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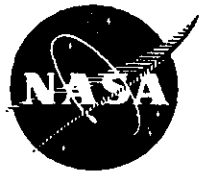
INSTRUMENTATION AND COMMUNICATIONS CABLE APPLICATIONS, STANDARD FOR

ENGINEERING DEVELOPMENT DIRECTORATE

National Aeronautics and
Space Administration

John F. Kennedy Space Center



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INSTRUMENTATION AND COMMUNICATIONS CABLE APPLICATIONS, STANDARD FOR

Approved:

Walter T. Murphy
Director of Engineering Development

JOHN F. KENNEDY SPACE CENTER, NASA

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ABBREVIATIONS AND ACRONYMS

AIR	air, with PE or TFE spacers
ASP	aluminum steel polyethylene
AT	aluminum tubing
AWG	American wire gage
CT	copper tubing
DB	double braid, tinned, copper
FEP	fluorinated ethylene propylene
FM	foam skin polyethylene
KSC	John F. Kennedy Space Center
MCM	thousands of circular mils
MI	mineral insulated
MIL	military
MM	multimode
NASA	National Aeronautics and Space Administration
NFPA	National Fire Protection Association
OS	overall shield
PA	paper (tape or pulp)
PC	polychloroprene
PDS	premise distribution system
PE	polyethylene
PE/F	foamed polyethylene
PE/SS	semisolid polyethylene
PT	pair, twisted
PTS	pair, twisted, shielded
PTSI	pair, twisted, shielded, and insulated
PVC	polyvinyl chloride
QT	quad, twisted
QTS	quad, twisted, shielded
QTSI	quad, twisted, shielded, and insulated
REA	Rural Electrification Administration
RMS	root mean square
SB	single braid, tinned, copper
SC	single conductor, unshielded
SM	single mode
SPEC	specification
SS	single conductor, shielded
SSI	single conductor, shielded, and insulated
STD	standard
TFE	polytetrafluoroethylene

ABBREVIATIONS AND ACRONYMS (cont)

TT	triplet, twisted
TTS	triplet, twisted, shielded
TTSI	triplet, twisted, shielded, and insulated
°C	degree Celsius
6T	sextet, twisted
6TS	sextet, twisted, shielded
6TSI	sextet, twisted, shielded, and insulated

INSTRUMENTATION AND COMMUNICATIONS CABLE APPLICATIONS, STANDARD FOR

1. INTRODUCTION

1.1 Scope. - This standard identifies the cable types that shall be used at the John F. Kennedy Space Center (KSC) for instrumentation and communications applications. The cable types listed herein shall be used for all new installations and for replacement of existing cabling. Cable types have been categorized in groups according to their intended usage. The electrical and mechanical characteristics of each cable are indicated where available.

1.2 Purpose. - This standard establishes a minimal complement of cable designs to be used at KSC in order to minimize design, documentation, and logistic costs and to utilize proven and reliable designs.

1.3 Limitations. - This standard is not applicable to alternating current power cables and elevator cables.

1.3.1 Alternating Current Power Cables. - Cable types of the designs normally utilized for 60-hertz, alternating current power applications with conductor sizes larger than 14 American wire gage (AWG) are excluded from this standard; these cables are specified in KSC-STD-E-0014.

1.3.2 Elevator Cables. - Elevator control cables are excluded from this standard. Such cables are specified in KSC-STD-E-0017.

2. APPLICABLE DOCUMENTS

The following documents form a part of this document to the extent specified herein. When this document is used for procurement, including solicitations, or is added to an existing contract, the specific revision levels, amendments, and approval dates of said documents shall be specified in an attachment to the Solicitation/Statement of Work/Contract. In the event of conflict between the documents referenced herein and the contents of this document, the contents of this document shall supersede except where otherwise noted. The NASA contract, purchase order, or program level documentation shall take precedence over the contents of this document in the event of conflicting requirements. Nothing in this document supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 Governmental.

2.1.1 Specifications.

John F. Kennedy Space Center (KSC), NASA

KSC-SPEC-E-0024	Cable, Electrical, Shielded, Jacketed for Harness Assemblies, General Specification for
KSC-SPEC-E-0025	Headset, Microphone and Cord Assembly, Specification for
KSC-SPEC-E-0031	Electrical Cables, General Specification for

Federal

J-C-580	Cord, Electrical and Wire, Electrical (0- to 600-Volt Service)

Military

MIL-C-17	Cables, Radio Frequency; Coaxial, Dual Coaxial, Twin Conductor and Twin Lead
MIL-C-22931	Cables, Radio Frequency, Semirigid, Coaxial, Semi-Air-Dielectric, General Specification for
MIL-C-23806	Cable, Radio Frequency, Coaxial, Semirigid, Foam Dielectric, General Specification for

2.1.2 Standards.

John F. Kennedy Space Center (KSC), NASA

KSC-STD-E-0014	Wire and Cable Applications, 60 Hertz AC Power, Standard for

KSC-STD-E-0017	Elevator Electric Traveling Cable Applications, Standard for

2.1.3 Drawings.

John F. Kennedy Space Center (KSC), NASA

75M10204	Cable, 6C(4-RG214/U, 1-RG62A/U, 1#12)OS
75M11004	Cable, 48(1SSI#14, 5PTSI#14, 11TTSI#14, and 4SSI#4)OS
75M14078	Cable, 1(500MCM)OS
79K02989	Cable, TV-39-UG Type, Specification for
79K04003	Cable, TV-39 Type, Specification for
79K04427	Cable, Telephone, Paper Insulated, Stalpeth Sheathed, Specification for
79K19026	Cable, Telephone, Plastic Insulated, Alpeth Sheathed, Specification for
79K28125	Cable, Fiber Optic, Specification for
79K33186	Premise Distribution System Specification
99K0000022	Cable, Code, Identification

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specified procurement functions should be obtained from the procuring activity or as directed by the Contracting Officer.)

2.2 Non-Governmental.

National Fire Protection Association (NFPA)

ANSI/NFPA 70	National Electrical Code

(Applications for copies should be addressed to the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, Massachusetts 02269-9101.)

Rural Electrification Administration (REA)

PE-89 Filled Telephone Cables With Expanded Insulation, Specification for

(Copies may be obtained from the KSC Library, Specification and Standards Branch, KSC, Florida 32899.)

3. REQUIREMENTS

Cable types listed herein are classified as general use or special purpose. General-use cable types are further classified by groups.

