

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

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COILS AND CASES

SPlicing LOADING COILS

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1. GENERAL

- 1.01 This section outlines the procedure to be followed in splicing potted loading coils to cable conductors.
- 1.02 There are two pairs in the loading coil stub cable connected to each loading coil. One of the two pairs is used to connect the coil to the pair in the main cable in one direction, and the second pair is used to connect the coil to the main cable in the other direction.
- 1.03 Loading coils may be connected to the main cable by splicing the stub from the case directly into the main cable, or by connecting the stub from the case through an intermediate stub to the main cable. Whenever practicable, the stubs on the loading cases should be spliced directly to the main cable without the use of an intermediate stub cable.
- 1.04 Check the arrangement and color code for the types of coils and cases being installed and be careful not to split quads or pairs in either the main or the stub cable.

2. PREPARATION

- 2.01 Test each pair in the stub cable for opens, crosses, short-circuits and grounds.

2.02 When testing for opens check the pairs in the stub cable to ensure that the wires are connected through the loading coils in accordance with the color codes. In tracing the wires through the loading coils in cases equipped with paper insulated stub do not remove the cotton thread binders which are wrapped around each quad. The binders should be tied with a slip tie and pushed back toward the butt at the time the splice is made.

2.03 The newer cases containing four-wire circuit coils have paper shields around the individual unit cables. In preparing to reuse an old case having a brass tape shield, it is not necessary to ground the shield to the sheath of the main cable at the splice as the shield is grounded inside the case.

2.04 To pick out the cable circuits to be loaded it is necessary to terminate the cable at one end, unless all the pairs in the main cable are to be loaded in one case with the same type of loading coils or unless all the pairs of one gauge or group which can be distinguished by color code are to be loaded in one case.

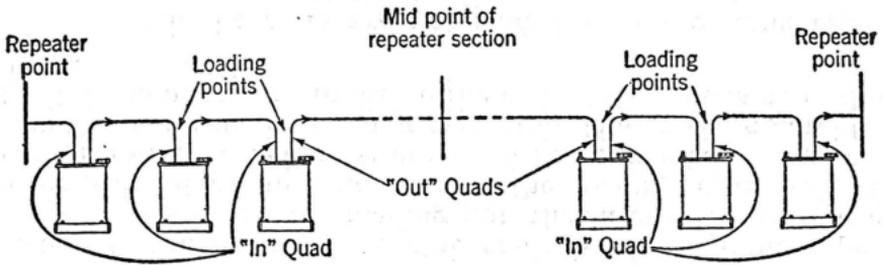
2.05 Any pairs in the main cable that are not to be loaded should be picked out and spliced through before the complement to be loaded is spliced to the loading case stub cable.

2.06 If two or more separate cases are used at each loading point, divide the pairs to be loaded into two or more groups and do not split the complements between cases at the loading points. If all the conductors are to be loaded in one case with the same type of loading coil at each loading point, the pairs or quads may be spliced to the loading coil stub at random.

3. POINTING OF COILS

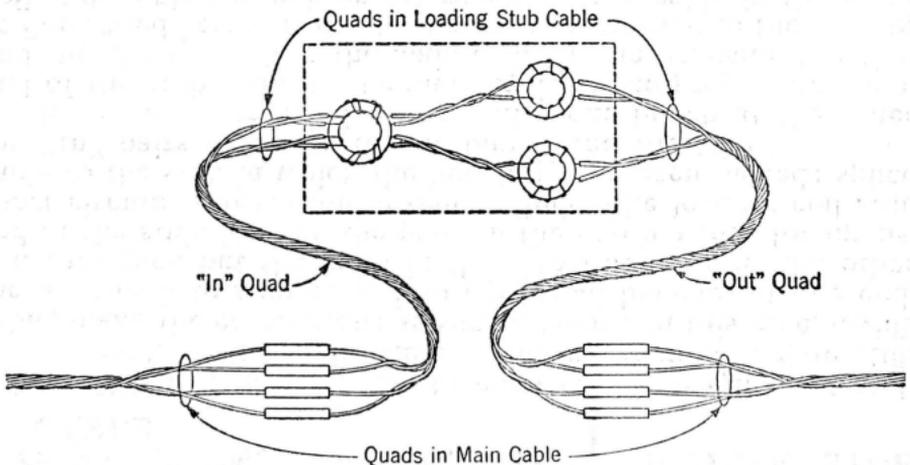
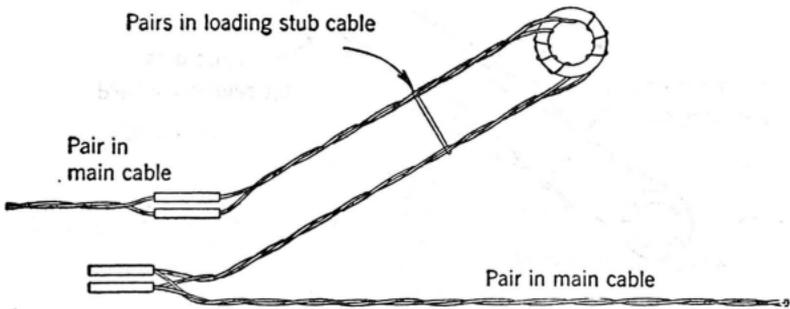
3.01 In connection with repeater operation on toll circuits, it is essential that loading coils in quadded cables be properly "pointed" (the "In" and "Out" terminals of the coils connected in a definite direction). Definite splicing instructions will be supplied when loading coils are to be spliced to quadded cables. In general, the "Out" terminals of the coils, quads having binders colored red, or containing red, will be connected in the direction toward the midpoint of each repeater section; and the "In" terminals of the coils, quads colored white, or containing white, away from the midpoint of each repeater section. This is illustrated in the diagram below.

