

fibre-optic links in the world, and will have a life expectancy of 30 years. A similar program being undertaken by Saskatchewan Telephone will provide about 32,000 kilometres (19,884 miles) of fibre-optic communications.

Canada is also self sufficient in terrestrial microwave telecommunications. Currently, three major microwave networks use various interconnecting spur microwave links across Canada. Two of them are operated by TCTS at 4 GHZ and one is operated by CNCP Telecommunications at 6 GHZ. The total system also includes more than 100 satellite earth stations that play a crucial role in joining many communities throughout the country. In 1980, an additional (8 GHZ) digital radio system was incorporated to overbuild on the existing Trans-Canada Telephone System's 4 GHZ analogue system between Toronto and Calgary.

With the launching of the ANIK A series of satellites in 1972, Canada established the world's first geostationary domestic satellite communications system. Three of the satellites have provided communication services to 10 million km<sup>2</sup> (3.9 million square miles) in Canada. Since 1972, a second, third and fourth series of satellites have either been built or are under development in collaboration with U.S. and European industry. Most of the world's commercial communication satellites carry some form of Canadian mechanical and electronic subsystems. In co-operation with NASA, Canada has developed the Remote Manipulation System for the space shuttle program. Spar Aerospace Ltd. is the prime Canadian contractor for satellite and other space systems.

Canada acquired its own national digital data networks in 1973, when DATROUTE was introduced into the Trans-Canada Telephone System (TCTS). Introduction of the Infoswitch and Datapac packet followed in 1977. They in turn linked into U.S. systems and should, in time, form part of an integrated network for voice, data and visual transmission services across Canada and into the United States. Today, Canadian manufacturers and system companies are designing and developing exceptionally sophisticated information processing services. Northern Telecom and AEL Microtel offer a wide range of products for such applications. Earth station suppliers also include Spar Aerospace, SED Systems, and Raytheon Canada.