

# *Voice Annunciator*

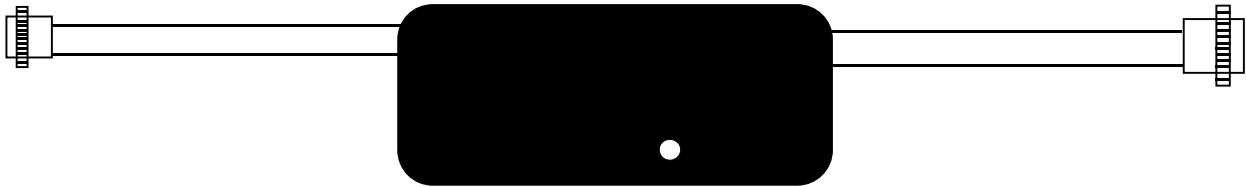
(AV-17)

## *Operating and Installation Instructions*

II 0428971

4/28/97

**You must read this manual before installing or operating the instrument. This manual contains warranty and other information that may affect your decision to install this product and/or the safety of your aircraft.**



### **Control Box**

(Mounts under the aircraft instrument panel)


S/N: \_\_\_\_\_



### **Control Panel**



***Electronics International Inc.*** ®

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# Important Notice

\*\*\*\*\* MUST READ \*\*\*\*\*

If you think it is not important to read this manual, you're wrong! This manual contains important installation information that may affect the safety of your aircraft, delay your installation or affect the operation of your instrument. You Must read this manual prior to installing your instrument.

Read the Warranty / Agreement. There is information in the Warranty / Agreement that may alter your decision to install this product. If you do not accept the terms of the Warranty / Agreement, do not install this product. This product may be returned for a refund. Contact Electronics International inc. for details.

Check that the instrument make and model marked on the side of the instrument and on the invoice are correct before starting the installation.

It is possible for any instrument to fail. Therefore, you must be able to recognize an instrument failure and you must be proficient in operating your aircraft safely in spite of an instrument failure. If you do not have this knowledge, contact the FAA or a local flight instructor for training.

The pilot must understand the operation of this product before flying the aircraft. Do not allow anyone to operate the aircraft that does not know the operation of this product. Keep the Operating Manual in the aircraft at all times.

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## Warranty / Agreement

Electronics International Inc. warrants this instrument and system components to be free from defects in materials and workmanship for a period of one year from the user invoice date. Electronics International Inc. will repair or replace any item under the terms of this Warranty provided the item is returned to the factory prepaid.

1. This Warranty shall not apply to any product that has been repaired or altered by any person other than Electronics International Inc., or that has been subjected to misuse, accident, incorrect wiring, negligence, improper or unprofessional assembly or improper installation by any person. This warranty does not cover any reimbursement for any person's time for installation, removal, assembly or repair. Electronics International retains the right to determine the reason or cause for warranty repair.
2. This warranty does not extend to any machine, vehicle, boat, aircraft or any other device to which the Electronics International Inc. product may be connected, attached, interconnected or used in conjunction with in any way.
3. The obligation assumed by Electronics International Inc. under this warranty is limited to repair, replacement or refund of the product, at the sole discretion of Electronics International Inc.
4. Electronics International Inc. is not liable for expenses incurred by the customer or installer due to factory updates, modifications, improvements, upgrades, changes, or any other alterations to the product that may affect the form, fit, function or operation of the product.
5. Personal injury or property damage do to misinterpretation or lack of understanding this product is solely the pilots responsibility. The pilot must understand the operation of this product before flying the aircraft. Do not allow anyone to operate the aircraft that does not know the operation of this product. Keep the Operating Manual in the aircraft at all times.
6. E. I. Inc. is not responsible for shipping charges or damages incurred under this Warranty.
7. No representative is authorized to assume any other liability for Electronics International Inc. in connection with the sale of Electronics International Inc. products.
8. If you do not agree to and accept the terms of this warranty, you may return the product for a refund.

This Warranty is made only to the original user. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR OBLIGATIONS: EXPRESS OR IMPLIED. MANUFACTURER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. PURCHASER AGREES THAT IN NO EVENT SHALL MANUFACTURER BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS OR LOSS OF USE OR OTHER ECONOMIC LOSS. EXCEPT AS EXPRESSLY PROVIDED HEREIN, MANUFACTURER DISCLAIMS ALL OTHER LIABILITY TO PURCHASER OR ANY OTHER PERSON IN CONNECTION WITH THE USE OR PERFORMANCE OF MANUFACTURER'S PRODUCTS, INCLUDING SPECIFICALLY LIABILITY IN TORT.

