

B PLENUM CABLE

DESCRIPTION AND INSTALLATION

1. GENERAL

1.01 This section provides information on B Plenum Cable. The B Plenum Cable, AT-8976 (Fig. 1), is designed primarily for business premises wiring directly in air handling plenums without the need for conduit.

1.02 Whenever this section is reissued, the reason(s) for reissue will be listed in this paragraph.

1.03 The B Plenum Cable is not intended as a replacement for D Inside Wiring Cable.

2. DESCRIPTION

2.01 The B Plenum Cable contains 25 pairs of 24 American Wire Gauge (AWG) copper conductors individually insulated with color coded polyvinyl chloride (PVC) insulation (Fig. 1). Pair identification is shown in Table A. The sheath and core wrap consist of a unique polyimide/aluminum/polyimide/ fiberglass construction which imparts a high degree of thermal resistance to the cable core. The representative outside diameter and weight of the cable are 0.44 inches and 104 pounds/1000 feet, respectively. The standard shipping lengths are 2500 feet and 1000 feet on reels.

2.02 The major advantages of B Plenum Cable are as follows:

- **Underwriters Laboratories (U.L.) Classification:** The U.L. has evaluated and classified this product as to fire and smoke characteristics in accordance with Section 800-3(d) of the National Electrical Code.
- **Mechanical Flexibility:** The construction of B Plenum Cable provides both mechanical strength and flexibility.

- **Standard D Inside Wiring Cable Core:** Allows for easy wire identification and field connectorization of B Plenum Cable.

- **Sequential Footage Markings:** During installation it enables accurate determination of installed cable length and residual wire on a reel. In the latter case, it also serves as a cable inventory aid.

- **Ease of Handling:** The flexibility of B Plenum Cable permits one craftperson to install the cable alone, in most situations. The cable's minimum bending radius is 1-inch.

- **Absence of Special Electrical Safety Precautions:** Special electrical safety precautions are eliminated. The B Plenum Cable does not have a metallic outer jacket. This eliminates time-consuming precautionary requirements such as grounding the shield, or reel, during placement operations.

- **Termination Capabilities:** B Plenum Cable can be terminated in any of the standard apparatus (the 66-type or 88-type connecting block).

- **Aluminum Sheath:** The use of an aluminum sheath layer provides shielding against electromagnetic interference and can serve as a coupled bonding conductor.

2.03 **Electrical and Transmission Characteristics.** Table B gives the representative transmission characteristics for 1000 feet of B Plenum Cable. The following are also representative values:

- Conductor DC resistance, 56 ohms per 1000 circuit feet
- Insulation resistance, 200 megohms 1000 feet

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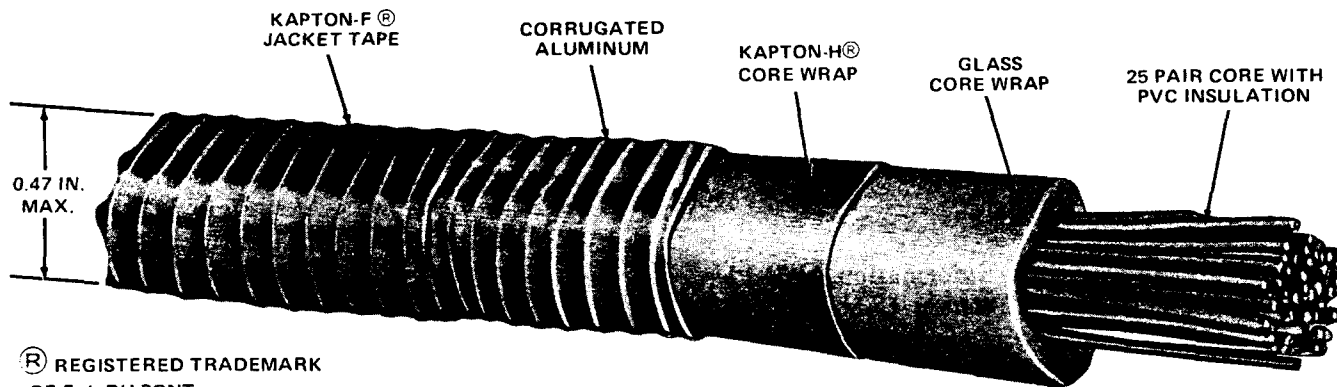


