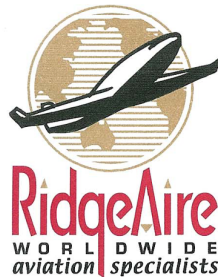


N2702L

1981 Cessna 414A

FAA Form 337s

MSN: 414A-0608



Prepared by the worldwide aviation specialists at RidgeAire, Inc.



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 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 N2702L	Serial No. 414A0608	
	Make CESSNA	Model 414A	Series
2. Owner	Name (As shown on registration certificate) LONE DUCK AVIATION LLC	Address (As shown on registration certificate) 600 S GERMAN LN UNIT 2 CONWAY, AR 72034-7027 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 Aerotech International, LLC 525 Airport Rd. Hangar A-18 Hot Springs, AR 71913 USA	B. Kind of Agency	
	☐ U. S. Certified Mechanic	☐ Manufacturer
	☐ Foreign Certified Mechanic	C. Certificate No.
	☒ Certified Repair Station	CRS # XKWR110B
	☐ Certified Maintenance Organization	AEROTECH INTL., LLC

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 JURGEN BOEHM 15-January-2019
--	--

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

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

Certificate or Designation No. XKWR110B	Signature/Date of Authorized Individual JURGEN BOEHM 15-January-2019
--	--

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 N2702L

Jan-15-2019

Nationality and Registration Mark

Date

REMOVED:

QTY	MAKE/MODEL	P/N
1 ea	Garmin GTX-327	011-00490-00
1 ea	ARC RT-859A	42260-1028

INSTALLED:

QTY	MAKE/MODEL	P/N
1 ea	Garmin GTX-345	011-03302-00

All work was performed in accordance with Garmin GTX-345 AML STC I/M 190-00734-10 Rev.10 and AC43.13-1B Ch 7 sec 1, sec 2, sec 3, sec 4, sec 5, sec 6, sec 7, sec 8, sec 11, Ch 10 sec 1, sec 2, Ch 11 sec 1, sec 3, sec 4, sec 5, sec 6, sec 7, sec 8, sec 9 sec 10, sec 11, sec 12, sec 13, sec 14, sec 15, sec 16, sec 17, sec 18, sec 19, sec 20, Ch 12, sec 1, sec 2, sec 3, and AC43.13-2B Ch 1, Ch 2. Ch 11.

Installed Garmin GTX-345 ADS-B transponder.

The FAA Approved Garmin GTX-345 Flight Manual Supplement, dated 12/21/2017 must be on board the aircraft at all times.

An electrical load analysis was performed and it was determined that the total continuous electrical load does not exceed the output of the aircraft alternator.

The aircraft weight and balance, and equipment list have been revised to reflect these alterations.

For further details concerning this installation see FAA CRS# XKWR110B work order 3376.

ICAs' for this installation are as follows:

Included Garmin document # 190-00734-15 Rev.5, GTX-345 Instructions For Continued Airworthiness, in the aircraft maintenance records.

-----END-----

☐ ADDITIONAL SHEETS ARE ATTACHED



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 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 N2702L	Serial No. 414A0608	
	Make CESSNA	Model 414A	Series
2. Owner	Name (As shown on registration certificate) LONE DUCK AVIATION LLC		Address (As shown on registration certificate) 1211 E 14TH ST RUSSELLVILLE, AR 72802 USA

3. For FAA Use Only

The data identified herein complies with applicable airworthiness
requirements and is approved only for the above described aircraft
subject to conformity inspection by a person authorized in FAR 43.7

OCT 12 2012
Date

[Signature]
LIT FSDO FAA Inspector
Jamie Black

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 Wings Avionics, Inc. 421 Ernest Lancaster Dr. Fayetteville, AR 72701 USA	B. Kind of Agency <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">☐ U. S. Certified Mechanic</td> <td style="width: 70%;">☐ Manufacturer</td> </tr> <tr> <td>☐ Foreign Certified Mechanic</td> <td>C. Certificate No.</td> </tr> <tr> <td>☒ Certified Repair Station</td> <td>W1NR1050</td> </tr> <tr> <td>☐ Certified Maintenance Organization</td> <td>RADIO, LIMITED AIRFRAME</td> </tr> </table>	☐ U. S. Certified Mechanic	☐ Manufacturer	☐ Foreign Certified Mechanic	C. Certificate No.	☒ Certified Repair Station	W1NR1050	☐ Certified Maintenance Organization	RADIO, LIMITED AIRFRAME
☐ U. S. Certified Mechanic	☐ Manufacturer								
☐ Foreign Certified Mechanic	C. Certificate No.								
☒ Certified Repair Station	W1NR1050								
☐ Certified Maintenance Organization	RADIO, LIMITED AIRFRAME								

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 BRADY N TERRY
--	---

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

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

Certificate or Designation No. W1NR1050	Signature/Date of Authorized Individual BRADY N TERRY
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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 N2702L

Oct-11-2012

Nationality and Registration Mark

Date

N2702L

C414A S/N 010-00330-53

12-OCT-2012

1. REMOVED A BENDIX ART161A RADAR RECEIVER/TRANSMITTER (R/T) UNIT, A BENDIX IN152A RADAR INDICATOR (IND), AN AIRCRAFT RADIO CORPORATION (ARC) 1000 SERIES REMOTE COMMUNICATION (COMM) TRANSCEIVER (XCVR), AN ARC C-1038A PANEL MOUNTED COMM CONTROL UNIT, AN ARC 1000 SERIES REMOTE MOUNTED NAVIGATION (NAV) RECEIVER (REC), AN ARC C-1048A PANEL MOUNTED NAV CONTROL UNIT, AN ARC R-1043A REMOTE MOUNTED GLIDE SLOPE (G/S) REC, AN ARC RN878A PANEL MOUNTED AREA NAVIGATION (RNAV) COMPUTER, AN ARC 800 SERIES DISTANCE MEASURING EQUIPMENT (DME) R/T UNIT, AN ARC C876A DME IND, AN ARC C1046A AUTOMATIC DIRECTION FINDER (ADF) CONTROL UNIT, AND A KING KT96 FLIGHT PHONE.
2. RELOCATED AN EXISTING GARMIN GNS430 GLOBAL NAVIGATION SYSTEM (SEE PARAGRAPH 3 FOR DETAILED INFORMATION) AND INSTALLED A COMANT CI505-TNC NAV ANTENNA (ANT) DIPLEXER (SEE PARAGRAPH 4 FOR DETAILED INFORMATION).
3. RELOCATED THE EXISTING PRIMARY GARMIN GNS430 GLOBAL NAVIGATION SYSTEM, PART NUMBER (P/N) 011-00280-10, SERIAL NUMBER (S/N) 97103643, TO THE SECONDARY NAV/COMM POSITION IN THE PRIMARY RADIO STACK VACATED BY THE PREVIOUSLY REMOVED ARC 1000 SERIES NAV/COMM PANEL MOUNTED CONTROL UNITS. INSTALLATION COMPLETED IN ACCORDANCE WITH THE GARMIN 400 SERIES INSTALLATION MANUAL, P/N 190-00140-02, REVISION (REV) T, DATED JUNE 17, 2010; AC 43.13-2B, PARAGRAPHS 201, 202, AND 203; AC 43.13-1B CHANGE 1, PARAGRAPHS 11-30, 11-31, 11-32, 11-47, 11-48, 11-66, 11-76, 11-77, 11-89, AND 11-96; AND MEETS THE REQUIREMENTS OF AC 20-138. THE GNS430 IS MANUFACTURED UNDER TSO C129, CLASS A1, AND WAS ORIGINALLY APPROVED FOR INSTALLATION UNDER STC NUMBER SA00705WI, DATED OCTOBER 2, 1998, WITH AN AMMENDED DATE OF JULY 25, 2002. THE GNS430 WAS INTERFACED TO THE EXISTING COMM ANTENNA (ANT) SYSTEM, THE EXISTING GA56 GLOBAL POSITIONING SYSTEM (GPS) ANT, THE EXISTING ARC IN1049A NAV/IND FOR COURSE DEVIATION INDICATOR (CDI) DISPLAY, THE SECONDARY NAV INPUTS OF THE EXISTING ARC 800B INTEGRATED FLIGHT CONTROL SYSTEM, AND THE SECONDARY NAV/COMM AUDIO INPUTS OF THE EXISTING ARC 1000 SERIES AUDIO PANEL.
4. THE COMANT CI505 NAV ANT DIPLEXER, NO S/N, WAS INSTALLED BEHIND THE COPILOT INSTRUMENT PANEL, AND INTERFACED TO THE EXISTING NAV ANT SYSTEM TO PROVIDE NAV AND GLIDE SLOPE RECEIVER SIGNAL INPUTS TO THE RELOCATED GNS430. INSTALLATION COMPLETED IN ACCORDANCE WITH AC 43.13-2B, CHAPTER 3; AND RAMP TESTED PER AC 43.13-1B CHANGE 1, PARAGRAPHS 12-11 AND 12-14.
5. A GARMIN GNS430 PILOT'S GUIDE, P/N 190-00140-00, REV J; A GNS430 QUICK REFERENCE GUIDE, P/N 190-00140-01, REV C; A 400/500 SERIES DISPLAY INTERFACES PILOT'S GUIDE ADDENDUM, P/N 190-00140-10, REV D; AND A 400/500 SERIES OPTIONAL DISPLAYS PILOT'S GUIDE ADDENDUM, P/N 190-00140-13, REV D; WERE PLACED IN THE AIRCRAFT RECORDS. A FAA APPROVED FLIGHT MANUAL SUPPLEMENT (FMS) DATED OCT 12 2012 WAS PLACED IN THE AIRCRAFT RECORDS. UPON COMPLETION OF A FLIGHT TEST EVALUATION IN ACCORDANCE WITH ADVISORY CIRCULAR AC20-138, PARAGRAPH 8c(2), AND AN AIRCRAFT LOGBOOK ENTRY MADE BY AN APPROPRIATELY RATED PILOT, THE PLACARD STATING "GNS430 LIMITED TO VFR USE ONLY" MAY BE REMOVED FROM THE PILOT INSTRUMENT PANEL.
6. THE MAXIMUM CONTINUOUS ELECTRICAL LOAD DOES NOT EXCEED 80% OF TOTAL RATED CAPACITY PER AC 43.13-1B, PARAGRAPH 11-33. POST-INSTALLATION GROUND CHECKS WERE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER INSTALLATION MANUALS AND FOUND TO OPERATE PROPERLY.
7. A LOGBOOK ENTRY UNDER WORK ORDER NUMBER 5563 WAS ENTERED IN THE AIRCRAFT RECORDS. WEIGHT AND BALANCE RECORDS AND EQUIPMENT LIST REVISED.
8. AN OPERATIONAL FLIGHT TEST MUST BE PERFORMED BY AN APPROPRIATELY RATED PILOT WITH AT LEAST A PRIVATE PILOT CERTIFICATE AND ENTERED INTO THE AIRCRAFT RECORDS TO COMPLY WITH THE REQUIREMENTS OF FAR 91.407(b).
9. INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ARE ATTACHED AS ADDITIONAL SHEETS.***END***

☐ ADDITIONAL SHEETS ARE ATTACHED



U.S. Department of Transportation
Federal Aviation Administration

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (*For Field Approvals-FAA Form 337*)

A/C Make: CESSNA Model: 414A S/N: 414A0608 Reg. #: N2702L
Revision: ORIGINAL Date: 15-OCT-2012

These sixteen item checklist are Instructions for Continued Airworthiness (ICA), and are applicable to the aircraft listed above when the following equipment is installed:

SYSTEM:

ITEM	CHECKLIST INFORMATION
1.	Introduction: This section briefly describes the aircraft, engine, propeller, or component that has been altered. Include any other information on the content, scope, purpose, arrangement, applicability, definitions, abbreviations, precautions, units of measurement, referenced publications, and distribution of the ICA as applicable. Comments: AIRFRAME ALTERATION.
2.	Description: Of the major alteration, its functions, including an explanation of its interface with other systems, if any. Comments: RELOCATED AN EXISTING GARMIN GNS430 GLOBAL NAVIGATION SYSTEM AND INSTALLED A COMANT CI505-TNC NAV ANTENNA (ANT) DIPLEXER.
3.	Control: Operation information: Or special procedures, if any. Comments: CONSULT THE GARMIN GNS430 PILOT'S GUIDE, P/N 190-00140-00, REV J; THE GNS430 QUICK REFERENCE GUIDE, P/N 190-00140-01, REV C; THE 400/500 SERIES DISPLAY INTERFACES PILOT'S GUIDE ADDENDUM, P/N 190-00140-10, REV D; THE 400/500 SERIES OPTIONAL DISPLAYS PILOT'S GUIDE ADDENDUM, P/N 190-00140-13, REV D; AND THE FAA APPROVED FLIGHT MANUAL SUPPLEMENT (FMS) FOR DETAILED OPERATING INSTRUCTIONS.
4.	Servicing information: Such as types of fluids used, servicing points, and location of access panels, as appropriate. Comments: N/A.
5.	Maintenance Instructions: Such as recommended inspection/maintenance periods in which each of the major alteration components are inspected, cleaned, lubricated, adjusted, tested, including applicable wear tolerances and work recommended at each scheduled maintenance period. This section refers to the manufacturers' instructions for the equipment installed where appropriate (e.g., functional checks, repairs, inspections.) It should also include any special notes, cautions, or warnings, as applicable. Comments: "ON-CONDITION" MAINTENANCE REQUIRED ONLY. CONSULT FAR PART 43, APPENDIX D, SECTION I, FOR RADIO AND ELECTRONIC EQUIPMENT INSPECTIONS DURING ANNUAL AND 100 HOUR INSPECTIONS.
6.	Trouble shooting information: Information describing possible malfunctions, how to recognize those malfunctions, and the remedial actions to be taken. Comments: CONSULT AC 43.13-1B CHANGE 1, SECTION 2, REGARDING GROUND OPERATIONAL CHECKS FOR AVIONICS EQUIPMENT. CONSULT THE MANUFACTURER MAINTENANCE AND INSTALLATION MANUALS FOR DETAILED INFORMATION.

7.	Removal and replacement information: This section describes the order and method of removing and replacing products, parts and any necessary precautions. This section should also describe or refer to manufacturer's instructions to make required tests, trim checks, alignment, calibrations, center of gravity changes, tilting or shoring, etc., if any. Comments: THE GNS430 IS RACK MOUNTED AND CAN BE REMOVED COUNTER-CLOCKWISE ROTATION OF THE 3/32 ALLEN-HEX SCREW LOCATED ON THE UNIT'S FRONT PANEL. THE CI505-TNC NAV ANT DIPLEXER IS LOCATED BEHIND THE COPILOT INSTRUMENT PANEL AND CAN BE ACCESSED BY REMOVAL OF THE GLARE SHIELD ASSEMBLY.
8.	Diagrams: Of access plates and information, if needed, to gain access for inspection. Comments: N/A.
9.	Special inspection requirements: Such as X-ray, ultrasonic testing, or magnetic particle inspection, if required. Comments: N/A.
10.	Application of protective treatments: To the affected area after inspection and/or maintenance, if any. Comments: N/A.
11.	Data: Relative to structural fasteners such as type, torque, and installation requirements, if any. Comments: N/A.
12.	List of special tools: Special tools that are required, if any. Comments: N/A.
13.	For commuter category aircraft: The following additional information must be furnished, as applicable: A. Electrical loads B. Methods of balancing flight controls C. Identification of Primary and secondary structures D. Special repair methods applicable to the airplane. Comments: N/A.
14.	Recommended overhaul periods: Are required to be noted on the ICA when an overhaul period has been set by the manufacturer of a component, or equipment. If there is no overhaul period, the ICA should state for item 14: No additional overhaul time limitations. Comments: NO ADDITIONAL OVERHAUL TIME LIMITATIONS.

15.	Airworthiness Limitation Section: Include any "approved" airworthiness limitations identified by the manufacturer or FAA Type Certificate Holding Office (e.g., An STC incorporated in a larger field approved major alteration may have an airworthiness limitation.) The FAA inspector should not establish, alter, or cancel airworthiness limitations without coordinating with the appropriate FAA Type Certificate Holding Office. If there are no changes to the airworthiness limitations, the ICA should state for item 15: "No additional airworthiness limitations" or "Not Applicable." Comments: NOT APPLICABLE.
16.	Revision: This section should include information on how to revise the ICA. For example, a letter will be submitted to the local FSDO with a copy of the revised FAA Form 337 and revised ICA. The FAA inspector accepts the change by signing Block 3 and including the following statement: "The attached revised/new Instructions for Continued Airworthiness (date) for the above aircraft or component major alteration have been accepted by the FAA, superseding the Instructions for Continued Airworthiness (date)." Once the revision has been accepted, a maintenance record entry will be made, identifying the revision, its location, date of the Form 337. Comments: N/A.

Note:

Implementation and Record Keeping: For major alterations performed in accordance with FAA Field Approval policy, the owner/ operator operating under part 91 is responsible for ensuring that the ICA is made part of the applicable section 91.409 inspection program for their aircraft. This is accomplished when a maintenance entry is made in the aircraft's maintenance record in accordance with section 43.9. This entry records the major alteration and identifies the original ICA location (e.g., Block 8 of FAA Form 337, dated 5/28/98) along with a statement that the ICA is now part of the aircraft's inspection/maintenance requirements.

For major alterations performed in accordance with a field approval on air carrier aircraft, the air carrier operator is

Responsible for ensuring that the ICA is made part of the applicable inspection/maintenance program for their aircraft. If a procedure is not currently included in the operator's manual to incorporate ICA, this process will need to be appropriately addressed (i.e. the operator submits a revision to its maintenance program to the applicable certificate-holding district office (CHUDO).

For aircraft inspected under an Approved Aircraft Inspection Program (AAIP), the operator will submit a change to the CHDO in accordance with section 135.419 b).

For air carrier aircraft inspected using an annual/100 hour inspection program, a reference to the new ICA will be made in the aircraft's maintenance record in accordance with section 43.9. This entry records the major alteration and identifies the original ICA location (e.g., ICA is located/attached to Block 8 of FAA Form 337, dated 5/28/98). In addition, the operator will request a revision to the operator's Operations Specifications, additional maintenance requirements, which incorporates the ICA into the inspection program.

Installation Center
Repair Station # W1NR1050

Name: WINGS AVIONICS

Address: 421 ERNEST LANCASTER DRIVE
FAYETTEVILLE, AR 72701

FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: CESSNA 414A

Reg. No. N2702L

Serial No. 414A0608

This document must be carried in the aircraft at all times. It describes the operating procedures for the Garmin GNS 430 navigation system when it has been installed in accordance with Garmin Installation Manual 190-00140-02 Rev. T (Rev. A or later appropriate revision) and FAA Form 337 dated OCT 12 2012.

For aircraft with an FAA Approved Airplane Flight Manual, this document serves as the FAA Approved Flight Manual Supplement for the Garmin GNS 430. For aircraft that do not have an approved flight manual, this document serves as the FAA Approved Supplemental Flight Manual for the Garmin GNS 430.

The Information contained herein supplements or supersedes the basic Airplane Flight Manual only in those areas listed herein. For limitations, procedures, and performance information not contained in this document, consult the basic Airplane Flight Manual.

