P122 and P132 Consoles

Electrical System Upgrade
Installation Instructions
GA107-1
STC SH4747NM

P122 **P132**

Electrical System Upgrade Installation Instructions

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1.0. INTRODUCTION.

The AEM Electrical System Upgrade STC provides for replacement of the factory standard center electrical console that has push-button switches & fuses and replaces them with a system of toggle switches and circuit breakers as a complete replacement console. The console comes in two basic designs that the installer may choose to use depending on their specific requirements.

1.1. The P122 Switch Console holds up to 24 Mil-Spec sealed toggle switches and up to 60 Mil-Spec circuit breakers. It comes pre-wired and assembled from AEM custom configured to match the installer's aircraft wiring requirements.

This console also features an LED backlit switch legend and an internal dimmer power supply and control that allow independent dimming of the console to any desired level for maximum crew comfort during night operations.

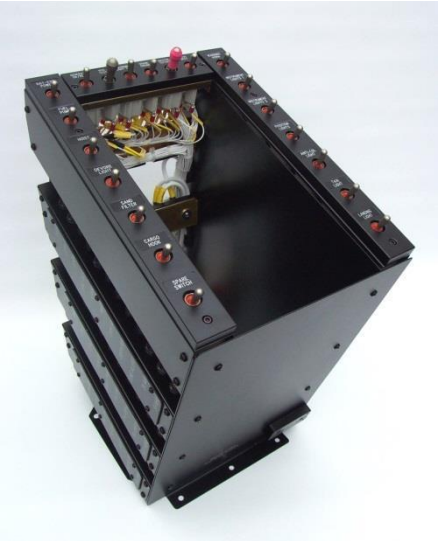
For P122 Console installations, refer to: G12311 P122 Installation Instructions.

1.2. The P132 Avionics Console holds up to 20 Mil-Spec sealed toggle switches and up to 60 Mil-Spec circuit breakers. It comes pre-wired and assembled from AEM custom configured to match the installer's aircraft wiring requirements.

This console features a central avionics bay for mounting up to 10.4" of avionics and radios.

This console also features LED backlit switch legends and an internal dimmer power supply and control that allow independent dimming of the console to any desired level for maximum crew comfort during night operations.

For P132 Console installations, refer to: GA107-6 P132 Installation Instructions.



This STC also contains optional modifications that may be installed to suit the installer's specific needs. These include:

1.3. P176 Dimmer Power Supply: This is a direct plug-in replacement for Eurocopter Dimmer 31L P/N 55670 (ref 704A46814049) used in all AS350 models manufactured Post-MOD 350A07-1182.

Refer to: GA107-12 P176 Dimmer Power Supply Installation Instructions.

1.4. Airframe Ground Points Upgrade. This modification is Optional at the installer's discretion, and improves the reliability of the airframe ground points. Refer to Section 2 of this document for instructions on this modification.

1.5. Auxiliary Circuit Breaker Rail G10268-10. This modification adds a bracket under the Instrument panel on the Pilot's side. This bracket provides a mounting location for up to 12 circuit breakers, 3 switches, an ELT switch and KA51B Slave Accessory switch group.

Refer to Section 3 of this document for instructions on this modification.

1.6. Accessory Relays and Circuit Breakers. This modification adds Accessory Relays and Circuit Breakers for non-essential equipment. Refer to Section 4 of this document for instructions on this modification.

1.7. For all modifications listed in this STC, wire bundles may be secured as required using nylon cable ties (Ty-Wraps) as listed in the tables below.

Cable Tie Selection Chart
Thomas & Betts Brand

Cat. No.	Body Width In.	Length In.	Max. Wire Bundle Dia. In.	Tensile Strength Lb.
TY23M	.091	3.62	.62	18
TY24M	.140	5.50	1.12	40
TY25M	.184	7.31	1.75	50

Cable Tie Selection Chart
Panduit Brand

Cat. No.	Body Width In.	Length In.	Max. Wire Bundle Dia. In.	Tensile Strength Lb.
PLT2M-M	.098	8.00	2.00	18
PLT31-M	.145	11.40	3.00	40

1.8. For all modifications listed in this STC, and at the installers discretion, wire bundles may have protective expandable sleeving applied. Ref: ICO-RALLEY p/n's XPF-1/8, XPF-1/4, XPF-3/8, XPF-1/2, XPF-3/4.

