

## ELECTRIC GROUNDING AND WIRING REQUIREMENTS

### BOOTHS—METAL

**1.02** Commercial power of 110- to 125-volt, 15-ampere ac is necessary for operation of blower and illumination of lamps.

**1.03** Wiring shall be installed to meet requirements of the National Electrical Code, local governmental regulations, and approved practices and standards of the local telephone company.

#### 2. ELECTRIC WIRING

**2.01** Electric wiring to metal booths and mountings is terminated on a standard 3-wire grounded receptacle mounted within the booth and designed to accept a standard plug with U-shaped grounding pin. All lamp and blower cords plug into this receptacle.

**2.02** The green or grounding terminal of the power receptacle is connected internally to the mounting lugs. When the receptacle is installed in the booth, the grounding circuit is completed between metal booth and grounding terminal of receptacle.

**2.03** No. 14 AWG conductors are used for electrical wiring of metal booths. A 15-ampere fuse or circuit breaker must be located in the power circuit to the booth.



*Rigid grounding requirements are necessary to ensure deenergizing of electrical circuit if a defect or fault occurs. This is accomplished by connecting all metal parts of the booth/mounting electrically to the power system ground.*

**2.04** Booths may be directly wired by conduit, armored cable, or connected to a receptacle with one of the following three power cable assemblies, which supersede all cable assemblies previously used:

- KS-19425, List 22 cable assembly (Fig. 2)—Used to bring power into the top of an indoor booth.
- KS-19580, List 30 power cord assembly (Fig. 3)—Used to bring power into the top of an outdoor booth.
- KS-19580, List 31 power cord group (Fig. 4)—Used to bring power into the bottom of an indoor or outdoor booth.

**2.05** A weatherproof power receptacle supplied by local electrician, should be used on all outdoor installations using the KS-19580, List 30 or List 31 power cords.

**2.06** Fig. 6 and 7 are typical outdoor power connections.

#### 3. POWER GROUNDING

**3.01** The metal booth power-grounding requirements are as follows:

- (a) If power is supplied to the booth by means of a metallic conduit, electric metallic tubing, or armored cable, the metal enclosure of the wiring usually provides a protective grounding path for the return of accidental fault currents to the power equipment. Wherever possible, this path should be paralleled by a third No. 14-gauge conductor within the enclosure to ensure continuity. This third wire may be bare copper or have a green colored insulation.
- (b) *If the third conductor has not been provided, and if the booth is located outdoors as a separate structure apart from the building serving the power, ground the booth in the following manner.*

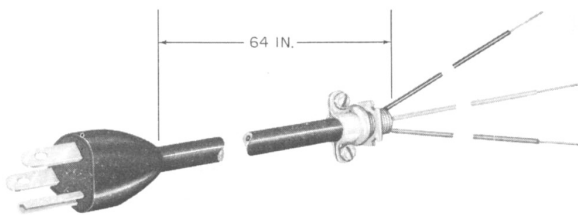


Fig. 2—KS-19425, List 22 Cable Assembly

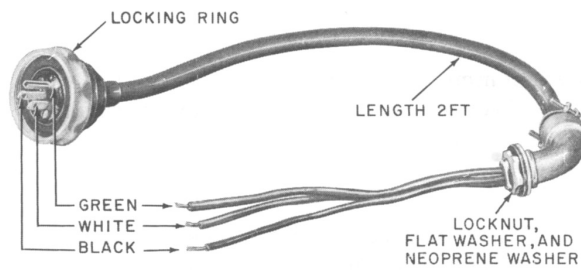


Fig. 3—KS-19580, List 30 Power Cord Assembly

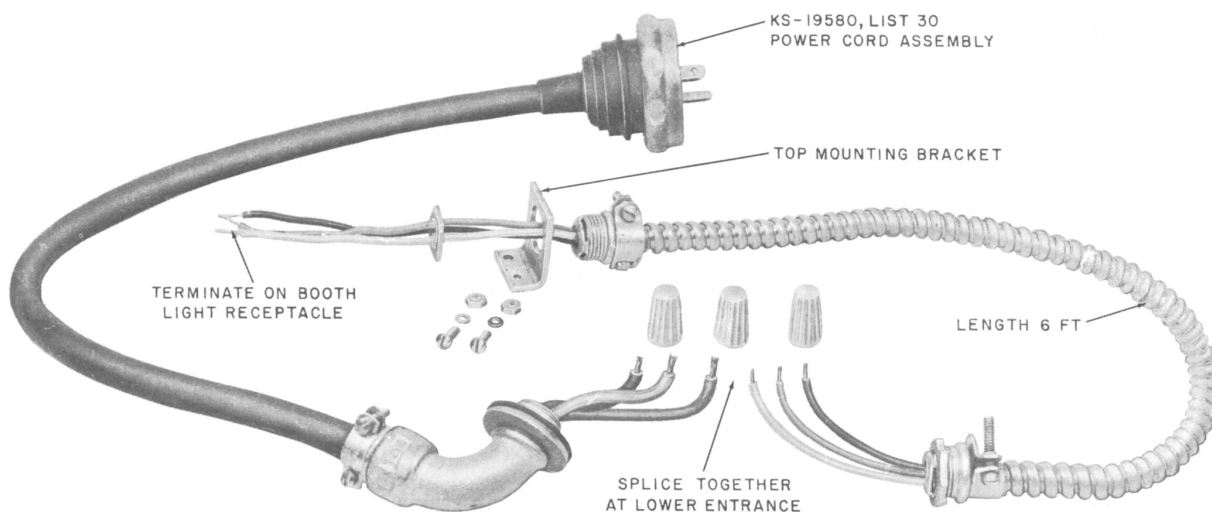


Fig. 4—KS-19580, List 31 Power Cord Group

(c) *If the third conductor has not been provided, and if the booth is located indoors, or outdoors against the building serving the power, the circuit must be rewired by an electrician to provide the grounding conductor.*

- (1) Have a local electrician interconnect the power neutral and protective ground terminal at the electrical receptacle.
- (2) Provide a power grounding electrode at the booth.

**Note 1:** A metallic conduit connected to the booth may serve as this electrode if a length of at least 10 feet of it is buried in permanently moist soil.

**Note 2:** If the booth is installed against a building with an accessible cold-water pipe, this water pipe may be connected to the booth with No. 6 AWG wire.

