P139-HD

DIGITAL AUDIO SYSTEM

EC145
INSTALLATION

MDL GA212 Rev A    STC SR02270SE

823 McTavish Road NE, Calgary, Alberta, Canada, T2E 7G9       Tel: 800 564 6469
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Recipient further agrees that Recipient will not allow the reverse engineering of any Eagle products.

Recipient further agrees that Recipient shall use information provide, for installation or application, to **one aircraft only** for each product purchased, unless the purchase agreement specifically authorizes the use on more than one aircraft.

Continuing past this page constitutes acceptance of the above agreement.

(End of Agreement)
United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number SR02270SE

This certificate, issued to

Eagle Copters USA, Inc.
19717 62nd Avenue South, Suite E-101
Kent, WA 98032

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part 33 of the * Regulations.

Original Product—Type Certificate Number: SR02270SE
Make: Protype
Model: Model A

* See attached Federal Aviation Administration (FAA) Approved Model List (AML) SR02270SE for approved rotorcraft models and applicable airworthiness regulations

Description of the Type Design Change: Fabrication and installation of Geneva Aviation Audio System per Geneva Aviation Master Drawing List as listed on AML SR02270SE. This modification must be inspected and maintained in accordance with the FAA-accepted Instructions for Continued Airworthiness (ICA) as listed on AML SR02270SE.

Limitations and Conditions: Approval of this change in type design applies to the rotorcraft listed on AML SR02270SE only. This approval should not be extended to other rotorcraft of this model on which other previously approved modifications are incorporated, unless it is determined that the relationship between this change and any of those other changes in type design will introduce no adverse effect upon the airworthiness of that rotorcraft. Rotorcraft modified in accordance with this supplemental type certificate must be operated in accordance with a copy of the FAA-approved Rotorcraft Flight Manual Supplement (RFMS) as listed on AML SR02270SE. A copy of this certificate, the AML, the MDL, the RFMS, and the ICA must be maintained as part of the permanent records of the modified rotorcraft.

If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked, or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of application: March 12, 2013
Date of issuance: April 19, 2013
Date reissued: September 29, 2014
Date amended:

By direction of the Administrator

[Signature]

Manager, Seattle Aircraft Certification Office

[Title]

Any alteration of this certificate is punishable by a fine of not exceeding $1,000, or imprisonment not exceeding 3 years, or both.

This certificate may be transferred in accordance with FAR 21.47.
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<tr>
<th>ITEM</th>
<th>ROTORCRAFT MAKE</th>
<th>ROTORCRAFT MODEL</th>
<th>ORIGINAL TC NUMBER</th>
<th>CERTIFICATION BASIS FOR ALTERATION</th>
<th>FAA APPROVED MASTER DRAWING LIST</th>
<th>FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT</th>
<th>INSTRUCTIONS FOR CONTINUED AIRWORTHINESS</th>
<th>AML REV DATE</th>
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<td>GA212</td>
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<td>ICA212-1</td>
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* Or later FAA Approved Revision
** Or later FAA Accepted Revision

FAA Approved: __________________________
Manager, Seattle Aircraft Certification Office

AMENDED: November 7, 2013; September 29, 2014; May 27, 2015
REISSUED: __________________________
Supplemental Type Certificate

This approval is issued to:
Eagle Copters USA, Inc.
19717 62nd Avenue South
Suite E-101
Kent, Washington
United States of America 98032

Number: SH14-33
Issue No.: 2
Approval Date: June 30, 2014
Issue Date: April 07, 2015

Responsible Office: Pacific
Aircraft/Engine Type or Model: Bell 204B, 205A, 205A-1, 205B, 212, 214B, 214B-1, 214ST, 412, 412 CF, 412 EP,

Canadian Type Certificate or Equivalent: H-104 (Bell 205B)
H-80 (Bell 214B, 214B-1)
H-86 (Bell 212, 412, 412 CF, 412 EP)
H-89 (Bell 214ST)
H-90 (Eurocopter Deutschland BK117 A-1, BK117 A-3,
  BK117 A-4, BK117 B-1, BK117 B-2, BK117 C-1, BK117 C-2)
H15W (Bell 204B, 205A, 205A-1)

Description of Type Design Change: Installation of an audio system in accordance with FAA STC SR02270SE

Installation/Operating Data, Required Equipment and Limitations:
Installation of the audio system must be in accordance with FAA approved Geneva Aviation Master Drawing List, GA212, Revision A, dated June 13, 2013*

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

Curtis Mah
For Minister of Transport
Maintenance of the audio system must be in accordance with FAA accepted Geneva Aviation Instructions for Continued Airworthiness, applicable to the specific make and model as follows:

"Bell 204/205/212/214/412 Series Helicopters", ICA212-1, Revision N/C, dated March 25, 2013**
"Eurocopter BK117 (EC145) Series Helicopters", ICA212-3, Revision N/C, dated March 25, 2013**

Operation of the audio system must be in accordance with FAA approved Geneva Aviation Rotorcraft Flight Manual Supplement, applicable to the specific make and model as follows:

"Bell 204/205/212/214/412 Series Helicopters", GA212-1, Revision A, dated October 22, 2013*
"Eurocopter BK117 (EC145) Series Helicopters", GA212-2, Revision A, dated October 22, 2013*

*or later FAA approved revision,  **or later FAA accepted revision

– End –
CERTIFICADO SUPLEMENTAR DE TIPO
(Supplemental Type Certificate)

Número 2014S11-01

Este certificado, emitido com base na Lei n° 7565 “Código Brasileiro de Aeronáutica”, de 19 de dezembro de 1986,
(This certificate, issued in the basis of the Law No. 7565 “Código Brasileiro de Aeronáutica”, dated 19 December 1986,

é conferido ao (a): Eagle Copters USA, Inc.
19717 62nd Ave. South, Suite E-101
Kent, WA, 98032
USA

por ter a modificação ao projeto de tipo do produto abaixo citado, observadas as limitações e condições
(specified hereon, met the applicable airworthiness requirements.)
especificadas, satisfeito aos requisitos de aeronavegabilidade aplicáveis.

Produto Original - Número do Certificado de Tipo: * See attached ANAC Approved Model List (AML), Rev. I.R.,
(Original Product - Type Certificate No.) dated 06 Nov. 2014, or later ANAC approved revisions.

Fabricante: *

(Modelo(s): *)

DESCRIÇÃO DA MODIFICAÇÃO AO PROJETO DE TIPO:
(Description of Type Design Change:)

Installation of Geneva Aviation Audio System in accordance with Geneva Aviation, Inc. Master Drawing List
as listed on attached ANAC Approved Model List (AML).

This CST validates in Brazil the STC # SR02270SE, issued by FAA (USA).

LIMITAÇÕES E CONDIÇÕES:
(Limitations and Conditions:)

See continuation sheet for applicable data.

DATAS:
(Dates of:)

Do Requerimento: 13 June 2014 Da emissão: 06 Nov. 2014 Da reemissão: Da emenda:
(Application:) (Issuance:) (Reissuance:) (Amendment:)

HÉLIO TARQUINIO JÚNIOR
Gerente-Geral, Certificação de Produto Aeronáutico
(General Manager, Aeronautical Product Certification)

DINO ISHIKURA
Superintendente de Aeronavegabilidade
(Airworthiness Superintendent)

F-400-01G (04.12)

H.02-4359-0
CERTIFICADO SUPLEMENTAR DE TIPO
(Supplemental Type Certificate)

NÚMERO 2014511-01
(Number)

LIMITAÇÕES E CONDIÇÕES:
(Limitations and Conditions:)

I. The approval of this type design change should not be extended to other rotorcraft of this model on which other previously approved modifications are incorporated unless it is determined by the installer that the relationship between this change and any of those other previously approved modifications, including changes in Type Design, will introduce no adverse effect upon the airworthiness of that rotorcraft.

II. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

III. Operation must be performed in accordance with FAA approved Rotorcraft Flight Manual Supplement (RFMS) specified in the ANAC Approved Model List (AML) for CST 2014511-01.

IV. Instructions for Continued Airworthiness (ICA) is required for this installation as listed on ANAC Approved Model List (AML) for CST No. 2014511-01.

V. A copy of this Certificate, the Supplement referred on item III above and the attached ANAC Approved Model List (AML) for CST No. 2014511-01, shall be maintained as part of the permanent records of the modified rotorcraft.

END
# ANAC APPROVED MODEL LIST (AML)

## FOR CST 2014S11-01

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<th>ITEM</th>
<th>AIRCRAFT MAKE</th>
<th>AIRCRAFT MODEL</th>
<th>TYPE CERTIFICATE</th>
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<th>FAA APPROVED ROTORCRAFT FLIGHT MANUAL SUPPLEMENT</th>
<th>INSTRUCTIONS FOR CONTINUED AIRWORTHINESS</th>
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</table>

**ANAC Approved:**

HÉLIO TARQUINIO JÚNIOR  
Gerente-Geral, Certificação de Produto Aeronáutico  
(General Manager, Aeronautical Product Certification)  
Flávia Lucrêcia Moraes Matos  
Gerente de Programas de Certificação - Substituto  
Certificação de Produto Aeronáutico

**ANAC Approved Date:** 06 Nov. 2014

**Revision:** I.R.
# MASTER DRAWING LIST

**GA212** Rev A  Dated 6/13/2013

## AUDIO SYSTEM

**NOTE:** X IN LR COLUMN INDICATES CHANGE FROM LAST REVISION LEVEL.

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## LOG OF REVISIONS

<table>
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<th>REVISION</th>
<th>DATE OF REVISION</th>
<th>PAGES</th>
<th>DESCRIPTION OF CHANGE</th>
<th>APPROVAL</th>
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<td>All</td>
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</table>
April 22, 2014

Mr. Vince Massey
Systems & Equipment Engineering
FAA, Seattle Aircraft Certification Office
ANM-130S
1601 Lind Ave SW
Renton, WA 98057
Tel: 425-917-6475
Fax: 425-917-6590

Subject: ECO-1518 GA212

Enclosed is ECO-1518 Rev – Dated 3/26/2014 for MDL GA212 Rev A Audio System STC:
SR02270SE. This ECO corrects minor changes to the drawings listed in the ECO list. Specifically:

- G13004: Rewrote EMER/GNORMAL notes on sht 13 for clarity.
- G13115: Revised labeling notes to engineering standards.
- G13116: Revised labeling notes to engineering standards.
- G13121: Corrected part number on back shell on sht 2.

