

1) Application Equipment

Glenair recommends the use of a Bak Rion Model 5100726 1600W hot-air-gun with a 34mm sieve spoon reflector (or equivalent system). Clamp the hot-air-gun in a bench mounted vice or comparable fixture to stabilize, with the reflector nozzle pointed upwards.



Hot air gun settings

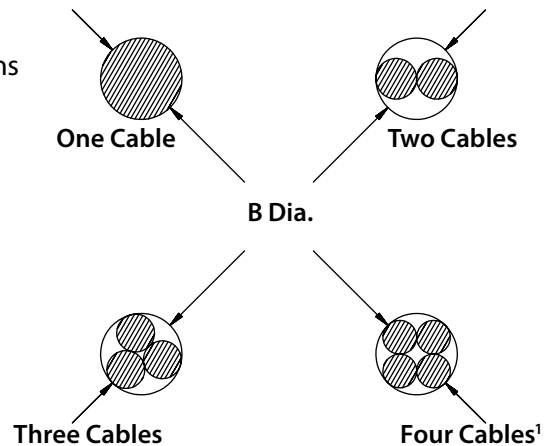
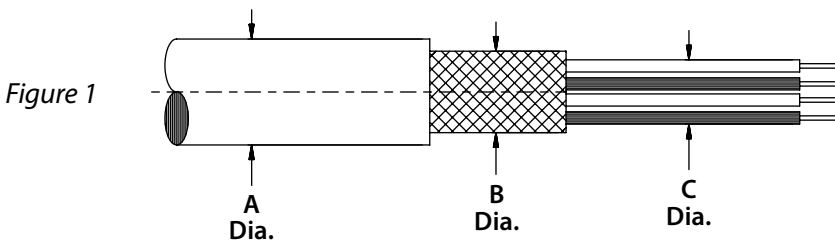
With the air-gun vent open and appropriate reflector nozzle installed, set the hot air gun as follows:

<p>For installation of protective sleeves: Use setting of 4-5 or 450°- 520°F (230°- 270°C)</p>	<p>For installation of the heat shrinkable terminator (HST): Use setting of 8-9 or 720°- 790°F (380°- 420°C)</p>
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While the hot air gun is warming, take a moment to check that all necessary StarShield assembly equipment is ready to terminate, and that extra components are on hand in case of a mis-termination.

2) Cable Preparation

Single or multi-conductor shielded cables meeting the envelope dimensions below may be used in any combination not to exceed 4 braids per ferrule.



Size	Envelope Diameters				
	Ø A		Ø B		Ø C Max
	Min.	Max.	Min.	Max.	
687-76A-02*	.122 (3.1)	.271 (6.9)	.094 (2.4)	.208 (5.3)	.165 (4.2)
687-764-04*	.169 (4.3)	.350 (8.9)	.094 (2.4)	.244 (6.2)	.165 (4.2)

* Finish Code

1) Refer to Figure 3 for Special Instructions

The filling factors listed below may be used as a guideline in determining the number of wires per ferrule. Actual fit-checks should be performed to ensure feasibility.

Circular Connectors

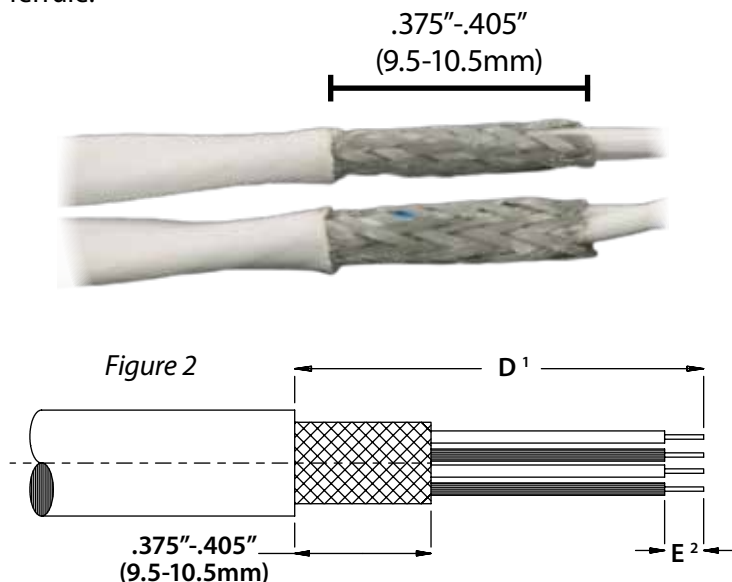
Connector		StarShield					
Size	AWG 22 Contact Qty	Size	Ferrule Qty	AWG 22 Shielded Wire Maximum Qty	Filling Factor	AWG 20 Shielded Wire Maximum Qty	Filling Factor
9-35	6	9	1	8	100%	6	100%
11-35	13	11	2	16	100%	12	92%
13-35	22	13	3	24	100%	18	82%
15-35	37	15	5	40	100%	24	37%
17-35	55	17	6	48	87%	36	55%
19-35	66	19	7	56	85%	42	64%
21-35	79	21	9	72	91%	54	68%
23-35	100	23	10	80	80%	60	60%
25-35	128	25	12	96	75%	72	56%

