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United States of America
Department of Transportation – Federal Aviation Administration
Supplemental Type Certificate

Number SA01969SE

This Certificate issued to:

Mid-Continent Instruments and Avionics
9400 East 34th Street North
Wichita, KS 67226

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 FAA-Approved Model List (AML) issued 17 January 2014 or later FAA-approved revisions for the list of approved airplane models, applicable installation data requirements, and specific limitations.

Make:
Model:

Description of Type Design Change: Installation of a Mid-Continent MD302 Standby Attitude Module in accordance with Master Data List AM0261-DL02-00, specified on the attached FAA-Approved Model List (AML) issued 17 January 2014, or later FAA-approved revision. Altered aircraft must be maintained in accordance with the Instructions for Continued Airworthiness (ICA) document AM0261-IC01-00, Revision "—", dated 11 November 2013 or later FAA-accepted revision.

Limitations and Conditions: Approval of this change in type design applies to the aircraft listed on the AML only. This approval should not be applied to an eligible aircraft model on which other previously-approved modifications are incorporated unless it is determined by the installer that the relationship between this change and the other previously-approved modifications will introduce no adverse effect upon the airworthiness of the aircraft.

(Limitations and Conditions continued on Page 3 of 3)

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

Date of application: March 25, 2013

Date received:

Date of issuance: January 17, 2014

Date issued:



By direction of the Administrator

Ben P. Smith
(Signature)

ODA Administrator
(Title)

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

This certificate may be transferred in accordance with FAR 21.47

INSTRUCTIONS: The transfer endorsement below may be used to notify the appropriate FAA Regional Office of the transfer of this Supplemental Type Certificate.

The FAA will reissue the certificate in the name of the transferee and forward it to him.

TRANSFER ENDORSEMENT

Transfer the ownership of the Supplemental Type Certificate Number _____

to *(Name of transferee)* _____

(Address of transfer) _____

(Number and street)

(City, State, and Zip code)

From *(Name of grantor) (Print or type)* _____

(Address of grantor) _____

(Number and street)

(City, State, and Zip code)

Extent of Authority (if licensing agreement): _____

Date of Transfer: _____

Signature of grantor (In ink): _____

United States of America
Department of Transportation – Federal Aviation Administration
Supplemental Type Certificate

(Continuation Sheet)

Number SA01969SE

Limitations and Conditions Continued

The MD302 cannot be used as a primary display. For aircraft that require the pilot to hold a type rating, the candidate aircraft must be equipped with primary flight displays that include vertical tape displays of airspeed and altitude. This AML STC is only applicable to 14 CFR part 23 Class I, II, III, and IV aircraft as defined in Advisory Circular 23.1309-1(). 14 CFR part 25, 27, and 29 aircraft are not authorized under this STC.

For airplanes with maximum gross weights of 6000 lbs or more (AC 23.1309-1() Class II and IV aircraft), the primary display systems must consist of at least two displays of airspeed, altitude, and attitude. If the primary display system does not include two displays of airspeed, altitude, and attitude, the installer must obtain an independent approval addressing the system safety aspects of the applicable amendment of 14 CFR 23.1309, Equipment, Systems, and Installations.

A copy of this certificate and the FAA-approved AML must be maintained as part of the permanent records for the modified aircraft.

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

-----END-----

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

This certificate may be transferred in accordance with FAR 21.47



**Master Data List
for the
Mid-Continent Instruments and Avionics
MD302 Standby Attitude Module Installation
On
Approved Model List**


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Manual Number: AM0281-DL02-00
Rev. B, 7/1/19

Log of Revisions

If this document is revised it will be revised and released as a new revision in its entirety. Log of revisions indicated the total pages in the document.

Revision	Pages	Description	Date	Mid-Continent Approval
—	1 - 3	Initial Release	17-Jan-2014	See file copy
A	1 - 3	Revise AM0261-DL03-00 to A and AM0261-DL05-00 to A.	15-Sep-2015	See file copy
B	1 - 3	Converted to Mid-Continent format.	1-Jul-2019	

Master Data List

This document is the Master Data List (MDL) for the installation of a Mid Continent Instruments MD302 SAM (Standby Attitude Module) on aircraft listed on the AML and identifies the Installation Data List (IDL) and the Compliance Data List (CDL).

The IDL provides a list of all data necessary for the installing agency to complete the modification. No other data lists or data is required by the installer for this modification.

DOCUMENTS			
Number	Revision	Date	Title
AM0261-DL03-00	B	1 Jul 2019	Installation Data List for the Mid-Continent Instruments MD302 Standby Attitude Module Installation on Approved Model List
AM0261-DL05-00	B	1 Jul 2019	Compliance Data List for the Mid-Continent Instruments MD302 Standby Attitude Module Installation on Approved Model List



**Installation Data List
for the
Mid-Continent Instruments and Avionics
MD302 Standby Attitude Module Installation
on
Aircraft Listed in the Aircraft Model List**

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Manual Number: AM0261-DL03-00
Revision B, 7/1/19

Compliance Data List

DRAWINGS and DOCUMENTS			
Number	Revision	Date	Title
AM0261-IM01-00	D	1-Jul-2019	Installation Instructions for the Installation of the MD302 Standby Attitude Module on Aircraft Listed in the Aircraft Model Listing
AM0261-IC01-00	A	1-Jul-2019	Instructions for Continued Airworthiness for the Installation of the Mid Continent Instruments MD302 on the Approved Model List Aircraft
AM0261-FM01-00	A	1-Jul-2019	FAA Approved Flight Manual Supplement for Aircraft on the STC Approved Model List - Installation of a Mid Continent MD302 Standby Attitude Module

