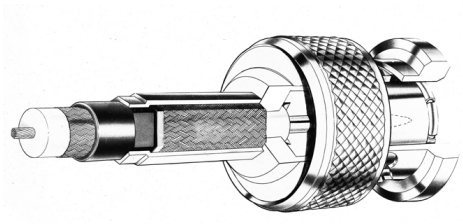
Central Office Telephony
BNC Connector Specification



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1.0 Scope

The purpose of this specification is to standardize and define in detail the requirements and capabilities of 75-Ohm BNC Plug Connectors to be used in central office network carrier telecommunication applications.

BNC Plug Connectors, which are compliant with this specification in its entirety, will be intermateable with 75-Ohm Jacks and interchangeable with compliant Plugs. The coaxial wireline is most often D3 or E3 data rate information. Important product attributes include long life, rugged mechanical characteristics, mate/demate cycle performance, and RF electrical performance.

2.0 Applicable Documents

ANSI/ASQC Z1.4	Sampling Procedures and tables for Inspection by Attribute
GR-63-CORE*	part of NEBS
GR-1089-CORE*	part of NEBS
GR-1217-CORE *	Generic Requirements for Separable Electrical Connectors Used in Telecommunications Hardware
MIL-STD-202	Military Standard, Test Method for Electronics and Electrical Component Parts
MIL-STD-1344	Test Methods for Electrical Connectors
MIL-C-39012	General Military Specification for Radio Frequency Coaxial Connectors
NEBS	Network Equipment Building Systems
TR-NWT-000078*	Generic Physical Design Requirements for Telecommunications Products
TR-NWT-000357*	Generic Requirements for Assuring the Reliability of Components used in Telecommunications Equipment

* These are Bellcore specifications, now part of Telcordia.

3.0 Requirements

3.1 Electrical

3.1.1 Dielectric Withstanding Voltage

There shall be no evidence of breakdown or flashover between the center contact and the outer body when connectors are tested in accordance with MIL-STD-1344, method 3001, test condition I, with a voltage of 1500 VAC at a duration of 5 seconds minimum.

3.1.2 Insulation Resistance

The insulation resistance between the center contact and the outer body shall be greater than 5000 Megohms at 500 volts when tested in accordance with MIL-STD-1344, method 3003.

3.1.3 Working Voltage

500 VAC, peak.

3.1.4 Impedance

75 Ohms with acceptable return loss up through 3 GHz, see section 3.1.7.

3.1.5 Contact Resistance (Initial)

The contact resistance of the center contact shall not exceed 6 milli-ohms at a current of 5 milli-amps maximum with a maximum open circuit of 20 milli-volts when tested in accordance with MIL-STD-202, method 307.

3.1.6 Contact Resistance (After environment)

The contact resistance of the center contact shall not exceed 12 milli-ohms at a current of 5 milli-amps maximum with a maximum open circuit of 20 milli-volts when tested in accordance with MIL-STD-202, method 307.

3.1.7 Voltage Standing Wave Ratio (VSWR)

The VSWR shall not exceed 1.10, up to 2 GHz and 1.16 up to 3 GHz, when tested in accordance with MIL-STD-1344, method 3005. This is equal to return loss values of –26.44 dB and –22.61 dB, respectfully.

3.1.8 Insertion Loss

0.2 dB max., up to 3 GHz when tested in accordance with MIL-C-39012.

3.2 Mechanical

3.2.1Visual and Mechanical

Connectors shall be visually examined to verify they have been processed in such a manner as to be uniform in quality and free from defects that would affect appearance, serviceability and reliability.

3.2.2 Materials and Finishes

3.2.2.1 Body

Brass per ASTM-B16, nickel plated per QQ-N-290, class 1, 0.0001 inches thick minimum. Zinc-alloy die cast per ASTM-B86, nickel plated per QQ-N-290, class 2, .0001 inches thick minimum is allowed as an alternative.