ARINC 600 Connectors

Connector		StarShield					
ARINC 600 Size	AWG 22 Contact Qty	Size	Ferrule Qty	AWG 22 Shielded Wire Maximum Qty	Filling Factor	AWG 20 Shielded Wire Maximum Qty	Filling Factor
2	300	21	18	144	48%	108	36%
3	600	21	36	288	48%	216	36%

- With an AWG 22 (wire OD .039"/1.0mm), a ferrule can accept up to 4 screened twisted pairs (8 wires total)
- With an AWG 20 (wire OD .051"/1.3mm), a ferrule can accept up to 3 screened twisted pairs (6 wires)
- Filling factors can be increased if unshielded wires are used by routing them through a drilled star.

Strip the cables according to the following dimensions. Make sure not to fray braided shielding ends. Contacts may be installed at this time if desired, provided their size is not so great as to prevent the leads to pass through the ferrule.



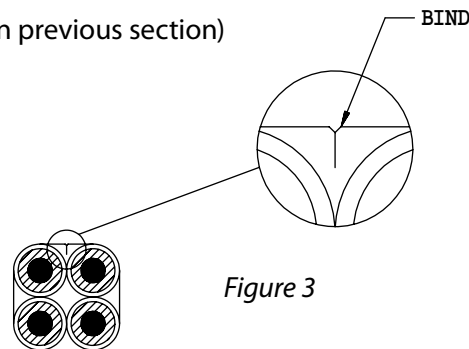
ADAPTER STYLE	SIZE	D DIM ±.02" (0.5mm)
Straight ARINC 600	All	3.23 (82)
Straight Circular	All	3.07 (78)
45° & 90° Circular	9	3.35 (85)
45° & 90° Circular	11 & 13	3.54 (90)
45° & 90° Circular	15 & 17	3.94 (100)
45° & 90° Circular	19	4.13 (105)
45° & 90° Circular	21	4.53 (115)
45° & 90° Circular	23	4.72 (120)
45° & 90° Circular	25	4.92 (125)

1. D Dimension allows for at least one repair of the crimp contact.
2. E Dimension determined by crimp contact mfgs. instructions.

3) Assembly

Arrange prepared cables into bundles in accordance with plan. (See figure 1 in previous section)

For applications with 4 braids, we recommend the use of a solid tin plated copper wire Ø.008-.016" (0.2-0.4mm) to bind the shields securely during the installation. Secure them together as shown in figure 3. Trim ends to .20" (5mm) long and fold flat along length of cable.