FAA Approved Model List (AML) No. SA01969SE
Mid-Continent Instruments
For Installation of MD302 Attitude Module

Item	Aircraft Make	Aircraft Model	TCDS	Certification Basis for Alteration	MDL Number / Revision / Date **	AFMS Number / Revision / Date **	AML Amendment Date
48	Piper	PA-28-140, PA-28-150, PA-28-160, PA-28-180, PA-28-235, PA-28S-160, PA-28S-180, PA-28R-180, PA-28R-200, PA-28-151, PA-28-161, PA-28-181, PA-28R-201, PA-28R-201T, PA-28-236, PA-28RT-201, PA-28RT-201T, PA-28-201T	2A13	CAR 3	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
49	Piper	PA-44-180, PA-44-180T	A19SO	14 CFR Part 23	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
50	Piper	PA-31, PA-31-300, PA-31-325, PA-31-350	A20SO	CAR 3	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
51	Piper	PA-42, PA-42-720, PA-42-1000	A23SO	14 CFR Part 23	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
52	Piper	PA-46-500TP	A25SO	14 CFR Part 23	AML0261-DL02-00; Rev -, 1/17/2014	AML0261-FM01-00; Rev -, 1/17/2014	Original
53	Piper	PA-46-310P, PA-46-350P, PA-46R-350T	A25SO	14 CFR Part 23	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
54	Piper	PA-42-720R	A32SO	14 CFR Part 23	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
55	Piper	PA-32-260, PA-32-300, PA-32S-300, PA-32R-300, PA-32RT-300, PA-32RT-300T, PA-32-301T, PA-32-301XTC, PA-32R-301 (SP), PA-32R-301 (HP), PA-32R-301T, PA-32-301, PA-32-301T	A33SO	CAR 3	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
56	Piper	PA-34-200, PA-34-200T, PA-34-220T	A7SO	14 CFR Part 23	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
57	Piper	PA-31P, PA-31T, PA-31TL, PA-31T2, PA-31T3, PA-31P-350	A8EA	CAR 3	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
58	Quest	Kodak 100	A00007SE	14 CFR Part 23	AML0261-DL02-00; Rev -, 1/17/2014	AML0261-FM01-00; Rev -, 1/17/2014	11/4/2014
59	SOCATA	TB 9, TB 10, TB 20, TB 21, TB 300	A51EU	14 CFR Part 23	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
60	Twin Commander	690C, 690D, 695, 695A, 695B	2A4	CAR 3	AM0261-DL02-00; Rev -, 1/17/2014	AM0261-FM01-00; Rev -, 1/17/2014	Original
61	Twin Commander	690, 690A, 690B	2A4	CAR 3	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015
62	Twin Commander	500, 500A, 500B, 500U, 520, 560, 560A, 560E, 500S	6A1	CAR 3	AM0261-DL02-00; Rev A, 9/15/2015	AM0261-FM01-00; Rev -, 1/17/2014	10/14/2015



**Compliance Data List
for the
Mid-Continent Instruments and Avionics
MD302 Standby Attitude Module Installation
on
Aircraft Listed in the Aircraft Model List**

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Manual Number: AM0261-DL05-00
Revision B, 7/1/2019

Log of Revisions

Revision	Pages	Description	Date	Mid-Continent Approval
—	1 - 3	Initial Release	17 Jan 2014	See file copy
A	1 - 3	Add AM0261-ER90-00 Rev B	3-Jul-2013	See file copy
B	1 - 3	Convert to Mid-Continent format	1-Jul-2019	<i>M. S. [Signature]</i>

Compliance Data List

DOCUMENTS			
Number	Revision	Date	Title
AM0261-ER01-00	A	1-Jul-2019	Structures Substantiation Report for the Installation of the Mid Continent Instruments MD302 on the Aircraft Model Listing
AM0261-ER10-00	B	1-Jul-2019	Systems Substantiation Report for the Installation of the MD302 Standby Attitude Module on Aircraft Listed in the Aircraft Model Listing
AM0261-ER13-00	A	1-Jul-2019	Systems Safety Analysis for the Installation of the MD302 Standby Attitude Module on the Approved Model List Aircraft
AM0261-ER14-00	A	1-Jul-2019	HIRF/Lightning Report for the Installation of the MD302 Standby Attitude Module on the Approved Model List Aircraft
AM0261-ER23-00	A	1-Jul-2019	Pitot/Static Systems Substantiation Report for the Installation of the MD302 Standby Attitude Module on Aircraft Listed in the Aircraft Model Listing
AM0261-ER90-00	B	1-Jul-2019	Model Qualification Process for the Installation of the Mid Continent Instruments MD302 on the Approved Model List Aircraft
AM0261-TP10-00	A	1-Jul-2019	EMI/RFI Test Plan for MD302 System on a Piper PA46-500TP Aircraft
AM0261-TR10-00	A	1-Jul-2019	EMI/RFI Test Report for MD302 System on a Piper PA46-500TP Aircraft
AM0261-TP13-00	B	1-Jul-2019	Ground Test Plan for the MD302 Standby Attitude Module on a Piper PA46-500TP
AM0261-TR13-00	A	1-Jul-2019	Ground Test Report for the MD302 Standby Attitude Module on a Piper PA46-500TP
AM0261-TP30-00	C	1-Jul-2019	Flight Test Plan for the MD302 Standby Attitude Module on a Piper PA46-500TP
AM0261-TR30-00	B	1-Jul-2019	Flight Test Report for the MD302 Standby Attitude Module on a Piper PA46-500TP