3.1 General-Use Cables. - General-use cables are intended for any application for which their design characteristics are suited. The cable types listed herein as general use constitute a complement of cable designs having a broad range of environmental and electrical capabilities to meet most requirements at KSC. General-use cables shall be utilized for all new designs and for replacement of existing installations, except for special-purpose cables specified in 3.2. Cable types classified as general use are grouped either by normal intended usage or by physical characteristics, whichever is more appropriate. Such groupings are intended to assist in locating cables with the desired physical and electrical characteristics and do not necessarily restrict the application. Cables utilized in hazardous locations must comply with the provisions of ANSI/NFPA 70, Articles 500 through 504. Cables utilized in plenum and riser applications are identified in and must meet the requirements of ANSI/NFPA 70, Article 770. The following general-use cable groups are listed in tables A-1 through A-7 in appendix A.

a. Table A-1: Mineral-Insulated Cable

b. Table A-2: Heavy-Duty Instrumentation and Control Cable

c. Table A-3: Lightweight Instrumentation and Control Cable

d. Table A-4: Radio Frequency Cable (Coaxial)

e. Table A-5: Flexible Video Frequency Cable (Twinaxial)

f. Table A-6: Telephone Communications Cable (Outside Plant)

g. Table A-7: Fiber-Optic Cable

h. Table A-8: Premise Distribution System

3.1.1 Mineral-Insulated Cables. - The mineral-insulated (MI) group of cables covers all mineral-insulated cable with conductor sizes of 14 AWG and smaller and with more than four conductors in larger conductor sizes (see table A-1). MI cables with four conductors or less with conductor sizes larger than 14 AWG are specified in KSC-STD-E-0014. MI cables consist of solid copper conductors embedded in compressed magnesium oxide within a solid copper sheath. MI cables are semirigid and should be used only in fixed installations. All MI cables listed in table A-1 have a voltage rating of 600 volts root mean square (RMS). MI cables will withstand any temperature up to the melting point of copper [1083 degrees Celsius (°C)]. Direct MI cable penetrations into explosionproof electrical enclosures are permitted by ANSI/NFPA 70. The magnesium oxide insulation is extremely hygroscopic, and the ends of the cable must be hermetically sealed at all times. Because of its high cost, the high installation cost, and the difficulty in proper installation, MI cable should be used only where its thermal or explosion-proof characteristics are essential. MI cables with a plastic sheath shall not be used.

3.1.2 Instrumentation and Control Cables. - The instrumentation and control group of cables covers all cables with conductor sizes of 14 AWG and smaller (excluding MI cable, radio frequency cable, communications cable, and power cord cable). Heavy-duty instrumentation and control cables are listed in table A-2 and lightweight cables are listed in table A-3.

3.1.2.1 Heavy-Duty Cables. - All heavy-duty cables with conductor sizes of 14 AWG and smaller are included in this group (see table A-2). All the cable types listed in table A-2 are heavy-duty designs suitable for rough-service use in exterior environments. The cables have good flexibility and are suitable for general interior use, including portable service. All heavy-duty cables have fine-stranded, tinned, copper conductors. The cable shields consist of a woven, tinned, copper braid. The cables are not designed for high-voltage operation and their service application should be limited to 600 volts RMS. The cables are rated for operation at a maximum continuous temperature of 75 °C but will withstand brief exposure to much higher temperatures.

3.1.2.2 Lightweight Cables. - Lightweight cables have a lighter sheath than heavy-duty types and should not be used where they will be subjected to mechanical abuse. Cable conductors are the same design as those in heavy-duty cables. The cables are flexible and are intended primarily for interior use, but may be

used in wet locations. All cables are rated for operation at 600 volts RMS maximum and at a maximum continuous temperature of 75 °C.

3.1.3 Radio Frequency Cable. - The radio frequency group of cables covers coaxial cables used for radio frequency applications (see table A-4). The cables listed in table A-4 are of the following basic types: (1) flexible, (2) semirigid, foam dielectric, and (3) semirigid, air dielectric.

3.1.3.1 Flexible Coaxial Cables. - Flexible coaxial cables have solid or semisolid polyethylene (PE) dielectrics, outer conductors of single or double braids of tinned copper strands, and polyvinyl chloride (PVC) jackets over the outer conductors. These cables have higher loss, lower propagation velocity, and poorer shielding effectiveness than the semirigid types but must be used where portable service and flexibility are required.

3.1.3.2 Semirigid, Foam Dielectric Coaxial Cables. - Semirigid, foam dielectric coaxial cables have solid copper center conductors, foamed polyethylene (PE/F) dielectrics, outer conductors of aluminum tubing (AT) and are available with no outer jacket, multiple outer jackets including flooding compound, and high-density PE jackets over the outer conductors. The cables have a higher loss and lower propagation velocity than the air dielectric cables but have the advantage of not requiring pressurization. The cables are suitable only for fixed installations. In general, connectors for this type of cable must be secured from the cable supplier.

3.1.3.3 Semirigid, Air Dielectric Coaxial Cables. - Semirigid, air dielectric coaxial cables have tubular copper center conductors, air dielectrics, outer conductors of AT or copper tubing (CT), and high-density PE jackets over the outer conductors. These cables have the lowest loss and highest propagation velocity of any of the coaxial designs listed in table A-4. These cables must be pressurized with dry gas at all times to prevent the entrance of moisture. The cables are suitable only for fixed installation. In general, connectors for this type of cable must be secured from the cable supplier.

3.1.4 Flexible Video Frequency Cables. - The video pair cable group covers flexible video pair cables for video frequency applications (see table A-5). Two types of video pair cable are listed in table A-5: (1) flexible pair cable and (2) miniature flexible pair cable. All of the cables consist of balanced, shielded pairs with a characteristic impedance of 124 ohms. Design characteristics and physical and electrical parameters of each type are given in 3.1.4.1, 3.1.4.2, and table A-5.

3.1.4.1 Flexible Video Pair Cables. - Flexible video pair cable consists of two 19 AWG solid uncoated copper conductors, insulated with solid PE, and color coded blue and white for circuit identification. The conductors are twisted and a solid

PE belt is extruded over the pair filling the interstices between conductors. Over this, two woven, silver-coated copper braid shields and a PVC jacket are applied.

3.1.4.2 Miniature Flexible Video Pair Cables. - Miniature flexible video pair cable is designed as an extra flexible lightweight cable that can be used as an alternate to the flexible video pair cable in applications where its higher attenuation is not critical. The miniature flexible video pair cable consists of two 24 AWG stranded, annealed, uncoated copper conductors that are insulated with solid PE and color coded blue and white for circuit identification. The conductors are twisted and a solid PE belt is extruded over the pair. Over this, a single woven, silver-coated copper braid shield and a PVC jacket are applied.

3.1.5 Telephone Communications Cables. - Telephone communications cables included in this group are designed for use in the outside plant portion of the KSC cable system (see table A-6) and are of three general types, each distinguished by the cable construction: (1) stalpeth-sheathed cable, (2) alpeth-sheathed cable, and (3) aluminum steel polyethylene (ASP) sheathed cable. All types have solid copper conductors (either 19, 22, or 24 AWG) twisted into pairs. The conductors of Stalpeth-sheathed and Alpeth-sheathed cables are PE insulated, and ASP-sheathed cables are foam skin polyethylene insulated. All three types have optimum characteristics for transmission of audio signals.