Fig. 1—B Plenum Cable, AT-8976

TABLE A

PAIR IDENTIFICATION IN B PLENUM

PAIR NO.	RING		TIP	
	COLOR OF INSULATION	COLOR OF MARKING	COLOR OF INSULATION	COLOR OF MARKING
1	Blue (BL)	W	White (W)	BL
2	Orange (O)	W	White	O
3	Green (G)	W	White	G
4	Brown (BR)	W	White	BR
5	Slate (S)	W	White	S
6 to 10	Blue to Slate } as above	R R R	Red (R) Red Red	BL to S } as above
11 to 15	Blue to Slate } as above	BK BK BK	Black (BK) Black Black	BL to S } as above
16 to 20	Blue to Slate } as above	Y Y Y	Yellow (Y) Yellow Yellow	BL to S } as above
21 to 25	Blue to Slate } as above	V V V	Violet (V) Violet Violet	BL to S } as above

- Dielectric strength pair to pair, 2500 volts ac (rms)
- Dielectric strength, core to shield 2000 volts ac (rms).

2.04 Hardware and Tools. There is no need for new or special hardware and tools for use with B Plenum Cable. Although there is no jacket rip cord,

the sheath can be removed with the following standard stripping tools:

- (a) Stripping Tool, R-4366 (Fig. 4)
- (b) Sheath Stripper, No. 45-128 (Fig. 5)
- (c) Cable Stripper, AT-7748X, per Section 081-780-102.

TABLE B

**B PLENUM CABLE
TRANSMISSION CHARACTERISTICS (SEE NOTE)**

FREQ. KZS	RES. (OHMS)	MUTUAL CAP. (NF)	CHARACTERISTIC IMPEDANCE		ATTENUATION (DB)
			ZO (OHMS)	DEGREES	
1	56.8	23.0	600.0	-45.0	0.53
2	56.8	22.7	445.8	-43.6	0.77
5	57.0	22.5	284.5	-41.6	1.18
10	57.2	22.5	204.1	-38.7	1.58
40	59.2	22.0	116.1	-25.8	2.50
100	63.9	21.8	96.6	-14.6	3.06
400	98.7	21.5	88.3	-6.4	5.20
1000	150.4	21.3	84.7	-4.1	8.47

Note: These transmission characteristics apply to 1000 feet of cable at a temperature of 72°F.

2.05 Bonding the cable shield is accomplished using B Bond Clips and 14 AWG appliance wire (Fig. 2). A plastic tie wrap around the shield and B bond clip provides sufficient strain relief (Fig. 4).

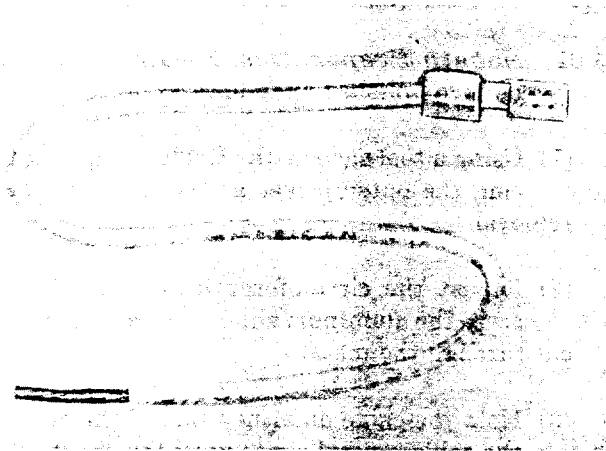


Fig. 2—B Bond Clip and No. 14 AWG Appliance Wire

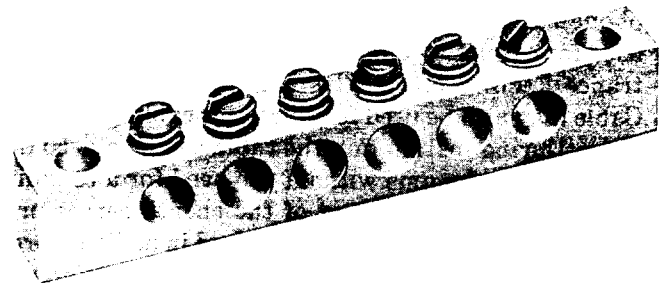


Fig. 3—8A Ground Strip

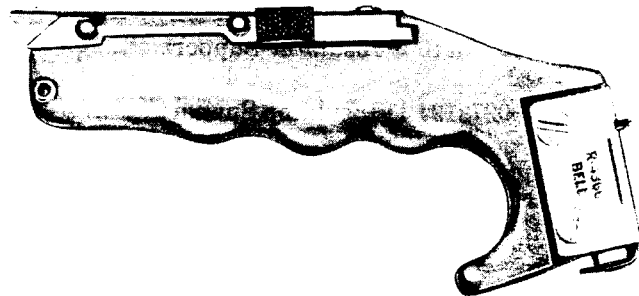


Fig. 4—R-4366 Stripping Tool

2.06 Although not unique to B Plenum Cable, the use of the 8A ground strip (Fig. 3) greatly facilitates bonding of several cable shields at the equipment closet, backboard, or terminal.

