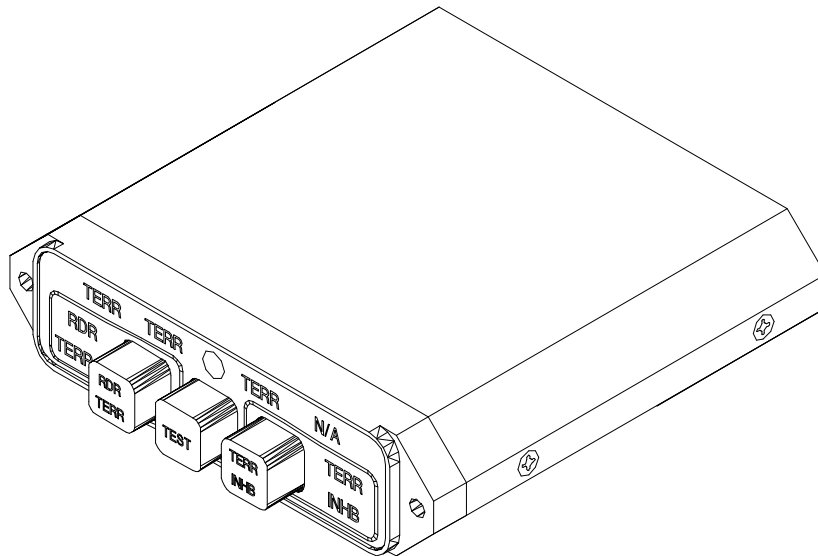




INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

MD41-1300 Series Terrain Awareness Annunciation Control Unit for Honeywell KGP 560 EGPWS Systems

| | | |
|-----------|-------|----------------------------------|
| MD41-1308 | 28vdc | Horizontal Mount |
| MD41-1318 | 28vdc | Vertical Mount (shown on page 9) |



Mid-Continent Instruments and Avionics
9400 E. 34th Street N., Wichita, KS 67226 USA
Phone 316-630-0101 • Fax 316-630-0723

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Revision Detail

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|-------------|-------------|--|
| N/R | 10/02/00 | Complete issue |
| A | 06/26/03 | Added MD41-1318, -1308(5v), -1318(5V) |
| B | 07/02/12 | Removed Schematic Diagram, Figure 3.4 |
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APPENDIX

ENVIRONMENTAL QUALIFICATION FORM

SECTION 1 GENERAL DESCRIPTION

1.1 INTRODUCTION

The MD41-1308, -1318, -1308(5V), -1318(5V) is a compact, self-contained Annunciation and Control unit. The fully integrated, control unit provides annunciation and mode selection for both TAWS (Terrain Awareness Warning System) and EGPWS (Enhanced Ground Proximity Warning system). It combines all the necessary functions required to interface a wide range of TAWS systems for FAA approval.

Other features include dual 20,000 hour lamps used for all annunciations, internally lighted selection switches and choice of manual or automatic photocell dimming. A external annunciation dimming adjustment is provided for balancing low level light conditions.

1.2 SPECIFICATIONS, TECHNICAL

1.2.1 PHYSICAL CHARACTERISTICS

| | |
|-----------|-------------|
| Mounting: | Panel |
| Width: | 3.25 Inches |
| Height: | .80 Inches |
| Depth: | 3.20 Inches |
| Weight: | 0.50 lbs. |

1.2.2 ENVIRONMENTAL CHARACTERISTICS

| | |
|------------------------------|--|
| PMA Compliance: | PQ3738CE |
| Applicable Documents: | RTCA DO-160C |
| Operating Temperature Range: | -55°C to +70°C |
| Humidity: | 95% Non-Condensing |
| Altitude Range: | 0 to 55,000 ft. |
| Vibration: | Cat. M and N |
| Operational Shock: | Rigid Mounting, 6 G Operational 15 G Crash Safety |

