

SKINNING AND PREPARING WIRE FOR CROSS-CONNECTIONS ON DISTRIBUTING FRAMES AND CROSS-CONNECTION FIELDS

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1. GENERAL

1.01 This section describes methods of skinning and preparing the various types of cross-connection wire used on distributing frames and cross-connection fields whenever soldering, crimping, or solderless-wrapping is involved.

1.02 This section is reissued to revise the skinning procedures and add skinning information for DT-type wire. Revision arrows have been used to indicate significant changes. The Equipment Test List is not affected.

1.03 For additional information about making cross-connections, refer to the following BSP sections.

(1) Section 201-220-301 covers conventional distributing frame cross-connections in general.

(2) Section 069-132-811 covers the making and removing of solderless-wrapped connections.

(3) Section 800-612-159 covers general equipment requirements for strapping and cross-connections.

(4) Section 800-612-154 covers general equipment requirements for connecting and soldering individual conductors.

1.04 The method of making connections to the 66- and 78-type connecting blocks with quick-connect terminals used on ESS systems and COSMIC systems is covered in Sections 201-221-301 and 201-222-301.

2. APPARATUS

2.01 *List of Tools and Materials*

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NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

SECTION 069-120-811

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
KS-8740, L13	Copper, Soldering
KS-15710, L1	Hand crimping tool
KS-16363, L3	Wire-wrap tool
KS-16902, L1	Wire stripper
KS-20620, L1-L7	Wire strippers
KS-21257, L1	Long pliers (uninsulated)
KS-21257, L2	Long pliers (insulated)
KS-21257, L3	Short pliers (uninsulated)
KS-21257, L4	Short pliers (insulated)
KS-22214, L1	Crimping tool
KS-22214, L2	Die set
KS-22035	Plastic spudger
R-4366	Cable butt and strip tool
KS-20962	Connecting bag
AT-8479	B or C Short-nose pliers
AT-7987	C or D Scissors
MATERIALS	
KS-13979, L2	Acetate fiber adhesive tape
KS-14090, L6	Gray plastic tape (3/8-inch wide)

3. WIRE TYPES

3.01 Table A lists all the standard types of wire used on distributing frames and cross-connection fields along with a brief description of the type of insulation.

4. SKINNING METHODS

General

4.01 Before removing insulation, protect the equipment adjacent to and particularly below the area in which the skinning operation is to be performed. The KS-20962 connecting bag should be used. Take care when removing the bag not to drop any of the debris on the equipment. Particles may lodge in spots which are not readily accessible or visible.

4.02 The length of the skinned portion will vary, depending on the type of connection to be made. In general, the following information may serve as a guide:

- (1) Soldered connections on terminals not designed for solderless-wrapped connections (that is, notched or perforated terminals)—1/4 to 1/2 inch.
- (2) Solderless plier-wrapped connections on notched terminals where this method is approved locally for use on No. 1 crossbar block relay frames and No. 5 crossbar number group frames—1-1/2 inches.
- (3) Solderless-wrapped connections on terminals designed for solderless-wrapped connections—1-5/8 inches for 22- and 24-gauge wires and 1-7/8 inches for 26-gauge wire.

4.03 The *skinning point* is the point on the wire where the insulation ends and the skinned portion begins. The skinning point may be determined by holding the wire to the terminal with the proper amount of slack and indicating with the thumbnail the point where the wire meets the terminal. When properly done, the skinned portions of the conductors in the cross-connection are staggered to allow for even tension at the terminals.

4.04 Care should be exercised to avoid nicking, crushing, scraping, or kinking the wire, and to avoid damaging the tin on tinned wire. This is important since crushed, kinked, scraped, or nicked wire may result in poor or damaged connections, particularly where the connection is to be solderless wrapped.