FAA APPROVED



Date: OCT 12 2012

Jamie L. Black
Federal Aviation Administration
Little Rock, AR

FAA APPROVED *AP*

DATE: OCT 12 2012
Page 1 of 10

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

LOG OF REVISIONS				
Revision Number	Page Number(s)	Description	* FAA Approved	Date of Approval
A	All	Initial Release		

FAA APPROVED 

DATE: OCT 12 2012
Page 2 of 10

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

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AIRPLANE & SYSTEM DESCRIPTIONS.....	10

FAA APPROVED 

DATE: OCT 12 2012
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FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

SECTION I
GENERAL

1. The GNS 430 System is a fully integrated, panel mounted instrument, which contains a VHF Communications Transceiver, a VOR/ILS receiver and a Global Positioning System (GPS) Navigation computer. The system consists of a GPS antenna, GPS Receiver, VHF VOR/LOC/GS antenna, VOR/ILS receiver, VHF COMM antenna and a VHF Communications Transceiver. The primary function of the VHF Communication portion of the equipment is to facilitate communication with Air Traffic Control. The primary function of the VOR/ILS Receiver portion of the equipment is to receive and demodulate VOR, Localizer, and Glide Slope signals. The primary function of the GPS portion of the system is to acquire signals from the GPS system satellites, recover orbital data, make range and Doppler measurements, and process this information in real-time to obtain the user's position, velocity, and time.
2. Provided the Garmin GNS 430's GPS receiver is receiving adequate usable signals, it has been demonstrated capable of and has been shown to meet the accuracy specifications for:
 - VFR/IFR enroute, terminal, and non-precision instrument approach (GPS, Loran-C, VOR, VOR-DME, TACAN, NDB, NDB-DME, RNAV) operation within the U.S. National Airspace System in accordance with AC 20-138.
 - One of the approved sensors, for a single or dual GNS 430 installation, for North Atlantic Minimum Navigation Performance Specification (MNPS) Airspace in accordance with AC 91-49 and AC 120-33.
 - The system meets RNP5 airspace (BRNAV) requirements of AC 90-96 and in accordance with AC 20-138 and JAA GAI-20 ACJ 20X4, provided it is receiving usable navigation information from the GPS receiver.

Navigation is accomplished using the WGS-84 (NAD-83) coordinate reference datum. Navigation data is based upon use of only the Global Positioning System (GPS) operated by the United States of America.

FAA APPROVED 

DATE: OCT 12 2012
Page 4 of 10

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

**SECTION II
LIMITATIONS**

1. The Garmin GNS 430 Pilot's Guide, P/N 190-00140-00, Rev. A, or later appropriate revision, must be immediately available to the flight crew whenever navigation is predicated on the use of the system. In addition to the Pilot's Guide, the 400/500 Series Garmin Optional Displays Pilot's Guide Addendum P/N 190-00140-13 Rev G, or later appropriate revision also must be immediately available to the flight crew if lightning detection, or Traffic Information Service (TIS) are interfaced to the system.

The 400/500 Series Display Interfaces Pilot's Guide Addendum P/N 190-00140-10 Rev D, or later appropriate revision also must be immediately available to the flight crew if the BFGoodrich WX-500 Stormscope® or the BFGoodrich SKYWATCH™ Traffic Advisory System (TAS) is installed.

2. The GNS 430 must utilize the following or later FAA approved software versions:

Function	Sub-System Version				
	Main	GPS	COM	VOR/LOC	G/S
Initial Approval	2.00	2.00	2.00	1.25	2.00

The Main software version is displayed on the GNS 430 self test page immediately after turn-on for 5 seconds. The remaining system software versions can be verified on the AUX group sub-page 2, "SOFTWARE/DATABASE VER".

3. IFR enroute and terminal navigation predicated upon the GNS 430's GPS Receiver is prohibited unless the pilot verifies the currency of the data base or verifies each selected waypoint for accuracy by reference to current approved data.
4. Instrument approach navigation predicated upon the GNS 430's GPS Receiver must be accomplished in accordance with approved instrument approach procedures that are retrieved from the GPS equipment data base. The GPS equipment database must incorporate the current update cycle.
 - (a) Instrument approaches utilizing the GPS receiver must be conducted in the approach mode and Receiver Autonomous Integrity Monitoring (RAIM) must be available at the Final Approach Fix.
 - (b) Accomplishment of ILS, LOC, LOC-BC, LDA, SDF, MLS or any other type of approach not approved for GPS overlay with the GNS 430's GPS receiver is not authorized.

FAA APPROVED 

DATE: OCT 12 2012
Page 5 of 10

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

- (c) Use of the GNS 430 VOR/ILS receiver to fly approaches not approved for GPS require VOR/ILS navigation data to be present on the external indicator.
 - (d) When an alternate airport is required by the applicable operating rules, it must be served by an approach based on other than GPS or Loran-C navigation, the aircraft must have the operational equipment capable of using that navigation aid, and the required navigation aid must be operational.
 - (e) VNAV information may be utilized for advisory information only. Use of VNAV information for Instrument Approach Procedures does not guarantee Step-Down Fix altitude protection, or arrival at approach minimums in normal position to land.
5. If not previously defined, the following default settings must be made in the "SETUP 1" menu of the GNS 430 prior to operation (refer to Pilot's Guide for procedure if necessary):
- (a) **dis, spd** $\overset{n}{m}$ $\overset{k}{t}$ (sets navigation units to "nautical miles" and "knots")
 - (b) **alt, vs** $\overset{ft}{ft}$ $\overset{fpm}{fpm}$ (sets altitude units to "feet" and "feet per minute")
 - (c) **map datum** .. WGS 84 (sets map datum to WGS-84, see note below)
 - (d) **posn** deg-min (sets navigation grid units to decimal minutes)

NOTE: In some areas outside the United States, datums other than WGS-84 or NAD-83 may be used. If the GNS 430 is authorized for use by the appropriate Airworthiness authority, the required geodetic datum must be set in the GNS 430 prior to its use for navigation.

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

SECTION III
EMERGENCY PROCEDURES

ABNORMAL PROCEDURES

1. If Garmin GNS 430 navigation information is not available or invalid, utilize remaining operational navigation equipment as required.
2. If "RAIM POSITION WARNING" message is displayed the system will flag and no longer provide GPS based navigational guidance. The crew should revert to the GNS 430 VOR/ILS receiver or an alternate means of navigation other than the GNS 430's GPS Receiver.
3. If "RAIM IS NOT AVAILABLE" message is displayed in the enroute, terminal, or initial approach phase of flight, continue to navigate using the GPS equipment or revert to an alternate means of navigation other than the GNS 430's GPS receiver appropriate to the route and phase of flight. When continuing to use GPS navigation, position must be verified every 15 minutes using the GNS 430's VOR/ILS receiver or another IFR-approved navigation system.
4. If "RAIM IS NOT AVAILABLE" message is displayed while on the final approach segment, GPS based navigation will continue for up to 5 minutes with approach CDI sensitivity (0.3 nautical mile). After 5 minutes the system will flag and no longer provide course guidance with approach sensitivity. Missed approach course guidance may still be available with 1 nautical mile CDI sensitivity by executing the missed approach.
5. In an in-flight emergency, depressing and holding the Comm transfer button for 2 seconds will select the emergency frequency of 121.500 MHz into the "Active" frequency window.

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

SECTION IV
NORMAL PROCEDURES

1. DETAILED OPERATING PROCEDURES

Normal operating procedures are described in the Garmin GNS 430 Pilot's Guide, P/N 190-00140-00, Rev. A, or later appropriate revision. Normal operating procedures for the Traffic Information Service (TIS) interface, and the Weather Data Link interface are described in the 400/500 Series Garmin Optional Displays Pilot's Guide Addendum, P/N 190-00140-13, Rev G, or later appropriate revision.

Normal operating procedures for the BFGoodrich WX-500 Stormscope® or the BFGoodrich SKYWATCH™ Traffic Advisory System (TAS) interface are described in the 400/500 Series Display Interfaces Pilot's Guide Addendum P/N 190-00140-10 Rev D, or later appropriate revision.

2. PILOT'S DISPLAY

The GNS 430 System data will appear on the Pilot's Secondary Course Deviation Indicator (CDI) located in the pilot instrument panel. The source of data is either GPS or VLOC as annunciated on the display above the CDI key located on the GNS430.

NOTE: It is the pilot's responsibility to assure that published or assigned procedures are correctly complied with. Course guidance is not provided for all possible ARINC 424 leg types. See the GNS 430 Pilot's Guide for detailed operating procedures regarding navigation capabilities for specific ARINC 424 leg types.

3. AUTOPILOT / FLIGHT DIRECTOR OPERATION

Coupling of the GNS 430 System steering information to the autopilot/flight director can be accomplished by engaging the autopilot/flight director in the NAV or APR mode, and selecting the NAV2 function switch located on the Autopilot Mode Selector.

When the autopilot/flight director system is using course information supplied by the GNS 430 System, the course pointer on the Secondary CDI must be manually set to the desired track (DTK) indicated by the GNS 430. For detailed autopilot/flight director operational instructions, refer to the FAA Approved Flight Manual Supplement for the autopilot/flight director.

4. CROSSFILL OPERATIONS

Crossfill Operations is not available for this installation.

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DATE: OCT 12 2012
Page 8 of 10

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

5. AUTOMATIC LOCALIZER COURSE CAPTURE

By default, the GNS 430 automatic localizer course capture feature is enabled. This feature provides a method for system navigation data present on the external indicators to be switched automatically from GPS guidance to localizer / glide slope guidance as the aircraft approaches the localizer course inbound to the final approach fix. If an offset from the final approach course is being flown, it is possible that the automatic switch from GPS course guidance to localizer / glide slope course guidance will not occur. It is the pilot's responsibility to ensure correct system navigation data is present on the external indicator before continuing a localizer based approach beyond the final approach fix. Refer to the GNS 430 Pilot's Guide for detailed operating instructions.

6. DISPLAY OF LIGHTNING STRIKE DATA

For installations that interface the BFGoodrich WX-500 Stormscope and the GNS 430, lightning strike data detected by the WX-500 will appear on the GNS 430. For detailed operating instructions regarding the interface of the GNS 430 with the WX-500, refer to the WX-500 Pilot's Guide and the 400/500 Series Display Interfaces Pilot's Guide Addendum, P/N 190-00140-10, Rev D, or later appropriate revision for the WX-500 Stormscope interface.

7. DISPLAY OF TRAFFIC ADVISORY DATA

For installations that interface the BFGoodrich SKYWATCH Traffic Advisory System (TAS) and the GNS 430, traffic data detected by the TAS will appear on the GNS 430. For detailed operating instructions regarding the interface of the GNS 430 with the SKYWATCH, refer to the FAA Approved Flight Manual Supplement for the SKYWATCH, the Pilot's Guide for the SKYWATCH and the 400/500 Series Display Interfaces Pilot's Guide Addendum P/N 190-00140-10, Rev D, or later appropriate revision for the SKYWATCH Traffic Advisory System interface.

8. DISPLAY OF TRAFFIC INFORMATION SERVICE DATA

TIS surveillance data uplinked by Air Traffic Control (ATC) radar through the GTX 330 Mode S Transponder will appear on the moving map and traffic display pages of the GNS 430. For detailed operating instructions regarding the interface of the GNS 430 with the GTX 330, refer to the 400/500 Series Garmin Optional Displays Pilot's Guide Addendum, P/N 190-00140-13, Rev G, or later appropriate revision for the TIS System interface.

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DATE: OCT 12 2012
Page 9 of 10

FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT
Garmin GNS 430 VHF Communications Transceiver /
VOR/ILS Receiver / GPS Receiver

Aircraft Make and Model: Cessna 414A
N2702L S/N 414A0608

**SECTION V
PERFORMANCE**

No change.

**SECTION VI
WEIGHT AND BALANCE**

See current weight and balance data.

**SECTION VII
AIRPLANE & SYSTEM DESCRIPTIONS**

See the Garmin GNS 430 Pilot's Guide for a complete description of the GNS 430 system.

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DATE: OCT 12 2012
Page 10 of 10



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 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 N2702L	Serial No. 414A0608	
	Make CESSNA	Model 414A	Series
2. Owner	Name (As shown on registration certificate) LONE DUCK AVIATION LLC	Address (As shown on registration certificate) 1211 E 14TH ST RUSSELLVILLE, AR 72802 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	
Wings Avionics, Inc. 421 Ernest Lancaster Dr. Fayetteville, AR 72701 USA		☐ U. S. Certified Mechanic	☐ Manufacturer
		☐ Foreign Certified Mechanic	C. Certificate No.
		☒ Certified Repair Station	WINR1050
		☐ Certified Maintenance Organization	RADIO, LIMITED AIRFRAME

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 BRADY N TERRY 15-October-2012
--	---

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

FAA Fit. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
BY FAA Designee	☒ Repair Station	Inspection Authorization	Other (Specify)
Certificate or Designation No. WINR1050	Signature/Date of Authorized Individual BRADY N TERRY 15-October-2012		

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 N2702L

Oct-15-2012

Nationality and Registration Mark

Date

N2702L

C414A S/N 010-00330-53

15-OCT-2012

1. INSTALLED A FACTORY NEW GARMIN GNS430W WIDE AREA AUGMENTATION SYSTEM (WAAS) GLOBAL NAVIGATION SYSTEM USING THE EXISTING GNS430 RACK ASSEMBLY AND EXISTING WIRING HARNESS.
2. THE GNS430W GLOBAL NAVIGATION SYSTEM, PART NUMBER (P/N) 011-01060-00, SERIAL NUMBER (S/N) 23434464, WAS INSTALLED IN THE EXISTING PRIMARY GNS430 RACK ASSEMBLY USING THE EXISTING WIRING HARNESS CURRENTLY INTERFACED TO THE NSD360 HORIZONTAL SITUATION INDICATOR (HSI). INSTALLATION COMPLETED USING SUPPLEMENTAL TYPE CERTIFICATE (STC) NUMBER SA01933LA-D, DATED NOVEMBER 6, 2006; WITH AN AMENDED DATE OF NOVEMBER 20, 2007; WITH A REISSUE DATE OF JULY 31, 2009 ; USING APPROVED MODEL LIST (AML) FOR STC NUMBER SA01933LA-D, DATED NOVEMBER 6, 2006; WITH A REVISED AML DATE OF JULY 31, 2009.
3. A GARMIN GNS400W SERIES PILOT'S GUIDE AND REFERENCE, P/N 190-00356-00, REVISION (REV) G; A GNS400W SERIES QUICK REFERENCE GUIDE, P/N 190-00356-01, REV F; A GARMIN 400W/500W SERIES OPTIONAL DISPLAYS PILOT'S GUIDE ADDENDUM, P/N 190-00356-30, REV H; AND A GARMIN 400W/500W SERIES DISPLAY INTERFACES PILOT'S GUIDE ADDENDUM, P/N 190-00356-31, REV D, WERE PLACED IN THE AIRCRAFT RECORDS. A FEDERAL AVIATION ADMINISTRATION (FAA) APPROVED GNS400W SERIES APPROVED FLIGHT MANUAL SUPPLEMENT (AFMS), P/N 190-00356-03, REV B, DATED JULY 31, 2009, WAS PLACED IN THE AIRCRAFT RECORDS.
4. THE MAXIMUM CONTINUOUS ELECTRICAL LOAD DOES NOT EXCEED 80% OF TOTAL RATED CAPACITY PER AC 43.13-1B, PARAGRAPH 11-33.
5. A LOGBOOK ENTRY UNDER WORK ORDER NUMBER 5563 WAS ENTERED IN THE AIRCRAFT RECORDS. WEIGHT AND BALANCE RECORDS AND EQUIPMENT LIST REVISED.
6. POST-INSTALLATION GROUND CHECKS WERE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER INSTALLATION MANUAL AND FOUND TO OPERATE PROPERLY.
7. AN OPERATIONAL FLIGHT TEST MUST BE PERFORMED BY AN APPROPRIATELY RATED PILOT WITH AT LEAST A PRIVATE PILOT CERTIFICATE AND ENTERED INTO THE AIRCRAFT RECORDS TO COMPLY WITH THE REQUIREMENTS OF FAR 91.407(b).
8. FACTORY SUPPLIED GARMIN 400W SERIES INSTRUCTIONS FOR CONTINUED AIRWORTHINESS, DOCUMENT NUMBER 190-00356-65, REVISION B, DATED JULY 30, 2009, ARE ATTACHED AS ADDITIONAL SHEETS.***END***



ADDITIONAL SHEETS ARE ATTACHED

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate

Number SA01933LA-D

This certificate issued to Garmin International, Inc.
1200 East 151st Street
Olathe, KS 66062

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

Original Product Type Certificate Number

*See attached Approved Model List (AML)

Make

No. SA01933LA-D for list of approved aircraft

Model

Models and applicable airworthiness regulations.

Description of Type Design Change: Installation of Garmin Model 400W / 500W Series GPS-WAAS Navigation System in accordance with FAA Approved Garmin 400W Series Master Data List, Drawing No. 005-C0221-00, Revision "B", dated October 1, 2007, or later FAA approved revision, or FAA Approved Garmin 500W Series Master Data List, Drawing No. 005-C0221-01, Revision "B", dated October 1, 2007, or later FAA approved revision. Use applicable FAA approved 400W Series Airplane Flight Manual Supplement, document No. 190-00356-03, Rev. "Original", dated November 20, 2007, or later FAA approved revision; FAA Approved 500W Series Airplane Flight Manual Supplement, document No. 190-00357-03, Rev. "Original", dated November 20, 2007, or later FAA approved revision, or FAA approved Airplane Flight Manual supplement as defined in Master Data List 005-C0221-00 or 005-C0221-01 defined above.

Limitations and Conditions: This approval should not be incorporated in any aircraft unless it is determined that the interrelationship between this installation and any previous approved configuration will not introduce any adverse effect upon the airworthiness of the 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 January 31, 2006

Date received July 31, 2009

Date of issuance November 6, 2006

Date amended November 20, 2007



By direction of the Administrator

David G. Armstrong
(Signature)

David Armstrong
ODA-STE Unit Administrator
ODA-240087-CF
Garmin International, Inc.

(Title)

Any violation of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 1 year, or both.

FAA Approved Model List (AML) STC SA01933LA-D

Aircraft Make (TCDS Holder) [common name or previous make]	Aircraft Model	Type Certificate Number	TC Certification Basis	Master Drawing List		AML Revision Date
				Document Number	Revision (or later FAA approved revision)	
Cessna (Cessna Aircraft Company)	525, 525A	A1WI	FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	177RG	A20CE	FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	404, 406	A25CE	FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	501, 551	A27CE	FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	441	A28CE	FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	336	A2CE	CAR 3	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	T303 (Crusader)	A34CE	FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	208, (208A), 208B	A37CE	FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	206, P206, P206A, P206B, P206C, P206D, P206E, TP206A, TP206B, TP206C, TP206D, TP206E, U206, U206A, U206B, U206C, U206D, U206E, U206F, U206G, TU206A, TU206B, TU206C, TU206D, TU206E, TU206F, TU206G, 206H, T206H	A4CE	CAR 3 FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	337, 337A, (USAF 02B), 337B, T337B, 337C, 337E, T337E, T337C, 337D, T337D, M337B (USAF 02A), 337F, T337F, 337G, T337G, 337H, P337H, T337H, T337H-SP	A6CE	CAR 3 FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	120, 140	A-768	CAR 3	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	190, 195, 195A, 195B	A-790	CAR 3	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	170, 170A, 170B	A-799	CAR 3	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company)	401, 401A, 401B, 402, 402A, 402B, 402C, 411, 411A, 414, 414A, 421, 421A, 421B, 421C, 425	A7CE	CAR 3	005-C0221-00 005-C0221-01	A	11/6/2006 Original
Cessna (Cessna Aircraft Company) [Columbia or Lancair]	LC40-550FG, LC41-550FG, LC42-550FG	A00003SE	FAR 23	005-C0221-00 005-C0221-01	A	11/6/2006 Original

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FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT
or
SUPPLEMENTAL AIRPLANE FLIGHT MANUAL
for
GARMIN 400W SERIES GPS-WAAS NAVIGATION SYSTEM
as installed in:

Cessna 414A

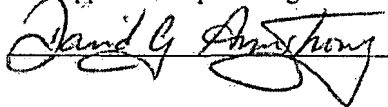
Make and Model Airplane

Reg. No. N2702L S/N 414A0608

This document serves as an Airplane Flight Manual Supplement or as a Supplemental Airplane Flight Manual when the aircraft is equipped with the Garmin 400W Series unit. This document must be carried in the airplane at all times when the Garmin 400W Series unit is installed in accordance with STC SA01933LA-D.