I certify that Geneva Aviation, Inc. has shown compliance with all the applicable requirements, as identified in the Statements Of Compliance With Airworthiness Standards (8110-3 forms) signed by DER Verl Herd submitted with this data. Please provide Geneva with an approval for ECO-1518. Please contact me if you need any additional information.

Best Regards,

Chris Bonar
Engineer Manager

(enclosures)
ENGINEERING CHANGE ORDER

Date:  3/26/2014

ECO No:  ECO- 1518    Rev:  --

STC:  SR02270SE    MDL:  GA212    Rev:  A

STC Title:  Audio System

Effective for:  ☑Production; or  ❏Listed Aircraft Only:

Primary Document Effected:  See list below

Description of Change:  Minor changes to drawings listed

Detailed Explanation:

This ECO corrects minor changes to the drawings listed.

G13004:  Rewrote EMERG/NORMAL notes on sht 13 for clarity.

G13115:  Revised labeling notes to engineering standards.

G13116:  Revised labeling notes to engineering standards.

G13121:  Corrected part number on back shell on sht 2.

ECO DOCUMENT LIST

NOTE:  X in CH (change) column indicates change from last revision level.
Documents with multiple pages, that have a different revision level on some pages, are listed by individual pages on this list.

<table>
<thead>
<tr>
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<td>13</td>
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<td>G13121</td>
<td>3</td>
<td>A</td>
<td>3/26/14</td>
<td>Audio Mixer Installation Instructions</td>
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ECO LOG OF REVISIONS

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<th>PAGES</th>
<th>DESCRIPTION OF CHANGE</th>
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</table>
May 22, 2014

Mr. Vince Massey
Systems & Equipment Engineering
FAA, Seattle Aircraft Certification Office
ANM-130S
1601 Lind Ave SW
Renton, WA 98057
Tel: 425-917-6475
Fax: 425-917-6590

Subject: ECO-1520 GA212

Enclosed is ECO-1520 Rev – Dated 5/08/2014 for MDL GA212 Rev A Audio System STC:
SR02270SE. This ECO defines three audio system configurations as follows:

- P139-HD (D) Uses Router G13000 in a “Dual-board” configuration. This is the standard
audio system that was previously specified in the STC and is shown in the diagrams. The
G13000 is the primary router used throughout the instructions.

- P139-HD (S) has been added as an optional system configuration. It uses Router G13000
in a “Single-board” configuration that uses the same case as the dual-board router, but with
only one audio board installed. These two routers share the same installation and wiring
drawings.

- P139-HD (T) has been added as an optional system configuration. It uses Router G13160
and is a “Three board” router. This installation replaces wiring drawing G13004 with
drawing G13162. Installation of this router is performed the same as the others two routers
with slight changes in the mounting hardware as noted in the instructions. The G13160
router supports more radios, control panels and headsets than what the G13000 provides.

This change is considered a minor change since the primary functionality of the system has not
changed; there is negligible change to weight, balance and power consumption; and there are no
changes required for the RFMS.

In addition, I have updated ICA212-1 Rev A & ICA212-3 Rev A to match the current approved STC
data. Due to their size I have not printed them, but instead provide them on the enclosed data CD
for your records.

I certify that Geneva Aviation, Inc. has shown compliance with all the applicable requirements, as
identified in the Statements Of Compliance With Airworthiness Standards (8110-3 forms) signed by
DER Verl Herd and DER Jeremey McClenanah submitted with this data. Please provide Geneva
with an approval for ECO-1520 and for the revised ICA’s. Please contact me if you need any
additional information.

Best Regards,

Chris Bonar
Engineer Manager

(enclosures)
ENGINEERING CHANGE ORDER

Date: 5/08/2014

ECO No: ECO-1520   Rev: --

STC: SR02270SE   MDL: GA212   Rev: A

STC Title: Audio System

Effective for: ☑Production; or ☐Listed Aircraft Only:

Primary Document Effected: See list below

Description of Change: Adds audio system configurations STC

Detailed Explanation:

This ECO defines three audio system configurations as follows:

- **P139-HD (D)** Uses Router G13000 in a “Dual-board” configuration. This is the standard audio system that was previously specified in the STC and is shown in the diagrams. The G13000 is the primary router used throughout the instructions.

- **P139-HD (S)** has been added as an optional system configuration. It uses Router G13000 in a “Single-board” configuration that uses the same case as the dual-board router, but with only one audio board installed. These two routers share the same installation and wiring drawings.

- **P139-HD (T)** has been added as an optional system configuration. It uses Router G13160 and is a “Three board” router. This installation replaces wiring drawing G13004 with drawing G13162. Installation of this router is performed the same as the others two routers with slight changes in the mounting hardware as noted in the instructions. The G13160 router supports more radios, control panels and headsets than what the G13000 provides.

This change is considered a minor change since the primary functionality of the system has not changed; there is negligible change to weight, balance and power consumption; and there are no changes required for the RFMS.

To support this change:

GA212-3 & GA212-4 have been revised to: add Section 1.3 defining the configurations; Revised the wording throughout the manual to define the installation differences between the different configurations. Updated the control panels section to show just the current panels offered. Figures throughout the manual have been updated for continuity.

G13004 has been updated to change the headset numbering scheme and to add external power for additional control panels.

G13160 Router drawing has been added for the three board router.

G13161 Tray has been added to be used in place of Tray G13009 for the G13160 Router.

G13161-1, -2, -3, & -4 detail drawings have been added.
G13162 wiring diagrams have been added to be used in place of G13004 for the G13160 Router.

**ECO DOCUMENT LIST**

NOTE:  
X in CH (change) column indicates change from last revision level. Documents with multiple pages, that have a different revision level on some pages, are listed by individual pages on this list.

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<th>DESCRIPTION</th>
</tr>
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<tr>
<td>X</td>
<td>GA212-3</td>
<td>18</td>
<td>A</td>
<td>4/23/14</td>
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August 28, 2014

Mr. Vince Massey
Systems & Equipment Engineering
FAA, Seattle Aircraft Certification Office
ANM-130S
1601 Lind Ave SW
Renton, WA 98057
Tel: 425-917-6475
Fax: 425-917-6590

Subject: ECO-1532 GA212

Enclosed is ECO-1532 Rev – Dated 8/13/2014 for MDL GA212 Rev A Audio System STC: SR02270SE. This ECO updates Audio Routers G13000 and G13160 to change the rated operating voltage from 10 – 30 VDC to 14 – 32 VDC to improve their operating efficiency.

I certify that Geneva Aviation, Inc. has shown compliance with all the applicable requirements, as identified in the Statements Of Compliance With Airworthiness Standards (8110-3 form) signed by Systems DER Veri Herd submitted with this data. Please provide Geneva with an approval for ECO-1532. Please contact me if you need any additional information.

Best Regards,

[Signature]

Chris Bonar
Engineer Manager

(enclosures)
**STATEMENT OF COMPLIANCE WITH AIRWORTHINESS STANDARDS**

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**Notes:**
1. This 8110-3 approves the design aspects of the avionics/electrical data only.
2. This ECO changed the router operating voltage from 10-30 VDC to 14-32 VDC.

**PURPOSE OF DATA**
To show compliance with 14 CFR pertaining to a change to STC SR02270SE.

**APPLICABLE REQUIREMENTS (List specific sections)**

14 CFR: 29.1301(a,b,c) Amdt 29-0

**CERTIFICATION**
Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under 14 CFR Part 183, data listed above and on attached sheets numbered XXXXXXXX have been examined in accordance with established procedures and found to comply with applicable requirements of the Airworthiness Standards Listed.

I (We) Therefore

- [ ] Recommend approval of these data
- [X] Approve these data

**SIGNED**

Verl Herd

**CLASSIFICATION(S)**

DERT-710121-SW

Electrical Systems & Equipment
ENGINEERING CHANGE ORDER

Date: 8/13/2014

ECO No: ECO-1532  Rev: --

STC: SR02270SE  MDL: GA212  Rev: A

STC Title: Audio System

Effective for: ☑ Production; or ☐ Listed Aircraft Only:

Primary Document Effected: See list below

Description of Change: Updates Routers

Detailed Explanation:

This ECO updates Audio Routers G13000 and G13160 to change the operating voltage from 10 – 30 VDC to 14 – 32 VDC.

ECO DOCUMENT LIST

NOTE: X in CH (change) column indicates change from last revision level. Documents with multiple pages, that have a different revision level on some pages, are listed by individual pages on this list.

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# Statement of Compliance with Airworthiness Standards

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## Purpose of Data

To show compliance with 14 CFR pertaining to a change to STC SR02270SE.

## Applicable Requirements (List specific sections)

14 CFR: 29.1301(a,b,c) Amdt 29-0; 29.1309(a,b1,c,g) Amdt 29-40; 29.1357(a,b,c,d,e) Amdt 29-24

## Certification

Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under 14CFR Part 183, data listed above and on attached sheets numbered XXXXXXXXXX have been examined in accordance with established procedures and found to comply with applicable requirements of the Airworthiness Standards Listed.

I (We) Therefore □ Recommend approval of these data

☑ Approve these data

## Signature(s) of Designated Engineering Representative(s)

| Verl Herd |

## Designation Number(s)

| DERT-710121-SW |

## Classification(s)

| Electrical Systems & Equipment |
ENGINEERING CHANGE ORDER

Date: 4/10/2015

ECO No: ECO-1540

STC: SR02270SE

Primary Document Effected: See list below

Description of Change: Added keylines to drawing. Added notes on signal shielding and Gnet bus wiring. Connector part number changes.

Detailed Explanation:

Both the G13000 and G13160 audio routers have been modified to provide additional spare keylines for user-defined functions. The G13004 and G13162 wiring drawings have been updated to show these new connections.

In addition, the following changes were made to both documents:

An additional note has been added to sheet 1 giving directions to the installer on the approved grounding of shielded wires.

Part numbers for D-Subminiature screw locks, and the D9M connector have been updated.

