

Sender link frames for No. 5 crossbar

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When a call from a No. 5 crossbar office requires pulsing to another office, a marker must connect a sender to the outgoing trunk to pulse out the digits for the called number. Depending on the type of office to which the trunk is connected, any of four types of pulsing may be required, and a different type of sender is used for each. After the marker has received the called number from a register, it selects both a trunk link frame that has an idle trunk circuit to the desired destination and an idle sender of the proper type. Since the trunks to any one destination will in general be distributed over a number, and perhaps all, of the trunk link frames, and since the senders of each type must be available to all trunks of that type, it is necessary to provide a flexible means of connecting any

are associated with the same trunk link frame, and there may be as many as four of these switches associated with trunks connected to one trunk link frame. Senders are arranged in groups depending on their type of pulsing, and all senders of a group are multiplied to all switches of all sender link frames that have trunks requiring that type of sender. The only exception is where there are more than ten senders of one type. Under this condition, the senders are divided into two groups, and each group will be associated with a different set of trunks. Omitting this latter arrangement, the association of trunk link frames, senders, and sender links is indicated in Figure 1.

Since flexibility is desired in associating trunks and senders with sender link frames,

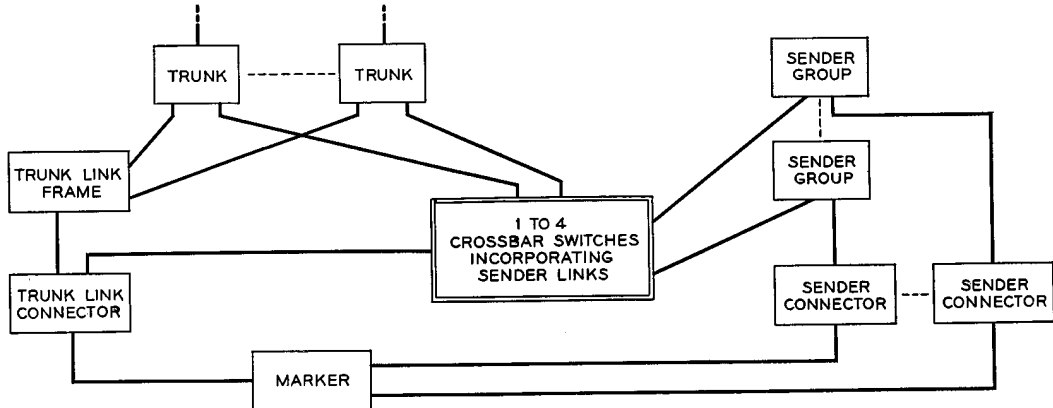


Fig. 1—Block diagram showing connecting paths to the sender link switches from the various trunks, sender groups, and trunk link connectors.

sender to any trunk that requires its type of pulsing. This is accomplished by having the trunks and the senders appear on crossbar switches of a sender link frame.

Such a frame carries a maximum of ten crossbar switches having trunks connected to their verticals and senders to their horizontals. All the trunks assigned to one switch

there is no fixed pattern of connecting the trunks to the verticals of the sender link switches or of connecting senders to their horizontals except that, as already mentioned, any one sender link switch serves trunks of only one trunk link frame, and any one sender is always assigned to the same horizontal of all the sender link switches to

