MAINTENANCE PRACTICES

1. General

The function of this section is to supply the service personnel with installation and maintenance data for the Honeywell CAS-100.

Components that are necessary in a CAS-100 installation that are part of other systems are included in this manual only as necessary to know their function in a TCAS system. Components that are part of the CAS-81 system are included in the related component maintenance manuals recorded in Table 5 of this manual.

Installation and maintenance data for the Mode S transponder, control units, and transponder related omni antennas are given in the applicable Mode S transponder system maintenance manual. (Refer to Table 5 in the DESCRIPTION AND OPERATION section of this manual.)

The installation instructions are supported by mechanical outline drawings and electrical interconnection drawings. These drawings, found at the back of this section, must be reviewed by the installing agency and specifications peculiar to the applicable airframe established before the installation is started.

2. Unpacking

Be careful when remove the contents of the CAS-100 components. Open send containers and carefully remove all items. Check the contents to make sure that all items identified on the packing list are included. Visually examine each component for damage caused during shipment; that is examine for dents, depth of abrasions, damaged paint, etc. If some component is damaged, tell the transportation carrier immediately.

3. Preinstallation Testing

The components of the CAS-100 system have all been adjusted and tested before shipment. Thus, preinstallation testing is not necessary. If preinstallation bench testing of the units is necessary, reference must be made to Section 1000, TESTING AND TROUBLESHOOTING, of the component maintenance manual for the applicable unit. Refer to Table Intro-1 in the INTRODUCTION section of this manual for a list of component maintenance manuals.

4. Equipment Changes and Markings

Honeywell uses a standardized marking system to give a procedure for identifying equipment that has changes included. Refer to the front of the applicable unit Component Maintenance Manual for a list of Service Bulletins affecting the different units in the CAS-100 system.

5. Installation Planning

A. General

The following paragraphs contain data for the initial installation of CAS-100 and supply the instructions about the location and assembly of the different components of the system. The CAS-100 system must installed in the aircraft in a procedure consistent with permitted quality and engineering procedures and as shown in the instructions set forward in this publication. To make sure that the system has been correctly and safely installed in the aircraft, the installer must make a full visual inspection and do the post-installation/operational check of the system on the ground before flight.

CAUTION: AFTER THE INSTALLATION OF THE CABLES AND BEFORE INSTALLATION OF THE EQUIPMENT, A CHECK MUST BE MADE WITH AIRCRAFT PRIMARY POWER SUPPLIED TO THE UNIT CONNECTORS TO MAKE SURE THAT POWER IS APPLIED ONLY TO THE PINS SPECIFIED IN THE INTERWIRING DIAGRAMS, FIGURE 2015.

B. Location of Equipment

(1) TCAS Processor Location

The TCAS processor is installed in one available remote location that is free of too much heat and vibration and gives reasonable access for inspection and maintenance. To achieve the maximum performance, the TCAS processor must be installed adjacent to other receiver/transmitters or boxes with equivalent functions. The length of cables from the TCAS processor mounting tray connector to other system units, except the TCAS antennas, is not important. This is because the TCAS unit interfaces are designed with high impedance input, low impedance output, and low noise permitted properties. If ARINC cooling is not supplied, a TCAS processor mounting tray with a blower assembly must be used to supply the unit with forced-air cooling. Air space must be given between and around the unit. Outline drawing, Figure 2006, shows TCAS processor dimensions.

NOTE: Refer to Interwiring diagram Figure 2015 for TCAS processor to antenna wiring particulars and interconnects.

(2) TCAS Antenna Location

The CAS-100 system uses a top-mounted directional antenna and either a bottom-mounted directional or omnidirectional antenna.

Refer to antenna outline drawings in Figures 2007, 2008, 2009, and 2010, and if applicable, manufacturer documentation for the TCAS antennas.

The top directional TCAS antenna must be installed within 5 degrees of the center line of the aircraft and as far forward on the constant radius portion of the fuselage as possible.