The notes on Gnet bus connections on sheet 12 have been clarified with respect to not needing a terminal block in busses with a single Gnet device, appropriate device ID numbering and allocation of devices among Gnet busses.

ECO DOCUMENT LIST

NOTE: X in CH (change) column indicates change from last revision level. Documents with multiple pages, that have a different revision level on some pages, are listed by individual pages on this list.

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The Geneva Aviation P139-HD Digital Audio System installed in accordance with STC SR02270SE requires this supplement to be included in the FAA Approved Rotorcraft Flight Manual for the aircraft.

This supplement only adds to the basic Rotorcraft Flight Manual. For limitations, normal procedures, emergency procedures and performance information not contained herein, consult the FAA Approved Rotorcraft Flight Manual.
## LOG OF REVISIONS

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**Note:**
The approval for the revision is implemented by the FAA Approval signature on the cover page.
# Table of Contents

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<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 GENERAL INFORMATION</td>
<td>4</td>
</tr>
<tr>
<td>2 LIMITATIONS</td>
<td>4</td>
</tr>
<tr>
<td>3 NORMAL PROCEDURES</td>
<td>4 - 6</td>
</tr>
<tr>
<td>4 EMERGENCY PROCEDURES</td>
<td>7 - 8</td>
</tr>
<tr>
<td>5 PERFORMANCE</td>
<td>8</td>
</tr>
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1. GENERAL INFORMATION

1.1. This aircraft has the Geneva Aviation P139HD Digital Audio System installed. This audio system controls the Intercom System (ICS) and the transmit/receive audio sources to and from the radios.

1.2. The audio system uses serial data control panels linked to a centralized Router unit to which each radio source is connected.

2. LIMITATIONS

No Limitations

3. NORMAL PROCEDURES

3.1. Power to the Audio System is supplied by two circuit breakers, AUD 1 and AUD 2. One is located on Essential Bus #1 and the second is located on Essential Bus #2. These Buses are controlled by the aircraft’s standard systems for these Buses.

3.2. Control Panel operation:

3.2.1. The rotary knob for each channel adjusts the volume level for that channel. Rotating the knob CCW decreases the volume.

3.2.2. Depressing the rotary knob and allowing it to pop out enables the channel. Depressing the rotary knob into the locked position disables the audio channel.

3.2.3. Depressing the button below each rotary knob toggles selection of a particular audio channel as the active transmitter. This audio channel will also be heard, whether or not the rotary knob is in the out (ON) position or the in (OFF) position. The associated LED is illuminated to indicate when a channel has been selected as the active transmitter.
3.2.4. A transmitter audio channel can be de-selected by selecting another transmitter or by pressing the button a second time. The LED associated with the channel will go out.

3.2.5. To activate the intercom system, press the ICS rotary knob so it pops out to the (ON) position. The earphone audio is controlled by the rotary knob; the microphone is energized by depressing the ICS key switch. For the pilot this means depressing the cyclic trigger to the first detent, for the copilot it can be either the cyclic trigger or foot switch. Additionally, the ICS / TX switch on the G13115 or G13116 audio control panels may be used. Forward (up) is ICS Key, Aft (down) is TX Key. For the passengers, a headset adapter cable with switches, or the VOX knob on the passenger audio control panel may be turned fully CW for “Hot Mic”. For non-shared audio panels such as the pilot and co-pilot panels, “Hot Mic” is achieved by rotating the VOX knob fully CW. To Disable VOX turn knob fully CCW. After adjusting, the rotary knob may be depressed to prevent nudging if desired. Depressing this knob will not defeat the VOX function.

3.3. For the pilot and co-pilot locations, the second detent of the cyclic trigger switch always keys the #1 VHF Comm Radio in the pilot’s location and #2 VHF Comm Radio in the co-pilot’s location regardless of the audio panel selection.

3.4. For the pilot and co-pilots locations, a cyclic switch is dedicated for Audio Panel Transmit. This switch will key the radio selected on the audio panel. Familiarize yourself with the locations of the switches as this location on the cyclic will change dependent on the configuration of the system installed in the rotorcraft. In the co-pilots location, an optional foot switch may have been installed for this function as well.

3.5. For passengers, the selected transmitter keying is accomplished with the appropriate push button switch on the headset adapter cable.
3.6. Setting Volume Levels: If volume levels are not set correctly, audio crosstalk and distortion may result.

3.6.1. To set volume levels correctly:
   a. Permanently adjust headset volume controls to maximum loudness.
   b. Set the audio panels volume controls to midrange. Verify that the Master Volume control is centered as well.
   c. Adjust audio source (radio, etc.) to a comfortable level.
   d. Use audio panel controls for adjusting listener’s volume.
   e. Please note that the Master Volume Control increases or decreases the audio level for all audio sources on the panel with the exception of the ICS Volume.

3.6.2. Crosstalk and distortion are the result of the audio source (radio, etc.) volume being excessive. This is normally a result of the headset volume control being turned down and/or the audio panel volumes being turned down, and the radio volume being up too loud.
4. EMERGENCY PROCEDURES

4.1. In the event of a complete failure of the audio system, the pilot's mic and ear phone will automatically be connected directly to the #1 VHF Comm Radio. The co-pilot's mic and ear phone will automatically be connected directly to the #2 VHF Comm Radio. Keying the transmitter is accomplished by depressing the trigger switch to the second detent as always in both the pilot and co-pilot locations. Volume control is possible using the volume control on the radio itself. All other audio functions for all users will be inoperable with the exception of ICS between the pilot and co-pilot. Keyed ICS between the pilot and co-pilot will remain active as long as power is present through either the AUD 1 or AUD 2 circuit breakers. No volume or VOX control is possible for the ICS under this condition and is a fixed level. All aircraft audio alert tones will be heard in all emergency and isolated modes at the pilot and co-pilot locations.

4.2. In the event of a loss of power to the audio system, the pilot's mic and ear phone will automatically be connected directly to the #1 VHF Comm Radio. The co-pilot's mic and ear phone will automatically be connected directly to the #2 VHF Comm Radio. Keying the transmitter is accomplished by depressing the trigger switch to the second detent as always in both the pilot and co-pilot locations. Receive audio for #1 VHF and #2 VHF Comm Radios will only be adjustable at the radio itself. All other audio functions for all users will be inoperable. All aircraft audio alert tones will be heard in all emergency and isolated modes at the pilot and co-pilot locations.

4.3. In the event of a malfunctioning audio system, the pilot's EMERG / NORMAL switch is located on both G13115 and G13116 type control panels, when placed in EMERG (Emergency) position, it will connect the pilot exclusively to #1 VHF Comm radio with the only effect to other occupants being the elimination of #1 VHF Comm radio access and the pilot's ICS audio between the pilot and other occupants. All aircraft audio alert tones will be heard in the EMERG (Emergency) mode at the pilot and co-pilot locations.
4.4. In the event of a malfunctioning audio system, the co-pilot’s EMERG / NORMAL switch is located on both G13115 and G13116 type control panels, when placed in EMERG (Emergency) position, it will connect the co-pilot exclusively to #2 VHF Comm radio with the only effect to other occupants being the elimination of #2 VHF Comm radio access and the co-pilot's ICS audio between the co-pilot and other occupants. All aircraft audio alert tones will be heard in the EMERG (Emergency) mode at the pilot and co-pilot locations.

4.5. In the event of generator failure or for any other reason that the electrical load must be reduced, the system is connected to the Essential Buss #1 and Essential Buss #2 and can be deactivated by pulling the AUD 1 and AUD 2 circuit breakers located on the overhead console. Pulling both circuit breakers will result in the pilot being isolated to the #1 VHF Comm Radio and the co-pilot being isolated to the #2 VHF Comm Radio automatically with no further action. No other audio system functions will be operable.

5. PERFORMANCE

No change to basic Rotorcraft Flight Manual.
1.0 INTRODUCTION

1.1. This document provides general information and instructions for the installation of the Eagle Audio P139-HD Digital Audio System, under STC SR00521SE.

1.2. Installation is to be accomplished in accordance with Eagle Copters Ltd. instructions. Throughout the installation of this product it is necessary to utilize proper aviation practices. Be sure that the installation of this product is in compliance with the aircraft manufacturer’s limitations and also that it is done in accordance FAA publication, AC 43.13-1B, Acceptable Methods, Techniques and Practices, Aircraft Inspection and Repair. These rules from the AC apply:

A. All wire to be 22 AWG unless otherwise specified.
B. Unshielded wire per MIL-W-22759/16; Shielded wire per MIL-M27500-xxTGxT14 ; xx- indicates wire gauge, x- indicates number of conductors.
C. Route and support wiring harness IAW AC 43.13-1b, Chapter 11 Section 8, Paragraph 11-96.
D. Clamp wiring harness IAW AC 43.13-1b, Chapter 11, Section 11, Paragraph 11-146.
E. Clamp and route wiring harness around movable controls IAW AC 43.13-1b, Chapter 11, Section 9, Paragraph 11-125.
F. Wiring and harness to be separated IAW AC 43.13-1b, Chapter 11, Section 8, Paragraph a 11-105 & 11-106.
G. Install service loops at harness terminations IAW AC 43.13-1b, Chapter 11, Section 9, Paragraph 11-139.
H. Install grounding connections and bonding IAW AC 43.13-1b, Chapter 11, Section 15, Paragraph 11-186 & 11-189.

Before installing any of the components, first read through all of the documentation to become familiar with the installation requirements. This installation requires a completed FAA Form 337 and appropriate log book entries.

Prior to installing each component, record weight and mounting location in the aircraft’s weight and balance record.

This product is provided with an FAA STC for certain aircraft models. If your installation is not covered by one of the models listed on the STC, then you may need to obtain a field approval from your local FAA Flight Standards District Office (FSDO).
The P139-HD Digital Audio Router contains no user serviceable internal components. Do not disassemble router or the factory warranty will be voided. For service, return the unit to Eagle Copters Ltd.

1.3. There are three types of P139-HD Audio Systems that the installer may choose to install at their discretion.

1.3.1. P139-HD (D) Uses Router G13000 in a “Dual-board” configuration and is shown in the diagrams and is the router used throughout the instructions.

