INCH-POUND

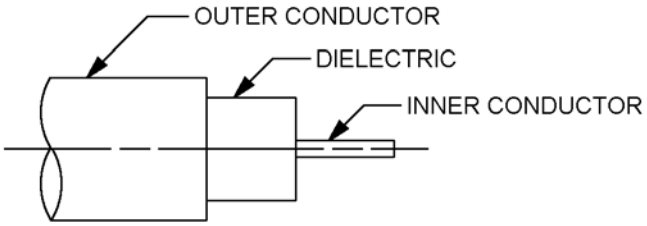
MIL-DTL-17/154A
w/AMENDMENT 1
20 April 2016
SUPERSEDING
MIL-DTL-17/154A
26 July 2006

DETAIL SPECIFICATION SHEET

CABLES, RADIO FREQUENCY, COAXIAL, 0.034 INCH DIAMETER, SEMRIGID, 50 OHMS, M17/154-0000I and M17/154-00002

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-DTL-17.



Inches	mm
.0005	0.013
.001	0.03
.002	0.05
.008	0.20
.026	0.66
.034	0.86

* Metric conversions for table I

FIGURE 1. Configuration.

TABLE I. Description.

Part or Identifying Number (PIN)	Inner conductor	Dielectric core	Outer conductor 1/	Weight pounds, per 1,000 feet (maximum)
M17/154-00001	Solid, silver-coated copper clad steel diameter .008 inch ± .0005	Type F-1 diameter .026 inch ± .001	Seamless copper tubing, diameter .034 ± .001	2.6
M17/154-00002	Same as above	Same as above	Seamless copper tubing tin-plated in accordance with ASTM B545, .0003 inch thick, minimum. diameter .034 inch +.002, -.001 2/	2.8

1/ Use of recrystalized welded outer conductor is optional.
2/ The outer diameter dimension is after plating.

Engineering information:

Continuous working voltage: 750 V rms, maximum.
Operating frequency: 20 GHz, maximum.
Velocity of propagation: 69.5 percent, nominal.
Power rating: See figure 2.
Operating temperature range: -40°C to +100°C.

Inner conductor properties:
DC resistance (maximum at 20°C): 41.9 ohm's per 100 feet.
Elongation: 10 percent minimum for class 40 A wire.
1.0 percent minimum for this 40 HS wire.
Tensile strength: 50 $klb_f/inch^2$ minimum for class 40 A wire.
110 $klb_f/inch^2$ minimum for class 40 HS wire.

Engineering notes: This cable is useful in critical RF performance applications. This cable is generally manufactured in 20-feet lengths. Different lengths are available.

REQUIREMENTS:

Dimensions, configuration, and descriptions: See figure 1 and table I.

Environmental and mechanical:
Eccentricity: 8.5 percent. maximum.
Adhesion of conductors:
Inner conductor to core: .5 pounds minimum, 5.5 pounds maximum.
Outer conductor to core: .5 pounds, minimum.
Aging stability: Not applicable.
Stress crack resistance: Not applicable.

Outer conductor integrity: (+175°C for recrystalized outer conductor cable). Four specimens, approximately 2 feet long, shall be cut from the sample unit. The specimens shall be suspended in a heat chamber without touching one another or the walls of the chamber and conditioned for 1 hour 30 minutes minimum at the specified maximum operating temperature ±5ºC. Heated air shall be circulated so as to maintain a uniform test temperature. After the conditioning period, the specimens shall be removed from the heat chamber and conditioned at room ambient temperature for 4 hours minimum. The specimen shall then have one end immersed into molten solder to a depth of 0.5 inch minimum for 15 seconds minimum. The molten solder temperature shall be +230°C minimum. After the conditioning period, the specimens shall be removed from the molten solder and conditioned at room ambient temperature for 1 hour minimum. Examine the specimens for cracks, flaws, or other damage in the outer conductor material.

Cold bend: Not applicable.
Dimensional stability: +100°C ± 5°C.
Core to conductor: .015 inch, maximum.
Contamination: Not applicable.
Bendability: Mandrel diameter: .25 inch, maximum.
Flammability: Not applicable.
Weight: See table I.