# AV-17

## Operating Instructions

### General Description:

The AV-17 is a Voice Annunciator packaged in a 4.1" by 2.6" by 1.7" Control Box tie wrapped under the instrument panel. Also, there is a small 1" x 1" Control Panel mounted on the aircraft instrument panel. The Control Panel allows you to turn the Voice Annunciator on or off. Also, it allows you to acknowledge and thereby deactivate any active alarm for either 1 minute or 10 minutes.

The AV-17 is connected to your headset through the Audio Panel or Intercom or it may be connected directly to your headset. The AV-17 has eighteen voice warnings and seventeen control lines. Additionally, a "Check Bus Voltage" warning is built into each AV-17. Most of its seventeen control lines receive signals from any one or more of Electronics International's instruments which feature a warning light. However, other signals may be received from any warning device that drives a horn or light. It is not necessary to activate all eighteen of the AV-17's warnings. Voice alarms can be activated as Electronics International instruments are added to your panel.

The AV-17 ends the need to constantly scan instruments. It also eliminates concern about missing an alarm at a critical moment. The instant a monitored alarm occurs, the Voice Annunciator will chime in the headset and a pleasant female voice will announce a phrase, such as: "Check Oil Pressure," or "Check Altitude," etc.

### Operating Features:

#### A. Task List:

The AV-17 has 17 Control Lines and one internal control line. When one of these lines is pulled low (grounded), the appropriate voice warning will be heard in the headset immediately.

If two or more alarms are activated, the alarms are placed on the AV-17's "task list" and are announced one at a time with a one-second delay between alarms. After the last alarm on the task list is announced there is a five-second delay and the alarms are once again announced in order. Activated alarms are prioritized and then announced in the following order:

1. Air Speed.
2. Landing Gear.
3. Oil Pressure and Temperature.
4. Oil Pressure.
5. Fuel Level and Pressure.
6. Fuel Level.
7. Turbine Inlet Temperature.
8. RPM.
9. Manifold Pressure.
10. Cylinder Head Temperature.
11. Exhaust Gas Temperature.
12. Engine Analyzer.
13. Cowl Air Temperature.
14. Bus Voltage.
15. Altitude and Timer.
16. Gyro Vacuum.
17. Timer.
18. Chime (3 beeps).

If at any time an additional alarm occurs which is of higher priority on the task list than the alarm being announced (i.e., #8 “RPM” is being announced and #4 “Oil Pressure” is activated), the AV-17 will announce the higher priority alarm next, and then announce the remaining alarms on the task list.

**B. Power-up Announcement:**

When power is applied to the AV-17 and the Control Panel Switch is placed in the “ON” position, the unit will announce “Voice Annunciator enabled. Have a nice flight.” This announcement will be made only once, at the beginning of each flight.



**Control Panel and Switch**

**C. Acknowledging and Silencing an Alarm:**

There are two ways to silence an AV-17 alarm. One way is to acknowledge the alarm on the faceplate of the instrument which generated the alarm (see the appropriate instrument manual). Alarms such as Altitude, Timer, Low Fuel, etc. can be acknowledged and silenced in this manner.

Other alarms such as Oil Pressure, Oil Temperature, RPM, etc., cannot be silenced at the instrument generating the alarm. To acknowledge and silence these alarms, as well as any active alarm, push the Switch on the AV-17 Control Panel momentarily to the “ACK” position. A high tone beep will be heard in the headset and all active alarms will be silenced for one minute. This is handy if you do not want to permanently shut off any alarms but you need silence for a minute to deal with other pressing matters. After one minute the silenced alarms will once again be announced in the headset.

Note: During the time one or more alarms are silenced, any newly activated alarm will be announced immediately in spite of the minute of silence. To silence this new alarm, once again push the Control Panel Switch one time momentarily to the “ACK” position.