Blockages, including other antennas, should not be present in the forward direction of the top or bottom TCAS antenna.

The bottom TCAS antenna (directional or omni) must be put within 5 degrees of the center line of the aircraft and as close as possible to the vertical frame station location of the top directional antenna (but can differ a maximum of 25 feet in longitude from the top antenna).

The TCAS top and bottom antenna should not be mounted closer than 30 inches from one antenna on the aircraft. This gives 20 dB of isolation or 2.5 wavelengths at 1090 MHz.

NOTE: Other than the antenna location considerations above, location of the CAS-100 equipment is not important if the equipment obeys environmental specifications. The location of TCAS components change depending on aircraft types.

Care must be used to prevent mounting the components near equipment that operates with high pulse current or high power output for example, radar and satellite communications equipment. In general, the equipment must be installed in a location available for the operation, inspection, and maintenance, and in an area free from too much vibration, heat, and noise generating sources.

(3) Display Units (TA/VSI, RA/VSI, and Dedicated Display)

The display units are usually installed in the instrument panel in front of the primary viewer to give the maximum visibility. There must be sufficient space on all sides of the installed display units for the ventilation (Figures 2011, 2012, and 2013).

Installation instructions for the ATC Mode S Transponder System and the PPI TCAS/Radar display are contained in isolated manuals recorded in Table 5 of this manual.

C. Interwiring and Cable Fabrication

(1) General

The Figure 2015 is a complete CAS-100 system interwiring diagram for the CAS-100. The Figures 8 and 9 supply a system connect description. Cables must be fabricated as shown in the interwiring diagrams in Figure 2015. The length of the wires to parallel pins must be approximately the same length, so that the best supply of current can be utilized. Honeywell recommends that all wires shown on the interwiring diagram, including spares, be included in the harness. However, if full wire is not necessary, the installer must make sure that the minimum wiring specifications for the features and the functions to be used are included.

The wires for optional functions are shown on the interwiring diagrams. The correct use of these wires is necessary for the installation, customer specifications and function of the units installed.

When the cables are installed in the aircraft, they must be supported tightly to prevent movement and must be carefully prevented against chafing. More protection must be shown in all locations where the cables can be subject to abuse. In the wire bundles, the cables must not be attached tightly together as this can increase the possibility of noise pickup and equivalent interference. When routing cables through the airframe, the cables must cross high-level lines at a right angle.

The installer must be knowledgeable of some system variations peculiar to the installation such as system strapping specifications shown in paragraph 5.D. The installer must use ARINC Characteristic 718 and 735 for reference during the fabrication and installation of the cables in the aircraft.

The notes on the interwiring diagram, Figure 2015, give specifications related to CAS-100 interwiring.

Antenna cables that have some different specifications are given in paragraph 5.C.(5).

(2) Interface Capability and Requirements

Figures 8 and 9, and Tables 11 and 12 in the DESCRIPTION AND OPERATION section of this manual list the types of external avionics equipment that can be connected to the TCAS processor, TA/VSI, and RA/VSI. Find the types of aircraft equipment to be connected to CAS-100.

(3) Primary Power and Circuit Breaker Requirements

The CAS-100 system operates primarily from the aircraft 115 V 400 Hz or 28 V dc power system. The displays use 5 V 400 Hz, 5 V dc or 28 V dc lighting power. A 26 V 400 Hz input is supplied for reference for the synchro-to-digital converters. The power decrease changes with the system configuration. The power connections are shown in Interwiring diagrams, Figure 2015. The circuit breaker specifications for each component and wire dimensions are shown in Figure 2015.

(4) Suppression Pulse Requirements and Wiring

The connections for the suppression pulse from the TCAS processor (see Figure 2015) are dependent on the aircraft equipment and wire. Typically, the suppression pin is connected from the TCAS processor to the suppression input on the L-band equipment (i.e., transponder and DME equipment).

(5) Antenna Cable Type Selection and Antenna Delay Program Straps

NOTE: Always check the following data with data on the aircraft interwiring diagram in Figure 2015.