1.3.2. P139-HD (S) Uses Router G13000 in a “Single-board” configuration that uses the same case as the dual-board router, but with only one audio board installed. These two routers share the same installation and wiring drawings.

1.3.3. P139-HD (T) uses Router G13160 and is a “Three board” router. This installation replaces wiring drawing G13004 with drawing G13162. Installation of this router is performed the in the same manner as the other two routers with slight changes in the mounting hardware as noted in the instructions.

1.4. Prior to installation of this system, it is the responsibility of the installer to confirm by analysis, that the additional power requirement will not exceed the capacity of the Essential Buses or the aircraft’s electrical system. Power consumption for this audio system is 5 amps maximum at 28 volts. The system is designed to use redundant power sources, from 28 VDC Essential Bus #1, and from 28 VDC Essential Bus #2. For each supply line, use a separate 5 amp circuit breaker and separate ground lines to two separate ground points. Refer to G13004 for wire harness details. The system will support supply voltages of 14 – 32 VDC.

1.5. The internal power supply of the router is sufficient to power six audio control panels. If the installation calls for more than six panels, the additional panels must be powered from a separate circuit breaker to the Router. Refer to G13004 sheet 12 for more information.

1.6. The FAA requirement regarding the securing of wire bundles using nonmetallic clamps is addressed by the use of nylon cable ties. The part numbers and description of these ties is as follows:

Following the guidelines in AC43.13-1B, cable ties are attached at a maximum of 4” spacing and ties are attached to nylon cable tie anchors, as necessary.
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1.7. The aircraft into which this product will be installed may be a new aircraft or an aircraft that has been in service. The configuration of the wiring and cabling will vary from aircraft to aircraft. The installation of the Eagle Audio system should use existing wire and cable runs when possible as it will not interfere with the existing aircraft wiring.

1.8. These instructions call out cables by reference to the drawing that defines the cable construction details. The installer may, at the installer’s discretion, substitute connectors, wire type, and connection details, so long as the final installations operate correctly and meets FAA standards.

1.9. The Router features a COM1 Isolate mode that automatically connects the pilot’s headset and mic switches directly to COM1 in the event of power loss or failure of the Audio Router. The pilot may also activate the COM1 Direct mode using the EMERG/NORMAL switch on the G13115 and G13116 control panels. This feature may also be set up for the Copilot to activate a COM2 Isolate mode using the EMERG/NORMAL switch on the copilot control panel.

1.10. For Non-Pilot positions, Control Panels G13115NS or G13116NS may be used. The panels do not have an internal COM1, COM2 isolate switch. For these panels, do not connect to the COM1 or COM2 circuits shown in wiring diagrams G13004.
2.0 **System Overview**

![Diagram of Digital Audio System Overview]

**Figure 1**

**Digital Audio System Overview**

2.1. The schematic shown in Figure 1 is a typical system. The installer may, at the installer’s discretion, add or remove radios, control panels, headset groups, or ICS and Transmit PTT switches as needed.

2.2. Control Panels G13115 and G13116 may be used interchangeably, depending on the control functions desired and number of radios installed.

2.3. It is the installer’s responsibility to document the system configuration as installed for maintenance purposes.
3.0 Component Installation & Hookup

![Diagram of G13000 Router Connector Layout]

**Figure 2**
G13000 Router Connector Layout
3.1. G13000 Router Connections (see Figure 2)

3.1.1. J1 is used to connect COM1 and radios XCVR3 – XCVR11.

3.1.2. J2 is used to connect COM2 and radios XCVR12 – XCVR20.

3.1.3. J3 is used to connect the Pilot’s control panel, Pilot’s headset group, headset groups 3 – 7 and passenger control panels.

3.1.4. J4 is used to connect the Copilot’s control panel, Copilot’s headset group, headset groups 8 – 12 and additional passenger control panels.

3.1.5. J5 is used to connect power, ground, Pilot’s COM1 Isolate, and Copilot’s COM2 Isolate.

3.1.6. J6 is a network port used for system configuration adjustment.

3.1.7. J7 is a memory card slot used for storing system configuration data onto removable media.

3.1.8. The Router contains no user serviceable internal components. Do not disassemble router or the factory warranty will be voided. Return the unit to Eagle Copters Ltd. for service.
Figure 3
G13160 Router Connector Layout
3.2. G13160 Router Connections (see Figure 3)

3.2.1. J1 is used to connect radios COM1 and radios XCVR3 – XCVR11.

3.2.2. J2 is used to connect the Pilot’s control panel, Pilot’s headset group, headset groups 3 – 7 and passenger control panels.

3.2.3. J3 is used to connect radios COM2 and radios XCVR12 – XCVR20.

3.2.4. J4 is used to connect the Copilot’s control panel, Copilot’s headset group, headset groups 8 – 12 and additional passenger control panels.

3.2.5. J5 is used to connect radios XCVR21 – XCVR30.

3.2.6. J6 is used to connect headset groups 13 – 18 and additional passenger control panels.

3.2.7. J7 is used to connect power, ground, Pilot’s COM1 Isolate, and Copilot’s COM2 Isolate.

3.2.8. J8 is a network port used for system configuration adjustment.

3.2.9. J9 is a memory card slot used for storing system configuration data onto removable media.

3.2.10. The Router contains no user serviceable internal components. Do not disassemble router or the factory warranty will be voided. Return the unit to Eagle Copters Ltd. for service.
3.3. Component Installation & Hookup

Figure 4
Router Installation

3.3.1. Install the router in the Aft Avionics Bay shelf, as shown in Figure 4. The exact placement is dependent on other pre-existing equipment installed. It is the installer’s responsibility to make sure this installation does not interfere with other installed equipment and that the installation does not exceed the shelf’s rated load limit.

Using Tray G13009 as a guide, layout and install (4) #10-32 potted inserts, NAS1832-3-3 into shelf in accordance with Eurocopter maintenance manual. Maintain 2 e/d edge margin for all mounting holes. Mount tray to shelf using (2) shims G13009-3 and (4) MS24693S276 #10 x 1.0 flat head screws. Slide Router into tray until clip on bottom engages the tray securely. Secure router to tray by tightening finger nut onto the front support hook.

3.3.2. Note: for the G13160 Router replace in Figure 5 the following items: G13009 with G13161; G13009-3 with G13161-3; G13006-2 with G13161-4 and use (3) MS24693S51 screws to install; use (2) NAS622CE2 Support Hooks.
3.3.3. For Router G13000, refer to drawing G13004 for the detailed wiring schematic used in this installation. For Router G13160, refer to drawing G13162 for the detailed wiring schematic used in this installation.

3.3.4. Be sure to carefully document the Radios and Control panels as installed and their related connections for future maintenance and troubleshooting purposes.
3.4. Control Panels

3.4.1. The Control Panels mount onto standard DZUS rails and should be mounted in locations designed for standard avionics mounting. The control panels connect to the router via the 4-wire GNET bus.

3.4.2. There can be more than one of these control panels in any combination connected to the system. Each audio board has two GNET ports giving 2, 4, 6 GNET ports for the P139 (S)/(D)/(T) routers respectively. If the configuration calls for more control panels than there are available GNET ports on the router, connect J1 of each control panel to a GNET port in parallel for pins 1 – 4. Pins 5 – 9 will be unique ID for each control panel connector. See G13004 sheet 9 for details.

3.4.3. The pilot control panel also controls the COM1 Isolate function. Optionally the copilot control panel controls the COM2 isolate function. See Section 1.8 for more information.

3.5. Control Panels G13115 & G13115NS

3.5.1. The G13115 & G13115NS Control panels provide separate transmit, receive and volume controls for up to 16 radios or other devices, as well as crew intercom functions and optionally installer-defined special functions. The G13115NS version does not have an EMERG/NORMAL switch and must not be used as a pilot or copilot primary panel.
3.6. Control Panels G13116 & G13116NS

3.6.1. The G13116 & G13116NS Control panels provide separate transmit, receive and volume controls for up to 8 radios or other devices, as well as crew intercom functions and optionally installer-defined special functions. The G13116NS version does not have an EMERG/NORMAL switch and must not be used as a pilot or copilot primary panel.

3.7. Headset Ports

3.7.1. The Pilot and Copilot Headset Group consists of the headset jack, ICS switch and transmit switches on the cyclic and/or foot switches.

3.7.2. For each passenger, a unique Passenger Headset Group is needed. The Passenger Headset Group consists of the passenger's headset jack, an ICS switch and a transmit switch.
3.8. COM1, COM2 and other radio ports

3.8.1. The G13000 digital audio router supports up to 20 radios and the G13160 router supports up to 30 radios. Each radio should be installed in accordance with the manufacturer's instructions.

3.8.2. For the G13000 the following connections are available:

3.8.2.1. The COM1 radio connects to J1 on the Router along with radios XCVR3 - XCVR11 (refer to G13004 sheet 4).

3.8.2.2. The COM2 radio connects to J2 on the router along with radios XCVR12 - XCVR20 (refer to G13004 sheet 5).

3.8.3. For the G13160 the following connections are available:

3.8.3.1. The COM1 radio connects to J1 on the Router along with radios XCVR3 - XCVR11 (refer to G13162 sheet 5).

3.8.3.2. The COM2 radio connects to J3 on the router along with radio ports XCVR12 - XCVR20 (refer to G13162 sheet 6).

3.8.3.3. Radios XCVR21 - XCVR30 connect to J5 on the router (refer to G13162 sheet 7).

3.8.4. While the term radio is used throughout this document, any type of audio device can be connected, such as tape recorders, scanners, telephones, hand-held radios, etc.

There is normally no need for any type of universal radio adapter between an audio device and the router.
4.0 **Functional Check**

4.1. Perform a check of all power and ground leads to confirm they are connected properly before applying power to the system. Incorrect wiring may cause damage to the units.

4.2. Connect headset adapter cables, headsets and switches. Apply power to audio system, radios and related accessories. Activate ICS and confirm proper operation. Place ‘PILOT EMERG/NORMAL’ switch in ‘EMERG’ position. Key transmit switch and confirm proper operation of COM1.

