



ENSTROM TH-28/480 SERIES MAINTENANCE MANUAL SUPPLEMENT 8
G1000H INTEGRATED FLIGHT DECK SYSTEM

Revision 2, dated Oct 18/19, applies to the Enstrom TH-28/480 Series Maintenance Manual Supplement 8, G1000H Integrated Flight Deck System.

Remove and insert the pages listed below. Avoid unintentional removal of pages by following this list carefully. Special instructions are denoted with asterisks where applicable.

Remove Pages	Insert Pages
i through ii	i through ii
v * through x	v * through x
xiii through xvi	xiii through xvi
1-5 through 1-6	1-5 through 1-6
1-9 through 1-14	1-9 through 1-14
1-21 through 1-22	1-21 through 1-22
1-35 through 1-36	1-35 through 1-36
1-43 through 1-44	1-43 through 1-44
1-47 through 1-54	1-47 through 1-54
None	1-123 through 1-132
2-1 through 2-2	2-1 through 2-2
3-1 through 3-2	3-1 through 3-2
4-1 through 4-2	4-1 through 4-2
4-5 through 4-8	4-5 through 4-8
5-1 through 5-2	5-1 through 5-2

* Removal/Insertion of the Record of Revision page (page v) is unnecessary if Revision 2 date and issue information is recorded.

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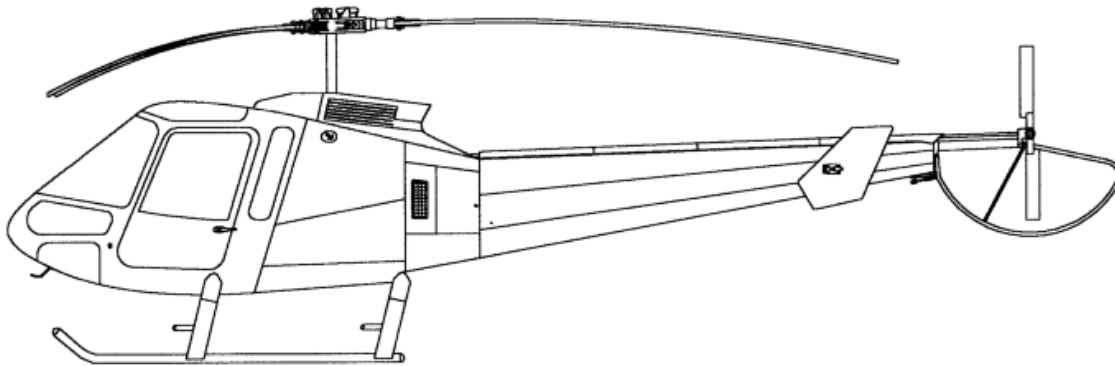


ENSTROM
HELICOPTER CORPORATION

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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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

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

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.

Enstrom distributes maintenance manual reissues and revisions in hardcopy form via mail to owners and operators who are registered with Enstrom. Notice of recently released Service Information Letters and Service Directive Bulletins is provided via a postcard mailing. Registration to receive publication mailings can be coordinated through Enstrom Product Support.