The following TCAS processor-to-antenna cable installation specifications must be adhered to:

- The total dB losses in any of the coaxial cable routes and related connects between the TPA-100A TCAS processor and each antenna port connector must not be less than 2 dB and must not be more than 3 dB at 1030 MHz.

- The round-trip (receive/transmit) delays between the TCAS processor and the top and the bottom antennas must have an effective delay difference of less than 50 nanoseconds. Providing the installation configuration does not set a delay differential more than 350 nanoseconds, four antenna delay program pins on the TCAS processor let strapped compensation to meet this 50 nanoseconds effective delay difference specification.

- The procedure for the selection of the TCAS hardware and the correct antenna delay program pin strapping necessary to meet the installation specifications is:

  a Determine the routing for the four cable routes to be used from the TPA-100A TCAS processor rear connector to the four rf connectors on the top directional antenna (and if applicable, the bottom directional antenna). The four cable routes to a directional antenna must follow the same routing paths and have the same number of disconnects for each path. For equidistant cable functions, the four cables must go near the bottom center of the directional antenna in a vertical direction and then flare out to the four rf connectors on the antenna.

  b If the bottom antenna is an omnidirectional antenna, find the routing for the cable route from the TCAS processor rear connector to the one rf connector on the omni antenna.

  NOTE: Calculations in the following procedures compare the top antenna cables to the bottom antenna cables. By adhering to the same cable routing and the same number of disconnects in the four cable runs to a directional antenna (see step (a) above), one of the four cable routes to a directional antenna needs to be used as a reference in the following procedures (unless otherwise specified).

(a) Find the connects that will be in the cable route between the TCAS processor and each antenna. The antenna connection between the TCAS processor rear connector and the TCAS processor mounting tray connector is one connect; the TNC coaxial connection at the antenna port is one more connect.

(b) Find the manufacturer type of connectors that will be at each cable route connect between the TCAS processor and each antenna. Check the manufacturer specifications for each connector and find the related dB loss that will be for each connect. Log these figures for future reference.

(c) Total the dB losses for connects in one cable route between the TCAS processor and the top antenna. Total the dB losses for connects in one cable route between the TCAS processor and the bottom antenna. Log these figures for future reference.

(d) If the total dB connect loss in a cable route between the TCAS processor and top or bottom antenna will be more than 3 dB, the loss caused by connections must be reduced by selecting different types of connectors, or by reducing the number of connects.

(e) If the total connect dB losses in a cable route between the TCAS processor and the top or the bottom antenna is more than 2 dB and less than 3 dB, subtract that total loss from 3 dB. This difference is the maximum allowable dB loss that can be imposed by the coaxial cable route from the TCAS processor to that antenna. In this case, minimum cable loss is not applicable. Log this maximum allowable loss for future reference.

(f) If the total connector dB losses in a cable route between the TCAS processor and the top or the bottom antenna is less than 2 dB, subtract that total loss from 2 dB. This remainder is the minimum amount of dB loss that must be imposed by the coaxial cable route from the TCAS processor to that antenna. Then, subtract the total dB loss between the TCAS processor and the antenna from 3 dB. The remainder after this subtraction is the maximum allowable dB loss that can be imposed by the coaxial cable route from the TCAS processor to that antenna. Log both the required minimum loss and the maximum allowable loss for future reference.

NOTE: At this point the installer has found the length of the cables to the top and the bottom antenna and has calculated the dB loss limitations of the cable routes. The top and bottom antenna cables must meet the 2.5 dB +0.5 dB specification and can not exceed the maximum 350 nanosecond delay difference requirement between the top and the bottom antenna cable routes.

(g) Refer to manufacturer coaxial cable data sheet specifications. Using the length of the top and the bottom antenna cables measured in step (a) and the manufacturer specified dB loss for each foot per cable type, select an applicable type or types of cable that meet the top and bottom cable loss limits calculated in steps (f) and (h). In anticipation of aging factors, it is recommended to select a cable type that has an insertion loss that when combined with connect losses will equal a dB loss as close as practical to 2.5 dB.