POINTING OF LOADING COILS.



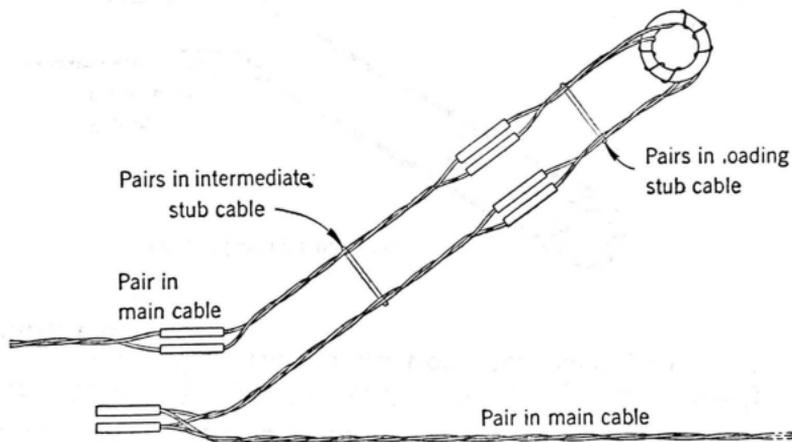
4. CONNECTIONS DIRECT TO MAIN CABLE

4.01 When the loading stub cable is spliced directly to the main cable, the connections for each pair or quad are as shown below.



5. CONNECTIONS THROUGH INTERMEDIATE STUB CABLE

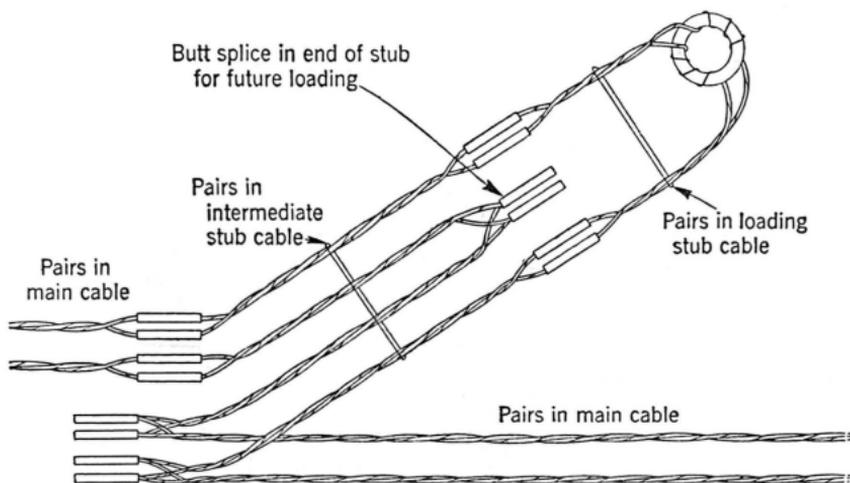
5.01 When it is necessary to connect the loading coil stub cable to the main cable by means of intermediate stub cable, make the connections as shown below. In this case, divide the intermediate stub cable into two equal bunches at one end, and then pick out the pairs in these two bunches at the other end of the stub. Test all the pairs in the two bunches for opens, short circuits, crosses and grounds. Splice the loading coil stub cable to the stub in which the bunches have been picked; splice the "In" pairs or quads to one bunch and the "Out" pairs or quads to the other bunch. Then splice one bunch at the other end of the stub cable to the main cable in the proper direction, and the other bunch to the main cable in the opposite direction as illustrated below. A quadded cable is connected to the loading coil stub cable through an intermediate stub cable in the same manner.



