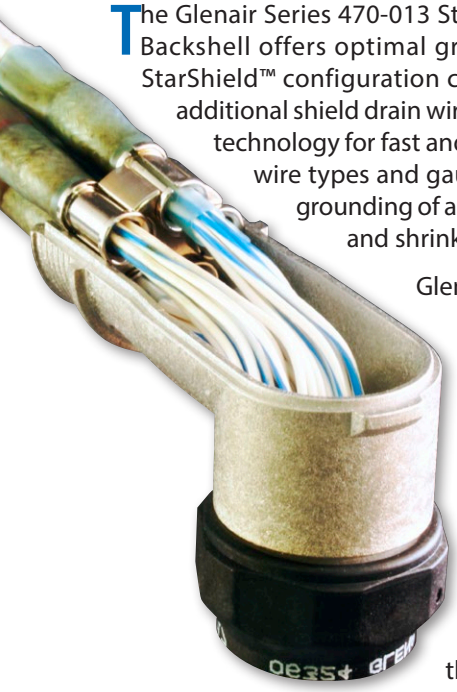
StarShield™

Zero-length individual shield termination backshell

The Glenair Series 470-013 StarShield™ "Zero Length" Individual Shield Termination Backshell offers optimal grounding of EMI/EMP braided shielding. The unique StarShield™ configuration completely eliminates the need for the termination of additional shield drain wires or pigtails. The backshell utilizes familiar solder sleeve technology for fast and reliable termination of shielding—even with dissimilar wire types and gauges. Tightening the coupling nut in place effects 360° grounding of all conductive surfaces. Standard designs include banding and shrink-boot versions.



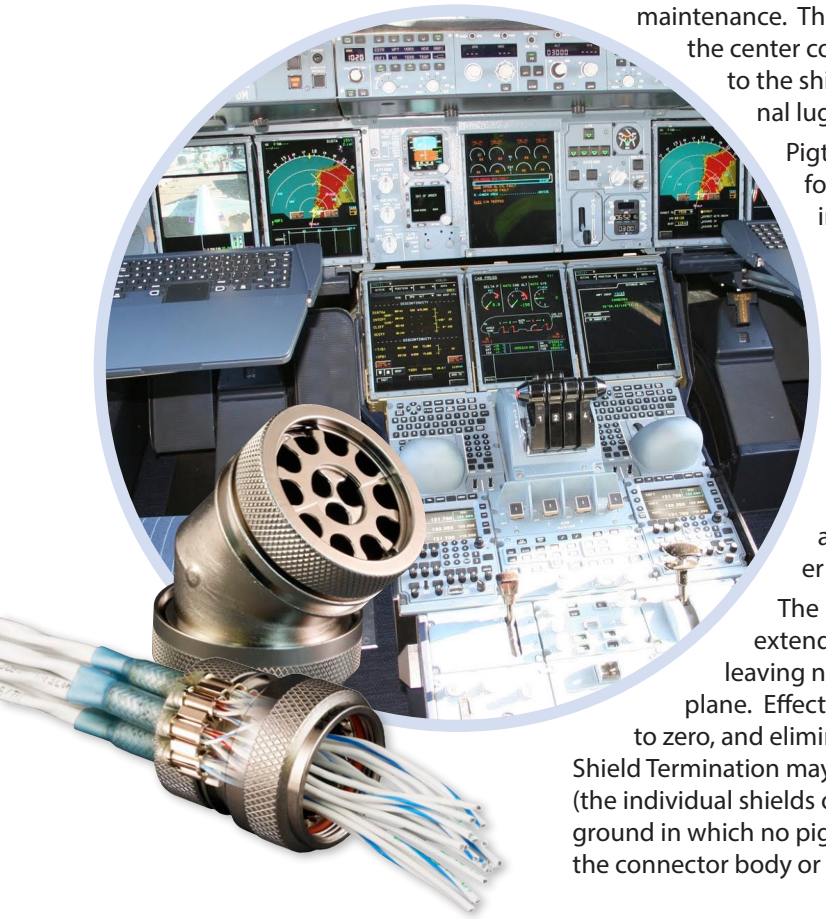
Glenair's StarShield "Zero Length Shield Termination" backshell methodology excludes pigtails or drain-wires altogether by providing termination platforms referred to as "ferrules" which allow individual shields to be terminated by a 360° solder connection in one easy process. The ferrules in-turn lock into a "star" that provide another 360° termination to the encapsulating ground plane of the backshell body. By eliminating the issues associated with pigtails or drain-wires, this system not only offers the highest level of EMC performance, but is also one of the most reliable, repairable individual shield termination methods on the market today.