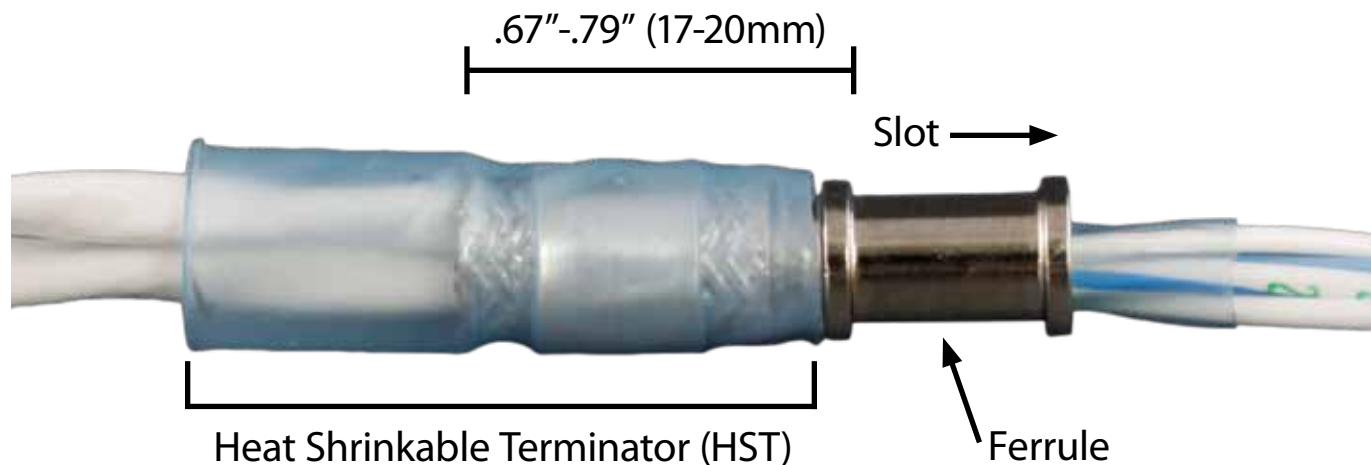
Using the hot air gun (see section 1), install provided .75" (19mm) protective sleeve directly adjacent the stripped braid. This will prevent the wire conductors from getting pinched in the ferrule slot as well as keeping the wire bundle well managed throughout the rest of the assembly process.

Heat Shrinkable Protective Sleeve



Stage the StarShield HST over the cable bundle, positioning the solder preform directly over the stripped section of braided shielding.

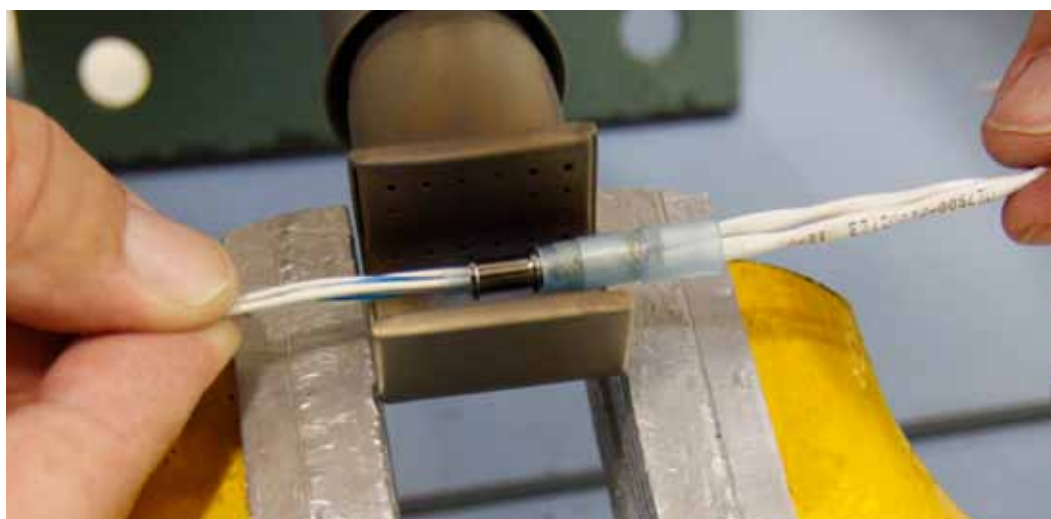
Next, carefully slide the StarShield ferrule (with slotted side oriented towards contacts) over the leads until the non-lipped end slides under the HST braid. Cable jacketing should be positioned on the ferrule as shown below.



4) Termination Procedure

Check that the hot-air-gun is set to the recommended setting and has been allowed to warm up for 1 minute.

Position cable and staged ferrule/HST in the center of the hot-air-gun reflector, being careful not to touch the outer heat shrink material to the reflector.



Focus heat on ferrule for a few seconds and begin moving towards the solder preform. Solder should melt and begin to flow freely. Continue to move the preform towards the center of the heat reflector as solder completely melts and flows along preform braid.