4.3. Place the ‘PILOT EMERG/NORMAL’ switch in ‘NORMAL’ position and check all transceivers, receivers and audio devices.

4.4. If the system is equipped with a ‘COPILOT EMERG/NORMAL’ switch, repeat the steps in sections 4.2 and 4.3 for Copilot position and COM2 respectively.

4.5. Check all pilot, copilot and passenger audio control panels for proper audio levels and operation. Should adjustments be required, follow the instructions in document GA063-3.
5.0 **Load Analysis**

5.1. At the completion of the installation of the audio system, the installer shall perform a load analysis test of the electrical branch circuit that powers the audio system, and also the entire aircraft electrical load, to confirm that the addition of the audio system will not cause an overload to the electrical branch circuit or the aircraft generator.

5.2. The current shall be measured using a properly calibrated ammeter. A clamp-on amp meter, such as Amprobe Instrument model number ACDC-600A, or equivalent will make this job easier.

5.3. Perform the branch circuit load analysis test by powering up all equipment that is intended to be operated at the same time on the branch circuit that the audio system is connected to. Additionally, key the three highest power communication transmitters at the same time, if possible, while the current measurements are being taken.

5.4. Measure the current of the branch circuit powering the audio system, by clamping the meter around the branch circuit wire near its origin. Confirm that the current draw during the above described test conditions is less than the current limiter (fuse or circuit breaker) rating for that branch circuit.

5.5. If the current draw is greater than the current limiter rating, it becomes the installer's responsibility to re-distribute some of the other equipment powered by this branch circuit to another suitable branch circuit, in order to reduce the load on the audio system's branch circuit to less than the current limiter rating.

5.6. Once the branch circuit loads are within limits, test the current load for the entire aircraft while all power for the aircraft is being supplied by the aircraft generator, battery, or external power source. Perform this load analysis test by powering up all equipment on the aircraft that is intended to be operated at the same time as the audio system. Additionally, key the three highest power communication transmitters at the same time, if possible, while the current measurements are being taken. Clamp the ammeter around the power source. Confirm that the current draw during the above described test is less than the generator rating.

5.7. Upon satisfactory completion of these load analysis tests, make an aircraft logbook entry that these tests have been performed satisfactorily in accordance with this STC.
6.0  **Interference Test Procedure**

6.1. Perform electrical interference test using GA1-2TP test procedure.

7.0  **Final Inspection**

7.1. Perform final inspection of installation confirming:
   7.1.1. There are no chaffing issues.
   7.1.2. There are no mechanical interference issues.
   7.1.3. Security of fasteners.
   7.1.4. Removal of all tools.
   7.1.5. Chips, shavings and other debris are removed.
   7.1.6. Proper reassembly of aircraft.
   7.1.7. Aircraft is airworthy prior to returning to service.

8.0  **FAA Requirements**

8.1. Amend the weight and balance records and make the necessary log book entry. Complete an FAA form 337 showing the installation of this equipment in accordance with the STC instructions and submit one copy to the FAA and one copy to the aircraft owner. File all data and a copy of the STC with the aircraft records.

**LOG OF REVISIONS**

<table>
<thead>
<tr>
<th>REVISION LEVEL</th>
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<th>PAGES</th>
<th>DESCRIPTION OF CHANGE</th>
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EMI Test Procedure
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<td>3, 4</td>
<td>Added coverage for FADEC aircraft under Scope. Revised procedure under Transponder test.</td>
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<td>C</td>
<td>5/13/2012</td>
<td>ALL</td>
<td>Revised Scope to remove FADEC references; Revised FAR references to CFR; Updated checklist for “other” equipment; Updated format of document to current standards;</td>
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</table>
Scope
This document is a test plan to be used to establish that newly installed electrical equipment does not interfere with essential aircraft equipment in any way that would impair safety of flight of the aircraft. Satisfactory completion of this test plan confirms that the newly installed equipment satisfies the EMI requirements of the Federal Aviation Administration. This test plan is applicable to FAR part 29 Rotorcraft.

Applicable Documents
CFR 29.1309(c), 29.1351(b)(1), 29.1351(b)(2) and AC25-10 Paragraph 5, sections: (m)(4) & (n).

Witnessing of EMI Test
This test shall be witnessed by someone who is authorized by the FAA to return the aircraft to service. This would include an FAA licensed Avionics Technician, A&P Mechanic, Inspector of Airworthiness, or the Repair Station’s Director of Maintenance. In addition, an FAA representative, such as a DAR or DER may witness the test.

Equipment Under Test
The newly installed Equipment Under Test (EUT) by this test plan shall be in proper working order throughout the test. If the EUT fails during this test, then this test shall be repeated with the EUT in proper working order.

Test Procedure
Testing shall normally be conducted with the aircraft running on the ground, or with battery or external ground power where appropriate. In the event that an aircraft system or component can only be evaluated for the effects of interference with the aircraft in flight, then the evaluation of that system or component shall be conducted with the aircraft in flight. Testing conducted with the aircraft in flight shall be performed with safety of flight in mind and with only necessary personnel on board.

Testing shall be conducted on the aircraft with all aircraft systems and equipment operating normally, and cycled as necessary to conduct the test. The EUT shall be operated normally. The EUT shall be cycled on and off. The EUT shall also be cycled through all of its operating modes.

Each aircraft system or component being evaluated for the effects of EMI will be observed as the EUT is cycled. A transient motion or flicker is acceptable provided no permanent deviation is established. There can be no stand-off conditions displayed on an instrument. In the case of audio equipment being evaluated for the effects of EMI, a change in the audio (such as background noise) that does not interfere with the intended purpose of the audio is acceptable.

For each aircraft system or component being evaluated for the effects of EMI, mark the item as PASS or FAIL based upon the outcome of this test procedure.

If an aircraft system or component being evaluated for the effects of EMI Fails this test procedure, then corrective action must be taken to reduce the interference to an acceptable level which allows the aircraft system or component being evaluated for the effects of EMI to PASS this test. When re-testing after corrective action, the only tests to be repeated are the tests that Failed previously. Items that previously Passed do not need to be re-tested, unless the method of corrective action results in changes to the EUT, which might cause the EUT to Fail previously Passed items. Mark the N/A ___ field on the re-test test plan for the items that previously Passed and are not being re-tested.
## Items To Evaluate

The following is a list of aircraft systems or components that must be evaluated for the effects of EMI if they are installed and are to be used at the same time as the EUT. If the item listed below is not installed or otherwise not applicable, then mark the N/A __ field.

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<tr>
<th>System</th>
<th>N/A</th>
<th>Pass</th>
<th>Fail</th>
</tr>
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<tr>
<td>Engine Temperature Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Engine RPM Indicator</td>
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<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Engine Torque Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Engine Fuel Control</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Engine Oil Pressure Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Engine Oil Temperature Indicator</td>
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<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Rotor RPM Indicator</td>
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<td>Fail</td>
</tr>
<tr>
<td>Fuel Quantity Indicator</td>
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<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Fuel Pressure Indicator</td>
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<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Generator Voltage Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Battery Voltage Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Directional Gyro / Heading Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Attitude Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Turn and Bank Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Annunciator Indicators</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Flight Time Hour Meter</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Warning Horn</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Outside Air Temperature Indicator</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
<tr>
<td>Transponder</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Set controls to mode C code 1200, or other code assigned by ATC. Cycle EUT and confirm proper data transmitted, either by use of transponder ground test equipment, or by confirmation from ATC of proper reception of correct data. Check for proper operation of reply light.

<table>
<thead>
<tr>
<th>System</th>
<th>N/A</th>
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<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOR</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Set Voice/Ident to Voice. Check frequencies for audible interference sounds. Set local VOR frequency for full needle displacement. Adjust course select knob for gradual reduction of needle displacement to half, fourth, and zero. Note stability at each displacement and that zero can be achieved without a standoff.

<table>
<thead>
<tr>
<th>System</th>
<th>N/A</th>
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<tbody>
<tr>
<td>DME</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Perform self test with EUT cycled. Note that no skips in miles display occurs. Observe that mile indications do not drift and there is no audible interference in Ident tone.

<table>
<thead>
<tr>
<th>System</th>
<th>N/A</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnetic Compass</td>
<td>N/A</td>
<td>Pass</td>
<td>Fail</td>
</tr>
</tbody>
</table>

Swing compass and adjust with EUT operating normally. If EUT causes erratic operation of magnetic compass, then mark compass as Fail.
<table>
<thead>
<tr>
<th>System</th>
<th>Status</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>VHF Communications System</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tune each comm receiver to a low, middle, and high frequency within its frequency range. Listen for audio interference. Transmit on low, middle, and high frequencies. Listen on an external receiver for audio interference.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPS Navigation Receiver</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check for proper operation. Observe signal to noise ratio readings to determine if reception is interfered with.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crew Interphone System</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check for normal operation of the interphone system. Listen for excessive background noise.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADF</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check for needle offset. Listen for audio interference.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glide Slope/LOC</td>
<td>N/A</td>
<td></td>
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</tr>
<tr>
<td>Check for needle offset. Perform test using TAC/30b or equivalent ground test equipment, or during flight while established on an ILS glide slope.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio Altimeter</td>
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<tr>
<td>Perform test with appropriate ground test equipment, or check reading in flight.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The space below is provided to include additional systems or devices not listed previously. These would include any Transceivers, Nav Aids, Radar, or Auto Pilot systems. Use the Manufacturers test procedures for each component listed with the EUT operating normally.

<p>| Other Equipment: ______________________ | N/A |      |      |
| Describe test: _________________________ |     |      |      |
|<em><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong><strong>|     |      |      |
| Other Equipment: ______________________ | N/A |      |      |
| Describe test: _________________________ |     |      |      |
|</strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></strong></em>|     |      |      |
| Other Equipment: ______________________ | N/A |      |      |
| Describe test: _________________________ |     |      |      |
|_______________________________________|     |      |      |</p>
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<tr>
<th>Other Equipment:</th>
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<tr>
<td>Describe test:</td>
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<tr>
<td>Other Equipment:</td>
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<td>Pass</td>
<td>Fail</td>
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<td>Pass</td>
<td>Fail</td>
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<tr>
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<td>Pass</td>
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<tr>
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<tr>
<td>Describe test:</td>
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</table>
Aircraft Tested:

Model ______________, Registration ___________, Serial Number ______

Location of Test _______________________, Date _____________

Equipment Under Test:

List: MODEL, PART NUMBER, SERIAL NUMBER

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________

Test performed by ________________________________________________

Name  Credentials

Test witnessed by ________________________________________________

Name  Credentials

I hereby certify that I have witnessed the above documented test and that the results documented above reflect my observations.