**D. Acknowledging and Silencing an Alarm for 10 Minutes:**

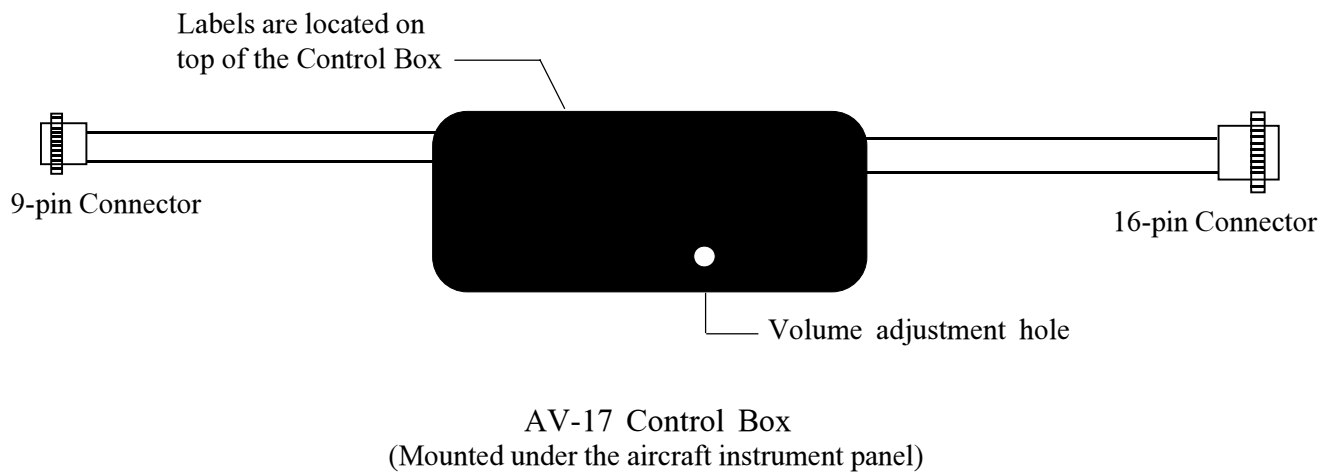
To acknowledge and silence any active alarm for 10 minutes, within three seconds or less push the AV-17 Control Panel Switch to the “ACK” position three times. On the third push, a low tone beep will be heard in the headset, indicating that all active alarms will then be silenced for 10 minutes.

E. Turning the AV-17 “OFF”:

To disable the AV-17, silence all voice alarms in the headset and reset any delay times, set the Control Panel Switch to the “OFF” position. When the AV-17 is once again set to the “ON” position, the AV-17 will announce “Voice Annunciator enabled.” This will be followed by announcement of any active alarms.

F. Adjusting the Volume of the Voice Alarms:

The AV-17 Control Box is mounted under the instrument panel. Insert a screwdriver in the hole on the side of the AV-17 Control Box to adjust the volume of the AV-17 voice warnings. A clockwise adjustment will increase the volume. If additional volume is required, see the "Note" in section F of the Installation Instructions found later in this manual.



# AV-17

## Installation Instructions

### A. Important Information and Initial Check Out:

- A. The installer and aircraft owner must read the Warranty before starting the installation. There is information in the Warranty that may alter your decision to install this device. If you do not accept the terms of the Warranty, do not install this device.
- B. If you are not an FAA Certified Aircraft Mechanic familiar with the issues of installing aircraft Intercoms and/or Audio Panels , Do Not attempt to install this device. The installer should use current aircraft standards and practices to install this unit (refer to AC 43.13-2A).
- C. This device's installation could be considered a minor alteration (as is true for clocks, radios, intercoms, headsets, audio panels, encoders, etc.). Installation of this device can be accomplished utilizing FAA acceptable methods, techniques and practices covered under AC 43.13-2A. This is a requirement under FAR Part 1 to qualify as a minor alteration. This instrument does not "appreciably" effect weight and balance or electrical load as described in FAR Part 1 and FAR 43 Appendix A (another requirement to qualify as a minor alteration). The AV-17 meet the environmental requirements of DO-160C. The AV-17 is manufactured in Electronics International's FAA PMA/TSO approved manufacturing facility. The STC for each appropriate Electronics International instrument allows for the connection of the AV-17 to that instrument. If the installer determines that installing this device is a minor alteration, he/she must note it as such in the aircraft log book. Example: "3/28/97 Installed Electronics International's AV-17 as a minor alteration. This device was installed in accordance with Installation Instructions II 0428971 dated 4/28/97 and AC 43.13-2A." A minor alteration does not require a 337. Resolve any possible FAA approval issues prior to starting the installation.
- D. Read these Installation Instructions in their entirety and resolve any issues you may have before starting the installation. This may eliminate any delays once the installation is started.
- E. THIS INSTALLATION MAY REQUIRE SOME PARTS UNIQUE TO YOUR AIRCRAFT THAT ARE NOT SUPPLIED IN THE KIT. Read the Installation Instructions and acquire all the parts necessary to install this instrument before starting the installation.
- F. Before starting the installation make sure the Control Panel and Switch will fit within the intended location and can be installed without obstructing the operation of any controls.
- G. The AV-17 was designed to be connected to a standard 500 ohm aircraft audio system. An intercom or audio panel is not necessary to allow the AV-17 to operate properly.



