

**BELL SYSTEM PRACTICES**  
**Outside Plant Construction**  
**and Maintenance**

**SECTION G50.444.2**  
**Issue 1, May, 1947**  
**AT&T Co Standard**

**CABLE REPAIRING—GENERAL**  
**.375-INCH COAXIALS**

<b>Contents</b>	<b>Page</b>
1. General .....	1
2. Opening and Closing Coaxials between Splices....	1
3. Opening and Closing Coaxials at a Splice.....	5

**1. GENERAL**

1.01 This section covers the opening of .375-inch coaxials for testing or repair purposes and the subsequent resplicing of the coaxials.

1.02 The B375 Coaxial Sleeve can usually be used in resplicing coaxials at splice points. However, the E375 and D375 Coaxial Sleeves are provided for resplicing the coaxials at points between splices or at splices where the coaxial is damaged and it is necessary to remove a portion of the outer conductor. By using the latter sleeves, repairs can often be made without cutting in a length of coaxial. The E and D sleeves have the same inside and outside diameters as the B375 sleeve but are 4 inches and 6 inches long, respectively. The E sleeve may be used to resplice coaxials when the distance between the ends of the outer conductor is not more than 2 inches, and the D sleeve when the distance is between 2 and 4 inches. When the opening between the ends of the outer conductor is more than 4 inches, the repair must be made by cutting in a length of coaxial.

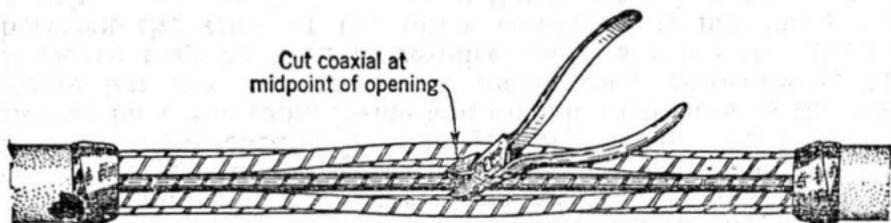
1.03 The procedure outlined in the section covering Coaxial Cable Precautions should be followed in opening cables containing working coaxials.

**2. OPENING AND CLOSING COAXIALS BETWEEN SPLICES**

2.01 Mark on the sheath where the cable is to be opened, a distance equal to the usual sheath opening. Remove the sheath, protect the ends of the sheath, etc., as covered in

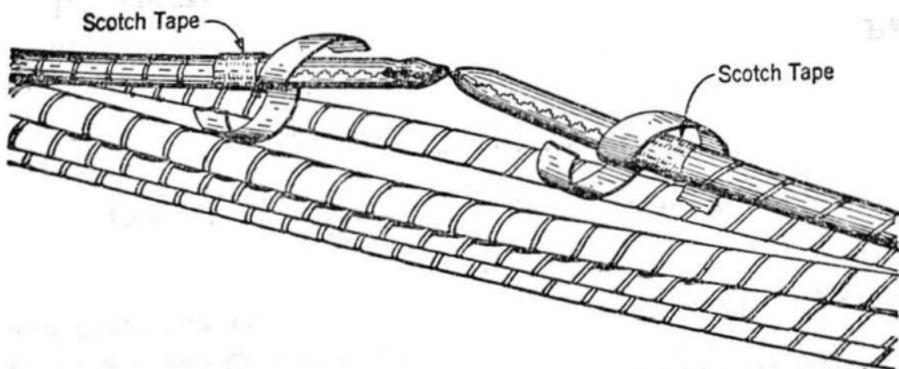
the coaxial splicing section. If the coaxials are surrounded by paper-insulated conductors, spread these conductors to get at the coaxials. If access to the coaxials cannot be obtained by spreading the paper-insulated conductors, it may be necessary to piece out some of these conductors to get at the coaxials.

2.02 At the midpoint of the sheath opening, short-circuit the outer conductor to the inner conductor by crimping the coaxial with a pair of diagonal pliers or side cutting pliers, as shown below, even though the damaged conductors appear to be in contact. This method of cutting will also flatten the ends of the coaxials and keep the steel tapes from loosening.

