

INSIDE WIRE AND CABLE SELECTION

1. GENERAL

1.01 This section describes the selection of inside wire and cable.

1.02 This section is reissued to:

- Remove reference to No. 14 AWG ground wire, which has been rated manufacture discontinued (MD), and show it replaced by No. 12 AWG wire
- Add KS-22084 air plenum station wire
- Revise Table C to add current H station wire color code.

2. SELECTION

2.01 In selecting wire or cable, the following should be considered:

- (a) **Type and gauge** of wire or cable to meet the specific job requirements
- (b) **Number of conductors** necessary for service and providing an economical allowance for future requirements
- (c) **Location of terminal**, protector, connecting block, telephone set, conduit facilities provided, etc
- (d) Customer satisfaction with appearance and routing of wire and cable
- (e) ♦Conference with National Electrical Code when wire is run in return air plenum
- (f) Type surface material on which wire or cable is to be applied.♦



Do not use privately-owned wire or cable systems without the approval of a supervisor.

2.02 Ordering Guide

(a) **Inside Wire:**

- Cordage, Flat, 4 Conductor, KS-7144*
- Wire, Block, E*
- Wire, Cross-Connecting, F*
- Wire, Ground*
- Wire, Station, B
- Wire, Station, D*
- Wire, Station, SK*
- Wire, Station, H*
- ♦Wire, Station, KS-22084L1 through L7*.♦

(b) **Inside Cable:**

- Cable, Wiring, Inside, D*.

*Include desired type, color, gauge, and/or pair size from Table A or F.

3. INSIDE WIRE

3.01 **Type, size, gauge, color, and use** are found in Table A.

3.02 **D Station Wire** is intended for general use in station wiring as a replacement for JKT and GS station wire.

NOTICE

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

(a) It is smaller in diameter and more flexible than JKT or GS, and the plastic jacket has improved frictional properties permitting placement without the aid of lubricants.

(b) It can be used for indoor or outdoor runs and may be terminated on any terminals which will accommodate 22 or 24 AWG conductors. **Do not use D station wire to span, eg, between buildings.**

(c) The insulation of the individual conductors is distinctively colored to provide identification. Refer to Table B for color codes.

(d) Wire runs should be limited to 250 feet for installations involving two talking circuits. Single-line installation length is determined by any signaling equipment used, or by dial- and night-light loading. See Section 501-136-100 for lamp loading information.

3.03 G (MD) Station Wire consists of three pairs of 24 AWG annealed copper conductors; each conductor has color-coded insulation (see Table C). The three twisted pairs are stranded together and jacketed with light olive gray colored polyvinyl chloride plastic (PVC) underlaid by a nylon jacket-slitting cord. The G (MD) station wire is used primarily for prewiring houses during construction.

3.04 H Station Wire replaces G (MD) station wire. It is intended for prewiring of single or multifamily residences during construction and for general use in station wiring. In most conduit or duct applications, the wire can be pulled without lubricants. It has three twisted pairs of PVC insulated 24 AWG copper conductors. Each conductor is distinctively colored (see Table C). The pairs have a different length of twist and are grouped together and jacketed with ivory colored PVC underlaid by a nylon jacket-slitting cord.

3.05 The jacket and insulation of H station wire will withstand the stress of installation down to a temperature of -10°F, and the jacket will resist deterioration of outdoor exposure to sunlight.

3.06 Length of runs of G (MD) and H station wire is determined by any signaling equipment used, or by dial- and night-light loading. See Section 501-136-100 for lamp loading information.

3.07 B Station Wire (adhesive-backed wire) is intended for use in areas where it is impossible or impractical to use D station wire and standard fasteners due to construction of buildings or building owner restrictions. All adhesive-backed wire should be used with the following precautions:

- Installations are much more expensive than conventional B station wire installations and should be used only where absolutely necessary
- Mounting surfaces must be clean in order to obtain satisfactory adhesion
- Solvent-activated primers improve adhesion to slightly soiled surfaces but increases the cost of installation
- Never mount on damp surfaces, raw plaster, or a coarse surface such as cinder block or untreated concrete
- Wire runs should be limited to 100 feet for any single-line installation and 60 feet for installations involving two talking circuits.