Date: 02-12-2019

RE: 14 CFR Part 91.403(d)

Mid-Continent Instrument Co., Inc. hereby gives permission to Cutter Aviation

for the installation of Mid-Continent Instruments and Avionics, 6430302-(1),

MD302 on Aircraft: ^{N45FF} Click here to enter text., Tail Number: ^{45FF} Click here to enter text.

and Serial Number ^{DIR-46-500TT} Click here to enter text., per STC SA01969SE.

⁴⁶⁹⁷²⁴¹

Mark W Smith
Director of Quality
Mid-Continent Instruments and Avionics
Wichita, KS



Instructions for Continued Airworthiness
for the
Installation of the Mid-Continent Instruments MD302
on the
Approved Model List Aircraft

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Manual Number: AM0261-IC01-00
Revision A, 7/1/2019

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01 Introduction

The Mid-Continent model MD302 series Standby Attitude Module, SAM™, is a self-contained instrument that provides aircraft attitude, altitude, airspeed, and slip indication. The compact design of the MD302 is specifically developed for maximum flexibility for installation in retrofit or modern instrument panels. Its size, extra wide viewing angle and selectable orientation allow it to be installed almost anywhere in the instrument panel and in less space than traditional 2 inch mechanical standby or primary flight instruments. With a 10 to 32 volt DC input range, the unit will work with 14 or 28V aircraft electrical buses and the selectable lighting input allows operation with 5, 14 or 28V lighting systems:

The MD302 is approved for use as a standby instrument in applications where there are primary instruments or displays existing in the aircraft to provide attitude, airspeed, and altitude to the required pilot(s). The MD302 does not have pitch or roll limits and therefore, when used as a third attitude indicator may replace a required turn rate indicator.

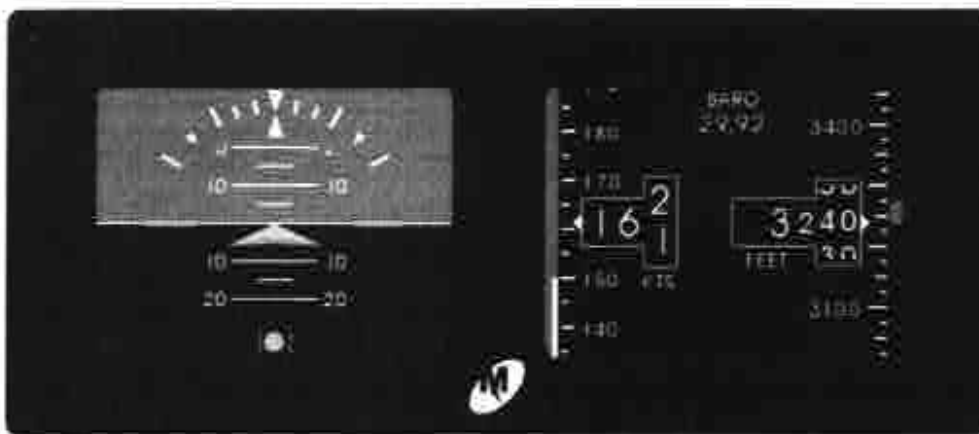


Figure 1 MD302

01-00-01 Distribution and Changes to the Instructions for Continued Airworthiness

This ICA will be provided to the owner of the aircraft upon initial installation of the STC on the aircraft. This document must be maintained current. Each time a change is required, Mid-Continent Instruments and Avionics will track all changes in the Log of Revisions. Mid-Continent Instruments and Avionics will make paper or electronic copies of the revised ICA's available upon request from the owner, operator or qualified maintenance personnel of an aircraft incorporating this modification.

It is the responsibility of the owner to ensure that this document is current prior to having any continued airworthiness maintenance performed. Prior to conducting maintenance, contact Mid-Continent Instruments and Avionics to verify the current revision level.

01-00-02 References

1. Mid-Continent document 9017782 Rev D, (or later revision) Installation Manual and Operating Instructions MD302 Series Standby Attitude Module
2. Mid-Continent document AM0261-IM01-00 Rev – (or later revision), Installation Instructions for the Installation of the Mid-Continent Instruments MD302 Standby Attitude Module on the Aircraft Listed in the Aircraft Model Listing.

01-00-03 Acronyms

CFR	Code of Federal Regulations
FAA	Federal Aviation Administration
ICA	Initial and Continued Airworthiness
IFR	Instrument Flight Rules
STC	Supplemental Type Certificate

05 Periodic Inspections

05-10-00 Airworthiness Limitations

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

No change to airworthiness limitations.

05-20-00 Scheduled Checks and Inspections

Pre-Flight (may be performed by the pilot)

1. Verify that the instrument face is not damaged.
2. Verify that the power up self-test completes successfully and that the battery capacity check is satisfactory. If the start-up battery capacity check fails the following screen will be displayed.



