

AEROSPACE ENGINEERING TEST ESTABLISHMENT

The Engineering Flight Test Capability of the Canadian Armed Forces

April 2015

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INTRODUCTION

1. The Department of National Defence requires an independent and impartial organization to provide flight and technical evaluation of aircraft and aerospace equipment for the Canadian Armed Forces. The organization that provides this capability to the Canadian Armed Forces is the Aerospace Engineering Test Establishment in Cold Lake, Alberta. The Aerospace Engineering Test Establishment organization provides flexible aerospace test and evaluation expertise and services in support of the Canadian Armed Force's operational capabilities. It possesses a broad spectrum of engineering expertise in order to perform many different types of tests, from investigating design assumptions in prototype installations to assessing a contender aircraft's suitability to accomplish a specific role.

AIM

2. The aim of this document is to describe the mission, organization and capabilities of the Aerospace Engineering Test Establishment.

MISSION

3. The mission of the Aerospace Engineering Test Establishment is to provide aerospace test and evaluation expertise and services in support of the Royal Canadian Air Force's operational capabilities. The Aerospace Engineering Test Establishment is an Assistant Deputy Minister (Materiel) field unit directly responsible to Director General Aerospace Equipment Program Management.

4. The Aerospace Engineering Test Establishment must be capable of conducting a broad range of ground and flight testing on aircraft and aircraft systems, and sufficiently flexible to respond to rapid changing priorities and, when required, to meet wartime demands. This sometimes includes deploying to austere locations to conduct testing. The scope of testing is technically diverse and could include such tests as weapons system software modifications, stores certification, avionics certification, unmanned aerial vehicle testing, escape systems testing (i.e. aircraft life support equipment and ejection seats), synthetic flight training device certification, ship/helicopter operating limits and flutter testing.

FACILITIES

5. The Aerospace Engineering Test Establishment is a lodger unit at 4 Wing, Cold Lake, Alberta, Canada, the largest fighter base in the Royal Canadian Air Force. As a lodger unit, the Aerospace Engineering Test Establishment receives administrative, technical and logistics support from 4 Wing. The Wing owns and maintains all fixed infrastructure used by the Aerospace Engineering Test Establishment. 4 Wing is responsible for airfield operations and provides full visual flight rules and instrument flight rules services for military aircraft 24 hours a day. There are two main parallel runways at 4 Wing measuring 12,500 x 200 feet and 10,000 x 150 feet. A cross runway measuring 8,300 x 200 feet is also in operation. The runways are capable of handling all types of aircraft from advanced fighter jets to heavy transport aircraft (Boeing 747, C-17 Globemaster, C-5 Galaxy class aircraft). Arresting gear is available for both approach and departure ends on all three runways. Instrument approach systems include Non-Directional Beacon, Tactical Air Navigation, Instrument Landing System and Precision

Approach Radar. 4 Wing is also licensed to store and assemble a wide variety of explosive ordnance.

6. 4 Wing maintains and operates the Cold Lake Air Weapons Range which is located 25 nautical miles north of the base. One of the largest ranges in the world, its foot print, from surface-to-infinity, measures 98 nautical miles long by 35 nautical miles wide and it contains several ground target complexes for inert bombing training and testing. The Cold Lake Air Weapons Range encompasses the Primrose Lake Evaluation Range, the Jimmy Lake Range and the Shaver River Range. The Jimmy Lake Range and Shaver River Range are operated by 4 Wing, and the Primrose Lake Evaluation Range is primarily operated by the Aerospace Engineering Test Establishment. Both the Jimmy Lake Range and Shaver River Range are licensed for live weapons up to 2,000 pound general purpose bombs, air-to-ground missile/rocket firings and for gun firings. Licences to drop live, newer generation, laser and Global Positioning System precision guided bombs on certain targets in the Cold Lake Air Weapons Range have been issued on a case by case basis. The Cold Lake Air Weapons Range also includes supersonic corridors and low flying areas.