**Note 3:** If neither of the conditions in Notes 1 and 2 are met, a ground rod must be provided and connected to the booth with No. 6 AWG wire.

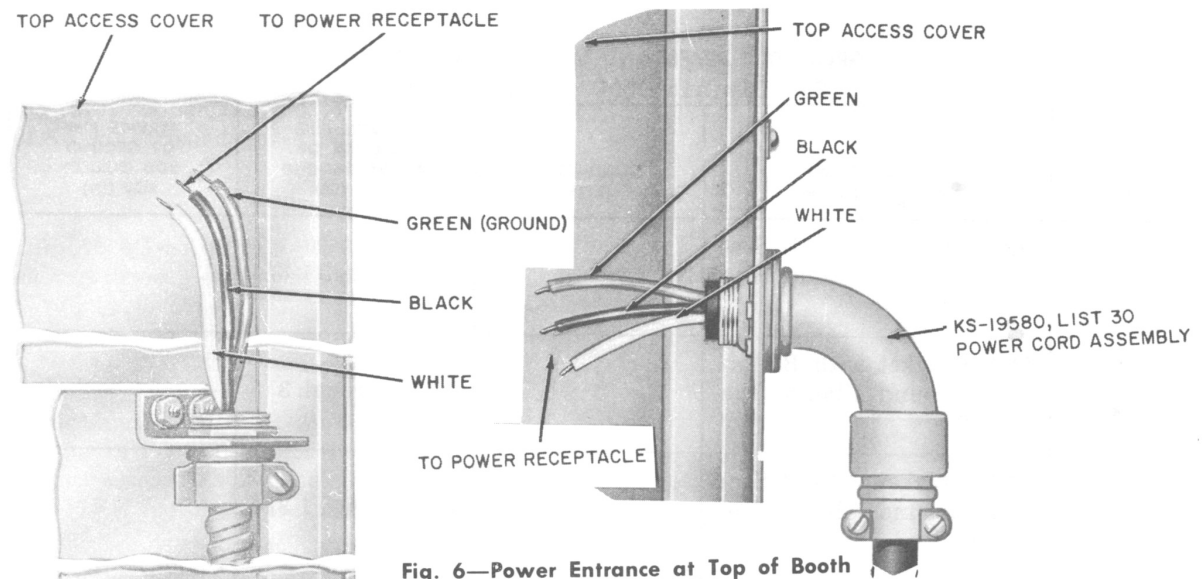


Fig. 6—Power Entrance at Top of Booth

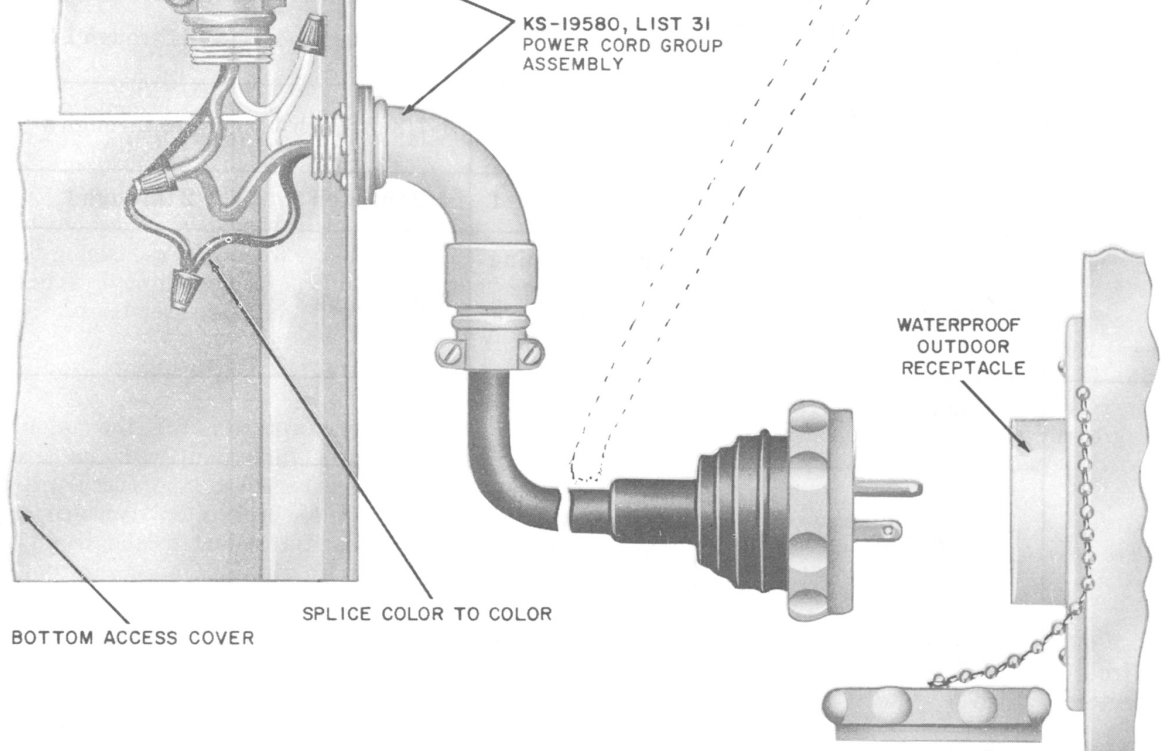


Fig. 7—Ground-Level Power Entrance

TABLE A

**GROUND CLAMPS AND WIRE CONNECTORS**  
(See Division 460 for Installation)

TYPE	BRACKET, CLAMP OR CONNECTOR	CONDUCTOR SIZE	SERVICE PIPE INTERIOR OR ABOVE GROUND SIZE (IN)	SERVICE PIPE OR GROUND ROD (BURIED) SIZE (IN)
Ground Clamps	72A Bracket with B Sta- tion Ground Clamp Size 6-3/4		3/8 through 1-3/4	
	72A Bracket with B Sta- tion Ground Clamp Size 12-1/2		1-7/8 through 3	
	90A Bracket with B Sta- tion Ground Clamp Size 6-3/4		3/8 through 1-3/4	
	90A Bracket with B Sta- tion Ground Clamp Size 12-1/2		1-7/8 through 3	
	B Station Ground Clamp Size 6-3/4	No. 14, 12, or 10	3/8 through 1-3/4	3/8 through 1-3/4
	B Station Ground Clamp Size 12-1/2	No. 14, 12, or 10	1-7/8 through 3	1-7/8 through 3
	B Ground Clamp	No. 8, 6, or 4	1/2 through 1	1/2 through 1
	L Ground Clamp	Small Opening No. 6; Large Opening No. 4 through 1/0	3/8 through 3	
Wire Connectors	E Connector Size 1	No. 14 through 4		
	E Connector Size 2	No. 4 through 1/10 and 8 through 4 Armored Bare Wire		
	AT-7796X Connector Size 6	No. 14 through 6		
	AT-7796X Connector Size 4	No. 8 through 4		
	AT-7796X Connector Size 2	No. 6 through 2		

## 5. BOOTH GROUNDING

**5.01** Always use No. 6 AWG wire when connecting a booth to an electrode.

**5.02** Electrode ground connections may be made as follows:

(a) **KS-19580 Outdoor Booth:** This booth is equipped with a ground lug near the bottom of the booth, behind the corner panel in the right rear corner (Fig. 8).