- **The unique StarShield™ configuration completely eliminates "standing antenna" problems common with pigtail shield termination systems**
- **The backshell utilizes familiar heat shrink termination (HST) sleeve technology for fast and reliable termination of shielding—even with dissimilar wire types and gauges**
- **Standard configurations include threaded compression nut and tapered split-ring that fits snugly into a conical backshell or a lightweight split banding version**

StarShield™

Zero-length individual wire shield termination backshell

WHAT IS STARSHIELD™"ZERO LENGTH SHIELD TERMINATION?"



For decades, bundles of individually shielded cables have been used to solve many electrical system design issues from cross-talk to wire-routing/management and maintenance. These individual shields were frequently "pigtailed" by pulling the center conductors through the outer shield, or by soldering drain-wires to the shield, then terminating these pigtails or drain wires via a terminal lug to the cable-clamp on the back of the connector.

Pigtails or drain wires, suffer from several shortcomings. First, they force shield current to flow in an asymmetrical manner yielding higher transfer impedances. Second, and perhaps more importantly, the pigtail or drain-wire itself creates a "loop in the shield" or "standing antenna" effect. Coupled with the exposed lengths of unshielded wires, this condition acts as a receptor and/or radiator of noise. EMC performance will drop to unacceptable levels at higher frequencies dependent on the length of the pigtail. Over the years, more elegant methods of terminating pigtails or drain-wires have been developed that effectively shorten these lengths, however the underlying issue still exists—particularly in higher-bandwidth and less noise-tolerant applications which demand ever-shorter pigtail lengths for acceptable performance.

The best connection is one in which the individual shields are extended up to and make solid 360° connections to the backshell leaving no length of unshielded wires exposed outside of the ground plane. Effectively, this reduces the length of the pigtails or drain-wires to zero, and eliminates the standing antenna. Said another way, Zero Length Shield Termination may be achieved via a 360° termination of signal group shields (the individual shields over the wires or twisted pairs in a bundle) to an encapsulating ground in which no pigtails or drain wires are necessary to terminate the shields to the connector body or backshell.

Test Description	StarShield™ Performance Requirements	Procedure
Magnetic Permeability	Relative permeability less than 2.0 for aluminum and 5.0 for stainless steel.	EIA-364.54
DC resistance	Resistance was measured between connector/fixture, and ferrule or a point near the end of the cable shield. Cable shield resistance was subtracted when measuring to a point near the end of the cable shield. The DC resistance did not exceed 5 milliohms after conditioning.	EIA-364.6
Durability	Backshells subjected to 10 cycles of assembly and disassembly (not including HST device). Showed no evidence of damage detrimental to performance.	GPS470013
Coupling Thread Strength	After testing, backshell showed no evidence of damage detrimental to performance.	SAE AS85049 category 3A
Vibration	Backshell was torqued to a suitable test fixture representative of an actual connector. Cable bundle was clamped or otherwise secured at 10.0 +/-.5 inches from the test fixture. After testing, Backshell showed no evidence of loosening or damage detrimental to performance with no discontinuities >1g5.	EIA-364.28 Condition VI, letter J 8 hrs/axis, monitored
Shock	The pulse was approximate half sine wave of 300 G ± 15 percent magnitude with duration of 3 ± 1 milliseconds. The wire bundle was clamped or otherwise secured at 10.0 +/-.5 inches from the test fixture. After testing, Backshell showed no evidence of loosening or damage detrimental to performance with no discontinuities >1g5.	EIA-364.27
Bending Moment	After testing, backshell showed no evidence of loosening or damage detrimental to performance.	AS85049, category 3A (heavy duty)
Cable Pull-out	A minimum of one ferrule per backshell was tested and wired with 4 shielded twisted pairs. DC resistance was monitored during the test. DC resistance during the test did not exceed 7 milliohms.	EIA364.38, condition E (25lbs)
Shielding effectiveness	One representative medium size StarShield™ backshell was fitted to a brass or copper fixture, wired with copper tubes and tested in accordance with VG95373-41. Shielding effectiveness was greater than 98 dB at 30 MHz and 90 dB at 100 MHz	VG95373-41