

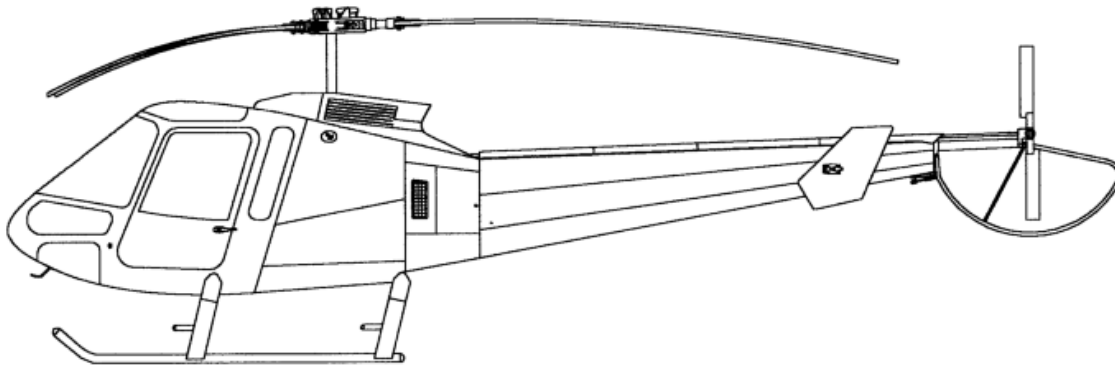


ENSTROM
HELICOPTER CORPORATION

ENSTROM TH-28/480 SERIES MAINTENANCE MANUAL

SUPPLEMENT 8

G1000H INTEGRATED FLIGHT DECK SYSTEM



The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under 14 CFR §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

For EASA approval, this Airworthiness Limitations section is approved and variations must also be approved.

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Page i

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RECOMMENDED CHANGE REPORT

This maintenance manual is prepared and distributed by The Enstrom Helicopter Corporation and is intended for use by personnel responsible for maintaining Enstrom TH-28, 480, and 480B helicopters. This manual is periodically revised. If, in the opinion of the user, any information has been omitted or requires clarification, please direct your comments to Enstrom via this form (duplicate) or other similar form. Send the recommended changes to:

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G1000H Integrated Flight Deck System

Manual Date: May 14/14

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Recommended Change:

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TABLE OF CONTENTS

Chapter	Page
Cover Page	i
Recommended Change Report	iii
Record of Revisions	v
Table of Contents	vii
List of Figures	x
List of Tables	x
List of Diagrams	xi
Effective Page List	xiii
 INTRODUCTION	
Avionic System(s) Effectivity	xv
Aircraft Effectivity	xv
Supplemental Changes and Revisions	xvi
Service Document Publications	xvi
Application of Warnings, Cautions, and Notes	xvii
 CHAPTER 1. G1000H INTEGRATED FLIGHT DECK.....	
1.1 System Description.....	1-1
1.1.1 System Overview	1-1
1.1.2 GDU 1040H Displays (PFD/MFD)	1-6
1.1.3 GIA 63H Integrated Avionics Unit	1-6
1.1.4 GEA 71H Engine Aircraft I/O Unit	1-7
1.1.5 ST 32 Signal Conditioners	1-7
1.1.6 GTX 33H w/ES Transponder	1-7
1.1.7 GRS 77H AHRS with GMU 44 Magnetometer	1-8
1.1.8 GDC 74H Air Data Computer with GTP 59 OAT Probe	1-9
1.1.9 Caution and Warning System	1-10
1.1.10 Data Logging	1-11
1.1.11 Vendor Publications	1-12
1.1.12 G1000H Software Versions	1-13
1.2 Airworthiness Limitations	1-14
1.3 Servicing, Troubleshooting and Periodic Inspection.....	1-15
1.3.1 Servicing	1-15
1.3.2 Troubleshooting	1-15
1.3.3 Periodic Inspections	1-15
1.4 G1000H Controls	1-16
1.4.1 Secure Digital Cards	1-18
1.4.2 Softkey Function	1-19
1.4.3 System Power Up	1-19
1.4.4 System Status Page	1-20
1.4.5 G1000H Modes of Operation	1-21
1.5 System Maintenance.....	1-25
1.5.1 GDU 1040H MFD/PFD (Figure 18).....	1-29
1.5.2 GDU 1040H MFD/PFD Cooling Fan (Figure 19, Figure 20).....	1-30

1.5.3	GIA 63H Integrated Avionics Unit (Figure 21)	1-32
1.5.4	GRS 77H AHRS (Figure 22, Figure 23)	1-33
1.5.5	GMU 44 Magnetometer (Figure 24).....	1-35
1.5.6	GDC 74H Air Data Computer (Figure 25).....	1-37
1.5.7	GEA 71H Engine and Airframe (Figure 26).....	1-39
1.5.8	GTX 33H Transponder (Figure 27).....	1-41
1.5.9	ST 32 Signal Conditioner (Figure 28)	1-42
1.5.10	Avionics Cooling Fan	1-43
1.5.11	Crew Alerting System	1-44
1.5.12	CMC/TOT Exceedances	1-52
1.6	G1000H System Wiring Diagrams	1-54
1.7	G1000H Configuration Pages.....	1-54
CHAPTER 2. GTS 800 TRAFFIC ADVISORY SYSTEM.....		2-1
2.1	System Description.....	2-1
2.1.1	Vendor Publications	2-1
2.2	Airworthiness Limitations	2-2
2.3	Servicing, Troubleshooting, and Periodic Inspections.....	2-3
2.3.1	Servicing	2-3
2.3.2	Troubleshooting	2-3
2.3.3	Periodic Inspections.....	2-3
2.4	System Maintenance – GTS 800	2-4
2.4.1	Scheduled Maintenance	2-4
2.4.2	Removal.....	2-4
2.4.3	Installation.....	2-4
CHAPTER 3. GDL 69AH XM WEATHER RECEIVER		3-1
3.1	System Description.....	3-1
3.1.1	Vendor Publications	3-1
3.2	Airworthiness Limitations	3-2
3.3	Servicing, Troubleshooting, and Periodic Inspections.....	3-3
3.3.1	Servicing	3-3
3.3.2	Troubleshooting	3-3
3.3.3	Periodic Inspections.....	3-3
3.4	System Maintenance – GDL 69AH.....	3-4
3.4.1	Scheduled Maintenance	3-4
3.4.2	Removal.....	3-4
3.4.3	Installation.....	3-4
CHAPTER 4. MD302 STANDBY ATTITUDE MODULE		4-1
4.1	System Description.....	4-1
4.1.1	Vendor Publications	4-1

4.2	Airworthiness Limitations	4-2
4.2.1	Retirement Life	4-2
4.3	Servicing, Troubleshooting, and Periodic Inspections	4-3
4.3.1	Servicing	4-3
4.3.2	Troubleshooting	4-3
4.3.3	Periodic Inspections.....	4-3
4.4	System Maintenance – MD302	4-4
4.4.1	Scheduled Maintenance	4-4
4.4.2	Removal	4-4
4.4.3	Installation.....	4-4
4.4.4	Long Term Storage – Battery Storage Mode.....	4-5
CHAPTER 5.	KN 63 DME	5-1
5.1	System Description	5-1
5.1.1	Vendor Publications	5-1
5.2	Airworthiness Limitations	5-2
5.3	Servicing, Troubleshooting, and Periodic Inspections	5-3
5.3.1	Servicing	5-3
5.3.2	Troubleshooting	5-3
5.3.3	Periodic Inspections.....	5-3
5.4	System Maintenance – KN 63	5-4
5.4.1	Scheduled Maintenance	5-4
5.4.2	Removal	5-4
5.4.3	Installation.....	5-4

LIST OF FIGURES

Figure 1. G1000H Installation Block Diagram.....	1-2
Figure 2. G1000H System LRU Installation Reference	1-3
Figure 3. Instrument Panel Mounted LRUs and Caution/Warning System Annunciators	1-3
Figure 4. Upper Console Mounted LRUs.....	1-4
Figure 5. Keel Mounted LRUs (bottom view of keel)	1-4
Figure 6. Antenna Installations	1-5
Figure 7. PFD and MFD controls	1-16
Figure 8. NAV, CRS/BARO, COM, FMS, and ALT knobs	1-18
Figure 9. Display Bezel SD Card Slots	1-19
Figure 10. Softkeys	1-19
Figure 11. Example System Status Page	1-20
Figure 12. 'Set' and 'Active' Commands	1-23
Figure 13. Configuration Status Prompts.....	1-24
Figure 14. System status indications	1-24
Figure 15. Example System Status Page	1-25
Figure 16. Circuit Breaker, Switch, and Alert Panel.....	1-27
Figure 17. Emergency Circuit Breaker Panel.....	1-28
Figure 18. GDU 1040H Installation and Removal.....	1-28
Figure 19. Shroud Installation	1-30
Figure 20. PFD/MFD Cooling Fan Installation	1-31
Figure 21. GIA 63H Installation and Removal.....	1-31
Figure 22. GRS 77H.....	1-34
Figure 23. GRS 77H Installation	1-34
Figure 24. GMU 44 Installation and Removal.....	1-36
Figure 25. GDC 74H Installation and Removal.....	1-38
Figure 26. GEA 71H Installation and Removal	1-40
Figure 27. GTX 33H Installations and Removal	1-40
Figure 28. Signal Conditioner Installation and Removal.....	1-42
Figure 29. Avionics Cooling Fan Installation.....	1-43
Figure 30. GTS 800 Installation and Removal.....	2-5
Figure 31. GDL 69AH Installation and Removal.....	3-5
Figure 32. MD302 Installation and Removal.....	4-5
Figure 33. MD302 Configuration Set-Up (Reference 4192810-3 Rev. A)	4-6
Figure 34. KN 63 Installation and Removal	5-5

LIST OF TABLES

Table 1. G1000H System Vendor Manuals	1-12
Table 2. Software Versions	1-13
Table 3. Data Path Status Indications.....	1-24
Table 4. DC Power Distribution.....	1-26
Table 5. CMC/TOT Exceedances	1-131
Table 6. Aircraft Flight Data	1-132
Table 7. Aircraft Engine Data	1-132
Table 8. GTS 800 Vendor Manuals	2-1
Table 9. GDL 69AH Vendor Manuals	3-1
Table 10. MD302 Vendor Manuals	4-1
Table 11. KN 63 Vendor Manuals.....	5-1

LIST OF DIAGRAMS

Diagram 1-1. G1000H Power Distribution Interface	1-55
Diagram 1-2. G1000H Interface	1-59
Diagram 1-3. G1000H Case Bonding and Grounding Interface	1-79
Diagram 1-4. G1000H Audio Panel Interface	1-83
Diagram 1-5. G1000H Interior Lighting Interface	1-87
Diagram 1-6. G1000H Exterior Lighting Interface	1-89
Diagram 1-7. G1000H Hour Meter Interface	1-91
Diagram 1-8. G1000H Day/Night Annunciator Dimmer Interface	1-93
Diagram 1-9. G1000H Power Distribution Interface	1-95
Diagram 1-10. G1000H Interface	1-99
Diagram 1-11. G1000H Ground Interface	1-119
Diagram 1-12. G1000H Interior Lighting Interface	1-121
Diagram 2-1. GTS 800 Traffic Advisory System Interface	2-9
Diagram 3-1. GDL 69AH Datalink Receiver Interface	3-9
Diagram 4-1. MD302 SAM Interface	4-7
Diagram 5-1. KN 63 DME Interface	5-6

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EFFECTIVE PAGE LIST

Page	Date	Page	Date
i	Oct 18/19	1-31	May 14/14
ii	May 14/14	1-32	Jan 25/18
iii	May 14/14	1-33	Jan 25/18
iv	May 14/14	1-34	May 14/14
v	Oct 18/19	1-35	Jan 25/18
vi	May 14/14	1-36	Oct 18/19
vii	Oct 18/19	1-37	Jan 25/18
viii	Oct 18/19	1-38	May 14/14
ix	Oct 18/19	1-39	Jan 25/18
x	Oct 18/19	1-40	May 14/14
xi	Jan 25/18	1-41	Jan 25/18
xii	Jan 25/18	1-42	Jan 25/18
xiii	Oct 18/19	1-43	Oct 18/19
xiv	Oct 18/19	1-44	May 14/14
xv	Oct 18/19	1-45	May 14/14
xvi	Jan 25/18	1-46	May 14/14
xvii	Jan 25/18	1-47	May 14/14
xviii	Jan 25/18	1-48	Oct 18/19
1-1	Jan 25/18	1-49	Oct 18/19
1-2	Jan 25/18	1-50	Oct 18/19
1-3	Jan 25/18	1-51	Oct 18/19
1-4	May 14/14	1-52	Oct 18/19
1-5	Oct 18/19	1-53	Oct 18/19
1-6	May 14/14	1-54	Oct 18/19
1-7	May 14/14	1-55	Jan 25/18
1-8	May 14/14	1-56	Jan 25/18
1-9	May 14/14	1-57	Jan 25/18
1-10	Oct 18/19	1-58	Jan 25/18
1-11	Oct 18/19	1-59	Jan 25/18
1-12	Jan 25/18	1-60	Jan 25/18
1-13	Oct 18/19	1-61	Jan 25/18
1-14	May 14/14	1-62	Jan 25/18
1-15	May 14/14	1-63	Jan 25/18
1-16	May 14/14	1-64	Jan 25/18
1-17	May 14/14	1-65	Jan 25/18
1-18	May 14/14	1-66	Jan 25/18
1-19	May 14/14	1-67	Jan 25/18
1-20	May 14/14	1-68	Jan 25/18
1-21	May 14/14	1-69	Jan 25/18
1-22	Oct 18/19	1-70	Jan 25/18
1-23	May 14/14	1-71	Jan 25/18
1-24	May 14/14	1-72	Jan 25/18
1-25	Jan 25/18	1-73	Jan 25/18
1-26	May 14/14	1-74	Jan 25/18
1-27	Jan 25/18	1-75	Jan 25/18
1-28	May 14/14	1-76	Jan 25/18
1-29	Jan 25/18	1-77	Jan 25/18
1-30	Jan 25/18	1-78	Jan 25/18

EFFECTIVE PAGE LIST

Page	Date	Page	Date
1-79	May 14/14	1-125	Oct 18/19
1-80	May 14/14	1-126	Oct 18/19
1-81	May 14/14	1-127	Oct 18/19
1-82	May 14/14	1-128	Oct 18/19
1-83	Jan 25/18	1-129	Oct 18/19
1-84	Jan 25/18	1-130	Oct 18/19
1-85	Jan 25/18	1-131	Oct 18/19
1-86	May 14/14	1-132	Oct 18/19
1-87	Jan 25/18	2-1	Oct 18/19
1-88	Jan 25/18	2-2	May 14/14
1-89	Jan 25/18	2-3	May 14/14
1-90	Jan 25/18	2-4	May 14/14
1-91	Jan 25/18	2-5	May 14/14
1-92	May 14/14	2-6	May 14/14
1-93	Jan 25/18	2-7	May 14/14
1-94	May 14/14	2-8	May 14/14
1-95	Jan 25/18	2-9	May 14/14
1-96	Jan 25/18	2-10	May 14/14
1-97	Jan 25/18	2-11	May 14/14
1-98	Jan 25/18	2-12	May 14/14
1-99	Jan 25/18	3-1	Oct 18/19
1-100	Jan 25/18	3-2	May 14/14
1-101	Jan 25/18	3-3	May 14/14
1-102	Jan 25/18	3-4	May 14/14
1-103	Jan 25/18	3-5	May 14/14
1-104	Jan 25/18	3-6	May 14/14
1-105	Jan 25/18	3-7	May 14/14
1-106	Jan 25/18	3-8	May 14/14
1-107	Jan 25/18	3-9	May 14/14
1-108	Jan 25/18	3-10	May 14/14
1-109	Jan 25/18	4-1	Oct 18/19
1-110	Jan 25/18	4-2	Jan 25/18
1-111	Jan 25/18	4-3	Jan 25/18
1-112	Jan 25/18	4-4	Jan 25/18
1-113	Jan 25/18	4-5	Jan 25/18
1-114	Jan 25/18	4-6	Oct 18/19
1-115	Jan 25/18	4-7	Oct 18/19
1-116	Jan 25/18	4-8	Jan 25/18
1-117	Jan 25/18	5-1	Oct 18/19
1-118	Jan 25/18	5-2	Jan 25/18
1-119	Jan 25/18	5-3	Jan 25/18
1-120	Jan 25/18	5-4	Jan 25/18
1-121	Jan 25/18	5-5	Jan 25/18
1-122	Jan 25/18	5-6	Jan 25/18
1-123	Oct 18/19		
1-124	Oct 18/19		

INTRODUCTION

Avionic System(s) Effectivity

The data is presented in this supplement is applicable to the avionic systems options listed in the following table.

Avionic System

Avionic System	Enstrom Part Number	Note
G1000H Installation	4220650-1	(Note 1, 3)
	4220650-3	(Note 2, 3)
GTS 800 Traffic Advisory System	4220656-1	
GDL 69AH XM Weather Receiver	4220660-1	
MD302 Standby Attitude Module	4220677-1	(Note 2)
KN 63 Distance Measuring Equipment	4220686-1	

NOTE 1

G1000H installation P/N 4220650-1 is certified as Non-required Safety Enhancing Equipment (NORSEE) as the helicopter is not equipped with a standby attitude module. Without a standby attitude module, the equipment does not meet all the operational requirements of some operating rules (e.g. 14 CFR 135). The operator must verify this installation is appropriate for its intended use.

NOTE 2

Standby attitude module P/N 4220677-1 is included in G1000H installation P/N 4220650-3.

NOTE 3

The G1000H System Installation may include the GMA 350H audio panel. For information regarding the GMA 350H, refer to electrical schematic Diagram 1-4 in this supplement and TH-28/480 Series Maintenance Manual Supplement 5 (Chapter 9). For operation, refer to 28-AC-051 Rotorcraft Flight Manual Supplement. For operation of helicopters registered in countries that recognize approvals granted by EASA, refer to 28-AC-073 Rotorcraft Flight Manual Supplement.

Aircraft Effectivity

The data presented in this TH-28/480 Series Maintenance Manual Supplement is applicable to all 480B model helicopters.

Supplemental Changes and Revisions

Subsequent to the publication of the initial issue of this supplement, changes in the avionics equipment, support concepts and procedures, as well as information developed by experience may affect the contents of this supplement. To ensure that coverage in the supplement continues to reflect such changes, revised information is released by one of the following methods:

1. Revision - A revision alters portions of the manual by replacement, addition, and/or removal of pages.
2. Reissue - A reissue of this supplement will occur when the amount of changes warrants complete reissue.

Service Document Publications

1. Service Directive Bulletins – Used to direct the owner/operator and/or maintenance personnel to make mandatory changes, improvements, or inspections to the aircraft applicable to the entire fleet or a segment of the fleet that are typically safety/airworthiness related. The information provided in the Service Directive Bulletins will be incorporated in the maintenance manual as needed at a later date. At the time of incorporation, the Service Directive Bulletin is superseded by the maintenance manual, and accomplishment or sign-off of the Service Directive Bulletin in the maintenance records book is no longer required. A detailed entry should be made in the maintenance records to indicate that the Service Directive Bulletin is superseded by the maintenance manual.
2. Service Information Letters – Used to transmit information, recommendations, and general service instructions to the aircraft owner/operator and/or maintenance personnel applicable to the entire fleet or a segment of the fleet. The information provided in the Service Information Letters will be incorporated into the maintenance manual as needed at a later date.
3. Service Instructions – Used to provide the owner/operator and/or maintenance personnel with information that is applicable to specific aircraft and does not meet the criteria of a Service Information Letter or Service Directive Bulletin. Service Instructions will not be distributed to the entire fleet.

Service Information Letters and Service Directive Bulletins incorporated into the maintenance manual are logged in the Service Information Letter Index or the Service Directive Bulletin Index (as appropriate) located on the Enstrom Helicopter website: www.enstromhelicopter.com (follow the applicable link under the Tech Publications section of the Technical Support page). Each index numerically lists all Service Information Letters and Service Directive Bulletins, respectively, and identifies those which have been incorporated into the maintenance manual. All Service Information Letters and Service Directive Bulletins are also located under the Tech Publications section of the website.

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Application of Warnings, Cautions, and Notes

Throughout this supplement, it is necessary to highlight or emphasize important points to avoid injury to personnel, damage to equipment, or unnecessary confusion while performing maintenance procedures. The terms “WARNING”, “CAUTION”, and “NOTE” are used to draw attention to instructions or information deserving special consideration.

WARNING

Calls attention to use of materials, processes, methods, procedures, or limits that must be followed to avoid injury to personnel.

CAUTION

Calls attention to methods and procedures that must be followed to avoid damage to equipment.

NOTE

Calls attention to information essential to highlight for clarification of procedures or to make a task easier.

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CHAPTER 1. G1000H INTEGRATED FLIGHT DECK

SECTION 1

SYSTEM DESCRIPTION

1.1 System Description

The G1000H system is an integrated flight deck system that presents flight instrumentation, position, navigation, communication, and identification information to the pilot through large format displays. The G1000H system also includes instrument panel mounted caution/warning annunciators and the Crew Alerting System (CAS) message display.

1.1.1 System Overview

The G1000H system installation consists of the following Line Replaceable Units (LRUs).

- **GDU 1040H** Primary Flight Display (PFD) and Multi-Function Display (MFD)
- **GIA 63H** Integrated Avionics Unit (2)
- **GEA 71H** Engine/Airframe Unit (2)
- **ST 32** Signal Conditioner (2)
- **GTX 33H** Mode S Transponder with Extended Squitter (ES)
- **GRS 77H** Attitude and Heading Reference System (AHRS)
- **GMU 44** Magnetometer
- **GDC 74H** Air Data Computer
- **GTP 59** Outside Air Temperature (OAT)
- Cooling Fans (Avionics, PFD, and MFD)
- (optional) **GTS 800** Traffic Avoidance System (TAS) with **GA 58** Antenna (see Chapter 2)
- (optional) **GDL 69AH** Satellite Data Link Receiver with **GA 55** Antenna (see Chapter 3)
- (For G1000H P/N 4220650-3 only) **MD302** Standby Attitude Module (SAM) (see Chapter 4)
- (optional) **KN 63** Distance Measuring Equipment (DME) (see Chapter 5)
- (optional) **GMA 350H** Audio Panel (see TH-28/480 Series Maintenance Manual Supplement 5, Chapter 9)

The G1000H system block diagram is shown in Figure 1.

Figure 2 shows LRU installation locations or references to the applicable figure for additional component installation detail.

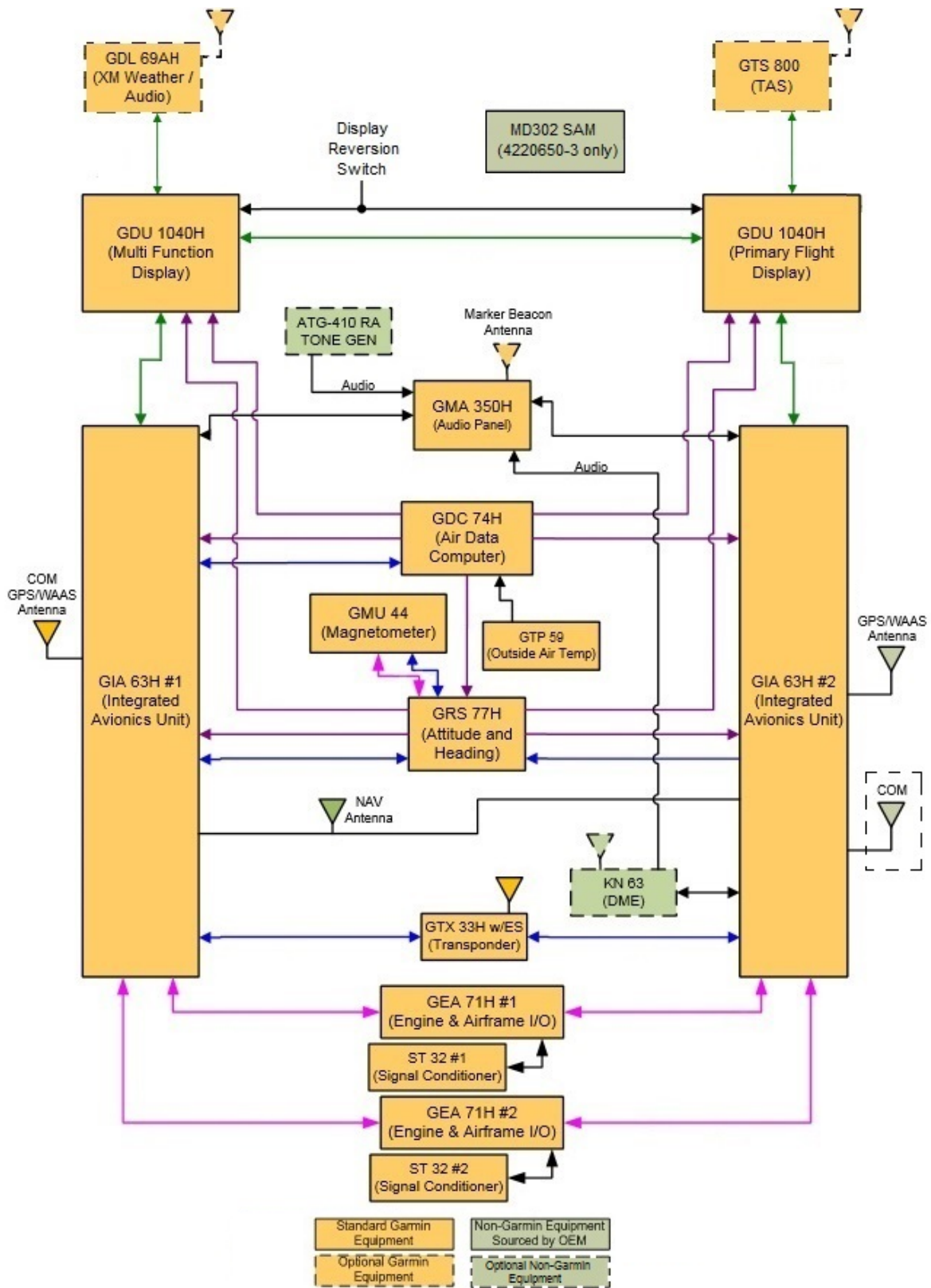


Figure 1. G1000H Installation Block Diagram

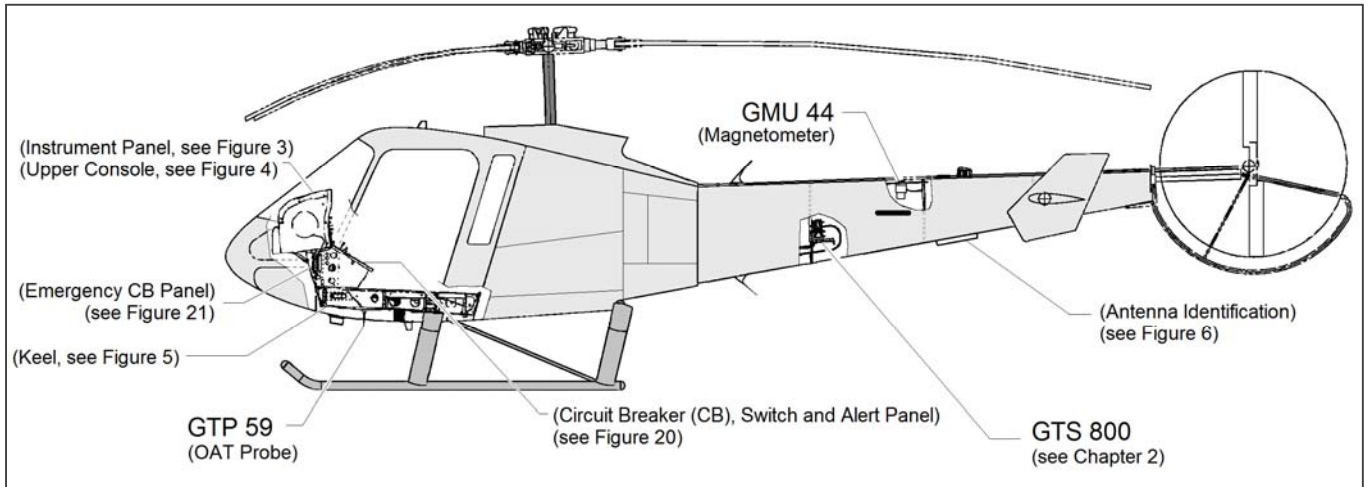


Figure 2. G1000H System LRU Installation Reference

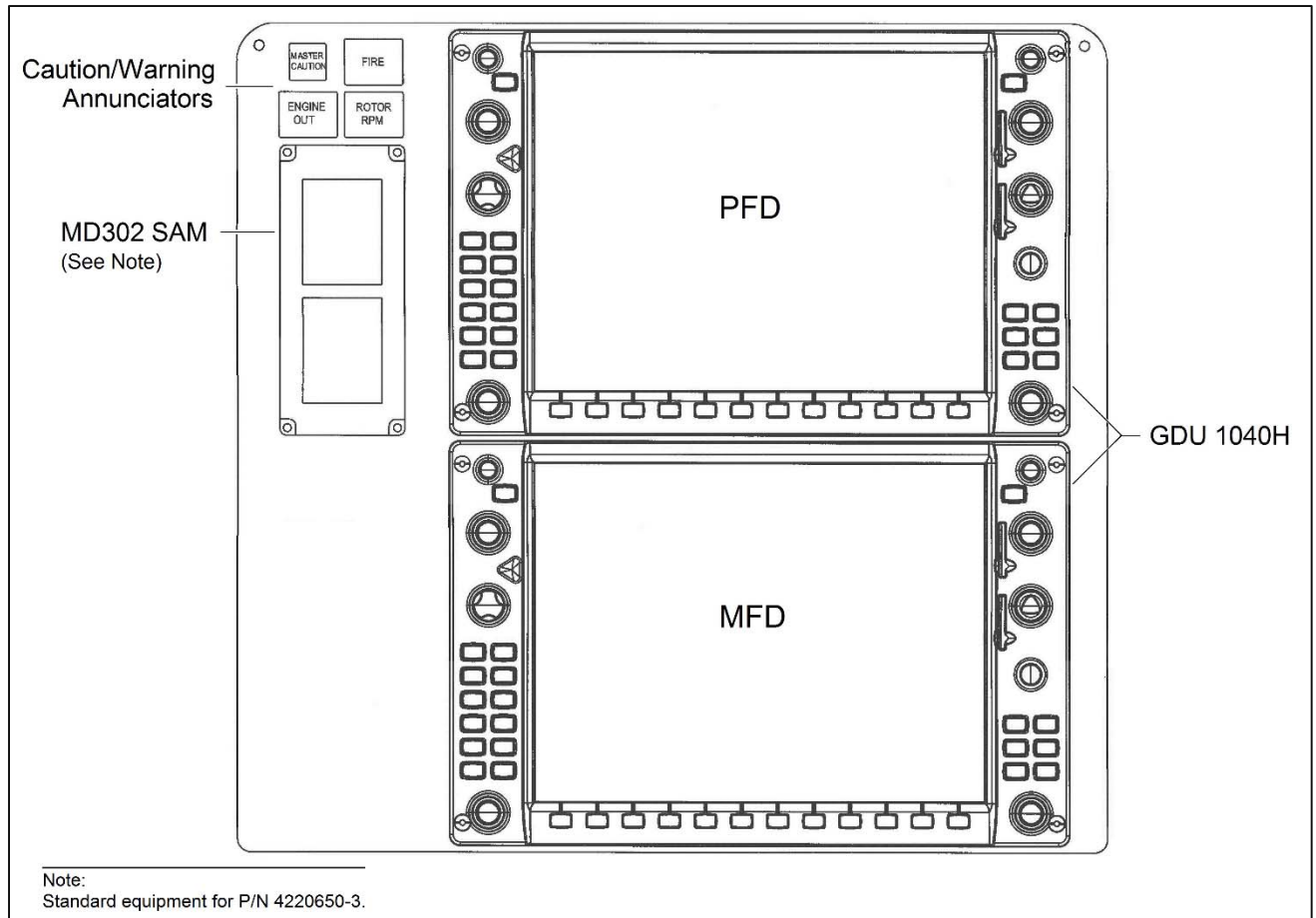


Figure 3. Instrument Panel Mounted LRUs and Caution/Warning System Annunciators

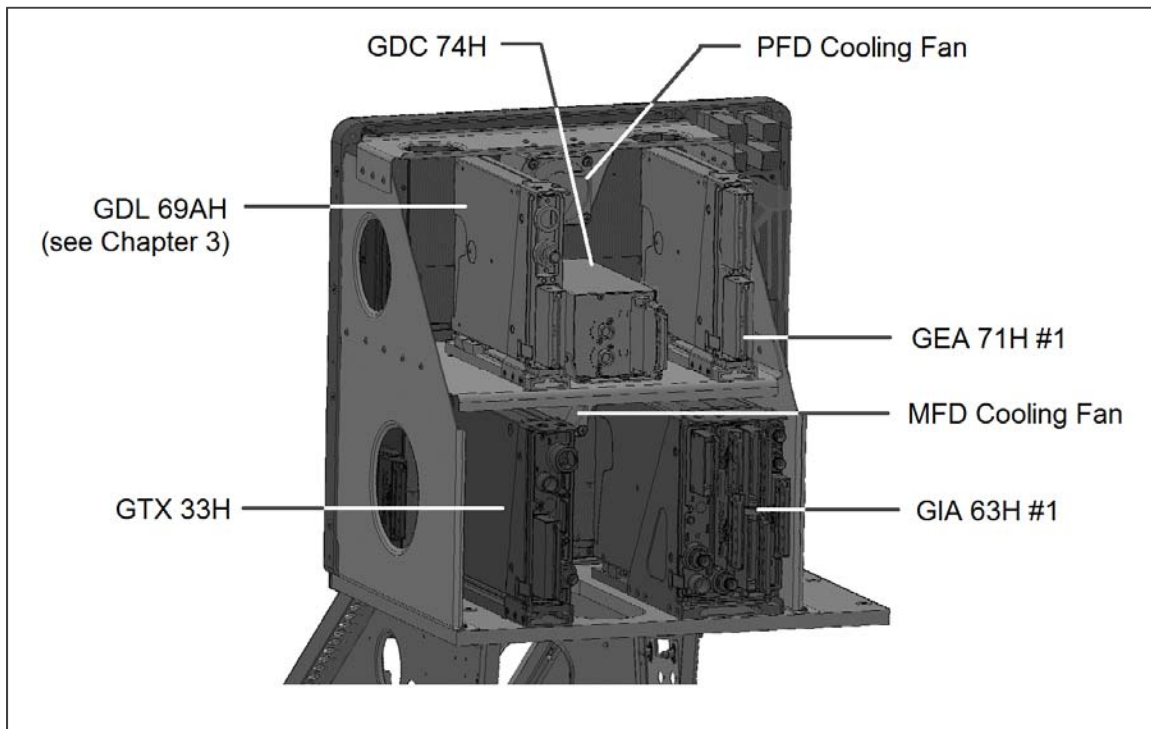


Figure 4. Upper Console Mounted LRUs

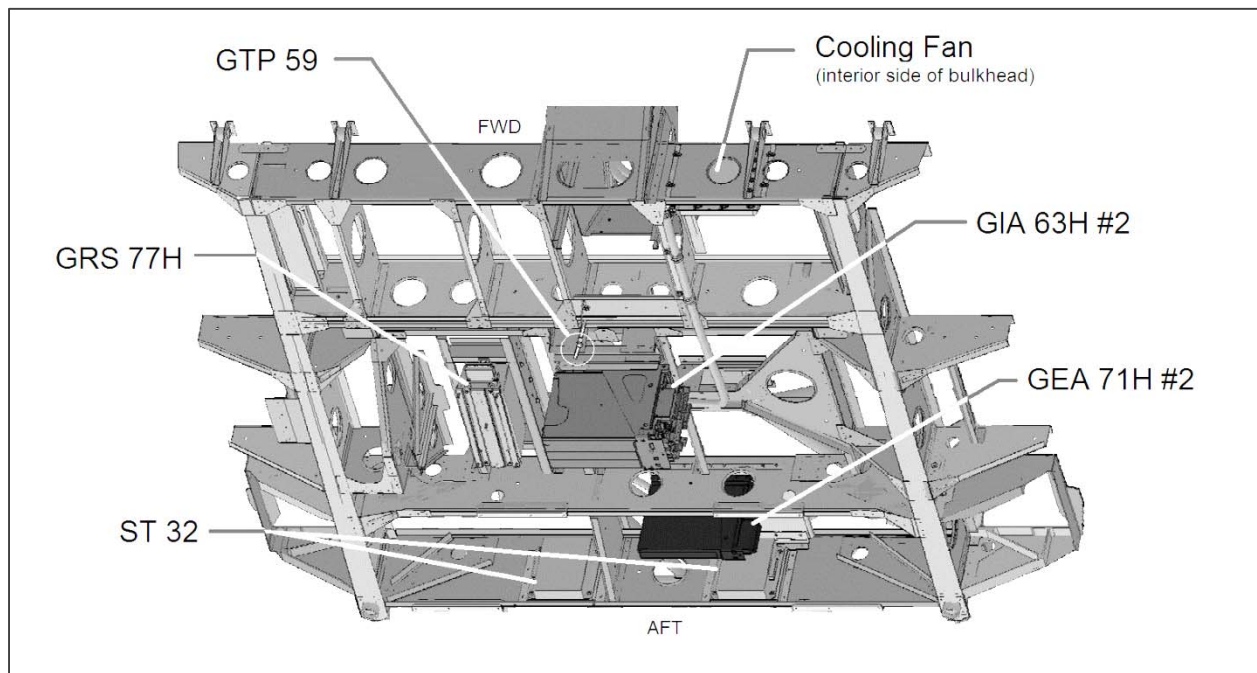


Figure 5. Keel Mounted LRUs (bottom view of keel)

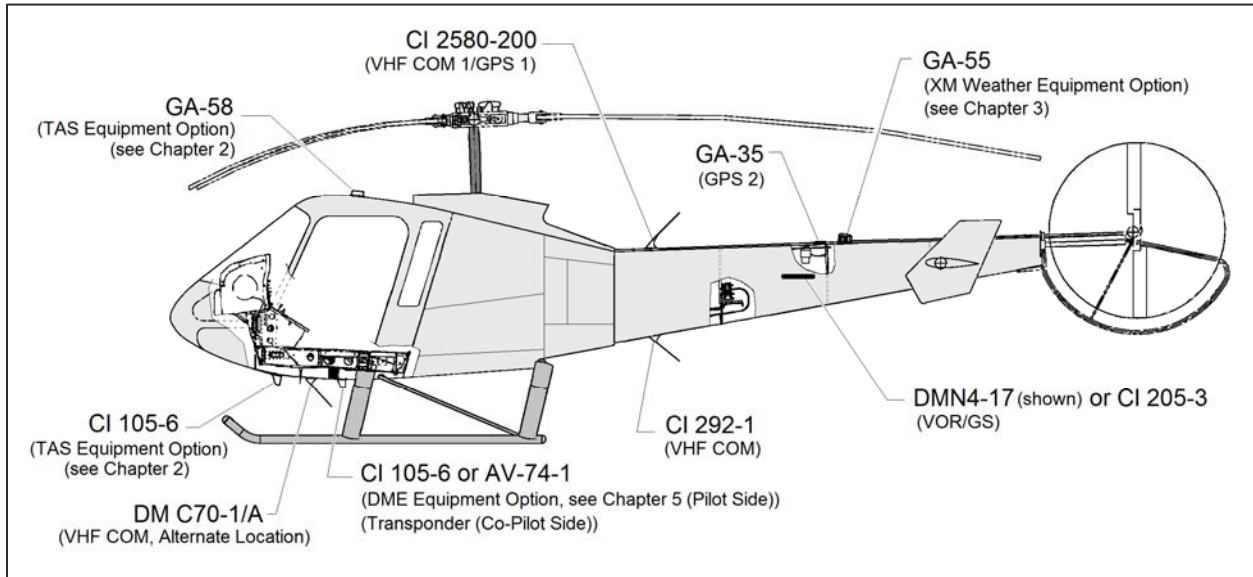


Figure 6. Antenna Installations

1.1.2 GDU 1040H Displays (PFD/MFD)

The GDU 1040H provides a central display and user interface for the G1000H Integrated Flight Deck. A GDU 1040H can be configured as either a PFD or an MFD through the aircraft wiring. The GDU 1040H provides the following functions:

Flight Instrument Functions

- Display of attitude (pitch and roll), rate of turn, slip/skid, heading, airspeed, altitude, and vertical speed information (PFD or reversionary modes only)
- Display of engine and airframe instrumentation (MFD or reversionary modes only)

Navigation Instrument Functions

- Display of position and ground speed for use by the pilot/flight crew
- Display of stored navigation and map databases for use by the pilot/flight crew
- Control and display of the HSI
- Area navigation functions using the determined position/velocity and stored navigation data
- Approach navigation functions and associated databases
- Barometric altitude settings

System Interface Functions

- Interfacing with the GIA 63H IAU
- Control and display of dual communications transceivers operating in the 118.00 to 136.975 MHz range in 8.33 kHz or 25 kHz frequency spacing
- Control and display of dual VOR/ILS receivers tuning from 108.00 to 117.95 MHz in 50 kHz increments
- Control and display of GTX 33H transponder and GDL 69AH data link

The GDU 1040H PFD and MFD are mounted flush to the aircraft instrument panel. See *Figure 3. Instrument Panel Mounted LRUs*. In this installation, the aircraft is configured with the PFD installed above the MFD on the instrument panel.

1.1.3 GIA 63H Integrated Avionics Unit

The GIA 63H is a microprocessor-based input/output LRU used in the G1000H Integrated Flight Deck. The GIA 63H communicates with the GDU via an ethernet HSDB and with other LRUs using RS-232, RS-485/422, and ARINC 429. All configurations are done through the GDU. The GIA 63H contains the following sub-assemblies:

- A main processor that interfaces with all LRUs in the G1000H sub-system.
- A 15 channel receiver (12 GPS and 3 GPS/WAAS/SBAS channels).
- A VHF COM transceiver that provides tuning from 118.00 to 136.992 MHz in 25 kHz or 8.33 kHz spacing for 760 or 2280 channel configurations, respectively.

