



C Rural Wire Description, Precautions, Attachments, and Placing Operations

Contents	Page
1. Overview	1
2. Description	1
3. Precautions	2
4. Placing	3
5. Sagging	5
6. Attaching to Poles	5

Contents	Page
7. Attaching to Crossarms	12
8. Attaching to Trees	14
9. Parallel Runs on Same Pole Line	18
10. Electrical Protection	19

Figures

1. C Rural Wire—Cross-Section — Typical Dimensions	2
2. Wire Placed with Snatch Block	4
3. Wire Dead Ended Without a Guy	6
4. Wire Dead Ended with a Guy	6
5. Placing Dead End Support (AT-7674)	7
6. Attachment to Poles (In-Line) — Change in Grade and Corner	9
7. Dead-End Wire in Both Directions	10
8. Poles—Corner with Over 3.05 meters (10 Feet) or Change in Grade Over 10 Degrees	11
9. Attaching to Crossarm on Corner Poles with Pull Up to 3.05 Meter (10 Feet)	12
10. Attaching to Crossarm on Pole with 3.05 to 15.25 meters (10- to 50-Foot) Pull	13
11. Tree Attachment — Corner of 1.52 meters (5 Feet) or Less	15

Contents	Page
12. Tree Attachment — Corner of More Than 1.52 meters (5 Feet), but Less Than 6.1 meters (20 Feet)	16
13. 107-Type Wire Terminal	17
14. Parallel Runs on Same Line	18

1. Overview

- 1.01** This practice describes C rural wire and outlines precautions, attachments, and placing operations.
- 1.02** This practice is reissued to convert all mathematical expressions and measurements to the metric equivalent.
- 1.03** Information formerly contained in AT&T 624-700-200 and 624-700-205 are included in this practice.
- 1.04** AT&T welcomes your comments on this practice. Your comments will aid us in improving the quality and usefulness of AT&T documentation. Please use the Feedback Form provided at the back of this practice.
- 1.05** Additional copies of this practice and any associated appendixes may be ordered from the AT&T Customer Information Center as follows:
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- 1.06** This practice is issued by:
- Document Development Organization
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2. Description

- 2.01** The C rural wire (Figure 1) is a self-supporting insulated paired wire for use in aerial distribution of telephone circuits. It consists of two parallel 1.6 mm (14 gauge), 30 percent conductivity, extra high strength copper-plated steel conductors insulated with high density polyethylene. A single ridge is molded in the insulation to provide conductor identification. The wire weighs approximately 15.88 kilograms (35 pounds) per 304.9 meters (1000 feet) and has a breaking strength of 1100 pounds. It can be used in spans up to 76.23, 167.70, and 182.94 meters (350, 550, and 600 feet) in the heavy, medium, and light storm loading areas, respectively.

2.02 The C rural wire shall not be used in place of drop wire for the span between a pole and a building.

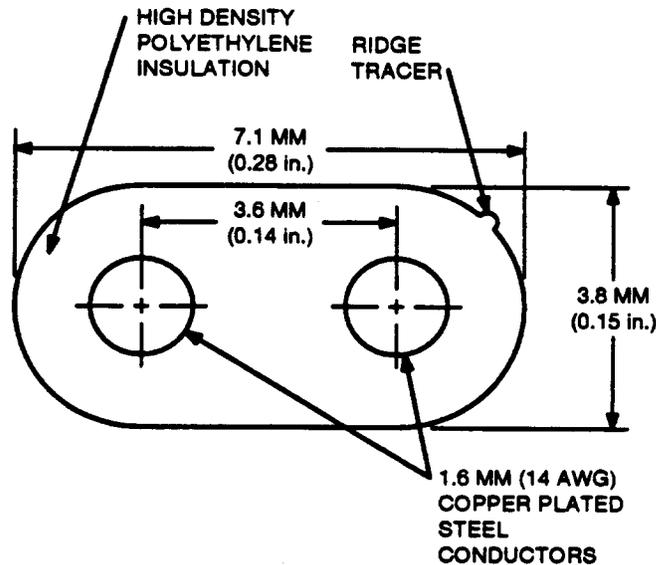


Figure 1. C Rural Wire—Cross-Section — Typical Dimensions

3. Precautions

- 3.01 Before starting operations, check that all easements and right-of-ways are in order.
- 3.02 The precautions, placing, protection, splicing, etc., described in the 462 Division of the AT&T Practices for C rural wire shall be observed unless otherwise specified.
- 3.03 The safety precautions contained in the following practices shall be observed:

Number	Title
AT&T 081-705-102	188A Test Set (Stop Light) Description and Use
AT&T 620-131-010	Precautions To Be Taken Before Climbing Poles or Working from Strand- or Pole-Supported Equipment
AT&T 620-100-011	Minimum Approach Distances to Exposed Energized Power Conductors
AT&T 620-132-010	Testing — General

AT&T 620-133-010 Temporary Supports

AT&T 620-105-010 B-Voltage Tester-Use on Joint Use Poles and Other Equipment, Observations and Tests To Be Made Before Climbing

3.04 The following precautions shall be observed when placing C rural wire on joint-use poles, at power line crossings, and in nonjoint-use situations involving electric induction from power lines.