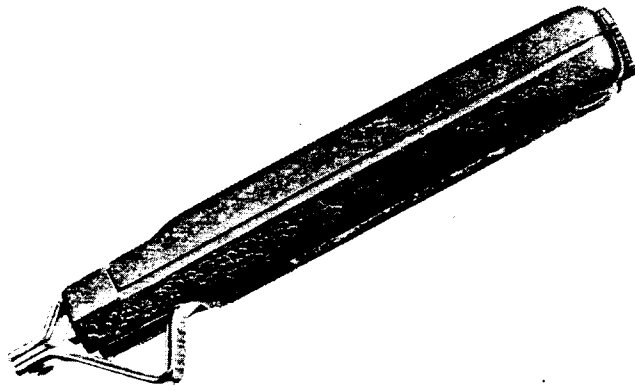


Fig. 5—No. 45-128 Sheath Stripper

2.07 The various hardware items used for building cable can be found in Section 627-610-200. Refer to paragraph 2.09 for ordering information.

2.08 Applications. B Plenum Cable is for use in business premises wiring to extend circuits from either equipment or satellite closets to telephone sets or other terminal equipment. It may be used for extending circuits between the Building Entrance Facility and a PBX (Fig. 6). The B Plenum Cable may also be used for computer cabling applications. During installation the cable can be placed directly in air plenums without the need for a conduit. The aluminum component of the sheath serves primarily as a reflective heat shield and in addition provides shielding against electromagnetic interference and can serve as a couple bonding conductor.

2.09 Ordering Information. Listed below are various items in a typical installation. These products are currently available and are stock items:

- 400273108 B Insulator Support
- 400273116 C Insulator Support
- 400273124 D Insulator Support
- 400273132 E Insulator Support
- 400273140 F Insulator Support
- 400273157 G Insulator Support
- 400071048 H Insulator Support

- 997302633 B Bond Clip (100 per package)
- 997126500 B Bond Clip (500 per package)
- 400287322 B Appliance Wire (50-foot spool)
- 400287330 B Appliance Wire (600-foot spool)
- 402731079 B Plenum Cable (25 pair [feet])
- 400366332 B Bond Clamp, AT-8544 No. 1
- Strip, Ground, 8A.

3. INSTALLATION

3.01 Although B Plenum Cable is somewhat stiffer than D Inside Wiring Cable, it can be installed in the same manner. Because it does not have a metallic outer jacket, there is no requirement to take extraordinary precautions such as grounding the shield or reel during placing operations. Normal precautions should be observed during installation to preclude sheath damage such as occurs when any cable is pulled around sharp edges or when using excessive tensions. Damage at bends can be minimized by running the cable through suitable size insulator supports attached to the building superstructure. Normal precautions should be observed when crossing duct work to prevent damage to duct insulation.

3.02 Sheath Preparation. Sheath removal can be accomplished as follows.

- (1) Using a tool such as the R-4366 stripping tool, ring the outer jacket at the point of sheath removal.
- (2) Repeat the circumferential cut as above to score the aluminum shield. There is no need to cut through the metal.
- (3) Hold the cable on either side of the cut. Flex the cable several times until the sheath separates at the ring cut.
- (4) The sheath can then be slipped from the core wrap and core with ease.
- (5) Cut the fiberglass core wrap, leaving about 1/2-inch extending beyond the aluminum shield and plastic jacket.