3.2.2.2 Bayonet Sleeve

Brass per ASTM-B16, nickel plated per MIL-C-26074, class 1, or MIL-P-7418, 0.0001 inches thick minimum. Zinc-alloy die cast per ASTM-B86, nickel plated per MIL-C-26074, class 1, or MIL-P-27418, 0.0001 inches thick minimum is allowed as an alternative.

3.2.2.3 Contact

Brass per ASTM-B16 or Leaded Ni Cu, condition HT or equivalent, gold plated per MIL-G-45204, type II, grade C, class 1, 0.000050 inches thick minimum over nickel per QQ-N-290, class 1, 0.00050 inches minimum over copper per MIL-C-14550, 0.000080 inches thick minimum.

3.2.2.4 Dielectric

PTFE per ASTM-D1710, type II or FEP per ASTM-D2116, type II.

3.2.2.5 Spring Finger

Beryllium copper per ASTM-B194, age hardened to Rc 36-44 or phosphor bronze per ASTM-B139; nickel plated per QQ-N-290, class 1, 0.0001 inches thick minimum.

3.2.2.6 Gasket

Silicone per ZZ-R-765, class 2B.

3.2.2.7 Spring Washer

Beryllium copper per ASTM-b194, age hardened to Rc 36-44, nickel plated per MIL-P-27418, 0.0002 inches thick minimum.

3.2.2.8 Washer

Brass per ASTM-B36, nickel-plated per QQ-N-290, class 1, 0.0001 inches thick minimum.

3.2.2.9 Crimp Sleeve

Brass per ASTM-B16, sulfamate nickel plated per MIL-P-27418, 0.0002 inches thick minimum.

3.2.3 Center Contact Retention

The center contact shall not dislocate when an axial load of 8 pounds is applied per MIL-STD-1344, method 2007. This is a measurement of contact retention within the dielectric and is tested prior to cable crimping.

3.2.4 Crimp Strength

The crimp strength (cable retention) for the overall terminated connector shall be as follows: 50 pounds minimum average for 735 type cable and 70 pounds minimum average for 734 type cable. Note that this may vary due to cable manufacturer, braid strand count, and cable stripping practices. Trompeter uses Judd and Lucent cable for this testing.

3.2.5 Spring Finger Engagement / Withdrawal Force

The engagement force shall be 1.5 pounds minimum, 5 pounds maximum and the withdrawal force shall be 12 ounces minimum using a 0.319 +0.000/-0.001 I.D. 16 microinch finish steel test ring gage.

3.3 Environmental

3.3.1 Temperature Cycling

Initial contact resistance shall be measured, followed by 50, 12 hour cycles of –40 degrees C to + 85 degrees C with contact resistance per paragraph 3.1.6 measured at conclusion of test.

3.3.2 Temperature Life

Initial contact resistance per paragraph 3.1.5 shall be measured, followed by 1000 hour exposure at 105 degrees +/- 2 degrees C per MIL-STD-202, method 108, condition D with contact resistance and ground finger continuity testing per paragraph 3.3.5 at conclusion of test.

3.3.3 Corrosion Resistance

Connectors shall be exposed to salt spray testing per MIL-STD-1344, method 1001, condition B.

3.3.4 Durability

Connectors shall be mated and unmated for 500 cycles, not exceeding 10 cycles per minute, with no evidence of damage detrimental to normal operation.

3.3.5 Ground Finger Continuity Test

The connector spring finger shall retain a 260 gram minimum load and comply with contact resistance per paragraph 3.1.5 after applying a 40 pound force in 4 axes at the rear of a semi-mated plug.

3.3.6 Vibration

There shall be no physical damage, loosening of parts or DS3 bit loss when connectors are subjected to testing per MIL-STD-1344, method 1001 at 20 G's / 10 Hz to 2 kHz.

3.3.7 Mechanical Shock

There shall be no physical damage, loosening of parts or DS3 bit loss when connectors are subjected to testing per MIL-STD-1344, method 2004, condition D.