The original electrical system including the battery, starter generator and distribution system is unchanged.

2. Airframe Ground Points Upgrade

This modification improves the reliability of the airframe ground points and is optional at the installer's discretion.

NOTE: Route all new wires along existing bundles. See FAA AC43.13-1B, Chapter 11, Section 15 for acceptable methods for routing, lacing and securing bundles.

2.1. Remove ground terminal blocks 1N, 2N, 3N, 4N, 9N, 10N, and 13N. (see section 90.00.10, sheet 1 of the latest revision of AS350 Wiring Diagram Manual for location of ground terminal blocks).

2.2. Remove the wires from each ground terminal. Strip insulation from wires and crimp an insulated #10 ring terminal of the correct size on to each wire. Refer to Table 1 for correct terminal/wire usage. Use the installation tools recommended by the terminal manufacturer.

Table 1

Manufacturer	Stud Size	Color	Wire Size (AWG)	AMP P/N
AMP or equivalent	4	Red	22-16	31880
AMP or equivalent	6	Red	22-16	36150
AMP or equivalent	6	Red	22-16	36152
AMP or equivalent	8	Red	22-16	31886
AMP or equivalent	10	Red	22-16	36154
AMP or equivalent	1/4	Red	22-16	31894
AMP or equivalent	6	Blue	16-14	36158
AMP or equivalent	8	Blue	16-14	320565
AMP or equivalent	10	Blue	16-14	36160
AMP or equivalent	6	Yellow	12-10	35107
AMP or equivalent	8	Yellow	12-10	35108
AMP or equivalent	10	Yellow	12-10	35109

2.3. Using a 1/2” diameter burnishing brush, clean to bare metal on both sides of the area around the holes where the original ground terminal blocks were attached. This cleaned area must now be corrosion-proofed. This is done by acid etch, rinsing with water and the application of alodine using a small brush, sponge or cloth soaked in alodine solution. Allow the alodine to soak the cleaned area for several minutes, rinse with water and dry the contact area. Use 1 ea. AN526-1032R14 screw, 5 ea. NAS1149F0363P washers and 2 ea. MS21042-3 locknuts for each group of up to 4 ground terminals.

2.4. Install the grounds at each location per AC 43.13-1B, Chapter 11, Section 15, Tables 11-14, 11-15, 11-16. Add additional ground points as needed. Cover completed grounds with standard green lacquer (Vernelec 43022, Airbus ECS2228.10 or equivalent).

3. Auxiliary Circuit Breaker Rail G10268-10

This modification is Optional at the installers discretion. This modification adds the Aux Circuit Breaker Rail under the Instrument panel on the Pilot's side. This bracket provides a mounting location for up to 12 circuit breakers, 3 switches, an Artex ELT control panel and KA-51B control panel.

