

B-4

### **Mass Opening of Telephone Networks using PEF-P and CCP Cables in Cities**

In the past, paper-insulated stalpeth cables used for telephone lines had a problem with high-frequency crosstalk characteristics, while PE (Polyethylene) used on the sea floor had a problem that the dielectric constant was higher than that of paper. The PEF cables made of foamed polyethylene (PE), which have a low effective dielectric constant and are economical, have achieved improved characteristics by homogenizing the outer diameter length direction, and have been introduced for out of cities, cities, and relays. CCP (Colored Code Polyethylene) cables that have improved core wire discrimination by the color coating of polyethylene that is easy to color have supported the immediate and mass opening of black telephones (landline telephones) in the 1960s, and they have contributed to the improvement of workability and the development of telephone networks by identifying the cords.

B-5

### **Crossbar Switching Systems**

In 1953, the development of a domestically produced crossbar switching system for public networks began, and joint research, development and commercialization were carried out by the Research Institute for Electrical Communication of Nippon Telegraph and Telephone Public Corporation and four switching system manufacturers. The communication path switch has switching elements arranged in a lattice pattern, and large economy was realized by arranging small switches in multiple stages. The C400 type crossbar switching system developed in 1965 was an excellent one that surpassed the world standard in realizing large economy and miniaturization, and was exported by the manufacturers.

B-6

### **Electronic Switching Systems**

In place of the crossbar switching system, an electronic switching system that makes extensive use of electronic components, uses a stored program control method, and can easily add new service functions by adding or changing programs was put into practical use. The D10 type electronic switching system for large-scale stations started its service in Tokyo, Osaka and Nagoya in 1972. Furthermore, in 1978, a high-performance D10-type electronic

switching system was developed to reduce the cost of the telephone line system and improve the performance of the central processing system. This also contributed to the development of a programming language (CHILL) for this electronic switching system.