4.05 Short cross-connections for cross-connections where the second end is to be terminated in a location which would make the skinning

TABLE A

WIRE TYPE	DESCRIPTION	WIRE TYPE	DESCRIPTION
C	Extruded polyvinyl chloride, cotton, lacquered (PVC CL) wire. Replaces double acetate cotton, lacquered (DACL) wire. (Mfr Disc. replaced by BW type.)	BU	Extruded polyvinyl chloride (PVC) wire.
		BW	Extruded polyvinyl chloride, cotton, lacquered (PVC CL) wire. Similar to type BG except smaller diameter.
J	Double cotton braid, wax-impregnated, (DCB Imp) strap wire.	DL	High-density polyethylene (PE) wire having a silver-coated braided shield covered with polyvinyl chloride (PVC) compound.
K	Double acetate, cotton braid, lacquered (DACBL) cross-connection wire. (Mfr Disc. replaced by DP-type wire.)		
U	Extruded polyvinyl chloride, cotton, lacquered (PVC CL) wire. (Mfr Disc. replaced by DT type.)	DP	Irradiated polyvinyl chloride (IPVC) wire.
BF	Extruded polyethylene (PE), shielded wire with plastic jacket outer cover.	DT	Extruded, irradiated polyvinyl chloride (IPVC) wire.
BG	Extruded polyvinyl chloride, cotton, lacquered (PVC CL) wire. (Mfr Disc. replaced by BW type.)	W	Extruded polyvinyl chloride (PVC), covered with a jacket of transparent nylon, wire. (Mfr Disc. replaced by DT and DY types.)
BH	Extruded polyvinyl chloride, cotton, braid, lacquered (PVC CBL) wire.	DY	Extruded, irradiated polyvinyl chloride (IPVC) wire, copper-steel conductor. (Use as DFW, only in No. 1 ESS frames equipped with 66 type connecting blocks.

procedure difficult are best prepared by skinning both ends before any terminating is done.

Caution: When placing skinned wire through fanning strips, avoid touching terminals with the bare conductor.

Danger: Gloves and glasses should be worn during the skinning operation to avoid possible injury.

Skinning the Wire

4.06 There are two methods of skinning wire, end stripping and the crush method. End stripping is the preferred method for both soldered and solderless-wrapped connections and is described in (a) below. The crush method is an alternate

method for preparing wire for a soldered connection and is described in (b) below.

(a) End Stripping (Preferred Method):

- (1) Determine the stripping point [see paragraphs 4.02(1) and 4.03].
- (2) Select applicable tool per Table B.
- (3) Place the skinning point of the wire into the applicable stripping notch and draw the pliers downward and toward the end of the wire, parting the insulation and sliding it off the fuse end.

Note: The KS-21257 pliers have a 1-5/8 inch gauge mark indicating the correct skinned

◆ TABLE B ◆

WIRE SIZE	TOOL	FIG. NO.
20	KS-20620, L4	1
22	KS-21257, L1-L4* or KS-16902, L1	2
24	KS-16902	1

*KS-21257 is the preferred tool for 22AWG DT-Type wire.

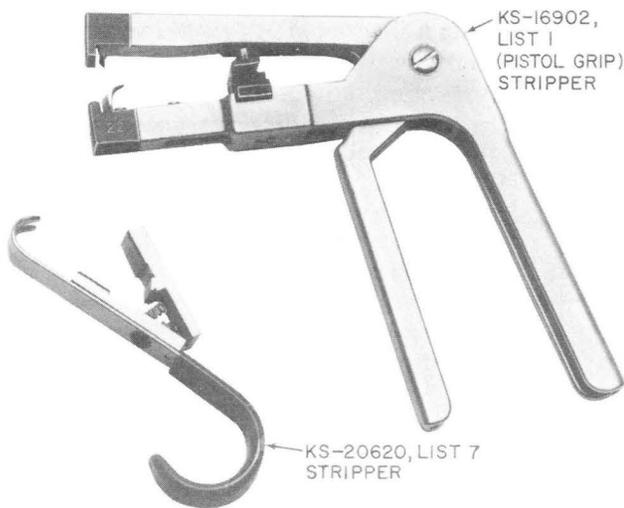


Fig. 1—KS-20620, L7, and KS-16902, L1, Strippers

length for 22 gauge connections. The KS-16902 and KS-20620, L7, tools will strip and cut the conductor to the correct length.