3.1.5.1 Stalpeth-Sheathed Cables. - Stalpeth-sheathed cables consist of: (1) an aluminum tape shield over the cable core, (2) a watertight steel tubular encasement over the aluminum shield, and (3) a jacket of black high-density PE extruded over the steel shell. Stalpeth-sheathed cables have paper-insulated conductors. This cable type is recommended for all permanent underground (in duct) outside plant installations.

3.1.5.2 Alpeth-Sheathed Cables. - Alpeth-sheathed cables consist of a sealed aluminum tape shield over the cable core with a jacket of black high-density PE extruded over the aluminum shield. Cable conductors are PE insulated. This cable type is recommended for use in all aboveground outside plant cable installations (including building cable).

3.1.6 Fiber-Optic Cables. - The fiber-optic cable group includes composite multimode (MM) and single-mode (SM) optical fibers suitable for transmission of audio, wideband, and high-speed data signals at KSC (see table A-7). The fibers are color coded in a loose buffering tube made of PVC, mylar, nylon, or a functionally equivalent material utilized for protection. The multi-mode fibers are considered first and the single-mode fibers are considered last in the core makeup for numbering or identification of fibers.

3.1.7 Premise Distribution Cables. Every facility requires a unique premise distribution system that includes voice, video, and data provided via premise distribution cabling (see table A-8). The cabling consists of two types: riser and horizontal. Riser cabling consists of inside building cabling from the entrance communication room to other communication rooms as in multistory buildings. Horizontal cabling consists of cabling from a communication room to a user location on the same floor level. Other subsystems are found in specification 79K33186. The primary services include telephones, local area networks, cable television, other broadband communications, and data terminals.

3.2 Unique Cables. - Certain cable systems at KSC utilize cable types designed specifically for those systems (see table B-1 in appendix B). Because of special system requirements or interfaces, continued use of these unique cables is required for maintenance, replacement, or expansion. It is the intent of this standard to restrict usage designs to a minimum. New designs shall utilize standard general-use cables to the greatest extent possible. Approval for use of cables other than those listed in table B-1 must be obtained in accordance with the waiver provisions in 3.3.

3.3 Request for Waivers. - Should a requirement exist for a cable type not listed in this standard, a waiver must be requested. Requests for waivers shall contain supporting technical information on the cable type needed and justifications as to why the cable type must be used. Requests for waivers should be addressed to Facilities Engineering Division, NASA, John F. Kennedy Space Center, Florida 32899.

4. QUALITY ASSURANCE PROVISIONS

4.1 General.

4.1.1 Workmanship. - Workmanship shall be of a level of quality adequate to ensure that the processed products meet the performance requirements of the engineering documentation and criteria delineated herein.

4.1.2 Inspection. - Inspection for acceptability shall be performed. Conductors shall not be physically disturbed to aid inspection. Inspections shall be made at appropriate points during assembly, at the completion of assembly, and after installation to establish that the appropriate requirements have been met. Inspection may include visual inspection, mechanical measurements, electrical testing, and other methods as deemed necessary. Inspection and testing points shall be specified on the applicable planning documents.

4.1.3 Quality Assurance Responsibilities. - Quality Assurance has the responsibility to verify compliance with all requirements of this document. Quality Assurance shall:

a. Verify all tests, inspections, and measurements have been performed.

b. Verify the facility cleanliness, environmental conditions, and lighting requirements are being met.

c. Verify procedures defining cleaning, handling, and packaging are approved and their requirements are followed.

4.1.4 Magnification Aids. - Inspection optics shall be provided as required. Visual inspection shall be aided by magnification between 4X and 10X. Additional magnification shall be used, as necessary, to resolve suspected anomalies or defects.

5. PREPARATION FOR DELIVERY

All cables shall be shipped on nonreturnable reels. The diameter of the drum shall be at least 13 times the diameter of the cable. The reels shall be substantial and so constructed as to prevent damage to the cable during shipment and handling. End seals shall be applied to each end of the cable to prevent moisture from entering the cable. The cabled reels shall be suitable for outside storage conditions when temperatures range from -40 to +65 °C, with relative humidity from 0 to 100 percent.

6. NOTES

Intended Use. - This standard is intended for use by designers in the selection of cables for new installations and cable replacements at KSC.

NOTICE. When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner

licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodian	Preparing Activity:
NASA - John F. Kennedy Space Center	John F. Kennedy Space Center Facilities Engineering Division Engineering Development Directorate

APPENDIX A

GENERAL-USE CABLES

Table A-1. Mineral-Insulated Cable

Item	Conductor Size	No. of Conductors	Diameter	Weight	Resistance	L Code
1	10	7	15.8 (0.621)	282 (622)	1.02	L26
2	12	7	13.8 (0.543)	209 (461)	1.62	
3	14	2	9.4 (0.371)	90 (199)	2.58	
4	14	3	9.8 (0.387)	101 (222)	2.58	L42
5	14	4	10.6 (0.418)	118 (260)	2.58	
6	14	7	12.6 (0.495)	167 (368)	2.58	
7	16	2	8.6 (0.340)	75 (166)	4.10	
8	16	3	9.0 (0.355)	84 (184)	4.10	
9	16	4	9.8 (0.387)	98 (217)	4.10	L439
10	16	7	11.4 (0.449)	133 (294)	4.10	L437

NOTES:

1. Conductor Size: Individual conductor size is in AWG.

2. No. of Conductors: The number of individual conductors in the cable.

3. Diameter: The nominal overall outside diameter of the cable in millimeters (inches).

4. Weight: The nominal weight of the cable is indicated in kilograms per 305 meters (pounds per 1000 feet) standard length.

5. Resistance: The maximum direct current resistance of each conductor in ohms per 305 meters (1000 feet) standard length, measured at 20 °C.

6. L Code: The L number, used in the abbreviated identification of cable types, has been taken from KSC drawing 99K0000022 and is given for cross-reference purposes.