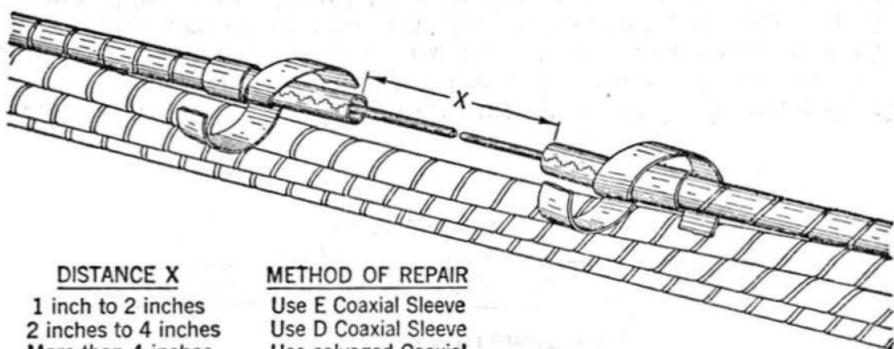


2.03 To determine whether the coaxial should be respliced using an E or D sleeve or whether a length of coaxial should be cut in, proceed as follows:

- (1) Place several turns of scotch tape about two inches from the cut to hold the tapes in place when the ends are unwound.
- (2) Unwind the ends of the steel tapes, as shown below.



(3) Remove the damaged portion of the outer conductor and measure the opening, as illustrated below. If the distance between the ends of the outer conductor is 2 inches or less an E sleeve may be used to resplice the coaxial. If the distance between the ends is more than 2 inches but less than 4 inches, the D sleeve may be used. If the opening is more than 4 inches, it will be necessary to make the repair by splicing in a piece of coaxial.



DISTANCE X	METHOD OF REPAIR
1 inch to 2 inches	Use E Coaxial Sleeve
2 inches to 4 inches	Use D Coaxial Sleeve
More than 4 inches	Use salvaged Coaxial

2.04 If the distance between the ends of the outer conductor is less than 2 inches, trim the ends back so that the opening is 2 inches. If the distance is more than 2 inches but less than 4 inches, trim the ends so that the opening is 4 inches.

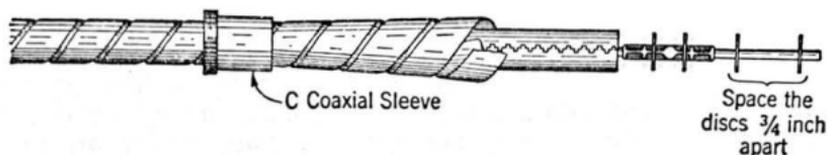
2.05 The right-hand and left-hand ends of the inner conductor should be cut 1/2 inch from the ends of the outer conductor.

2.06 Prepare the right and left-hand coaxials in the standard manner, except that the left-hand inner conductor should be lengthened as follows: The conductor should be pieced out using a short length of inner conductor and an S100 Brass Sleeve, as illustrated below.

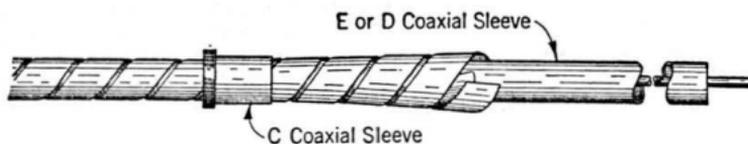


When E Coaxial Sleeve is used,  $X = 1\frac{3}{4}$  inches  
 When D Coaxial Sleeve is used, make  $X = 3\frac{3}{4}$  inches

2.07 Place discs from a discarded length of coaxial on the inner conductor, 3/4 inch apart, as shown below. Also place B375 coaxial discs in the usual manner on the S100 Brass Sleeves.



2.08 Place the E or D sleeve on the left-hand coaxial, sliding it well under the loosened steel tapes, as illustrated below. This will leave adequate inner conductor projecting from the sleeve for making the splice. Join the inner conductors in the usual manner using an S100 Brass Sleeve and slide the repair sleeve into position against the temporary spacer. Rewind the loosened steel tapes and place the left-hand C375 sleeve in position for rolling.



2.09 In rolling a joint containing an E or D sleeve, only the ends of the sleeve should be rolled down so as to cause the least stretching of the sleeve, otherwise the C375 sleeve and crimping ring on the right-hand side may be displaced. The joint should be rolled as follows: Start rolling the left-hand end with the rollers turned about 1/4 turn beyond the usual starting position. Start rolling the right-hand end about one inch from the right-hand end of the E or D sleeve and complete rolling in the usual manner.

