American Telephone and Telegraph Company

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G74.940.4
Issue A, 8-20-54
Long Lines Department
Dist. Class. 209.1

CABLE MAINTENANCE

CABLE FAILURES- RESTORATION OF CABLES CONTAINING VIDEO PAIRS

1. GENERAL

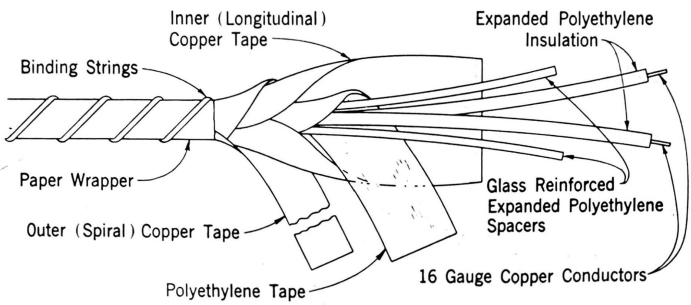
1.01 This section and Section E21.907.4 which is identical describe the methods to be used in restoring video facilities involved in cable failures.

1.02 Cables containing video pairs may also contain paired or quadded facilities or coaxials. Bell System Practices Section G74.940.2 and G74.940.3 cover restoration of such facilities. These sections are identical to E21.907.2 and E21.907.3, respectively.

2. VIDEO CABLE MAKEUP AND NUMBERING SYSTEM

2.01 A video cable consists of a number of video pairs (any number from 2 to 24) the pairs being constructed as shown in the following sketches.

NEW TYPE VIDEO PAIR



OLD TYPE VIDEO PAIR

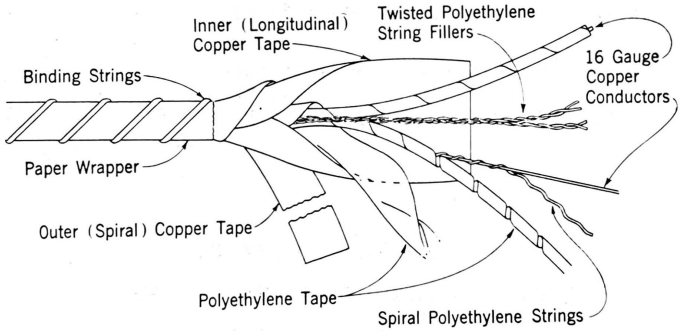


Figure 1

2.02 The video pair count is determined by the color of the binder strings and the layer in which the video pairs are located. The pair count starts with a red binder string pair in the outer layer and proceeds through the blue binder pair and then in succession through the pairs with white binder strings in the same layer. The next pair in the count is the pair with red binder strings in the next inner layer.

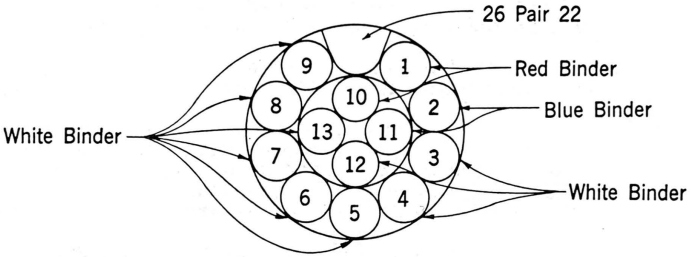


Figure 2

3. RESTORATION METHODS - GENERAL

3.01 Emergency restoration of video pairs is generally to be made using 754 type cable. This is a flexible shielded video cable consisting of a pair of 18 or 19 gauge solid conductors with polyethylene over the conductors, then a polyethylene jacket, two copper shielding braids and an outside plastic jacket.

3.02 In cases involving trouble in either buried or underground video cable where the length of damaged section is short it may be possible to effect repairs by piecing through the video pairs and other facilities.

3.03 For troubles involving cable in conduit, traffic conditions, heavy duty pavement, etc. may make it impractical to excavate and expose a fault. In such cases consideration should be given to opening adjacent splices and temporarily making video and other facilities good, using 754 type cable for the video pairs.

3.04 The 754 type cable is waterproof and can be placed in conduit, laid on the ground or placed aerially. If placed aerially it should be supported by a steel messenger strand. If rings are not available the 754 type cable can be wrapped with friction tape at 5 foot intervals and secured by lashing the taped section to the messenger with marlin.