Table A-2. Heavy-Duty Instrumentation and Control Cable

Item	Conductor Size	No. of Conductors	Cable Construction	Conductor Insulation	Sheath	Diameter	Weight	Resistance	L Code	Specification	Stock Number
1	14	2	SC/OS	PE	PC			2.99			
2	14	3	SC/OS	PE	PC			2.99	L413		
3	14	4	SC/OS	PE	PC			2.99			
4	14	7	SC/OS	PE	PC			2.99			
5	14	11	SC/OS	PE	PC			2.99			
6	14	18	SC/OS	PE	PC			2.99			
7	14	30	SSI/OS	PE	PC	39.9 (1.57)	798 (1758)	2.99	L204	KSC-SPEC-E-0031	6145K019175
8	14	40	20PTSI/OS	PE	PC	54.1 (2.13)	1748 (3850)	2.99	L5	KSC-SPEC-E-0031	6145K000766
9	14	45	15TTSI/OS	PE	PC	52.3 (2.06)	1641 (3615)	2.99	L6	KSC-SPEC-E-0031	6145K013411
10	14	48	12QTSI/OS	PE	PC	51.1 (2.01)	1230 (2710)	2.99	L239	KSC-SPEC-E-0031	
11	14	60	SC/OS	PE	PC	39.4 (1.55)	802 (1767)	2.99	L1	KSC-SPEC-E-0031	6145K000764
12	14	60	SS/OS	PE	PC	48.3 (1.90)	1285 (2831)	2.99	L2	KSC-SPEC-E-0031	6145K000765
13	14	60	30PTS/OS	PE	PC	59.9 (2.36)	1929 (4248)	2.99	L3	KSC-SPEC-E-0031	6145K000770
14	14	60	20TTS/OS	PE	PC	54.1 (2.13)		2.99	L7	KSC-SPEC-E-0031	6145K024481
15	14	60	15QTS/OS	PE	PC	53.8 (2.12)		2.99	L8	KSC-SPEC-E-0031	6145K013412
16	16	2	SC/OS	PE	PC			4.76			
17	16	2	PTS/OS	PE	PC			4.76			
18	16	3	SC/OS	PE	PC			4.76			
19	16	4	SC/OS	PE	PC			4.76			

Table A-2. Heavy-Duty Instrumentation and Control Cable (cont)

Item	Conductor Size	No. of Conductors	Cable Construction	Conductor Insulation	Sheath	Diameter	Weight	Resistance	L Code	Specification	Stock Number
20	16	6	SC/OS	PE	PC	12.7 (0.50)	45 (100)	4.76	L61	KSC-SPEC-E-0031	6145K018140
21	16	10	SC/OS	PE	PC	16.8 (0.66)	94 (206)	4.76	L201	KSC-SPEC-E-0031	6145LC12648
22	16	15	SC/OS	PE	PC			4.76			
23	16	20	SC/OS	PE	PC	20.3 (0.80)	54 (118)	4.76	L231	KSC-SPEC-E-0031	6145LC12657
24	16	25	SC/OS	PE	PC			4.76			
25	16	30	SSI/OS	PE	PC	34.8 (1.37)	574 (1265)	4.76	L247	KSC-SPEC-E-0031	6145K024482
26	16	37	SC/OS	PE	PC	27.9 (1.11)	445 (980)	4.76	L250	KSC-SPEC-E-0031	
27	16	40	20PTSI/OS	PE	PC	46.2 (1.82)	1056 (2325)	4.76	L142	KSC-SPEC-E-0031	6145LC12670
28	16	45	15TTSI/OS	PE	PC	42.9 (1.69)	917 (2020)	4.76	L246	KSC-SPEC-E-0031	6145K023863
29	16	47	SC/OS	PE	PC			4.76			
30	16	48	12QTSI/OS	PE	PC	42.7 (1.68)	894 (1970)	4.76	L245	KSC-SPEC-E-0031	
31	16	48	6-8TSI	PE	PC					KSC-SPEC-E-0031	614500K275694
32	16	60	SC/OS	PE	PC	30.5 (1.20)	295 (650)	4.76	L144	KSC-SPEC-E-0031	6145K018533
33	16	60	SS/OS	PE	PC	35.3 (1.39)		4.76	L33	KSC-SPEC-E-0031	6145K807221
34	16	60	30PTS/OS	PE	PC	45.7 (1.80)		4.76	L328		
35	16	60	20TTS/OS	PE	PC			4.76			
36	16	60	15QTS/OS	PE	PC			4.76			

Table A-2. Heavy-Duty Instrumentation and Control Cable (cont)

Item	Conductor Size	No. of Conductors	Cable Construction	Conductor Insulation	Sheath	Diameter	Weight	Resistance	L Code	Specification	Stock Number
37	16	72	12-6TSI/OS	PE	PC	57.2 (2.25)	1135 (2500)	4.76	L363		
38	18	60	30PT/OS	PE	PC			6.08	L24		
39	18	100	50PT/OS	PE	PC	41.4 (1.63)		6.08	L335	KSC-SPEC-E-0031	6145K806913
40	20	2	SC/OS	PE	PC	9.1 (0.36)	22 (49)	9.70	L159	KSC-SPEC-E-0031	6145LC12659
41	20	3	SC/OS	PE	PC	9.4 (0.37)	26 (58)	9.70	L221	KSC-SPEC-E-0031	6145LC12660
42	20	4	SC/OS	PE	PC			9.70			
43	20	5	SC/OS	PE	PC			9.70			
44	20	5	SS	PE	PC			9.70			
45	20	6	3PTSI	PE	PC			9.70			
46	20	9	SC/OS	PE	PC			9.70			
47	20	9	SS	PE	PC			9.70			
48	20	12	6PTSI	PE	PC	20.3 (0.80)		9.70	L301		
49	20	18	SC/OS	PE	PC	14.7 (0.58)	79 (173)	9.70	L230	KSC-SPEC-E-0031	6145LC12654
50	20	18	SS	PE	PC	17.3 (0.68)	73 (161)	9.70	L401	KSC-SPEC-E-0031	
51	20	24	12PTSI	PE	PC	27.9 (1.10)		9.70	L293		
52	20	25	SC/OS	PE	PC			9.70			
53	20	34	SS/OS	PE	PC			9.70			
54	20	35	SC/OS	PE	PC			9.70			
55	20	40	20PTSI/OS	PE	PC	35.3 (1.39)	763 (1680)	9.70	L55	KSC-SPEC-E-0031	6145LC12666

Table A-2. Heavy-Duty Instrumentation and Control Cable (cont)

Item	Conductor Size	No. of Conductors	Cable Construction	Conductor Insulation	Sheath	Diameter	Weight	Resistance	L Code	Specification	Stock Number
56	20	60	SC/OS	PE	PC	22.9 (0.90)	200 (440)	9.70	L22	KSC-SPEC-E-0031	6145LC12656
57	20	60	SS/OS	PE	PC			9.70			
58	20	60	30PT/OS	PE	PC	20.3 (0.88)		9.70	L28		
59	20	60	30PTS/OS	PE	PC			9.70			
60	20	61	SC	PE	PC	24.9 (0.98)	163 (358)	9.70	L140	KSC-SPEC-E-0031	6145LC12641

NOTES:

1. Conductor Size: Individual conductor size is in thousands of circular mils (MCM) or American wire gage (AWG), as applicable.