- A VOR/ILS localizer receiver that provides tuning from 108.00 to 117.95 MHz in 50 kHz increments.
- An ILS glideslope receiver that provides tuning from 328.6 to 335.4 MHz as paired with the frequency tuned on the VOR/ILS localizer receiver.

This installation contains two GIA 63H units. GIA 63H #1 unit is installed in rack mounted in the upper console; GIA 63H #2 unit is installed in the keel. See *Figure 4. Upper Console Mounted LRUs* and *Figure 5. Keel Mounted LRUs*.

1.1.4 **GEA 71H Engine Aircraft I/O Unit**

The GEA 71H is a micro-processor based input/output LRU used to monitor sensor inputs and drive annunciator outputs for airframe and engine systems. The GEA 71H interfaces with various sensors on the aircraft and communicates airframe and engine information via RS-485 digital interface to GIA 63H IAU. The GIAs then interface with the GDU PFD and MFD. Typically, the MFD shows engine instrumentation while the PFD normally shows airframe alerts provided by the GEA 71H. Engine/airframe instrumentation is also displayed on the PFD and/or MFD while the system is in reversionary mode.

The GEA 71H uses a configuration module temperature sensor and a thermocouple sensor housed in a back shell assembly to monitor back shell junction temperatures to maintain thermocouple accuracy.

This installation contains two rack mounted GEA 71H units. GEA 71H #1 unit is installed in the upper console; GEA 71H #2 unit is installed in the keel. See *Figure 4. Upper Console Mounted LRUs* and *Figure 5. Keel Mounted LRUs*.

1.1.5 **ST 32 Signal Conditioners**

The ST 32 is dual function signal conditioner. It converts three channels of the sinusoidal output of tach generators and one channel of analog strain gauge pressure to a digital signal that can be used by aircraft display and/or control systems.

This installation contains two ST 32 units installed in the keel. See *Figure 5. Keel Mounted LRUs*.

1.1.6 **GTX 33H w/ES Transponder**

The Garmin GTX 33H Mode S transponder is a radio transmitter and receiver that operates on radar frequencies, receiving ground radar or TCAS interrogations at 1030 MHz and transmitting a coded response of pulses to ground-based radar on a frequency of 1090 MHz. The GTX 33H is equipped with IDENT capability that activates the SPI pulse for 18 seconds.

The GTX 33H replies to Mode A, Mode C, and Mode S interrogation. Mode A replies consist of framing pulses and any one of 4,096 codes, which differ in the position and number of pulses transmitted. Mode C replies include framing pulses and encoded altitude. Mode S replies consist of any combination of the transponder's permanent

ICAO 24-bit aircraft address and other aircraft information sent to the Secondary Surveillance Radar system.

The GTX 33H with extended squitter (ES) enabled provides ADS-B technology that improves situational awareness and flight safety. With ADS-B capabilities, position, velocity, and heading information are automatically transmitted to other aircraft and ground stations. The current ATC system depends on the transmission of interrogations for pertinent aircraft information at a slower update rate. ADS-B provides immediate surveillance of air-to-air traffic and aircraft in areas not currently covered by radar.

Ground stations can interrogate Mode S transponders individually using a 24-bit ICAO Mode S address, which is unique to the particular aircraft. In addition, ground stations may interrogate a GTX 33H for its transponder data capability and the aircraft's flight ID, which is the registration number or other call sign. The GTX 33H makes the maximum airspeed capability (set during configuration setup) available to TCAS systems on-board nearby aircraft to aid in the determination of TCAS advisories.

The unit features an altitude monitor and TIS traffic advisories. A voice or tone audio output announces altitude and traffic alerts. The GDU 1040H PFD screen displays the code, reply symbol, and mode of operation, depending on equipment connections and configuration selection.

The GTX 33H features multiple transmit/receive ARINC 429 and RS-232 data ports. The unit concentrates data from three ARINC 429 inputs, gray code, RS-232 input data, and discrete inputs to the high-speed RS-232 data ports for display on the flight displays. Although multiple output capability is available, the unit is designed to feed all outgoing data via RS-232 data ports. Two RS-232 data ports send and receive data to/from the GIA 63H IAU.

The GTX 33H unit is installed in a rack mounted in the upper console. See *Figure 4. Upper Console Mounted LRUs*.

1.1.7 **GRS 77H AHRS with GMU 44 Magnetometer**

The Garmin GRS 77H AHRS and GMU 44 Magnetometer are remote mounted devices that provide flight attitude and heading data for flight instrumentation. With information available and valid from all sensors, the GRS 77H AHRS provides valid attitude, angular rate, and acceleration information to the GIA 63H IAU and the GDU 1040H PFD.

An Attitude and Heading Reference System combines the functions of a vertical gyro and a directional gyro to provide measurement of roll, pitch, and heading angles. The Garmin AHRS and magnetometer replace traditional rotating mass instruments.

Using long-life solid-state sensing technology, the GRS 77H AHRS and GMU 44 Magnetometer combine 3-axis angular rate, linear acceleration and magnetic field measurements to create an electronically stabilized AHRS.

The GRS 77 AHRS provides the following information in ARINC 429 format:

- Aircraft heading, pitch, and roll angles
- Aircraft yaw, pitch, and roll rates
- Aircraft body-axis accelerations
- Rates of change of heading, pitch, and roll
- Aircraft accelerations expressed in a local level frame of reference

The operating voltage range of the GRS 77H AHRS is from 10 to 33 volts DC. The GRS 77H AHRS provides operating voltage to the GMU 44 Magnetometer. The GRS 77H AHRS/GMU 44 Magnetometer is capable of maneuvers through a range of 360° in bank and pitch. The rotation rate capability is $\pm 200^\circ$ per second. However, ARINC 429 angular rate output messages are limited to $\pm 128^\circ$ per second. Bank error and pitch error are within $\pm 1.25^\circ$ over the range of 30° bank, left and right, and 15° pitch nose up and nose down. Heading is accurate to within 2° in straight and level flight.

Operation in the following regions is not authorized due to unsuitability of the magnetic fields near the Earth's poles:

- North of 72° North latitude at all longitudes
- South of 70° South latitude at all longitudes
- North of 65° North latitude between longitude 75° W and 120° W (Northern Canada)
- North of 70° North latitude between longitude 70° W and 128° W (Northern Canada)
- North of 70° North latitude between longitude 85° E and 114° E (Northern Russia)
- South of 55° South latitude between longitude 120° E and 165° E (Region south of Australia and New Zealand)

The GRS 77H unit is installed in the keel. See *Figure 5. Keel Mounted LRUs*. The GMU 44 unit is installed in the tailcone. See *Figure 2. G1000H System LRU Installation Reference*.

1.1.8 GDC 74H Air Data Computer with GTP 59 OAT Probe

The Garmin GDC 74H Air Data Computer is a remote mounted device that provides air data for flight instrumentation. The GDC 74H requires an input from an outside air temperature probe (the GTP 59 OAT). The system measures aircraft static and impact pressure information from pressure transducers and raw air temperature from the outside temperature probe. Using the raw data from the appropriate sensors, the unit computes pressure altitude, vertical speed, airspeed values, air temperature information, and density altitude. Aircraft specific configuration parameters are stored in an external configuration module to make the GDC 74H an LRU. The system provides pitot static and temperature derived air data to the GIA 63H IAU and the GDU 1040H PFD.

The GDC 74H provides the following information in ARINC 429 format:

- Air Temperature (total air temperature, outside/static air temperature)
- Corrected Static Pressure
- Density Altitude
- Impact Pressure, Uncorrected
- Indicated Airspeed
- Mach Number
- Pressure Altitude
- Total Pressure
- True Airspeed
- Vertical Speed

The GDC 74H unit is installed in a rack mounted in the upper console. See *Figure 4. Upper Console Mounted LRUs*. The GTP 59 is installed in the keel. See *Figure 2. G1000H System LRU Installation Reference* and *Figure 5. Keel Mounted LRUs*.

1.1.9 Caution and Warning System

The caution and warning system includes the following:

- Master caution annunciator/switch and warning annunciators located on the instrument panel (see *Figure 3. Instrument Panel Mounted LRUs and Caution/Warning System Annunciators*)
- Emergency bus and display backup annunciator/switches located on the alert panel (see *Circuit Breaker, Switch, and Alert Panel Figure 16. Circuit Breaker, Switch, and Alert Panel*)
- The Crew Alerting System (CAS); warning (red), caution (amber), and advisory (green) messages displayed on the Auxiliary Flight Display window on the PFD

Pressing down the MASTER CAUTION RESET annunciator/switch longer than four seconds initiates an annunciator test. The following annunciators and CAS alerts will illuminate and extinguish after a few seconds:

- FIRE, ROTOR, ENGINE OUT annunciators
- MASTER CAUTION, EMERG BUS, DISP BACKUP annunciators
- ENG CHIP, MAIN XMSN CHIP, and TAIL CHIP CAS alerts
- When CAS is activated, all amber level alerts will produce a single ping audio alert and activate the master caution annunciator output signal alert. The CAS alerts will flash until acknowledged by the MASTER CAUTION RESET annunciator/switch. After acknowledgment, all amber level alerts will remain steady on as long as the condition persists.

All green CAS level alerts will remain steady on as long as the condition persists.

When activated, the warning annunciators, ENGINE OUT, ROTOR RPM, and FIRE, will illuminate in steady state. Activated warning annunciators will not activate the MASTER CAUTION RESET annunciator/switch.

1.1.10 Data Logging

1.1.10.1 CMC Data Logging

When operational limits are exceeded, the data logging function of the Central Maintenance Computer (CMC) will record the specific limit or limits that were exceeded and the time the exceedance occurred. The logged data is accessed in the configuration pages and may be downloaded to an SD card. These exceedances are listed in Table 5.

1.1.10.2 Flight Data Logging

The flight data logging function of the G1000H on the 480B automatically stores flight and engine data to the top SD card on the MFD. This data is stored to the SD card up to the allowable size limit (currently 16 GB) every second.

Data is written to the SD card once each second while the MFD is powered on. All flight data logged on a specific date is stored in a file named in a format which includes the date, time, and nearest airport identifier. The file is created automatically each time the G1000H system is powered on, provided an SD card has been inserted.

The status of the Flight Data Logging feature can be viewed on the AUX-UTILITY page. If no SD card has been inserted, "NO CARD" is displayed. When data is being written to the SD card, "LOGGING DATA" is displayed.

The .csv file may be viewed with Microsoft Excel® or other spreadsheet applications.

The aircraft flight data and the aircraft specific engine data parameters that are to be recorded and stored are outlined in Table 6 and Table 7.

1.1.11 Vendor Publications

The following components listed in Table 1 are to be operated and maintained I/A/W the current vendor's instructions to ensure the continued airworthiness of the aircraft:

Table 1. G1000H System Vendor Manuals

COMPONENT	PUBLICATION	VENDOR
G1000H	G1000 System Installation Manual 190-00303-00, latest revision	Garmin International, Inc. 1200 E. 151st Street Olathe, KS 66062 Telephone: 913-397-8200
	G1000H Integrated Avionics System Standard Maintenance Manual, 190- 01739-00, latest revision	
	G1000/G1000H System Maintenance Manual, 190-00907-00, latest revision	
GDC 74H	GDC 74(X) Air Data Computer Installation Manual, 190-00303-15, latest revision	
GDU 1040H	GDU 104X Installation Manual, 190- 00303-01, latest revision	
GEA 71H	GEA 71H Installation Manual, 190- 00303-40, latest revision	
GIA 63H	GIA 63 Installation Manual, 190- 00303-05, latest revision	
GRS 77/GMU 44	GRS 77/GMU 44 Installation Manual, 190-00303-10, latest revision	
GTS 800	GTS 8XX/GPA 65 Installation Manual, 190-00587-00, latest revision	
GTX 33	GTX 33 Transponder Installation Manual, 190-00906-00, latest revision	
ST 32 Signal Conditioners	ST 32 Installation Manual, 305952- 00-IM, latest revision	SANDIA Aerospace 3700 Osuna Rd NE, Ste 711 Albuquerque, NM 87109
SAM MD302	Installation Manual And Operating Instructions, Model MD302 Series, Manual Number 9017782	Mid-Continent Instruments Co., Inc. 9400 East 34 th Street North Wichita, Kansas 67226 Tel: 316-630-0101, 800-821-1212 Fax: 316-630-0723 mci@mcico.com
KN 63 DME	Honeywell Installation Manual, Bendix King KN 63 Distance Measuring Equipment, Manual Number 006-00176-0004, Latest Revision	Support US and Canada: 1-855-250-7027 Support International 1-505-903-6148

1.1.12 G1000H Software Versions

Table 2. Software Versions

COMPONENT	IDENTIFICATION	SOFTWARE VERSION
GDC 74H	ADC	For P/N 4220650-1, See 28-AC-060; For P/N 4220650-3, See 28-AC-075
GDU 1040H	PFD, MFD	
GEA 71H	Engine I/O	
GIA 63H COM	Integrated Avionics Unit	
GIA 63H GPS	Integrated Avionics Unit	
GIA 63H Main	Integrated Avionics Unit	
GIA 63H NAV	Integrated Avionics Unit	
GMU 44	Magnetometer	
GRS 77H	AHRS	
GTP 59	Temperature Probe	
GTX 33 ES	Transponder	For P/N 4220650-1, See 28-AC-060; For P/N 4220650-3, See 28-AC-075
ST 32	Signal Conditioner	No Software
GDL 69AH	XM Weather	See 28-AC-062
GMA 350H	Audio Panel	See 28-AC-051
		See 28-AC-073 (Applicable to helicopters registered in countries that recognize approvals granted by EASA)
GTS 800	Traffic Alert	See 28-AC-061
MD302	Standby Attitude Module	See 28-AC-075
KN 63	DME	No Software

SECTION 2

AIRWORTHINESS LIMITATIONS

1.2 Airworthiness Limitations

The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under 14 CFR §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

SECTION 3

SERVICING, TROUBLESHOOTING, AND PERIODIC INSPECTIONS

1.3 Servicing, Troubleshooting and Periodic Inspection

1.3.1 Servicing

The G1000H system LRUs contain no user serviceable components or assemblies. Operations involving the removal of the G1000H LRUs must be done by authorized maintenance technicians.

Database updates may be performed by the operator as described in the vendor manuals.

1.3.2 Troubleshooting

For Garmin system LRUs, refer to Section 3 in the G1000H Integrated Avionics System Standard Maintenance and Manual, 190-01739-00. Refer also to the electrical wiring diagrams in Section 6 of this chapter.

1.3.3 Periodic Inspections

The following inspection checklist is intended as a guide for 100 hour/annual inspections for aircraft operating under normal conditions. More frequent inspections may be required should adverse operating conditions be encountered.

Date			
Signature			
Aircraft Registration Number			
Aircraft Serial Number			
G1000H Integrated Flight System			
INITIAL EACH ITEM AFTER ACCOMPLISHMENT			
Inspect the following items every 100 hours or annually			INITIAL
1. Inspect the G1000H LRU's, electrical cables, and mounts for security, damage, and obvious defects.			
2. Inspect the G1000H LRU's hardware for corrosion, damage or obvious defects.			
3. Inspect the antennas and mounts for security, damage, and obvious defects.			

SECTION 4

CONTROL AND OPERATING PROCEDURES

The G1000H Integrated Flight Deck system is controlled through interaction with the PFD and MFD. The G1000H system controls include knobs, keys, and joystick located on the PFD and MFD bezels. Basic interaction and functionality will be discussed in this section. Refer to the Enstrom 480/480B RFMS for detailed operating instructions of the G1000H system.

1.4 G1000H Controls

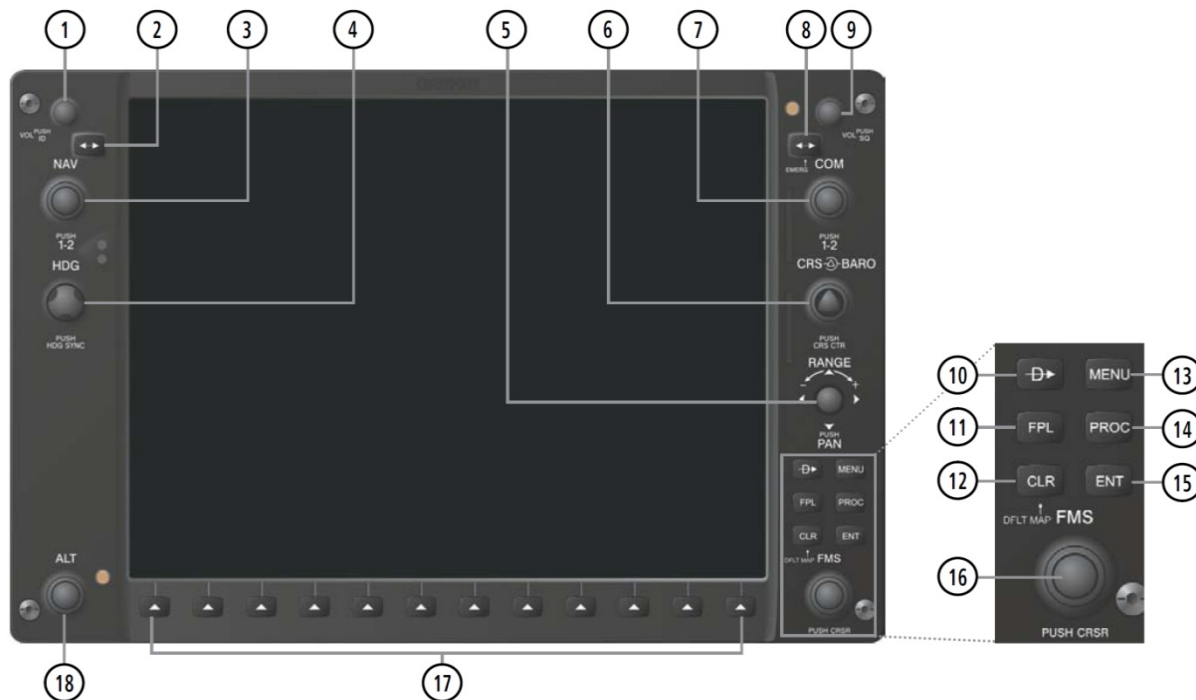


Figure 7. PFD and MFD controls

The following list provides an overview of the controls located on the PFD bezel (*Figure 7. PFD and MFD controls*).

<p>1. NAV VOL/ID Knob:</p>	<p>Turn to control NAV audio volume (shown in the NAV Frequency Box as a percentage). Press to toggle Morse code identifier audio ON/OFF</p>
<p>2. NAV Frequency Transfer Key</p>	<p>NAV Frequency Transfer Key</p>
<p>3. NAV Knob</p>	<p>Turn to tune NAV receiver standby frequencies (large knob for MHz; small for kHz). Press to toggle light blue tuning box between NAV1 and NAV2</p>

4. Heading Knob	Turn to manually select a heading. Press to display a digital heading momentarily to the left of the HSI and synchronize the Selected Heading to the current heading
5. Joystick	Turn to change map range. Press to activate Map Pointer for map panning.
6. CRS/BARO Knob	Turn large knob for altimeter barometric pressure setting. Turn small knob to adjust course (only when HSI is in VOR or OBS Mode). Press to re-center the CDI and return course pointer directly TO bearing of active waypoint/station.
7. COM Knob	Turn to tune COM transceiver standby frequencies (large knob for MHz; small for kHz). Press to toggle light blue tuning box between COM1 and COM2. The selected COM (green) is controlled with the COM MIC Key (Audio Panel).
8. COM Frequency Transfer Key (EMERG)	Transfer the standby and active COM frequencies. Press and hold two seconds to tune the emergency frequency (121.5 MHz) automatically into the active frequency field.
9. COM VOL/SQ Knob	Turn to control COM audio volume level (shown as a percentage in the COM Frequency Box). Press to turn the COM automatic squelch ON/OFF.
10. Direct-to Key	Activates the direct-to function and allows the user to enter a destination waypoint and establish a direct course to the selected destination (specified by identifier, chosen from the active route)
11. FPL Key	Displays flight plan information
12. CLR Key (DFLT MAP)	Erases information, cancels entries, or removes menus. Press and hold to display the MFD Navigation Map Page (MFD only).
13. MENU Key	Displays a context-sensitive list of options for accessing additional features or making setting changes.
14. PROC Key	Gives access to IFR departure procedures (DPs), arrival procedures (STARs), and approach procedures (IAPs) for a flight plan or selected airport.
15. ENT Key	Validates/confirms menu selection or data entry
16. FMS Knob (Flight Management System Knob)	<p>Press to turn the selection cursor ON/OFF.</p> <p>Data Entry: With cursor ON, turn to enter data in the highlighted field (large knob moves cursor location; small knob selects character for highlighted cursor location)</p> <p>Scrolling: When a list of information is too long for the window/box, a scroll bar appears, indicating more items to view. With cursor ON, turn large knob to scroll through the list.</p> <p>Page Selection: Turn knob on MFD to select the page to view (large knob selects a page group; small knob selects a specific page from the group)</p>

17. Softkey Selection Keys	Press to select softkey shown above the bezel key on the PFD/MFD display
18. ALT Knob	Sets the Selected Altitude, shown above the Altimeter (the large knob selects the thousands, the small knob selects the hundreds)

The **NAV**, **CRS/BARO**, **COM**, **FMS**, and **ALT** knobs are concentric dual knobs, each having small (inner) and large (outer) control portion. When a portion of the knob is not specified in the text, either may be used.

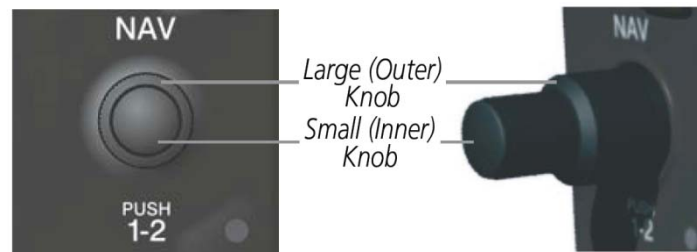


Figure 8. NAV, CRS/BARO, COM, FMS, and ALT knobs

1.4.1 Secure Digital Cards

The PFD and MFD data card slots use Secure Digital (SD) cards and are located on the top right portion of the display bezels. Each display bezel is equipped with two SD card slots. SD cards are used for aviation database and system software updates as well as terrain database storage. The cards contain all necessary files to load software and configuration settings to all G1000H LRUs. Not all SD cards are compatible with the G1000H. Only Sandisk cards are approved for use with the G1000H. Use only SD cards supplied by Enstrom. Basically, all software and configuration parameters are pre-determined by Garmin and/or the OEM. During removal and replacement of LRUs, software and configuration files may need to be reloaded.

It is very important that the technician use the correct card part number because each card part number defines all files found on the card for this specific G1000H installation except for certain configuration settings such as the aircraft registration number (N#) which must be entered manually.

Use care when using the card during maintenance. The G1000H is designed to immediately initialize the card upon power-up. On-screen prompts must be given careful attention in order to avoid potential loss of data. Always read and thoroughly understand all related information before attempting to use the card.

Install an SD card: Ensure that the G1000H system is powered off. Insert the SD card in the SD card slot with the label facing to the left, pushing the card in until the spring latch engages. The front of the card should remain flush with the face of the display bezel.

Remove an SD card: Ensure that the G1000H system is powered off. Gently press on the SD card to release the spring latch and eject the card.



Figure 9. Display Bezel SD Card Slots

1.4.2 Softkey Function

The softkeys are located along the bottom of the displays. The softkeys shown depend on the softkey level or page being displayed. The bezel keys below the softkeys can be used to select the appropriate softkey. When a softkey is selected, its color changes to black text on gray background and remains this way until it is turned off, at which time it reverts to white text on black background.



Figure 10. Softkeys

1.4.3 System Power Up

The G1000H system is integrated with the aircraft electrical system and receives power directly from electrical busses. The G1000H PFD, MFD and supporting sub-systems include both power-on and continuous built-in test features that exercise the processor, RAM, ROM, external inputs and outputs to provide safe operation.

During system initialization, test annunciations are displayed. All system annunciations should disappear typically within one minute of power-up at normal temperature, but may take as long as 10 minutes at cold temperatures. Upon power-up, key annunciator lights also become momentarily illuminated on the audio panels, the control units and the display bezels.

On the PFD, the AHRS begins to initialize and displays 'AHRS ALIGN: Keep Wings Level'. The AHRS should display valid attitude and heading fields typically within one minute of power-up. The AHRS can align itself both while taxiing and during level flight.

When the MFD powers up the MFD Power-up Page displays the following information:

- System version
- Copyright
- Land database name and version
- Safe Taxi database information
- Terrain database name and version
- Airport Terrain database name and version
- Obstacle database name and version
- Navigation database name, version, and effective dates
- Airport Directory name, version and effective dates
- FliteCharts/ChartView database information
- Pilot Profile selection

Current database information includes the valid operating dates, cycle number and database type. When this information has been reviewed for currency (to ensure that no databases have expired), the pilot is prompted to continue. Pressing the **ENT** Key acknowledges this information and displays the Auxiliary (AUX) Weight Planning Page.

1.4.4 System Status Page

The System Status Page displays the status and software version numbers for all detected system LRUs. Pertinent information on all system databases is also displayed. Active LRUs are indicated by green check marks and failed LRUs are indicated by red "X"s. Failed LRUs should be noted and an Enstrom service center dealer informed. The system status page can be accessed by entering configuration mode.

LRU INFO	STATUS	SERIAL NUMBER	VERSION
COH1	✓		7.00
COH2	✓		7.00
GCU	✓	27000006	2.02d
GDC1	✓	47801548	1.05
GDC2	✓	47801373	1.05
DDL69	✓	47750372	3.02.00
GEA1	✓	46701911	2.07
GEA2	✓	46701913	2.07
GIA1	✓	FFFFFFFFF	1.02
GIA2	✓	68500319	1.02
GMA1	✓	48400000	3.01
GMA2	✓	48400001	3.01
GMC	✓		2.02d
GHU1	✓	47500593	2.01
GHU2	✓	47500607	2.01
GPS1	✓	AB0062149	2.3

AIRFRAME	VALUE
AIRFRAME	
SYS SOFTWARE VERSION	1237.00
CONFIGURATION ID	76C4B894
CRG PART NUMBER	
SYSTEM ID	200000000
CHECKLIST	NOT AVAILABLE

MFD1 DATABASE	VALUE
TERRAIN - BOTTOM CARD	
REGION	WORLDWIDE-9
VERSION	2.04
CYCLE	08T2
Copyright 2008 Garmin Ltd. or its subsidiaries	
AIRPORT TERRAIN - BOTTOM CARD	
REGION	WORLDWIDE
VERSION	2.04
CYCLE	08A2
Copyright 2008 Garmin Ltd. or its subsidiaries	
OBSTACLE - BOTTOM CARD	
REGION	US/EUROPE
VERSION	2.08

Figure 11. Example System Status Page

1.4.5 G1000H Modes of Operation

1.4.5.1 Normal Mode

The G1000H normal system mode is automatically entered when power is applied to the system. Refer to the G1000H RFMS to operate the G1000H system in normal mode.

1.4.5.2 Reversionary Mode

Should a display communications/hardware failure occur, the G1000H system automatically enters reversionary mode. The system reversionary mode forces the remaining display into showing the PFD page. The reversionary mode can be manually activated by toggling the training mode switch.

1.4.5.3 Configuration Mode

The purpose of this section is to give the technician a general idea of the configuration mode of operation which can be used in troubleshooting and configuring the G1000H.

To enter configuration mode:

1. Press and hold the ENT key on the PFD while applying power. Release the ENT key after 'INITIALIZING SYSTEM' is displayed in the upper left corner of the PFD.
2. Repeat step 1 for the MFD. The System Status Page is displayed on the MFD and the PFD.

Once the G1000H is placed in configuration mode, the large and small FMS knob is used to cycle through the different configuration pages, to change page groups, and to change pages in a group. The FMS knob is also used to perform the following:

- To activate the cursor press the small FMS knob.
- To cycle the cursor through different data fields rotate the large FMS knob.
- To change the contents of a highlighted data field rotate the small FMS knob. This action displays an options menu for the particular field, or in some cases, allows the user to enter data for the field.
- To confirm a selection press the ENT key.

To cancel a selection, press the small FMS knob. Pressing the small FMS knob again turns the cursor off. The CLR key can also be used to cancel a selection or turn the cursor off.

1.4.5.4 Configuration Pages

Some configuration pages have commands or selections that are activated by display softkeys. If a softkey is associated with a command, that command will be displayed directly above the key. A grayed-out softkey shows a command that is unavailable. A softkey that is highlighted shows the current active selection.

Configuration pages are grouped according to function. The active page title is displayed at the top of the screen in the center. In the bottom right corner of the screen, the current configuration page group, number of pages available in the group, and placement of the current page within the group are indicated by icons.

NOTE: The GRS 77H AHRS and GMU 44 Magnetometer LRUs do not use configuration files. However, these LRUs do require several calibrations during installation and/or maintenance.

NOTE: Refer to paragraph 1.7 for diagrams depicting the default factory configurations pages and settings.

1.4.5.5 Configuration Files

The G1000H Loader Card contains the following configuration files:

- AIRFRAME – configures the G1000H for the specific aircraft.
- SYSTEM - configures the G1000H Ethernet to communicate with a PFD, MFD, and GIAs and other LRUs that support HSDB.
- MANIFEST - uploads a manifest of all software part numbers and versions associated with an approved system configuration.
- MFD1 - configures the MFD serial/discrete communications settings.
- PFD1/PFD2 - configures PFD serial/discrete communication system settings.
- GIA1/GIA2 - these files configure GIA1/GIA2 serial/discrete and other digital communication settings.
- GTX1/GTX2 - configures GTX transponder and serial communications settings.
- GEA1/GEA2 - configures GEA engine/airframe parameters.
- GDC1/GDC2 - configures GDC air data values for the aircraft.
- GDL69 - configures GDL 69AH data link and communications settings.
- CALIBRATION - configures the fuel and trim calibration data as well as other calibration data. This data is typically loaded only during initial production, or prior to recalibrating a specific aircraft system.
- AUDIO - configures all of the audio messages for the G1000H system including tones and voice messages.
- GTS – configures GTS 800 TAS.
- ALERT - configures the GIA for alert messages.

1.4.5.6 'Set' and 'Active' Commands

The SET and ACTIVE commands on various configuration pages are used for setting input/output conditions (Figure 12. 'Set' and 'Active' Commands).

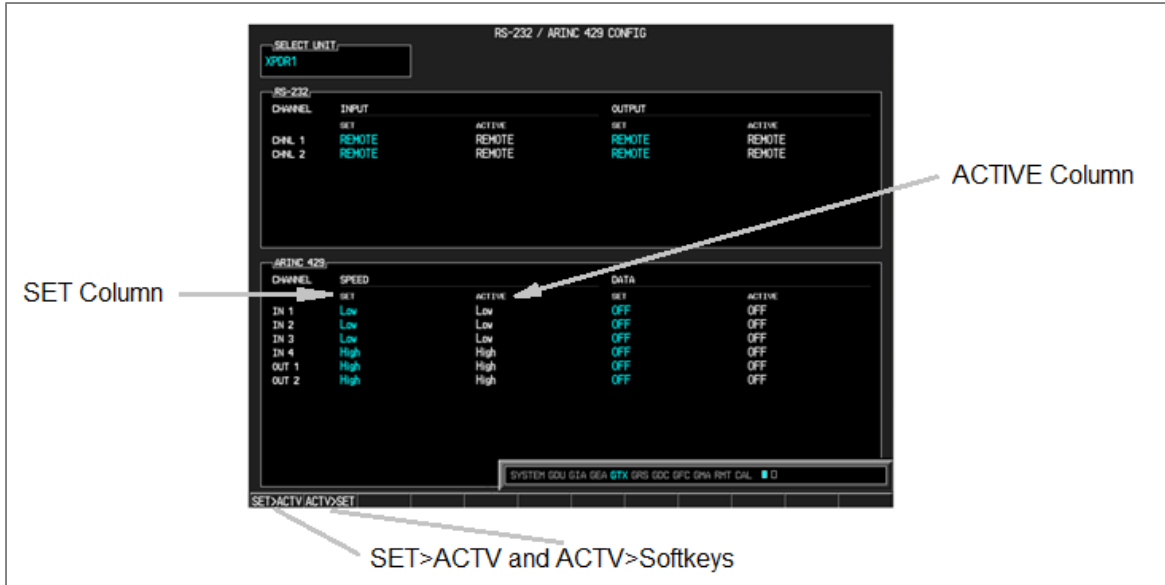


Figure 12. 'Set' and 'Active' Commands

When troubleshooting the system, the technician can look for inequalities (configuration mismatches) between the SET and ACTIVE columns. Certain problems can be resolved by pressing the SET>ACTV softkey which reloads settings to the specific LRU from the PFD (this can also be accomplished by reloading the configuration files for the LRU using the G1000H SW Loader Card).

Definitions:

SET—refers to a setting or group of settings that reside in the PFDs internal memory and/or master configuration module.

ACTIVE—refers to a current setting stored and used in a LRU. LRUs store the 'active' settings within internal memory.

Data can be manually copied from one column to the other by using the following two softkeys:

SET>ACTV (Set to Active)—allows the installer to send the information in the SET column (data stored in the master configuration module) to the ACTV column (data used by the LRU).

ACTV>SET (Active to Set)—causes the current settings of the LRU to be copied to the master configuration module as SET items.

1.4.5.7 Configuration Status

Whenever configuration settings are changed, the technician receives on-screen prompts and/or confirmation similar to those shown in Figure 13. Configuration Status Prompts.



Figure 13. Configuration Status Prompts

1.4.5.8 LRU Status

The system status page uses an indicator light system to show the online/offline status of LRUs. This can help in identifying a fault.

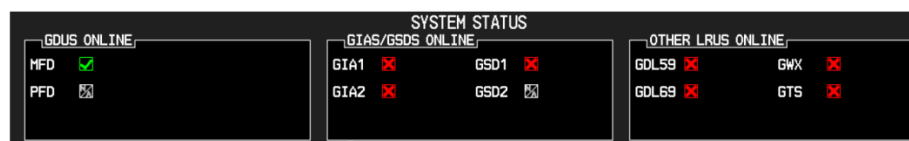


Figure 14. System status indications

1.4.5.9 Data Path Status Indications

In addition to LRU status, indicator lights and symbols show the status of LRU/Channel data paths. This can help in identifying a fault. These apply to GDU Software for v9.10 and greater.

Table 3. Data Path Status Indications

INDICATOR	MEANING
	The LRU is online and reports that the item located next to the indicator box is communicating.
	The LRU is online, and reports that the item located next to the indicator box is not communicating.
	The LRU is not reporting a status for the item located next to the indicator box. This may be because the data is not available, not applicable, or not expected.
	The LRU is not reporting status for the item located next to the indicator box. This may be due to the fact that the data is not available or is not expected.
	“True” condition; i.e., necessary conditions have met in order to activate the item.
	“False” condition; i.e., necessary conditions have not been met in order to activate the item.
	“High” condition; i.e., the system expects a high voltage or a high resistance input to trigger the item (fan operation, etc.)
	“Low” condition; i.e., the system expects a low voltage or a low resistance input to trigger the item (fan operation, etc.)

SECTION 5

SYSTEM MAINTENANCE

1.5 System Maintenance

Before removing an LRU, verify its software part number and version against the software listed in Section 1.1.12 **G1000H Software Versions**. To check a Garmin LRU software part number and/or version:

1. Start the G1000H system in configuration mode.
2. The System Status Page (Figure 15. Example System Status Page) shows a list of LRUs in the LRU window. Activate the cursor and use the FMS knob to scroll through the list in the window and select the displayed LRUs.



Figure 15. Example System Status Page

3. The software part number and version is displayed in the DATA window. Compare this to the software configuration in Section 1.1.12 **G1000H Software Versions**.
4. If a faulty LRU is not reporting its software version and part number, check aircraft maintenance logs for last software version loaded and verify against Section 1.1.12 **G1000H Software Versions**. The Software Manifest Page can also be used to check part numbers and versions.

Refer to Table 4. DC Power Distribution, when pulling circuit breakers for installation or removal of system components. Refer to Figure 16 for the main circuit breaker and switch panel layout. Refer to Figure 17 for the emergency circuit breaker panel.

NOTE

Removal or installation of equipment will change the aircraft empty weight and empty weight c.g. These changes will be recorded on Form F-511-5, Basic Weight and Balance Record, as required (reference Enstrom 480B Series Maintenance Manual).

Table 4. DC Power Distribution

Circuit Breaker Name	Circuit Breaker Rating	Circuit Breaker Location
MAIN GEN	10 Amps	Main C/B and Switch Panel
IGN EXCITE	2 Amps	
28 VDC BUS SWITCHES		
AVI MSTR	35 Amps	Main C/B and Switch Panel
STRB LTS	5 Amps	
NAV LTS	7½ Amps	
28 VDC AVIONICS BUS CIRCUIT BREAKERS		
COM 1	7½ Amps	Main C/B and Switch Panel
COM 2	7½ Amps	
XPNDR	2½ Amps	
28 VDC BATTERY BUS CIRCUIT BREAKERS		
TRIM	3 Amps	Main C/B and Switch Panel
N2 BP TRIM	2 Amps	
START RLY	5 Amps	
FIRE DETECT	2 Amps	
XMSN PUMP	1½ Amps	
FUEL QY	1 Amp	
DOME LT	½ Amp	
HR MTR	½ Amp	
PFD	5 Amps	
MFD	5 Amps	
IAU 1	3 Amps	
IAU 2	3 Amps	
EIS 1	3 Amps	
EIS 2	3 Amps	
ADC	1 Amp	
AHRS	½ Amp	
AVIONIC CF	1 Amp	
PFD FAN	½ Amp	
MFD FAN	½ Amp	
ENG WARNING	1½ Amps	
28 VDC BATTERY BUS CIRCUIT BREAKERS		
LDG LT	5 Amps	Main C/B and Switch Panel
LDG LT RLY	2 Amps	
PNL LTS	5 Amps	
28 VDC EMERGENCY BATTERY BUS		
PFD	5 Amps	Lower Console Side Panel
MFD	5 Amps	
IAU 1	3 Amps	
IAU 2	3 Amps	
ANN	1 Amp	
EIS 1	3 Amp	
EIS 2	3 Amp	
ADC	1 Amp	
AHRS	1 Amp	

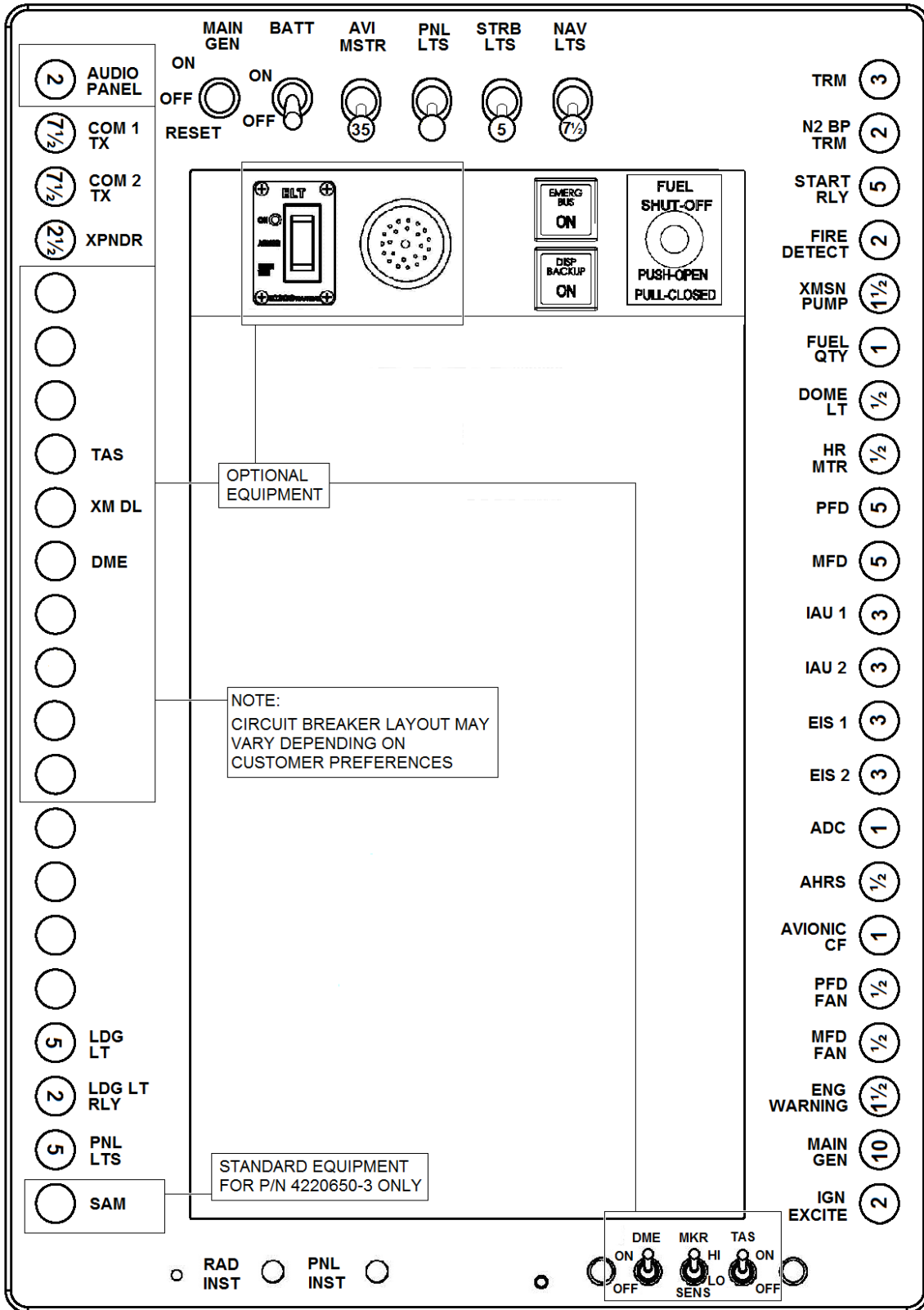


Figure 16. Circuit Breaker, Switch, and Alert Panel

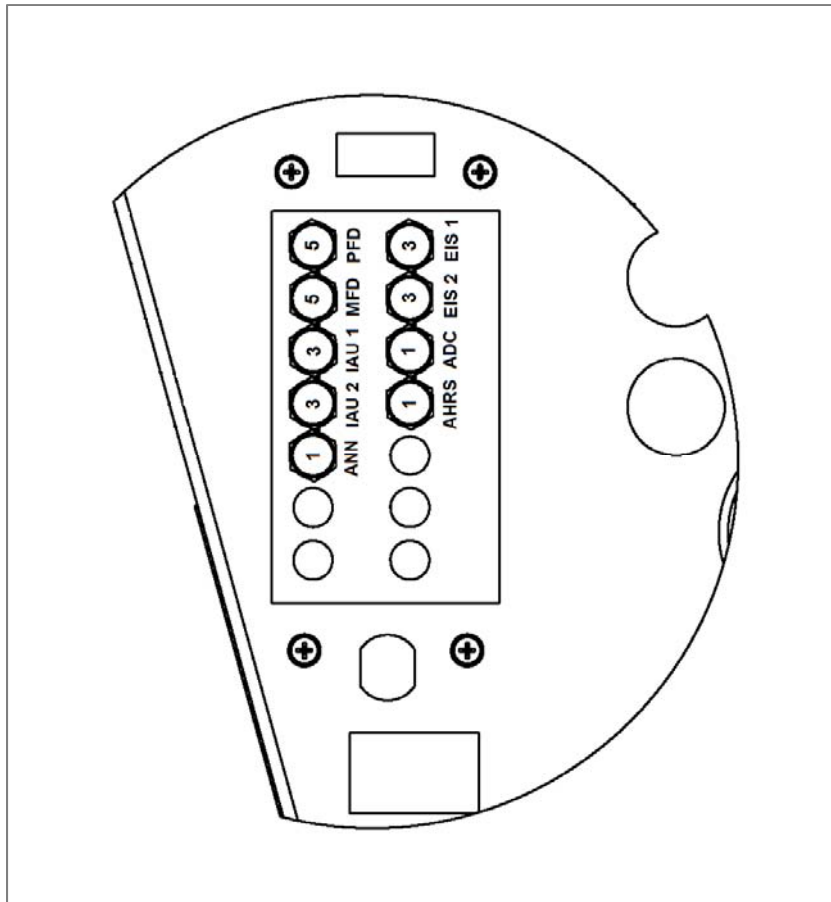


Figure 17. Emergency Circuit Breaker Panel

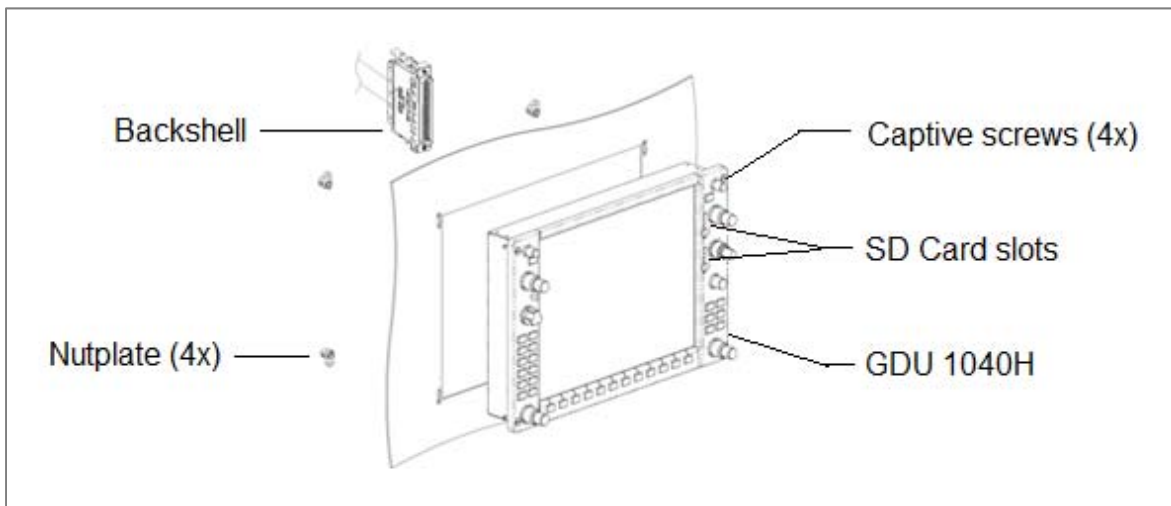


Figure 18. GDU 1040H Installation and Removal

1.5.1 GDU 1040H MFD/PFD (Figure 18)

1.5.1.1 Scheduled Maintenance

There is no scheduled maintenance for the GDU 1040H. Maintenance is “On Condition Only”.