(b) **Crushing and Stripping (Alternate Method):**

- (1) Determine the skinning point (see paragraphs 4.02 and 4.03 and Fig. 5.)
- (2) Use KS-21257 pliers for this method.
- (3) Place the wire in the crushing slot and press firmly on the plier handles to crush the insulation. A second crush adjacent to the first may facilitate the skinning operation (see Fig. 3.)
- (4) Slide the wire into the stripping notch about one half to one inch above the

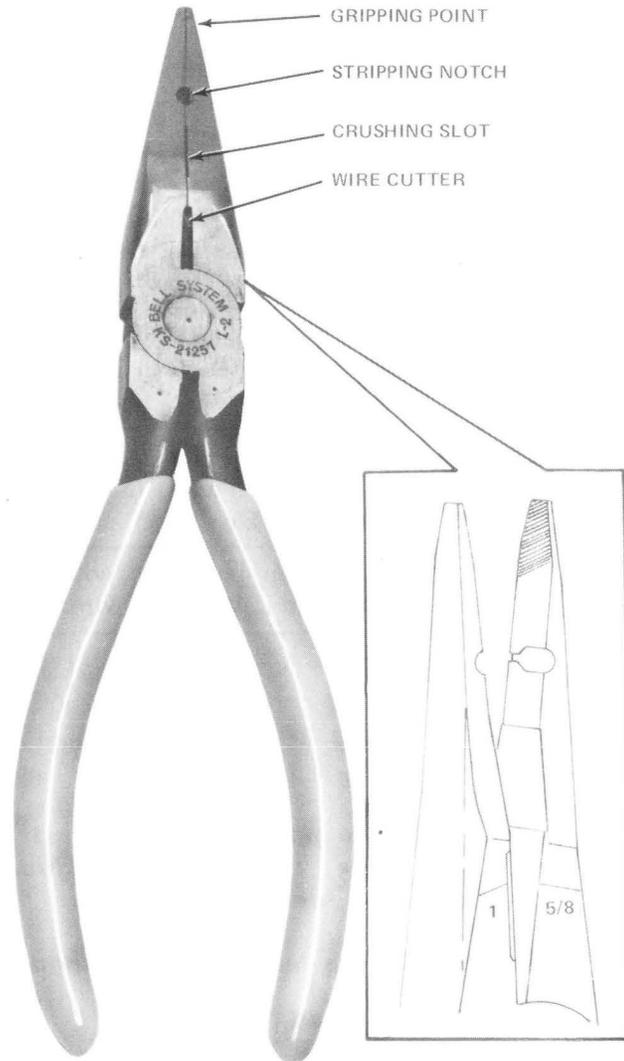
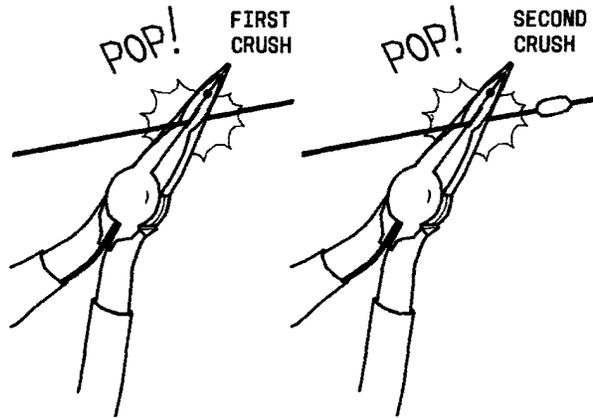