2. No. of Conductors: The number of individually insulated conductors in the cable.

3. Cable Construction:

SC = single conductor, unshielded (SC may be omitted in cable designations for "single conductor" cable configurations.)
SS = single conductor, shielded
SSI = single conductor, shielded, and insulated
PT = pair, twisted
PTS = pair, twisted, shielded
PTSI = pair, twisted, shielded, and insulated
TT = triplet, twisted
TTS = triplet, twisted, shielded
TTSI = triplet, twisted, shielded, and insulated
QT = quad, twisted
QTS = quad, twisted, shielded
QTSI = quad, twisted, shielded, and insulated
6T = sextet, twisted
6TS = sextet, twisted, shielded
6TSI = sextet, twisted, shielded, and insulated
OS = overall shield

Table A-2. Heavy-Duty Instrumentation and Control Cable (cont)

NOTES: (cont)

4. Conductor Insulation:

   PE = polyethylene

5. Sheath:

   PC = polychloroprene

6. Diameter: The nominal overall outside diameter of the cable in millimeters (inches).

7. Weight: The nominal weight of the cable is indicated in kilograms per 305 meters (pounds per 1000 feet) standard length.

8. Resistance: The maximum direct current resistance of each conductor in ohms per 305 meters (1000 feet) standard length, measured at 20 °C.

9. L Code: The L number, used in the abbreviated identification of cable types, has been taken from KSC drawing 99K0000022 and is given for cross-reference purposes.

10. Specification: The specification number given is the cable design specification. This specification, in conjunction with the basic cable description and the manufacturer's part number, when applicable, is sufficient definition for competitive procurement of the cable.

11. Stock Number: The stock numbers are taken from the KSC Stores Stock Catalog, where available. Numbers containing only numerical characters are carried in the Federal Supply System.

Table A-3. Lightweight Instrumentation and Control Cable

Item	Conductor Size	No. of Conductors	Cable Construction	Conductor Insulation	Sheath	Diameter	Resistance	Specification	Stock Number
1	14	1	SC/OS	PE	PVC	4.5 (0.176)	2.99	KSC-SPEC-E-0024/1	
2	14	2	PT/OS	PE	PVC	8.3 (0.326)	2.99	KSC-SPEC-E-0024/2	
3	14	3	TT/OS	PE	PVC	8.8 (0.348)	2.99	KSC-SPEC-E-0024/3	
4	14	4	QT/OS	PE	PVC	9.8 (0.386)	2.99	KSC-SPEC-E-0024/4	
5	14	6	6T/OS	PE	PVC	12.0 (0.472)	2.99	KSC-SPEC-E-0024/6	
6	16	1	SC/OS	PE	PVC	3.8 (0.151)	4.76	KSC-SPEC-E-0024/1	6145K027887
7	16	2	PT/OS	PE	PVC	6.6 (0.260)	4.76	KSC-SPEC-E-0024/2	6145K027889
8	16	3	TT/OS	PE	PVC	7.1 (0.278)	4.76	KSC-SPEC-E-0024/3	
9	16	4	QT/OS	PE	PVC	7.8 (0.307)	4.76	KSC-SPEC-E-0024/4	
10	16	6	6T/OS	PE	PVC	9.7 (0.380)	4.76	KSC-SPEC-E-0024/6	
11	16	8	SC/OS	PE	PVC			KSC-SPEC-E-0024/8	614500K044846
12	16	48	TSI						614500K275694
13	18	1	SC/OS	PE	PVC	3.7 (0.144)	6.08	KSC-SPEC-E-0024/1	
14	18	2	PT/OS	PE	PVC	6.2 (0.243)	6.08	KSC-SPEC-E-0024/2	
15	18	3	TT/OS	PE	PVC	6.6 (0.260)	6.08	KSC-SPEC-E-0024/3	
16	18	4	QT/OS	PE	PVC	7.3 (0.287)	6.08	KSC-SPEC-E-0024/4	

Table A-3. Lightweight Instrumentation and Control Cable (cont)

Item	Conductor Size	No. of Conductors	Cable Construction	Conductor Insulation	Sheath	Diameter	Resistance	Specification	Stock Number
17	18	6	6T/OS	PE	OVC	9.1 (0.357)	6.08	KSC-SPEC-E-0024/6	
18	20	1	SC/OS	PE	PVC	3.1 (0.123)	9.70	KSC-SPEC-E-0024/1	6145K027888
19	20	2	PT/OS	PE	PVC	4.9 (0.191)	9.70	KSC-SPEC-E-0024/2	
20	20	3	TT/OS	PE	PVC	5.2 (0.205)	9.70	KSC-SPEC-E-0024/3	
21	20	4	QT/OS	PE	PVC	5.8 (0.227)	9.70	KSC-SPEC-E-0024/4	
22	20	6	6T/OS	PE	PVC	7.0 (0.275)	9.70	KSC-SPEC-E-0024/6	
23	20	8	SC/OS	PE	PVC			KSC-SPEC-E-0024/1	614500K044847
24	22	1	SC/OS	PE	PVC	2.9 (0.115)	15.50	KSC-SPEC-E-0024/1	
25	22	2	PT/OS	PE	PVC	4.4 (0.174)	15.50	KSC-SPEC-E-0024/2	
26	22	3	TT/OS	PE	PVC	4.6 (0.183)	15.50	KSC-SPEC-E-0024/3	
27	22	4	QT/OS	PE	PVC	5.1 (0.202)	15.50	KSC-SPEC-E-0024/4	
28	22	6	6T/OS	PE	PVC	6.2 (0.243)	15.50	KSC-SPEC-E-0024/6	
29	24	4							614500K058479
30	22	25	SC/OS						614500K048811
31	22	4							6145009578519

Table A-3. Lightweight Instrumentation and Control Cable (cont)

NOTES:

1. Conductor Size: Individual conductor size is in thousands of circular mils (MCM) or American wire gage (AWG), as applicable.
2. No. of Conductors: The number of individually insulated conductors in the cable.
3. Cable Construction:

SC	=	single conductor, unshielded (SC may be omitted in cable designations for "single conductor" cable configurations.)
SS	=	single conductor, shielded
SSI	=	single conductor, shielded, and insulated
PT	=	pair, twisted
PTS	=	pair, twisted, shielded
PTSI	=	pair, twisted, shielded, and insulated
TT	=	triplet, twisted
TTS	=	triplet, twisted, shielded
TTSI	=	triplet, twisted, shielded, and insulated
QT	=	quad, twisted
QTS	=	quad, twisted, shielded
QTSI	=	quad, twisted, shielded, and insulated
6T	=	sextet, twisted
6TS	=	sextet, twisted, shielded
6TSI	=	sextet, twisted, shielded, and insulated
OS	=	overall shield

4. Conductor Insulation:

   PE = polyethylene

5. Sheath:

   PVC = polyvinyl chloride

6. Diameter: The nominal overall outside diameter of the cable in millimeters (inches).
7. Resistance: The maximum direct current resistance of each conductor in ohms per 305 meters (1000 feet) standard length, measured at 20 °C.
8. Specification: The specification number given is the cable design specification. This specification, in conjunction with the basic cable description and the manufacturer's part number, when applicable, is sufficient definition for competitive procurement of the cable.
9. Stock Number: The stock numbers are taken from the KSC Stores Stock Catalog, where available. Numbers containing only numerical characters are carried in the Federal Supply System.