- (a) **Joint-Use Construction:** Prior to placing the initial section of wire when placing from a moving reel or prior to sagging when placing from a stationary reel, connect both conductors to an effective ground such as a grounded metallic cable sheath or multigrounded neutral wire. Additional sections of wire shall be grounded either as indicated for the initial section or by bonding the conductors of both sections. Adequate precautions shall be taken to prevent the wire from contacting power conductors. Rubber gloves shall be worn during stringing and sagging operations and during the operation of grounding the conductors when the wire has been placed from a stationary reel.
- (b) **Power Crossings:** Temporary ties or supports shall be used to prevent contact with the electric conductors in the crossing span. (See AT&T 623-101-010.) Insulating gloves shall be worn during stringing and sagging operations.
- (c) **Electric Induction From Power Lines:** In joint-use construction or in nonjoint-use construction where electric induction is sufficient to require drainage, the precautions contained in paragraph 3.04(a) will also serve to reduce the effects of electrical induction. In nonjoint-use construction where grounds as specified in paragraph 3.04(a) are not available, connection of the conductors to grounds such as anchor rods, down guys, or ground rods should be made to reduce the effects of electrical induction.

3.05 If the wire is to be placed using an aerial lift truck, review the 649 Division of the AT&T Practices which cover the description and operation of approved aerial lifts. All safety precautions given in the applicable practice are to be observed.

3.06 The polyethylene insulation on C rural wire has low crushing strength; therefore, the wire should be handled carefully when pulled over drive hooks or other small radius supports. Place P wire guards at all contact points to prevent damage to insulation when C rural wire is placed through trees.

3.07 Vehicular traffic should not be allowed to pass over wire. The wire should be suspended temporarily above roads, driveways, etc., or adequately protected by planks or other means to prevent damage to the conductor insulation.

4. Placing

4.01 The C rural wire may be placed by the aerial lift vehicle and the moving reel method where the terrain is suitable for the operation of a vehicle along the pole line on which the wire is to be placed. The C rural wire should be placed on the road

side of the line where possible, but may be placed on the field side of the line. The vehicle should move in the direction of traffic whenever practical.

4.02 When placing C rural wire from a moving reel, the wire may be lifted with a wire raising tool and laid over a drive hook. At corners where the wire pulls against the hook (inside corners) and at poles where downward change in grade exceeds 10 percent, support the wire during placing and sagging with a 5101 snatch block attached to the drive hook. (See Figure 2.)

4.03 The C rural wire may be pulled over drive hooks from a stationary reel except at corners where the wire pulls against the hook and at poles where the downward change in grade exceeds 10 percent. At such locations, support the wire during placing and sagging with a 5101 snatch block as shown in Figure 2. Prevent the wire from dragging over obstructions in the span by use of a wire payout reel equipped with a B reel brake placed between the wire supply reel and the first pole of the wire run. A single turn of wire is made around the payout reel, and tension is maintained by the reel brake. Do not pass the wire through the loop on the reel brake tension arm.

4.04 The dead-end support may be used where temporary dead ends are required to maintain clearances during placing operations.

