

# DESCRIPTION, INSTALLATION, OPERATION AND MAINTENANCE MANUAL

REMOTE SWITCH 453-0023, MODULE INTERFACE 453-1101
AND BUZZER 452-6505 INSTALLATION

570-0023 Rev. G

**Artex Products / ACR Electronics, Inc.** 

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131-0001 CELL WARNING: DO NOT RECHARGE, SHORT-CIRCUIT, DISASSEMBLE, DEFORM, HEAT OR PLACE NEAR A DIRECT FLAME

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32	04/16/09	DCN 3418, ECO 15051
33	04/16/09	DCN 3418, ECO 15051

## **Revision History**

REVISION	ENGINEERING CHANGE ORDER	DATE
-	RELEASE	06/02/06
Α	DCN 2819, 2825	11/01/06
В	DCN 2818, 2929	01/29/07
С	DCN 3068	02/14/08
D	DCN 3418	04/16/09
E	DCN 3459	07/27/09
F	ECO 15051	4/30/12
G	ECO 15431	7/25/13

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## 1. INTRODUCTION

This manual contains detailed information to install the self-powered remote switch 453-0023, module interface 453-1101, and the buzzer 452-6505. In addition, these instructions highlight the methodology to replace the cell in the remote switch. This manual is not intended to be an installation for the ELT system.

Use this manual in conjunction with any of Artex ME406 series ELT manuals.

## 2. PARTS LIST

The following parts should be included with the 455-0023 and 455-7420 Pack Lists. Please contact ACR Electronics, Inc., if shortages are found.

<b>QUANTITY</b>	PART NUMBER	DESCRIPTION
	455-0023	Pack List, Self-Powered Remote Switch
4 ea.	209-0002	Screw, 4-40 X 1/2, SOC, SS, BLK
4 ea.	241-0400	HEX Nut, 4-40 Reduced Dim.
1 ea.	453-0023	Remote Switch, Self-Powered Assembly
1 ea.	570-0023	Manual, Remote Switch 453-0023, Module Interface 453-1101 and Buzzer 452-6505 Installation
1 ea.	591-0003	Label, 453-0023 Remote Switch Horizontal
1 ea.	591-0036	Label, Cell Replacement Warning
1 ea.	591-3029	Label, 453-0023 Remote Switch

<b>QUANTITY</b>	PART NUMBER	<b>DESCRIPTION</b>
	455-7420	Pack List, ME406 Install Kit
4 ea.	201-0810	Screw, PHP 8-32 x 5/8 SS
4 ea.	241-0832	Nut, HEX 8-32 x 1/4 SS
4 ea.	246-0008	Washer, Flat, SS .036"045"
2 ea.	850-0814	Sealant Strip, D-sub Connector

## 3. WIRING PIN OUT

The following information highlights the pin out of the remote switch and module interface.

Remote Switch Back View		
VIEW	PIN#	SIGNAL DESCRIPTION
	2	Light
PIN 2	3	External On
	4	Reset 1
	5	Reset 2

Module Interface Front View		
VIEW	PIN#	SIGNAL DESCRIPTION
	2	Light
	5	G-Switch Loop
	6	Reset 1
	7	Ground
	8	Horn Power
	12	G-Switch Loop
	13	Reset 2
	14	External ON

Module Interface Back View		
VIEW	PIN#	SIGNAL DESCRIPTION
	2	Light
PIN 2	3	External On
	4	Reset 1
	5	Reset 2

#### 4. HARNESS

Due to the large array of configurations possible, ACR Electronics, Inc. does not provide a harness or RJ11 plugs (telephone connector) as part of the installation of the ELT. Accordingly, it is the responsibility of the installer to manufacture a harness or ensure that the existing harness is adequate for the installation.

The harness must be manufactured following the cross-wired configuration mentioned in Subsection 6.2.

**NOTE:** Refer to Subsection 6.1 for Ameri-King and ACK retrofit installations.

Artex recommends using a shielded cable to prevent signals related to power frequency, audio frequency and electrical transients generated from on-board equipments from interfering with the ELT operation.