Heat until shrink sleeve has fully recovered around preform assembly and solder has completely melted and flowed through copper braid (approximately 15-45 seconds). Some solder flowing over the stripped cable braids should be seen. The solder will take on a lustrous appearance when properly melted. (Note: luster will subside as preform assembly cools to ambient temperature).

Be careful not to overheat preform assembly and scorch outer shrink sleeve. Slight browning of outer shrink sleeve is acceptable, but severe discoloration is indicative of improper termination.

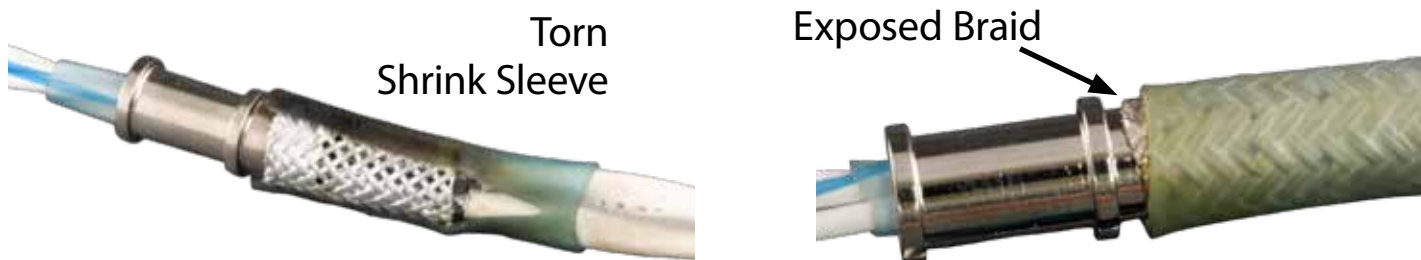


5) Inspection

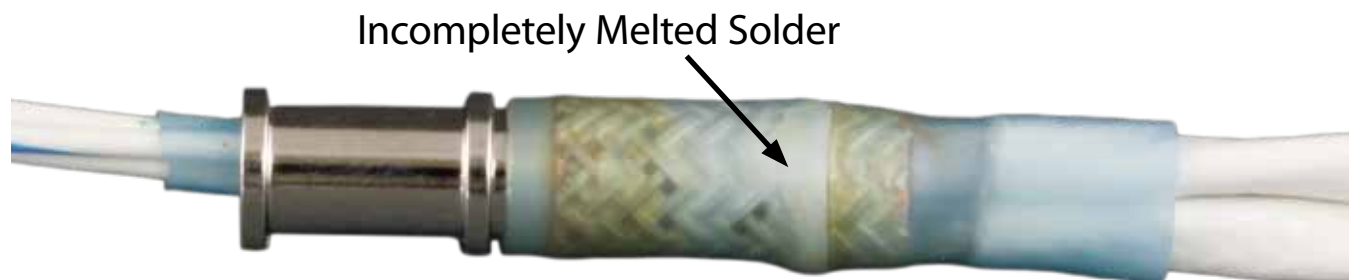
Allow the ferrule and HST assembly to cool completely before touching with bare hands.

Check for cuts, splits or charred spots in the outer heat shrink sleeve. A complete discolored dark brown sleeve indicates an overheated termination. A slight browning of the sleeve is acceptable.

Make sure that no braid strands are exposed from under the sleeve. If any such damage is evident, remove damaged sleeve and replace with new heat shrinkable sleeve Glenair part number 687-808-02 or 687-808-04.



If solder has not completely melted and flowed within the preform assembly and/or outer heat shrink sleeve has not fully recovered, reheating may be necessary.