5.02 If the intermediate stub cable is of the same type as the stub on the loading pot, the intermediate stub may be considered as an extension of the loading case stub. The pairs in the intermediate stub should be connected to the corresponding pairs in the loading case stub. Under these conditions it will be unnecessary to divide the cable into groups as outlined above.

5.03 If all the pairs are not loaded with the same type of loading coils at the loading point, it will be necessary to pick bunches for each type of loading in the stub cable which connects the loading coil stub to the main cable.

5.04 If only part of a cable is loaded, and it is planned to load the rest of the pairs at some future time, the intermediate stub cable used to connect the loading stub to the main cable shall be large enough to care for the ultimate loading, if practicable.



6. BALLOON SPLICES

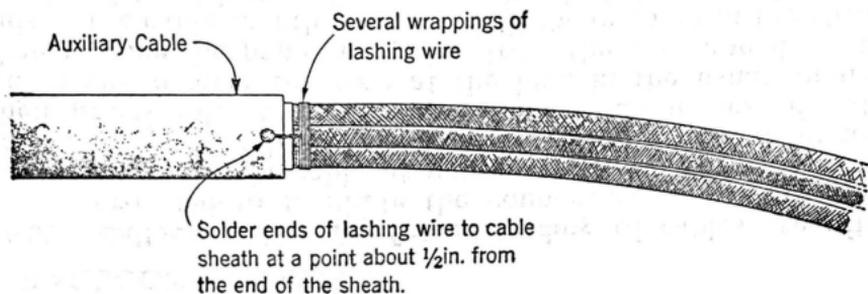
6.01 **Balloon splices for future loading** of cables are often provided to facilitate the connection of loading stubs directly to the main cable at points where no splice is made. Approximately 9 inches of slack should be left in the conductors, when practicable. Remove approximately 26 inches of cable sheath and protect the core at the butt in the usual manner. Then remove the paper wrapping from the core and draw the ends of the cable sheath together until the opening in the sheath is reduced to 17 inches. Dispose of the slack by wrapping small groups of conductors successively around the core, and wrap the conductors in the usual manner to permit placing the lead sleeve over the wires.

7. CARRIER LOADING

7.01 **The stub cables of cases containing carrier loading coils** are spliced to main cables in the same manner as described in the preceding sections, except for differences noted below.

7.02 Tinsel braids or copper tapes may be used to shield individual quads or pairs in the stub cable. These shields are grounded to the coil case inside the case and, therefore, it is not necessary to ground them to the cable sheath at the splice.

7.03 Where an auxiliary length of special shielded cable is required this cable should be of the same type as the loading coil stub. In splicing such cable to the stub cable, it is necessary to connect together and ground the tinsel braids or copper tapes of the auxiliary cable, but not those of the stub cable. This can be done by grounding them on the sheath as shown below.



7.04 Where cases containing carrier loading coils are installed at open wire terminal poles on which there is a cross-connecting terminal in place, the splicing arrangements are shown below.

#83-A Protector mounting with 6RD copper bond between ground post of protector-mounting and cable sheath.

This splice should, preferably, be made before the upper cable terminal is mounted, so that splicing can be done in horizontal position.

If section between terminal and loading coil stub splice is more than 10 feet, use screened or quadded cable. If section is 10 feet or less, use F type terminal with a tap of sufficient length, or a piece of 22 gauge non-quadded cable, to meet loading coil stub splice.

Loading coil stub splice

Special F type terminal

Loading coil case

Special F type terminal

Not more than 2 feet if screened or quadded cable is used.