The information contained herein supplements or supersedes the information made available to the operator by the manufacturer in the form of clearly stated placards, markings, or manuals or in the form of an FAA approved Airplane Flight Manual, only in those areas listed herein. For limitations, procedures and performance information not contained in this document, consult the basic placards, markings, or manuals or the basic FAA approved Airplane Flight Manual.

FAA Approved By:



David G Armstrong
ODA STC Unit Administrator
Garmin International, Inc.
ODA-240087-CE

Date:

7/31/09

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AIRPLANE FLIGHT MANUAL SUPPLEMENT
or SUPPLEMENTAL AIRPLANE FLIGHT MANUAL
for a Garmin 400W Series Navigation System

LOG OF REVISIONS				
Rev. No.	No.	Page Date	Description	FAA Approved
A Original	All	11-20-07	Complete Supplement	<u>Seyed-Youssef Hashemi</u> Mgr. Flt. Test Br., ANM-160L FAA, Los Angeles ACO Transport Airplane Directorate Date <u>Nov. 20, 2007</u>
B	All	7/31/09	Added 'D' to STC number, added LP approach type	<u>David G. Armstrong</u> ODA STC Unit Administrator ODA-240087-CE Garmin International, Inc.

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AIRPLANE FLIGHT MANUAL SUPPLEMENT
or SUPPLEMENTAL AIRPLANE FLIGHT MANUAL
for a Garmin 400W Series Navigation System

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**AIRPLANE FLIGHT MANUAL SUPPLEMENT
or SUPPLEMENTAL AIRPLANE FLIGHT MANUAL
for a Garmin 400W Series Navigation System**

Section 1. GENERAL

1.1 Garmin 400W Series GPS/WAAS Nav Com

The Garmin 400W Series GPS/WAAS Navigator is a panel-mounted product that contains a GPS/WAAS receiver for GPS approved primary navigation, under TSO C146a (plus optional VHF Com and VHF Nav radios) in an integrated unit with a moving map and color display. The 400W Series unit features a graphical display which may also be used to depict traffic, weather, or terrain data.

The navigation functions are operated by dedicated keys and graphical menus which are controlled by the buttons and the dual concentric rotary knob along the bottom and right side of the display.

Optional VHF Com and VHF Nav radio functions are controlled via dedicated buttons and knobs on the left side of the display and adjacent to frequencies they are controlling.

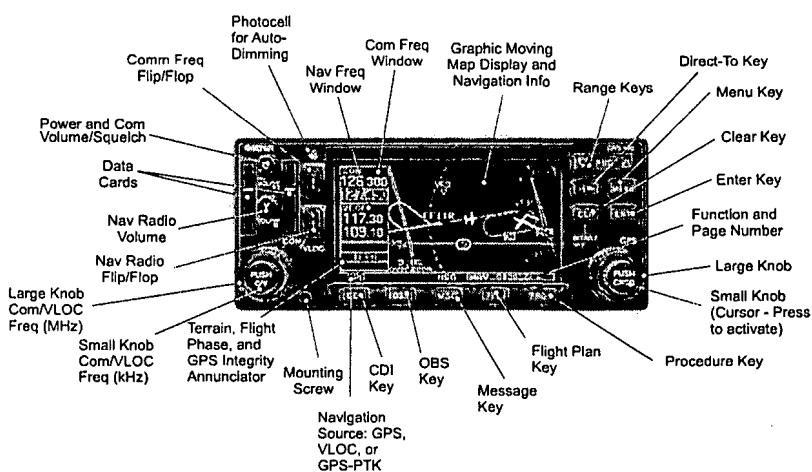


Figure 1 - 400W Series Control and Display Layout

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**AIRPLANE FLIGHT MANUAL SUPPLEMENT
or SUPPLEMENTAL AIRPLANE FLIGHT MANUAL
for a Garmin 400W Series Navigation System**

1.2 Operation

GPS/WAAS TSO-C146a Class 3 Operation: The Garmin 400W Series unit, when installed in accordance with STC SA01933LA-D, uses GPS and WAAS (within the coverage of a Space-Based Augmentation System complying with ICAO Annex 10) for enroute, terminal area, non-precision approach operations (including “GPS”, “or GPS”, “RNAV”, “LNAV”, and “LP” approaches), and approach procedures with vertical guidance (including “LNAV/VNAV” and “LPV”).

Navigation is accomplished using the WGS-84 (NAD-83) coordinate reference datum. GPS navigation data is based upon use of only the Global Positioning System (GPS) operated by the United States of America.

1.3 Class II Oceanic, Remote, and other Operations:

The Garmin 400W Series, as installed, has been found to comply with the requirements for GPS primary means of Class II navigation in oceanic and remote airspace, when used in conjunction with WAAS Garmin Prediction Program part number 006-A0154-03. Oceanic operations are supported when the 400W Series unit annunciates OCN. This provides an alarm limit of four NMI and a mask angle of five degrees. The 400W series unit also has the ability to predict RAIM availability at any waypoint in the database or if WAAS corrections are expected to be absent or disabled. This AFMS does not constitute an operational approval for Oceanic or Remote area operations. Additional equipment installations or operational approvals may be required.

- a) Oceanic navigation requires an additional approved long range oceanic and/or remote area navigation system with independent display, sensors, antenna, and power source. (It may be a second 400W/500W Series unit.)
- b) Redundant VHF Com and VHF Nav systems may be required for other than U.S. 14 CFR Part 91 operations. Check foreign regulation requirements as applicable. (It may be a second 400W/500W Series unit.)
- c) Operations approval may be granted for the use of the 400W Series unit RAIM prediction function in lieu of the Prediction Program for operators requiring this capability. Refer to your appropriate civil aviation authorities for these authorizations.

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AIRPLANE FLIGHT MANUAL SUPPLEMENT
or SUPPLEMENTAL AIRPLANE FLIGHT MANUAL
for a Garmin 400W Series Navigation System

Section 2. LIMITATIONS

2.1 Pilot's Guide

The GARMIN 400W Series Pilot's Guide, part number and revision listed below (or later applicable revisions), must be immediately available for the flight crew whenever navigation is predicated on the use of the 400W Series unit.

- 400W Series Pilot's Guide & Reference P/N 190-00356-00 Rev E
- 400W/500W Series Optional Displays P/N 190-00356-30 Rev F
- 400W/500W Series Display Interfaces P/N 190-00356-31 Rev B

This AFM supplement does not grant approval for IFR operations to aircraft limited to VFR operations. Additional aircraft systems may be required for IFR operational approval. Systems limited to VFR shall be placarded in close proximity to the 400W Series unit
"GPS LIMITED TO VFR USE ONLY".

2.2 System Software:

The system must utilize the Main and GPS software versions listed below (or later FAA approved versions). The software versions are displayed on the self-test page immediately after turn-on for approximately 5 seconds or they can be accessed in the AUX pages.

Subsequent software versions may support different functions. Check the 400W Series Pilot's Guide for further information.

Table 1 - Approved Software Versions

Software Item	Approved Software Version (or later FAA approved versions for this STC)	
	SW version	As displayed on unit
Main SW Version	3.30	3.30
GPS SW Version	3.2	3.2

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**AIRPLANE FLIGHT MANUAL SUPPLEMENT
or SUPPLEMENTAL AIRPLANE FLIGHT MANUAL
for a Garmin 400W Series Navigation System**

2.3 Navigation Database

The 400W Series unit database card must be installed. (IAW the TSO deviations granted to Garmin for the 400W unit, navigation database cards may not be marked with the part number. The software automatically precludes invalid databases for use by the 400W)

- a) IFR enroute and terminal navigation is prohibited unless the pilot verifies the currency of the database or verifies each selected waypoint for accuracy by reference to current approved data.
- b) GPS instrument approaches using the 400W Series units are prohibited, unless the 400W Series unit's approach data is verified by the pilot or crew to be current. Instrument approaches must be accomplished in accordance with an approved instrument approach procedure that is loaded from the 400W Series unit database.
- c) Installations with dual 400W/500W Series units will only crossfill between units when they contain the same database cycle. Updating of each database must be accomplished on the ground prior to flight.

2.4 Terrain Database

The 400W Series unit supports Terrain and requires a Terrain database card to be installed in order for the feature to operate. The table below lists compatible database cards for the 400W series. Each of the data base cards contains the following data:

- a) The Terrain Database has an area of coverage from North 75° Latitude to South 60° Latitude in all longitudes.
- b) The Airport Terrain Database has an area of coverage that includes the United States, Canada, Mexico, Latin America, and South America.
- c) The Obstacle Database has an area of coverage that includes the United States, and is updated as frequently as every 56 days.

NOTE: The area of coverage may be modified as additional terrain data sources become available.

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Table 2 – Approved Terrain Database Cards

Part Number	Description
010-10201-20	Data Card, TAWS / Terrain, 128MB
010-10201-21	Data Card, TAWS / Terrain, 256MB

2.5 Navigation

No navigation is authorized north of 89° (degrees) north latitude or south of 89° (degrees) south latitude.

2.6 Approaches

- a) During GPS approaches, the pilot must verify the 400W Series unit is operating in the approach mode. (LNAV, LNAV+V, L/VNAV, LP, or LPV)
- b) When conducting approaches referenced to true North, the heading selection on the AUX pages must be adjusted to TRUE.
- c) Accomplishment of an ILS, LOC, LOC-BC, LDA, SDF, MLS, VOR approach, or any other type of approach not approved for GPS overlay, is not authorized with GPS navigation guidance.
- d) Use of the GNS 430W VOR/LOC/GS receiver to fly approaches not approved for GPS requires VOR/LOC/GS navigation data to be present on the external indicator (i.e. proper CDI source selection).
- e) For aircraft with remote source selection annunciation or remote GPS navigation annunciations installed, conducting IFR approaches is prohibited if the remote annunciation is found to be inoperative during pre-flight. (This limitation does not prohibit the conduct of an IFR approach if the required remote annunciation fails during flight. The indications provided on the 400W Series unit display may be used as a backup).
- f) Except in emergency conditions, IFR approaches are prohibited whenever any physical or visual obstruction (such as a throw-over yoke) restricts pilot view or access to the 400W Series unit or the affected CDI.

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2.7 Autopilot Coupling

IFR installations of a Garmin 400W Series unit allow the operator to fly all phases of flight based on the navigation information presented to the pilot; however, not all modes may be coupled to the autopilot. All autopilots may be coupled in Oceanic (OCN), Enroute (ENR), and Terminal (TERM) modes; however, the FAA requires that vertical coupling of an autopilot for approaches be demonstrated to meet their intended function and provide safe and proper operation to published minimums. This installation is limited to:

- ☒ No limitations for autopilot coupling.
- ☐ Lateral GPS coupling (LNAV only). For 430W units: The GS of an ILS (VLOC) may be coupled to the autopilot without any limitations.

This limitation may be removed after an FAA Flight Test demonstration. Contact Garmin International, Tech Support for additional information.

2.8 Terrain Display

Terrain refers to the display of terrain information. Pilots are NOT authorized to deviate from their current ATC clearance to comply with terrain/obstacle alerts. Terrain unit alerts are advisory only and are not equivalent to warnings provided by TAWS. Navigation must not be predicated upon the use of the terrain display.

The terrain display is intended to serve as a situational awareness tool only. By itself, it may not provide either the accuracy or the fidelity on which to base decisions and plan maneuvers to avoid terrain or obstacles.

2.9 VNAV

VNAV information may be utilized for advisory information only. Use of VNAV information for Instrument Approach Procedures does not guarantee Step-Down Fix altitude protection, or arrival at approach minimums in a normal position to land.

2.10 Weather Display

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If an optional weather receiver is interfaced to the 400W Series unit, the weather information displayed is limited to supplemental use only and may not be used in lieu of an official weather data source.

2.11 Traffic Display

Traffic may be displayed on the 400W Series unit when connected to an approved optional TCAS, TAS, or TIS traffic device. These systems are capable of providing traffic monitoring and alerting to the pilot. Traffic shown on the display may or may not have traffic alerting available. The display of traffic is an aid to visual acquisition and may not be utilized for aircraft maneuvering. Display of this traffic data and related operations are described in the 400W Series unit Pilot's Guide.

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Section 3. EMERGENCY PROCEDURES

3.1 Emergency Procedures

No change.

3.2 Abnormal Procedures

- a) If the Garmin 400W Series unit GPS navigation information is not available, or is invalid, utilize other remaining operational navigation equipment installed in the airplane as appropriate. If the 400W Series unit loses GPS position and reverts to Dead Reckoning mode (indicated by the annunciation of “DR” in the lower left of the display), the moving map will continue to be displayed. Aircraft position will be based upon the last valid GPS position and estimated by Dead Reckoning methods. Changes in airspeed or winds aloft can affect the estimated position substantially. Dead Reckoning is only available in Enroute mode; Terminal and Approach modes do not support DR.
- b) If a “Loss of Integrity” (INTEG) message is displayed during:
 - Enroute/Terminal: continue to navigate using GPS equipment and periodically cross-check the GPS guidance to other approved means of navigation.
 - GPS Approach: GPS approaches are not authorized under INTEG - Execute missed approach or revert to alternate navigation.
- c) During a GPS LPV precision approach or GPS LNAV/VNAV approach, the 400W Series unit will downgrade the approach if the Vertical alarm limits are exceeded. This will cause the vertical guidance to flag as unavailable. The procedure may be continued using the LNAV only minimums.
- d) During a GPS LP approach, the 400W Series may downgrade the approach prior to the Final Approach Fix if alarm limits are exceeded. If this occurs, a message will be displayed advising the pilot to use LNAV minimums. If alarm limits are exceeded after the Final Approach Fix, the 400W Series unit will flag the lateral guidance and generate a system message “ABORT APPROACH loss of navigation”. Immediately upon viewing the message the unit will revert to Terminal alarm limits. If the position integrity is within these limits lateral guidance will be restored

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and the GPS may be used to execute the missed approach, otherwise alternate means of navigation should be utilized.

- e) During any GPS approach in which precision and non-precision alarm limits are exceeded, the 400W Series unit will flag the lateral guidance and generate a system message "ABORT APPROACH loss of navigation". Immediately upon viewing the message the unit will revert to Terminal alarm limits. If the position integrity is within these limits lateral guidance will be restored and the GPS may be used to execute the missed approach, otherwise alternate means of navigation should be utilized.

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Section 4. NORMAL PROCEDURES

Refer to the 400W Series unit Pilot's Guide defined in paragraph 2.1 on page 6 of this document for normal operating procedures. This includes all GPS operations, VHF COM and NAV, and Multi-Function Display information. For information on TIS traffic, or data linked weather see the Pilot's Guide addendum for optional displays. For information on active traffic sensor or Stormscope operation and displays see the Pilot's Guide addendum for display interfaces.

Although intuitive and user friendly the 400W Series unit requires a reasonable degree of familiarity to prevent operations without becoming too engrossed at the expense of basic instrument flying in IMC and basic see-and-avoid in VMC. Pilot workload will be higher for pilots with limited familiarity in using the unit in an IFR environment, particularly without the autopilot engaged. Garmin provides excellent training tools with the Pilot's Guide and PC based simulator. Pilots should take full advantage of these training tools to enhance system familiarization. Use of an autopilot is strongly encouraged when using the 400W Series unit in IMC conditions

4.1 Approaches with Vertical Guidance

The 400W Series unit supports three types of GPS approaches with vertical guidance: LPV approaches, LNAV/VNAV (annunciated as L/VNAV) approaches, and LNAV approaches with advisory vertical guidance (annunciated as LNAV+V). For LNAV approaches with advisory vertical guidance, the 400W Series will annunciate LNAV+V indicating vertical guidance is available. LNAV minimums will be controlling in this case.

NOTE:

If flying an LPV or LNAV/VNAV approach, be prepared to fly the LNAV only approach prior to reaching the final approach fix (FAF). If the GPS integrity is not within vertical approach limits, the system will flag the vertical guidance. This may be annunciated by a downgrade to LNAV message.

For additional information on approaches with vertical guidance refer to the 400W Series unit Pilot's Guide.

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4.2 Approaches without Vertical Guidance

The 400W Series unit supports Localizer Performance approaches (annunciated as LP). Published LP minimums will be controlling in this case.

NOTE:

If flying an LP approach, be prepared to fly the LNAV only approach prior to reaching the final approach fix (FAF). If the GPS integrity is not within LP approach limits, the system will notify the pilot by a downgrade to LNAV message.

For additional information on LP approaches refer to the 400W Series unit Pilot's Guide.

4.3 Autopilot Operation

The Garmin 400W Series may be coupled to an optional autopilot if installed in the aircraft when operating as prescribed in the LIMITATIONS section of this manual. For lateral guidance, some installations may utilize GPSS or GPS Roll Steering in lieu of the analog deviation information. If an HSI is used with GPSS engaged, the pilot should rotate the course pointer as prompted on the 400W Series unit to prevent loss of situational awareness and to prevent the aircraft from turning inappropriately if the autopilot is switched from digital (GPSS) to analog mode. For autopilot operational instructions, refer to the FAA approved Flight Manual or Flight Manual Supplement for the autopilot.

4.4 Coupling the Autopilot during approaches

The Garmin 400W Series supports analog and digital (GPSS) control interfaces to an optionally installed autopilot. Some autopilots revert to ROLL mode (wings level) and/or flag a NAV failure if the digital data becomes unavailable or is inhibited. The CDI selection of VLOC should inhibit the digital control interface. When switching between GPS and VLOC the pilot should be aware that the autopilot may need to be re-engaged into APR or NAV mode after changing the CDI source.

Autopilot coupling to GPS vertical guidance requires that the autopilot be engaged in an analog APR mode identical to coupling to an ILS. Some autopilots may revert to ROLL mode when the navigation outputs of the 400W Series unit sequence to the final approach fix. In these installations

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the unit will be configured to PROMPT the pilot to “Enable the autopilot approach outputs” in order to prevent the autopilot from entering ROLL mode without the pilot being aware of the transition.

- ☐ This installation prompts the pilot and requires the pilot to enable the A/P outputs just prior to engaging the autopilot in APR mode.
- ☐ This installation supports a seamless transition from digital (GPSS) to analog guidance for the autopilot. To capture the vertical guidance, the pilot may engage the autopilot in APR mode at any time when the GPS Glide Slope (VDI) becomes valid (displayed without a FLAG).
- ☒ This installation interfaces to the autopilot in analog mode only. To capture the vertical guidance, the pilot may engage the autopilot in APR mode at any time when the GPS Glide Slope (VDI) becomes valid.
- ☐ The autopilot does not support any vertical capture or tracking in this installation.

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Analog only autopilots should use APR mode for coupling to LNAV approaches. Autopilots which support digital roll steering commands (GPSS) may utilize NAV mode and take advantage of the digital tracking during LNAV only approaches.

4.5 WFDE Prediction Program

The Garmin WAAS Fault Detection and Exclusion (WFDE) Prediction Program is required for Remote/Oceanic operations.

The Prediction Program should be used in conjunction with the Garmin 400W/500W Simulator. After entering the intended route of flight in the Simulator flight plan the pilot selects the FDE Prediction Program under the Options menu of the Simulator program.

For detailed information refer to the WFDE prediction program instructions (190-00643-01). The availability of FDE is only required for Oceanic or Remote operations.

Section 5. PERFORMANCE

No change.

Section 6. WEIGHT AND BALANCE

See current weight and balance data.

Section 7. SYSTEM DESCRIPTIONS

See Garmin 400W Series unit Pilot's Guide for a complete description of the 400W Series unit.

400W Series

Instructions for Continued Airworthiness

Document Number 190-00356-65 Rev. B

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Record of Revision

Rev.	Date	Description of Change
1	10-19-06	Initial Release
A	11-03-06	Revision for STC Issuance
B	07-30-09	Add the "-D" to STC number when reissued under ODA

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1. INTRODUCTION

1.1 PURPOSE

This document is designed for use by the installing agency of the Garmin Model 400W Series GPS/WAAS Nav/Com as Instructions for Continued Airworthiness in response to Federal Aviation regulation (FAR) Part 23.1529, and Part 23 Appendix G. The ICA includes information required by the operator to adequately maintain the Garmin Models 400W series installed under Approved Model List (AML) STC SA01933LA-D.