NOTE: It is conceivable that the type of cable selected to meet the dB loss specifications of the top antenna cable will be different from the type of cable selection necessary to meet the dB loss specifications of the bottom antenna. For example: if the cable route to one antenna is lengthy, and the cable route to the other antenna is short, the long route can require low loss antenna cable to meet the less than 3 dB antenna cable/interconnect specification while the short route can require a relatively high loss cable to exceed the 2 dB antenna cable/interconnect loss specification.

(h) Consult the manufacturers data sheets to find the nanosecond delay per foot (at 1030 MHz) for the type or types of cable selected in step (g).

(i) Calculate the round-trip (receive/transmit) cable delay in the top antenna cable route and then the bottom antenna cable route as follows:

Length of cable [see step (a)] X nanosecond delay per foot [see step (i)] X 2 (round-trip) = cable run delay.

Example: Top cable length = 65 feet

Top cable delay = 1.25 nanoseconds per foot

Round-trip top cable delay = 65 x 1.25 x 2 = 162.5 nanoseconds

Bottom cable length = 20 feet

Bottom cable delay = 1.25 nanoseconds per foot

Round-trip bottom cable delay = 20 x 1.25 x 2 = 50 nanoseconds

(j) Subtract smallest round-trip cable delay from largest round-trip cable delay to determine cable delay difference between top and bottom antenna.

Example: Top round-trip cable delay = 162.5 nanoseconds

Bottom round-trip cable delay = 50.0 nanoseconds

Top/Bottom Cable Delay Differential = 112.5 nanoseconds

NOTE: Antenna delay program pins are supplied on the TCAS processor rear connector that let the straps to be installed to adjust for maximum 350 nanosecond delay difference between the top and the bottom antenna cable routes. Providing the top/bottom antenna cable delay differential is not more than 350 nanoseconds, selection of the correct antenna delay program pin strapping will adjust the delay differences to 50 nanoseconds or less.

If the top/bottom cable delay difference calculated in step (k) is more than 350 nanoseconds, steps (h) through (k) must be repeated using different cable type(s).

(k) Refer to Interwiring Diagrams Figure 2015. If the length of the cable route to the top antenna, measured in step (a), is longer than the length of the cable route to the bottom antenna measured in step (a), strap the antenna delay program pin on TCAS processor connector RBP pin 7G to common on RBP pin 7K. This lets the TCAS processor software to add the antenna delay factor to the bottom antenna signal processing.

If the length of the cable route to the top antenna is shorter than the cable route length to the bottom antenna, keep antenna delay program RBP pin 7G open. This lets TCAS processor software to add the antenna delay factor to the top antenna signal processing.

Example: Top cable route length = 75 feet

Bottom cable route length = 25 feet

Strap RBP pin 7G to RBP pin 7K

(l) Reference the antenna delay program strap table on Interwiring Diagram Figure 2015. Based on the top/bottom antenna delay differential calculated in step (k), set the correct strapping configuration for TCAS processor connector RBP pins 7H and 7J that will give the necessary quantity of delay compensation. Strap accordingly.

Example: Top/Bottom Cable Delay Differential = 112 nanoseconds

Strap RBP pin 7J to common on RBP pin 7K

Leave RBP pin 7H open

(m) Cut antenna cables to the lengths found in step (a) of this procedure. Be careful to cut the four cables to a directional antenna to equal lengths. Five inches is the maximum length difference that can be tolerated between one of the four cables to a directional antenna.

(n) Make the cables. See the connectors, paragraph 5.C.(6).

(6) Connectors

The mating connectors for the CAS-100 units are identified on the applicable outline drawing. Related connector kits are specified in Table 2 in the DESCRIPTION AND OPERATION section of this manual.