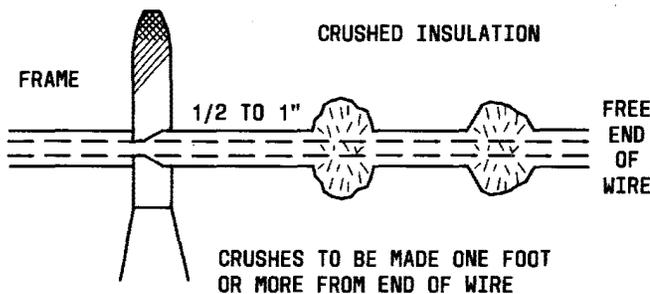
Fig. 2—KS-21257 Pliers



NOTE: DT-TYPE WIRE MAY POP WHEN CRUSHED

Fig. 3—Crushing the Wire

crushed area of the wire. Keep the wire as perpendicular (squared off) as possible to the pliers edge. This prevents damaging and nicking the wire in any way. Press firmly on the handle and pull toward the crushed area which is the direction of the free end of the wire (see Fig. 4). Make an opening of 1/4 to 1/2 inch in the insulation, approximately 8 to 12 inches from free end of wire as shown in Fig. 5.



ALWAYS STRIP IN DIRECTION OF CRUSHES

STRIPPING THE WIRE

Fig. 4—Stripping the Wire

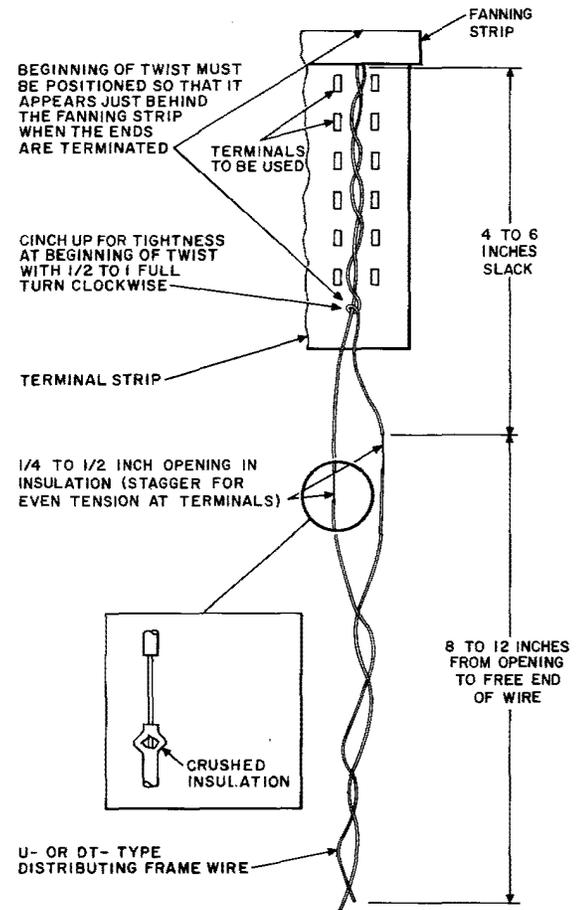


Fig. 5—Alternate Method of Skinning Distributing Frame Wire for Soldered Connections

5. PREPARING DT-TYPE WIRE FOR CROSS-CONNECTIONS ON DISTRIBUTING FRAMES

5.01 Prepare wire as follows:

- (1) Use a slip knot to tie down wire in the terminal block fanning strip hole on the horizontal (equipment) side of the frame (see Fig. 6). Make sure that sufficient slack is left to make a soldered or solderless connection as applicable.

Note: See Section 201-220-301 for additional information.

- (2) Take wire to vertical side and pass enough through fanning strip hole so there is sufficient