1.2 Scope

This document identifies the Instruction for Continued Airworthiness for the modification of the aircraft for installation of the Garmin Models 400W series GPS/WAAS Nav/Com installed under Approved Model List (AML) STC SA01933LA-D.

1.3 Document Control

This document shall be released, archived, and controlled in accordance with the Garmin document control system. When this document is revised, refer to Section 2.15 for information on how to gain FAA acceptance or approval and how to notify customers of changes.

1.4 Airworthiness Limitations Section

There are no additional Airworthiness Limitations as defined in 14 CFR § 23, Appendix G. G23.4 that result from this modification. 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.

1.5 Permission to Use Certain Documents

Permission is granted to any corporation or person applying for approval of a Garmin Model 400W Series to use and reference appropriate STC documents to accomplish the Instructions for Continued Airworthiness and show compliance with STC engineering data. This permission does not construe suitability of the documents. It is the responsibility of the applicant to determine the suitability of the documents for the ICA.

1.6 Definitions

The following terminology is used within this document:

- 1) **AC:** Advisory Circular
- 2) **ACO:** Aircraft Certification Office
- 3) **AEG:** Aircraft Evaluation Group
- 4) **CFR:** Code of Federal Regulations
- 5) **DER:** Designated Engineering Representative
- 6) **FAA:** Federal Aviation Administration

- 7) **IAW:** In Accordance With
- 8) **ICA:** Instructions for Continued Airworthiness
- 9) **MFD:** Multi-Function Display unit
- 10) **PMI:** Primary Manufacturing Inspector
- 11) **POI:** Primary Operations Inspector
- 12) **STC:** Supplemental Type Certificate
- 13) **TC:** Type Certification or Type Certificate
- 14) **TSO:** Technical Standard Order

2. INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

2.1 Introduction

Content, Scope, Purpose and Arrangement:	This document identifies the Instructions for Continued Airworthiness for the modification of the aircraft by installation of the Garmin Models 400W Series GPS/WAAS Nav/Com.
Applicability:	Applies to aircraft altered by installation of the Garmin Model 400W Series GPS/WAAS Nav/Com.
Definition of Abbreviations:	See Section 1.6
Precautions:	None
Units of measurement:	None
Referenced publications:	190-00356-02 Rev. G <i>400W Series Installation Manual</i>
(or later FAA approved revisions)	005-C0221-00 Rev. F <i>400W Series STC Master Data List</i>
Retention:	This document, or the information contained within, will be included in the aircraft's permanent records.

2.2 Description of Alteration

The Garmin Model 400W Series GPS/WAAS Nav/Com unit is a 6 ¼ inch wide panel mounted unit with all the interface connections behind the instrument panel. Installation of the Garmin Model 400W Series GPS/WAAS Nav/Com system interfaces, specific for the aircraft installation, is documented in the GNS 400W Series Post-Installation Checkout Log that is retained as part of the aircraft's permanent records. The 400W Series units combine a large number of easily acceptable controls to use the color multi-function display, Nav and Com transceiver, GPS/WAAS navigator in a single unit.

2.3 Control, Operating Information

See the 400W Series Installation Manual, listed under the reference documentation in paragraph 2.1 of this document, for system operation and self-test information.

2.4 Servicing Information

None. In the event of system failure, return the unit to the manufacturer or an approved Garmin repair station.

2.5 Periodic Maintenance Instructions

The 400W Series units are designed to detect internal failure. A thorough self-test is executed automatically upon application of power to the units, and built-in test is continuously executed. Detected errors are indicated on the equipment via failure annunciations and maintenance is on-condition.

Operation of the 400W Series unit is not permitted unless an inspection as described in this section has been completed within the preceding 12 calendar months. Conduct a visual inspection on the 400W series unit and its wire harness to insure installation integrity:

1. Inspect the unit for security of attachment.
2. Inspect all knobs and buttons for legibility.
3. Inspect condition of wiring, routing and attachment/clamping.

2.5.1 Cleaning the Front Panel

The front bezel, keypad, and display can be cleaned with a soft cotton cloth dampened with clean water. DO NOT use any chemical-cleaning agents. Care should be taken to avoid scratching the surface of the display.

2.5.2 Display Backlight

The display backlight lamp is rated by the manufacturer as having a usable life of 20,000 hours. This life may be more or less than the rated time depending on the operating conditions of the 400W series unit. Over time, the backlight lamp may dim and the display may not perform as well in direct sunlight conditions. The user must determine by observation when the display brightness is not suitable for its intended use. Contact the Garmin factory repair station when the backlight lamp requires service.

2.5.3 Battery Replacement

The 400W series has an internal keep-alive battery that will last about 10 years. The battery is used for GPS system information. Regular planned replacement is not necessary. The 400W series will display a 'low battery' message when replacement is required. Once the low battery message is displayed, the battery should be replaced within 1 to 2 months.

If the battery is not replaced and becomes totally discharged, the 400W series unit will remain fully operational, but the GPS signal acquisition time may be increased. This acquisition time can be reduced by entering a new seed position each time the unit is powered on. There is no loss of function or accuracy of the 400W series unit with a dead battery.

The battery must be replaced by the Garmin factory repair station or factory authorized repair station.

2.6 Troubleshooting Information

If error indications are displayed on the 400W series unit, consult the Troubleshooting section contained in the 400W Series Installation Manual, listed under reference documentation in paragraph 2.1 of this



document. The '400W Series Post-Installation Checkout Log' in the aircraft permanent records includes the configuration information for the installation. (See Section 5 in the 400W Series Installation Manual for a sample Log).

2.7 Removal and Replacement Information

If the 400W series unit is removed and reinstalled, verify that the 400W series unit power-up self-test sequence is successfully completed and no failure messages are annunciated.

If the 400W series unit is removed for repair and reinstalled, or if the 400W unit is removed and replaced with a different 400W series unit, then follow 'Post Installation Configuration & Checkout Procedures' procedures contained in the 400W Series Installation Manual listed in paragraph 2.1 of this document, and verify the 400W unit power-up self-test sequence is successfully completed and no failure messages are annunciated.

If any work has been done on the aircraft that could affect the system wiring, antenna cable, or any interconnected equipment, verify the 400W series unit power-up self-test sequence is successfully completed and no failure messages are annunciated.

To remove the 400W series unit from the mounting rack, insert a 3/32-inch hex drive tool into the access hole at the bottom of the unit face. Rotate the hex tool counterclockwise until the unit is forced out about 3/8 inches and can be freely pulled from the rack.

The 400W unit is installed in the rack by sliding it straight in until it stops, about 1 inch short of the final position. Insert the hex drive tool into the access hole at the bottom of the unit face. Rotate the hex tool clockwise while pressing on the left side of the bezel until the unit is firmly seated in the rack.

Note: There are no special handling requirements for the 400W series units.

2.8 Diagrams

Refer to the 400W Series Installation Manual (listed under reference documentation in section 2.1 of this document) for drawings applicable to this installation. Point to point wiring diagrams are in Appendix H of the 400W Series Installation Manual. Refer to the GNS 400W Series Post-Installation Checkout Log retained in the aircraft permanent for a list of the interfaced equipment. The antenna cables are routed between the 400W series unit and the antenna with disconnects at each unit. The antenna cable typically is routed behind interior panels in the fuselage.

2.9 Special Inspection Requirements

None, N/A.

2.10 Application of Protective Treatments

None, N/A.

2.11 Data Relative to Structural Fasteners

None, N/A.



2.12 Special Tools

No special tools are required for system checkout. See 400W Series Installation Manual listed in reference documentation in section 2.1 of this document.

2.13 Additional Instructions

None

2.14 Overhaul Period

The system does not require overhaul at a specific time period. Power on self-test and continuous BIT will monitor the health of the 400W series unit. If the unit indicates an internal failure, the unit may be removed and replaced. See troubleshooting section contained in the 400W Series Installation Manual, listed under reference documentation in paragraph 2.1 of this document.

2.15 ICA Revision and Distribution

To revise this ICA, a letter must be submitted to the ACO along with the revised ICA. The ACO will obtain AEG acceptance, and approve any revision to the Airworthiness Limitations Section 1.4. After FAA acceptance/approval, Garmin will release the revised ICA for customer use, and provide any required notification of the revision.

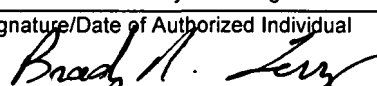
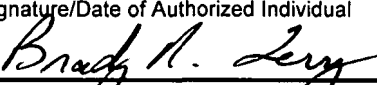
The latest revision of this document will be available on the Garmin website (www.garmin.com). A Garmin Service Bulletin, describing ICA revision, will be sent to dealers if revision is determined to be significant.

2.16 Assistance

Flight Standards Inspectors or the certificate holder's PMI have the required resources to respond to questions regarding this ICA. In addition, the customer may refer questions regarding this equipment and its installation to the manufacturer, Garmin. Garmin customer assistance may be contacted during normal business hours via telephone 913-397-8200 or email from the Garmin web site at www.garmin.com.

2.17 Implementation and Record Keeping

Modification of an aircraft by this Supplemental Type Certificate obligates the aircraft operator to include the maintenance information provided by this document in the operator's aircraft maintenance manual and/or the operator's aircraft scheduled maintenance program.

 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 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 N2702L		Serial No. 414A0608										
	Make CESSNA		Model 414A	Series									
2. Owner	Name (As shown on registration certificate) LONE DUCK AVIATION LLC		Address (As shown on registration certificate) 1211 E 14TH ST RUSSELLVILLE, AR 72802 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 Wings Avionics, Inc. 421 Ernest Lancaster Dr. Fayetteville, AR 72701 USA			B. Kind of Agency <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>☐ U. S. Certified Mechanic</td> <td>☐ Manufacturer</td> </tr> <tr> <td>☐ Foreign Certified Mechanic</td> <td>C. Certificate No.</td> </tr> <tr> <td>☒ Certified Repair Station</td> <td>W1NR1050</td> </tr> <tr> <td>☐ Certified Maintenance Organization</td> <td>RADIO, LIMITED AIRFRAME</td> </tr> </table>			☐ U. S. Certified Mechanic	☐ Manufacturer	☐ Foreign Certified Mechanic	C. Certificate No.	☒ Certified Repair Station	W1NR1050	☐ Certified Maintenance Organization	RADIO, LIMITED AIRFRAME
☐ U. S. Certified Mechanic	☐ Manufacturer												
☐ Foreign Certified Mechanic	C. Certificate No.												
☒ Certified Repair Station	W1NR1050												
☐ Certified Maintenance Organization	RADIO, LIMITED AIRFRAME												
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  BRADY N TERRY 15-October-2012											
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													
	FAA Flt. Standards Inspector		Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport								
BY	FAA Designee	☒	Repair Station	Inspection Authorization	Other (Specify)								
Certificate or Designation No. W1NR1050		Signature/Date of Authorized Individual  BRADY N TERRY 15-October-2012											

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 N2702L

Oct-15-2012

Nationality and Registration Mark

Date

N2702L

C414A S/N 414A0608

15-OCT-2012

1. INSTALLED A GARMIN GA35 GLOBAL POSITIONING SYSTEM (GPS)/WIDE AREA AUGMENTATION SYSTEM (WAAS) ANTENNA (ANT).
2. THE GA35 GPS/WAAS ANT, PART NUMBER (P/N) 013-00235-00, SERIAL NUMBER (S/N) 87645, WAS INSTALLED AT FLIGHT STATION 149 USING GEORGIAN AEROSPACE GROUP LEFT HAND (LH) GA35 GPS ANT DOUBLER INSTALLATION DRAWING NUMBER 70G-316F276, REVISION IR, DATED 10-02-2012; ANT DOUBLER DETAIL DRAWING NUMBER 00G-316D001, REVISION IR, DATED 08-26-2004; WITH FAA FORM 8110-3, DATED OCTOBER 02, 2012.
3. THE GA35 GPS/WAAS ANT WAS INTERFACED TO THE GNS430W GLOBAL NAVIGATION SYSTEM GPS INPUT USING A FABRICATED RG400 COAXIAL CABLE ASSEMBLY.
4. A LOGBOOK ENTRY UNDER WORK ORDER NUMBER 5563 WAS ENTERED IN THE AIRCRAFT RECORDS. WEIGHT AND BALANCE RECORDS AND EQUIPMENT LIST REVISED.
5. POST-INSTALLATION GROUND CHECKS WERE PERFORMED IN ACCORDANCE WITH THE MANUFACTURER INSTALLATION MANUAL AND FOUND TO OPERATE PROPERLY.
6. INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ARE ATTACHED AS ADDITIONAL SHEETS.***END***



ADDITIONAL SHEETS ARE ATTACHED



U.S. Department of Transportation
Federal Aviation Administration

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (*For Field Approvals-FAA Form 337*)

A/C Make: CESSNA Model: 414A S/N: 414A0608 Reg. #: N2702L
Revision: ORIGINAL Date: 15-Oct-12

These sixteen item checklist are Instructions for Continued Airworthiness (ICA), and are applicable to the aircraft listed above when the following equipment is installed:

SYSTEM:

ITEM	CHECKLIST INFORMATION
1.	Introduction: This section briefly describes the aircraft, engine, propeller, or component that has been altered. Include any other information on the content, scope, purpose, arrangement, applicability, definitions, abbreviations, precautions, units of measurement, referenced publications, and distribution of the ICA as applicable. Comments: AIRFRAME ALTERATION.
2.	Description: Of the major alteration, its functions, including an explanation of its interface with other systems, if any. Comments: INSTALLED A GARMIN GA35 GLOBAL POSITIONING SYSTEM (GPS)/WIDE AREA AUGMENTATION SYSTEM (WAAS) ANTENNA (ANT).
3.	Control: Operation information: Or special procedures, if any. Comments: NOT APPLICABLE.
4.	Servicing information: Such as types of fluids used, servicing points, and location of access panels, as appropriate. Comments: N/A.
5.	Maintenance Instructions: Such as recommended inspection/maintenance periods in which each of the major alteration components are inspected, cleaned, lubricated, adjusted, tested, including applicable wear tolerances and work recommended at each scheduled maintenance period. This section refers to the manufacturers' instructions for the equipment installed where appropriate (e.g., functional checks, repairs, inspections.) It should also include any special notes, cautions, or warnings, as applicable. Comments: "ON-CONDITION" MAINTENANCE REQUIRED ONLY. CONSULT FAR PART 43, APPENDIX D, SECTION I, FOR RADIO AND ELECTRONIC EQUIPMENT INSPECTIONS DURING ANNUAL AND 100 HOUR INSPECTIONS.
6.	Trouble shooting information: Information describing possible malfunctions, how to recognize those malfunctions, and the remedial actions to be taken. Comments: CONSULT AC 43.13-1B CHANGE 1, SECTION 2, REGARDING GROUND OPERATIONAL CHECKS FOR AVIONICS EQUIPMENT. CONSULT THE MANUFACTURER INSTALLATION MANUAL FOR DETAILED INFORMATION.

7.	Removal and replacement information: This section describes the order and method of removing and replacing products, parts and any necessary precautions. This section should also describe or refer to manufacturer's instructions to make required tests, trim checks, alignment, calibrations, center of gravity changes, tilting or shoring, etc., if any. Comments: THE GA35 GPS/WAAS ANT CAN BE ACCESSED BY REMOVING THE UPPER LEFT HEADLINER ASSEMBLY LOCATED ABOVE THE PILOT SEATING, AND REMOVED WITH ATTACHING HARDWARE.
8.	Diagrams: Of access plates and information, if needed, to gain access for inspection. Comments: N/A.
9.	Special inspection requirements: Such as X-ray, ultrasonic testing, or magnetic particle inspection, if required. Comments: N/A.
10.	Application of protective treatments: To the affected area after inspection and/or maintenance, if any. Comments: N/A.
11.	Data: Relative to structural fasteners such as type, torque, and installation requirements, if any. Comments: N/A.
12.	List of special tools: Special tools that are required, if any. Comments: N/A.
13.	For commuter category aircraft: The following additional information must be furnished, as applicable: A. Electrical loads B. Methods of balancing flight controls C. Identification of Primary and secondary structures D. Special repair methods applicable to the airplane. Comments: N/A.
14.	Recommended overhaul periods: Are required to be noted on the ICA when an overhaul period has been set by the manufacturer of a component, or equipment. If there is no overhaul period, the ICA should state for item 14: No additional overhaul time limitations. Comments: NO ADDITIONAL OVERHAUL TIME LIMITATIONS.

15.	Airworthiness Limitation Section: Include any "approved" airworthiness limitations identified by the manufacturer or FAA Type Certificate Holding Office (e.g., An STC incorporated in a larger field approved major alteration may have an airworthiness limitation.) The FAA inspector should not establish, alter, or cancel airworthiness limitations without coordinating with the appropriate FAA Type Certificate Holding Office. If there are no changes to the airworthiness limitations, the ICA should state for item 15: "No additional airworthiness limitations" or "Not Applicable." Comments: NOT APPLICABLE.
16.	Revision: This section should include information on how to revise the ICA. For example, a letter will be submitted to the local FSDO with a copy of the revised FAA Form 337 and revised ICA. The FAA inspector accepts the change by signing Block 3 and including the following statement: "The attached revised/new Instructions for Continued Airworthiness (date) for the above aircraft or component major alteration have been accepted by the FAA, superseding the Instructions for Continued Airworthiness (date)." Once the revision has been accepted, a maintenance record entry will be made, identifying the revision, its location, date of the Form 337. Comments: N/A.

Note:

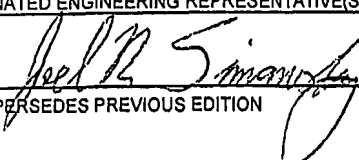
Implementation and Record Keeping: For major alterations performed in accordance with FAA Field Approval policy, the owner/ operator operating under part 91 is responsible for ensuring that the ICA is made part of the applicable section 91.409 inspection program for their aircraft. This is accomplished when a maintenance entry is made in the aircraft's maintenance record in accordance with section 43.9. This entry records the major alteration and identifies the original ICA location (e.g., Block 8 of FAA Form 337, dated 5/28/98) along with a statement that the ICA is now part of the aircraft's inspection/maintenance requirements.

For major alterations performed in accordance with a field approval on air carrier aircraft, the air carrier operator is

Responsible for ensuring that the ICA is made part of the applicable inspection/maintenance program for their aircraft. If a procedure is not currently included in the operator's manual to incorporate ICA, this process will need to be appropriately addressed (i.e. the operator submits a revision to its maintenance program to the applicable certificate-holding district office (CHUDO).

For aircraft inspected under an Approved Aircraft Inspection Program (AAIP), the operator will submit a change to the CHDO in accordance with section 135.419 b).

For air carrier aircraft inspected using an annual/100 hour inspection program, a reference to the new ICA will be made in the aircraft's maintenance record in accordance with section 43.9. This entry records the major alteration and identifies the original ICA location (e.g., ICA is located/attached to Block 8 of FAA Form 337, dated 5/28/98). In addition, the operator will request a revision to the operator's Operations Specifications, additional maintenance requirements, which incorporates the ICA into the inspection program.