(b) **KS-19425 Indoor-Outdoor Booth:** This booth is equipped with a ground lug near the bottom of the booth in the right rear corner column. It is the same type as the one in the KS-19580 booth.

(c) **KS-14611 Outdoor Booth:** This booth is equipped with a 5/16—18 by 1-1/4 FHM screw with two 3/8-inch steel washers and one 5/16—18 hex nut (Fig. 9), located in the right rear corner on the mounting bracket. Wrap the ground wire around the screw, between the two washers as shown.

**Note:** Future reconditioned KS-14611 booths will have a ground lug similar to the KS-19580 booth.

(d) **KS-16797 Universal Booth:** This booth will require the use of the mounting bolt in the right rear corner for connecting the ground wire (Fig. 10) unless a KS-16797, List 21 junction box is used. When the junction box is used, the ground terminal in the junction box may be used for connecting ground wire.

**Note:** Future reconditioned KS-16797 booths will have a ground lug similar to the KS-19425 booth.

(e) **KS-19426 Walk-Up, Drive-Up Mounting:** For post mountings, use ground terminal in junction box behind post cover. For wall mountings, use grounding screw in electrical receptacle.

(f) **KS-16705 Walk-Up, Drive-Up Mounting:** Use threaded hole in post for ground screw or use mounting bolt which secures subscriber set housing to backboard.

(g) **KS-19206 Curved Door Booth and KS-19442 Glass Deluxe Booth:** These booths are for indoor installation only. Each is equipped with a 3-conductor cord for plugging into a grounded, 3-terminal electrical receptacle.

## 6. MULTIPLE BOOTH INSTALLATIONS

**6.01** When booths are installed in multiples, they should be bonded together for grounding purposes.

**6.02** Electrical power should be connected to the end booth and extended to remaining booths by running 3-conductor cables through knockouts provided in the roof and side assemblies.

## 7. STATION PROTECTOR GROUNDING

**7.01** The station protector for the telephone instrument is provided with its ground terminal already connected to the booth. If this ground lead becomes broken or damaged, bond the protector ground terminal to the booth with wire no less than No. 14.

**7.02** When a protector is located within the building where the booth is installed, the protector in the booth can be used as a connecting block and the connection between the ground terminal and the booth **should not** be removed.

**7.03** When a booth is located outdoors, a ground rod for protector grounding must be installed, unless:

(1) At least 10 feet of metallic conduit buried in permanently moist soil is connected to the booth, or

(2) The power ground rod of Multigrounded Neutral system is located adjacent to the booth—Bond the booth to the power ground rod with No. 6 wire, or

(3) A cold water pipe is available or a power ground rod has been installed as described in 3.01(b).

**Note:** The grounding conductor (third wire of an electrical wiring system) should never be used as the protector ground.

**7.04** Refer to the sections pertaining to station protection for detailed information.

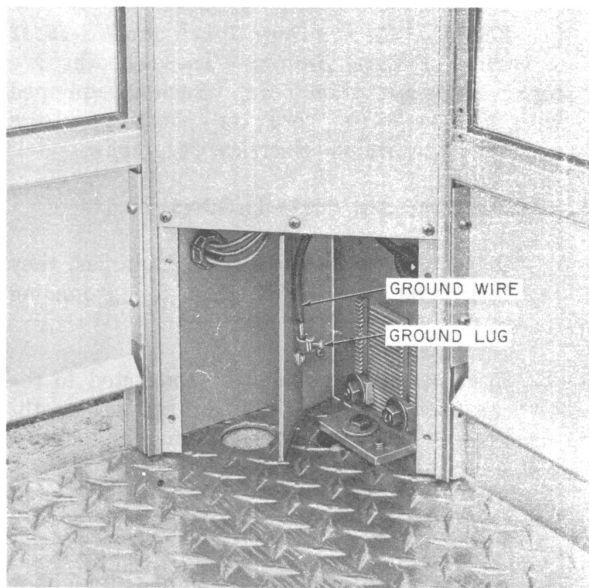


Fig. 8—Grounding Screw in KS-19580 Booth

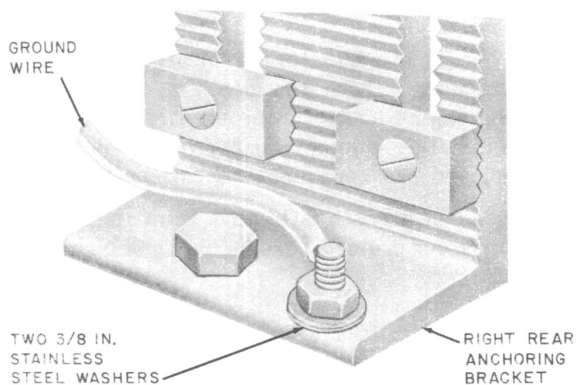


Fig. 9—Grounding Screw in KS-14611 Booth

## 8. INDIVIDUAL POWER SOURCE FOR BOOTH OR MOUNTING

**8.01** Refer to Fig. 11 and 12 for this type service. Similar installations may have the fuse and cutout switch mounted on an adjoining post or wall, on the booth/mounting, or on a service mast.

