

faster the speed of transmission. CN-CP will offer three bandwidths: four kilocycles for voice, facsimile and data (from 1,000 to 3,000 words a minute); 16 kilocycles for high fidelity radio program transmission and facsimile; and 48 kilocycles for high-speed computer-to-computer data exchange (51,000 words a minute) and high-speed facsimile (35 seconds). The four-kilocycle bandwidth is now operational and the 16-kilocycle and 48-kilocycle bandwidths will become available with customer demand.

The initial system consists of four main switching exchanges located at Montreal, Toronto, Winnipeg and Vancouver. Concentrators or, more aptly, 'links' to ten communities surrounding these four main centres lead into the main exchanges to connect other communities to the network. Broadband uses the most advanced techniques known to ensure error-free data transmission. The exchanges are entirely electronic, using dry reeds and without moving parts. Present-day exchange centres, including telephone exchanges, use electro-mechanical switching equipment which can occasionally cause disturbances and errors while transmitting computer data. Without mechanical equipment in the Broadband exchanges, transmission disturbance is virtually eliminated. Transmission is carried by the CNT-CPT microwave system using frequency diversity techniques to provide a high degree of reliability. In other words, the transmission is carried twice both ways over different circuits at the same time, one being a back-up system for the other.

Each subscriber has in his office a voice-data subset—a most advanced telephone instrument which, with a flick of a button, can change from voice communication to transmission of computer data. The subset features push-button 'dialing' and the customer, to reach a distant point, simply pushes the buttons in a series of seven digits. The first three digits pressed designate the distant exchange, the fourth digit indicates the desired bandwidth and the last three digits are for the line of the desired party. A re-ring button is included so that the customer may signal the distant party to revert to voice communication during or after sending computer data. A feature of Broadband is abbreviated keying, where customers may contact frequently called stations by pushing a two-digit code instead of the normal seven. Broadband will make distant connections, including keying time, within five seconds, or two seconds on the special 'hot line' service. Actual connection time after keying or 'dialing' is less than two seconds. Another feature of Broadband is conference calling, where a subscriber, by pushing a two-digit code, will automatically contact a pre-determined list of parties needed for the conference. Subscribers are charged on a 'pay-as-you-use' basis.

**Data-Phone Service.**—The major Canadian telephone systems operate Data-Phone service which transmits data from punched cards, tape or magnetic tape between two or more machines or computers. It takes pulses from punched cards or tape-data machines and transforms them into tones which are sent over telephone circuits or leased private lines. The subscriber pays for the line while being used at regular long-distance rates. Data-Phone transmits at a speed of 1,200 bits a second or 1,000 words a minute.

**Wide Area Telephone Service.**—Wide Area Telephone Service (WATS), operated by the Trans-Canada Telephone System, provides dial-type telephone communications from one WATS zone directly to another long-distance zone. In other words, the subscriber has a wider area that he may call directly without going through the long-distance operator or Direct Distance Dialing, and he may select any or all of the WATS zones he wishes. The customer has an access line to a dial exchange office for use only in originating WATS calls. He is charged on a measured time-period rate and an additional hourly rate. The measured time-period is ten hours of accumulated time in each month and the additional hourly rate applies to the time used above the measured time.