_________________________  _______________________
Signature              Date
CONNECT THE FOLLOWING PINS TOGETHER FOR GNET ADDRESSING AS SPECIFIED IN SYSTEM REQUIREMENTS

0 = 5-6-7-8-9
1 = 6-7-8-9
2 = 5-7-8-9
3 = 7-8-9
4 = 5-6-8-9
5 = 6-8-9
6 = 5-8-9
7 = 8-9
8 = 5-6-7-9
9 = 6-7-9
A = 5-7-9
B = 7-9
C = 5-6-9
D = 6-9
E = 5-9
F = NONE

NOTES
1. REFER TO GEVEVA DOCUMENT G12100 TO IDENTIFY MATERIALS LABELED ON THIS DRAWING.
2. REFER TO GENEVA DOCUMENT G12101 FOR FABRICATION AND INSPECTION INFORMATION.
3. REFER TO GENEVA DOCUMENT FOR WIRE ROUTING IN APPROPRIATE STC FOR LENGTH AND ROUTING INFORMATION REQUIRED TO FABRICATE A PARTICULAR DASH NUMBER.
4. USE M22759/16-24-9 24GA WIRE 1.5" LONG FOR ADDRESSING.
5. LEAVE ADDRESS PINS DISCONNECTED UNLESS INSTRUCTED OTHERWISE.
9 POSITION FEMALE D SUBMINIATURE CONNECTOR
CONNECTOR: TYCO/AMP 1757820-1
CONTACTS: TYCO/AMP 205090-1
BACKSHELL: KOBICONN 156-3009-E

D9F OR 9F

9 POSITION MALE D SUBMINIATURE CONNECTOR
CONNECTOR: TYCO/AMP 1757819-1
CONTACTS: TYCO/AMP 205089-1
BACKSHELL: KOBICONN 156-3009-E

D9M OR 9M

15 POSITION FEMALE D SUBMINIATURE CONNECTOR
CONNECTOR: TYCO/AMP 1757820-21
CONTACTS: TYCO/AMP 205090-1
BACKSHELL: KOBICONN 156-3015-E

D15F OR 15F

15 POSITION MALE D SUBMINIATURE CONNECTOR
CONNECTOR: TYCO/AMP 1757819-2
CONTACTS: TYCO/AMP 205089-1
BACKSHELL: KOBICONN 156-3015-E

D15M OR 15M

25 POSITION FEMALE D SUBMINIATURE CONNECTOR
CONNECTOR: TYCO/AMP 1757820-3
CONTACTS: TYCO/AMP 205090-1
BACKSHELL: KOBICONN 156-3025-E

D25F OR 25F

25 POSITION MALE D SUBMINIATURE CONNECTOR
CONNECTOR: TYCO/AMP 1757819-3
CONTACTS: TYCO/AMP 205089-1
BACKSHELL: KOBICONN 156-3025-E

D25M OR 25M

37 POSITION FEMALE D SUBMINIATURE CONNECTOR
CONNECTOR: TYCO/AMP 1757820-4
CONTACTS: TYCO/AMP 205090-1
BACKSHELL: KOBICONN 156-3037-E

D37F OR 37F

37 POSITION MALE D SUBMINIATURE CONNECTOR
CONNECTOR: TYCO/AMP 1757819-4
CONTACTS: TYCO/AMP 205089-1
BACKSHELL: KOBICONN 156-3037-E

D37M OR 37M

15 POSITION FEMALE D SUBMINIATURE CONNECTOR,
SOLDER CUP
CONNECTOR: TYCO/AMP 5-747909-2
BACKSHELL: KOBICONN 156-3015-E

D15FS OR 15FS

15 POSITION MALE D SUBMINIATURE CONNECTOR,
SOLDER CUP, HIGH DENSITY
CONNECTOR: NORCOMP 180-015-103L001
BACKSHELL: KOBICONN 156-3009-E

15HMS

U92

U92 UA HELICOPTER HEADSET JACK
BULKHEAD: NEXUS TJ-120
INLINE: NEXUS TJ-102

2F

2 POSITION FEMALE MATE-N-LOK CONNECTOR
CONNECTOR: TYCO/AMP 1-480318-0
CONTACTS: TYCO/AMP 60617-1

2M

2 POSITION MALE MATE-N-LOK CONNECTOR
CONNECTOR: TYCO/AMP 1-480319-0
CONTACTS: TYCO/AMP 60618-1

4F3

3 POSITION FEMALE INLINE XLR CONNECTOR
DELTORON 712-0300

4F4

4 POSITION FEMALE INLINE XLR CONNECTOR
DELTORON 712-0400

4F5

5 POSITION FEMALE INLINE XLR CONNECTOR
DELTORON 712-0500

4M3

3 POSITION MALE INLINE XLR CONNECTOR
DELTORON 713-0300

4M4

4 POSITION MALE INLINE XLR CONNECTOR
DELTORON 713-0400

4M4

NOTES
1. GENERIC COMPONENTS LISTED ABOVE MAY BE SUBSTITUTED AT THE INSTALLER'S DISCRETION.
2. ALL COMPONENTS LISTED ABOVE MAY BE SUBSTITUTED WITH A COMPONENT OF THE SAME TYPE
   THAT MATCHES OR EXCEEDS THE CURRENT AND FIRE RATINGS OF THE COMPONENT LISTED.
3. THE FOLLOWING ARE CONSIDERED GENERIC COMPONENTS: HOODS, BACKSHELLS, XLR
   CONNECTORS, BNC CONNECTORS (BE SURE TO MATCH IMPEDANCE AND CABLE TYPE), AUDIO
   CONNECTORS AND CONNECTOR MOUNTING HARDWARE (SCREWS, NUTS, LATCHING HARDWARE, ETC.)
4. COMPONENT COLOR IS OPTIONAL.
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<th>DATE</th>
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<td>CB</td>
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<td>B</td>
<td>REPLACED VENDOR PART NUMBERS WITH MANUFACTURER PART NUMBERS, ADDED ADDITIONAL PART NUMBERS TO 16A, ADDED NOTES</td>
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<tr>
<td>D</td>
<td>UPDATED PART NUMBERS FOR RHCS COMPLIANCE</td>
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<td>11/21/07</td>
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| 4M5 | 5 POSITION MALE IN LINE XLR CONNECTOR DELTRON 713-0300 |
| 5F3 | 3 POSITION FEMALE BULKHEAD XLR CONNECTOR DELTRON 724-0300 |
| 5F4 | 4 POSITION FEMALE BULKHEAD XLR CONNECTOR DELTRON 724-0400 |
| 5F5 | 5 POSITION FEMALE BULKHEAD XLR CONNECTOR DELTRON 724-0500 |
| 5M3 | 3 POSITION MALE BULKHEAD XLR CONNECTOR DELTRON 725-0300 |
| 5M4 | 4 POSITION MALE BULKHEAD XLR CONNECTOR DELTRON 725-0400 |
| 5M5 | 5 POSITION MALE BULKHEAD XLR CONNECTOR DELTRON 725-0500 |
| 4A  | 4 POSITION FEMALE CIRCULAR CONNECTOR HIROSE HR10A-7P-4S(73) |
| 6A  | BNC CONNECTOR, COAXIAL, 75Ω KINGS 2065-11-9 |
| 6B  | BNC CONNECTOR, TRIAXIAL, 50Ω TYCO/AMP 5225395-1 |
| 7B  | CANNON PLUG AMPHENOL INDUSTRIAL MS3116F8-4S |
| 7C  | CANNON PLUG AMPHENOL INDUSTRIAL MS3116F12-10S |
| 8A  | 1/8" MONO AUDIO CONNECTOR KOBICORN 171-1041 |
| 8B  | 2.5MM DC POWER PLUG KOBICORN 171-0702-EX |
| 8C  | 2.1MM DC POWER PLUG KOBICORN 171-3217-EX |
| 9A  | RCA PLUG DELTRON 333-0000 |

**NOTES**

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4. COMPONENT COLOR IS OPTIONAL.

**BREAK SHARP EDGES**

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

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<td>±1/8 X 1/600</td>
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<tr>
<td>±1/16 X 1/600</td>
<td>±1/8 X 1/1000</td>
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**DESIGNED BY:**

**DT DATE:** 2/24/98

**DRAWN:**

**CHECKED:**

**APPROVED MH:** 4/3/98

**DRAWING NUMBER:** G12100

**REV:** D

**TITLE:** CONNECTOR AND WIRE PART LIST

**PROD NO:** GA182

**SIZE A SHEET:** 2 OF 3

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1. GENERIC COMPONENTS LISTED ABOVE MAY BE SUBSTITUTED AT THE INSTALLER'S DISCRETION.
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4. COMPONENT COLOR IS OPTIONAL.