1.5.1.2 Removal

- A. Remove power to the GDU 1040H. Pull the PFD and/or MFD circuit breakers out (emergency circuit breaker panel also). Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Remove each of the four captive screws from the front of the display using a 3/32” hex drive tool.
- C. Gently pull the display out of the panel. Hold unit tightly to prevent dropping it. The display is only about 2-3 inches thick.
- D. Remove the connector from the back of the unit by loosening the hardware on the backshell.
- E. Remove and save any SD cards to install in the replacement display.

1.5.1.3 Installation

- A. Inspect wire harness connector for damaged pins before installing the unit.
- B. Attach the backshell to the unit and tighten hardware.
- C. Hold the GDU flush with the instrument panel and ensure that the captive screws on the GDU align with the hardware on the instrument panel.
- D. Turn each of the four captive screws clockwise using a 3/32” hex drive tool (not exceeding 20 +/-2 in-lb).
- E. Remove the cable tie or other similar device from the PFD and/or MFD circuit breaker stem and push the stem in to set the circuit breaker.
- F. Perform the GDU testing procedure in accordance with Section 6 of the G1000H Integrated Avionics System Standard Maintenance Manual.

1.5.2 GDU 1040H MFD/PFD Cooling Fan (Figure 19, Figure 20)

1.5.2.1 Scheduled Maintenance

There is no scheduled maintenance for the cooling fan. Maintenance is “On Condition Only”.

1.5.2.2 Removal

- A. Remove power to the GDU 1040H cooling fan(s). Pull the PFD FAN and/or MFD FAN circuit breaker(s) out. Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Access the cooling fan by removing the instrument console shroud from the upper console. Remove the shroud attachment hardware shown in the figure below.
- C. Disconnect the electrical wiring.
- D. Remove the four attachment screws and washers and remove the fan.

1.5.2.3 Installation

- A. Install the cooling fan with the four attachment screws and washers.
- B. Connect the electrical wiring.
- C. Reinstall the instrument console shroud.
- D. Remove the cable tie or other similar device from the PFD FAN and/or MFD FAN circuit breaker stem and push the stem in to set the circuit breaker.

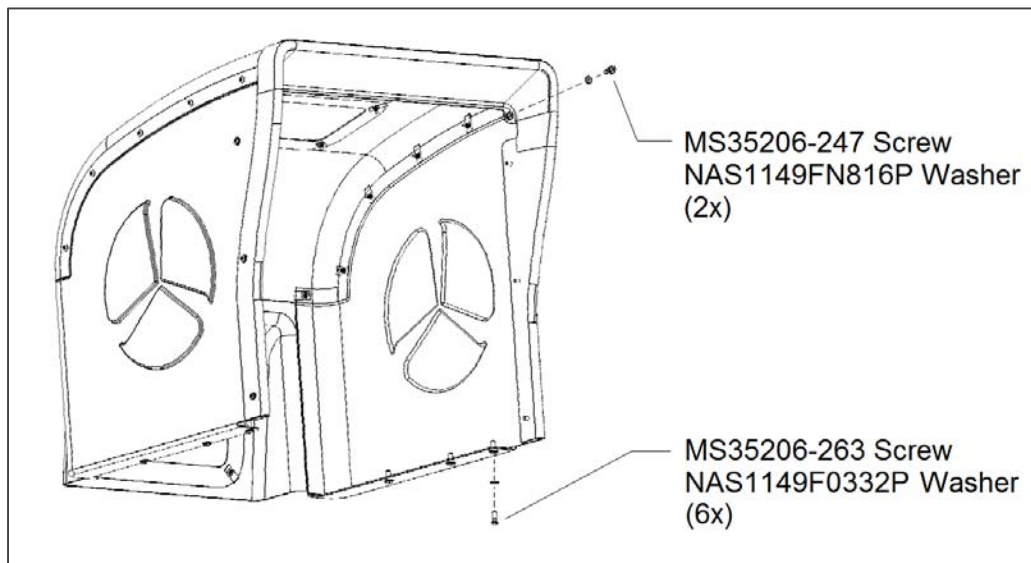


Figure 19. Shroud Installation

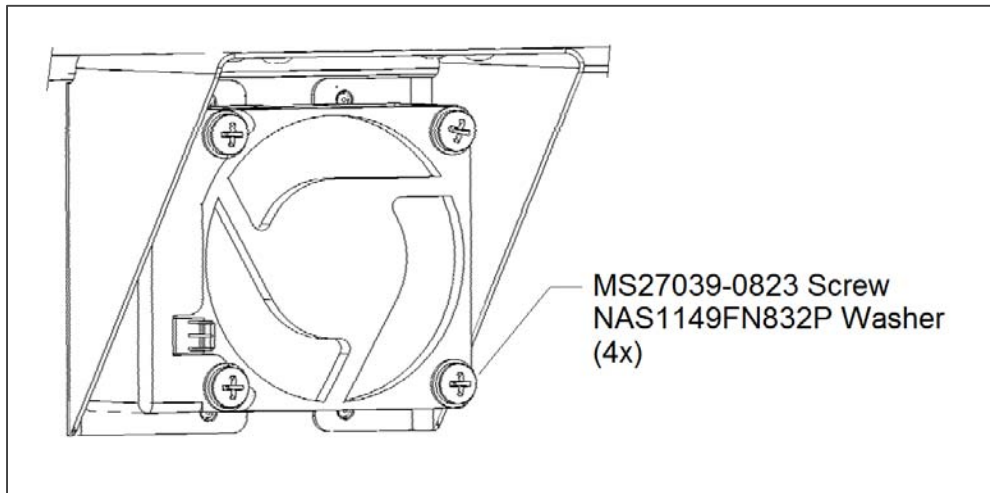


Figure 20. PFD/MFD Cooling Fan Installation

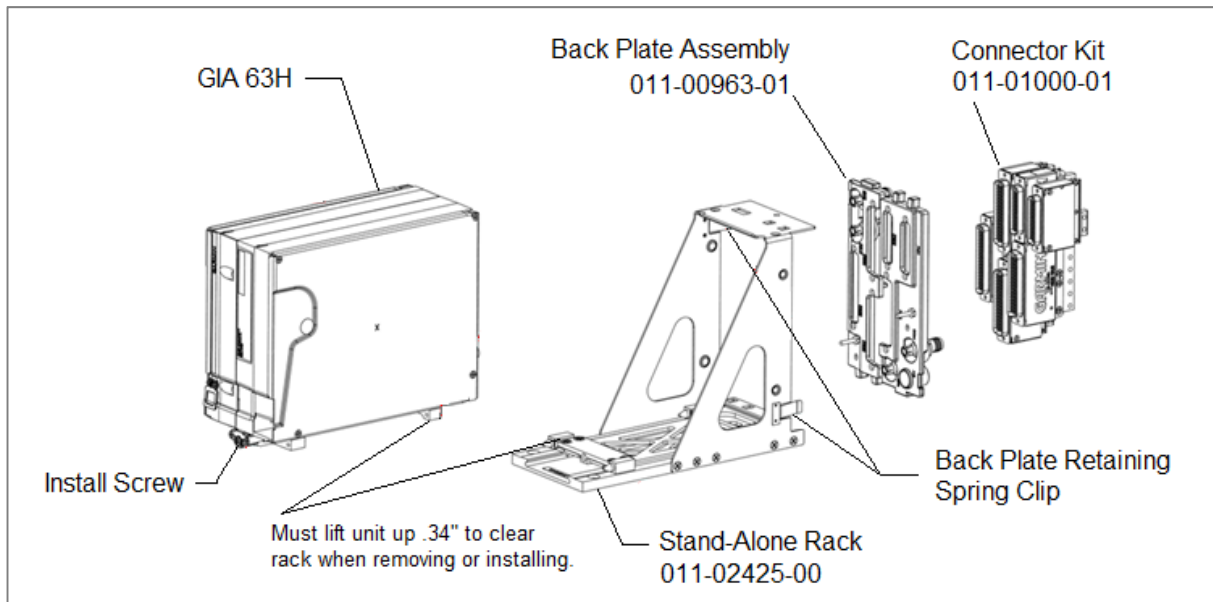


Figure 21. GIA 63H Installation and Removal

1.5.3 GIA 63H Integrated Avionics Unit (Figure 21)

1.5.3.1 Scheduled Maintenance

There is no scheduled maintenance for the GIA 63H. Maintenance is “On Condition Only”.

1.5.3.2 Removal

- A. Remove power to the GIA 63H. Pull the MFD, COM 1 TX, COM 2 TX, IAU 1, and IAU 2 circuit breakers out (MFD, IAU 1, and IAU 2 circuit breakers are also located on the emergency circuit breaker panel). Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. (GIA 63H #1) Access the GIA 63H #1 by removing the MFD (para. 1.5.1.2).
- C. (GIA 63H #2) Access the GIA 63H #2 by removing the copilot side keel access panel (TH-28/480 Series Maintenance Manual (MM), para. 8-14, B).
- D. Loosen the install screw.
- E. Pull the GIA 63H outward and up at least .34 inch to disengage and clear the retaining wedges for removal.
- F. Remove the unit from the rack.

1.5.3.3 Installation

- A. Inspect rack connectors for damaged pins before installing the unit.
- B. Locate the GIA 63H on the rack. Lift unit up .34 inch to clear rack mounting hardware and align with retaining wedges.
- C. Tighten installation screw to 15 +/- 2 in-lb.
- D. Reinstall the MFD (para. 1.5.1.3) or keel access panel (MM, para. 8-17, B), as applicable.
- E. Remove the cable tie or other similar device from the MFD, COM 1 TX, COM 2 TX, IAU 1, and IAU 2 circuit breaker stem and push the stem in to set the circuit breaker.
- F. Perform the GIA 63H testing procedure in accordance with Section 6 of the G1000H Integrated Avionics System Standard Maintenance Manual.

1.5.4 GRS 77H AHRS (Figure 22, Figure 23)

1.5.4.1 Scheduled Maintenance

The GRS 77H utilizes an earth magnetic field model which is updated once every five years. The update is expected to be available from Garmin by July 1 of each of the following years: 2010, 2015, and every five years thereafter, as long as the GRS 77 remains a Garmin supported product. Otherwise maintenance of the GRS 77 is on condition of failure only.

1.5.4.2 Removal

- A. Remove power to the GRS 77H. Pull the AHRS circuit breakers out (emergency circuit breaker panel also). Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Access the GRS 77H by removing the copilot side keel access panel (MM, para. 8-14, B). The GRS 77H is installed on the GRS 77H installation rack located in the mount bracket assembly (P/N 4118901-3).
- C. Remove the D-subminiature connector from the back of the GRS 77H.
- D. Support the mount bracket assembly and remove eight NAS1352-08-08P screws and eight NAS1149FN832P washers (4 per side) and remove the mount bracket assembly from the aircraft structure.
- E. Loosen four mounting screws holding the GRS 77H to the installation rack.

1.5.4.3 Installation

NOTE

If the mounting rack was removed, follow the instructions for GRS 77H Rack to Unit Flatness Check in the GRS 77/GMU 44 Installation Manual when installing the GRS 77H onto the Installation Rack.

- A. Tighten four mounting screws to secure the GRS 77H to the installation rack.
- B. Install the GRS 77H mount bracket assembly to the aircraft structure by installing eight NAS1352-08-08P screws and eight NAS1149FN832P washers (4 per side).
- C. Connect the D-subminiature connector to the back of the GRS 77H.
- D. Reinstall the keel access panel (MM, para. 8-17, B).
- E. Remove the cable tie or other similar device from the AHRS circuit breaker stem and push the stem in to set the circuit breaker.

- F. Perform the GRS 77H testing and calibration procedures in accordance with Section 6 of the G1000H Integrated Avionics System Standard Maintenance Manual.

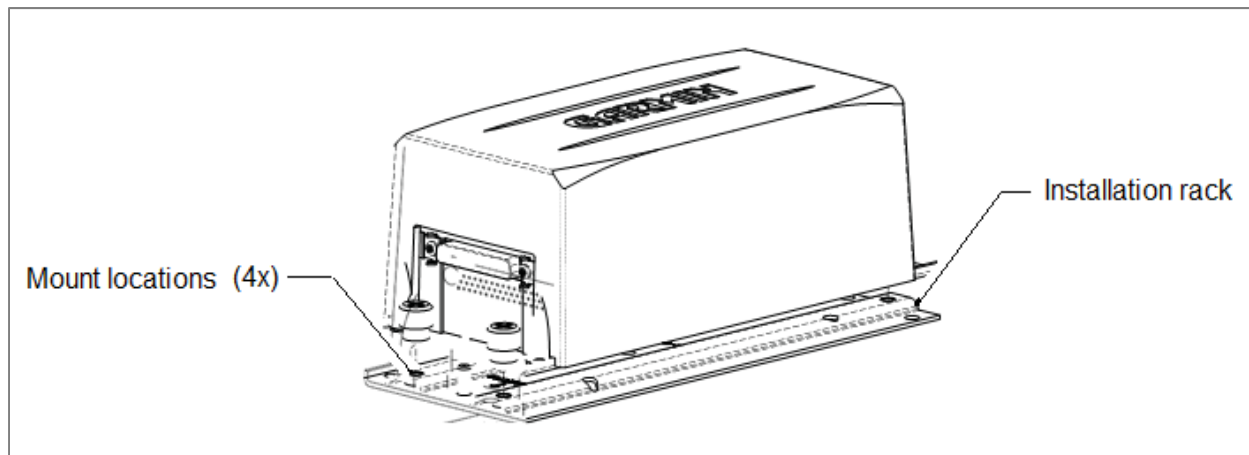


Figure 22. GRS 77H

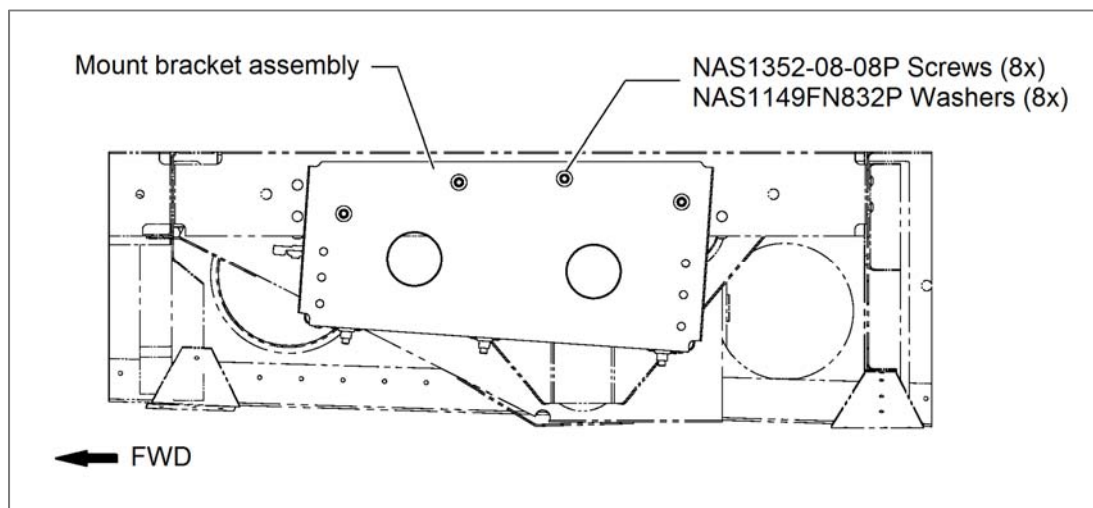


Figure 23. GRS 77H Installation

1.5.5 GMU 44 Magnetometer (Figure 24)

1.5.5.1 Scheduled Maintenance

There is no scheduled maintenance for the GMU 44. Maintenance is “On Condition Only”.

NOTE

Do not use a magnetic screwdriver or steel screws to mount the GMU44 or the cover plate.

1.5.5.2 Removal

- A. Remove power to the GRS 77H. Pull the AHRS circuit breakers out (emergency circuit breaker panel also). Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Firmly grasp the GMU 44 and loosen the three MS35214-26 screws and the three NAS1149B616H washers disconnecting the GMU 44 from the 115-00481-10 GMU 44 Mounting Rack.
- C. Disconnect cable and remove from the aircraft. Remove mounting rack and adapter plate if necessary.

1.5.5.3 Installation

- A. Inspect wire harness connector for damaged pins before installing the new unit.
- B. Connect the cable making sure it is properly secured.
- C. Fasten the GMU 44 to the GMU 44 mounting rack with three new MS35214-26 screws and NAS1149B616H washers.
- D. Remove the cable tie or other similar device from the AHRS circuit breaker stem and push the stem in to set the circuit breaker.
- E. Perform the GMU 44 calibration procedure in accordance with Section 6 of the G1000H Integrated Avionics System Standard Maintenance Manual.

NOTE

If original screws must be re-used, coat screws with Loctite 242 (blue) thread locking compound.

CAUTION

Mounting screws must be brass.

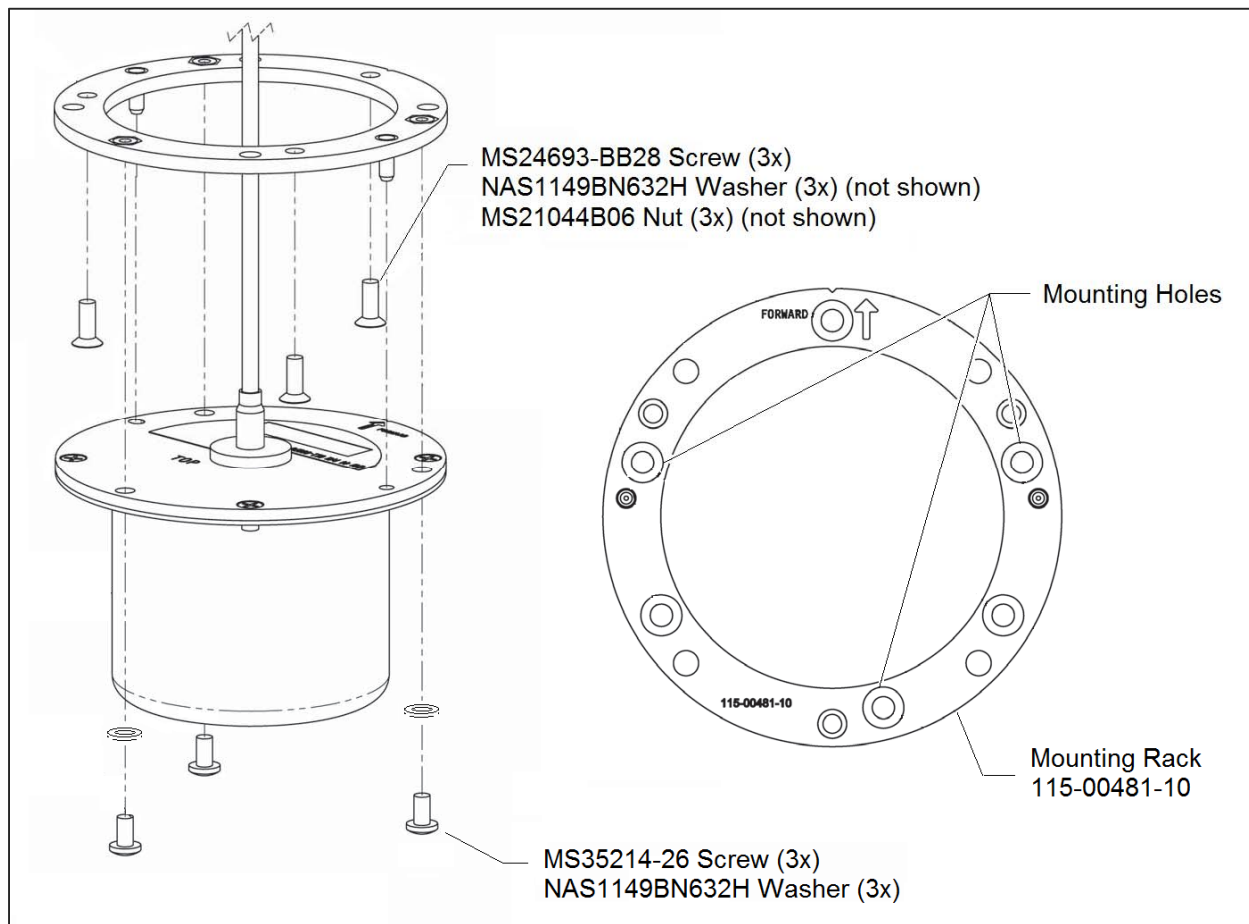


Figure 24. GMU 44 Installation and Removal

1.5.6 GDC 74H Air Data Computer (Figure 25)

1.5.6.1 Scheduled Maintenance

The GDC 74H is subject to conditional maintenance with the exceptions described in Section 7 of the G1000H Integrated Avionics System Standard Maintenance Manual.

1.5.6.2 Removal

- A. Remove power to the GDC 74H. Pull the ADC circuit breakers out (emergency circuit breaker panel also). Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Access the GDC 74H by removing the PFD (para. 1.5.1.2).
- C. Hold the LRU firmly in hand and remove 4x MS24693-274 screws and 4x NAS1149FN832P washers from the unit.
- D. Loosen the jackscrews holding the backshell to the LRU. Remove the connector from the back of the unit.

CAUTION

Use care to avoid getting fluids or particles anywhere within the pitot and static lines connected to the GDC 74H.

- D. Disconnect the pitot-static plumbing from the unit. Remove Teflon tape or sealing compound. Cap the openings on the GDC 74H if it is to be reinstalled.

1.5.6.3 Installation

- A. Inspect connector(s) and pitot-static plumbing for damage.
- B. Connect the pitot-static plumbing to the unit. Seal the connections, as required.
- C. Connect the backshell and connector to the unit and fasten jackscrews.
- D. Fasten the unit to the tray with 4x MS24693-274 screws and 4x NAS1149FN832P washers.
- E. Reinstall the PFD (para. 1.5.1.3).
- F. Remove the cable tie or other similar device from the ADC circuit breaker stem and push the stem in to set the circuit breaker.
- G. Perform the GDC 74H testing (and field calibration, if required) procedure in accordance with Section 6 of the G1000H Integrated Avionics System Standard Maintenance Manual.

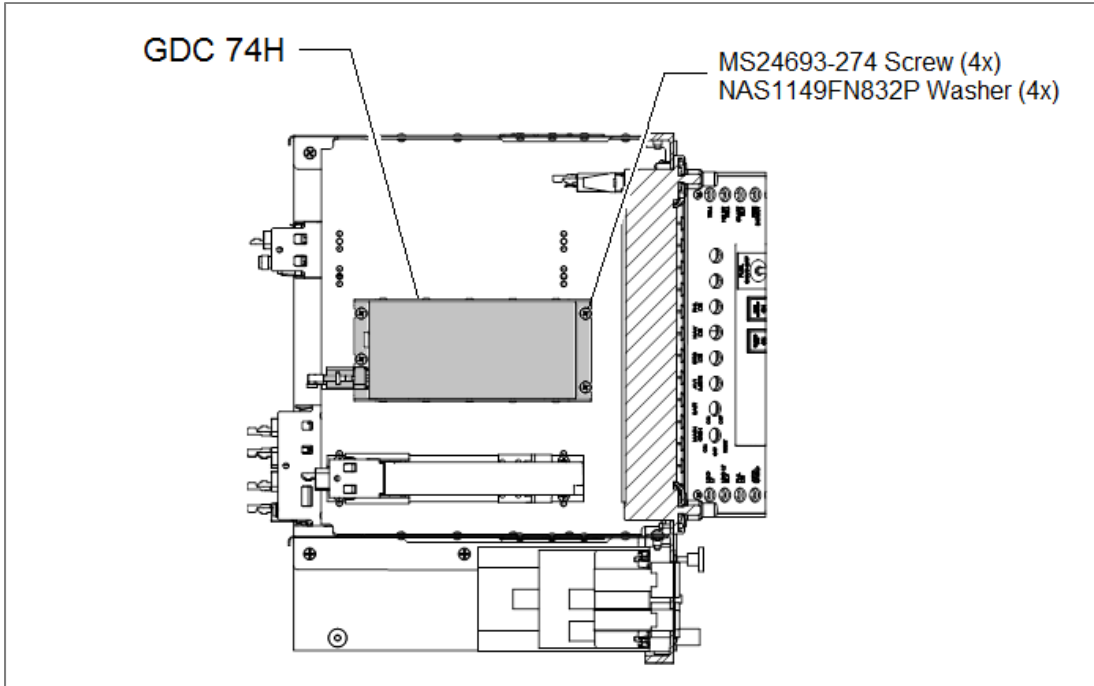


Figure 25. GDC 74H Installation and Removal

1.5.7 GEA 71H Engine and Airframe (Figure 26)

1.5.7.1 Scheduled Maintenance

There is no scheduled maintenance for the GEA 71H. Maintenance is “On Condition Only”.

1.5.7.2 Removal

- A. Remove power to the GEA 71H. Pull the PFD, EIS 1, and EIS 2 circuit breakers out (PFD, EIS 1, and EIS 2 circuit breakers are also located on the emergency circuit breaker panel). Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. (GEA 71H #1) Access the GEA 71H #1 by removing the PFD (para. 1.5.1.2).
- C. (GEA 71H #2) Access the GEA 71H #2 by removing the pilot side keel access panel (MM para. 8-14, B).
- D. Loosen the install screw.
- E. Pull the GEA outward and up at least .34 inch to disengage and clear the retaining wedges for removal.
- F. Remove the unit from the rack.

1.5.7.3 Installation

- A. Inspect the rack connectors for damaged pins before installing the unit.
- B. Locate the unit on the rack. Lift unit up .34 inch to clear the rack mounting hardware and align with retaining wedges.
- C. Tighten the installation screw to 15 +/- 2 in-lb.
- D. Reinstall the PFD (para. 1.5.1.3) or keel access panel (MM para. 8-17, B), as applicable.
- E. Remove the cable tie or other similar device from the PFD, EIS 1, and EIS 2 circuit breaker stem and push the stem in to set the circuit breaker.
- F. Perform the GEA 71 testing and calibration procedures in accordance with Section 6 of the G1000H Integrated Avionics System Standard Maintenance Manual.

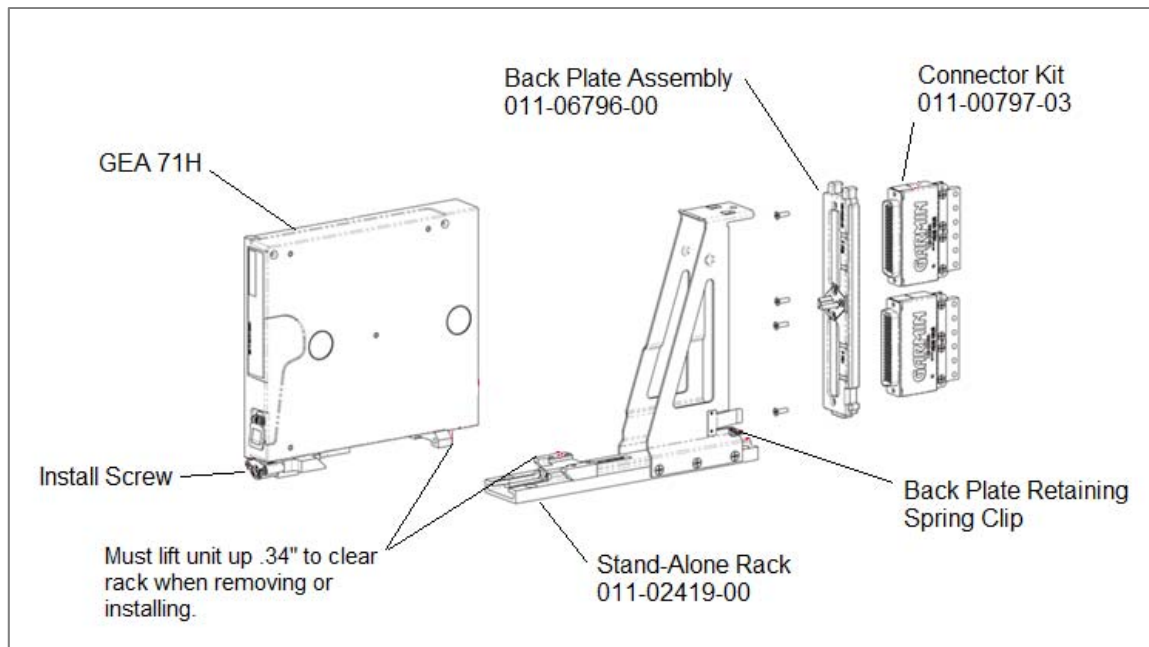


Figure 26. GEA 71H Installation and Removal

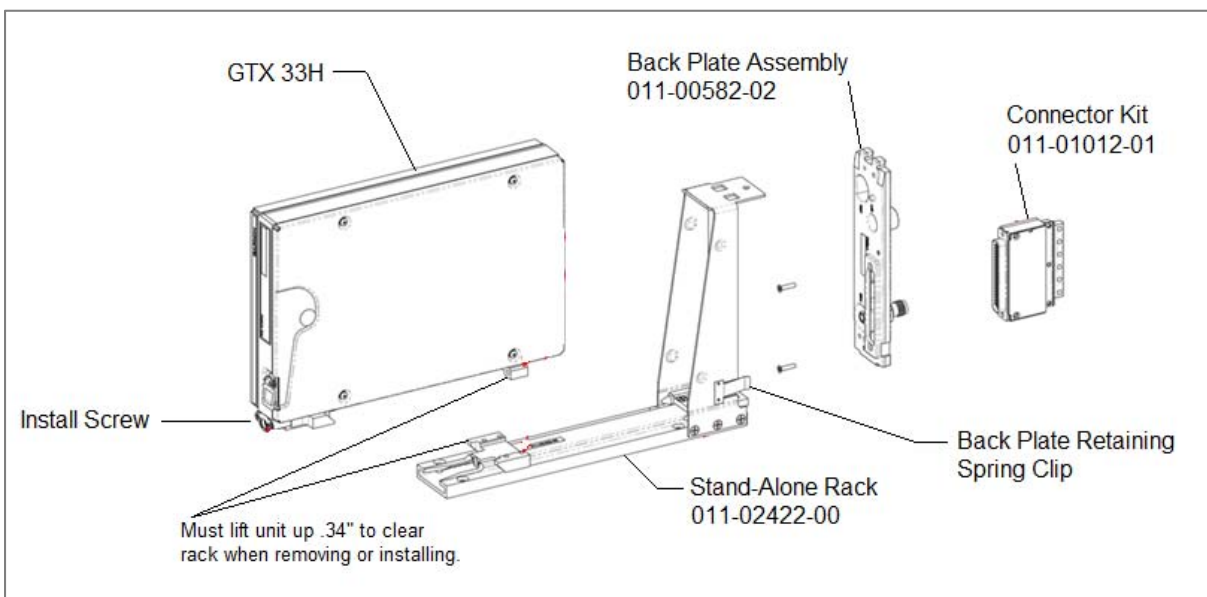


Figure 27. GTX 33H Installations and Removal

1.5.8 GTX 33H Transponder (Figure 27)

1.5.8.1 Scheduled Maintenance

The GTX 33H is subject to conditional maintenance with the exception described in Section 7 of the G1000H Integrated Avionics System Standard Maintenance Manual.

1.5.8.2 Removal

- A. Remove power to the GTX 33H. Pull the MFD and XPNDR circuit breakers out (MFD circuit breaker is also located on the emergency circuit breaker panel). Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Access the GTX 33 by removing the MFD (para. 1.5.1.2).
- C. Loosen the install screw.
- D. Pull the GTX 33 outward and up to at least .34 inch to clear the rack mounting hardware and align with retaining wedges.
- E. Remove the unit from the rack.

1.5.8.3 Installation

- A. Inspect rack connectors for damaged pins before installing the unit.
- B. Locate unit on the rack. Lift unit up .34 inch to clear the rack mounting hardware and align with retaining wedges.
- C. Tighten the installation screw to 15 +/- 2 in-lb.
- D. Reinstall the MFD (para. 1.5.1.3).
- E. Remove the cable tie or other similar device from the MFD and XPNDR circuit breaker stem and push the stem in to set the circuit breaker.
- F. Perform the GTX 33 testing procedure in accordance with Section 6 of the G1000H Integrated Avionics System Standard Maintenance Manual.

1.5.9 ST 32 Signal Conditioner (Figure 28)

1.5.9.1 Scheduled Maintenance

There is no scheduled maintenance required for the ST 32 Signal Conditioners. Maintenance is "On Condition Only".

1.5.9.2 Removal

- A. Remove power to the GEA 71H. Pull the EIS 1 and EIS 2 circuit breakers out (EIS 1 and EIS 2 circuit breakers are also located on the emergency circuit breaker panel). Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Access the ST 32 signal conditioners by removing the pilot side and copilot side keel access panel (MM para. 8-14, B).
- C. Remove connectors from both units.
- D. Carefully remove MS27039-0807 screws and NAS1149FN832P washers (4x).
- E. Remove the Signal Conditioner from the 4118899 Bracket Assembly.

1.5.9.3 Installation

- A. Place the Signal Conditioner on the 4118899 Bracket Assembly.
- B. Install MS27039-0807 screws and NAS1149FN832P washers (4x).
- C. Inspect connectors for damaged pins before connecting to the unit.
- D. Install the pilot side keel access panel (MM para. 8-17, B).
- E. Remove the cable tie or other similar device from the EIS 1 and EIS 2 circuit breaker stem and push the stem in to set the circuit breaker.

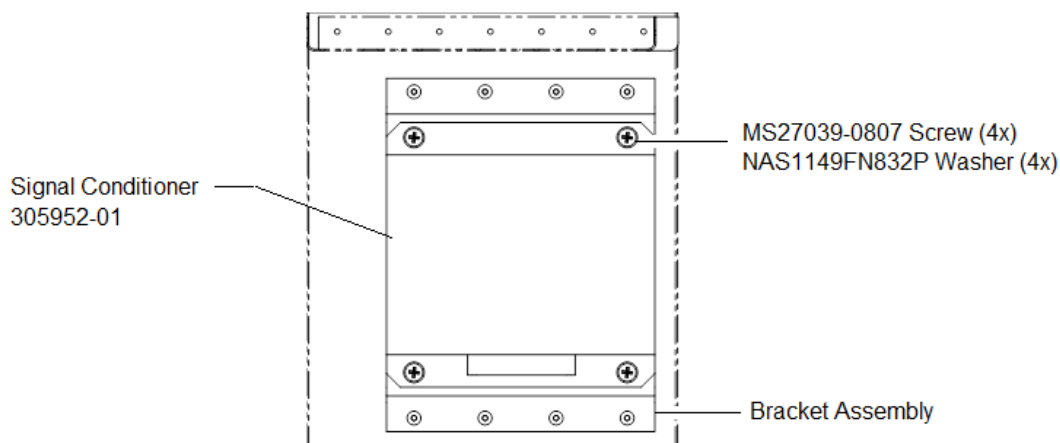


Figure 28. Signal Conditioner Installation and Removal

1.5.10 Avionics Cooling Fan

1.5.10.1 Scheduled Maintenance

There is no scheduled maintenance required for the avionics cooling fan. Maintenance is "On Condition Only".

1.5.10.2 Removal

- A. Remove power to the avionics cooling fan. Pull the AVIONIC CF circuit breaker out. Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Access the avionics cooling fan by removing the pilot side keel access panel (MM para. 8-14, B).
- C. Remove the hose clamps from the existing ducting. Do not remove the hose clamps that secure the blower port caps.
- D. Carefully remove MS35206-227 screws and NAS620-6L washers (6x).
- E. Remove the avionics cooling fan from the fan bracket assembly.

1.5.10.3 Installation

- A. Install the avionics cooling fan to the fan bracket assembly with MS35206-227 screws and NAS620-6L washers (6x).
- B. Attach ducting and tighten the hose clamps.
- C. Remove the cable tie or other similar device from the AVIONIC CF circuit breaker stem and push the stem in to set the circuit breaker.