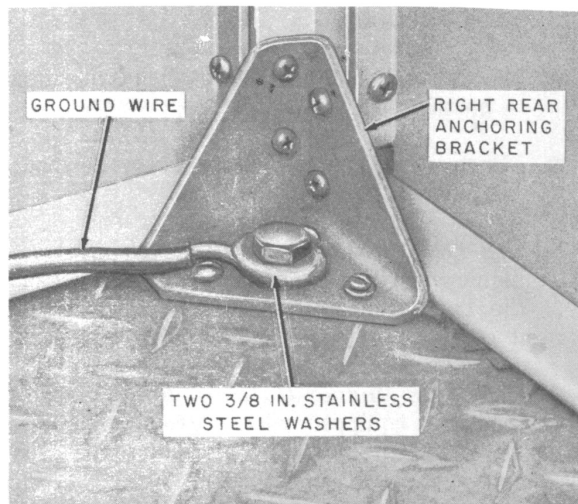


Fig. 10—Grounding Screw in KS-16797 Booth

**8.02** The connection is made directly to the power company secondary. The branch circuit conductors from the booth are connected in the service equipment cabinet.

**8.03** In these installations the power-grounding electrode will also be used as a booth-grounding electrode.

**8.04** Choice of ground for power service is given in the National Electrical Code. Refer to latest revision.

## 9. EXTENDING BRANCH CIRCUIT TO BOOTH OR MOUNTING

**9.01** This part describes those installations where a branch circuit from a building is extended to the booth by power cords, metal conduit, or open conductors.

**9.02** Where the branch circuit wiring in the building is metallically enclosed (conduit, EMT, AC cable, or raceway) the continuity of the metallic enclosure is depended upon to provide a grounding path back to the service equipment. This path is extended to the booth through the third conductor in the power cord, open wiring, or conduit. See 3.01.