7. The Primrose Lake Evaluation Range contains three drop zones; drop zones ALPHA and BRAVO are on land and are used for air-to-ground operations including live weapons such as rockets and general purpose bombs, and drop zone CHARLIE is a water zone used for weapons delivery in both winter and summer. The use of water allows easy assessment of the performance of unique stores such as dispenser or cluster munitions. A ground firing rack provides the ability to conduct static rocket firing onto the lake surface. All three zones are visible by the Time Space Position Information System. In addition, impact point scoring is also available.

8. The Aerospace Engineering Test Establishment resides in the Janus Zurkowski Building (7 Hangar) which provides office, laboratory, workshop and aircraft storage and servicing facilities. The building also contains a test bay capable of handling aircraft as large as CC130 Hercules and CP140 Aurora. The test bay contains reinforced floor anchors to permit aircraft structural testing and loads applications and is temperature controlled to permit calibration of sensitive instrumentation any time of the year. The test bay can also be blacked out and sealed from external light so that visual performance of lighting systems as well as night vision goggle compatibility evaluations can be done using its night sky simulator.

ORGANIZATION

9. The Aerospace Engineering Test Establishment is divided into a Command and Control group and four Branches: Evaluation, Evaluation Support, Logistics (which includes financial administration, training and human resources) and Safety. The unit manages, on average, 30 projects of various complexities at any given time and releases approximately 20 reports and technical notes per year. Many projects involve deployment to Royal Canadian Air Force Wings across Canada or to original equipment manufacturer facilities all over the world. Recent projects have involved deployments to austere locations such as Resolute Bay and Alert, NWT; Kandahar, Afghanistan; and onboard a Royal Canadian Navy frigate in the North Atlantic Ocean.

COMMAND AND CONTROL

10. The Command and Control group, comprising the Commanding Officer, Unit Chief Warrant Officer and a small cadre of senior personnel, is responsible for the day-to-day operation and management of all activities at the unit. Specific responsibilities include final acceptance authority of new projects, release authority for project estimates and test reports, release authority for contractual and financial reports and responsibility for the quality of all work and deliverables, organizational efficiency and discipline, and safety.

EVALUATION BRANCH

11. The Evaluation Branch has 54 positions, including the Senior Test Pilot, and is divided into seven sections: Multiengine Evaluation; Fighter/Trainer Evaluation; Rotary Wing Evaluation; Avionics/Crew Systems Evaluation; Aerospace Engineering Test Establishment Detachment Trenton; Operations; and Project Control.

Evaluation Sections

12. The Multiengine Evaluation, Fighter/Trainer Evaluation, Rotary Wing Evaluation, and Aerospace Engineering Test Establishment Detachment Trenton sections consist of Qualified Test Pilots, Flight Test Engineers, Qualified Systems Evaluators, as well as specialist support engineers.

13. Most of the 14 Qualified Test Pilots and nine Flight Test Engineers are employed in these sections, and all are graduates of either the National Test Pilot School, Empire Test Pilot School, International Test Pilots School, United States Navy Test Pilot School, United States Air Force Test Pilot School, or the École du personnel navigant d'essais et de reception. Qualified Test Pilots and Flight Test Engineers are qualified to evaluate performance, stability, control, captive carriage, stores clearance, flutter, and more on new, modified, repaired, and overhauled multi-engine, fighter, trainer and rotary wing aircraft, unmanned aerial vehicles and flight simulators. They also have the expertise to evaluate avionics and mission systems.

14. Most of the Qualified Systems Evaluators are also employed in the Evaluation sections. Qualified Systems Evaluators are Air Combat Systems Operator officers with significant Royal Canadian Air Force operational experience, plus advanced education or training relevant to aerospace systems evaluation. On the systems evaluation projects to which they are assigned, Qualified Systems Evaluators have responsibilities, on the ground and in flight, identical to Flight Test Engineers.