3.08 KS-7144 Flat Cordage is used for station wiring under rugs on subscriber premises.

- (a) Insulation of individual conductors is colored red, green, yellow, and black for identification.
- (b) Wire runs should be limited to 100 feet for any single-line installation and 60 feet for installations involving two talking circuits.

3.09 ♦KS-22084L1 is a highly fire resistant station wire intended for use in air return plenums. **It should not otherwise be used as general purpose station wire.** It consists of four No. 22 AWG conductors, individually insulated and colored red, green, yellow, and black for identification.

Caution: KS-22084L1 station wire must not be stapled due to jacket and insulation characteristics.▲

3.10 SK Station Wire is a shielded twisted pair wire.

- (a) It is used where trouble is experienced with impulse noise between dc metallic teletypewriter loops and DATAPHONE® lines in the same run.

- (b) It is used in loudspeaker systems as amplifier output leads and associated wiring.
- (c) Insulation of individual conductors is colored blue and white.

3.11 *Ground Wire* is a single-conductor insulated wire.

- (a) No. 6 ground wire is used to make ground connections to protected cable, cable terminals, protector mountings, and to groups of station protectors.
- (b) No. 10 and 12 ground wires are used to make ground connections primarily in station wiring.

3.12 *E Block Wire* is used on block distribution and in ring runs on buildings. It may also be used inside factories, freezing rooms, or for short runs in homes. It is available in one- and two-pair sizes.

- (a) It may be used in spans not exceeding 35 feet in length.
- (b) The inner layer of insulation on the individual conductor is distinctly colored to ease identification. Refer to Table D.
- (c) Wire runs should be limited to 250 feet for installations involving two talking circuits (two-pair size). Single-line installation length is determined by any signaling equipment used, or by dial- and night-light loading. See Section 501-136-100 for lamp loading information.

3.13 *F Cross-Connecting Wire* is used for all indoor cross-connection applications between incoming cables and station equipment. (Not for use in central offices.) It may be used for pedestal and aerial Serving Area Interfaces (SAI).

- (a) Conductor identification is established through use of colored insulation in combination with single dashes of colored ink. Refer to Table E.

- (b) The insulation will withstand the stress of installation down to a temperature of -10°F.

4. INSIDE WIRING CABLE

4.01 *Type, size, gauge, and use* are found in Table F.

4.02 *D Inside Wiring Cable* is for general use in customer telephone systems wiring. The plastic jacket has improved frictional properties, permitting placement without the aid of lubricants. Lubricants could eventually corrode and clog conduit, making it more difficult to place additional wire.

- (a) All pairs in the 4- and 6-pair size are laid parallel to one another.
- (b) All pairs in the 12- to 25-pair sizes are made with a stranding lay; individually paired and twisted.
- (c) The 50- to 100-pair is composed of 2 to 4 units of 25 pairs each. The units are stranded together to form the core. Each unit has a different color binder for unit identification. Refer to Table G.
- (d) The colored insulation in combination with single dashes of colored ink provide individual conductor identification.
- (e) Length of runs is determined by any signaling equipment used, or by dial- and night-light loading. See Section 501-136-100 for lamp loading information.

4.03 ♦The KS-22084L2 through L7 is a highly fire resistant plenum cable that is U.L. approved for use in air return plenums without conduit per the National Electrical Code. It should not otherwise be used as general purpose station cable.

- (a) The cable is available in six sizes (see Table F) with all pairs stranded into a cable form.
- (b) Cable pairs are identified with solid colors only, however, each pair has a unique color combination for identification (see Table H).♦