1.2.3 SPECIFICATIONS, ELECTRICAL

| | |
|--------------------------|-----------------|
| Design | All Solid State |
| MD41-1308, -1318 | 0.30 Amps |
| MD41-1308(5V), -1318(5V) | 0.30 Amps |

1.2.4 FRONT PANEL CONTROLS AND ANNUNCIATIONS

1.2.4.1 CONTROLS

| | |
|-----------|--|
| RDR/TERR | Momentary Switch, when pressed, will select TWAS info on the radar or MFD. |
| TEST | Momentary switch, when pressed, will activate the TWAS computer self-test. |
| TERR/INHB | Alternate action switch, when pressed, will place TWAS/EGPWS computer in standby mode. |

1.2.4.2 ANNUNCIATIONS

| | |
|-----------------|---|
| TERR/NA | Terrain information is not available. |
| TERR (amber) | Terrain is very near or above the aircraft altitude. |
| TERR (red) | Terrain is well above aircraft altitude. |
| TERR/ INHB | TWAS/EGPWS system has been placed in standby mode. |
| RDR/ TERR | This indicates if TWAS information is selected or deselected to be viewed on the radar indicator. |

SECTION 2 INSTALLATION CONSIDERATIONS

2.1 COOLING

No direct cooling is required. As with any electronic equipment, overall reliability may be increased if the MD41-1308, -1318, -1308(5V), -1318(5V) is not located near any high heat source or crowded next to other equipment. Means of providing a gentle airflow will be a plus.

2.2 EQUIPMENT LOCATION

The MD41-1300 series ACU must be mounted as close to the pilot's field of view as possible. Please reference the EGPWS installation manual for approved locations. The unit depth, with connector attached, must also be taken into consideration.

2.3 ROUTING OF CABLES

Care must be taken not to bundle the MD41-1300 series ACU logic and low level signal lines with any high energy sources. Examples of these sources include 400 HZ AC, Comm, DME, HF and transponder transmitter coax. Always use shielded wire when shown on the installation print.

Avoid sharp bends in cabling and routing near aircraft control cables.

SECTION 3 INSTALLATION PROCEDURES

3.1 GENERAL INFORMATION

This section contains interconnect diagrams, mounting dimensions and other information pertaining to the installation of the MD41-1308, -1318, -1308(5V), -1318(5V). After installation of cabling and before installation of the equipment, ensure that power is applied only to the pins specified in the interconnect diagram.

3.2 UNPACKING AND INSPECTING EQUIPMENT

When unpacking equipment, make a visual inspection for evidence of damage incurred during shipment. The following parts should be included:

1. MD41-1308 (28V) Horiz. Mount or
MD41-1318 (28V) Vert. Mount
MD41-1308(5V), (28volt) 5 volt button lighting Horiz. Mount or
MD41-1318(5V), (28volt) 5 volt button lighting Vert. Mount
2. J1 Connector Kit (25 pin). MCI P/N 7014517
3. Installation Manual. MCI P/N 9011644

3.3 MOUNTING THE MD41-()

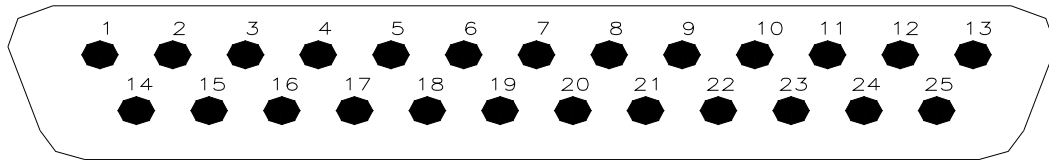
Avoid mounting close to heater vents or other high heat sources. Allow a clearance of at least 3 inches from back of unit for plug removal.

The indicator is secured in place behind the panel since it is designed for rear mount only. Make a panel cutout as shown in Figure 3-2. Secure the indicator in place with two 4-40 x 3/8 flat head phillips screws.