3.3.8 Humidity

Connectors shall meet DWV requirements per paragraph 3.1.1, I.R. per paragraph 3.1.2 and contact resistance per paragraph 3.1.5 after exposure to 504 hours at 40 degrees C with a relative humidity of 90 to 95% per MIL-STD-1344, method 1002, condition C.

3.3.9 Bayonet Sleeve Retention

The bayonet sleeve shall withstand 100 pounds minimum force for qualification testing and 20 to 25 pounds non-destructive force for in-process testing.

4.0 Quality Assurance

The supplier shall maintain a well-established quality assurance program in compliance with ANSI/ASQC Z1.4 and be ISO 9001 certified, assuring the manufacture and inspection of connector components and assemblies fully comply with the design, specifications and requirements.

5.0 Part Marking

All connectors shall be legibly and permanently marked with the date code, part number, and supplier identification and/or CAGE code.

6.0 Packaging

Connectors shall be unit packaged to prevent damage from normal handling and shall include complete assembly instructions. Instructions may be printed on bags providing they remain legible after opening.

7.0 Tooling

Connectors shall accommodate industry standard crimp sleeve and center contact tooling as outlined below:

7.1 Cable cutting

Trompeter hand tool cutter model number 700-0024

7.2 Cable Stripping – two alternatives

- Schleuniger Power Cable Stripper – model number 207.
- Hand held battery operated stripper – Trompeter model number BCWS with C26T31 and C26T3D cutter heads.

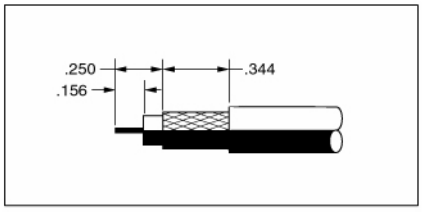
7.3 Center contact crimping – two alternatives

Trompeter multipoint (12-point) indenter model # 010-0098 or #010-0080.

7.4 Crimp sleeve crimping – two alternatives

- Trompeter benchtop power crimper, includes tooling for both 735 and 734 cable types, air actuated.
- Trompeter CT4L frame with CD3-19 die

7.5 Strip Dimensions



SCALE 1:1
USE AS STRIPPING
TEMPLATE FOR 75 OHM TOOL CRIMP
BNC PLUG

Note: Dimension .156 inches is a minimum, the maximum is .175 inches. Either dimension, or anything in between, works fine.

7.6 Post Connector Installation Testing

Pin height and continuity testing – Trompeter model # 010-0133

8.0 **Design / Construction**

Connectors may comply with the design, construction and physical dimensions of Figures 1, 2, 3, 4 and 5.

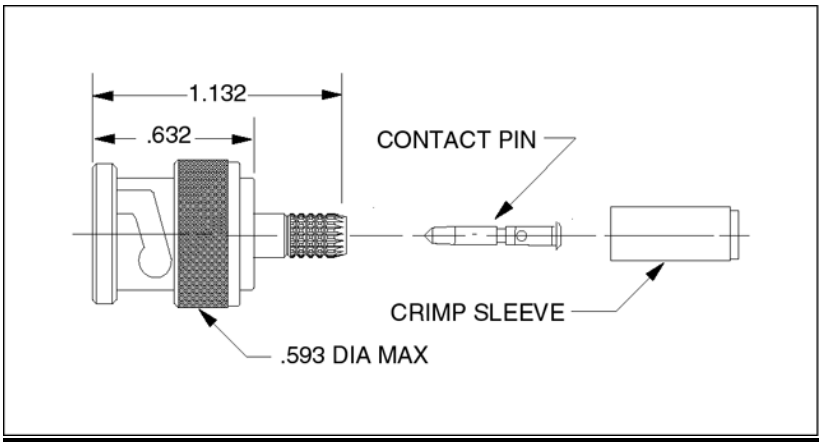


Figure 1 – Straight BNC connector (UPL220-xxx)