Screened or quadded cable

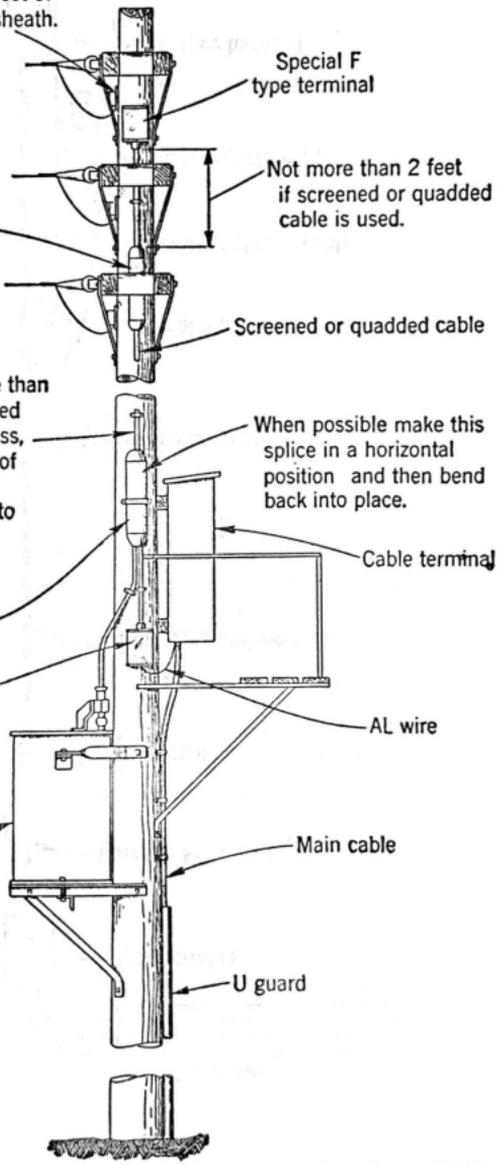
When possible make this splice in a horizontal position and then bend back into place.

Cable terminal

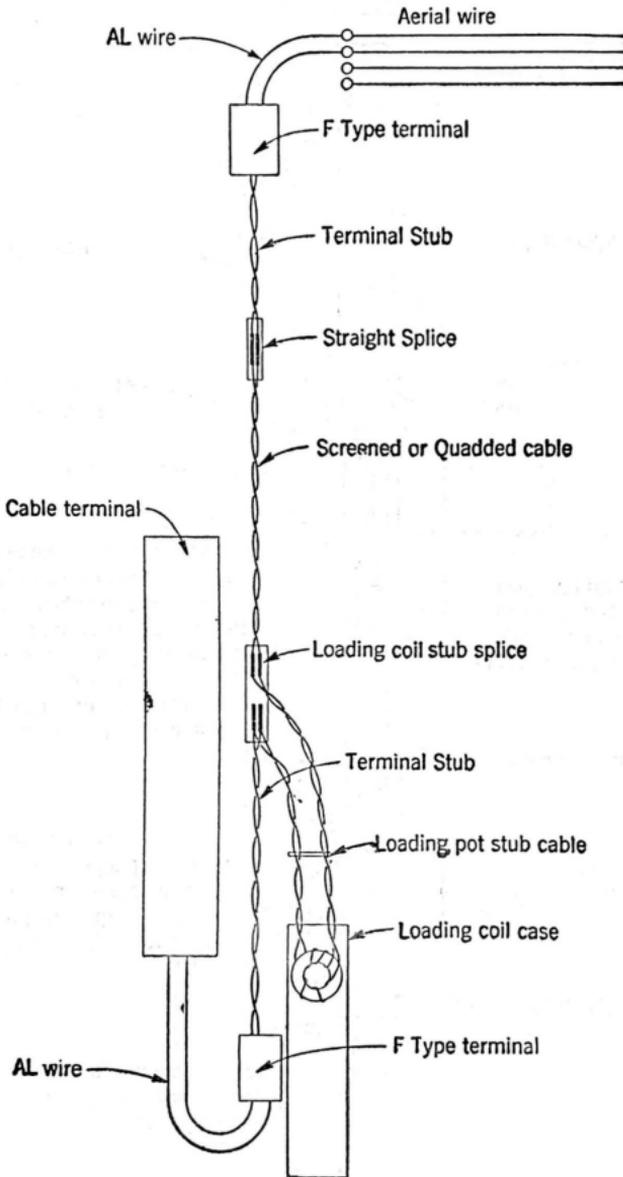
AL wire

Main cable

U guard



7.05 A schematic diagram of the connections for each pair is shown below.



7.06 Where there is sufficient room in the cable terminal for placing a binding post chamber or a special F type terminal for terminating the conductors of the carrier loading coils, the splicing arrangement is as shown below. In this case the terminal stub cable is connected to the cable from the loading splice inside the cable terminal.