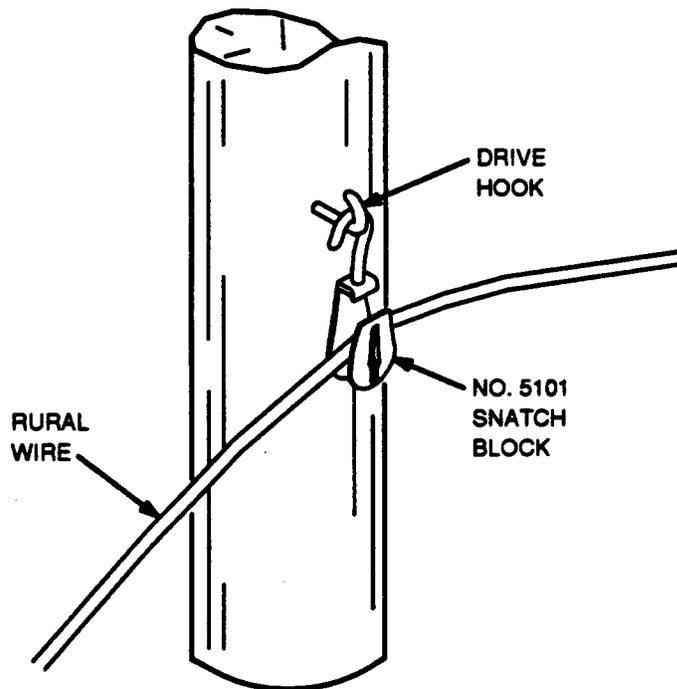


Figure 2. Wire Placed with Snatch Block

5. Sagging

- 5.01** Sag C rural wire in accordance with the sag tables in the 462 Division of the AT&T Practices.
- 5.02** The dead-end support can be used as a temporary grip during the sagging operation.
- 5.03** The C rural wire should not be pulled around corners exceeding a 3.05 meters (10-foot) pull during the final sagging operation. In leads where such corners exist, it will be necessary to sag the wire by sections and to dead end the wire in both directions.

6. Attaching to Poles

- 6.01** After sagging, but before making the pole attachment, introduce at least ten complete twists (in either direction) into the wire in each span. This will minimize noise from power line induction as well as the dancing of the wire in high winds. These twists may be placed in two spans of wire at an intermediate pole, after the attachments have been made to the adjacent poles, by lifting the D wire support at the intermediate pole and rotating it through ten complete turns before placing it on the drive hook. Where there is an odd number of spans, rotate the D wire support at the pole between the last span and the next-to-last span through ten complete turns in the same direction as the last previous rotation. This will introduce 20 twists into the next-to-last span in order to get 10 twists into the last span.
- 6.02** Attachments at dead-end poles are made with the dead-end support as shown in Figures 3 and 4.

