US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved OMB No. 2120-0020 2/28/2011 | Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark: USA N365JC	Serial No.: LJ-2057	
	Make: Beechcraft	Model: C90GTi	Series: King Air
2. Owner	Name *(As shown on registration certificate)*: Green Flash Ventures LLC	Address *(As shown on registration certificate)*: Address 19100 Von Karman Ave STE 950; City Irvine; State CA; Zip 92612-6583; Country USA	

3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
☐	☑	AIRFRAME	———	*(As described in Item 1 above)*	———
☐	☐	POWERPLANT			
☐	☐	PROPELLER			
☐	☐	APPLIANCE	Type / Manufacturer		

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency		
Name Elliott Aviation of Minneapolis, LLC	☐	U. S. Certificated Mechanic	☐ Manufacturer
Address 13801 Pioneer Trail	☐	Foreign Certificated Mechanic	C. Certificate No.
City Eden Prairie State MN	✓	Certificated Repair Station	
Zip 55347 Country USA	☐	Certificated Maintenance Organization	KX5R005N

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B ☐	Signature/Date of Authorized Individual	
	Jeff Solberg	05/15/2020

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☑ Approved ☐ Rejected

BY								
		FAA Flt. Standards Inspector		Manufacturer		Maintenance Organization		Persons Approved by Canadian Department of Transport
		FAA Designee	✓	Repair Station		Inspection Authorization		Other *(Specify)*

Certificate or Designation No.	Signature/Date of Authorized Individual	
KX5R005N	Jeff Solberg	05/15/2020

FAA Form 337 (10-06)

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N365JC	05/15/2020
Nationality and Registration Mark	Date

Performed Pro-Line 21 LPV ADS-B Out, and Synthetic Vision upgrade per BHE & Associates STC SA11134SC. All wiring modifications and equipment installations performed referencing BHE & Associates Master Data List 544-00-0001 rev. M. Entered FAA Approved Airplane Flight Manual Supplement 544-00-0055 rev. C in Pilots Operating Handbook. Instructions for Continued Airworthiness document 544-00-0056 rev. E provided to aircraft operator.
Added 2 each 3 amp circuit breakers P/N7277-2-3 labeled SVC and VIU on RH CB panel left hand buss.
Verified FSA-5000 software P/N 810-0001-109 Installed.
Complied with Functional ground check referencing BHE Doc. 544-00-0072 Rev. E.
Complied with ground test plan referencing BHE Doc. 544-00-0051 Rev. A .
Complied with EMC ground test plan referencing BHE Doc. 544-00-0050 Rev. A .
Updated aircraft weight and balance and equipment list.

A satisfactory ground test of the ADS-B Out system was completed using Aeroflex IFR-6000 equipment testing for proper configuration and equipment performance requirements. The Installed ADS-B Out system has been shown to meet the equipment requirements of 14CFR 91.227. The Transponders installed were tested as required by 14CFR91.413 and found to comply with 14CFR43 appendix E, paragraph (c) ,and 14CFR part 43 appendix F.

Performed Data Base Unit upgrade per Rockwell Collins STC SA01430WI-D referencing Rockwell Collins DBU-5010E Installation Instructions Document RCA-2394 rev.D. This installation is a model number change only with no changes to existing DBU-5000/5010E ICA or weight and balance.

Performed modification of Rockwell Collins GPS installation under STC SA01434WI-D by installation of GPS4000S P/N 822-2189-004. Updated equipment list and installed AFMS supplement ACC-07-009 Rev. B. No changes to existing weight and balance or ICA.

Performed modification BHE & Associates Pro Line 21 FMS 3000- LPV upgrade under STC SA10966SC. All wiring modifications and equipment installations performed referencing BHE & Associates Master Data List 335-00-0001 rev. G.
Installed Aircraft data base upgrade software p/n 9100008-03207F.
Performed GPS configuration strap upgrade reference BHE drawing 335-00-0003 Rev. A.
Installed ACSS TAWS update p/n 9100008-03207F.
Performed ground test procedure reference BHE Document 335-00-0011 Rev. A.
Installed AFMS 335-00-0014 Rev. B in flight manual.
Provided ICA 335-00-0015 rev. C to operator. No changes to weight and balance.

END

☐ Additional Sheets Are Attached

400 Collins Road NE
Mail Station 164-100
Cedar Rapids, IA 52498
USA
Phone: (319) 295-7769
Fax: (319) 295-0337
Email: certcenter@rockwellcollins.com

Collins Aerospace
A United Technologies Company
Rockwell Collins, Inc. ODA-500864-CE

Jennifer L. Harleen
STC Customer Support Specialist
Collins Aerospace Aircraft Certification Center

March 2, 2020 WO200233

Elliott Aviation
13801 Pioneer Trail
Eden Prairie, MN 55347
Tel: 952.944.1200
Email: rdonat@elliottaviation.com

Attention: Mr. Robert Donat

Subject: Letter of Authorization (LOA) for STC SA01430WI-D Modification of a Rockwell Collins, Inc. Data Base Unit (DBU) installation

Dear Mr. Donat:

Attached are electronic copies of the following FAA approved STC data:

1. Supplemental Type Certificate SA01430WI-D, dated September 12, 2011;
2. Approved Model List (AML) RCA-0374, Revision E;
3. Drawing Index RCA-0122-001, Revision D;
4. One file for each drawing listed on Drawing Index RCA-0122-001.

Rockwell Collins, Inc. authorizes Elliott Aviation to use the FAA approved data listed above to modify your customer's Hawker Beechcraft Corporation model C90GTi aircraft, serial number LJ-2057.

Please note that the documentation is provided to you on an "as is" basis, and your acceptance of the documentation serves to hold Rockwell Collins, Inc. harmless for any liability arising out of the use of such documentation.

Elliott Aviation is responsible for the development and approval of any deviations from the STC type design data provided for the modification of the aircraft authorized above. Elliott Aviation is also responsible for acquiring all parts, kits and services required to complete the STC installation.

This authorization is limited to the aircraft listed above and may not be extended to other aircraft without the written authorization from Rockwell Collins, Inc. This authorization grants the usage of the type design

data for the expressed purpose of the modification of the aircraft authorized and may not be utilized for any other purposes.

It is expressly prohibited to disclose this documentation to any third party. Authorization to use this documentation or any portion thereof may not be assigned or sub-licensed by recipient without the express written consent of Collins Aerospace.

We trust this data will fulfill your requirements. However, if you have any questions, please contact your Collins Aerospace Customer Administrator.

For any STC integration questions contact certcenter@rockwellcollins.com.

For any general avionics questions contact CustomerSupport@rockwellcollins.com.

Sincerely,

Jen Harleen

Jennifer L Harleen
Collins Aerospace Aircraft Certification Center
Mail Station 164-100

/jlh

Attachments

United States of America

Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

Number SA01430WI-D

This certificate, issued to Rockwell Collins, Inc.
400 Collins Road NE, MS 164-100
Cedar Rapids, IA 52498

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 23 of the Federal Aviation Regulations.

Original Product Type Certificate Number: See attached FAA Approved Model List (AML), Document
Make: No. RCA-0374, Rev (B), or later FAA approved revisions for the list of approved airplane models, applicable installation
Model: data requirements and specific limitations.

Description of Type Design Change: Modification of a Rockwell Collins, Inc. Data Base Unit (DBU) installation in accordance with:

(1) Rockwell Collins, Inc. Drawing Index RCA-0122-001, Rev C, dated September 12, 2011, or later FAA approved revision, as listed on the attached FAA Approved Model List (AML).

Limitations and Conditions:

(1) Prior FAA approved installation of a Rockwell Collins, Inc. DBU part number specified by Rockwell Collins, Inc. AML No. RCA-0374 is a prerequisite to this STC.
(2) Approval of this change in type design applies to the above model aircraft only.
(3) Compatibility of this design change with previously approved modifications must be determined by the installer.
(4) A copy of this Certificate and the FAA Approved Model List (AML) must be maintained as part of the permanent records for the modified aircraft.
(5) 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: December 7, 2006

Date reissued:

Date of issuance: July 19, 2007

Date amended: October 30, 2007, May 14, 2008, September 12, 2011

By direction of the Administrator

(Signature)

Steven P. Brune

STC ODA Administrator, ODA-500864-CE

(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.

United States of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA01430WI-D

Certification Basis:

Based on 14 CFR §§ 21.115 and 21.101, and the FAA policy for significant changes in FAA Order 8110.48, the certification basis for the FAA Approved Model List (AML) No. RCA-0374 is as follows:

(1) The type certification basis for all Models included in AML No. RCA-0374 is included in the applicable TCDS as listed in the FAA approved AML for parts not changed or not affected by the change.

(2) The certification basis for parts changed or affected by this change since the reference date of application, December 7, 2006, is as follows:

FAA Approved Model List (AML) No. RCA-0374

14 CFR Part		Amend.
23.1301	(a)(b)(c)(d)	20
23.1309	(a)(b)(c)(d)(e)	49
23.1316	(b)	80
23.1351	(a)(b)	49
23.1357	(a)(b)(c)(d)	51
23.1431	(a)(b)	49
23.1529	all	26

Rockwell Collins

APPROVED MODEL LIST (AML)
REPLACEMENT DATABASE UNIT (DBU)
14 CFR PART 23 AIRCRAFT

STC SA01430WI-D

RCA-0374
Revision: E
January 8, 2014

FAA APPROVED BY:

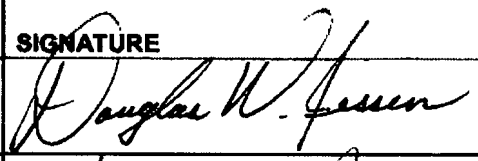
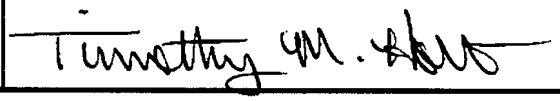
Steven P. Brune
STC ODA Administrator, ODA-500864-CE

NOTE(S):

This document is maintained in the Aircraft Certification Center configuration management system.

Paragraphs and/or figures with a vertical line outside the right margin (|) indicate a change to the latest revision.

SIGNATURES

	NAME	SIGNATURE
Prepared by:	D. W. Jessen	
Checked by:	V. J. Humphrey	
Approved by:	T. M. Holt	

1. AML REVISION LOG

Rev	Page(s)	ECO	Description	Date
-	All	N/A	Original Release	07/19/2007
A	1	N/A	Amended AML to change Raytheon Aircraft Company to Hawker Beechcraft Corporation. Added HBC B200GT, B200CGT and C90GTi aircraft models.	01/08/2008
B	1-5	INU011	Revised AML format to better align with AC 23-22 dated 01/27/05.	09/12/2011
C	4-5	INU370	Revised AML due to a revision change of Drawing Index RCA-0122-001.	02/01/2013
D	4 4-5	INU446	Amended AML to add Cessna models 525, 525A, 525B and 525C. Revised the paragraph in Section 3, Important Note. Added Note 1 to Required Approved Data.	12/10/2013
E	5	INU464	Amended AML to add Beechcraft Corporation Model 300.	01/08/2014

2. INTRODUCTION

This document is the FAA Approved Model List for STC No. SA01430WI-D for the replacement of existing approved Database Unit (DBU) in 14 CFR Part 23 Aircraft.

3. IMPORTANT NOTE

It is the responsibility of the installer to ensure the existing aircraft equipment configuration is compatible with this STC. Refer to Installation Instructions RCA-2394 for the approved equipment replacements.

4. APPROVED MODEL LIST

Item	Aircraft Make	Aircraft Model	Type Certificate Number	Required Approved Data[1] Model Specific Limitations	AML Amdt Date
1	Cessna	525 525A 525B 525C	A1WI Revision 21 08/08/2012	***Installation Instructions:*** Drawing Index, RCA-0122-001, Rev. D ***Airplane Flight Manual Supplement:*** N/A ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	12/10/13
2	Piaggio Aero Industries S.p.A.	P-180	A59EU Revision 15 08/05/2006	***Installation Instructions:*** Drawing Index, RCA-0122-001, Rev. D ***Airplane Flight Manual Supplement:*** N/A ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	
3	Hawker Beechcraft Corporation	390 (Premier I)	A00010WI Revision 8 03/26/2007	***Installation Instructions:*** Drawing Index, RCA-0122-001, Rev. D ***Airplane Flight Manual Supplement:*** N/A ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	01/08/08

Item	Aircraft Make	Aircraft Model	Type Certificate Number	Required Approved Data[1] Model Specific Limitations	AML Amdt Date
4	Beechcraft Corporation	300 B200 B200C B200GT B200CGT B300 B300C	A24CE Revision 107 04/12/2013	***Installation Instructions:*** Drawing Index, RCA-0122-001, Rev. D ***Airplane Flight Manual Supplement:*** N/A ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	01/08/14
5	Hawker Beechcraft Corporation	C90GTi	3A20 Revision 66 12/13/2007	***Installation Instructions:*** Drawing Index , RCA-0122-001, Rev. D ***Airplane Flight Manual Supplement:*** N/A ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	01/08/08

[1] Or later approved revision

Rockwell Collins

DRAWING INDEX
DBU-5000/DBU-5010E DATA BASE UNIT REPLACEMENT
14 CFR PART 23 AIRCRAFT

RCA-0122-001
Revision: D
February 1, 2013

FAA
APPROVED
BY ODA-500864-CE
STC NO SA01430WI-D
DATE 2-28-13 BY

NOTICE:

The contents of this document are proprietary to Rockwell Collins, and shall not be disclosed, disseminated, copied or used except for purpose expressly authorized in writing by Rockwell Collins

Rockwell Collins, Inc.
Cedar Rapids Iowa 52498 USA
CAGE: 0EFD0

NOTE(S):

This document is maintained in the Aircraft Certification Center configuration management system.

Paragraphs and/or figures with a vertical line outside the right margin (|) indicate a change to the latest revision.

SIGNATURES

	NAME	SIGNATURE
Prepared by:	D. W. Jessen	
Checked by:	V. J. Humphrey	
Approved by:	C. J. Terrington	

TABLE OF REVISION

Rev	Page(s)	ECO	Description	Date	Approved
-	1 - 4	INT564	Original Issue	11/16/06	DJC
A	4	INT875	Revised RCA-2394.	09/30/08	DWJ
B	4	INT964	Revised RCA-2394.	04/27/09	CJT
C	All	INU011	Revised document to new format and drawing number RCA-2394.	09/12/11	SPB
D	4	INU370	Revised RCA-2394.	02/01/13	CJT

Drawing Number	Drawing Title	Revision Letter	Date
RCA-2394	Installation Instructions DBU-5000 / DBU-5010E Data Base Units Part 23 Aircraft	D	02/01/13

400 Collins Road NE
Mail Station 164-100
Cedar Rapids, IA 52498
USA
Phone: (319) 295-7769
Fax: (319) 295-0337
Email: certcenter@rockwellcollins.com

Collins Aerospace
A United Technologies Company
Rockwell Collins, Inc. ODA-500864-CE

Jennifer L. Harleen
STC Customer Support Specialist
Collins Aerospace Aircraft Certification Center

March 2, 2020 WO200235

Elliott Aviation
13801 Pioneer Trail
Eden Prairie, MN 55347
Tel: 952.944.1200
Email: rdonat@elliottaviation.com

Attention: Mr. Robert Donat

Subject: Letter of Authorization (LOA) for STC SA01434WI-D Modification of a Rockwell Collins, Inc. Global Positioning System (GPS) installation

Dear Mr. Donat:

Attached are electronic copies of the following FAA approved STC data:

1. Supplemental Type Certificate SA01434WI-D, dated January 24, 2012;
2. Approved Model List (AML) RCA-0395, Revision F;
3. Drawing Index RCA-0124-001, Revision K;
4. One file for each drawing listed on Drawing Index RCA-0124-001;
5. Airplane Flight Manual Supplement ACC-07-009, Revision B.

Rockwell Collins, Inc. authorizes Elliott Aviation to use the FAA approved data listed above to modify your customer's Hawker Beechcraft model C90GTi aircraft, serial number LJ-2057.

Please note that the documentation is provided to you on an "as is" basis, and your acceptance of the documentation serves to hold Rockwell Collins, Inc. harmless for any liability arising out of the use of such documentation.

Elliott Aviation is responsible for the development and approval of any deviations from the STC type design data provided for the modification of the aircraft authorized above. Elliott Aviation is also responsible for acquiring all parts, kits and services required to complete the STC installation.

This authorization is limited to the aircraft listed above and may not be extended to other aircraft without the written authorization from Rockwell Collins, Inc. This authorization grants the usage of the type design

data for the expressed purpose of the modification of the aircraft authorized and may not be utilized for any other purposes.

It is expressly prohibited to disclose this documentation to any third party. Authorization to use this documentation or any portion thereof may not be assigned or sub-licensed by recipient without the express written consent of Collins Aerospace.

We trust this data will fulfill your requirements. However, if you have any questions, please contact your Collins Aerospace Customer Administrator.

For any STC integration questions contact certcenter@rockwellcollins.com.

For any general avionics questions contact CustomerSupport@rockwellcollins.com.

Sincerely,

Jennifer L Harleen
Collins Aerospace Aircraft Certification Center
Mail Station 164-100

/jlh

Attachments

United States of America

Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

Number SA01434WI-D

This certificate, issued to Rockwell Collins, Inc.
400 Collins Road NE, MS 164-100
Cedar Rapids, IA 52498

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 23 of the Federal Aviation Regulations.

Original Product Type Certificate Number: See attached FAA Approved Model List (AML), Document No. RCA-0395, Rev (C), or later FAA approved revisions for the list of approved airplane models, applicable installation data requirements and specific limitations.

Make:

Model:

Description of Type Design Change: Modification of a Rockwell Collins, Inc. Global Positioning System (GPS) installation in accordance with:

(1) Rockwell Collins, Inc. Drawing Index RCA-0124-001, Rev. G, dated January 19, 2012, or later FAA approved revision, as listed on the attached FAA Approved Model List (AML).

Limitations and Conditions:

(1) Prior FAA approved installation of a Rockwell Collins, Inc. GPS part number specified by Rockwell Collins, Inc. AML No. RCA-0395 is a prerequisite to this STC.
(2) This STC does not approve WAAS LPV.
(3) Approval of this change in type design applies to the above model aircraft only.
(4) Compatibility of this design change with previously approved modifications must be determined by the installer.
(5) A copy of this Certificate and the FAA Approved Model List (AML) must be maintained as part of the permanent records for the modified aircraft.
(6) 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 14, 2007

Date of issuance: May 22, 2007

Date reissued:

Date amended: January 24, 2012

By direction of the Administrator

(Signature)

Steven P. Brune

STC ODA Administrator, ODA-500864-CE

(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.

United States of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA01434WI-D

Certification Basis:

Based on 14 CFR §§ 21.115 and 21.101, and the FAA policy for significant changes in FAA Order 8110.48, the certification basis for the FAA Approved Model List (AML) No. RCA-0395 is as follows:

(1) The type certification basis for all Models included in AML No. RCA-0395 is included in the applicable TCDS as listed in the FAA approved AML for parts not changed or not affected by the change.

(2) The certification basis for parts changed or affected by this change since the reference date of application, March 14, 2007, is as follows:

FAA Approved Model List (AML) No. RCA-0395

14 CFR Part		Amend.
23.1301	(a)(b)(c)(d)	20
23.1309	(a)(b)(c)(d)(e)	49
23.1357	(a)(c)	43
23.1431	(a)(b)	49
23.1529	all	26
23.1581	(a)	50

--------END--------

Rockwell Collins

APPROVED MODEL LIST (AML)
GPS-4000S GLOBAL POSITIONING SENSOR
14 CFR PART 23 AIRCRAFT

STC SA01434WI-D

RCA-0395
Revision: F
November 6, 2012

FAA APPROVED BY:

Steven P. Brune
STC ODA Administrator, ODA-500864-CE

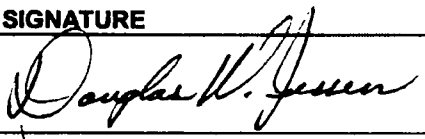
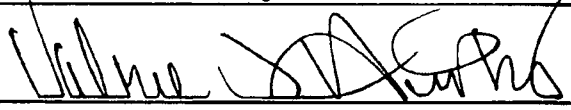
NOTE(S):

This document is maintained in the Aircraft Certification Center configuration management system.

Paragraphs and/or figures with a vertical line outside the right margin (|) indicate a change to the latest revision.

CAGE Code: 0EFD0

SIGNATURES

	NAME	SIGNATURE
Prepared by:	D.W. Jessen	
Checked by:	V.J. Humphrey	
Approved by:	S.P. Brune	

1. AML REVISION LOG

Rev	Page(s)	ECO	Description	Date
-	1	N/A	Original Issue	05/22/2007
A	2	N/A	Revised AML to change Raytheon Aircraft Company to Hawker Beechcraft Corporation. Amended AML to add Hawker Beechcraft Corporation models B200GT, B200CGT and C90GTi.	01/08/2008
B	1-2	N/A	Revised AML to update RCA-0124-001 and ACC-07-009 revision letters.	01/18/2011
C	1-2	INU268	Revised AML format to better align with AC 23-22 dated 01/27/05.	01/19/2012
D	5	INU320	Amended AML to add Hawker Beechcraft Corporation model 300.	07/11/2012
E	4	INU336	Revised AML to capture Revision H of Drawing Index RCA-0124-001. Amended AML to add Cessna model 525C.	10/16/2012
F	4 - 5	INU353	Revised AML to capture Revision J of Drawing Index RCA-0124-001.	11/06/2012

2. INTRODUCTION

This document is the FAA Approved Model List for STC No. SA01434WI-D for the modification of Rockwell Collins, Inc. Global Positioning System (GPS) installation in 14 CFR Part 23 Aircraft.

3. IMPORTANT NOTE

The existing equipment specified within the Installation Instructions RCA-2399 is a prerequisite to this STC for each airplane eligible for this proposed modification. It is the responsibility of the installer to ensure this prerequisite equipment is properly linked to meet the intended function for the system, as certified under this AML approval.

4. APPROVED MODEL LIST

Item	Aircraft Make	Aircraft Model	Type Certificate Number	Required Approved Data[1] Model Specific Limitations[1]	AML Amdt Date
1	Cessna	525 525A 525B 525C	A1WI Revision 19 03/01/2011	***Installation Instructions:*** Drawing Index, RCA-0124-001, Rev. J ***Airplane Flight Manual Supplement:*** ACC-07-009, Rev. B ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	10/05/12
2	Piaggio	P-180	A59EU Revision 20 03/21/2011	***Installation Instructions:*** Drawing Index, RCA-0124-001, Rev. J ***Airplane Flight Manual Supplement:*** ACC-07-009, Rev. B ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	05/22/07
3	Hawker Beechcraft	390 (Premier I)	A00010WI Revision 8 03/26/2007	***Installation Instructions:*** Drawing Index, RCA-0124-001, Rev. J ***Airplane Flight Manual Supplement:*** ACC-07-009, Rev. B ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	05/22/07

[1] Or later approved revision

Item	Aircraft Make	Aircraft Model	Type Certificate Number	Required Approved Data[1] Model Specific Limitations[1]	AML Amdt Date
4	Hawker Beechcraft	300 B200 B200C B200GT B200CGT B300 (Super King Air 350) B300C (Super King Air 350C)	A24CE Revision 103 12/20/2011	***Installation Instructions:*** Drawing Index, RCA-0124-001, Rev. J ***Airplane Flight Manual Supplement:*** ACC-07-009, Rev. B ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	07/11/12
5	Hawker Beechcraft	C90GTi	3A20 Revision 71 12/02/2011	***Installation Instructions:*** Drawing Index, RCA-0124-001, Rev. J ***Airplane Flight Manual Supplement:*** ACC-07-009, Rev. B ***Instructions for Continued Airworthiness:*** N/A ***Additional Limitations:*** N/A	01/08/08

[1] Or later approved revision

Rockwell Collins

DRAWING INDEX
GPS-4000S GLOBAL POSITIONING SENSOR
14 CFR PART 23 AIRCRAFT

FAA
APPROVED
BY ODA-500864-CE
STC NO SA01434WI-D
DATE 02-24-16 BY SPB

RCA-0124-001
Revision: K
February 3, 2016

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NOTE(S):

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Paragraphs and/or figures with a vertical line outside the right margin (|) indicate a change to the latest revision.

CAGE Code: 0EFD0

SIGNATURES

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TABLE OF REVISIONS

Rev	Page(s)	Description	Date
-	1 – 4	Original Issue	02/14/07
A	4	Revised drawing RCA-2399.	01/18/08
B	4	Revised drawing RCA-2399.	11/11/08
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F	4	Revised drawing RCA-2399.	05/11/11
G	4	Revised drawing RCA-2399.	01/19/12
H	4	Revised drawing RCA-2399.	04/06/12
J	4	Revised drawing RCA-2399.	11/06/12
K	4	Revised drawing RCA-2399.	02/03/16

Drawing Number	Drawing Title	Revision Letter	Date
RCA-2399	Installation Instructions GPS-4000S Global Positioning Sensor in 14 CFR Part 23 Aircraft	K	02/03/16

Rockwell Collins, Inc.
400 Collins Road NE
Cedar Rapids, IA 52498

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR 14 CFR PART 23 AIRPLANES

WITH COLLINS GPS-4000S GLOBAL POSITIONING SYSTEM

Serial No. _____

Registration No. _____

This supplement must be attached to the approved airplane flight manual when a Collins GPS-4000S Global Positioning System is installed in accordance with STC No SA01434WI-D. The information contained herein supplements the information of the basic Airplane Flight Manual. For limitations, procedures and performance information not contained in this supplement consult the basic Airplane Flight Manual.

Concurred by:

Keith Kanklefitz
Flight Test Pilot

FAA Approved by:

John S. Bohn
Administrator, DAS-500864-CE

LOG OF REVISIONS

Filename is [R07009b0.DOC]

Rev. Letter	Page Number(s)	Description	Date of Revision	FAA Approval*
-	1-5	INT565 - Original Issue	04/02/07	JSB
A	4	Revised Section 2	02/26/08	SPB
B	4	INU041 - Revised Section 2	12/08/09	SPB

NOTE: Revision bars indicate changes to content incorporated by the latest revision. Revision bars are not included for format changes.

* For Administrator, ODA-500864-CE

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SECTION 1 - GENERAL

NAVIGATION CAPABILITIES

The GPS-4000S Global Positioning System (GPS) is a TSO-C145a navigation sensor. The GPS is designed to acquire Radio Frequency (RF) transmissions from the Global Positioning Satellites. The GPS uses the RF transmissions to calculate the aircraft Position, Velocity, and Time (PVT) data. The GPS outputs the PVT data for use by an external navigation computer (i.e. Flight Management Computer). In addition to receiving signals from the GPS satellites the unit is designed to also receive signals from the Satellite Based Augmentation Systems (SBAS), such as the United States Wide Area Augmentation System (WAAS). The application of the correction and integrity data provided by the SBAS enables the GPS-4000S to provide augmented PVT data with higher accuracy, availability and integrity than that provided by the GPS-4000 and GPS-4000A.

The Satellite Based Augmentation System (SBAS) consists of ground reference stations, master stations, uplink stations, and geostationary communications satellites. The ground reference stations are surveyed very accurately. The ground reference stations compare the known location with the received GPS satellite signals to detect errors. The data collected by the ground reference stations is provided to the master station. The master station generates the augmentation signals that allow the GPS receivers to remove errors in the GPS signals. The master station provides the data to the uplink stations. The uplink stations transmit the data to the geostationary communications satellites. The geostationary communications satellites output the correction and integrity data on a GPS-like signal. The GPS-4000S reserves two channels to receive the SBAS data. The GPS-4000S receives the correction data to the GPS signal and calculates a more accurate position solution. When in the SBAS coverage area, the GPS-4000S relies on the SBAS signal to communicate satellite defects.

SECTION 2 – LIMITATIONS

No change

SECTION 3 - EMERGENCY PROCEDURES

No change

SECTION 4 – ABNORMAL/NORMAL PROCEDURES

SECTION 4.1 - ABNORMAL PROCEDURES

No change

SECTION 4.2 - NORMAL PROCEDURES

1. For US RNAV routes, SIDs, and STARs, an approved TSO-145a WAAS receiver installation (GPS-4000S) removes the requirement to run a pre-flight prediction of RAIM availability along the intended route if no satellites are NOTAM'd as out of service over the intended route.
2. There is no change to existing authorizations for non-WAAS approach operations.

NOTE: PRNAV and BRNAV operations outside of the U.S. utilizing GPS as the only navigation sensor require the following pre-flight planning:

- During the pre-flight planning phase, the crew must confirm, for the intended flight (route and time), the availability of receiver autonomous integrity monitoring (RAIM) with the latest information from the U.S. Coast Guard giving details of satellite non-availability (see http://www.navcen.uscg.gov). The U.S. Notices to Airmen (NOTAM) Office also provides satellite non-availability data.

- The confirmation of the availability of RAIM should be obtained from the Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008, Rev -, or later version. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. The use of the EUROCONTROL AUGUR tool may be used to satisfy this requirement. See http://augur.ecacnav.com/.

SECTION 5 - PERFORMANCE

No Change

SECTION 6 – WEIGHT AND BALANCE

No Change

BHE & Associates, Ltd.
12002 Warfield
Suite 250
San Antonio, TX 78216

March 3, 2020

Robert Donat
Elliott Aviation
13801 Pioneer Trail
Eden Prairie, MN 55347

Subject: Authorization to install STC

References: FAA STC Number SA10966SC

Dear Mr. Donat,

BHE & Associates, Ltd. hereby authorizes Elliott Aviation to install the Pro Line 21, FMS-3000 LPV upgrade in accordance with FAA STC number SA10966SC on a Textron Aviation, C90GTi, serial number LJ-2057.

Please note that the Collins GPS-4000S (-100 status) is on a stop ship from Collins Aerospace at the present time. If you have another access to the GPS-4000S (-100 status), you may install the unit and proceed with the modification. All other GPS equipment listed on the STC are not affected by the stop ship and may be installed. For any questions related to this unit, contact your Collins Representative.

Please note that the documentation is provided to you on an "as is" basis, and your acceptance of the documentation serves to hold BHE & Associates and Collins Aerospace harmless for any liability arising out of the use of such documentation. BHE & Associates and Collins Aerospace grant no warranties as to current serviceability, completeness or correctness.

Prior to beginning the installation, Elliott Aviation must review the STC, all limitations, prerequisites and the data package to verify this modification is applicable to the aircraft model, serial number, equipment and aircraft configuration.

There is always a possibility of variability between the initial certification aircraft and the aircraft being considered for installation of the STC(s) noted above.

Elliott Aviation is responsible for developing and approving any differences in engineering (deviations to the STC) required to modify the aircraft and the actual aircraft modifications and for obtaining FAA and/or other host country regulatory agency approval of any deviations.

Elliott Aviation is also responsible for supplying any parts or engineering services required for manufacturing the installation kits/parts for the aircraft.

This authorization is limited to the aircraft listed above and may not be extended to other aircraft without the written authorization from BHE & Associates. This authorization does not grant Elliott Aviation rights or usage of this documentation for any other non- Collins Aerospace product or program. This documentation or any portion thereof shall not be used in any manner to manufacture, design, substantiate and/or certify by similarity or any other method, any non- Collins Aerospace product.

It is expressly prohibited to disclose this documentation to any third party without written approval by BHE & Associates and Collins Aerospace. Authorization to use this documentation or any portion thereof may not be assigned or sub-licensed by recipient without the express written consent of BHE & Associates and Collins Aerospace.