Table A-4. Radio Frequency Cable (Coaxial)

Item	Cable Type	Dielectric	Outer Conductor	Sheath	Impedance	Velocity	Attenuation	Diameter	Weight	L Code	Specification	Stock Number
1	RG-11A/U	PE	SB	PVC	75	65.9	5.2	10.3 (0.405)	44 (96)	L75	MIL-C-17/6	61451610885
2	RG-58C/U	PE	SB	PVC	50	65.9	14.0	5.0 (0.195)	13 (29)	L289	MIL-C-17/28	61455426092
3	RG-59B/U	PE	SB	PVC	75	65.9	9.0	6.1 (0.242)	15 (32)	L365	MIL-C-17/29	61456610191
4	RG-62A/U	PE/SS	SB	PVC	93	84.0	8.0	6.1 (0.242)	17 (38)	L36	MIL-C-17/30	61451610913
5	RG-174/U	PE	SB	PVC	50	---	20.0	2.5 (0.100)			MIL-C-17/119	
6	RG-213/U	PE	SB	PVC	50	65.9	5.5	10.3 (0.405)	48 (106)	L31	MIL-C-17/74	61456608711
7	RG-214/U	PE	DB	PVC	50	65.9	5.5	10.8 (0.425)	68 (150)	L53	MIL-C-17/75	61456608054
8	RG-218/U	PE	SB	PVC	50	65.9	2.5	22.1 (0.870)	209 (460)	L96	MIL-C-17/79	61455778113
9	RG-331/U	PE/F	AT	PE	50	81.0	1.8	12.7 (0.5)	195 (430)		MIL-C-23806/1	61451743587
10	RG-335/U	PE/F	AT	PE	75	81.0	1.9	12.7 (0.5)	175 (386)		MIL-C-23806/1	
11	RG-333/U	PE/F	AT	PE	50	81.0	1.2	22.2 (0.875)	474 (1045)		MIL-C-23806/2	61458271938
12	RG-306/U	PE/F	AT	PE	75	81.0	1.2	22.2 (0.875)	406 (894)		MIL-C-23806/2	
13	RG-318/U	AIR	CT	PE	50	91.6	0.94	22.2 (0.875)	241 (530)	L471	MIL-C-22931/11	
14	RG-247/U	AIR	AT	PE	75	90.0	1.0	22.2 (0.875)	192 (423)		MIL-C-22931/12	
15	RG-319A/U	AIR	CT	PE	50	92.0	0.54	41.3 (1.625)	472 (1040)	L468	MIL-C-22931/13	

Table A-4. Radio Frequency Cable (Coaxial) (cont)

Item	Cable Type	Dielectric	Outer Conductor	Sheath	Impedance	Velocity	Attenuation	Diameter	Weight	L Code	Specification	Stock Number
16	RG-249/U	AIR	AT	PE	75	91.0	0.54	41.3 (1.625)	498 (1098)		MIL-C-22931/14	
17	7(RG-58C/U)OS	PE	SB	PC	50	65.9	14.0			L20		
18	7(RG-59/U)OS	PE	SB	PC	75	65.9	9.0					
19	7(RG-62A/U)OS	PE/SS	SB	PC	93	84.0	8.0					
20	RG-180B/U	TFE	SB	FEP	95		17.0	3.7 (0.145)	9 (19.8)		MIL-C-17/95	
21	RG-187A/U	TFE	SB	PTFE	75		21.0	2.8 (0.110)			MIL-C-17/68	61450806515

NOTES:

1. Cable Type: The cable type shown is the RG type by which the cable is identified in the applicable specification.

2. Dielectric:

   PE = polyethylene, solid
   PE/SS = polyethylene, semisolid
   PE/F = polyethylene, foamed
   AIR = air, with PE or TFE spacers
   TFE = polytetrafluoroethylene, solid

3. Outer Conductor:

   SB = single braid, tinned, copper
   DB = double braid, tinned, copper
   AT = aluminum tubing
   CT = copper tubing

Table A-4. Radio Frequency Cable (Coaxial) (cont)

NOTES: (cont)

4. Sheath:

   PVC = polyvinyl chloride
   PE = polyethylene
   PC = polychloroprene
   FEP = fluorinated ethylene propylone

5. Impedance: The characteristic impedance of the cable in ohms.

6. Velocity: The wave propagation velocity of the cable in percent, relative to that of free space.

7. Attenuation: The signal attenuation afforded by the cable is expressed in decibels per each 30.5 meters (100 feet) at a frequency of 400 megahertz, measured at 20 °C.

8. Diameter: The nominal overall outside diameter of the cable in millimeters (inches).

9. Weight: The nominal weight of the cable is indicated in kilograms per 305 meters (pounds per 1000 feet) standard length.

10. L Code: The L number, used in the abbreviated identification of cable types, has been taken from KSC drawing 99K0000022 and is given for cross-reference purposes.

11. Specification: The specification number given is the cable design specification. This specification, in conjunction with the basic cable description and the manufacturer's part number, when applicable, is sufficient for competitive procurement of the cable.

12. Stock Number: The stock numbers are taken from the KSC Stores Stock Catalog, where available. Numbers containing only numerical characters are carried in the Federal Supply System.

Table A-5. Flexible Video Frequency Cable (Twinaxial)

Item	Cable Type	Attenuation	Diameter	Weight	L Code	Stock Number
1	Flexible video pair cable, General Cable Corp. P/N T-43, ATT P/N 102-215-753	2.6	10.7 (0.420)	62 (137)	L9	614500958-3654
2	Miniature flexible video pair cable, General Cable Corp. P/N T-43M	3.6	6.4 (0.250)			

NOTES:

1. Cable Type: The cable type shown is the manufacturer's part designation.

2. Attenuation: The signal attenuation afforded by the cable is expressed in decibels per each 30.5 meters (100 feet) at a frequency of 1.0 megahertz, measured at 20 °C.

3. Diameter: The nominal overall outside diameter of the cable in millimeters (inches).

4. Weight: The nominal weight of the cable is indicated in kilograms per 305 meters (pounds per 1000 feet) standard length.