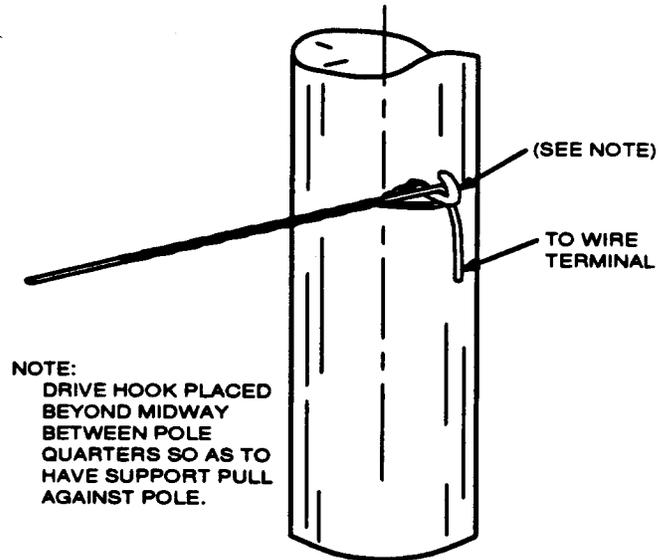


Figure 3. Wire Dead Ended Without a Guy

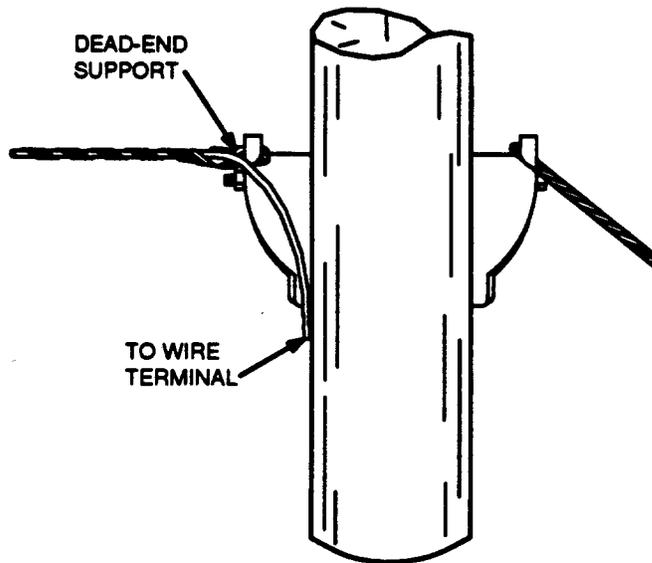


Figure 4. Wire Dead Ended with a Guy

6.03 The dead-end support can be applied to the C rural wire (Figure 5) as follows:

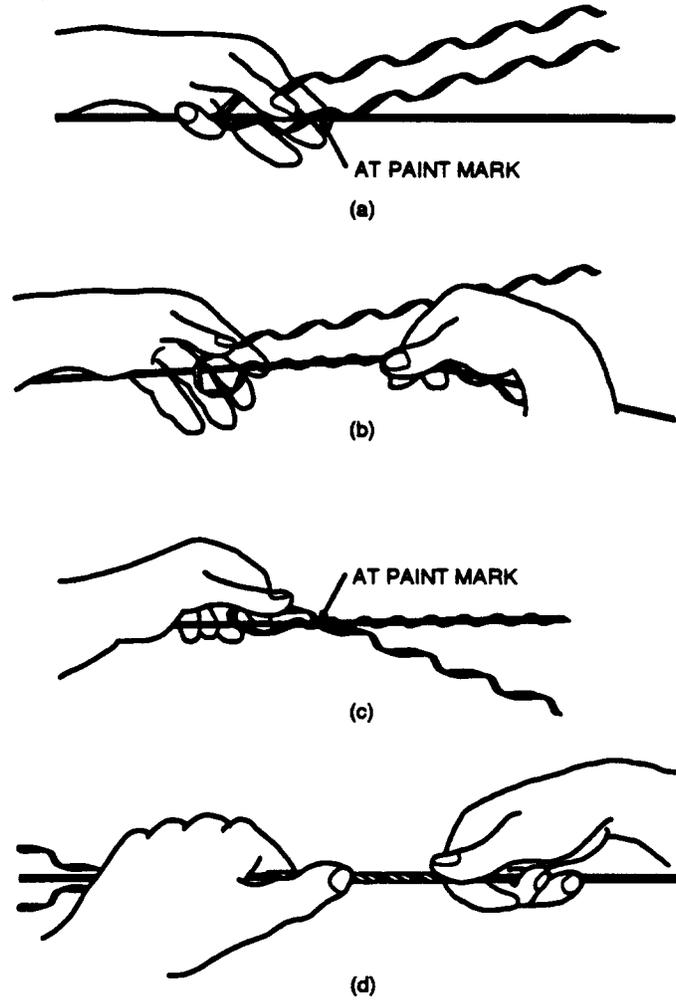
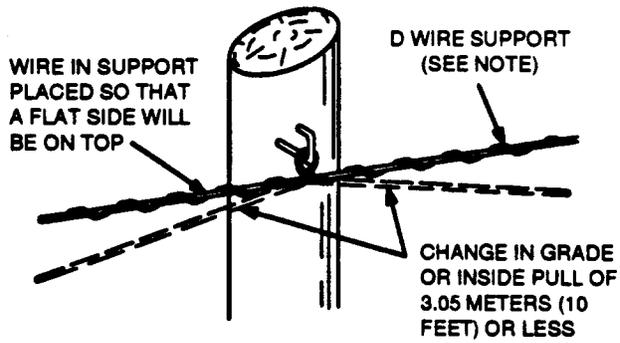
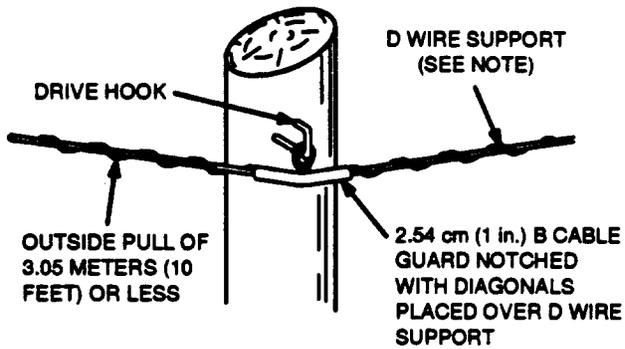


Figure 5. Placing Dead End Support (AT-7674)

- (1) Hold the support with the eye toward or engaged with the pole hardware. Place the wire between the spirals in one of the legs at the point indicated by the colored paint marking.
 - (2) Wrap the leg around the wire, using the thumb and forefinger and working from the point of contact near the eye toward the tail of the leg. Wrap the entire length of the leg around the wire. Do not wind by holding the tail end of the leg.
 - (3) Cross the second leg over the first at the color-marked points, and wrap it around the wire in the same manner.
 - (4) Make sure the end of each leg is completely over the wire. It may be necessary to snap in the end with thumb pressure.
- 6.04** Attachments on in-line poles with a change in grade or on corner poles with up to a 3.05 meters (10-foot) or less pull are made with the D wire support as follows:
- **CONDITION A** (Figure 6) shows attachments to in-line poles with changes in grade up to 10 degrees and attachment to inside corner poles with a 3.05 meters (10-foot) or less pull.
 - **CONDITION B** (Figure 6) shows attachments to outside corner poles with pulls of 3.05 meters (10-feet) or less.



CONDITION A



CONDITION B

NOTE:
WIRE SUPPORT CAN BE OF 1-WIRE
OR 2-WIRE CONSTRUCTION

Figure 6. Attachment to Poles (In-Line) — Change in Grade and Corner

⇒ NOTE:

In high-wind areas where dancing can be expected, all attachments should be made as described in paragraph 6.06.

6.05 Where attachments are made to poles adjacent to road crossings, C rural wire shall be dead ended in both directions, as illustrated in Figure 7.