Please return a record of any additional aircraft serial number(s) to your Collins Aerospace customer order administrator for installations performed using this STC. Collins Aerospace needs to receive this data before BHE & Associates can authorize any installations.

For technical questions regarding this STC please contact Timothy Horgan at 210-349-9488. For administrative questions, please contact your Collins Aerospace customer administrator.

Sincerely,

Robert M. Hurley
President

United States Of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number SA10966SC

This Certificate issued to BHE & Associates, Ltd.
12002 Warfield Dr.
Suite 250
San Antonio, TX 78216

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Air *Regulations.*

Original Product Type Certificate Number: 3A20

Make: Hawker Beechcraft Corporation

Model: C90GTi

Description of Type Design Change: Installation of upgraded hardware to the Rockwell Collins Pro Line 21 FMS-3000 to provide Localizer Performance with Vertical Guidance (LPV) in accordance with master drawing list 335-00-0001, revision A, dated January 12, 2010, or later approved FAA revision. Airplane flight manual supplement, document 335-00-0014, revision IR, dated January 12, 2010, or later approved FAA revision, is required.

Limitations and Conditions: The installer must determine whether this design change is compatible with previously approved modifications. 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 installation is limited to airplane serial numbers listed in BHE & Associates document 335-00-0002, revision IR, dated November 24, 2009, or later FAA approved revision.

(See continuation sheet 3 of 3)

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: November 03, 2009

Date reissued: April 6, 2010

Date of issuance: January 21, 2010

Date amended:

By direction of the Administrator

(Signature)

S. Frances Cox
Manager, Special Certification Office
Southwest Region

(Title)

United States Of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA10966SC
Date of Issuance: January 21, 2010
Date of Reissuance: April 6, 2010

Certification Basis: The Certification Basis for this installation is per Type Certificate Data Sheet 3A20 plus the following:

Regulations that meet amendment 23-1
23.671

Regulations that meet amendment 23-14
23.771 (a)

Regulations that meet amendment 23-21
23.1501 (b); 23.1541

Regulations that meet amendment 23-34
23.1; 23.1523

Regulations that meet amendment 23-37
Appendix G

Regulations that meet amendment 23-43
23.1331

Regulations that meet amendment 23-45
23.773 (a); 23.1525

Regulations that meet amendment 23-49
23.867 (a) (b); 23.1307; 23.1309 (f); 23.1329 (h); 23.1351 (a) (b) (c) (d); 23.1431 (e)

Regulations that meet amendment 23-50
23.3; 23.1581; 23.1583 (h) (m); 23.1585 (a) (j)

Regulations that meet amendment 23-51
23.777 (a) (b)

Regulations that meet amendment 23-57
23.1308 (d)

--End--

BHE & Associates, Ltd.
Master Data List

UPGRADE OF A ROCKWELL COLLINS FMS-3000 WITH LPV - C90GTI

335-00-0001

ODA/FAA PROJECT NO: ----------

STC NO: SA10966SC

REV: G DATE: 5/29/2019

APPROVED: _____

REV*	DRAWING NO	TITLE	REVISION	REL DATE	DOC TYPE
R	335-00-0002	FLIGHT MANAGEMENT SYSTEM (FMS) UPGRADE EQUIPMENT INSTALLATION	E	2/1/2019	S E
	335-00-0003	GPS CONFIGURATION STRAP UPGRADE	A	4/27/2010	E
	335-00-0011	GROUND TEST PROCEDURE COLLINS PRO LINE 21 FMS-3000 WITH LPV	A	10/6/2010	C
R	335-00-0014	FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT	B	3/19/2019	C
R	335-00-0015	INSTRUCTIONS FOR CONTINUED AIRWORTHINESS	C	1/24/2014	C
	335-00-0016	ELECTRICAL LOAD ANALYSIS	IR	11/24/2009	C

Data Type Definitions: Drawings: E-Electrical M-Mechanical S-Structural P-Powerplant
Compliance Documents: C-Compliance
See seperate approvals for Compliance Documents
*** "R" = Document revised since last MDL revision**

Instructions for Continued Airworthiness
For
Rockwell Collins Pro Line 21
In
Hawker Beechcraft Corporation
Model C90GTi

REPORT No. 335-00-0015

Revision C

BHE & Associates, Ltd.
San Antonio, TX 78216 USA
CAGE: N/A

BHE Approval Signatures

	NAME	SIGNATURE
Prepared by:	D. Kendricks	See Rev IR for Signatures
Checked By:	S. Penn	See Rev IR for Signatures
Approved By:	R. Hurley	See Rev IR for Signatures

REVISION LOG

Rev.	Page	Description	Approved	Date
IR	All	Initial Release	RMH	11-24-09
A	6 6 6 7 11 11	4.3.1.b: Changed ICC-3010 to ICC-3000 4.3.2.a: Changed ICC-3010 to ICC-3000 4.3.4.b: Changed ICC-3010 to ICC-3000 4.3.5.a: Changed ICC-3010 to ICC-3000 5.0: Corrected publication p/n to 523-0807237 6.1: Changed "system" to "LRUs"	RMH	12-21-09
B	4 4 7	2.1: Added GPS antenna location 3.0: Remove FAA signature block 4.4.1: Added GPS antenna location	RMH	01-12-10
C	iv 11, 15 12 15 A-1	Entered STC number Revised interval requirements (was 600 Hrs), deleted "Phase 3" reference to align with MM requirements. 6.4 Deleted inspection instructions for Fwd and Aft Pressure Bulkhead, para. 6.4.2 6.8 Deleted Inspection instructions for Fwd and Aft Pressure Bulkhead Deleted description from MDL, added "or later" to reference documents		1/24/11

Introduction

These Instructions for Continued Airworthiness document has been developed using the guidelines in Appendix "G" of FAR Part 23 as required by FAR 21.50 and 23.1529.

This document is designed to provide avionics and aircraft technicians with sufficient information to inspect, troubleshoot, adjust, repair, test, remove, and install the Rockwell Collins Pro Line 21 FMS-3000 system installed in accordance with FAA Supplemental Type Certificate No. SA10966SC. See the List of Applicable Publications (LOAP) in Appendix A of this document. The publications listed in the LOAP constitute the required information essential for continued airworthiness for the aircraft.

The information in this document supplements or supersedes the original manufacturer's maintenance manual only in those areas listed. For limitations, procedures and other information not contained in this document, refer to the aircraft manufacturer's maintenance manuals, illustrated parts manuals and wiring diagrams or the vendor manuals as listed in the LOAP.

Record of Revisions

For continuous use of this document, this document must be maintained in current revision status. Each time the STC holder finds it necessary to revise this document; a revision will be distributed to all users of the STC. Changes to this document will be incorporated by a "new" revision to the complete document. All pages will indicate the "new" revision level. Upon receipt of the revision, the "old" revision should be discarded and replaced with the "new" revision. Changes to this document will be listed in the revision block on page 1.

It is the responsibility of the person(s) performing maintenance on the installed system to ensure that this document is current prior to performing this maintenance. The current revision number may be verified by contacting the STC holder, BHE & Associates, 12002 Warfield Suite 250, San Antonio, Texas 78216.

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1. SYSTEM DESCRIPTION

1.1 GENERAL

1.1.1 Flight Management System (FMS)

The FMS supplies the capability of en route, terminal, and precision or non-precision approach lateral navigation. The system contains an advanced Global Positioning System (GPS) receiver that processes the transmissions from multiple satellites to calculate navigation solutions. When the Satellite Based Augmentation System (SBAS) is enabled, additional satellites provide corrections for lateral guidance and offer the user a true satellite based precision guidance capability. The system also supplies predictive Receiver Autonomous Integrity Monitoring (RAIM), which is used to determine whether the satellite geometry at the destination airport will be sufficient to support a non-precision GPS based approach at the planned time of arrival. When the FMS is in a GNSS navigation mode, the FMS uses only the Global Navigation Satellite System (GNSS) data and does not blend other sensors into the position estimation. The FMS also receives data from the AHS, ADC, DME, and VOR. The FMS supplies necessary controls for all input sensors, when appropriate. The FMS can be initialized, waypoints chosen, and destination selected by a variety of pilot-friendly means. Database SID, STAR, and airway routes are accommodated. A great circle route is calculated between waypoints for en route lateral navigation, and roll steering is supplied to the Flight Guidance System (FGS). A sophisticated interface with the FGS lets the FMS VNAV function select various FGS vertical modes of navigation. The FMS supplies vertical steering when appropriate. The FMS interfaces with a Data Base Unit (DBU) data loader to update its internal database. The FMS interfaces with the Adaptive Flight Display (AFD) electronic flight displays to supply conventional navigation information and state-of-the-art map presentation.

A single FMS system with single CDU and GPS is standard. A second FMS system with CDU 2 and GPS 2 is optional.

The FMC(s) are located in the IAPS assembly on the avionics shelves in the nose. The CDUs are located in the pedestal.

1.1.2 Global Positioning System (GPS)

The GPS-4000S Global Positioning System (GPS) provides accurate worldwide navigation capabilities. The GPS-4000S Global Positioning System processes GPS satellite signals to provide navigational data outputs. The GPS System contains two GPS-4000S receivers and two GPS antennas. The GPS antenna provides the GPS-4000S receiver with the radio frequency signals from the GPS satellites. The antenna is an active receive only device operating with the L-band frequency of 1575.42 10MHz. The antenna uses right hand circular polarization and is a microscopy patch type design. The Rockwell Collins, Inc. CDU-3000 Control Display Unit (CDU) provides backup display pages for the GPS navigation data. The GPS receivers process the GPS signals received from the antenna together with inputs from other airplane sensors to provide position, velocity, and time outputs through the integrated avionics processor's input/output data concentrators to the flight management system.

Both CDUs can display GPS data. The CDU INDEX page is used to select the FMS1 GPS CONTROL page. The FMS1 GPS CONTROL page is used to select a GPS receiver for position data and to deselect all usage of GPS data. The

FMS1 GPS CONTROL page displays the position difference between each GPS receiver position and flight management computers computed position.

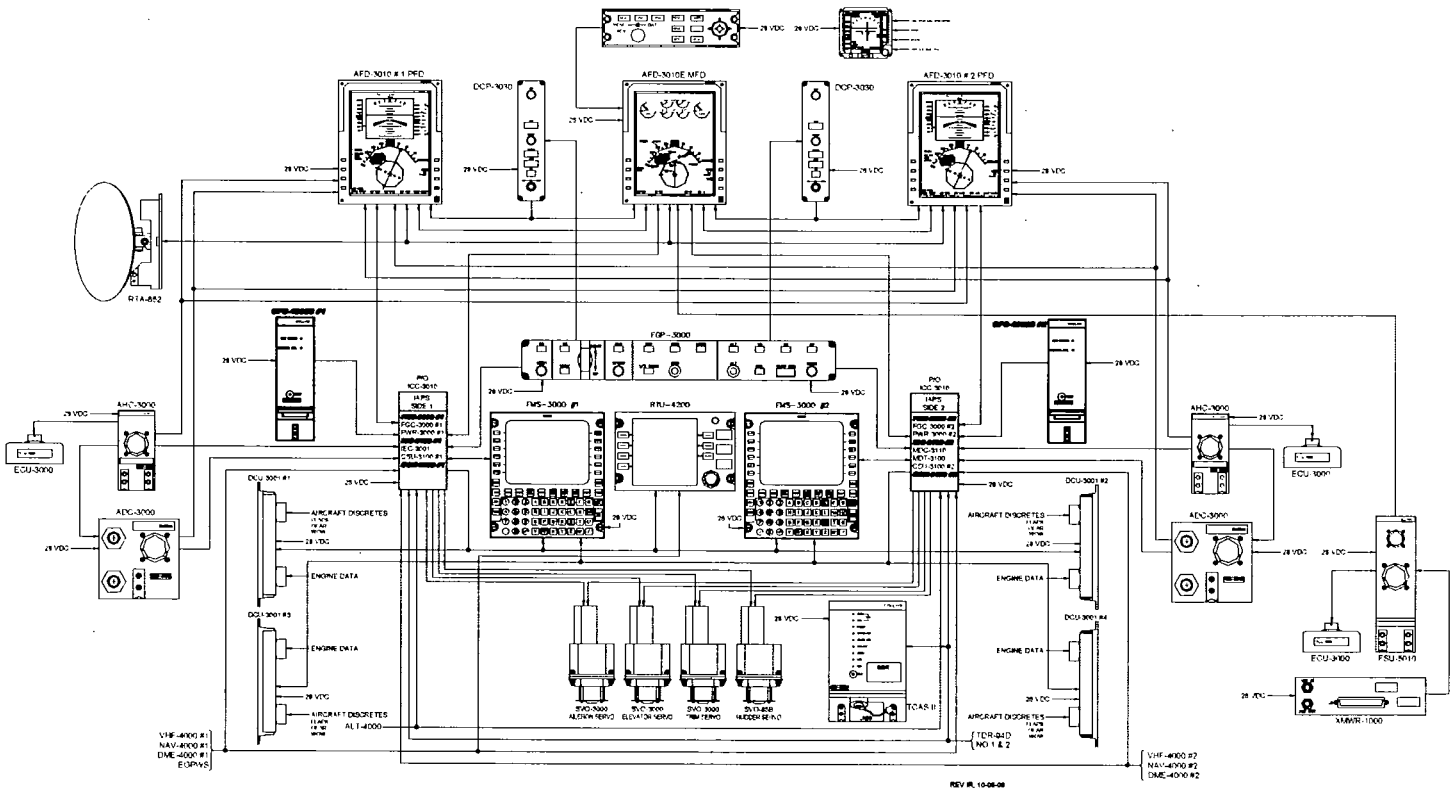
The CDU-3000 INDEX page is used to select the GPS1 POS page. The GPS1 POS page displays the following information from the on-side GPS receiver: GPS Date, Latitude, Longitude, Track Angle, Ground Speed, Receiver Autonomous Integrity Monitoring (RAIM) Limit, Probable Error, GPS Mode, and Number of GPS Satellites used.

All GPS position data, date, and time are displayed in green. If GPS data is flagged or missing, the GPS position Data is replaced with yellow dashes.

A detailed description and operation of the GPS-4000S Global Positioning Receiver and CDU-3000 Control Display Unit (CDU) is located in the Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237.

1.1.3 Data Base Unit

The DBU-5000, located in the pedestal (reference Figure 2), is a panel mounted data loader that communicates with external equipment using an ARINC-429, RS-422 and Ethernet interfaces. The DBU has the capability of transferring data files between removable media (USB memory devices) and aircraft LRUs. It also performs the task of interfacing with aircraft LRUs. In particular, the FMS system uses the DBU to load data base updates into the FMS computers. The IAPS maintenance diagnostic computer uses the DBU to upload maintenance tables or download maintenance data files. The IFIS system uses the DBU for loading FSU database files.



SECTION 1 – DESCRIPTION – BLOCK DIAGRAM

2. COMPONENTS

The Collins Pro Line 21 Avionics FMS-3000 System installation consists of the following systems and sub-systems with component locations noted:

2.1 Pro Line 21 Flight Management System (FMS)

1 ea	FMC-3000 Flight Management Computers	IAPS Cage-Nose
	Second FMC-3000 Optional	
1 ea	CDU-3000 Control Display Unit	Pedestal
	Second CDU-3000 Optional	
1 ea	GPS-4000S GPS Receiver	Nose
	Second GPS-4000S Optional	
1 ea	DBU-5000 Database Unit	Pedestal
2 ea	OCM-3100 Optional Control Module	IAPS Cage-Nose
2 ea	IOC-4110 Input Output Concentrator	IAPS Cage-Nose
2 ea	CI 429-210/400 GPS antennas	Top, forward Fuselage

3. AIRWORTHINESS LIMITATIONS

No additional Airworthiness Limitations have been issued due to the installation of the Pro Line 21. The Airworthiness Limitations section is FAA approved and specifies maintenance required under § 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

4. MAINTENANCE PRACTICES

4.1 MAINTENANCE – GENERAL

Reference Hawker Beechcraft Corporation approved inspection program in the Airplane Maintenance Manual. This document addresses additional maintenance for the Pro Line 21 FMS-3000 installation.

4.2 REMOVAL / INSTALLATION

The following installation and/or systems manuals contain complete detailed instruction for installation and removal of equipment and should be consulted for all maintenance activities:

Refer to Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, Chapter 2 – INSTALLATION and Chapter 5 – MAINTENANCE for the following systems: Flight Management System (FMS)

4.3 FMS SYSTEM

4.3.1 INPUT/OUTPUT CONCENTRATOR (IOC-3100) REMOVAL -

NOTE

Before removing the IOC-3100, remove electrical power from the airplane.

a. The IOC-3100 Input/Output Concentrator is located in the IAPS card cage. Gain access to the IAPS Card Cage by opening the access panels for the right nose avionics bay.

b. Perform the ICC-3000 IAPS Card Cage Modules removal procedure (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, INSTALLATION AND REMOVAL PROCEDURES subsection in the INSTALLATION section).

4.3.2 INPUT/OUTPUT CONCENTRATOR (IOC-3100) INSTALLATION

NOTE

Before installing the IOC-3100, remove electrical power from the airplane.

a. Perform the ICC-3000 IAPS Card Cage Modules installation procedure (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, INSTALLATION AND REMOVAL PROCEDURES subsection in the INSTALLATION section).

b. Restore electrical power to the airplane.

c. Perform Input/Output Concentrator (IOC-3100) Adjustment/Test procedure.

d. Close up all access panels that were opened while accessing the IOC-3100.

4.3.3 INPUT/OUTPUT CONCENTRATOR (IOC-3100) ADJUSTMENT/TEST

a. Ensure electrical power has been restored to the airplane.

b. Perform the IOC 1 and/or IOC 2 Test Procedure for the IOC-3100 (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, TESTING AND TROUBLESHOOTING subsection in the MAINTENANCE section).

4.3.4 FLIGHT MANAGEMENT COMPUTER (FMC-3000) REMOVAL

NOTE

Before removing the FMC-3000, remove electrical power from the airplane.

a. The No. 1 and No. 2 FMC are located in the IAPS Card Cage. Gain Access to the IAPS Card Cage by opening the panel for the right nose avionics bay.

b. Perform the ICC-3000 IAPS Card Cage Modules removal/installation procedure (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, INSTALLATION AND REMOVAL PROCEDURES subsection in the INSTALLATION section).

4.3.5 FLIGHT MANAGEMENT COMPUTER (FMC-3000) INSTALLATION

NOTE

Before installing the FMC-3000, remove electrical power from the airplane.

a. Perform the ICC-3000 IAPS Card Cage Modules removal/installation procedure (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, INSTALLATION AND REMOVAL PROCEDURES subsection in the INSTALLATION section).

b. Restore electrical power to the airplane.

c. Perform the Flight Management Computer (FMC-3000) Adjustment/Test procedure.

d. Close up all panels that were opened while accessing the FMC-3000.

4.3.6 FLIGHT MANAGEMENT COMPUTER (FMC-3000) ADJUSTMENT/TEST

a. Ensure electrical power has been restored to the airplane.

b. Perform the FMC 1 and/or FMC 2 Test Procedure for the FMC-3000 (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, TESTING AND TROUBLESHOOTING subsection in the MAINTENANCE section).

4.4 GLOBAL POSITIONING SYSTEM

4.4.1 GLOBAL POSITIONING SYSTEM ANTENNA (GPS-ANT) REMOVAL

a. The GPS antennas are located on the top, forward fuselage. Gain access to the respective GPS Antenna.

b. Remove sealant and screws (four places) from antenna base.

c. Carefully pry around antenna base with sealant removal tool until sealant is completely broken.

CAUTION

When removing antenna, do not pull on cables. Damage to cables could result. Lift antenna only far enough to disconnect cables.

d. Raise antenna until connector is accessible.

e. Disconnect antenna cable and remove antenna. Install protective cover to the antenna connector.

WARNING

Use cleaning solvents in a well ventilated area. Do not inhale vapor. Do not allow fluid to contact the skin. Prolonged exposure may result in unconsciousness or lung or skin irritation.

f. Remove existing sealant from aircraft skin.

4.4.2 GLOBAL POSITIONING SYSTEM ANTENNA (GPS-ANT) INSTALLATION

a. Visually inspect mounting surfaces of antenna and airplane for corrosion and dirt. Clean mounting surfaces as required.

WARNING

Use cleaning solvents in a well ventilated area. Do not inhale vapor. Do not allow fluid to contact the skin. Prolonged exposure may result in unconsciousness or lung or skin irritation.

b. Apply acceptable corrosion-inhibiting compound per aircraft maintenance manual to mounting surfaces of antenna and aircraft.

c. Remove the protective cover from the connector of antenna and inspect for dirt or damage.

d. Position antenna in place and install mounting screws (four places) through antenna mounting base. Tighten screws to near contact with bearing surface and determine friction drag torque required to turn the screw into securing nut. Torque screws to friction drag torque plus 20 in-lbs. maximum.

e. Verify antenna bonding by removing one mounting screw and measuring resistance from antenna mounting base to aircraft skin. Resistance/impedance must be less than 0.0025Ω.

f. Reinstall antenna mounting screw per step e above.

g. Apply Pro-Seal, P/S 870B-1/2 weather/aerodynamic fillet sealant or equivalent to periphery of antenna and shape as necessary. Remove any excess sealant.

h. Cover heads of mounting screws with layer of Dow-Corning RTV-3145 sealant, or electrical equivalent, having dielectric constant of 2.8, or less, at 100 Hz. Blend sealant smooth with the mounting holes. Remove any excess.

i. Perform Global Positioning System (GPS-4000A/4000S) Adjustment/Test procedure.

4.4.3 GLOBAL POSITIONING SYSTEM RECEIVER (GPS-4000S) REMOVAL

NOTE

Before removing the GPS-4000S Receiver, remove electrical power from the airplane.

a. The No. 1 GPS-4000S Global Positioning System Receiver(s) is located on the left middle nose avionic rack. Gain access to the No. 1 GPS receiver by opening the panel for the left nose avionics bay. The No. 2 GPS-4000S Global Positioning System Receiver(s) is located on the right middle nose avionic rack. Gain access to the No. 2 GPS receiver by opening the panel for the right nose avionics bay.

b. Perform the RACK MOUNTED LRU removal procedure for the GPS-4000S system (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, INSTALLATION AND REMOVAL PROCEDURES subsection in the INSTALLATION section).

4.4.4 GLOBAL POSITIONING SYSTEM RECEIVER (GPS-4000S) INSTALLATION

NOTE

Before installing the GPS-4000S Receiver, remove electrical power from the airplane.

a. Perform the RACK MOUNTED LRU installation procedure for the GPS-4000S (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, INSTALLATION AND REMOVAL PROCEDURES subsection in the INSTALLATION section).

b. Restore electrical power to the airplane.

c. Perform Global Positioning System Adjustment/Test procedure.

d. Close up all panels that were opened while accessing the GPS-4000S.

4.4.5 GLOBAL POSITIONING SYSTEM (GPS-4000S) ADJUSTMENT/TEST

a. Ensure electrical power has been restored to the airplane.

b. Perform the No. 1 GPS and/or No. 2 GPS Test Procedure for the GPS-4000S (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, TESTING AND TROUBLESHOOTING subsection in the MAINTENANCE section).

4.4.6 DATA BASE UNIT (DBU-5000) REMOVAL

The DBU-5000 Data Base Unit is located in the pedestal. Perform the DBU-5000 removal procedure (Ref. Rockwell Collins, Inc. DBU-5000 Data Base Unit Installation Manual 523-0808860, INSTALLATION and REMOVAL subsection in the INSTALLATION section).

4.4.7 DATA BASE UNIT (DBU-5000) INSTALLATION

The DBU-5000 Data Base Unit is located in the pedestal. Perform the DBU-5000 installation procedure (Ref. Rockwell Collins, Inc. DBU-5000 Data Base Unit Installation Manual 523-0808860, INSTALLATION and REMOVAL subsection in the INSTALLATION section).

4.4.8 DATA BASE UNIT (DBU-5000) ADJUSTMENT/TEST

Perform the DBU Test Procedure for the DBU-5000 (Ref. Rockwell Collins, Inc. DBU-5000 Data Base Unit Installation Manual 523-0808860, TESTING PROCEDURES subsection in the MAINTENANCE section.

4.5 FMS-3000 NAVIGATION DATABASE LOADING

a. The FMS database memory stores VHF navaid and airport reference point information for use by the flight management subsystem. Each database also contains named en route waypoints for the applicable geographic area. The FMS database expires periodically and must be updated with the latest information on a 28-day cycle. When the database has expired, a warning displays on the CDU during FMS initialization

b. Every 28 days, Collins Business and Regional Systems will distribute the latest database information. Database updates may also be received via the Internet.

c. Subscription information may be obtained by contacting Rockwell Collins Database Technical Support at 319-295-2512 or via the Internet at www.RockwellCollins.com/FMS.

d. A new database should be loaded into system memory as soon as it arrives. Do not wait for the current database to expire. Perform the update while the airplane is parked on the ground.

e. Several types of databases may be loaded into the FMS: navigation database, route database, pilot waypoint database. Two navigation databases may be loaded into the memory of a flight management computer. In a dual FMS system, database loading is independent. (Ref. Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237 and DBU-5000 Operators Guide 523-0808703).

5. SYSTEM TROUBLESHOOTING

For troubleshooting information refer to the following documents or follow the steps listed:

Refer to the Collins Pro Line 21 Raytheon King Air with IFIS System Manual 523-0807237 Section 5.8 Testing and Troubleshooting.

6. INSPECTION REQUIREMENTS

6.1 SCHEDULED INSPECTIONS AND MAINTENANCE CHECKS

No scheduled inspection or maintenance is required for the FMS-3000 LRUs.

6.2 VISUAL WIRING INSPECTION

Perform visual inspections of the Pro Line 21 System wiring. These visual inspections should be performed as part of the existing inspections at an interval not to exceed 800 hours.

A "visual inspection" is defined as the process of using the eye, alone or in conjunction with various aids, as the sensing mechanism from which judgments may be made about the condition of a unit to be inspected.

This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to enhance visual access to all exposed surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight or droplight and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

The inspection criteria provided below is intended to be used as general guidance. Special inspection should be conducted as deemed appropriate by each operator based on aircraft experience. Any discrepancies found should be repaired.

6.3 WIRING INSPECTION GUIDANCE

The inspection criteria provided below is intended to be used as general guidance. Special inspection should be conducted as deemed appropriate by each operator, based on aircraft experience. Any discrepancies found should be repaired.

a. Perform a visual inspection of the wiring for security of installation and cleanliness.

b. Perform a visual inspection of clamping points, and observe for signs of wire chaffing due to loose clamp, damaged clamp, clamp cushion migration, or improper clamp installation.

c. Perform a visual inspection of connectors and observe for signs of wiring and/or connector damage due to loose connector, excessive corrosion, missing plug, missing dummy contact, condition of strain relief, grommet degradation, and condition of drip loops near connectors.

d. Perform a visual inspection of wiring terminations and observe for mechanical damage, heat damage, and chemical contamination.

e. Perform a visual inspection of backshells and observe for wire damage and loss of bonding.

f. Perform a visual inspection of sleeving and conduits and observe for wire damage.

g. Perform a visual inspection of grounding points and observe for security (or tightness), condition of termination, cleanliness and corrosion.

h. Perform a visual inspection around electrical panels and observe for broken wires and/or damaged insulation.

i. Perform a visual inspection around LRUs and observe for broken wires and/or chaffed insulation.

j. Perform any other checks deemed necessary to observe condition of system wiring.

k. Perform any cleaning and/or repair deemed necessary based on the findings of these inspections.

CAUTION

Use care when disturbing or removing wire harness/bundles to minimize the possibility of wire insulation damage or cracking. Care must be especially used in areas with severe moisture problems. During any repair, modification, or installation work in close proximity to wire bundles, mounts, connectors and systems, ensure that these areas are protected from and/or cleaned of metal shavings and debris.

6.4 STRUCTURAL INSPECTIONS

Perform the following visual inspections at intervals shown in chart in section 6.8. Perform visual inspections as detailed in section 6.5. These inspections and intervals are taken from the King Air B200/B200C Maintenance Manual and the King Air B300/B300C Maintenance Manual and are repeated here for ease of maintenance.

6.4.1 Antennas

Inspect all external antennas for leading edge erosion and condition of base seals.

6.5 VISUAL INSPECTIONS

The equipment necessary for conducting a visual inspection usually consists of a strong flashlight, a mirror with a ball joint, and a 2.5x - 4x magnifying glasses. A 10x magnifying glass is recommended for positive identification of suspected cracks.

6.5.1 Corrosion Treatment

Before attempting a close, visual inspection of any selected part or structural area, it should be checked for signs of corrosion. Any corrosion found should be tested to discover its extent and severity. Heavy or severe corrosion requires immediate corrective action. If mild corrosion is present, it should be carefully, but completely, removed before continuing with preparations for the visual inspection.

6.5.2 Structural Failure Determination

The first step in a visual inspection should be an examination of the area for deformed or missing fasteners. These should be identified for subsequent replacement. A close examination for cracks in the surfaces of structural members should then be made with the aid of a flashlight. The majorities of cracks start at, and progress from, points of concentrated stress such as sharp corner cutouts and fastener holes. Cracks may also occur in sheet metal bend radii and similar places that were subjected to severe forming operations during manufacture.

6.5.3 Cleaning of Structural Parts

All parts of areas from which mild corrosion has been removed should be thoroughly cleaned using an approved solvent. (Metal conditioner should not be applied at this time as it may interfere with subsequent dye penetrant inspection.)

6.5.4 Cleaning Other Areas

All other areas to be inspected should also be cleaned of any deposits that might hinder the discovery of existing surface flaws. The protective finish need not be removed. The cleaning should be performed using any approved solvent. For cleaning high heat treat steel parts, or areas in which a high heat steel part is installed, use only the approved solvents.

6.5.5 Crack Detection Technique

When looking for surface cracks, the inspector should point his flashlight towards himself and hold it at an angle of 5° - 45° to the surface. (See Figure 1) The extent of the crack may be traced by directing the beam at right angles to the crack. Never direct the light beam at such an angle that the reflected beam shines directly into the eyes. The proper procedure is to keep the eyes above the reflected beam.

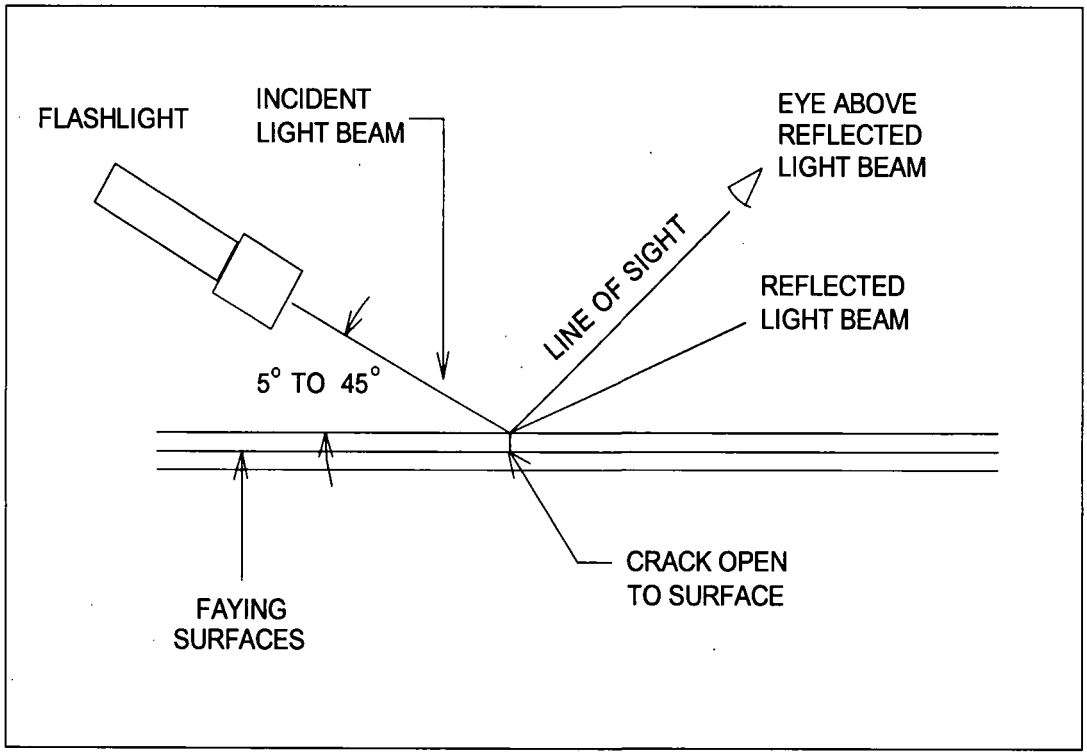


Figure 1

6.5.6 Verification of Cracks

A 10x magnifying glass may be used to confirm the existence or extent of a suspected crack.