## B. Mount the AV-17 Control Panel and Switch:

1. Locate the Control Panel and Switch in the AV-17 kit. Find an appropriate mounting location on the aircraft instrument panel for the Control Panel and Switch. The Switch will require 3/4" clearance behind the aircraft instrument panel.

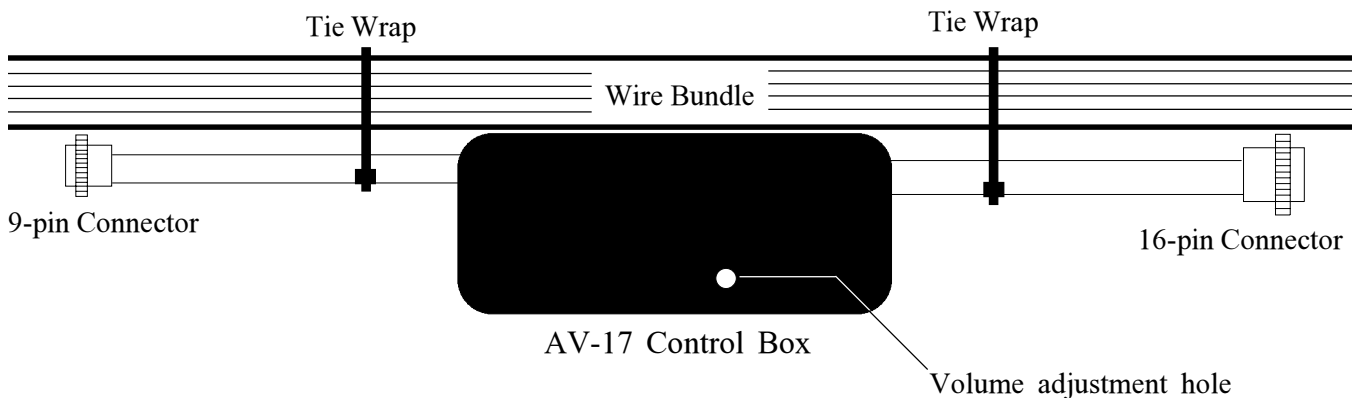


### Control Panel

2. Using the AV-17 Control Panel as a template, mark the aircraft instrument panel and drill a 1/4" hole for the AV-17 Switch.
3. Mount the Switch from behind the aircraft instrument panel. Be careful not to damage the silkscreening on the Control Panel. The Switch must be mounted with the white/orange wire "up." The lock washer should be mounted on the Switch and behind the aircraft instrument panel.

## C. Mount the AV-17 Control Box:

Tie wrap the AV-17 Control Box to a wire bundle under the aircraft instrument panel using two tie wraps (one on each side of the Control Box). The small hole on the side of the box will need to be accessible to allow for volume adjustment described later in this manual.



**D. Connect the 9-Pin Wire Harness and Route Wires:**

Connect the 9-pin Wire Harness to the AV-17 and route the wires as shown below. Tie wrap all the wires so they do not obstruct the freedom of travel of any controls. See the AV-17 Wiring Diagram at the back of this manual.

<b>AV-17 9-Pin Connector</b>	
<b>AV-17 Wire Color:</b>	<b>Connects to:</b>
Black	Ground - Use the same ground as the audio panel or intercom.
Red	12-Volt Radio Bus via one amp fuse (open for a 24-Volt system).
Yellow	24-Volt Radio Bus via one amp fuse (open for a 12-Volt system).
White/Brown White/Red White/Orange	AV-17 Control Panel Wires (match colors).
White/Violet	See AV-17 16-Pin Connector Chart (Chime Warning).
Orange	See following text (AV-17 Voice Warning output).