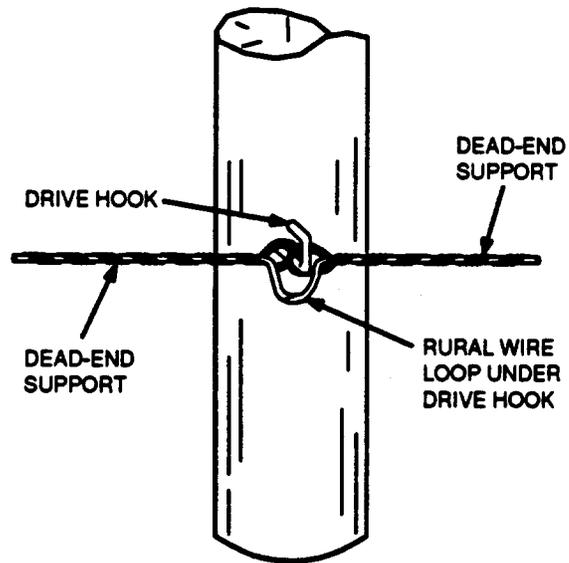
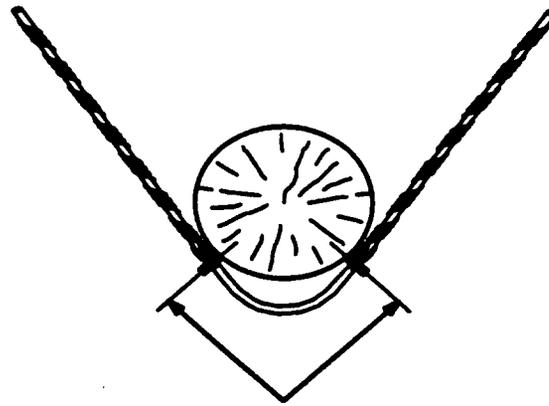


Figure 7. Dead-End Wire in Both Directions

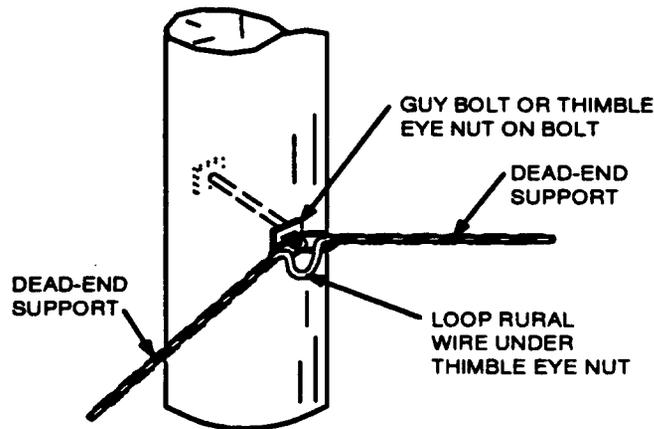
6.06 At corner poles where the pull is more than 3.05 meters (10 feet) or at poles where the change in grade is greater than 10 percent, dead end the C rural wire from both directions as follows:

- **CONDITION A** (Figure 8) shows attachments at outside corners where there is more than 3.05 meters (10 feet) of pull.
- **CONDITION B** (Figure 8) shows attachments at inside corners where there is more than 3.05 meters (10 feet) of pull.



DRIVE HOOKS SPACED SO THAT DEAD-END SUPPORTS WILL PULL TOWARD POLE

CONDITION A



CONDITION B

Figure 8. Poles—Corner with Over 3.05 meters (10 Feet) or Change in Grade Over 10 Degrees

7. Attaching to Crossarms

- 7.01 The same twists described in paragraph 6.01 should be carried out when attaching to a crossarm.
- 7.02 Attachments to crossarms on in-line poles and on poles with corners up to 3.05 meters (10 feet) of pull are made with the C wire support as shown in Figure 9. Other C rural wires can be run parallel to the first, provided a separation of at least 7.62 cm (3 inches) is maintained.
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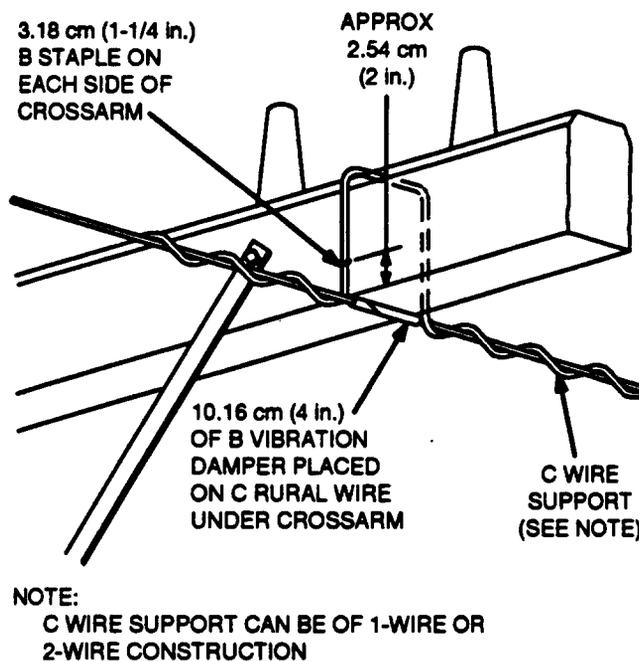