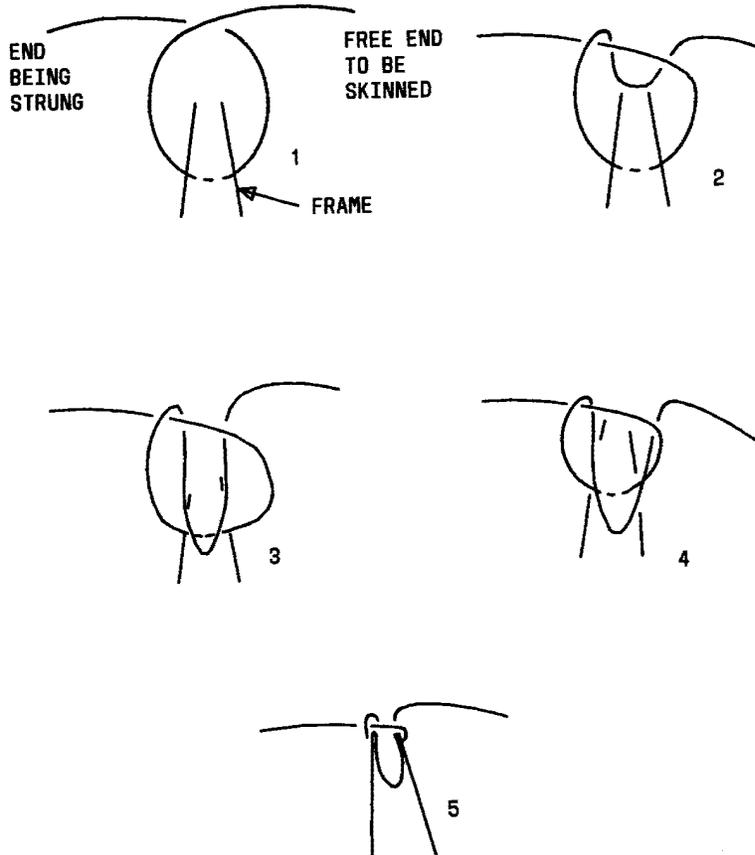


Fig. 6—Method for Making Solderless-Wrapped Connections

slack past terminal block for making solderless connection. (**Note:** Some older frames may require soldered connections at this point.)

- (3) Strip wire per paragraph 4.06(1).
- (4) Attach wire to appropriate terminal using KS-16363, L3, wire-wrap tool per Section 069-132-811 or KS-8740, L13, soldering iron, if required. (See Section 069-140-811 for soldering instruction.)
- (5) Return to horizontal side of the frame and remove the slip knot and skin wire per paragraph 4.06(1).
- (6) Using the KS-21257 or AT-8479 pliers, grasp the skinned portion of the wire. Wrap wire around the proper terminal lay so that it makes a maximum amount of contact with the lug. (See Section 201-220-301 for details.) Use care

not to touch adjacent terminals. Repeat process with other wires.

- (7) Solder connections using the KS-8740, L13, soldering iron per Section 069-140-811.♦

6. PREPARING BF- OR DL-TYPE SHIELED WIRE FOR SKINNING OPERATION

6.01 Preparation of BF- or DL-type wire is as follows:

- (1) Determine the butting point, and then cut the wires so the length of the wire from the butt to the end will be approximately 1-7/8 inches longer than the required skinned length.
- (2) Using the R-4366 cable butt and strip tool, cut the plastic jacket approximately 3/8 inch forward from the butting point. Using the same tool, strip off the jacket. Push the shield braid

up to the jacket sufficiently to bunch the braid. Using the C or D scissors or the diagonal pliers, neatly cut off the shield braid at the edge of the jacket. Again, using the R-4366 tool, cut the plastic jacket at the butting point and strip off the jacket.

Warning: Any scoring or nicking of the shield, particularly at the point of jacket removal, can seriously degrade the final connection. The slightest scoring, in many instances, will result in broken strands when the shield is moved or expanded.

- (3) To apply the compression-type shield connector, proceed as covered in paragraph 6.02.

6.02 Application of Compression-Type Shield Connector: Apply the compression-type shield connector to BF- or DL-type wire as follows:

- (1) Slip the proper outer sleeve shield connector over the exposed shield braid and back on to the outer covering. (See Table C.)
- (2) To facilitate inserting the inner sleeve, fan the shield by rotating the inner conductors around with a circular motion.

(3) Slide the proper inner sleeve under the shield, and position it so the end of the sleeve extends approximately 1/32 inch beyond the end of the shield. Cut off any loose strands of the shield so no strand extends past the end of the inner sleeve. (See Table C.)

(4) Slide the outer sleeve over the shield, and position it over the inner sleeve as shown in Fig. 7. When an external ground lead is to be connected to the shield, insert the folded skinned end of the lead between the outer sleeve and the shield.

(5) Insert the assembly to be crimped into the proper die opening of the KS-15710 or KS-22214 hand crimping tool, and make the crimped connection. The ground lead should be under the flat part of the hexagon compression after the assembly is crimped.

