

**BELL SYSTEM PRACTICES**

**Outside Plant Construction  
and Maintenance**

**SECTION G50.445.1**

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**AT&T Co Standard**

**CABLE REPAIRING  
COAXIAL EMERGENCY PATCHING CORDS**

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**1. GENERAL**

1.01 In the event of major damage to a working coaxial cable, service on the coaxial conductors can be restored on an emergency basis by terminating the coaxials at each end of the break with 479-type jacks and spanning the break with flexible coaxial cords equipped with plugs for connection to the jacks. This section covers the use of 479-type jacks, the B coaxial reel and patching cords in restoring service on an emergency basis.

1.02 The patching cords and other items used for this purpose are listed below:

- |                            |  |
|----------------------------|--|
| <b>Cord, P2BD</b>          | Coaxial cord 25 feet long with 337B Plug at each end.  |
| <b>Cord, P2BE</b>          | Coaxial cord 600 feet long with 337B Plug at one end and 466B Jack at other end, wound on metal reel which is equipped with cover. |
| <b>Seal, Duct, Plastic</b> | Used in making temporary splice protection with CR Tape.   |

<b>Grip, Cable, Lay-cit, J. R. Kearney Corp., 6804-1</b>	Used to fasten adjacent lengths and anchor ends of P2BE Cords when they are installed aerially.
<b>Jack, 479A</b>	Cord adapter for .270-inch coaxial.
<b>Jack, 479B</b>	Cord adapter for .375-inch coaxial.
<b>Frame, Payout, Coaxial, B</b>	Metal frame for carrying coaxial reel and paying out P2BE Cord.
<b>Satchel, Repair- man's, Station</b>	Used to store 479-Type Jacks and as many as eight P2BD Cords.
<b>Stand, Reel, Coaxial, B</b>	Metal stand for holding coaxial reel and frame while rewinding the P2BE Cord.
<b>Tape, B, 2-inch</b>	Used in making temporary splice protection with CR Tape.
<b>Tape, CR, 1-inch</b>	For protecting coaxial jack and plug connections in the field and in storage.
<b>Tape, CR, 28-inch x 20 ft.</b>	For protecting splice where patching cords are applied.
<b>Tubing, Transflex, No. 3/4</b>	For protecting coaxial jacks in storage.

## 2. PRECAUTIONS

2.01 Coaxials are operated with a high voltage from the center conductor to ground. Furthermore, a working coaxial may carry several hundred circuits. It is, therefore, important that the workman be thoroughly familiar with the precautions outlined in Section G74.440 and that no coaxial be opened until it has been positively identified and tested to see that the power has been turned off.

2.02 **Identifying Coaxials:** At splices, the coaxials to be patched can be identified by means of the numbered coaxial tags. At other openings in the cable, the coaxials can be identified according to the numbering plan outlined in Section G50.606.2.

2.03 Before opening a coaxial, its identity should be verified and removal of power should be checked using the approved apparatus and methods.

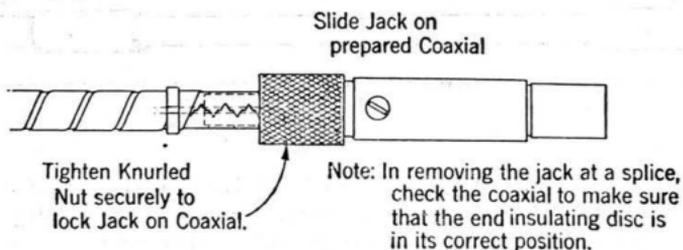
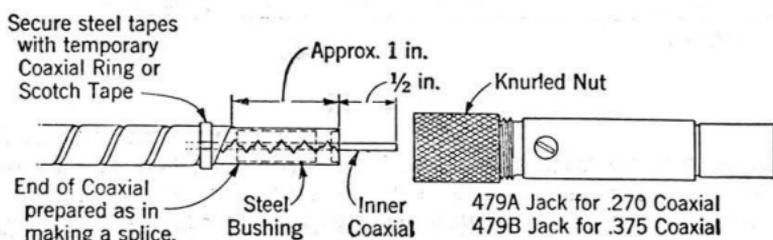
2.04 **Protecting Jack and Plug Connections:** In order to avoid possible interruption of circuits operating over the temporary patching cords, it is important that the jacks and plugs are dry before connection and that the connections are made secure and wrapped as outlined in this section, to protect them from moisture and prevent them from being pulled apart.