15. The Evaluation branch also has specialist engineers in fields like aeronautical, avionics, electrical, armament, structural, mechanical, propulsion, imaging, human factors, or systems engineering. The specialist engineers can lead certain ground-based test projects, and they provide specialist support to project officers for flight test projects. Specific backgrounds and responsibilities of the specialist engineers include the following:

- a. Armament Systems Engineers: Engineers with applicable graduate and post-graduate degrees to provide support to aircraft stores/weapons clearance projects such as:

- (1) Fit and function;
 - (2) Measurement of mass properties;
 - (3) Development and verification of load checklists;
 - (4) Safe carriage;
 - (5) Separation/jettison;
 - (6) Ballistics and stores flutter testing;
 - (7) Weapons system accuracy testing;
 - (8) Development of weapon safety templates; and
 - (9) Expansion of store/weapon clearance envelopes.
- b. Aeronautical Engineers: Engineers with graduate and post-graduate degrees to provide support to projects requiring aerodynamic analysis such as:
- (1) Performance and flying qualities (stability and control);
 - (2) External stores certification;
 - (3) Flutter testing;
 - (4) Structural Clearance testing;
 - (5) Measurement of captive air loads; and
 - (6) Pitot-static system testing.
- c. Mechanical Engineers: Engineers with graduate and post-graduate degrees to provide support to projects require mechanical analysis such as life support equipment (ejection seats, parachutes).
- d. Aircraft Structures Engineers: Engineers with graduate and post-graduate degrees to provide support to projects require structural analysis such as:
- (1) Static strength and fatigue testing;
 - (2) Ground airframe vibration testing;
 - (3) Static and dynamic structural loading in flight;
 - (4) Flutter testing; and
 - (5) Appliance environmental testing (vibration, shock load, climate).

16. Avionics/ Crew System Evaluation section is composed 16 personnel with varied skill sets. The four Qualified System Evaluators, all of whom are graduates of the Canadian Forces' Aerospace Systems Course and/or engineering graduates with advanced degrees, are supported by an Electromagnetic Compatibility engineer, an Electromagnetic Compatibility technologist and three Aviation Life Support Technicians. Together they evaluate avionics systems, missions systems, and Aviation Life Support Equipment and escape systems.

17. Evaluation personnel continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety, and acquire and develop expertise in project management. The project responsibilities of Evaluation personnel include the following:

- a. As Project Officer, act as the project manager to lead the test team to accomplish project objectives;
- b. Work with support engineers, Flight Test Instrumentation engineers and data engineers to define the data required to answer the questions being posed by the sponsor and Director Technical Airworthiness and Engineering Support in the tasking;
- c. Create the project estimate, test plan, risk assessments and associated test reports;
- d. Assist with the creation of the data acquisition and data reduction plans;
- e. Liaise with applicable Department of National Defence units and external agencies to obtain and schedule all resources required for the ground and flight test;
- f. Prepare for, attend and/or lead project meetings, briefings, presentations, technical review boards and safety review boards;
- g. Create test cards, pre and post mission briefs and post flight reports to ensure all data is recorded;
- h. Lead the test team and execute/direct the flight test plan as a test director (Flight Test Engineer) or test pilot;
- i. Summarize test procedures, conditions, results and collateral observations by drafting, reviewing and approving (according to delegated authority) official military flight test reports based on the standard seven-part paragraph, which emphasizes military role relation; and
- j. Provide engineering analyses in the form of technical notes as required.

Operations

18. The Operations section comprises 15 positions including aircrew, weather specialists, and range control personnel. The section is responsible for approving, coordinating and supervising

all local daily flying operations and all activities in the Primrose Lake Evaluation Range, and coordinates Aerospace Engineering Test Establishment airspace, range, airfield, aircraft fuel, and other requirements with 4 Wing. The Operations section also manages aircrew training and standardization.

