

**Procedure  
For  
Installation  
Of the  
P/N 2040-1-1(p)  
&  
P/N 2040-1-2(p)  
Voice Alert Systems**

**Procedure IP-1  
Rev. 4**

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**Approved By** \_\_\_\_\_

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## **Introduction**

Most general aviation aircraft were designed during a time when few pilots wore headsets. On these aircraft, the stall and gear warning annunciators were placed in the cockpit, where they would be heard by the pilot. Today most pilots wear headsets, including the new active noise reduction headsets, designed to cut out the cockpit sounds. These innovations make it more difficult for the pilot to hear the warning horns.

The Voice Alert system is an electronic device which detects the activation of the existing aircraft stall and/or gear warning annunciators, and responds by placing an instantly recognizable voice warning directly in the pilot's headset, and through a built in speaker. The voice warnings provide the pilot with instant recognition of the unsafe conditions. Separate voice messages are used for the stall warning, and the gear warning, to promote instant recognition. The Voice Alert is a stand-alone system. The Voice Alert does not affect the operation of the existing aircraft warning systems in any way. The Voice Alert is available for installation in both fixed and retractable gear aircraft.

The P/N 2040-1-1 unit is similar to the P/N 2040-1-2, the difference being that the 2040-1-1 incorporates the ability to interface to additional electronic devices in the aircraft and provide additional voice alert messages that are heard directly in the pilot's headset.

### **A. Installation of P/N 2040-1-1**

The following sections provide specific detailed installation instructions for installing the P/N 2040-1-1 system. The installer should read the material in this manual to become familiar with the installation and the work involved before starting. This work must meet the requirements of the applicable sections of AC 43.13-1B

#### **I. General Installation Information**

1. The P/N 2040-1-1 unit has the capability of providing voice messages for gear and stall warnings, and up to 7 additional voice messages that can be programmed into the unit. These additional inputs can be connected to any device having an external output that provides a switch closure. This switch closure can provide either a ground or aircraft voltage to the selected input. Once activated, the stall and gear warning messages will repeat continuously until the signal is removed. The additional inputs are designed to sound the voice message in the pilot's headset twice, and then not repeat until the signal has been cleared and then set again. The duration and selection of the additional voices is available with standard preprogrammed settings, or custom settings for the additional voices, duration and power/ground triggers.

Note: The activation signal must be at least 250 millisecond in length to insure it is recognized. The system can be configured to be activated by a signal that provides a ground or a signal that applies aircraft voltage. In the event that more than one signal is received at the same time, the unit will respond to the first signal, then respond to the second.

2040-1-1STD standard settings are as follows.

Voice	Alert Message	Trigger	Duration
1	Stall	Power or Ground	Repeats until condition is corrected
2	Check Landing Gear	Power or Ground	Repeats until condition is corrected
3	Temperature	Ground	Repeats twice then mutes until reset
4	Auto Pilot	Ground	Repeats twice then mutes until reset
5	Low Fuel	Ground	Repeats twice then mutes until reset
6	Low Vacuum	Ground	Repeats twice then mutes until reset
7	Altitude	Ground	Repeats twice then mutes until reset
8	Fuel Pressure	Ground	Repeats twice then mutes until reset
9	Oil Pressure	Ground	Repeats twice then mutes until reset

2. If a custom system was ordered, the voice messages desired and the activating modes were selected and programmed into the unit. A copy of the system configuration form (Form 2040-config), detailing what voice messages were programmed into the unit, how they are activated, and which input wire causes its activation is included with the installation documentation. A copy of this form is to be attached to and become a part of the ICA, and a copy is to be attached to and become a part of the AFMS when the installation is completed.

## II. Installation in fixed gear aircraft

1. This section provides the instructions for installing the system in a fixed gear aircraft. Note: Before starting the installation, activate the stall warning horn and mentally note the level of the horn volume. This will permit making a comparison of the horn volume after the installation to ensure that it has not been affected by the installation of the Voice Alert system.

2. Select a location to firmly mount the Electronic Module to the aircraft. It can be mounted to the firewall, side panel, or other secondary aircraft structure. Do not alter, modify or drill any aircraft structural members when making this installation. Check to verify that the installation does not interfere with the aircraft controls or with other equipment. Do not mount the electronic module within 3 inches of a high current buss. Any additional wire required for the installation should be #22 gauge or larger and must meet the type defined in AC43.13-1B chapter 11 section 7. Wiring should not be bundled with high current carrying conductors, coaxial antenna cables, or conductors carrying pulsed signals. Bundle and secure wiring. Refer to AC43.13-1B sections 11-115 through 11-118 for information on bundling and securing wiring. Drill 4 mounting holes as shown on Fig 1. Mount the Electronic Module as shown on FIG 2, using the hardware provided.

3. Wire the system as shown on installation drawings for 2040-1-1 Fig A, B, C, D, or E. using the cable assembly provided, and the information on form 2040-config. Installation drawings are in the rear of the manual.

a) Attach the **RED** wire to the 12v or 24v power buss through a 1 circuit breaker using a ring connector provided. Note: The circuit breaker must be the reset able type and must be mounted within the pilot's reach to allow turning the system off in flight if required. Normal current draw is 150 ma.

b) Attach the **BLACK** wire to a good aircraft ground point using a ring connector provided. The ground wire should be bolted to the aircraft structure using a machine screw and nut. Refer to AC43.13-1B section 11-186 for details on grounding electronic equipment.

4. Attach the **WHITE** wire to the aircraft audio system. The **WHITE** wire is a 600 ohm low level audio signal. This signal must be hooked to the aircraft audio system in a way, which prevents the pilot from accidentally turning it off. If the aircraft has an audio panel with an un-switched audio input, the **WHITE** wire should be attached directly to this un-switched input so that the voice message will be heard directly through the cabin speaker and the headsets. If the aircraft does not have an un-switched input, then the **WHITE** wire can be hooked directly into the pilot's headset jack.

5. Locate the stall horn in the aircraft. Using a meter, measure the voltage on both sides of the stall horn when the horn is both sounding and silent. The voltage on one of the connections at the stall horn will change between aircraft voltage and ground as the horn activates. This is the point where the Voice Alert **GREEN** wire will connect. Connections can be made to the stall horn using a ring connector if the horn has terminals or by soldering or splicing into the existing wiring harness. Refer to AC43.13-1B sections 11-167, 11-174, and 11-178 for information on splicing and terminal installation. Refer to Installation drawing 2040-1-1 Fig A.

6. Refer to the form 2040-config that was supplied with the unit. Hook the control inputs from the various devices in the aircraft to the Voice Alert in accordance with the information given on form 2040-config and the color codes given. *NOTE: Inputs that provide a ground when activating can be hooked directly to the Voice Alert. Inputs that supply aircraft power when activating will require installing an external resistor in the wiring as shown on installation drawing 2040-1-1(Fig L)*

7. Cut any unused wires, and secure against shorts. The unstripped cut ends can be doubled over and covered with a piece of the heat shrink tubing and secured in the wire bundle. Attach the cable to the electronic box. This completes the installation. Proceed to section C for test of the system.

### **III. Installation in Retractable Gear Aircraft having Separate Stall and Gear Warning Horns**

The following section provides specific detailed installation instructions for retractable gear aircraft.

1. Select a location to firmly mount the Electronic Module to the aircraft. It can be mounted to the firewall, side panel, or other secondary aircraft structure. Do not alter, modify or drill any aircraft structural members when making this installation. Check to verify that the installation does not interfere with the aircraft controls or with other equipment. Do not mount the electronic module within 3 inches of a high current buss. Any additional wire required for the installation should be #22 gauge or larger, and must meet the type defined in AC43.13-1B chapter 11 section 7. Wiring should not be bundled with high current carrying conductors, coaxial antenna cables, or conductors carrying pulsed signals. Bundle and secure wiring. Refer to AC43.13-1B sections 11-115 through 11-118 for information on bundling and securing wiring. Drill 4 mounting holes as shown on FIG 1. Mount the Electronic Module as shown on FIG 2, using the hardware provided.

2. Perform the following test to verify the wiring configuration for the unit. Locate the landing gear warning horn in the aircraft. Some installations have a single electrical connection and a ground wire at the horn, other installations will have two wires running to the horn. With the landing gear retracted, and the horn silent, measure the voltage at both of the gear warning horn connections. The voltage will either be ground on both sides, or aircraft voltage on both sides. Next, retard the throttle and activate the horn. Measure the voltage on both sides of the gear warning horn again. One of the connections will have changed from the original readings. If the connection was originally ground, and now reads aircraft voltage, use Installation Drawing 2040-1-1 Fig C. If the connection was originally aircraft voltage and now reads ground, use Installation Drawing 2040-1-1 Fig B.

3. Wire the system as shown on the correct installation drawing using the cable assembly provided. Attach the **RED** wire to the 12v or 24v power buss through a 1 circuit breaker using a ring connector provided. Note: The circuit breaker must be the reset able type and must be mounted within the pilot's reach to allow turning the system off in flight if required. Normal current draw is 150 ma. Attach the **BLACK** wire to a good aircraft ground point using a ring connector provided. The ground wire should be bolted to the aircraft structure using a machine screw and nut. Refer to AC43.13-1B section 11-186 for details on grounding electronic equipment.

4. Attach the **WHITE** wire to the aircraft audio system. The **WHITE** wire is a 600 ohm low level audio signal. This signal must be hooked to the aircraft audio system in a way, which prevents the pilot from accidentally turning it off. If the aircraft has an audio panel with an un-switched audio input, the white wire should be attached directly to this un-switched input so that the voice message will be heard directly through the cabin speaker and the headsets. If the aircraft does not have an un-switched input, then the **WHITE** wire can be hooked directly into the pilot's headset jack.

5. Locate the stall horn in the aircraft. Using a meter, measure the voltage on both sides of the stall horn when the horn is both sounding and silent. The voltage on one of the connections at the stall horn will change between aircraft voltage and ground as the horn activates. This is the point where the Voice Alert **GREEN** wire will connect. Connections can be made to the stall horn using a ring connector if the horn has terminals or by soldering or splicing into the existing wiring harness. Refer to AC43.13-1B sections 11-167, 11-174, and 11-178 for information on splicing and terminal installation. Refer to Installation drawing 2040-1-1B.

6. Refer to the form 2040-config that was supplied with the unit. Hook the control inputs from the various devices to the Voice Alert in accordance with the information given, and the color codes given. *NOTE: Inputs that provide a ground when activating can be hooked directly to the Voice Alert. Inputs that supply aircraft power when activating will require installing an external resistor in the wiring as shown on installation drawing 2040-1-1 (Fig L).*

7. If using Installation Drawing Fig B, hook the **YELLOW** wire to the horn connection which changed from aircraft voltage to ground. If using Installation Drawing Fig C, hook the **BROWN** wire to the horn connection that changed from ground to aircraft voltage.