(6) Remove the paper tape covering the inner conductors as close to the inner sleeve as possible.

(7) Skin the conductors as covered in Part 4.

(8) Where protection is required, the shield connector shall be covered with KS-14090, L6, gray plastic tape.

TABLE C

TYPE WIRE	NUMBER OF CONDUCTORS	SHIELD CONNECTORS						INSTALLING TOOLS			
		INNER SLEEVE			OUTER SLEEVE			DIE SHAPE	COLOR	KS-15710 LIST	KS-22214 LIST
		KS-15711 LIST	ID	COLOR	KS-15712 LIST	ID	COLOR				
BF	1	2	.096	Purple	1	.175	Blue	L	Red	1	3
BF	2	4	.149	Blue	3	.232	Orange	P	Orange	1	4
DL	2	24	.128	Tin	32(Note4)	.205	Yellow	—	Yellow	6	2

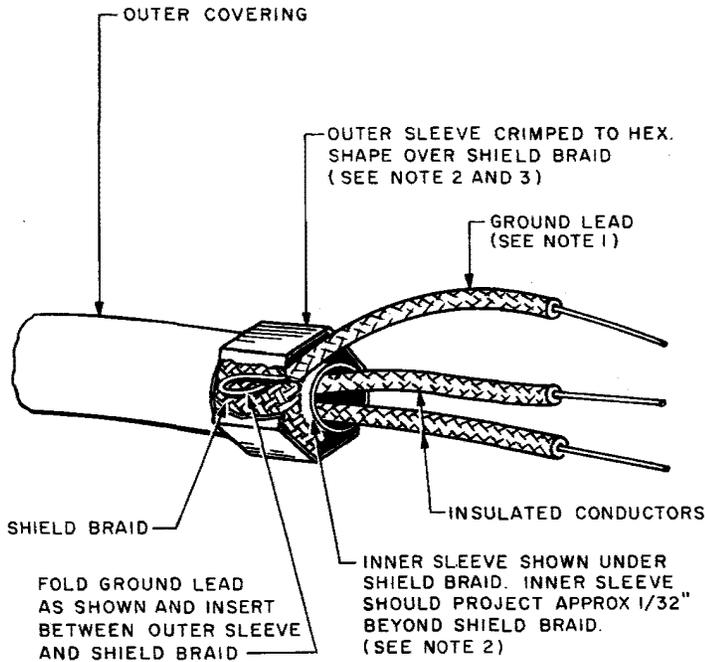
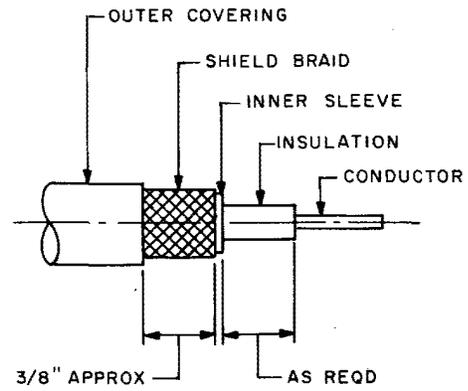


FIG. B



PREPARATION
(INNER SLEEVE INSERTED
UNDER SHIELD BRAID)

FIG. A

NOTES:

1. WHERE A LEAD FOR GROUND CONNECTION IS REQUIRED USE 22 GAUGE SWITCHBOARD WIRE UNLESS SPECIAL CONSIDERATIONS REQUIRE A HEAVIER GAUGE, SUCH AS IN THE CASE WHERE EXTREMELY LOW IMPEDANCE TO GROUND IS A REQUIREMENT.
2. REFER TO TABLE B FOR THE PROPER INNER AND OUTER SLEEVES TO BE USED.
3. BUTT APPROX FLUSH WITH END OF OUTER SLEEVE.
4. THE L32 OUTER SLEEVE FOR DL WIRE IS SELF-INSULATED.

Fig. 7—Preparation of BF- or DL-Type Shielded Wire Using Compression—Type Shield Connector (BF-Type Wire Shown)