Although it might be appropriate to use a telephone line (minimum UL flammability rating VW-1) in some instances, each installation is different and should be evaluated on a case by case basis. Accordingly, it is the responsibility of the ELT installer to ensure that the installations follow FAA regulations such as but not limited to Advisory Circular 43.13.

Refer to the installation section of any of the ME406 series manuals for ELT related information.

#### 5. WIRING DIAGRAMS

Refer to the following wiring diagrams to connect the remote switch 453-0023, module interface 453-1101, and buzzer 452-6505 to the ME406 series ELT.

**NOTE:** For Ameri-King or ACK ELT retrofit application, refer to Subsection 6.1.

Figures 1 and 2 apply to composite aircraft, whereas Figures 3 and 4 apply to metal aircraft.

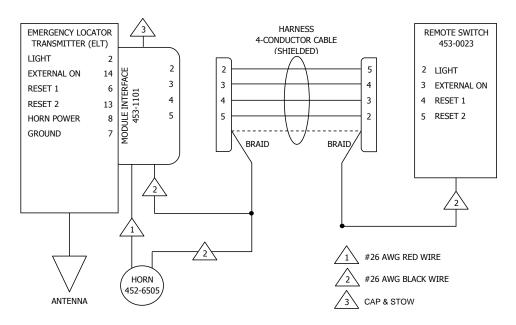


Figure 1: Wiring Diagram for Shielded Cable (Composite Aircraft)

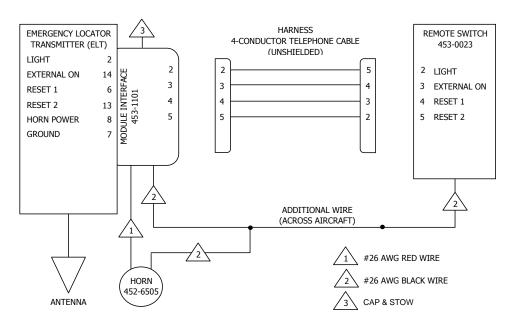


Figure 2: Wiring Diagram for Unshielded Telephone Cable (Composite Aircraft)

Figures 3 and 4 apply to metal aircraft.

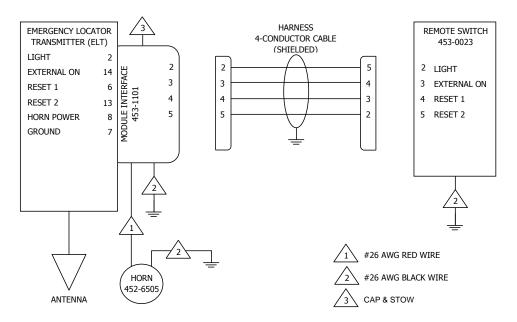


Figure 3: Wiring Diagram for Shielded Cable (Metal Aircraft)

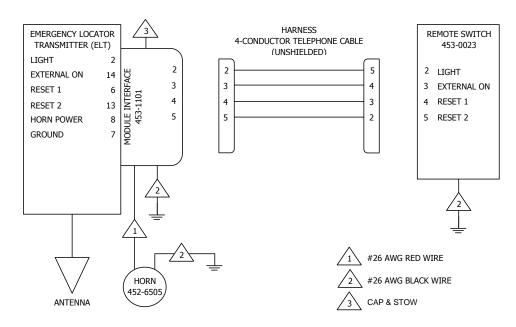


Figure 4: Wiring Diagram for Unshielded Telephone Cable (Metal Aircraft)

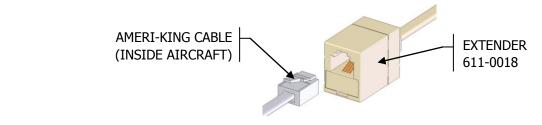
## 6. 453-0023 REMOTE SWITCH INSTALLATION

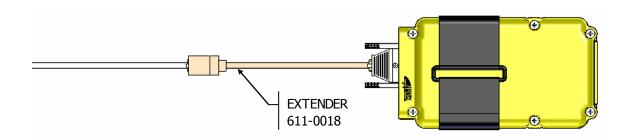
## 6.1 Ameri-King and ACK Installation Retrofit

## Ameri-King retrofit:

The remote switch 453-0023 and ME406 series ELT cannot be used in conjunction with the Ameri-King interconnecting cable unless extender 611-0018 is connected directly with the Ameri-King cable. This 611-0018 extender is provided as part of the ELT installation pack list or can be ordered as line item.