Figure 2 Battery Test Fail Message

Annually or Every 100 hrs.

1. Complete the pre-flight checks.

Every 24 Months

1. For applications where the aircraft is operated IFR, perform the altimeter and static system checks in accordance with 14CFR part 91.411.

05-50-01 Special Inspection Procedures

There are no special inspection requirements.

06 Dimensions and Areas

There are no changes to the dimensions and areas specifications for the aircraft including structural access panels. The MD302 is instrument panel mounted.

07 Lifting and Shoring

There are no changes to the jacking information.

08 Leveling and Weighing

There are no changes to the leveling or weighing requirements.

09 Towing and Taxiing

There are no changes to the towing or taxiing information.

10 Parking, Mooring and Storage

There are no changes to the parking, mooring and storage.

11 Placards and Markings

There are no changes to the markings or placards.

12 Servicing

There are no changes to the aircraft servicing information.

31 Indicating/ Recording Systems**31-20-00 Independent Instruments****31-20-01 MD302 Standby Attitude Module Description**

The Mid-Continent model MD302 series Standby Attitude Module, SAM™, is a self-contained instrument that provides aircraft attitude, altitude, airspeed, and slip indication. The compact design of the MD302 is specifically developed for maximum flexibility for installation in retrofit or modern instrument panels. Its size, extra wide viewing angle and selectable orientation allow it to be installed almost anywhere in the instrument panel and in less space than traditional 2 inch mechanical standby or primary flight instruments. With a 10 to 32 volt DC input range, the unit will work with 14 or 28V aircraft electrical buses and the selectable lighting input allows operation with 5, 14 or 28V lighting systems.

31-20-02 MD302 Limitations

Temperature – For units prior to mod 2, the display is operable but marginally usable at -30°C. Display is fully functional at temperatures higher than -30°C.

Units incorporating mod 2 have a built-in heater to provide full display visibility within 5 minutes of applying power, at -45°C.

Roll Rate- The maximum roll rate is 300 °/ second.

31-20-03 Operation

The MD302 Standby Attitude Module provides standby instrument functions for Attitude, Altitude, Airspeed and Skid/slip. It contains a battery which will power the unit for at least 60 minutes after the failure of primary power.

The MD302 SAM Standby Attitude Module is designed for simple, intuitive operation for ease of use and quick interpretation of the information displayed. The central control knob can be located at the bottom-center, middle-left or middle-right of the unit bezel depending on the installation orientation. This is the only user interface on the unit.

The knob has two functions: push and turn. The knob provides 16-detents per revolution and typically increments whatever element it is controlling on the display one unit per detent. The push function is typically used to select the highlighted option in a menu and/or to enter and exit menus and control functions. The push function can also perform certain operations with a push-and-hold action.

CAUTION

The unit may be operated after the battery capacity check fails, however the battery may not provide the expected duration. The MD302 cannot be used as a standby instrument for IFR flight if the battery fails the capacity check.

For additional operation details see the Mid-Continent document 9017782 Rev D, (or later revision) titled; Installation Manual and Operating Instructions MD302 Series Standby Attitude Module.

31-20-04 Special Tools
 No special tools are required.

31-20-05 System Components

Model	Part Number	Description	Function
MD302	6420302-()	Standby Attitude Module	All in one airspeed, attitude, altitude system
N/A	9017275	Configuration Module	Stores unit setup configuration

31-20-06 Electrical Connections

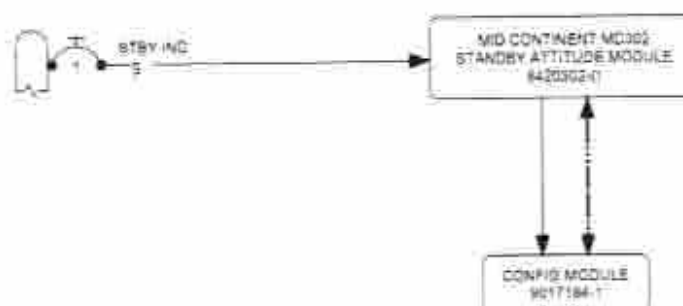


Figure 3 Block Diagram

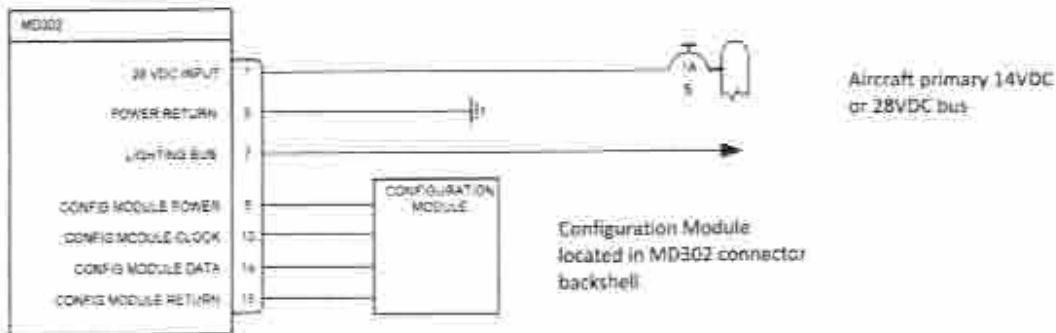


Figure 4 Wiring Diagram
15-pin D-Sub Connector

Pin No.	Description	Pin No.	Description
1	+11-22VDC Input	8	ARINC Out A
2	Valid Signal Out	9	Reserved
3	ARINC Out B	10	Config Module Clock
4	Reserved	11	Reserved
5	Config Module Power	12	ARINC In A
6	Power Return / Ground	13	ARINC In B
7	Lighting Bus Input	14	Config Module Data
		15	Config Module Return

TABLE 2.1



Figure 5 Rear Connector

31-20-07 MD302 Removal

The MD302 is instrument panel mounted and connected to electrical power, pitot and static systems.