5. L Code: The L number, used in the abbreviated identification of cable types, has been taken from KSC drawing 99K0000022 and is given for cross-reference purposes.

6. Stock Number: The stock numbers are taken from the KSC Stores Stock Catalog, where available. Numbers containing only numerical characters are carried in the Federal Supply System.

Table A-6. Telephone Communications Cable (Outside Plant)

Item	Conductor Size	No. of Conductor Pairs	Conductor Insulation	Sheath	Loop Resistance	Mutual Capacitance	Attenuation	Diameter	Weight	L Code	Specification	Stock Number
1	19	400	PA	Stalpeth	57 (92)	0.052 (0.084)	1.31	66.0 (2.6)	1905 (4195)	L498	79K04427	6145K025365
2	19	550	PA	Stalpeth	57 (92)	0.052 (0.084)	1.31	76.2 (3.0)	2572 (5665)	L441	79K04427	6145K026710
3	22	25	PA	Stalpeth	116 (186)	0.052 (0.084)	1.85	16.0 (0.63)	98 (215)		79K04427	6145K025367
4	22	50	PA	Stalpeth	116 (186)	0.052 (0.084)	1.85	19.8 (0.78)	159 (350)	L476	79K04427	6145K025361
5	22	100	PA	Stalpeth	116 (186)	0.052 (0.084)	1.85	25.4 (1.0)	277 (610)	L484	79K04427	6145K025363
6	22	200	PA	Stalpeth	116 (186)	0.052 (0.084)	1.85	35.6 (1.4)	522 (1150)	L493	79K04427	6145K025364
7	22	400	PA	Stalpeth	116 (186)	0.052 (0.084)	1.85	48.3 (1.9)	985 (2170)	L499	79K04427	6145K026708
8	22	600	PA	Stalpeth	116 (186)	0.052 (0.084)	1.85	58.4 (2.3)	1439 (3170)	L504	79K04427	6145K025366
9	22	900	PA	Stalpeth	116 (186)	0.052 (0.084)	1.85	68.6 (2.7)	2111 (4650)	L509	79K04427	6145K025359
10	22	1200	PA	Stalpeth	116 (186)	0.052 0.084	1.85				79K04427	6145K028801
11	19	6	PE	Alpeth	57 (92)	0.052 (0.084)	1.30	12.4 (0.49)	48 (105)		79K19026	
12	19	12	PE	Alpeth	57 (92)	0.052 (0.084)	1.30	2.54 (0.62)	79 (175)		79K19026	
13	19	25	PE	Alpeth	57 (92)	0.052 (0.084)	1.30	12.8 (0.81)	145 (320)		79K19026	6145K025344
14	19	50	PE	Alpeth	57 (92)	0.052 (0.084)	1.30	27.9 (1.1)	288 (635)	L19	79K19026	6145K025338
15	19	100	PE	Alpeth	57 (92)	0.052 (0.084)	1.30	40.6 (1.6)	540 (1190)	L446	79K19026	6145K025357

Table A-6. Telephone Communications Cable (Outside Plant) (cont)

Item	Conductor Size	No. of Conductor Pairs	Conductor Insulation	Sheath	Loop Resistance	Mutual Capacitance	Attenuation	Diameter	Weight	L Code	Specification	Stock Number
16	19	200	PE	Alpeth	57 (92)	0.052 (0.084)	1.30	53.3 (2.1)	1040 (2290)	L520	79K19026	6145K025339
17	19	400	PE	Alpeth	57 (92)	0.052 (0.084)	1.30	73.7 (2.9)	2011 (4430)		79K19026	6145K025340
18	22	25	PE	Alpeth	116 (186)	0.052 (0.084)	1.85	16.0 (0.63)	82 (180)	L298	79K19026	6145K025341
19	22	50	PE	Alpeth	116 (186)	0.052 (0.084)	1.85	21.3 (0.84)	159 (350)	L299	79K19026	6145K025342
20	22	100	PE	Alpeth	116 (186)	0.052 (0.084)	1.85	30.5 (1.2)	291 (640)	L297	79K19026	6145K025343
21	22	200	PE	Alpeth	116 (186)	0.052 (0.084)	1.85	38.1 (1.5)	540 (1190)	L296	79K19026	6145K025345
22	22	400	PE	Alpeth	111 (186)	0.052 (0.084)	1.85	53.3 (2.1)	1044 (2300)	L295	79K19026	
23	24	<1800	FM	ASP	180 (290)	0.052 (0.083)					REA PE-89	
24	22	<1200	FM	ASP	114 (184)	0.052 (0.083)					REA PE-89	
25	19	<25	FM	ASP	57 (92)	0.052 (0.083)					REA PE-89	

NOTES:

1. Conductor Size: Individual conductor size in AWG.
2. No. of Conductor Pairs: The total number of conductor pairs in the cable.

Table A-6. Telephone Communications Cable (Outside Plant) (cont)

NOTES: (cont)

3. Conductor Insulation:

   FM = foam skin polyethylene
   PA = paper (tape or pulp)
   PE = polyethylene
   ASP = aluminum steel polyethylene

4. Sheath: See 3.1.5.

5. Loop Resistance: The direct-current loop resistance (twice that of a single conductor) of the conductor pair in ohms per kilometer (mile), measured at 20 °C.

6. Mutual Capacitance: The nominal mutual capacitance between the conductors of a pair in microfarads per kilometer (mile), measured at a frequency of 1 kilohertz, measured at 20 °C.

7. Attenuation: The signal attenuation afforded by the cable is expressed in decibels per 1.6 kilometers (1.0 mile), offered to a 1 kilohertz signal), measured at 20 °C.

8. Diameter: The nominal overall outside diameter of the cable in millimeters (inches).

9. Weight: The nominal weight of the cable is indicated in kilograms per 305 meters (pounds per 1000 feet) standard length.

10. L Code: The L number, used in the abbreviated identification of cable types, has been taken from KSC drawing 89K0000022 and is given for cross-reference purposes.

11. Specification: The specification number given is the cable design specification. This specification, in conjunction with the basic cable description and the manufacturer's part number, when applicable, is sufficient definition for competitive procurement of the cable.

12. Stock Number: The stock numbers are taken from the KSC Stores Stock Catalog, where available. Numbers containing only numerical characters are carried in the Federal Supply System.

Table A-7. Fiber-Optic Cable

Item	Fiber Mode	Type	Number of Fibers	Window	Core	Specification	Attenuation	Band-width
1	Multi-	A	Note 3	850	50	(See note 2.)		
2	Multi-	B	Note 3	1300	50	79K28125	1.0	1000
3	Multi-	C	Note 3	1550	50	79K28125	1.0	NA
4	Single	NA	Note 3	1300* 1550	9	79K28125	0.5	NA

*Used at KSC

NOTES:

1. Fiber: The fiber type being specified.

2. Type: Utilize letter indicated or "0" if not required. "A" is no longer used at KSC.

3. Number of Fibers: Composite fiber total with multimode in ratio to single mode of 1:1 (216, 144, 72, or 24), 2:1 (90, 60, 30, or 6), and 5:1 (144, 72, or 36). Multimode fibers are considered first in numbering or identifying fibers.