8. Cut any unused wires, and secure against shorts. The unstripped cut ends can be doubled over and covered with a piece of the heat shrink tubing and secured in the wire bundle. Attach the cable to the electronic box. This completes the installation. Proceed to section C for test of the system.

#### **IV. Installation in Retractable Gear Aircraft that use a single electronic dual warning unit for activating both the gear and stall warnings.**

The following section provides specific installation instructions for retractable gear aircraft that utilize a single electronic warning unit to produce both the stall and gear warning sounds.

1. Select a location to firmly mount the Electronic Module to the aircraft. It can be mounted to the firewall, side panel, or other secondary aircraft structure. Do not alter, modify or drill any aircraft structural members when making this installation. Check to verify that the installation does not interfere with the aircraft controls or with other equipment. Do not mount the electronic module within 3 inches of a high current buss. Any additional wire required for the installation should be #22 gauge or larger, and must meet the type defined in AC43.13-1B chapter 11 section 7. Wiring should not be bundled with high current carrying conductors, coaxial antenna cables, or conductors carrying pulsed signals. Bundle and secure wiring. Refer to AC43.13-1B sections 11-115 through 11-118 for information on bundling and securing wiring. Drill 4 mounting holes as shown on Fig 1. Mount the Electronic Module as shown on FIG 2, using the hardware provided.

2. Perform the following test to determine the correct configuration for wiring the system. Locate the electronic dual warning unit in the aircraft. You will find the following connections:

- a) A connection to the wing mounted stall switch
- b) A connection to the aircraft gear position lights
- c) A connection to the throttle switch

With the gear extended, measure the voltage at the gear position light terminal (b above). It will be either ground or aircraft voltage. If it is ground, use Installation Drawing 2040-1-1 Fig D. If it reads aircraft voltage, use Drawing 2040-1-1 Fig E for installation.

3. Wire the system as shown on the selected installation drawing, using the cable assembly provided. Attach the **RED** wire to the 12v or 24v power buss through a 1 circuit breaker using a ring connector provided. Note: The circuit breaker must be the reset able type and must be mounted within the pilot's reach to allow turning the system off in flight if required. Normal current draw is 150 ma. Attach the **BLACK** wire to a good aircraft ground point using a ring connector provided. The ground wire should be bolted to the aircraft structure using a machine screw and nut. Refer to AC43.13-1B section 11-186 for details on grounding electronic equipment.

4. Attach the **WHITE** wire to the aircraft audio system. The **WHITE** wire is a 600 ohm low level audio signal. This signal must be hooked to the aircraft audio system in a way, which prevents the pilot from accidentally turning it off. If the aircraft has an audio panel with an un-switched audio input, the white wire should be attached directly to this un-switched input so that the voice message will be heard directly through the cabin speaker and the headsets. If the aircraft does not have an un-switched input, then the **WHITE** wire can be hooked directly into the pilot's headset jack.

5. Attach the **GREEN** wire to the stall switch connection on the dual warning unit. Attach the **BLUE or ORANGE** wire from Fig D or Fig E as previously determined in item 1 above to the gear light terminal on the dual warning unit. Attach the **YELLOW** wire to the throttle switch connection on the dual warning unit.

6. Refer to the form 2040-config that was supplied with the unit. Hook the control inputs from the various devices to the Voice Alert in accordance with the information given, and the color codes given. *NOTE: Inputs that provide a ground when activating can be hooked directly to the Voice Alert. Inputs that supply aircraft power when activating will require installing an external resistor in the wiring as shown on installation drawing 2040-1-1(FIG L).*

7. Cut any unused wires, and secure against shorts. The unstripped cut ends can be doubled over and covered with a piece of the heat shrink tubing and secured in the wire bundle. Attach the cable to the electronic box. This completes the installation. Proceed to section C for test of the system.

## **B. Installation of P/N 2040-1-2**

### **I. Installation in fixed gear aircraft**

1. This section provides the instructions for installing the system in a fixed gear aircraft. This work must meet the requirements of the applicable sections of AC 43.13-1B Note: Before starting the installation, activate the stall warning horn and mentally note the level of the horn volume. This will permit making a comparison of the horn volume after the installation to insure that it has not been effected by the installation of the Voice Alert system.



2. Select a location to firmly mount the Electronic Module to the aircraft. It can be mounted to the firewall, side panel, or other secondary aircraft structure. Do not alter, modify or drill any aircraft structural members when making this installation. Check to verify that the installation does not interfere with the aircraft controls or with other equipment. Do not mount the electronic module within 3 inches of a high current buss. Any additional wire required for the installation should be #22 gauge or larger, and must meet the type defined in AC43.13-1B chapter 11 section 7. Wiring should not be bundled with high current carrying conductors, coaxial antenna cables, or conductors carrying pulsed signals. Bundle and secure wiring. Refer to AC43.13-1B sections 11-115 through 11-118 for information on bundling and securing wiring. Drill 4 mounting holes as shown on Fig 1. Mount the Electronic Module as shown on FIG 2, using the hardware provided.

3. Wire the system as shown on installation drawings for 2040-1-2 Figures F,G,H,J, or K using the cable assembly provided

a) Attach the **RED** wire to the 12v or 24v power buss through a 1 circuit breaker using a ring connector provided. Note: The circuit breaker must be the reset able type and must be mounted within the pilot's reach to allow turning the system off in flight if required. Normal current draw is 150 ma.

b) Attach the **BLACK** wire to a good aircraft ground point using a ring connector provided. The ground wire should be bolted to the aircraft structure using a machine screw and nut. Refer to AC43.13-1B section 11-186 for details on grounding electronic equipment.

4. Attach the **WHITE** wire to the aircraft audio system. The **WHITE** wire is a 600 ohm low level audio signal. This signal must be hooked to the aircraft audio system in a way, which prevents the pilot from accidentally turning it off. If the aircraft has an audio panel with an un-switched audio input, the white wire should be attached directly to this un-switched input so that the voice message will be heard directly through the cabin speaker and the headsets. If the aircraft does not have an un-switched input, then the **WHITE** wire can be hooked directly into the pilot's headset jack.

5. Locate the stall horn in the aircraft. Using a meter, measure the voltage on both sides of the stall horn when the horn is both sounding and silent. The voltage on one of the connections at the stall horn will change between aircraft voltage and ground as the horn activates. This is the point where the Voice Alert **BLUE** wire will connect. Connections can be made to the stall horn using a ring connector if the horn has terminals or by soldering or splicing into the existing wiring harness. Refer to AC43.13-1B sections 11-167, 11-174, and 11-178 for information on splicing and terminal installation. Refer to Installation drawing FIG F. The stall system in the aircraft may be wired in either configuration as shown on the drawing.

6. Cut any unused wires, and secure against shorts. The unstripped cut ends can be doubled over and covered with a piece of the heat shrink tubing and secured in the wire bundle. Attach the cable to the electronic box. This completes the installation. Proceed to section C for test of the system.

## II. Installation in Retractable Gear Aircraft that use separate annunciators for Gear and Stall warning.

The following section provides specific detailed installation instructions for retractable gear aircraft.

1. Select a location to firmly mount the Electronic Module to the aircraft. It can be mounted to the firewall, side panel, or other secondary aircraft structure. Do not alter, modify or drill any aircraft structural members when making this installation. Check to verify that the installation does not interfere with the aircraft controls or with other equipment. Do not mount the electronic module within 3 inches of a high current buss. Any additional wire required for the installation should be #22 gauge or larger and must meet the type defined in AC43.13-1B chapter 11 Section 7.

Wiring should not be bundled with high current carrying conductors, coaxial antenna cables, or conductors carrying pulsed signals. Bundle and secure wiring. Refer to AC43.13-1B sections 11-115 through 11-118 for information on bundling and securing wiring. Drill 4 mounting holes as shown on Fig 1. Mount the Electronic Module as shown on FIG 2, using the hardware provided.

2. Perform the following test to verify the wiring configuration for the unit. Locate the landing gear warning horn in the aircraft. Many installations will have a single electrical connection and a ground wire at the horn, other installations will have two wires running to the horn. With the landing gear retracted, and the horn silent, measure the voltage at both of the gear warning horn connections. The voltage will either be ground on both sides, or aircraft voltage on both sides. Retard the throttle and activate the horn. Measure the voltage on both sides of the gear warning horn again. One of the connections will have changed from the original readings. If the connection was originally ground, and now reads aircraft voltage, use Installation Drawing 2040-1-2 Fig H. If the connection was originally aircraft voltage and now reads ground, use Drawing 2040-1-2 Fig G to install the system.

3. Wire the system as shown on Fig G or Fig H. as defined above, using the cable assembly provided

a) Attach the **RED** wire to the 12v or 24v power buss through a 1 circuit breaker using a ring connector provided. Note: The circuit breaker must be the reset able type and must be mounted within the pilot's reach to allow turning the system off in flight if required. Normal current draw is 150 ma.

b) Attach the **BLACK** wire to a good aircraft ground point using a ring connector provided. The ground wire should be bolted to the aircraft structure using a machine screw and nut. Refer to AC43.13-1B section 11-186 for details on grounding electronic equipment.

4. Attach the **WHITE** wire to the aircraft audio system. The **WHITE** wire is a 600 ohm low level audio signal. This signal must be hooked to the aircraft audio system in a way, which prevents the pilot from accidentally turning it off. If the aircraft has an audio panel with an un-switched audio input, the white wire should be attached directly to this un-switched input so that the voice message will be heard directly through the cabin speaker and the headsets. If the aircraft does not have an un-switched input, then the **WHITE** wire can be hooked directly into the pilot's headset jack.

5. Locate the stall horn in the aircraft. Using a meter, measure the voltage on both sides of the stall horn when the horn is both sounding and silent. The voltage on one of the connections at the stall horn will change between aircraft voltage and ground as the horn activates. This is the point where the Voice Alert **BLUE** wire will connect. Connections can be made to the stall horn using a ring connector if the horn has terminals or by soldering or splicing into the existing wiring harness. Refer to AC43.13-1B sections 11-167, 11-174, and 11-178 for information on splicing and terminal installation. Refer to the Installation drawing. The stall system in the aircraft may be wired in either configuration as shown on the drawing.

6. If using Fig G for the installation, hook the **GREEN** wire to the horn terminal that changed voltage in the above test. If using Fig H for installation, hook the **ORANGE** wire to the horn terminal that changed voltage in the above test.

7. Cut any unused wires, and secure against shorts. The unstripped cut ends can be doubled over and covered with a piece of the heat shrink tubing and secured in the wire bundle. Attach the cable to the electronic box. This completes the installation. Proceed to section C for test of the system.