6.6 RETURN TO SERVICE

This inspection form is provided only as a guide and checklist for inspecting the installed system.

Aircraft S/N: _____ **Aircraft Registration No:**_____

Aircraft Total Time: _____ **W/O No.:** _____

6.7 LRU INSPECTION

Any time a Pro Line 21 component is removed and replaced following repair or maintenance, a return to service test is required per BHE & Associates Ground Test 335-00-0011. Check applicable maintenance practices for each individual component removed to determine what level of testing is required for returning to service.

6.8 Mechanical and Electrical Hardware Inspection

Perform the following at an interval not to not to exceed 800 hours	**Date**	**Technician**
1. Visually inspect the antenna from outside of aircraft for leading edge erosion and condition of the base seal. From inside the aircraft visually inspect all doublers and fasteners for cracking, corrosion and proper mounting.		
2. Inspect the fwd avionic compartment, instrument panel and pedestal for all Pro Line 21 IDS equipment mounting & attachment security.		
3. Inspect the circuit breaker(s) for security of attachment, operation, & chaffing and labeling		
4. Inspect all related wiring for general condition routing, chafing, bonding and integrity of stand offs and clamping.		

Appendix A
List of Applicable Publications

The publications listed in the LOAP constitute the required information essential for continued airworthiness for the aircraft.

Document Title	Document Number	Revision/Date
Flight Manual Supplement	335-00-0014	FAA Date
Master Drawing List	335-00-0001	Rev IR or later
Raytheon Aircraft Model King Air C90GTi Maintenance Manual	90-590012-13B	Revised October 31, 2006 or later
Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual	523-0807237	1st Edition 30 Sept 2005 or later
Rockwell Collins, Inc. DBU-5000 Data Base Unit Installation Manual	523-0808860	2nd Edition, Rev 1 16 May 2008 or later
Rockwell Collins, Inc. Installation Practices Manual	523-0775254	3rd Edition 1 Sept 1998 or later

Appendix B
Special Tools and Equipment

No special tools or test equipment for the FMS-3000 System

BHE & Associates, Ltd.
12002 Warfield, Ste 250
San Antonio, TX 78216

BHE Document Date: 3/19/2019

FAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR THE
HAWKER BEECHCRAFT CORPORATION C90GTi
WITH
COLLINS AEROSPACE FMS-3000 LPV UPGRADE

Serial No. _____

Reg. No. _____

The information in this supplement is FAA approved material which, together with the basic Airplane Flight Manual 90-590024-163 on Rockwell Collins Pro Line 21 equipped aircraft is applicable and must be carried in the basic manual when the airplane is modified in accordance with STC No. **SA10966SC**.

The information contained in this supplement supersedes the basic manual only where covered herein. For Limitations, Normal Procedures, Emergency Procedures, Abnormal Procedures, Performance, Weights and Balance, and Manufacturers Data information not contained in this supplement, consult the basic Airplane Flight Manual and applicable AFM Supplements.

FAA Approved by:

for Manager

Southwest Flight Test Section, AIR-713

Federal Aviation Administration

Ft Worth TX. 76177

Date: 7/16/2019

LOG OF REVISIONS

Rev. Letter	Page Number(s)	DESCRIPTION	Date of Revision	FAA Approved*
IR	ALL	Initial Release	Jan 12, 2010	Gary Sharon For S. Frances Cox
A	1-5 1-6 1-10 2-5	Changed TSO-C129a Class B1/CI to TSO-C146c Class Delta 4 Added RNP-1 section, re-numbered pages following Added Radius to Fix section Added Flight Control System limitation FMS-3000 V4.0 requirement.	Nov 4, 2010	S. Frances Cox, Manager
B	Title All 1-1 1-2 thru 1-3 1-4 1-5 1-6 1-7 thru 1-8	Updated signature information. Changed barometric VNAV to "Baro-VNAV" on numerous pages. Added VNAV on statements following "NAV." Changed GPS to "GNSS" on numerous pages or removed "GPS." Updated TOC. Added numerous acronyms to list. Shortened section title of FMS Navigation Capabilities. Edited the statements preceding the tables. Oceanic and Remote, updated the listed TSOs and listed navigation conditions. North Atlantic (NAT) High Level Airspace (HLA), edited the details under section. Added Barometric VNAV (Baro-VNAV) section. RNP-1, added numerous new bullets that contain updated information. Added sections including RNP 2/4.	7/16/2019	for Manager Southwest Flight Test Section, AIR-713 Federal Aviation Administration Fort Worth, Texas 76177

Rev. Letter	Page Number(s)	DESCRIPTION	Date of Revision	FAA Approved*
B	1-8 thru 1-10	RNP 10 Airspace (RNAV 10), edited the details under section. P-RNAV (RNAV 1), edited the details under section. Enroute and Terminal, including B-RNAV (RNAV 5) and RNAV (GPS) / RNAV (GNSS) or GPS (GNSS) Overlay Non-Precision Approach, edited the details under sections.	See page i	See page ii
	1-11	Added section Area Navigation on US Conventional Routes or Procedures. US RNAV/SIDS/STARS, removed the references to the IRS and updated the FAA website. Added new details throughout section. Removed sections RNAV Approach with Barometric VNAV and RNAV RNP Approach (RNP APCH)		
	2-2 thru 2-3	Added AHRS section. Flight Management System (FMS), removed and renumbered bullets and included new bullet 9.		
	2-4	Vertical Navigation, edited the bullets and wording regarding the baro altimeters during VNAV. Added bullets and notes regarding FMS temperature compensation.Vertical Navigation, edited the bullets and wording regarding the baro altimeters during VNAV. Added bullets and notes regarding FMS temperature compensation.		
	2-5	Approach, edited numerous details throughout the section, including adding bullets regarding LNAV/VNAV procedures.		
	4-2 thru 4-3	Edited title of section FMS Approach Procedure with Baro-VNAV. Added (LSK) to represent line side key on bullets 2 & 3. Removed L/V from bullet 4. Added notes to the end of bullet 6. Separated bullet 7 into several paragraphs and edited the wording for clarity.		

Rev. Letter	Page Number(s)	DESCRIPTION	Date of Revision	FAA Approved*
B	4-48 thru 4-6 4-7	FMS LPV Approach Procedure, removed "L/V" from title. Added notes to beginning of section. Changed the details on bullets 2 & 3.. FMS LPV Approach Procedure, removed "L/V" from title. Added notes to beginning of section. Changed the details on bullets 2 & 3. Edited the note following bullet 5. Edited the wording throughout bullet 7 for clarity. Added bullet 8. Non Precision Approach RAIM Page, changed WAAS to "SBAS" in statement.	See page i	See page ii

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SECTION I
GENERAL
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Introduction

This supplement is part of, and must be placed in, the basic FAA Approved Airplane Flight Manual for airplanes equipped with the Collins Pro Line 21 Avionics System installed in accordance with STC No. **SA10966SC**. The information contained herein supplements the information of the basic FAA Approved Airplane Flight Manual (AFM) and the approved Pro Line 21 Airplane Flight Manual Supplement (AFMS). For limitations, procedures and performance information not contained in this supplement, consult the basic FAA Approved Airplane Flight Manual.

This airplane is certified in accordance with FAR 23 Normal Category.

Symbols, Abbreviations and Terminology

ACT ..... Active
ACT FPLN ..... Active Flight Plan
BARO (Baro) ..... Barometric
CAT ..... Category
CRS ..... Course
DA ..... Decision Altitude [1]
DEST ..... Destination
DIST ..... Distance
FMS ..... Flight Management System
FACF ..... Final Approach Course Fix
FAF ..... Final Approach Fix
FGP ..... Flight Guidance Panel
FPLN ..... Flight Plan
Geometric Altitude .....Altitude that is derived from a mathematical model [2]
GNSS ..... Global Navigation Satellite System
GPS ..... Global Positioning System
GS ..... Glideslope
ILS ..... Instrument Landing System
INTC CRS ..... Intercept Course

[1] Decision Altitude: A barometric altitude used to determine the lowest Altitude on a CAT 1 Approach (NPA or ILS) prior to taking over visually or going missed approach. A DA can only be used if a glide path is displayed.

[2] Geometric Altitude: Altitude that is derived from a GNSS using the WGS84 mathematical model of the earth. It is the altitude used in SBAS-VNAV approaches (LPV) to determine glide path.

LDA ..... Localizer Directional Aid
LOI ..... Loss of Integrity
LNAV ..... Lateral Navigation [3]
LNAV/VNAV ..... LNAV/VNAV is an NPA that uses barometric [4]
LPV ..... Localizer Performance with Vertical Guidance [5]
LSK ..... Line Select Keys
MDA ..... Minimum Descent Altitude [6]
MFD ..... Multifunction Display
NAV ..... Navigation
NOTAM ..... Notice to Airman
NPA..... Non Precision Approach
ORIG ..... Origin
PFD ..... Primary Flight Display
PPOS ..... Present Position
SBAS ..... Satellite Based Augmentation System [7]
SID ..... Standard Instrument Departure
STAR ..... Standard Terminal Arrival Route
TOD ..... Top of Descent
TRANS ..... Transition
VGP ..... Vertical Glide Path [8]
VNAV ..... Vertical Navigation
VPA..... Vertical Path Angle
WAAS ..... Wide Area Augmentation System

[3] Lateral Navigation: A LNAV approach is an NPA that uses barometric altitude to an MDA.

[4] Lateral Navigation / Vertical Navigation: LNAV/VNAV is an NPA that uses barometric altitude to a DA. The VGP computation is based on barometric altitude and therefore is less accurate than SBAS (LPV) approaches.

[5] Localizer Performance with Vertical Guidance: A NPA that uses barometric altitude to a DA. The approach displays SBAS angular deviations. The VGP computation is based on geometric altitude.

[6] Minimum Descent Altitude: Will not normally have a VGP displayed.

[7] Satellite Based Augmentation System: SBAS is the term used for any space based "navigation" augmentation system. In the US it is called WAAS. Approaches that use SBAS data in the US are referred to as LPV.

[8] Vertical Glide Path: The vertical deviation indication and the vertical FMA annunciated when an NPA with vertical guidance is captured.

Flight Management System (FMS) Navigation Capabilities

The Collins FMS-3000 provides centralized control for navigation, flight planning, radio tuning, and fuel management functions.

- For additional information, refer to The Operator's Guide, FMS-3000 v4.0 Flight Management System for King Air Series Aircraft. Publication Number 523-0816977-002117, 2nd Edition, dated 06 February 2009 or later.

NOTE

Use of joystick on Cursor Control Panel (CCP-3000) to enter waypoint should only be done in the PLAN MAP mode. Do not use the joystick waypoint function on the Present Position (PPOS) map.

Display Scaling

When FMS is the selected NAV source, lateral and vertical full-scale deviations are listed in the table below. Full scale deviation is 2 dots deviation laterally or vertically from the center of the deviation scale.

SCALE	OCEANIC (**OCEANIC** ANNUNCIATED)	ENROUTE	TERMINAL (**TERM** ANNUNCIATED)	VOR/DME/RNAV APPROACH (**APPR** ANNUNCIATED)	RNAV (GPS) or RNAV (GNSS) APPROACH (**GPS APPR** ANNUNCIATED)
Lateral	**4 nm**	**2 nm**	**1 nm**	**1 nm**	**0.3 nm**
Vertical	**500 ft**	**500 ft**	**500 ft**	**250 ft**	**250 ft**

SCALE	GPS (GNSS) SBAS APPROACH (**LPV APPR** ANNUNCIATED)
Lateral	**Angular deviation**
Vertical	**Angular deviation**

Although most scale changes occur in a seamless manner, the pilot should expect to occasionally observe "jumps" in the lateral and vertical scale presentations as the aircraft transitions through various phases of the approach.

Laterally - Oceanic to En Route

En Route to Terminal

Terminal to GPS (GNSS) or GPS (GNSS) SBAS Approach

Vertically - En Route VNAV to GPS (GNSS), GPS (GNSS) SBAS or VOR/DME RNAV Approach

Navigation Capabilities

The single or dual Collins FMS (Flight Management System) is approved under Technical Standard Orders (TSO) TSO-C115b and TSO-C146a Class Delta 4.

When the FMS is receiving appropriate navigation signals, it meets the accuracy specifications for the following operations:

Oceanic and Remote

The FMS and Collins GNSS have been demonstrated to comply with the requirements for GNSS primary means of navigation in oceanic and remote airspace in accordance with AC 20-138C, provided that;

- Two FMS units are operating and receiving usable signals from two GNSS sensors and used in conjunction with the Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/-009/-012, Rev –, or later revision, or
- For routes approved for single GNSS navigation, a single FMS is operating and receiving usable signals from the single GNSS sensor and used in conjunction with the Collins GPS Coverage Prediction Program listed above.

NOTE
This does not constitute an operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.

North Atlantic (NAT) High Level Airspace (HLA)

The FMS and Collins GNSS have been demonstrated to meet the performance requirements of the NAT HLA, in accordance with AC 91-70B and NAT Doc 007, provided that:

- Two FMS units are operating and receiving usable signals from two GNSS sensors and used in conjunction with the Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/-009/-012, Rev –, or later revision.

NOTE
This does not constitute an operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.

Barometric VNAV (Baro-VNAV)

In accordance with AC 20-138C, the VNAV system is approved for enroute, terminal, and approach operations.

NOTE
The actual VNAV path may deviate significantly below the intended VNAV path in cold temperatures.

RNP 1

The FMS is capable of operations on RNP 1 Departure Procedures and STARS in accordance with the AC 20-138D Change 2 and ICAO Doc 9613 Vol II, Part C, provided that:

- The FMS is receiving usable signals from at least one Collins GNSS sensor, and
- The operator/pilot has confirmed that a Type 2 Letter of Authorization is valid for the navigation database. This is available from Collins Aerospace by accessing the Collins Aerospace Navigation Database website, and
- The length of each individual flight plan leg does not exceed 200 NM for those legs for which RNP 1 operations are intended, and
- The pilot monitors the lateral deviation and ensures the aircraft does not exceed full scale lateral deviation (2 Dots), and
- None of the following messages are displayed on any PFD or CDU:
    - CHK POS
    - FMS DR
    - VOR/DME ONLY or V/D ONLY
    - VOR/DME DIST > 40 NM
- And for ICAO PBN RNP 1 and other procedures that require GNSS or when GNSS is the only sensor available, none of the following messages are displayed on any PFD or CDU:
    - GNSS NOT AVAILABLE
    - GNSS-FMS DISAGREE
    - LOSS OF INTEGRITY or LOI
- And for those RNP 1 procedures within the U.S. National Air Space System that do not require GNSS, confirm proper DME/DME operation when GNSS is not available:
    - The FMS is receiving usable signals from at least one DME with auto-tune selected, and
    - The crew has entered unserviceable navaids (check NOTAMs) on the CDU VOR/DME CONTROL page.

The following pre-flight planning only applies when SBAS is not available (check NOTAMs) or the aircraft is outside the SBAS coverage area and the procedure requires GNSS or GNSS is the only available sensor.

The availability of receiver autonomous integrity monitoring (RAIM) for the intended flight (route and time) should be confirmed using all available information. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. Predictions may be performed using the following tools:

- Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/-009/-012, Rev -, or later version.
- The FAA website http://sapt.faa.gov/default.php
- EUROCONTROL AUGUR, http://augur.ecacnav.com/augur/app/home

NOTE

This does not constitute an operational approval.
AC 91-70B and NAT Doc 007 provide additional operational guidance.

RNP 2

The FMS is capable of RNP 2 navigation in accordance with AC 20-138D Change 2 and ICAO Doc 9613 Vol II, Part C, provided that:

- For operations in oceanic/remote areas, two FMS systems are operating and receiving usable signals from two operating Collins GNSS sensors, and
- For operations in oceanic/remote areas or if otherwise required by the state authority, pre-departure GNSS predictions for the intended route of flight have been performed using Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/-009/-012, Rev -, or later version, and
- For the segment of route intended as RNP 2, the distance between consecutive waypoints does not exceed 400 NM, and
- Lateral deviation remains within 2 NM, corresponding to:
    - 2 dots when lateral deviation scaling is 2 NM
    - 1 dot when lateral deviation scaling is 4 NM (when OCEANIC is displayed on the PFD) which occurs in the region defined by boundaries:
        - Latitude ranges from N27° to N67°
        - Longitude ranges from W010° to W060°
- And none of the following messages are displayed on any PFD or CDU:
    - CHK POS
    - FMS DR
    - GNSS NOT AVAILABLE
    - GNSS-FMS DISAGREE
    - LOSS OF INTEGRITY or LOI
    - VOR/DME ONLY or V/D ONLY
    - VOR/DME DIST > 40 NM

NOTE

This does not constitute an operational approval.
AC 91-70B and NAT Doc 007 provide additional operational guidance.
Routes designated as RNP 2 may have additional requirements for communication, surveillance and operation.

RNP 4

The FMS is capable of RNP 4 navigation in accordance with AC 20-138D Change 2 and ICAO Doc 9613 Vol II, Part C provided that:

- Two FMS systems are operating and receiving usable signals from two operating Collins GNSS sensors, and
- Pre-departure GNSS predictions for the intended route of flight have been performed using Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/-009/-012, Rev -, or later version, and
- For the segment of route intended as RNP 4, the distance between consecutive waypoints does not exceed 800 NM, and

- None of the following messages are displayed on any PFD or CDU:
  - CHK POS
  - FMS DR
  - GNSS NOT AVAILABLE
  - GNSS-FMS DISAGREE
  - LOSS OF INTEGRITY or LOI
  - VOR/DME ONLY or V/D ONLY
  - VOR/DME DIST > 40 NM

NOTE

This does not constitute an operational approval.
AC 91-70B and NAT Doc 007 provide additional operational guidance.
Routes designated as RNP 4 may have additional requirements for communication, surveillance and operation.

RNP 10 Airspace (RNAV 10)

The FMS with Collins GNSS has been demonstrated to meet the criteria of AC 20-138C Required Navigation Performance Type 10 (RNP 10) without time limitations provided that:

- The message "FMS DR" is not displayed on any PFD or CDU, and
- Two FMS systems are operating and receiving usable signals from two operating GNSS sensors and used in conjunction with the Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/009/-012, Rev -, or later version.

NOTE

This does not constitute an operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.

P-RNAV (RNAV 1)

In accordance with the criteria of JAA TGL-10 and AC 90-96A, Change 1, the FMS is capable of P-RNAV operations provided that:

- The message "FMS DR" is not displayed on any PFD or CDU, and
- The FMS is receiving usable signals from at least one of the following:
  - A single Collins GNSS sensor, or
  - A single DME if auto-tune is selected and the crew has entered unserviceable navaids (check NOTAMs) on the CDU VOR/DME CONTROL page.
- And the operator/pilot has confirmed that a Type 2 Letter of Authorization is valid for the navigation database. This is available from CollinsAerospace by accessing the Collins Aerospace Navigation Database website.

The operator/pilot should confirm the requirements of the national, area, or local air traffic control agency for determining the availability of GNSS RAIM for the intended route of flight prior to departure. Some terminal areas may require dual operating FMS and GNSS equipment.

NOTE

P-RNAV (RNAV 1) operations utilizing GNSS as the only nav sensor require the following pre-flight planning:

The availability of receiver autonomous integrity monitoring (RAIM) for the intended flight (route and time) should be confirmed using all available information. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. Predictions may be performed using the following tools:

- Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/-009/-012, Rev -, or later version.
- EUROCONTROL AUGUR, http://augur.ecacnav.com/augur/app/home

NOTE

This does not constitute an operational approval.

Enroute and Terminal, including B-RNAV (RNAV 5)

In accordance with AC 90-45A, AC 20-138C, AC 90-96A Change 1, AMC 20-4, and AMC 20-5, the FMS is capable of enroute and terminal operations, including B-RNAV, provided "FMS DR" is not displayed on any PFD or CDU and the FMS is receiving usable signals from at least one of the following:

- A single Collins GNSS sensor, or
- A single DME if auto-tune is selected and the crew has entered unserviceable navaids (check NOTAMs) on the CDU VOR/DME CONTROL page.

NOTE

B-RNAV (RNAV 5) operations utilizing GNSS as the only nav sensor require the following pre-flight planning:

The availability of receiver autonomous integrity monitoring (RAIM) for the intended flight (route and time) should be confirmed using all available information. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. Predictions may be performed using the following tools:

- Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/-009/-012, Rev -, or later version.
- EUROCONTROL AUGUR, http://augur.ecacnav.com/augur/app/home

NOTE

This does not constitute an operational approval.

Non-Precision Approach

RNAV (GPS) / RNAV (GNSS) or GPS (GNSS) Overlay Non-Precision Approach

In accordance with AC 20-130C:

- The FMS is capable of RNP Approach operations to RNP 1 in the Initial, Intermediate and Missed Approach Segments and to RNP 0.3 in the Final Approach Segment provided:
  - The FMS is receiving usable signals from at least one Collins GNSS sensor, and
  - The GPS APPR annunciation is displayed at the final approach fix, and
  - The auto pilot or flight director is engaged.
- The FMS is capable of LPV (APV SBAS) Approach operations provided:
  - The FMS is receiving usable signals from at least one Collins GNSS sensor, and
  - The LPV APPR annunciation is displayed at the final approach fix, and
  - The auto pilot or flight director is engaged.

A current altimeter setting for the landing airport is required. Where remote altimeter minima are shown, the VNAV function may be used only to the published MDA.

NOTE

AC 90-105A provides additional operational guidance.
The FMS is not certified to conduct RNP AR (formerly RNP SAAAR) instrument procedures.

VOR/DME Approach (non-GPS (GNSS) overlay)

In accordance with TSO C115b, and AC 20-130C, the FMS has been demonstrated capable of RNAV (VOR/DME) approaches provided that:

- The FMS is receiving the approach reference VOR/DME station, and
- The GNSS sensors are disabled, and
- The APPR annunciation is displayed at the final approach fix, and
- The auto pilot or flight director is engaged.

VOR, TCN, NDB Approach (non-GPS (GNSS) overlay)

For an approach that does not have a GPS (GNSS) overlay, a white "APPR FOR REF ONLY" will be annunciated on the PFD when the aircraft is in the terminal area. Depending on database coding, the FMS may provide approach guidance (APPR) for some VOR approaches based on a VOR/DME or VORTAC.

NOTE

Some approaches are not included in the database.

Area Navigation on US Conventional Routes or Procedures

In accordance with AC 90-108 Change 1, the FMS is capable of operating on or transitioning to, conventional routes and procedures within the United States (US) National Airspace System (NAS).

US RNAV/DP/STARS

The FMS is capable of operations on U.S. Area Navigation (Q) routes, RNAV 1 or RNAV 2, Departure Procedures and STARS in accordance with the criteria of AC 90-100A, provided that:

- The FMS is receiving usable signals from at least one DME with auto-tune selected or a single Collins GNSS sensor, and
- The crew has entered unserviceable navaids (check NOTAMs) on the CDU VOR/DME CONTROL page, and
- The operator/pilot has confirmed that a Type 2 Letter of Authorization is valid for the navigation database. This is available from Collins Aerospace by accessing the Collins Aerospace Navigation Database website, and
- None of the following messages are displayed on any PFD or CDU:
    - FMR DR
    - VOR/DME ONLY or V/D ONLY
    - VOR/DME DIST > 40 NM
- And for procedures that require GNSS or when GNSS is the only sensor available, provided none of the following messages are displayed on any PFD or CDU:
    - GNSS NOT AVAILABLE
    - GNSS-FMS DISAGREE
    - LOSS OF INTEGRITY
- And the availability of the navigation infrastructure, required for the intended routes and procedure (including any non-RNP contingencies) is confirmed for the period of intended operations using all available information.

The following pre-flight planning only applies when SBAS is not available (check NOTAMs) or the aircraft is outside the SBAS coverage area and the procedure requires GNSS or GNSS is the only available sensor.

The availability of receiver autonomous integrity monitoring (RAIM) for the intended flight (route and time) should be confirmed using all available information. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. Predictions may be performed using the following tools:

- Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-008/-009/-012, Rev -, or later version.
- The FAA website http://sapt.faa.gov/default.php

SECTION II
LIMITATIONS
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General ---------- 2-6

AVIONICS

1. The following documents must be carried onboard the airplane at all times:
   - Operator's Guide, FMS-3000 v4.0 Flight Management System for King Air Series Aircraft. Publication Number 523-0816977-002117, 2nd edition, dated 06 February 2009 or later.

Attitude and Heading Reference System (AHRS)

For systems based on magnetic heading (no True Heading Source) flight operations are approved:

- At any longitude for the area bounded by 65° North latitude and 55° South latitude.
- To 70° North latitude for the area East of 70° West longitude and West of 125° West longitude.
- To 75° North latitude for the areas:
  - East of 50° West longitude and West of 60° East longitude, and
  - East of 150° East longitude and West of 160° West longitude
- To 80° North latitude for the area East of 10° West longitude and West of 40° East longitude.
- To 75° South latitude for the area East of 165° East longitude and West of 110° East longitude.
- Operations outside of the limits described above must be based on a main Field Horizontal Intensity (H) of 6000 nano Tesla (nT) or greater, providing a margin to the minimum acceptable field strength of 3000 nT.

Sources (WMM calculators) for the current International Geomagnetic Reference Field model for Main Field Horizontal Intensity (H) can be found at the following web sites:

- http://www.ngdc.noaa.gov/geomag/WMM/image.shtml
- http://www.geomag.bgs.ac.uk/data_service/models_compass/home.html
- http://geomag.nrcan.gc.ca/index-en.php

Other acceptable sources for current Main Field Horizontal Intensity (H) may be available.

Flight Management System (FMS)

General

1. The system program number (SCID) displayed on the STATUS page must be:
   - 832-4120-063 (without Search and Rescue), or
   - 832-4120-064 (with Search and Rescue).
2. IFR en route and terminal navigation is prohibited unless the pilot has verified the currency of the database or verifies each selected waypoint for accuracy by reference to current approved data.
3. If the Satellite Based Augmentation System (SBAS) is not available or disabled, the aircraft must have additional navigation equipment appropriate to the intended route, and it must be operational.
4. During periods of dead reckoning, indicated by the FMS DR annunciation, the FMS shall not be utilized as the primary source of navigation.
5. The WGS-84 or NAD-83 coordinate reference datum must be used.

6. The display of Geometric Altitude, GNSS HT or GNSS ALT, shall not be referenced for compliance with published or controller-issued altitudes.
7. Fuel management parameters are advisory only and do not replace the primary fuel quantity indications.
8. RNP operations are authorized as noted in the FMS Navigation Capabilities Section.
9. The FMS is not approved for navigation operations at latitudes greater than 73° North or 60° South without a true heading source such as an IRS.

Vertical Navigation

1. The barometric altimeter(s) shall be referenced to assure compliance with altitude restrictions for all flight operations, including departure, any approach and missed approach segment, step-down fix and "climb to" restrictions.

NOTE

Step down fixes may not be available in the navigation database for certain approaches and approach segments.

NOTE

"Climb to" altitudes are those altitudes that must be reached prior to initiating a turn to a subsequent waypoint or vector. These altitudes are shown in parentheses on the CDU and do not define waypoints.

2. Use of VNAV guidance for a V-MDA approach that includes a step-down fix between the final approach fix and missed approach point is prohibited.
3. VNAV altitudes must be displayed on the MFD map page or CDU legs page when utilizing VNAV for flight guidance.
4. When conducting an instrument approach using Baro-VNAV to LNAV/VNAV DA minimums, the flight director or autopilot must be used and VGP mode must be active. This limitation does not apply to LPV operations.
5. Editing altitudes on FMS CONTROL Display Unit (CDU) ACT/MOD/SEC LEGS on departure procedures and missed approach procedures is prohibited at all times for all ground and flight operations.
6. Baro-VNAV approach guidance to a DA is not authorized if the reported surface temperature is higher or lower than the Baro-VNAV temperature limitations specified on the applicable approach procedure chart unless temperature compensation is utilized. The final segment of an LPV approach is not subject to temperature restrictions.
7. Manual Temperature Compensation: The use of manual Temperature Compensated VNAV altitude constraints is prohibited unless authorized by Air Traffic Control or required by the appropriate governing authority.
8. Automatic (FMS) Temperature Compensation: Any use of the automatic FMS Temperature Compensation Function is prohibited for all ground and flight operations.

NOTE

To disable the FMS Temperature Compensation Feature refer to Service Information Letter CSU-XX00-18-1 Rev-1 titled, "Instructions for Disabling of Automatic Temperature Compensation Option in Pro Line 4 and Pro Line 21 Systems", RCPN 523-0825521.

9. Temperature compensation may only be accomplished manually, without using the FMS, by entering temperature-corrected altitudes on the altitude preselect on the Flight Guidance Panel and/or using basic altimetry techniques.

NOTE

Operating at uncompensated minimum IFR altitudes will not provide expected terrain and obstacle clearance for temperature below ISA.

Approach

1. FMS instrument approaches must be accomplished in accordance with approved instrument approach procedures that are retrieved from the FMS navigation database. The FMS database must incorporate the current update cycle.
2. The FMS with inputs from the GNSS may only be used for approach guidance if the reference coordinate data system for the instrument approach is WGS-84 or NAD-83.
3. Use of Baro-VNAV Decision Altitude (DA) is not authorized with a remote altimeter setting. A current altimeter setting for the landing airport is required. Where remote altimeter minima are shown, the VNAV function may be used only to the published MDA.
4. LNAV/VNAV must be accomplished using procedures for uncompensated Baro-VNAV systems. If reported airport temperature is outside published limits for the approach, Baro-VNAV operation is permitted only to the LNAV or circling line of minima, as applicable.
5. ILS, LOC, LOC-BC, LDA and SDF approaches using the FMS for approach guidance are prohibited. If an ILS, LOC-BC, LDA or SDF approach is loaded from the database, the pilot must ensure that the active NAV source transitions from FMS to short range NAV prior to the FAF.
6. When the approach at the destination is based on GNSS guidance and the Satellite Based Augmentation System (SBAS) is not available or disabled, an alternate airport required by operating rules must be served by an approach based on other than GNSS navigation. The aircraft must have operational equipment capable of using that navigation aid, and the required navigation aid must be operational.
7. Inserting waypoints on a published approach is prohibited.
8. Approaches copied from the SEC FLPN must be re-entered if previously flown.
9. Use of FMS guidance for conducting instrument approach procedures is prohibited with the FMS annunciation NO APPR illuminated.
10. The use of manually inserted runway coordinates of FMS Visual Approaches is limited to VFR operations only.
11. Use of FMS to capture and track a DME arc outside the published end points is prohibited.
12. RF Leg operations are not approved
13. RNP AR (formerly RNP SAAAR) operations are prohibited.