4. Window: The optical spectrum window required in nanometers.

5. Core: Size of core diameter in micrometers.

6. Specification: The specification number given is the cable design specification. This specification, in conjunction with the basic cable description and the manufacturer's part number, when applicable, is sufficient definition for competitive procurement of the cable.

7. Attenuation: The signal attenuation afforded by the cable is expressed in decibels per kilometer an optical spectrum window at 1300 ±50 nanometers measured at 20 °C.

8. Bandwidth: A bandwidth length product greater than the value shown expressed in megahertz-kilometers.

9. The cable types are identified by a three-letter symbol at KSC. The first symbols identify the total number of fibers, and the wavelength window of the multimode fiber is indicated by letters or an "O" (e.g., 144/OBC). Where all single mode (SM) fibers are specified, the symbol is listed after the number of fibers (e.g., 48/SM).

10. A metallic armor shield shall be used where direct buried cable is utilized.

Table A-8. Premise Distribution Cable

1. Copper:

Item	Conductor Size	No. of Conductors	No. of Pairs	Type	Conductor Insulation	Jacket	Specification
1	24	8	4	H	PVC	PVC	79K33186
2	24	50	25	H	PVC	PVC	79K33186
3	24	600	300	R	Foam polyethylene	PVC	79K33186
4	24	200	100	R	Foam polyethylene	PVC	79K33186
5	22	200	100	R	Foam polyethylene	PVC	79K33186
6	22	4	2	H	Foam polyethylene	PVC	79K33186
7	24	150	75	H	PVC	PVC	79K33186
8	24	100	50	H	PVC	PVC	79K33186
9	22	4	2	R/H	Foam polyethylene	PVC	79K33186
10	22	8	4	R/H	Teflon	Copolymer PVDF	79K33186
11	Copper clad aluminum	1		R		Aluminum	79K33186
12	Copper steel, 20	1		H		PVC	79K33186
13	Copper steel, 18	1		H	Cellular polyethylene	PVC	79K33186
14	Copper steel, 20	1		H	FEP	Teflon	79K33186
15	50 r coaxial	1		R/H	Cellular FEP	Teflon	79K33186

2. Optical Fiber:

Item	Type of Fiber	Window	Core	Attenuation	Bandwidth	Specification
16	multimode	1300	62.5	<1.75	500	79K33186

Table A-8. Premise Distribution Cable (cont)

NOTES:

1. Conductor Size: Individual conductor size in AWG.

2. No. of Conductors: The number of individual conductors in the cable.

3. No. of Pairs: The total number of conductor pairs in the cable.

4. Type:

   H = horizontal
   R = riser

5. Conductor Insulation:

   FM = foam skin polyethylene
   PVC = polyvinyl chloride
   FEP = fluorinated ethylene propylone

6. Jacket:

   PVC = polyvinyl chloride
   PVDF = copolymer

APPENDIX B

UNIQUE CABLES

Table B-1. Unique Cable

Item	Description	System	Function	L Code	Specification	Stock Number
1	46(22PT#22,1PTS#14)OS	OIS-A	End instrument cable			6145K902171
2	3(2#16,2COAX)	OIS-RF	Station tap cable			6145K001968
3	6(4#24,2SS#24)	OIS-RF	Headset cord		KSC-SPEC-E-0025	
4	TV-39	OTV	Camera cable		79K04003	6145K000767
5	TV-39-UG	OTV	Camera Cable		79K02989	614500K02-8615
6	60 Conductors-#16 AWG	Timing countdown	Distribution cable	L121	KSC-SPEC-E-0031	6145LC09464
7	8(3PTSI#16,1PT#12)OS	Photo-optical	Camera cable		KSC-SPEC-E-0031	6145K027611
8	15(13#16,1PTSI#16)OS	Photo-optical	Camera cable		KSC-SPEC-E-0031	6145K804854
9	4(1#16,3#8)OS	Control systems	Power cable	L105	KSC-SPEC-E-0031	6145K018535
10	29(16#14,9#6,4#2)OS	Control systems	Vehicle hydraulic control	L120	KSC-SPEC-E-0031	6145K018162
11	35(26PTSI#14,6#7,3#0)OS	Control systems	Boattail heater control	L155	KSC-SPEC-E-0031	6145K018164
12	40(20#14,5QTSI#10)OS	Control systems	Power x signal to stage	L154	KSC-SPEC-E-0031	6145K018537
13	48(11TTSI#14,5PTSI#14,1SSI#14, 4SSI#4)OS	Control systems	Power x signal to stage	L153	75M11004	6145K018163
14	60(5PTSI#14,50SSI#14)OS	Control systems	Signals to stage	L145	KSC-SPEC-E-0031	6145K018145
15	60(48#14,3PTSI#14,2TTSI#14)OS	Control systems	Signals to stage	L131	KSC-SPEC-E-0031	6145K018141
16	60(45SSI#14,3TTSI#14, 3PTSI#14)OS	Control systems	Signals to stage	L267	KSC-SPEC-E-0031	6145K019803
17	60(50#14,5PTSI#14)OS	Control systems	Signals to stage	L130	KSC-SPEC-E-0031	6145K019809
18	60(17PTSI#14,6TTSI#14, 8SSI#14)OS	Control systems	Signals to stage	L268	KSC-SPEC-E-0031	6145K019807
19	60(24SSI#14,12PTSI#14, 4TTSI#14)OS	Control systems	Signals to stage	L276	KSC-SPEC-E-0031	
20	6(4RG214/U,1RG62A/U,1#12)OS	Control systems	Signals to stage	L4	75M10204	6145K018144

Table B-1. Unique Cable (cont)

NOTES:

1. Description: The cable description given is a unique designation given the cable by the using system engineers or a descriptive designation in accordance with a set format.
2. System: The system in which the cable is used.
3. Function: The function for which the cable is used in the using system.
4. L Code: The L number, used in the abbreviated identification of cable types, has been taken from KSC drawing 99K0000022 and is given for cross-reference purposes.
5. Specification: The specification number given is the cable design specification. This specification, in conjunction with the basic cable description and the manufacturer's part number, when applicable, is sufficient definition for competitive procurement of the cable.
6. Stock Number: The stock numbers are taken from the KSC Stores Stock Catalog, where available. Numbers containing only numerical characters are carried in the Federal Supply System.
7. A metallic armor shield shall be used where direct buried cable is utilized.