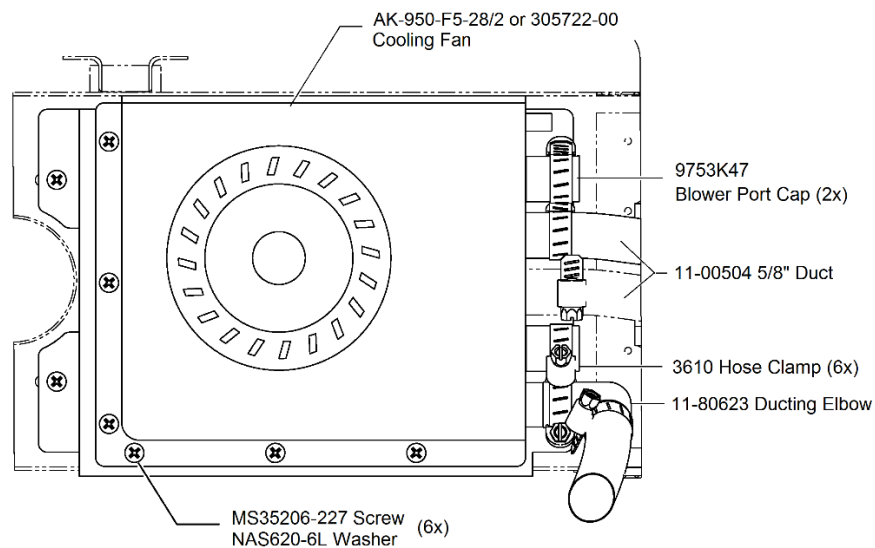


Figure 29. Avionics Cooling Fan Installation

1.5.11 Crew Alerting System

1.5.11.1 Functional Test

- A. Rotor RPM and Engine Out Annunciators; Engine, Main and Tail Rotor Transmission Chip Detector CAS Alerts; Engine Oil Pressure and DC Generator CAS Alerts
- (1) Verify all circuit breakers are closed (push in).
 - (2) Apply external power to the aircraft and turn the BATT switch on. Wait for the system to fully initialize.
 - (3) Verify **ROTOR RPM** and **ENGINE OUT** annunciators are steady on.
 - (4) Pull FIRE DETECT (CB29) circuit breaker.
 - (5) Press and hold the **MASTER CAUTION** annunciator/switch for greater than four seconds.
 - (6) Verify that the **FIRE** annunciator does not illuminate. Verify that the **MASTER CAUTION, EMERG BUS, DISP BACKUP** annunciators illuminate and then extinguish after a few seconds.
 - (7) Verify that the **ENG CHIP, MAIN XMSN CHIP, and TAIL CHIP** CAS alerts are flashing.
 - (8) Verify an audible ping is heard in the crew headset.
 - (9) Push in FIRE DETECT (CB29) circuit breaker.
 - (10) Press and hold the **MASTER CAUTION** annunciator/switch for greater than four seconds.
 - (11) Verify that the **ENG CHIP, MAIN XMSN CHIP, and TAIL CHIP** CAS alerts are flashing and the **FIRE** annunciator is steady on.
 - (12) Verify an audible ping is heard in the crew headset.
 - (13) Pull the collective up greater than 4°.
 - (14) Verify the ROTOR RPM and ENGINE OUT audio horns are operating.
 - (15) Verify the ROTOR RPM and ENGINE OUT audio alerts are heard in the crew headset.
 - (16) Verify that the **ENG OIL PRESS** and **DC GENERATOR** CAS alerts and **MASTER CAUTION** annunciator are flashing.

- (17) Verify an audible ping is heard in the crew headset.
 - (18) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
 - (19) Verify the **MASTER CAUTION** annunciator is extinguished and **ENG OIL PRESS** and **DC GENERATOR** CAS alerts are steady on.
 - (20) Pull the **ENG WARNING** (CB173) circuit breaker.
 - (21) Verify the **ROTOR RPM** and **ENGINE OUT** audio horns are extinguished.
 - (22) Verify the **ROTOR RPM** and **ENGINE OUT** annunciators are extinguished.
 - (23) Pull the **HR MTR** (CB 121) circuit breaker.
 - (24) Connect a pressure source to the engine oil press transducer and apply pressure.
 - (25) Verify that the **ENG OIL PRESS** CAS alert extinguishes at 51 psi.
 - (26) Verify that the **ENG OIL PRESS** CAS alert is flashing at 131 psi.
 - (27) Reduce the pressure to zero and disconnect the pressure source.
 - (28) Push the collective down.
 - (29) Push in **ENG WARNING** (CB173) circuit breaker.
 - (30) Verify that the **DC GENERATOR** and **ENG OIL PRESS** CAS alerts are extinguished and the **ROTOR RPM** and **ENGINE OUT** annunciators are steady on.
 - (31) Push in the **HR MTR** (CB 121) circuit breaker.
- B. Engine Oil Temperature CAS Alert
- (1) Remove the engine oil temperature probe and heat probe to 225°F/107°C.
 - (2) Verify that the **ENG OIL TEMP** CAS alert and the **MASTER CAUTION** annunciator is flashing.
 - (3) Verify an audible ping is heard in the crew headset.
 - (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
 - (5) Verify the **MASTER CAUTION** annunciator is extinguished and **ENG OIL TEMP** CAS alert is steady on.

- (6) Cool the engine oil temperature probe to 212°F/100°C
- (7) Verify the **ENG OIL TEMP** CAS alert is extinguished.
- (8) Reinstall the engine oil temperature probe.

C. Main Rotor Transmission Oil Temperature CAS Alert

- (1) Remove the transmission oil temperature probe and heat probe to 225°F/107°C.
- (2) Verify that the **MAIN XMSN HOT** CAS alert and the **MASTER CAUTION** annunciator is flashing.
- (3) Verify an audible ping is heard in the crew headset.
- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
- (5) Verify the **MASTER CAUTION** annunciator is extinguished and **MAIN XMSN HOT** CAS alert is steady on.
- (6) Cool the engine oil temperature probe to 212°F/100°C
- (7) Verify the **MAIN XMSN HOT** CAS alert is extinguished.
- (8) Reinstall the transmission oil temperature probe.

D. Main Rotor Transmission Pressure CAS Alert

- (1) Pull XMSN PUMP (CB71) circuit breaker.
- (2) Verify that the **MAIN XMSN PRESS** CAS alert and the **MASTER CAUTION** annunciator is flashing.
- (3) Verify an audible ping is heard in the crew headset.
- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/switch.
- (5) Verify the **MASTER CAUTION** annunciator is extinguished and **MAIN XMSN PRESS** CAS alert is steady on.
- (6) Push in CB71 (XMSN PUMP) circuit breaker.
- (7) Verify the **MAIN XMSN PRESS** CAS alert is extinguished.

E. Low Fuel CAS Alert

- (1) Remove connector J134 and jumper pins 1 and 2 together.
- (2) Verify that the **FUEL LOW** CAS alert and the **MASTER CAUTION** annunciator is flashing.
- (3) Verify an audible ping is heard in the crew headset.
- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
- (5) Verify the **MASTER CAUTION** annunciator is extinguished and the **FUEL LOW** CAS alert is steady on.
- (6) Remove jumper wire and reconnect J134 connector.
- (7) Verify the **FUEL LOW** CAS alert is extinguished.

F. Forward and Aft Drive Bearing CAS Alert

- (1) Remove forward and aft lower pulley bearing thermocouple probes and heat probes to 248°F/120°C.
- (2) Verify that the **FWD DR BRG HOT** and **AFT DR BRG HOT** CAS alerts and the **MASTER CAUTION** annunciator is flashing.
- (3) Verify an audible ping is heard in the crew headset.
- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
- (5) Verify the **MASTER CAUTION** annunciator is extinguished and the **FWD DR BRG HOT** and **AFT DR BRG HOT** CAS alerts are steady on.
- (6) Cool the forward and aft lower pulley bearing thermocouple probes to 212°F/100°C.
- (7) Verify the **FWD DR BRG HOT** and **AFT DR BRG HOT** CAS alerts are extinguished.
- (8) Reinstall the forward and aft lower pulley bearing thermocouple probes.

G. Engine Inlet Air CAS Alert

- (1) Remove connector J69 and jumper pins A and B together.
- (2) Verify that the **ENG INLET AIR** CAS alert and the **MASTER CAUTION** annunciator is flashing.
- (3) Verify an audible ping is heard in the crew headset.

- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
 - (5) Verify the **MASTER CAUTION** annunciator is extinguished and **ENG INLET AIR CAS** alert is steady on.
 - (6) Remove jumper and reconnect J69 connector.
 - (7) Verify the **ENG INLET AIR CAS** alert is extinguished.
- H. Fuel Filter CAS Alert
- (1) Remove connector J68 and jumper pins A and B together.
 - (2) Verify that the **FUEL FILTER CAS** alert and the **MASTER CAUTION** annunciator is flashing.
 - (3) Verify an audible ping is heard in the crew headset.
 - (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
 - (5) Verify the **MASTER CAUTION** annunciator is extinguished and **FUEL FILTER CAS** alert is steady on.
 - (6) Remove jumper and reconnect J68 connector.
 - (7) Verify the **FUEL FILTER CAS** alert is extinguished.
- I. Air Frame Fuel Filter CAS Alert (Optional Equipment)
- (1) Press and hold the test button on the external fuel filter assembly.
 - (2) Verify that the **A/F FUEL FILTER CAS** alert and the **MASTER CAUTION** annunciator is flashing.
 - (3) Verify an audible ping is heard in the crew headset.
 - (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
 - (5) Verify the **MASTER CAUTION** annunciator is extinguished and **A/F FUEL FILTER CAS** alert is steady on.
 - (6) Release the test button on the external fuel filter assembly.
 - (7) Verify the **A/F FUEL FILTER CAS** alert is extinguished.
- J. N1, N2, NR, TOT Miscompare CAS Alerts
- (1) Pull EIS 2 (CB151) circuit breaker.

- (2) Verify that the **N1 MISCOMPARE**, **N2 MISCOMPARE**, **NR MISCOMPARE**, and **TOT MISCOMPARE** CAS alerts and the **MASTER CAUTION** annunciator are flashing.
- (3) Verify an audible ping is heard in the crew headset.
- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
- (5) Verify the **MASTER CAUTION** annunciator is extinguished and **N1 MISCOMPARE**, **N2 MISCOMPARE**, **NR MISCOMPARE**, and **TOT MISCOMPARE** CAS alerts are steady on.
- (6) Push in EIS 2 (CB151) circuit breaker.
- (7) Verify the **N1 MISCOMPARE**, **N2 MISCOMPARE**, **NR MISCOMPARE**, and **TOT MISCOMPARE** CAS alerts are extinguished.

K. TOT Exceedance CAS Alert

- (1) Drive TOT indication to 1,702 °F/928 °C using the TOT Calibration Check (reference the TH-28/480 Series Maintenance Manual, paragraph 7-45).
- (2) Verify that the **TOT EXCEEDANCE** CAS alert and the **MASTER CAUTION** annunciator is flashing.
- (3) Verify an audible ping is heard in the crew headset.
- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
- (5) Verify the **MASTER CAUTION** annunciator is extinguished and **TOT EXCEEDANCE** CAS alert is steady on.
- (6) Drive TOT indication down to ambient using the TOT Calibration Check procedure.
- (7) Export and clear the TOT Exceedance per Section 1.5.12.2.

L. PFD Cooling Fan CAS Alert

- (1) Pull PFD FAN (CB155) circuit breaker.
- (2) Verify that the **PFD FAN** CAS alert and the **MASTER CAUTION** annunciator is flashing.
- (3) Verify an audible ping is heard in the crew headset.
- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.

- (5) Verify the **MASTER CAUTION** annunciator is extinguished and **PFD FAN CAS** alert is steady on.
- (6) Push in PFD FAN (CB155) circuit breaker.
- (7) Verify the **PFD FAN CAS** alert is extinguished.

M. MFD Cooling Fan CAS Alert

- (1) Pull MFD FAN (CB156) circuit breaker.
- (2) Verify that the **MFD FAN CAS** alert and the **MASTER CAUTION** annunciator is flashing.
- (3) Verify an audible ping is heard in the crew headset.
- (4) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
- (5) Verify the **MASTER CAUTION** annunciator is extinguished and **MFD FAN CAS** alert is steady on.
- (6) Push in MFD FAN (CB156) circuit breaker.
- (7) Verify the **MFD FAN CAS** alert is extinguished.

N. Avionics Cooling Fan CAS Alert

- (1) Pull IAU 2 (CB149) circuit breaker.
- (2) Pull AVIONIC CF (CB154) circuit breaker.
- (3) Verify that the **AVI FAN FAIL CAS** alert and the **MASTER CAUTION** annunciator is flashing.
- (4) Verify an audible ping is heard in the crew headset.
- (5) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
- (6) Verify the **MASTER CAUTION** annunciator is extinguished and **AVI FAN FAIL CAS** alert is steady on.
- (7) Push in AVIONIC CF (CB154) circuit breaker.
- (8) Verify the **AVI FAN FAIL CAS** alert is extinguished.
- (9) Push in IAU 2 (CB149) circuit breaker.
- (10) Pull IAU 1 (CB148) circuit breaker.

- (11) Pull AVIONIC CF (CB154) circuit breaker.
 - (12) Verify that the **AVI FAN FAIL** CAS alert and the **MASTER CAUTION** annunciator is flashing.
 - (13) Verify an audible ping is heard in the crew headset.
 - (14) Acknowledge by pressing the **MASTER CAUTION** annunciator/ switch.
 - (15) Verify the **MASTER CAUTION** annunciator is extinguished and **AVI FAN FAIL** CAS alert is steady on.
 - (16) Push in AVIONIC CF (CB154) circuit breaker.
 - (17) Verify the **AVI FAN FAIL** CAS alert is extinguished.
 - (18) Push in IAU 1 (CB148) circuit breaker.
- O. Landing Light On CAS Message
- (1) Position the LDG LT switch (SW107) to ON.
 - (2) Verify that the **LDG LIGHT ON** CAS message is displayed.
 - (3) Position the LDG LT switch (SW107) to OFF.
 - (4) Verify that the **LDG LIGHT ON** CAS message is extinguished.
- P. Pulse Landing Light On CAS Message (Optional Equipment)
- (1) Position the LDG LT switch (SW107) to PULSE.
 - (2) Verify that the **LDG LIGHT PULSE** CAS message is displayed.
 - (3) Position the LDG LT switch (SW107) to OFF.
 - (4) Verify that the **LDG LIGHT PULSE** CAS message is extinguished.
- Q. Engine Anti-Ice CAS Message
- (1) Turn the Anti-Ice switch to the ON position.
 - (2) Verify that the **ENG ANTI-ICE** CAS message is displayed.
 - (3) Turn the Anti-Ice switch to the OFF position.
 - (4) Verify that the **ENG ANTI-ICE** CAS message is extinguished.

1.5.12 CMC/TOT Exceedances

1.5.12.1 Exporting CMC/TOT Exceedances

A. Perform these steps for CMC Datalog Exceedance Retrieval for both the `cmc_exceedance` (INT) and `tot_exceedance` (INT) folder:

- (1) Place an SD Card in the top slot of the MFD (lower display).
- (2) Apply power to the G1000H system and scroll to the AUX Maintenance page using the inner and outer FMS knobs located on the lower right side of the MFD.
- (3) Press the PSWD softkey.
- (4) Enter the password “eN480B” using the inner and outer FMS knobs. Press the “ENT” button located directly above the FMS knob.
- (5) Press the small inner FMS knob to bring up the blue cursor highlight in the “Folders” window. Scroll down to the `cmc_exceedance` (INT) option, then press the “ENT” button.
- (6) Scroll the Logs page up and down using the inner and outer FMS knob until the date and time range in the vicinity of the suspected flight the exceedance occurred is found.

NOTE

If no exceedance occurred, no file will be created.

- (7) Press the small inner FMS knob to bring up the blue cursor highlight on the “Export” options selection. Scroll the cursor to the associated “Export” option and press the “ENT” button. This can be done with multiple exceedance files. The files will then be saved to the SD card in an Excel format.
- (8) Press the small inner FMS knob to bring up the blue cursor highlight in the “Folders” window. Scroll down to the `tot_exceedance` (INT) option, then press the “ENT” button.
- (9) Scroll the Logs page up and down using the inner and outer FMS knob until the date and time range in the vicinity of the suspected flight the exceedance occurred is found.

NOTE

If no exceedance occurred, no file will be created.

- (10) Press the small inner FMS knob to bring up the blue cursor highlight on the “Export” options selection. Scroll the cursor to the associated “Export” option and press the “ENT” button. This can be done with multiple exceedance files. The files will then be saved to the SD card in an Excel format
- (11) Power may then be removed from the G1000H system.
- (12) On the SD card, open the `cmc_exceedance` or `tot_exceedance` folder as required. Open the Excel file which is named according to the date and time of the exceedance. See Table 5 for the list of exceedances.

1.5.12.2 Clearing CMC/TOT Exceedances

NOTE

The following steps will delete all exceedances. Prior to deleting and clearing exceedances, retrieve and export all `cmc_exceedance` (INT) and `tot_exceedance` (INT) exceedances to an SD card as required or necessary per Section 1.5.12.1.

- A. Clear the TOT EXCEEDANCE CAS alert from the CMC data log via the configuration page using the following steps:
 - (1) Apply power to the G1000H system and scroll to the AUX Maintenance page using the inner and outer FMS knobs located on the lower right side of the MFD.
 - (2) Press the PSWD softkey.
 - (3) Enter the password “eN480B” using the inner and outer FMS knobs. Press the “ENT” button located directly above the FMS knob
 - (4) Press the “Menu” button located above the FMS knob.
 - (5) Using the small inner FMS knob located on the lower right side of the MFD, scroll down to the **DELETE ALL LOGS** option, then press the “ENT” button located directly above the FMS knob. A confirmation window will appear, and once again press the “ENT” button. All exceedance logs will be deleted and the amber **TOT EXCEEDANCE** CAS message on the PDF will be extinguished.
 - (6) Recycle power on the G1000H and let the system boot up in normal mode. Verify that the amber **TOT EXCEEDANCE** CAS message on the PFD remains extinguished.
 - (7) Power may then be removed from the G1000H.

SECTION 6

ELECTRICAL WIRING DIAGRAMS

1.6 G1000H System Wiring Diagrams

G1000H Interface	Diagram Reference	
	P/N 4220650-1	P/N 4220650-3
Power Distribution	1-1	1-9
G1000H Interface	1-2	1-10
Case Bonding and Grounding	1-3	1-11
Audio Panel	1-4	1-4
Interior Lighting	1-5	1-12
Exterior Lighting	1-6	1-6
Hour Meter	1-7	1-7
Day/Night Annunciator Dimmer	1-8	1-8

SECTION 7

CONFIGURATION PAGE DIAGRAMS

1.7 G1000H Configuration Pages

G1000H Configuration Page	Diagram 1-13
	(Sheet)
Main Lighting – PFD1	1
Main Lighting – MFD1	2
System Setup	3
Com Setup – GIA1	4
Com Setup – GIA2	4
System Configuration	5
GMA Marker Beacon	5
Fuel Tank Calibration	6
Transponder	7

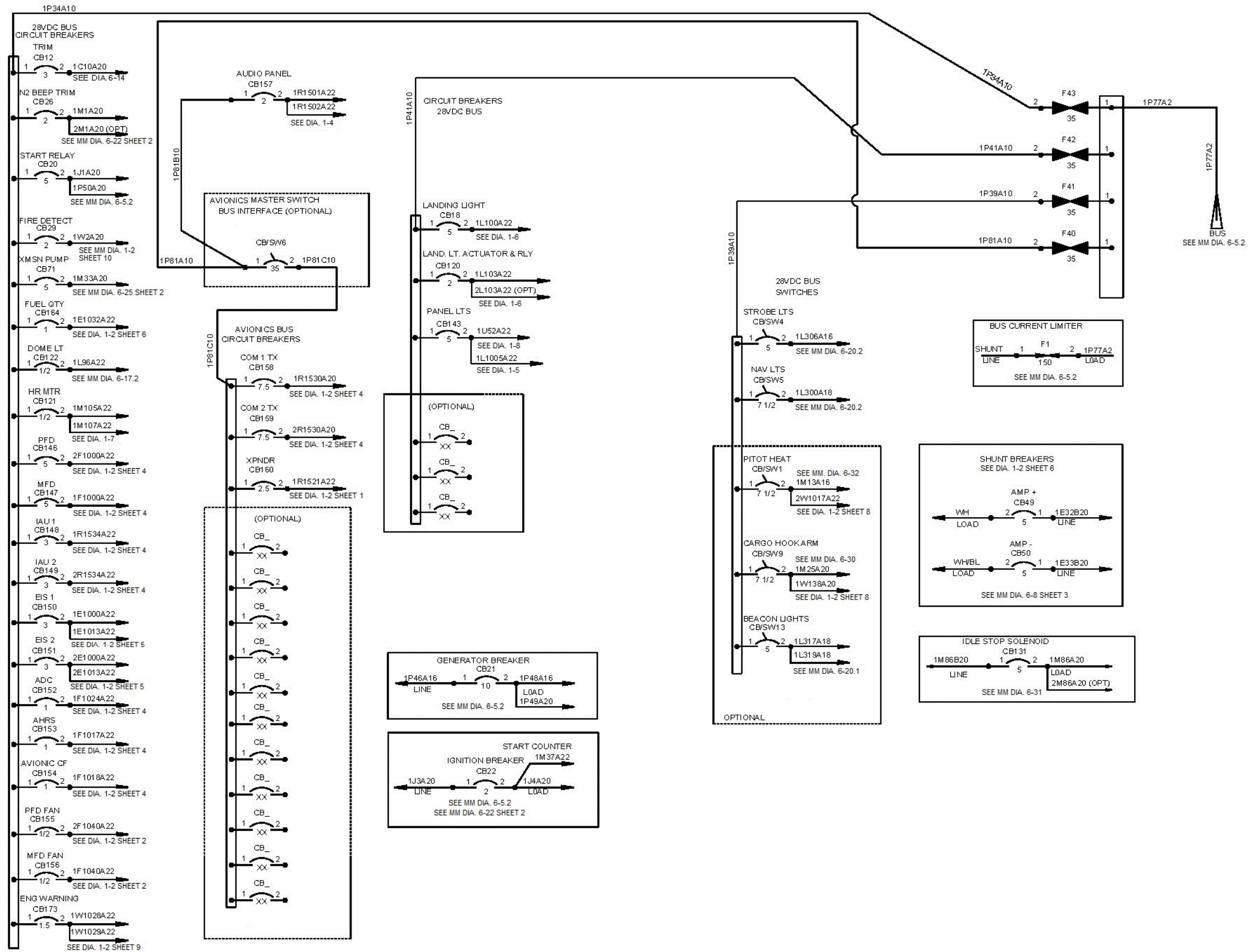


Diagram 1-1. G1000H Power Distribution Interface
 (Ref. 4192805-1 Rev. A) (Sheet 1 of 2)
 Rev. 1, Jan 25/18
 Page 1-55 (1-56 Blank)

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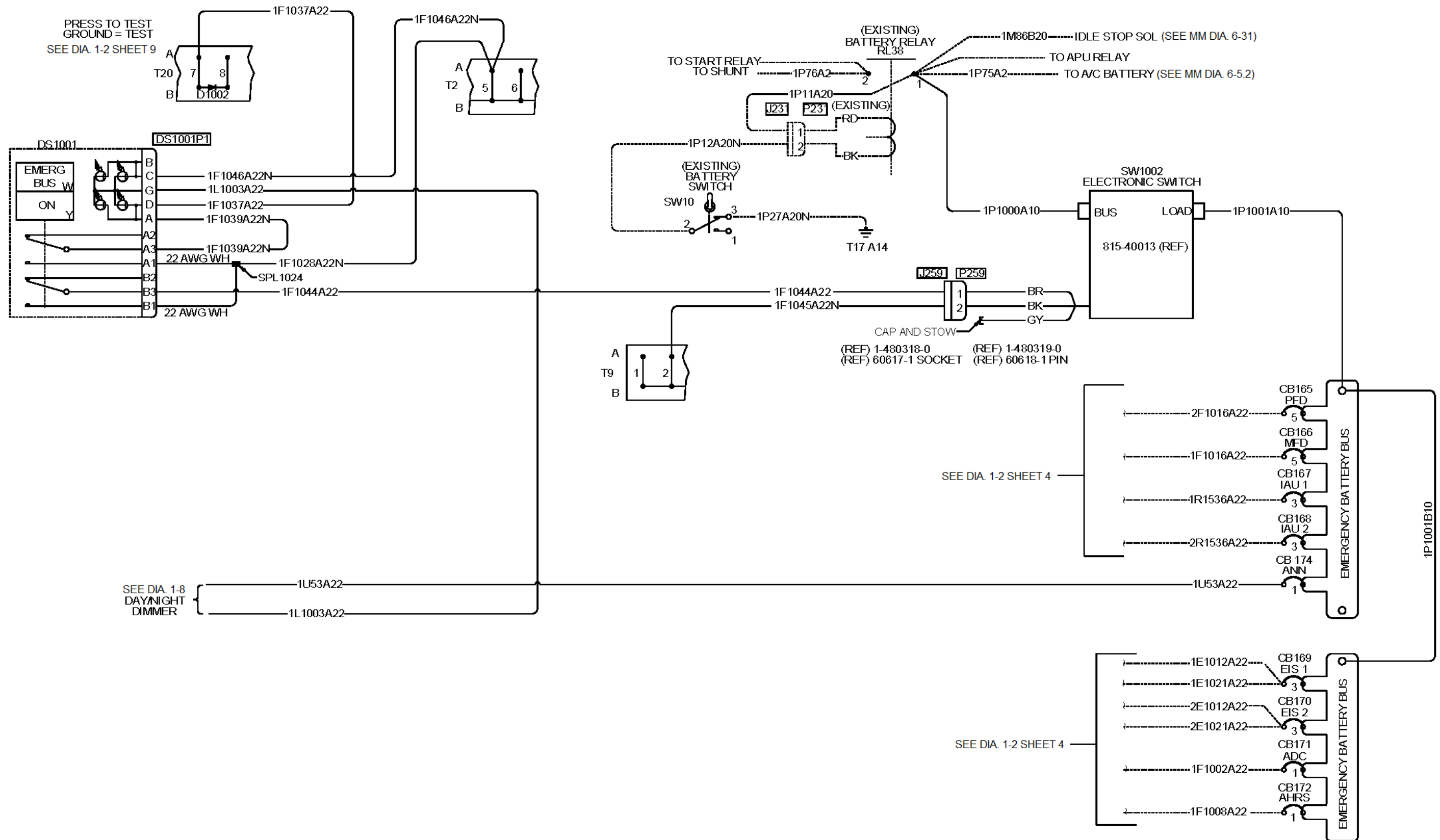


Diagram 1-1. G1000H Power Distribution Interface
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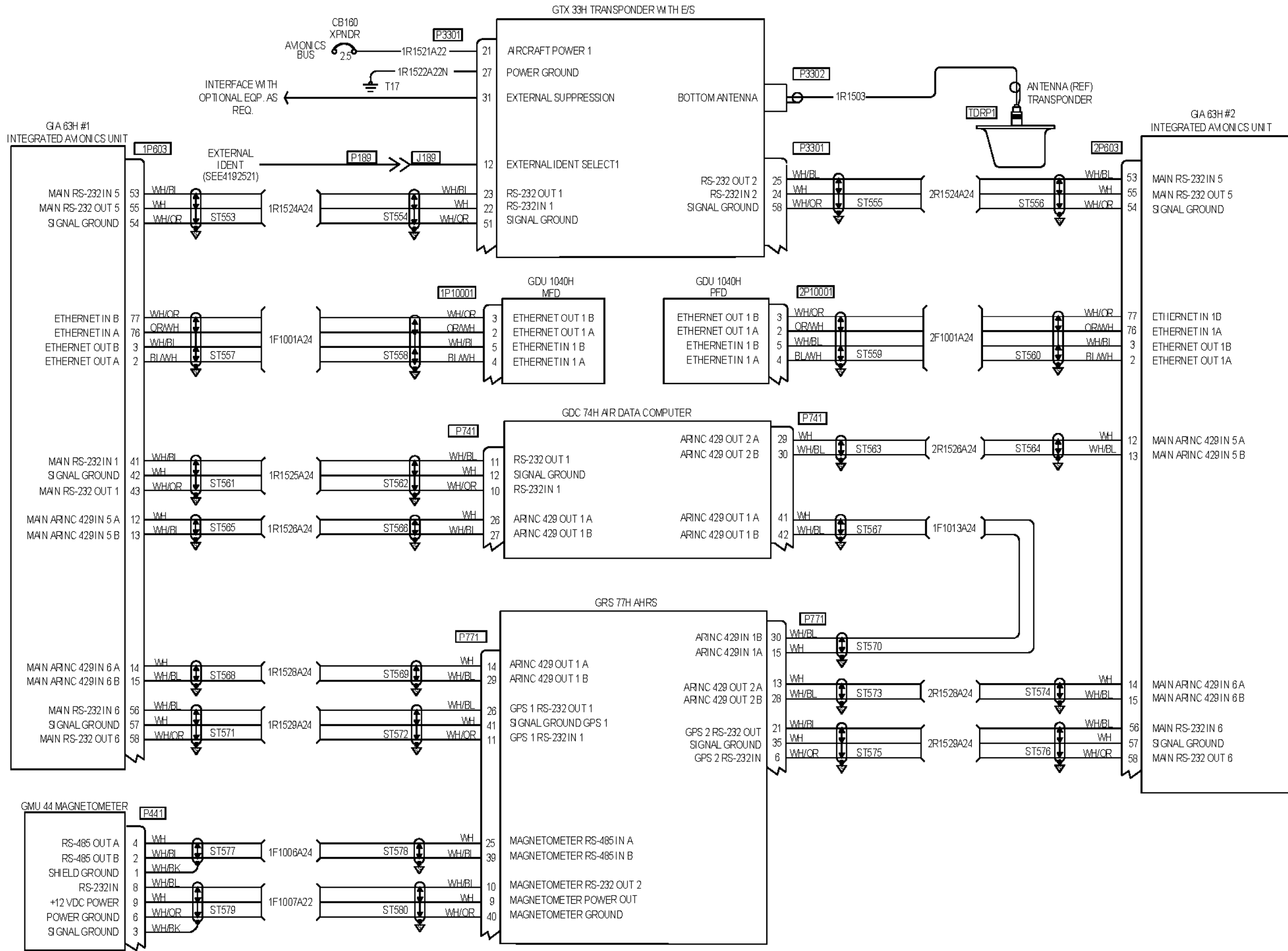


Diagram 1-2. G1000H Interface
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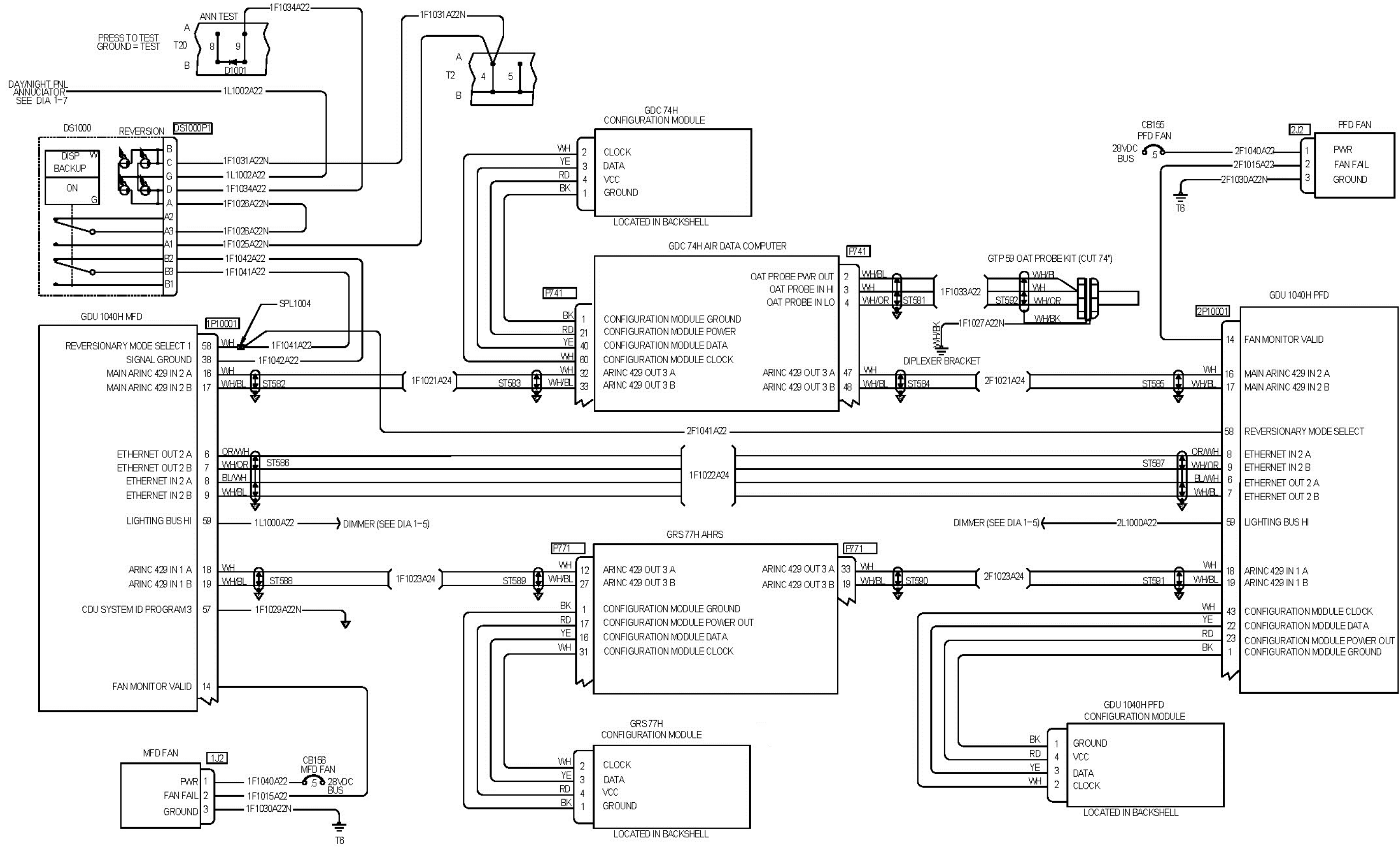
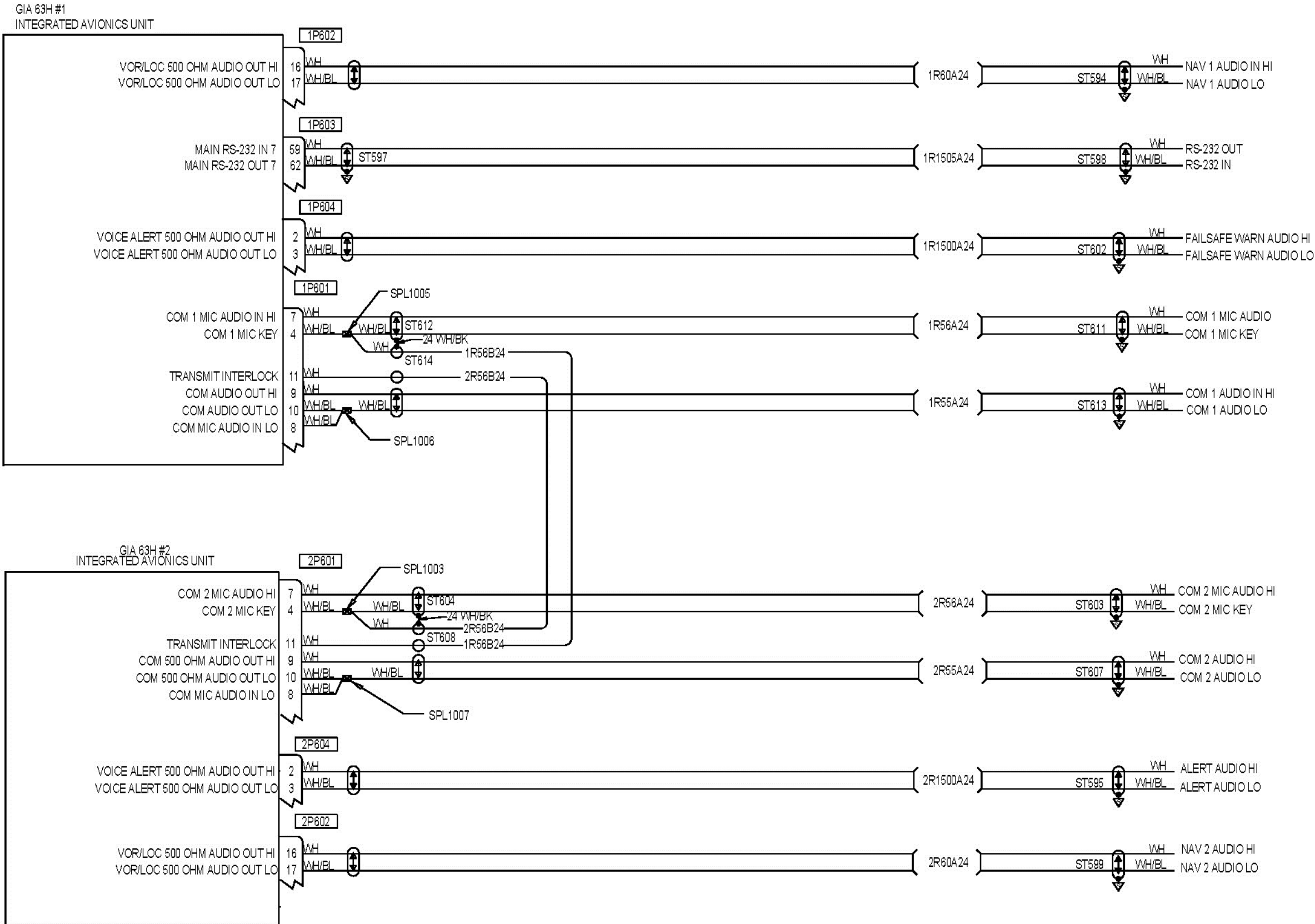


Diagram 1-2. G1000H Interface
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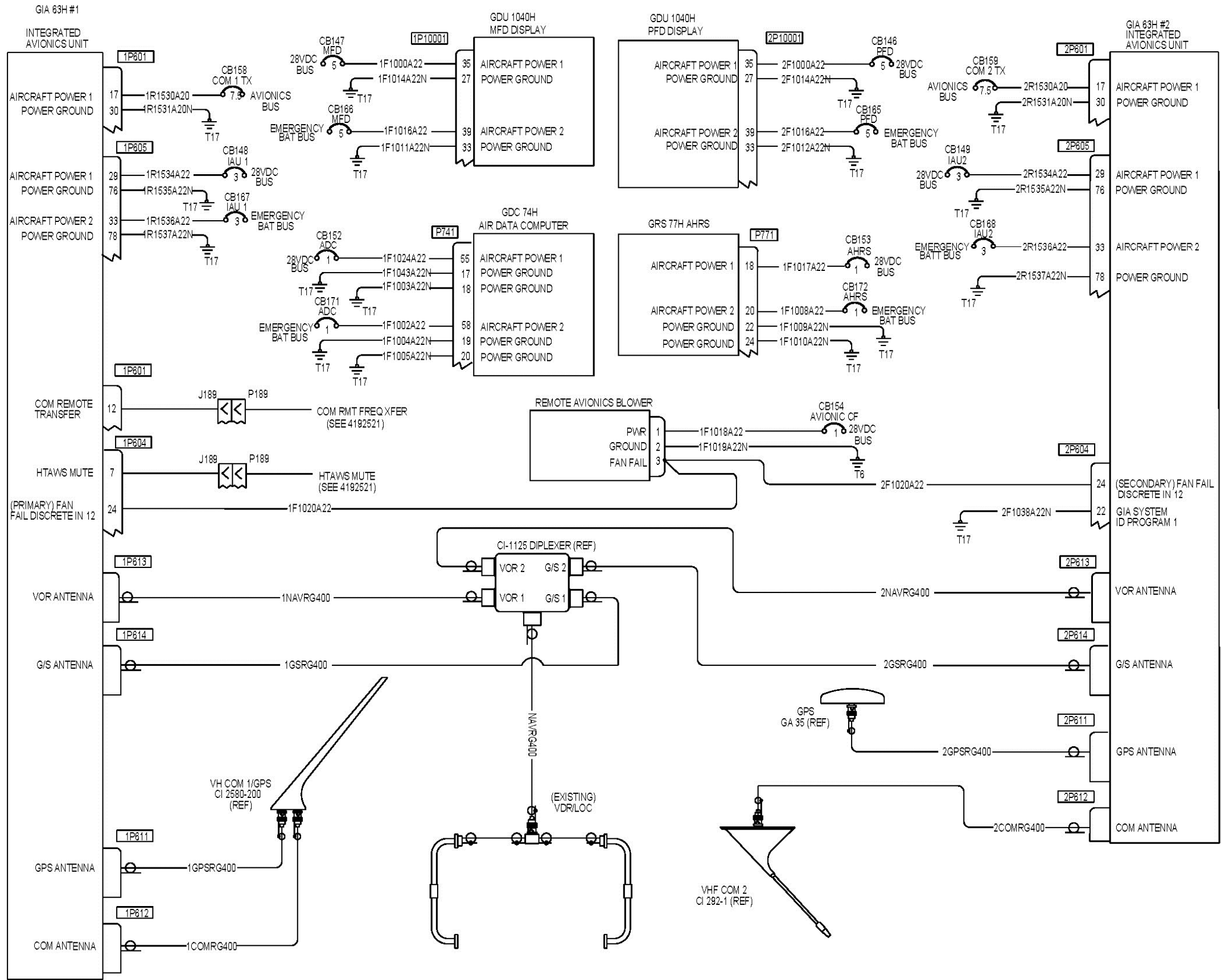
SEE DIA 1-4
 AUDIO PANEL DRAWING