4. RESTORATION METHODS - OPENING A SPLICE IN VIDEO CABLE

4.01 The following text and sketches describe, opening an existing video splice.

(a) After the sleeve is taken off, remove the muslin wrapper and expose the splice. Verify between manholes or splice pits the defective video pair or pairs, using the color of the binding strings to determine this.

(b) Remove the half lapped layer of scotch tape wrapped over the video pair splice.

(c) Unsolder the joint between the ends of the outer copper tapes and unwind these outer tapes back to the scotch tape marker about six inches from the center of the splice at either end.

(d) Open the longitudinal inner copper strip from around the splice at the middle of the splice and unsolder it at both ends. Video pair splice should now appear as per sketch below.

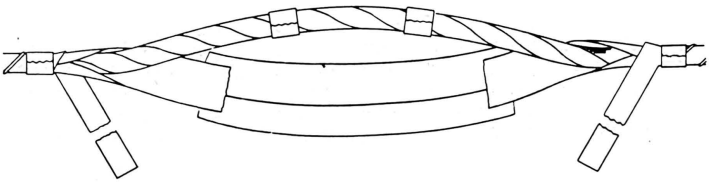


Figure 3

(e) Spread out the inner longitudinal copper tape to expose the video pair. If the inner copper tape is wrapped on, unwrap it carefully back to the scotch tape marker.

(f) The polyethylene tape over the video pairs should be unwound and the transflex tubing over each splice slid back along the conductors in the direction of the good cable. This exposes the tinned copper sleeve. See sketch below.

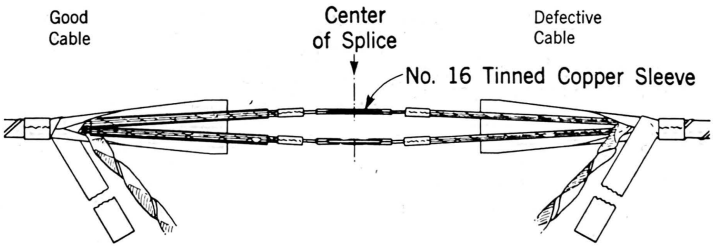


Figure 4

(g) The tinned copper sleeve joining the video conductor or video pairs should then be heated with a soldering copper and removed. No more heat than necessary should be applied. The video pair should look substantially as the sketch below when these operations are completed.

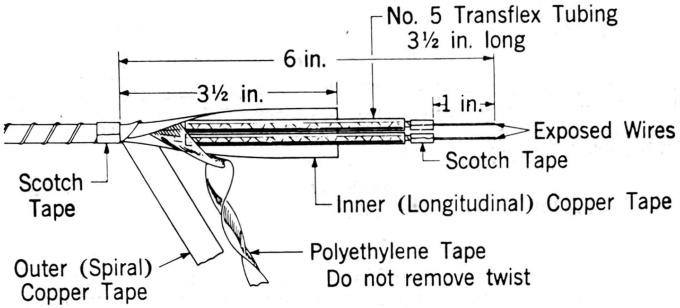


Figure 5

(h) The tip and ring of the video pair on the good cable must now be determined by testing with the testboard or radio station since there is no color code identification of the two wires.

5. PREPARATION OF 754 CABLE FOR SPLICING TO VIDEO PAIR

5.01 If possible one length of 754 cable should be used to make good a damaged section of video pair in a cable. If lengths of 754 cable have to be sliced together it should be done as per Bell System Practices Section G50.659.3.

5.02 Prepare the end of the flexible (754) cable as illustrated.

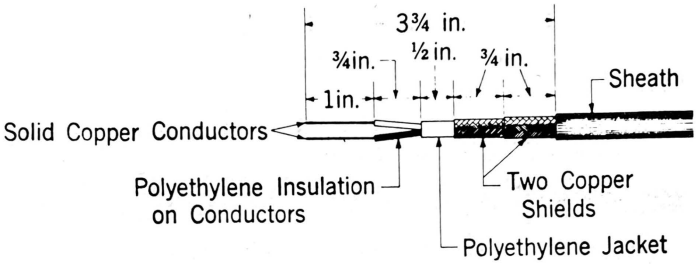


Figure 6

6. JOINING FLEXIBLE CABLE (754) TO VIDEO PAIR IN EXISTING SPLICE.

6.01 The end of the good video pair in the splice and the end of the flexible 754 cable should be joined tip to tip and ring to ring using No. 16 tinned copper sleeves as illustrated below.

