

## Space

The space industry includes providers of goods and services that generally are part of larger space systems, including satellites, ground stations (that manage space-based assets) and launch/propulsion systems. It also includes, when appropriate, a wide range of service providers (such as geomatics and telecommunications firms) who make use of space-related assets to produce other products.

### International Environment

The world space industry activity is estimated at over US\$55 billion. It is concentrated in the U.S. (68 percent), Russia (14 percent), Europe (11 percent) and Japan (3 percent).

Government defence and civilian programs account for fully 94 percent of the space market worldwide. The defence portion is difficult to estimate, but is believed to be slightly less than civilian spending. For national security reasons, most governments try to procure equipment from domestic firms and use the space program as a vehicle for national industrial and scientific development.

Military space programs are among the few still growing in the U.S. and Europe. Surveillance, command, control and communications via satellite have continued to rise in importance since the early 1980s, and especially since the Gulf war. On the other hand, due to the end of the cold war, defence spending is on the decline in many markets. As a result of rationalization, many marginally profitable firms are being taken over by larger, more diversified firms; defence space firms are looking to the civilian space arena; and strategic alliances are being formed to lower R&D costs and improve market access. While the former U.S.S.R. was not an active participant in the international space market, Russia has the interest and potential to be a major player.

The high cost of R&D has also contributed to the internationalization of major space programs, characterized by the establishment of new or stronger links between space companies in different markets or trading blocs. For example, the

European Space Agency (ESA) is a key vehicle for cooperation in space projects for its 15 members, including Canada. The U.S.-led International Space Station (ISS) is currently a cooperative effort among ESA, Japan and Canada, and soon may include Russia.

The use of space for commercial purposes is growing and evolving. Space-based communications is the most commercial space activity, relying on government support only for some R&D and advanced technology development. Although there is a commercial market for remotely sensed data, and the reception and processing equipment needed to acquire it, remote sensing does not yet generate sufficient returns to cover the cost of remote-sensing satellites, which are usually procured by governments.

### Communications

Satellite communications is driven by the rapidly growing \$600-billion annual demand for communications services including telephony, data transmission, cable and broadcast services. In 1992, commercial satellite systems operators and transponder brokers earned roughly \$4.4 billion from sales of satellite-based communications services, 34 percent of which was in the U.S.

The world civilian market for satellite communications space-based equipment is forecast at roughly \$1.4 billion annually, declining slightly in the late 1990s for a 10-year market of approximately \$12 billion to \$13 billion. Past market shares for geostationary communications satellites are estimated at U.S. 30 percent, Europe 25 percent, and other parts of the world 45 percent. In the future, the U.S. market is