NOTE

Not all published approaches are in the FMS database. The flight crew must ensure that the planned approach is in the database.

Flight Control System (FCS)

General

1. Flight Guidance Computer units, FGC-3000, part number 822-1108-147, must only be installed on aircraft with FMS-3000 V4.0 Flight Management Systems.

SECTION III
EMERGENCY PROCEDURES

No Changes to this Section

SECTION IIIA
ABNORMAL PROCEDURES
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AVIONICS

FMS Caution Messages

The yellow MSG displayed on each PFD indicates presence of an FMS message on the CDU that requires pilot awareness and may require pilot action. Refer to the Collins FMS-3000 Flight Management System Pilot's Operating Manual, under Messages and Annunciations, Section 15.

APPR NOT AVAILABLE (CDU MFD)

This message is displayed in the terminal area (31 NM from the origin or destination) when the FMS determines the system does not meet the navigational requirements for approach operations.

- Select an approach not based on GNSS or proceed to the alternate airport if an approach cannot be completed in visual conditions.

CHK SBAS SVC PRVDR (CDU)

This message is displayed when Satellite Based Augmentation System is not available or is not enabled.

- Verify the SBAS provider is enabled.

CRS TO FAF > 45 DEG (CDU)

This message is displayed after executing a direct-to the FAF with an INTC CRS greater than 45 degrees from the final approach course. The FMS will not transition to the approach mode and SEQ INHB will be displayed on the PFD in yellow. If the approach is flown with this message displayed, the FMS will not provide guidance beyond the FAF to track the final approach course.

- Perform a direct-to the FAF with an INTC CRS within 45 degrees of the final approach course.

HALF BANK SELECTED (CDU)

This message is displayed when the autopilot/flight director 1/2 BANK and NAV modes are active, an approach is in the flight plan and the aircraft is within 31 NM of the approach airport. The message is also displayed within 1 minute of entering a holding pattern.

- Deselect 1/2 BANK mode prior to commencing the approach or entering a holding pattern.

GNSS NOT AVAILABLE (CDU)

This message is displayed when the FMS cannot use any of the enabled GNSS sensors or the crew has disabled all GNSS sensors via the GNSS CTL page.

- Continue FMS navigation with remaining valid sensors appropriate for the route of flight.

LOI (PFD) and LOSS OF INTEGRITY (CDU MFD)

This message is displayed when the FMS detects that the GNSS position does not meet the requirements for navigational use in the current phase of flight.

1. Select a navigation source other than FMS.

   OR

2. Deselect the GNSS receivers and continue FMS navigation with remaining valid sensors in accordance with airspace requirements.

NO APPR (PFD)

This message is displayed when the FMS is in approach mode and the FMS determines the system does not meet the navigational requirements for approach operations.

- Execute a go-around if the approach cannot be completed in visual conditions.

USE LNAV MINIMUM (CDU MFD)

This message is displayed when the GNSS vertical signal is inadequate for operating to the LPV minimums. This message will be accompanied with the "LPV NOT AVAILABLE" message.

Select BARO via the ARR DATA page and fly the approach utilizing BARO VNAV to LNAV/VNAV minimums or LNAV minimums. The selection of BARO must be executed prior to the FAF.

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NORMAL PROCEDURES
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AVIONICS

FMS Message

The white MSG displayed on each PFD indicates presence of an FMS white message that requires pilot awareness and may require pilot action. Refer to the Collins FMS-3000 Flight Management System Pilot's Operating Manual, under Messages and Annunciations section 15.

MFD FMS map source data is controlled by the menu button on the CCP, when a map is displayed on the MFD.

The EFIS transition altitude FL alert caution setting is controlled from the FMS VNAV setup page.

FMS Approach Procedure with Baro-VNAV (LNAV/VNAV or LNAV)

CAUTION

Use of the autopilot/flight director 1/2 BANK mode may result in excessive deviation from the course during an approach or holding pattern due to the limits these modes place on autopilot command authority.

1. On the CDU, press the DEP ARR function key to show the ARRIVAL page.

NOTE

Either an origin (ORIG) or a destination (DEST) airport must be specified in the flight plan for approach selections to be available on the ARRIVAL page. When the DEP ARR key is pressed, one of three pages is shown: DEPART, ARRIVAL, or DEP/ARR INDEX. If the aircraft is on the ground, or airborne less than 50 NM from the origin airport, or less than halfway to the destination airport, the DEPART page for the ORIGIN airport shows. If the aircraft is airborne and more than halfway to the destination airport, the ARRIVAL page for the destination airport is shown.

2. Press the line select key (LSK) adjacent to the desired approach.
3. Press the line select key (LSK) adjacent to the desired transition.

NOTE

If the desired approach or transition is not visible under the APPROACHES or TRANS list, press the NEXT or PREV function keys to scroll through additional selections.

4. Via the ARR DATA page, select BARO if the approach is a LPV as set by the database.
5. Once the approach, approach transition and BARO (if required) have been selected, press the EXEC function key to add the approach to the flight plan.

NOTE

When an approach is added to a flight plan from the ARRIVAL page, a discontinuity may be added immediately before the approach procedure in the flight plan.

6. To intercept the final approach course via vectors, select the flight director NAV or APPR mode. When flying an approach via a transition other than vectors and APPR is the desired vertical mode to complete the approach, verify APPR mode is selected prior to 2NM from the final approach fix.

CAUTION

Approach guidance is no longer valid when an amber NO APPR annunciation is displayed in the status field, below and to the left of the ADI. When approach guidance is no longer

valid, execute a missed approach unless the approach can be continued visually. In this situation the green APPR FMS# Flight Mode message will still be displayed above the ADI.

NOTE

Flying temperature compensated altitudes without approval of Air Traffic Control or the appropriated governing authority can lead to a loss of traffic separation.

7. If VNAV path guidance is desired for a non-precision approach, select VNAV mode, prior to the final approach fix. The FMS will provide a vertical path for those approaches with a vertical angle displayed on the CDU LEGS page to the altitude at the runway or missed approach point. Approaches without a vertical angle will display V-MDA above the missed approach point altitude on the CDU LEGS page.

   If the APPR and VNAV modes are selected on the FGP, a white GP annunciation will be displayed no later than 2 nm from the final approach fix. This indicates the system is armed to capture and track a VNAV glidepath past the final approach fix. After glidepath capture, the annunciation will change to VGP in green. In VGP mode, the VNAV system ignores the preselected altitude. Set the preselector to the missed approach altitude. VGP mode is similar to GS mode for an ILS approach and is appropriate when operating to a DA.

   If the NAV and VNAV modes are selected on the FGP, a white PATH annunciation will be displayed no later than 2 nm from the final approach fix. This indicates the system is armed to capture and track a VNAV path past the final approach fix. After path capture, the annunciation will change to VPATH in green. In VPATH mode, the VNAV system will level at the preselected altitude or VNAV reference altitude whichever is higher. There may be subsequent step-down fixes after the FAF that require pilot action to continue the descent to the MDA.

   VNAV path guidance after the FAF is not available for those approaches with V-MDA displayed above the missed approach point altitude on the CDU. If flying level to the FAF, the aircraft will remain in an altitude hold mode past the FAF unless another flight director vertical mode is selected for descent to the desired MDA. If descending to the FAF via a VNAV defined path the flight director will revert to PTCH mode at the FAF and the aircraft will continue the descent at the aircraft pitch value present at the transition to PTCH mode. There may be subsequent step-down fixes after the FAF that requires pilot action to continue the descent to the MDA.

FMS LPV Approach Procedure

CAUTION

Use of the autopilot/flight director 1/2 BANK mode may result in excessive deviation from the course during an approach or holding pattern due to the limits these modes place on autopilot command authority.

CAUTION

Approach guidance is no longer valid when an amber NO APPR annunciation is displayed in the status field, below and to the left of the ADI. When approach guidance is no longer valid, execute a missed approach unless the approach can be continued visually. In this situation the green APPR FMS# Flight Mode message will still be displayed above the ADI.

NOTE

On hot days when performing LPV approaches and while transitioning from barometric altitude to LPV glidepath, the glidepath may jump. The airplane may be high and pilot action may be required to capture the glidepath. Early activation of the approach mode after being cleared for the approach and established on a published portion of the approach will help to minimize the glidepath movement.

NOTE

Use barometric altitude (MSL) for the Decision Altitude (DA) minimums.

NOTE

Check with local authorities to determine if temperature compensation is required when performing LPV approach operations outside of the U.S.A.

1. On the CDU, press the DEP ARR function key to show the ARRIVAL page.

NOTE

Either an origin (ORIG) or a destination (DEST) airport must be specified in the flight plan for approach selections to be available on the ARRIVAL page. When the DEP ARR key is pressed, one of three pages is shown: DEPART, ARRIVAL, or DEP/ARR INDEX. If the aircraft is on the ground, or airborne less than 50 NM from the origin airport, or less than halfway to the destination airport, the DEPART page for the ORIGIN airport shows. If the aircraft is airborne and more than halfway to the destination airport, the ARRIVAL page for the destination airport is shown.

2. Press the line select key (LSK) adjacent to the desired LPV approach.
3. Press the line select key (LSK) adjacent to the desired transition.

NOTE

If the desired approach or transition is not visible under the APPROACHES or TRANS list, press the NEXT or PREV function keys to scroll through additional selections.

4. Once the approach and transition have been selected, press the EXEC function key to add the approach to the flight plan. The FMS annunciates "LPV TERM" on the PFD when the aircraft is within the terminal area (31 NM) of the selected facility.

NOTE

When an approach is added to a flight plan from the ARRIVAL page, a discontinuity may be added immediately before the approach procedure in the flight plan.

5. To intercept the final approach course via vectors, select the flight director APPR mode. When flying an approach via a transition other than vectors, verify APPR mode is selected prior to 2NM from the final approach fix.

NOTE

The final segment of an LPV approach is not subject to temperature limitations.

6. Select VNAV mode prior to the Final Approach Fix (FAF). RWY is annunciated on the PFD when within 500 ft (approximately 2 dots) of the LPV vertical path. If APPR mode is selected on the FGP, a white GP annunciation will be displayed no later than 2 nm from the final approach fix. This indicates the system is armed to capture and track a glidepath past the final approach fix. After glidepath capture, the annunciation will change to VGP in green. In VGP mode, the VNAV system ignores the preselected altitude. Set the preselector to the missed approach altitude. VGP mode is similar to GS mode for an ILS approach and is appropriate for operations to a DA.
7. When the flight plan leg after the Final Approach Course Fix (FACF) becomes active and the aircraft meets the lateral capture criteria, the PFD annunciates LPV APPR and displays angular lateral and vertical deviation for the LPV approach. RWY will be annunciated on the PFD in the VNAV target altitude field after LPV is annunciated and the aircraft is within 500 ft of the SBAS vertical path.

NOTE

The TOD displayed past the FACF is based on a Baro-VNAV path to the final approach fix altitude until the FMS transitions to LPV APPR mode. After transition to FMS approach mode, the TOD represents the intercept point of the SBAS vertical path.

The FMS transitions to LPV APPR mode under any of the following conditions:

- The FACF is sequenced and flying on the published procedure.
- Intercepting inside the FACF via HDG mode and within 0.2nm of the lateral path.
- If a direct-to the FAF was selected with a INTC course within 45 degrees of the final approach course, LPV APPR will be annunciated 2nm prior to the FAF.
- If a vertical direct-to to FAF was selected, LPV APPR will be annunciated 2 nm prior to FAF.
- If the FACF is deleted, LPV APPR will be annunciated after sequencing the next step down fix or in absence of any step down fixes 2 nm prior to the FAF. If the last step down altitude is less than 2 nm from the FAF, the FMS approach mode activates 2 nm prior to the FAF.
- If step down altitudes between the FACF and FAF have been modified with an AT constraint altitude, LPV APPR will activate after the last modified step down altitude. If the last step down altitude is less than 2 nm from the FAF, the FMS approach mode activates 2 nm prior to the FAF.
- When flying parallel to the final approach course in heading mode, LPV APPR will activate crossing the 2 nm radius circle around the FAF.

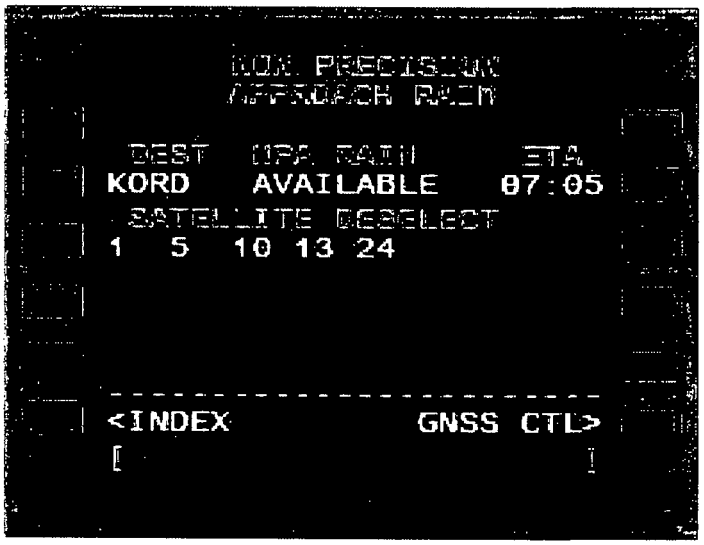
- During LPV APPR operations:
  - Engage the flight director and/or autopilot, and check that the active flight director vertical mode is "VGP" or "VPATH",
  - Select the Present Position (PPOS) map such that lateral path deviations are evident, recommended to be an outer range of 25 NM or less, and
  - Execute the missed approach and do not use the LPV vertical deviation if:
    - Lateral deviation is at or beyond full scale deflection, or
    - The vertical flight director mode is not VGP or VPATH.

Missed Approach Procedure

Missed approach procedures are automatically added to the flight plan with the selection of an approach. The missed approach procedure begins on the LEGS page with the leg immediately following the MISSED APPR label. It will also display on the ACT/MOD FPLN page as MISSED APPROACH. A missed approach is activated by pressing the GA button.

1. If a missed approach is required from a localizer based approach:
   a. Select the GA button to initiate the go-around and missed approach procedure.
   b. Set power, configure, and climb on course as required.
   c. On the LEGS page, verify AUTO sequence is selected.
   d. Select FMS as the active NAV source.
   e. Set the appropriate lateral and vertical flight director modes.
   f. Engage the autopilot (if desired).
2. If a missed approach is required from an FMS based approach:
   a. Select the GA button to initiate the go-around and missed approach procedure.
   b. Set power, configure, and climb on course as required.
   c. On the LEGS page, verify AUTO sequence is selected.
   d. Confirm or select FMS as the active NAV source.
   e. Set the appropriate lateral and vertical flight director modes.
   f. Engage the autopilot (if desired).

NON Precision Approach RAIM Page



This function is only required when conducting a GNSS based approach outside of SBAS coverage or when SBAS is not available (check NOTAMs). Verification of Non Precision Approach RAIM availability is not required when conducting SBAS based approaches.

FMS NAV TO NAV Operation

FMS NAV-to-NAV operation did not change as a result of this installation. The following explanation provides additional information for the white "NO APPR" message on the PFD.

The white "NO APPR" message is displayed on the PFD within 31 NM of the destination airport and a localizer based approach is in the flight plan when a condition exists that will inhibit the automatic transition from FMS to LOC navigation source. These conditions include:

- The NO APPR indication is displayed on the PFD when APPR is selected more than 31 nm from the airport. When within the 31 nm radius of the airport, selecting NAV and then APPR will clear the NO APPR indication.
- The NO APPR indication is displayed on the PFD when the localizer is not tuned to the proper frequency.

The crew must select APPR (on the Flight Guidance Panel) after the FMS completes the NAV-to-NAV set-up for the automatic transition from FMS to LOC navigation to occur. The crew can confirm that the FMS has completed the NAV-to-NAV set-up for the selected approach by observing the following on the PFD displays when the aircraft is in the terminal area:

- Localizer is tuned to the ILS frequency corresponding to the selected approach
- Localizer course is set
- LOC is the preselected navigation source

SECTION V
PERFORMANCE

No changes to this section

SECTION VI
WEIGHT & BALANCE/EQUIPMENT LIST

No Changes to this Section.

SECTION VII
SYSTEMS DESCRIPTION

No Changes to this Section

SECTION VIII
HANDLING, SERVICING AND MAINTENANCE

No Changes to this Section

SECTION IX
SUPPLEMENTS

No Changes to this Section

SECTION X
SAFETY INFORMATION

No Changes to this Section

BHE & Associates, Ltd.
12002 Warfield
Suite 250
San Antonio, TX 78216

March 3, 2020

Robert Donat
Elliott Aviation
13801 Pioneer Trail
Eden Prairie, MN 55347

Subject: Authorization to install STC

References: FAA STC Number SA11134SC

Dear Mr. Donat,

BHE & Associates, Ltd. hereby authorizes Elliott Aviation to install the Proline 21 ADS-B and optional SVS upgrade system in accordance with FAA STC Number SA11134SC on a Textron Aviation, C90GTi, serial number LJ-2057.

Please note that the Collins GPS-4000S (-100 status) is on a stop ship from Collins Aerospace at the present time. If you have another access to the GPS-4000S (-100 status), you may install the unit and proceed with the modification. All other GPS equipment listed on the STC are not affected by the stop ship and may be installed. For any questions related to this unit, contact your Collins Representative.

Please note that the documentation is provided to you on an "as is" basis, and your acceptance of the documentation serves to hold BHE & Associates and Collins Aerospace harmless for any liability arising out of the use of such documentation. BHE & Associates and Collins Aerospace grant no warranties as to current serviceability, completeness or correctness.

Prior to beginning the installation, Elliott Aviation must review the STC, all limitations, prerequisites and the data package to verify this modification is applicable to the aircraft model, serial number, equipment and aircraft configuration.

There is always a possibility of variability between the initial certification aircraft and the aircraft being considered for installation of the STC(s) noted above.

Elliott Aviation is responsible for developing and approving any differences in engineering (deviations to the STC) required to modify the aircraft and the actual aircraft modifications and for obtaining FAA and/or other host country regulatory agency approval of any deviations.

Elliott Aviation is also responsible for supplying any parts or engineering services required for manufacturing the installation kits/parts for the aircraft.

This authorization is limited to the aircraft listed above and may not be extended to other aircraft without the written authorization from BHE & Associates. This authorization does not grant Elliott Aviation rights or usage of this documentation for any other non-Collins Aerospace product or program. This documentation or any portion thereof shall not be used in any manner to manufacture, design, substantiate and/or certify by similarity or any other method, any non-Collins Aerospace product.

It is expressly prohibited to disclose this documentation to any third party without written approval by BHE & Associates and Collins Aerospace. Authorization to use this documentation or any portion thereof may not be assigned or sub-licensed by recipient without the express written consent of BHE & Associates and Collins Aerospace.

Please note that incorporation of this STC disables the remote checklist display button. If the Integrated Flight Information System (IFIS) is installed, a format that supports checklist can be stored on one of the MEM keys for quick access. Alternatively, the checklist can be displayed by using the top left Multi-Function Display (MFD) line select key.

Additionally, we will mail a CD containing the configuration data for the PL21 upgrade. Use this CD (**Rev D**) for FAA STC number SA11134SC on a C90GTi.

Please return a record of any additional aircraft serial number(s) to your Collins Aerospace customer order administrator for installations performed using this STC. Collins Aerospace needs to receive this data before BHE & Associates can authorize any installations.

For technical questions regarding this STC please contact Timothy Horgan at 210-349-9488. For administrative questions, please contact your Collins Aerospace customer administrator.

Sincerely,

Robert M. Hurley
President

United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

Number SA11134SC

This certificate issued to: BHE & Associates, Ltd
12002 Warfield St.
Suite 250
San Antonio, TX 78216

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 23 of the Federal Aviation Regulations.

Original Product – Type Certificate Number: 3A20
Make: Textron Aviation Inc.
Model: C90GTi

Description of Type Design Change
Installation of a Rockwell Collins Pro Line 21 update to include optional TAWS mode 5 warnings during LPV approaches, optional ADS-B Out and optional synthetic vision system (SVS) in accordance with Master Drawing List 544-00-0001, revision E, dated 12/11/2015 or later approved FAA revision; Airplane Flight Manual Supplement 544-00-0055, revision IR, dated 12/11/2015 or later FAA revision; and Instructions for Continued Airworthiness 544-00-0056, revision A , dated November 12, 2015 or later FAA accepted revision.

Limitations and Conditions:

1. The installer must determine whether this design change is compatible with previously approved modifications.
2. If the holder agrees to permit another person to use this certificate to alter a product, the holder must give the other person written evidence of that permission.
3. Must have factory installed Pro Line 21 and IFIS.
4. If the TAWS mode 5 during LPV approaches option is selected, the aircraft must have factory installed LPV or LPV installed per FAA STC SA10966SC or SA10969SC.

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

Date of application: 14 Sept 2015
Date of issuance: 15 December 2015

Date reissued: 12 January 2016
Date amended: 16 January 2017

By direction of the Administrator

Signature _____

Title VT-DRB Aviation Project ODA Administrator
ODA-831473-SW

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 or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120

SUPPLEMENTAL TYPE CERTIFICATE, FAA FORM 8110-2 (CONTINUED)

INSTRUCTIONS: The transfer endorsement below may be used to notify the appropriate FAA Aircraft Certification Office of the transfer of this Supplemental Type Certificate. The FAA will reissue the certificate in the name of the transferee and forward it to him.

TRANSFER ENDORSEMENT

Transfer the ownership of Supplemental Type Certificate Number:

To *(Name of transferee)*

(Address of transferee)

(Number and street)

(City, State, and ZIP Code)

From *(Name of grantor)*

(Address of grantor)

(Number and street)

(City, State, and ZIP Code)

Extent of Authority (if licensing agreement):

Date of Transfer:

Signature of grantor:

United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

(Continuation Sheet)

Number SA11134SC
Date of Issuance 15 December 2015
Date Reissued 12 January 2016
Date Amended 16 January 2017

New Certification Basis: Based on 14 CFR §§ 21.115 and 21.101, and the FAA policy for significant changes in FAA Order 8110.48, the certification basis for the Textron Aviation Inc. C90GTi Installation of a Rockwell Collins Pro Line 21 update to include optional TAWS mode 5 warnings during LPV approaches, optional ADS-B Out and optional synthetic vision system (SVS):

a. The type certification basis for Textron Aviation C90GTi airplane is shown on TCDS 3A20 for parts not changed or not affected by the change.

b. The certification basis for parts changed or affected by the change since the reference date of application, 14 September 2015 include:

Regulations at the latest amendment 23-0 through 23-62:
14 CFR § 23.23(a)(1)(ii), 23.773(a)(b), 23.1306(a)(b), 23.1543(b), 23.301(a)(b), 23.305(a)(b), 23.603(a)(b), 23.605(a), 23.867(a)(b)(1), 23.1581(a)(b)(c)(d)(f).

Regulations at an intermediate amendment
14 CFR § 23.853(a)(d) Amendment 23-49

BHE & Associates, Ltd.
Master Data List

MR10 EQUIPMENT WITH ADSB & SVS OPTION IN C90GTi AIRCRAFT

544-00-0001

ODA/FAA PROJECT NO: ----------

STC NO: SA11134SC

REV: M DATE: 5/8/2019

APPROVED: _____

REV*	DRAWING NO	TITLE	REVISION	REL DATE	DOC TYPE
	544-00-0002	GENERAL ARRGMT - BASELINE MR10 EQUIP UPDATE WITH ADSB, SVS & LPV OPTS	C	10/12/2018	S E
	544-00-0003	WIRE ROUTING - BASELINE MR10 EQUIPMENT WITH ADSB SVS & LPV OPTS	B	10/28/2016	S E
	544-00-0004	INSTALLATION - BASELINE MR10 EQUIPMENT	H	4/4/2019	S E
	544-00-0005	INSTALLATION - ADSB EQUIPMENT (OPTIONAL)	D	11/15/2018	S E
	544-00-0006	INSTALLATION - SYNTHETIC VISION EQUIPMENT (OPTIONAL)	E	1/12/2017	S E
	544-00-0007	INSTALLATION - LPV EQUIPMENT (OPTIONAL)	B	10/12/2018	S E
	544-00-0030	WIRING DIAGRAM - SYNTHETIC VISION OPTION	E	1/22/2019	E
	544-00-0031	WIRING DIAGRAM - CONFIGURATION STRAP UNIT	E	3/14/2019	E
	544-00-0032	INPUT OUTPUT CONCENTRATOR UNIT CONFIGURATION DOCUMENT	D	10/12/2018	E
	544-00-0033	WIRING DIAGRAM - ADS-B OPTION	C	10/12/2018	E
R	544-00-0034	WIRING DIAGRAM - FLIGHT DISPLAY MOD	F	4/11/2019	E
	544-00-0050	EMC TEST PLAN	A	12/3/2015	C
	544-00-0051	GROUND TEST PLAN	A	11/17/2015	C
	544-00-0055	FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT	C	12/5/2018	C
	544-00-0056	INSTRUCTIONS FOR CONTINUED AIRWORTHINESS	E	1/23/2019	C
	544-00-0058	WEIGHT & BALANCE - PRO LINE 21 MR 10 UPDATE WITH ADS-B & OPT SVS	IR	9/28/2015	C

Data Type Definitions: Drawings: E-Electrical M-Mechanical S-Structural P-Powerplant
Compliance Documents: C-Compliance
See seperate approvals for Compliance Documents
*** "R" = Document revised since last MDL revision**

544-00-0001

ODA/FAA PROJECT NO: ----------

STC NO: SA11134SC

REV: M DATE: 5/8/2019

APPROVED: _____

REV*	DRAWING NO	TITLE	REVISION	REL DATE	DOC TYPE
	544-00-0059	ELECTRICAL LOAD ANALYSIS	A	10/28/2016	C
	544-00-0072	FUNCTIONAL GROUND CHECK	E	4/8/2019	REF

Data Type Definitions: Drawings: E-Electrical M-Mechanical S-Structural P-Powerplant
Compliance Documents: C-Compliance
See seperate approvals for Compliance Documents
*** "R" = Document revised since last MDL revision**

Rel'd By VT-DRB, FSCM 47MZ7, Sht 2 of 2, 2019/May/08

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

ROCKWELL COLLINS, INC.
TAWS MODE 5 (OPTION) & ADS-B (OPTION) & SYNTHETIC VISION SYSTEM (SVS) (OPTION)
IN
BEECHCRAFT C90GTi SERIES AIRCRAFT

REPORT No. 544-00-0056

Revision: E
January 23, 2019

BHE & Associates, Ltd.
San Antonio, TX 78216 USA
CAGE: N/A

APPROVAL SIGNATURES

	NAME	SIGNATURE
Prepared by:	T. Jensen	Signatures on file (see IR revision)
Checked By:	T. Horgan	Signatures on file (see IR revision)
Approved By:	Kevin Campros	Signatures on file (see IR revision)

REVISION LOG

Rev	Page	Description	Date	Approved
IR	All	Initial Release	10/29/15	K Campros
A	Pg. 6	Added FAA approval note to beginning of limitations section.	11/12/15	T. Horgan
B	All	Revised and added equipment options to allow customers to select equipment updates that would allow update of the new ADS-B mandate at minimal cost.	11/8/16	T. Horgan
	i	Revised Title		
	iii	Added new, AFD, RTU, CDU to list of equipment. Re-arranged equipment options.		
	1-2	1.1, revised general description, added new options, 1.2.1 Added new acronyms for new equipment.		
	2-6	1.2.2 thru 1.2.12 added base line components. Re-arranged sections, added AFD, IOC descriptions.		
	9	Fig 2-1 added STA location to bulkhead		
	11	Added Darryl Seow, Project ODA Administrator to FAA approval block.		
	13	4.1 revised loading paragraph, revised table 4-1 Updated table with AFD-3010, RTU & CDU units		
	14	5.2, 5.3, revised Functional Ground check doc.		
	16	5.5 added IOT information to IOC description.		
	17	5.10 Added testing section for AFD, Revised section numbers.		
	18	6.1, 6.1.1 added base line equipment troubleshooting info. Revised section numbers.		
	20	6.1 added Base line equipment reference. 6.2 added wd reference & functional ground check doc.		
	19	7.2.1 added base line equipment troubleshooting info. Revised section numbers. 7.2.2.1 added Functional Ground Check doc.		
	25	7.7 added Functional Ground Check doc.		
	A1	LOAP table, added Functional Ground Check doc.		

Rev	Page	Description	Date	Approved
C	8	Revised Figure 2-1	11/30/16	TH
D	11 18	Updated address for VT-DRB. 6.1.1, added note for TCAS I installations.	10/12/18	TH
E	5-6	Section 1, Paragraph 1.2.7.2 updated interface items description. Paragraph 1.2.9.1 deleted info about configuring SVCM unit and removed reference to load enable switch.	1/23/19	TH
	11	Added statement regarding FAA approved Airworthiness Limitations.		
	14-15	Section 5, Paragraph 5.3, & 5.3.1 updated SVS section to add runway database load procedure.		

INTRODUCTION

These Instructions for Continued Airworthiness document has been developed using the guidelines in Appendix "G" of 14 CFR Part 23 as required by §FAR 21.50 and §23.1529.

This document is designed to provide avionics and aircraft technicians with sufficient information to inspect, troubleshoot, adjust, repair, test, remove, and install the Pro Line 21 system upgrade to include optional TAWS Mode 5 Warning during LPV approaches, optional ADS-B upgrade, and an optional Rockwell Collins Synthetic Vision System as follows:

AFD-3010 or AFD-3010E Adaptive Flight Displays, Primary Flight Displays (PFDs)

AFD-3010E Adaptive Flight Displays, Multifunction Display (MFD)

IOC-4110 – Input Output Concentrator, Field Loadable Configuration Change

IOT-4110 – Input Output Table

MDT-3110 – Maintenance Diagnostic Tables, Field Loadable Software Change

FMC-3000 Flight Management Computer

GPS-4000S – Global Positioning System

FSA-5000 – File Server Application

OPTIONAL EQUIPMENT

Option 1, ADS-B update

TDR-94/94D Transponders

Existing RTU/CDU Remote Turning Unit and Control Display Unit) are updated to display Flight ID. All maintenance activity remains un-change with these units. Refer to the Beechcraft Aircraft Maintenance Manual. See appendix A LOAP. .

Option 2, TAWS update

OCM (option control module) LPV update for TAWS Mode 5 warnings

Note: aircraft must have the LPV TC or STC for this option

Option 3 SVS update, option 2 is a prerequisite for this option

SVC-3000 Synthetic Computer
SVCM-3000 – Configuration Module

VIU-3000 Video Interface unit

The above equipment is installed in accordance with FAA Supplemental Type Certificate No. SA11134SC. See the List of Applicable Publications (LOAP) in Appendix A of this document. The publications listed in the LOAP constitute the required information essential for continued airworthiness for the aircraft.

The documents listed in the LOAP are a necessary part of this ICA and the latest revision should be available when performing maintenance. The STC holder will continue to monitor changes to ICA that were the basis of the supplementary ICA and provide revised supplemental ICA as necessary. The information in this document supplements or supersedes the original manufacturer's maintenance manual only in those areas listed. For limitations, procedures and other information not contained in this document, refer to the aircraft manufacturer's maintenance manuals, illustrated parts manuals and wiring diagrams or the vendor manuals as listed in the LOAP.