Project Control

19. The Project Control Office is responsible for day-to-day project tasking and tracking. The section has four positions, including officers with relevant flight test experience, and maintains a master schedule of all active projects with associated resource allocations and timelines. The Project Control Office coordinates taskings with the Air Force Test and Evaluation Coordination office in Ottawa throughout the life cycle of a project, from initiation through closure

20. The Project Control Office develops and maintains the Aerospace Engineering Test Establishment's Project Management Manual and manages all personnel Engineering Test and Evaluation qualification and authorization files. The Project Control staff also serves as the Commanding Officer's staff for a wide variety of issues and initiatives.

EVALUATION SUPPORT BRANCH

21. Evaluation Support Branch consists of four sections (Aircraft Maintenance, Data Acquisition and Processing, Technical Services, and Airworthiness and Quality Management), and is the largest branch containing 164 personnel. The three main sections (excluding Airworthiness and Quality Management) are described in more detail in the following paragraphs.

Aircraft Maintenance

22. The Aircraft Maintenance section, which consists of 73 personnel (including technicians from all aircraft trades), is responsible for the servicing, maintenance and repair of the aircraft assigned to the Aerospace Engineering Test Establishment, as well as all Aircraft Life Support Equipment. There are two CF-188 Hornets, five CT-114 Tutors, and two CH-146 Griffon aircraft assigned to the unit for use as project test, safety/photo chase and pilot proficiency platforms. One of the CH-146s and three of the CT-114s are fitted with specialized instrumentation packages that can be used to meet the Aerospace Engineering Test Establishment's mandate. The Aircraft Maintenance section is an Accredited Maintenance Organization, signifying that the unit's Maintenance Policy Manual has undergone detailed audits by the Director of Technical Airworthiness and Engineering Support to ensure all the maintenance procedures and policies are in compliance with the applicable requirements of the Technical Airworthiness Manual and 1 Canadian Air Division Maintenance Policies.

23. The Aircraft Maintenance section is headed by the Unit Aircraft Maintenance Engineering Officer, who is also responsible for the Foreign Object Damage Prevention Program. First and second line maintenance of the aircraft is the responsibility of the Aircraft Production Officer. First line maintenance activities are closely linked to the day-to-day flying operation and include before and after flight inspections, aircraft starts, parking, and refuelling, in addition to configuration changes and aircraft repairs. Although the Aerospace Engineering

Test Establishment does some major inspections for the CH-146 Griffon, the major inspections of the CF-188 Hornets and CT-114 Tutors are conducted by other units. The off aircraft equipment maintenance and shop activities, including the aircraft structural repair shop and the Aircraft Life Support Equipment shop, are the responsibility of the Aircraft Maintenance Support Officer. The Aircraft Maintenance Control and Records Officer is responsible for scheduling aircraft preventive maintenance and inspections and for maintaining the integrity of the aircraft maintenance record sets.

Data Acquisition and Processing

24. The Data Acquisition and Processing section comprises three sub-sections, Flight Test Instrumentation Engineering, Airborne Data Systems lab, and Data Processing Engineering. The Aerospace Engineering Test Establishment is an Accredited Design Organization. Similar to the Accredited Maintenance Organization designation process, the Director of Technical Airworthiness and Engineering Support has audited the Aerospace Engineering Test Establishment's engineering processes involved with the development, design, manufacture and installation of instrumentation for flight test to ensure they all comply with the requirement of the Technical Airworthiness Manual and the 1 Canadian Air Division Maintenance Policies.