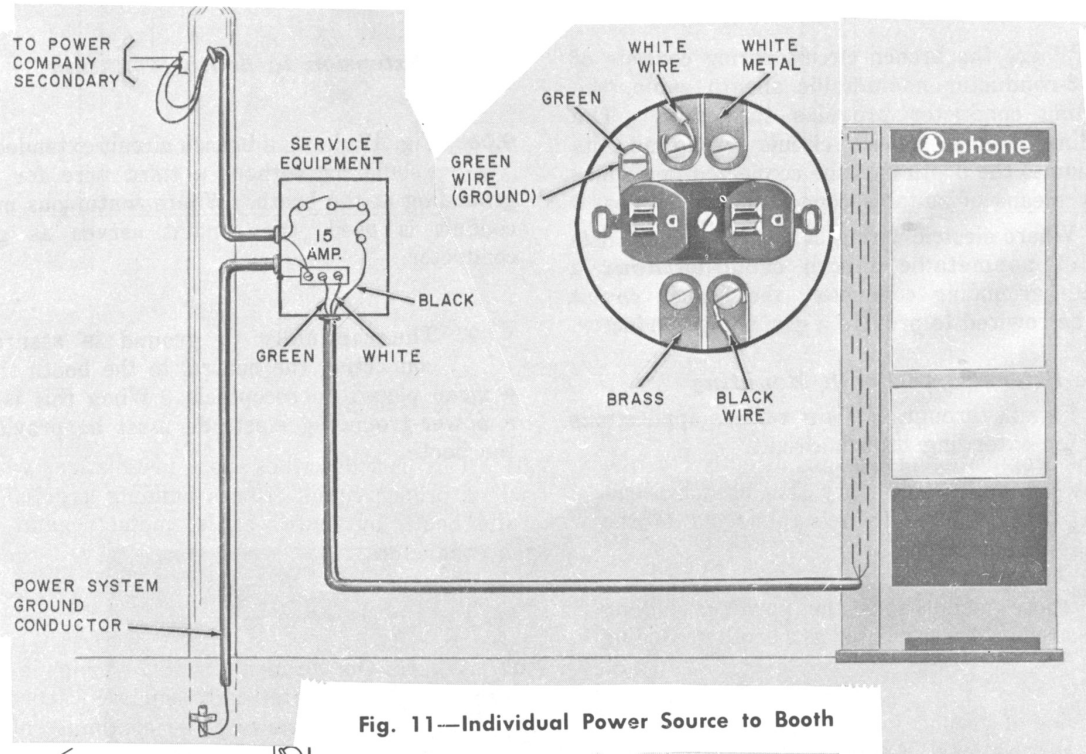


Fig. 11—Individual Power Source to Booth

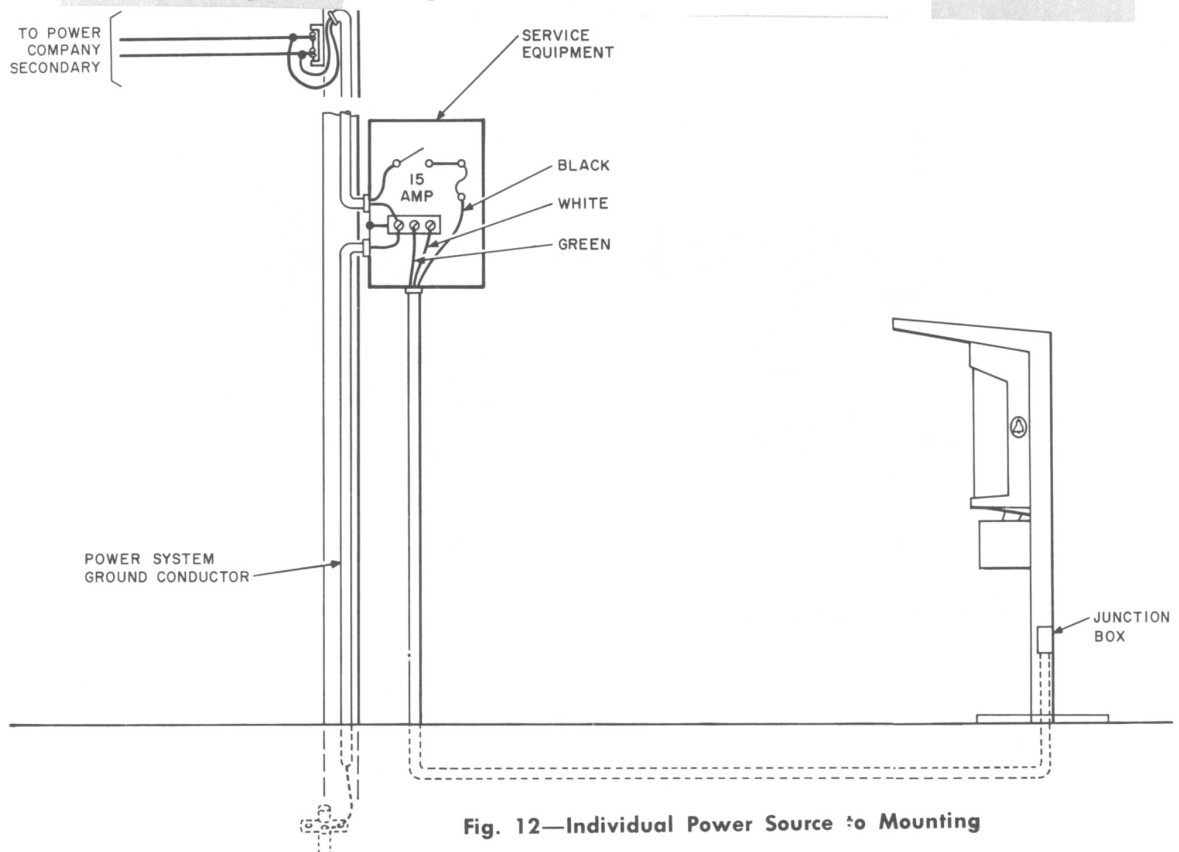


Fig. 12—Individual Power Source to Mounting

**9.03** Where the branch circuit wiring consists of 3-conductor nonmetallic sheath cable, the grounding conductor provides this path. The grounding path in branch circuit wiring and its extension to the booth must be connected in a splice box by means of suitable connectors or fittings.

**9.04** Where electric wiring in the building consists of nonmetallic sheath cable *without* a separate grounding conductor, the branch circuit *must* be rewired to provide a grounding conductor.

### 3-Wire Extension to Booth/Mounting

**9.05** Fig. 13 through 16 show various applications for extending branch circuit.

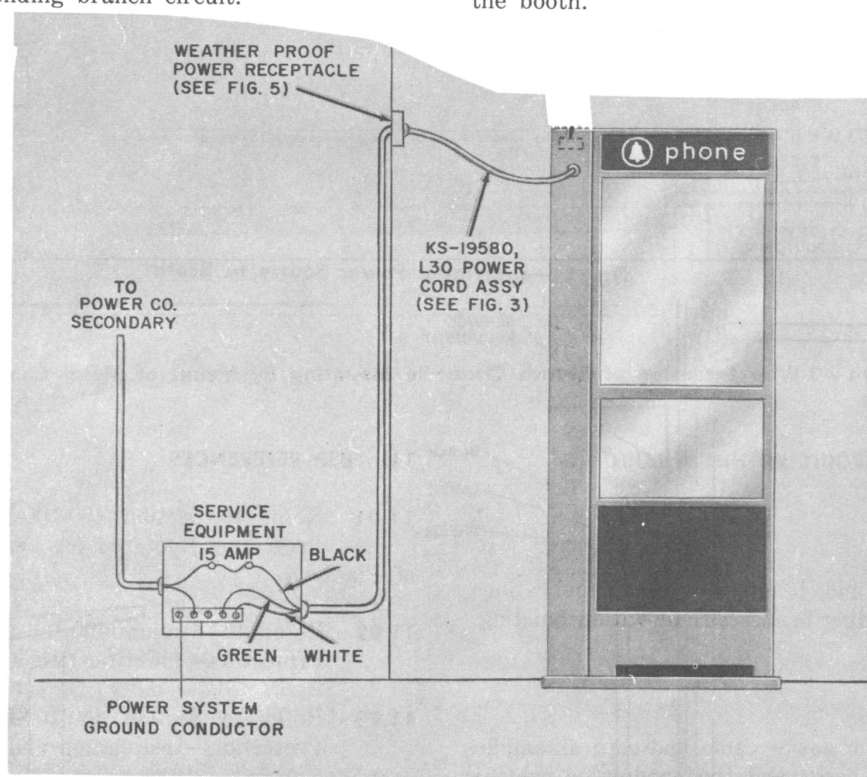


Fig. 13—3-Wire Extension of Branch Circuit to Booth By Means of Power Cord

### 2-Wire Extension to Booth/Mounting

**9.06** Fig. 17 shows a branch circuit extended from a building without a third wire for power grounding at the booth. Where continuous metallic conduit is used, the conduit serves as ground conductor.

**9.07** The continuity to ground is assured by connecting the neutral to the booth through a strap placed on receptacle. When this is done, a power-grounding electrode must be provided at the booth.

## 10. BRANCH CIRCUIT WITHIN A BUILDING

**10.01** Fig. 18 and 19 show various applications of extending branch circuit within building.

**10.02** When the power cable and cord assemblies are not used, and the conduit or cable is fastened directly to booth, grounding is provided as outlined in Part 9.