2.10 This procedure will leave an unrolled portion in the center of the E or D sleeve.

2.11 If more than one coaxial must be opened, the coaxials should be tagged at each end with coaxial tags before cutting, to avoid wrong connections.

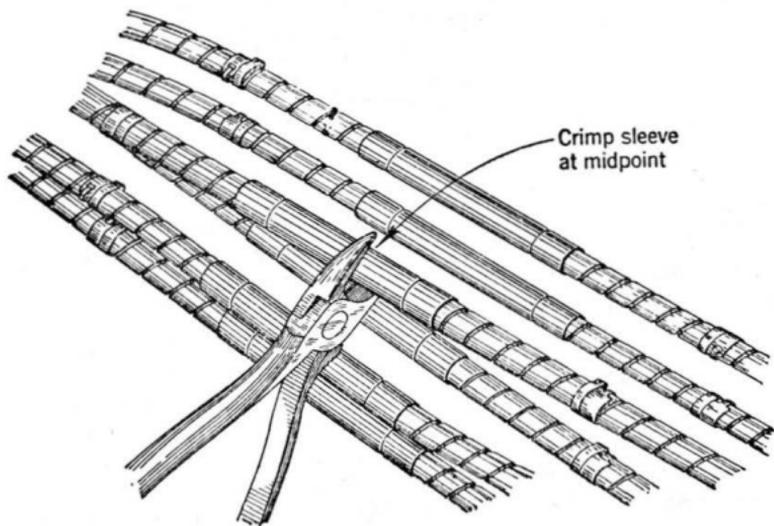
2.12 If the work to be done is expected to take considerable time, or if the weather is unfavorable, the paper-insulated conductors should be kept dry by means of desiccant, wrapping them with muslin and a rubber bandage.

2.13 After the coaxials have been respliced, check to ensure that the tags are in position on each side of the splice. The completed splice should be wrapped and dried with desiccant in the usual manner. A split lead sleeve should be used to cover the opening.

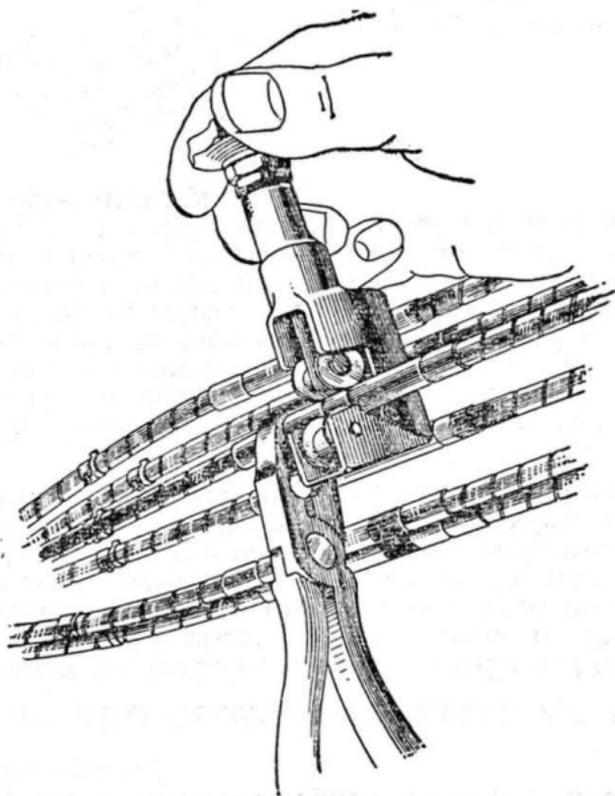
### 3. OPENING AND CLOSING COAXIALS AT A SPLICE

3.01 Remove the lead sleeve and the muslin and polyethylene wrappers. In order to gain access to the coaxials, balloon the splice and tie the paper-insulated conductors so that in so far as practicable, they are at the rear and below the coaxials. Enclose the paper-insulated conductors in a temporary wrapping of muslin as a protection while working on the coaxials. Remove the insulating wrapping around the coaxials.

3.02 After identifying the coaxial to be worked on, short-circuit the outer conductor to the inner conductor by crimping the outer connecting sleeve with a pair of diagonal or side-cutting pliers, as shown below. The crimp should be made at the center of the splice. A deep crimp is necessary to ensure positive contact with the inner conductor. After positive contact has been made between the outer and inner sleeves, partially round out the deformed portion of the outer sleeve with a pair of side-cutting pliers.

