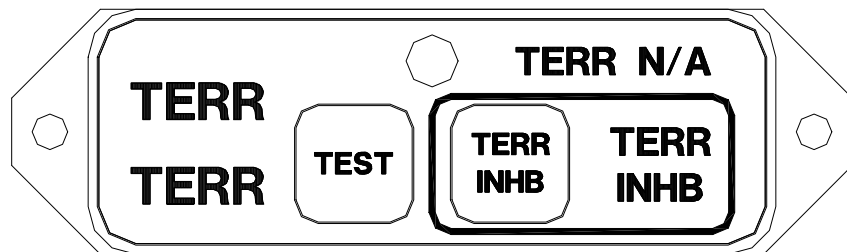




## INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

### MD41-12XX Series Terrain Awareness Annunciation Control Unit for Honeywell KGP 560 and KGP 860 EGPWS Systems

MD41-1208	28vdc	Horizontal Mount
MD41-1218	28vdc	Vertical Mount (shown on page 10)
MD41-1204	14vdc	Horizontal Mount
MD41-1214	14vdc	Vertical Mount (shown on page 10)



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## Revision History

<b>Rev.</b>	<b>Date</b>	<b>Detail</b>
N/R	08/07/00	Complete issue
A	09-26-02	Added MD41-1204, -1214, -1208(5V), -1218(5V)
B	07-27-04	Environmental tests were DO160C, now DO160D. Added TSO C151a approval. All annunciators are LED.
C	07-02-12	Removed schematics, Figure 3.4
D	05-22-2014	Revised Equipment Limitations, Section 1.2.5

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## SECTION 1 GENERAL DESCRIPTION

### 1.1 INTRODUCTION

The MD41-1204, -1214, -1208, -1218 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 systems).

Other features include dual 100,000 hour LED's 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:	2.75 Inches
Height:	0.80 Inches
Depth:	3.22 Inches
Weight:	0.50 lbs.

#### 1.2.2 ENVIRONMENTAL CHARACTERISTICS

TSO Compliance:	C151a
PMA Compliance	PQ3738CE
Applicable Documents:	RTCA DO-160D
Operating Temperature Range:	-55°C to +70°C
Humidity:	95% Non-Condensing
Altitude Range:	0 to 55,000 ft.
Operational Shock:	Rigid Mounting, 6 G Operational 20 G Crash Safety

#### 1.2.3 SPECIFICATIONS, ELECTRICAL

Design	All Solid State
MD41-1204, -1214	0.30 Amps
MD41-1208, -1218	0.40 Amps
MD41-1208(5V), -1218(5V)	0.42 Amps

## 1.2.4 FRONT PANEL CONTROLS AND ANNUNCIATIONS

### 1.2.4.1 CONTROLS

TEST	Momentary switch, when pressed, will activate the TAWS computer self-test.
TERR/INHB	Alternate action switch, when pressed, will place TAWS/EGPWS computer in standby mode.

### 1.2.4.2 ANNUNCIATIONS

TERR/NA (amber)	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 (white)	TWAS/EGPWS system has been placed in standby mode.

## 1.2.5 EQUIPMENT LIMITATIONS

The MD41-12XX series control units contain specific dash numbers to be used with various Terrain Awareness Warning Systems. The installer must match the correct controller part number with the system being installed.

The MD41-1204, -1214, -1208, -1218, -1208(5V), -1218(5V) is TSO'D and certified for use as part of a TAWS System. The previous dash numbers listed are compatible with the Honeywell KGP 560 EGPWS & KGP 860 EGPWS systems.

**NOTE:** If the MD41-( ) is disconnected or removed from the aircraft, there will be no effect in the operation of the EGPWS system.

## 1.2.6 MAJOR COMPONENTS

This system is comprised of one major component, the MD41-12XX series TAWS Annunciation Control Unit.

