

all the remote manipulators (Canada is the leader in this field) used by the U.S. space shuttle program; and Canadian Astronautics (CAL) supplied most of the Sarsat (search and rescue satellite) ground receiving stations. Canadian leading edge technology projects currently under way include the satellite RADARSAT scheduled for launch in 1994 and MSAT, the world's first domestic communications satellite for mobile users.

In addition to dominating certain subsystem markets, Canadian companies have expertise in selling communications satellites systems in: (i) the private market sector, such as U.S. companies and owners or operators such as Intelsat and Telesat; (ii) the public market sector, such as the governments of Brazil, India and Indonesia and the European Space Agency (ESA); and, to a lesser extent, (iii) the military market. Specifically, in the field of remote sensing satellite systems, Canadian companies have expertise in selling to public sector market customers such as the Canadian government, the governments of India and Japan, and ESA. In the field of space robotics, Canadian companies have demonstrated expertise in sales to the public market sector through government procurement. Sales to Japan and to organizations such as NASA and ESA are evidence of this ability.

In conclusion, like the more traditional part of the aerospace industry, the space industry is witnessing a rapid increase in international co-operation. For instance, the Canadian government has signed co-operative agreements with Japan, India, ESA (in 1978 and in 1984), and NASA. Canada is associated with the ESA through a co-operative agreement (CTS, Olympus, ERS-1 and -2, PSDE, Hermès, DRTM and ASTP) and also has collaborative agreements with France (SPOT, COSPAS/SARSAT, WINDII/UARS) -- which also include the U.S.A. and U.S.S.R. (COSPAS/SARSAT). Canadian companies are likely to continue to find their success in market niches for high-tech systems and subsystems in which performance is an essential element.

#### **b) European Aerospace Industry**

The EC internal aerospace market and industry are both relatively large in size. The European aerospace market is the second largest after the U.S. market. In 1987 the European market represented

about 40 per cent of the U.S aerospace production value. In terms of production, sales made by the European companies in the aerospace industry reached approximately \$58 billion in 1988, more than half of which originated from sales to external markets.

The importance of the European aerospace industry increased rapidly in the 1970s. At that time, the production value of the EC was only 20 per cent of that of the U.S. as opposed to 40 per cent in 1987. Furthermore, the industry increased its share of the world market from 5 per cent in the early 1970s to 25 per cent in the mid 1980s. Finally, a European government-led and financed co-operative effort has allowed the industry to make a successful comeback on the important world market for large commercial transport aircraft with the development and introduction of the Airbus family.<sup>23</sup>

The promotion of industrial co-operation has played a significant role in the European aerospace industry's recently improved performance. Currently, a large part of the total production in the sector is based on international co-operation in the form of joint projects and programs (for example, Airbus, Tornado, Alfajet, ATR, CFM56-engine, and Ariane) involving companies from different European countries and even non-European partners.

Major European aerospace companies and most European aerospace production are located in four EC member states (see Table 5 in Appendix A): the United Kingdom (40 per cent), France (30 per cent), the Federal Republic of Germany (12 per cent) and Italy (9 per cent). Spain, in contrast, accounts for 1 per cent of production. The United Kingdom and France together monopolize 70 per cent of the EC activity in this industry.

The aerospace industry in Europe is divided into two sub-industries: (i) the production of military products such as fighter and training aircraft, military helicopters and missiles and (ii) the manufacture of civilian products, such as commercial jets, commuter aircraft, helicopters and engines. In the early 1980s, military production in this industry represented 70 per cent of total industry output. Since then, however, the percentage of civilian products has increased and presently represents 36 per cent of the total value of