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION			1. DATE
STATEMENT OF COMPLIANCE WITH AIRWORTHINESS STANDARDS			02 October 2012
AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION			
2. MAKE	3. MODEL NO.	4. TYPE (Aircraft, Engine, Propeller, etc.)	5. NAME OF APPLICANT
Cessna Aircraft Company	414A	Aircraft	Wings Avionics, Inc. CRS# W1NR1050
LIST OF DATA			
6. IDENTIFICATION		7. TITLE	
DRAWINGS: REV:			
70G-316F276 IR (Dated 02 Oct 2012)		Instl, LH GA35 GPS Antenna, FS 149	
00G-316D001 IR (Dated 26 Aug 2004)		Detail, Antenna Doubler	
REPORTS:			
70GR316F276 IR (Dated 25 Sep 2012)		Structural Analysis of Drawing 70G-316F276	
-----END OF DATA-----		-----END OF DATA-----	
NOTES:			
1. The structural aspects only of the above listed data are approved herein, only those regulations listed below in "Applicable Requirements" are approved. 2. The approval is only for the engineering design and is not installation approval. 3. For Certification Basis, refer to TC Data Sheet Number A7CE. 4. Drawing 00G-316D001 Rev: IR was previously approved by Mr. Daniel J. Utterson on 8110-3 identified as "SALU-027" dated: 26 August 04			
8. PURPOSE OF DATA			
In support of the Major Alteration listed for Cessna Aircraft Company Model 414A, SN: 414A0608 (NN: N2702L).			
9. APPLICABLE REQUIREMENTS (List specific sections)			
CAR 3.171, .172, .173, .174, .197, .292, .293, .294, .295, .296, .301.			
10. CERTIFICATION - Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under 14 CFR Part 183, data listed above and on attached sheets numbered <u>None</u> have been examined in accordance with established procedures and found to comply with applicable requirements of the Airworthiness Standards listed.			
☐ Recommend approval of these data ☒ Approve these data			
I (We) Therefore			
11. SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVE(S)	12. DESIGNATION NUMBER(S)	13. CLASSIFICATION(S)	
Joel R. Simansky 	DETR-830566-CE	Structures	

INTRODUCTION

The following report outlines the structural aspects only of the installation of the GA35 GPS Antenna located at F.S. 149 on left side of the aircraft centerline on the upper skin. This installation is on the Cessna Model: 414A, SN: 414A0608, as defined on drawing 70G-316F276. Structural substantiation for the installation is per the pertinent sections of CAR 3.

3.171	Loads
3.172	Factor of safety
3.173	Strength & Deformation
3.174	Proof of structure
3.197	Pressurized cabin loads
3.292	Materials and workmanship
3.293	Fabrication methods
3.294	Standard fastenings
3.295	Protection
3.296	Inspection Provisions
3.301	Material strength properties and design values

DISCUSSION

The GA35 GPS Antenna is installed on the aircraft upper skin, fabricated of 0.032" thick 2024-T42 clad aluminum. For the antenna, a 0.75" diameter hole is cut thru the skin and doubler, fabricated from 0.040" thick 2024-T3 clad aluminum. The doubler is installed on the cabin side of the skin with NAS1097AD4 rivets and is detailed on Georgian Aerospace Group, Inc., drawing 00G-316D001.

ALLOWABLES**Original Material**

2024-T42 Clad Aluminum (*0.010" to 0.062" thickness*)

Reference 1 Table 3.2.3.0(e₃)

$$F_{tu} = 57 \text{ ksi}$$

$$F_{cy} = 34 \text{ ksi}$$

$$F_{bru} (e/D = 2.0) = 113 \text{ ksi}$$

Doubler Material

2024-T3 Clad Aluminum

Reference 1 Table 3.2.3.0(e₁)

$$F_{tu} = 59 \text{ ksi}$$

$$F_{cy} = 36 \text{ ksi}$$

$$F_{bru} (e/D = 2.0) = 121 \text{ ksi}$$

Fasteners

NAS1097AD4 Rivet (*in 0.032" 2024-T42 clad sheet*)

Reference 2 Figure 54

$$P_{shear} = 300 \text{ lbs}$$

$$P_{bearing} = 0.129" \times 0.032" \times 113 \text{ ksi} = 466 \text{ lbs}$$

$$\rightarrow P_{NAS1097AD4} = 300 \text{ lbs}$$

ANALYSIS

Due to the low frontal surface area of the antenna, aerodynamic forces are considered to not be critical.

Analysis Continued

The following equivalent strength analysis is based upon ultimate tensile strength values of the skin material, thus existing airframe design margins of safeties are already accounted (IE, 1.5 factor of safety per CAR 3.172 and 1.33 factor of safety per CAR 3.197(c)).

Material

The loss in strength due to the cutout will be calculated by the use of the material's ultimate tensile strength, skin thickness and cutout diameter (0.75"). The short side (width) of the doubler is 4.0" which is used to check the installation material. A Comparative Margin of Safety will be calculated.

$$P_{lost} = L_{hole} \times t \times F_{tu} = 0.75'' \times 0.032'' \times 57 \text{ ksi} = 1,368 \text{ lbs}$$

$$P_{doubler} = (L_{doubler} - L_{hole}) \times t_{doubler} \times F_{tu \text{ doubler}} = (4.0'' - 0.75'') \times 0.040'' \times 59 \text{ ksi} = 7,670 \text{ lbs}$$

$$M.S. = \frac{P_{doubler}}{P_{lost}} - 1.0 = \frac{7,670 \text{ lbs}}{1,368 \text{ lbs}} - 1.0 = +4.61 \quad \leftarrow \text{Material}$$

Fasteners

The doubler is fastened to the skin with a minimum of five (5) each NAS1097AD4 rivets in each of the four (4) sides of the cutout. A Comparative Margin of Safety will be calculated.

$$M.S. = \frac{P_{fstnr} \times \#_{fstnr}}{P_{lost}} - 1.0 = \frac{300 \text{ lbs} \times 5 \text{ fasteners}}{1,368 \text{ lbs}} - 1.0 = +0.10 \quad \leftarrow \text{Fasteners}$$

CONCLUSION

It is concluded that the GA35 GPS Antenna installation shown on drawing 70G-316F276 meets the requirements of CAR 3 as listed in the Introduction.

REFERENCE

- 1) MIL-HDBK-5G, *Metallic Materials and Elements for Aerospace Vehicle Structures*, 1994.
- 2) Douglas, *DC-10 Structural Repair Manual*.

— End of Report —

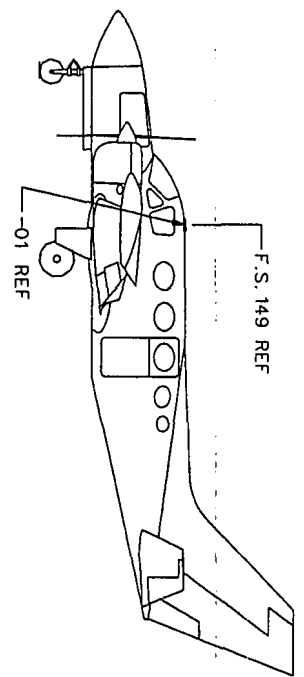
William Bausch
September 25, 2012

9. THE FOLLOWING ABBREVIATIONS MAYBE USED ON THIS DRAWING:
EQUALLY SPACED IS "=". & REFERENCE IS "()".
8. ORIENT NUTPLATE AS INDICATED ON DRAWING. INSTALL
ITEM 09 (NUTPLATE) WITH 2 EACH ITEM 10 (RIVET).
7. THE FOLLOWING PN ARE ACCEPTABLE SUBSTITUTES FOR
ITEM 09 (NUTPLATE): NAS1473A08, NAS1474A08 OR MS21069L06.
6. FASTENER CODE:
+ — EXISTING FASTENER (REF).

5. BEAD SEAL ANTENNA INSTALLATION WITH PRI422B
SEALANT (OR EQUIVALENT).
4. USE PRI422B SEALANT (OR EQUIVALENT) BETWEEN
LAYING SURFACES OF PRIMARY OR SECONDARY
AIRFRAME STRUCTURE AS APPLICABLE.
3. ALODINE PER MIL-DTL-5541 AND APPLY PRIMER
PER MIL-PRF-23377 ON ALL APPLICABLE PARTS.
2. BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
1. MATERIAL PROCESS AND METHODS SHALL COMPLY WITH
PERTINENT FAA AC NO. 43.13 SPECIFICATIONS OR EQUIVALENT.

-GENERAL NOTES-

THESE TECHNICAL DATA AND THE DESIGN DISCLOSED HEREIN ARE THE
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HEREIN, OR THAT MAY BE ASSERTED AGAINST SUCH PERSONS TO THE
EXTENT THAT SUCH RIGHTS EXIST.

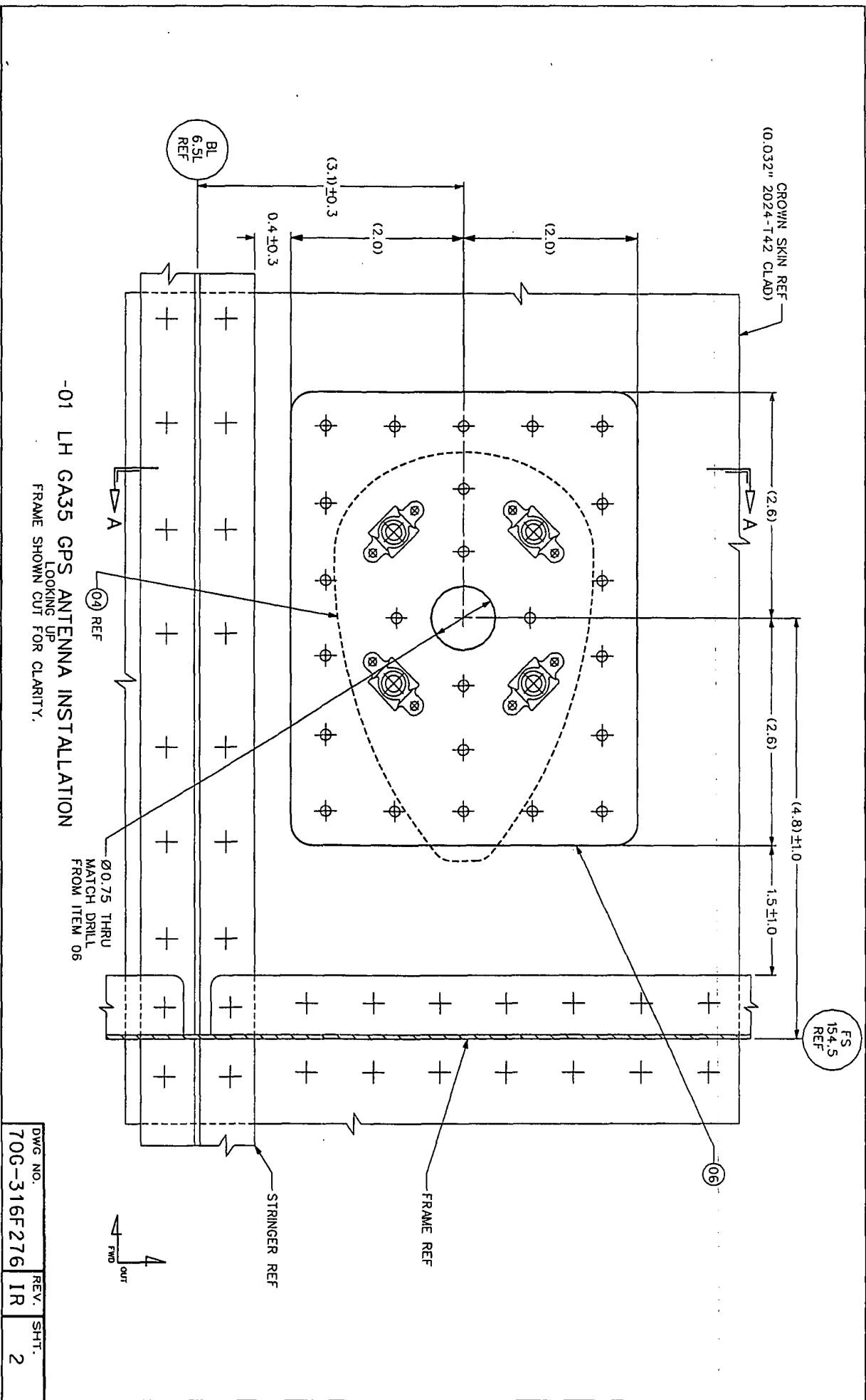


GENERAL LOCATION

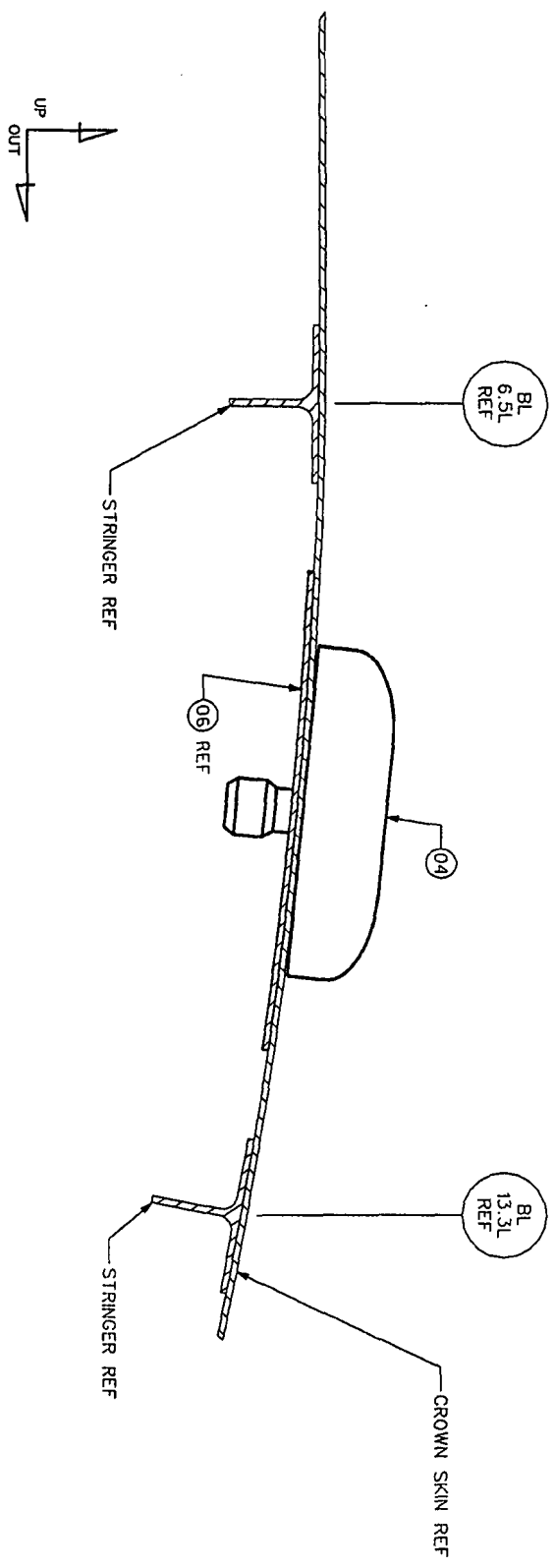
(SCALE: NONE)

INSTL/OTY		ITEM		PART NUMBER		NOMENCLATURE		VENDOR / MATERIAL	
AR	11			NAS1097AD4		RIVET			
	10			MS20426AD3		RIVET			
	09			MS21059L08		NUTPLATE			
	08			MS35190-257		SCREW			
	07								
	06			00G-3160001-040		ANTENNA DOUBLER, 0.040"		GAG, INC., DRAWING	
	05								
	04			013-00235-00		GA35 GPS ANTENNA (REF)		GARMIN	
	03								
	02								
	01			-01		LH GA35 GPS ANTENNA INSTALL			
	-01								

LIST OF MATERIALS		TITLE	
ANCHOR: CESSNA 414A	ANCHOR NO: 414A0608	INSTL, LH GA35 GPS	
PREPARED BY: BILL BAUSCH	DATE: 9/25/12	ANTENNA, FS 149	
CHECKED BY: [Signature]	DATE: 10/2/12		
 GEORGIAN AEROSPACE GROUP, INC.		SCALE: FULL DWG: 70G-316F276 REV: 1 of 3	

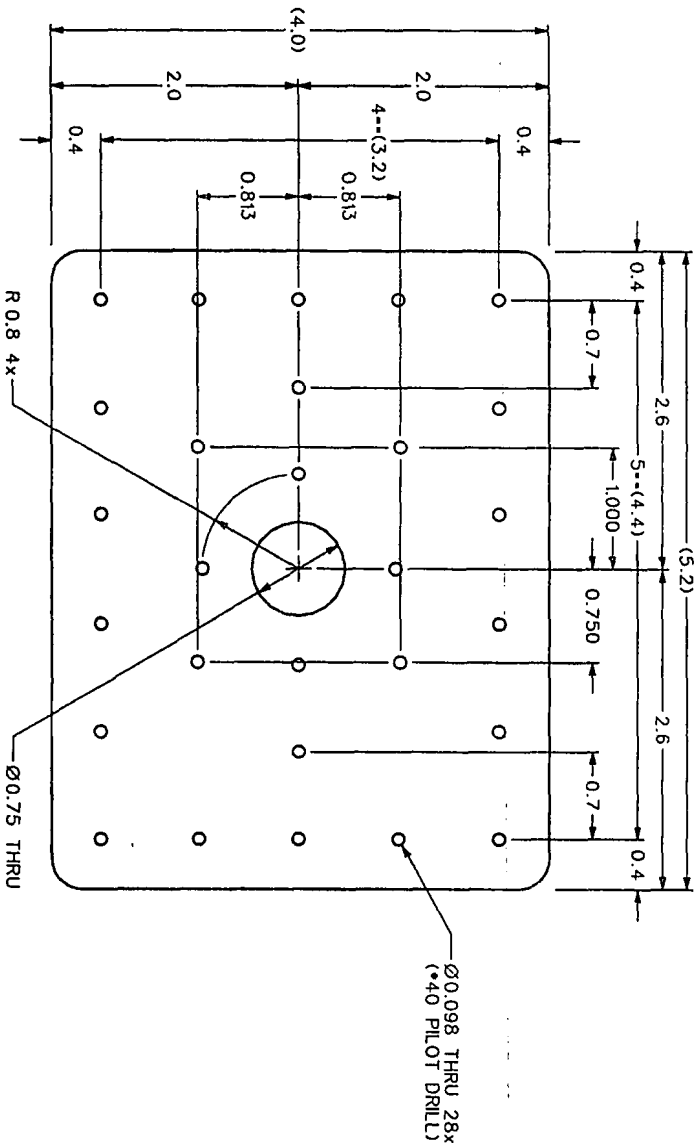


DWG NO.	REV.	SHT.
70G-316F276	1R	2



SECTION A-A
LOOKING AFT

DWG NO.	REV.	SHT.
70G-316F276	1R	3 of 3



-040 OR -050 ANTENNA DOUBLER (ITEMS 01 OR 02)

- THE FOLLOWING ABBREVIATIONS ARE USED ON THIS DRAWING:
EQUALLY SPACED IS "E" & REFERENCE IS "R".
- BEFORE INSTALLATION OF ITEM 01 OR 02 (ANTENNA DOUBLERS),
ROLL TO MATCH SPECIFIC AIRCRAFT MOLD LINE RADIUS.
- ALODINE PER MIL-C-5541 AND APPLY PRIMER
PER MIL-P-23377 ON ALL APPLICABLE PARTS.
- BREAK ALL SHARP EDGES AND REMOVE ALL BURRS.
- MATERIAL PROCESS AND METHODS SHALL COMPLY WITH
PERTINENT FAA AC NO. 43.13 SPECIFICATIONS OR EQUIVALENT.

-GENERAL NOTES-

THESE TECHNICAL DATA AND THE DESIGNER'S DESIGN ARE THE
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ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL,
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SYSTEM, WITHOUT THE WRITTEN CONSENT OF GEORGIAN AEROSPACE
GROUP, INC. THE RECIPIENT OF THIS DOCUMENT, BY ITS RETURN AND USE
HEREIN, IS TO BE CONSIDERED TO HAVE AGREED TO THESE
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INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION
SYSTEM, WITHOUT THE WRITTEN CONSENT OF GEORGIAN AEROSPACE
GROUP, INC. EXCEPT THAT SUCH RIGHTS EXIST.