(a) TPA-100A TCAS Processor Connectors

The connector for the TPA-100A is installed on the center grid of the TCAS processor rear panel to ARINC Characteristic 735. This connector is a low-insertion-force, size-3 shell, ARINC 600 connector with polarization projections that prevent incorrect connector insertion. The mating connector is specified in the TPA-100A outline drawing, Figure 2006, and is part of the TCAS processor mounting tray.

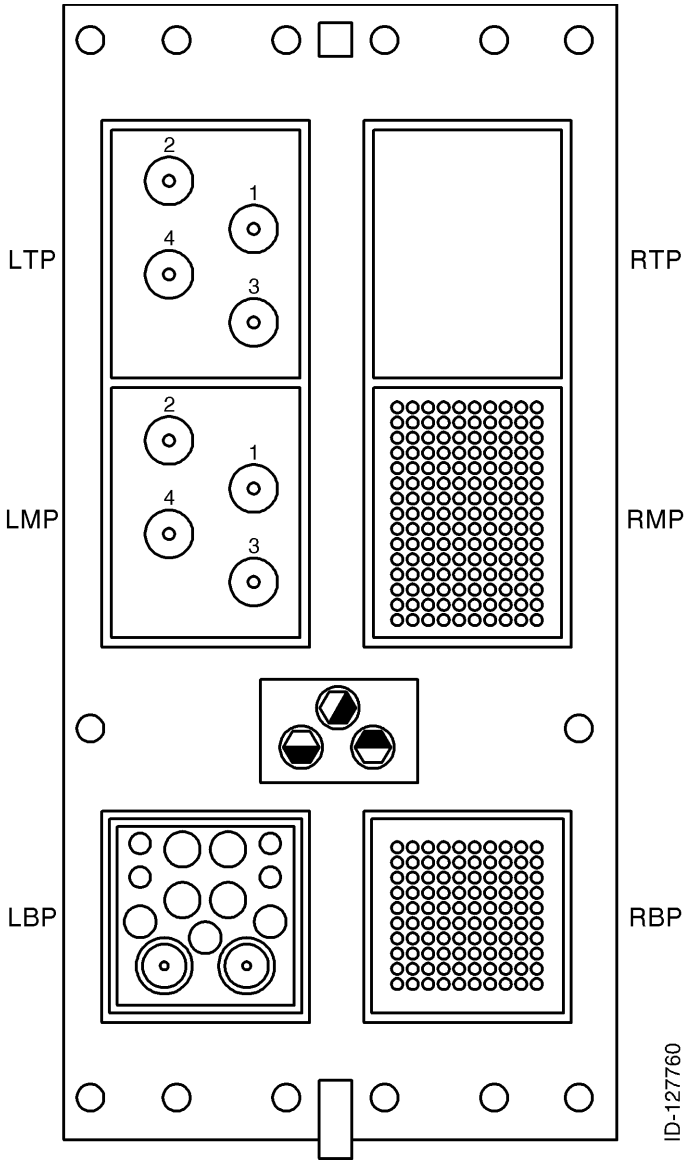
The rear connector, shown on Figure 2001, is divided into six sections; left bottom plug (LBP), right bottom plug (RBP), left middle plug (LMP), right middle plug (RMP), left top plug (LTP), and right top plug (RTP). The Table 2001 and system Interwiring diagram, Figure 2015, give the external input to each pin of the six plug sections. The Table 11 in the DESCRIPTION AND OPERATION section gives a general description for the signals.

(b) Directional Antenna Connectors

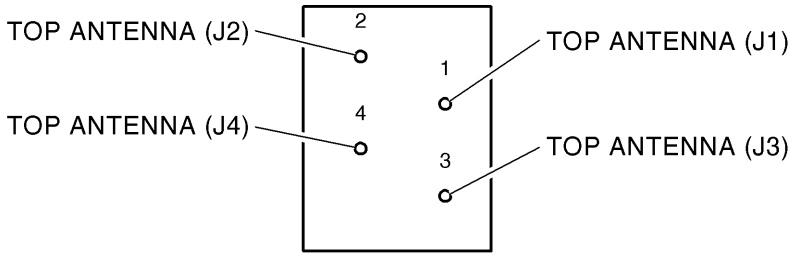
Four coaxial cables that use TNC connectors connect the directional antenna connectors J1 through J4 to the TCAS processor. See antenna outline drawings in I.B 1181, Interwiring diagram Figure 2015, and paragraph 6.B. for particulars.