The 611-0019 flat cable can be discarded since it is intended for ACK retrofit.



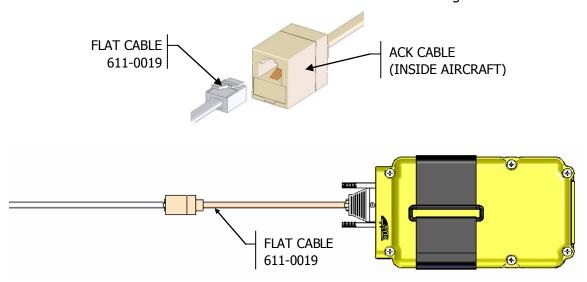


## **ACK retrofit:**

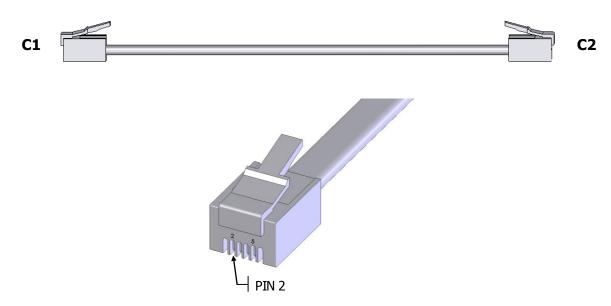
The remote switch 453-0023 and ME406 series ELT cannot be used in conjunction with the ACK interconnecting cable unless Flat Cable 611-0019 is connected directly with the ACK cable.

This 611-0019 cable is provided as part of the ELT installation pack list or can be ordered as line item. The cable is installed on the ELT side.

The 611-0018 extender can be discarded since it intended for Ameri-King ELT retrofit.



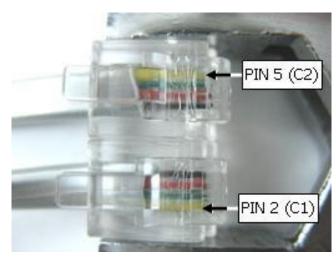
611-0019 Wiring		
C1	C2	
2	5	
3	4	
4	3	
5	2	



## 6.2 Typical Installation

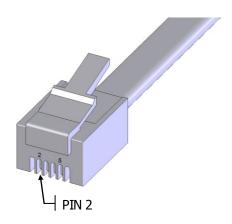
- 6.2.1 Due to the large array of configurations possible, ACR Electronics, Inc. does not provide a harness or RJ11 plugs (telephone connector) as part of the installation of the ELT.
- 6.2.2 The harness must be manufactured following the cross-wired configuration shown below.

**NOTE:** Refer to Subsection 6.1 for ACK and Ameri-King retrofits.



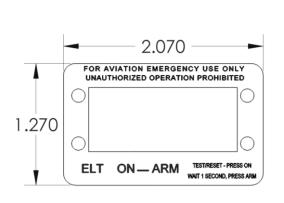
Wiring		
<b>C1</b>	C2	
2	5	
3	4	
4	3	
5	2	





#### 6.3 Panel Cutout Instructions

6.3.1 Select a mounting location where the remote switch can be seen from the pilot's seated location, easily be reached by the pilot, out of direct sunlight, and can accommodate the remote switch and the label. Depending on the remote switch orientation on the control panel, choose the appropriate label and discard the other one. Label 591-0003 and label 591-3029 are provided in the 455-0023 pack list.



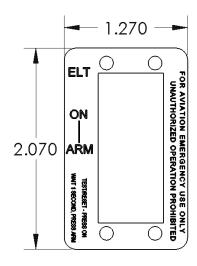
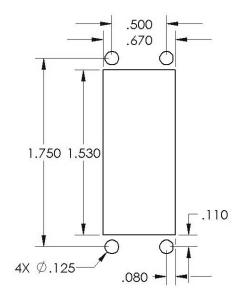


Figure 5: Labels 591-0003 & 591-3029

6.3.2 Create a cutout in the panel for the remote switch according to the minimum dimensions specified below and drill four 1/8" diameter holes. The dimensions apply to both 591-0003 and 591-3029 labels. Adjust the hole-pattern appropriately on the panel depending on the orientation of the remote switch.