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**NOTES**

**REV**  **DESCRIPTION**  **APPROVED**  **DATE**
A  UPDATED DRAWING VIRTUALLY  CB  1/9/03
B  REPLACED VENDOR PART NUMBERS WITH MANUFACTURER PART NUMBERS, ADDED ADDITIONAL PART NUMBERS TO 16A, ADDED NOTES  CB  6/15/05
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D  UPDATED PART NUMBERS FOR ROHS COMPLIANCE  GA  11/21/07

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**BREAK SHARP EDGES**

**DESIGNED**  **DATE**

**DRAWN**  **CHECKED**  **APPROVED**

**DATE**  **DATE**  **DATE**

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**WORLDWIDE FLEET MANAGEMENT**

**CONNECTOR AND WIRE PART LIST**

**DRAWING NUMBER**  **PROD NO**  **SIZE**  **SHEET**

**G12100**  **GA182**  **A**  **3 OF 3**
G13000  P139-HD ROUTER
WEIGHT = 5 LBS MAX
POWER = 5 AMPS MAX
VOLTAGE = 14 - 32 VDC

OPTIONAL:
SUPPORT HOOK (NAS622CE2)
INSTALLED WITH (2) #6-32 X .5
FLAT HEAD SCREWS (MS24693S28)
AND NUTPLATES (MS21071L06)
OR LOCKNUTS (MS21042L06)

J5

J6 NETWORK PORT

J1

J2

J3

J4

J7 MEMORY CARD SLOT

OPTIONAL:
CLIP G13006-2
INSTALLED WITH (2) #8-32 X .62
FLAT HEAD SCREWS (MS24693S51)
AND NUTPLATES (MS21059L08)

OPTIONAL SINGLE AUDIO BOARD CONFIGURATION:
J1 AND J3 ARE REPLACED WITH COVER PLATE G13000-9

WEIGHT = 5 LBS MAX
POWER = 5 AMPS MAX
VOLTAGE = 14 - 32 VDC

VOLTAGE RANGE WAS 10 - 30 VDC 08/13/14

ADDED OPTIONAL FRONT AND BOTTOM CLIPS FOR TRAY INSTALLATION
11/20/12

REVISED FRONT SCREWS FOR G13009 TRAY INSTALLATION
1/13/12

REVISED LABEL ON J7 5/12/09

ADDED SINGLE BOARD CONFIGURATION NOTE
6/10/11

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AND SHALL NOT BE USED OR DUPLICATED BY ANYONE WITHOUT THE WRITTEN PERMISSION OF EAGLE COPTERS LTD.
## AUDIO BOARD OPTIONS:

The P139-HD can be set up in one of two configurations:

- Dual Audio Board system with 4 audio connectors J1, J2, J3, J4
- Single Audio Board with 2 audio connectors J2 and J4

Pages 1, 11 and 12 are common to all installations.

Wiring diagrams for the Dual Audio Board system are found on pages 2 through 7

Wiring diagrams for the Single Audio Board system are found on pages 8 through 10

### NOTES:

1. Unless otherwise noted: All wires are 22 awg; all shielded wire is MIL-DTL-27500; all unshielded wire is MIL-W-22759/16.
2. All Grounding and Bonding will be IA/W AC 43.13-18, Chapter 1, Section 15.

- **SPARE KEY line function and connections are installer defined and depend on the specific system configuration.**
- **D50M connector assembly consists of:** Connector M24308/4-5F; Cinch backshell DD-24661-34; 2ea. Cinch Screwlocks D20420-42. Alternate Backshell: Conec 165X10179X.
- **D50f connector assembly consists of:** Connector M24308/2-5F; Cinch backshell DD-24661-34; 2ea. Cinch Screwlocks D20420-42. Alternate Backshell: Conec 165X10179X.
- **D9f connector assembly consists of:** Connector M24308/2-1F; Cinch backshell DE-24657-30; 2ea. Cinch Screwlocks D20419-46. Alternate Backshell: Conec 165X10139X.

When COM1DIR (P5, Pin 10) is not grounded, the Pilot headset is in EMERGENCY mode and the following lines are diverted:

- **HEADSET 1** connects directly to RX1, RX11 (Unswitched Alert Tones) and the emergency intercom.
- **MIC 1** connects directly to TX 1 and the emergency Intercom.
- **XMIT KEY 1** and **PLT COM1 KEY** connect to TX KEY 1.
- **ICS KEY 1** keys the emergency intercom, if at least one Power Input Circuit Breaker to the G13000 Audio Router has power.
- **TX11 (CVR)** transmits HEADSET1, MIC1 and Emergency Intercom if at least one Power Input Circuit Breaker to the G13000 Audio Router has power.

When COM2DIR (P5, Pin 11) is not grounded, the Copilot headset is in EMERGENCY mode and the following lines are diverted:

- **HEADSET 2** connects directly to RX2, RX20 (Unswitched Alert Tones) and the emergency intercom.
- **MIC 2** connects directly to TX 2, and the emergency Intercom.
- **XMIT KEY 2** and **CPLT COM2 KEY** connect to TX KEY 2.
- **ICS KEY 2** keys the emergency intercom, if at least one Power Input Circuit Breaker to the G13000 Audio Router has power.
- **TX20 (CVR)** transmits HEADSET2, MIC2 and Emergency Intercom if at least one Power Input Circuit Breaker to the G13000 Audio Router has power.

**TERMINAL BLOCK assembly consists of:** Deutsch block CTJ122E05E; Deutsch socket contacts CTS-S22/22 or M39029/22-191. A Gnet channel backshell is connected to only one control panel or other device may be wired directly without using a terminal block.

### DEFINITIONS:

<table>
<thead>
<tr>
<th>N/C:</th>
<th>MAKE NO CONNECTION. The pin is not connected to anything internally and therefore shall have no connection externally</th>
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<tbody>
<tr>
<td>RESERVED:</td>
<td>MAKE NO CONNECTION. Internal circuitry may be added in the future, or may be present and relevant for testing but not relevant to operation for flight.</td>
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</table>
NOTE: VIEW IS FROM REAR OF AIRFRAME CONNECTOR
NOTE: VIEW IS FROM REAR OF AIRFRAME CONNECTOR
NOTE: VIEW IS FROM REAR OF AIRFRAME CONNECTOR
CONNECT THESE TWO GROUND WIRES TO SEPARATE SCREWS.

TO PILOT CONTROL PANEL
SEE SHEET 13

TO PILOT CONTROL PANEL
SEE SHEET 13

NOT USED ON SINGLE-BOARD SYSTEMS.
To Gnet connections on G13000 J3 and J4 (typical for each Gnet bus).

Additional control panels or other Gnet interface devices as required, up to 15 total per Gnet bus.

If the number of installed control panels is equal to or less than the number of available Gnet busses (4 for dual-board, 2 for single-board) then each panel should be connected to a separate Gnet bus and terminal blocks are not required.

The pilot's primary control panel should be the first device on Gnet bus 1. The copilot's primary control panel should be the first device on Gnet 3 in a dual-board system and the first device on Gnet 2 on a single-board system.

Additional control panels should be evenly distributed among available Gnet busses.

GNET EXTERNAL POWER:
If the audio system has more than 6 control panels an external power source for the additional panels must be provided. Up to 12 additional control panels may be powered from each external 5A breaker.

CONTROL PANEL BUS ASSIGNMENT:
If the number of installed control panels is equal to or less than the number of available Gnet busses (4 for dual-board, 2 for single-board) then each panel should be connected to a separate Gnet bus and terminal blocks are not required.

The pilot's primary control panel should be the first device on Gnet bus 1. The copilot's primary control panel should be the first device on Gnet 3 in a dual-board system and the first device on Gnet 2 on a single-board system.

Additional control panels should be evenly distributed among available Gnet busses.

GNET ADDRESS JUMPERS:
For every control panel or other peripheral device connected to a particular Gnet bus, a unique device address from "1" to "9" or "A" to "F" must be wired into the connector. The address for each device on each Gnet bus is defined in the system configuration software for the specific installation.

Using 24 AWG wire 1.5" long for each jumper, connect the following pins together for Gnet addressing for each connector, as specified in the system configuration requirements. Make no connections to unlisted pins.

The first control panel on any given Gnet bus should be set as address "F" with no jumpers. Additional panels on the same bus should be given addresses in descending order: "E", "D", "C" etc.

GNET DATA LO
GNET DATA HI
GNET GND
GNET +28V

+28V AVIONICS POWER
TO GNET CONNECTIONS ON J3 AND J4 (TYPICAL FOR EACH GNET CHANNEL)

AIRFRAME GROUND
TERMINAL BLOCK

Additional control panels or other Gnet interface devices as required, up to 15 total per Gnet bus.

To additional Control panel if required
To additional control panel or additional terminal blocks if required
The G13115 and G13116 control panels have two electromechanical toggle switches on the front panel; an EMERG/NORMAL locking toggle switch, and a 3-position momentary switch for ICS/OFF/TX PTT. When each switch is "on" the appropriate pin on the J3 connector is connected to GND, pin 7.

The above wiring diagram illustrates the use of the EMERG/NORMAL switch on the pilot's G13115 or G13116 primary control panel to control the Emergency Mode operation for the pilot headset. The operation of the Digital Audio System in Emergency Mode is detailed in NOTE 8 on G13004 sheet 1.

The pilot's primary control panel MUST be wired to COM1DIR as shown if this is the primary audio system installed. ONLY if the audio system is installed as a secondary may the connection be omitted and the COM1DIR pin on the G13000 be directly connected to ground.

In most installations, the copilot's primary control panel will be wired to COM2DIR, connecting to the appropriate pins as shown in the above table. Exceptions are if the audio system is not the primary audio system or if the HEADSET 2 port is not at a location used by flight crew. In these situations the COM2DIR pin on the G13000 should be directly connected to ground.

On a single-board system there is no copilot Emergency Mode, and the COM2DIR pin is not connected.

The EMERG/NORMAL switch is only connected for the pilot's and copilot's primary control panel. For other control panel locations, a G13115NS or G13116NS panel with the EMERG/NORMAL switch not installed may be used.

The ICS PTT and TX PTT pins on the copilot control panel should be connected in parallel with the appropriate PTT switches on the copilot cyclic and/or foot switches.

In all other crew positions the ICS PTT and TX PTT pins on the associated control panel may be connected in parallel with the appropriate PTT switches for that headset.
NOTES:

BUTTON LABELS SHOWN ARE FOR REFERENCE ONLY AND ARE INSTALLER DEFINED.