The requirements of FAR Part 26 do not apply to the Beechcraft C90GTi Aircraft as it is certified for less than 30 passengers and a payload of less than 7,500 pounds.

RECORD OF REVISIONS

For continuous use of this document, this document must be maintained in current revision status. Each time the STC holder finds it necessary to revise this document; a revision will be distributed to all users of the STC. Revisions will be supplied by e-mail via a PDF file or mailed via a Compact Disc or Digital Video Disc (CD/DVD). Changes to this document will be incorporated by a "new" revision to the complete document. All pages will indicate the "new" revision level. Upon receipt of the revision, the "old" revision should be discarded and replaced with the "new" revision. Changes to this document will be listed in the revision block on page iii.

It is the responsibility of the person(s) performing maintenance on the installed system to ensure that this document is current prior to performing this maintenance. The current revision number may be verified by contacting the STC holder, BHE & Associates, 12002 Warfield Suite 250, San Antonio, Texas 78216.

Report any discrepancies to the installation of this STC using the form in Appendix C of this document. Once filled out the form must be sent to both the ODA and the STC holder. Their addresses are as follows:

ODA
VT-DRB Aviation Consultants
27326 U.S. 281 North
San Antonio, Texas 78260

STC Holder
BHE & Associates, Ltd. Proprietary
12002 Warfield
Suite 250
San Antonio, Texas 78216

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APPENDIX C – DISCREPANCY REPORTING FORM **C1**

1.0 SYSTEM DESCRIPTION

1.1 General

This STC will update some of the current components of the Pro line 21 system. This will allow the new optional items to function. The new optional items are Automatic Dependent Surveillance – Broadcast (ADS-B) Out DO-260B, TAWS Mode 5 callouts during an LPV Approach (below glideslope), and Synthetic Vision System to display on the PFDs.

1.2 Components

1.2.1. List of Acronyms & Abbreviations

Acronym	Description
ADS-B	Automatic Dependent Surveillance - Broadcast
AFD	Adaptive Flight Display
AHRS	Attitude and Heading Reference System
CB	Circuit Breaker
CDU	Control Display Unit
CSU	Configuration Strapping Unit
CRC	Cyclic Redundancy Check
DBU	Data Base Unit
DCU	Data Concentrator Unit
EDC	Engine Data Concentrator
EGPWS	Enhanced Ground Proximity Warning System
FCC	Flight Control Computer
FMC	Fight Management Computer
FSU	File Server Unit
FSA	File Server Application
IAPS	Integrated Avionic Processor System
IEC	IAPS Environmental Controller
IOC	Input/Output Concentrator
ICC	Integrated Avionic Processor System Card Cage
LOAP	List of Applicable Publications
LRU	Line Replaceable Unit
LPV	Localizer Performance with Vertical Guidance
MFD	Multifunction Display
PFD	Primary Flight Display
PWR	Power
MFD	Multifunction Display
MDT	Maintenance Diagnostics Tables
SVC	Synthetic Vision Computer

Acronym	Description
SVCM	Synthetic Vision Configuration Module
SVS	Synthetic Vision System
TAWS	Terrain awareness and warning system

The following components and locations are noted below. The upper scripted asterisk denotes the unit is updated via Service Bulletin

1.2.2. Base Line components

The baseline installation for this STC will update the Rockwell Collins Pro Line 21 to MR10.3 displays and update the flight management system (FMS) to Ver.4.2. Several of the Pro Line 21 components must be updated to allow proper interface with existing equipment. These components are included as part of the baseline STC.

The base line update includes:

2ea. AFD-3010/AFD-3010E Adaptive Flight Displays (PFDs)
1 ea. AFD-3010E Adaptive Flight Displays (MFD)
1 ea. FMC -3000 Flight Management Computer*
1 ea GPS-4000S Global Position System*
2 ea. IOC-4110 Input Output Concentrators is updated via SB
2 ea. IOT-4110 Input Output table
1 ea. MDT-3110 Maintenance Diagnostic Table
*Optional # 2 units maybe installed.

Note: If not already factory installed the data loader DBU-5010 has been updated to a DBU-5010E unit per AML STC SA10970SC. This unit has additional port to load the new software and configuration files required.

1.2.3. Adaptive Flight Display

AFD-3010/AFD-3010E Adaptive Flight Display (PFD)
AFD-3010E Adaptive Flight Display (MFD)

1.2.3.1 System Description

The AFD-3010/AFD-3010E Adaptive Flight Displays is the heart of the Electronic Flight Information System (EFIS). The Electronic Flight Instrument System (EFIS) AFDs receive various sensor data from aircraft avionics systems and generates graphic displays to present this information to the flight crew. Its basic operation remains unchanged. These units are updated to allow additional communication between the updated components necessary for the ADS-B & TAWS mode 5, & SVS operations. Otherwise the display operation remains unchanged. AFD-3010E unit signifies that the unit has and additional Ethernet card to provide the FSU and video interface

which make compatible with the IFIS system for MFD. The AFD-3010E unit is also necessary for the PFDs when the optional SVS is installed and provides video interface.
A detailed description and operation of the AFD-3010/AFD-3010E is located in the Rockwell Collins, Inc. Raytheon King Air with IFIS Avionics System Manual 523-0807237, See appendix A LOAP.

1.2.4. Flight Management System (FMS)

FMC -3000 Flight Management Computer

1.2.4.1 System Description

The FMS supplies the capability of en route, terminal, and precision or non-precision approach lateral navigation. The system contains an advanced Global Positioning System (GPS) receiver that processes the transmissions from multiple satellites to calculate navigation solutions. When the Satellite Based Augmentation System (SBAS) is enabled, additional satellites provide corrections for lateral guidance and offer the user a true satellite based precision guidance capability. The system also supplies predictive Receiver Autonomous Integrity Monitoring (RAIM), which is used to determine whether the satellite geometry at the destination airport will be sufficient to support a non-precision GPS based approach at the planned time of arrival. When the FMS is in a GNSS navigation mode, the FMS uses only the Global Navigation Satellite System (GNSS) data and does not blend other sensors into the position estimation. The FMS also receives data from the AHS, ADC, DME, and VOR. The FMS supplies necessary controls for all input sensors, when appropriate. The FMS can be initialized, waypoints chosen, and destination selected by a variety of pilot-friendly means. Database SID, STAR, and airway routes are accommodated. A great circle route is calculated between waypoints for en route lateral navigation, and roll steering is supplied to the Flight Guidance System (FGS). A sophisticated interface with the FGS lets the FMS VNAV function select various FGS vertical modes of navigation. The FMS supplies vertical steering when appropriate. The FMS interfaces with a Data Base Unit (DBU) data loader to update its internal database. The FMS interfaces with the Adaptive Flight Display (AFD) electronic flight displays to supply conventional navigation information and state-of-the-art map presentation.
A single FMS system with single CDU and GPS is standard. A second FMS system with CDU 2 and GPS 2 is optional. The FMC will receive a software update.

1.2.5. Global Positioning System (GPS)

GPS-4000S Global Position System

1.2.5.1 System Description

The GPS-4000S Global Positioning System (GPS) provides accurate worldwide navigation capabilities. The GPS-4000S Global Positioning System processes GPS satellite signals to provide navigational data outputs. The GPS System contains one GPS-4000S receiver and one GPS antenna. The GPS antenna provides the GPS-4000S receiver with the radio frequency signals from the GPS satellites. The antenna is an active receive only device operating with the L-band frequency of 1575.42 10MHz. The antenna uses right hand circular polarization and is a microscopy patch type design. The Rockwell Collins, Inc. CDU-3000 Control Display Unit (CDU) provides backup display pages for the GPS navigation data. The GPS receivers process the GPS signals received from the antenna together with inputs from other airplane sensors to provide position, velocity, and time outputs through the integrated avionics processor's input/output data concentrators to the flight management system. The # 2 GPS unit is an optional unit.

A detailed description and operation of the GPS-4000S Global Positioning Receiver and CDU-3000 Control Display Unit (CDU) is located in the Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533, See appendix A LOAP.

1.2.6. Input / Output Concentrators (IOC)/ Input / Output Table (IOT)

IOC-4110 Input / Output Concentrators, IOT-4110 Input / Output Table

1.2.6.1 System Description

The IOC Input / Output Concentrators provide a data management function by acting as a central data collection and distribution point. These IOCs receive data bus inputs from each major LRU on aircraft. The IOCs process and sort data words, then transmit only the words of interest to the individual LRUs. The Input / Output table (IOT-4110) is loaded in to the IOC to provide the data bus mapping functions.

1.2.7. ADS-B Out System, Optional

TDR-94 or TDR-94D Transponder

1.2.7.1 System Description

ADS-B is a generation surveillance technology incorporating both air and ground aspects that provide Air Traffic Control (ATC) with a more accurate picture of the aircraft's three-dimensional position in the en route, terminal, approach and surface environments. The aircraft provides the airborne portion in the form of a broadcast of its identification, position, altitude, velocity, and other information. The ground portion is comprised of ADS-B ground stations which receive these broadcasts and direct them to ATC automation systems for presentation on a controller's display. In addition, aircraft equipped with ADS-B IN capability can also receive these broadcasts and display the information to improve the pilot's situation awareness of other traffic.

ADS-B is automatic because no external interrogation is required. It is dependent because it relies on onboard position sources and broadcast transmission systems to provide surveillance information to ATC, and other users."

The TDR-94 or TDR-94D units have been upgraded to be compliant to RTCA DO-178B and applicable chapters of FAA Order 8110.49, and AC 20-165A.

The existing Radio Tuning unit (RTU) & Control Display Unit (CDU) have been updated to display flight ID.

1.2.7.2 External Interfaces

It is important that any future maintenance or design changes to these interfacing components be accomplished in such a way that continued satisfactory performance of the overall ADS-B system is maintained.

The following ADS-B System interfaces were added if not already installed with this update.

1. GPS-4000S No. 1 ARINC 429 port to No.1 & No.2 TDR.
2. GPS-4000S No. 1 via Time Mark to No.1 TDR.
3. IAPS via ARINC 429 port to No.1 & No.2 TDR.
4. GPS-4000S No. 2 (Optional) ARINC 429 port to No.1 & No.2 TDR.
5. GPS-4000S No. 2 (Optional) via Time Mark to No.2 TDR.

1.2.8. TAWS Mode 5 Update, Optional

1 ea. OCM-3100 Optional Equipment Module

1.2.8.1 System Description

When the Pro Line 21 STC baseline was originally obtained, current TAWS systems did not have the capability to provide a Mode-5 alert when conducting LPV approaches, due to interface issues. Rockwell Collins has since updated their equipment so that TAWS Mode 5 warnings are provided during LPV approaches if installed.

1.2.9. Synthetic Vision System (SVS), Optional

SVC-3000 Synthetic Vision Computer
VIU-3000 Video Interface Unit.
SVCM-3000 Synthetic Vision Configuration Module

1.2.9.1 System Description

The Synthetic Vision System creates synthetic images of terrain to be displayed on the Collins adaptive flight displays (AFD's). The SVS image provides a sense of terrain contours. These terrain images show whether the terrain is near; far; above; or below the aircraft. In addition to the terrain, the SVS can display both arriving and departing runways.
The SVCM-3000 configuration module comes pre-configured for standard installations.

The SVC-3000 and VIU will be installed in the nose avionics compartment. A SVS configuration/terminal port connector will be installed in the nose avionics compartment.

1.2.10. Integrated Flight Information System (IFIS)

1 ea. FSA-5000 File Server Application

1.2.10.1 System Description

The IFIS provides mass data storage for all the databases required for the IFIS feature of the MFD as well as graphical processing capabilities for display list rendering.

For aircraft with IFIS 4.0 or 5.0 the File Server Application software must be updated to IFIS 6.0 in order to be compatible with MR10.3 update.

1.3 Operation

For operational information on the individual systems, refer to:

1.3.1. SVS, TAWS, & ADS-B Operation

Rockwell Collins, Inc. Pro Line 21 Major Retrofit/Integrated Display System with Synthetic Vision and ADS-B, Operator's Guide, document 523-0822966, See appendix A LOAP.

2.0 AIRWORTHINESS LIMITATIONS

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

2.1 Inspection Intervals

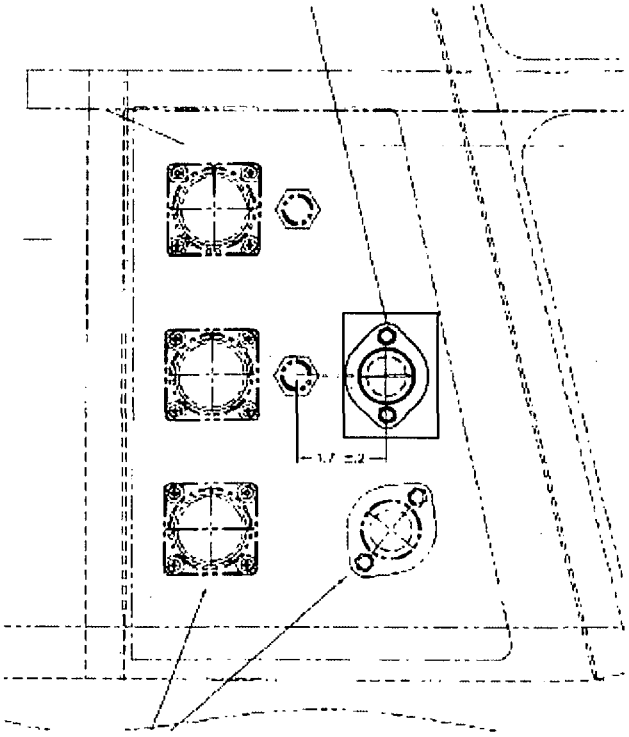
The following items require inspections as listed in the table below. Reference Figure 2-1 for installation locations.

ITEM	INSPECTION INTERVAL	INSPECTION TYPE
Fwd Pressure Feed-thru Installation Areas	12,800 Cycles (Initial)✱ 12,800 Cycles (Recurring)✱	High Frequency Eddy Current

✱ **NOTE**: Cycles taken from report 544-00-0068 Strength Evaluation Misc. Fuselage Penetrations

INSPECTION AREA & METHOD

Forward Bulkhead



HFEC Inspection Area of the bulkhead web

Figure 2-1: Fwd Pressure Feed Thru

View looking aft at lower right hand area of fwd pressure bulkhead (FS 84.00)

2.2 Eddy Current Inspection

Reference Beechcraft King Air Structural Inspection and Repair Manual P/N 98-39006, See Appendix A, LOAP.

Eddy Current Inspection requirements and procedures refer to the Structural Inspection and Repair Manual chapter 20-00-00 for the Beechcraft King Air aircraft. This section describes the various rules for HF eddy current inspection, indicating the parameters to be used for implementation of this method with test instruments recommended by Beechcraft Corporation. HF eddy current inspection is used to inspect working parts made of aluminum alloy, titanium, steel or magnesium with simple geometry.

The defects identified by this method are incipient fatigue or corrosion stress cracks in bores, machining radii, shoulders and countersunk holes, and in the actual skin. The directions of propagation of defects are perpendicular to in-flight stresses in the case of fatigue stress cracks, or perpendicular to internal stresses for stress corrosion cracks. This method also detects minor corrosion-induced surface damage.

2.2.1. EDDY CURRENT INSTRUMENTATION

The following test instruments are recommended by Beechcraft Corporation for this inspection method.

Multifunction test instruments:

- Magnaflux, Model ED-530 or ED-530M
- Eddy Current Probe, 6270-1 1.55
- Eddy Current Flex Shaft, 6270-3 1.68 or Model F90 9270-5 1.432.
- Eddy Current Unit Nortec 19E
- Eddy Current Flat Probe, SPO3806 1kHz – 10kHz
- Eddy Current 90 Deg Probe P/100-500 kHz/A/90.03/6
- Eddy Current 90 Deg Probe P/100-500 kHz/A/90.75/6
- 1/8-inch Bolt Hole Probe
- 3/16-inch Blot Hole Probe
- 5/32-inch Blot Hole Probe
- Eddy Current Standard Nortec SPO-3932
- Eddy Current Standard aluminum test block with 0.020-inch electrical discharge machined (EDM) notch Notrec TB-SI #190250
- Bolt Hole Standard with 1/8, 3/16 and 5/32-inch size holes with EDM notches 0.020-inch deep 2024-T6 Aluminum Block
- Eddy Current Standard, Replacement for EC1006

Inspection can be carried out using other equipment, but the operator is responsible for checking that equivalent performance is nevertheless obtained.

The main probes used for this type of inspection are straight or elbow pencil type absolute or differential probes, screened or not, operating in a frequency range from 500 kHz to 6 MHz. The choice of the probe shape to be used depends on geometry and access to the zones to be inspected, applying a compromise between small diameter (high sensitivity) and larger diameter (wider zone covered). If inspection is conducted close to an edge, attachment fittings, zones of geometrical changes, etc., a screened probe is generally more appropriate. Probe ends can be advantageously protected with PTFE adhesive tape, which also makes it easier to slide the probe over the part.

A standard reference gauge, or an equivalent, with appropriate sensitivity for the type of defect to be identified, is required for phase and gain adjustment. It incorporates three artificial defects: 0.2, 0.5 and 1 mm (0.0079, 0.0197 and 0.0394 in.). There is a dedicated standard reference gauge for each potential material of the working part to be inspected:

- ref. 29AO29 for aluminum alloy
- ref. 29AO32 for titanium
- ref. 29AO28 for steel
- ref. 29A120 for magnesium

In the case of inspection where a thick paint coating is present which, for example, has a material impact on detection sensitivity, this finish can be simulated on the gauge by application of an equivalent thickness of PTFE tape.

For equipment operation details refer to equipment manufactures operation instructions.

RESULT:

- The presence of a crack is indicated by the sudden appearance of a horizontal signal, towards the right of the screen.
- Gap or perpendicularity variations are indicated by vertical displacement of the signal.
- Any signal with a value 30% less than that of the reference signal is ignored, or exceeding 30% of the signal obtained when setting sensitivity (namely more than 3 divisions from the point of balance on the horizontal scale, corresponding to the lower limit of the alarm) is taken as a defect signal.
- The operator must identify signal deflections due to edge effect, stacking, geometry or progressive variation of magnetic permeability, etc., which are not recognized as defects.

When a defect is recognized, it is necessary to identify and record:

- The type of the defect: crack, corrosion, scoring or separation,
- The location: position and orientation with respect to the structure or zone inspected,
- The defect length: the defect is demarcated by a zig-zag scan perpendicular to the direction of the crack, and progressing in the direction of the crack. When the signal disappears, this indicates the end of the defect. The operator must record this value, taking due account of the type of probe used (screened or not).

NOTE:

If the inspection zone has been stripped, it must be protected as quickly as possible, applying the protection rules per Beechcraft King Air Chapter 20 Standard Practices. See appendix A LOAP.

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

DocuSigned by:
FAA APPROVED: Darryl Seow
4D54D5F9C35743F...

Darryl Seow, Project ODA Administrator

A Division of VT San Antonio Aerospace, Inc.

9800 John Saunders Rd, San Antonio, TX 78216

Date 2/4/2019

3.0 MAINTENANCE PRACTICES

3.1 Maintenance – General

Reference Hawker Beechcraft Corporation approved inspection program in the Airplane Maintenance Manual.

- Beechcraft Aviation approved inspection program in the Beechcraft King Air 90 series Maintenance Manual. See appendix A LOAP.

3.2 Removal/Installation

No additional hardware was added for the installation of the TAWS mode 5 and ADS-B update, only hardware replacement and/or software updates were applied. For removal/installation instructions, see Beechcraft maintenance manuals. The aircraft maintenance manuals contain complete detailed instruction for installation and/or removal of this equipment and should be consulted for all maintenance activities.

For installation of the optional Synthetic Vision System (SVS), location and installation information can be found on BHE drawing, 544-00-0006 Instl-Synthetic Vision Equipment. For removal & installation information refer to Rockwell Collins, Inc. Synthetic Vision System for Pro Line 21 Installation Manual, document 523-0821140, Section 2.12 "Installation and Removal Procedures". See appendix A LOAP.

NOTE:

Before the removal or installation of any SVS component(s), power should be removed from the system. If necessary pull the circuit breaker (s) listed in section 4.2 to remove power.

Upon removal and reinstallation of the SVS component(s) each component(s) security of attachment in regards to the component(s) and mating connectors should be verified as well as cleanliness of the connectors and surrounding areas. In addition, a complete operational test should be performed. Reference section 4 any Adjustments/ Test for testing requirements.

3.3 ACCESS LOCATION

Refer to the Beechcraft King Air 90 Series Maintenance Manual, for specific access panel removal details. See appendix A LOAP.

Location of Access	Access Panels
Nose Avionics Bay	Forward Nose Access Panels (Right & Left)
Tail Avionics Bay	Tail Access Panel

4.0 POWER DISTRIBUTION

4.1 EQUIPMENT CHANGES

The following equipment part numbers have changed with this update, but did not change any bussing or loading characteristics:

Table 4-1: Equipment Replacement Table

Existing equipment Type	Qty	New equipment Type	Qty
AFD-3010	2	AFD-3010 or AFD-3010E	2
AFD-3010E	1	AFD-3010E	1
TDR-94 or	1 or 2	TDR-94 or	1 or 2
TDR-94D	1 or 2	TDR-94D	1 or 2
GPS-4000A	1 or 2	GPS-4000S	1 or 2
FMC-3000	1 or 2	FMC-3000	1 or 2
CDU-3000	1 OR 2	CDU-3000	1 OR 2
IOC-3100	2	IOC-4110	2
RTU-42x0	1	RTU-42X0	1

4.2 CIRCUIT BREAKERS BY BUS

The following represents the listing of the circuit breakers added by bus if the optional SVS system is installed. The chart lists the circuit breaker name and nominal power consumption.

28VDC Left Generator Avionics Bus				
Equipment/System	**Model**	**CB Name**	**Nom Load**	**Location**
SVS Computer	SVC-3000	SVS	1.5	A146 PNL Assy (RH CB PNL)
Video Interface Unit	VIU-3000	VIU	.2	A146 PNL Assy (RH CB PNL)

5.0 ADJUSTMENTS/TEST

System/LRUs that require specific adjustment/test procedures are covered in this section. For Systems/LRUs not listed, refer to the Maintenance Section of the appropriate document as listed Section 3.1 MAINTENANCE – GENERAL.

5.1 TDR-94/94D

The ADS-B upgrade is only done in software/configuration, therefore only the external sources of data listed on this document are affected.

- Apply electrical power to the airplane.
- Perform the TESTING AND TROUBLESHOOTING procedure for the TDR-94/94D. (Ref. Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533). See appendix A LOAP.
- Remove electrical power from the airplane.

5.2 TAWS Mode 5, ADS-B Out & SVS.

There is no adjustment associated with the installations of this equipment. For testing, reference the appropriate sections of Functional Ground check document 544-00-0072. See appendix A LOAP.

5.3 Synthetic Vision Computer

The Synthetic Vision System requires a database update every 28 days for navigation and airport updates. The database is uploaded using the Collins DBU-5010E database unit located in the aircraft cockpit.

For testing, reference the appropriate sections of Functional Ground check document 544-00-0072. See appendix A LOAP.

5.3.1. Synthetic Vision Computer Database Loading

Download SVC Runway database from the Collins Aerospace website.

Run executable to extract files onto USB drive.

Load SVC Runway Database using DBU-5010E

1. Using the Control Display Unit (CDU), Press MCDU MENU if available, or press INDEX for 5 seconds, and select DBU (Depending on installations, it may say AFIS/DBU)
2. Select AVAILABLE LRU, then UPDATE LIST
3. Once the LRU list is updated, select 429 LRU option at the top of the page.

NOTE:
If 429 LRU is not visible, verify that the LOAD 429 LRU options has been enabled. This is be done by selecting DBU STATUS from the DBU MENU page, and selecting DBU

OPTIONS. Verify the ENABLED option is Highlighted. (After enabling, select DBU STATUS, then DBU, and go to Step 2.

4. The CDU should now show FINDING LOADABLE FILES as the DBU looks through the available files on the USB memory stick.
5. Select the Runway Database to be loaded and the DATA LOAD PROGRESS page should start showing LOAD IN PROGRESS.
   a. Database will show as PL21_APTRWY_XXXX_YYYY where XXXX is the cycle, and YYYY is the database effectivity date.
6. Once dataload is complete, CDU will show 100% LOAD COMPLETE.
7. SVC computer will reboot and return to normal operation.
8. For any additional DBU loading information, reference Rockwell Collins, Inc. DBU-5000/5010/5010E Data Base Unit Operators Guide, document 523-0808703.

NOTE

For SVS database effectivity dates to show, the SVS system must be receiving GPS signal.

5.4 CSU-4100 Configuration Strap Unit Settings

This section addresses procedures to verify and if necessary set the configuration straps on the CSU-4100 Configuration Strap Unit. These strap settings are unique to the Synthetic Vision upgrade to the Pro Line 21 for the Beechcraft C90Gti series aircraft.

NOTE

Before changing any CSU strapping it is suggested that pictures be taken before any changes have been made for future reference.

For strapping specific to this project refer to Drawing 544-00-0031.

For the existing strapping refer to the Beechcraft Aircraft Wiring Diagram Manual, Section 31-40-00. See appendix A LOAP.

5.4.1. CSU-4100 Configuration Strap Unit Programming

NOTE

The installer must verify all strap settings based on the avionics installed and customer preference.

CAUTION:

Configuration Strapping Unit settings are unique to each aircraft configuration based on options, operator preferences, LRUs installed, etc. Verify airplane configuration before modifying Configuration Strapping Unit settings.

- Remove cover from ICC-4009 IAPS Card Cage.
- Remove left and right CSU-4100 Configuration Modules from the card cage. See Figure 3 for location.

- Loosen the 6 cover screws on the face of the CSU-4100.
- Slide the cover in the direction of the arrow to expose the strap dip switches.
- Refer to WIRING DIAGRAM – CONFIGURATION STRAP UNIT, 544-31-4100, and verify all switches are set identical to this document. See appendix A LOAP.
- Return the cover to the closed position and tighten the 6 cover screws.
- Repeat these procedures for the second CSU-4100.
- Reinstall both CSU-4100 Configuration Strap Units in the ICC-4009 IAPS Card Cage and secure the card cage cover.

5.4.2. CSU-4100 Configuration Strap Verification

- With all avionics equipment installed, apply power to that aircraft per Beechcraft King Air Aircraft 90 Series Maintenance Manual.
- Apply power to the avionics systems.
- Select IDX key on either MFD.
- Select MAINTENANCE key.
- Select CONFIGURATION STRAPPING UNIT.
- All WORD(s) should appear in white. This verifies that both CSU-4100s are strapped identically.
  - If any WORD(s) should appear in yellow, repeat 3.4.1 CSU-4100 CONFIGURATION STRAP UNIT PROGRAMMING.
- Refer to WIRING DIAGRAM – CONFIGURATION STRAP UNIT, 544-31-4100, and verify all WORD strap patterns are set identical to this document. See appendix A LOAP.

5.4.3. CSU-4100 Maintenance Interval

Configuration strap programming should be verified after any maintenance has been performed on either CSU-4100 Configuration Strapping Unit or if a new CSU-4100 is installed.

5.5 IOC-4110 Input Output Concentrator

5.5.1. IOC-4110 Input Output Concentrator

The configurable IOC-4110, Input Output Concentrator, are avionics units that provide the AFD displays with the proper display data. Each IOC contains a configuration file that is used to tailor the displays to each specific aircraft. The IOC must be loaded with the IOT-4110 and configured. The IOT and configuration file must be verified prior to return to service after IOC installation, replacement, or reconfiguration. The IOT and configuration data is uploaded using the DBU USB port, and a data load cable connected between the DBU 429 DATA LOAD and the IOC front panel, 68 pin connector. You may find the port located on the right side of the aircraft, in nose avionics component lower shelf.

a. Apply electrical power to the airplane.

- Do the TESTING AND TROUBLESHOOTING procedure for the IOC-4110. (Ref. Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533.) See appendix A LOAP
- Remove electrical power from the airplane.

5.5.2. IOC-4110 Data Load

Data load the IOC-4110 per the INPUT OUTPUT CONCENTRATOR UNIT CONFIGURATION Document 544-00-0032. See appendix A LOAP. This document gives instructions for how to load the IOC-4110 with the IOT-4110 and to load the IOC configuration files. This document contains a record of the standard configuration settings of the IOC (Input Output Concentrator) installed in the nose avionics compartment in Beechcraft C90GTi Series Aircraft. The use of this document for loading and configuration of IOC ensures the configuration is certified by requiring that the operator verifies the correct IOT and CRC / Checksum for the configuration for their airplane matches the CRC / Checksum provided herein.

5.6 Flight Management Computer (FMC-3000)

a) Apply electrical power to the airplane.

NOTE:

If the Flight Management Computer was replaced, perform Step b., otherwise proceed to Step c.

b) Do the DATA BASE UPDATE PROCEDURE. (Ref. Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533, and DBU-5000, 5010, and 5010E Data Base Unit, Operator's Guide, 523-0808703.)
c) Do the TESTING AND TROUBLESHOOTING procedure for the FMC-3000 1/FMC-3000 2. (Ref. Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533.)
d) Remove electrical power from the airplane.

5.7 FMS-3000 Navigation Database Loading

a) The FMS database memory stores VHF navaid and airport reference point information for use by the flight management subsystem. Each database also contains named enroute waypoints for the applicable geographic area. The FMS database expires periodically and must be updated with the latest information on a 28-day cycle. When the database has expired, a warning displays on the CDU during FMS initialization
b) Every 28 days, Collins Business and Regional Systems will distribute the latest database information. Database updates may also be received via the Internet.
c) Refer to DATA BASE UPDATE PROCEDURE. (Ref. Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft

Systems Manual 523-0808533, and DBU-5000, 5010, and 5010E Data Base Unit, Operator's Guide, 523-0808703.)

5.8 Global Positioning System (GPS-4000S)

a) Apply electrical power to the airplane.
b) Do the TESTING AND TROUBLESHOOTING procedure for the GPS-4000A/S. (Ref. Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533.)
c) Remove electrical power from the airplane.

5.9 File Server Application (FSA-5000)

a) Refer to FSU DATA BASE UPDATE PROCEDURE. (Ref. Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533.)

5.10 AFD-3010/AFD-3010E Adaptive Flight Display (PFD & MFD)

a. Apply electrical power to the airplane.
b. Do the TESTING AND TROUBLESHOOTING procedure for the PFD or MFD as required. (Ref. Rockwell Collins, Inc. System Manual (523-0817405) for the King Air Pro Line 21 Avionics System.)
c. Remove electrical power from the airplane.

6.0 TROUBLESHOOTING

For Troubleshooting information refer to the following documents:

6.1 BaseLine Pro Line Equipment update.

6.1.1. Pro Line 21 equipment.

Refer to Rockwell Collins, Inc. Pro Line 21 Avionics System for the Beechcraft King Air, document 523-0818103, Chapter 4. Additional information may be found in Pro Line Avionics System Upgrade for King Air Series Maintenance chapter 4, P/N 523-0817405. See appendix A LOAP.

NOTE:

For aircraft equipped with a TCAS I system, there will be a fault displayed in the Maintenance Diagnostic Current Faults pages that states TCAS I OFF/NO OUTPUT. This is a nuisance message and should be ignored. The TCAS I system will operate normally.

6.2 Synthetic Vision System (SVS)

6.2.1. Synthetic Vision System

Refer to Rockwell Collins, Inc. Synthetic Vision System for Pro Line 21 Installation Manual, document 523-0821140 Section 5.2.2 "Troubleshooting Procedures" and BHE & Associates wiring diagram 544-00-0003. For testing information refer to Functional Ground Check Document 544-00-0072 Section 3. See appendix A LOAP.