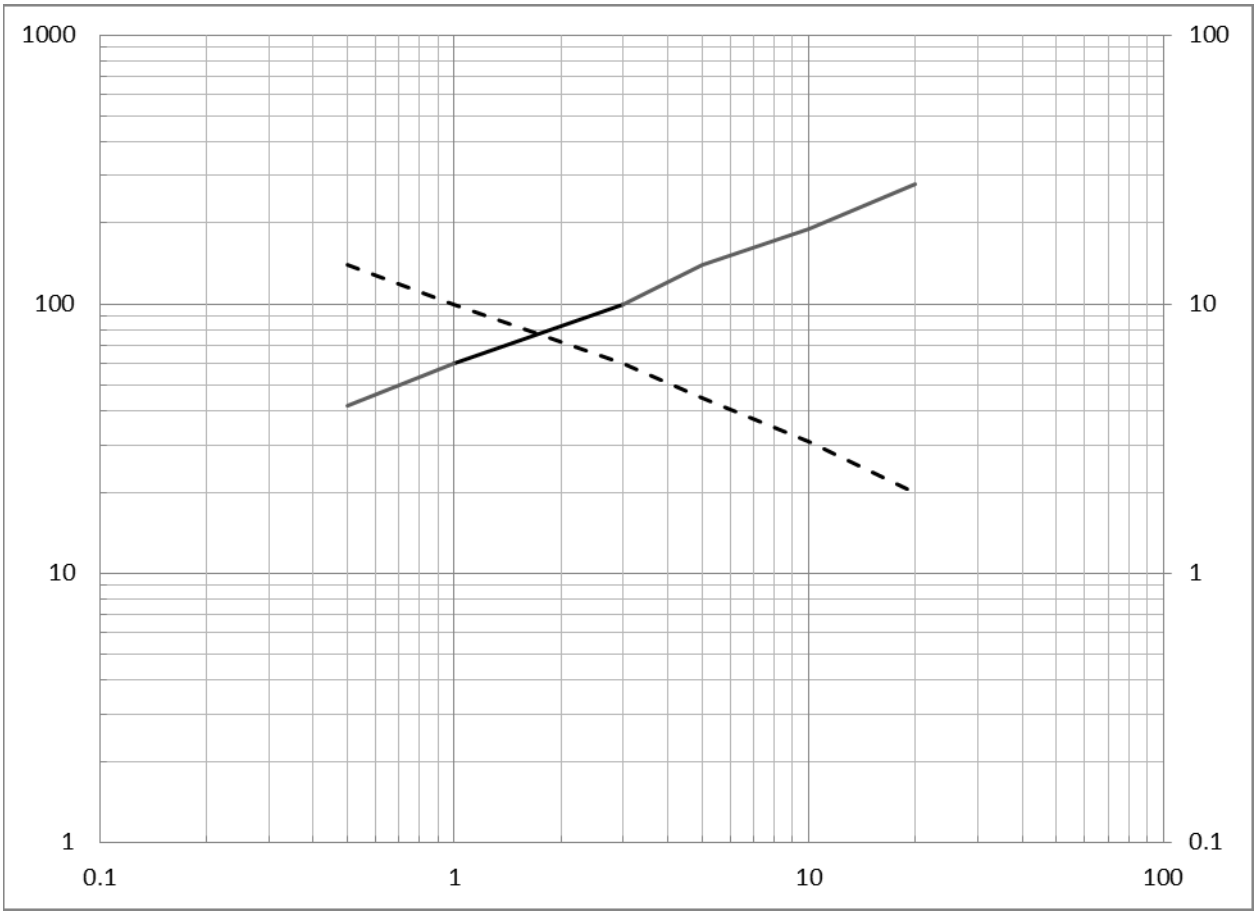
Electrical:

Test frequency: 500 MHz to 20 GHz.
Spark test: Not applicable.
Voltage withstanding: 2,000 V rms, minimum.
Insulation resistance: Not applicable.
Corona extinction voltage: 750 V rms, minimum.
Characteristic impedance: 50.0 ohms $\pm$ 3.0.
Attenuation: See figure 2.
Structural return loss: See figure 3.
Capacitance: 32 pF per foot, maximum.
Capacitance stability: Not applicable.
Capacitance unbalance: Not applicable.
Transmission unbalance: Not applicable.
Phase stability: Not applicable.
Mechanically induced noise voltage: Not applicable.
Time delay: Not applicable.