**NOTE:** For Ameri-King retrofit applications, use the existing mounting holes since the face plate of the remote switch is designed to accommodate that hole-pattern.



Tolerance: +.020, -.000

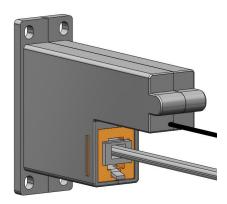
**Figure 6: Panel Cutout Dimensions** 

- 6.3.3 Clean the application surface area thoroughly prior to applying label 591-0003 or 591-3029.
- 6.3.4 Remove the paper backing from the label and line up the label over the cutout.
- 6.3.5 Press firmly and evenly over the label to produce maximum adhesion.
- 6.3.6 Trim the label with an Exacto knife if it partially covers the mounting holes.

## 7. INSTALLATION

## 7.1 Instructions

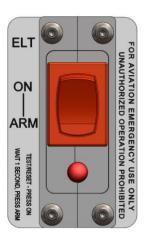
- 7.1.1 Feed the modular jack connector from the harness through the panel cutout.
- 7.1.2 Plug the modular jack connector to the remote switch.



**Figure 7: Harness to Remote Switch Connection** 

- 7.1.3 Slide the remote switch and the harness inside the cutout following the orientation shown below.
- 7.1.4 Secure the remote switch using the hardware provided in the 455-0023 pack list. Use a 1/16 hex socket for the nuts and a small Phillips screwdriver for the screws. The torque on the screws is 4.0 Lb-in ( $\pm$  0.5 Lb-in).





**Figure 8: Remote Switch Orientation** 

7.1.5 Fasten the ground wire along the harness within one inch of the remote switch using a tie cable.

**NOTE:** The ground wire should have enough slack to prevent tensile load.

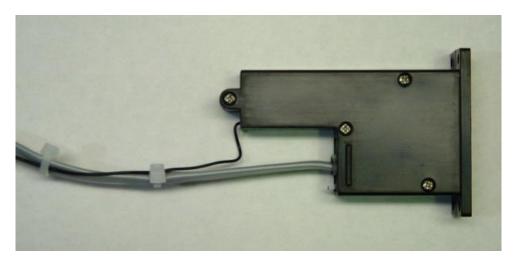


Figure 9: Remote switch wire tensile load release

(Panel not shown)

- 7.1.6 Connect the remote switch 26 AWG ground wire according to the wiring diagrams highlighted in section 5 using a ring or a fork terminal quick disconnect.
  - **NOTE:** Secure an additional wire to the ground wire with a butt slice to extend the length if necessary.
- 7.1.7 Fasten the harness to the aircraft. Ensure that the harness has enough slack to prevent tensile load on the modular jack connector of the remote switch.
- 7.1.8 Plug the modular jack connector of the harness to the module interface 453-1101 if it is already installed.
- 7.1.9 Refer to the Transmitter Test section of the ME406 series ELT manuals to check the operation of the complete connection to the ELT.
- 7.1.10 Apply Cell Replacement Warning label 591-0036 from kit 455-0023 inside the aircraft's logbook. The intent of the label is to remind the pilot to change the cell inside the remote switch every five years or sooner depending on usage.
- 7.1.11 Enter the date, installer's initials and whether the ELT passed or failed into the aircraft's logbook.

## 8. 453-1101 MODULE INTERFACE INSTALLATION

#### 8.1 Instructions

- 8.1.1 Place the two sealing strips 850-0814 provided in the 455-7420 install kit into the ELT 15-pin D-sub connector.
- 8.1.2 Insert the module interface 453-1101 into the ELT D-sub and secure it in place using the two thumbscrews. The torque on the thumbscrews is 4 to 5 Lb-in.



**Figure 10: Module Interface to ELT Connection** 

(Red Wire - Horn Power, Black Wire - A/C Ground, Blue Wire - Cap & Stow)

8.1.3 Fasten the three wires along the harness within one inch of the module interface using cable ties.

**NOTE:** The length of the wires between the end of the module and the first cable tie should have enough slack to provide strain relief.

