What to Consider When Choosing a Cable

Cable Construction
The complexity of spaceflight requires a different type of cable for every application and each type of orbit—GEO, LEO, MEO, SSO, and GTO.

Phase Stability
Array antennas are becoming the standard on larger satellites to support the growing RF channels they are being designed to handle, requiring the phase matching of each cable assembly to tune it within the array grouping.

Shielding
Shielding effectiveness typically increases a cable's weight and reduces its flexibility. Finding the proper balance to meet the RF and lift criteria for the vehicle is essential.

Light Weight
Cable mass plays a role in the overall cost of launch and becomes even more critical when more and longer cable assemblies are added to a modern satellite.

Solder vs. Solderless Termination
While traditional solder terminations are cost-effective, durable, and can withstand extreme temperature changes, they introduce a potential fatigue point when tight routing is required. In this case, a solderless termination is ideally suited for the installation.

Additional consideration should also be given to multipaction, passive intermodulation distortion, radiation resistance, and the potential for extended frequency requirements.

With the right connections, anything is possible.

megaphase.com/space

MegaPhase

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MegaPhase

The Sky is No Longer the Limit

High-Performance, Space-Qualified Cable Assemblies

A Heritage of Excellence

MegaPhase continues to lead the way in RF and microwave coaxial assemblies designed to withstand the extreme challenges posed by space environments. Our full line of space-qualified products, available in flexible, semi-rigid, and lightweight versions, are ESCC 3408 compliant and operate as high as 110 GHz.

Our cables flew aboard the Hayabusa, supporting its seven-year mission to rendezvous with a near-Earth asteroid and return with samples. A new, high-power satellite for EchoStar's Hughes Network System also relies on MegaPhase cables to provide service to millions. When it just has to work, customers turn to MegaPhase.

ULTRAPHASE™

Through 110 GHz
Phase and Temperature Stable Performance

semi-Rigid

Through 110 GHz
Excellent Shielding with Standard or Custom Designs

Phase3™

Through 67 GHz
Ultra Low Loss Performance

AlumiBend™

Through 90 GHz
Hand Formable and 40% Lighter than Copper

GrooveTube® TECHNOLOGY

Through 50 GHz
Rugged, Low Loss Performance for Severe Environments

HyperFlex™

Through 67 GHz
Solderless Terminations for Superior Behind-the-Connector Flexibility
Space qualification coming soon!

Product Specifications

Series	OD (in)	Frequency to	Weight (lbs/ft)
UltraPhase™	0.056	110 GHz	0.0041
UltraPhase™	0.100	67 GHz	0.0110
UltraPhase™	0.150	40 GHz	0.0246
Phase3™	0.100	110 GHz	0.006
Phase3™	0.110	67 GHz	0.0100
Phase3™	0.140	50 GHz	0.0190
Phase3™	0.144	40 GHz	0.0200
Phase3™	0.225	26.5 GHz	0.0400
Phase3™	0.310	18 GHz	0.0900
GrooveTube®	0.285	32 GHz	0.0500
GrooveTube®	0.400	18 GHz	0.1400
Semi-Rigid (Copper)	0.034	50 GHz	0.0026
Semi-Rigid (Copper)	0.047	110 GHz	0.0045
Semi-Rigid (Copper)	0.086	50 GHz	0.0152
Semi-Rigid (Copper)	0.141	34 GHz	0.0343
Semi-Rigid (Copper)	0.250	18 GHz	0.0925
AlumiBend™	0.047	90 GHz	0.0022
AlumiBend™	0.086	50 GHz	0.0063
AlumiBend™	0.141	34 GHz	0.0167
HyperFlex™	0.09	80 GHz	TBD
HyperFlex™	0.12	54 GHz	TBD
HyperFlex™	0.141	41 GHz	TBD

Testing Data

Area	Test or Inspection	Specification	Requirement
Mechanicals	Finish	MIL-PRF-39012, paragraph 4.6.1.1	Gold over nickel per ASTM-B-488, Type II, Code C, Class 1.27, 50 microinches minimum thickness and Type II SAE-AMS-QQ-N-290 Type 1, 100 microinches minimum thickness
	Dissimilar Metals	MIL-STD-889D	No galvanic couple formation allowed by design
	Mating Characteristics	MIL-PRF-39012, paragraph 4.6.4	Mating Dimensions, Center Contact Insertion and Withdrawal force per IEEE 287-2007 or MIL-STD-348
	Center Contact Retention	MIL-PRF-39012, paragraph 4.6.9	1 lbs. minimum
	Connector Durability	MIL-PRF-39012, paragraph 4.6.12	500 mating cycles
	Cable Retention Force	MIL-PRF-39012, paragraph 4.6.21 and MIL-PRF-55427, paragraph 4.7.6.	30 lbs. pull test holding tension for >30 seconds; Hold 10 lbs. tensile load and apply 5 in-oz torsion force
	Coupling Retention Force	MIL-PRF-39012, paragraph 4.6.22	60 lbs. pull held for 60 seconds minimum
	Permanence of Marking	MIL-STD-202, Method 215, mixture para. 4.1.1a and apply per 4.2.1a	Marking content legible after exposure to mixture
	Workmanship	MIL-PRF-39012, paragraph 3.30	Visual inspection at 7X magnification, >20X when required
Electricals	VSWR	MIL-PRF-39012, paragraph 4.6.11	MegaPhase Internal Datasheet
	Insertion Loss	MIL-PRF-39012, paragraph 4.6.24	MegaPhase Internal Datasheet
	Insulation Resistance	MIL-PRF-39012, paragraph 4.6.8 and MIL-STD-202, Method 302, Test Condition B	> 5,000 megohms, 500 VAC for 120 seconds
	DWV	MIL-PRF-39012, paragraph 4.6.14 and MIL-STD-202, Method 301	500 Vrms for 60 seconds
	RF Leakage	MIL-PRF-39012, paragraph 4.6.23, Triaxial Chamber	> 85 dB
	Contact Resistance	MIL-PRF-39012, paragraph 4.6.13	10 milliohms
Environments	Sine Vibration	MIL-PRF-39012, paragraph 4.6.15, and MIL-STD-202, Method 204	Test Condition D (20 G Peak), 20 minutes in each of three mutually perpendicular axes
	Mechanical Shock	MIL-PRF-39012 paragraph 4.6.16, and MIL-STD-202, Method 213	Test Condition I in each of three mutually perpendicular axes, 100 G Magnitude, Half Sine for 6ms
	Thermal Shock	MIL-PRF-39012, paragraph 4.6.17 and MIL-STD-202, Method 107	Test Condition B, 25 cycles, -55°C to +125°C, 30 minutes dwells at each extreme
	Moisture Resistance	MIL-PRF-39012, paragraph 4.6.18, and MIL-STD-202, Method 106	16 hours soak at constant ambient conditions of +85°C and 85% Relative Humidity
	Corona Level	MIL-PRF-39012, paragraph 4.6.19	Vacuum chamber equivalent to 70,000 ft. in altitude, 175 Vrms