Recommendation U.5

REQUIREMENTS TO BE MET BY REGENERATIVE REPEATERS IN INTERNATIONAL CONNECTIONS

(former CCIT Recommendation E.5, Geneva, 1956;
amended at Geneva, 1964, Mar del Plata, 1968 and Geneva, 1976)

The CCITT,

considering

(a) that it may be desirable to include regenerative repeaters in teleprinter switching networks;

(b) that the only signals other than teleprinter signals that must be transmitted by a regenerative repeater are the clearing signal and the call—connected signal (see § 3.1.3 below), since all other signals can be bypassed;

(c) that other signals may be transmitted by regenerative repeaters,

unanimously declares the view

1 that, when regenerative repeaters are used in switching systems, the clearing signal should be retransmitted with a minimum of delay. This delay is of course the same as for the transmission of teleprinter signals;

2 that to ensure the correct retransmission of the call—connected signal (see § 3.1.3 below) and the clearing signal, the regenerative repeater must not automatically insert the stop element in either of these signals;

3 that for other signals that may pass through regenerative repeaters, the tolerances at the origin and after retransmission through the regenerative repeaters are as stated below.

Note — The characteristics and tolerances quoted are for the signals at the origin. The tolerances at the input to the regenerative repeater will depend on the degree of distortion in the transmission path from the origin to the input of the regenerative repeater. The tolerances at the output will depend on the normal tolerances for the regenerative repeater.

3.1 *Pulse signals*

3.1.1 *Call—confirmation (proceed—to—select) signal. Type B signalling*

A pulse of stop polarity of duration from 17.5 to 35 milliseconds. The nominal duration of the pulse after retransmission through the regenerative repeater should not be less than 20 milliseconds or more than 40 milliseconds.

Note — This signal will be transmitted over only one international trunk circuit and should thus normally pass through not more than one regenerative repeater.

3.1.2 *Dial selection signals. Type B signalling*

These signals have been standardized (Recommendation U.2) at a dial speed of 10 pulses per second ± 10%, and a pulse ratio (start/stop) between the tolerance of 1.2:1 and 1.9:1 with a nominal ratio lying between 1.5:1 and 1.6:1. Such signals after retransmission through several regenerative repeaters should not fall outside the tolerances stated above.

3.1.3 *Call—connected signal. Type A signalling*

A pulse of start polarity lasting 150 ± 11 milliseconds. The nominal duration of the pulse after retransmission through several regenerative repeaters should be within the limits of 140 to 160 milliseconds.

3.1.4 *Busy signal.* Type B signalling

Pulses of stop polarity lasting 165—260 milliseconds, separated by intervals of start polarity lasting 1.5 seconds ± 30%. After retransmission through several regenerative repeaters neither the pulses nor the intervals should be shortened by more than 10%.

3.2 *Sequence signals (involving a single change of polarity)*

3.2.1 *Calling signal.* Types A and B signalling

3.2.2 *Call—connected signal.* Type B signalling

These signals (inversion from start to stop polarity) have no timing tolerances as such. It is, however, essential that they should be retransmitted by a regenerative repeater with a minimum of delay which in no case should exceed 20 milliseconds.