6.3 TAWS MODE 5 Equipment Update.

6.3.1. Pro Line 21 equipment.

Refer to Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533. See appendix A LOAP.

6.4 ADS-B Out System

6.4.1. TDR-94 or TDR-94D

a) Apply electrical power to the airplane.
b) Perform the TESTING AND TROUBLESHOOTING procedure for the TDR-94/94D. (Ref. Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual 523-0808533.) See appendix A LOAP.
c) Remove electrical power from the airplane.

7.0 INSPECTION REQUIREMENTS

7.1 Scheduled Inspections and Maintenance Checks

The Pro Line 21 and ADS-B hardware has been replaced by upgraded hardware in the same locations. For inspecting this equipment, refer to Beechcraft King Air 90 Series Aircraft Maintenance Manual. (See appendix A LOAP). Additional information may be found in "Rockwell Collins, Inc. Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT, Aircraft Systems Manual", 523-0808533.

7.2 Time Limits – Inspection and Maintenance Checks

NOTE:

Recommended inspection/maintenance intervals do not guarantee that the item will function properly between inspection/maintenance checks. The inspection intervals are based on average usage and environmental conditions. Aircraft operated under extreme conditions, (extreme hot, extreme cold, high humidity, salty air, etc.) may require more frequent maintenance than the intervals specified in this document. The aircraft operator may perform more frequent inspection/maintenance checks based on his usage.

7.2.1. Base Line Equipment

7.2.1.1 Pro Line 21 equipment.

Testing and inspection requirement for Pro Line 21 equipment remains unchanged. Refer to Beechcraft King Air 90 Series Aircraft Maintenance Manual, See appendix A, LOAP.

7.2.2. Synthetic Vision System (SVS)

7.2.2.1 Synthetic Vision Computer

Operational testing and Inspections is required at 200 hrs, at each phase. For operational testing refer to Functional Ground Check Document 544-00-072 See appendix A LOAP.

- A visual inspection should be performed as outline in section 6.3.
- Maintenance for the Synthetic Vision Computer is on-condition.

7.2.2.2 SVCM-3000 Configuration Module

- No timed inspection or maintenance is required for the Rockwell Collins Configuration Module.
- Maintenance for the configuration module is on-condition

7.2.2.3 VIU- Video Interface Unit

- No timed inspection or maintenance is required for the Rockwell Collins Video Interface Unit.
- A visual inspection should be performed as outline in section 6.3.
- Maintenance for the video interface unit is on-condition.

7.2.3. ADS-B Out System

7.2.3.1 TDR-94/94D

ATC transponders MUST be tested and inspected in compliance with the requirements specified in 14 CFR 91.411 and 91.413 at 24-month intervals or anytime the system is opened. Operational testing may be performed IAW Functional Ground Check Document 544-00-072 See appendix A LOAP

7.2.4. TAWS MODE 5 Equipment Update.

7.2.4.1 Pro Line 21 equipment.

Testing and inspection requirement for Pro Line 21 equipment remains unchanged. Refer to Beechcraft King Air 90 Series Aircraft Maintenance Manual, See appendix A, LOAP.

7.2.5. 200 – Hour Phase Inspection Program

A complete inspection cycle is 800 hours or 24 months. The inspection cycle is divided into four phases and each inspection is done at 200 hours with each consecutive phase 200 hours after the previous phase. The phase 1, 2, 3, and 5 inspections provide a thorough inspection of specific components and systems. A compete inspection cycle is as follows:

PHASE	HOURS
1	200
2	400
3	600
4	800

7.3 Visual Wiring Inspection

Perform visual inspections of the new system wiring. These visual inspections should be performed as part of the existing phase 3 inspection (600 hour) inspection. Refer to:

Beechcraft King Air Chapter 20 Standard Practices - Airframe, Section 20-12-00. See appendix A LOAP.

A "visual inspection" is defined as the process of using the eye, alone or in conjunction with various aids, as the sensing mechanism from which judgments may be made about the condition of a unit to be inspected.

This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to enhance visual access to all exposed surfaces in the inspection area. This level of inspection is made under normally available lighting conditions such as daylight, hangar lighting, flashlight or droplight and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

The inspection criteria provided below is intended to be used as general guidance. Special inspection should be conducted as deemed appropriate by each operator based on aircraft experience. Any discrepancies found should be repaired.

7.4 Wiring Inspection Guidance

The inspection criteria provided below is intended to be used as general guidance. Special inspection should be conducted as deemed appropriate by each operator. Any discrepancies found should be repaired.

a) Wire/Wire Bundle – Inspect for:

- Aluminum drill shavings, lint or dust on or inside wire bundles. Aluminum shavings can, with vibration or other motion, cut through wire insulation and provide a conductive path between wires in a bundle or to adjacent grounded structure. Lint and dust can accumulate on wire bundles and may, if subjected to overheated wires, ignite or possibly feed an electrical fire.
- Wire insulation that has become brittle. Wire may be more susceptible to cracking. Damaged insulation and/or exposed conductor material of wires. Cracked, chafed and cut insulation can provide a conductive path between wires in a bundle or to adjacent grounded structure.
- Pinched wires can occur at wire clamps, connector backshell clamps, excessively tight cable ties, etc.
- Inappropriate/improper wiring repairs such as the use of duct tape, electrical tape, poor crimp splices, etc.
- Wire insulation damage due to fluid leaks (i.e. fuel, hydraulic fluid, etc.)
- Separation of electrical wires from hydraulic, fuel and oxygen lines. Make sure a minimum of 0.5-inch separation and any wiring routed within 2.0 inches must be clamped to provide separation.
- Small bend radii of wire. Wiring subjected to excessively tight bend radii may sustain damage to the wire insulation.
- Sagging wire bundles. Make sure bundles are not allowed to droop onto structure, components, cables, hoses, other bundles, etc.
- Wire attached to the outside of a wire bundle using plastic ties instead of being installed under existing wire clamps. Can cause chafed and cut wire insulation.
- Unsupported wires running into conduit or wire supported in such a way as to pull the wire against the side of the conduit entrance instead of into the center. Can cause chafed and cut wire insulation.
- Proximity to high temperature equipment. Wiring shall be kept separate from high temperature equipment, such as resistors, exhaust stacks, heating ducts and deicers, to prevent wire insulation deterioration.

- Wires with different insulation types should not be routed together, where possible. Certain wire insulations may be easily abraded by other types of wire insulation.

b) Wire Harness Clamps - Inspect for:

- Condition. Make sure any protective material on the wire clamp (i.e. rubber, plastic, etc.) is in serviceable and functional condition. Clamps should be secured to structure and wire bundle should be snug in clamp.
- Make sure clamps are not installed over splices.

c) Connectors - Inspect for:

- Condition. Make sure connectors are free of corrosion, moisture, dust and metal shavings. Check for worn environmental seals, loose contact tension, proper contact locking, missing seal plugs, missing dummy contacts, etc. Drip loops should be maintained when connectors are below the level of the harness and tight bends at connectors should be avoided or corrected.

d) Backshells - Inspect for:

- Condition. Wires may break at connector backshells due to excessive flexing, lack of strain relief or improper buildup. Loss of backshell bonding may also occur due to these and other factors.

e) Electrical Conduits and Sleeving - Inspect for:

- Susceptibility to water/moisture entrance. Conduits should not be susceptible to the entrance of moisture. If moisture going into conduits and sleeving is unavoidable, provisions should be made in the lower portions of the conduit to drain any moisture and prevent accumulation.
- Condition. Damage to sleeving and conduits, if not corrected, will often lead to wire damage. Make sure components are free from corrosion, moisture, dust, and metal shavings. Check that conduit is secured to structure.

f) Terminations - Inspect for:

- Condition. Terminal lugs and splices are susceptible to mechanical damage, corrosion, heat damage and chemical contamination. Also, the buildup and nut torque on wire lugs is critical to their performance.

g) Grounding Points - Inspect for:

- Condition. Grounding points should be checked for security (i.e. tightness) condition of termination, cleanliness and corrosion. Any grounding points that are corroded or have lost their protective coating should be repaired and be checked for proper resistance.

CAUTION

Use care when disturbing or removing wire harness/bundles to minimize the possibility of wire insulation damage or cracking. Care must be especially used in areas with severe moisture problems. During any repair, modification, or installation work in close proximity to wire bundles,

mounts, connectors and systems, ensure that these areas are protected from and/or cleaned of metal shavings and debris.

7.5 Visual Inspections

The equipment necessary for conducting a visual inspection usually consists of a high brightness flashlight, a mirror with a ball joint, and a 2.5x - 4x magnifying glasses. A 10-x magnifying glass is recommended for positive identification of suspected cracks.

7.5.1. Corrosion Treatment

Before attempting a close, visual inspection of any selected part or structural area, it should be checked for signs of corrosion. Any corrosion found should be tested to discover its extent and severity. Heavy or severe corrosion requires immediate corrective action. If mild corrosion is present, it should be carefully, but completely, removed before continuing with preparations for the visual inspection.

For corrosion detection, removal and prevention techniques refer to Beechcraft Aircraft Recommended Maintenance Manual Chapter 20, Standard Practices. See appendix A LOAP.

7.5.2. Structural Failure Determination

The first step in a visual inspection should be an examination of the area for deformed or missing fasteners. These should be identified for subsequent replacement. A close examination for cracks in the surfaces of structural members should then be made with the aid of a flashlight. The majorities of cracks start at, and progress from, points of concentrated stress such as sharp corner cutouts and fastener holes. Cracks may also occur in sheet metal bend radii and similar places that were subjected to severe forming operations during manufacture. All cracks to be repaired per Beechcraft Aircraft Recommended Maintenance Manual Chapter 20, Standard Practices. See Appendix A LOAP.

7.5.3. Cleaning Areas

All parts of areas from which mild corrosion has been removed should be thoroughly cleaned using an approved solvent. (Metal conditioner should not be applied at this time as it may interfere with subsequent dye penetrant inspection.)

All other areas to be inspected should also be cleaned of any deposits that might hinder the discovery of existing surface flaws. The protective finish need not be removed. The cleaning should be performed using any approved solvent. For cleaning high heat-treat steel parts, or areas in which a high heat steel part is installed, use only the approved solvents.

7.5.4. Crack Detection Technique

When looking for surface cracks, the inspector should point his flashlight towards himself and hold it at an angle of 5° - 45° to the surface. (See Figure 6-1) The extent of the crack may be traced by directing the beam at right angles to the crack. Never direct the light beam at such an angle that the reflected beam shines directly into the eyes. The proper procedure is to keep the eyes above the reflected beam.

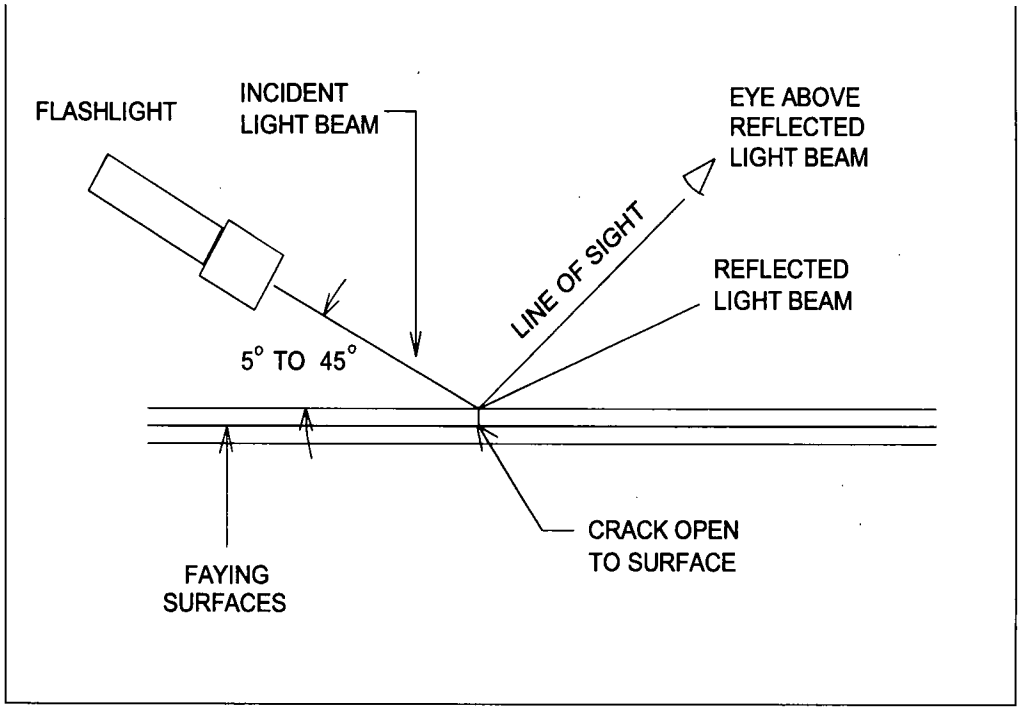


Figure 7-1: Crack Inspection Diagram

7.5.5. Verification of Cracks

A 10-x magnifying glass may be used to confirm the existence or extent of a suspected crack.

7.6 RETURN TO SERVICE

This inspection form is provided only as a guide and checklist for inspecting the installed system.

Aircraft S/N: _____ **Aircraft Registration No:** _____

Aircraft Total Time: _____ **W/O No.:** _____

7.7 LRU Inspection

Any time a component from this update is removed and replaced following repair or maintenance, a return to service test is required per BHE & Associates Functional Ground Check Document 544-00-0072. See appendix A LOAP. Check applicable maintenance practices for each individual component removed to determine what level of testing is required for returning to service.

APPENDIX A - LIST OF APPLICABLE PUBLICATIONS

The publications listed in the LOAP, including those listed within the Master Drawing List, constitute the required information essential for continued airworthiness for the aircraft.

Document Title	Document Number
Master Drawing List (includes wiring diagrams, equipment installations and Functional checkout procedure)	544-00-0001
Beechcraft King Air 90 Series Aircraft Maintenance Manual	90-590012-13
Beechcraft Aviation Structural Inspection and Repair Manual	98-39006
King Air Chapter 20 Standard Practices - Airframe	130-590031-487
Beechcraft King Air C90GT/C90GTi/B200GT/B200CGT	523-0808533
MDT-3110 Field Loadable Software, Service Information Letter	523-0806716
Rockwell Collins, Inc. DBU-5000/5010/5010E Data base Unit, Operator's Guide	523-0808703
Rockwell Collins, Inc. DBU-5000/5010/5010E Data base Unit, Installation Manual	523-0808860
Aircraft Field Loadable Software Procedures, Service Information Letter	523-0806245
Rockwell Collins, Inc. Synthetic Vision System for Pro Line 21, Installation Manual	523-0821140
Rockwell Collins, Inc. Pro Line 21 Major Retrofit/Integrated Display System with Synthetic Vision and ADS-B, Operator's Guide	523-0822966
Rockwell Collins, Inc, Field Loadable Software, Installation Manual	523-0806267
BHE & Associates Functional Ground Check	544-00-0072

APPENDIX B - SPECIAL TOOLS AND EQUIPMENT

Reference section 2 for Eddy current inspection equipment requirements.

APPENDIX C – DISCREPANCY REPORTING FORM

This form to be used by aircraft owner operators and modification centers to report discrepancies with modifications and repairs approved by the ODA.

Rel'd By VT-DRB, FSCM 47MZ7, Sht 37 of 38, 2019/Jan/23

DATE DISCREPANCY DISCOVERED: *Self explanatory.*

DISCREPANCY: *Describe the discrepancy in detail.*

RECOMMENDED CORRECTIVE ACTION:
Describe what actions you recommend taking to correct the discrepancy.

REPORTED BY: *Self explanatory.*

COMPANY NAME:_____

PERSON TO CONTACT:_____ **PHONE NUMBER:**____

TITLE:_____

Signature:	*Self explanatory.*	**Date:**	*Self explanatory.*

Rel'd By VT-DRB, FSCM 47MZ7, Sht 38 of 38, 2019/Jan/23

BHE & Associates, Ltd.
12002 Warfield, Ste 250
San Antonio, TX 78216

BHE Doc Date: 12/5/2018

FAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR THE
BEECHCRAFT C90GTi SERIES AIRCRAFT
WITH
FACTORY INSTALLED ROCKWELL COLLINS PRO LINE 21 AVIONICS,
AND MODIFIED WITH ONE OR MORE OF:

AN ADS-B UPGRADE (OPTION),
A TAWS MODE 5 CALLOUT FOR LPV APPROACHES (OPTION) &/OR
A SYNTHETIC VISION SYSTEM (SVS) (OPTION)

Serial No. _____

Reg. No. _____

The information in this supplement is FAA approved material which, together with the basic Airplane Flight Manual 90-590024-163A1 for the C90GTi, is applicable and must be carried in the basic manual when the airplane is modified in accordance with **STC SA11134SC.**

The information contained in this supplement supersedes the basic manual only where covered herein. For Limitations, Normal Procedures, Emergency Procedures, Abnormal Procedures, Performance, Weights and Balance, and Manufacturers Data not contained in this supplement, consult the basic Airplane Flight Manual and applicable AFM Supplements.

FAA Approved by:
DocuSigned by:
Darryl Seow
4D54D5F8C35743F...

Darryl Seow
Project ODA Administrator
ODA-831473-SW
9800 John Saunders Road.
San Antonio, TX 78216

Date: 2/4/2019

NOTE: REVISION BARS INDICATE CHANGES INCORPORATED BY LATEST CHANGE ONLY.

REVISION LOG

Rev	Page	Description	Date of Rev	FAA Approved
IR	All	Initial Release	12/11/2015	Robert M. Hurley Robert M. Hurley Project ODA Administrator ODA-831473-SW
A	Cover 3-7, 9 1-2 5 & 9 5 11 22, 23	Revised title for equipment options. Revised Rockwell Collins Pre-Departure GPS Coverage Predictor Program PN. Sec 1.1 Updated introduction, Added equipment options. Revised link to FAA's RAIM web site Sec 5 RNP 10 airspace removed reference to FAA Order 8400.12C Added abbreviations CDU, IOC, OCM, QFE & WMM. Removed step 4, LPV, TAWS mode 5 ILS statement. Renumbered remaining sections.	12/16/2016	Darryl Seow Darryl Seow Project ODA Administrator ODA-831473-SW
B	Cover All	Updated ODA address. Added "TAWS" before Mode 5 on numerous pages. Changed barometric VNAV to "Baro-VNAV" on numerous pages. Changed GPS to "GNSS" or removed "GPS" on numerous pages. Removed mention of FAA AC 20-138D from several lines.	See page v	See page v

Rev	Page	Description	Date of Rev	FAA Approved
	SECTION 1			
	1	BaseLine Equipment, Added "IOT-4110 input output table" in the line with the IOT under. Removed and replaced previous statement with FSU-5010E and added statements for the MDT-3110 and FSU-5010 with new application software FSA-5000. Optional LRUs, Added "updated to provide Flight ID information" to Option 1. Edited the note regarding LPV TC under Option 2.		
	2	1.1, Added details regarding the ADS-B out operation and requirements in paragraph following Optional LRUs. Replaced "TAWS box" with "Class A TAWS unit" in statement regarding LPV approaches. 1.2, Changed "center of the display" to "center of the deviation scale."	See page v	See page v
	4	1. Oceanic and Remote, separated sub section into bullets and edited details throughout this sub section. Added additional details regarding operational guidance to note. 2. North Atlantic (NAT) High Level Airspace (HLA), separated sub section into bullets and edited details throughout this sub section. Added details regarding operational guidance to note.		

Rev	Page	Description	Date of Rev	FAA Approved
B	SECTION 1		See page v	See page v
	4	3. Barometric VNAV, added note following statement.		
	5	4. RNP 1, removed FAA AC 90-105 from first sentence. Reorganized several bullet points throughout this sub section. Added several bullet points regarding the FMS using receivable signals and accessing the Rockwell Collins Navigation Database. Edited wording on numerous existing bullet points. Added a note to the end of this sub section regarding operational guidance.		
	6	Added sub section 5, RNP 2.		
	7	Added sub section 6. RNP 4. 7. RNP 10 Airspace, separated sub section into bullets and edited the details throughout this sub section. Added a note to the end of this sub section regarding operational guidance.		
	8	8. P-RNAV (RNAV 1), separated sub section into bullets and edited the details throughout this sub section. Removed the table listing required P-RNAV Equipment.		
	9	9. RNAV 5, swapped the order of the bullets after the first paragraph of this sub section and added details regarding the DME.		

Rev	Page	Description	Date of Rev	FAA Approved
B	SECTION 1		See page v	See page v
	10	10. Non-Precision Approach, separated sub section into bullets and edited the details throughout this sub section. Added numerous new bullet points regarding the FMS and added a note regarding operational guidance.		
	11	Added section 11. Area Navigation on US conventional Routes or Procedures. 12. US RNAV/DP/STARS, added numerous new bullet points regarding the FMS and edited details throughout this sub section.		
	12	13. Radius to Fix (RF) Leg Capability, edited note.		
	13	1.4 Symbols, Abbreviations and Terminology, added several new acronyms to list. Added a new foot note regarding CAT 1 Approaches.		
	SECTION 2			
	18	2.3 ADS-B Out, edited details throughout sub section.		
	19	2.6 Flight Management System (FMS), updated the system program number (SCID). Rearranged numbered parts of section, deleted several parts and resequenced numbers.		

Rev	Page	Description	Date of Rev	FAA Approved
B	SECTION 2 20 21 SECTION 4 25 SECTION 5 26-27	Vertical Navigation, edited first part and added new notes. Added numerous new parts and added details throughout sub section. Approach, added a new part 4 regarding LNAV/VNAV. Added parts 12 and 13. Added section 2.7 Integrated Flight Information System (IFIS). Added section 4.1 PFD Reversion. 4.3 ADS-B Fail Indication, added steps to follow in the event of a failure. Edited first statement of part 4. Under part 8, edited details and removed the note.		not signed Darryl Seow Project ODA Administrator ODA-831473-SW
C	SECTION 1 14 SECTION 5 26	1.4, Added SELCAL to list. Item10, added CDU note about SECAL prompt.	2/4/2019	DocuSigned by: Darryl Seow 4D54D5F9C35743F...

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SECTION I GENERAL

1.0 GENERAL

1.1 Introduction

This STC will update some of the current components of the factory installed Pro-Line 21 equipment. The upgrade provides for optional Automatic Dependent Surveillance – Broadcast (ADS-B) Out DO-260B functionality, optional TAWS Mode 5 (glideslope) callouts during LPV approaches and allows for the optional Synthetic Vision System to be activated. The following LRUs were updated for this STC.

Base Line Equipment:

AFD-3010/AFD-3010E to programmable Adaptive Flight Displays.

FMC-3000 Flight Management Computers.

GPS-4000A or GPS-4000S units to GPS-4000S.

IOC-4110 Input Output Concentrators along with the IOT-4110 input output table.

MDT-3110 Maintenance Data Table was updated.

If not already installed, the DBU-5010E was updated with an AML STC.

The FSU-5010 was updated to new application software (FSA-5000). The FSA-5000 software may have previously been updated.

Optional LRUs:

- Option 1, ADS-B update

  TDR-94 or TDR-94D Transponders

  Existing RTU/CDU (Remote Turning Unit and Control Display Unit) are updated to provide Flight ID information

- Option 2, TAWS Mode 5 for LPV update

  OCM (option control module) LPV update for TAWS Mode 5 warnings

  NOTE: For this option, the aircraft must have the LPV TC or STC and a Class A TAWS that provides "Glideslope" call-outs for ILS approaches

- Option 3 SVS update, option 2 is a prerequisite for this option

  SVC-3000 Synthetic Vision Computer

  VIU-3000 Video Interface Unit

The Transponder is approved under Technical Standard Order (TSO) TSO C-166B. The optional ADS-B out capability meets the FAA mandated functionality. The installed ADS-B Out system has been shown to meet the equipment requirements of 14 CFR 91.227 and has been demonstrated to comply with EASA requirements CS-ACNS (for ADS-B). While the transponder is turned on, the ADS-B is operating.

The optional TAWS Mode 5 upgrade enables Mode 5 (Glideslope) callouts during LPV approaches. Refer to Rockwell Collins, Inc. Pro Line 21 Major Retrofit/Integrated Display System with Synthetic Vision and ADS-B, Operator's Guide P/N 523-0822966 for LPV approach and TAWS operational information.

For LPV approaches, the Pro Line 21 system outputs angular deviations, much like an ILS approach, suitable for a compatible Class A TAWS unit to provide an audible 'GLIDESLOPE" caution message in the event the aircraft flies low on the glideslope.

The optional SVS generates a virtual landscape image for video display on the PFDs. The SVS image is generated from a terrain database using current aircraft position and attitude information, The SVS image is displayed from the aircraft cockpit (Egocentric view) point of view and when turned on, replaces the background (blue sky / brown ground) depiction on the ADI. The ADI foreground items remain unchanged. Terrain elevation is shown by color-coded altitude bands. Texture patterns, shading, shadowing and grid lines are overlaid on the terrain.

1.2 Flight Management System

The Rockwell Collins FMS-3000 provides centralized control for navigation, flight planning, radio tuning, and fuel management functions. The Flight Management System (FMS) will also be updated to Ver.4.2.

Display Scaling

With the FMS updated to Version 4.2, and when the FMS is the selected NAV source selected, the lateral and vertical full-scale deviations are as listed in the table below. Full scale deviation is 2 dots deviation laterally or vertically from the center of the deviation scale.

TABLE 1

SCALE	OCEANIC	ENROUTE	TERMINAL	VOR/DME/RNAV APPROACH (APPR ANNUNCIATED)	RNAV (GPS) or RNAV (GNSS) APPROACH (GPS APPR ANNUNCIATED)
Lateral	**4 nm**	**2 nm**	**1 nm**	**1 nm**	**0.3 nm**
Vertical	**500 ft**	**500 ft**	**500 ft**	**150 ft (FAF to MAP)**	**150 ft (FAF to MAP)**

TABLE 2

SCALE	GPS (GNSS) SBAS APPROACH (LPV APPR ANNUNCIATED)
Lateral	**Angular deviation**
Vertical	**Angular deviation**

Although most scale changes occur in a seamless manner, the pilot should expect to occasionally observe "jumps" in the lateral and vertical scale presentations as the aircraft transitions through various phases of the approach.

Laterally - Oceanic to Enroute

Enroute to Terminal

Terminal to GPS (GNSS) or GPS (GNSS) SBAS Approach

Vertically - Enroute VNAV to GPS (GNSS), GPS (GNSS) SBAS or VOR/DME RNAV Approach

NOTE: When approach mode is active on a Baro-VNAV approach, vertical deviation scaling initially adjusts to ±250 feet, then changes to ±150 feet at the FAF.

1.3 FMS Navigation Capabilities

The Rockwell Collins FMS (Flight Management System) is approved under Technical Standard Orders (TSO) TSO-C115b and TSO-C146c Class Delta 4.

When the FMS is receiving appropriate navigation signals, it meets the accuracy specifications for the following operations:

1. Oceanic and Remote

The FMS and Rockwell Collins GNSS have been demonstrated to comply with the requirements for GNSS primary means of navigation in oceanic and remote airspace in accordance with AC 20-138D, provided that;

- Two FMS units are operating and receiving usable signals from two GNSS sensors and used in conjunction with the Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev –, or later revision, or
- For routes approved for single GNSS navigation, a single FMS is operating and receiving usable signals from the single GNSS sensor and used in conjunction with the Rockwell Collins GPS Coverage Prediction Program listed above.

NOTE

This does not constitute an operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.

2. North Atlantic (NAT) High Level Airspace (HLA)

The FMS and Rockwell Collins GNSS have been demonstrated to meet the performance requirements of the NAT HLA, in accordance with AC 91-70B and NAT Doc 007, provided that:

- Two FMS units are operating and receiving usable signals from two GNSS and used in conjunction with the Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev –, or later revision.

NOTE

This does not constitute an operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.

3. Barometric VNAV (Baro-VNAV)

In accordance with FAA AC 20-138D, the VNAV system is approved for enroute, terminal, and approach operations.

NOTE

The actual VNAV path may deviate significantly below the intended VNAV path in cold temperatures.

4. RNP 1

The FMS is capable of operations on RNP 1 Departure Procedures and STARS in accordance with AC 20-138D Change 2 and ICAO Doc 9613 Vol II, Part C, provided that:

- The FMS is receiving usable signals from at least one Rockwell Collins GNSS, and
- The operator/pilot has confirmed that a Type 2 Letter of Authorization is valid for the navigation database. This is available from Rockwell Collins, Inc. by accessing the Rockwell Collins Navigation Database website, and
- The length of each individual flight plan leg does not exceed 200 NM for those legs for which RNP 1 operations are intended, and
- The pilot monitors the lateral deviation and ensures the aircraft does not exceed full scale lateral deviation (2 Dots), and
- None of following messages are displayed on any PFD or CDU:
    - CHK POS
    - FMS DR
    - VOR/DME ONLY or V/D ONLY
    - VOR/DME DIST > 40 NM
- And for ICAO PBN RNP 1 and other procedures that require GNSS, or when GNSS is the only sensor available, none of the following messages are displayed on any PFD or CDU:
    - GNSS NOT AVAILABLE
    - GNSS-FMS DISAGREE
    - LOSS OF INTEGRITY or LOI
- And for those RNP 1 procedures within the U.S. National Air Space System that do not require GNSS, confirm proper DME/DME operation when GNSS is not available:
    - The FMS is receiving usable signals from at least one DME with auto-tune selected
    - The crew has entered unserviceable navaids (check NOTAMs) navaids on the CDU VOR/DME CONTROL page.

The following condition only applies when SBAS is not available (check NOTAMs) or the aircraft is outside the SBAS coverage area and the procedure requires GNSS or GNSS is the only available sensor.

The availability of receiver autonomous integrity monitoring (RAIM) for the intended flight (route and time) should be confirmed using all available information. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. Predictions may be performed using the following tools:

- Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev -, or later version.
- The FAA website http://sapt.faa.gov/default.php
- EUROCONTROL AUGUR, http://augur.ecacnav.com/augur/app/home

NOTE

This does not constitute an operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.

5. RNP 2

The FMS is capable of RNP 2 navigation in accordance with AC 20-138D Change 2 and ICAO Doc 9613 Vol II, Part C, provided that:

- For operations in oceanic/remote areas, two FMS systems are operating and receiving usable signals from two operating Rockwell Collins GNSS sensors, and
- For operations in oceanic/remote areas or if otherwise required by the state authority, Pre-departure GNSS predictions for the intended route of flight have been performed using Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev -, or later version, and
- For the segment of route intended as RNP 2, the distance between consecutive waypoints does not exceed 400 NM, and
- Lateral deviation remains within 2 NM, corresponding to:
  - 2 dots when lateral deviation scaling is 2 NM
  - 1 dot when lateral deviation scaling is 4 NM (when OCEANIC is displayed on the PFD) which occurs in the region defined by boundaries:
    - Latitude ranges from N27° to N67°
    - Longitude ranges from W010° to W060°
- And none of the following messages are displayed on any PFD or CDU:
    - CHK POS
    - FMS DR
    - GNSS NOT AVAILABLE
    - GNSS-FMS DISAGREE
    - LOSS OF INTEGRITY or LOI
    - VOR/DME ONLY or V/D ONLY
    - VOR/DME DIST > 40NM

NOTE

This does not constitute an operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.
Routes designated as RNP 2 may have additional requirements for communication, surveillance and operation.