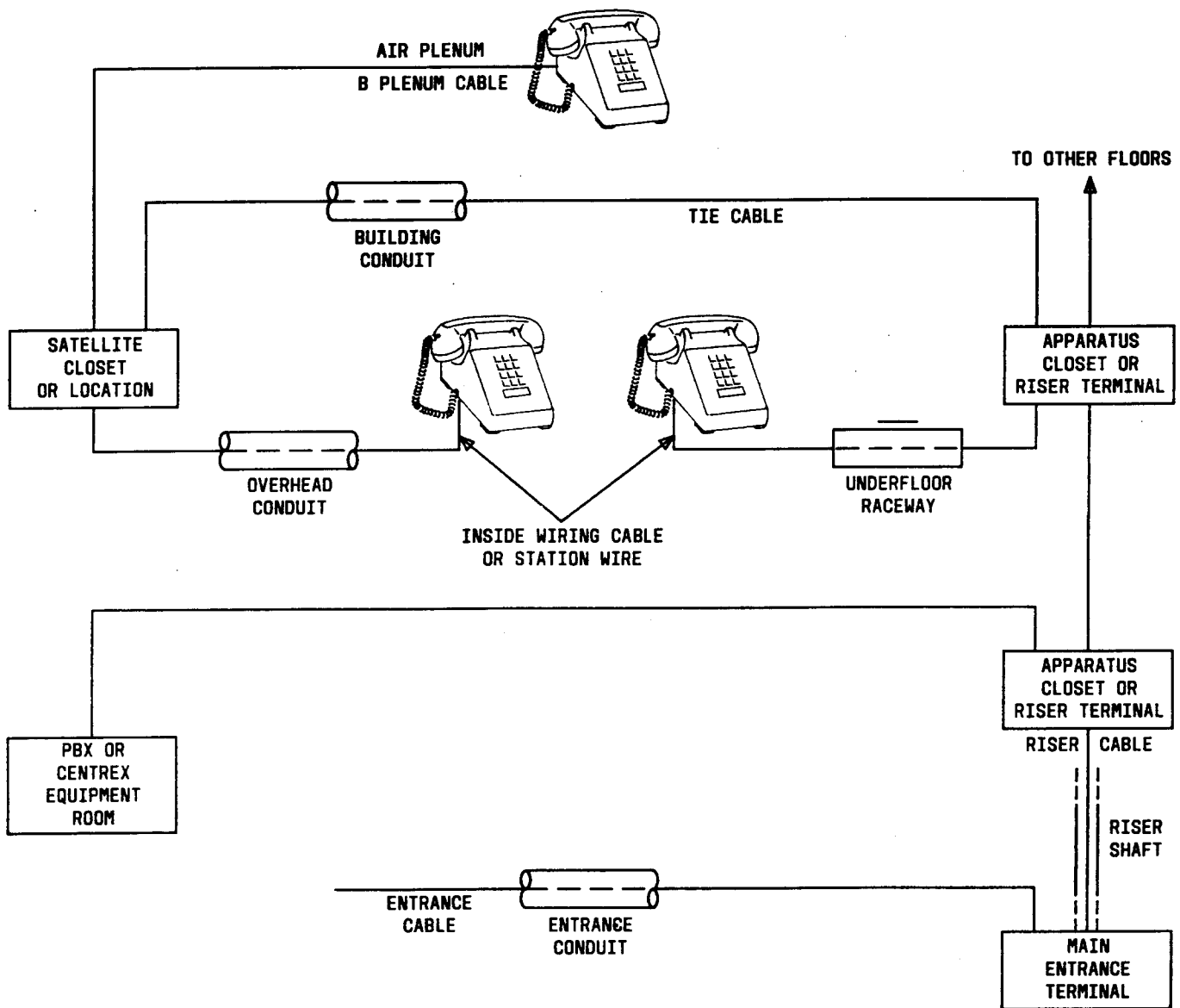


Fig. 6—Typical Building Cable System

- (6) Preparation of the individual conductors is the same as D Inside Wiring Cable.

3.03 Wiring Termination. Terminating the conductors of B Plenum Cable follows the same methods as D Inside Wiring Cable. The conductor insulation and color code are identical and no special methods, tools, or hardware are required (see Section 461-200-100). The B Plenum Cable can be connectorized in the field using ribbon connectors. An installation of this type is shown in Fig. 7.

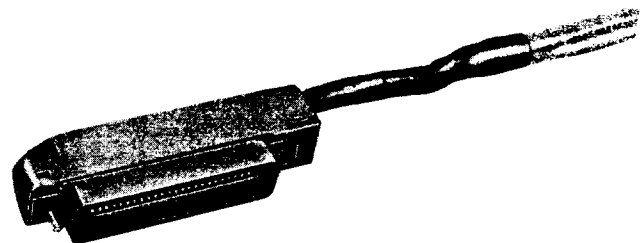


Fig. 7—Ribbon Connector/Plenum Cable Assembly

3.04 Bonding and Grounding. Bonding and grounding of B Plenum Cable shall be accomplished in the following manner.

- (1) Apply to the source end only (the end terminated at the junction with the outside plant cables) of each cable shield a B Bond Clip and one 14 AWG appliance wire.
- (2) Terminate each appliance wire in an appropriate ground strip such as the 8A ground strip which is securely fastened to the backboard associated with the terminal or cross-connecting facility. Up to five wires can be terminated under each screw of the 8A ground strip.
- (3) Connect the ground strips together with 6 AWG ground wire and run to the nearest approved ground as covered in Section 876-300-100, Part B. When the B Plenum Cable is an extension

of a shielded house cable, install a B Bond Clamp and run a 6 AWG ground wire to the shield of that cable.