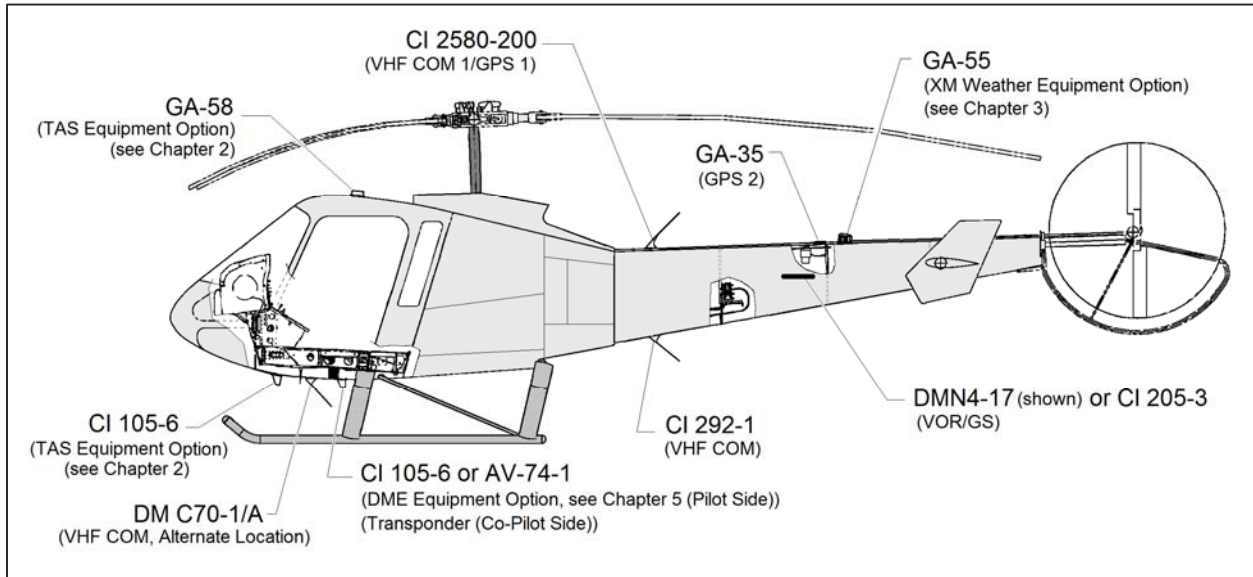


Figure 6. Antenna Installations

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.

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.

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.

1.5.5 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.

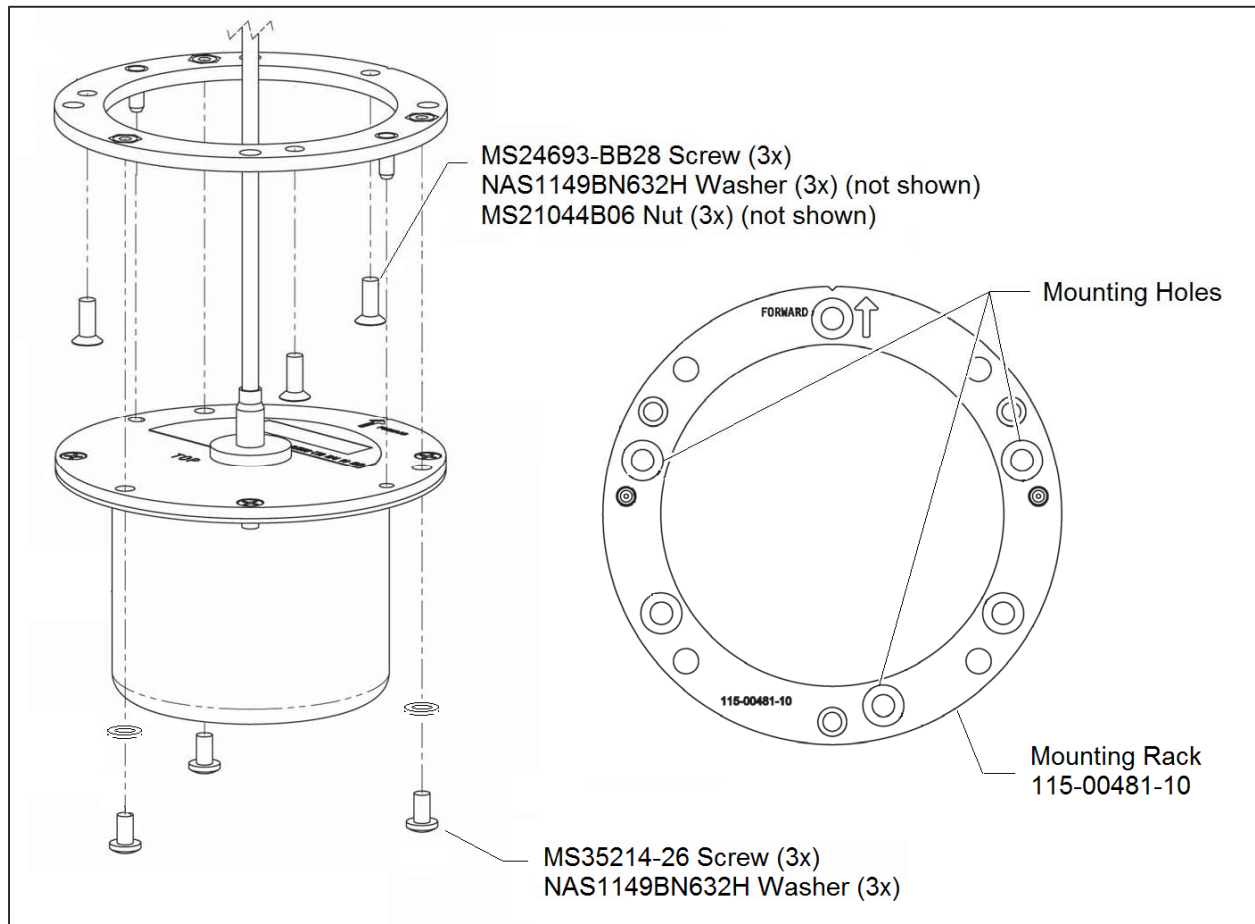


Figure 24. GMU 44 Installation and Removal

1.5.10 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.