3.1. Remove vent cable from vent support (350A25-1342-21)

3.2. Remove and discard vent support.

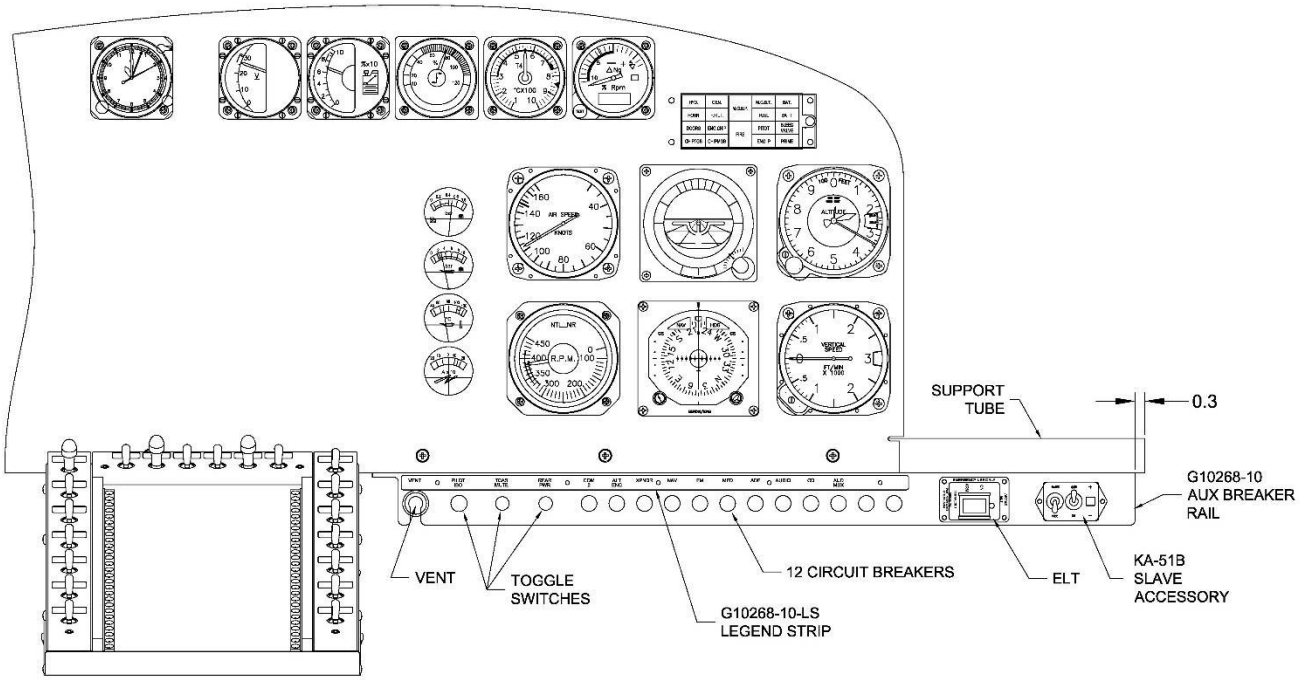


FIGURE 1

3.3. Position the Aux Circuit Breaker Rail as shown in Figure 1 onto bottom of the Instrument panel Support Tube. Back drill the support tube in 4 places 0.129 Dia (#30 Drill) using the Aux Circuit Breaker Rail as a guide.

3.4. Install Rail to Support tube using (4) CR3213-4-3 "Cherrymax" rivets (or equivalent), mount Aux Circuit Breaker Rail to the support tube.

3.5. Use the slotted inboard hole of the Aux Circuit Breaker Rail to remount the pilot's vent cable.

3.6. Install desired circuit breakers and switches into holes provided in rail. Ensure that the circuit breakers are connected to the correct "PP" buss for correct load distribution. See Airbus Helicopters WDM chapter 39 for each system's "PP" assignment.

3.7. Use buss bar P/N G12135-x if multiple breakers are to be joined to a common buss. The “x” in the buss bar part number represents the number of breakers to be connected together. Example: for 2 breakers, use buss bar G12135-2. Circuit Breaker spacing is for MS26574-xx Circuit Breakers or equal.