### **III. Detailed Installation Instructions for Retractable Gear Aircraft that use an electronic dual warning unit and single annunciator for both the gear and stall warnings.**

The following section provides specific installation instructions for retractable gear aircraft that utilize a single electronic warning unit to produce both the stall and gear warning sounds.

1. Select a location to firmly mount the Electronic Module to the aircraft. It can be mounted to the firewall, side panel, or other secondary aircraft structure. Do not alter, modify or drill any aircraft structural members when making this installation. Check to verify that the installation does not interfere with the aircraft controls or with other equipment. Do not mount the electronic module within 3 inches of a high current buss. Any additional wire required for the installation should be #22 gauge or larger, and must meet the type defined in AC43.13-1B chapter 11 section 7. Wiring should not be bundled with high current carrying conductors, coaxial antenna cables, or conductors carrying pulsed signals. Bundle and secure wiring. Refer to AC43.13-1B sections 11-115 through 11-118 for information on bundling and securing wiring. Drill 4 mounting holes as shown on Fig 1. Mount the Electronic Module as shown on FIG 2, using the hardware provided.

2. Perform the following test to determine the correct configuration for wiring the system. Locate the electronic dual warning unit in the aircraft. You will find the following connections:

- a) A connection to the wing mounted stall switch
- b) A connection to the aircraft gear position lights
- c) A connection to the throttle switch

With the gear down, measure the voltage at the gear position light terminal (b above). It will be either ground or aircraft voltage. If it is ground, use Installation Drawing 2040-1-2 Fig J. If it measures aircraft voltage, use drawing 2040-1-2 Fig K to install the system.

3. Wire the system as shown on the appropriate installation drawing as determined above, using the cable assembly provided

a) Attach the **RED** wire to the 12v or 24v power buss through a 1 circuit breaker using a ring connector provided. Note: The circuit breaker must be the reset able type and must be mounted within the pilot's reach to allow turning the system off in flight if required. Normal current draw is 150 ma.

b) Attach the **BLACK** wire to a good aircraft ground point using a ring connector provided. The ground wire should be bolted to the aircraft structure using a machine screw and nut. Refer to AC43.13-1B section 11-186 for details on grounding electronic equipment.

4. Attach the **WHITE** wire to the aircraft audio system. The **WHITE** wire is a 600 ohm low level audio signal. This signal must be hooked to the aircraft audio system in a way, which prevents the pilot from accidentally turning it off. If the aircraft has an audio panel with an un-switched audio input, the white wire should be attached directly to this un-switched input so that the voice message will be heard directly through the cabin speaker and the headsets. If the aircraft does not have an un-switched input, then the **WHITE** wire can be hooked directly into the pilot's headset jack.

5. Attach the **BLUE** wire to the stall switch connection on the dual warning unit.

6. If using Fig J for installation, connect the **YELLOW** wire to the gear light terminal. If using Fig K for installation, connect the **BROWN** wire to the gear light terminal.

7. Attach the **GREEN** wire to the throttle switch connection on the dual warning unit.

8. Cut any unused wires, and secure against shorts. The unstripped cut ends can be doubled over and covered with a piece of the heat shrink tubing and secured in the wire bundle. Attach the cable to the electronic box. This completes the installation. Proceed to section C for test of the system.

## C. System Test

### 1. Ground Test

This test is to be performed on the ground both with and without the engine running prior to flight:

1. Activate the aircraft existing stall and or gear warning horns. Note the volume level of the horn sound, and compare that sound level to the sound level experienced in the test of the system performed prior to the start of the installation. There must be no noticeable decrease in sound level. The headset volume can be adjusted by turning the volume adjust screw accessible through a small hole in the top on the electronic module. Hole is on the DB connector side of the module and can be turned with a small phillips screwdriver. Verify voice clarity.

2. With electrical power applied to the Voice Alert unit, individually turn on the various electrical devices in the aircraft. Use the table attached to this procedure as a guide for performing this test. The acceptance criteria given below must be met, as each electrical device is activated and then turned off.

3. Verify that the aircraft devices operate normally and are not affected by the Voice Alert. The acceptance criteria given below must be met.

4. If inputs from external devices are connected to the voice alert, verify that the voice messages do not falsely sound at any time

5. Taxi the aircraft. The acceptance criteria given below must be met.

## **2. Ground Test Acceptance Criteria**

The following criteria must be met for each part of the ground test.

a) False triggering of the Voice Alert at any time constitutes failure of the test.

b) If the Voice Alert, and/or the Stall or Gear Warning, activates when it should not, that constitutes failure of the test.

c) If any electronic device in the aircraft does not operate correctly, turn off the Voice Alert and determine if it is the cause. If the Voice Alert affects the operation of any electronic device, that constitutes failure and must be corrected.

d) There must be no noticeable decrease in the warning horn sound level after the system installation.

e) The voice level must be adequate, and understandable.

## **3. Flight Test Procedure**

This test is to be performed with the aircraft in flight. Flight tests should be conducted at an altitude and in a flight area suitable for this activity. The acceptance criteria given below must be met during this test.

3. Perform a normal takeoff.

2. Fly the aircraft at different speeds from normal cruise speed to approach speed. The acceptance criteria given below must be met during this test.

3. Perform a stall. The Voice Alert must activate with the proper voice message whenever the aircraft stall warning sounds, and the voice must stop when the stall horn stops. The volume level must be adequate to hear and recognize the message above other sounds. Verify that the presence of a stall warning can be recognized along with simultaneous radio reception. Failure to fully meet this criteria constitutes failure of this test. (Stalls should be performed at different power levels to insure the voice can be heard over the background sounds).

4. With the landing gear retracted, pull the throttle to idle. The Voice Alert must sound with the proper message at the time that the gear warning horn sounds, and it must stop when the gear horn stops. The volume level must be adequate to hear and recognize the message above other sounds. Verify that the voice message can be recognized along with simultaneous radio reception. Failure to fully meet this criteria constitutes failure of this test.

5. With the gear retracted and the throttle retarded, activate the gear warning horn and the voice message. Decrease the airspeed until the aircraft approaches a stall and the stall horn sounds. The voice message must instantly change to the stall warning message as the stall horn sounds.

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The voice message must change back to the gear warning message within 1 voice cycle after the stall warning stops, and the gear warning horn continues. Failure to fully meet this criteria constitutes failure of this test.

6. Individually turn on the various electrical devices in the aircraft. Use the attached table as a guide. As each device is activated, verify that its operation is not affected by the Voice Alert, and that the Voice Alert does not false trigger as the various electrical devices are turned on.

7. Cause as many of the auxiliary devices attached to the Voice Alert to activate as practical. The voice message must play twice then stop. It must not repeat until the signal has reset and is then reactivated.

#### **4. Flight Test Acceptance Criteria**

The following criteria must be met during the flight test. This is in addition to other criteria that may be defined in the individual test sections.

- a) False trigger of the Voice Alert at any time constitutes failure of this test.
- b) If the Voice Alert, and/or either the stall or gear warning or other devices activates when it should not, that constitutes failure of the test.
- c) There must be no noticeable decrease in the stall or gear warning sound levels from that heard in the test performed prior to the start of the installation.
- d) The voice volume must be adequate and the voice understandable.

#### **D. Documentation**

3. The installer is responsible for making log book entries, revised weight & balance, and other documentation as necessary.

## **E. Equipment**

The following is a listing of the parts and materials included with this kit.

1. (1) P/N 2040-1-1 or P/N 2040-1-2 Electronic Module
2. (1) P/N 2040-3-1 or P/N 2040- 3-2 Cable Assembly
3. (4) Machine Screws, #8 X 32 X ½ RH P SS
4. (4) Hex Nuts, #8 X 32 self-locking SS
5. (4) Flat Washers, #8 SS
6. (4) Insulated Ring Connectors, #8, 18-22 wire
7. (20) Nylon Ty-wraps
8. (1) Length 1/8 dia heat shrink
9. (1) Length 3/8 dia heat shrink
10. (2) 1N4007 Diodes

## Interference Test Checklist

The following is a checklist to be used when checking for interference between the Voice Alert system and other electrical equipment installed in the aircraft. This is a suggested listing only. Testing should include the electrical equipment actually installed in the aircraft.

ITEM	FLIGHT TEST	GROUND TEST
1. Master Switch		
2. Avionics Master Switch		
3. Electronic Aircraft Instrumentation		
4. Audio System		
5. Boost Pump		
6. Flaps		
7. Landing Gear Actuators		
8. Trim Motors		
9. Accessory Motors		
10. Communication Radios		
11. GPS		
12. VOR receivers		
13. ADF receiver		
14. DME		
15. Transponder		
16. Marker beacon receiver		
17. TCAS system		
18. Strobe lights		
19. Rotating Beacon		
20. Electric clocks/timers		
21. Pitot heat.		
22. Navigation lights		
23. Landing lights		