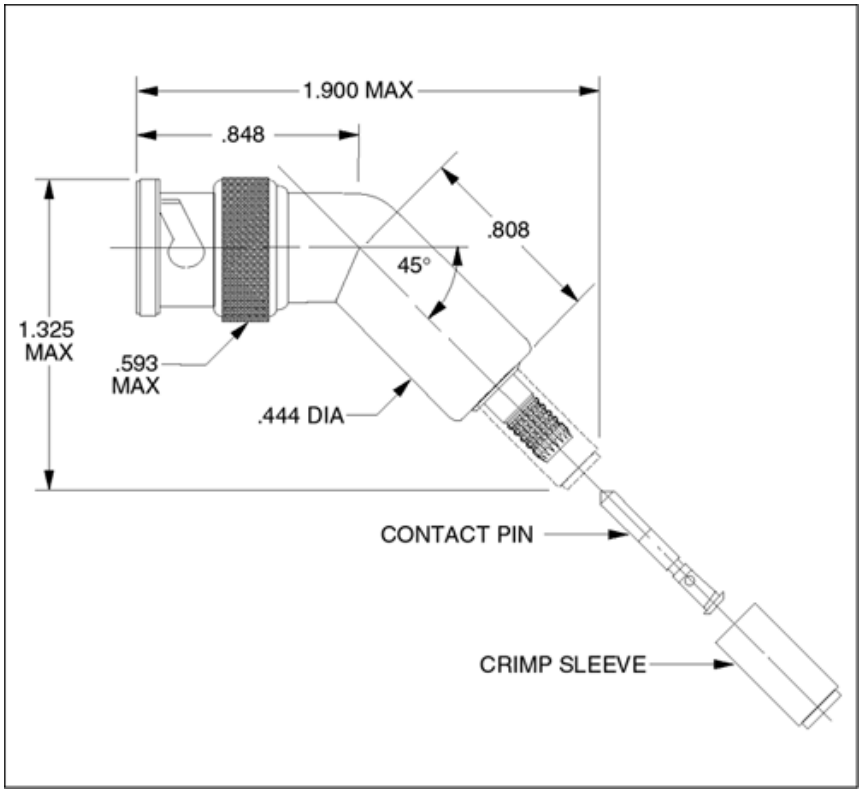


Figure 2 – 45 degree BNC connector (UPLFF220-xxx)