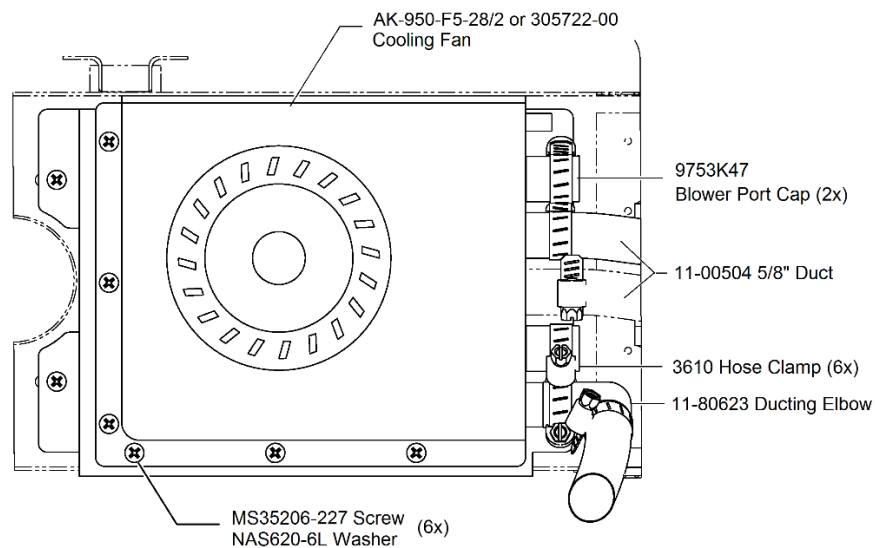


Figure 29. Avionics Cooling Fan Installation

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.

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	
	<i>P/N 4220650-1</i>	<i>P/N 4220650-3</i>
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

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				
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= 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	FUEL UNITS	POUNDS(LB, LB/HR)
ENG 2 SCALE 1.00000	SENSOR LIMITS		SENSOR INPUTS
FUEL TEMP L	LEFT 1 FLOOR 0.00000	LEFT 1	197.22238
OFFSET -----	LEFT 1 CEILING 341.85526	LEFT 2	-----
RAW VAL ----- °C	LEFT 2 FLOOR 0.00000	LEFT 3	-----
CAL VAL 0.000 °C	LEFT 2 CEILING 0.00000	LEFT 4	-----
	LEFT 3 FLOOR 0.00000	LEFT 5	-----
	LEFT 3 CEILING 0.00000		
	LEFT 4 FLOOR 0.00000	ACTUAL	CALIBRATION VALUE
	LEFT 4 CEILING 0.00000	FUEL QUANTITY	197.22238
	LEFT 5 FLOOR 0.00000		
	LEFT 5 CEILING 0.00000		
		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.

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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.

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.

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.

- (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).