**Information on External Inputs**  
**For use with installation of P/N 2040-1-1 Voice Alert System**

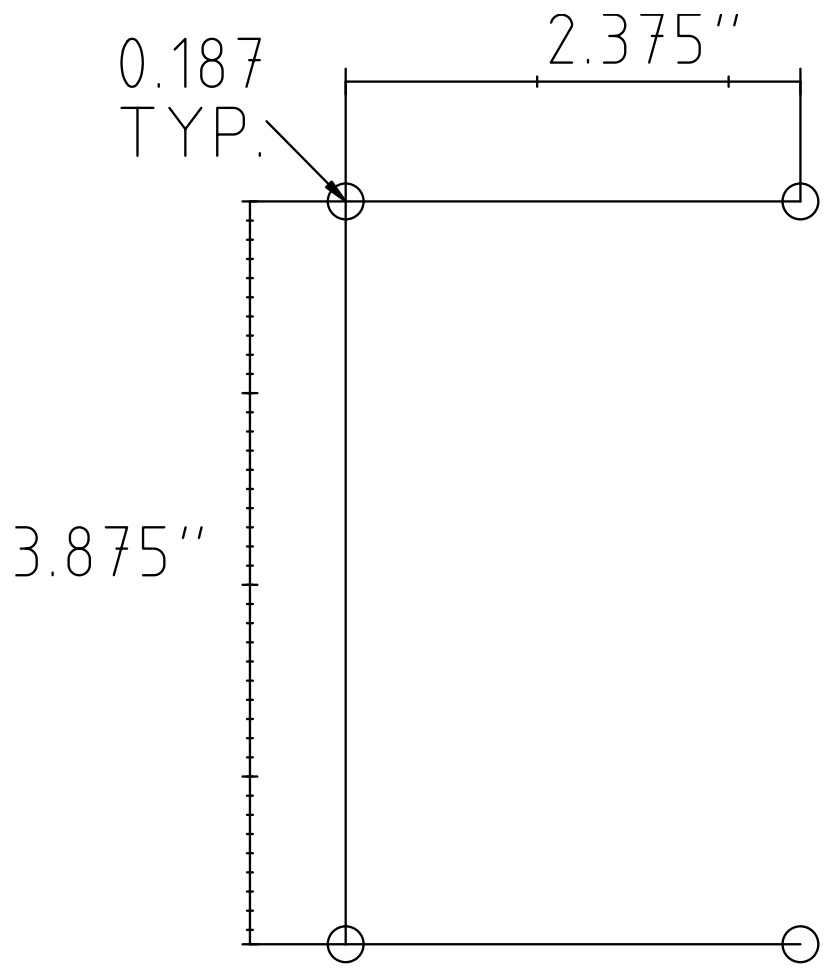
**P/N 2040-1-1**    S/N \_\_\_\_\_

**Additional Voice Messages**

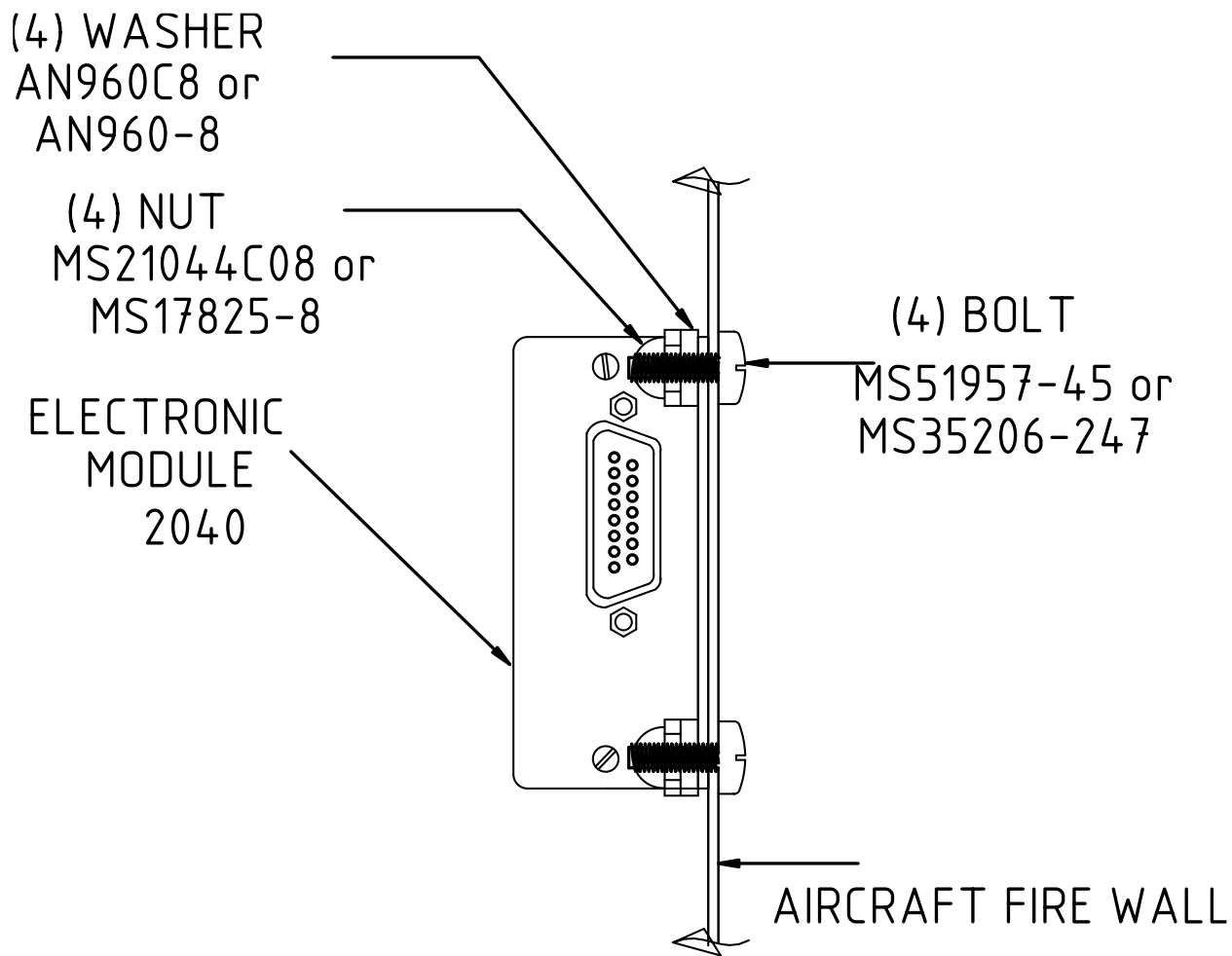
<b>Input</b>	<b>Pin Number</b>	<b>Wire Color</b>	<b>External Device</b>	<b>Voice Message</b>	<b>Activation, G or V</b>
1					
2					
3					
4					
5					
6					
7					

**NOTES:**

1. A copy of this form is to be attached to the ICA and become part of that document when this system is installed.
2. These additional voice messages are designed to play twice then stop. The activation signal must reset and then reactivate for the voice to sound again.

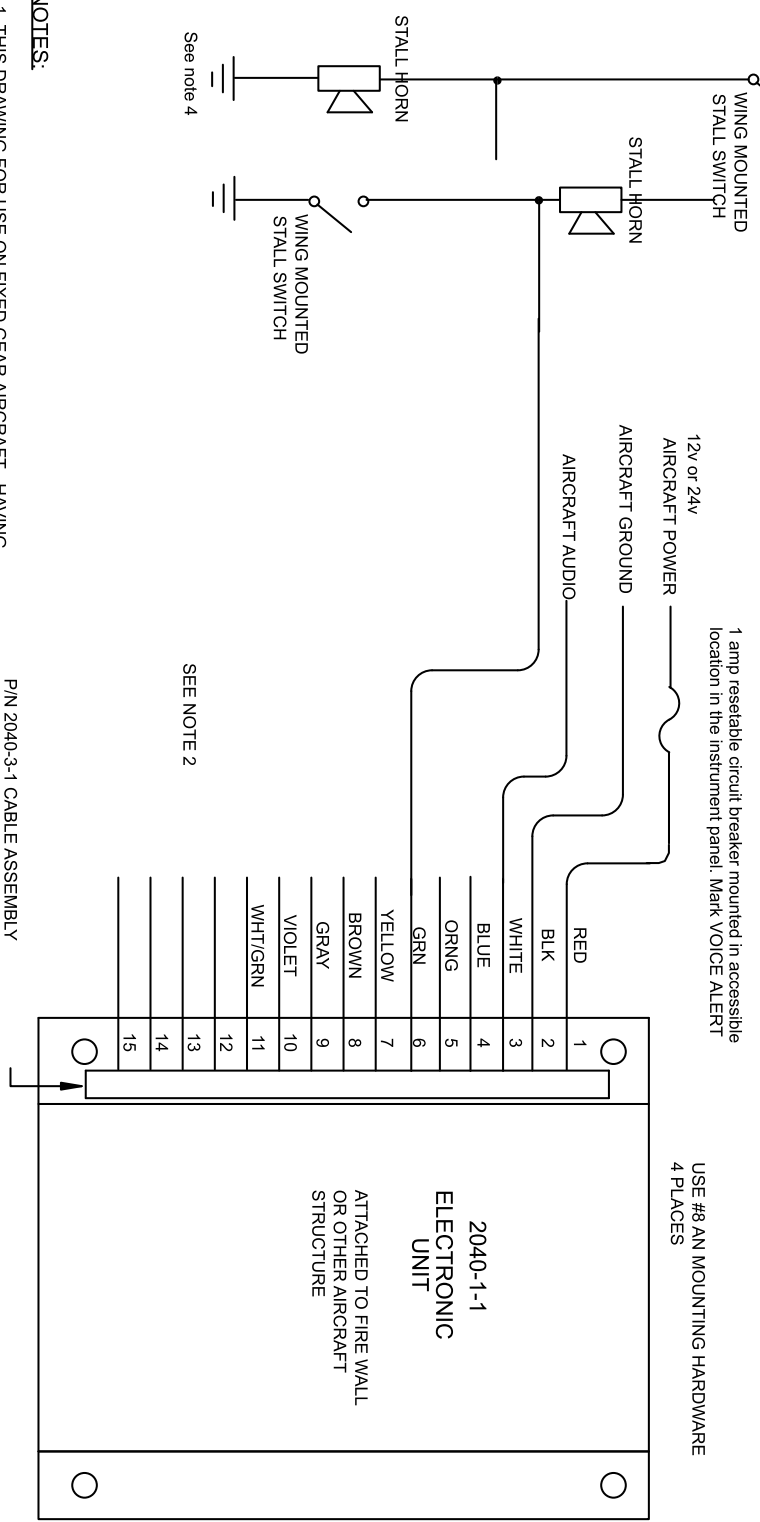


Electronic Module Template  
Figure 1



Electronic Module Installation  
Figure 2

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



P/N 2040-3-1 CABLE ASSEMBLY

SEE NOTE 2

See note 4

**NOTES:**

1. THIS DRAWING FOR USE ON FIXED GEAR AIRCRAFT HAVING A WING MOUNTED STALL SWITCH.
2. PINS 9 TO 15 FOR EXTERNAL INPUTS. ADD ADDITIONAL WIRES AS NEEDED
3. IF THE WHITE WIRE IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS.
4. SYSTEM WILL FUNCTION WITH EITHER WIRING CONFIGURATION.