6. RNP 4

The FMS is capable of RNP 4 navigation in accordance with AC 20-138D Change 2, and ICAO Doc 9613 Vol II, Part C provided that:

- Two FMS systems are operating and receiving usable signals from two operating Rockwell Collins GNSS sensors, and
- Pre-departure GNSS predictions for the intended route of flight have been performed using Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev -, or later version, and
- For the segment of route intended as RNP 4, the distance between consecutive waypoints does not exceed 800NM, and
- None of the following messages are displayed on any PFD or CDU:
    - CHK POS
    - FMS DR
    - GNSS NOT AVAILABLE
    - GNSS-FMS DISAGREE
    - LOSS OF INTEGRITY or LOI
    - VOR/DME ONLY or V/D ONLY
    - VOR/DME DIST > 40NM

NOTE

This does not constitute and operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.
Routes designated as RNP 4 may have additional requirements for communication, surveillance, and operations.

7. RNP 10 Airspace (RNAV 10)

The FMS with Rockwell Collins GNSS has been demonstrated to meet the criteria of AC 20-138D Required Navigation Performance Type 10 (RNP 10) without time limitations provided that:

- The message "FMS DR" is not displayed on any PFD or CDU, and
- Two FMS systems are operating and receiving usable signals from two operating GNSS sensors and used in conjunction with the Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev -, or later version.

NOTE

This does not constitute an operational approval.
AC 90-105A and AC 91-70B provide additional operational guidance.

8. P-RNAV (RNAV 1)

In accordance with the criteria of JAA TGL-10 and AC 90-96A, Change 1, the FMS is capable of P-RNAV operations provided that:

- The message "FMS DR" is not displayed on the PFD or CDU, and
- The FMS is receiving usable signals from at least one of the following:
  - A single Rockwell Collins GNSS sensor, or
  - A single DME if auto-tune is selected and the crew has entered unserviceable navaids (check NOTAMs) on the CDU VOR/DME CONTROL page.
- The operator/pilot has confirmed that a Type 2 Letter of Authorization is valid for the navigation database. This is available from Rockwell Collins, Inc. by accessing the following website: www.rockwellcollins.com/fms.

The operator/pilot should confirm the requirements of the national, area, or local air traffic control agency for determining the availability of GNSS RAIM for the intended route of flight prior to departure. Some terminal areas may require dual operating FMS and GPS equipment.

NOTE

P-RNAV (RNAV 1) operations utilizing GNSS as the only nav sensor require the following pre-flight planning:

The availability of receiver autonomous integrity monitoring (RAIM) for the intended flight (route and time) should be confirmed using all available information. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. Predictions may be performed using the following tools:

- Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev -, or later version.
- EUROCONTROL AUGUR, http://augur.ecacnav.com/augur/app/home

NOTE

This does not constitute an operational approval.

9. Enroute and Terminal, including B-RNAV (RNAV 5)

In accordance with AC 90-45A, AC 20-138D, AC 90-96A Change 1, AMC 20-4, and AMC 20-5, the FMS is capable of enroute and terminal operations, including B-RNAV, provided "FMS DR" is not displayed on any PFD or CDU and the FMS is receiving usable signals from at least one of the following:

- A single Rockwell Collins GNSS sensor, or
- A single DME if auto-tune is selected and the crew has entered unserviceable navaids (check NOTAMs) on the CDU VOR/DME CONTROL page.

NOTE

B-RNAV (RNAV 5) operations utilizing GNSS as the only nav sensor require the following pre-flight planning:

The confirmation of the availability of receiver autonomous integrity monitoring (RAIM) for the intended flight (route and time) should be confirmed using all available information. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. Predictions may be performed using the following tools:

- Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev -, or later version.
- EUROCONTROL AUGUR, http://augur.ecacnav.com/augur/app/home

NOTE

This does not constitute an operational approval.

10. Non-Precision Approach

RNAV (GPS) / RNAV (GNSS) or GPS (GNSS) Overlay Non Precision Approach

In accordance with AC 20-138D:

- The FMS is capable of RNP Approach operations to RNP 1 in the Initial, Intermediate and Missed Approach Segments and to RNP 0.3 in the Final Approach Segment provided:
  - The FMS is receiving usable signals from at least one Rockwell Collins GNSS, and
  - The GPS APPR annunciation must be displayed at the final approach fix, and
  - The auto pilot or flight director is engaged.
- The FMS is capable of LPV (APV SBAS) Approach operations provided:
  - The FMS is receiving usable signals from at least one Rockwell Collins GNSS, and
  - The LPV APPR annunciation is displayed at the final approach fix, and
  - The auto pilot or flight director is engaged.

A current altimeter setting for the landing airport is required. Where remote altimeter minima are shown, the VNAV function may be used only to the published MDA.

NOTE

AC 90-105A provides additional operational guidance.
The FMS is not certified to conduct RNP AR (formerly RNP SAAAR) instrument procedures.

VOR/DME Approach (non-GPS (GNSS) overlay) – In accordance with TSO C115B, and AC 20-138D, the FMS has been demonstrated capable of RNAV (VOR/DME) approaches provided that:

- The FMS is receiving the approach reference VOR/DME station, and
- The GNSS sensors are disabled, and
- The APPR annunciation is displayed at the final approach fix, and
- The auto pilot or flight director is angaged.

VOR, TCN, NDB (non-GPS (GNSS) overlay) – For an approach that does not have a GPS (GNSS) overlay, a white "APPR FOR REF ONLY" will be annunciated on the PFD when the aircraft is in the terminal area. Depending on database coding, the FMS may provide approach guidance (APPR) for some VOR approaches based on a VOR/DME or VORTAC.

NOTE

Some approach transitions are not included in the database.

11. Area Navigation on US Conventional Routes or Procedures

In accordance with AC 90-108 Change 1, the FMS is capable of operating on or transitioning to, conventional routes and procedures within the United States (US) National Airspace System (NAS).

12. US RNAV/DP/STARS

The FMS is capable of operations on U.S. Area Navigation (Q) routes, RNAV 1 or RNAV 2 Departure Procedures and STARS in accordance with the criteria of AC 90-100A, provided that:

- The FMS is receiving usable signals from at least one DME with auto-tune selected or a single Rockwell Collins GNSS, and
- The crew has entered unserviceable navaids (check NOTAMs) on the CDU VOR/DME CONTROL page, and
- The operator/pilot has confirmed that a Type 2 Letter of Authorization is valid for the navigation database. This is available from Rockwell Collins, Inc. by accessing the following website: www.rockwellcollins.com/fms, and
- None of the following messages are displayed on any PFD or CDU:
    - FMS DR
    - VOR/DME ONLY or V/D ONLY
    - VOR/DME DIST > 40 NM
- And for procedures that require GNSS or when GNSS is the only sensor available, provided none of the following messages are displayed on any PFD or CDU:
    - GNSS NOT AVAILABLE
    - GNSS-FMS DISAGREE
    - UNABLE RNP
- And the availability of the navigation infrastructure, required for the intended routes and procedure (including any non-RNP contingencies) is confirmed for the period of intended operations using all available information.

The following condition only applies when SBAS is not available (check NOTAMs) or the aircraft is outside the SBAS coverage area and the procedure requires GNSS or when GNSS is the only available sensor:

The availability of receiver autonomous integrity monitoring (RAIM) for the intended flight (route and time) should be confirmed using all available information. Dispatch should not be made in the event of predicted continuous loss of RAIM of more than 5 minutes for any part of the intended flight. Predictions may be performed using the following tools:

- Rockwell Collins Pre-Departure GPS Coverage Predictor Program, CPN 832-3443-009/-012, Rev -, or later version.

- The FAA website http://sapt.faa.gov/default.php

13. Radius To Fix (RF) Leg Capability

In accordance with AC 20-138D, Appendix 7 and AC 90-105, Appendix 5, this FMS installation is capable of Radius To Fix (RF) Leg transitions for Initial, Intermediate, and Missed approach segments of instrument approaches, RNP Departure Procedures (DP) and RNP STARs utilizing a Rockwell Collins GNSS sensor with autopilot or flight director engaged.

NOTE

The FMS is not certified to conduct RNP AR (formerly RNP SAAAR) instrument procedures.

14. Synthetic Vision System (SVS)

The SVS generates a virtual landscape image for video display on the PFDs. The SVS image is generated from a terrain database using current aircraft position / attitude information, and follows changes to the position and attitude of the aircraft.

The SVS image is from the aircraft cockpit (egocentric view) and when turned on, replaces the background (blue sky / brown ground) depiction on the ADI. The ADI foreground items remain unchanged.

Terrain elevation is shown by color-coded altitude bands. Texture patterns, shading, shadowing and grid lines are overlaid on the terrain.

1.4 Symbols, Abbreviations and Terminology

Acronym	Description
ADS-B	Automatic Dependent Surveillance - Broadcast
AFD	Adaptive Flight Display
AHRS	Attitude and Heading Reference System
BARO (Baro)	Barometric
CAT	Category
CB	Circuit Breaker
CDU	Control Display Unit
DA	Decision Altitude[1]
DBU	Data Base Unit
DCU	Display Control Unit
EGPWS	Enhanced Ground Proximity Warning System
FACF	Final Approach Course Fix
FCC	Flight Control Computer
FGP	Flight Guidance Panel
FMA	Flight Mode Annunciator
FMC	Fight Management Computer
Geometric Altitude	Altitude derived from mathematical model[2]
GPS	Global Position Satellite
GNSS	Global Navigation Satellite System
HPL	Horizontal Precision Lateral
IFIS	Integrated Flight Information System
ILS	Instrument Landing System
IOC	Input Output Concentrator
LOI	Loss of Integrity
LOPA	List of Applicable Publications
LPV	Localizer Performance with Vertical Guidance[3]
MDT	Maintenance Diagnostic Table
MFD	Multifunction Display
NPA	Non-Precision Approach
OCM	Optional Control Module
PFD	Primary Flight Display
PWR	Power
QFE	Altimeter setting reference to airport field elevation
RNP	Required Navigation Performance
RNP AR	Required Navigation Performance Authorization Required
RTU	Radio Tune Unit

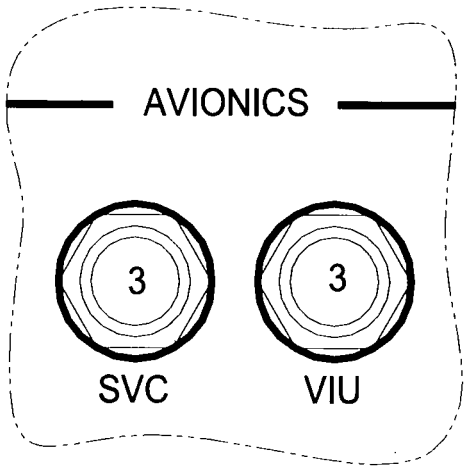
[1] A barometric altitude used to determine the lowest Altitude on a CAT 1 Approach (NPA or ILS) prior to taking over visually or going missed approach. A DA can only be used if a glide path is displayed.
[2] Altitude that is derived from a GNSS using the WGS84 mathematical model of the earth. It is the altitude used in SBAS-VNAV approaches (LPV) to determine glide path (Optional).
[3] Lateral Precision with Vertical Guidance is an NPA that uses barometric altitude to a DA. The approach displays SBAS angular deviations. The VGP computation is based on geometric altitude.

1.4 Symbols, Abbreviations and Terminology (Cont.)

SAAAR.....Special Aicraft and Aircrew Authorization Required
SBAS..... Satellite Based Augmentation System[4]
SELCAL ..... Selective Calling System
SVC..... Synthetic Vision Computer
SVS ..... Synthetic Vision System
TAWS..... Terrain Awareness and Warning System
VGP.....Vertical Glide Path[5]
VIU ..... Video Interface Unit
VNAV .....Vertical Navigation
VPA ..... Vertical Path Angle
WAAS .....Wide Area Augmentation System (USA)
WMM..... World Magnetic Model

[4] SBAS is the term used for any space based "navigation" augmentation system. In the United States it is called WAAS. Approaches that use SBAS data in the US are referred to as LPV.
[5] The vertical deviation indication and the vertical FMA annunciated when an NPA with vertical guidance is captured.

1.1 Added Circuit Breakers



RH CIRCUIT BREAKER PANEL
CIRCUIT BREAKER LAYOUT MAY VARY FROM AIRCRAFT TO AIRCRAFT.

Figure 1-1: Circuits Breakers

EFF	NAME	RATING	LOCATION
Option 3	SVC	3A	A146 RH Circuit Breaker Panel
Option 3	VIU	3A	A146 RH Circuit Breaker Panel

SECTION II LIMITATIONS

2.0 LIMITATIONS

2.1 General requirements

1. The following documents must be carried onboard the airplane at all times:

   - The Rockwell Collins, Inc. Pro Line 21 Major Retrofit/Integrated Display System with Synthetic Vision and ADS-B, Operator's Guide P/N 523-0822966, Second Edition, dated 01 March 2015 (or a later approved revision) must be immediately available to the flight crew.

2. This STC is approved for the following variants of the C90GTi aircraft.

   - POH & AFMS Doc. No.09-135-206:
     Quiet Turbofan Propellers - STC SA3593NM (D9290K) &
     Pratt & Whitney PT6A-135(A) Engines via one of the following:
     Hawker Beechcraft C90GT, C90GTi per TCDS 3A20
     Blackhawk Modifications – STC SA10341SC
     Silverhawk- STC SA107441SC

   - POH & AFMS Doc. No.13-135-206:
     Quiet Turbofan Propellers - STC SA3593NM (D9590SK) &
     Pratt & Whitney PT6A-135/-135(A) Engines via one of the following:
     Beechcraft C90GT/C90GTi per TCDS 3A20(-135A)
     Blackhawk Modifications – STC SA10341SC(-135A)
     Silverhawk- STC SA107441SC(-135 or-135A)

   - POH & AFMS Doc. No.C90GT-1900:
     Quiet Turbofan Propellers - STC SA3593NM (D9590K)
     Dual Aft Body Strakes-STC SA4010NM
     Increased Gross Weight – STC

   - POH & AFMS Doc. No.13-C90GT-1900:
     Quiet Turbofan Propellers - STC SA3593NM (D9590SK)
     Dual Aft Body Strakes-STC SA4010NM
     Increased Gross Weight – STC

- POH & AFMS Doc. No. 14-C90GTx:
  Swept Blade Turbofan Propellers- STC SA3593NM
  Dual Aft Body Strakes-STC SA4010NM &
  Beechcraft Increased Max Operating Weight – STC SA1047SC
  BLR Aerospace Winglet System – STC SA02054SE

- POH & AFMS Doc. No. 14-C90GTRx:
  Swept Blade Turbofan Propellers- STC SA3593NM
  Dual Aft Body Strakes-STC SA4010NM &
  Pratt & Whitney PT6A-135(A) Engines via one of the following:
  Hawker Beechcraft C90GT, C90GTi per TCDS 3A20
  Blackhawk Modifications – STC SA10341SC
  Silverhawk- STC SA107441SC
  Beechcraft Increased Max Operating Weight – STC SA1047SC
  BLR Aerospace Winglet System – STC SA02054SE

2.2 Synthetic Vision System

1. A valid and compatible database must be installed and contain current data.

2. SVS is a supplemental display, (reference only) and as such, it is not intended to be used for navigation.

3. TAWS must be operational for SVS to function. The SVS image is not meant to be used for navigation or guidance, and is not a replacement for TAWS. TAWS commands take precedence over the SVS.

4. SVS shall be off during QFE operations.

5. The Synthetic Vision System uses corrected barometric altitude to determine the aircraft's altitude with respect to the synthetic view of the outside terrain. Corrected barometric altitude is subject to various errors, including altimetry miss-set and altimetry errors due to non-standard temperatures. Such errors can result in the aircraft appearing significantly higher, or lower, than is actually the case, with respect to the synthetic view of the outside terrain. At low altitudes, this could give the illusion that the aircraft would clear terrain, which it might not. The SVS shall not be relied upon for terrain clearance.

NOTE

The Synthetic Vision System display uses different hues of blue for sky and water features. Caution must be exercised when taking off and landing at airports near bodies of water. It is recommended that SVS be deselected when landing or taking off over water.

2.3 ADS-B Out

The ADS-B is always broadcasting when a transponder is selected ON and neither the ADS-B Fail Flag (boxed yellow ADSB) nor the Transponder Fail Flag (boxed yellow XPDR) are displayed on the PFD. Prior to taxiing, verify one of the transponders is selected ON.

2.4 RVSM Capability

The RVSM capability is unchanged by this installation.

2.5 Attitude Heading Reference System (AHRS)

For systems based on magnetic heading (no True Heading Source) flight operations are approved:

1. At any longitude for the area bounded by 65° North latitude and 55° South latitude.

2. To 70° North latitude for the area East of 70° West longitude and West of 125° West longitude.

3. To 75° North latitude for the areas:
   - East of 50° West longitude and West of 60° East longitude, and
   - East of 150° East longitude and West of 160° West longitude

4. To 80° North latitude for the area East of 10° West longitude and West of 40° East longitude.

5. To 75° South latitude for the area East of 165° East longitude and West of 110° East longitude.

6. Operations outside of the limits described above must be based on a main Field Horizontal Intensity (H) of 6000 nano Tesla (nT) or greater, providing a margin to the minimum acceptable field strength of 3000 nT.

Sources (WMM calculators) for the current International Geomagnetic Reference Field model for Main Field Horizontal Intensity (H) can be found at the following web sites:

- http://www.ngdc.noaa.gov/geomag/WMM/image.shtml
- http://www.geomag.bgs.ac.uk/data_service/models_compass/home.html
- http://geomag.nrcan.gc.ca/index-en.php

Other acceptable sources for current Main Field Horizontal Intensity (H) may be available.

2.6 Flight Management System (FMS)

GENERAL

1. The following document must be on board the aircraft: Operator's Guide FMS-3000 v4.2 Flight Management System for King Air Series Aircraft, Publication Number 523-0821485-001117, 1st Edition, Revision (-), dated 23 January 2013 or later.

2. The system program number (SCID) displayed on the STATUS page must be:
   - 832-4120-089 (without Search and Rescue), or
   - 832-4120-090 (with Search and Rescue).

3. IFR en route and terminal navigation is prohibited unless the pilot has verified the currency of the database or verifies each selected waypoint for accuracy by reference to current approved data.

4. If the Satellite Based Augmentation System (SBAS) is not available or disabled, the airplane must have additional navigation equipment appropriate to the intended route, and it must be operational.

5. During periods of dead reckoning, indicated by the FMS DR annunciation, the FMS shall not be utilized as the primary source of navigation.

6. The WGS-84 or NAD-83 coordinate reference datum must be used.

7. The display of Geometric Altitude, GNSS HT or GNSS ALT, shall not be referenced for compliance with published or controller-issued altitudes.

8. Fuel management parameters are advisory only and do not replace the primary fuel quantity indications.

9. RNP operations are authorized, as noted in the FMS Navigation Capabilities section.

VERTICAL NAVIGATION

1. The barometric altimeter(s) shall be referenced to assure compliance with altitude restrictions for all flight operations, including departure, any approach and missed approach segment, step-down fix and "climb to" restrictions.

NOTE

Step down fixes may not be available in the navigation database for certain approaches and approach segments.

NOTE

"Climb to" altitudes are those altitudes that must be reached prior to initiating a turn to a subsequent waypoint or vector. These altitudes are shown in parentheses on the CDU and do not define waypoints.

2. Use of VNAV guidance for a V-MDA approach that includes a step-down fix between the final approach fix and missed approach point is prohibited.

3. VNAV altitudes must be displayed on the MFD map page or CDU legs page when utilizing VNAV for flight guidance.

4. When conducting an instrument approach using Baro-VNAV to LNAV/VNAV DA minimums, the flight director or auto-pilot must be used and VGP mode must be active. This limitation does not apply to LPV operations.

5. Editing altitudes on FMS CONTROL Display Unit (CDU) ACT/MOD/SEC LEGS on departure procedures and approach, including missed approach, procedures is prohibited at all times for all ground and flight operations.

6. Baro-VNAV approach guidance to a DA is not authorized if the reported surface temperature is higher or lower than the Baro-VNAV temperature limitations specified on the applicable approach procedure chart. The final segment of an LPV approach is not subject to temperature restrictions.

7. Manual Temperature Compensation: The use of manual Temperature Compensated VNAV altitude constraints is prohibited unless authorized by Air Traffic Control or required by the appropriate governing authority.

8. Automatic (FMS) Temperature Compensation: Any use of the automatic FMS Temperature Compensation Function is prohibited for all ground and flight operations.

NOTE

To disable the FMS Temperature Compensation Feature refer to Service Information Letter CSU-XX00-18-1 titled, "Instructions for Disabling of Automatic Temperature Compensation Option in Pro Line 4 and Pro Line 21 Systems", RCPN 523-0825521.

9. Temperature compensation may only be accomplished manually, without using the FMS, by entering temperature-corrected altitudes on the altitude preselect on the Flight Guidance Panel and/or using basic altimetry techniques.

NOTE

Operating at uncompensated minimum IFR altitudes will not provide expected terrain and obstacle clearance for temperature below ISA.

APPROACH

1. FMS instrument approaches must be accomplished in accordance with approved instrument approach procedures that are retrieved from the FMS navigation database. The FMS database must incorporate the current update cycle.

2. The FMS with inputs from the GNSS may only be used for approach guidance if the reference coordinate data system for the instrument approach is WGS-84 or NAD-83.

3. Use of Baro-VNAV Decision Altitude (DA) is not authorized with a remote altimeter setting. A current altimeter setting for the landing airport is required. Where remote altimeter minima are shown, the VNAV function may be used only to the published MDA.

4. LNAV/VNAV must be accomplished using procedures for uncompensated Baro-VNAV systems. If reported airport temperature is outside published limits for the approach, Baro-VNAV operation is permitted only to the LNAV or circling line of minima, as applicable.

5. ILS, LOC, LOC-BC, LDA and SDF approaches using the FMS for approach guidance are prohibited. If an ILS, LOC-BC, LDA or SDF approach is loaded from the database, the pilot must ensure that the active NAV source transitions from FMS to short range NAV prior to the FAF.

6. When the approach at the destination is based on GNSS guidance and the Satellite Based Augmentation System (SBAS) is not available or disabled, an alternate airport required by operating rules must be served by an approach based on other than GNSS navigation. The airplane must have operational equipment capable of using that navigation aid, and the required navigation aid must be operational.

7. Inserting waypoints on a published approach is prohibited.

8. Approaches copied from the SEC FLPN must be re-entered if previously flown.

9. Use of FMS guidance for conducting instrument approach procedures is prohibited with the FMS annunciation NO APPR illuminated.

10. The use of manually inserted runway coordinates of FMS Visual Approaches is limited to VFR operations only.

11. Use of FMS to capture and track a DME arc outside the published end points is prohibited.

12. Radius To Fix (RF) Leg airspeeds are restricted to a maximum of 220 KIAS.

13. RNP AR (formerly RNP SAAAR) operations are prohibited.

NOTE

Not all published approaches are in the FMS database. The flight crew must ensure that the planned approach is in the database.

2.7 Integrated Flight Information System (IFIS)

The Integrated Flight Information System (IFIS-5000) is approved under Technical Standard Orders (TSO) TSO-C113 and TSO-C165. IFIS provides supplemental airplane situational awareness information and is approved by STC SA11134SC as installed.

NOTE

This does not constitute an operational approval.

1. For a single IFIS, adequate backup documentation must be immediately available to the flight crew.
2. The IFIS related databases utilized (i.e. charts, airspace, airways, geographic, political, graphical weather) must incorporate the current update cycle.
3. The IFIS does not include enroute charts.
4. The airplane symbol on the electronic charts is advisory and is presented for increased situational awareness. It is not to be used for navigation.
5. The display of geo-political boundaries, airspace and airways on the MFD (Enhanced Map overlays) is for enhanced situational awareness only, and use for navigation is prohibited.
6. All weather products data linked to the airplane are advisory.
7. Incorporation of Dual IFIS does not constitute operational approval to dispatch without adequate backup documentation.

SECTION III EMERGENCY PROCEDURES

3.0 EMERGENCY PROCEDURES

No Changes to this Section

SECTION IV ABNORMAL PROCEDURES

4.0 ABNORMAL PROCEDURES

4.1 PFD Reversion.

1. When the remote display reversion switch is set to the PFD position, engine indication is displayed on the top of both PFD. If the remote display reversion switch is set back to Normal, engine indication may be retained on the PFD.

2. To remove engine indication from the PFD, toggle the the remote display reversion switch to the MFD position then back to the Normal position.

4.2 SVS Information Not Available.

1. If the Rockwell Collins Synthetic Vision information is not available or invalid, deselect SVS on REF page 2/3 and utilize remaining operational navigation equipment as appropriate.

4.3 ADS-B Fail Indication.

1. ADS-B Fail Indication indicates the ADS-B is not being broadcast. The Transponder Fail Annunciation appears in the same location as the ADS-B fail annunciation. The Transponder Fail annunciation takes priority over the ADS-B annunciation. If either failure indication is present, select the cross-side transponder. If the failure continues, advise ATC of the failure.

SECTION V NORMAL PROCEDURES

5.0 NORMAL PROCEDURES

1. Normal operating procedures are outlined in the Rockwell Collins, Inc. Pro Line 21 Major Retrofit/Integrated Display System with Synthetic Vision and ADS-B, Operator's Guide.

2. SVS Display (PFD) – Refer to the Pro Line 21 Major Retrofit/Integrated Display System with Synthetic Vision and ADS-B, Operator's Guide for a complete description of the SVS display.

3. TAWS Display – Unchanged from the basic Pro Line 21 installation – Refer to the Pro Line 21 Major Retrofit/Integrated Display System with Synthetic Vision and ADS-B, Operator's Guide for a complete description of the TAWS display.

NOTE

For LPV approaches, the Pro Line 21 system outputs angular deviations, much like an ILS approach, suitable for a compatible TAWS box. This provides an audible 'GLIDESLOPE" message for TAWS Mode 5 operations.

4. ADS-B operation is automatic once a Transponder is selected ON – Transponder operation is unchanged from the basic Pro Line 21 installation. Refer to the Pro Line 21 Major Retrofit/Integrated Display System with Synthetic Vision and ADS-B, Operator's Guide for a complete description of the ADS-B operation.

5. The SVS receives all external inputs from the side the aircraft is coupled to on the mode control panel.

6. The SVS databases provide natural terrain and airport data only. Obstacles are not included.

7. The active FMS flight plan provides SVS with both the airport and runway for the departure and destination.

8. With SVS installed, the pitch tape range on the PFD is reduced from ±20 degrees to ±10 degrees so that it is conformal with the field of view of the SVS. To manually set the Flight Director pitch reference (V-bar or cross-pointer) to values greater than +/-10 degrees:

   a. Pitch references that would be out-of-view on the pitch tape can be set when PITCH is the active VNAV FMA.

b. The pitch reference moves 0.25 degrees per click of the VS/Pitch Wheel when in Pitch mode.

   i. The displayed pitch reference value is the aircraft pitch attitude, (at the moment that the pitch mode is selected) plus the value selected with the VS/Pitch Wheel in 0.25 degree increments. For example if the aircraft is sitting at 1.7 degrees nose up, one click of the VS/Pitch will add 0.25 degree indicating 1.9 degrees.
      NOTE: The amount of change will vary each click from 0.2 degrees to 0.3 degrees due the rounding decimals.

   ii. To set the desired pitch reference T/O value round the indicated PITCH value in the FMA to the nearest 0.2 or 0.3 degree.

9. SVS data base updates are released every 28 days. It is recommended to use the latest data set for the synthetic vision system.

10. SELCAL selection on CDU page 2 is not used in this installation and should be ignored. Aircraft with SELCAL installed will continue to operate normally.

SECTION VI PERFORMANCE

6.0 PERFORMANCE

No Changes to this Section

SECTION VII WEIGHT & BALANCE/EQUIPMENT LIST

7.0 WEIGHT & BALANCE/EQUIPMENT LIST

7.1 Installed Equipment

Updated by installer.

7.2 Removed Equipment

Updated by installer.

SECTION VIII SYSTEMS DESCRIPTION

8.0 SYSTEMS DESCRIPTION

No changes to this section

SECTION IX HANDLING, SERVICING AND MAINTENANCE

9.0 MISCELLANEOUS MAINTENANCE

9.1 Data Base Updates

Data base updates are released every 28 days. It is recommended to use the latest data set for the synthetic vision system. Loading operating procedures are outlined in the Rockwell Collins SVS Operators Guide.

SECTION X SUPPLEMENTS

No Changes to this Section

SECTION XI SAFETY INFORMATION

No Changes to this Section

US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved OMB No. 2120-0020 2/28/2011 | Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft	Nationality and Registration Mark: N365JC	Serial No.: LJ-2057	
	Make: HAWKER BEECHCRAFT CORP	Model: C90GTI	Series: KING AIR 90
2. Owner	Name *(As shown on registration certificate)*: SOPMACJ LLC	Address *(As shown on registration certificate)*: Address 368 W CLARKSON AVE; City CARUTHERS; State CA; Zip 93609-9606; Country USA	

3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
☐	☑	AIRFRAME	—	*(As described in Item 1 above)*	—
☐	☐	POWERPLANT			
☐	☐	PROPELLER			
☐	☐	APPLIANCE	Type / Manufacturer		

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency		
Name Sacramento Citation Service Center	☐	U. S. Certificated Mechanic	☐ Manufacturer
Address 5850 Citation Way	☐	Foreign Certificated Mechanic	C. Certificate No.
City Sacramento State CA	✓	Certificated Repair Station	
Zip 95837 Country USA	☐	Certificated Maintenance Organization	CNQ4918C

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B	Signature/Date of Authorized Individual
☐	Darrin Newkirk 1/04/2015

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☑ Approved ☐ Rejected

BY								
	☐	FAA Flt. Standards Inspector	☐	Manufacturer	☐	Maintenance Organization	☐	Persons Approved by Canadian Department of Transport
	☐	FAA Designee	✓	Repair Station	☐	Inspection Authorization		Other *(Specify)*

Certificate or Designation No.	Signature/Date of Authorized Individual
CNQ4918C	Dennis Murany 1/04/2015

FAA Form 337 (10-06)

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N365JC	01/04/2015
Nationality and Registration Mark	Date

Aircraft S/N: LJ-2057
Aircraft Total Time: 833.2

This 337 is to document the installation of Raisbeck King Air 90 EPIC Package and Nacelle Over Wing Storage Locker System Installation to include the following.

*Swept Blade Turbofan Propeller System	STC# SA3593NM
*Nacelle Over Wing Storage Locker System	STC# SA2939NM
*Lower Aft Fuselage Strakes	STC# SA4010NM

Swept Blade Turbofan Propeller System was installed in accordance with Raisbeck Engineering Master Drawing List 86-2500, Rev BG dated November 18, 2013 per STC# SA3593NM dated August 19, 2014.

Nacelle Over Wing Storage Locker System was installed in accordance with Raisbeck Engineering Drawing List 85-1001, Rev. AB dated January 18, 2008 per STC# SA2939NM dated January 18, 2008.

Lower Aft Fuselage Strakes were installed in accordance with Raisbeck Engineering Drawing List 87-2004, Rev. I dated January 18, 2008 per STC# SA4010NM dated January 18, 2008.

Weight and balance data and equipment list information were updated.

Instructions for Continuous Airworthiness (ICA): No periodic scheduled inspection or maintenance is necessary for continued airworthiness of the above installations. No change to manufactures (Beechcraft) inspection program. Components to be inspected under normal Beechcraft inspection criteria per Chapter 5 of the Beechcraft King Air 90 Series Maintenance Manual.