(c) TA/VSI and RA/VSI Connectors

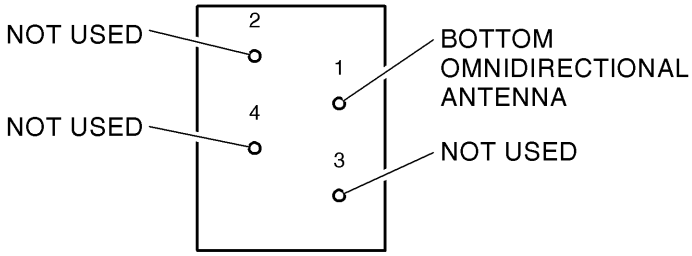
The pneumatic and electrical connectors for the TA/VSI and RA/VSI are attached on the rear panel of the units as shown in Figure 2002.



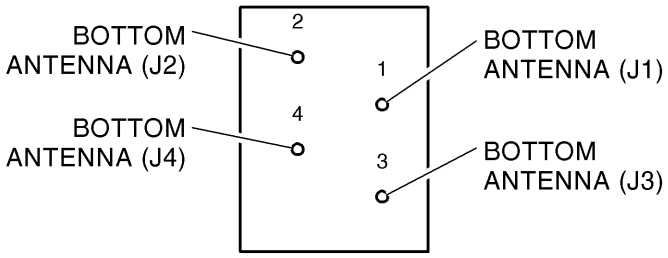
TPA-100A TCAS Processor Aft Connector
Figure 2001 (Sheet 1 of 2)



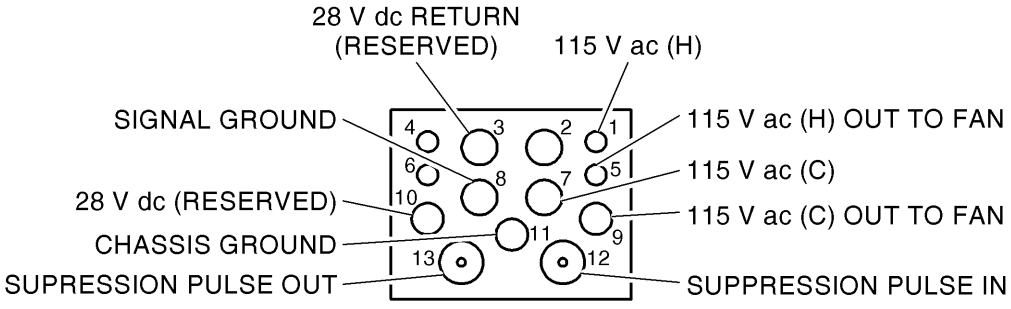
LEFT TOP INSERT (LTP)



LEFT MIDDLE INSERT (LMP)
STANDARD CONFIGURATION



LEFT MIDDLE INSERT (LMP)
OPTIONAL CONFIGURATION



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LEFT BOTTOM INSERT (LBP)
CONNECTOR INSERT LAYOUT

TPA-100A TCAS Processor Aft Connector
Figure 2001 (Sheet 2 of 2)