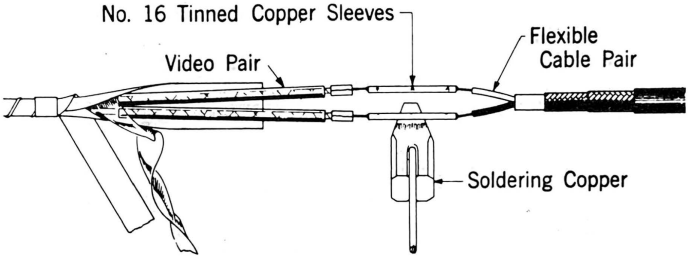


Figure 7

6.02 Slide the transflex tubing into place over the splice on each video pair and secure it as shown below.

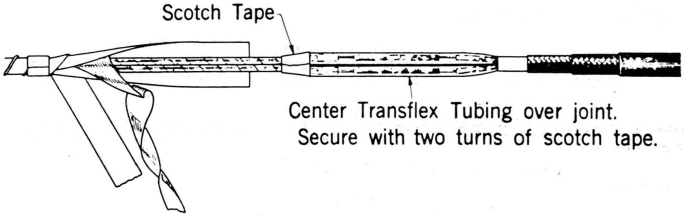


Figure 8

6.03 Wrap on the polyethlene tape already in place on the video pair as far as it will go, and piece out with half lapped scotch tape as illustrated below.

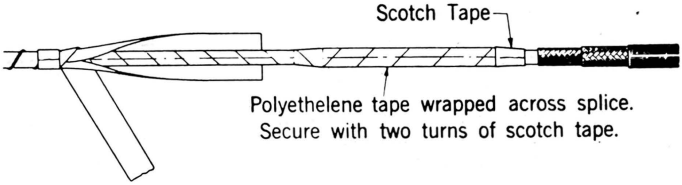


Figure 9

6.04 Fold the inner longitudinal copper tape around the cable. Then take a length of outer copper tape and starting about one half (1/2) way back on the inner copper tape spiral wrap it with a half lap over the inner tape and splice and terminate it by soldering to the inner copper shielding braid of the flexible video cable. Secure the other end of the copper tape with a wrap of 1/2 inch scoth tape. The splice at the point should be substantially as per the sketch.

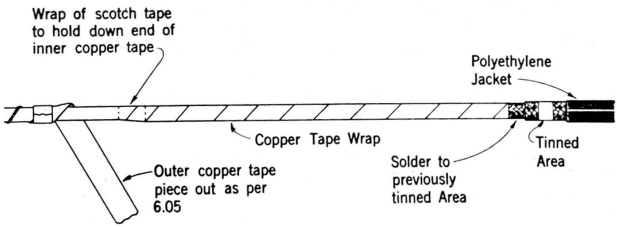


Figure 10

6.05 Solder a piece of copper tape to the end of the spiral outer copper tape already in place on the good cable and then wind this outer copper

with about an 1/8 inch overlap as smoothly as practicable over the splice to terminate on the outer shielding braid. Solder the copper tape to the outer shielding braid which should previously have been tinned.

6.06 Starting at the tape collar on the video cable apply a half lapped layer of scotch tape across the splice to terminate on the polyethylene jacket about one inch from the end.

7. JOINING FLEXIBLE VIDEO CABLE (754 TYPE) TO VIDEO PAIRS IN CABLE WHERE NO SPLICE EXISTS

7.01 After exposing the cable the amount of good core to be exposed to permit splicing will be determined by the type of cable but should be not less than 16 inches. This permits putting on a scotch tape marker six inches from the sheath termination point and leaves ten inches to prepare the end for splicing. It also provides enough tape length to wrap around the splice.

7.02 The end of the video pair should be prepared for splicing as per sketch in Paragraph 4.01 (g).

7.03 The end of the flexible video cable should be prepared as per sketch in Paragraph 5.02.

8. PROTECTING TEMPORARY SPLICES

8.01 The usual steps shall be taken to wrap up temporary splices to protect them from moisture, and also to protect them from being damaged.