APPROVED	<b>MDG</b>
DATE	<b>6/28/06</b>

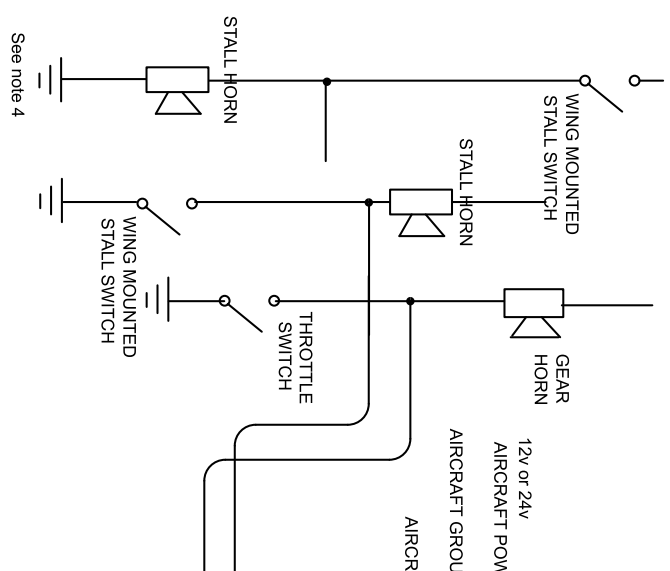
**AIRCRAFT COMPONENTS INC.**  
**P/N 2040-1-1 Voice Alert**  
**Installation Drawing**

SIZE	FSCM NO.	DWG NO.	REV
<b>A</b>		<b>FIG A</b>	<b>0</b>
SCALE	DRAWN BY	SHEET	
<b>NONE</b>	<b>J.D.G.</b>	<b> </b>	

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

1 amp resettable circuit breaker mounted in accessible location in the instrument panel. Mark VOICE ALERT

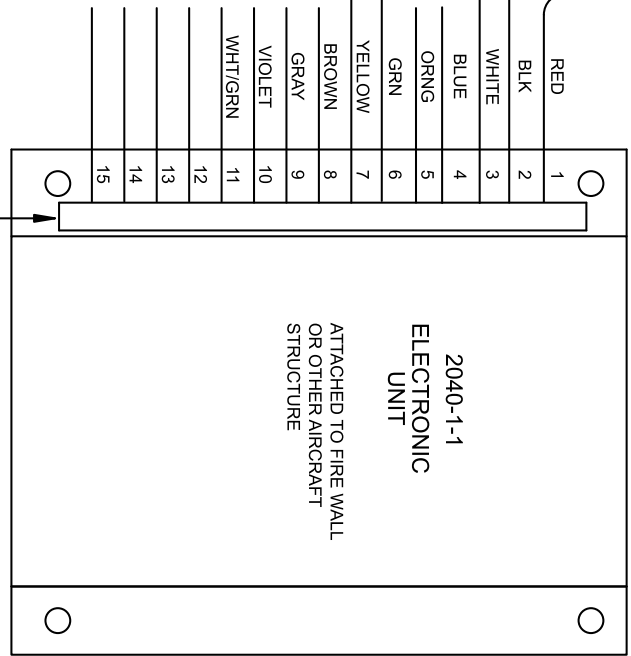
USE #8 AN MOUNTING HARDWARE  
4 PLACES



See note 4

SEE NOTE 2

P/N 2040-3-1 CABLE ASSEMBLY



- NOTES:**
1. THIS DRAWING FOR USE ON RETRACTABLE GEAR AIRCRAFT HAVING A WING MOUNTED STALL SWITCH, AND A GEAR HORN WIRED SO THAT CLOSING THE THROTTLE APPLIES GROUND TO ACTIVATE THE HORN
  2. PINS 9 TO 15 FOR EXTERNAL INPUTS. ADD ADDITIONAL WIRES AS NEEDED
  3. IF THE WHITE WIRE IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS.
  4. SYSTEM WILL FUNCTION WITH EITHER WIRING CONFIGURATION.

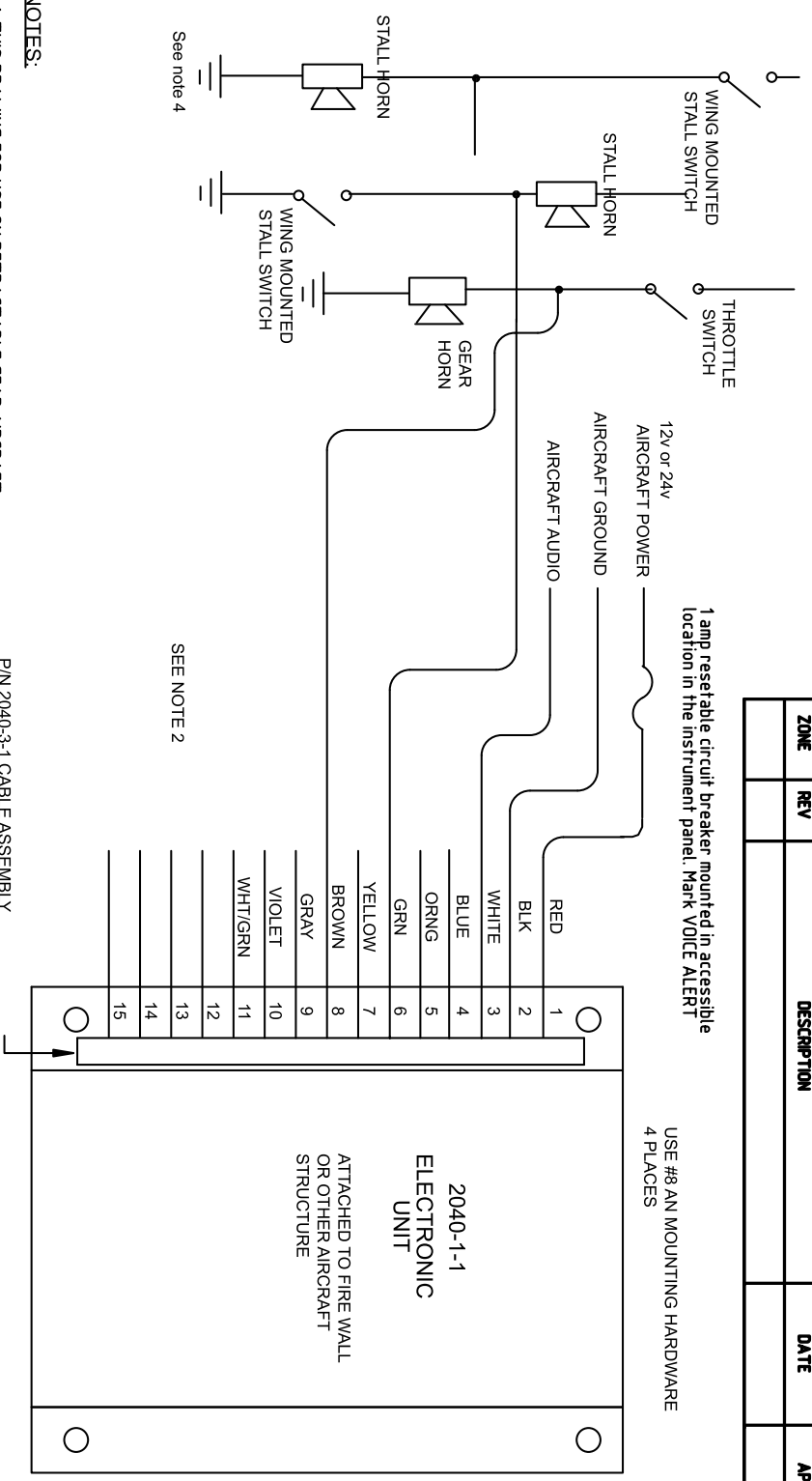
APPROVED	MDG
DATE	6/28/06

SIZE	FSC# NO.	DWG NO.	REV
A	NONE	J.D.G.	0
SCALE	DRAWN BY		SHEET
NONE	J.D.G.		FIG B

**AIRCRAFT COMPONENTS INC.**

P/N 2040-1-1 Voice Alert  
Installation Drawing

REVISIONS			DATE	APPROVED
ZONE	REV	DESCRIPTION		



See note 4

SEE NOTE 2

P/N 2040-3-1 CABLE ASSEMBLY

- NOTES:**
1. THIS DRAWING FOR USE ON RETRACTABLE GEAR AIRCRAFT HAVING A WING MOUNTED STALL SWITCH AND A GEAR HORN WIRED SO THAT CLOSING THE THROTTLE APPLIES POWER TO ACTIVATE THE HORN
  2. PINS 9 TO 15 FOR EXTERNAL INPUTS. ADD ADDITIONAL WIRES AS NEEDED
  3. IF THE WHITE WIRE IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS.
  4. SYSTEM WILL FUNCTION WITH EITHER WIRING CONFIGURATION.

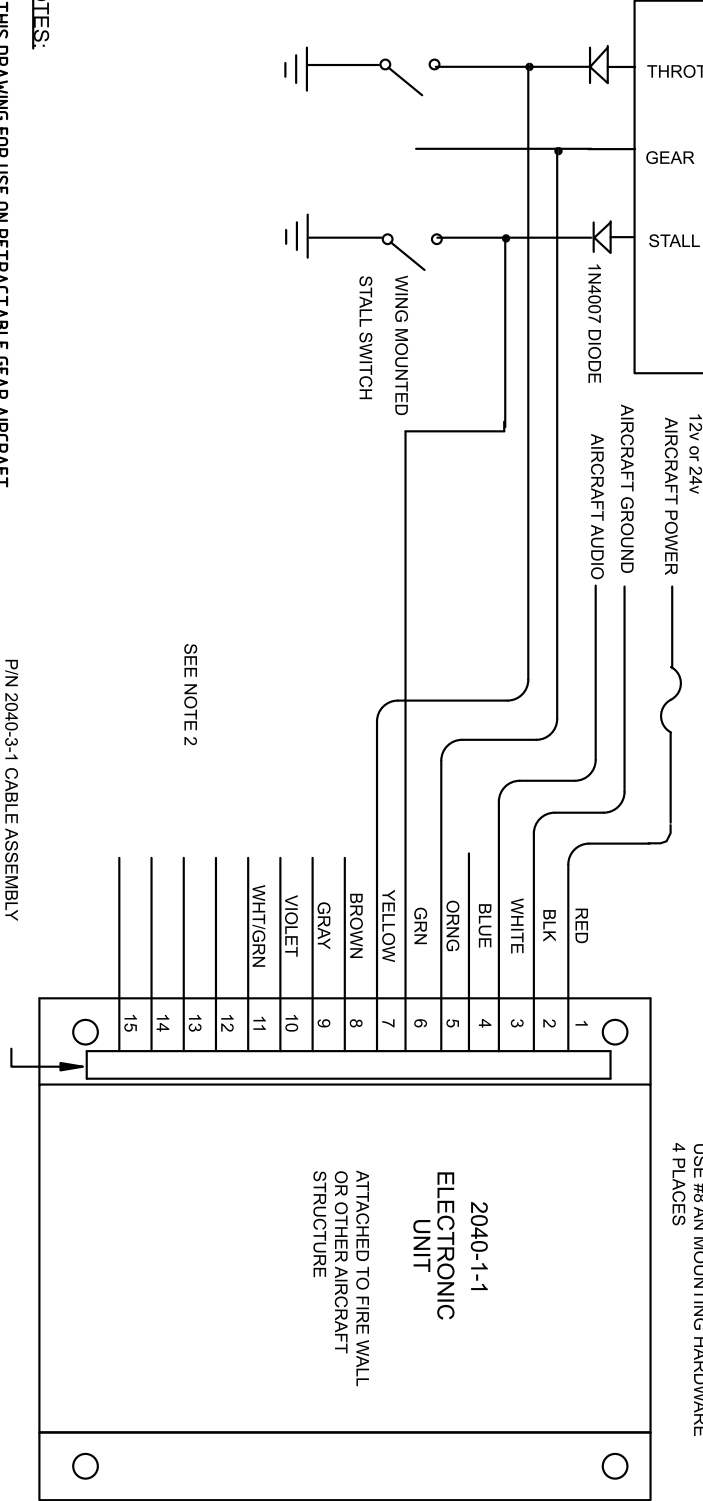
APPROVED	MDG
DATE	6/28/06

SIZE	FSCM NO.	DWG NO.	REV
A	NONE	FIG C	0
SCALE	DRAWN BY	SHEET	
	J.D.G.		