2.05 Since the patching cords may remain in storage and unused for long periods of time, the cords should be carefully rewound and the ends securely wrapped on completion of the job as outlined in this section.

2.06 **Preventing Cord Damage:** The cords are made with solid insulation and have a braided copper shield and tough outer jacket. However, they are not rugged enough to withstand rough handling, dragging along the ground in long lengths or being run over by vehicles. This should be borne in mind in selecting the location for placing the cords and in rewinding the cords.

### 3. PLACING 479-TYPE JACKS

3.01 The following illustration shows how the 479-type jacks are placed on the coaxials.

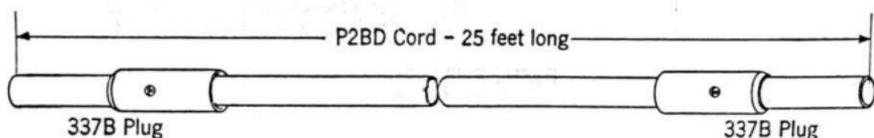


3.02 At an open splice, no further preparation is necessary after the long outer sleeve and the inner sleeve have been removed from the spliced coaxial. If the cable is opened at other than a splice point, the coaxials to be patched should be prepared as illustrated above. The coaxial pliers can be used to tighten the knurled nut securely.

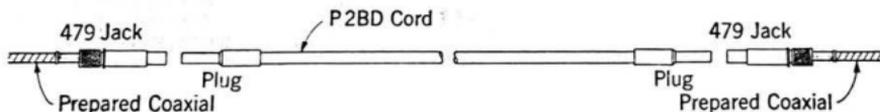
3.03 At all locations where the 479-type jacks are placed, the outer coaxial conductors should be bonded to the sheath and copper jacket or other steel tapes or armor wire, using four strands of tinned copper lashing wire or equivalent. Firmly hand twisted connections are adequate; do not solder this bond.

#### 4. ARRANGEMENT OF PATCHING CORDS

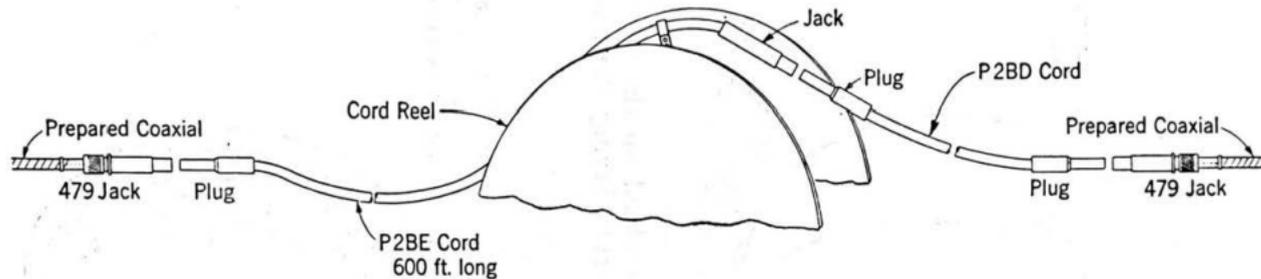
4.01 The P2BD cord illustrated below has a plug at each end which will fit the 479-type jacks. The P2BD cord can be used by itself when the distance to be spanned is relatively short. This cord is also used to connect the jack end of the P2BE cord to the jack on the coaxial cable.



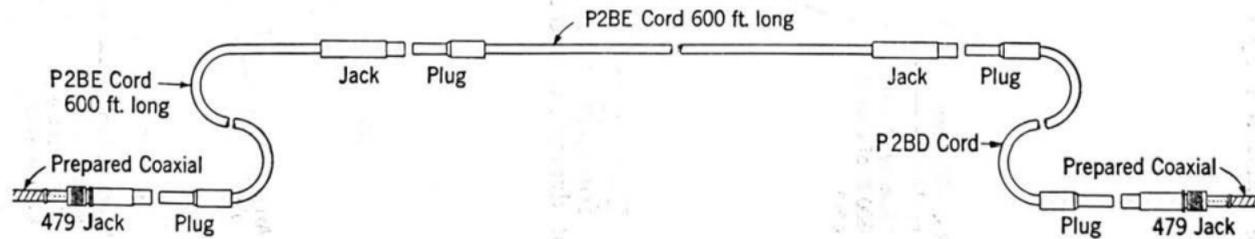
4.02 Three typical methods of using the P2BD (short cords) and P2BE (long cords) are illustrated below. The arrangement used will depend on the length of the section to be spanned with the cords.