- (4) Stress relief must be provided through the use of small cable ties.
- (5) Cases may arise where B Plenum Cable may be used to service exposed off-premise stations which are fed from a point in the building apart from the main terminal. In such cases, the B Bond Clip is specifically prohibited. Instead, bonding must be accomplished at both ends of the plenum cable using No. 1 B Bond Clamps and 10 AWG wire.

3.05 Figure 8 shows a typical termination assembly with the shields bonded away from the cable ends.

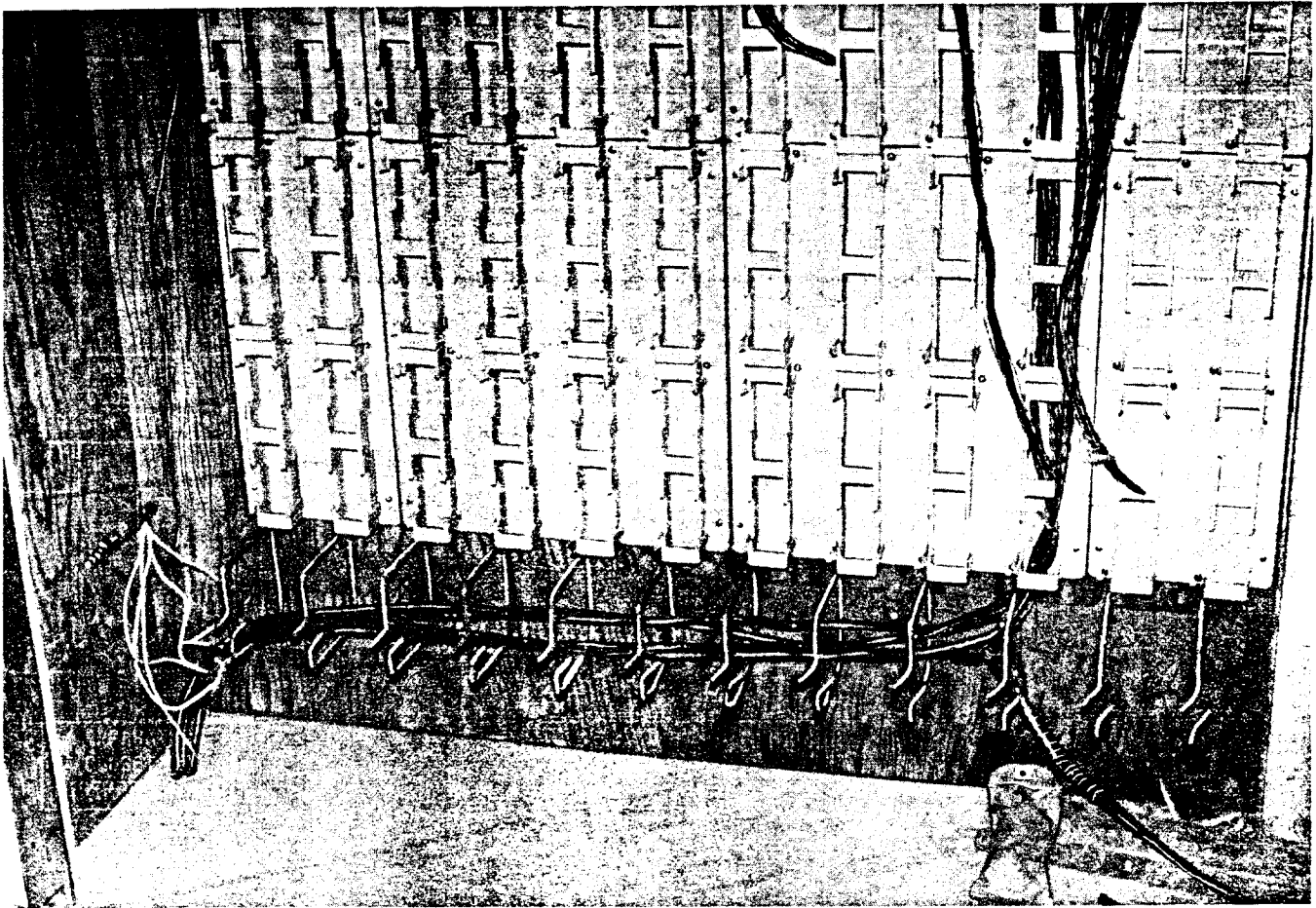


Fig. 8—Typical Termination Assembly with the Shields Bonded Away From the Cable Ends