BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

SECTION G50.668.3
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CABLE SPLICING—GENERAL
SECTION REPLACEMENT—INAUDIBLE TONE METHOD

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1. GENERAL

1.01 This section outlines the method to be followed in making a section replacement using inaudible tone in identifying the conductors.

1.02 This method makes use of a high frequency tone that, when adjusted to proper value can be connected to working voice frequency toll or carrier cables (except coaxials) as well as interoffice trunk cables without causing interference. If this tone is used and if the circuit continuity is maintained during the splicing operations by temporarily bridging the conductors, the section replacement can be made without listening on the conductors, turning down or rerouting special circuits.

1.03 The set will operate through loading coils. Therefore this method cannot be used if the section to be replaced includes loading coils.

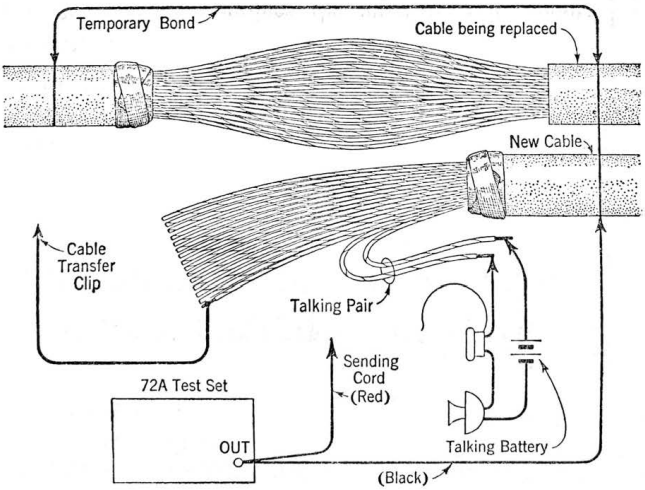
2. PROCEDURE

2.01 Arrange the cables to facilitate splicing to the new cable. Open the cables and prepare them for splicing in the usual way except that in the cable that is to be replaced it is often advisable to remove additional sheath to make the conductors more accessible. If the new cable is quadded, a 1/2-inch length of cotton sleeving may be slipped over each quad to keep the four conductors together.

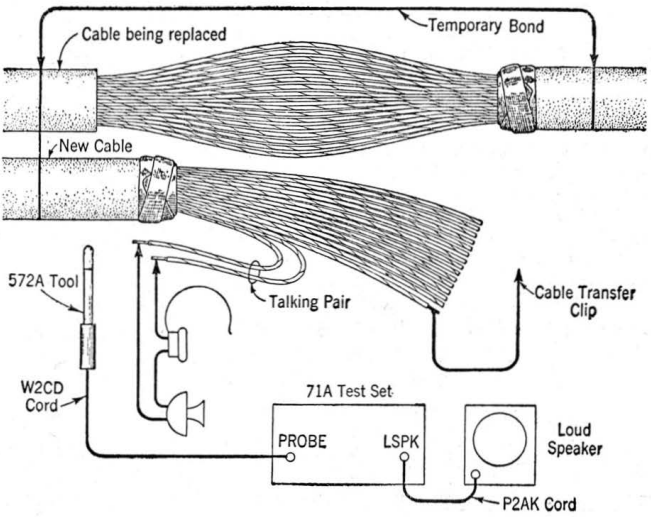
2.02 Board the new cable at both ends. Since the conductors are to be handled one at a time, without a listening test but with the conductors temporarily bridged to maintain service, it is advisable to use exchange type boards and to place only one conductor in a hole. For example, if the cable is quadded the first quad is boarded in holes 1, 2, 3, 4; holes 1 and 2 for the first pair and holes 3 and 4 for the second pair. The conductors of each quad or pair must be boarded in the same sequence at each end.

2.03 Determine from which end the tone from the 72A set is to be sent. Usually this should be the end that has the smaller amount of slack in the conductors, thus permitting the probe and the 71A set to be used where there is a greater amount of slack.

