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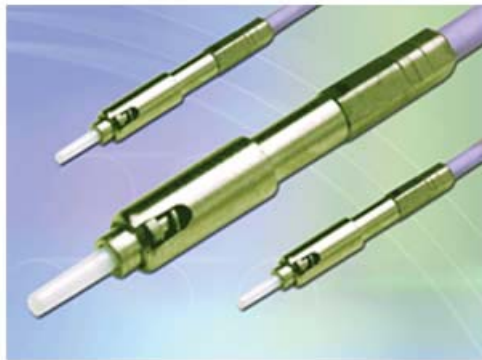
### Military/Aerospace ARINC 801-2 Assemblies

Fiber optic assemblies in military and aviation applications have been a boon. The assemblies reduce weight dramatically; they have improved speed and bandwidth characteristics over copper assemblies; and they are immune to electro-magnetic interference and eavesdropping.

In the 1980s, when the first Ticonderoga class cruisers were under development and construction, the copper cable assemblies used in the phased-array radar system were so heavy, they made the ships top-heavy. The weight was significantly reduced when fiber optic cable assemblies were employed for the radar. In the new Boeing 787 Dreamliner, Boeing estimates that they eliminated 60 miles of copper conductors from their airframe. The benefits of fiber optic assemblies have been well demonstrated, but a lack of standardization and myriad product variations complicated their adoption into design.

The arrival of standards for cable assemblies in commercial electronics, such as USB assemblies in computers and peripheral equipment, has hugely benefited the industry. The ARINC specification 801 may do the same thing for fiber optic cable assemblies in aviation applications. Eliminating the proliferation of competing designs that perform the same function will streamline avionics design.

ARINC was founded in the late 1920s to provide communications services to the nascent U.S. airline industry. It is best known today for helping to develop standards, particularly for the commercial aviation and U.S. military industries. ARINC is owned by the Carlyle Group.



**Sabritec ARINC 801 Terminus**

The ARINC 801-2 specification is defined by its contact (terminus), the connectors, and the fiber optic cable. The contact is hermaphroditic in design (both sides the same) with a standard 1.25 mm ferrule and sleeve, which is able to accommodate standard high-density connectors. The contacts come in different variations to accommodate different cable types. The contact interface is a butt-joint that can be used in single-mode or multi-mode fiber optic cable applications. The contacts crimp on to the cable jacket, eliminating the need for cable strain reliefs on the back of the connector assembly. The contact interface is held in position by a floating mechanism to avoid signal losses when the cable is pulled on.

The ARINC 801-2 specification is compatible with several connector types commonly used in avionic applications. Standard connectors include MIL-DTL-38999, MIL-DTL-83527, and ARINC 600.

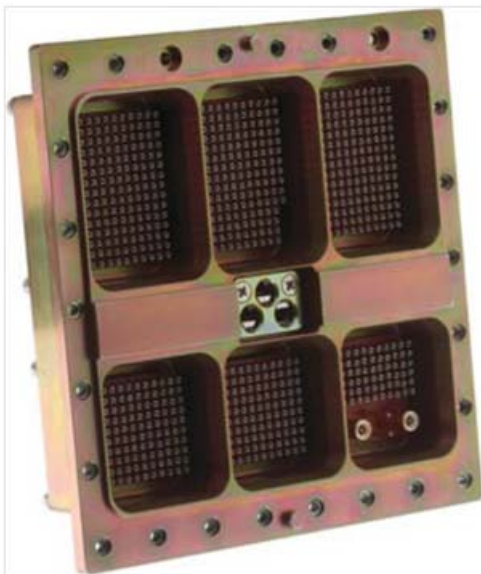
MIL-DTL-38999 is often used in feed-thru, bulkhead applications in airframes and military equipment.





Pictured above is the ARINC 600 Connector Shell types available from Carlisle Interconnect Technologies.

ARINC 600 connectors are typically used in trays that hold the avionics equipment used for flight control, communications, and navigation.



Pictured left, MIL-DTL-83527 rack-and-panel style connectors from Amphenol.

This extreme-environment connector series has the advantage of available backshells for environmental sealing from electro-magnetic and radio frequency interference. The backshells also allow multiple cable entry points. The series is very durable in extreme environments for shock, vibration, and humidity.

Fiber optic cable termination for the ARINC 801-2 contact is similar to terminating a standard LC connector – cut, strip, epoxy, polish, and test.

**Bishop Comments:**

ARINC 801 is a positive step forward toward the broader use of fiber optic assemblies in commercial airframes and military equipment. The termini perform well, they fit into standard connector insert arrangements, they are easy to terminate, and they work well in high-vibration environments. Although this is not a USB equivalent, it is a good step forward in the standardization process.

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David Phetepplace joined Bishop & Associates Inc. in 2008, and in September 2011, he became vice president. He is also the managing director of Bishop's cable assembly division, which he established in 2008. He has more than 20 years of experience in the interconnect industry, including managing divisions of Amphenol, Cinch, and Robinson Nugent. [Email David Phetepplace.](mailto:David.Phetepplace@bishopandassociates.com)



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