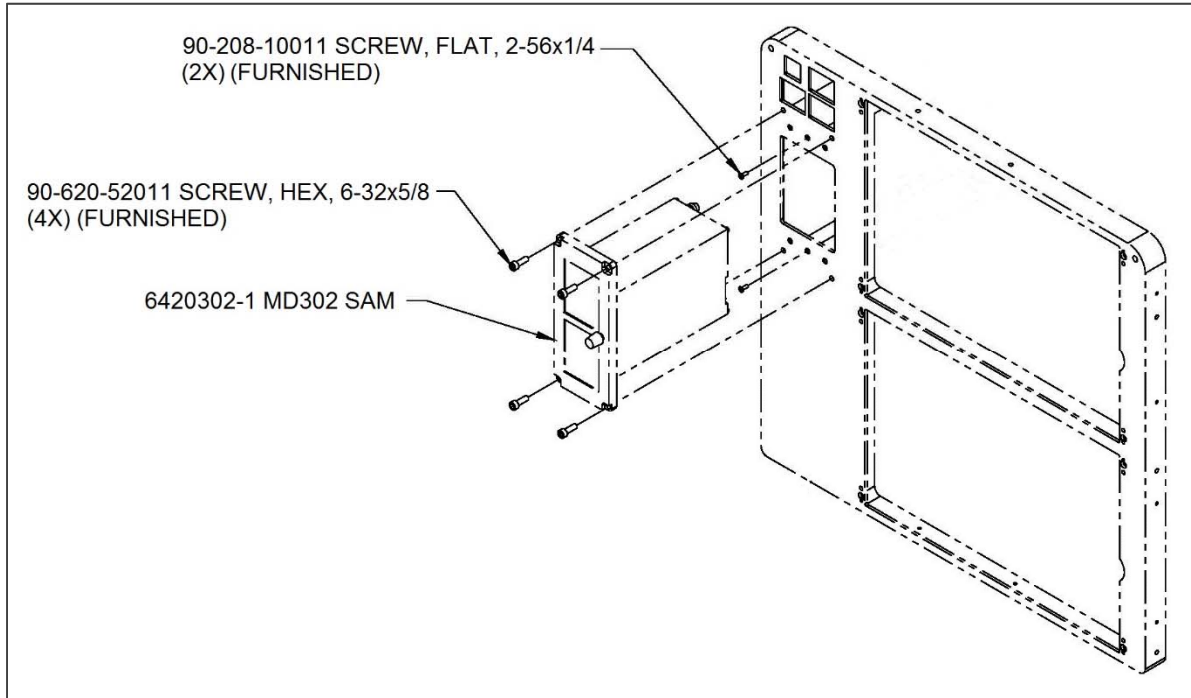


Figure 32. MD302 Installation and Removal

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

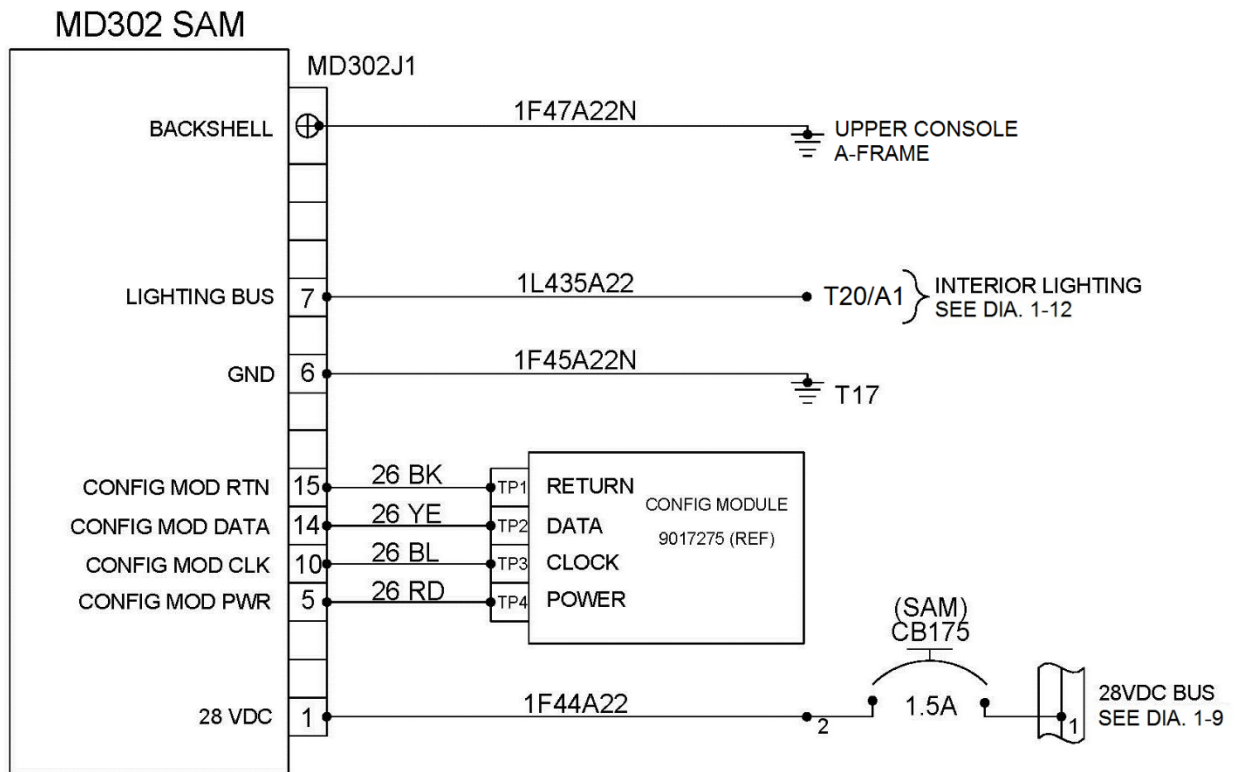


Diagram 4-1. MD302 Electrical Schematic (4192810-3 Rev. B)

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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.