Figure 9. Attaching to Crossarm on Corner Poles with Pull Up to 3.05 Meter (10 Feet)

- 7.03 Dead ends for C rural wire attached to crossarms should be made at the pole in accordance with paragraph 6.02.

7.04 Corners where the pull is more than 3.05 meters (10 feet) and less than 15.25 meters (50 feet) can be made on the crossarms by using guard arm hooks as shown in Figure 10. At corners with over 15.25 meters (50 feet) of pull, the wire should be dead ended in the usual manner. When the corner is made with a double arm, attach one guard arm hook in each crossarm to hold the dead-end support.

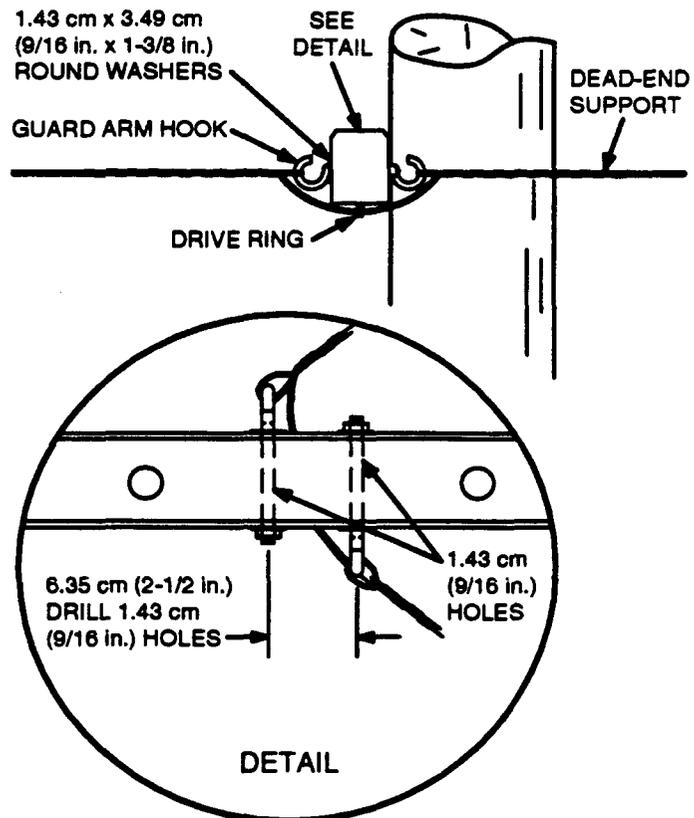


Figure 10. Attaching to Crossarm on Pole with 3.05 to 15.25 meters (10- to 50-Foot) Pull

8. Attaching to Trees



DANGER:

Climbers should not be used when climbing trees.

8.01 Trees may be used for supporting C rural wire in areas where it is considered uneconomical to use poles, and where there are trees suitable for making attachments. Trees selected for attaching C rural wire should be alive, sound, and at least 20.32 cm (8 inches) in diameter at the point of the attachment.

8.02 A tree attachment consists of:

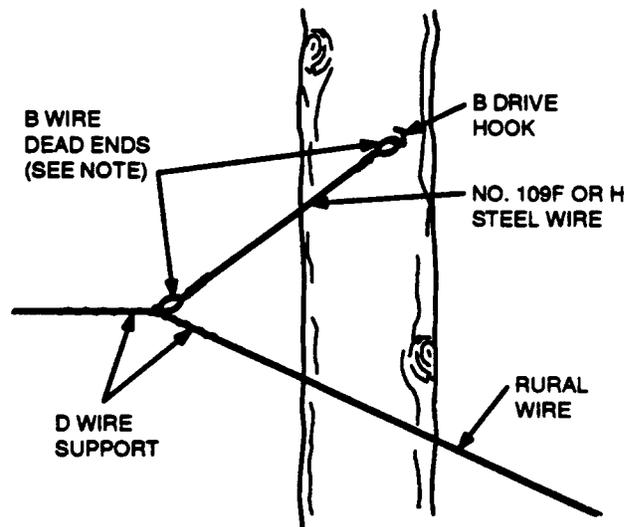
- (a) A sling made from a length of 109H or 109F steel line wire with a B wire dead end or wire vise at each end
- (b) A drive hook for securing one end of the sling to the tree
- (c) Supports (D wire or dead ended) for connecting the other end of the sling to C rural wire.