PIN: See table I.

Attenuation
dB / 100 Ft

WATTS



Frequency in GHz

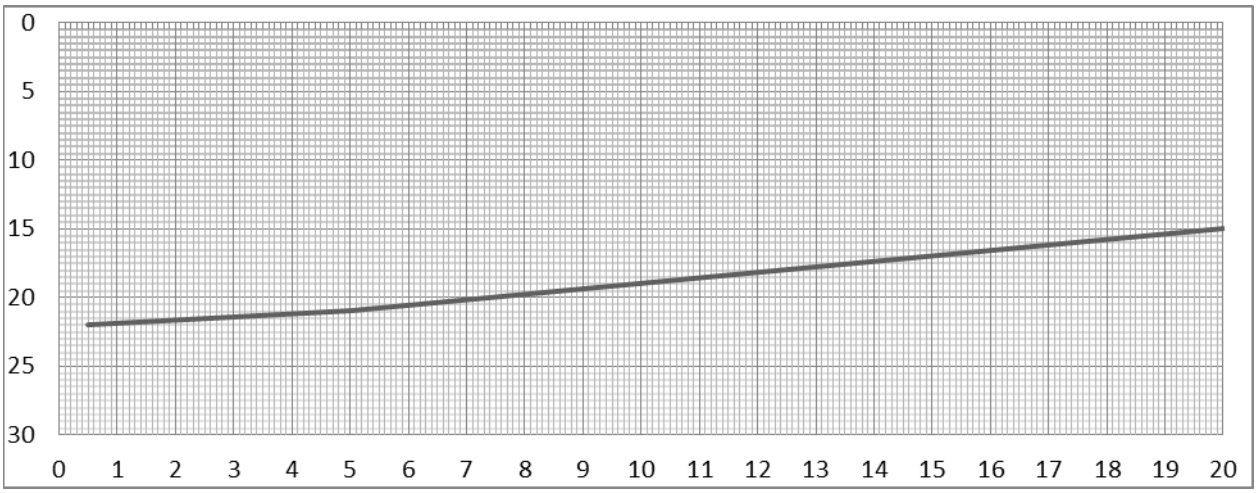
Maximum attenuation ———————— (Test requirements shall be as noted as line indicated on graph).

Maximum power - - - - - - - - - - - - - -
At 25°C sea level.

Attenuation		Power
MHz	dB	Watts
500	42	14
1000	60	10
3000	100	6
5000	140	4.5
10000	190	3.1
20000	280	2

FIGURE 2. Power rating and attenuation.

RETURN LOSS Db MINIMIM STRUCTURAL RETURN LOSS



Frequency in GHz

SWR	REFLECTION COEFFICIENT	RETURN LOSS dB	SWR	REFLECTION COEFFICIENT	RETURN LOSS dB
17.3910	.8913	1	1.3767	.1585	16
8.7242	.7943	2	1.3290	.1413	17
5.8480	.7079	3	1.2880	.1259	18
4.4194	.6310	4	1.2528	.1122	19
3.5698	.5623	5	1.2222	.1000	20
3.0095	.5012	6	1.1957	.0891	21
2.6146	.4467	7	1.1726	.0794	22
2.3229	.3981	8	1.1524	.0708	23
2.0999	.3548	9	1.1347	.0631	24
1.9250	.3162	10	1.1192	.0562	25
1.7849	.2818	11	1.1055	.0501	26
1.6709	.2512	12	1.0935	.0447	27
1.5769	.2239	13	1.0829	.0398	28
1.4985	.1995	14	1.0736	.0355	29
1.4326	.1778	15	1.0653	.0316	30

Structural	Return loss
MHz	dB
500	22
5000	21
20000	15

FIGURE 3. Structural return loss.

Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Referenced documents. In addition to MIL-DTL-17, this document references the following:

ASTM B545

CONCLUDING MATERIAL

Custodians:
Army - CR
Navy - EC
Air Force – 85
DLA - CC

Preparing activity:
DLA - CC

(Project 6145-2016-004)

Review activities:
Army – AR, AT, CR4, MI
Navy - AS, MC, OS, SH
Air Force - 19, 99
DLA - IS

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.