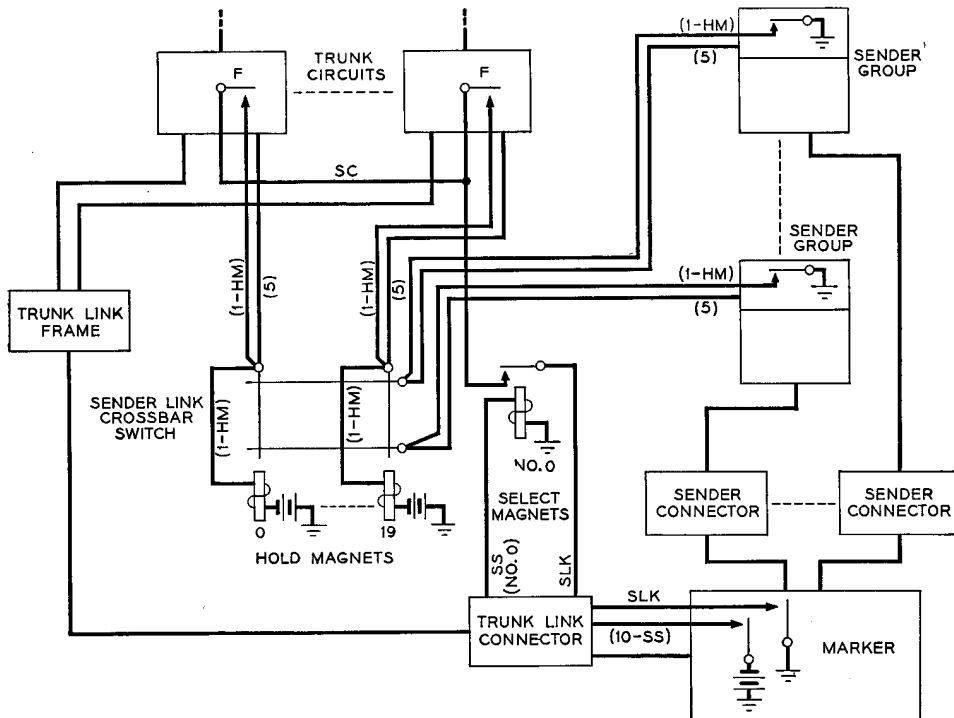


Fig. 2—Paths over which the select and hold magnets of the sender link switches are operated.

which it is connected. The marker has no direct access to the sender link switches but operates the proper select and hold magnets through the trunk link connector and sender it has selected for use. How this is accomplished is indicated in Figure 2, which shows one of the four possible crossbar switches comprising the sender link for one particular trunk link frame.

After the marker has seized a sender, it obtains from it the horizontal level to which that sender is connected on the sender link switches. The marker has ten *ss* leads running to the connectors for all the trunk link frames, and from the connector these leads run to the select magnets of the sender link switches associated with that trunk link frame. The No. 0 *ss* lead is connected to the No. 0 select magnet of all of the sender link switches associated with the trunk link frame selected; the No. 1 *ss* lead is connected to all the No. 1 select magnets, and so on. After the marker has received the proper level number from the sender, it connects battery to the corresponding *ss* lead, and as a result

the corresponding select magnets of these sender link switches are operated.

The marker connects ground to an *slk* lead, which is also extended to the sender link switches through the trunk link connector. Through contacts associated with the operated select magnets, this *slk* lead is connected to an *sc* lead that is multiplied to all the trunks appearing on the same switch.

The sender link switches are of the six-wire type—each crosspoint consisting of six contacts. Two of the contacts connect to the tip and ring conductors of the trunk and are used for pulsing; the other four are used as control leads between sender and trunk. Each hold magnet of the sender link switches is connected to an *hm* lead that forms one of the six leads connecting the trunk circuit to the vertical of a sender link switch. After the marker has seized the trunk, the *sc* and *hm* leads are connected together in the trunk circuit. As a result, the proper hold magnet is operated from the ground on the *slk* lead in the marker, through the trunk link connector, the contacts associated with the

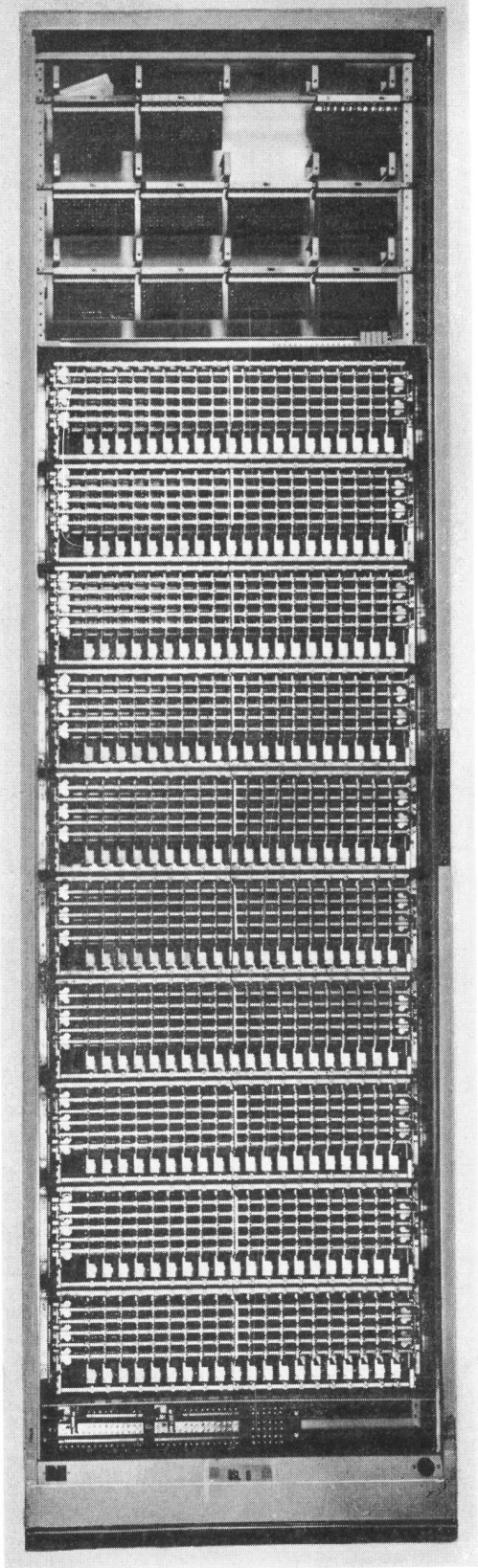
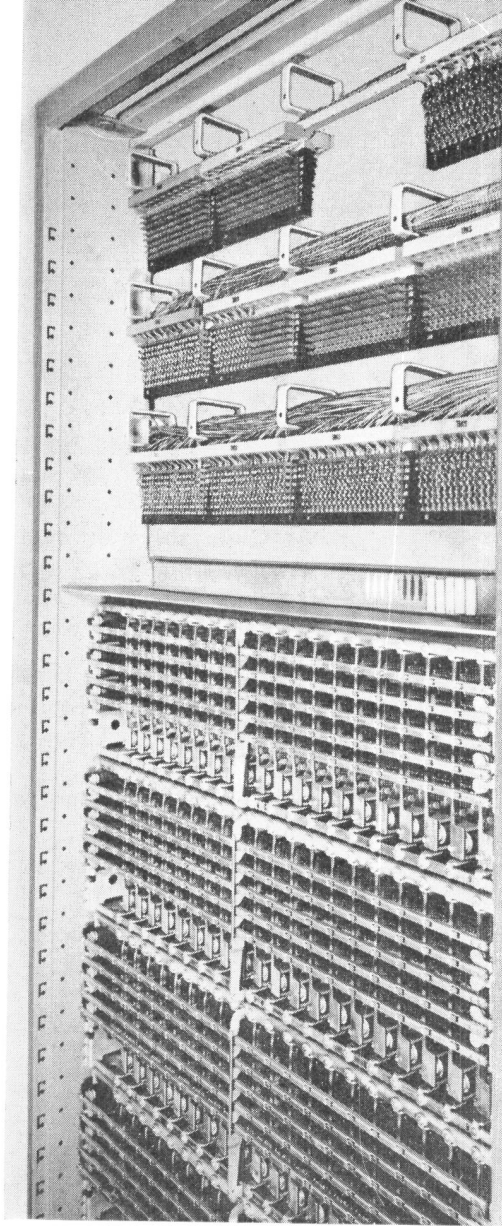