**AIRCRAFT COMPONENTS INC.**

P/N 2040-1-1 Voice Alert  
Installation Drawing

REVISIONS			DATE	APPROVED
ZONE	REV	DESCRIPTION		



- NOTES:**
1. THIS DRAWING FOR USE ON RETRACTABLE GEAR AIRCRAFT HAVING AN ELECTRONIC DUAL WARNING UNIT WIRED SO THAT THE GEAR TERMINAL IS GROUNDED WHEN THE GEAR IS DOWN.  
"This Fig for use on Cessna Aircraft only"
  2. PINS 9 TO 15 FOR EXTERNAL INPUTS. ADD ADDITIONAL WIRES AS NEEDED.
  3. IF THE WHITE WIRE IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS.

APPROVED	MIDG
DATE	6/28/06

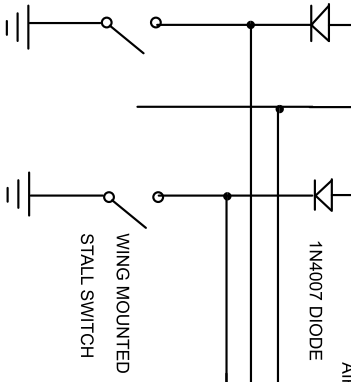
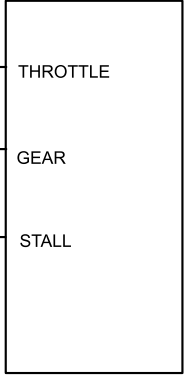
SIZE	FSCM NO.	DWG NO.	REV
A	NONE	FIG D	0
SCALE	DRAWN BY	SHEET	
NONE	J.D.G.		

**AIRCRAFT COMPONENTS INC.**

P/N 2040-1-1 Voice Alert  
Installation Drawing

REVISIONS			DATE	APPROVED
ZONE	REV	DESCRIPTION		

ELECTRONIC DUAL WARNING UNIT

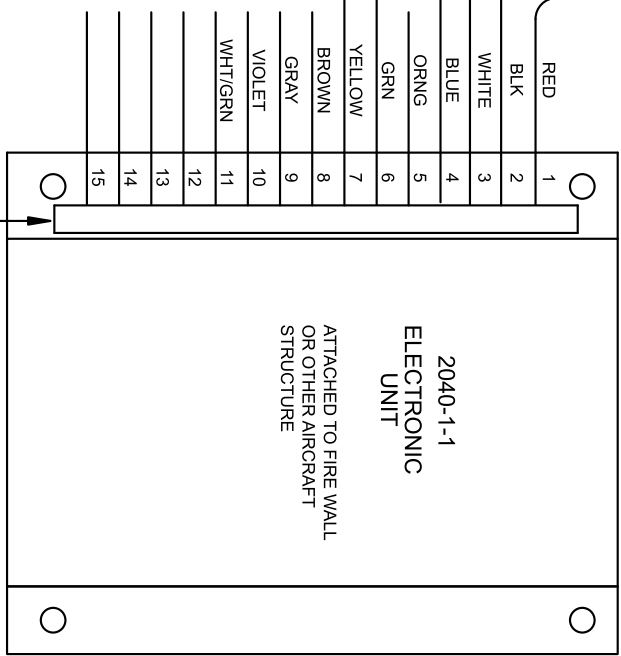


1 amp resettable circuit breaker mounted in accessible location in the instrument panel. Mark VOICE ALERT

USE #8 AN MOUNTING HARDWARE 4 PLACES

P/N 2040-3-1 CABLE ASSEMBLY

SEE NOTE 2



2040-1-1  
ELECTRONIC  
UNIT  
ATTACHED TO FIRE WALL  
OR OTHER AIRCRAFT  
STRUCTURE

**NOTES:**

1. THIS DRAWING FOR USE ON RETRACTABLE GEAR AIRCRAFT HAVING AN ELECTRONIC DUAL WARNING UNIT WIRED SO THAT POWER IS APPLIED TO THE GEAR TERMINAL WHEN THE GEAR IS DOWN.
2. PINS 9 TO 15 FOR EXTERNAL INPUTS. ADD ADDITIONAL WIRES AS NEEDED
3. IF THE WHITE WIRE IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS.

"This Fig for use on Cessna Aircraft only"

APPROVED	MDG
DATE	6/28/06

SIZE	FSCM NO.	DWG NO.	REV
A		FIG E	0
SCALE	NONE	DRAWN BY	SHEET
		J.D.G.	

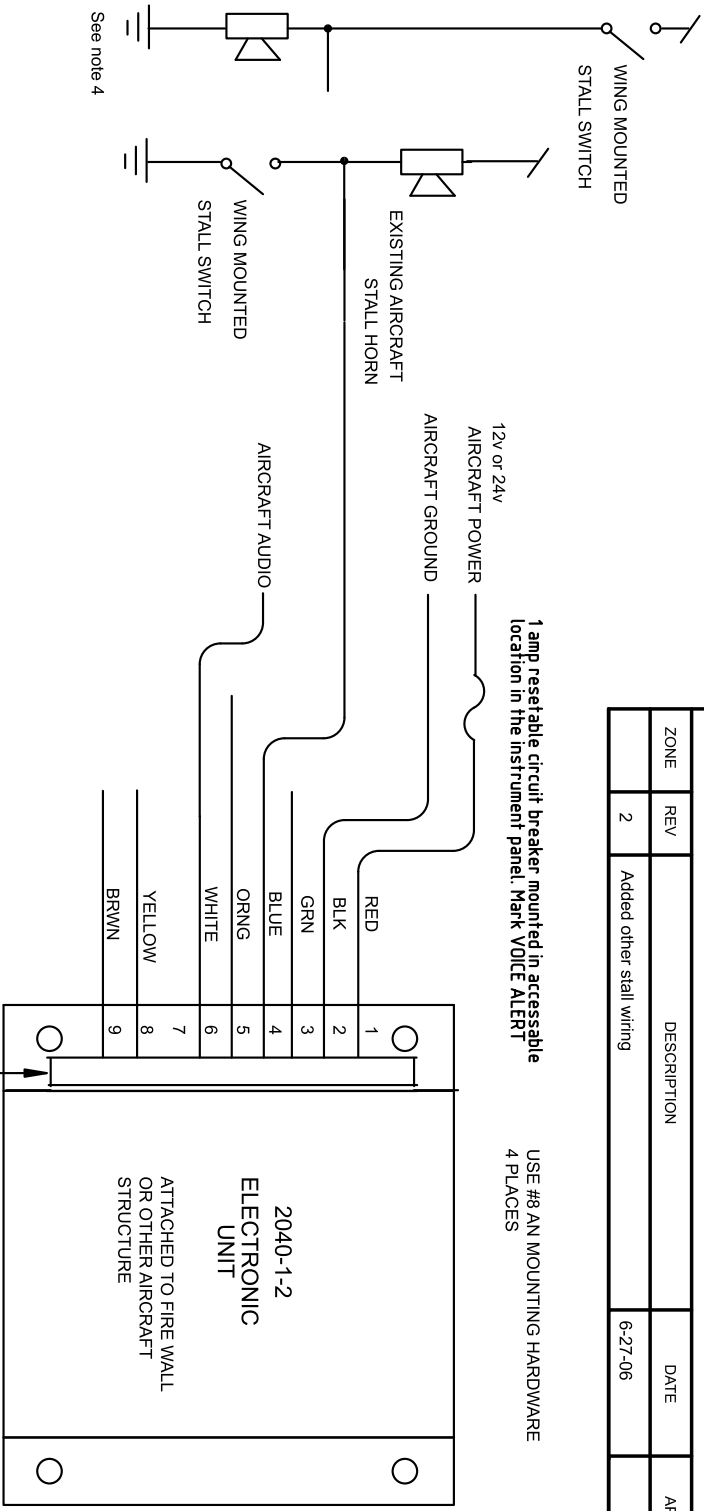
**AIRCRAFT COMPONENTS INC.**  
P/N 2040-1-1 Voice Alert  
Installation Drawing



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
	2	Added other stall wiring	6-27-06	

1 amp resettable circuit breaker mounted in accessible location in the instrument panel. Mark VOICE ALERT

USE #8 AN MOUNTING HARDWARE 4 PLACES



P/N 2040-3-2 CABLE ASSEMBLY

**NOTES:**

1. THIS SCHEMATIC FOR USE ON FIXED GEAR AIRCRAFT
2. THE GRN, ORNG, YELLOW, & BRWN WIRES ARE NOT USED IN THIS INSTALLATION
3. IF THE WHITE WIRE IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS
4. SYSTEM WILL WORK WITH EITHER WIRING CONFIGURATION. ATTACH BLUE WIRE AS SHOWN.