1. Remove aircraft electrical power.
2. The MD302 is retained in the instrument panel with 4 screws in the flange of the unit. Remove all 4 screws.



- Slide the MD302 out of the panel far enough to gain access to the electrical connector and pitot and static connections.

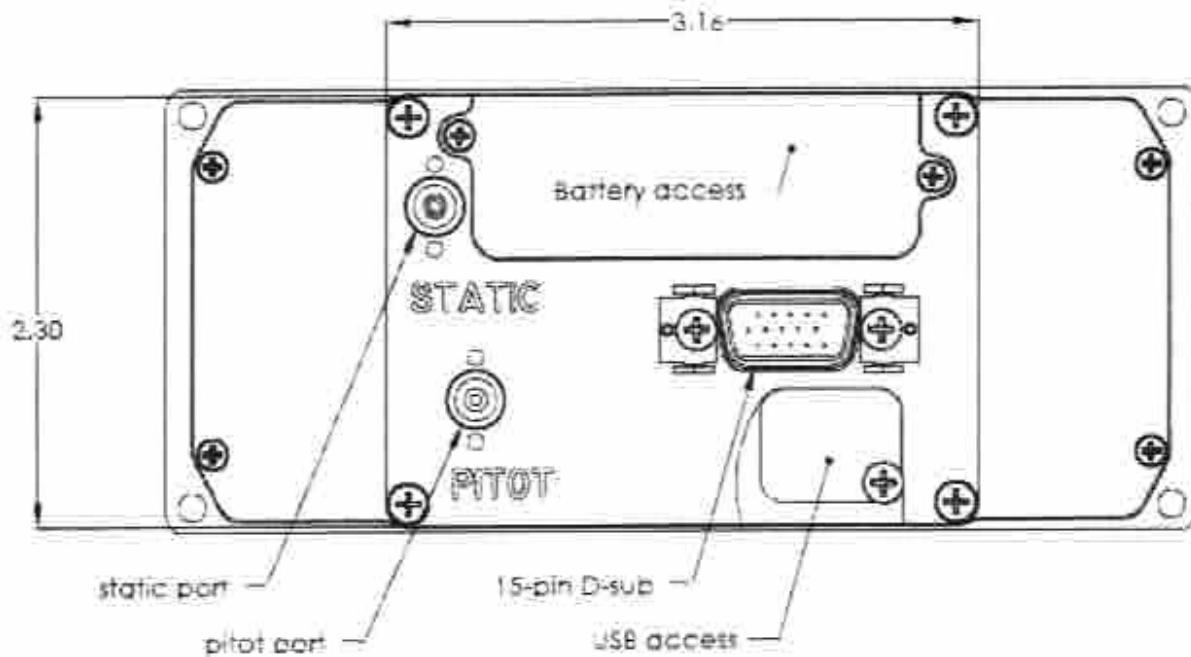


Figure 6 MD 302 Rear View



Figure 7 Pitot and Static Quick Disconnect

- Remove the electrical connector
- The pitot and static connections are quick couplings requiring no tools. Depress the release on the coupling and remove the pitot and static couplings.

CAUTION

The pitot and static connections are interchangeable. Identify the pitot and static lines so that they may be reinstalled correctly.

- Remove the unit from the instrument panel.
- Protect the pitot and static lines from foreign object entry.
- Protect the pitot and static fittings on the MD302 from foreign object entry.

31-20-08 Configuration Module Removal

The configuration module is only removed if it has failed. Otherwise the configuration module remains in place in the aircraft connector Backshell. Reference figure 8 for the details of the installation.

NOTE

The Configuration Module PC Board Assembly contains sensitive electronics that can be damaged by electrostatic discharge (ESD). Appropriate precautions should be applied prior to handling this component.

1. Remove the MD302 Indicator (see section 31-20-06 above).
2. Remove the 2 screws (item 9) from the Backshell cover and remove the cover (item 2)
3. Remove the configuration module pins from the connector and remove the configuration module.