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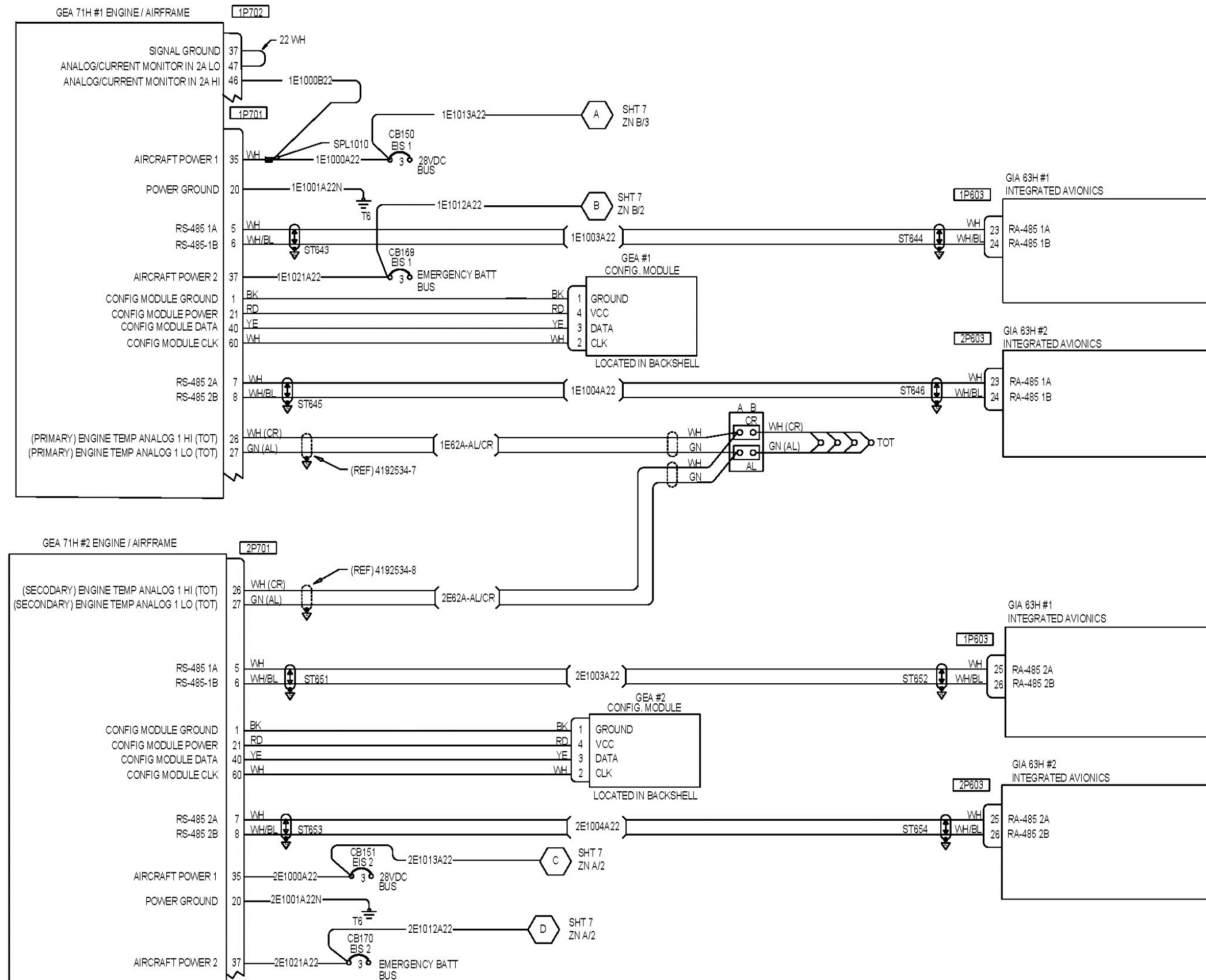


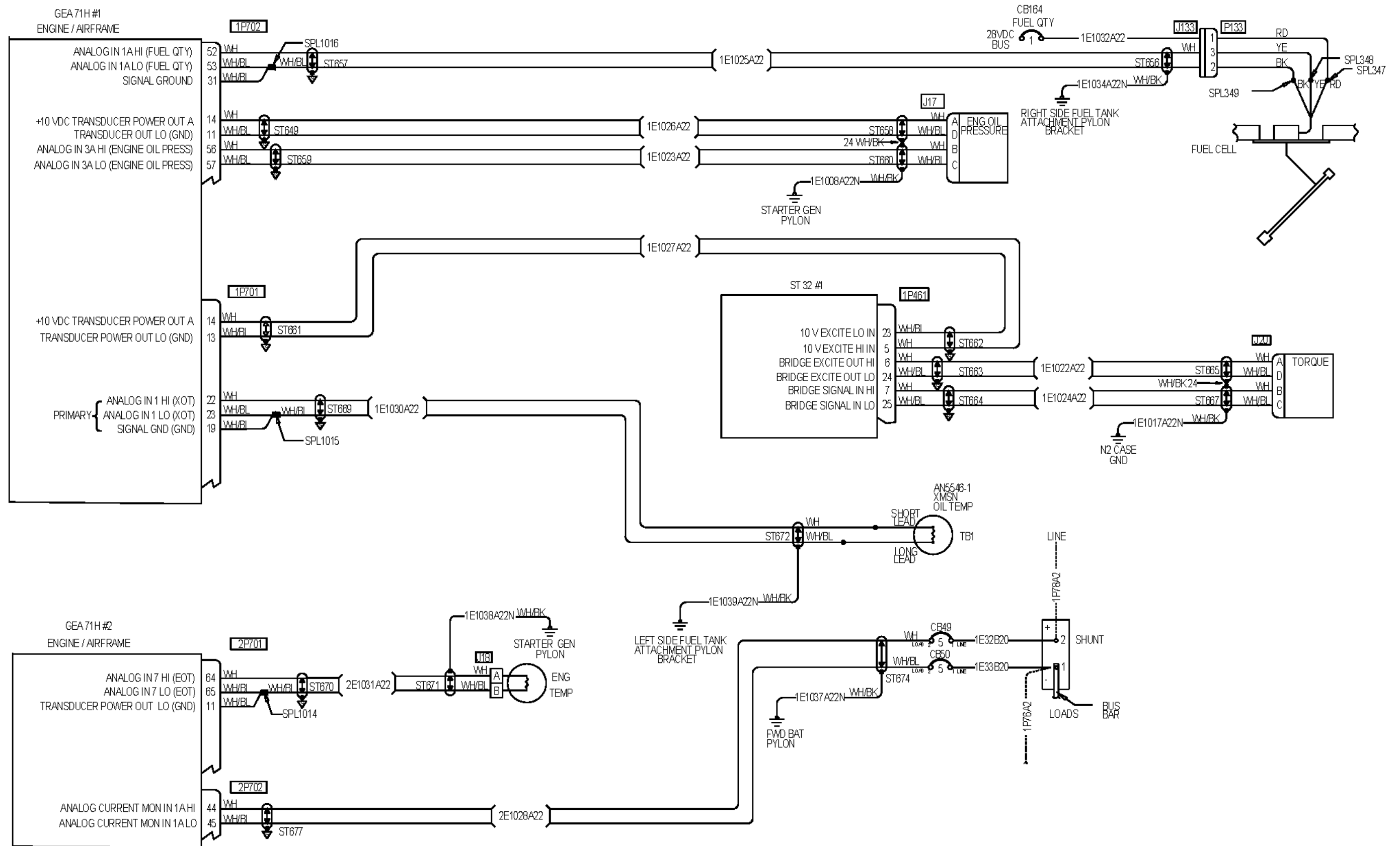
Diagram 1-2. G1000H Interface
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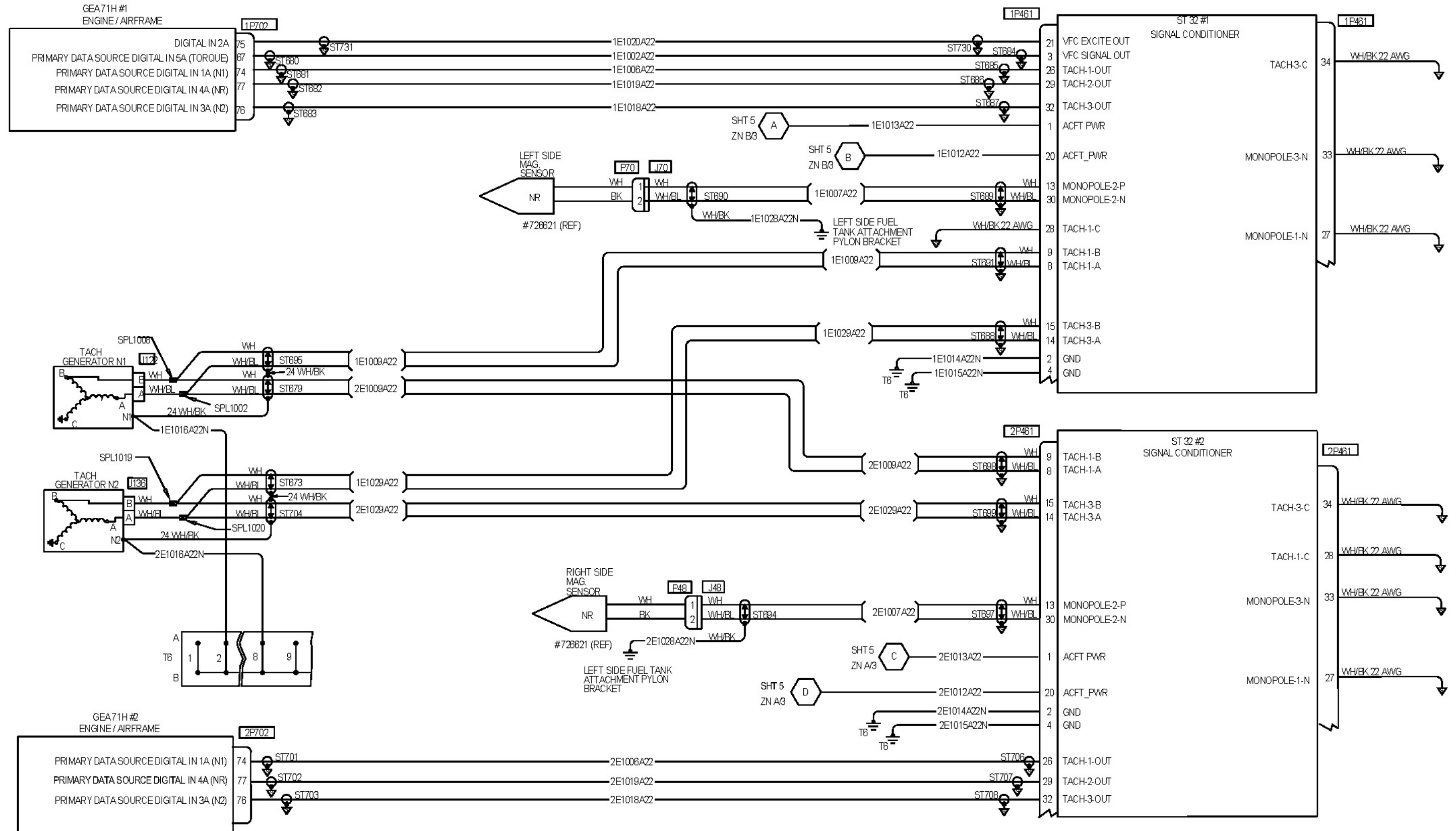
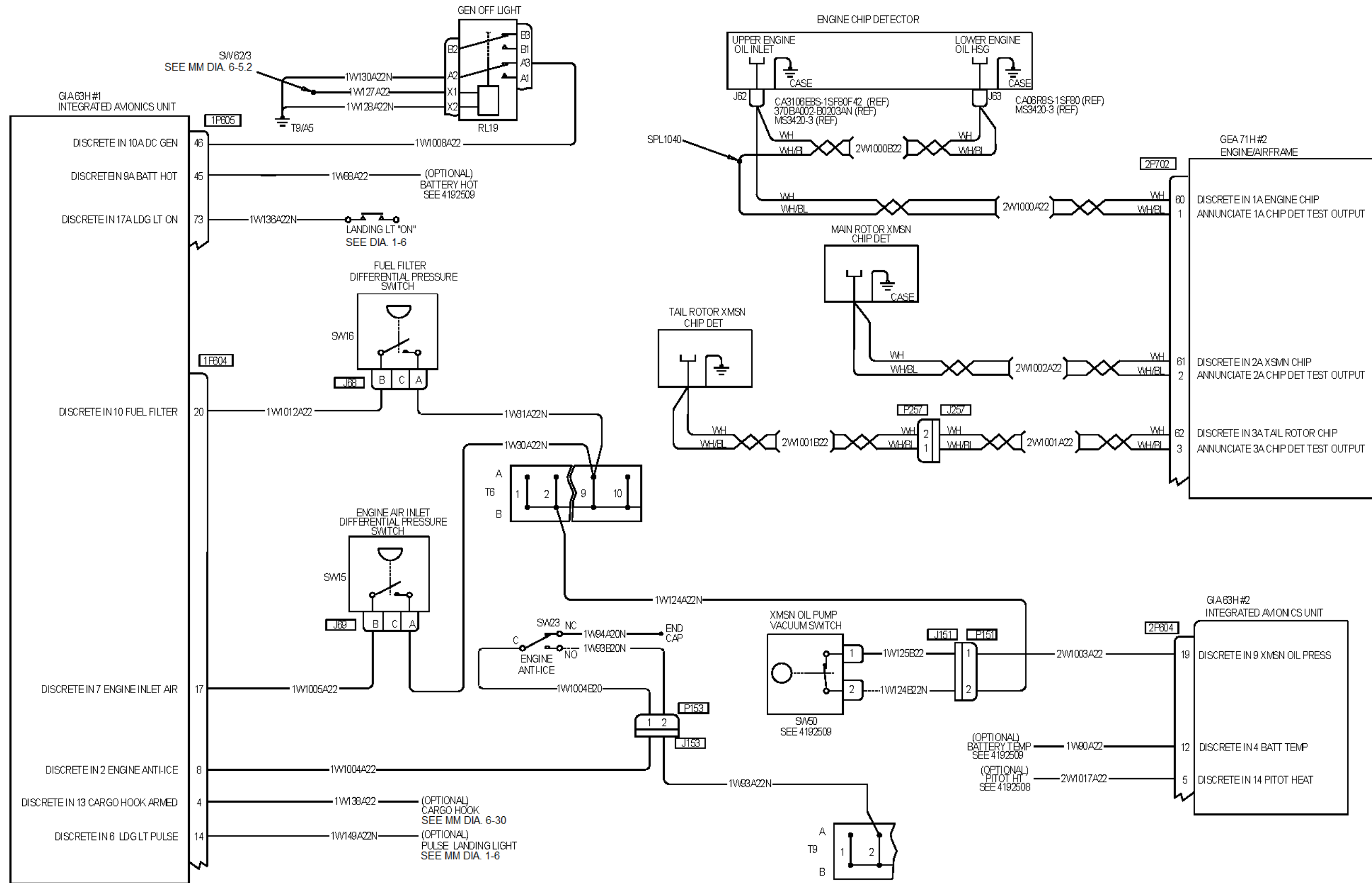


Diagram 1-2. G1000H Interface
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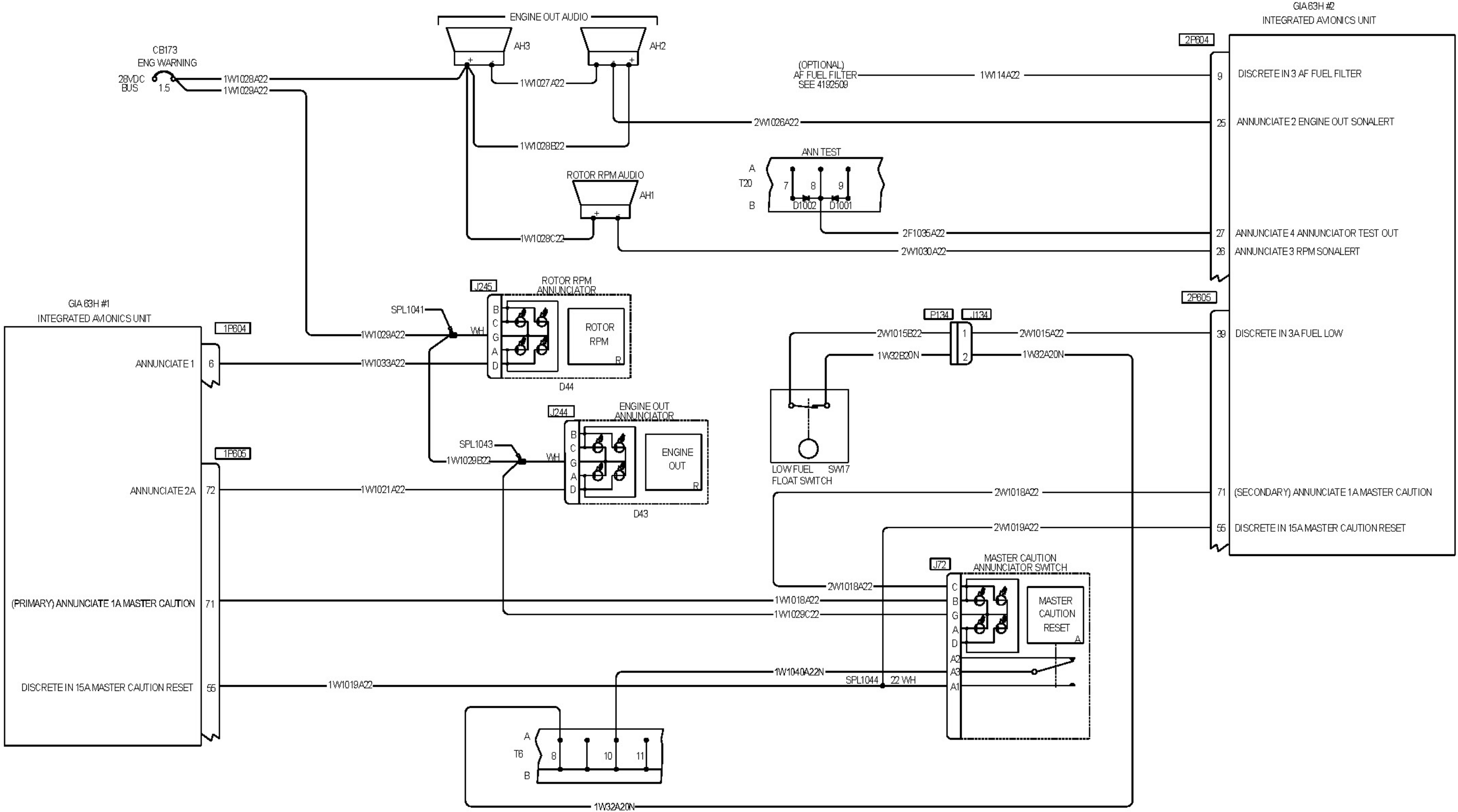


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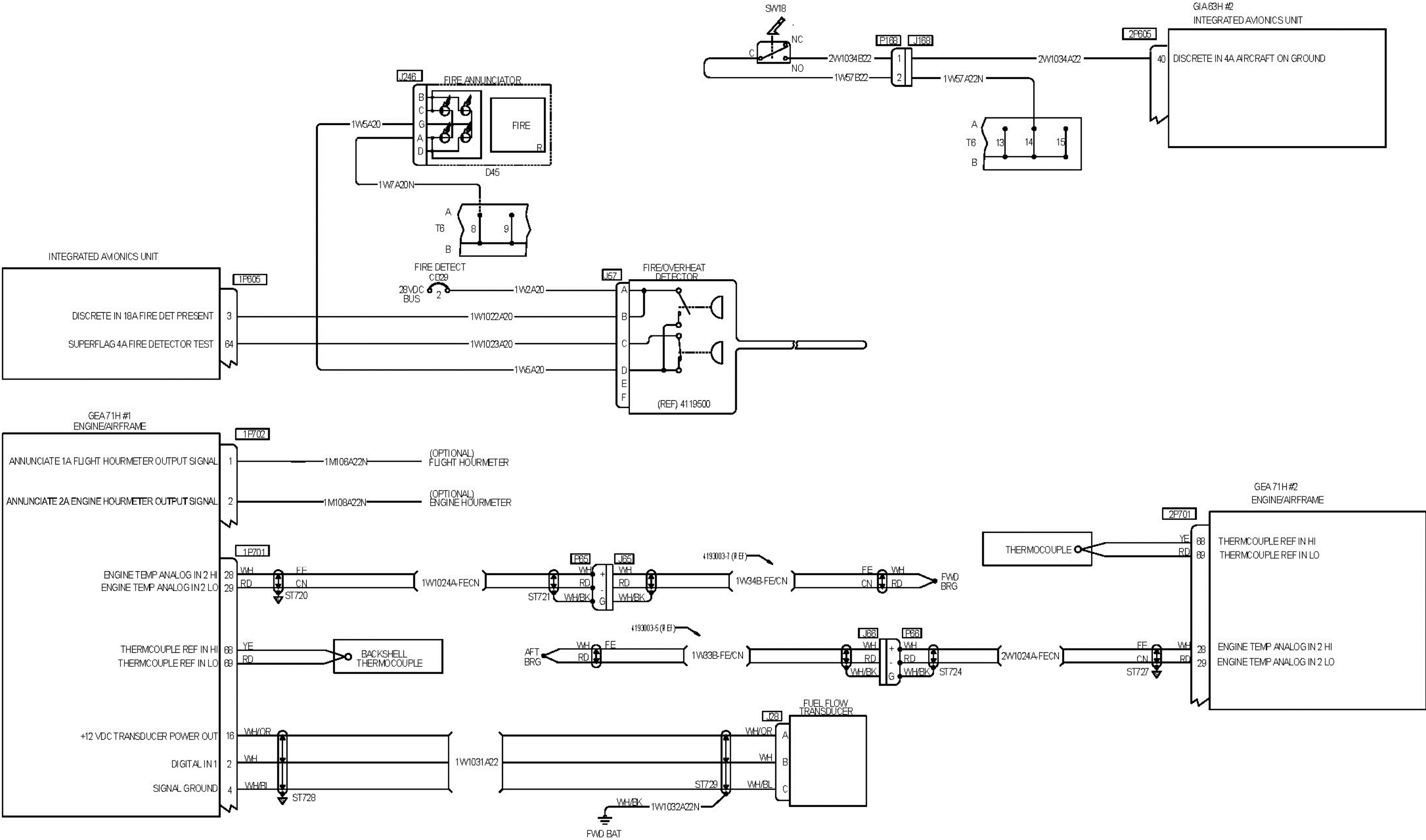


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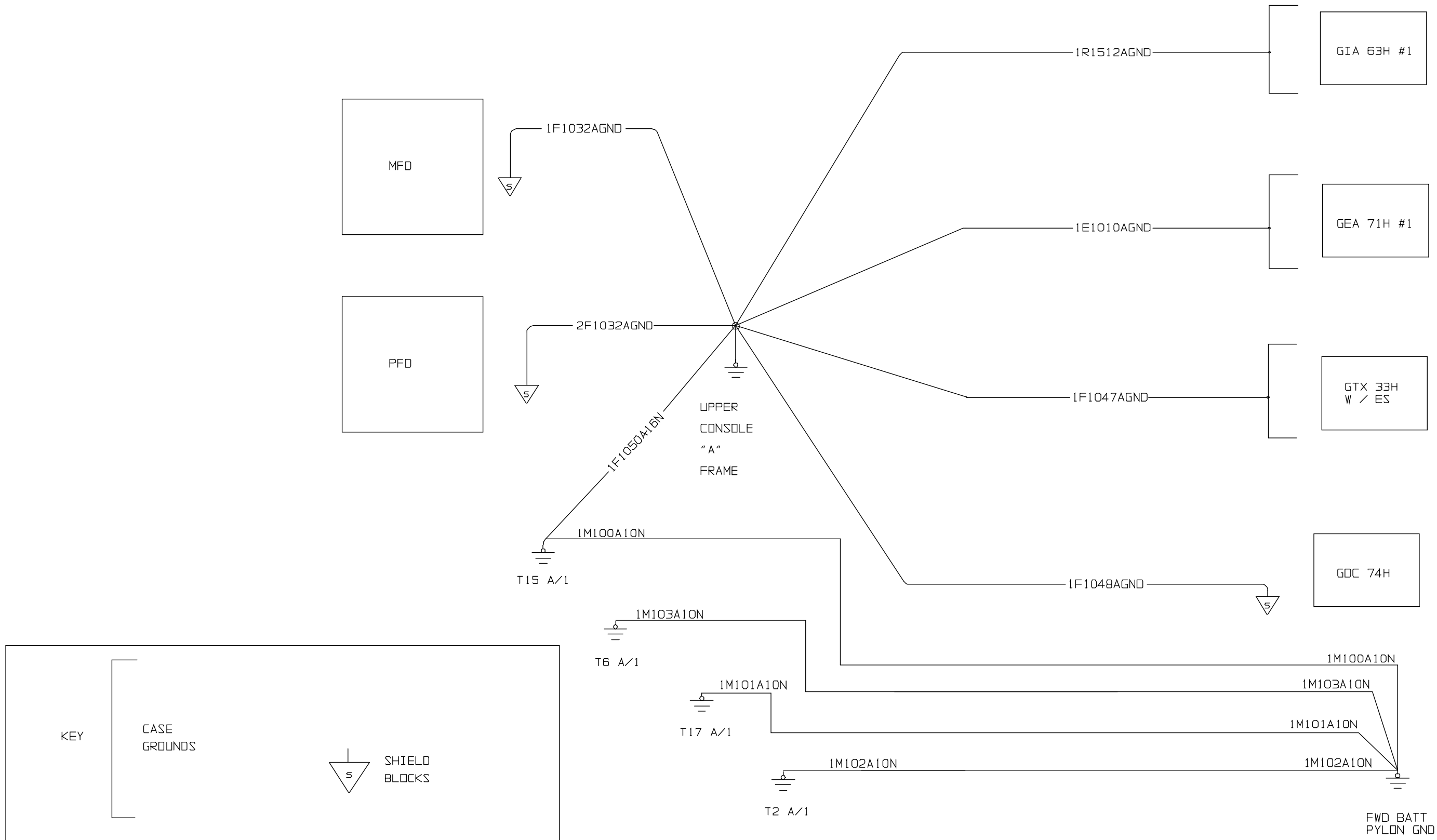


Diagram 1-3. G1000H Case Bonding and Grounding Interface (Sheet 1 of 2)

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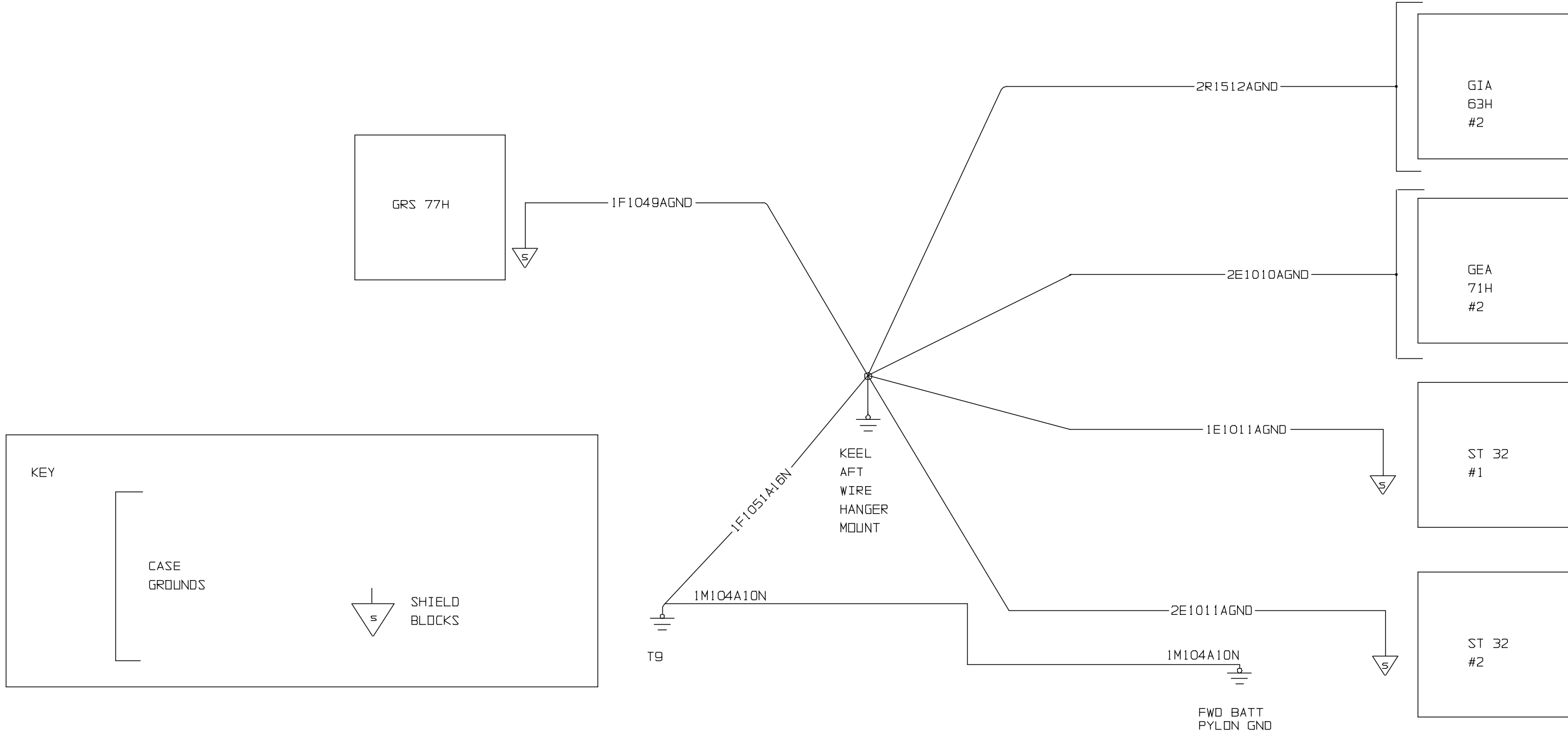


Diagram 1-3. G1000H Case Bonding and Grounding Interface (Sheet 2 of 2)

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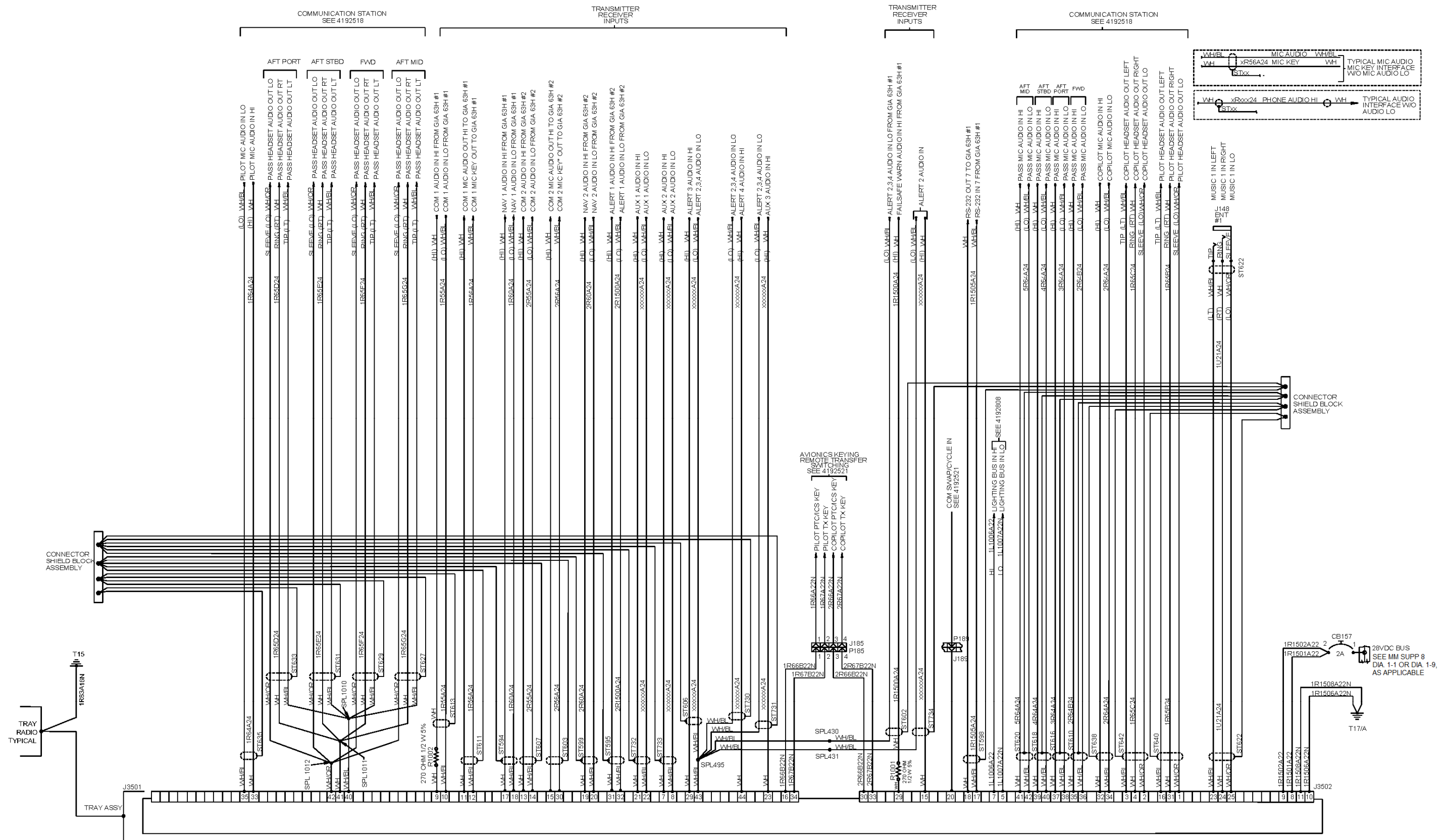


Diagram 1-4. G1000H Audio Panel Interface
(Ref. 4192807-1 Rev. A) (Sheet 1 of 2)
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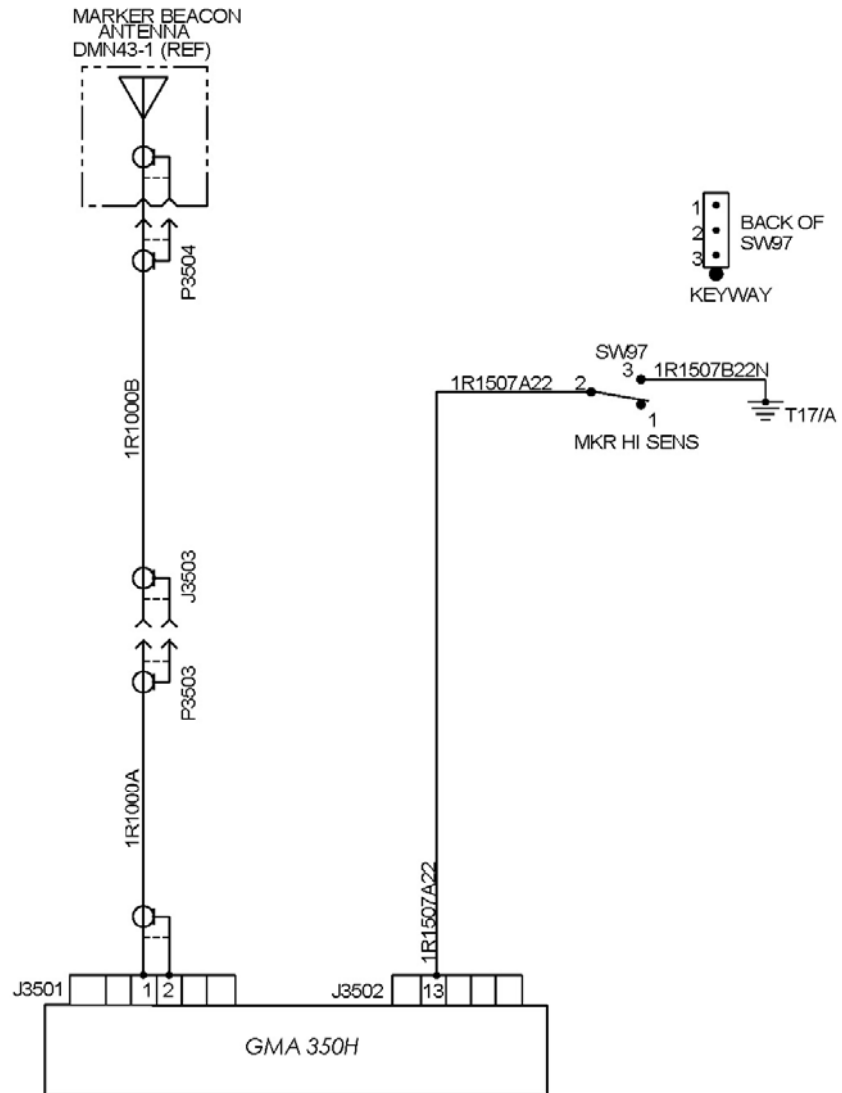


Diagram 1-4. G1000H Audio Panel Interface
(Ref. 4192807-3 Rev. -) (Sheet 2 of 2)
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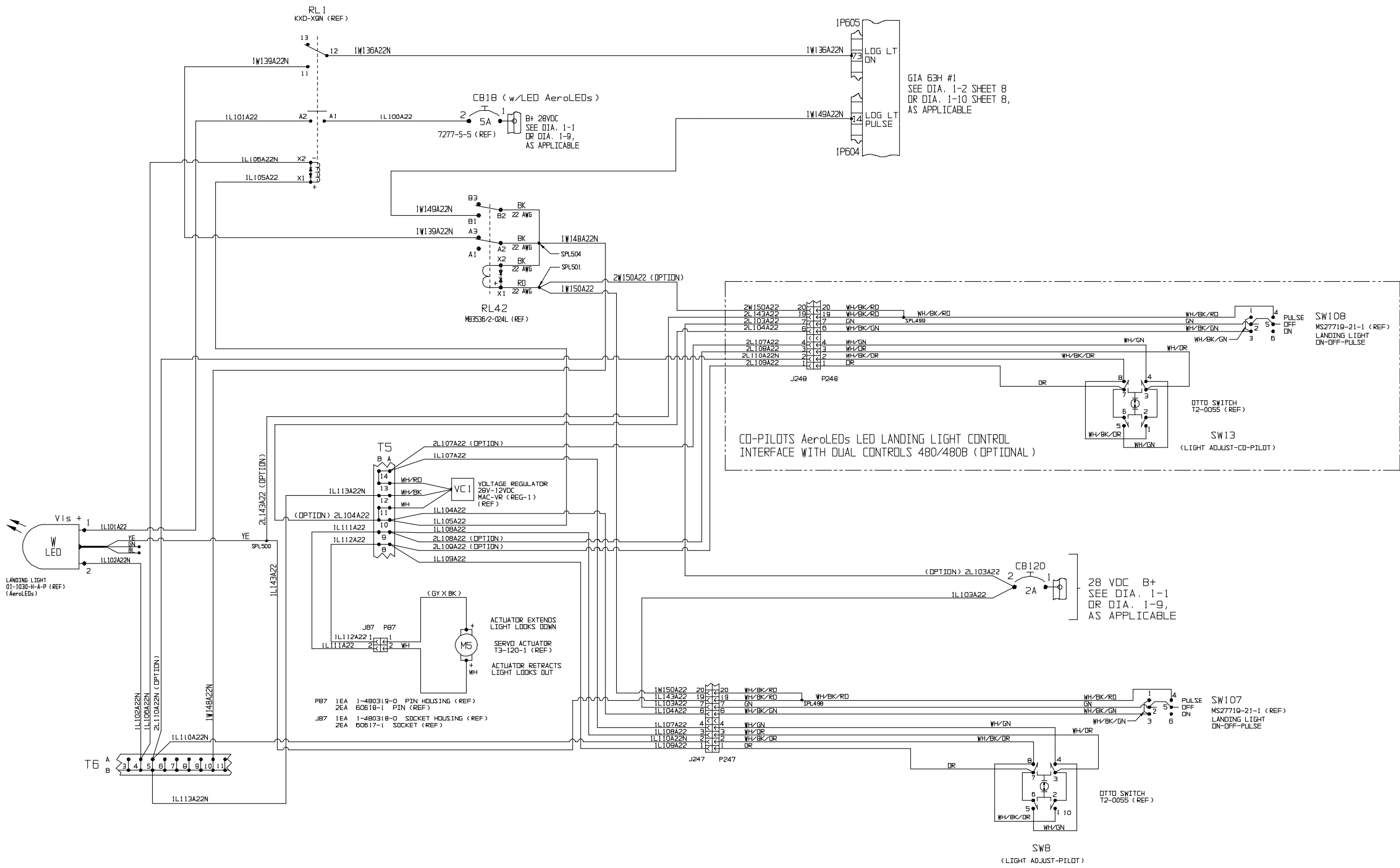


Diagram 1-6. G1000H Exterior Lighting Interface
 (Ref. 4192513-17 Rev. G)
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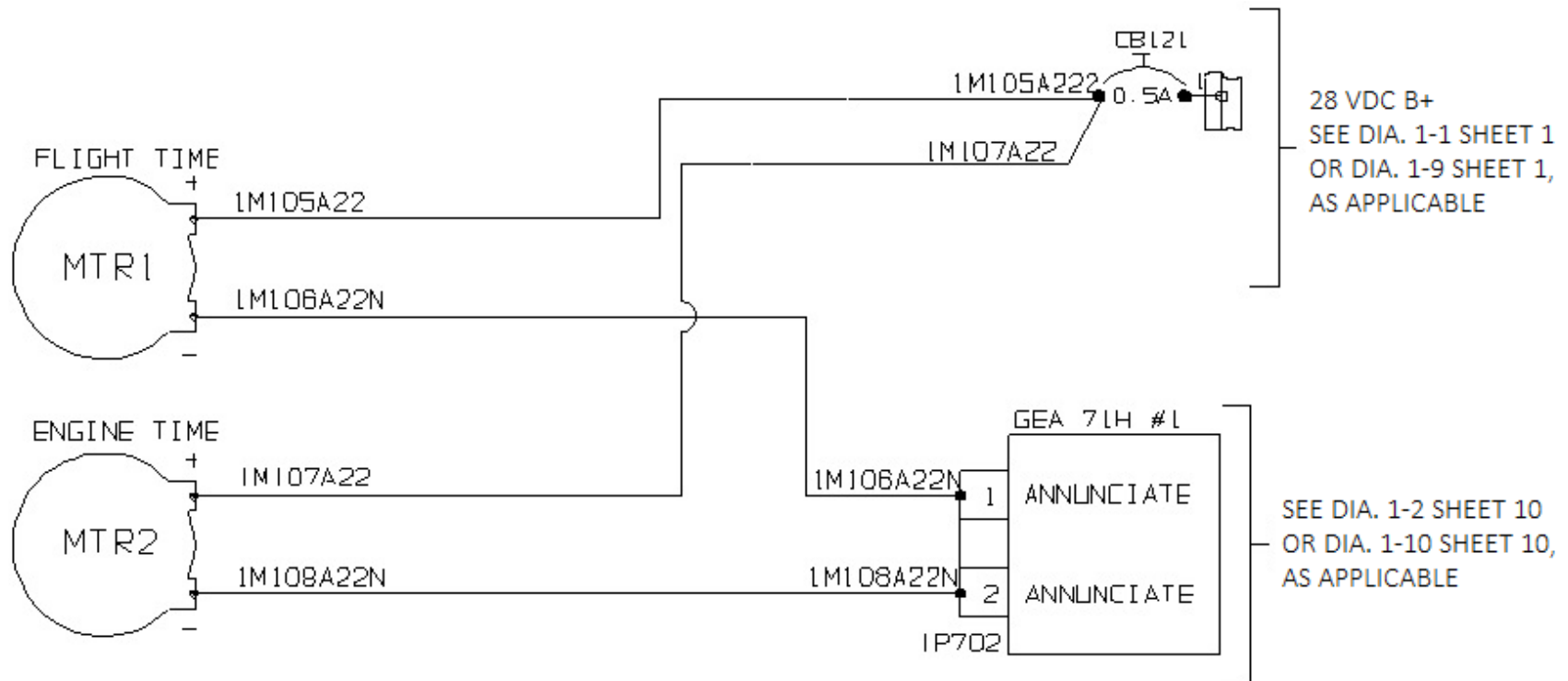