## **SECTION 2 INSTALLATION CONSIDERATIONS**

### **2.1 COOLING**

No direct cooling is required. As with any electronic equipment, overall reliability may be increased if the MD41-1204, -1214, -1208, -1218 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 MD41-12XX 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 MD41-1204, -1214, -1208, -1218 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 where 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 MD41-1204, -1214, -1208, -1218. 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. MD41-1204 (14V) or MD41-1208 (28V) Horiz. Mount  
MD41-1214 (14V) or MD41-1218 (28V) Vert. Mount  
MD41-1208(5V), (28volt) 5 volt button lighting Horiz. Mount  
MD41-1218(5V), (28volt) 5 volt button lighting Vert. Mount
2. J1 Connector Kit (25 pin). MCI P/N 7014517
3. Installation Manual. MCI P/N 9012220

### 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.

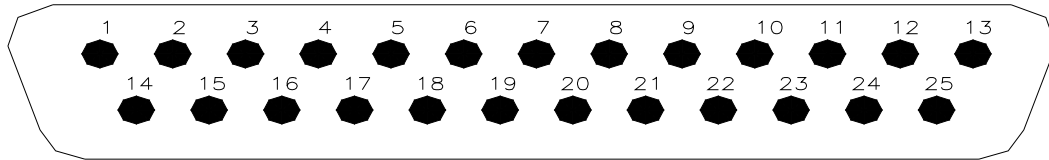
The indicator is secured in place behind the panel since it is designed for rear mount only. Make a panel cutout as shown in Figure 3-2. Secure the indicator in place with two 4-40 x 3/8 flat head Phillips screws.

### 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. Also see equipment limitations, section 1.2.5.

“The TSO identifies the minimum performance standards, tests and other conditions applicable for issuance of design and production approval of the article. The TSO does not specifically identify acceptable conditions for installations of the article. The TSO applicant is responsible for documenting all limitations and conditions suitable for installation of the article. An applicant requesting approval for installation of the article within a specific type or class of product is responsible for determining environmental and functional compatibility.”  
This Annunciation Control Unit is part of a incomplete system. The intended function is to provide required or optional annunciation and mode selection for Class A, B or C TAWS systems.

