CANADIAN AVIONICS CAPABILITIES

BY DARYL MACINTOSH

Avionics shop repair technicians work in specially-equipped facilities, where they troubleshoot and repair complex avionics equipment, down to the component level. **Krista Misener Photo**

Looking for an avionics service provider to repair, retrofit or replace your aircraft's avionics? Do your homework and investigate all possible options. This article helps to explain how the avionics sector fits into the Canadian MRO landscape, and contains useful information to help you select the best service provider for your job.

AVIONICS AMOS

Avionics capability is a specialized niche (or, perhaps more accurately, a number of specialized niches) within Canada's overall aviation MRO industry. As of May 2012, there were 892 approved maintenance organizations (AMOs) listed in Transport Canada's approved organization database, but only 190 of these had avionics capability.

Of those 190 avionics-rated AMOs, just 66 are regular members of the Aircraft Electronics Association (AEA), an international trade association which represents more than 1,300 aviation businesses, including those specializing in maintenance, repair and installation of avionics and electronic systems in general aviation aircraft. While recognizing that AEA membership is not mandatory, the 66 Canadian AMOs included on the AEA list do correlate closely with my own perception of which companies are performing the lion's share of avionics work on Canadian business, commercial and general aviation aircraft.

The remaining 124 Canadian AMOs with avionics ratings include major airlines, regional airlines, airline maintenance specialists, aircraft manufacturers, avionics equipment manufacturers, government flight departments, corporate flight departments, charter operators, helicopter operators, in-flight entertainment specialists, and a few generalist maintenance providers. Although several of the larger airlines and airline-focused maintenance facilities do perform a substantial amount of specialized avionics maintenance, repair and modification work, a significant proportion of these avionics AMOs only have capability for routine maintenance tasks. Aircraft operators who maintain limited in-house avionics capability perceive that by having specially-trained avionics personnel with experience on their own aircraft types, they will benefit by minimizing down time and costs. Sometimes, these operators view the avionics department strictly as a cost centre, making it difficult for the department to obtain funding to purchase specialized test equipment and spare parts. Thus, a technician's ability to meet the

operator's expectations is undermined.

There are two main categories of avionics AMOs:

Category 1 Avionics AMOs: The AMO owners in this group view avionics technology as the main focus of their business. They invest heavily in test equipment, special tooling and technical training. They regularly attend industry trade shows and seminars to increase their product knowledge and to stay abreast of the latest regulatory changes. These AMOs are usually fully authorized dealer-service centres for a variety of avionics manufacturers. They are go-to sources for accurate, up-to-date avionics information.

Category 2 Avionics AMOs: The AMO owners in this group do not generate their primary revenue from avionics, and therefore tend to consider it a cost centre. Their avionics investments are usually focused on expense reduction, while keeping the aircraft flying. The technicians working for these AMOs generally do a good job because they are intimately familiar with the nuances of each particular airframe. This type of AMO does not usually have the capability or capacity to carry out a major avionics upgrade.

TYPES OF AVIONICS CAPABILITY

Avionics capabilities fall into three main categories (shop repair, flight line maintenance and new installations), each with their own unique skill and equipment requirements. Although there are some exceptions, most avionics technicians have the appropriate skills and work experience for employment in just one, or sometimes two, of these categories. Likewise, only a minority of avionics AMOs offers competent services in all three categories.

Avionics - Shop Repair

Shop repair is the process of repairing a piece of equipment that has been removed from an aircraft. Avionics shop repair technicians (commonly referred to as bench technicians) typically work in a specially-equipped shop somewhat removed from operational aircraft. These bench technicians have a completely different skill set from the avionics technicians working on aircraft. Bench technicians utilize their considerable electronics skills, along with sophisticated test equipment, to troubleshoot and repair complex avionics equipment, right down to the component level. Virtually all AMOs with broad shop repair capabilities have been in business for decades, as it would be cost prohibitive for a newcomer to gear up from scratch.

Avionics - Flight Line Maintenance

The term "avionics flight line maintenance" (avionics FLM) refers to the type of work performed by technicians during maintenance checks, as well as troubleshooting and repairs on operational aircraft. Successful avionics FLM requires well trained, experienced technicians and access to appropriate ground support test equipment. Technicians performing FLM are frequently under pressure to quickly diagnose a problem and then complete the necessary repairs to minimize aircraft down time. A typical repair includes troubleshooting the system, removing a faulty piece of equipment and replacing it with a serviceable unit. Technicians employed by airlines and other commercial aircraft operators are most frequently utilized for flight line maintenance.

Avionics – New Installations & Major Upgrades

Avionics systems are upgraded and legacy systems are modified in order to add operational capabilities, safety enhancements and/or to improve system reliability. Most major avionics manufacturers require their equipment to be installed by authorized dealers, in order to ensure the systems are installed correctly and operate as designed. An AMO that isn't an authorized dealer for a specific avionics product may not have access to the manufacturer's technical documentation, which is necessary for installation. Without that documentation, they will not meet Transport Canada requirements to certify the installation. In order to be successful with avionics installation services, an AMO must invest significant resources to ensure their technicians remain up-to-date with the latest technology.

Observation: The acronym MRO (maintenance, repair & overhaul) is not a particularly representative term for avionics specialists, since a significant portion of its revenue may come from retrofitting aircraft with new technology systems. A more accurate acronym for avionics would perhaps be MROR (maintenance, repair, overhaul and retrofit).

MAJOR AVIONICS UPGRADES – THE PLAYERS

Not all avionics facilities are capable of carrying out a major avionics upgrade on a complex aircraft. In order to undertake a large retrofit, the facility must have: project managers, experienced installation technicians, system design/interface capability, available hangar space, access to the system manufacturer's technical data, appropriate tooling, and the necessary test equipment. The two types of players performing most major avionics upgrades are described below.

The Nose to Tail MRO – Avionics Upgrades: Maintenance facilities that claim nose-to-tail capability usually specialize on a specific airframe model, series of models or a specific category of aircraft. They may also be a manufacturer-authorized service centre for those particular aircraft type(s).

Possible Advantages:

- Technicians should be well experienced on the specialized aircraft types.
- One-stop shopping – maintenance, interior, paint, avionics and component repair.
- They may offer a unique proprietary solution to meet your particular need.

Potential Disadvantages:

- Avionics services might be an add-on capability rather than a core competency.
- Avionics knowledge could be limited to the specific products they offer.
- They may not offer a full range of avionics products.
- They may charge premium pricing because of their market position.
- Some larger organizations utilize contracted technicians during busy periods. The quality and experience level of contracted technicians varies widely.

The Avionics Specialist – Avionics Upgrades: Successful companies in this group do truly specialize in avionics. They have experience installing most major lines of avionics into a wide variety of aircraft types.

Possible Advantages:

- Can offer a wide range of avionics products and avionics services.
- Technicians have broad experience, enabling them to meet almost any challenge.
- Fully authorized by the avionics manufacturer for sales and service.
- Ability to partner with other specialty aviation service providers to offer best-of-class turnkey solutions.
- Cost competitive

Potential Disadvantages

- They are not a factory-authorized aircraft service centre.

FINAL WORD

In summary, the avionics segment of Canada's MRO industry is skilled, capable, diverse, productive, and experienced in completing a wide variety of work for all classes of aircraft operators. In my opinion, the quality of avionics work completed in Canada is in a class by itself when compared to the rest of the world.

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