APPROVED BY: [Signature]
DATE: 12/20/04
D.J. UTTERSON

UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS
TOLERANCES
FRACTIONAL TOLERANCES
DECIMAL TOLERANCES
HOLE TOLERANCES
SHAFT TOLERANCES
ALL DIMENSIONS ARE IN INCHES
DIMENSIONS
TOLERANCES
FRACTIONAL TOLERANCES
DECIMAL TOLERANCES
HOLE TOLERANCES
SHAFT TOLERANCES

PREPARED BY: [Signature]
DATE: 12/20/04
D.J. UTTERSON

GEORGIAN
AEROSPACE
GROUP, INC.

DETAIL, ANTENNA DOUBLER
SCALE: FULL
PART: 00G-316D001
REV: 1
SHEET: 1 of 1



US Department
of Transportation
Federal Aviation
Administration

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

Form Approved
OMB No. 2120-0020

For FAA Use Only

Office Identification

AWCE-05

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 civil penalty not to exceed \$1,000 for each such violation (Section 901 Federal Aviation Act of 1958).

1. Aircraft	Make CESSNA	Model C 414A
	Serial No. 414A0608	Nationality and Registration Mark USA-N2702L
2. Owner	Name (As shown on registration certificate) BERGTOLD MARGARET A	Address (As shown on registration certificate) RR 1 BOX 154 GOODMAN MO. 64843-9710

3. For FAA Use Only

4. Unit Identification

5. Type

Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	(As described in Item 1 above)				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				

6. Conformity Statement

A. Agency's Name and Address	B. Kind of Agency	C. Certificate No.
RON SIDENSTRICKER PO BOX 72 NECK CITY MO. 64849	☒ U.S. Certificated Mechanic ☐ Foreign Certificated Mechanic ☐ Certificated Repair Station ☐ Manufacturer	2843114

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.

Date 1/18/06	Signature of Authorized Individual <i>[Signature]</i>
-----------------	--

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Fit. Standards Inspector	Manufacturer	☒	Inspection Authorization	Other (Specify)
	FAA Designee	Repair Station		Person Approved by Transport Canada Airworthiness Group	
Date of Approval or Rejection 1/18/06		Certificate or Designation No. A&P 3008859 IA		Signature of Authorized Individual <i>[Signature]</i>	

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.)

Installed(4) RAM "slip-joint" assy's. p/n's 1001-3 , done IAW STC #
SA4331SW per RAM dwg.#1153 and installation instructions furnished . For continued
airworthiness TO BE INSPECTED IAW AD 2000-01-16 mandatory .

—————END—————

| Additional Sheets Are Attached



US Department
of Transportation
Federal Aviation
Administration

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

Form Approved
OMB No. 2120-0020

For FAA Use Only

Office Identification

ARM
ACE-FS10-05

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 of 1958).

1. Aircraft	Make Cessna	Model 414A
	Serial No. 414A-0608	Nationality and Registration Mark USA N-2702L
2. Owner	Name (As shown on registration certificate) Bergtold Margaret A	Address (As shown on registration certificate) Route 1 Box 154 Goodman MO 64843

3. For FAA Use Only

4. Unit Identification				5. Type	
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	~~~~~(As described in Item 1 above)~~~~~				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				

6. Conformity Statement

A. Agency's Name and Address Kings Avionics, Inc. One Kings Court Box 19 New Century, KS 66031-0019	B. Kind of Agency ☐ U.S. Certificated Mechanic ☐ Foreign Certificated Mechanic ☒ Certificated Repair Station ☐ Manufacturer	C. Certificate No. TF2R185L Radio Class 1,2,3
---	--	---

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.

Date May 9, 2001	Signature of Authorized Individual 2347550
----------------------------	--

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Flt. Standards Inspector	Manufacturer	Inspection Authorization	Other (Specify)
	FAA Designee	X Repair Station	Person Approved by Transport Canada Airworthiness Group	
Date of Approval or Rejection 05-09-01		Certificate or Designation No. TF2R185L	Signature of Authorized Individual 2347550	

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.)

Installed Garmin Model GNS-430 per manufacturer prints and drawings contained in installation manual P/N 190-00140-02 Rev. G dated April 2000.

Equipment List and Weight and Balance updated.

See Weight and Balance this date for loading.

Aircraft placard "GPS NOT APPROVED FOR IFR".

Installation complies with AC-43.13 1B and 2A.

-----THE END-----

☐ Additional Sheets Are Attached



US Department
of Transportation
Federal Aviation
Administration

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

Form Approved
OMB No. 2120-0020

For FAA Use Only

Office Identification

APR
ACE-FSDO-05

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 of 1958).

1. Aircraft	Make Cessna	Model 414A
	Serial No. 414A-0608	Nationality and Registration Mark USA N-2702L
2. Owner	Name (As shown on registration certificate) Bergtold Margaret A	Address (As shown on registration certificate) Route 1 Box 154 Goodman MO 64843

3. For FAA Use Only

4. Unit Identification

5. Type

Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	~~~~~ (As described in Item 1 above) ~~~~~				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				

6. Conformity Statement

A. Agency's Name and Address Kings Avionics, Inc. One Kings Court Box 19 New Century, KS 66031-0019	B. Kind of Agency ☐ U.S. Certificated Mechanic ☐ Foreign Certificated Mechanic ☒ Certificated Repair Station ☐ Manufacturer	C. Certificate No. TF2R185L Radio Class 1,2,3
---	--	---

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.

Date May 9, 2001	Signature of Authorized Individual <i>[Signature]</i> 2347550
----------------------------	--

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Ftl. Standards Inspector	Manufacturer	Inspection Authorization	Other (Specify)
	FAA Designee ☒	Repair Station	Person Approved by Transport Canada Airworthiness Group	
Date of Approval or Rejection 05-09-01		Certificate or Designation No. TF2R185L	Signature of Authorized Individual <i>[Signature]</i> 2347550	

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.)

Installed BF Goodrich WX-500 Stormscope per manufacturer prints and drawings contained in the installation manual P/N 009-11500-001 Rev. B dated May 16, 2000.

Installation meets or exceeds AC 43.13-2A Chapters 1, 2, and 3, acceptable methods, techniques, and practices.

The installation was done per BF Goodrich installation manual P/N 009-11500-001 (A).

Weight and Balance and Equipment List updated this date.

Ground checked satisfactory.

Flight test accomplished and systems checked normal.

-----THE END-----

☐ Additional Sheets Are Attached



US Department
of Transportation
Federal Aviation
Administration

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

Form Approved
OMB No. 2120-0020

For FAA Use Only

Office Identification

ACE-FSDO-05

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 of 1958).

1. Aircraft	Make Cessna	Model 414A
	Serial No. 414A-0608	Nationality and Registration Mark USA N-2702L
2. Owner	Name (As shown on registration certificate) Bergtold Margaret A	Address (As shown on registration certificate) Route 1 Box 154 Goodman MO 64843

3. For FAA Use Only

The data identified herein complies with the applicable airworthiness requirements and is approved for the above described aircraft, subject to conformity inspection by a person authorized in FAR Part 43, Section 43.7.

**AIRPLANE FLIGHT MANUAL SUPPLEMENT
IS COMPATIBLE WITH THIS AIRCRAFT.**

CE-05 5/31/01 *Allen R. Mantera*
District Office Date Signature of FAA Inspector

4. Unit Identification

5. Type

Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	~~~~~ (As described in Item 1 above) ~~~~~				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				

6. Conformity Statement

A. Agency's Name and Address Kings Avionics, Inc. One Kings Court Box 19 New Century, KS 66031-0019	B. Kind of Agency	C. Certificate No. TF2R185L Radio Class 1,2,3
	☐ U.S. Certificated Mechanic	
	☐ Foreign Certificated Mechanic	
	☒ Certificated Repair Station	
	☐ Manufacturer	

D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.

Date May 9, 2001	Signature of Authorized Individual <i>[Signature]</i> 2347550
----------------------------	--

7. Approval for Return To Service

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA Flt. Standards Inspector	Manufacturer	Inspection Authorization	Other (Specify)
	FAA Designee	☒ Repair Station	Person Approved by Transport Canada Airworthiness Group	
Date of Approval or Rejection 06-07-01		Certificate or Designation No. TF2R185L	Signature of Authorized Individual <i>[Signature]</i> 2347550	

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.)

Installed a Garmin GNS-430 Nav/Com/GPS. The equipment was installed in accordance with Garmin installation manual P/N 190-00140-02 Rev. B dated October 22, 1998. In addition to the referenced manufacturer installation manual, the installation of this equipment was made in accordance with FAA AC 43.13-2A paragraphs 2, 4, 5, 9, 10, 11, 12, 21, 22, 24, 27, and 36.

The pilot has the ability to select either Nav-1 or GPS for display on the HSI and input to the Autopilot system. Barometric altitude information is supplied to the GNS-430 from the pilot's encoder.

FAA Advisory Circular 20-138 was used as a basis to evaluate and approved this GPS equipment for use as a supplemental navigation system for oceanic and remote, domestic en route, terminal, and non-precision instrument approach (except localizer, localizer directional aid (LDA) and simplified directional facility (SDF)) operations. This installation was evaluated as a "follow-on" approval to the Garmin installation approved in accordance with STC SA00705W3 issued 10/21/98.

The following specific paragraphs in AC 20-138 were complied with to evaluate and obtain IFR Airworthiness Installation approval as provided for in paragraph 8.C2 "Follow-On IFR Airworthiness Installation Approvals": 8c (2) (i) (A), 8c (2) (i) (B), 8c (2) (i) (C), and 8c (2) (i) (D).

A data evaluation was conducted I/A/W AC 20-138 paragraph 8c (2) (iii) which was similar to that outlined in paragraph 8c (1) (ii), specifically as follows: paragraph 8c (1) (ii) (A), 8c (1) (ii) (B), 8c (1) (ii) (C), 8c (1) (ii) (D), 8c (1) (ii) (E), 8c (1) (ii) (F), and 8c (1) (ii) (G).

A function flight evaluation was made in accordance with AC 20-138 paragraph 8c (2) (iv) (A), 8c (2) (iv) (B), 8c (2) (iv) (C), 8c (2) (iv) (D), 8c (2) (iv) (E), 8c (2) (iv) (F), 8c (2) (iv) (G), 8c (2) (iv) (H), 8c (2) (iv) (I), 8c (2) (iv) (J), and 8c (2) (iv) (K).

"GPS not approved for IFR" placard was removed.

A FAA Approved Airplane Flight Manual Supplement has been added to the FAA Approved Airplane Flight Manual.

An entry documenting this installation and IFR approval status has been made in the aircraft log.

The instructions for continuous airworthiness items 1 - 16 are not applicable.

-----THE END-----

☐ Additional Sheets Are Attached

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION				Form Approved Budget Bureau No. 04-R060.1	
MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				FOR FAA USE ONLY	
				OFFICE IDENTIFICATION <i>NECO</i> <i>FILED ESPO</i>	
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.					
1. AIRCRAFT	MAKE	Cessna		MODEL	414A
	SERIAL NO.	414A-0608		NATIONALITY AND REGISTRATION MARK	N2702L
2. OWNER	NAME (As shown on registration certificate)		ADDRESS (As shown on registration certificate)		
	D.W. Machine Products, Inc.		1111 Sixth Street Highland, Illinois 62249		
3. FOR FAA USE ONLY					
4. UNIT IDENTIFICATION					
UNIT	MAKE	MODEL	SERIAL NO.	REPAIR	ALTERATION
AIRFRAME	(As described in item 1 above)				X
POWERPLANT	TCM	TSIO-520-NCNB	L-509818		X
PROPELLER					
APPLIANCE	TYPE				
	MANUFACTURER				
5. TYPE					
6. CONFORMITY STATEMENT					
A. AGENCY'S NAME AND ADDRESS		B. KIND OF AGENCY		C. CERTIFICATE NO.	
RAM Aircraft Corporation P. O. Box 5219 Waco, Texas 76708		U.S. CERTIFICATED MECHANIC FOREIGN CERTIFICATED MECHANIC ☒ CERTIFICATED REPAIR STATION MANUFACTURER		CRS VAIR551K	
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
DATE		SIGNATURE OF AUTHORIZED INDIVIDUAL			
November 18, 1994		<i>[Signature]</i>			
7. APPROVAL FOR RETURN TO SERVICE					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is: ☒ APPROVED ☐ REJECTED					
BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION	OTHER (Specify)	
	FAA DESIGNEE ☒	REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT		
DATE OF APPROVAL OR REJECTION		CERTIFICATE OR DESIGNATION NO.		SIGNATURE OF AUTHORIZED INDIVIDUAL	
November 18, 1994		CRS VAIR551K		<i>[Signature]</i>	

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.)

Engine modified for all operation power rating to 325 HP at 41" MAP and 2700 RPM according to RAM Dwg. List 1186, Rev. F, dated 7/11/86. Modified in accordance w/STC SE4327SW Rev. 3. Customer furnished with RAM Overhaul Manual Supplement, Operators Manual Supplement, and Parts Manual Supplement. See specific operating limitations in Aircraft Flight Manual or Supplemental Flight Manual.

Engine cylinders modified per Dwg. 1158, Rev. X dated 12/8/93 I/A/W STC SE3631SW.

Engine crankcase modified per Dwg. 1157, Rev. O dated 2/22/93 I/A/W STC SE3630SW.

Engine installed per RAM Dwg. 1016, Rev. P, dated 9/20/93 I/A/W STC SA4546SW.

Aircraft maximum certificated weight changed to 7105 lbs. Installed propeller model PHC-C3YF-2UF and includes installation of vortex generators (SA8125SW) per RAM Dwg. 1610, Rev. A, dated 11/2/93 I/A/W STC SA8728SW.

Installed Floscan Fuel Flow transducer per Dwg. 1083, Rev. G, dated 11/3/93 in accordance w/STC SE5726SW.

Installed Slick pressurized magnetos p/n 6320 per Dwg. 1036, Rev. T, dated 2/24/94 and Dwg. 1068, Rev. K, dated 3/3/94 I/A/W STC SE4651SW.

Installed spring load induction hose clamps per Dwg. 1171 dated 5/23/85 I/A/W STC SE3632SW.

Exhaust slip joints modified to slip joint configuration per Dwg. 1001, Rev. N, dated 4/20/93 I/A/W STC SA4331SW.

RAM installed propeller cable p/n 1220-25 on left engine I/A/W Cessna 414A Service Manual Instructions and STC SA7594SW.

Installed vacuum pump cooling shroud on engine vacuum pump I/A/W RAM Dwg. 1221, Rev. H, dated 3/21/94 and RAM Dwg. 1199, Rev. F, dated 3/21/94 per STC SA3721SW.

Installed RAM vortex generators and strakes per Dwg. 1507, Rev. E, dated 12/01/92 with Flight Manual Supplement (Option 2) dated 12/6/93 furnished with change in airspeed markings I/A/W STC SA8125SW.

SEE ATTACHED CONTINUATION SHEET

☒ **ADDITIONAL SHEETS ARE ATTACHED**

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.)

CONTINUATION SHEET FOR N2702L DATED 11/18/94

New empty weight and balance computed.

Customer furnished w/FAA approved Overhaul and Parts Manual Supplements for all alterations.

Customer furnished w/FAA approved Flight Manual Supplements for all operations.

Pertinent details of the above installations are on file under work order no. 1465.

END

☐ ADDITIONAL SHEETS ARE ATTACHED

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION				Form Approved Budget Bureau No. 04-R060.1																						
MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				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.				OFFICE IDENTIFICATION H160 FW FSL																						
1. AIRCRAFT	MAKE	Cessna	MODEL	414A																						
	SERIAL NO.	414A-0608	NATIONALITY AND REGISTRATION MARK	N2702L																						
2. OWNER	NAME (As shown on registration certificate)		ADDRESS (As shown on registration certificate)																							
	D. W. Machine Products, Inc.		1111 6th Street Highland, IL 62249																							
3. FOR FAA USE ONLY																										
4. UNIT IDENTIFICATION																										
UNIT	MAKE	MODEL	SERIAL NO.	5. TYPE																						
AIRFRAME	(As described in item 1 above)			REPAIR	ALTERATION																					
POWERPLANT	TSIO-520-NE			R-521612	X																					
PROPELLER				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>A1A</td><td>MGR</td><td>SEP 15 1994</td></tr> <tr><td>A2</td><td>APPM</td><td></td></tr> <tr><td>A3</td><td>RECEIVED</td><td></td></tr> <tr><td>A4</td><td></td><td></td></tr> <tr><td>A5</td><td></td><td></td></tr> <tr><td>A6</td><td></td><td></td></tr> <tr><td>A7</td><td></td><td></td></tr> </table>		A1A	MGR	SEP 15 1994	A2	APPM		A3	RECEIVED		A4			A5			A6			A7		
A1A	MGR	SEP 15 1994																								
A2	APPM																									
A3	RECEIVED																									
A4																										
A5																										
A6																										
A7																										
APPLIANCE	TYPE																									
	MANUFACTURER																									
6. CONFORMITY STATEMENT																										
A. AGENCY'S NAME AND ADDRESS		B. KIND OF AGENCY		C. CERTIFICATE NO.																						
RAM Aircraft Corporation P. O. Box 5219 Waco, TX 76708		U.S. CERTIFICATED MECHANIC		VAIR551K																						
		FOREIGN CERTIFICATED MECHANIC																								
		☒ CERTIFICATED REPAIR STATION																								
		MANUFACTURER																								
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.																										
DATE		SIGNATURE OF AUTHORIZED INDIVIDUAL																								
9/12/94																										
7. APPROVAL FOR RETURN TO SERVICE																										
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is: ☒ APPROVED ☐ REJECTED																										
BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION																							
	FAA DESIGNEE	☒ REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT																							
DATE OF APPROVAL OR REJECTION		CERTIFICATE OR DESIGNATION NO.		SIGNATURE OF AUTHORIZED INDIVIDUAL																						
9/12/94		VAIR551K																								

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.)

Engine modified for all operation power rating to 325 HP at 41" MAP and 2700 RPM according to RAM Dwg. List 1186, Rev. F, dated 7/11/86. Modified in accordance with STC SE4327SW, Rev. 4. Customer furnished with RAM Overhaul Manual Supplement, Operators Manual Supplement, and Parts Manual Supplement. See specific operating limitations in Aircraft Flight Manual or Supplemental Flight Manual.

Engine cylinders modified per Dwg. 1158, Rev. X, dated 12/8/93 I/A/W STC SE3631SW.

Installed RAM p/n 1700-1 RAM rocker arm bushing I/A/W RAM Dwg. No. 1700, Rev. A, ECN 993, dated July 29, 1994, per attached DER approval dated 9/12/94.

Engine crankcase modified per Dwg. 1157, Rev. O, dated 2/22/93 I/A/W STC SE3630SW.

Engine installed per RAM Dwg. 1016, Rev. P, dated 9/20/93 I/A/W STC SA4546SW.

Installed Floscan Fuel Flow transducer per Dwg. 1083, Rev. G, dated 11/3/93 I/A/W STC SE5726SW.

Installed Slick pressurized magnetos p/n 6320 per Dwg. 1036, Rev. T, dated 2/24/94 and Dwg. 1068, Rev. K, dated 3/3/94 I/A/W STC SE4651SW.

Installed spring load induction hose clamps per Dwg. 1171 dated 5/23/85 I/A/W STC SE3632SW.

Negligible weight and balance change.

Customer furnished with FAA approved Overhaul and Parts Manual Supplements for all alterations.

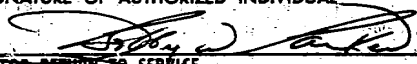
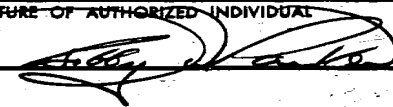
Pertinent details of the above installations are on file under work order no. 1379.