6) Repair

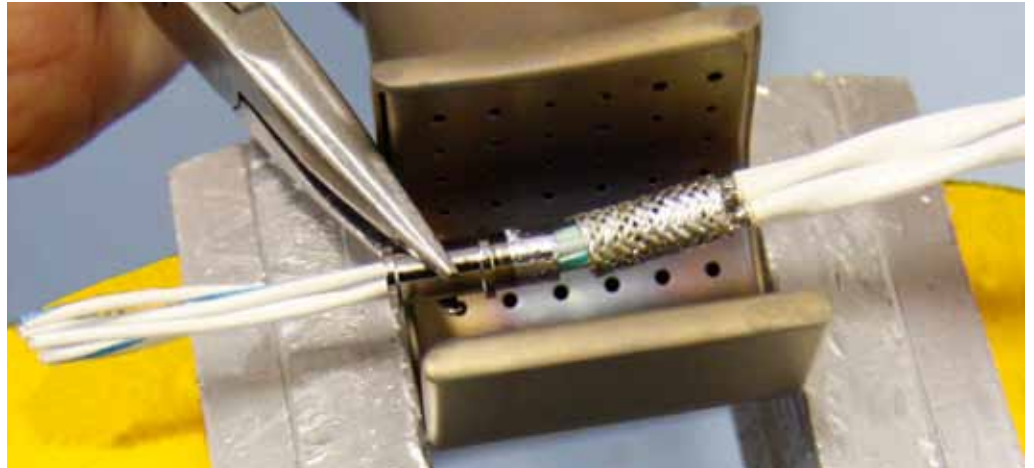
Reheat incompletely melted terminations to obtain proper solder flow and/or fully recovered sleeve onto the cable jacket. If the outer shrink sleeve has split during the assembly process, it must be replaced. To do so, cut away existing (damaged) shrink sleeve with snips and carefully remove from solder preform. Slide replacement heat-shrinkable sleeve (Glenair P/N 687-808-**) over terminated solder preform, leaving roughly .06" (1.5mm) of overlap on the braid/ferrule transition point. Heat new shrink sleeve until it recovers fully around preform and wires, making sure to constantly move it within the hot air gun reflector to ensure even heating and recovery. Once the new shrink sleeve is fully recovered, remove assembly from the hot air gun and allow the assembly to cool before proceeding with subsequent steps. Repeat inspections per section 6.

7) Dismantling

In the case of severely damaged StarShield HST assemblies, complete removal and re-termination may be necessary. Users will need a hot air gun fixed in a bench mount (see section 1), needle nose pliers and an unused StarShield HST kit (Glenair part number 687-764-***)

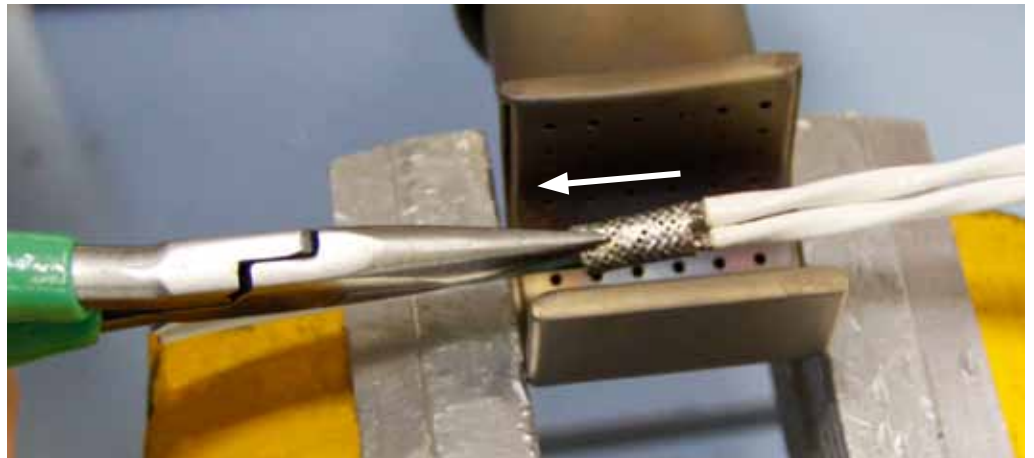
Set hot-air-gun to recommended setting (see section 1) and allow to warm up for one minute. Remove outer heat shrink sleeve completely, being careful not to cut or damage wire jacketing.

With needle nose pliers firmly planted on end of ferrule, place StarShield ferrule/HST in hot air gun and allow solder to melt and flow. Once solder is molten, gently pull ferrule away from braided preform and slide off wires. Remove assembly from heat and set aside.



Next, grasp preform braid with needle nose pliers and return assembly to hot air gun reflector. When solder begins to melt, gently pull preform braid away from cable. Remove from heat and allow to cool.

Once assembly cools to ambient temperature, use fingers to gently scrape residual solder off cable jacketing and protective sleeve.



Re-terminate with a new StarShield HST (Glenair part number 687-764-***) and inspect for damage per previous instructions.