Schematic Arrangement of Coaxial Patching Devices where P2BD Cord will span defective portion of Coaxial



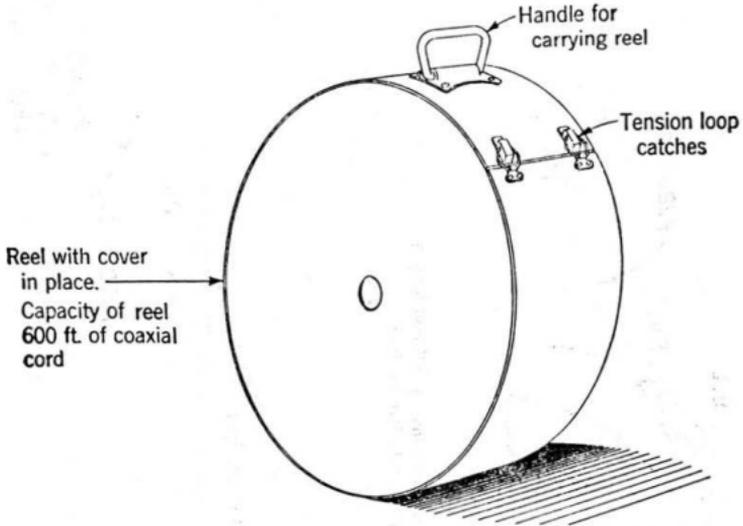
Schematic Arrangement of Coaxial Patching Devices where less than a full reel length of P2BE Cord is necessary to span defective section



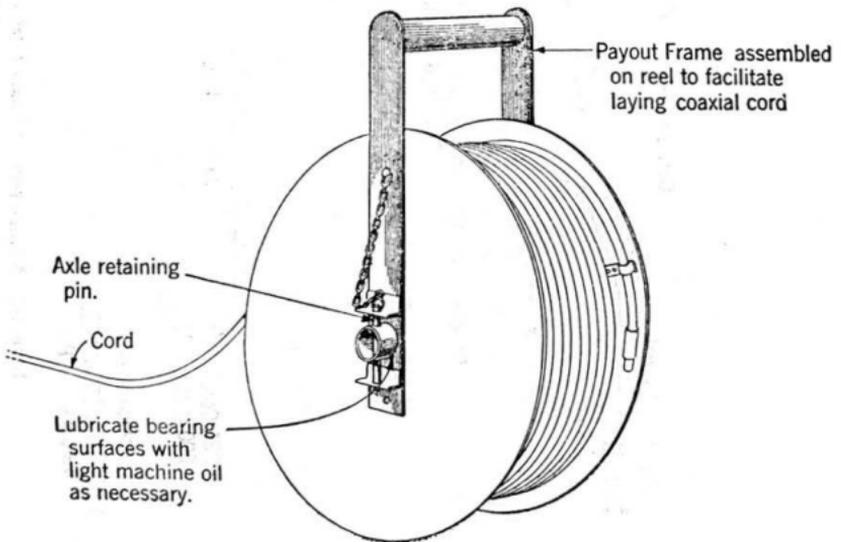
Schematic Arrangement of Coaxial Patching Devices where more than one reel of P2BE Cord is necessary to span the defective section

## 5. LAYING P2BE CORD

5.01 The B coaxial reel on which the P2BE cord is wound is illustrated below. The metal cover is removed by loosening the tension loop catches.



5.02 The payout frame shown assembled on the reel in the following sketch is used to permit laying the long cord without dragging it on the ground.