Diagram 1-7. G1000H Hour Meter Interface
 (Ref. 4192508-53/-55 Rev. N)

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Page 1-91

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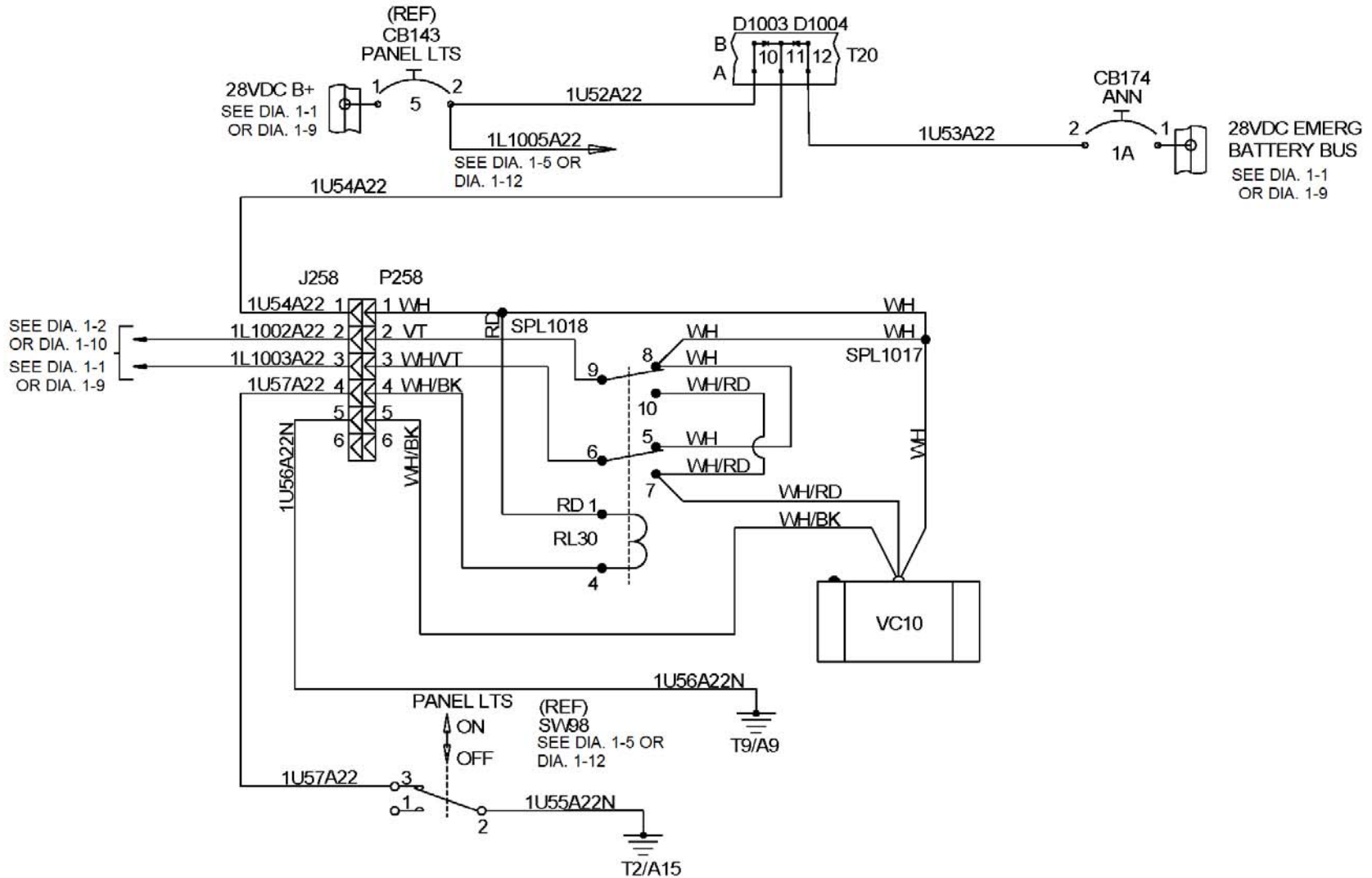


Diagram 1-8. G1000H Day/Night/Annunciator Dimmer Interface
(Ref. 4192809-1 Rev. A)

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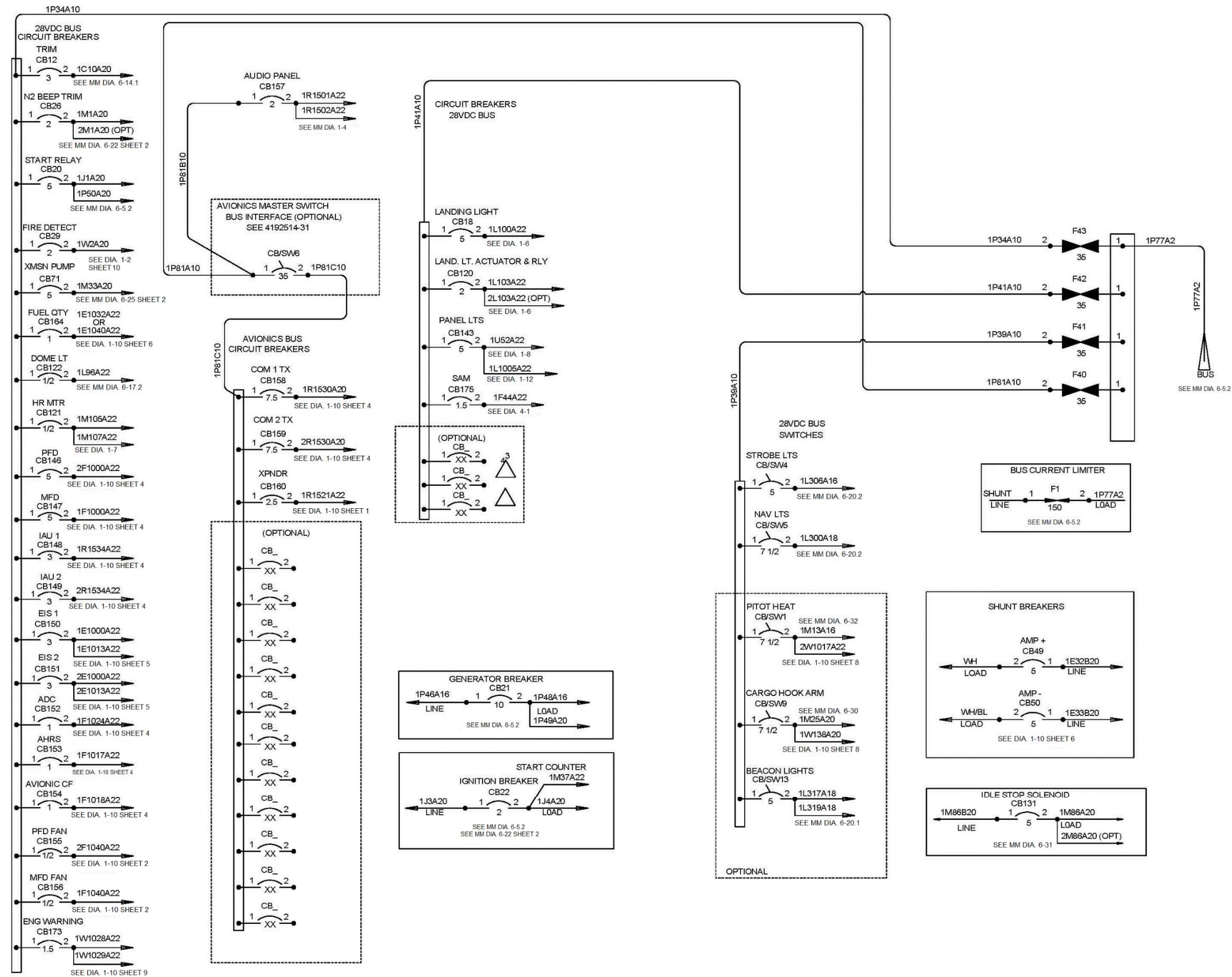


Diagram 1-9. G1000H Power Distribution Interface
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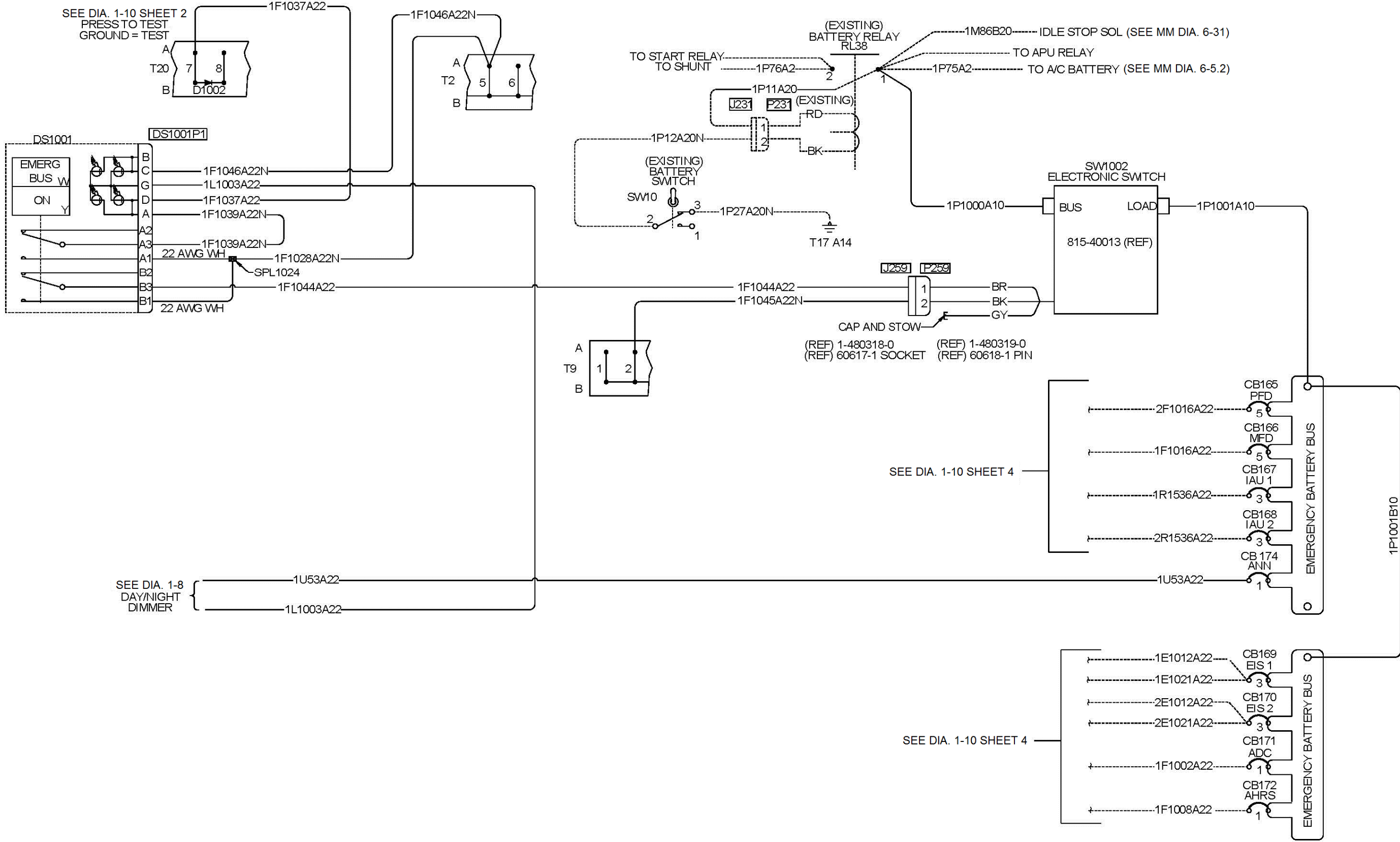


Diagram 1-9. G1000H Power Distribution Interface
 (Ref. 4192805-1 Rev. B) (Sheet 2 of 2)
 Rev. 1, Jan 25/18
 Page 1-97 (1-98 Blank)

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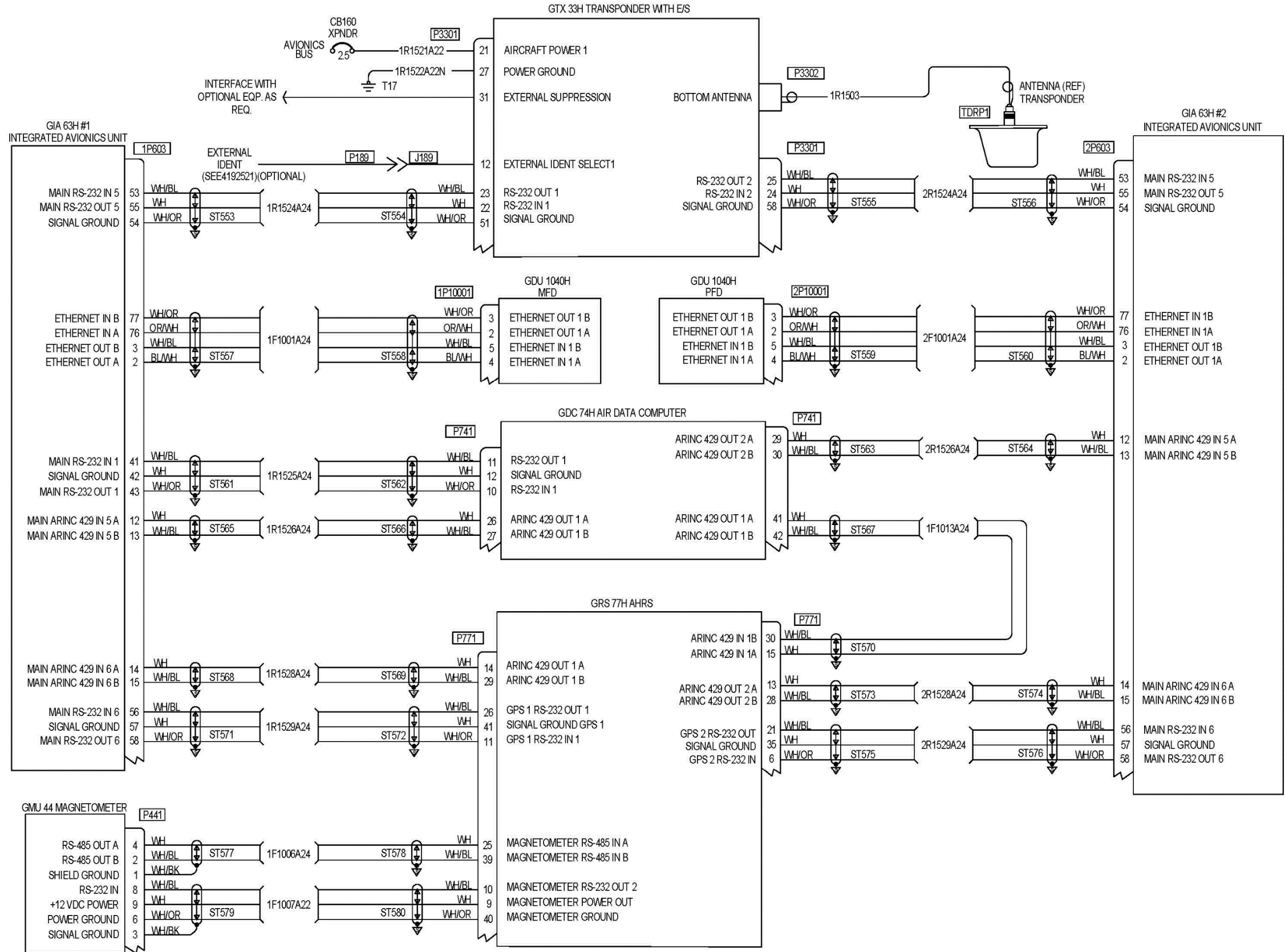


Diagram 1-10. G1000H Interface
 (Ref. 4192801-3 Rev. A) (Sheet 1 of 10)
 Rev. 1, Jan 25/18
 Page 1-99 (1-100 Blank)

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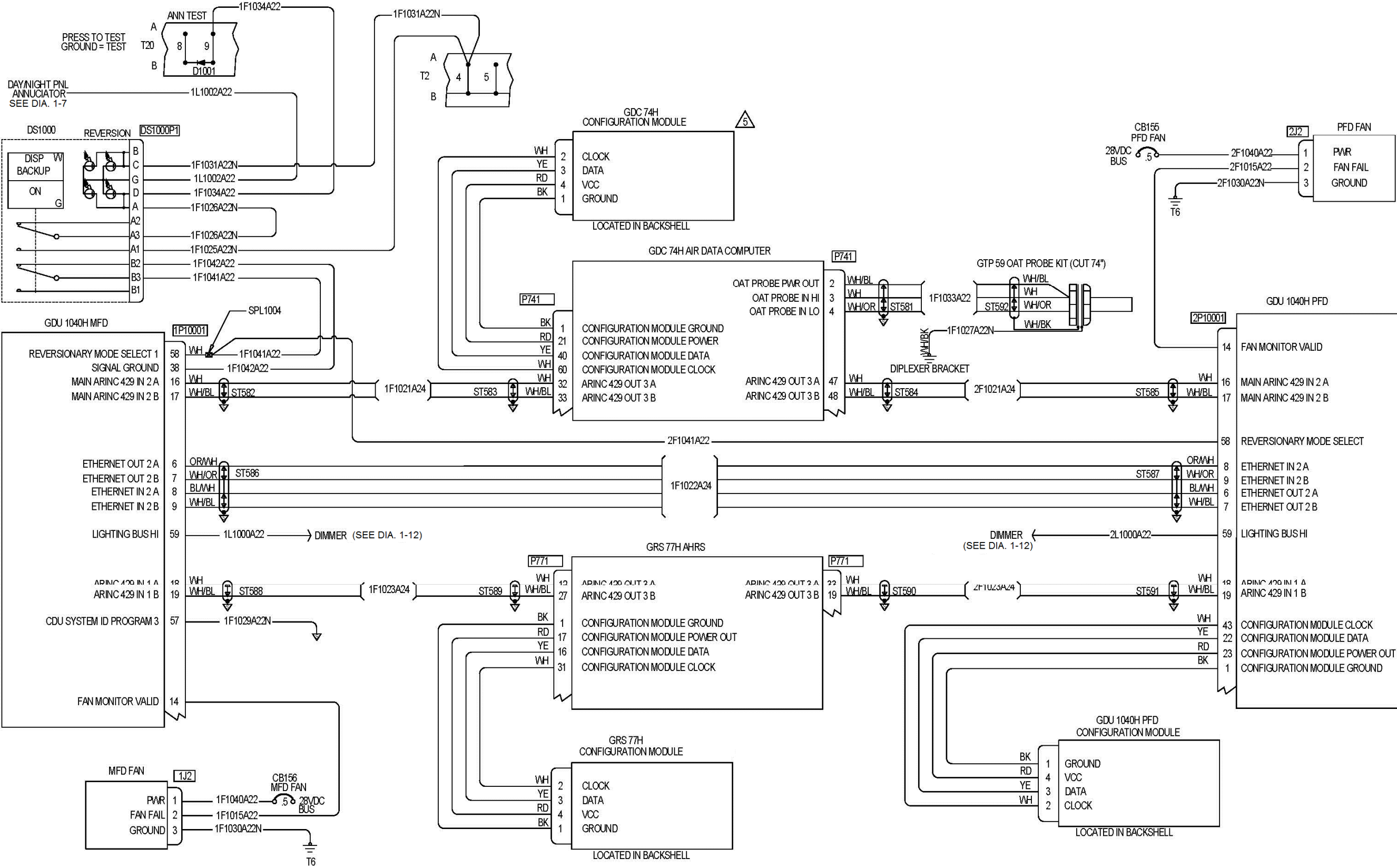
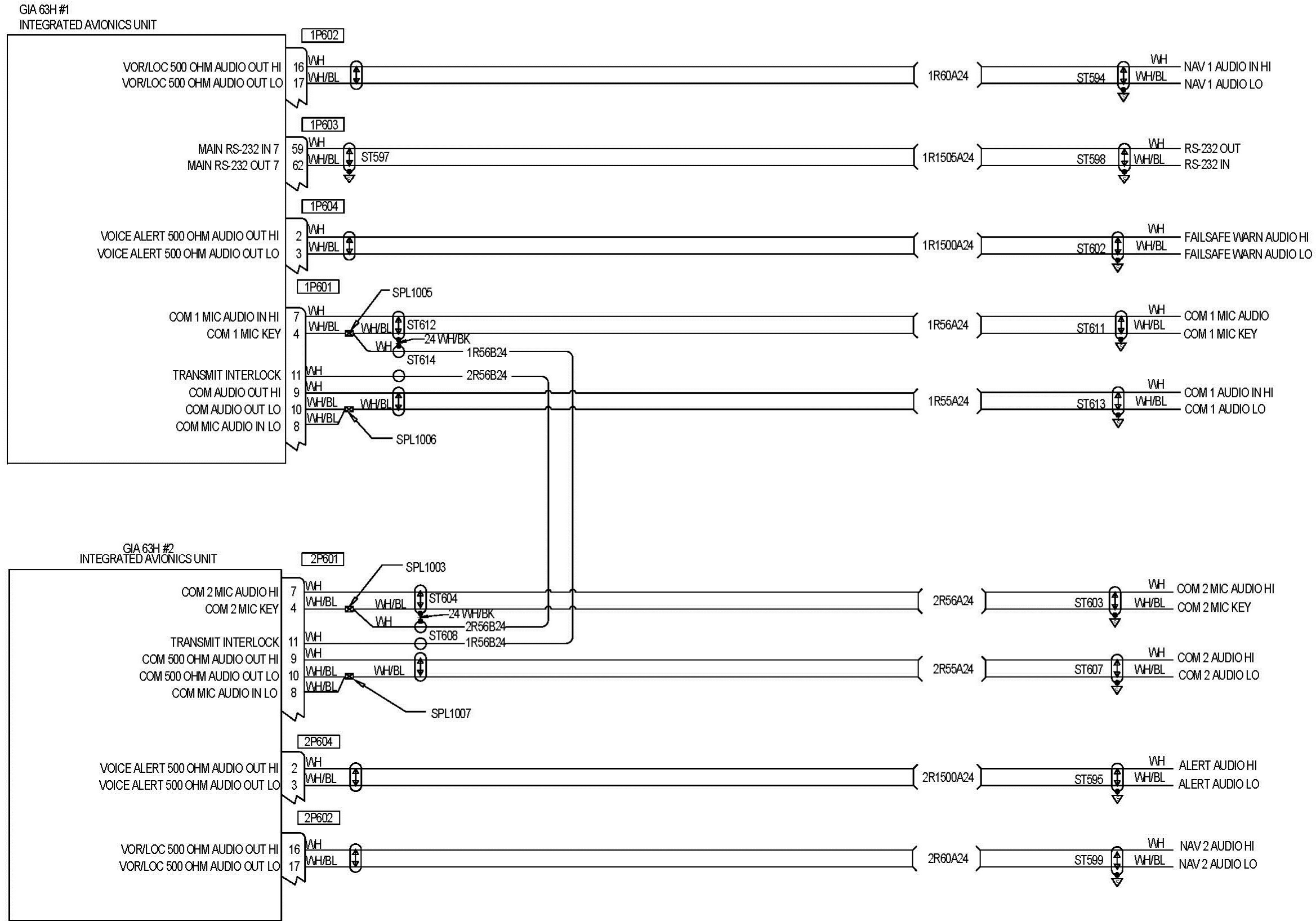


Diagram 1-10. G1000H Interface
 (Ref. 4192801-3 Rev. A) (Sheet 2 of 10)
 Rev. 1, Jan 25/18
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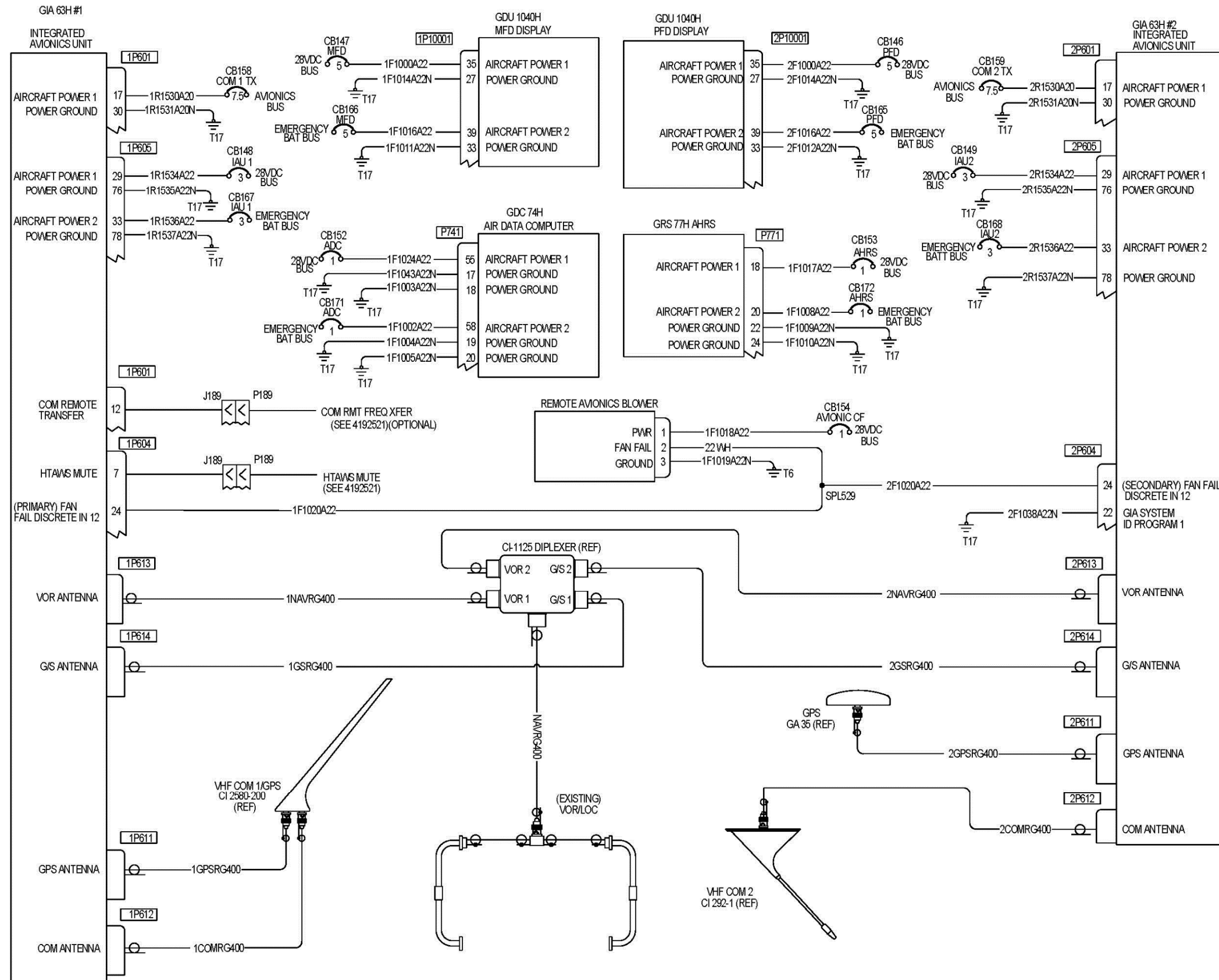


Diagram 1-10. G1000H Interface
(Ref. 4192801-3 Rev. A) (Sheet 4 of 10)
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Page 1-105 (1-106 Blank)

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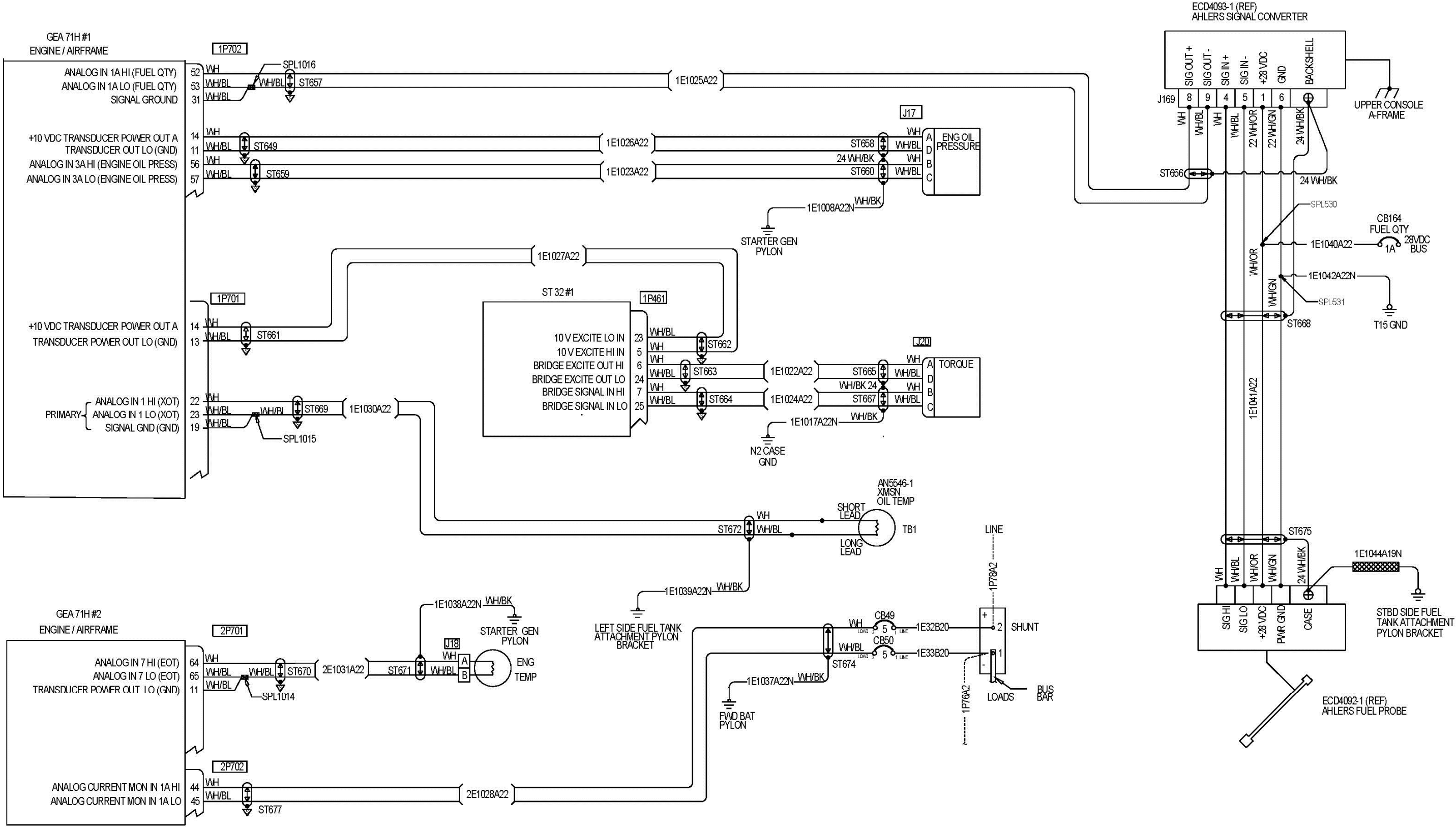


Diagram 1-10. G1000H Interface
 (Ref. 4192801-3 Rev. A) (Sheet 6 of 10)
 Rev. 1, Jan 25/18
 Page 1-109 (1-110 Blank)

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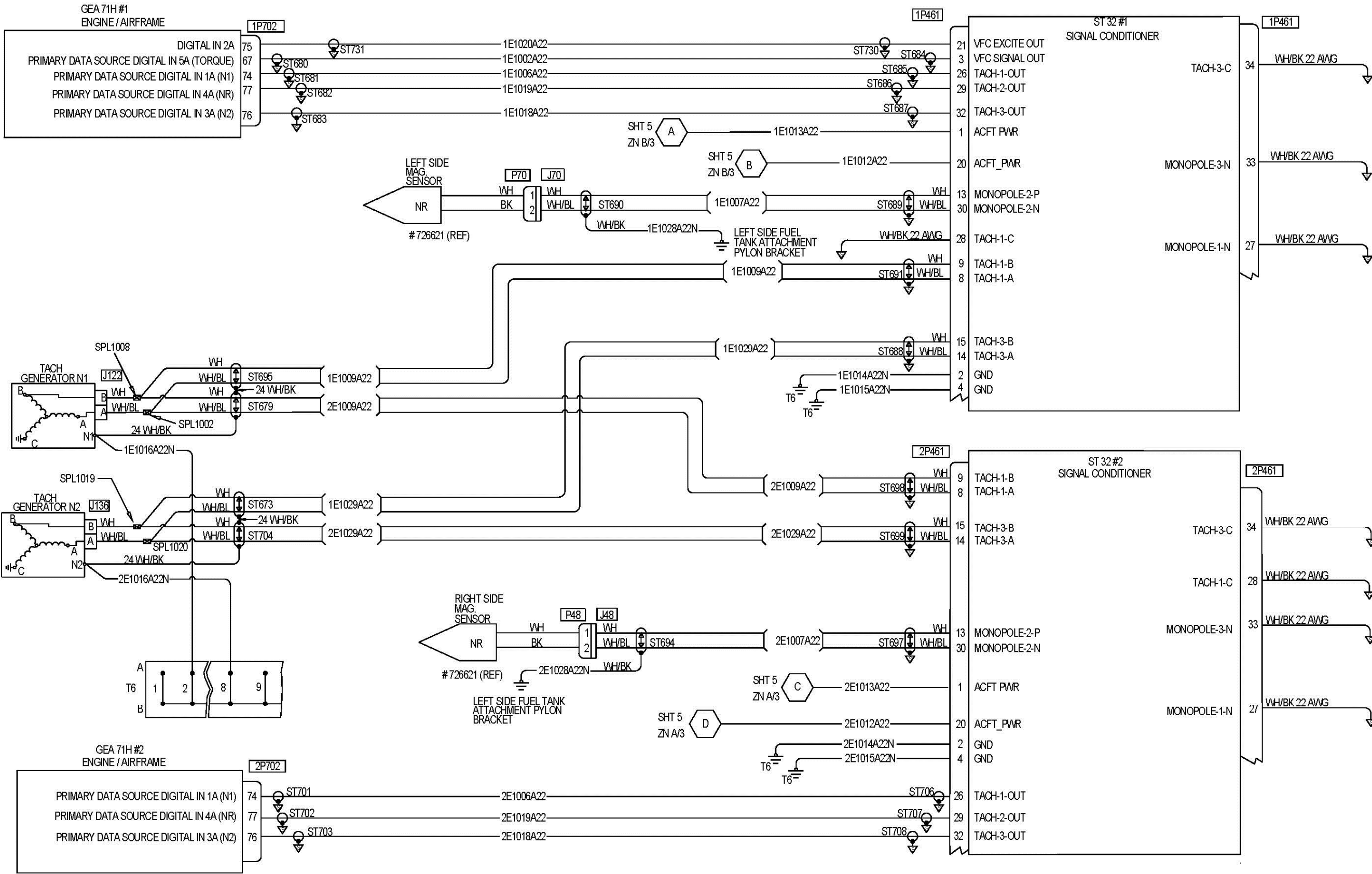


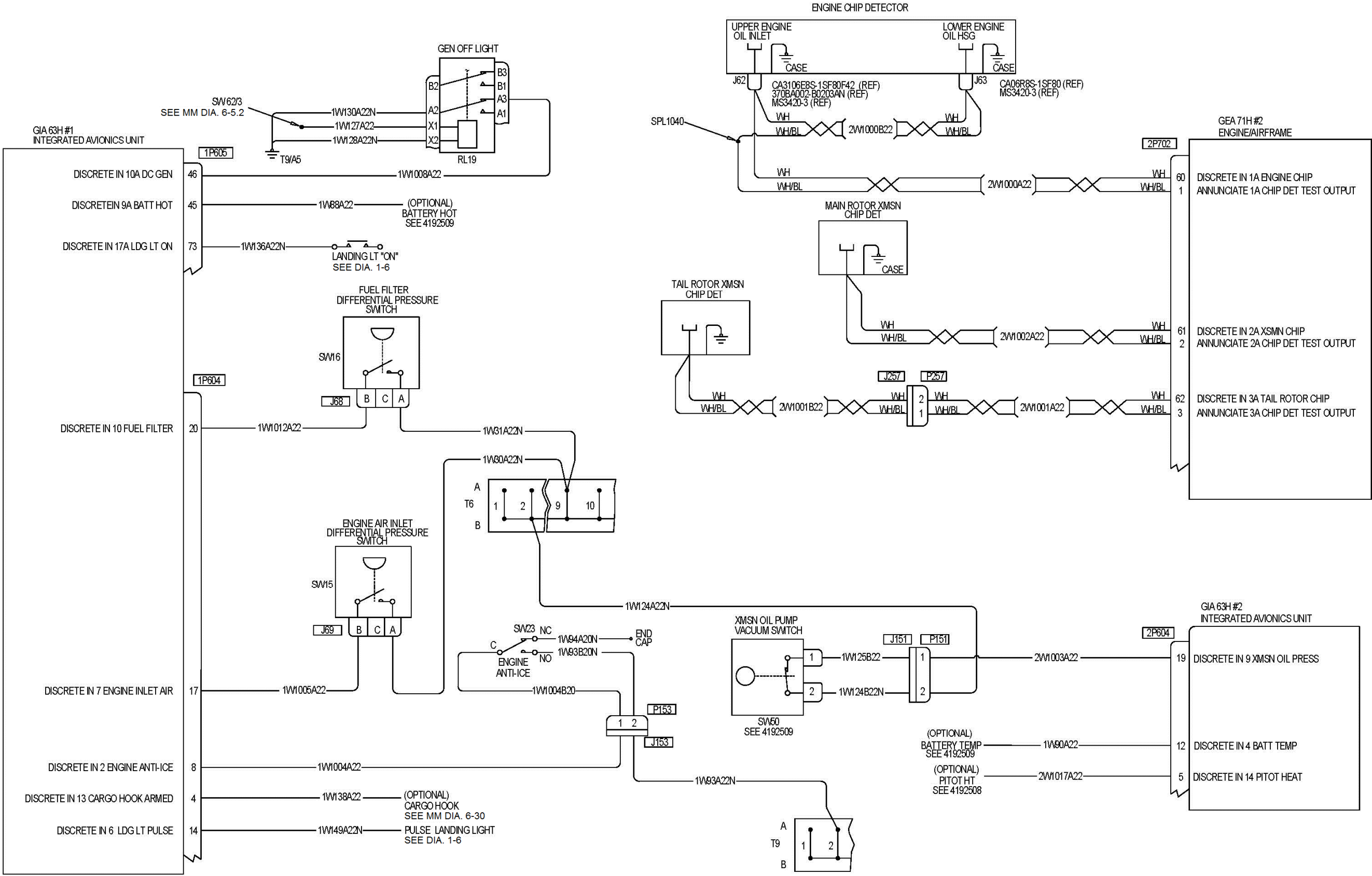
Diagram 1-10. G1000H Interface
(Ref. 4192801-3 Rev. A) (Sheet 7 of 10)
Rev. 1, Jan 25/18
Page 1-111 (1-112 Blank)

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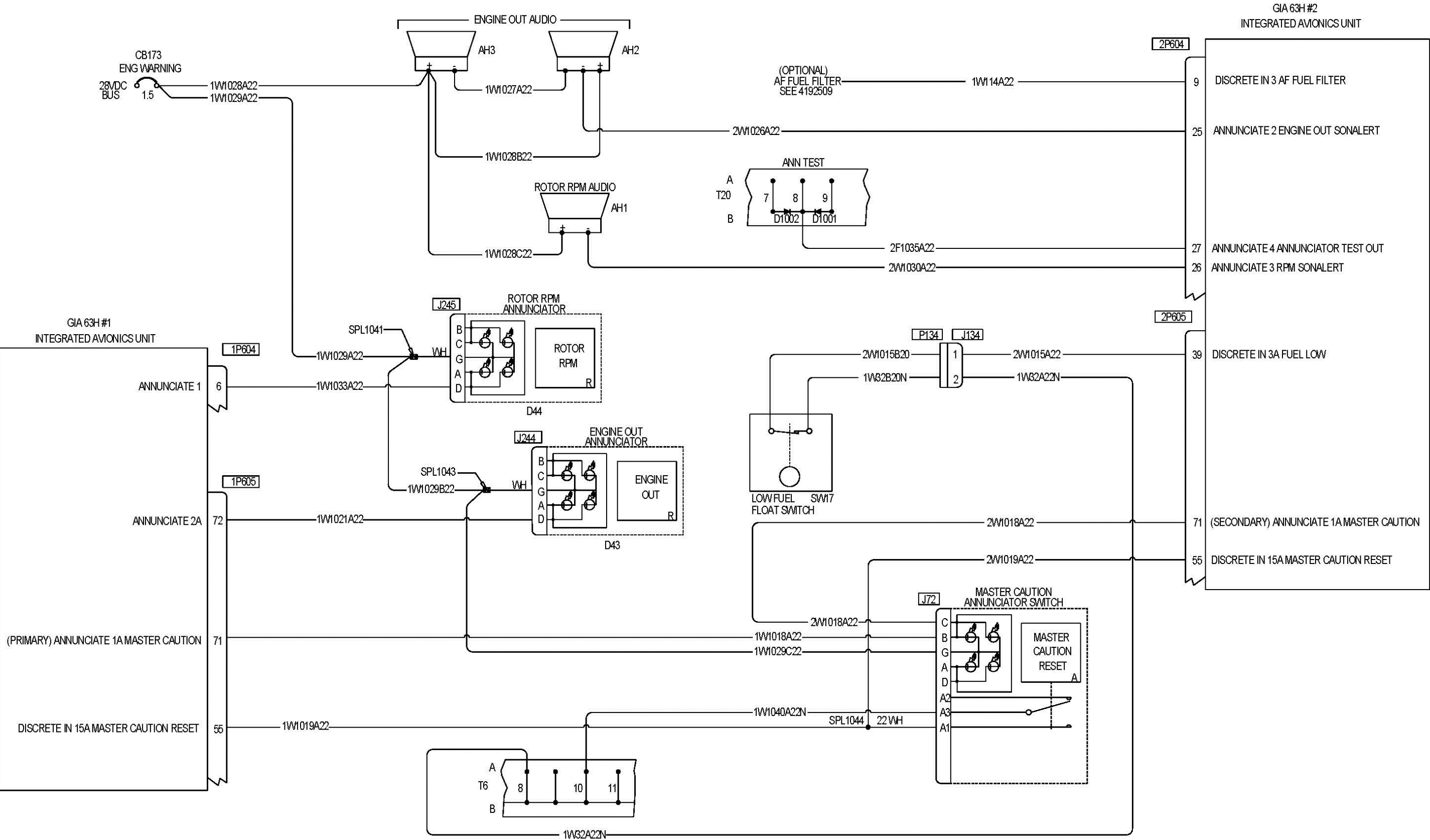