2.04 Establish a talking circuit through one of the cables. The 71A and 72A sets do not provide a talking battery and, therefore, it is necessary to use two Cableman's Talking Sets, a separate battery, or the battery in the 43A or 76-type set. Select a conductor in the new cable and at each end connect to it a test cord terminating in a transfer clip. This conductor is to be used to maintain service during the splicing operations. Arrange the equipment at the sending end as shown in the following diagram.



2.05 Arrange the equipment at the identifying end as shown in the following diagram.

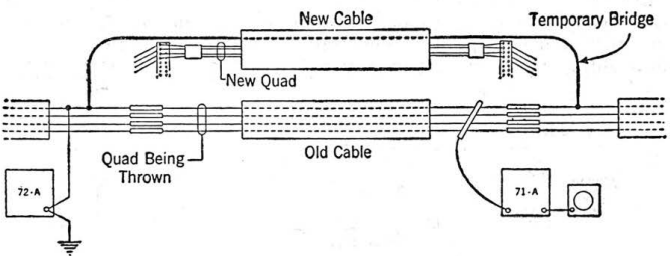


2.06 Arrange the cords from the test sets, bridging conductor and the talking sets so that they will not accidentally become grounded, crossed or short circuited Connect the sending cord from the 72A set to one of the outer conductors in the old cable, preferably a tracer, and identify it at the other end with the 572A tool. Adjust the output of the 72A set for the type of cable circuits involved and adjust the gain control of the 71A set until the best tone output is obtained with the least spread to adjacent conductors. After the sets are adjusted the general procedure is as follows:

(1) At the sending end select a quad or pair in the old cable and send tone on one of the conductors. The clip on the sending cord should be connected to the conductor as far away as practicable from the end of the section that is to be replaced. The 72A set is not equipped with a tone signaling arrangement and the splicer at the sending end should tell the splicer at the identifying end through the talking circuit "Tone on 1".

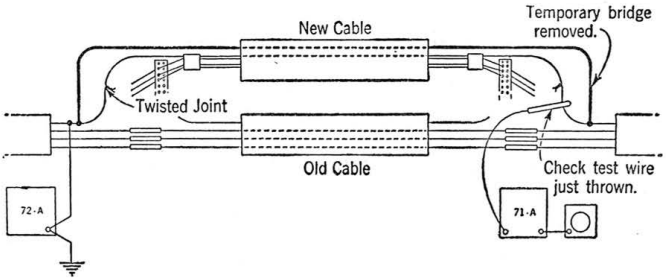
(2) At the identifying end the splicer probes through the old cable with the 572A tool until he locates this conductor. When he is sure that he has the correct conductor he tells the splicer at the sending end "On 1".

(3) Each splicer connects his bridging cord to the identified conductor as far away as practicable from the end of the section that is to be replaced. The cable transfer clip should be connected to the conductor with a single firm motion. Each splicer then cuts the conductor close to the end of the cable that is to be replaced. The splicer at the identifying end checks with the probe to make sure that tone is still on the temporary bridging cord. The circuit arrangements should be as shown in the following diagram of a typical job.



(4) The splicer at the sending end selects a quad or pair in the new cable that will give a satisfactory layup for splicing to the old quad. He removes the lowest numbered conductor of this quad or pair from the test board and tells the number to the splicer at the identifying end. For example, assume that it is a quad and is boarded in holes 41, 42, 43, and 44. The first splicer would remove the conductor in hole 41 and tell the other splicer "new 41". The splicer at the identifying end would remove the conductor from hole 41 and repeat the number.

(5) The splicer at the sending end then tells the other splicer "Splice 41" and each splices the new conductor to the old conductor. The typical arrangements at this stage are shown in the following diagram.



(6) The splicer at the sending end then says "Clear 41" which means to remove the bridging cords at each end. The splicer at the identifying end checks the new conductor to make sure that tone is still heard. If so, he says "O.K. 41" and the tone sending cord is removed from the conductor.

(7) If soldering is required, each splicer solders his joint and slides the cotton sleeve into final position before starting on another conductor.

2.07 The following points are important and should be observed in this method:

(a) Only one conductor can be worked on at a time.

(b) The tone sending cord should be left connected until the final check has been made.

(c) The continuity of service over the conductor being tested depends on the temporary bridging circuit. The cable transfer clips must make good contact and must be kept in place until the circuit is completed through the new cable.