3.4 INSTALLATION LIMITATIONS

Wire the aircraft harness according to figure 3-3 or 3-4. Use at least 24 AWG wire for all connections. Avoid sharp bends and routing cable near high-energy sources. Care must be taken to tie the harness away from aircraft controls and cables.

J1 CONNECTOR

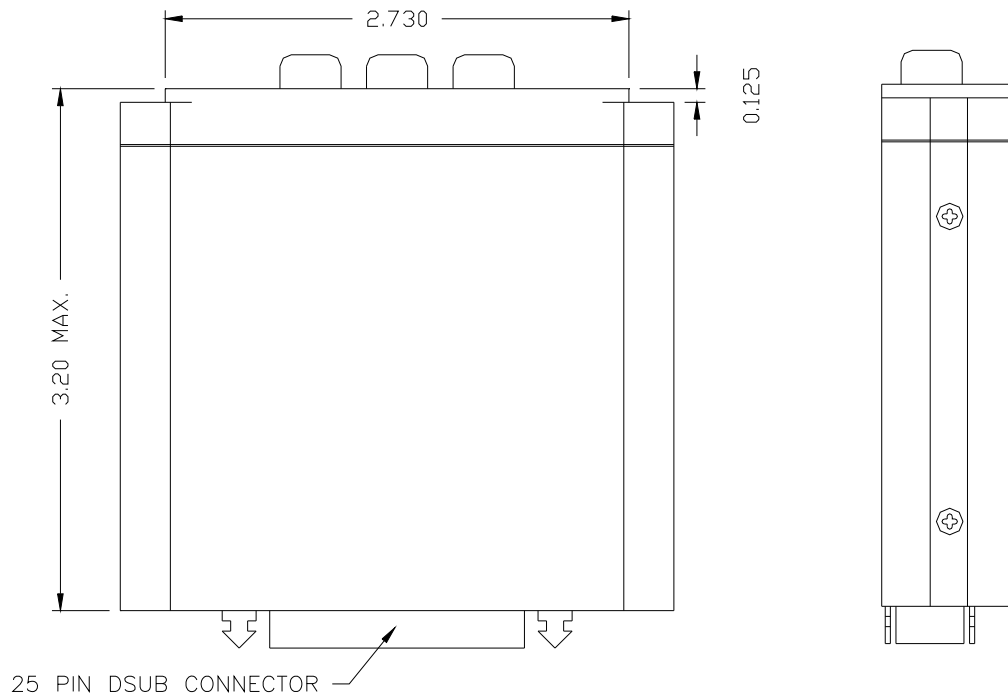


REAR VIEW OF J1 (bottom) CONNECTOR

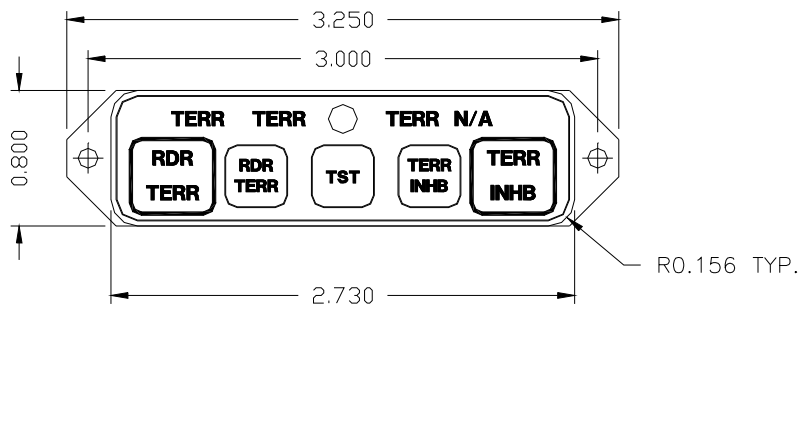
J1
PIN NO.

