Rural Electrification Administration
Telephone Engineering and Construction Manual

Section 329
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EXPANSION OF EXISTING DIAL CENTRAL OFFICE SWITCHBOARDS

Purpose: The purpose of this addendum is to provide information concerning possible solutions for complex switching and trunking problems resulting from the rapid growth and expansion of existing step-by-step dial telephone systems. A requirement for expanding extended area service or other services may introduce complex trunking patterns which in a step-by-step system may lead to inefficient use of stepping switches. An available means for surmounting these difficulties is the introduction of indirect control facilities into the system through the installation of register-senders with translation features.

Deletions: Delete the heading, "8. USE OF REGISTER-SENDERS WITH DIRECT RESPONSE SWITCHBOARDS" and the paragraph numbered 8.1 in the text of Section 329, Issue No. 1. Make a notation alongside this paragraph, "SEE ADDENDUM NO. 3."

Additions:

8. USE OF REGISTER-SENDERS WITH STEP-BY-STEP SYSTEMS

8.1 A step-by-step switching system is operated primarily by direct control. The switches are actuated from pulses generated by the dial at the calling telephone and the positioning of these switches is associated directly with the digits dialed. By opening circuits between line-finders and local first selectors and inserting access equipment to register-senders with translating facilities, it is possible to divorce the control of the switches from the pulses received directly from the dials.

8.2 The access equipment permits the subscribers to reach the register-senders without making any changes in the existing switches. A register-sender is an electromechanical, electronic or combination device which receives information in dial pulse or tone form and converts it into codes which are presented to a translator. The translator accepts this coded information, processes it through its memory and returns the proper routing information to the register-sender. The register-sender converts this information to the proper mode for outpulsing in dial pulse or multifrequency form as required. The translator is provided with a readily changed memory so it may meet future expansion or different routing requirements.

8.3 The more evident applications for register-senders are as follows:

8.31 When a complex extended area service network is being designed with universal directory numbering, or an existing EAS network is to be expanded, thereby introducing conflicts in a uniform numbering plan, the use of register-senders may eliminate the need for cumbersome multiple stages of step-by-step switching, or in some cases may provide the only possible solution to the switching problem.

8.32 The register-sender can perform the digit absorbing function, thus making it unnecessary to absorb digits in the first selector.

8.33 Sometimes a saving in trunk quantities can be realized by using alternate routing to absorb overflow traffic as directed by register-senders.

8.34 A saving in EAS trunks may result if traffic can be directed through tandem facilities.

8.35 Offices in or near metropolitan areas may be required to send the full complement of seven digits to the connecting office. The use of register-senders is the only means of accomplishing this feature without requiring the subscribers to dial directing digits.

8.36 Register-senders will permit the introduction of the standard access codes for direct distance dialing (1 + station-to-station; 0 + person-to-person) and the standard codes for special services (411; 1 + 411 information; etc.).

8.37 Register-senders may be arranged to provide the facilities for push button dialing.

8.38 The use of register-senders may provide facilities for MF sending and receiving to and from other common control offices.

8.4 Illustration: FIGURE 2. Register-Sender Control of Step-by-Step Switching System. This figure shows how the access equipment is inserted between linefinders and first selectors. An access circuit is required for each linefinder. When a subscriber goes "off-hook" the linefinder finds his line and extends it to the associated access circuit. A link finder is associated with each register-sender and it selects the access circuit requiring service. The subscriber's line is then connected to the register-sender and dial tone is returned from the register-sender to the subscriber.

8.5 When the calling party starts to dial, the digits are received in the register where they are counted on a counting chain and stored in code form during the interdigital time. The register may have some translation capabilities and where these are exceeded it presents the stored codes to the regular translator. When sufficient information has been received in digital form to determine the disposition of the call, the sender will outpulse in the dial pulse mode to actuate the switches. It will then release and the register-sender becomes available for another call.

8.6 If one or more digits as dialed by the subscriber determine that register-sender and translator facilities are not required, these pulses may be absorbed in the switch train and the link to the register-sender released. The circuit between the linefinder and the first selector is now bridged directly and further pulses from the dial are routed directly into the switch train.