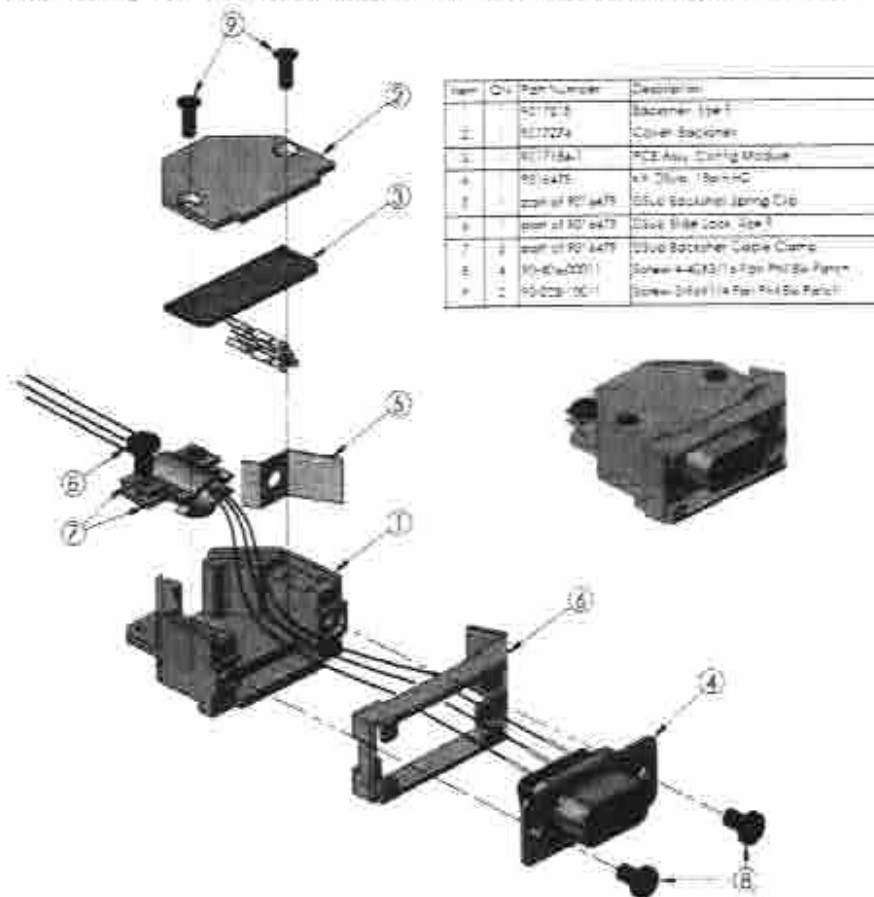


Figure 8. Connector and Configuration Module Assembly

31-20-09 MD302 Installation

1. Remove power from the aircraft.
2. Prior to installation in the instrument panel, connect the pitot and static connections.

CAUTION

The pitot and static connections are interchangeable. Verify the pitot and static line identity prior to connecting.

3. Connect the electrical connector. Lock the connector in place
4. Install the MD302 into the instrument panel. Secure with 4 screws (existing).
5. Apply power to the MD302 and verify that the start-up self-test passes.
6. If external lighting controls are a part of the MD302 installation verify proper operation of the MD302 dimming function.
7. Perform a static system leak check in accordance with 14CR part 91.411. Pitot system leak checks are to be performed by pressurizing the pitot system to indicate 150 knots on the airspeed indicator. A leak rate of 10 knots/minute or less is acceptable.

31-20-10 Configuration Module Installation

Reference figure 10 for the installation details.

CAUTION

The Configuration Module PC Board Assembly contains sensitive electronics that can be damaged by electrostatic discharge (ESD). Appropriate precautions should be applied prior to handling this component.

1. Insert the pins of the Configuration Module PC Board Assembly (Item 3) Figure 10 into their corresponding locations as noted below using an appropriate pin insertion tool.
 - a. The wires coming from the Configuration Module PC Board Assembly are marked as follows on the circuit board: TP1, TP2, TP3, TP4.
 - b. With the D-Sub oriented up (pin locations 1-5 on top) orient the Configuration Module PC Board Assembly with the electronic parts facing UP prior to pin insertion.
 - c. Install each pin into the rear of the D-Sub connector as follows:

Wire ID	Function	Connector pin
TP1	config return	15
TP2	config data	14
TP3	config clock	10
TP4	config power	5

Figure 9 Configuration Module PCB to D-sub Connections

2. Install the D-Sub Backshell Spring (Item 5) as shown.
3. Place the D-Sub Slide Lock (Item 6) over the D-Sub connector.
4. Install the D-Sub connector with Slide Lock and cable harness attached into the Backshell (item 9) and secure with (2) screws (Item 8). Verify that the Backshell Spring is between the Slide Lock and Backshell. Move the Slide Lock back and forth to verify free movement.
5. Route the aircraft wire harness bundle between the two halves of the Cable Strain Relief Clamp (item 7). The Clamp should be placed over the chafe protection installed in Step 2 (if used).
6. Loosely connect the two halves of the Cable Strain Relief Clamp with (2) screws (Item 8).

7. Place the Cable Strain Relief Clamp in the Backshell as shown.
8. Bend the wires of the Configuration Module PC Board Assembly 180 degrees so that the PC Board has its electrical components facing down as shown. Be careful not to place excess strain on the solder connections between the wires and the PC Board.
9. Capture the Configuration Module PC Board Assembly into the Backshell by placing the Backshell Cover (Item 2) on top of the Backshell.
10. Secure the Backshell Cover onto the Backshell using (2) Screws (Item 9).
11. Verify that the Slide Lock operates freely and that no wires are pinched, nicked, or otherwise damaged.
12. Reinstall the connector on the MD302 and reinstall the MD302.
13. Apply power to the instrument. If the configuration module is a replacement, the MD302 configuration will have to be setup in accordance with section 4 of the Mid-Continent document 9017782 Rev C, Installation Manual and Operating Instructions MD302 Series Standby Attitude Module.