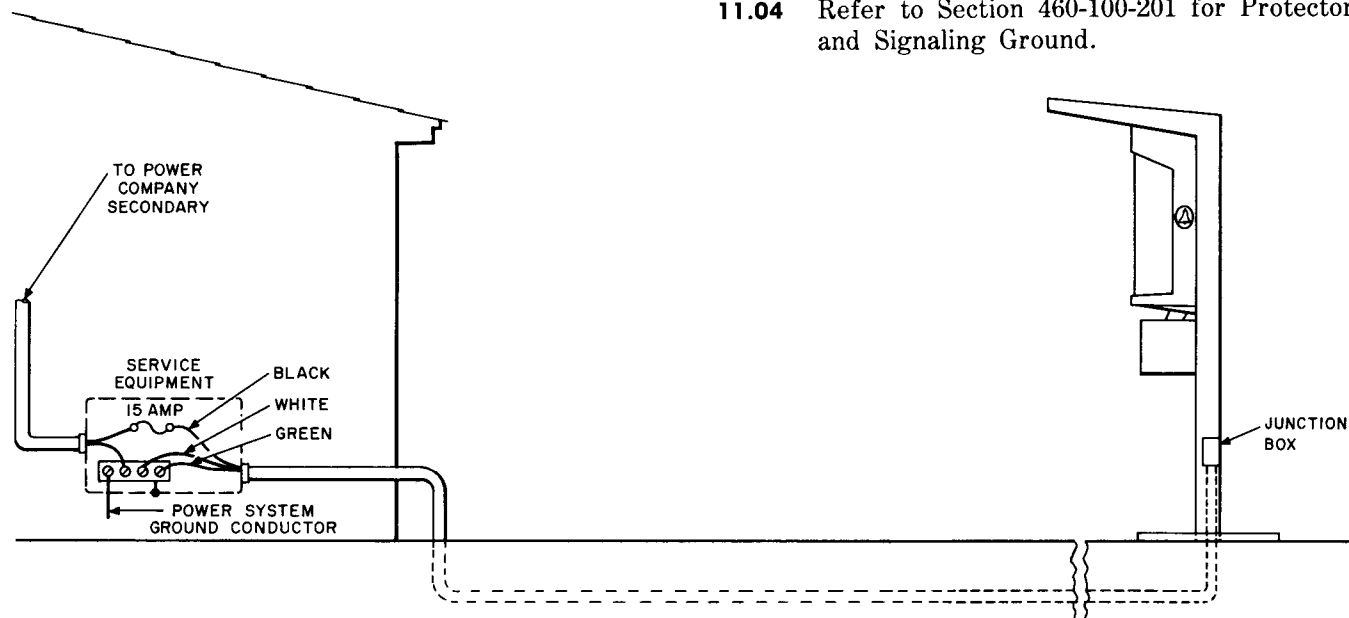
**11. BSP REFERENCES**

**11.01** Refer to Section 460-100-100 for Station Protection Required for Various Conditions of Plant.

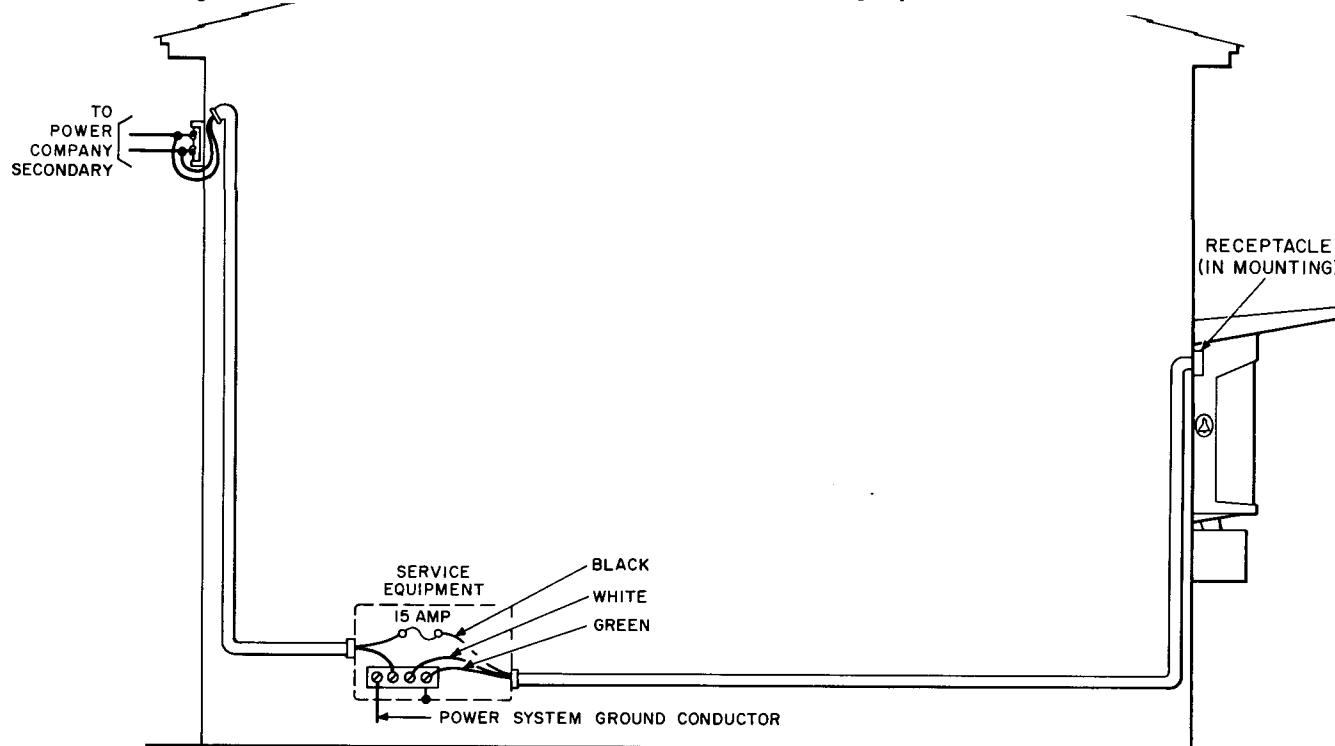
**11.02** Refer to Section 460-100-101 for Station Protectors—Identification and Selection.