◆ TABLE A ◆
SELECTION OF WIRE

TYPE OF WIRE (NOTE)	SIZE	JACKET OR INSULATION COLOR					CONDUCTOR IDENTIFICATION	USE											REMARKS						
		GAUGE	LT OLIVE GRAY	IVORY	BLACK	WHITE		GROUND		CLASS OF SERVICE				CIRCUITS						CROSS-CONN					
								SIGNAL	PROTECTOR	BUSINESS	RESIDENCE	ALL	ALL	INDIVIDUAL	PTY	COIN	LENGTH RESTRICTION (SEE PARAGRAPHS 3.02, 3.07, 3.08)	EXTENSION RINGER			TELETYPE	LEASED WIRE	LOUDSPEAKER AND PAGING SYSTEM, ETC	PREWIRE	TERM. AND CROSS-CONN BOX
Station	D	Quad	22	●	●		See Table B			●	●	●	●	●	●									Use for all interior station wiring including ducts and all conduits. May be run outside of wall of building for short runs between terminal and protector, protector and station, extension station, or bell where the wire run on building extends outdoors. D station wire should not be used for prewiring purposes.	
	G (MD)	3 Pairs	24	●			See Table C			●	●										●		Same application as D except should not be exposed to sunlight. Use for all prewiring purposes and for interior station wiring including ducts and conduits.		
	H	3 Pairs	24		●		See Table C			●	●										●		Same applications as D. May be exposed to sunlight. Use for all prewiring purposes and for interior station wiring including ducts and conduits.		
	KS-7144 Flat Cordage	Quad	18	●			See Table B			*	*	*			*								Use under rugs and carpets.		
	SK	Pair	22	●			Blue-White									●				●			Shielded Wire (see paragraph 3.10).		
	B	2 Pairs	26		●																		Adhesive-backed (see paragraph 3.07 and Section 461-200-206).		

◆ TABLE A (Contd) ◆

SELECTION OF WIRE

TYPE OF WIRE (NOTE)	SIZE	GAUGE	JACKET OR INSULATION COLOR				CONDUCTOR IDENTIFICATION	GROUND		CLASS OF SERVICE				USE							REMARKS					
			LT	OLIVE GRAY	IVORY	BLACK		WHITE	SIGNAL	PROTECTOR	BUSINESS	RESIDENCE	ALL	ALL	IND. VIDU-AL	PTY	COIN	CIRCUITS								
																		LENGTH RESTRICTION (SEE PARAGRAPHS 3.02, 3.07, 3.08)	EXTENSION RINGER	TELETYPE		LEASED WIRE	LOUDSPEAKER AND PAGING SYSTEM, ETC	PREWIRE	TERM. AND CROSS-CONN BOX	CROSS-CONN
Station (Contd)	KS-22084	Quad	22				●	See Table B			●	●	●	●	●							Station wire use only in air return plenums, not as general purpose station wire.				
		L1																								
		L2	4 Pairs	24					See Table H																	
		L3	6 Pairs																							
		L4	12 Pairs																							
		L5	16 Pairs																							
		L6	21 Pairs																							
	L7	25 Pairs																								
Ground		Single	12	●					●	●												Size No. 12 10 6	Protectors			
		Single	10	●					†	●													Fused	Fuseless†		
		Single	6	●					†	●													12 10 6	1 to 6 7 or more Any number	1 or 2 3 to 6 Any number	
E Block		Single	21-1/2				●	See Table D	●														Used outdoors, in freezing rooms, factories, and for short runs in homes or offices.			
		Pair								●																
		Triple									*	●	●	●												

♦TABLE A (Contd)♦

SELECTION OF WIRE

TYPE OF WIRE (NOTE)	SIZE	GAUGE	JACKET OR INSULATION COLOR	CONDUCTOR IDENTIFICATION	USE													REMARKS			
					GROUND		CLASS OF SERVICE					CIRCUITS					CROSS-CONN				
					SIGNAL	PROTECTOR	BUSINESS	RESIDENCE	ALL	ALL	INDIVIDUAL	PTY	COIN	LENGTH RESTRICTION (SEE PARAGRAPHS 3.02, 3.07, 3.08)	EXTENSION RINGER	TELETYPE	LEASED WIRE		LOUDSPEAKER AND PAGING SYSTEM, ETC	PREWIRE	TERM. AND CROSS-CONN BOX
F Cross-Conn	Pair	24	See Table E															•			
	Triple																		•		
	2 Pairs																			•	
	3 Pairs																			•	

Note: All wires listed should not be used near heat sources exceeding 140°F except KS-22084 station wire which can be used at temperature up to 200°F.

* Local option.

† Any ground wire that can be used as a protector ground can also be used as a signal ground. Because of expense, it is not recommended that No. 10 or 6 gauge wire be placed for use as signal ground only.