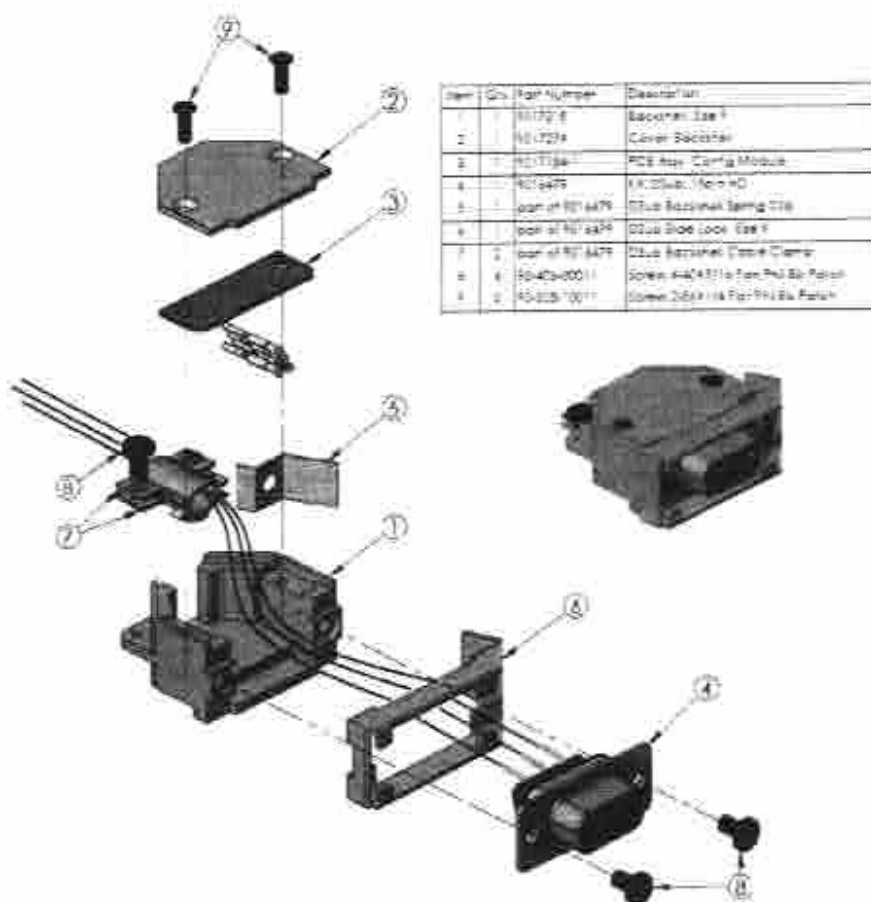


Figure 10 Connector and Configuration Module Assembly

31-20-11 Repair of MD302

For all repairs of the MD302, except battery replacement, return the unit a properly rated and certificated facility for repair.

For battery replacement, see Figure 11 and use the following procedures:

1. Remove the MD302 from the instrument panel.
2. Remove the 2 screws securing the battery compartment cover on the rear of the instrument.
3. Pull the battery out using the handle/strain relief built onto the battery.
4. Place the new battery into the compartment.
5. Secure the battery cover with the 2 screws.
6. Reinstall the MD302 in the instrument panel
7. Apply power to the MD302 and verify that it passes the battery capacity check.

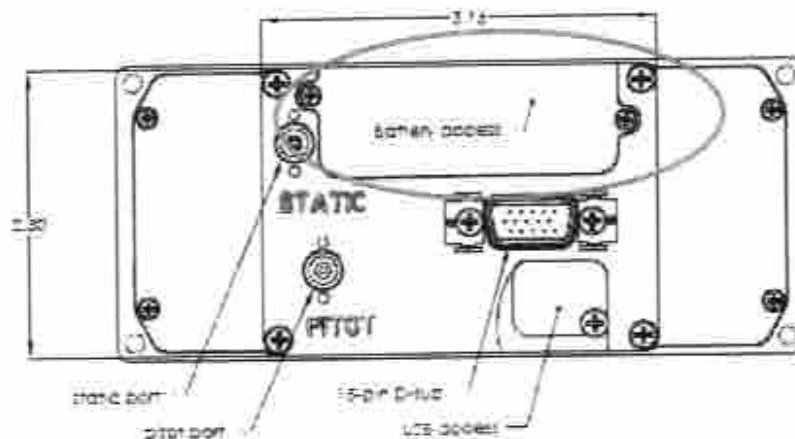


Figure 11 Battery Access Plate

31-20-12 Troubleshooting

The following are the troubleshooting procedures for the MD302. Details of the MD302 failure indications are provided in the Mid-Continent document 9017782, Installation Manual and Operating Instructions MD302 Series Standby Attitude Module.

For all failures except a failure of the battery to pass the capacity test, remove the MD302 and return a properly rated and certificated facility for service.

1. Battery capacity check fails
 - a. If the MD302 has been unused for more than 30 days or the unit was inadvertently left on and the battery discharged, allow the unit to recharge the battery by applying power to the MD302 until the battery test passes. If the battery capacity check fails after allowing adequate time for recharge, replace the battery
 - b. If the unit has been cold soaked in temperatures below 0°C warm the cockpit and unit with power applied until the unit has had the opportunity to warm to 0°C. Retest battery capacity by cycling power to the unit. If the battery capacity check fails again, replace the battery.

CAUTION

The unit may be operated after the battery capacity check fails, however the battery may not provide the expected duration. The MD302 cannot be used as a standby instrument for IFR flight if the battery fails the capacity check.