8.03 The route of the wire, while using a zigzag pattern, should be as direct as practical. The trees should be sufficiently out of line to prevent tree and wire contact when attachments are placed. A pull of 0.91 to 1.52 meters (3 to 5 feet) is adequate. A pull of 6.1 meters (20 feet) or more should be avoided. Where corners with pulls over 6.1 meters (20 feet) cannot be avoided, make dead-end attachments directly to the tree on separate drive hooks for each direction. The distance between dead-end attachments should conform to spans outlined in paragraph 8.06. The attachments and wire shall be located to maintain proper clearance when loaded with snow or ice as well as when under normal conditions.

8.04 Class 9 or 10 poles may be used to improve alignment, maintain ground clearance, or to shorten span lengths where suitable trees are not available. These poles should be located 0.61 or 0.91 meters (2 or 3 feet) out of line so that the C rural wire can be suspended in the sling, pulling away from the pole. To maintain the flexibility of the tree line construction, attachments to these poles should be the same as those used for trees.

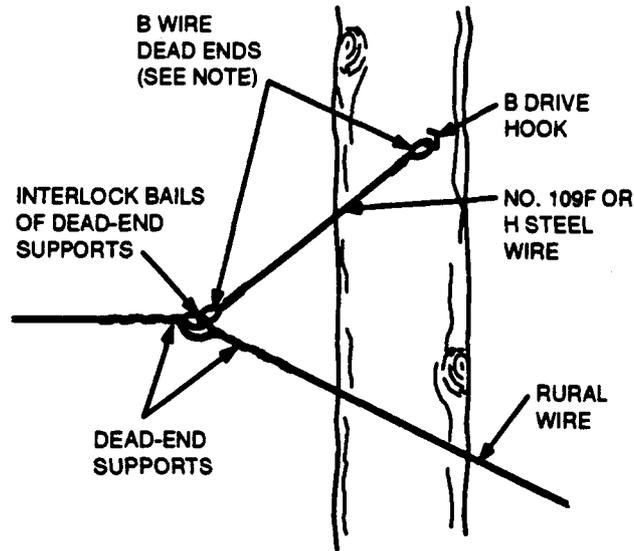
8.05 The spans between dead-end attachments should be as uniform as practical to prevent uneven distribution of slack in the wire. If possible, a dead-end attachment should be made about every 0.805 km (1/2 mile) to facilitate construction and maintenance.

- 8.06** Use drive hooks to make attachments to trees. Drive the hook until the opening between the drive hook and tree is about 1.27 cm (1/2 inch). Do not remove the bark from the area around the drive hook. If it is necessary to replace a drive hook, remove the original hook from the tree.
- 8.07** Drive hooks placed in trees should be at an angle to the wire route to prevent the hook from pulling out of the tree by any stress placed on the line, such as ice or falling limbs.
- 8.08** Slings should be at least 1.22 meters (4 feet) long. Shorter slings may be used if necessary, but are undesirable because they reduce the amount of slack and flexibility in the line.
- 8.09** For attaching the sling to the C rural wire and drive hook, use the B wire dead end or the 109 wire vise. Do not use the 109 wire vise in a corrosive area.
- 8.10** Figures 11 through 13 illustrate attachments to trees.



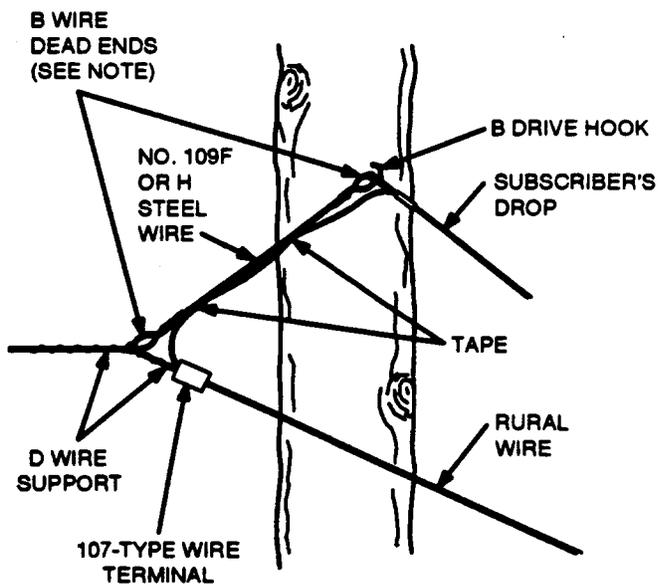
NOTE:
WHERE B WIRE DEAD-ENDS OR WHERE SUPPORTS INTERLOCK, A 0.79 cm (5/16 in.) THIMBLE IS USED.