POWER: 28 VDC @ 250mA MAX
WEIGHT: 1.50 LBS MAX
OPTIONAL: TEXT MAY BE ENGRAVED, STAMPED OR PRINTED ON PART AS DESIRED

PIN G13115 : AS SHOWN
PIN G13115NS : REPLACE SWITCH WITH HEYCO HOLE PLUG #2603
NOTES:

BUTTON LABELS SHOWN ARE FOR REFERENCE ONLY AND ARE INSTALLER DEFINED

POWER: 28VDC @ 250mA MAX

WEIGHT: 1.25 LBS MAX

OPTIONAL: TEXT MAY BE ENGRAVED, STAMPED OR PRINTED ON PART AS DESIRED

PIN G13116: AS SHOWN

PIN G13116NS: REPLACE SWITCH WITH HEYCO HOLE PLUG #2603
10.00

8.50

3.50

G13160 P139-HD
3 BOARD ROUTER
WEIGHT = 5.3 LBS MAX
POWER = 5 AMPS MAX
VOLTAGE = 14 - 32 VDC

J1 J5
J7
J8 NETWORK PORT
J9 MEMORY CARD SLOT

OPTIONAL (2) PLACES:
SUPPORT HOOK (NAS622CE2)
INSTALLED WITH (2) #6-32 X .5
FLAT HEAD SCREWS (MS24693S28)

J1 J2 J3 J4
J5 J6 J7 J8

OPTIONAL:
CLIP G13161-4
INSTALLED WITH (3) #8-32 X .62
FLAT HEAD SCREWS (MS24693S51)

OPTIONAL: TEXT MAY BE ENGRAVED, STAMPED OR PRINTED ON PART AS DESIRED

WEIGHT = 5.3 LBS MAX
POWER = 5 AMPS MAX
VOLTAGE = 14 - 32 VDC

12/9/13 CLB

3 BOARD ROUTER

WEIGHT = 5.3 LBS MAX
POWER = 5 AMPS MAX
VOLTAGE = 14 - 32 VDC

12/9/13 CLB

3 BOARD ROUTER

WEIGHT = 5.3 LBS MAX
POWER = 5 AMPS MAX
VOLTAGE = 14 - 32 VDC

12/9/13 CLB

3 BOARD ROUTER

WEIGHT = 5.3 LBS MAX
POWER = 5 AMPS MAX
VOLTAGE = 14 - 32 VDC

12/9/13 CLB

3 BOARD ROUTER

WEIGHT = 5.3 LBS MAX
POWER = 5 AMPS MAX
VOLTAGE = 14 - 32 VDC
NOTES:
1. Unless otherwise noted: All wires are 22 awg; all shielded wire is MIL-DTL-27500; all unshielded wire is MIL-W-22759/16.
2. Grounding and Bonding will be I/A/W AC 43.13-1B, Chapter 11, Section 15. Make no connection. Internal circuitry may be added in the future, or may be present and relevant for testing but not relevant to operation for flight.

DEFINITIONS:
N/C: MAKE NO CONNECTION. The pin is not connected to anything internally and therefore shall have no connection externally

RESERVED: MAKE NO CONNECTION. Internal circuitry may be added in the future, or may be present and relevant for testing but not relevant to operation for flight.

1. Terminal block assembly consists of: Deutsch block CTJ122E05E; M39029/22-191, Cinch backshell DE-24658-31; 2ea. Cinch Screwlocks D20419-46. Alternate backshell: 165X10149X. Conductors shown with splices may be implemented by soldering the supply wire to both pins after soldering and insulating the adjacent connections.

The Audio System works with a range of supply voltages, as specified in the installation instructions. Breaker ratings and wire sizes shown are for 28V systems. For 12V systems, the breaker ratings must be increased to 10A and the size of the shielded supply and ground wires must be increased to 18 AWG. The splice wires at P7 remain at 20 AWG.

2. The COM1DIR pin MUST be wired to an appropriate switch to control Emergency Mode for the pilot headset. Emergency Mode is mandatory when the G13160 Audio Router is used as the primary audio system. See notes on sheet 13.


6. Shielding: For shielded wire, the shield must be connected to airframe ground or connector ground as follows:
   - For wire carrying audio signals, the shield must be grounded at one end ONLY. Grounding both ends may lead to audio noise.
   - Audio shield ground connections should be made at the G13160 connectors but may be made at the other end at the installers discretion.

7. For all other shielded wire, e.g. Gnet and power, the shield must be grounded at both ends.

8. D9F connector preferred assembly consists of: Connector M24308/2-1F; Cinch backshell DA-24655-31; 2ea. Cinch Screwlocks D20419-46. Alternate Backshell: 165X10149X. Conductors shown with splices may be implemented by soldering the supply wire to both pins after soldering and insulating the adjacent connections.
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     - For all other shielded wire, e.g. Gnet and power, the shield must be grounded at both ends.

   - D9F connector preferred assembly consists of: Connector M24308/2-1F; Cinch backshell DA-24655-31; 2ea. Cinch Screwlocks D20419-46. Alternate Backshell: 165X10149X. Conductors shown with splices may be implemented by soldering the supply wire to both pins after soldering and insulating the adjacent connections.

9. Terminal block assembly consists of: Deutsch block CTJ122E05E; Deutsch socket contacts CTS-S22/22 or M39029/22-191. A Gnet bus that is connected to only one control panel or other device may be wired directly without using a terminal block.

D9M connector assembly consists of: Connector M24308/4-1F; Cinch backshell DE-24657-30; 2ea. Cinch Screwlocks D20419-46. Alternate Backshell: 165X10149X. Conductors shown with splices may be implemented by soldering the supply wire to both pins after soldering and insulating the adjacent connections.
NOTE: VIEW IS FROM REAR OF AIRFRAME CONNECTOR
**NOTE:** VIEW IS FROM REAR OF AIRFRAME CONNECTOR

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**RAW Text:**

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<td>RX 1 LO</td>
<td>RX 4 HI</td>
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<td>GNET 3 +28V</td>
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<td>GNET 3 DATA HI</td>
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**Diagram:**

- **P3 D50F**
- **P4 D50M**

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**REV. DESCRIPTION DATE APPROVAL**

See sheet 1 for revision history

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NOTE: VIEW IS FROM REAR OF AIRFRAME CONNECTOR
P139-HD AUDIO SYSTEM
ROUTER J1

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See sheet 1 for revision history.
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**Notes:**
- SEE GNET BRANCH INTERCONNECT DRAWING ON SHEET 12
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P139-HD AUDIO SYSTEM
ROUTER J7 CONNECTIONS

- +28V AVIONICS POWER 1
- +28V AVIONICS POWER 2
- COM1DIR
- COM2DIR
- GND
- DIMMER 1
- DIMMER 2
- RESERVED
- RESERVED
- TO DIMMER BUS 1
- TO DIMMER BUS 2
- TO PILOT CONTROL PANEL
- TO COPilot CONTROL PANEL
- 20 AWG
- AUDIO ROUTER 1
- AUDIO ROUTER 2

Connect these two ground wires to separate screws.

RESERVED
RESERVED
COM2DIR
GND
GND
DIMMER 2
DIMMER 1
GND
GND
GND
+28V IN 1
+28V IN 2
+28V IN 1
+28V IN 2

P7 D15F

J7

TO PILOT CONTROL PANEL
SEE SHEET 13

TO COPilot CONTROL PANEL
SEE SHEET 13

TO DIMMER BUS 1

TO DIMMER BUS 2

CONNECT THESE TWO GROUND WIRES TO SEPARATE SCREWS
To additional Control panel if required

To additional control panel or additional terminal blocks if required

GNET EXTERNAL POWER:
If the audio system has more than 6 control panels an external power source for the additional panels must be provided. Up to 12 additional control panels may be powered from each external 5A breaker.

CONTROL PANEL BUS ASSIGNMENT:
If six or less control panels are to be installed then each panel should be connected to a separate Gnet bus and terminal blocks are not required.

The pilot's primary control panel should be the first device on Gnet bus 1. The copilot's primary control panel should be the first device on Gnet bus 3. The control panel associated with HEADSET13 should be the first device on Gnet bus 5.

Additional control panels should be evenly distributed among available Gnet busses.

GNET ADDRESS JUMPERS:
For every control panel or other peripheral device connected to a particular Gnet bus, a unique device address from "1" to "9" or "A" to "F" must be wired into the connector. The address for each device on each Gnet bus is defined in the system configuration software for the specific installation.

Using 24 AWG wire 1.5" long for each jumper, connect the following pins together for Gnet addressing for each connector, as specified in the system configuration requirements. Make no connections to unlisted pins.

The first control panel on any given Gnet bus should be set as address "F" with no jumpers. Additional panels on the same bus should be given addresses in descending order: "E", "D", "C" etc.

GNET ADDRESS JUMPERS (SEE BELOW):

ADDRESS JUMPERS:

ADDRESS SET TO 'F' (SEE BELOW):

GNET DATA LO
GNET DATA HI
GNET GND
GNET +28V

+28V AVIONICS POWER
TO GNET CONNECTIONS ON J3 AND J4 (TYPICAL FOR EACH GNET CHANNEL)

To Gnet connections on G13160 J2, J4 and J6 (typical for each Gnet bus)
The G13115 and G13116 control heads have two electromechanical toggle switches on the front panel; an EMERG/NORMAL locking toggle switch, and a 3-position momentary switch for ICS/OFF/TX PTT. When each switch is "on" the appropriate pin on the J3 connector is connected to GND, pin 7.

The above wiring diagram illustrates the use of the EMERG/NORMAL switch on the pilot's G13115/G13116 primary control panel to control the Emergency Mode operation for the pilot headset. The operation of the Digital Audio System in Emergency Mode is detailed in NOTE 8 on G13162 sheet 1.

The pilot's primary control head MUST be wired to COM1DIR as shown if this is the primary audio system installed. ONLY if the audio system is installed as a secondary may the connection be omitted and the COM1DIR pin on the G13160 be connected to ground.

In most installations, the copilot's primary control panel will be wired to COM2DIR, connecting to the appropriate pins as shown in the above table. Exceptions are if the audio system is not the primary audio system or if the HEADSET 2 port is not at a location used by flight crew. In these situations the COM2DIR pin on the G13160 should be directly connected to ground.

NOTE: When the Copilot goes into Emergency Mode, Headset Port 13 and Radio Ports 21 and 30 will also go into emergency mode as detailed in NOTE 8 on G13162 sheet 1.

The EMERG/NORMAL switch is only connected for the pilot and copilot control head. For other control panel locations, a G13115NS or G13116NS panel with the EMERG/NORMAL switch not installed may be used.

The ICS PTT and TX PTT pins on the copilot control panel should be connected in parallel with the appropriate PTT switches on the copilot cyclic and/or foot switches.

In all other crew positions the ICS PTT and TX PTT pins on the associated control head may be connected in parallel with the appropriate PTT switches for that headset.