25. The heart of the Accredited Design Organization is Flight Test Instrumentation Engineering. This sub-section employs two electrical engineers, four structural engineers and two instrumentation engineers, as well as four design technologists, that design and head up the certification effort for all Flight Test Instrumentation and data acquisition systems required for flight testing. The specific responsibilities of the Flight Test Instrumentation Engineering personnel could include the following:

- a. Flight Test Instrumentation Engineers
 - (1) Work with the Project Officer, data processing engineers and technologists to determine what data will be required to answer the questions posed by the sponsor;
 - (2) Work with the technologists and technicians to design and certify the acquisition and storage system or telemetry system that will be used obtain the data;
 - (3) As the Project Engineer act as the instrumentation/data project manager and be responsible to ensure the Flight Test Instrumentation design meets the requirements and is completed on time with the allotted resources;
 - (4) Require a detailed knowledge of the Department of National Defence Technical Airworthiness system as well as 1 Canadian Air Division Maintenance Policies;
 - (5) Specify and procure electrical and mechanical parts using the military procurement system;

- (6) Work with the electrical, instrumentation and mechanical technicians as well as the aircraft technicians to install the data acquisition package on the aircraft;
 - (7) Provide inputs to the processes which make up the Accredited Design Organization;
 - (8) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety;
 - (9) Acquire and develop expertise in project management; and
 - (10) Maintain the ability to deploy into the field and to sea as required.
- b. Design Technologists (both mechanical and electrical)
- (1) Work with the Flight Test Instrumentation engineers, technologists and technicians to design and certify the acquisition and storage system or telemetry system that will be used obtain the data;
 - (2) Create both the electrical and mechanical drawings;
 - (3) Specify and procure electrical and mechanical parts using the military procurement system;
 - (4) Work with aircraft structures technicians to modify the mechanical designs as required;
 - (5) Work with the instrumentation technicians and technologists to solve any issues that arise during the Flight Test Instrumentation manufacturing; and
 - (6) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test, and flight test safety.

26. The manufacturing, installation, maintenance and repair of this instrumentation are done by the Airborne Data Systems lab which comprises 14 specialized avionics technicians and four technologists. Airborne Data Systems is an Accredited Design Organization, signifying that their Engineering Process Manual has been audited to ensure it is in compliance with all the applicable requirements of the Technical Airworthiness Manual and 1 Canadian Air Division Maintenance Policies.

27. The Airborne Data Systems lab also maintains and operates many of the environmental test beds (mass properties, vibration, environmental test chamber) required to meet the environmental certification standards for avionics in addition to specialized equipment to test night vision imaging systems. The specific responsibilities of Airborne Data Systems personnel could include the following:

a. Instrumentation Technicians

- (1) Work with the Flight Test Instrumentation engineers, instrumentation technologists and aircraft technicians to design and certify the acquisition and storage system or telemetry system that will be used obtain the data;
- (2) Manufacture and troubleshoot the prototype harnesses and other components for Flight Test Instrumentation installations;
- (3) Obtain and maintain high reliability soldering qualification for the sensor builds;
- (4) Work with the aircraft technicians to install the Flight Test Instrumentation kits on to the aircraft and aircraft components;
- (5) Operate the environmental test equipment;
- (6) Operate various Flight Test Instrumentation pallets and any other test equipment as required;
- (7) Perform integrated logistics system (training, maintenance, sparing, disposal etc.) for manufactured Flight Test Instrumentation and all other system used in test (environmental test equipment, Ground Vibration Test equipment, Night Vision Imaging System lab equipment etc.) to ensure the equipment is maintained, calibrated and ready for testing;
- (8) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety; and
- (9) Maintain the ability to deploy into the field and to sea as required.

b. Instrumentation Technologists

- (1) Work with the Flight Test Instrumentation engineers, and technicians to design and certify the acquisition and storage system or telemetry system that will be used obtain the data;
- (2) Program the computers that modulate the signals for transmission or storage;
- (3) Maintain and set up the telemetry systems on and off aircraft;
- (4) Maintain and setup the Flight Test Control Room infrastructure;
- (5) Determine the format and program the displays used in the Flight Test Control Room for real-time monitoring;
- (6) Calibrate the Flight Test Instrumentation systems;

- (7) Perform Integrated Logistics Support for all Flight Test Control Room; telemetry and calibration equipment; and
- (8) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test, and flight test safety.