- 8.1.4 Fasten the harness to the aircraft. Ensure that the harness has enough slack to prevent tensile load on the modular jack connector of the module interface.
- 8.1.5 Plug the modular jack connector of the harness to the remote switch 453-0023 if it is already installed.
- 8.1.6 Refer to the Transmitter Test section of the ME406 series ELT manuals to check the operation of the complete connection to the ELT.
- 8.1.7 Enter the date, installer's initials and whether the ELT passed or failed into the aircraft's logbook.

#### 9. 453-1101 MODULE INTERFACE AND 452-6505 BUZZER WIRING

#### 9.1 Instructions

9.1.1 Follow the appropriate wiring diagram in Section 5, depending if the aircraft is metal or composite.



Connect RED wire to Horn Power connection
Connect BLACK wire to A/C Ground
Cap & stow BLUE wire

9.1.2 Mount the buzzer according to the instructions highlighted in the ME406 series ELT manuals.

**NOTE:** Allow enough slack to prevent tensile load on the wires leading from the module interface and the buzzer. Depending on the location of the buzzer, additional wires can be strung between the buzzer and the module interface.

## 10. REMOTE SWITCH CELL REPLACEMENT



131-0001 CELL WARNING: DO NOT RECHARGE, SHORT-CIRCUIT, DISASSEMBLE, DEFORM, HEAT OR PLACE NEAR A DIRECT FLAME

#### 10.1 Cell Shelf Life

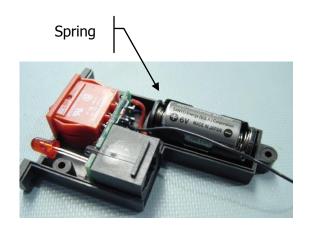
- 10.1.1 The shelf life of the cell is 5 years. The cell is available through ACR Electronics, Inc. under part number 131-0001.
- 10.1.2 The Lithium content of the cell is less than 0.15 Gram.

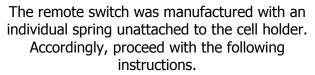
## 10.2 Mating Cover Removal

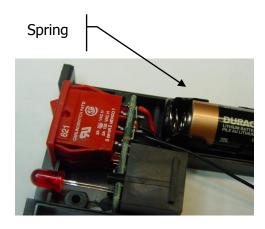
- 10.2.1 Remove the four retaining nuts and screws securing the remote switch 453-0023 to the panel.
- 10.2.2 Slide the remote switch from the panel.
- 10.2.3 Cut the tie cables securing the ground wire to the harness.
- 10.2.4 Disconnect the modular jack connector of the harness from the remote switch.
- 10.2.5 Remove the four retaining screws from the remote switch to access the cell compartment.
- 10.2.6 Remove the protective cover opposite of the product label.

## 10.3 Cell Replacement from Cell Holder with Stand Alone Spring

10.3.1 At this point, two options are available depending on the manufacturing date of the remote switch:







This newest version of the remote switch was manufactured with a built-in spring permanently attached to the cell holder.

Accordingly, proceed to section 10.4.

Figure 11: Spring Configuration

10.3.2 Carefully remove the cell 131-0001 from the plastic cell holder and keep the conical spring.

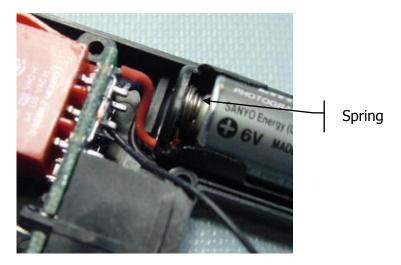


Figure 12: Conical Spring

- 10.3.3 Dispose of the cell according to the instructions specified in section 10.6.
- 10.3.4 Carefully slide the replacement cell 131-0001 inside the plastic cell holder <u>following the</u> <u>polarity</u> mentioned inside the holder and on the cell, or by matching the positive (+) end of the cell to the red wire side of the holder.
- 10.3.5 Install the conical spring between the positive side of the cell and the cell holder.
- 10.3.6 Push the cell against the conical spring.



Figure 13: Conical Spring Installation

10.3.7 Gently route the black and red wires from the plastic cell holder away from the leads of the rocker switch if necessary.

