continued

The room was divided into quarters, storage, office keypunch and computer room. The IBM 1620 in use at the time to meet engineering and scientific needs required all input in punch card format. The data was coded onto specially designed forms completed by the user. The keypunch operators keyed this information into cards that were then verified and sorted.

This method of input did not change until the mid-1970s. Then keypunch operators transferred the data on the coded form to magnetic tape instead of a punched card. To allow for expansion to accounting and business applications, a Honeywell 1200 computer was acquired in the late 1960s. This consisted of five tape drives, card reader, card sorter, printer, and console.

The increasing demand for more applications soon required this system to be upgraded. In early 1967, renovation work began on the east side of the cafeteria to accommodate the "Systems and Information" department and the new Honeywell 4200 computer in a modern computer complex. At the time of its installation in May 1970, the model 4200 was the largest and most sophisticated computer in Canada.

Nine offices, a systems and programming area, a keypunch area, a general office area, and a conference room accommodated all the operators and programmers. One room was dedicated solely to the computer and peripheral equipment. The computer room itself was 32' x 57'; a sub-floor was installed to bury electrical wiring and computer cables, and to allow air to circulate around the computer, which was highly sensitive to temperature and humidity. Except for four air conditioning units (6'x3' each) strategically placed on its outer walls, the room was completely filled with banks of tape drives, CPU units, card readers, card sorters, printer and console. Punched cards were still used on this computer but the recently introduced magnetic tape became the most useable source of input and storage of data. Storage space for these tapes became critical. Tapes and tape racks were purchased frequently, and off-site storage rooms were acquired in the main Orenda plant and office areas.

By 1979, the Honeywell was becoming obsolete. Because it was one of only two in North America, repair and maintenance could not be guaranteed. A DEC 2020 was acquired from Digital. Although the DEC occupied only half of the computer room, its memory capabilities were far superior. The system consisted of two magnetic tape drives, four disc drives, one printer and one console.

The DEC served Orenda's needs until the late 1990s, when demand for information exceeded its capability. A HP (Hewlett Packard) Series 70, with storage for 400,000,000 bytes of information was installed in late 1989, giving users on-line interactive access to data. The HP consisted of seven disc drives, one tape drive and one Digital Audio Tape (DAT) drive, a mainframe printer and a console. Although physically the HP was about the same size as the DEC, its functionality and memory capacity was much larger. Storage of information was done overnight and data was written onto a cassette-size tape utilizing the DAT drive. The back-up procedure was automatic; in the past, an operator had to replace the magnetic tape when it reached its capacity.

Late in 1993, the HP was upgraded to a Series 957. The new computer is the size of a large filing cabinet. Within this "filing cabinet" is one DAT drive and four disk drives, providing 8 GB of memory. A console terminal and a mainframe printer complement the computer system.

With a shrinking hardware system, the Data Centre was no longer suitable and the computer facility was relocated to the old Conference Room 'C'. The computer room is the same size as the first one back in 1966, but the capabilities of the computer have expanded immensely. Some 1200 business application programs run on the system; 100 on-line users connect with it and print on any one of 23 printers strategically placed throughout the company.

OWNERS, ORENDA HAS KNOWN

In its early life, Orenda was the Gas Turbine Division of A.V. Roe Canada, owned by the Hawker Siddeley Group of Great Britain. In 1955, the Gas Turbine Division became Orenda Engines Ltd., still part of the A.V. Roe organization. Four years later, Orenda Engines join three other A.V. Roe companies to form Avro Aeronautical.

In 1962, deHavilland Canada bought Avro's Malton plant and Avro closed its doors. Orenda became a division of Hawker Siddeley Canada.

Orenda Limited was formed from the Orenda Division in 1966, when Hawker Siddeley sold 40 percent of its shares to United Aircraft.

It bought back those shares in 1973, regaining 100 percent ownership. In 1990, Orenda purchased Middleton Aerospace Corporation, Massachusetts, and its Windsor Aero-space Division in Windsor, Ontario. Hawker Siddeley, worldwide, was taken over in 1991 by BTR (British Tire & Rubber). BTR sold Hawker Siddeley Canada into the public market three years later. In that same year, 1994 the Orenda Division of Hawker Siddeley Canada purchased A.R. Technologies in British Columbia.

A year later, Hawker Siddeley Canada announced that it was selling off its component companies. After a six-month period of uncertainty, Orenda was purchased by Fleet Aerospace, becoming a sister company of Fleet Industries of Fort Erie. Orenda's full name is now Orenda Aerospace Corporation.