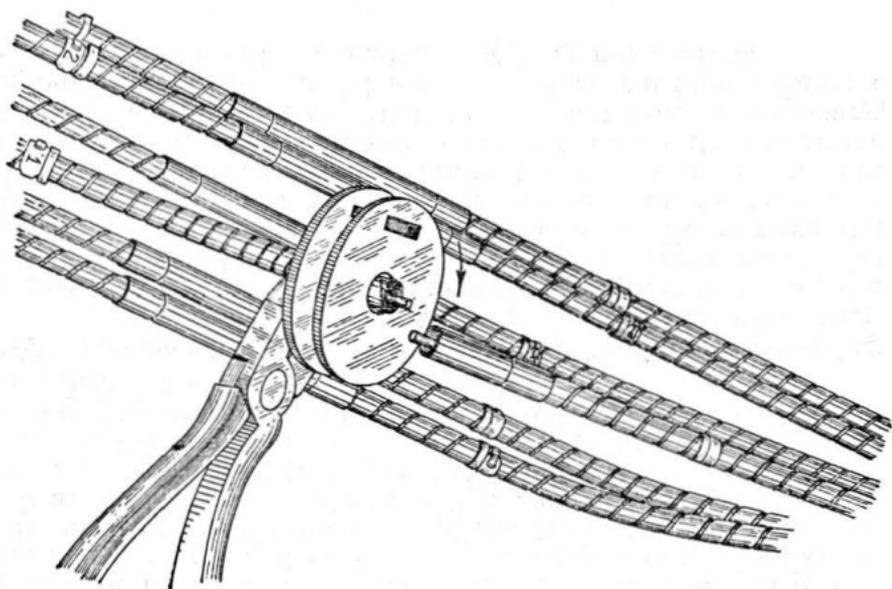


3.03 Place the B Coaxial Sleeve Cutter so that it spans the crimp in the center of the sleeve and turn the handle until the cutting wheels are in firm contact with the sleeve, as shown below. Firmly grasp the other end of the B sleeve with a pair of coaxial pliers and rotate the cutter back and forth through a small arc. Then turn the handle and increase the arc until the cutter remains in firm contact over the circumference of the sleeve. Continue to rotate the cutter back and forth through an arc of about  $120^\circ$ , turning the handle until the  $3/8$ -inch section of the sleeve is cut free. Then remove the cutter, cut the  $3/8$ -inch section with a pair of diagonal pliers and remove it.

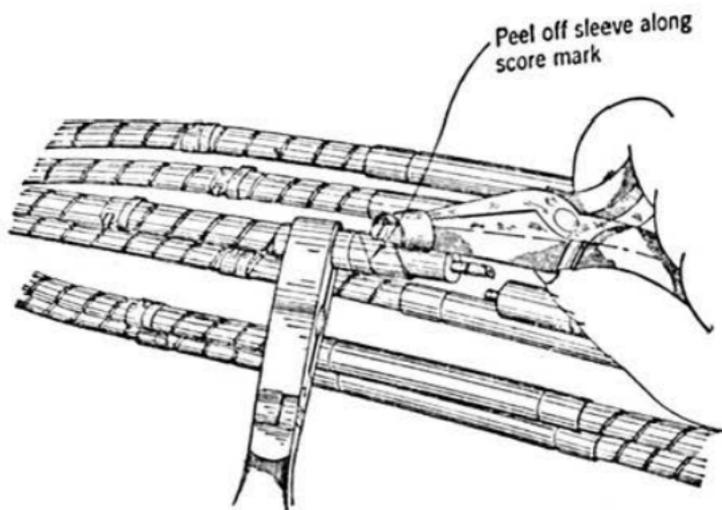


3.04 Cut the inner connecting sleeve at its midpoint with a pair of diagonal pliers. Bend the ends of the coaxial away from the splice and place the C Coaxial Sleeve Cutter over the left-hand end, as shown below. One edge of the cutter should be approximately in line with the cut end of the sleeve. Adjust the cutter so that it is in firm contact with the sleeve. Grasp the coaxial adjacent to the C sleeve with a pair of

coaxial pliers. Rotate the cutter in a clockwise direction until it touches the pliers. Then reverse the direction of rotation and run the cutter off the cut end of the sleeve. It is important to turn down the cutting wheel tightly as the cutter is run off in order to ensure easy starting of the subsequent operation.