3.8. Buss wires are attached to the buss bar as shown in Figure 2.

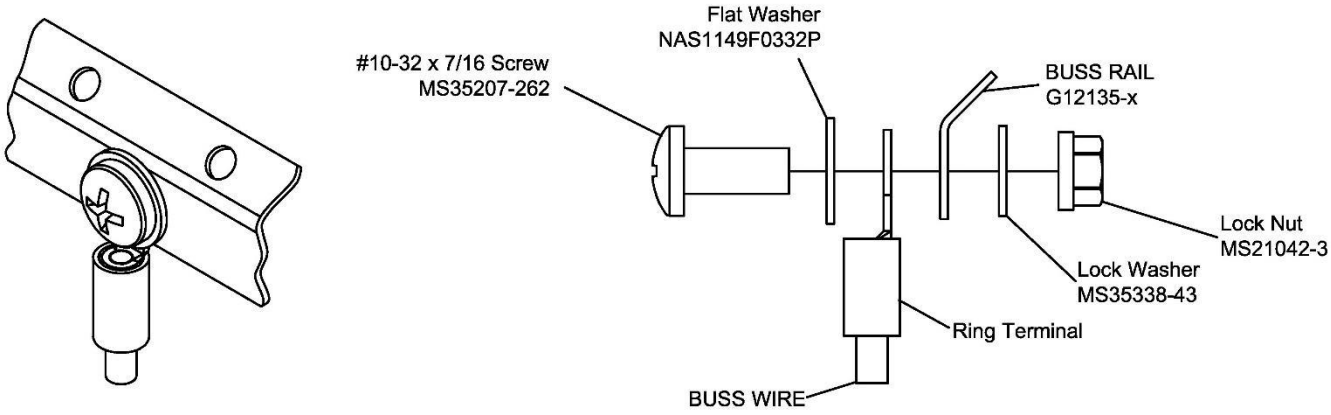


FIGURE 2

3.9. See Table 1 for ring terminal part numbers.

3.10. For circuits requiring #8 AWG wire, use wire P/N M22759/16-8-9 and ring terminals AMP #33460 (#10-32) at one end and AMP #324061 (#8-32) at circuit breaker end. Install rubber boots MS25171-2S over #8 ring terminals.

3.11. Switch and circuit breaker wires for optional installation can be fabricated from #6 ring terminals #36152, #18 AWG wire P/N M22759/16-18-9 and butt splices #320559. Route and secure wire bundles IAW AC 43.13-1B, Chapter 11, Section 15.

3.12. Optionally, the installer may mount an ARTEX ELT control panel in the space provided using the hardware supplied with the control panel.

3.13. Optionally, the installer may mount a KA-51B control panel in the space provided using the hardware supplied with the control panel.

3.14. Install a placard above each switch and circuit breaker. Optionally, the installer may use Legend Strip G10268-10-LS using (5) #4-40 x .31 screws (MS35206-214 or 4C31PPMSB).

4. Accessory Relays and Circuit Breakers

This modification is Optional at the installer's discretion. This modification adds Accessory Relays and Circuit Breakers for non-essential equipment.

4.1. Refer to drawing G10284 for additional installation instructions.

4.2. Master Electrical Box (MEB) Modifications.

4.2.1. Refer to Sheet 1 of G10284.

4.2.2. Attach CBF1 – CBF3 to mounting bracket G10269-1 and Bus Rail G10269-3.

4.2.3. Install Terminal Bridge G10269-5 to terminal block.

4.2.4. Temporarily install the CBF1 - CBF3 / bus rail assembly onto terminal strip as shown in view A-A.

4.2.5. As shown in View A-A, Use mounting bracket as a guide to locate and drill (2) 0.156 Dia mounting holes for mounting bracket into the side of the MEB Case.

4.2.6. Remove CBF1 – CBF3 / bus rail assembly from Terminal Strip and install bus wires onto the Circuit Breakers.

4.2.7. Reattach CBF1 - CBF3 / bus rail assembly onto terminal strip.

4.2.8. Attached CBF1 – CBF3 to MEB wall using Doubler G10269-2 and (2) #6-32 x .5 pan head screws (MS35206-230).

4.2.9. Repeat Steps 4.2.2 - 4.2.8 for CBF4 using Bus Rail G10269-8.

4.2.10. Label each circuit breaker with designator and function. Ex. "CBF1 Avionics".

4.2.11. Locate existing hole in frame adjacent to airframe ground point 4N, see detail view D-D. Using a 1/2" diameter burnishing brush, clean to bare metal on both sides of the area around the hole. Spot alodine area around hole to protect the bare metal.