-----END-----

☐ ADDITIONAL SHEETS ARE ATTACHED

JR-94-94

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION STATEMENT OF COMPLIANCE WITH THE FEDERAL AVIATION REGULATIONS			DATE September 12, 1994
AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION			
MAKE Teledyne Continental Motors	MODEL NO. *See Below	TYPE(Airplane, Radio, Helicopter, etc.) Engine	NAME OF APPLICANT RAM Aircraft Corporation P.O. Box 5219 Waco, Texas 76708
LIST OF DATA			
IDENTIFICATION	TITLE		
RAM Dwg. No. 1700 Rev. A ECN 993 Dated: 7/29/94	<u>Drawing Title: RAM Rocker Arm Bushing:</u> The RAM part no. 1700-1 RAM rocker arm bushing is to be installed in lieu of the TCM p/n 652129 rocker arm bushing in the standard TCM TS10-520 series engine rocker arm assembly. The RAM bushing is manufactured from TCM bushing p/n 652129. The RAM bushing was subjected to appropriate tests and inspections to verify FAR Regulatory Compliance. The RAM bushing provides increased oil flow out of the valve squirt orifice and increased lubricant volume to the rocker shaft to rocker bushing interface when compared to the 652129 TCM bushing installation. These facts were documented by direct comparison testing. Twelve RAM 1700-1 bushings were installed in the twelve rocker arm assemblies installed on TS10-520-NB engine s/n R-521612 as part of the RAM FAR Repair Station engine overhaul process. This engine was also modified in accordance with STC SE3631SW. The engine STC had not been revised at this time to include the above discussed rocker arm bushing revision. Rocker arm shafts and the RAM bushing 1700-1 fits, tolerances, material alloys, and finishes are unchanged from the standard TCM type certificate approved values including the TCM TS10-520 Overhaul Manual Limits and Specifications.		
PURPOSE OF DATA			
Engineering approval of data in support of installation.			
APPLICABLE REQUIREMENTS (LIST SPECIFIC SECTIONS) CAM 13.101 Materials CAM 13.104 Durability			
CERTIFICATION-Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under Part 183 of the Federal Aviation Regulations, data listed above and on attached sheets numbered _____ have been examined in accordance with established procedures and found to comply with applicable requirements of the Federal Aviation Regulations. I () therefore () Recommend approval of these data (XX) Approve these data			
SIGNATURE(S) OF DESIGNATED ENGINEERING REPRESENTATIVE(S)	DESIGNATION NUMBER(S)	CLASSIFICATION(S)	
<i>Jack M. Riley, Jr.</i> Jack M. Riley, Jr.	SW-394	Powerplant CAR 3,	
		FAR 23, Chart B	
		All of Areas A & B	

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION				Form Approved Budget Bureau No. 04-R060.1	
MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				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.				OFFICE IDENTIFICATION <i>X/180</i> <i>FILE FSDO</i>	
1. AIRCRAFT	MAKE Cessna	MODEL 414A			
	SERIAL NO. 414A-0508	NATIONALITY AND REGISTRATION N2702L		MARK	
2. OWNER	NAME (As shown on registration certificate) D.W. Machine Products, Inc.		ADDRESS (As shown on registration certificate) 1111 6th St. Highland, IL 62249		
	3. FOR FAA USE ONLY				
				A1	MGR
				A1B	APPM
				A2	RECEIVED NOV 20 1991
				A3	
				A4	
				A5	
				A6	
4. UNIT IDENTIFICATION				TYPE	
UNIT	MAKE	MODEL	REPAIR STATION		
AIRFRAME	(As described in item 1 above)		X		
POWERPLANT	TCM	TSIO-520-McNB	L-509475	X	
PROPELLER					
APPLIANCE	TYPE				
	MANUFACTURER				
6. CONFORMITY STATEMENT					
A. AGENCY'S NAME AND ADDRESS			B. KIND OF AGENCY		C. CERTIFICATE NO.
RAM Aircraft Corporation P. O. Box 5219 Waco, Texas 76708			U.S. CERTIFICATED MECHANIC		VA1R551K
			FOREIGN CERTIFICATED MECHANIC		
			☒ CERTIFICATED REPAIR STATION		
			MANUFACTURER		
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
DATE 11/15/91			SIGNATURE OF AUTHORIZED INDIVIDUAL 		
7. APPROVAL FOR RETURN TO SERVICE					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED					
BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION		
	FAA DESIGNEE	REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT		
DATE OF APPROVAL OR REJECTION 11/15/91		CERTIFICATE OR DESIGNATION NO. VA1R551K		SIGNATURE OF AUTHORIZED INDIVIDUAL 	

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.)

Engine modified for all operation power rating to 325 HP at 41" MAP and 2700 RPM according to RAM Dwg. List 1186, Rev. F, dated 7/11/86. Modified I/A/W STC SE4327SW, Rev. 3. Customer furnished w/RAM Overhaul Manual Supplement, Operator's Manual Supplement, and Parts Manual Supplement. See specific operating limitations in Aircraft Flight Manual or Supplemental Flight Manual.

Engine cylinders modified per Dwg. 1158, Rev. Q, dated 9/5/91 I/A/W STC SE3631SW.

Engine crankcase modified per Dwg. 1157, Rev. L, dated 1/26/90 I/A/W STC SE3630SW.

Engine installed per RAM Dwg. 1016, Rev. N, dated 6/18/90 I/A/W STC SA4546SW.

Installed Slick pressurized magnetos p/n 6320 per Dwg. 1036, Rev. Q, dated 6/28/91 and Dwg. 1068, Rev. I, dated 7/1/91 I/A/W STC SE4651SW.

Exhaust slip joints modified to slip joint configuration per Dwg. 1001, Rev. G, dated 7/16/85 I/A/W STC SA4331SW.

Installed spring load induction hose clamps per Dwg. 1171 dated 5/23/85 I/A/W STC SA3632SW.

Negligible weight and balance change.

Customer furnished w/FAA approved Overhaul and Parts Manual Supplements for all alterations.

Customer furnished w/FAA approved Flight Manual Supplements for all operations.

Pertinent details of the above installations are on file under work order #11931.

END

74	75	76	77
78	79	80	81
82	83	84	85
86	87	88	89
90	91	92	93

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
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51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

☐ ADDITIONAL SHEETS ARE ATTACHED

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION				Form Approved Budget Bureau No. 04-R060.1	
MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				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.				OFFICE IDENTIFICATION FTW FSDO	
1. AIRCRAFT	MAKE Cessna	MODEL 414A			
	SERIAL NO. 414A-0608	NATIONALITY AND REGISTRATION MARK N2702L			
2. OWNER	NAME (As shown on registration certificate) D. W. Machine Products, Inc.		ADDRESS (As shown on registration certificate) 1111 6th Street Highland, IL 62249		
	3. FOR FAA USE ONLY				
4. UNIT IDENTIFICATION					
UNIT	MAKE	MODEL	SERIAL NO.	5. TYPE	
AIRFRAME	(As described in item 1 above)			REPAIR	ALTERATION
POWERPLANT	TCM	TS10-520-NB	A1 A1B A2 A3 A4 A5 A6 A7 A8	MGR R-519764 RECEIVED NOV 20 1992 FTW FSDO AT A & AT	B1 B1A B2 B3 B4 B5 B6 B7 B8
PROPELLER					X
APPLIANCE					
6. CONFORMITY STATEMENT					
A. AGENCY'S NAME AND ADDRESS		B. KIND OF AGENCY		C. CERTIFICATE NO.	
RAM Aircraft Corporation P O. Box 5219 Waco, Texas 76708		☐ U.S. CERTIFICATED MECHANIC		VA1R551K	
		☐ FOREIGN CERTIFICATED MECHANIC			
		☒ CERTIFICATED REPAIR STATION			
		☐ MANUFACTURER			
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
DATE 11/18/92		SIGNATURE OF AUTHORIZED INDIVIDUAL <i>Randal Schaper</i>			
7. APPROVAL FOR RETURN TO SERVICE					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED					
BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION		
	FAA DESIGNEE	REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT		
DATE OF APPROVAL OR REJECTION 11/18/92		CERTIFICATE OR DESIGNATION NO. VA1R551K		SIGNATURE OF AUTHORIZED INDIVIDUAL <i>Randal Schaper</i>	

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.)

Engine modified for all operation power rating to 325 HP at 41" MAP and 2700 RPM according to RAM Dwg. List 1186, Rev. F, dated 7/11/86. Modified I/A/W STC SE4327SW, Rev. 3. Customer furnished w/ RAM Overhaul Manual Supplement, Operators Manual Supplement, and Parts Manual Supplement. See specific operating limitations in Aircraft Flight Manual or Supplemental Flight Manual.

Engine cylinders modified per Dwg. 1158, Rev. Q, dated 9/5/91 I/A/W STC SE3631SW.

Engine crankcases modified per Dwg. 1157, Rev. L dated 1/26/90 I/A/W STC SE3630SW.

Engine installed per RAM Dwg. 1016, Rev. N, dated 6/18/90 I/A/W STC SA4546SW.

Installed Slick pressurized magnetos p/n 6320 per Dwg. 1036, Rev. Q, dated 6/28/91 and Dwg. 1068, Rev. I, dated 7/1/91 I/A/W STC SE4651SW.

Exhaust slip joints modified to slip joint configuration per Dwg. 1001, Rev. G, dated 7/16/85 I/A/W STC SA4331SW.

Installed spring load induction hose clamps per Dwg. 1171 dated 5/23/85 I/A/W STC SA3632SW.

Installed vacuum pump cooling shroud on engine vacuum pump I/A/W RAM Dwg. 1221, Rev. E, dated 2/25/92 and RAM Dwg. 1199, Rev. C, dated 12/12/88 per STC SA3721SW.

Negligible weight and balance change.

Customer furnished w/FAA approved Overhaul and Parts Manual Supplements for all alterations.

Customer furnished w/FAA approved Flight Manual Supplements for all operations.

Pertinent details of the above installations are on file under work order #0361.

-----END-----

☐ ADDITIONAL SHEETS ARE ATTACHED

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION				Form Approved Budget Bureau No. 04-R060.1	
MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				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.				OFFICE IDENTIFICATION <i>H B</i> <i>FTW FSDO</i>	
1. AIRCRAFT		MAKE Cessna	MODEL 414A		
		SERIAL NO. 4500-0608	NATIONALITY AND REGISTRATION MARK N27021		
2. OWNER		NAME (As shown on registration certificate) D. Machine Products, Inc.		ADDRESS (As shown on registration certificate) 1111 6th Street Highland, IL 62249	
3. FOR FAA USE ONLY					
4. UNIT IDENTIFICATION					
UNIT	MAKE	MODEL	SERIAL NO.	REPAIR	ALTERATION
AIRFRAME	***** (as described in item 1 above) *****				X
POWERPLANT	TCH	TS10-520-NE	A1 A1B A2 A3 A4 A5 A6 A7 A8 A9	MGR R-219764 RECEIVED NOV 20 1992 FTW FSDO AT A & AT	B1 B1A B2 B3 B4 B5 B6 B7 B8
PROPELLER					
APPLIANCE	TYPE MANUFACTURER				
5. TYPE					
A. AGENCY'S NAME AND ADDRESS				B. KIND OF AGENCY	
RAM Aircraft Corporation P O. Box 5219 Waco, Texas 76708				U.S. CERTIFICATED MECHANIC FOREIGN CERTIFICATED MECHANIC ☒ CERTIFICATED REPAIR STATION MANUFACTURER	
C. I certify that the repair and/or alteration made to the unit(s) identified in item 4 above as 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.				D. CERTIFICATE NO. VAIR551K	
DATE 11/18/92		SIGNATURE OF AUTHORIZED INDIVIDUAL <i>Randal Schaper</i>			
7. APPROVAL FOR RETURN TO SERVICE					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is: ☒ APPROVED ☐ REJECT					
BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION		
	FAA DESIGNEE	REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT		
DATE OF APPROVAL OR REJECTION 11/18/92		CERTIFICATE OR DESIGNATION NO. VAIR551K		SIGNATURE OF AUTHORIZED IN <i>Randal Schaper</i>	

Weight and balance or operating limitations shall be entered in the appropriate aircraft record. Alterations to assure continued conformity with the applicable airworthiness requirements.

NOTICE

shall be entered in the appropriate aircraft record. Alterations to assure continued conformity with the applicable airworthiness requirements.

8. DESCRIPTION OF WORK ACCOMPLISHED

Engine modified for all 2700 RPM according to Modified I/A/W STC SE437. Manual Supplement, and Parts Manual Supplement. See special limitations in Aircraft Flight Manual or Supplemental Parts Manual.

Engine cylinders modified per SE3631SW.

Engine crankcases modified per SE3630SW.

Engine installed per Rev. Dwg. SA4546SW.

Installed Slick pressurized dated 6/28/91 and Dwg. 1036.

Exhaust slip joints modified per Rev. G, dated 7/16/85 I/A/W STC SA3632SW.

Installed spring load induction valve clamps per Dwg. 1171 dated 5/23/85 I/A/W STC SA3632SW.

Installed vacuum pump cool down and on engine vacuum pump I/A/W RAM Dwg. 1221, Rev. E, dated 12/12/88 per STC SA3721SW.

Negligible weight and balance.

Customer furnished w/FAA approval for all alterations.

Customer furnished w/FAA approval for all operations.

Pertinent details of the above installations are on file under work order #0361.

Required, attach additional sheets. Identify with aircraft work completed.)

Power rating to 325 HP at 41" MAP and 1186, Rev. F, dated 7/11/86. Customer furnished w/FAA approval Supplement, and Parts Manual Supplement, and Parts Manual Supplement limitations in Aircraft Flight Manual or Supplemental Parts Manual.

1158, Rev. Q, dated 9/5/91 I/A/W STC

1157, Rev. L dated 1/26/90 I/A/W STC

1036, Rev. N, dated 6/18/90 I/A/W STC

otos p/n 6320 per Dwg. 1036, Rev. Q, dated 7/1/91 I/A/W STC SE4651SW.

p joint configuration per Dwg. 1001, dated 7/16/85 I/A/W STC SA3632SW.

Installed spring load induction valve clamps per Dwg. 1171 dated 5/23/85 I/A/W STC SA3632SW.

Installed vacuum pump cool down and on engine vacuum pump I/A/W RAM Dwg. 1221, Rev. E, dated 12/12/88 per STC SA3721SW.

Negligible weight and balance.

Customer furnished w/FAA approval for all alterations.

Customer furnished w/FAA approval for all operations.

Pertinent details of the above installations are on file under work order #0361.

END

ADDITIONAL SHEETS ARE ATTACHED

MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				Form Approved OMB No. 2120-0020 For FAA Use Only Office Identification CE 03 R44	
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 of 1958).					
1. Aircraft	Make	Cessna	Model	414A	
	Serial No.	414A0608	Nationality and Registration Mark	USA N2702L	
2. Owner	Name (As shown on registration certificate)	D.W. Machine Products, Inc.		Address (As shown on registration certificate) 1500 Crafton Ave. Redlands, CA 92373	
	3. For FAA Use Only				
4. Unit Identification					
Unit	Make	Model	Serial No.	5. Type	
AIRFRAME	(As described in Item 1 above)			Repair	Alteration
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				
6. Conformity Statement					
A. Agency's Name and Address		B. Kind of Agency		C. Certificate No.	
Premier Air Center, Inc. 18 Terminal Drive East Alton, IL 62024		☐ U.S. Certificated Mechanic ☐ Foreign Certificated Mechanic ☒ Certificated Repair Station ☐ Manufacturer		PAZR068H	
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
Date September 3, 1992		Signature of Authorized Individual David Pranger Alt. Inspector			
7. Approval for Return To Service					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED					
BY	FAA Fit. Standards Inspector	Manufacturer	Inspection Authorization	Other (Specify)	
	FAA Designee	☒ Repair Station	Person Approved by Transport Canada Airworthiness Group		
Date of Approval or Rejection September 3, 1992		Certificate or Designation No. PAZR068H	Signature of Authorized Individual David Pranger Alt. Inspector		

NOTICE

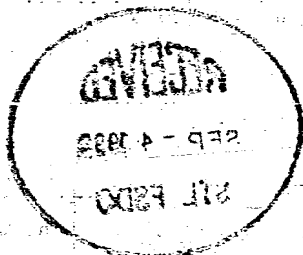
Weight and balance or operating limitation changes shall be entered in the appropriate aircraft record. An alteration must be compatible with all previous alterations to assure continued conformity with the applicable airworthiness requirements.

8. Description of Work Accomplished

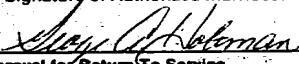
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Replaced RH outboard flap skin P/N 0825000-60, replaced LH elevator skins P/N 5034000-3, 5034000-4, 5034000-5. Balanced checked after painting and was within limits. Replaced RH elevator upper skin P/N 5034000-25. Balanced checked after painting and was within limits. Repairs performed per Cessna service manual, section 16, structural repair manual and AC43.13-1A.

END



☐ Additional Sheets Are Attached

 U.S. Department of Transportation Federal Aviation Administration		MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)		Form Approved OMB No. 2120-0020 For FAA Use Only Office Identification STL-FSDO LEX	
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 of 1958).					
1. Aircraft	Make CESSNA		Model 414A		
	Serial No. 414A-0608		Nationality and Registration Mark N2702L		
2. Owner	Name (As shown on registration certificate) D.W. MACHINE PRODUCTS, INC.		Address (As shown on registration certificate) 1500 CRAFTON AVE. REDLANDS, CA 92373		
3. For FAA Use Only					
4. Unit Identification				5. Type	
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	(As described in Item 1 above)				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				
6. Conformity Statement					
A. Agency's Name and Address		B. Kind of Agency		C. Certificate No.	
PREMIER AIR CENTER, INC. 18 TERMINAL DRIVE EAST ALTON, IL 62024		☐ U.S. Certificated Mechanic ☐ Foreign Certificated Mechanic ☒ Certificated Repair Station ☐ Manufacturer		PAZRO68H	
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
Date AUGUST 28, 1992		Signature of Authorized Individual  ALT. INSPECTOR GEORGE HOLTMAN			
7. Approval for Return To Service					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED					
BY	FAA Fit. Standards Inspector	Manufacturer	Inspection Authorization	Other (Specify)	
	FAA Designee ☒	Repair Station	Person Approved by Transport Canada Airworthiness Group		
Date of Approval or Rejection AUGUST 28, 1992		Certificate or Designation No. PAZRO68H	Signature of Authorized Individual  ALT. INSPECTOR GEORGE HOLTMAN		

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.)

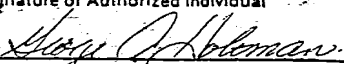
Installed in aircraft the Garmin GPS 100 AVD S/N 92600043 Global Positioning System Receiver, Garmin P/N 011-00042-00 S/N 001070 GPS Antenna and Northern Airborne Technologies RS08-001 S/N 9757 Switching Assembly according to Garmin Installation Manual P/N 190-00004-00 Revision F dated May 4, 1992, Northern Airborne Technologies RS08-001 Installation Instructions and in accordance with AC 43.13-1A Chapter 11 sections 2 & 3 and AC 43.13-2A Chapters 2 & 3.

The Garmin GPS 100 AVD Global Positioning System is approved for VFR use only and is placarded accordingly.

-----END-----

☐ Additional Sheets Are Attached

ORC

 U.S. Department of Transportation Federal Aviation Administration		MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)		Form Approved OMB No. 2120-0020 For FAA Use Only Office Identification STL-FSDO	
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 of 1958).					
1. Aircraft	Make	CESSNA	Model	414A	
	Serial No.	414A-0608	Nationality and Registration Mark	N2702L	
2. Owner	Name (As shown on registration certificate)	D.W. MACHINE PRODUCTS, INC.	Address (As shown on registration certificate)		
			1500 CRAFTON AVE. REDLANDS, CA 92373		
3. For FAA Use Only The alteration identified herein complies with the applicable airworthiness requirements and is approved for the above described aircraft, subject to conformity inspection by a person authorized in FAR Part 43, Section 43.7. STL-FSDO Date 10-11-91 Bill Bunch FLIGHT MANUAL SUPPLEMENT IS COMPATIBLE WITH AIRCRAFT. District Office Date FAA Inspector					
4. Unit Identification					
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	(As described in item 1 above)				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				
6. Conformity Statement					
A. Agency's Name and Address		B. Kind of Agency		C. Certificate No.	
PREMIER AIR CENTER, INC. 18 TERMINAL DRIVE EAST ALTON, IL 62024		☐ U.S. Certificated Mechanic ☐ Foreign Certificated Mechanic ☒ Certificated Repair Station Manufacturer		PAZRO68H	
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
Date		Signature of Authorized Individual			
AUGUST 15, 1991		 GEORGE HOLTMAN ALT. INSPECTOR			
7. Approval for Return To Service					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED					
BY	FAA Fit. Standards Inspector	Manufacturer	Inspection Authorization		Other (Specify)
	FAA Designee	X Repair Station	Person Approved by Transport Canada Airworthiness Group		
Date of Approval or Rejection		Certificate or Designation No.	Signature of Authorized Individual		
10-11-91		PAZRO68H			

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.)