28. Data reduction, taking raw experimental data and transforming it into data that is useful to engineers and project officers, is done by Data Processing Engineering. This sub-section employs two engineers (Electrical / Signal Processing), two technologists and three technicians. Data Processing Engineering not only assists with the conceptual design of the Flight Test Instrumentation at the start of the project, they also work with the test team during project execution and archive the data when the project is complete. Some of their many tasks include: generate Time Space Position Information from various sources; plot the Time Space Position Information and other information using Microsoft Excel and other custom and proprietary programs; perform statistical analysis to validate data or to provide confidence levels for derived or primary data; perform Numerical analysis (e.g. curve-fitting, differentiation/integration of data) and signal processing. To enable Unmanned Aerial Vehicle testing, facilitate complex aircraft testing and to enhance the safety of higher risk testing the Aerospace Engineering Test Establishment operates a Flight Test Control Room. The Flight Test Control Room is connected via a microwave link to the Primrose Lake Evaluation Range and is configurable to allow the test team to monitor data that is transmitted from the test vehicle. The specific responsibilities of Data Processing Engineering personnel could include the following:

a. Data Processing Engineers

- (1) Work with the Project Officer, Flight Test Instrumentation engineers, technologists and technicians to determine what data will be required to answer the questions posed by the sponsor;
- (2) Create Data Acquisition Plans using the Data Requirements Annex developed by the Project Officer;
- (3) Determine the methodology required for data processing and document it in Data Reduction Plans;
- (4) Work with the Project Officer and Instrumentation Technologists to determine the format of the displays in the Flight Test Control Room for real-time monitoring as required;
- (5) Process the recorded raw data to produce engineering information that will be used for graphs, statistics, technical notes, etc. This may require tasks such as the following:
 - (a) Develop computer programs to extract/merge data of interest from various data streams; and

- (b) Perform numerical modelling and analysis as well as signal processing (filtering and Fast Fourier Transforms);
 - (6) Interpret the post processed engineering data and produce the relevant graphs, statistical analysis etc. that will be used by the Project Officer for inclusion in the final report;
 - (7) Produce technical documentation as required;
 - (8) Using various analytical tools, determine the location of Time Space Position Information System constellation to ensure the most accurate positional data with suitable redundancy;
 - (9) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety;
 - (10) Acquire and develop expertise in project management; and
 - (11) Maintain the ability to deploy into the field and to sea as required.
- b. Data Processing Technologists
- (1) Use the tools created by the data processing engineers to convert the data from its raw modulated form into engineering units;
 - (2) Read and understand Interface Control Documents that define data structures;
 - (3) Use various software tools to extract data of interest from various data streams;
 - (4) Using video processing software to process the Time Space Position Information System video streams to produce Time Space Position Information data streams;
 - (5) Develop, and audit processes to ensure accurate, valid and traceable data;
 - (6) Continuously develop professional competencies to keep pace and maintain flight test flexibility with technology advances in aircraft, aircraft systems, flight test and flight test safety; and
 - (7) Maintain the ability to deploy into the field and to sea as required.

Technical Services

29. The Technical Services section is comprised of 39 personnel and is responsible for the operation, maintenance and Integrated Logistics Support of all non-aircraft related technical infrastructure from the technical library to the Time Space Position Information System. The

Technical Services section is divided into three sub-sections; Information Systems, Ground Data Systems and Image Data Systems.