Computer-Aided Manufacturing System CAD/CAM

Although the machinery on the shop floor was increasingly sophisticated, the programming to process parts on NC machines was entirely manual until 1968. In that year, process planning became computer-assisted through use of a programming language called APT.

In the 1970s through to mid-1988, Orenda utilized a time-sharing service provided by GE for production of Numerical Control tapes for NC machine tools. During those years, the shop floor became more technologically advanced. To provide greater capability and support to Component Manufacturing, early in 1988 the company installed three Auto-trot CAD/CAM advanced graphics workstations.

The CAD/CAM system enabled the company to develop tool designs, generate detailed process planning and inspection method sheets. The system also facilitated estimates, which could be prepared on the system by carrying out detailed planning on components and by extracting "like parts" from the system for modification. Another six stations were installed in early 1989.

Today, the process planners use sophisticated technology to facilitate parts manufacture. Sixteen Hewlett Packard workstations are networked to each other for ease of communication, and they are all connected to Orenda's local area network to enable data transfer to AMES in Ottawa. The Auto-trot software Series 7000 produces 3D designs and does all the NC part programming for all the automated NC machines, as well as tool design. The Series 5000 software produces the processes needed to move the part through all stages of its manufacture from forging to shipping.



Orenda and Customer Service

Throughout its history, Orenda has provided after-market customer service second to none, in the field as well as in the plant.

The Field Engineering Department, now called the Military Support Department (MSD), was composed of field representatives assigned to RCAF Command Headquarters and Operational Units (both overseas and in Canada) and personnel at Orenda who provided analytical and documentation support. The RCAF contracted Orenda to provide "on-the-spot" technical support to ensure that engines operated at maximum efficiency with a minimum of unserviceable time.

The Field Engineering personnel were the links between the field representatives and the in-house Orenda engineers. They analyzed reported problems and directed their recommendations to the design engineers at Orenda for action or referral to the prime design authority (for example, General Electric for the J-79 and J-85 engines). The department analyzed proposed design changes for impact on the engines in service and translated the changes into modifications bulletins, procedures, and inspection limits, for action in Repair and Overhaul, or at the operational level. Technical items affecting engine publications were passed on to the Graphics Department to be included in the RCAF engineering manuals which were constantly updated for the Canadian Armed Forces.

Over time, the Field Engineering Department has supported a wide variety of engines, including the Orenda 2, 8, 9, 10, 11 and 14 Series, the J79-OEL7, the J85-CAN-40 and the J85-CAN15 produced under licence to GE and the F404-GE-400. Field engineering representatives have worked in West Germany, Venezuela, and the Netherlands, as well as at various Canadian Forces bases across Canada. Mobile Repair Parties made up of designated experts from the plant were sent to assist at bases in Canada or abroad where the required expertise was not available locally. Provision of these services was reduced because of military spending cutbacks.

The department maintains a logbook of all engines manufactured or overhauled by Orenda, along with the relevant technical publications. This record becomes invaluable when engines are transferred to new owners.

Today, MSD continues to provide short-term engineering and investigative services on site. Representatives have been sent to various Canadian

Forces bases and Turkey, for example, to investigate operational problems and other problems and to implement solutions.

Orenda service analysts write and continually update engineering manuals for the Canadian Forces for each engine model supported by Orenda. These manuals are specially tailored to each customer's requirements and their maintenance capabilities. This service confirms Orenda's reputation as a superior customer service provider.

Orenda in the 1990s...

Orenda is an established leader in power and propulsion technologies. It provides a wide range of products and services, including: gas turbine engine repair and overhaul; component manufacturing for OEMs of the world's leading turbine engines; high technology reciprocating power plants; industrial power packages; and advanced materials and energy systems.

Repair and Overhaul (R&O)

Throughout its history, Orenda's engineers have been developing innovative, cost-saving repair procedures to support, repair and overhaul gas turbine engines and fleets around the world.

Applying advanced technology and processes, Orenda is able to economically repair more than 50 percent of the components in conventional gas turbine engines, both aero and industrial. When these components are returned to customers, their quality and performance are equal and sometimes superior to those of the original factory components.

Since 1955, the Canadian Armed Forces have relied upon Orenda's repair and overhaul capabilities to support the operation of six different aircraft types, including the J85 and F-404, and all of their variations. The U.S. Navy chose Orenda to repair and overhaul F-404 jet engine exhaust frames for its fleet of F/A-18 fighters.

Despite military spending cutbacks, the future looks bright for R&O, as its representatives seek new opportunities to apply the unit's specialized skills and comprehensive facilities throughout the world.