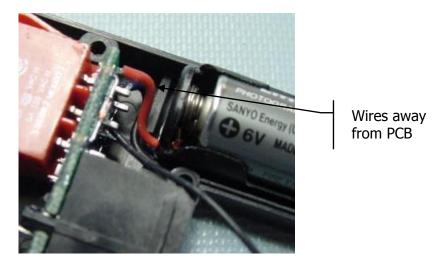
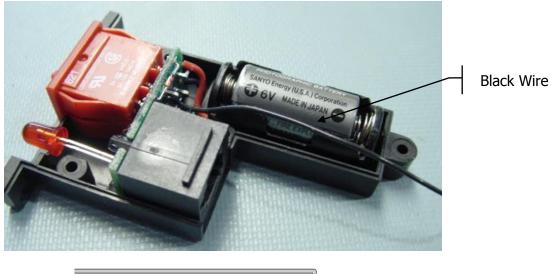


Figure 14: Cell Holder Wires

10.3.8 Position the ground wire (black) along the side of the plastic cell holder and <u>away from the screw boss</u>.



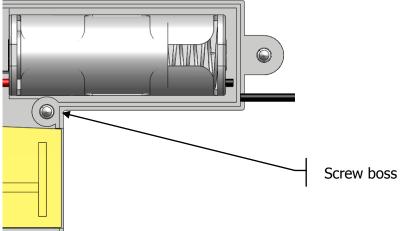


Figure 15: Ground Wire

10.3.9 Refer to Subsection 10.5 to install the mating cover.

## 10.4 Cell Replacement from Cell Holder with Built-in Spring

- 10.4.1 Carefully remove the cell 131-0001 from the plastic cell holder.
- 10.4.2 Dispose of the cell according to the instructions specified in Subsection 10.6.
- 10.4.3 Carefully slide the negative end of the replacement cell 131-0001 inside the plastic cell holder <u>following the polarity</u> mentioned inside the holder and on the cell, or by matching the positive (+) end of the cell to the red wire side of the holder.

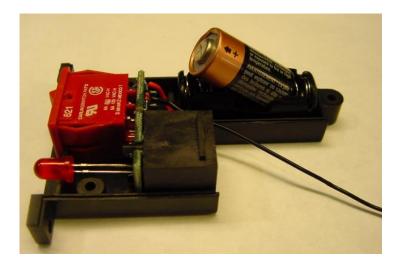


Figure 16: Cell Installation

10.4.4 Pull the built-in spring away from the end of the cell using tweezers and slide the cell inside the holder.

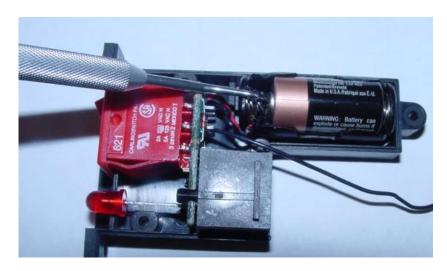


Figure 17: Spring Installation

10.4.5 Release the spring and ensure that it is properly pushing against the end of the cell.

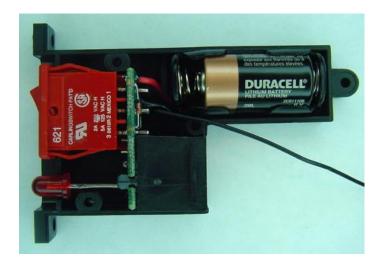


Figure 18: Spring Fit

10.4.6 Gently route the black and red wires from the plastic cell holder away from the leads of the rocker switch if necessary.