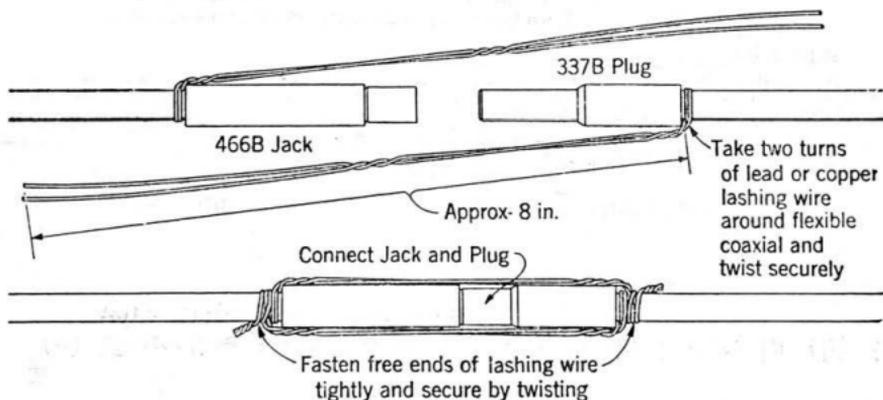
5.03 In laying the cord, the outer end is held or anchored to some convenient object. The reel is then carried by means of the handle on the payout frame which allows the cord to unwind.

5.04 One 104 or larger bare copper wire should be placed with the emergency patching cords when the length used exceeds 600 feet and the cords are placed during seasons when lightning storms are prevalent. The copper wire should be bonded to the sheath and copper jacket, steel tapes or armor wire of the main cable at each end of the patched section.

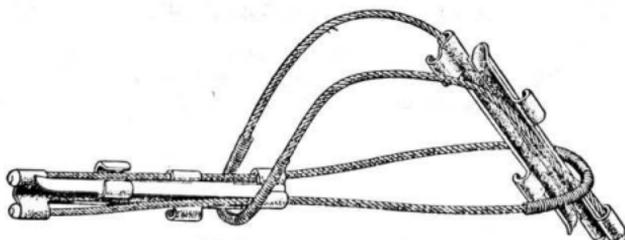
## 6. SECURING AND PROTECTING CORD CONNECTIONS AND CORDS

6.01 **Securing Cord Connections:** The following sketches illustrate three methods of fastening the plugs and jacks to prevent accidental disconnection.

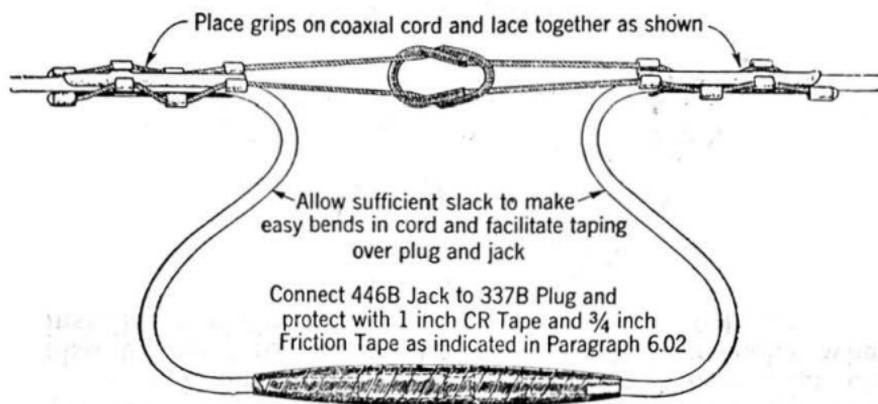
(a) **Lashing Wire Method.** Used when the cords are laid on the ground or in a shallow trench.



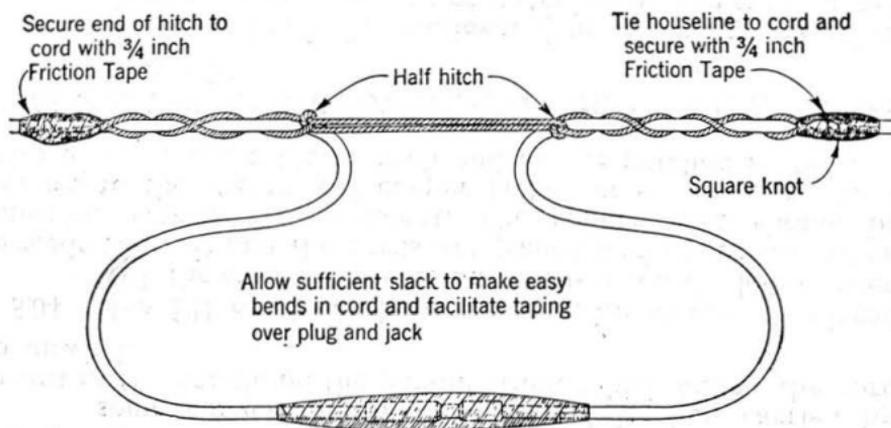
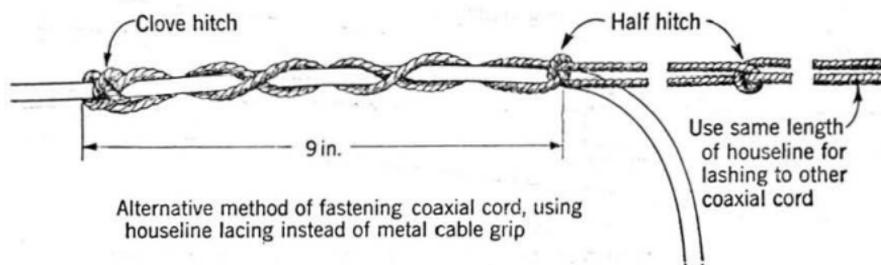
(b) **Wire Grip Method.** Used when the cords are carried on strand across roads, driveways, etc. These grips can also be used to fasten the cord to the end poles when installed aerially.