Installed in aircraft the ARNAV R-501 P/N 453-1050 S/N 140770 Loran C Receiver and ARNAV P/N 452-0139 S/N 013845 Pre-Amp Loran C Antenna according to ARNAV Installation Manual P/N 570-1026A dated September 5, 1990 and pertinent data in AC 20-121A.

System flight checked in enroute and terminal modes and was within limits of AC 20-121A paragraph 9.

System approved for IFR enroute and terminal use in accordance with AC 20-121A paragraphs 9a,b,c,e and 10b have been met and placarded "Enroute and terminal modes approved for IFR" and "approach mode not approved for IFR".

Installed Flight Manual Supplement "ARNAV R-501 Loran C Navigation System" dated AUG. 15, 1991 is compatible with aircraft.

ENROUTE FLIGHTS

Flight was from St. Louis Regional Airport over Vandalia VORTAC, flight over Vandalia VOR on heading of 070° with a distance of zero miles, the error was .25 miles maximum.

Flight over Vandalia VORTAC to over Troy VORTAC. Flight over Troy VORTAC on heading 234° with distance of zero miles, the error was .25 miles maximum.

Flight over Troy VORTAC to St. Louis Regional Airport.

Flight on 4 Cardinal headings over St. Louis Regional Airport has less than .5 mile error.

END

 U.S. Department of Transportation Federal Aviation Administration		MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)		Form Approved OMB No. 2120-0020 For FAA Use Only Office Identification STL-FSDA	
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 of 1958).					
1. Aircraft Make CESSNA Serial No. 414A-0618		Model 414A Nationality and Registration Mark N2702L			
2. Owner Name (As shown on registration certificate) D.W. MACHINE PRODUCTS, INC.		Address (As shown on registration certificate) 1500 CRAFTON AVE. REDLANDS, CA 92373			
3. For FAA Use Only					
4. Unit Identification					
Unit	Make	Model	Serial No.	Repair	Alteration
AIRFRAME	(As described in Item 1 above)				X
POWERPLANT					
PROPELLER					
APPLIANCE	Type				
	Manufacturer				
5. Conformity Statement					
A. Agency's Name and Address PREMIER AIR CENTER, INC. 18 TERMINAL DRIVE EAST ALTON, IL 62024		B. Kind of Agency ☐ U.S. Certificated Mechanic ☐ Foreign Certificated Mechanic ☒ Certificated Repair Station ☐ Manufacturer		C. Certificate No. PAZRO68H	
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
Date JULY 11, 1991		Signature of Authorized Individual GEORGE HOLTMAN ALT. INSPECTOR			
7. Approval for Return To Service					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED					
BY	FAA Fit Standards Inspector	Manufacturer	Inspection Authorization	Other (Specify)	
	FAA Designee	X Repair Station	Person Approved by Transport Canada Airworthiness Group		
Date of Approval or Rejection JULY 11, 1991		Certificate or Designation No. PAZRO68H		Signature of Authorized Individual GEORGE HOLTMAN ALT. INSPECTOR	

RECEIVED
JUL 15 1991
STL FSDA

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

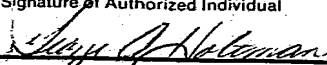
(If more space is required, attach additional sheets. Identify with aircraft nationality and registration mark and date work completed.)

Removed from aircraft the ARNAV R-30 Loran C System consisting of: R-30A
P/N 453-0109 S/N 61382 Receiver and Pre-Amp Antenna P/N 452-0112
S/N 32076.

Installed in aircraft the ARNAV R-50i Loran C System consisting of: R50i
P/N 453-1050-00 S/N 140770 Receiver and Pre-Amp Antenna P/N 452-0139
S/N 013845 according to ARNAV Installation Manual P/N 570-1026B dated
January 21, 1991 and in accordance with AC 43.13-1A Chapter 11 section 2 & 3
and AC 43.13-2A Chapters 2 & 3.

The ARNAV R-50i Loran C System is approved for VFR use only and is placarded
accordingly.

-----END-----

 MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)		Form Approved OMB No. 2120-0020 For FAA Use Only Office Identification STA FSDO		
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 of 1958).				
1. Aircraft	Make	CESSNA	Model	414A
	Serial No.	414A-0608	Nationality and Registration Mark	N2702L
2. Owner	Name (As shown on registration certificate)		Address (As shown on registration certificate)	
	D.W. MACHINE PRODUCTS INC.		1500 CRAFTON AVE. REDLANDS, CA 92373	
3. For FAA Use Only				
4. Unit Identification				
Unit	Make	Model	Serial No.	5. Type
				Repair
				Alteration
AIRFRAME	(As described in Item 1 above)			X
POWERPLANT				
PROPELLER				
APPLIANCE	Type			
	Manufacturer			
6. Conformity Statement				
A. Agency's Name and Address		B. Kind of Agency		C. Certificate No.
PREMIER AIR CENTER, INC. 18 TERMINAL DRIVE EAST ALTON, IL 62024		☐ U.S. Certificated Mechanic ☐ Foreign Certificated Mechanic ☒ Certificated Repair Station ☐ Manufacturer		PAZRO68H
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.				
Date		Signature of Authorized Individual		
MAY 10, 1990		 ALT. INSPECTOR		
7. Approval for Return to Service				
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED				
BY	FAA Fit Standards Inspector	Manufacturer	Inspection Authorization	Other (Specify)
	FAA Designee	☒ Repair Station	Person Approved by Transport Canada Airworthiness Group	
Date of Approval or Rejection		Certificate or Designation No.	Signature of Authorized Individual	
MAY 10, 1990		PAZRO68H	 ALT. INSPECTOR	

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.)

Installed in aircraft the Trans-Cal D120-P2-T S/N 36648 Altitude Digitizer coupled to the existing #2 Transponder ARC RT-859A S/N 1876 according to Trans-Cal Industries Installation manual P/N 7421 November 1977 and in accordance with AC 43.13-1A Chapter 11, Sections 2 & 3 and AC 43.13-2A Chapter 2. Leak check Co-pilot's side Static System per F.A.R. 23.1325. Performed correspondence check per F.A.R. 91.36b.

-----END-----

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION		Form Approved Budget Bureau No. 04-R060.1	
MAJOR REPAIR AND RECEIVED (Airframe, Powerplant, Propeller, or Appliance)		FOR FAA USE ONLY	
INSTRUCTIONS: Print or type all entries. See FAR 43.8, FAR 43.9, Appendix B, and AC 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form.		OFFICE IDENTIFICATION	
1. AIRCRAFT	MAKE Cessna	MODEL 414A	
	SERIAL NO. 414A-0608	NATIONALITY AND REGISTRATION MARK FSDO-63 N2702L	
2. OWNER	NAME (As shown on registration certificate) Walston Airbusiness Inc.		
	ADDRESS (As shown on registration certificate) 12 Terminal Drive East Alton, IL 62024		
3. FOR FAA USE ONLY			
4. UNIT IDENTIFICATION			5. TYPE
UNIT	MAKE	MODEL	SERIAL NO.
AIRFRAME	(As described in item 1 above)		X
POWERPLANT	TCM	TS10-520-NB	X
PROPELLER			
APPLIANCE			
6. CONFORMITY STATEMENT			
A. AGENCY'S NAME AND ADDRESS		B. KIND OF AGENCY	
RAM Aircraft Corporation, P. O. Box 5219, Waco, Texas 76708		U.S. CERTIFICATED MECHANIC FOREIGN CERTIFICATED MECHANIC ☒ CERTIFICATED REPAIR STATION MANUFACTURER	
		C. CERTIFICATE NO. 202-76	
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.			
DATE 9/3/87		SIGNATURE OF AUTHORIZED INDIVIDUAL <i>John Sator</i>	
7. APPROVAL FOR RETURN TO SERVICE			
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED			
BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION
	FAA DESIGNEE	☒ REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT
DATE OF APPROVAL OR REJECTION	CERTIFICATE OR DESIGNATION NO.	SIGNATURE OF AUTHORIZED INDIVIDUAL	
9/3/87	202-76	<i>John Sator</i>	

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.)

Engines modified for all operation power rating to 325 HP at 41" MAP and 2700 RPM according to RAM Dwg. List 1186, Rev. F, dated 7/11/86. Modified in accordance with STC SE4527SW. Customer furnished w/Overhaul Manual Supplement, Operator's Manual Supplement, and RAM Recommended Operational Procedures Supplement. See specific operating limitations in Aircraft Flight Manual or Supplemental Flight Manual.

Engine cylinders modified per Dwg. 1158, Rev. C dated 6/11/86 in accordance with STC SE3631SW.

Engine crankcases modified per Dwg. 1157, Rev. B dated 7/9/86 in accordance with STC SE3630SW.

Installed Floscan Fuel Flow transducers per Dwg. 1083, Rev. A, dated 10/1/84 in accordance with STC SE5726SW.

Installed SDI Hoskins Fuel Flow System per Dwg. 1078, Rev. A, dated 9/24/84 in accordance with STC SA5796SW. Flight Manual Supplement dated 9/20/84.

Installed Slick pressurized magnetos p/n 6220 per Dwg. No. 1036, Rev. G, dated 9/30/83 in accordance with STC SE4651SW.

Hartzell Q-Tip propellers model PHC-C3YF-2UF installed in accordance with STC SA4546SW in conjunction w/TS10-S20-NB engines modified to 325 HP per STC SE4327SW.

Installed Woodward Type II Synchrophase System per Dwg. 213718, Rev. A13, dated 9/16/80 per STC SA20GL. Woodward governors installed per STC SA300CE in conjunction with Type II Synchrophase System. Operations Manual furnished.

Installed Alcor EGT system per manufacturer's instructions in accordance with STC SA522SW.

Exhaust slip joints modified to slip joint configuration per Dwg. 1001, Rev. G, dated 7/16/85 in accordance with STC SA4331SW.

Installed spring load induction hose clamps per Dwg. 1171 dated 5/23/85 in accordance with STC SE3632SW.

Customer furnished w/FAA approved Flight Manual Supplements for all operations.

Pertinent details of the above installations are on file under work order #10175.

END

☐ ADDITIONAL SHEETS ARE ATTACHED

RECEIVED

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION				Form Approved Budget Bureau No. 04-R060.1	
MAJOR REPAIR AND ALTERATION SEP 1 1987 (Airframe, Powerplant, Propeller, or Appliance)				FOR FAA USE ONLY	
INSTRUCTIONS: Print or type all entries. See FAR 43.9, FAR 43 Appendix A, FAR 43.9-1 (or subsequent revision thereof) for instructions and disposition of this form.				OFFICE IDENTIFICATION	
1. AIRCRAFT	MAKE	Cessna	MODEL	414A	NATIONALITY AND REGISTRATION MARK N2702L
	SERIAL NO.	414A-0608			
2. OWNER	NAME (As shown on registration certificate) 7W Enterprises Inc. DBA 7 Bar Ranch			ADDRESS (As shown on registration certificate) Sand Springs, Montana 59077	
3. FOR FAA USE ONLY					
4. UNIT IDENTIFICATION					
UNIT	MAKE	MODEL	SERIAL NO.	5. TYPE	
AIRFRAME	(As described in item 1 above)			REPAIR	ALTERATION
POWERPLANT	TCM	TSIO-520-MB	L-509932 R-514339		X
PROPELLER					
APPLIANCE					
6. CONFORMITY STATEMENT					
A. AGENCY'S NAME AND ADDRESS			B. KIND OF AGENCY		C. CERTIFICATE NO.
RAM Aircraft Corporation P. O. Box 5219 Waco, Texas 76708			☐ U.S. CERTIFICATED MECHANIC ☐ FOREIGN CERTIFICATED MECHANIC ☒ CERTIFICATED REPAIR STATION ☐ MANUFACTURER		202-76
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
DATE	9/3/87		SIGNATURE OF AUTHORIZED INDIVIDUAL John Sartin		
7. APPROVAL FOR RETURN TO SERVICE					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED					
BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION		OTHER (Specify)
	FAA DESIGNEE	REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT		
DATE OF APPROVAL OR REJECTION	9/3/87		CERTIFICATE OR DESIGNATION NO.	SIGNATURE OF AUTHORIZED INDIVIDUAL	
			202-76	John Sartin	

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.)

Engines modified for all operation power rating to 325 HP at 41" MAP and 2700 RPM according to RAM Dwg. List 1186, Rev. F, dated 7/11/86. Modified in accordance with STC SE4327SW. Customer furnished w/Overhaul Manual Supplement, Operator's Manual Supplement, and RAM Recommended Operational Procedures Supplement. See specific operating limitations in Aircraft Flight Manual or Supplemental Flight Manual.

Engine cylinders modified per Dwg. 1158, Rev. C dated 6/11/86 in accordance with STC SE3631SW.

Engine crankcases modified per Dwg. 1157, Rev. E dated 7/9/86 in accordance with STC SE3630SW.

Installed Floscan Fuel Flow transducers per Dwg. 1083, Rev. A, dated 10/1/84 in accordance with STC SE5726SW.

Installed SDI Hoskins Fuel Flow System per Dwg. 1078, Rev. A, dated 9/24/84 in accordance with STC SA5796SW. Flight Manual Supplement dated 9/20/84.

Installed Slick pressurized magnetos p/n 6220 per Dwg. No. 1036, Rev. G, dated 9/30/83 in accordance with STC SE4651SW.

Hartzell Q-Tip propellers model PHC-C3YF-2UF installed in accordance with STC SA4546SW in conjunction w/TSI0-520-NB engines modified to 325 HP per STC SE4327SW.

Installed Woodward Type II Synchrophase System per Dwg. 213718, Rev. A13, dated 9/16/80 per STC SA20GL. Woodward governors installed per STC SA300CE in conjunction with Type II Synchrophase System. Operations Manual furnished.

Installed Alcor EGT system per manufacturer's instructions in accordance with STC SA522SW.

Exhaust slip joints modified to slip joint configuration per Dwg. 1001, Rev. G, dated 7/16/85 in accordance with STC SA4331SW.

Installed spring load induction hose clamps per Dwg. 1171 dated 5/23/85 in accordance with STC SE3632SW.

Customer furnished w/FAA approved Flight Manual Supplements for all operations.

Pertinent details of the above installations are on file under work order #10175.

END

☒ ADDITIONAL SHEETS ARE ATTACHED

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION				Form Approved Budget Bureau No. 04-R060.1	
MAJOR REPAIR AND ALTERATION (Airframe, Powerplant, Propeller, or Appliance)				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.				OFFICE IDENTIFICATION ACE-FSD 62	
1. AIRCRAFT	MAKE	Cessna	MODEL	414A	
	SERIAL NO.	414A-0608	NATIONALITY AND REGISTRATION MARK	N2702L	
2. OWNER	NAME (As shown on registration certificate) Highland Supply Corp.		ADDRESS (As shown on registration certificate) 1111 Sixth Street Highland, IL 62249		
	3. FOR FAA USE ONLY				
4. UNIT IDENTIFICATION					
UNIT	MAKE	MODEL	SERIAL NO.	5. TYPE	
AIRFRAME	***** (As described in item 1 above) *****			REPAIR	ALTERATION
POWERPLANT					
PROPELLER					
APPLIANCE	TYPE				
	MANUFACTURER				
6. CONFORMITY STATEMENT					
A. AGENCY'S NAME AND ADDRESS			B. KIND OF AGENCY		C. CERTIFICATE NO.
AirBusiness Incorporated of St. Louis 18 Terminal Drive E. Alton, IL 62024			☐ U.S. CERTIFICATED MECHANIC ☐ FOREIGN CERTIFICATED MECHANIC ☒ CERTIFICATED REPAIR STATION ☐ MANUFACTURER		CRS3735
D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.					
DATE		SIGNATURE OF AUTHORIZED INDIVIDUAL			
10-2-86		 Alt. Inspector			
7. APPROVAL FOR RETURN TO SERVICE					
Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED.					
BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION		
	FAA DESIGNEE	REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT		
DATE OF APPROVAL (OR REJECTION) 10-2-86		CERTIFICATE OR DESIGNATION NO. CRS3735		SIGNATURE OF AUTHORIZED INDIVIDUAL	
				 Alt. Inspector	

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.)

Installed ARNAV R-30 Loran, S/N 60137 in accordance with ARNAV and Cessna wiring diagrams. This system is approved for VFR use only and is placarded accordingly.

END

☐ ADDITIONAL SHEETS ARE ATTACHED

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**MAJOR REPAIR AND ALTERATION**
(Airframe, Powerplant, Propeller, or Appliance)Form Approved
Budget Bureau No. 04-R060.1

FOR FAA USE ONLY

OFFICE IDENTIFICATION

ACE FSDO 62

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.

1. AIRCRAFT	MAKE Cessna	MODEL 414A
	SERIAL NO. 414A-0608	NATIONALITY AND REGISTRATION MARK N2702L
2. OWNER	NAME (As shown on registration certificate) Highland Supply	ADDRESS (As shown on registration certificate) 1111 Sixth Street Highland, IL 62249

3. FOR FAA USE ONLY

4. UNIT IDENTIFICATION

UNIT	MAKE	MODEL	SERIAL NO.	REPAIR	ALTERATION
AIRFRAME	***** (As described in item 1 above) *****				X
POWERPLANT					
PROPELLER					
APPLIANCE	TYP				
	MANUFACTURER				

6. CONFORMITY STATEMENT

A. AGENCY'S NAME AND ADDRESS AirBusiness Incorporated of St. Louis 18 Terminal Drive E. Alton, IL 62024	B. KIND OF AGENCY U.S. CERTIFICATED MECHANIC FOREIGN CERTIFICATED MECHANIC ☒ CERTIFICATED REPAIR STATION MANUFACTURER	C. CERTIFICATE NO. CRS3735
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D. I certify that the repair and/or alteration made to the unit(s) identified in item 4 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.

DATE 7-14-86	SIGNATURE OF AUTHORIZED INDIVIDUAL <i>George R. Williams</i> Avionics Service Foreman
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7. APPROVAL FOR RETURN TO SERVICE

Pursuant to the authority given persons specified below, the unit identified in item 4 was inspected in the manner prescribed by the Administrator of the Federal Aviation Administration and is ☒ APPROVED ☐ REJECTED

BY	FAA FLT. STANDARDS INSPECTOR	MANUFACTURER	INSPECTION AUTHORIZATION	OTHER (Specify)
	FAA DESIGNEE	REPAIR STATION	CANADIAN DEPARTMENT OF TRANSPORT INSPECTOR OF AIRCRAFT	
DATE OF APPROVAL OR REJECTION 7-14-86	CERTIFICATE OR DESIGNATION NO. CRS3735	SIGNATURE OF AUTHORIZED INDIVIDUAL <i>George R. Williams</i> Avionics Service Foreman		

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.)

Installed G-895B 4" Flight Director with previously installed 4" HSI system. All work done according to Cessna Aircraft wiring diagram #9719235 and #9719195 dated 7-29-81 and 2-24-77 and inverter diagram #9718170 dated 5-31-77.

END

☐ ADDITIONAL SHEETS ARE ATTACHED