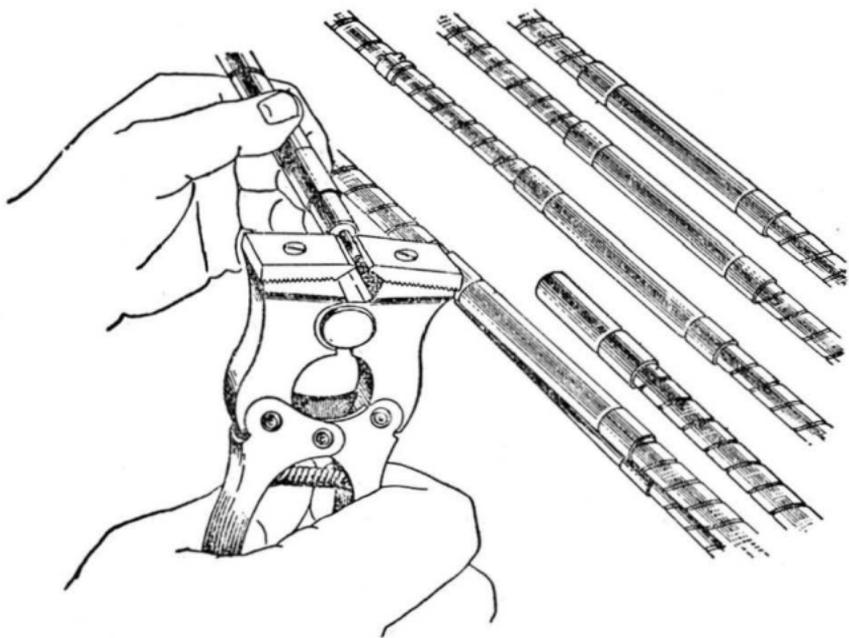


3.05 Make a cut with a pair of diagonal pliers on the end of the outer sleeve along the start of the spiral score mark. Grasp the end at the cut with a pair of long nose pliers and peel the sleeve off by rotating the pliers, as shown below. In rotating the pliers keep their center line at such an angle with the coaxial that the tear will follow the score mark. This will prevent the copper strip from breaking off. After about half of the scored sleeve has been peeled off, cut off the copper strip accumulated on the pliers. In cutting, be sure to leave enough of the strip projecting from the sleeve to permit grasping the end to complete the tear. The right half of the B sleeve should be removed in a similar manner.



3.06 If it is necessary to remove the C sleeve which secures the steel tapes, the C Coaxial Sleeve Cutter should be placed over the end of the coaxial and the sleeve scored in the same manner as the B sleeve. Then grasp the coaxial adjacent to the C sleeve with the coaxial pliers. Make a cut in the score mark at the end of the sleeve with a sharp chipping knife and hammer. With a pair of diagonal pliers turn back the cut edges and grasp the end with a pair of long nose pliers. The sleeve can then be removed by peeling in the manner described in Paragraph 3.05 for removing the B sleeve.

3.07 Before removing the two halves of the inner connecting sleeve, adjust the jaws of the nippers so that when they are closed, the space between the jaws is slightly less than the diameter of the inner conductor. This adjustment should be made on a separate piece of inner conductor. To remove the sleeve, center the jaws along the brass sleeve, as shown below, and press the nipper handles. Make a second longitudinal cut  $1/4$  turn from the first cut. When making these cuts, the sleeve will come off easily if the nippers are centered. If necessary, complete the split by careful use of the diagonal pliers. Remove the sleeve with a pair of diagonal or long nose pliers.



3.08 To resplice the coaxial, tighten the steel tapes to get them into their original position and complete preparation of the ends in the usual manner. It is not necessary to insert new steel reinforcing bushings, but make sure that an insulating disc is under the end of each outer conductor and that the discs are not in contact with the bushings. Complete preparation of the joint and roll the sleeves in the usual manner. Check to determine that the coaxial tags are securely attached to the coaxials on each side of the splice.

3.09 Dispose of the slack in the paper-insulated pairs in the usual manner; then wrap and place desiccant in the splice in the usual manner. Place and wipe the lead sleeve and if the splice is in a manhole, replace the coaxial cable warning tag.