| | |
|----------|---|
| 1 ----- | WX RADAR/ KCPB 453 A Input. From N/C relay. |
| 2 ----- | KCPB 453 A Input. From N/O relay contact. |
| 3 ----- | WX RADAR 453 B Output. From N/C relay contact. |
| 4 ----- | WX/TERRAIN Select Input. Ground to energize 453 data relays. |
| 5 ----- | Terrain Caution annunciate input. Receives logic low to annunciate. |
| 6 ----- | LAMP TEST (receives ground from remote test switch)(optional conn). |
| 7 ----- | Bright/Dim annunciation lamp power. 28Vdc for bright, 18Vdc for dim. |
| 8 ----- | Push Button Lighting. To 28Vdc lighting buss or 5 Volt for (5V) units |
| 9 ----- | Ground for push-button lighting. |
| 10 ----- | Terrain N/A annunciate input. Receives logic low to annunciate. |
| 11 ----- | Terrain Warning annunciate input. Receives logic low to annunciate. |
| 12 ----- | Internal photocell dimming output. To use, jumper pin 12 to pin 7. |
| 13 ----- | 28 Vdc unit power. |
| 14 ----- | WX RADAR 453 A Output. From N/C relay contact. |
| 15 ----- | KCPB 453 B Input. From N/O relay contact. |
| 16 ----- | WX RADAR/ KCPB 453 B Input. From N/C relay contact. |
| 17 ----- | 28Vdc EGPWS power input. Voltage for 453 data relays. |
| 18 ----- | Terrain Display select output. Momentary switch, provides ground output to select. |
| 19 ----- | Terrain Self-Test switch. Momentary switch, provides ground output to select. |
| 20 ----- | Terrain Inhibit select switch. Alternate action switch, provides ground output to select. |
| 21 ----- | Power Ground |
| 22 ----- | Shield Ground |
| 23 ----- | Shield Ground |
| 24 ----- | Shield Ground |
| 25 ----- | Shield Ground |

FIGURE 3-1 SCHEMATIC PINOUT, 25 PIN DSUB



HORIZONTAL MOUNT



Note 1: Use two 4-40 X 3/8" Flat Head Phillips Screws for Mounting

FIGURE 3-2 OUTLINE DRAWING

NOTES:

- 1) Unit shall incorporate both photocell and external dimming input. This is configured by installer.
- 2) Design shall meet DO160C environmental tests.
- 3) Jump the internal dimming output (PIN 12) to BRT/DIM input (PIN 7) to use internal dimming circuit, otherwise leave it open.

J1 (25 PIN D-SUB)

| | | |
|----------------------------------|----|--------------------------|
| WX RADAR/KCPB 453 A INPUT | 1 | |
| KCPB 453 A INPUT | 2 | |
| WX RADAR 453 B OUTPUT | 3 | |
| WX/TERRAIN SELECT INPUT | 4 | |
| TERRAIN CAUTION ANNUNCIATE INPUT | 5 | |
| ANNUNCIATOR PRESS TO TEST INPUT | 6 | |
| BRT/DIM ANNUNCIATOR POWER INPUT | 7 | |
| 0-28VDC PANEL LIGHTING | 8 | (5 VOLTS FOR (5V) UNITS) |
| LIGHTING LOW | 9 | |
| TERRAIN N/A ANNUNCIATE INPUT | 10 | |
| TERRAIN WARNING ANNUNCIATE INPUT | 11 | |
| INTERNAL DIMMING OUTPUT (NOTE 3) | 12 | |
| +28VDC ANNUNCIATOR POWER INPUT | 13 | |
| WX RADAR 453 A OUTPUT | 14 | |
| KCPB 453 B INPUT | 15 | |
| WX RADAR/KCPB 453 B INPUT | 16 | |
| +28VDC EGPWS POWER INPUT | 17 | |
| TERRAIN DISPLAY SELECT OUTPUT | 18 | |
| TERRAIN SELF-TEST OUTPUT | 19 | |
| TERRAIN INHIBIT SELECT INPUT | 20 | |
| POWER GROUND | 21 | |
| SHIELD GROUND | 22 | |
| SHIELD GROUND | 23 | |
| SHIELD GROUND | 24 | |
| SHIELD GROUND | 25 | |