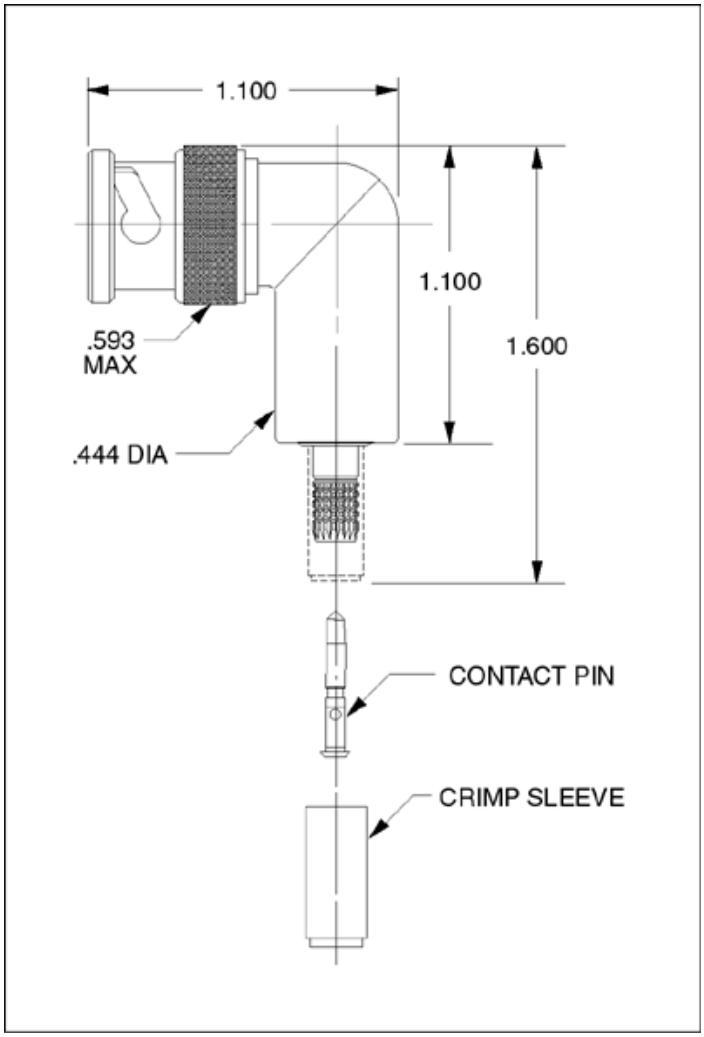


Figure 3 – 90 degree BNC connector (UPLR220-xxx)

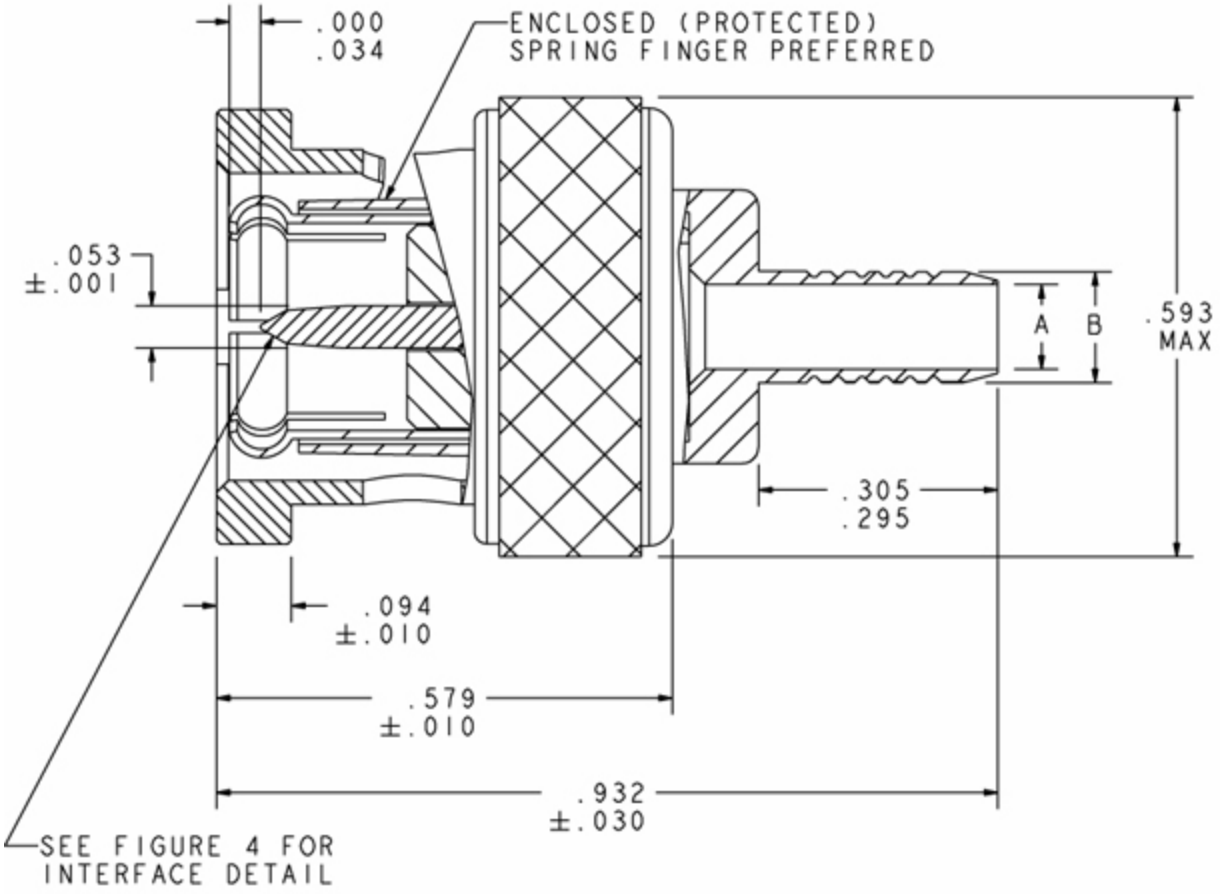
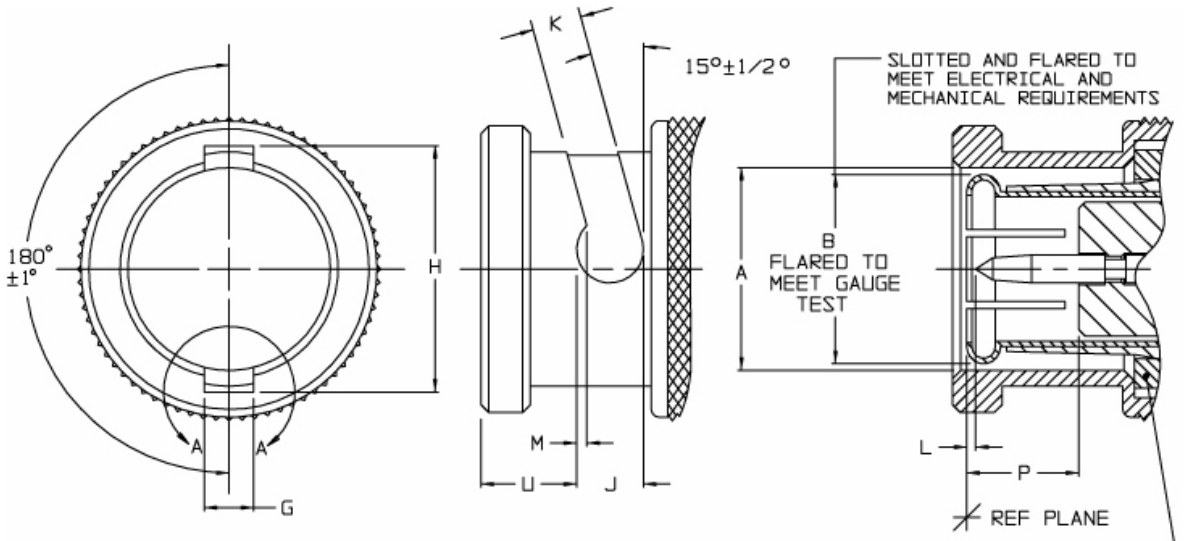