The Orange Wire (AV-17 Voice Warning Output) may be connected using several different methods. The methods listed below are in order of preference:

1. Connect the AV-17's Orange Wire to the pilot's headphone female connector (tip).

Note: If the co-pilot's headphones are paralleled with the pilot's headphones (which is usually the case), both the pilot and co-pilot will hear the AV-17 voice warnings. If the passengers' headphones are paralleled with the pilot's headphones, the passengers also will hear the AV-17 voice warnings.

Note: The AV-17's output impedance is designed to have little or no effect on the intercom or audio panel output volume.

2. If there is an audio panel in the aircraft, the AV-17's Orange Wire may be connected to the non-switched audio input on the audio panel. The AV-17 may be paralleled with other warning devices. If any paralleled device has a low output resistance, the AV-17 volume will be very low. If this is the case, place a 330 ohm 1/4 watt 5% resistor in series with the output of the low resistance warning device. This will allow both devices to operate properly.
  
3. The AV-17's Orange Wire may be connected to the output of the radio. Some radios have low output resistance. This will cause the AV-17's volume to be very low. If this is the case, place a 330 ohm 1/4 watt 5% resistor in series with the output of the radio. This will allow the radio and the AV-17 to operate properly.

**E. Connect the 16-Pin Wire Harness and Route Wires:**

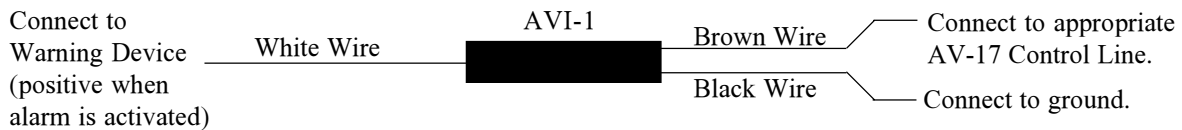
Connect the 16-pin Wire Harness to the AV-17 and route the wires as shown below. Tie wrap all the wires so they do not obstruct the freedom of travel of any controls. See the AV-17 Wiring Diagram at the back of this manual.

<b>AV-17 16-Pin Connector</b>		
<b>Wire Color</b>	<b>Voice Warning ("Check: ")</b>	<b>May Connect to:</b>
Brown	Air Speed	Stall Warning Horn.
Red	Landing Gear	Gear Warning Horn.
Orange	Oil Pressure and Temp.	OPT-1
Yellow	Oil Pressure	Any Oil Pressure Switch.
Green	Fuel Level and Pressure	FP-5 w/Fuel Pressure
Blue	Fuel Level	FP-5 and/or FL-2
Violet	Turbine Inlet Temp.	T-1P, TT-1P, TC-1P, etc.
Gray	RPM	R-1
White	Manifold Pressure	M-1
Black	CHT	C-1P, CC-1P, EC-1P, etc.
White/Brown	EGT	E-1P, EE-1P, EC-1P, etc.
White/Red	Engine Analyzer	US-8A or SR-8A
White/Orange	Cowl Air Temperature	Special Instrument
White/Yellow	Altitude and Timer	ASC-5
White/Green	Gyro Vacuum	Special Instrument
White/Blue	Timer	SC-5
White/Violet	Chime (3 Beeps)	Any Instrument or Device. (This wire is located on the 9-Pin Connector)

All of the E.I. Instruments listed in the AV-17 16-Pin Connector Chart have an External Warning Control Line. This line is a white/yellow wire. This wire pulls to ground when a specific condition occurs, thereby activating the appropriate AV-17 Voice Warning. For more information regarding conditions which activate the External Control Line on a specific E.I. Instrument, please refer to the appropriate Instrument Operating Manual.

Note: The “Check Bus Voltage” control line is built into the AV-17 (i.e., the AV-17 does not need to connect to the VA-1A Volt/Amp Instrument).

All of the AV-17 control lines have high input resistance and will not affect any device to which they are connected. To activate a specific AV-17 voice warning, the appropriate control line must be pulled to ground (grounded). If a positive voltage is required to activate a specific voice warning, an AVI-1 Inverter must be wired in series with the appropriate AV-17 Control Line as shown below.