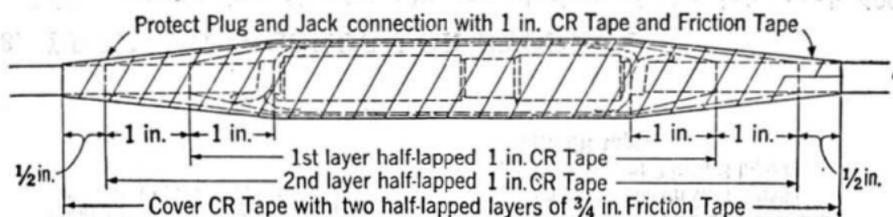
Method of Coupling Cable Grips



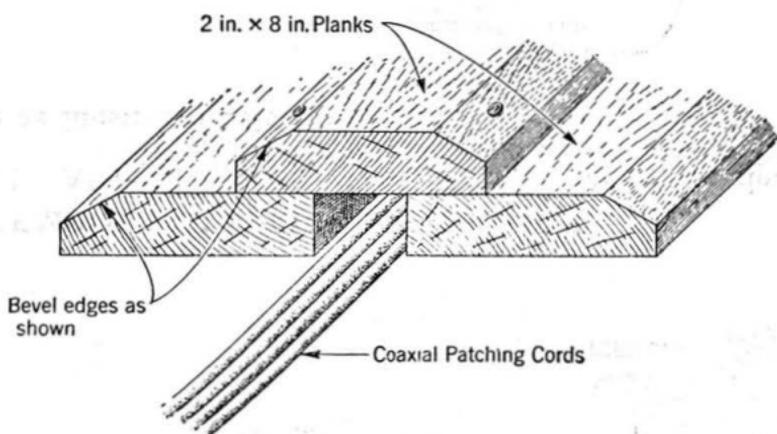
(c) **Houeline Grip Method.** Used as indicated in (b) if wire grips are not available.



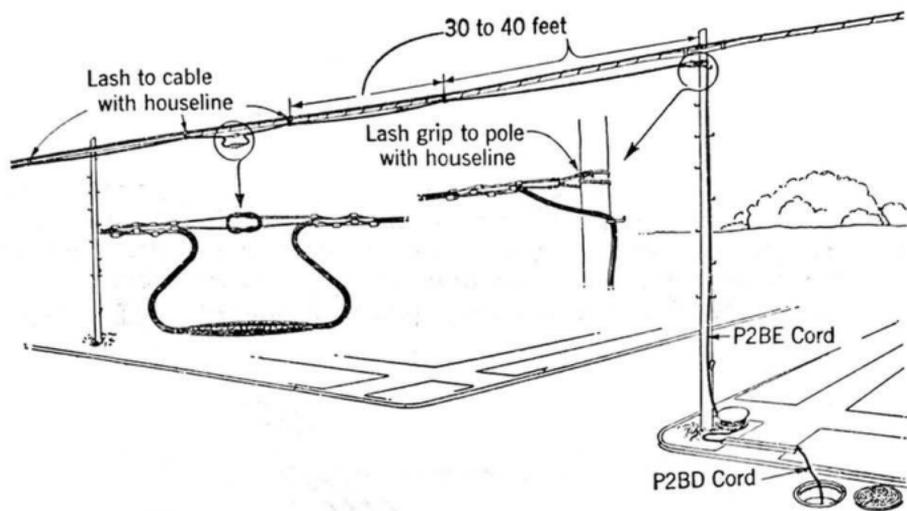
6.02 The plug and jack connections should be protected against moisture by wrapping as shown below.