# J1 CONNECTOR



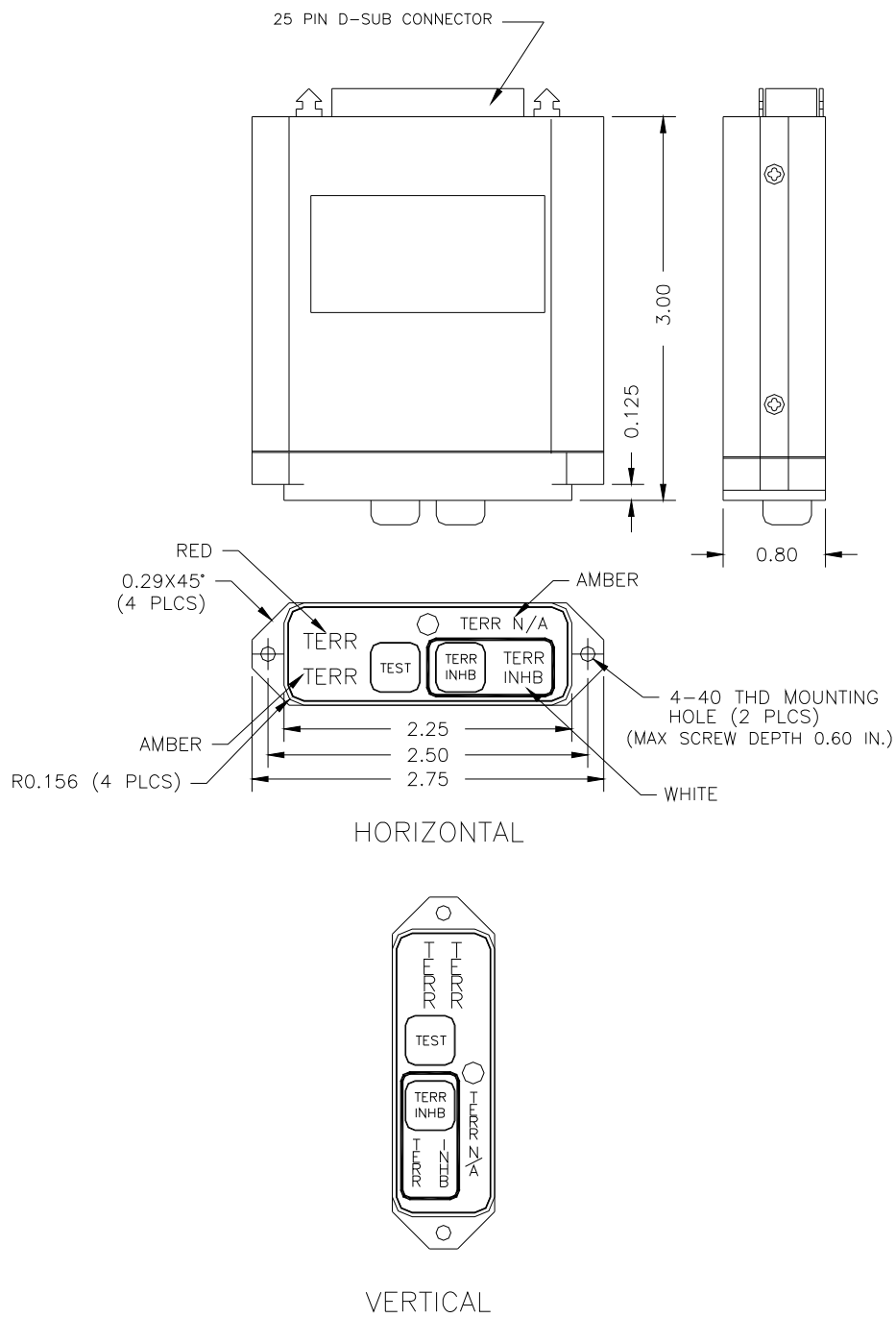
REAR VIEW OF J1 CONNECTOR

J1  
PIN NO.

1 -----	Spare
2 -----	Spare
3 -----	Spare
4 -----	Spare
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..
8 -----	Push Button Lighting. To lighting buss.
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 -----	Unit power.
14 -----	Spare
15 -----	Spare
16 -----	Spare
17 -----	Spare
18 -----	spare
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

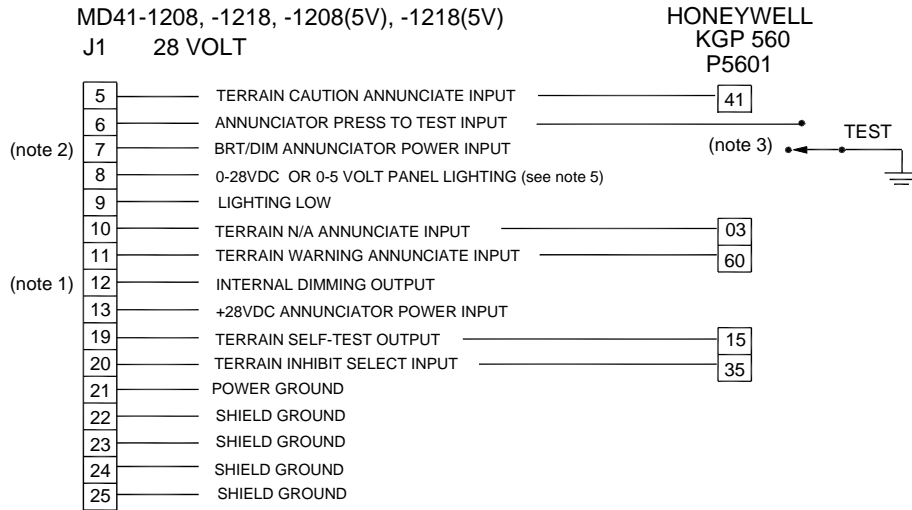
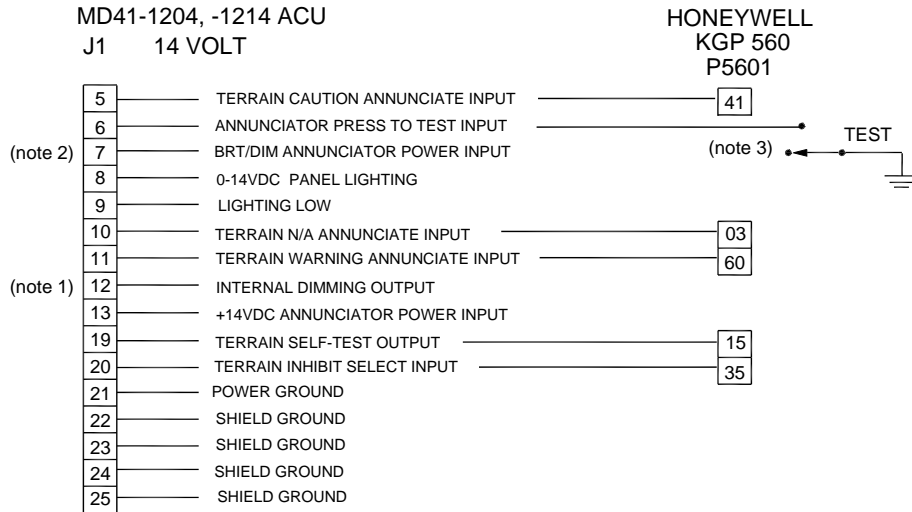
**FIGURE 3-1 SCHEMATIC PINOUT, 25 PIN DSUB**