**AIRCRAFT COMPONENTS INC.**

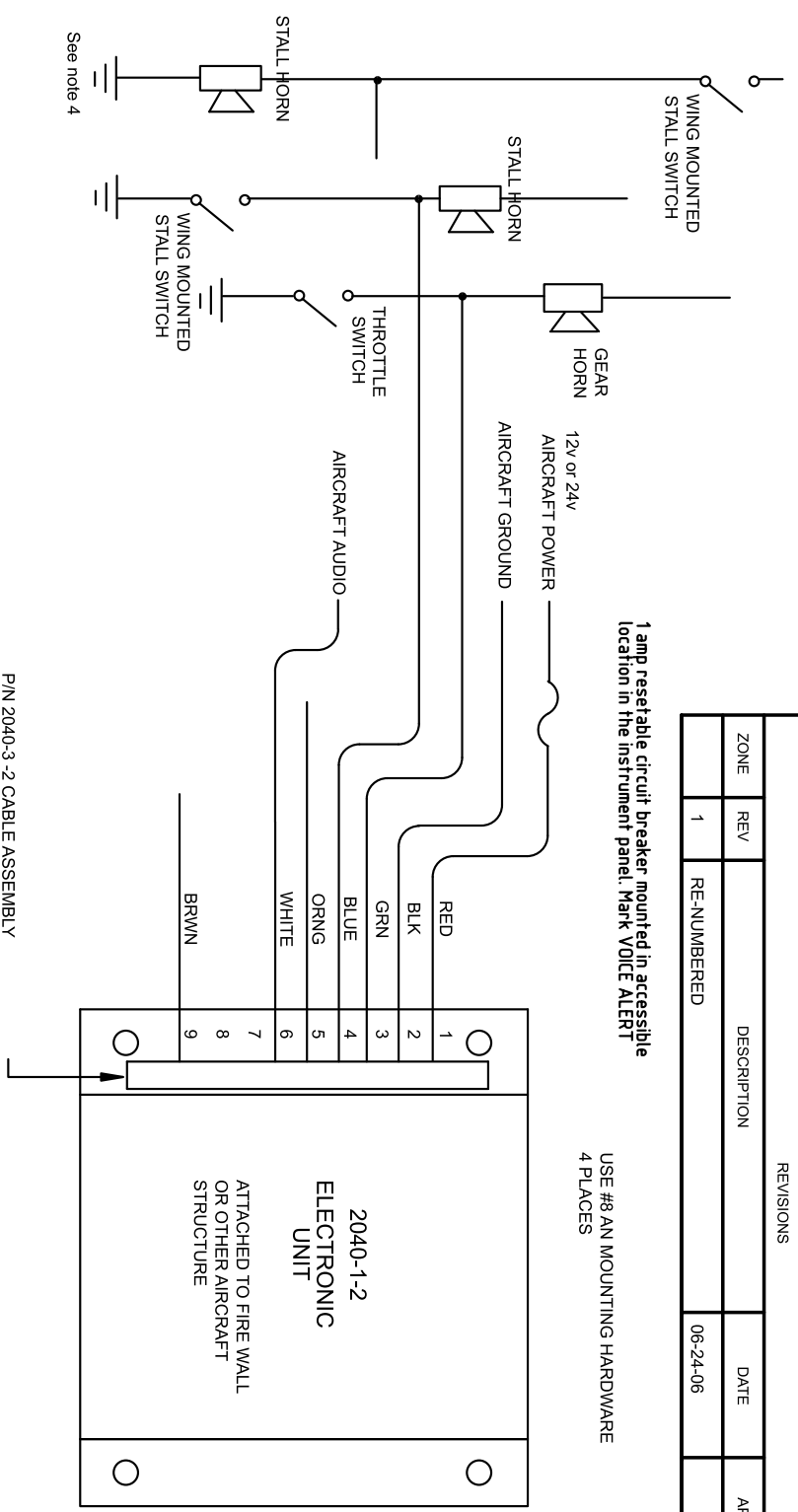
**P/N 2040-1-2 Voice Alert**  
Installation Drawing

APPROVED	MDG	SIZE	FSCM NO.	DWG NO.	REV
DATE	06-27-06	A	NONE	FIG F	1
		SCALE	NONE	DRAWN BY	SHEET
				J.D.G.	1

REVISIONS			DATE	APPROVED
ZONE	REV	DESCRIPTION		
	1	RE-NUMBERED	06-24-06	

1 amp resettable circuit breaker mounted in accessible location in the instrument panel. Mark VOICE ALERT

USE #8 AN MOUNTING HARDWARE  
4 PLACES



P/N 2040-3 -2 CABLE ASSEMBLY

**AIRCRAFT COMPONENTS INC.**

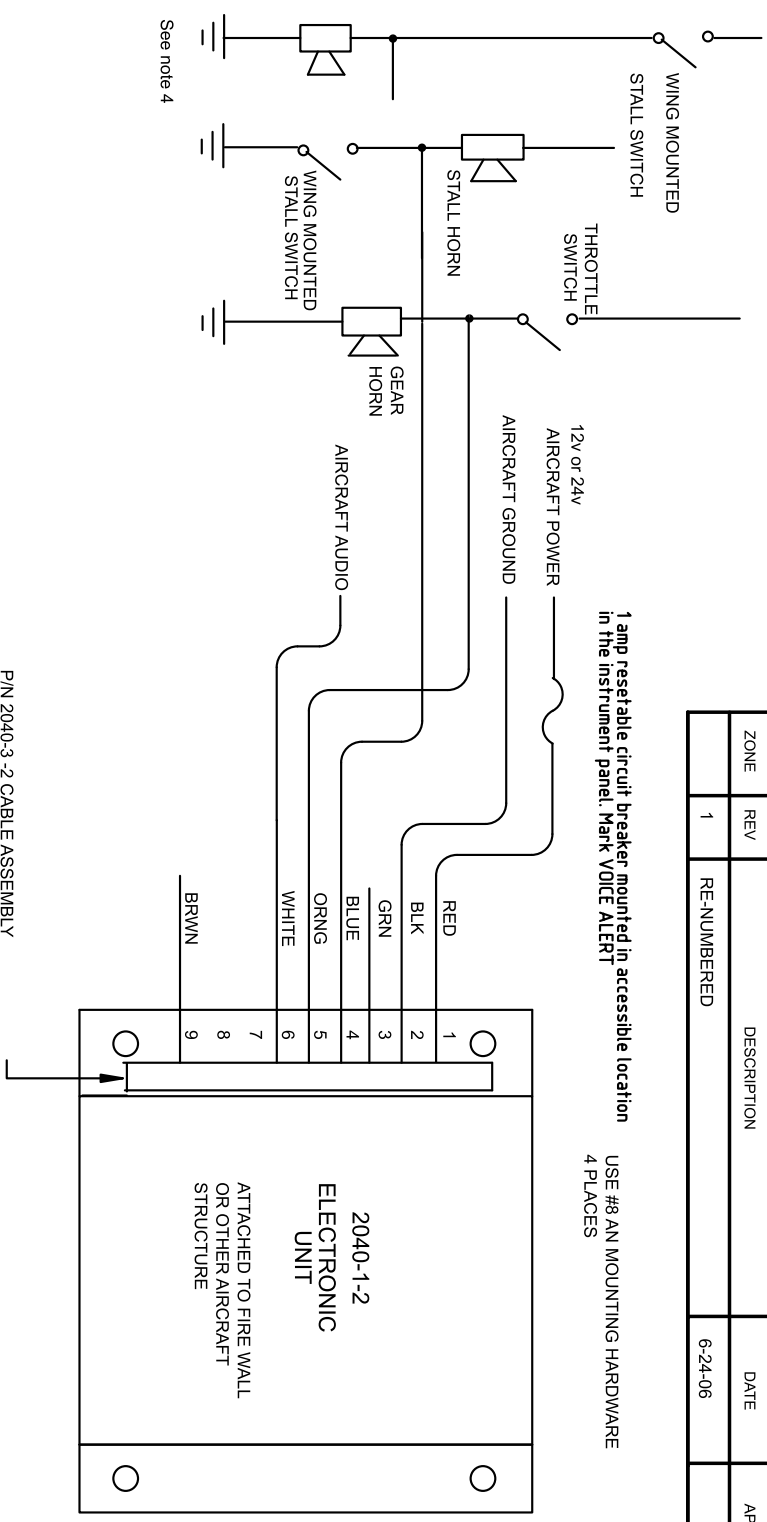
**P/N 2040-1-2 Voice Alert  
Installation Drawing**

SIZE	FSCM NO.	DWG NO.	REV
A		FIG G	1
SCALE	NONE	DRAWN BY	SHEET
		J.D.G.	1

APPROVED	DATE
	06-24-06

- NOTES:**
1. THIS DRAWING FOR USE ON RETRACTABLE GEAR AIRCRAFT HAVING A WING MOUNTED STALL SWITCH AND A GEAR HORN WIRED SO THAT CLOSING THE THROTTLE APPLIES GROUND TO ACTIVATE THE HORN
  2. ORANGE AND BROWN WIRES NOT USED
  3. IF THE WHITE WIRE IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS
  4. SYSTEM WILL WORK WITH EITHER WIRING CONFIGURATION, ATTACH WIRING AS SHOWN.

REVISIONS			DATE	APPROVED
ZONE	REV	DESCRIPTION		
1		RE-NUMBERED	6-24-06	



P/N 2040-3-2 CABLE ASSEMBLY

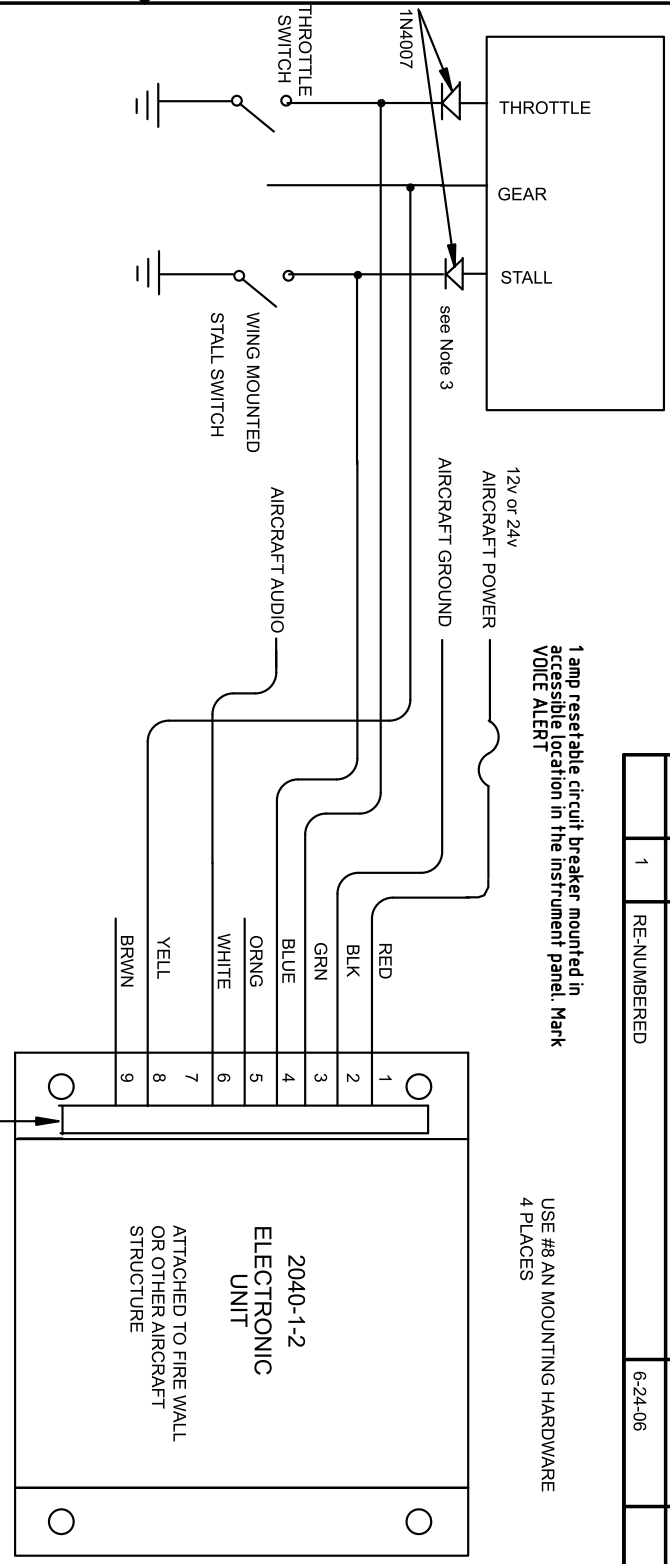
- NOTES:**
1. THIS DRAWING FOR USE ON RETRACTABLE GEAR AIRCRAFT HAVING A WING MOUNTED STALL SWITCH, AND A GEAR HORN WIRED SO THAT CLOSING THE THROTTLE APPLIES POWER TO ACTIVATE THE HORN
  2. GREEN AND BROWN WIRES NOT USED
  3. IF THE WHITE WIRE IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS
  4. SYSTEM WILL WORK WITH EITHER WIRING CONFIGURATION, ATTACH WIRING AS SHOWN.