6.03 **Installing and Protecting Cords:** If the cords are laid across a hard surfaced road, a bridge made from wood planks should be provided to prevent damage by vehicles. On dirt roads and lanes the cords can be laid in a shallow trench, protected with a plank to prevent crushing, then back filled.

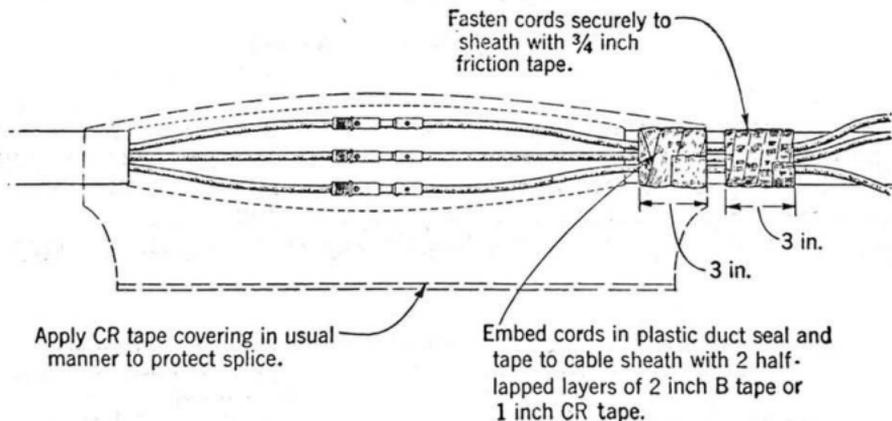


6.04 The following sketch illustrates the general arrangement where the patching cord is carried across a road by supporting it from an existing cord. The wire grip method of fastening adjacent lengths and securing the cord to the end pole is shown.



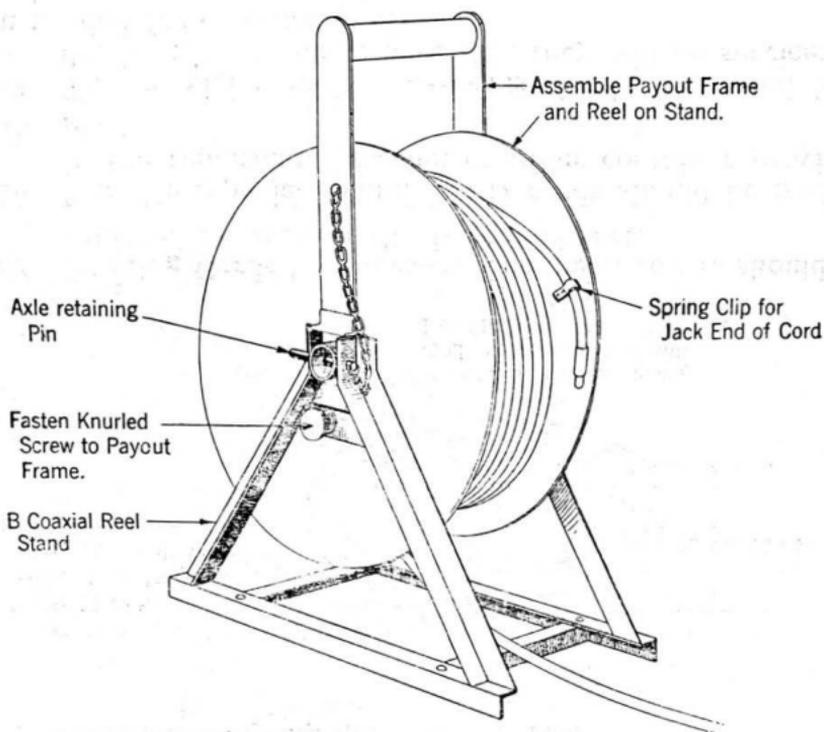
## 7. TEMPORARY SPLICE PROTECTION

7.01 After placing the 479-type jacks and connecting the cords at a splice, the splice can be protected with CR tape as illustrated below.



## 8. PREPARING CORDS FOR STORAGE

8.01 **Rewinding Cords:** On completion of the job, each 600-foot length of coaxial cord should be carefully rewound on a reel. To facilitate rewinding the reel and payout frame are assembled on the B coaxial reel stand as illustrated below.