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins

Pin	Description	Data Type	Source	Destination
LBP1	115 V ac Primary Power (Hot)	Power/Ground	Shelf	TCAS
LBP2	Spare	Power/Ground	NA	NA
LBP3	28 V dc Return	Power/Ground	Shelf	TCAS
LBP4	Spare	Power/Ground	NA	NA
LBP5	115 V ac (Hot) Output to Fan	Power/Ground	Shelf	TCAS
LBP6	Spare	Power/Ground	NA	NA
LBP7	115 V ac Primary Power (Cold)	Power/Ground	Shelf	TCAS
LBP8	Signal Ground	Ground	Shelf	TCAS
LBP9	115 V ac (Cold) Output to Fan	Power/Ground	Shelf	TCAS
LBP10	+28 V dc Primary Power	Power/Ground	Shelf	TCAS
LBP11	Chassis Ground	Power/Ground	Shelf	TCAS
LBP12	Suppression Pulse I/O	Suppression	XPDR1, XPDR2, other TCAS	TCAS
LBP13	Suppression Pulse I/O	Suppression	TCAS	XPDR1, XPDR2, other TCAS
LMP1	Bottom Omni Antenna, J1	RF	Antenna	TCAS
LMP2	Bottom Antenna, J2	RF	Antenna	TCAS
LMP3	Bottom Antenna, J3	RF	Antenna	TCAS
LMP4	Bottom Antenna, J4	RF	Antenna	TCAS
LTP1	Top Antenna, J1	RF	Antenna	TCAS
LTP2	Top Antenna, J2	RF	Antenna	TCAS
LTP3	Top Antenna, J3	RF	Antenna	TCAS
LTP4	Top Antenna, J4	RF	Antenna	TCAS
RBP1A	Spare Selected Altitude Synchro Input X	Synchro	Unused	Unused
RBP1B	Spare Selected Altitude Synchro Input Y	Synchro	Unused	Unused
RBP1C	Spare Selected Altitude Synchro Input Z	Synchro	Unused	Unused
RBP1D	Spare Selected Altitude 26 V ac Ref (Hot)	Synchro	Unused	Unused
RBP1E	Spare Selected Altitude 26 Vac Ref (Cold)	Synchro	Unused	Unused
RBP1F	Spare	Spare	NA	NA
RBP1G	Spare	Spare	NA	NA

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RBP1H	RA Guidance Bit 18 Discrete Output	Discrete Output	TCAS	FDR
RBP1J	RA Guidance Bit 19 Discrete Output	Discrete Output	TCAS	FDR
RBP1K	RA Guidance Bit 20 Discrete Output	Discrete Output	TCAS	FDR
RBP2A	Spare Program Pins	Program Pin	NA	TCAS
RBP2B	Spare Program Pins	Program Pin	NA	TCAS
RBP2C	Spare Program Pins	Program Pin	NA	TCAS
RBP2D	Spare Program Pins	Program Pin	NA	TCAS
RBP2E	Spare Program Pins	Program Pin	NA	TCAS
RBP2F	Spare Program Pins	Program Pin	NA	TCAS
RBP2G	Spare Program Pins	Program Pin	NA	TCAS
RBP2H	RA Guidance Bit 21 Discrete Output	Discrete Output	TCAS	FDR
RBP2J	RA Guidance Bit 22 Discrete Output	Discrete Output	TCAS	FDR
RBP2K	RA Guidance Bit 23 Discrete Output	Discrete Output	TCAS	FDR
RBP3A	Radio Altimeter No. 2 ARINC 552/552A +	ARINC 552/552A	RA No. 2	TCAS
RBP3B	Radio Altimeter No. 2 ARINC 552/552A -	ARINC 552/552A	RA No. 2	TCAS
RBP3C	Radio Altimeter No. 2 Valid Discrete Input	Discrete Input	RA No. 2	TCAS
RBP3D	Radio Altitude No. 2 - A429 Input A	LS 429 Input	RA No. 2	TCAS
RBP3E	Radio Altitude No. 2 - A429 Input B	LS 429 Input	RA No. 2	TCAS
RBP3F	Spare	Spare	NA	NA
RBP3G	Spare	Spare	NA	NA
RBP3H	RA Guidance Bit 24 Discrete Output	Discrete Out	TCAS	FDR
RBP3J	RA Guidance Bit 25 Discrete Output	Discrete Out	TCAS	FDR
RBP3K	RA Guidance Bit 26 Discrete Output	Discrete Out	TCAS	FDR