APPROVED		MDG		<b>AIRCRAFT COMPONENTS INC.</b> P/N 2040-1-2 Voice Alert Installation Drawing			
							DATE
SIZE	A	FSCM NO.		DWG NO.	FIG H	REV	1

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
1	1	RE-NUMBERED	6-24-06	

1 amp resettable circuit breaker mounted in accessible location in the instrument panel. Mark VOICE ALERT

USE #8 AN MOUNTING HARDWARE 4 PLACES



NOTES:  
 1. THIS DRAWING FOR USE ON RETRACTABLE GEAR AIRCRAFT HAVING A WING MOUNTED STALL SWITCH AND AN ELECTRONIC DUAL WARNING UNIT WIRED SO THAT THE GEAR TERMINAL IS GROUNDED WHEN THE GEAR IS DOWN.  
 "This Fig for use on Cessna Aircraft only"

P/N 2040-3 ITEM 2 CABLE ASSEMBLY

**AIRCRAFT COMPONENTS INC.**

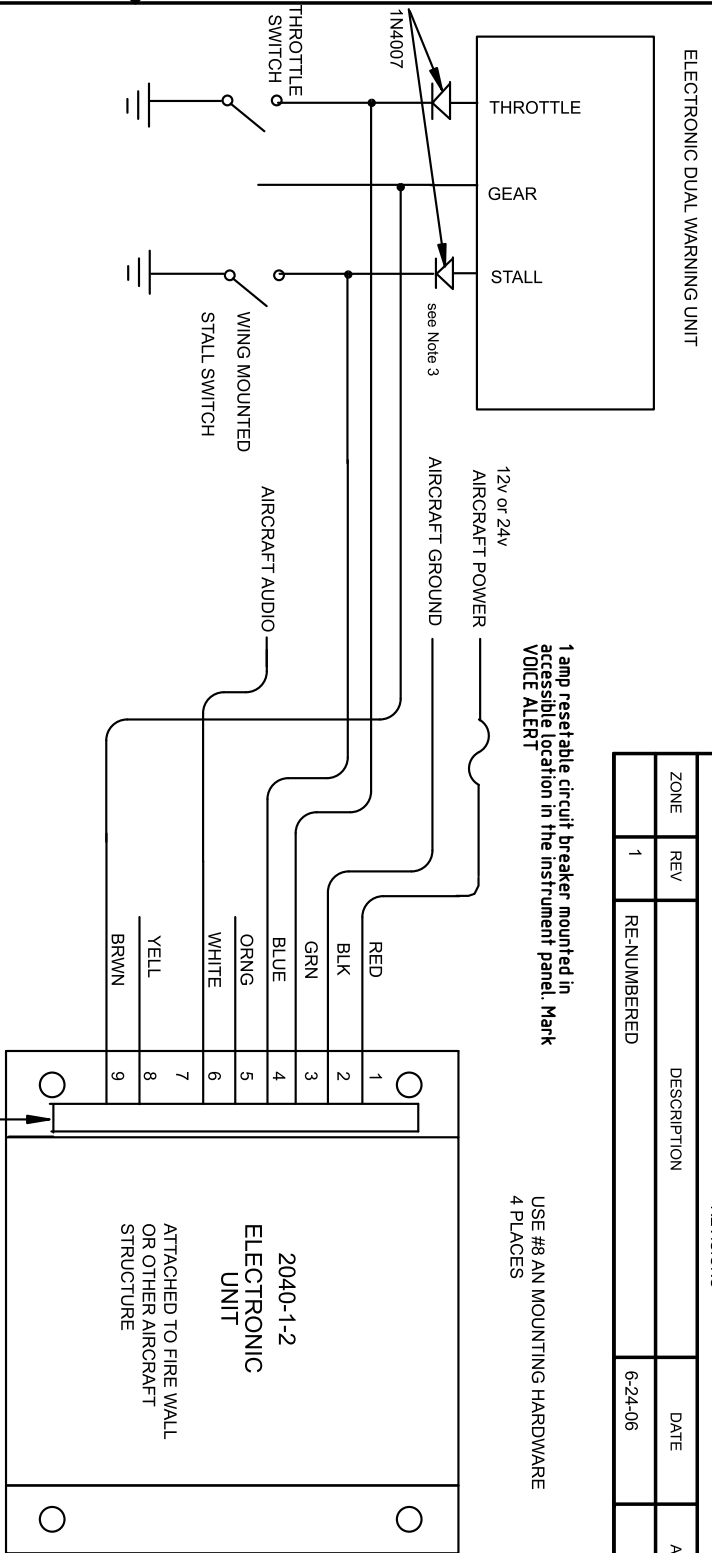
**P/N 2040-1-2 Voice Alert Installation Drawing**

APPROVED	MDG	SIZE	FSCM NO.	DWG NO.	FIG J	REV
DATE	06-24-06	SCALE	NONE	DRAWN BY	J.D.G.	SHEET
						1

REVISIONS			DATE	APPROVED
ZONE	REV	DESCRIPTION		
	1	RE-NUMBERED	6-24-06	

1 amp resettable circuit breaker mounted in accessible location in the instrument panel; Mark VOICE ALERT

USE #8 AN MOUNTING HARDWARE 4 PLACES



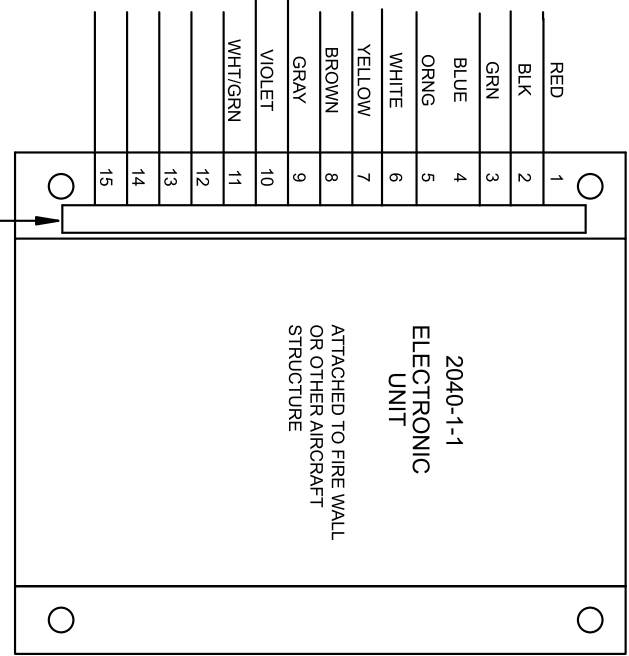
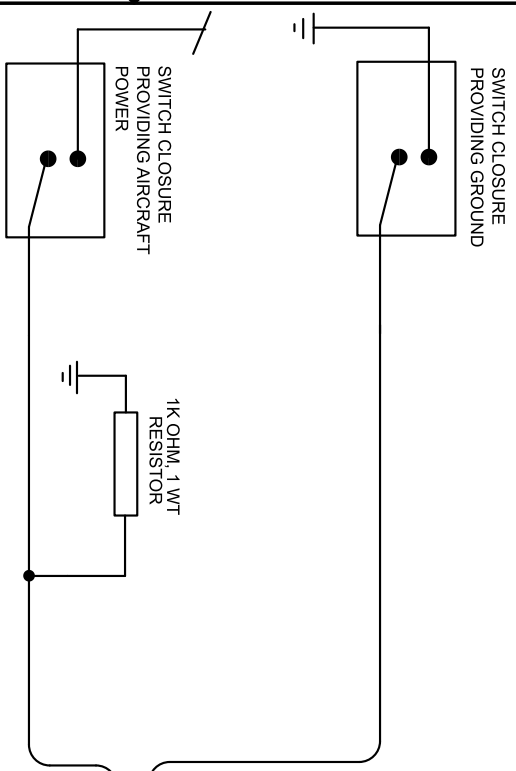
P/N 2040-3 ITEM 2 CABLE ASSEMBLY

**NOTES:**

1. THIS DRAWING FOR USE ON RETRACTABLE GEAR AIRCRAFT HAVING A WING MOUNTED STALL SWITCH AND AN ELECTRONIC DUAL WARNING UNIT WIRED TO APPLY AIRCRAFT POWER WHEN THE GEAR IS DOWN.
2. "This Fig for use on Cessna Aircraft only"
3. IF THE WHITE WIRES IS HOOKED TO AN UNSWITCHED AUDIO INPUT, THE VOICE WILL BE HEARD IN THE CABIN SPEAKER AND ALL THE HEADSETS
3. DIODES MAY BE REQUIRED TO ISOLATE SYSTEMS

<b>AIRCRAFT COMPONENTS INC.</b>	
P/N 2040-1-2 Voice Alert Installation Drawing	
APPROVED	MDG
DATE	06-24-06
SIZE	A
FSCM NO.	
DWG NO.	FIG K
SCALE	NONE
DRAWN BY	J.D.G.
SHEET	
REV	1

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



P/N 2040-3-1 CABLE ASSEMBLY

- NOTES:
1. SCHEMATIC SHOWS TYPICAL HOOK UP OF INPUTS FROM EXTERNAL DEVICES. ACTUAL INSTALLATION TO BE IN ACCORDANCE WITH INFORMATION ON FORM 2040-CONFIG.
  2. PINS 9 TO 15 FOR EXTERNAL INPUTS. ADD ADDITIONAL WIRES AS NEEDED
  3. THIS DWG SHOWS INSTALLATION OF EXTERNAL INPUTS ONLY. REFER TO APPROPRIATE INSTALLATION DWG FOR ALL OTHER INFORMATION

APPROVED	MDG
DATE	6/28/06

**AIRCRAFT COMPONENTS INC.**

P/N 2040-1-1 Voice Alert  
External Input Installation Drawing

SIZE	FSCM NO.	DWG NO.	REV
A		FIG L	0
SCALE	NONE	DRAWN BY	SHEET
		J.D.G.	