Fig. 3—Front view of an outgoing sender link frame for the No. 5 crossbar system.

select magnets that have been operated on the sender link frame, over the SC lead to the trunk, and thence over the HM lead to the hold magnet for that trunk. As a result of operating the hold magnet, the proper sender is connected to the selected trunk through the six crosspoint contacts. The sender then grounds its end of the HM lead to keep the hold magnet operated after the marker has released, and to notify the marker that the connection has been established.

The marker has already transmitted the pulsing information to the sender, and after it has ascertained that the connection between sender and trunk has been properly made, it disconnects itself from both the sender and trunk link frames. After the sender has transmitted its pulses, the connection between trunk and sender is released.

Sender link switches are mounted on standard frames that have fuse panels on the bottom and terminal strips at the top. The latter are used for connecting the trunks to the switch verticals, and the SLK lead and the ten SS leads to the trunk link connector. On one of the side uprights of the frame is a jack strip used for maintenance. Each such frame will mount ten switches, and as many frames are used as are needed to take care of all of the trunks. Since the only restriction on the assignment of the ten switches of a sender link frame to trunk link frames is that one switch cannot be associated with more than one trunk link frame, a single sender link frame may provide twenty trunks for each of ten trunk link frames, forty trunks for each of five trunk link frames, or any other division that does not assign the twenty trunks of one switch to more than one trunk link frame. Additions may be made at any time either by adding switches to existing frames or by adding new frames. A front view of one of the frames in the Western Electric shop is shown in Figure 3 and the upper part of the frame in the Media office is shown in Figure 4. The eight terminal strips in the two lower rows and the two at the left in the top row take care of the 200 trunks that may be served by a single sender link frame, while the terminal strip at the upper right is for the SLK lead and the ten SS leads. Jumpers from the rear of the trunk terminal strips run directly to the switch verticals and may be readily changed when



a trunk is moved from one sender group or one trunk link frame to another. Leads from the senders are cabled directly to the horizontals of the switches.

Because of the method of operating the select and hold magnets of the sender link switches, it is not necessary to restrict one switch to one type of trunk or one type of sender. The major limiting factor is the total number of trunks of one type and the number of senders required to serve them. If, for example, there were only five senders of each of two types, both groups of senders could be connected to the horizontals of the same sender link switch, and thus two types of trunks could be served by that switch. When a single switch must serve two types of trunks, each having access to ten senders, the horizontal multiple of the switch is cut. This permits one part of the switch to serve one group of trunks and the other part another group.

To make the senders more accessible to the markers, the ten possible senders on the levels of one sender link switch are divided into two subgroups, and each subgroup is served by a separate sender connector. This permits two markers to use senders of the same type and complete calls on two trunk link frames at the same time.

Fig. 4--Upper half of an outgoing sender link frame in the Media office.