Figure 4 – Showing interface and cross-sectional view



DIM LETTER	DIMENSIONS IN INCHES	
	MINIMUM	MAXIMUM
A	.385	.390
B	GAUGE TEST	
D	.052	.054
G	.091	.097
H	.463	.473
H*	.394	.400
J	.124	———
K	.091	.097
L	.003	———
N	———	.025
P	.208	.228
M	.018	.022
U	.180	.185
T*	.045	.049

Figure 5 – Showing interface dimensions

9.0 Approved Source of Supply

Trompeter Electronics FSCM #14949
31186 La Baya Drive
Westlake Village, CA 91362
USA

www.trompeter.com
voice 818.707.2020
fax 818.706.1040

Part numbers

	Individual bagged	Bulk packs
Straight BNC plug	UPL220-xxx	yes
45 Degree BNC plug	UPLFF220-xxx	yes
90 Degree BNC plug	UPLR220-xxx	yes

Where xxx defines the cable group being attached to the connector, see Trompeter central office catalog or website at www.trompeter.com For example, the –026 cable group is sized to handle traditional 735 cable and the –025 cable group is sized to handle traditional 734 cable.

Note – the Trompeter UPL220-026 has been presented to National Technical Systems for full NEBS Qualification testing to Level 3 Type 2 Central Office DS3 coaxial wireline applications and has achieved certification – see test report 074-0206A and 074-0206B.

The CLEI code for this part is T3PQAR3LAA, ECI barcode 278316.

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