**11.03** Refer to Section 460-100-200 for Station Protection—Installation and Inspection.

**11.04** Refer to Section 460-100-201 for Protector and Signaling Ground.



**Fig. 14—3-Wire Extension of Branch Circuit to Mounting By Means of Metal Conduit**



**Fig. 19—Mounting Located on Same Building as Branch Circuit**

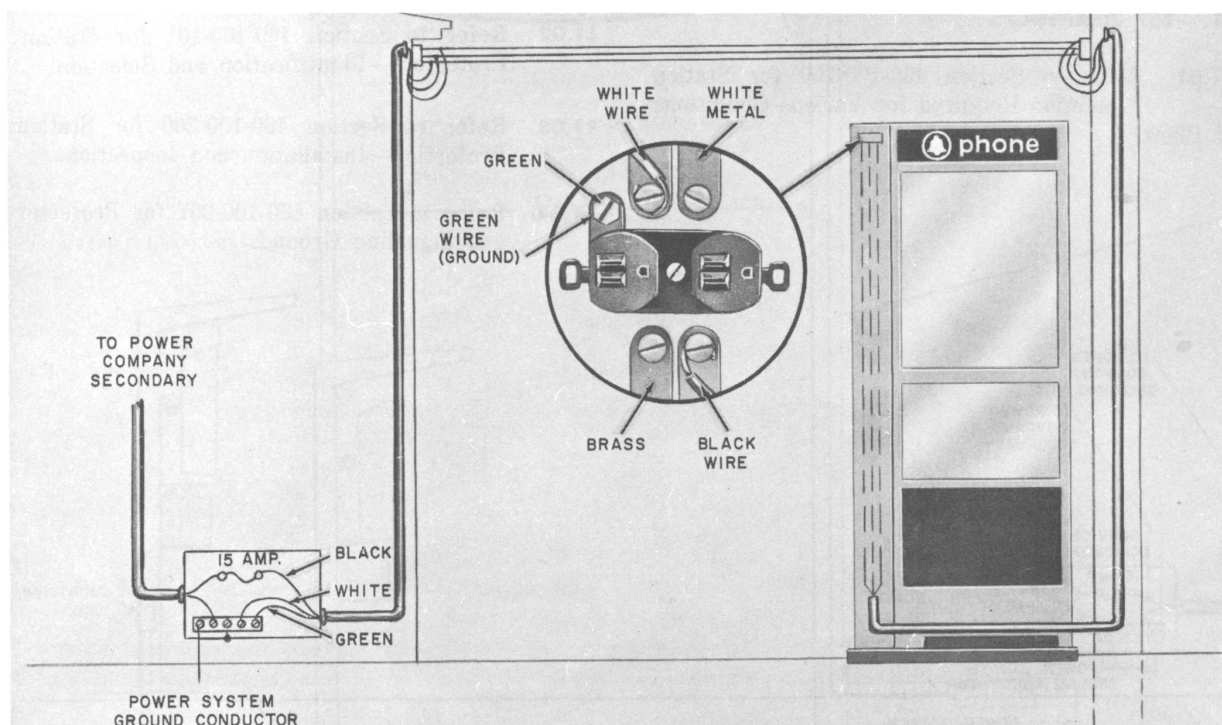


Fig. 15—3-Wire Extension of Branch Circuit to Booth By Means of Open Conductors

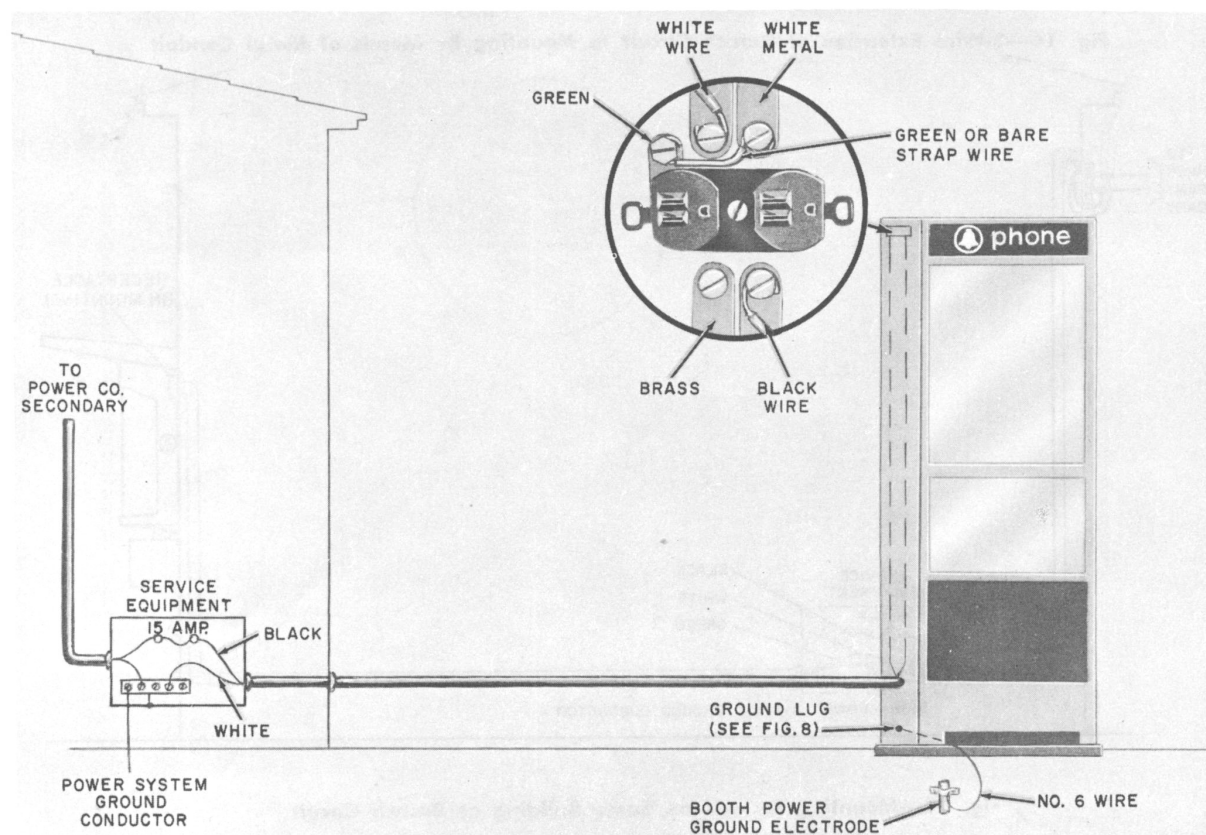
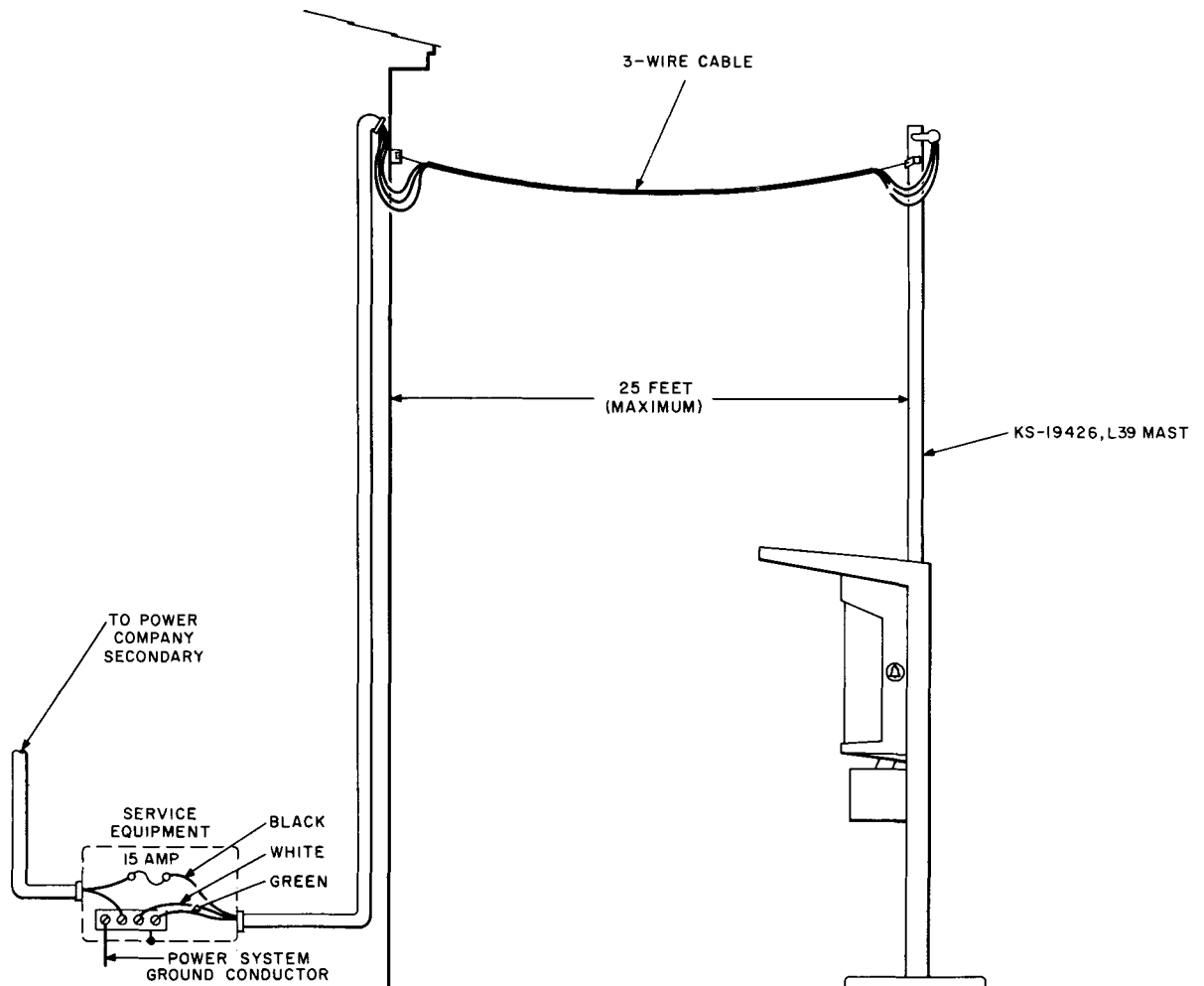