30. The Information Systems sub-section has nine personnel to manage the unit's computer and telecommunications infrastructure, as well as the secure processing facility. The secure processing facility is certified for the processing of classified data up to the SECRET level. Additionally, classified operational briefings and debriefings can be carried out inside the secure processing facility. Specific backgrounds and responsibilities of Information Systems sub-section personnel include the following:

- (1) Provide network administrator management functions;
- (2) Maintenance and Integrated Logistics Support of the desktop computers and network systems;
- (3) Maintenance and Integrated Logistics Support of specialized computer systems;
 - (a) Classified systems;
 - (b) Computer Aided Design Software and Systems;
 - (c) Configuration Management Software for design documents (Technical Notes and drawings);
 - (d) Flight Test Control Room network;
 - (e) Image processing stations used to transform Time Space Position Information system information into Time Space Position information;
 - (f) Custom application programming and software in C, C++ and other languages; and
 - (g) Maintenance of secure processing facility; and
 - (h) Provide telecommunications support both wired and wireless.

31. The Ground Data Systems Lab is comprised of 12 personnel and is responsible for the maintenance of the Time Space Position Information System (optical tracking mounts, bridge work stations, generators, trailers etc.), the Primrose Lake Evaluation Range Tower, meteorology equipment and computers and communications equipment, as well as the telemetry infrastructure at both the Primrose Lake Evaluation Range and the Flight Test Control Room (7 Hangar). Specific backgrounds and responsibilities of Ground Data Systems sub-section personnel include the following:

- (1) Perform Integrated Logistics Support for all ground data systems used for test and supporting of testing (i.e. System, differential Global Positioning System, Flight Test Control Room antenna, microwave links, etc.);
- (2) Install and maintain antennae, radios, microwave links as required;
- (3) Install and maintain range telecommunication systems; and
- (4) Setup and install Time Space Position Information System constellations as required.

32. Image Data Systems Lab is comprised of 17 personnel and is responsible for operational employment of the Time Space Position Information System as well as any other photography (still or video) requirements of the Aerospace Engineering Test Establishment. Specific backgrounds and responsibilities of Image Data Systems sub-section personnel include the following:

- (1) Backseat qualified for jet aircraft and camera use Photo/Safety Chase;
- (2) Qualified egress training for helicopter test missions;
- (3) Operate the thermal imaging cameras, laser spot viewer etc.;
- (4) Assist with test and evaluation of new cameras introduced for use in the Royal Canadian Air Force to ensure flight compatibility and safe use in all Royal Canadian Air Force aircraft;
- (5) Qualified as Optical Tracking Mount operators, Photo Controller and/or Acquisition Controller to operate the Time Space Position Information System;
- (6) Video/photo editing and archiving of test data and accident footage; and
- (7) Perform the Integrated Logistics Support for all specialized photo and video editing equipment.

LOGISTICS SUPPORT BRANCH

33. The Logistics Support Branch consists of 20 personnel and is responsible for the management of all administration functions at the unit. This includes the many functions associated with human resource management (military and civilian, training, staffing), financial management (budget forecasting and reporting) and material control (procurement, storage, shipping and receiving). Specific functions include the following:

- a. Human Resource Management
 - (1) General personnel (military and civilian) administration;

- (2) Administration of candidates for test pilot school, post graduate and all other out of service training programs
 - (3) Training; and
 - (4) Staffing.
- b. Finance
- (1) Travel claims approval and processing;
 - (2) Test pilot school contract development and maintenance;
 - (3) Contracting of other specialized training;
 - (4) Procurement of range time;
 - (5) Budget management of National Procurement and Operations and Maintenance funds; and
 - (6) Periodic expenditure reporting.
- c. Material Control
- (1) Provision of Flight Test Instrumentation components;
 - (2) Provision of aircraft components; and
 - (3) Low-dollar value purchasing to support routine activities; and
 - (4) High-dollar contracting to support project requirements and capability growth and maintenance.

SAFETY BRANCH

34. The Safety Branch consists of two personnel who are responsible to develop, promote and administer both the Flight Safety Program (including the Air Weapons Safety Program) and the General Safety Program. Some specific responsibilities include dissemination of educational material, conduct of Committee meetings, research and staffing of airworthiness investigation activities, conduct of surveys and investigations, implementation of a bird strike prevention program, correction of hazardous conditions and provision of advice on safety matters.