31-20-13 Field Loading Software

The MD302 operating software may be updated by appropriately rated maintenance personnel. Mid-Continent Instruments and Avionics will release all software updates via a Service Bulletin. The following procedures provide instructions for the field loading of a software update.

Prior to proceeding with a software update, verify the current software version by powering the unit and observing the display during the pre-flight mode.

1. Acquire the software
 - a. Follow the Mid-Continent Instruments and Avionics Service Bulletin issued for the software update. Either procure the software from Mid-Continent installed on a USB stick or download the file from the Mid-Continent web site following the instructions in the Service Bulletin. Contact Mid-Continent for log in information to obtain the file.
 - b. The filename of the downloaded file is MC_SOFT.BIN.
 - c. If the file was downloaded, prepare a USB compatible, standard FAT formatted memory stick of 256mb capacity or more for the file.
 - i. Ensure by there are no other files in the root directory and that at least 20mb of space is available on the USB memory stick.
 - d. After the file has been downloaded to your computer copy it to the root directory of the memory stick.
2. Remove the MD302 if required to gain access to USB access cover on the rear of the MD302.
 - a. See section 31-20-06 for removal instructions. Leave the electrical connector connected.
3. Upload the new software
 - a. Loosen the screw of the USB access cover on the rear of the MD302. Move the USB access port aside until the USB port is accessible.
 - b. Insert the USB memory stick containing the new software in the USB port.
 - c. Turn on the MD302 by depressing the front control knob. Continue holding the control knob depressed as prompted (approx. 10 seconds) until the preflight screen appears. Once the Configure Menu is displayed, the unit is in configuration mode.
 - d. Apply external power to the unit.

NOTE

Software updates cannot be performed on battery power.

- e. Turn the Control Knob to highlight the UPDATE SOFTWARE option. This option will not be available if external power is not applied.
- f. Press the Control Knob to initiate the software load.
- g. The update process will continue as the screen will read "UPDATE STATUS".
- h. There are two items displayed at this time. Record both the serial number and code for future use per the relevant Service Bulletin.

NOTE

If the software update is unsuccessful, an **ERROR** message will be displayed. Should this occur, remove the USB flash drive, power down the unit and return to Step 5 of the Service Action above. If the error message persists, contact Mid-Continent Instruments and Avionics.

4. Verification

- a. Upon startup, verify the Pre-Flight Screen displays the S/W Version you just loaded
- b. Verify that the SAM continues to the flight mode properly.
- c. Remove power from the MD302 and allow it to shut down.
- d. Remove the USB memory stick.

5. Conclusion

- a. Secure the USB port access cover by aligning the cover over the access port and tightening the fastener.
- b. Reinstall the MD-302 (see section 31-20-07)
- c. Complete the upload by making a logbook entry recording the software version uploaded.



U.S. Department of Transportation
Federal Aviation Administration

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

Form Approved
OMB No. 2120-0020
2/28/2011

Electronic Tracking Number

For FAA Use Only

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

1. Aircraft	Nationality and Registration Mark N45FF	Serial No. 4697241	
	Make Piper Aircraft Inc.	Model PA46-500TP	Series Merridian
2. Owner	Name (As shown on registration certificate) Stephen R Swensen		Address (As shown on registration certificate) 1148 W Legacy Crossing BLVD
			City Centerville State Utah
			Zip 84014-5539 Country United States

3. For FAA Use Only

4. Type		5. Unit Identification			
Repair	Alteration	Unit	Make	Model	Serial No.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	AIRFRAME	_____	(As described in Item 1 above)	_____
<input type="checkbox"/>	<input type="checkbox"/>	POWERPLANT			
<input type="checkbox"/>	<input type="checkbox"/>	PROPELLER			
<input type="checkbox"/>	<input type="checkbox"/>	APPLIANCE	Type		
			Manufacturer		

6. Conformity Statement

A. Agency's Name and Address		B. Kind of Agency	
Name Cutter Aviation Dallas		U. S. Certificated Mechanic	
Address 4500 Claire Chennault Dr.		Foreign Certificated Mechanic	
City Addison State Texas		<input checked="" type="checkbox"/> Certificated Repair Station	
Zip 75001 Country United States		Certificated Maintenance Organization	
		C. Certificate No. UXCR663X	

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 <input type="checkbox"/>	Signature/Date of Authorized Individual Robert Fulcher 12/7/2020
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7. Approval for Return to Service

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

BY	FAA Fit. Standards Inspector	Manufacturer	Maintenance Organization	Persons Approved by Canadian Department of Transport
	FAA Designee <input checked="" type="checkbox"/>	Repair Station	Inspection Authorization	Other (Specify)

Certificate or Designation No. UXCR663X	Signature/Date of Authorized Individual Robert Fulcher 12/7/2020
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Paperwork Reduction Act Statement: The reason for collecting this information is to track major maintenance performed on aircraft. The collected information is used as part of the aircraft's historical file. The public reporting burden for this collection of information is estimated to average 30 minutes per response. Responses are mandated by 14 CFR Part 43. Collected information becomes part of the public record and no confidentiality is required. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control number associated with this collection is 2120-0020. Comments concerning the accuracy of this burden and suggestions for reducing the burden should be directed to the FAA at: 800 Independence Ave. SW Washington, DC 20591, Attn: Information Collection Clearance Officer, AES-200.