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

**FIGURE 3-2 OUTLINE DRAWING**



NOTES:

- 1) JUMPER 7 TO 12 FOR ANNUNCIATION BRIGHTNESS TO BE CONTROLLED BY INTERNAL PHOTOCELL OR PIN 7 MAY BE CONNECTED TO AIRCRAFT BRT/DIM SWITCH
- 2) ANNUNCIATOR POWER MUST BE SELECTED SO THAT ANNUNCIATORS ARE VISIBLE UNDER ALL LIGHTING CONDITIONS.
- 3) MOMENTARY SWITCH FOR LAMP TEST. (optional connection)
- 4) REFER TO HONEYWELL KGP 560 INSTALLATION MANUAL FOR ACTUAL INSTALLATION.
- 5) 5 VOLT FOR MD41-1208(5V), -1218(5V)

**FIGURE 3-3 WIRING DIAGRAM, MD41-1204, -1214. -1208, -1218  
-1208(5V), -1218(5V)**

## **SECTION 4 POST INSTALLATION CHECKOUT**

### **4.1 PRE INSTALLATION TESTS**

With the MD41-( ) 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**

Press the lamp test button (if installed), all annunciations should light. Continue pressing the lamp test button and cover the photocell window located in the center of the front panel. All annunciations should dim.

Annunciation brightness at the minimum dimming level may be adjusted by rotation of the dimmer control located on the bottom of the MD41-( ) case. CW rotation lowers the dimming level.

Refer to the appropriate EGPWS pilots guide or installation manual for final testing of the MD41-12XX.

## **SECTION 5: INSTRUCTIONS FOR CONTINUED AIRWORTHINESS**

### **5.1 INTRODUCTION**

This document identifies the instructions for Continued Airworthiness for the MD41-12XX series TAWS Annunciation Control Unit.

### **5.2 CONTROL, OPERATION INFORMATION**

Refer to the Honeywell Pilots Guide and section 1.2.4 of this manual.

### **5.3 MAINTENANCE INSTRUCTIONS**

Repair of the MD41-12XX ACU is “on condition only”, periodic maintenance is not required.

Calibration and inspection intervals are not required. Service life will be a minimum of 20,000 hours.

### **5.4 TROUBLESHOOTING INFORMATION**

Refer to the MD41-12XX series Maintenance Manual.

### **5.5 REMOVAL AND REPLACEMENT INFORMATION**

If the unit is removed and reinstalled, a functional check of the equipment should be conducted in accordance with the Honeywell KGP 560 preflight test procedure.

### **5.6 DIAGRAMS**

Refer to figure 3-2 and 3-3 of this manual.

### **5.7 SPECIAL INSPECTION REQUIRMENTS: N/A**

### **5.8 SPECIAL TOOLS: None**

### **5.9 OVERHAUL PERIOD: No overhaul time limitations**

**ENVIRONMENTAL QUALIFICATION FORM**  
**RTCA / DO160D**

NOMENCLATURE: MD41-( ) TERRAIN AWARENESS ANNUNCIATION CONTROL  
UNIT

MODEL NO: MD41-( )

TSO C151a

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

Conditions	Section	Description of Conducted Tests
Temperature and Altitude	4.0	Equipment tested to Category A1 and F2  Cooling air not required  Not Tested
Low Temperature	4.5.1	
High Temperature	4.5.2 & 4.5.3	
In-Flight Loss of Cooling	4.5.4	
Altitude	4.6.1	
Decompression	4.6.2	
Overpressure	4.6.3	
Temperature Variation	5.0	Equipment tested to Category C
Humidity	6.0	Equipment tested to Category A
Shock	7.0	Equipment tested to Category B
Operational	7.2	
Crash Safety	7.3	
Vibration	8.0	Aircraft type 1 (helicopter) tested to category U Aircraft type 2 through 6 tested to category S
Explosion	9.0	Equipment identified as Category X, no test required
Waterproofness	10.0	Equipment identified as Category X , no test required

**Environmental Qualification (cont.)**

Conditions	Section	Description of Conducted Tests
Fluids Susceptibility	11.0	Equipment identified as Category X, no test required
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 B and M
Lightning Induced Transient Susceptibility	22.0	Equipment tested to Category A3C3
Lightning Direct Effects	23.0	Equipment identified as Category X, no tests required
Icing	24.0	Equipment identified as Category X, no test required