8) Assembly of StarShield adapters

Install HST/ferrules onto cables per instructions 1 through 7.

Terminate crimp contacts onto leads per Glenair crimping instructions, or follow appropriate connector manufacturer's contact procedure.

Slide the gland nut, compression ring and adapter body / coupling nut assembly over the cable bundle—paying special attention to the order and orientation of each component. For adapters with drilled stars, route the wires that pass through the center hole of the star before inserting the contacts into the connector.



Using appropriate insertion tools, insert terminated contacts into the connector per Glenair insertion instructions, or per connector manufacturer's procedure.



Hand tighten the adapter body / coupling nut assembly onto the connector accessory threads until anti-rotation teeth engage. Once threads have engaged and anti-rotation teeth are sitting peak-to-valley, begin tightening with assembly tool to specified torque value. We suggest the connector be mated to an appropriate holding tool (see Glenair tools catalog) before final tightening takes place. Continue to tighten the coupling nut until specified torque value has been reached. Effective EMI grounding is dependent upon proper tightening of backshell to connector body. Snap ferrules into place on

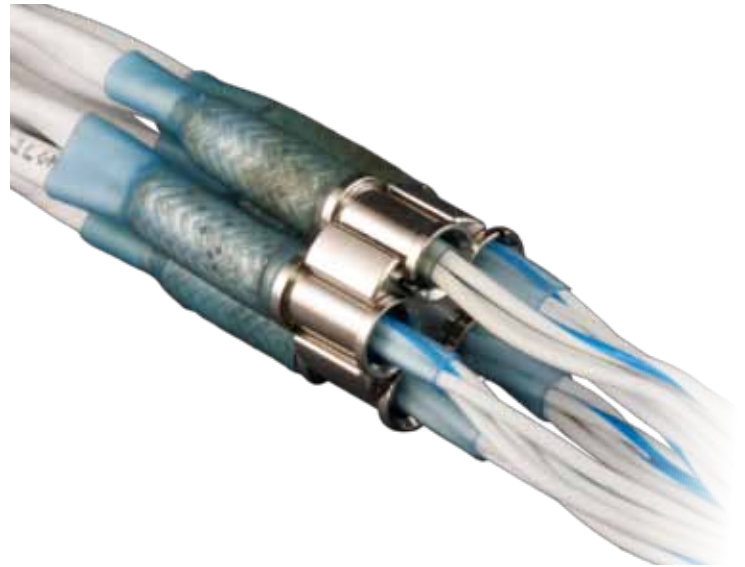
470-013 Glenair StarShield Assembly Procedure



the StarShield “star”. For star-in-star or split star configurations, install ferrules starting from the inner star or ferrule slot. Position conical ring on the star.

Position the sub-assemblies (stars, compression ring and ferrules) into the body by carefully twisting to “birdcage” the wires. If necessary, heat may be applied to the wires to make them more pliable and easier to fit into adapter body (Hot air gun setting 4–5 or 450°–520°F / 230°–270°C with reducer nozzle). Apply heat, then push and twist the wires until the gland nut threads engage the threads on the body.

Tighten the gland nut on the body to the appropriate torque value.



Glenair recommends the use of an appropriately sized Series 600 backshell holding wrench, TG70 strap wrench, or TG69 soft jaw pliers. (These tools are used to grip the self-locking coupling nut. Any one of the three will do the job.) Connector plug or receptacle holder: These tools take the form of a socket device used in conjunction with a torque wrench, either hand held (600-161) or bench mounted (600-162). These tools are used to hold the inner body of the connector in place while the StarShield adapter coupling nut and clamping nut are torqued onto the back. Note: most holder series tools provide “universal polarization”, but a few connector series require specific polarization for each alternate keying arrangement. Please see the Glenair Backshell Assembly Tools Catalog for tool ordering information.

Dismantling StarShield Adaptors:

Dismantling is the reverse of the assembly. To remove a ferrule from a star, grip the ferrule assembly as close to the star as possible. Carefully twist and lift the ferrule straight up from the ferrule slot in the star. Do not remove the ferrule by lifting or pulling on the cable or wires only, or damage to the termination may result. For maximum contact extraction tool access, unclip all ferrules from the star, remove the star from the cable bundle before pushing the adapter body towards the cable.