#### F. AV-17 Check-out and Volume Adjustment:

1. Apply power to the AV-17. Each time the AV-17 Control Panel Switch is placed in the momentary “ACK” position a “Beep” can be heard in the headset. If a “Beep” cannot be heard, perform the following:
  - A. Insert a small flat tip screwdriver in the hole on the side of the AV-17 Control Box and adjust the AV-17 volume to maximum (full clockwise adjustment). The AV-17 Control Box is mounted under the instrument panel.
  - B. Verify that the AV-17’s ground and power wires are connected properly.
  - C. Verify that the orange wire (AV-17 Voice Warning Output) is connected properly. The orange wire may be connected directly to the headset. Disconnect all other wires on the headset female connector (tip) and connect only the orange wire. Make sure the headset female connector (barrel) is grounded. If the AV-17 works properly, replace each disconnected wire until you find the wire which causes the AV-17 to function improperly.

Note: If any paralleled device or radio has a low output resistance, the AV-17 volume will be very low. If this is the case, place a 330 ohm 1/4 watt 5% resistor in series with the output of the low resistance warning device. This will allow both devices to operate properly.

2. Adjust the volume on the side of the AV-17 Control Box. Do not make the AV-17 volume too loud. Keep in mind that it is possible for an AV-17 voice warning to occur at the same time the pilot is listening to a radio message. The AV-17 Control Box is mounted under the instrument panel. Insert a screwdriver in the hole on the side of the AV-17 Control Box to adjust the volume.

When the AV-17 is set from the “OFF” to the “ON” position, the AV-17 will announce “Voice Annunciator enabled.” You may want to listen to this announcement when adjusting the AV-17 volume.

# Specifications and Operating Features

## Model:

AV-17 (Voice Annunciator)

AVI-1 (Inverter)

## Dimensions:

Control Box - 4.1" x 2.6" x 1.7" depth

Control Panel - 1" x 1"

## Weight:

Control Box - 8.8 Oz.

Control Panel - 0.6 Oz.

## Environmental:

Meets TSO-C50b and DO-160C

## Power Requirements:

7.5 to 35 Volts, 1/10 Amp.

## 17 Control Line:

Diode protected to 75 volts, 221K ohms input resistance (pulls up to 5 volts), triggers voice warning at approx.  $\leq 1.4$  volts.

## Voice Warning Output:

Capacitive coupled, 330 ohms, will drive 10 - 500 ohm headsets.

## Trip Voltages for "Check Bus Voltage" warning:

12 Volt System -- 13.0 Volts (+/- .3) and 15.1 Volts (+/- .3).

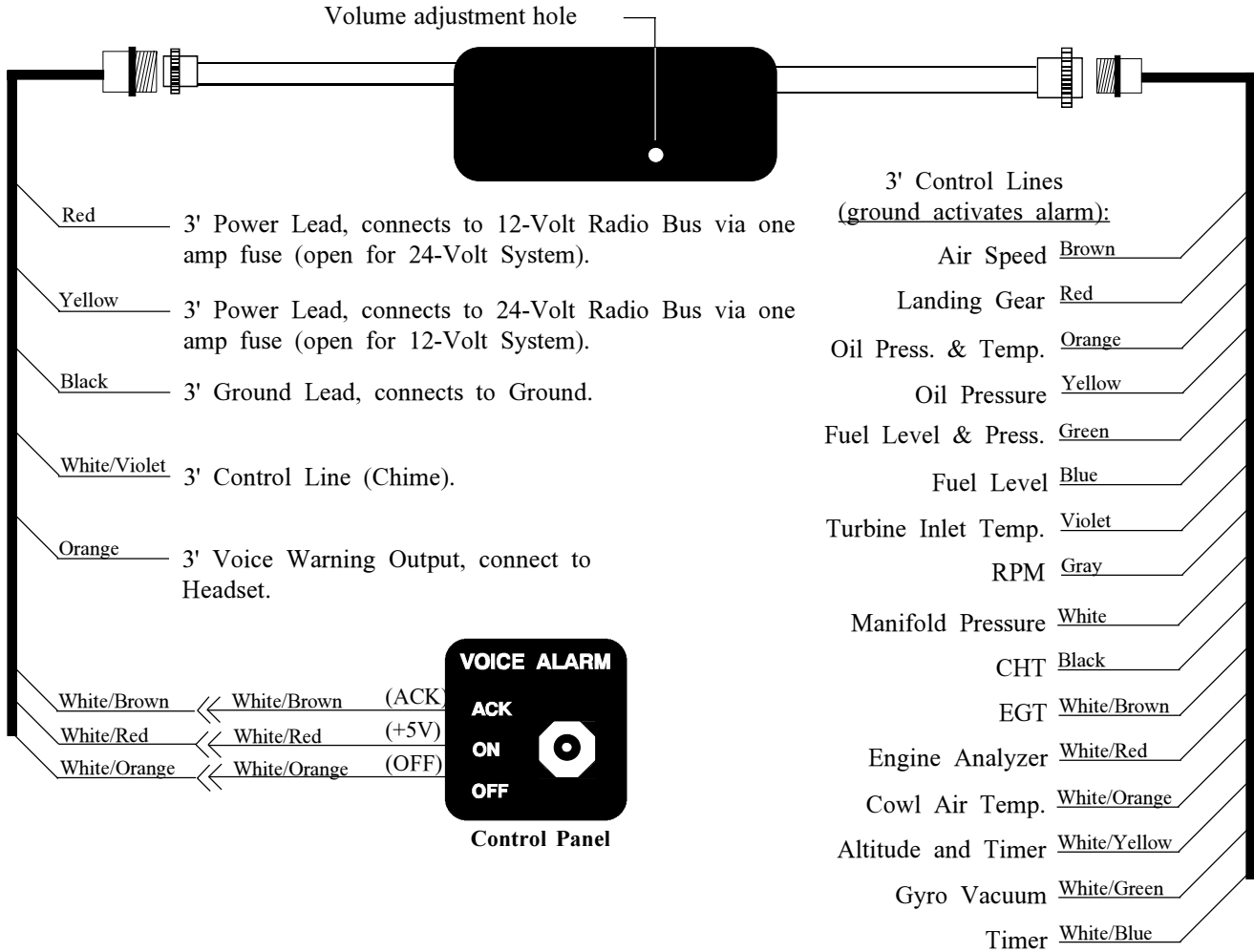
24 Volt System -- 26.0 Volts (+/- .3) and 30.2 Volts (+/- .3).