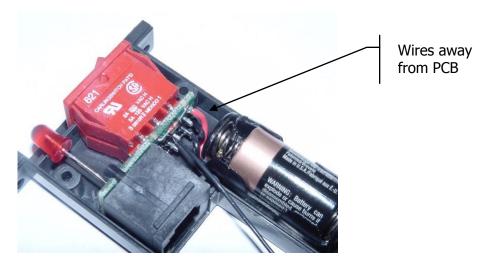
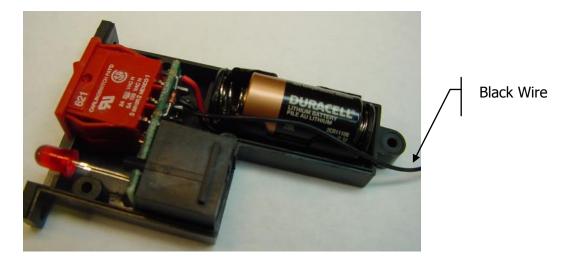


Figure 19: Cell Holder Wires

10.4.7 Position the ground wire (black) along the side of the plastic cell holder and <u>away from the screw boss</u>.



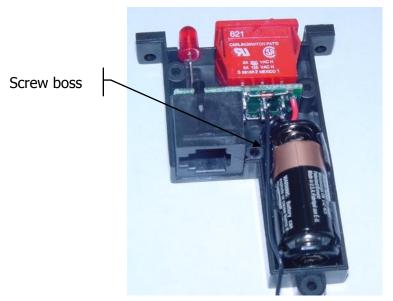
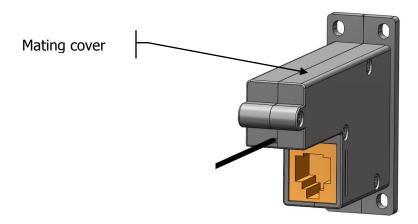


Figure 20: Ground Wire

## 10.5 Mating Cover Installation

- 10.5.1 Install the mating cover to the assembly by matching the cutouts according to the different components.
- 10.5.2 Ensure that the 26 AWG ground wire is properly fed through the notch of the mating cover and is not pinched by the screw boss.



**Figure 21: Mating Cover Installation** 

10.5.3 Secure the covers together using the retaining screws previously removed. The torque on the screws is 2.0 Lb-in (+0 Lb-in, - 0.5 Lb-in).

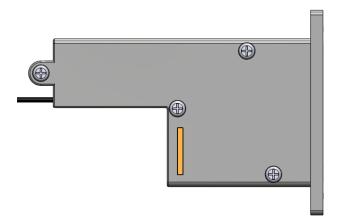


Figure 22: Retaining Screws Installation

- 10.5.4 Refer to section 7 to install the remote switch back on the panel.
- 10.5.5 Refer to the Transmitter Test section of the ME406 series ELT manuals to check the operation of the complete connection to the ELT.
- 10.5.6 Apply Cell Replacement Warning label 591-0036 from kit 455-0023 inside the aircraft's logbook. The intent of the label is to remind the pilot to change the cell inside the remote switch every five years or sooner depending on usage.
- 10.5.7 Enter the date, installer's initials and whether the ELT passed or failed into the aircraft logbook.

## 10.6 Cell Disposal Instructions

Lithium batteries are best disposed of as a non-hazardous waste when fully or mostly discharged. The Federal Environmental Protection Agency (EPA) governed by the Resource Conservation and Recovery Act (RCRA) do not list or exempt Lithium as a hazardous waste. However, if waste lithium batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of the significant amounts of un-reacted or unconsumed lithium remaining in the spent battery. The batteries must be neutralized through an approved secondary treatment facility prior to disposal as a hazardous waste (as required by the U.S. Land Ban Restrictions for the hazardous and Solid Waste Amendments of 1984.) Secondary treatment centers receive these batteries as manifested hazardous waste under code "D003 - reactive". Button cells are exempt because they contain so little lithium and therefore can be disposed of in the normal municipal waste stream.

#### 11. TROUBLESHOOTING GUIDE

Refer to the ME406 series ELT manuals for flash error codes during Self-Test.

SYMPTOM	LIKELY CAUSE	ACTION
	The voltage of the cell is below 3.3 volts.	Replace the cell.
	The harness is not secured to the remote switch.	Check that the modular jack is fully inserted inside the back of the remote switch.
LED of the remote switch is not flashing when either the ELT or the remote switch	The remote switch ground wire is not connected to the module interface ground.	For a metallic aircraft, check the resistance between the remote switch and the module interface (10 $\Omega$ min.)
is turn ON.	The module interface is not connected to the ELT.	Check the connection.
	Cell is not installed properly.	Check the polarity of the cell with respect to the plastic cell holder.
	The wiring configuration is incorrect.	Refer to Section 5.