Figure 11. Tree Attachment — Corner of 1.52 meters (5 Feet) or Less



NOTE:
WHERE B WIRE DEAD-ENDS OR WHERE SUPPORTS
INTERLOCK, A 0.79 cm (5/16 in.) THIMBLE IS USED.

Figure 12. Tree Attachment — Corner of More Than 1.52 meters (5 Feet), but Less Than 6.1 meters (20 Feet)



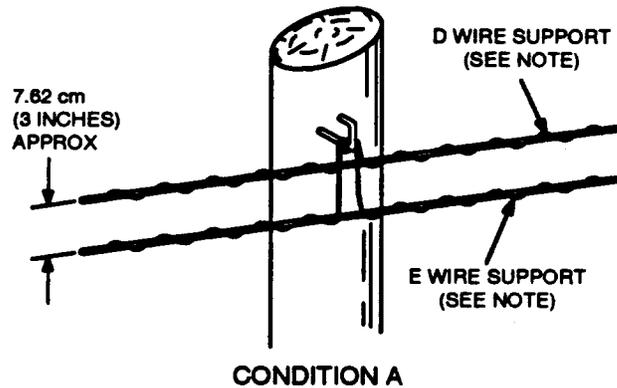
NOTE:
WHERE B WIRE DEAD-ENDS OR WHERE SUPPORTS
INTERLOCK, A 0.79 cm (5/16 in.) THIMBLE IS USED.

Figure 13. 107-Type Wire Terminal

9. Parallel Runs on Same Pole Line

9.01 Two or more parallel C rural wires on the same pole should be separated from each other by at least 7.62 cm (3 inches). Care should be taken to adjust the sags in these spans so that the lower wire will have a larger sag than the upper wire. At in-line poles and at corner poles with pulls up to 3.05 meters (10 feet), a second C rural wire can be attached to the same drive hook by using the E wire support as follows:

- **CONDITION A** (Figure 14) shows an attachment at an in-line pole or pull away from the pole at corners up to 3.05 meters (10 feet) of pull.
- **CONDITION B** (Figure 14) shows attachments at outside corners with up to 3.05 meters (10 feet) of pull.



NOTE:
CAN BE OF 1-WIRE OR
2-WIRE CONSTRUCTION

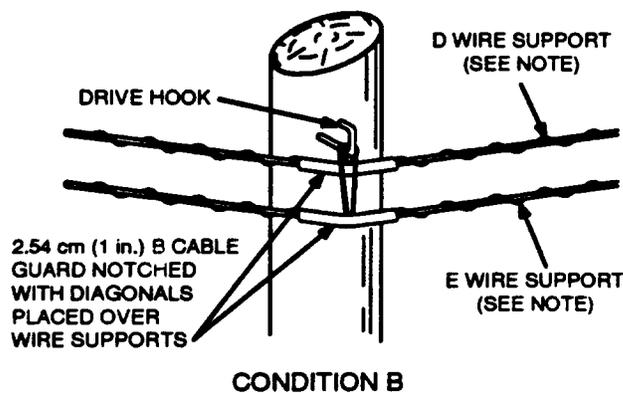


Figure 14. Parallel Runs on Same Line

9.02 The second C rural wire at dead-end poles and at corners with more than 3.05 meters (10 feet) of pull should be attached on its own attachments in the same manner as the first wire with a minimum separation of 7.62 cm (3 inches) from the first wire.

10. Electrical Protection

10.01 Subscriber stations that are served by C rural wire require a fuse-type station protector. However, a fuseless-type station protector may be used when both of the following conditions are met:

- (a) The subscriber drop wire is connected to the C rural wire by a fuse link of E block wire (the 462 Division of the AT&T Practices)
- (b) The station protector is grounded to a water pipe or to the ground (or electrode) of a multigrounded neutral power system (AT&T 462-005-100).

10.02 When C rural wire is placed jointly with power circuits less than 2900 volts to ground (5000 volts phase to phase), no special protection is required for the wire unless lightning protection is specified.

10.03 When C rural wire is placed jointly with power circuits exceeding 2900 volts to ground and less than 11,500 volts to ground (20,000 volts phase to phase), the type and location of protection required should be specified on the detail construction plans. However, protectors are not required under the following conditions:

- (a) When C rural wire is installed below a metallic sheath telephone cable
- (b) When C rural wire is installed below open wire telephone circuits on crossarms or brackets
- (c) On leads of 304.9 meters (1000 feet) or less in length fed directly from cable.

10.04 When C rural wire is placed jointly with power circuits exceeding 11,500 volts to ground, the detail construction plans should specify the type and location of the protection.

10.05 The need for lightning protection at junctions of C rural wire and other types of plant will depend upon the degree of exposure of the wire. The detail construction plans should specify the type and location of this protection when it is required.