---------- END ----------

☑ Additional Sheets Are Attached

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number SA3593NM

This certificate, issued to **Raisbeck Engineering**
4411 South Ryan Way
Seattle, WA 98178

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 **3** *of the* **Civil Air** *Regulations.*

Original Product—Type Certificate Number: 3A20
Make: Beechcraft Corporation
Model: 65-A90; B90; C90; C90A; C90GT; C90GTi; E90

Description of the Type Design Change: Installation of Raisbeck/Hartzell Quiet Turbofan Propellers or Swept Blade Turbofan Propellers, and optional Increased Gross Weight in accordance with Raisbeck Engineering Master Drawing List 86-2500, Revision BG, dated November 18, 2013, or later Federal Aviation Administration (FAA) approved revision.

Limitations and Conditions: Approval of this change in type design applies to the above model aircraft only. This approval should not be extended to other aircraft on which other previously approved modifications are incorporated unless it is determined that the relationship between this change and any other previously approved modifications, including changes in type design, will introduce no adverse effect upon the airworthiness of that aircraft. Aircraft must be operated in accordance with the applicable FAA-approved Airplane Flight Manual Supplement (AFMS) listed in Raisbeck Engineering Document 10-90S-ORL, Revision D, dated December 20, 2013, or later FAA-approved revision. Aircraft must be maintained in accordance with Raisbeck Engineering Maintenance Manual Document No. 85-120, Revision P, or later FAA-approved revision.

(See Continuation Sheet Page 3 of 4 Pages)

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 11, 1986
Date of issuance: September 12, 1986
Date reissued:
Date amended: 4/1/88; 5/19/88; 6/1488; 11/21/88; 2/23/89; 9/2890; 4/29/91; 7/22/94; 8/11/94; 11/8/95; 2/24/06; 5/9/06; 3/15/08; 9/2/08; 9/19/08; 12/9/08; 11/4/09; 11/9/10; 7/27/12; 12/31/13; 8/19/14

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.

Supplemental Type Certificate
(Continuation Sheet)

Number **SA3593NM**

Raisbeck Engineering

Issued: September 12, 1986

Reissued:

Amended: 4/1/88; 5/19/88; 6/1488; 11/21/88; 2/23/89; 9/2890; 4/29/91; 7/22/94; 8/11/94; 11/8/95; 2/24/06; 5/9/06; 3/15/08; 9/2/08; 9/19/08; 12/9/08; 11/4/09; 11/9/10; 7/27/12; 12/31/13; 8/19/14

Limitations and Conditions continued:

A copy of this certificate, FAA-approved AFMS, and Maintenance Manual Supplement must be maintained as part of the permanent records for the modified aircraft.

Propellers and Propeller Limitations:

Either 2 Hartzell HC-D4N-3C Hubs with Hartzell D9290K Blades in Pairs, or 2 Hartzell HC-D4N-3C Hubs with Hartzell D9510SK Blades in Pairs.

For 2 Hartzell HC-D4N-3C Hubs with Hartzell D9290K Blades in Pairs.

Diameter 93.0 in. (Maximum); Minimum allowable for repair: 92.0 in.
No further reduction in diameter permitted.

Pitch Settings:

Low Pitch:	20.1 deg	+/- 0.1 deg
Reverse:	-9.0 deg	+/- 0.5 deg
Feathered:	+84.5 deg	+/- 0.5 deg

Stabilized ground operation is prohibited below 1100 RPM, except with the propeller feathered, operation at or below 400 RPM is permissible.

Auto-feathering system must be installed and operational, except when optional propeller cam is installed.

Optional Propellers and Propeller Limitations:

For C90A Aircraft Models only,
Hartzell Model No. HC-E4N-3N/D8990(k) as listed on and installed in accordance with STC SA00966CH

For C90GT/C90CTi Aircraft Models only,
Hartzell Model No. HC-E4N-3N/D8990SK as listed on and installed in accordance with TCDS 3A20

United States of America
Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate
(Continuation Sheet)

Number **SA3593NM**

Raisbeck Engineering

Issued: September 12, 1986

Reissued:

Amended: 4/1/88; 5/19/88; 6/1488; 11/21/88; 2/23/89; 9/2890; 4/29/91; 7/22/94; 8/11/94; 11/8/95; 2/24/06; 5/9/06; 3/15/08; 9/2/08; 9/19/08; 12/9/08; 11/4/09; 11/9/10; 7/27/12; 12/31/13; 8/19/14

Limitations and Conditions continued:

Propellers and Propeller Limitations:

For 2 Hartzell HC-D4N-3C Hubs with Hartzell D9510SK Blades in Pairs.

Diameter 96.0 in. (Maximum); Minimum allowable for repair: 95.0 in.
No further reduction in diameter permitted.

Pitch Settings:

Low Pitch:	+18.6 deg	+/- 0.1 deg
Reverse:	-10.0 deg	+/- 0.5 deg
Feathered:	+86.7 deg	+/- 0.5 deg

Stabilized ground operation is prohibited below 1100 RPM, except with the propeller feathered, operation at or below 400 RPM is permissible.

Auto-feathering system must be installed and operational.

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.

- END -

United States of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number SA2939NM

This certificate, issued to: **Raisbeck Engineering**
4411 South Ryan Way
Seattle, WA 98178

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Aviation *Regulations.*

Original Product—Type Certificate Number: 3A20

Make: Raytheon (Beech)

Model: 65-90, 65-A90, B90, C90, C90A, C90GT, E90, C90GTi

Description of the Type Design Change: Installation of nacelle overwing storage lockers and lower flap fairing per Raisbeck Engineering Drawing List 85-1001, Rev. AB, dated January 18, 2008, or later FAA-approved revision. This modification must be maintained in accordance with Raisbeck Engineering Document No. 85-120, issued January 1990, or later FAA-accepted revision.

Limitations and Conditions: Approval of this change in type design applied to the above model aircraft only. This approval should not be extended to other aircraft of this model on which other previously approved modifications have been incorporated unless it is determined 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 aircraft. Aircraft modified in accordance with this STC must be operated in accordance with an FAA-approved copy of Raisbeck Engineering FAA-approved Pilots Operating Handbook and Airplane Flight Manual Supplement (AFMS) 85-101, Revision E, dated January 18, 2008 or later FAA-approved revision. A copy of this certificate and Maintenance Manual must be maintained as part of the permanent record of the modified aircraft.

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: October 22, 1986 *Date reissued*

Date of issuance: January 30, 1987 *Date amended:* August 24, 1990; April 27, 2006;

January 18, 2008

By direction of the Administrator

FEDERAL AVIATION ADMINISTRATION

(Signature)

Acting 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.

FAA FORM 8110-2(10-68)

United States of America

Department of Transportation - Federal Aviation Administration

Supplemental Type Certificate

Number SA4010NM

This certificate, issued to: **Raisbeck Engineering**
4411 South Ryan Way
Seattle, WA 98178

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified hereon meets the airworthiness requirements of Part 3 *of the* Civil Aviation *Regulations.*

Original Product—Type Certificate Number: 3A20

Make: Raytheon (Beech)

Model: 65-90, 65-A90, B90, C90, C90A, C90GT, E90, C90GTi

Description of the Type Design Change: Installation of lower aft fuselage strakes in accordance with Raisbeck Master Drawing List 87-2004, Rev. I, dated January 18, 2008, or later FAA-approved revision. This modification must be maintained in accordance with Raisbeck Engineering Document 85-120, issued January 1990, or later FAA-accepted revision.

Limitations and Conditions : Approval of this change in type design applied to the above aircraft models only. This approval should not be extended to other aircraft of this model on which other previously approved modifications have been incorporated unless it is determined 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 aircraft. A copy of this certificate and Maintenance Manual must be maintained as part of the permanent records for the modified aircraft.

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: June 22, 1987

Date reissued

Date of issuance: August 24, 1987

Date amended: November 23, 1990; May 10, 2006;

January 18, 2008

By direction of the Administrator

(Signature)

Acting 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.

FAA Form 8110-2(10-68)

US Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

OMB No. 2120-0020
Exp: 8/31/2014

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See Title 14 CFR §43.9, Part 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. §44701). Failure to report can result in a civil penalty for each such violation. (49 U.S.C. §46301(a))

1. Aircraft

Nationality and Registration Mark	Serial No.	
N365JC	W-2057	
Make	**Model**	**Series**
Hawker Beechcraft	C90GTX	

2. Owner

Name *(As shown on registration certificate)*	Address *(As shown on registration certificate)*
Joe Campos	Address 368 W. Clarkson Rd.
	City Carithers State CA
	Zip 95609-9607 Country USA

3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
☐	☒	AIRFRAME	—	*(As described in Item 1 above)*	—
☐	☐	POWERPLANT			
☐	☐	PROPELLER			
☐	☐	APPLIANCE	Type / Manufacturer		

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency		
Name Clyde Merrill Blumer	X	U. S. Certificated Mechanic	☐ Manufacturer
Address 120 Olmsted Way #5	☐	Foreign Certificated Mechanic	C. Certificate No.
City Monterey State CA	☐	Certificated Repair Station	A&P# 1773082
Zip 93940 Country USA	☐	Certificated Maintenance Organization	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B ☐	Signature/Date of Authorized Individual
	C M Blumer 3/28/2014

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ Approved ☐ Rejected

BY								
	☐	FAA Flt. Standards Inspector	☐	Manufacturer	☐	Maintenance Organization	☐	Persons Approved by Canadian Department of Transport
	☐	FAA Designee	☐	Repair Station	X	Inspection Authorization		Other *(Specify)*

Certificate or Designation No.	Signature/Date of Authorized Individual
	C M Blumer 3/28/2014

FAA Form 337 (10/06)

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

USA N365JC	3/18/2014
Nationality and Registration Mark	Date

Removed left and right main landing gear wheels, bearings and brakes assemblies from aircraft. Installed Parker Hannifin Brake & Wheel Conversion Kit p/n 199-90 per STCSA619GL and Parker Installation Manual.

☐ Additional Sheets Are Attached

UNITED STATES OF AMERICA

DEPARTMENT OF TRANSPORTATION-FEDERAL AVIATION ADMINISTRATION

STANDARD AIRWORTHINESS CERTIFICATE

1 NATIONALITY AND REGISTRATION MARKS	2 MANUFACTURER AND MODEL	3 AIRCRAFT SERIAL NUMBER	4 CATEGORY
N365JC	Raytheon Aircraft Corporation C90GTI	LJ-2057	Normal

5 AUTHORITY AND BASIS FOR ISSUANCE

This airworthiness certificate is issued pursuant to 49 U.S.C. § 44704 and certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to conform to the type certificate therefor, to be in condition for safe operation, and has been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation, except as noted herein.

Exceptions:

NONE

6 TERMS AND CONDITIONS

Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the FAA, this airworthiness certificate is effective as long as the maintenance, preventative maintenance, and alterations are performed in accordance with Parts 21, 43, and 91 of the Federal Aviation Regulations, as appropriate, and the aircraft is registered in the United States.

DATE OF ISSUANCE	FAA REPRESENTATIVE	DESIGNATION NUMBER
R 11/28/2012	Richard L. Terrell	ACE-FSDO-07

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

THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

FAA Form 8100-2 (04-11) Supersedes Previous Edition

UNITED STATES OF AMERICA

DEPARTMENT OF TRANSPORTATION-FEDERAL AVIATION ADMINISTRATION

STANDARD AIRWORTHINESS CERTIFICATE

1 NATIONALITY AND REGISTRATION MARKS	2 MANUFACTURER AND MODEL	3 AIRCRAFT SERIAL NUMBER	4 CATEGORY
N257HB	Hawker Beechcraft Corporation C90GTi	LJ-2057	Normal

5 AUTHORITY AND BASIS FOR ISSUANCE

This airworthiness certificate is issued pursuant to 49 U.S.C. § 44704 and certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to conform to the type certificate therefor, to be in condition for safe operation, and has been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation, except as noted herein.

Exceptions:

NONE

6 TERMS AND CONDITIONS

Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the FAA, this airworthiness certificate is effective as long as the maintenance, preventative maintenance, and alterations are performed in accordance with Parts 21, 43, and 91 of the Federal Aviation Regulations, as appropriate, and the aircraft is registered in the United States.

DATE OF ISSUANCE	FAA REPRESENTATIVE	DESIGNATION NUMBER
11/28/2012	Dale W. Dodd	ODA-230339-CE

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

THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

FAA Form 8100-2 (04-11) Supersedes Previous Edition

U.S Department of Transportation
Federal Aviation Administration

MAJOR REPAIR AND ALTERATION
(Airframe, Powerplant, Propeller, or Appliance)

Form Approved OMB No. 2120-0020 11/30/2007

Electronic Tracking Number

For FAA Use Only

INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form. This report is required by law (49 U.S.C. 1421). Failure to report can result in a civil penalty not to exceed $1,000 for each such violation (Section 901 Federal Aviation Act 1958)

1. Aircraft	Nationality and Registration Mark: N257HB	Serial No.: LJ-2057	
	Make: HAWKER BEECHCRAFT CORP	Model: C90GTI	Series:
2. Owner	Name *(As shown on registration certificate)*: SOPMACJ LLC	Address *(As shown on registration certificate)*: Address 368 W CLARKSON AVE; City CARUTHERS; State CALIFORNIA; Zip 93609-9606; Country USA	

3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial Number
☐	☒	AIRFRAME	—	*(As described in Item 1 above)*	—
☐	☐	POWERPLANT			
☐	☐	PROPELLER			
☐	☐	APPLIANCE	Type / Manufacturer		

6. *Conformity Statement*

A. Agency's Name and Address	B. Kind of Agency			
Name: Hawker Beechcraft Services	☐	U.S. Certificated Mechanic	☐	Manufacturer
Address: 1980 Airport Rd.	☐	Foreign Certificated Mechanic	C. Certificate No.	
City: Wichita State: KS	☒	Certificated Repair Station	BWVR672C	
Zip: 67209 Country: USA	☐	Certificated Maintenance Organization		

D. I certify that the repair and/or alteration made to the unit(s) identified in item 5 above and described on the reverse or attachments hereto have been made in accordance with the requirements of Part 43 of the U.S. Federal Aviation Regulations and that the information furnished herein is true and correct to the best of my knowledge.

Extended range fuel per 14 CFR Part 43 App. B ☐	Signature/Date of Authorized Individual
	Edwin P. Cooke – Avionics Inspector 02/27/2013

7. Approval for Return to Service

Pursuant to the authority given persons specified below, the unit identified in item 5 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY								
	FAA Flt Standards Inspector		Manufacturer		Maintenance Organization		Person Approved by Canadian Department of Transport
	FAA Designee	X	Repair Station		Inspection Authorization		Other *(Specify)*

Certificate or Designation No.	Signature/Date of Authorized Individual
BWVR672C	Edwin P. Cooke – Avionics Inspector 02/27/2013

NOTICE

Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

N257HB	02/27/2013
Nationality and Registration Mark	Date

INSTALLED STC SA02372AK, Max-Vlz Enhanced Vision System (EVS) Model 1500. The installation was accomplished IAW Master Data List, Doc. No. 20 11 00, Rev 5, Dated June 30, 2011, and Approved Model List (AML) SA02372AK, Dated August 12, 2010, and per the criteria of AC 43.13-1B, Ch. 6, Secs. 3 and 4; Ch. 7, Secs. 1 thru 5; Ch. 11, Secs. 1,3 thru 13 and 15 thru 17; Ch. 12, Sec. 2, and AC 43.13-2B, Chapters 1 and 2. This Alteration complies with the safety requirements of FAR 23.1301 and FAR 23.1431; copies of installation data and wiring prints are on file at this Station.

LIMITATIONS:

The use of this system is for "VMC USE ONLY". A placard, "**VMC USE ONLY**" has been attached to the Control Panel.

The mechanical installation is IAW Dwg. 201001, Rev. B, dated 07/19/10 The Sensor Unit (P/N 756500041) was installed along with the Enclosure (P/N 221300-29) between FS 57.50 and FS 70.75 at BL 3.13, WL 117.0. The Power Supply (P/N 756500042) was located on the existing equipment shelf at FS 59.3. The Control Panel Assy (P/N 241001-01) was installed in the existing Center Pedestal.

The electrical installation was accomplished IAW Dwg. 231101, Rev. 2, dated 07/27/10. The system is powered by the +28 vdc PRI – 2 Bus, and protected with a 7.5 amp circuit breaker located on the EVS control panel located in the center pedestal. A momentary switch was added to each yoke for zoom control and labeled **EVS VIEW**.

The Supplemental Equipment List and Serial Component List have been updated and a copy placed in the aircraft records. A copy of the Airplane Flight Manual Supplement, Doc. No. 32 11 04, Rev. C, Dated January 1, 2011, has been placed in the POH.

Changes to Weight and Balance have been annotated and inserted in the POH for this alteration.

INSTRUCTIONS for CONTINUED AIRWORTHINESS:

A copy of document no. 32 11 05, Version 2, Dated 1/01/2011, has been added to the Aircraft records.

END

☐ Additional Sheets Are Attached

SUPPLEMENT TYPE CERTIFICATE
PERMISSION STATEMENT

The holder of this letter is hereby authorized by ONE SKY AVIATION to a one-time use of the One Sky Aviation STC No. SA02372AK to modify (1) Hawker Beechcraft B200/300/C90 Series Aircraft (applicable model noted on STC). Upon receipt of this form duly completed and signed by the installer, ONE SKY AVIATION (the STC holder) grants permission to the aircraft owner to modify the aircraft specified below in accordance with the following STC:

(THIS SECTION TO BE COMPLETED BY RSI PRIOR TO SHIPMENT OF STC)

Part Number: 926500022 Description: EVS 1500 STC Kit

Serial/Batch No.: 956500022-009 STC No.: SA02372AK

(THIS SECTION TO BE COMPLETED BY OR FOR OWNER)

Installing Company Name: Hawker Beechcraft Services
Address: 1980 Airport Rd Installation Date : 2-27-2013
Wichita, Ks ~~67206~~ 67209 Installed By: ED Cooke
(Please Print Legibly)

Aircraft Owner Name: SoPMACJ LLC
Address: 368 W. Clarkson Ave Aircraft Model: ~~AS 350B3~~ C90GTi
Carruthers, CA 93609-9606 Registration No.: ~~N794AE~~ N257HB
Aircraft Serial No.: ~~7007~~ LJ-2057

Please Return completed form to One Sky Aviation VIA US Mail, FAX or EMAIL.

3665 Aircraft Drive, Anchorage AK 99502 • Office (907) 245-1759
• Cellular (907) 230-0488 • Cellular (907) 230-0488 • Fax (907) 248-1759
oneskyaviation@acsalaska.net

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

Number SA02372AK

This certificate issued to: One Sky Aviation
3665 Aircraft Drive
Anchorage, Alaska 99502

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 23 of the Federal Aviation Regulations

Original Product – Type Certificate Number: * See FAA Approved Model List (AML) SA02372AK, dated August 12, 2010, or later FAA approved revision.

Make: *

Model: *

Description of Type Design Change:

Installation of the Max-Viz® Enhanced Vision System (EVS) Model-1500 on Hawker Beechcraft Corporation B200/B300/C90 series aircraft equipped with a panel-mounted Multi-Function Display (MFD) with the ability to display video imagery in accordance with One Sky Aviation Master Data List, Doc. No. 20 11 00, Rev. 6, dated September 5, 2012, or later FAA approved revision.

Limitations and Conditions:

1. Compatibility of the design change with previously approved modifications must be determined by the installer.
2. FAA approved One Sky Aviation Airplane Flight Manual Supplement, Doc. No. 32 11 04, Rev. C, dated July 9, 2012, or later FAA approved revision, is a required part of this modification.
3. For Instructions for Continued Airworthiness (ICA), refer to One Sky Aviation ICA, Doc. No. 32 11 05, Ver. 3, dated June 9, 2012, or later FAA accepted revision.
4. 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: November 30, 2009
Date of issuance: May 19, 2010

Date reissued: May 24, 2010
Date amended: August 12, 2010;
September 18, 2012

By direction of the Administrator

(*Signature*)
August A. Asay
Manager, Anchorage 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.

FAA APPROVED MODEL LIST (AML) SA02372AK
FOR
ONE SKY AVIATION LLC

STC Issue date: August 12, 2010

Airplane Make	Airplane Model	Type Certificate Number	Certification Basis for Alteration	Instructions for Continued Airworthiness
Hawker Beechcraft Corporation	B200, B200C, B200CT, B200T, B200GT, B200CGT, B300, B300C	A24CE	FAR Part 23	Doc. No. 32 11 05 Version: 1 Date: July 19, 2010
Hawker Beechcraft Corporation	C90GT, C90GTi	3A20	FAR Part 23	Doc. No. 32 11 05 Version: 1 Date: July 19, 2010

FAA APPROVED: _____

Manager, Anchorage Aircraft Certification Office
Federal Aviation Administration
Anchorage, Alaska

Date: August 12, 2010
Revision: IR

FAA FORM 8130-6, APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

Form Approved O.M.B. No. 2120-0018
Expiration Date 05/31/2011

Accepted CB Jan/29/2013

U.S. Department of Transportation
Federal Aviation Administration

APPLICATION FOR U.S. AIRWORTHINESS CERTIFICATE

INSTRUCTIONS - Print or type. Do not write in shaded areas. These are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required use an attachment. For special flight permits complete Sections II, VI and VII as applicable.

I. AIRCRAFT DESCRIPTION

1. REGISTRATION MARK	2. AIRCRAFT BUILDER'S NAME (Make)	3. AIRCRAFT MODEL DESIGNATION	4. YR MFR	FAA CODING
N257HB	Hawker Beechcraft Corporation	C90GTi	2012	
5. AIRCRAFT SERIAL NO.	**6. ENGINE BUILDERS NAME (Make)**	**7. ENGINE MODEL DESIGNATION**		
LJ-2057	Pratt & Whitney Canada Corp	PT6A-135A		
8. NUMBER OF ENGINES	**9. PROPELLER BUILDER'S NAME (Make)**	**10. PROPELLER MODEL DESIGNATION**	**11. AIRCRAFT IS (Check if applicable)**	
2	Hartzell Propeller, Inc.	HC-E4N-3N	IMPORT	

II. CERTIFICATION REQUESTED

APPLICATION IS HEREBY MADE FOR: *(Check applicable items)*

A	1	X	STANDARD AIRWORTHINESS CERTIFICATE *(Indicate category)*	X	NORMAL		UTILITY		ACROBATIC		TRANSPORT		COMMUTER		BALLOON		OTHER
B			SPECIAL AIRWORTHINESS CERTIFICATE *(Check appropriate items)*														
	7		PRIMARY														
	9		Light Sport (Indicate Class)		Airplane		Power-Parachute		Weight-Shift-Control		Glider		Lighter than Air				
	2		LIMITED														
	5		PROVISIONAL (Indicate class)	1	Class I												
				2	Class II												
	3		RESTRICTED *(Indicate operation(s) to be conducted)*	1	AGRICULTURE AND PEST CONTROL	2	AERIAL SURVEY	3	AERIAL ADVERTISING								
				4	FOREST *(Wildlife Conservation)*	5	PATROLLING	6	WEATHER CONTROL								
				0	OTHER *(Specify)*												
	4		EXPERIMENTAL *(Indicate operation(s) to be conducted)*	1	RESEARCH AND DEVELOPMENT	2	AMATEUR BUILT	3	EXHIBITION								
				4	AIR RACING	5	CREW TRAINING	6	MARKET SURVEY								
				0	TO SHOW COMPLIANCE WITH THE CFR	7	OPERATING *(Primary Category)* KIT BUILT AIRCRAFT										
				8	OPERATING LIGHT-SPORT	8A	Existing Aircraft without an airworthiness certificate & do not meet § 103.1										
						8B	Operating Light-Sport Kit-Built										
						8C	Operating light-sport previously issued special light-sport category airworthiness certificate under § 21.190										
				9	UNMANNED AIRCRAFT	9A	RESEARCH AND DEVELOPMENT	9C	CREW TRAINING								
						9B	MARKET SURVEY										
	8		SPECIAL FLIGHT PERMIT *(Indicate operation to be conducted then complete Section VI or VII as applicable on reverse side)*	1	FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE, OR STORAGE												
				2	EVACUATE FROM AREA OF IMPENDING DANGER												
				3	OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT												
				4	DELIVERING OR EXPORTING	5	PRODUCTION FLIGHT TESTING										
				6	CUSTOMER DEMONSTRATION FLIGHTS												
C	6		MULTIPLE AIRWORTHINESS CERTIFICATE *(Check ABOVE: "Restricted Operation" and "Standard" or "Limited" as applicable)*														

III. OWNER'S CERTIFICATION

A. REGISTERED OWNER *(As shown on certificate of aircraft registration)* — IF DEALER, CHECK HERE: X

NAME	ADDRESS
Hawker Beechcraft Corporation	P.O. Box 85, Wichita, KS 67201-0085

B. AIRCRAFT CERTIFICATION BASIS *(Check applicable blocks and complete items as indicated)*

X	AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET *(Give No. and Revision No.)* 3A20, Rev. 72	X	AIRWORTHINESS DIRECTIVES *(Check if all applicable AD's complied with and give the number of the last AD SUPPLEMENT available in the biweekly series as of the date of application)* ISSUE 2012-23
	AIRCRAFT LISTING *(Give page number(s))* N/A	X	SUPPLEMENTAL TYPE CERTIFICATE *(List number of each STC incorporated)* SA02054SE, SA10747SC

C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS

X	CHECK IF RECORDS IN COMPLIANCE WITH 14 CFR section 91.417	TOTAL AIRFRAME HOURS 4.0	8	EXPERIMENTAL ONLY *(Enter hours flown since last certificate issued or renewed)*	N/A

D. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.

DATE OF APPLICATION	NAME AND TITLE *(Print or type)*	SIGNATURE
11-28-2012	Andrea Gambill – Tech Support Specialist, QA	Andrea Gambill

IV. INSPECTION AGENCY VERIFICATION

A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY *(Complete these sections only if 14 CFR part 21.183(d) applies)*

2	14 CFR PART 121 CERTIFICATE HOLDER *(Give Certificate No.)*	3	CERTIFICATED MECHANIC *(Give Certificate No.)*	6	CERTIFICATED REPAIR STATION *(Give Certificate No.)*
5	AIRCRAFT MANUFACTURER *(Give name or firm)*				

DATE	TITLE	SIGNATURE

V. FAA REPRESENTATIVE CERTIFICATION

(Check ALL applicable blocks in items A and B)

A. I find that the aircraft described in Section I or VII meets requirements for: X THE CERTIFICATE REQUESTED; 4 AMMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE

B. Inspection for a special flight permit under Section VII was conducted by: FAA INSPECTOR / FAA DESIGNEE; CERTIFICATE HOLDER UNDER: 14 CFR part 65 / 14 CFR part 121 or 135 / 14 CFR part 145

DATE	DISTRICT OFFICE		FAA INSPECTOR'S SIGNATURE or DESIGNEE'S SIGNATURE AND NO.		FAA INSPECTOR'S CERTIFICATION FILE REVIEW SIGNATURE
11-28-2012	CE-43	4	Dale W. Dodd Dale W. Dodd, ODA-230339-CE	1	Felix F. Chapa FELIX F. CHAPA, ASI, 12/18/2012

VI. PRODUCTION FLIGHT TESTING

A. MANUFACTURER

NAME	ADDRESS

B. PRODUCTION BASIS *(Check applicable items)*

- ☐ PRODUCT CERTIFICATE *(Give production certificate number)*
- ☐ TYPE CERTIFICATE
- ☐ OTHER

C. GIVE QUANTITY OF CERTIFICATES REQUIRED FOR OPERATING NEEDS

DATE OF APPLICATION	NAME AND TITLE *(Print or type)*	SIGNATURE

VII. SPECIAL FLIGHT PERMIT PURPOSES OTHER THAN PRODUCTION FLIGHT TEST

A. DESCRIPTION OF AIRCRAFT

REGISTERED OWNER	ADDRESS
BUILDER *(Make)*	MODEL
SERIAL NUMBER	REGISTRATION MARK

B. DESCRIPTION OF FLIGHT — CUSTOMER DEMONSTRATION FLIGHTS ☐ *(Check if applicable)*

FROM	TO	
VIA	DEPARTURE DATE	DURATION

C. CREW REQUIRED TO OPERATE THE AIRCRAFT AND ITS EQUIPMENT

☐ PILOT ☐ CO-PILOT ☐ FLIGHT ENGINEER ☐ OTHER *(Specify)*

D. THE AIRCRAFT DOES NOT MEET THE APPLICABLE AIRWORTHINES REQUIREMENTS AS FOLLOWS:

E. THE FOLLOWING RESTRICTIONS ARE CONSIDERED NECESSARY FOR SAFE OPERATION *(Use attachment if necessary)*

F. CERTIFICATION - I hereby certify that I am the registered owner (or his agent) of the aircraft described above; that the aircraft is registered with the Federal Aviation Administration in accordance with Title 49 of the United States Code 44101 et seq. and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy for the flight described.

DATE	NAME AND TITLE *(Print or type)*	SIGNATURE

VIII. AIRWORTHINESS DOCUMENTATION (FAA/DESIGNEE use only)

X	A. Operating Limitations and Markings in compliance with 14 CFR section 91.9 as Applicable		G. Statement of conformity, FAA Form 8130-9 *(Attach when required)*
	B. Current Operating Limitations Attached		H. Foreign Airworthiness Certification for Import Aircraft *(Attached when required)*
	C. Data, Drawings, Photographs, etc. (Attach when required)		I. Previous Airworthiness Certificate issued in Accordance with 14 CFR Section_____ CAR_____ *(Original attached)*
X	D. Current Weight and Balance Information Available in Aircraft		
	E. Major Repair and Alteration, FAA Form 337 *(Attached when required)*	X	J. Current Airworthiness Certificate Issued in Accordance with 14 CFR Section 21.183(a) *(Copy attached)*
X	F. This inspection Recorded in Aircraft Records		K. Light-Sport Aircraft Statement of Compliance, FAA Form 8130-15 *(Attach when required)*

UNITED STATES OF AMERICA

DEPARTMENT OF TRANSPORTATION-FEDERAL AVIATION ADMINISTRATION

STANDARD AIRWORTHINESS CERTIFICATE

COPY

1 NATIONALITY AND REGISTRATION MARKS	2 MANUFACTURER AND MODEL	3 AIRCRAFT SERIAL NUMBER	4 CATEGORY
N257HB	Hawker Beechcraft Corporation C90GTi	LJ-2057	Normal

5 AUTHORITY AND BASIS FOR ISSUANCE

This airworthiness certificate is issued pursuant to 49 U.S.C. § 44704 and certifies that, as of the date of issuance, the aircraft to which issued has been inspected and found to conform to the type certificate therefor, to be in condition for safe operation, and has been shown to meet the requirements of the applicable comprehensive and detailed airworthiness code as provided by Annex 8 to the Convention on International Civil Aviation, except as noted herein.

Exceptions:

NONE

6 TERMS AND CONDITIONS

Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the FAA, this airworthiness certificate is effective as long as the maintenance, preventative maintenance, and alterations are performed in accordance with Parts 21, 43, and 91 of the Federal Aviation Regulations, as appropriate, and the aircraft is registered in the United States.

DATE OF ISSUANCE	FAA REPRESENTATIVE	DESIGNATION NUMBER
11/28/2012	Dale W. Dodd	ODA-230339-CE

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

THIS CERTIFICATE MUST BE DISPLAYED IN THE AIRCRAFT IN ACCORDANCE WITH APPLICABLE FEDERAL AVIATION REGULATIONS.

FAA Form 8100-2 (04-11) Supersedes Previous Edition