#### METHOD OF REELING CORD

- 1.- Secure Jack end of cord in spring clip.
- 2.- Turn Reel by hand. Wind cord on Reel smoothly and without overlapping turns.
- 3.- Leave sufficient slack in last turn to permit connecting Plug and Jack and facilitate applying tape protection.
- 4.- As cord is being reeled, wipe off with cloth to remove dirt.

8.02 If the cord is being drawn along the ground, the plug at the outer end should be protected with a half-lapped layer of friction tape to prevent dirt entering the plug.

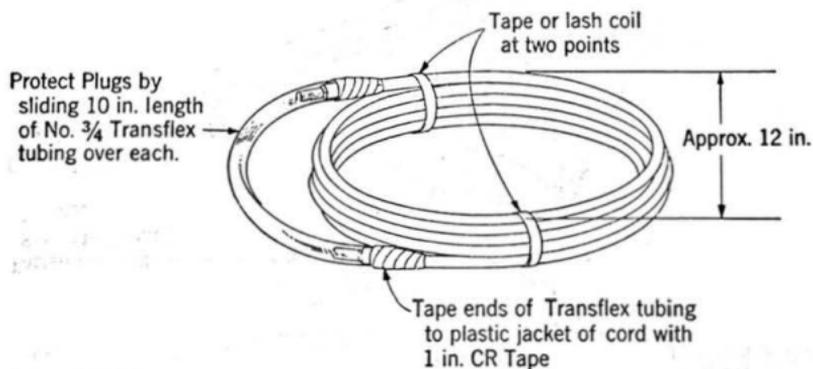
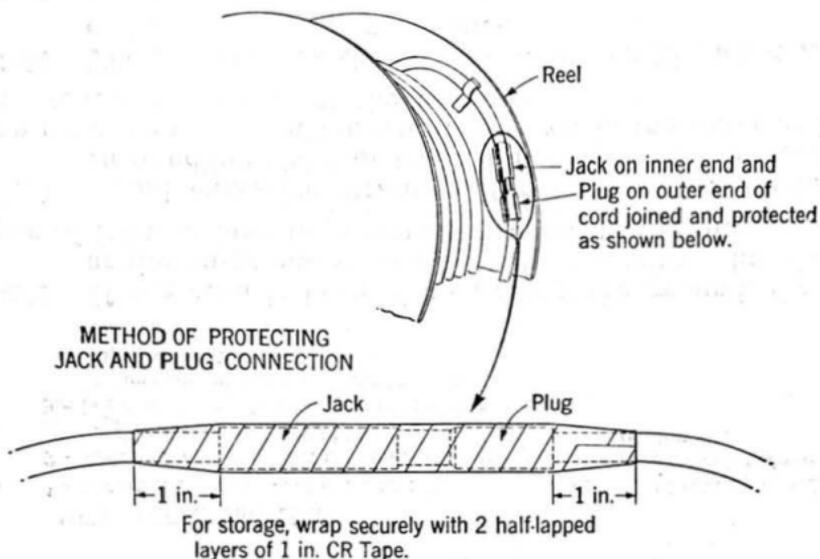
8.03 Avoid excessive strain on the cord during rewinding. In handling 600-foot lengths, it is advisable to station a man near the middle of the length to draw in the outer end and thus relieve the strain at the reel end.

8.04 The P2BD cords should be wound to a 12-inch diameter coil and taped at two points.

8.05 **Checking Condition of P2BD and P2BE Cords:** Before storing cords for future use, it is advisable to test each cord for shorts and opens with battery and receiver and then measure the insulation resistance with a megger. A reading of 50 megohms or higher between inner and outer conductor should be obtained. If the reading is less than 50 megohms, blow dry

nitrogen in each plug and jack for one or two minutes to remove any moisture that may be present and then repeat the test.

8.06 **Protecting Jacks and Plugs:** In order to keep the plugs and jacks on the cords clean and dry during storage, they should be protected as illustrated in the following sketches.



8.07 **Packing Cords for Storage:** The metal covers should be replaced on each of the B coaxial reels.

8.08 The 479-type jacks and P2BD cords should be packed in the repairman's satchel or other container provided for the purpose.

8.09 The coaxial patching materials should be stored in a dry location to make sure that they will be serviceable when needed for emergency use.