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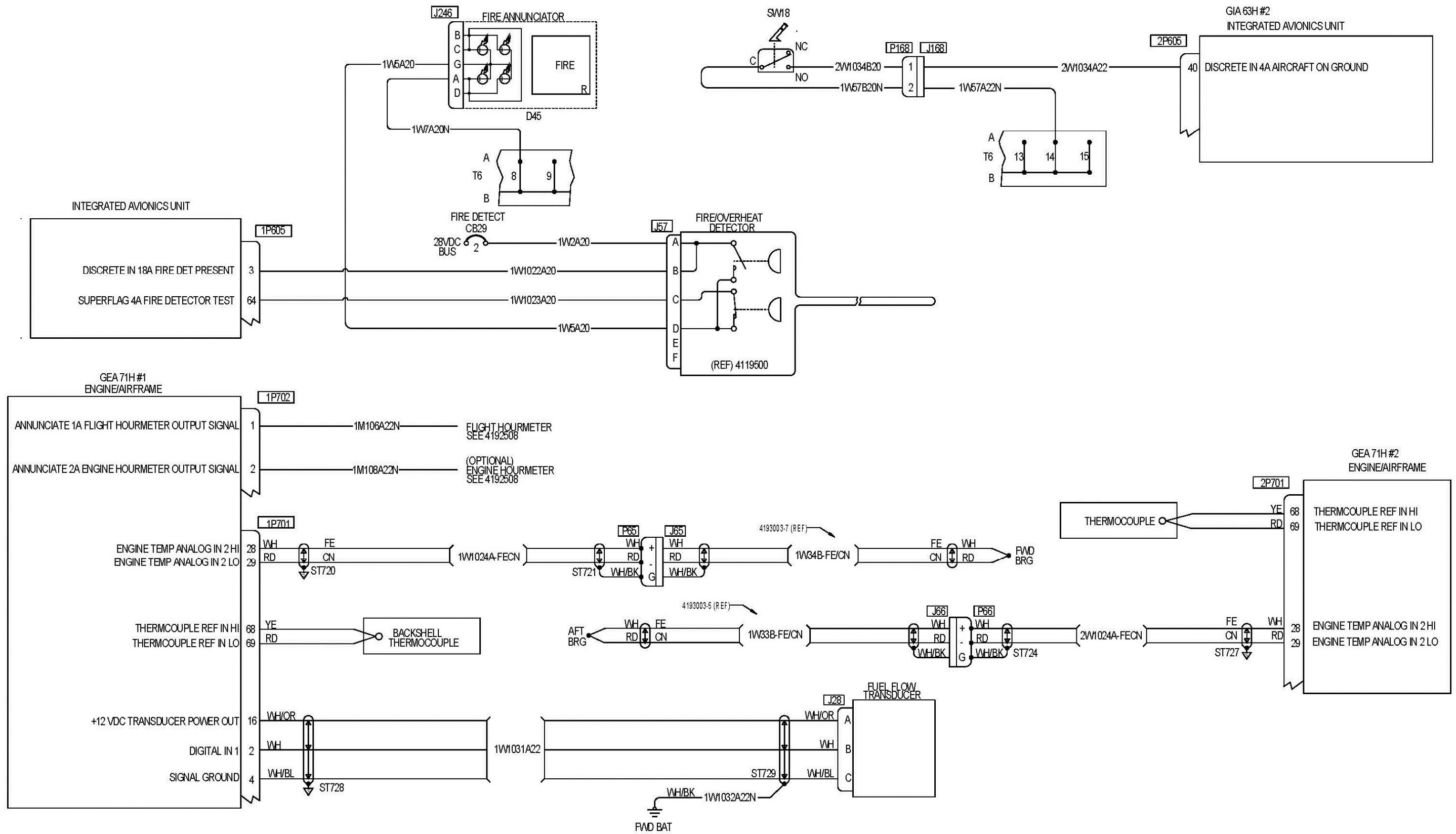


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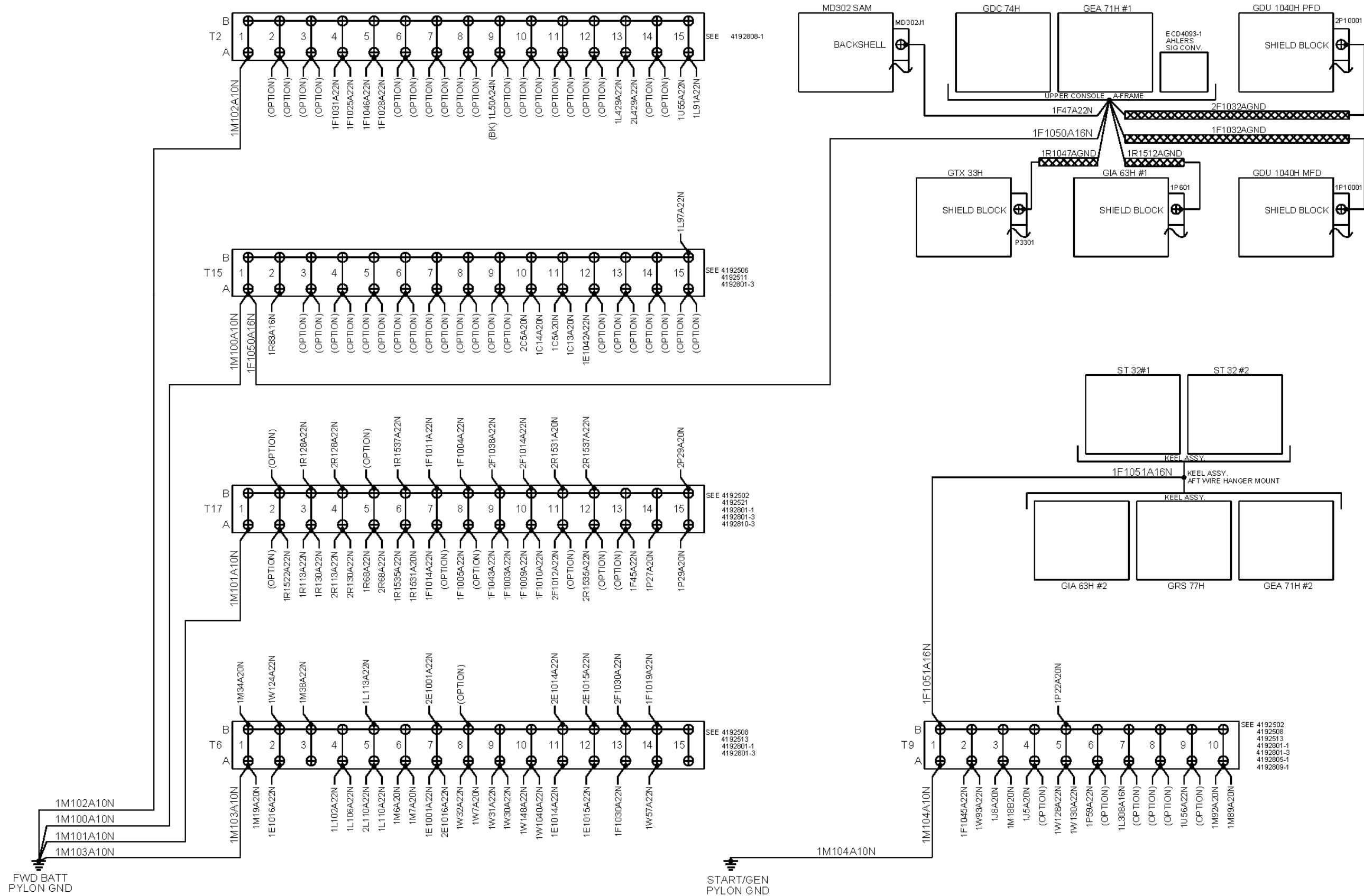


Diagram 1-11. G1000H Ground Interface
(Ref. 4192806-1 Rev. A)
Rev. 1, Jan 25/18
Page 1-119 (1-120 Blank)

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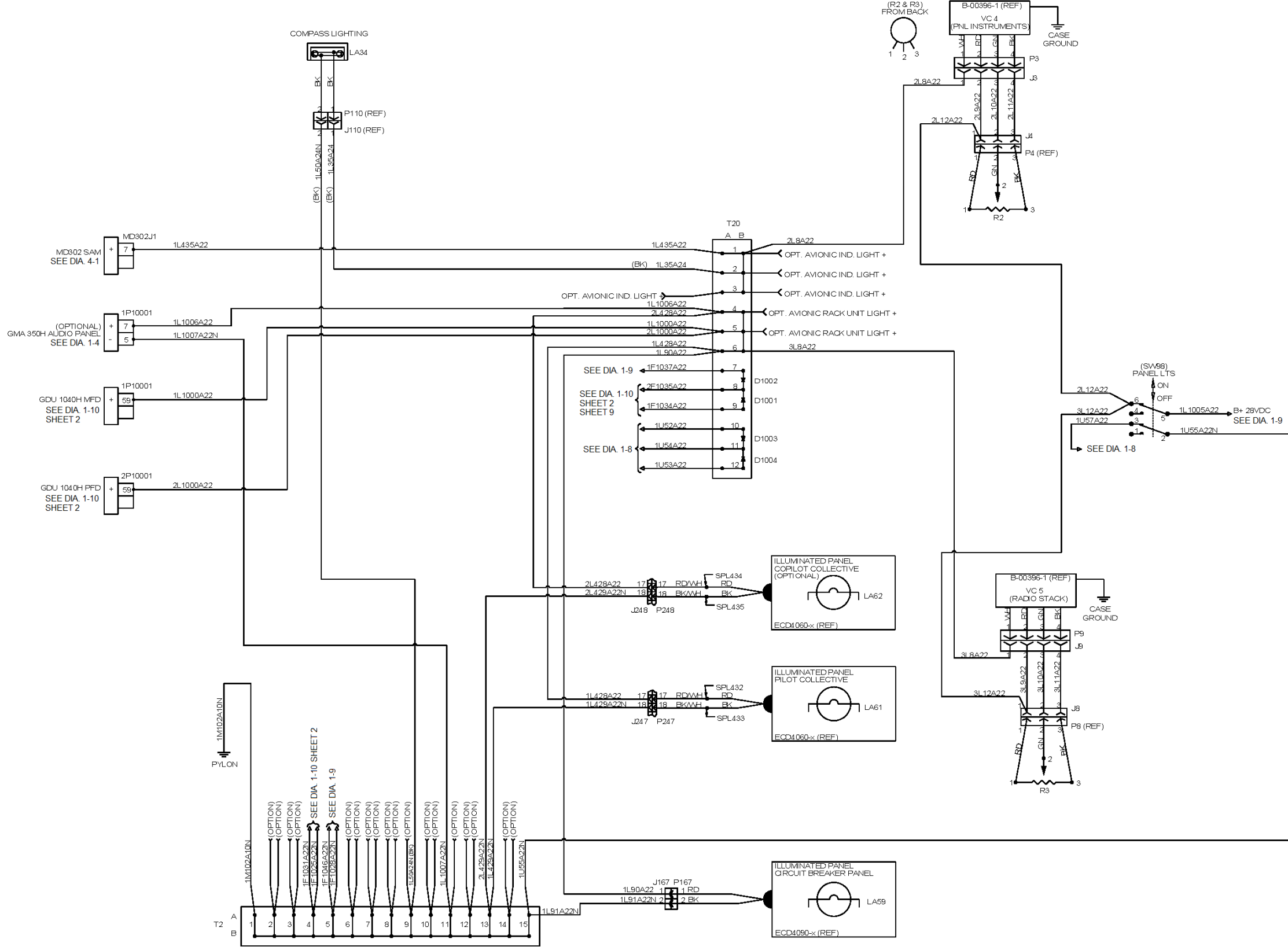


Diagram 1-12. G1000H Interior Lighting Interface
 (Ref. 4192808-1 Rev. A)
 Rev. 1, Jan 25/18
 Page 1-121 (1-122 Blank)

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MAIN LIGHTING					
SELECT UNIT					
PFD1					
DISPLAY					
INPUT	PHOTO	96.98		SET CURVE	
BRIGHTNESS		96.98		x1= 0	y1= 0
LIGHTING MODE	NORMAL			x2= 20	y2= 0
SOURCE	28V DC			x3= 40	y3= 1
ES REPOSE TIME	0			x4= 60	y4= 2
PC RESPONSE TIME	0			x5= 80	y5= 3
MINIMUM	0.14			x6= 100	y6= 8
EDIT CURVE VERTEX	NONE			SET PHOTO	
PHOTO TRANSITION %	10.0			x1= 0	y1= 0
EDIT PHOTO VERTEX	NONE			x2= 20	y2= 20
				x3= 40	y3= 40
				x4= 60	y4= 60
				x5= 80	y5= 80
				x6= 100	y6= 100
KEY					
INPUT		0.00		SET CURVE	
BRIGHTNESS		0.14		x1= 0	y1= 0
LIGHTING MODE	NORMAL			x2= 20	y2= 1
SOURCE	28V DC			x3= 40	y3= 1
ES REPOSE TIME	0			x4= 51	y4= 2
PC RESPONSE TIME	0			x5= 73	y5= 5
MINIMUM	0.14			x6= 100	y6= 8
EDIT CURVE VERTEX	NONE			SET PHOTO	
				x1= 0	y1= 0
				x2= 15	y2= 23
				x3= 30	y3= 45
				x4= 45	y4= 68
				x5= 78	y5= 78
				x6= 82	y6= 0

MAIN LIGHTING					
SELECT UNIT					
MFD1					
DISPLAY					
INPUT	PHOTO	96.98		SET CURVE	
BRIGHTNESS		96.98		x1= 0	y1= 0
LIGHTING MODE	NORMAL			x2= 20	y2= 0
SOURCE	28V DC			x3= 40	y3= 1
ES REPOSE TIME	0			x4= 60	y4= 2
PC RESPONSE TIME	0			x5= 80	y5= 3
MINIMUM	0.14			x6= 100	y6= 8
EDIT CURVE VERTEX	NONE				
PHOTO TRANSITION %	10.0			SET PHOTO	
EDIT PHOTO VERTEX	NONE			x1= 0	y1= 0
				x2= 20	y2= 20
				x3= 40	y3= 40
				x4= 60	y4= 60
				x5= 80	y5= 80
				x6= 100	y6= 100
KEY					
INPUT		0.00		SET CURVE	
BRIGHTNESS		0.14		x1= 0	y1= 0
LIGHTING MODE	NORMAL			x2= 20	y2= 1
SOURCE	28V DC			x3= 40	y3= 2
ES REPOSE TIME	0			x4= 51	y4= 3
PC RESPONSE TIME	0			x5= 72	y5= 5
MINIMUM	0.14			x6= 100	y6= 8
EDIT CURVE VERTEX	NONE				
				SET PHOTO	
				x1= 0	y1= 0
				x2= 15	y2= 23
				x3= 30	y3= 45
				x4= 45	y4= 68
				x5= 78	y5= 78
				x6= 82	y6= 0

SYSTEM SETUP		
DATE/TIME	AIRSPACE ALERTS	MFD DATA BAR FIELDS
DATE 06-JUN-14	ALTITUDE BUFFER 200FT	FIELD 1 GS
TIME 1:49:05PM	CLASS B/TMA ◀OFF▶	FIELD 2 DTK
TIME FORMAT LOCAL 12hr	CLASS C/TCA ◀OFF▶	FIELD 3 TRK
TIME OFFSET -05:00	CLASS D ◀OFF▶	FIELD 4 ETE
DISPLAY UNITS	RESTRICTED ◀OFF▶	GPS CDI
NAV ANGLE MAGNETIC(°)	MOA (MILITARY) ◀OFF▶	SELECTED AUTO
MAG VAR 4°W	OTHER/ADIZ ◀OFF▶	SYSTEM CDI 2.00 NM
DIS. SPD NAUTICAL(NM,KT)	ARRIVAL ALERT	COM SPACING
ALT. VS FEET(FT,FPM)	◀ON▶ 1.0NM	CHANNEL SPACING 25.0 kHz
TEMP CELSIUS(°)	AUDIO ALERT	NEAREST APT
FUEL POUNDS(LB,LB/HR)	VOICE FEMALE	RNWX SURFACE HARD/SOFT
WEIGHT POUNDS(LB)	FLIGHT DIRECTOR	MIN LENGTH 0FT
POSITION HDDD°MM.MM'	FORMAT ACTIVE SNGL CUE	
BARO TRANSITION ALERT	FORMAT ALLOWED SNGL CUE	
◀OFF▶ ALTITUDE 18000FT		
FUEL		
TYPE Jet A		
ALT SEL		
ROUND ALT		
CLICKS IN OUT		
LARGE INCR		
SMALL INCR		

COM SETUP				
SELECT GIA UNIT				
GIA1				
CONFIGURATION / CALIBRATION				
			SET	ACTIVE
FREQUENCY	136.975	EMERGENCY VOL	32	32
SPACING	25.0 kHz	SQ 250	0	0
VOLUME	35	SQ 833	0	0
		SIDETONE	0	0
		MIC GAIN	0	0

COM SETUP				
SELECT GIA UNIT				
GIA2				
CONFIGURATION / CALIBRATION				
			SET	ACTIVE
FREQUENCY	118.000	EMERGENCY VOL	32	32
SPACING	25.0 kHz	SQ 250	0	0
VOLUME	35	SQ 833	0	0
		SIDETONE	0	0
		MIC GAIN	0	0

SYSTEM CONFIGURATION			
GDUS PRESENT			
MFD1	<input checked="" type="checkbox"/>		
PFD1	<input checked="" type="checkbox"/>		
PFD2	<input type="checkbox"/>		
GIAS PRESENT			
GIA1	<input checked="" type="checkbox"/>		
GIA2	<input checked="" type="checkbox"/>		
GSDS PRESENT			
GSDS1	<input type="checkbox"/>		
GSDS2	<input type="checkbox"/>		
GSDS3	<input type="checkbox"/>		
OTHER LRUS PRESENT			
GDL59	<input type="checkbox"/>	GRA1	<input type="checkbox"/>
GDL69	<input type="checkbox"/>	DRA2	<input type="checkbox"/>
GWX	<input type="checkbox"/>		
GTS	<input type="checkbox"/>		
GTC1	<input type="checkbox"/>		
GTC2	<input type="checkbox"/>		
GTC3	<input type="checkbox"/>		
GTC4	<input type="checkbox"/>		
GMA1	<input checked="" type="checkbox"/>		
GMA2	<input type="checkbox"/>		
GDR	<input type="checkbox"/>		

GMA MARKER BEACON CONFIGURATION		
SELECT GMA UNIT		
GMA1		
CONFIGURATION / CALIBRATION		
	SET	ACTIVE
DISABLE HIGH SENSITIVITY	FALSE	FALSE
AUDIO OFFSET THRESHOLD	-10dB	-10dB
AUDIO OFF DEBOUNCE	700	700
HI SENSITIVITY OFFSET	0	0
LO SENSITIVITY OFFSET	0	0

FUEL TANK CALIBRATION			
- Calibrate the fuel quantity to the points listed in the Actual Quantity Column in the Calibration Table as shown: - Enter Fuel Flow ENG 1 SCALE adjustment by using the following equation:			
$ENG\ 1\ SCALE = \frac{36.0}{K\ FACTOR\ (printed\ on\ the\ fuel\ flow\ transducer)}$			
FUEL FLOW		FUEL CALIBRATION POINTS	
ENG 1 SCALE	0.83026	CURRENT TANK	LEFT
ENG 2 SCALE	1.00000	FUEL UNITS	POUNDS(LB, LB/HR)
FUEL TEMP L		SENSOR LIMITS	
OFFSET	-----	LEFT 1 FLOOR	0.00000
RAW VAL	-----°C	LEFT 1 CEILING	341.85526
CAL VAL	0.000°C	LEFT 2 FLOOR	0.00000
		LEFT 2 CEILING	0.00000
		LEFT 3 FLOOR	0.00000
		LEFT 3 CEILING	0.00000
		LEFT 4 FLOOR	0.00000
		LEFT 4 CEILING	0.00000
		LEFT 5 FLOOR	0.00000
		LEFT 5 CEILING	0.00000
		SENSOR INPUTS	
		LEFT 1	197.22238
		LEFT 2	-----
		LEFT 3	-----
		LEFT 4	-----
		LEFT 5	-----
		ACTUAL FUEL QUANTITY	197.22238
		CALIBRATION VALUE	
		CALIBRATE?	
		CALIBRATION TABLE	
		ACTUAL QUANTITY	CALIBRATED VALUE
		0.00LB	5.30842
		16.80LB	36.31241
		33.60LB	58.33197
		50.40LB	76.01625
		67.20LB	89.31068
		100.80LB	103.53942
		134.40LB	120.45727
		168.00LB	141.24989
		201.60LB	151.22206
		235.20LB	166.59962
		268.80LB	182.89868
		302.40LB	195.92339
		336.00LB	209.91383
		369.60LB	223.92796
		403.20LB	238.05873
		436.80LB	252.80664
		470.40LB	268.15509
		504.00LB	284.37354
		537.60LB	301.82996
		571.20LB	320.52600
		606.00LB	337.71881
		CALIBRATED TOTAL	305.41 LB
NOTE: ENG 1 SCALE VALUE AND CALIBRATION TABLE VALUES VARY FROM HELICOPTER TO HELICOPTER. TYPICALLY, NO ADJUSTMENTS ARE NECESSARY UNLESS THE FUEL FLOW TRANSDUCER OR FUEL QUANTITY SENSOR IS REPLACED.			

TRANSPONDER CONFIGURATION			
SELECT GIA UNIT			
XPNDR1			
CONFIGURATION			
	SET	ACTIVE	
LATERAL OFFSET FROM CENTER (M)	0	0	
LONGITUDINAL OFFSET FROM NOSE (M)	6	6	
AIRFRAME CONFIGURATION			
	SET	XPNDR1 ACTIVE	NOTES
VFR CODE	1200	1200	
AIRCRAFT WEIGHT	ROTORCRAFT	ROTORCRAFT	
MAX AIRSPEED	<= 150 KTS	<= 150 KTS	
ADDRESS TYPE	US TAIL	US TAIL	Typical for U.S. customers
	HEX ID	HEX ID	Typical for non-U.S. customers
ICAO ADDRESS	AXXXXX	AXXXXX	
FLIGHT ID TYPE	SAME AS TAIL	SAME AS TAIL	Default setting/if PFD entry of FLIGHT ID is not desired
	PFD ENTRY	PFD ENTRY	If PFD entry of FLIGHT ID is desired
FLIGHT ID	AXXXXX	AXXXXX	
ENHANCED SURVEIL	DISABLED	DISABLED	
1090 IN	DISABLED	DISABLED	
UAT IN	DISABLED	DISABLED	
ADS-B TRANSMIT	PILOT SELECT	PILOT SELECT	
AIRCRAFT WIDTH	<= 11.5 MT	<= 11.5 MT	
AIRCRAFT LENGTH	<= 15 MT	<= 15 MT	
SOURCE INTEGRITY	<1x10 ⁻⁷ ERR/HR FLT	<1x10 ⁻⁷ ERR/HR FLT	
			After the transponder configuration settings have been set, on the aircraft configuration page, enter the aircraft registration number and press the "SET GTX1" softkey.

INTENTIONALLY LEFT BLANK

Table 5. CMC/TOT Exceedances

ALERT ID	ALERT NAME	ALERT TRIGGER LOGIC
Alert 17	ROTOR HIGH	NR > 385
Alert 18	ROTOR LOW	(AOG = FALSE) + (NR < 334)
Alert 19	N2 HIGH	N2 > 103
Alert 20	N2 LOW	(AOG = FALSE) + (N2 < 101)
Alert 21	N2 MAX LIMIT	(N2 > 113)
Alert 22	N2 TRANSIENT	(113 ≥ N2 > 103) > (15 Sec)
Alert 1049 (Trigger ID 1048)	TOT LIMIT 5 MIN	(N1 ≥ 58) + (810 > TOT > 737) > (5 Min)
	TOT TRANSIENT	(N1 ≥ 58) + (810 < TOT ≤ 843) > (6 Sec)
	TOT MAX LIMIT	(N1 ≥ 58) + (TOT > 843)
Alert 1049 (Trigger ID 1047)	TOT START LIMIT 10 SEC	(N1 < 58) + (927 > TOT > 810) > (10 Sec)
	TOT START LIMIT 1 SEC	(N1 < 58) + (927 = TOT) > (1 Sec)
	TOT START MAX LIMIT	(N1 < 58) + (TOT > 927)
	TOT START LIMIT 5 MIN	(N1 < 58) + (810 > TOT > 737) > (5 Min)
Alert 29	TORQUE LIMIT 5 MIN	(65 < TORQUE ≤ 72) > (5 Min)
Alert 30	TORQUE MAX LIMIT	(TORQUE > 72)
Alert 31	ENGINE OUT	(AOG = FALSE) + (N1 < 59)
Alert 32	N1 LIMIT 15 SEC	(105 < N1 ≤ 106) > (15 Sec)
Alert 33	N1 MAX LIMIT	(N1 > 106)
Alert 34	XMSN OIL TEMP	(XMSN OT > 107)
Alert 35	XMSN OIL PRESS	(AOG = FALSE) + (MAIN XMSN PRESS CAS = TRUE)
Alert 36	ENG OIL TEMP	(EOT > 107)
Alert 37	ENG OIL PRESS MAX LIMIT	(EOP > 130)
Alert 38	ENG OIL PRESS LOW 94 N1	(N1 > 94) + (EOP < 115) > (1 Sec)
Alert 39	ENG OIL PRESS LOW 78.5 N1	(78.5 ≤ N1 ≤ 94) + (EOP < 90) > (1 Sec)
Alert 40	ENG OIL PRESS LOW	(58 < N1 < 78.5) + (EOP < 50) > (1 Sec)
Alert 41	VDC MAX LIMIT	(VDC > 32)
Alert 42	AMP MAX LIMIT	(AMP > 150)
Alert 43	ENG CHIP	(ENG CHIP CAS = True) + (AOG = FALSE)
Alert 44	MAIN XMSN CHIP	(MAIN XMSN CHIP CAS = TRUE) + (AOG = FALSE)
Alert 45	TAIL ROTOR CHIP	(TAIL ROTOR CHIP CAS = TRUE) + (AOG = FALSE)
Alert 46	ENG INLET AIR	(ENG INLET AIR CAS = TRUE) + (AOG = FALSE)
Alert 47	DC GENERATOR	(DC GENERATOR CAS = TRUE) + (AOG = FALSE)
Alert 48	FWD DR BRG HOT	(FWD DR BRG HOT CAS = TRUE) + (AOG = FALSE)
Alert 49	AFT DR BRG HOT	(AFT DR BRG HOT CAS = TRUE) + (AOG = FALSE)
Alert 52	FUEL FILTER	(FUEL FILTER CAS = TRUE) + (AOG = FALSE)
Alert 53	A/F FUEL FILTER	(A/F FUEL FILTER CAS = TRUE) + (AOG = FALSE)
Alert 54	FUEL LOW	(FUEL LOW CAS = TRUE) + (AOG = FALSE)
Alert 55	AVI FAN FAIL	(AVI FAN FAIL CAS = TRUE)
Alert 56	PFD FAN FAIL	(PFD FAN FAIL CAS = TRUE)
Alert 57	MFD FAN FAIL	(MFD FAN FAIL CAS = TRUE)
Alert 58	AIRSPEED LIMIT	(AIRSPEED > 125) + (AOG = FALSE)
Alert 59	N1 MISCOMPARE	(N1 MISCOMPARE CAS = TRUE)
Alert 60	N2 MISCOMPARE	(N2 MISCOMPARE CAS = TRUE)
Alert 61	NR MISCOMPARE	(NR MISCOMPARE CAS = TRUE)
Alert 62	TOT MISCOMPARE	(TOT MISCOMPARE CAS = TRUE)

Table 6. Aircraft Flight Data

Local Date (YYYY-MM-DD)
Local Time (HH:MM:SS)
UTC Offset (HH:MM)
Active Waypoint Identifier
Latitude (degrees)
Longitude (degrees)
Barometric Altitude (feet)
Altimeter Setting (in. Hg.)
Mean Sea level (feet)
OAT (deg. °C)
Indicated Airspeed (kts)
Ground Speed (kts)
Vertical Speed (fpm)
Pitch (degrees)
Roll (degrees)
Lateral Acceleration (g)
Normal Acceleration (g)
Heading (degrees magnetic)
Ground Track (degrees magnetic)
E1 Batt Voltage (volts)
E2 Batt Amps (amps)
Fuel Quantity (gals)
GPS Altitude (ft)
True Airspeed (kts)
HSI Selection (GPS,NAV1/2)
Course (deg)
NAV1 Frequency (MHz)
NAV2 Frequency (MHz)
COM1 Frequency (MHz)
COM2 Frequency (MHz)
Horiz. CDI Deflection (0.0 to 1.0)
Vert. CDI Deflection (0.0 to 1.0)
Wind Speed (kts)
Wind Direction (degrees mag.)
Active Waypoint Distance (nm)
Active Waypoint Bearing (degrees mag.)
Magnetic Variation (degrees)
AFCS On (0 – false, 1 – true)
AFCS Roll Mode (e.g. HDG, LOC, GPS, VOR, ROL)
AFCS Pitch Mode (e.g. ALT, GS, GP, VS)
Roll Commanded (degrees)
Pitch Commanded (degrees)
Vert. Speed Selected (fpm)
GPS Fix (e.g. 2D, 3D, 3DDiff)
Horizontal Alert Limit (HAL, meters)
Vertical Alert Limit (VAL, meters)
Horizontal Protection Level (HPLWAS, meters)
Horizontal Protection Level (HPLFD, meters)
Vertical Protection Level (VPLWAS, meters)

Table 7. Aircraft Engine Data

E1 Fuel Flow (gph)
E1 Oil Temperature (°F) <i>(XMSN Oil Temp)</i>
E1 Engine Oil Pressure (psi)
E1 NP RPM (RPM) <i>(NR Main Rotor RPM)</i>
E1 ITT (°C) <i>(TOT)</i>
E1 N1 RPM (% RPM)
E1 N2 RPM (% RPM)
E2 Engine Oil Temperature (°F)
E2 NP RPM (RPM) <i>(NR Main Rotor RPM)</i>
E2 ITT (°C) <i>(TOT)</i>
E2 N1 RPM (% RPM)
E2 N2 RPM (% RPM)

Notes

“E1” and “E2” correspond with data from the #1 and #2 GEA/Systems, respectively.

Not all fields may be applicable on the 480B at this time, such as AFCS and steering commands.

CHAPTER 2. GTS 800 TRAFFIC ADVISORY SYSTEM

SECTION 1

SYSTEM DESCRIPTION

2.1 System Description

The GTS 800 is a microprocessor-based LRU that uses active interrogations of Mode C transponders to provide Traffic Advisories (TA) to the pilot. The GTS 800 will be interfaced to the GTX 33H with extended squitter (which provides 1090 MHz ADS-B transmit capability) to add passive surveillance capability. Traffic is displayed on the GDU 1040H MFD via an ethernet HSDB. An aural alert is also provided to inform the crew that a TA is being displayed.

The GTS 800 installation includes two antennas. A top-mounted directional antenna (GA 58) is used to derive bearing and altitude of the intruder aircraft. Top antenna transmitted interrogations are directional, reducing the number of transponders that receive the interrogation thus reducing potential garble on the 1090 MHz band. Bottom antenna transmitted interrogations are omni directional, using a monopole antenna (CI 105-6).

Power to the GTS 800 system is provided via the TAS (CB162, 7½ amp) circuit breaker located on the left side of the circuit breaker panel (Figure 16).

Refer to Figure 2 for the GTS 800 unit location and Figure 6 for the antenna locations. Refer to 28-AC-061 Rotorcraft Flight Manual Supplement for GTS 800 operation.

2.1.1 Vendor Publications

The following components listed in Table 8 are to be operated and maintained I/A/W the current vendor's instructions to ensure the continued airworthiness of the aircraft.

Table 8. GTS 800 Vendor Manuals

COMPONENT	PUBLICATION	VENDOR
GTS 800	GTS 8XX/GPA65 Installation Manual, 190-00587-00, latest revision	Garmin International, Inc. 1200 E. 151 st Street Olathe, KS 66062 USA Telephone: 913-397-8200
	G1000H Integrated Avionics System Standard Maintenance Manual, 190-01739-00, latest revision	

SECTION 2

AIRWORTHINESS LIMITATIONS

2.2 Airworthiness Limitations

The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under 14 CFR §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

SECTION 3

SERVICING, TROUBLESHOOTING, AND PERIODIC INSPECTIONS

2.3 Servicing, Troubleshooting, and Periodic Inspections

2.3.1 Servicing

The GTS 800 contains no user serviceable components.

2.3.2 Troubleshooting

Refer to Section 4, *Troubleshooting*, in the G1000H Integrated Avionics System Standard Maintenance Manual, 190-01739-00, and the electrical wiring diagrams in Section 5 of this chapter.

2.3.3 Periodic Inspections

The following inspection checklist is intended as a guide for 100 hour/annual inspections for aircraft operating under normal conditions. More frequent inspections may be required should adverse operating conditions be encountered.

Date		
Signature		
Aircraft Registration Number		
Aircraft Serial Number		
GTS 800		
INITIAL EACH ITEM AFTER ACCOMPLISHMENT		
Inspect the following items every 100 hours or annually	INITIAL	
1. Inspect the GTS 800, electrical cables, and mounts for security, damage, and obvious defects.		
2. Inspect the GTS 800 hardware for corrosion, damage or obvious defects.		
3. Inspect the antennas and mounts for security, damage, and obvious defects.		

SECTION 4

SYSTEM MAINTENANCE

NOTE

Removal or installation of equipment will change the aircraft empty weight and empty weight c.g. These changes will be recorded on Form F-511-5, Basic Weight and Balance Record, as required (reference Enstrom 480B Series Maintenance Manual).

2.4 System Maintenance – GTS 800

2.4.1 Scheduled Maintenance

There is no scheduled maintenance for the GTS 800. Maintenance is “On Condition Only”.

2.4.2 Removal

- A. Remove power to the GTS 800 unit. Pull the TAS circuit breaker out. Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Turn the harness connector jackscrews counterclockwise to disengage them from the unit. Pull the harness connectors away from the unit to remove them.
- C. Disengage the QMA coax connectors by pulling back firmly on the outer sleeve of the QMA plug away from the jack connector. This will disengage the locking mechanism that secures the plug connector to the jack connector. Pulling on or disengaging the QMA connectors in any other way is not recommended and may cause damage to both the connectors and coaxial cable.
- D. Loosen the unit hold down clamp by turning counterclockwise until it disengages the unit hold down tab.
- E. From the connector end of the unit, pull the unit up slightly at an angle and pull the unit out of the rack.

2.4.3 Installation

- A. Hold the unit at a slight angle with the connector end up and slide the back of the unit into the rack engaging the curled up lip at the back of the rack.
- B. Firmly seat the unit the rest of the way in the rack and tighten hold down clamp by turning clockwise.
- C. Inspect rack connectors and for damaged pins before installing the unit. Install rack connectors.

- D. Install antenna COAX cable connections. Refer to the electrical interface (Diagram 2-1) or TAS information will be improperly displayed.
- E. Remove the cable tie or other similar device from the TAS circuit breaker stem and push the stem in to set the circuit breaker.
- F. Perform the GTS 800 checkout procedure in accordance with Paragraph 3.11 of the GTS 8XX/GPA 65 Installation Manual.

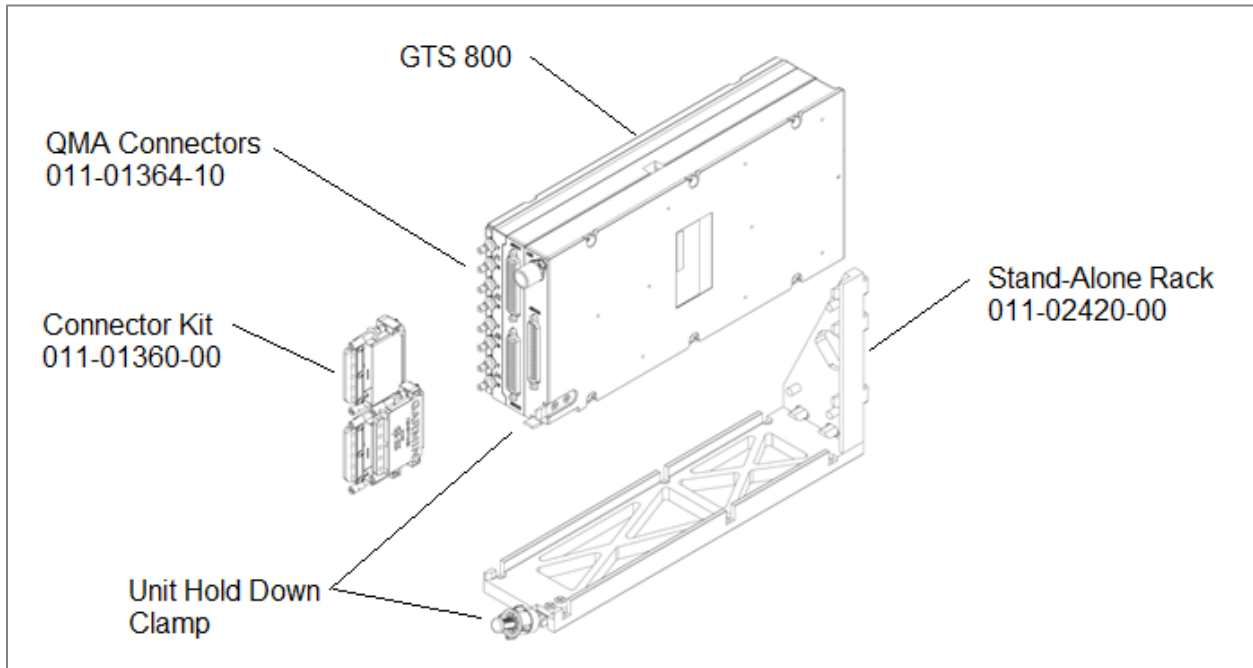


Figure 30. GTS 800 Installation and Removal

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SECTION 5
ELECTRICAL WIRING DIAGRAMS

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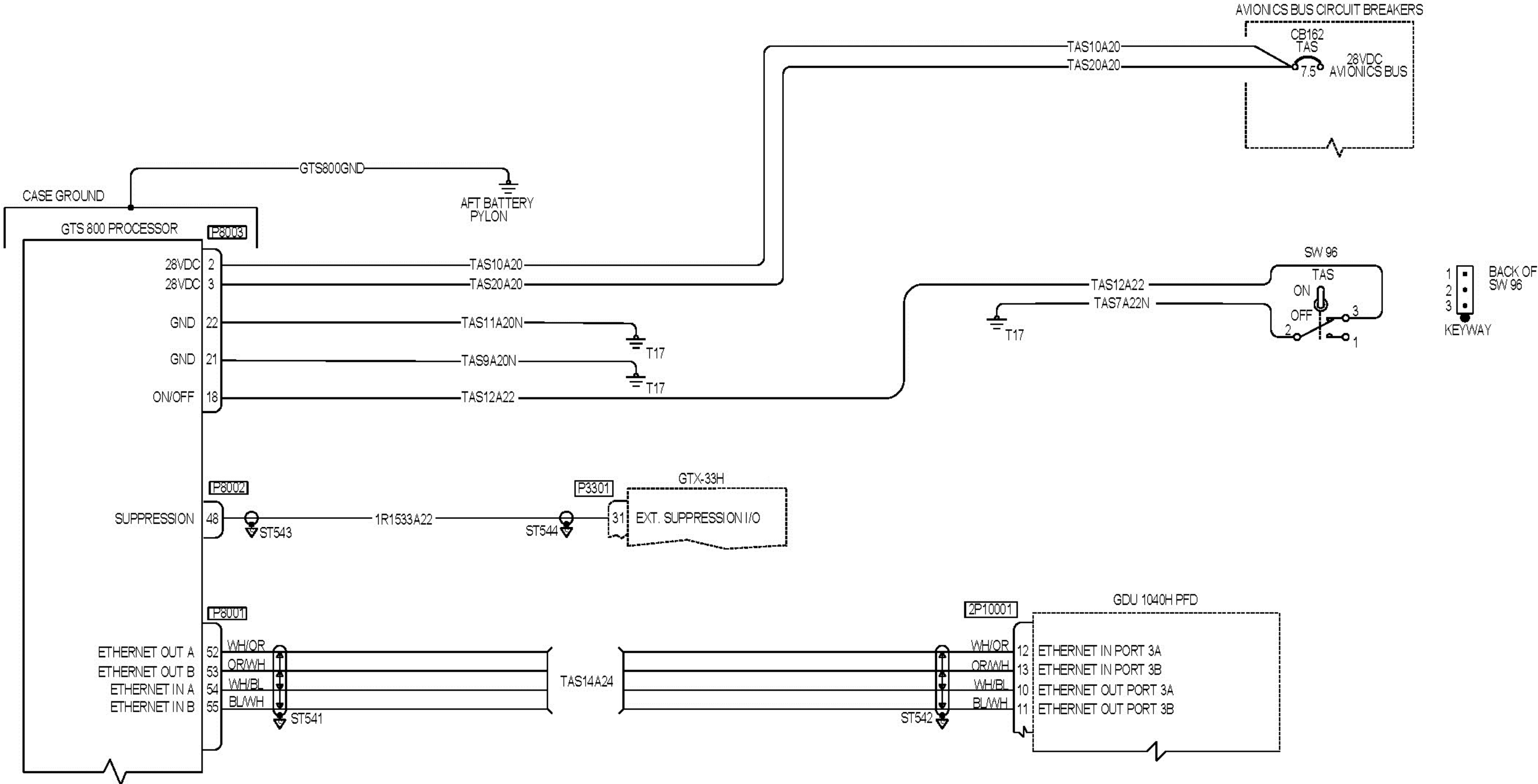


Diagram 2-1. GTS 800 Traffic Advisory System Interface (Sheet 1 of 2)

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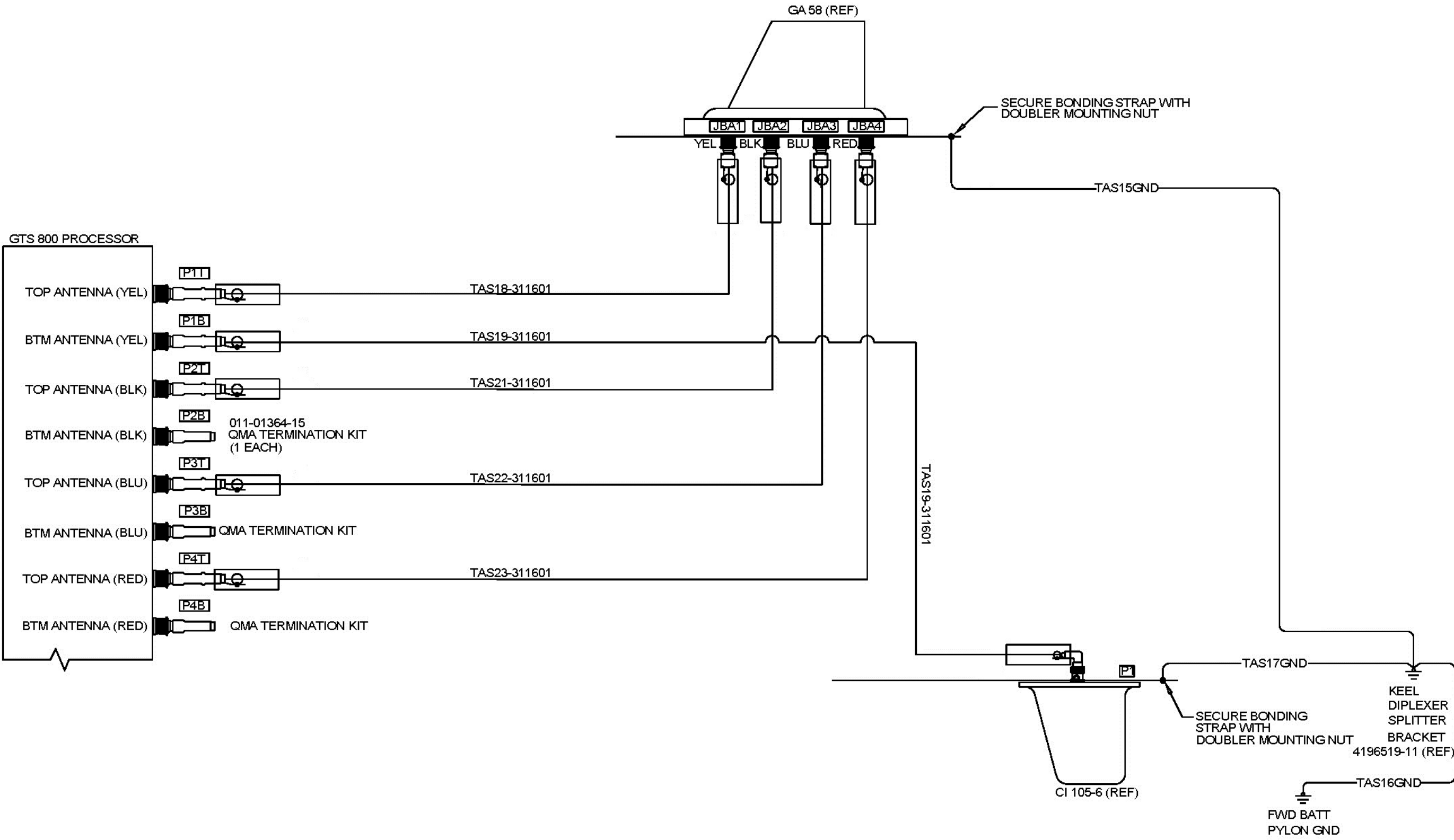


Diagram 2-1. GTS 800 Traffic Advisory System Interface (Sheet 2 of 2)

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CHAPTER 3. GDL 69AH XM WEATHER RECEIVER

SECTION 1

SYSTEM DESCRIPTION

3.1 System Description

The GDL 69AH is an XM Satellite Radio data link receiver. The XM Satellite Radio antenna (GA 55) receives the XM satellite signal and passes it to the GDL 69AH. The GDL 69AH is a weather receiver with the addition of XM Satellite Radio audio entertainment. Weather information is displayed on the GDU 1040H (MFD) display via an ethernet link. The GDL 69AH is interfaced to the Garmin GMA 350H audio panel for amplification and distribution of the audio signal.