TABLE B

D STATION WIRE, KS-7144
 FLAT CORDAGE, AND
 KS-22084L1 CONDUCTOR
 IDENTIFICATION

SIZE	PAIR NO.	COLOR	
		TIP	RING
Quad	1	Green	Red
	2	Black	Yellow

TABLE C

G (MD) AND H STATION WIRE
 CONDUCTOR IDENTIFICATION

TYPE WIRE	SIZE	PAIR NO.	COLOR	
			TIP	RING
G (MD) and H	3 Pairs	1	W-BL	BL-W
		2	W-O	O-W
		3	W-G	G-W
H*	3 Pairs	1	W-BL	BL
		2	W-O	O
		3	W-G	G

* Current Production

TABLE D

E BLOCK WIRE
 CONDUCTOR IDENTIFICATION

SIZE	PAIR NO.	COLOR	
		TIP	RING
1 Pair	1	Green	Red
2 Pairs	1	Green	Red
	2	Black	Yellow

TABLE E

F CROSS-CONNECTING WIRE
CONDUCTOR IDENTIFICATION

SIZE	PAIR NO.	COLOR		
		TIP	RING	SLEEVE OR GROUND
Pair		Y-BL	BL-Y	
Triple		O-BK	BL-BK	G-BK
2 Pairs	1	R-BL	BL-R	
	2	R-O	O-R	
3 Pairs	1	W-BL	BL-W	
	2	W-O	O-W	
	3	W-G	G-W	

♦TABLE F♦

SELECTION OF INSIDE WIRING CABLE

TYPE CABLE	PAIR SIZE	GAUGE	JACKET				USE				REMARKS
			LT OLIVE GRAY	WHITE	PVC	TEFLON FEP	DUCT AND CONDUIT SYSTEMS	AIR PLENUMS WITHOUT CONDUIT	TERMINALS AT		
									DAMP LOCATIONS	DRY LOCATIONS	
D Inside Wiring	4, 6, 12 16, 21, 25 50, 75, 100	24	●		●		●		●	●	Annealed-copper conductors (plastic PVC insulated) color coded
KS-27084 Air Plenum Cable	L2	4		●		●		●		●	Annealed-copper conductors (teflon FEP insulated) color coded
	L3	6									
	L4	12									
	L5	16									
	L6	21									
	L7	25									

TABLE G
D INSIDE WIRING CABLE
CONDUCTOR IDENTIFICATION

PAIR	TIP WIRE	RING WIRE	BINDER COLOR FOR 25, 50, 75, AND 100 PAIRS
1	W-BL	BL-W	BL-W
2	W-O	O-W	
3	W-G	G-W	
4	W-BR	BR-W	
5	W-S	S-W	
6	R-BL	BL-R	
7	R-O	O-R	
8	R-G	G-R	
9	R-BR	BR-R	
10	R-S	S-R	
11	BK-BL	BL-BK	
12	BK-O	O-BK	
13	BK-G	G-BK	
14	BK-BR	BR-BK	
15	BK-S	S-BK	
16	Y-BL	BL-Y	
17	Y-O	O-Y	
18	Y-G	G-Y	
19	Y-BR	BR-Y	
20	Y-S	S-Y	
21	V-BL	BL-V	
22	V-O	O-V	
23	V-G	G-V	
24	V-BR	BR-V	
25	V-S	S-V	
26-50	Repeat First 25 Colors		O-W
51-75	Repeat First 25 Colors		G-W
76-100	Repeat First 25 Colors		BR-W

◆TABLE H◆

KS22084 AIR PLENUM
INSIDE WIRING CABLE
PAIR IDENTIFICATION

PAIR	TIP WIRE	RING WIRE	LIST NO.				BINDER		
1	W	BL	LIST 7	LIST 6	LIST 5	LIST 4	LIST 3	LIST 2	L1
2	W	O							
3	W	G							
4	W	BR							
5	W	S							
6	R	BL							
7	R	O							
8	R	G							
9	R	BR							
10	R	S							
11	BK	BL							
12	BK	O							
13	BK	G							
14	BK	BR							
15	BK	S							
16	Y	BL							
17	Y	O							
18	Y	G							
19	Y	BR							
20	Y	S							
21	V	BL							
22	V	O							
23	V	G							
24	V	BR							
25	V	S							

Corewrap of teflon TFE impregnated fiberglass. Color may vary according to manufacturer(s).