## AVI-1 Inverter:

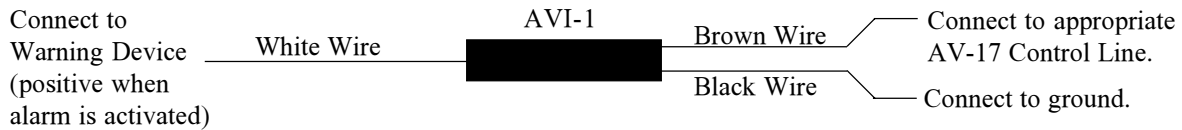
100K ohms input resistance (pulls to ground), triggers at approx.  $\Rightarrow 5.5$  volts.

# AV-17 Wiring Diagram

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The AVI-1 allows a positive signal to activate a single voice warning alarm on the AV-17.



# AV-17

## Circular Connectors

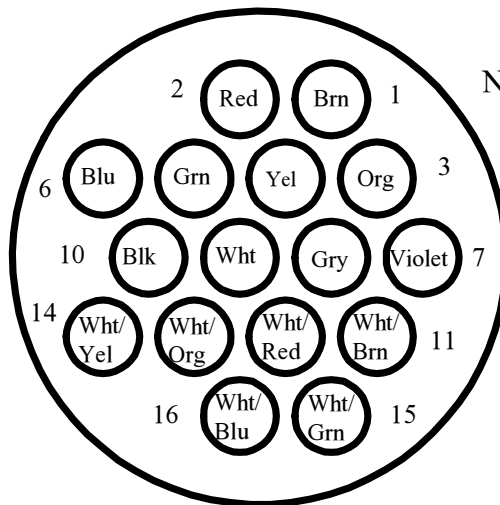
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### AV-17 16-Pin Connector

Connecting Cable Harness, Back View (wire side)

OR

AV-17 Control Box Connector, Front View



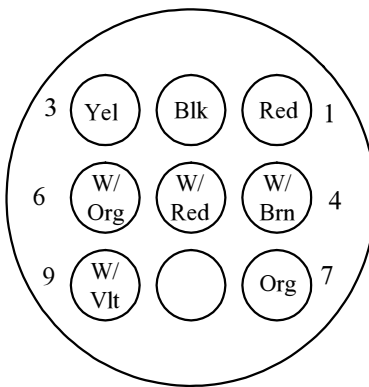
Note: See Wiring Diagram for hook up information.

### AV-17 9-Pin Connector

Connecting Cable Harness, Back View (wire side)

OR

AV-17 Control Box Connector, Front View



Note: See Wiring Diagram for hook up information.