FIGURE 3-3 WIRING DIAGRAM, MD41-1308, -1318, -1308(5V), -1318(5V)

SECTION 4 POST INSTALLATION CHECKOUT

4.1 PRE INSTALLATION TESTS

With the MD41-1308, -1318, -1308(5V), -1318(5V) disconnected, turn on the avionics master switch and verify that aircraft power is on pin 13 for. Using an ohm-meter, verify pin 21 is aircraft ground.

4.2 OPERATING INSTRUCTIONS

Refer to the EGPWS pilots guide or installation manual for final testing of the MD4-1300 series ACU.

4.3 AIRWORTHINESS STATEMENT

No periodic scheduled maintenance or calibration is necessary for continued airworthiness of the MD41-1308, -1318, -1308(5V), -1318(5V). If unit fails to perform to specifications, the unit must be removed and serviced by a qualified service facility.

ENVIRONMENTAL QUALIFICATION FORM

RTCA / DO160C

NOMENCLATURE: MD41-() TERRAIN AWARENESS ANNUNCIATION CONTROL
UNIT

MODEL NO: MD41-()

PMA PQ3738CE

MANUFACTURER TEST SPECIFICATION:

MPS 7015613

MANUFACTURER: Mid-Continent Instruments and Avionics
9400 E. 34th Street N.
Wichita, KS 67226
Phone (316) 630-0101

| Conditions | Section | Description of Conducted Tests |
|---|---|--|
| Temperature and Altitude Low Temperature High Temperature In-Flight Loss of Cooling Altitude Decompression Overpressure | 4.0 4.5.1 4.5.2 & 4.5.3 4.5.4 4.6.1 4.6.2 4.6.3 | Equipment tested to Categories A1 & F2 except as noted Cooling air not required Not Tested |
| Temperature Variation | 5.0 | Equipment tested to Category B |
| Humidity | 6.0 | Equipment tested to Category A |
| Shock Operational Crash Safety | 7.0 7.2 7.3 | Equipment tested per DO-160C Par. 7.2.1 |
| Vibration | 8.0 | Equipment tested without shockmounts to Categories M and N (Table 8-1) |
| Explosion | 9.0 | Equipment identified as Category X, no test required |
| Waterproofness | 10.0 | Equipment identified as Category X, no test required |
| Fluids Susceptibility | 11.0 | Equipment identified as Category X, no test required |

Environmental Qualification (cont.)

| Conditions | Section | Description of Conducted Tests |
|--|---------|---|
| Sand and Dust | 12.0 | Equipment identified as Category X, no test required |
| Fungus | 13.0 | Equipment identified as Category X, no test required |
| Salt Spray | 14.0 | Equipment identified as Category X, no test required |
| Magnetic Effect | 15.0 | Equipment tested to Class Z |
| Power Input | 16.0 | Equipment tested to Category B |
| Voltage Spike | 17.0 | Equipment tested to Category A |
| Audio Frequency Susceptibility | 18.0 | Equipment tested to Category B |
| Induced Signal Susceptibility | 19.0 | Equipment tested to Category A |
| Radio Frequency Susceptibility | 20.0 | Equipment tested to Category T |
| Radio Frequency Emissions | 21.0 | Equipment tested to Category Z |
| Lightning Induced Transient Susceptibility | 22.0 | Equipment identified as Category X, no tests required |
| Lightning Direct Effects | 23.0 | Equipment identified as Category X, no tests required |
| Icing | 24.0 | Equipment identified as Category X, no test required |
| | | |
| | | |