Fig. 17—2-Wire Extension of Branch Circuit to Booth By Means of Metal Conduit

**CAUTION:**

OBSERVE MINIMUM CLEARANCES, SEE SECTION 461-200-201

**Fig. 16—3-Wire Extension of Branch Circuit to Mounting By Means of 3-Wire Cable**

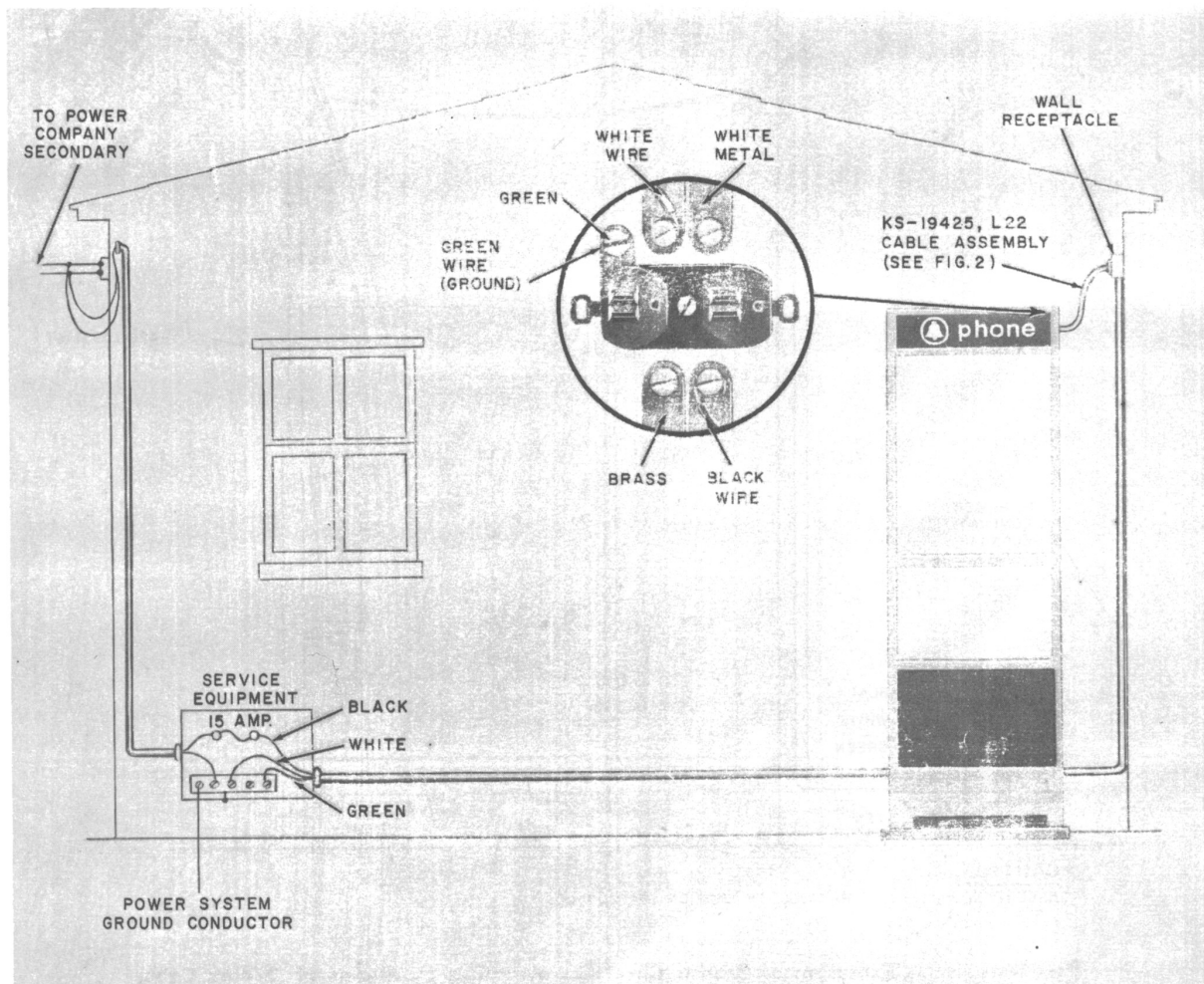


Fig. 18—Booth Located Within Same Building as Branch Circuit