Power to the GDL 69AH system is provided via the XM DL (CB163, 1 amp) circuit breaker located on the left side of the circuit breaker panel (Figure 16).

Refer to Figure 4 for the GDL 69AH unit location and Figure 6 for the antenna location. Refer to 28-AC-062 Rotorcraft Flight Manual Supplement for GDL 69AH operation.

NOTE

For information regarding the GMA 350H audio panel, refer to the GMA 350H electrical schematic (Diagram 1-4) in this supplement and TH-28/480 Series Maintenance Manual Supplement 5 (Chapter 9). For operation, refer to 28-AC-051 Rotorcraft Flight Manual Supplement. For operation of helicopters registered in countries that recognize approvals granted by EASA, refer to 28-AC-073 Rotorcraft Flight Manual Supplement.

3.1.1 Vendor Publications

The following components listed in Table 9 are to be operated and maintained I/A/W the current vendor's instructions to ensure the continued airworthiness of the aircraft:

Table 9. GDL 69AH Vendor Manuals

Component	Publication	Vendor
GDL 69AH	GDL 69 Series Installation Manual, 190-00355-07, latest revision	Garmin International, Inc. 1200 E. 151 st Street Olathe, KS 66062 USA Telephone: 913-397-8200
	G1000H Integrated Avionics System Standard Maintenance Manual, 190-01739-00, latest revision	

SECTION 2

AIRWORTHINESS LIMITATIONS

3.2 Airworthiness Limitations

The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under 14 CFR §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

SECTION 3

SERVICING, TROUBLESHOOTING, AND PERIODIC INSPECTIONS

3.3 Servicing, Troubleshooting, and Periodic Inspections

3.3.1 Servicing

The GDL 69AH contains no user serviceable components.

3.3.2 Troubleshooting

Refer to Section 4, *Troubleshooting*, in the G1000H Integrated Avionics System Standard Maintenance Manual, 190-01739-00, and the electrical wiring diagrams in Section 5 of this chapter.

3.3.3 Periodic Inspections

The following inspection checklist is intended as a guide for 100 hour/annual inspections for aircraft operating under normal conditions. More frequent inspections may be required should adverse operating conditions be encountered.

Date		
Signature		
Aircraft Registration Number		
Aircraft Serial Number		
GDL 69AH XM Weather Receiver		
INITIAL EACH ITEM AFTER ACCOMPLISHMENT		
Inspect the following items every 100 hours or annually		INITIAL
1. Inspect the GDL 69AH, GA 55 antenna, electrical cables, and mounts for security, damage, and obvious defects.		
2. Inspect the GDL 69AH and GA 55 antenna hardware for corrosion, damage or obvious defects.		

SECTION 4
SYSTEM MAINTENANCE

NOTE

Removal or installation of equipment will change the aircraft empty weight and empty weight c.g. These changes will be recorded on Form F-511-5, Basic Weight and Balance Record, as required (reference Enstrom 480B Series Maintenance Manual).

3.4 System Maintenance – GDL 69AH

3.4.1 Scheduled Maintenance

The GDL 69AH is subject to conditional maintenance with the exception described in Section 7 of the G1000H Integrated Avionics System Standard Maintenance Manual.

3.4.2 Removal

- A. Remove power to the GDL 69AH and the PFD. Pull the XM DL and PFD circuit breakers out. Disable the circuit breakers by installing a cable tie or other similar device around the circuit breaker stem.
- B. Access the GDL 69AH by removing the PFD (para. 1.5.1.2).
- C. Loosen the install screw.
- D. Pull the GDL outward and up at least .34 inch. This disengages and clears the retaining wedges for removal.
- E. Remove unit out of the rack.

3.4.3 Installation

- A. Inspect rack connectors for damaged pins before installing the unit.
- B. Locate unit on rack. Lift unit up .34 inch to clear rack mounting hardware and align with retaining wedges.
- C. Tighten installation screw to 15 +/- 2 in-lbs.
- D. Reinstall the PFD (para. 1.5.1.3).
- E. Remove the cable tie or other similar device from the XM DL and PFD circuit breaker stem and push the stem in to set the circuit breaker.
- F. Perform the GDL 69AH testing procedure in accordance with Section 6 of the G1000H Integrated Avionics System Standard Maintenance Manual.

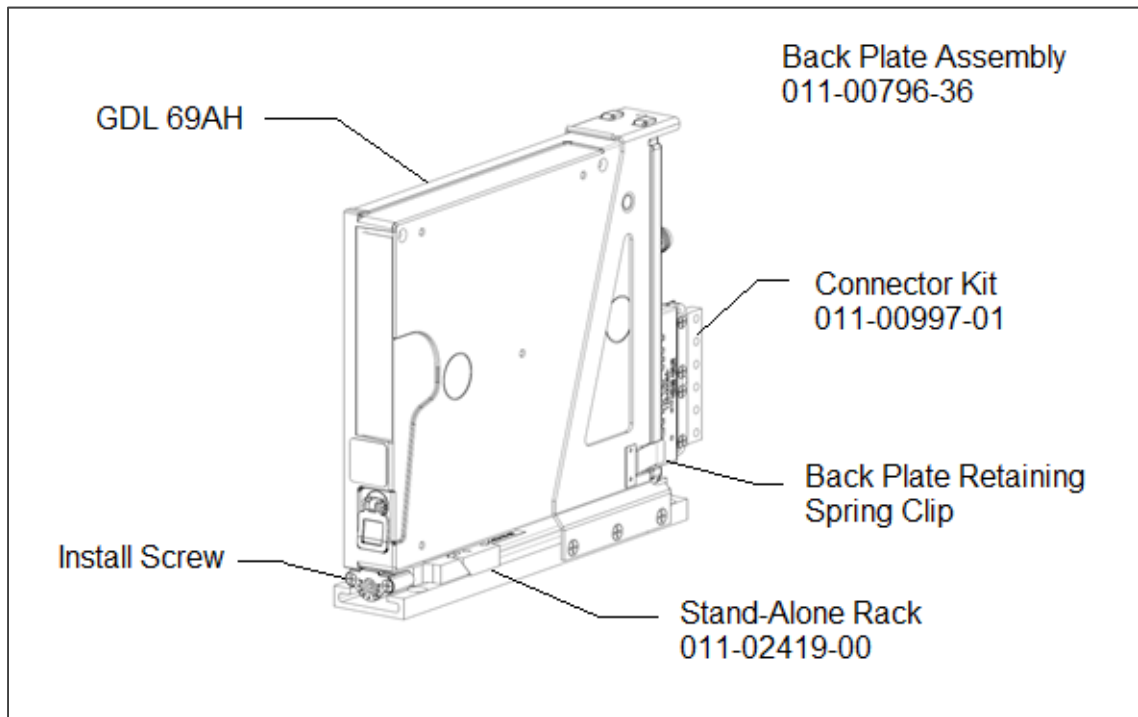


Figure 31. GDL 69AH Installation and Removal

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SECTION 5
ELECTRICAL WIRING DIAGRAMS

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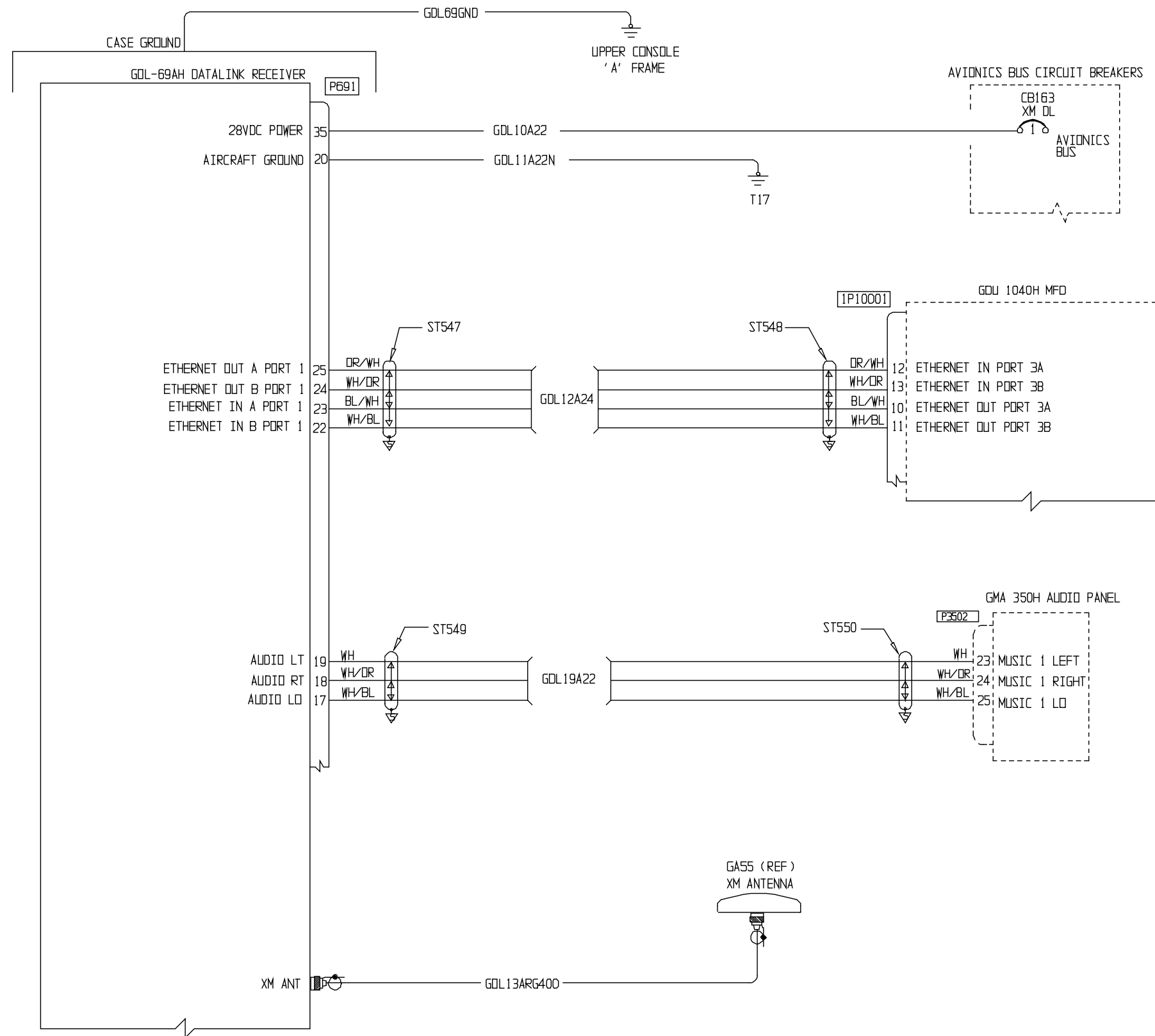


Diagram 3-1. GDL69AH Datalink Receiver Interface
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CHAPTER 4. MD302 STANDBY ATTITUDE MODULE

SECTION 1

SYSTEM DESCRIPTION

4.1 System Description

The Mid-Continent MD302 Standby Attitude Module (SAM) is installed as part of G1000H configuration part number 4220650-3.

The MD302 SAM is a self-contained situational awareness instrument that provides four secondary functions: attitude, altitude, airspeed and slip indication. The central control knob is the only user interface on the unit located at the middle-right of the unit bezel.

The MD302 SAM contains an internal and field-replaceable Nanophosphate lithium-ion battery, which recharges during normal flight, contains a heater for low temperature conditions, and provides a minimum of 1 hour of operation and up to 2.5 hours when new. If aircraft power to the unit is lost in flight, the unit will immediately begin operating on internal battery power.

Power to the MD302 is provided via the **SAM** (CB175, 1.5 amp) circuit breaker located on the left side of the circuit breaker panel (Figure 16).

Refer to Figure 4 for the MD302 unit location. Refer to 28-AC-075 Rotorcraft Flight Manual Supplement for MD302 operation.

4.1.1 Vendor Publications

The following components listed in Table 10 are to be operated and maintained I/A/W the current vendor's instructions to ensure the continued airworthiness of the aircraft:

Table 10. MD302 Vendor Manuals

Component	Publication	Vendor
MD302	Model MD302 Series Installation Manual and Operating Instructions, Manual Number 9017782	Mid-Continent Instruments and Avionics Email: mcia@mcico.com Kansas, USA: Tel 316.630.0101 Tel 800.821.1212 Fax 316.630.0723 And, 16320 Stagg Street Van Nuys, California 91406 USA Tel 818.786.0300 Tel 800.345.7599 Fax 818.786.2734
	MD302 Standby Attitude Module, Pilot's Guide, Manual Number 9017782	

SECTION 2

AIRWORTHINESS LIMITATIONS

4.2 Airworthiness Limitations

The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under 14 CFR §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

4.2.1 Retirement Life

The battery module is rated for an estimated life of six (6) years. Extreme temperature, repeated full-depth discharges or other abuse may reduce battery life.

SECTION 3

SERVICING, TROUBLESHOOTING, AND PERIODIC INSPECTIONS

4.3 Servicing, Troubleshooting, and Periodic Inspections

4.3.1 Servicing

The MD302 contains an internal and field-replaceable Nanophosphate lithium-ion battery. If a unit has a battery pack warning, and the warning persists over subsequent dispatches, it should be replaced.

- A. Remove the two small screws on the rear of the unit.
- B. Remove the battery cover and pull the battery out using the handle/strain relief built onto the battery.
- C. Install the new battery and verify operation.

4.3.2 Troubleshooting

Refer to Section 5.1.4, *Troubleshooting*, in the *MD302 Series Installation Manual and Operating Instructions* (reference Table 10), and the electrical wiring diagrams in Section 5 of this chapter.

4.3.3 Periodic Inspections

The following inspection checklist is intended as a guide for aircraft operating under normal conditions. More frequent inspections may be required should adverse operating conditions be encountered.

Date		
Signature		
Aircraft Registration Number		
Aircraft Serial Number		
MD302 SAM		
INITIAL EACH ITEM AFTER ACCOMPLISHMENT		
Inspect the following items every 100 hours or annually		INITIAL
1. Inspect the MD302 and electrical cables for security, damage, and obvious defects.		
Inspect the following items bi-annually.		INITIAL
1. Verify the static pressure system and altimeter operation (reference 14 CFR 91.411).		

SECTION 4

SYSTEM MAINTENANCE

NOTE

Removal or installation of equipment will change the aircraft empty weight and empty weight c.g. These changes will be recorded on Form F-511-5, Basic Weight and Balance Record, as required (reference Enstrom 480B Series Maintenance Manual).

4.4 System Maintenance – MD302

4.4.1 Scheduled Maintenance

The MD302 is subject to conditional maintenance.

4.4.2 Removal

- A. Remove power to the MD302. Pull the **SAM** circuit breaker out. Disable the circuit breaker by installing a cable tie or other similar device around the circuit breaker stem.
- B. Remove the four mounting screws attaching the bezel of the unit to the panel.
- C. Pull the unit forward until the end plate is accessible.
- D. Disconnect the electrical connector.
- E. Disconnect the pitot and static connections.
- F. Remove the unit from the instrument panel.

4.4.3 Installation

- A. Inspect the connections for damage or corrosion before installing the unit.
- B. Connect the pitot and static lines.
- C. Connect the electrical line.
- D. Push the unit into position in the instrument panel.
- E. Install the four attachment screws.
- F. Remove the cable tie or other similar device from the **SAM** circuit breaker stem and push the stem in to set the circuit breaker.
- G. Verify the basic operation of the unit and conduct a standard leak check of the pitot/static system per the *TH-28/480 Series Maintenance Manual*, Paragraph 7-68.

- (1) When initially powering the unit, an error may occur if the unit has yet to be configured. Acknowledge the error and proceed to configure the unit in accordance with Figure 33 and the Configuration Set-Up instructions in the *MD302 Series Installation Manual and Operating Instructions* (reference Table 10).

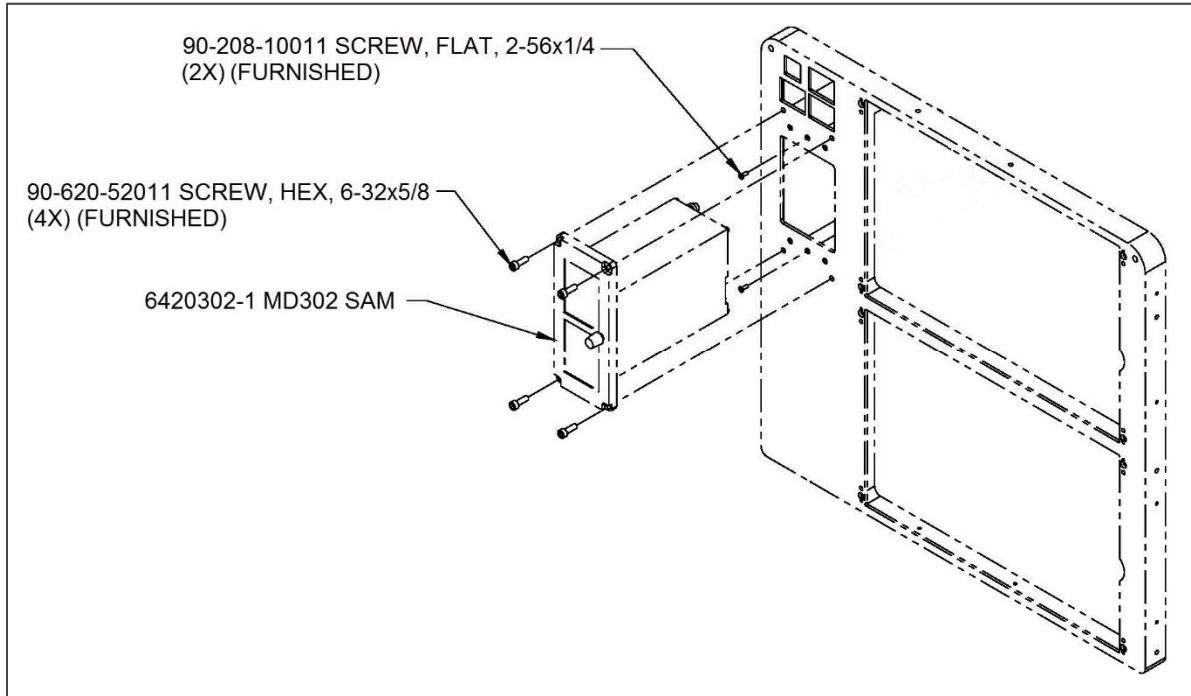


Figure 32. MD302 Installation and Removal

4.4.4 Long Term Storage – Battery Storage Mode

To extend the battery shelf life, temporarily disable the battery operation as follows:

A. Access the Configuration Mode menu.

- (1) Press and hold the control knob prior to applying power to the unit. After approximately 6 seconds, the following message will appear: “CONTINUE HOLDING TO ENTER CONFIG MODE”. After a few more seconds, the introduction screen will appear and the knob can be released. The CONFIGURE MENU will be displayed.

B. Turn the control knob to the “BATTERY STORAGE MODE” function and press the control knob to select. Once selected, two screens will appear:

- (1) First, “ENTERING STORAGE MODE” screen (a yellow status bar is displayed).
- (2) Then, “TURN OFF EXTERNAL POWER NOW” screen. At this time, remove external power.

NOTE: Upon applying external power, the unit will exit BATTERY STORAGE MODE and return to normal operation.

OPTIONS MENU			
ALT UNITS	>	FEET	
BARO UNITS	>	IN HG	
SYMBOL	>	SPLIT DELTA	("DELTA" IF VERSION 1.0.5)
ATT MASK	>	OFF	
ALT TREND	>	ON	
CONFIGURE AIRCRAFT			
PANEL TILT	>	Adjust for 0° at 6° ND in FWD flight	
PANEL ROLL	>	Adjust for 0° Roll	
RANGE MMO	>	0	
RANGE MARKINGS	>	#	TYPE CLR V1 V2
		1	FULL GRN 020 125
		2	FULL RED 125 MAX
		3	RAD RED 125 125
		4	RAD BAR 85 85
		5-8	OFF
VNE TABLE	>	#	ALT (FT) KTS
		1	00000 125
		2-7	UNUSED 000
CONFIGURE ARINC			
PASS-THROUGH	>	OFF	(N/A IF VERSION 1.0.5)
TRANSMIT SPEED		N/A	
CONFIGURE BARO SYNC			
OFF			
CONFIGURE DIMMING			
DIMMING CONTROL	>	EXT 28V	
DIMMING CURVE	>	Adjust to match installed equipment	
CONFIGURE DISPLAY			
ROLL DISPLAY	>	FIXED POINTER	
AIRSPED UNITS	>	KNOTS	
AIRSPED MINIMUM	>	20 KNOTS	
DISPLAY ORIENTATION	>	VERTICAL RIGHT	
HORIZON DISPLAY	>	SHADED	
CONFIGURE HEADING			
DISPLAY	>	OFF	(N/A IF VERSION 1.0.5)
CALIBRATE ("CALIBRATE PRESSURES" IF VERSION 1.0.5)			
CALIBRATE AIRSPEED		A/R	(A/R IF VERSION 1.0.5)
CALIBRATE ALTITUDE		A/R	
CALIBRATE HEADING		N/A	
CLEAR SSEC TABLE (VERSION 1.1.1 ONLY)			
N/A			

Figure 33. MD302 Configuration Set-Up (Reference 4192810-3 Rev. B)

SECTION 5
ELECTRICAL WIRING DIAGRAMS

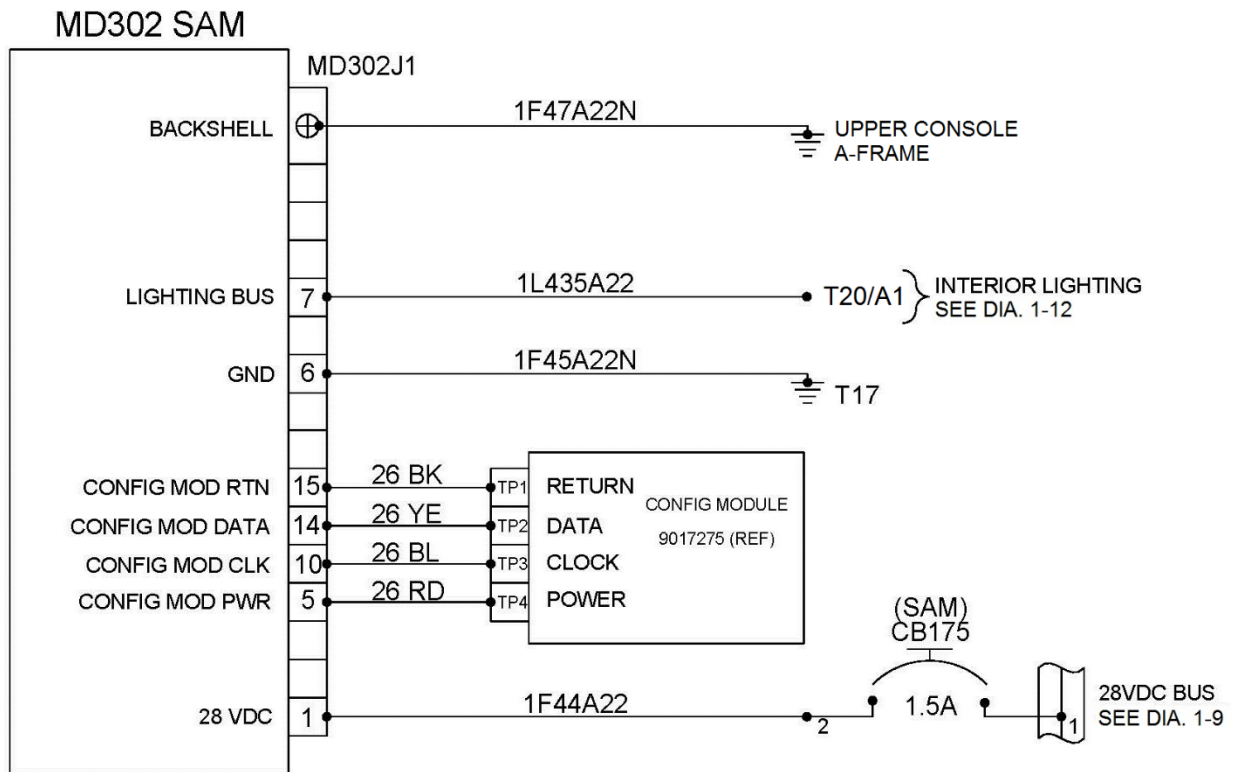


Diagram 4-1. MD302 Electrical Schematic (4192810-3 Rev. B)

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CHAPTER 5. KN 63 DME

SECTION 1

SYSTEM DESCRIPTION

5.1 System Description

The KN 63 DME measures slant-range distance (aircraft to ground station). It is a remote mounted, 200 channel DME, employing a solid-state transmitter and large scale integrated circuit (LSI) technology. All tuning is done electronically using a single crystal, digital, frequency synthesizer. Slant range is measured digitally using two LSI's. Another LSI is employed in the digital frequency synthesizer.

The KN 63 DME outputs a minimum of 50 watts peak pulsed power and a nominal 100 watts through CI 105-6 DME antenna.

The KN 63 DME is interfaced with the G1000H for tuning and display. The PFD will display the DME information in the DME Information Window, which shows the DME tuning mode, frequency, and distance. The KN 63 DME audio is used to identify the DME ground stations being received.

The KN 63 is powered by the avionics bus and is protected by a 3 amp circuit breaker **DME** (CB36) located on the left side of the circuit breaker panel (Figure 16). Power to the KN 63 may also be controlled by a remote **DME ON/OFF** switch located at the bottom of the circuit breaker panel (Figure 16).

Refer to Figure 34 for the KN 63 unit location. Refer to 28-AC-075 Rotorcraft Flight Manual Supplement for KN 63 operation.

5.1.1 Vendor Publications

The following components listed in Table 11 are to be operated and maintained I/A/W the current vendor's instructions to ensure the continued airworthiness of the aircraft:

Table 11. KN 63 Vendor Manuals

Component	Publication	Vendor
KN 63	KN 63 Installation Manual, Number 006-00176-0004	BendixKing Support US & Canada: 1.855.250.7027 Support international: 1.505.903.6148 Office: 1.505.828.6749 http://www.bendixking.com/Support

SECTION 2

AIRWORTHINESS LIMITATIONS

5.2 Airworthiness Limitations

The Airworthiness Limitations Section is FAA approved and specifies inspections and other maintenance required under 14 CFR §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

SECTION 3

SERVICING, TROUBLESHOOTING, AND PERIODIC INSPECTIONS

5.3 Servicing, Troubleshooting, and Periodic Inspections

5.3.1 Servicing

The KN 63 contains no user serviceable components.

The antenna should be kept clean. The range of the DME may be affected if the antenna is dirty (oil covered).

5.3.2 Troubleshooting

Refer to the electrical wiring diagram in Section 5 of this chapter.

5.3.3 Periodic Inspections

The following inspection checklist is intended as a guide for aircraft operating under normal conditions. More frequent inspections may be required should adverse operating conditions be encountered.

Date		
Signature		
Aircraft Registration Number		
Aircraft Serial Number		
KN 63 DME		
INITIAL EACH ITEM AFTER ACCOMPLISHMENT		
Inspect the following items every 100 hours or annually	INITIAL	
1. Inspect the KN 63 and electrical cables for security, damage, and obvious defects.		
2. Inspect the antenna and cables for security, damage, and obvious defects.		
3. Inspect the antenna for cleanliness.		

SECTION 4

SYSTEM MAINTENANCE

NOTE

Removal or installation of equipment will change the aircraft empty weight and empty weight c.g. These changes will be recorded on Form F-511-5, Basic Weight and Balance Record, as required (reference Enstrom 480B Series Maintenance Manual).

5.4 System Maintenance – KN 63

5.4.1 Scheduled Maintenance

The KN 63 is subject to conditional maintenance.

5.4.2 Removal

- A. Remove power to the DME and the PFD. Pull the **DME** and **PFD** circuit breakers out. Disable the circuit breakers by installing a cable tie or other similar device around the circuit breaker stems.
- B. Access the KN 63 via the aft baggage box.
- C. Remove the eight AN525 screws that secure the cover to the airframe (cover not shown in Figure 34).
- D. Disconnect the wire harness connector and antenna cable.
- E. Loosen the screw for the hold-down clamp.
- F. Slide the KN 63 out of the rack.

5.4.3 Installation

- A. Install the KN 63 in the mounting rack so the connectors are on the same end as the hold down clamp. Tighten the hold down screw to secure the unit in place.
- B. Connect the wire harness connector.
- C. Connect the antenna cable to the antenna connector.
- D. Remove the cable tie or other similar device from the **DME** and **PFD** circuit breaker stems and push the stems in to set the circuit breakers.
- E. Verify DME audio output by selecting AUX on the audio panel.

- F. If necessary, the audio output may be adjusted as desired.
 - (1) Remove the three screws that secure the rear plate (the third screw may be under a tamper seal) and the three screws that secure the dust cover.
 - (2) Access the audio level adjustment by peeling back the foil tab marked "Audio Level" through a hole in one of the inner covers.
- G. Install the cover to the airframe with eight AN525 screws.

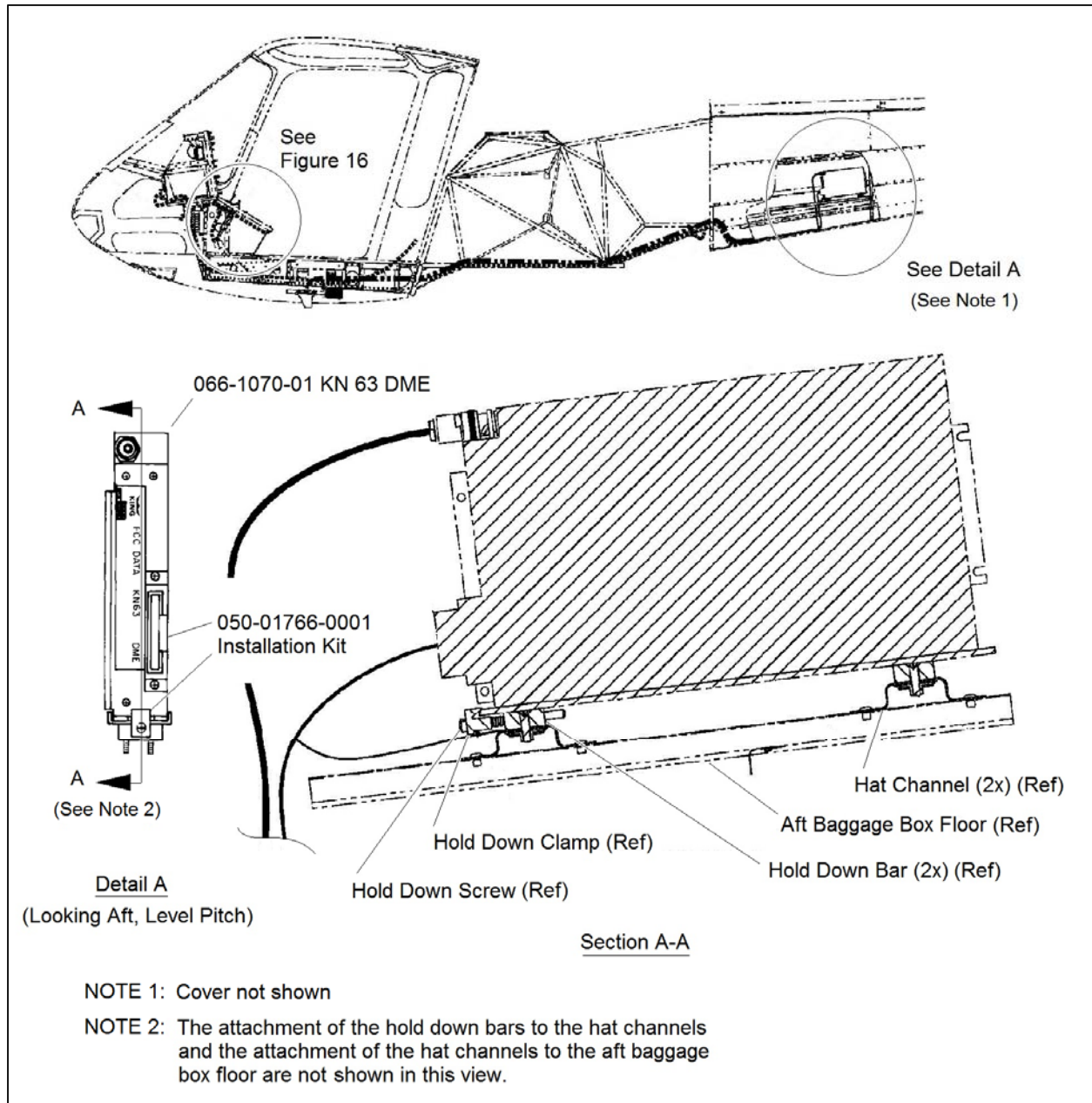


Figure 34. KN 63 Installation and Removal

SECTION 5

ELECTRICAL WIRING DIAGRAMS

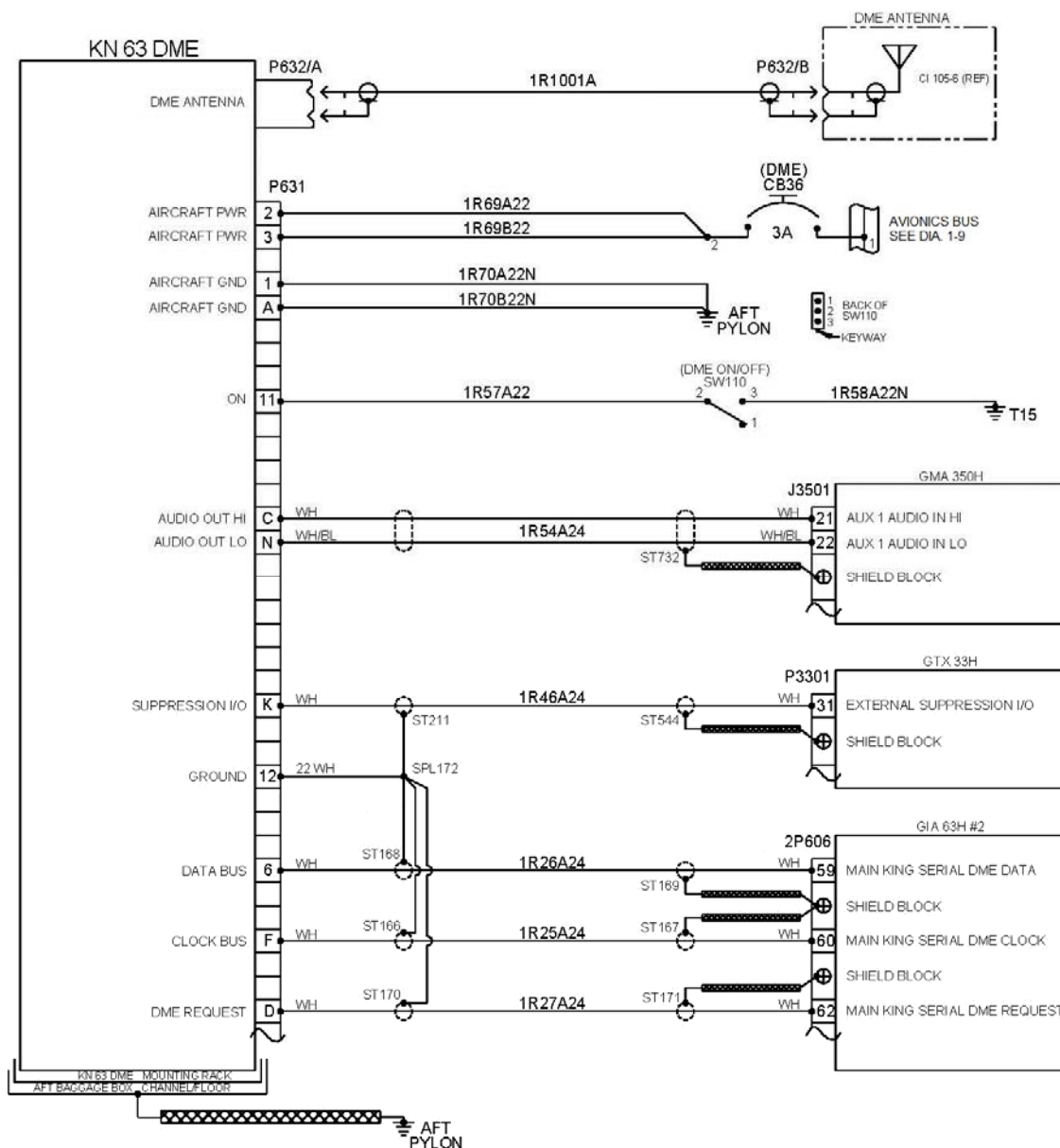


Diagram 5-1. KN 63 Electrical Schematic (4192804-1 Rev. A)