4.2.12. Install ground stud as shown in view D-D. This ground point may be used for the CBF4 circuit and/or other installer defined circuits. Use Table 1 to select the correct ring terminal for the installed wire.

4.3. Accessory Relay Installation.

4.3.1. Refer to Sheet 2 of G10284.

4.3.2. Note: This installation shows the mounting of three relays on the LH side keel beam at STA 91.54 . At the installer's discretion, they may choose to install only one or two relays, depending on the specific accessory system requirements.

4.3.3. The installation shown is typical and for reference only. At the installer's discretion, the relays may be relocated to an alternate location to avoid interference with pre-existing equipment.

4.3.4. Using doubler G10269-9 as a guide, layout and drill mounting points.

4.3.5. Install doublers and nutplates using rivets shown in View F-F.

4.3.6. Install Relays using hardware shown in View E-E.

4.3.7. Install wiring connection to relays and secure cable harness.

4.3.8. Label each Relay with designator and function. Ex. "Avionics Master".

4.4. Accessory Wiring Installation.

4.4.1. Refer to Sheet 3 of G10284 for instructions on fabricating cable harness.

4.4.2. The circuitry shown represents a typical ENG configuration of one avionics bus controlled by a separate switch and two accessory buses controlled by one switch located in the P122/P132 switch console. Other configurations may require only a single avionics master circuit and no accessory circuits, or a second avionics master circuit, etc.

4.4.3. Unless otherwise noted, all shielded wire is M27500-(ga)TG(n)T14 and all unshielded wire is M22759/16-(ga)-9, where (ga) is the wire gauge and (n) is the number of wires inside the shield.

4.4.4. All Bonding and Grounding will be done in accordance with AC 43.13-1B, Chapter 11, Section 15.

4.4.5. All G12113-xxx wires are 8 GA unshielded. All G12091-xxx wires are 20 GA unshielded. The wire numbers shown are examples. At the installer's discretion, different wire numbers may be used , provided that they uniquely identify each wire and the gauge of the wire.

4.4.6. When Routing wires through the MEB case, use existing feed-thru grommets on the FWD outboard area.

4.4.7. When installing wires to the circuit breakers, a service loop of 3-4 inches should be left at each wire with respect to the circuit breaker it is associated with.

4.4.8. All 8 GA wire terminations should have 1" of black heatshrink tubing (3/8" dia) applied over the barrel of the terminal and the first 1/2" of the wire.

4.4.9. Route wires G12113-xxxx along the left side of ship following wire PP6E and secure at the same locations.

4.4.10. Route wires G12113-xxxx and G12091-xxxx along left side of ship following existing cable runs up to P122/P132 console to connect with the designated bus or switch circuit.

4.4.11. Test continuity through each installed circuit breaker and relay before applying power.

LOG OF REVISIONS

REVISION LEVEL	DATE OF REVISION	PAGES	DESCRIPTION OF CHANGE	APPROVAL
--	7/26/98	All Pages	Initial Release	GLH
A	11/19/90	All Pages	Revised for AS350B2	GLH
B	8/7/93	All Pages	Revised for AS350BA	GLH
C	7/25/95	All Pages	Added Option 1	GLH
D	12/15/98	All Pages	Text Change	GLH
E	1/15/2004	All Pages	Renamed document and removed P132 Console	CLB
F	4/25/08	All	Added P148 & P149 consoles	CLB
G	12/5/14	All	Removed P148 & P149 and obsolete modifications. Updated format and company name to Eagle Copters	CLB
H	4/01/15	5	Revised fastener order for Figure 2	CLB
J	5/19/15	3	Added sections 1.7 & 1.8	CLB
1.00	11/15/22	All Pages	ECO 1152: Document rebranded to AEM document standard. No technical information was altered in any form.	TB AEM Todd Blackstock Program Manager 15-Nov-2022
1.01	6/07/23	1	RAS 1111: Title page corrected to identify applicability for P122 and P132	TB AEM Todd Blackstock Program Manager 8-Jun-2023

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