## 12. SPECIFICATIONS

## 12.1 Components Dimensions

The following dimensions are displayed in [millimeters] and inches.

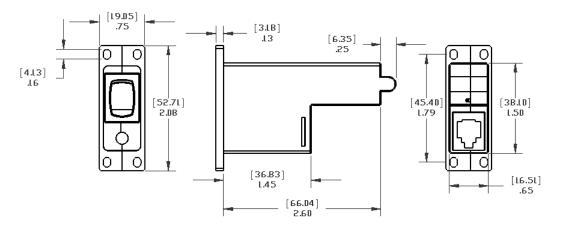


Figure 23: 453-0023 Remote Switch

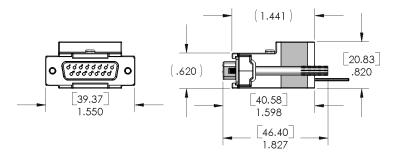


Figure 24: 453-1101 Module Interface

## 12.2 Components Weight

PART NUMBER	DESCRIPTION	WEIGHT						
452-6505	Buzzer, Piezo	.34 oz (9.64 gr.) Max.						
453-0023	Remote Switch, Self-Powered	1.30 oz (36.85 gr.) Max.						
453-1101	Module Interface, ELT to Remote Switch	1 oz (28.35 gr.) Max.						

The buzzer 452-6505 is included with the ELT Pack List.

## 12.3 Environmental Categories

DO-160D Environmental categories for nameplates:

## Remote switch 453-0023:

DO-160D Env. Cat. F1XCAA[204]XWXXXXXXXXA[XXX]X[XXXX]XXX

F1	Х	С	Α	Α	[204]	Х	W	Х	Х	Х	Х	Х	Х	Х	Х	Α	[XXX]	Х	[XXXX]	Χ	Χ	Χ
TEMPERATURE & ALTITUDE	IN-FLIGHT LOSS OF COOLING	TEMPERATURE VARIATION	HUMIDITY	OPERATIONAL SHOCK AND CRASH SAFETY	VIBRATION	EXPLOSION	WATERPROOFNESS (10.3.2)	FLUIDS SUSCEPTIBILITY	SAND AND DUST	FUNGUS	SALT SPRAY	MAGNETIC EFFECT	POWER INPUT	VOLTAGE SPIKE	AUDIO FREQUENCY SUSCEPTIBILITY	INDUCED SIGNAL SUSCEPTIBILITY	RADIO FREQUENCY SUSCEPTIBILITY	EMISSION OF RF ENERGY	LIGHTNING	LIGHTNING DIRECT EFFECTS	ICING	ELECTROSTATIC DISCHARGE
4	4.5.4	Oi	တ	7	00	9	10	1	12	13	14	15	16	17	18	19	20	21	22	23	24	25

## Module interface 453-1101:

DO-160D Env. Cat D2XBA[204][204]XWXXXXXXXXA[XXX]X[XXXX]XXX

D2	Х	В	Α	[204]	[204]	Х	W	Х	Х	Х	Х	Х	Х	Х	Х	Α	[XXX]	Х	[XXXX]	Х	Χ	Х
TEMPERATURE & ALTITUDE	IN-FLIGHT LOSS OF COOLING	TEMPERATURE VARIATION	HUMIDITY	OPERATIONAL SHOCK AND CRASH SAFETY	VIBRATION	EXPLOSION	WATERPROOFNESS (10.3.2)	FLUIDS SUSCEPTIBILITY	SAND AND DUST	FUNGUS	SALT SPRAY	MAGNETIC EFFECT	POWER INPUT	VOLTAGE SPIKE	AUDIO FREQUENCY SUSCEPTIBILITY	INDUCED SIGNAL SUSCEPTIBILITY	RADIO FREQUENCY SUSCEPTIBILITY	EMISSION OF RF ENERGY	LIGHTNING	LIGHTNING DIRECT EFFECTS	ICING	ELECTROSTATIC DISCHARGE
4	4.5.4	Oi	6	7	00	9	10	1	12	13	14	귥	16	17	≅	19	20	21	22	23	24	25

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