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RBP4A	Reserved Discrete Input 15	Discrete Input	NA	NA
RBP4B	Spare	Spare	NA	NA
RBP4C	Reserved Aural Label 057 Enable Program Pin	Program Pin	NA	NA
RBP4D	Reserved E-TCAS Select Program Pin	Program Pin	NA	NA
RBP4E	Reserved Discrete Input 16	Discrete Input	NA	NA
RBP4F	Reserved Discrete Input 17	Discrete Input	NA	NA
RBP4G	RA Valid Discrete Disable Program Pin	Program Pin	RBP7K	TCAS
RBP4H	RA Guidance Bit 27 Discrete Output	Discrete Output	TCAS	FDR
RBP4J	RA Guidance Bit 28 Discrete Output	Discrete Output	TCAS	FDR
RBP4K	RA Guidance Bit 29 Discrete Output	Discrete Output	TCAS	FDR
RBP5A	Advisory Inhibit Discrete Input 1	Discrete Input	Aircraft System	TCAS
RBP5B	Advisory Inhibit Discrete Input 2	Discrete Input	Aircraft System	TCAS
RBP5C	Advisory Inhibit Discrete Input 3	Discrete Input	Aircraft System	TCAS
RBP5D	Advisory Inhibit Discrete Input 4	Discrete Input	Aircraft System	TCAS
RBP5E	Increase Climb Inhibit Discrete Input 1	Discrete Input	Aircraft System	TCAS
RBP5F	Increase Climb Inhibit Discrete Input 2	Discrete Input	Aircraft System	TCAS
RBP5G	Increase Climb Inhibit Discrete Input 3	Discrete Input	Aircraft System	TCAS
RBP5H	Increase Climb Inhibit Discrete Input 4	Discrete Input	Aircraft System	TCAS
RBP5J	Climb Inhibit No. 3 Discrete Input	Discrete Input	Aircraft System	TCAS
RBP5K	Climb Inhibit No. 4 Discrete Input	Discrete Input	Aircraft System	TCAS

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RBP6A	Data Loader Enable Discrete Input	Discrete Input	Data Loader	TCAS
RBP6B	Spare Data Loader Function Discrete Input No. 2	Discrete Input	Data Loader	TCAS
RBP6C	Spare Data Loader Function Discrete Input No. 3	Discrete Input	Data Loader	TCAS
RBP6D	Spare Software Part Number Enable Discrete Input	Discrete Input		TCAS
RBP6E	TCAS Maintenance Data - A429 Output A	LS 429 Output	TCAS	CFDS
RBP6F	TCAS Maintenance Data - A429 Output B	LS 429 Output	TCAS	CFDS
RBP6G	Maintenance Data - A429 Input A	LS 429 Input	CFDS	TCAS, XPDR
RBP6H	Maintenance Data - A429 Input B	LS 429 Input	CFDS	TCAS, XPDR
RBP6J	Single Transponder Program Pin	Program Pin	RBP7K	TCAS
RBP6K	Single Radio Altimeter Program Pin	Program Pin	RBP7K	TCAS
RBP7A	Airborne Audio Level Program Pin No. 1	Program Pin	RBP7K	TCAS
RBP7B	Airborne Audio Level Program Pin No. 2	Program Pin	RBP7K	TCAS
RBP7C	Airborne Audio Level Program Pin No. 3	Program Pin	RBP7K	TCAS
RBP7D	Aural Advisory Discrete Program Pin	Program Pin	RBP7K	TCAS
RBP7E	Ground Display Mode Program Pin	Program Pin	RBP7K	TCAS
RBP7F	Display All Traffic/Threat Program Pin	Program Pin	RBP7K	TCAS
RBP7G	Cable Delay Program Pin Sign	Program Pin	RBP7K	TCAS
RBP7H	Cable Delay Program Pin MSB	Program Pin	RBP7K	TCAS
RBP7J	Cable Delay Program Pin LSB	Program Pin	RBP7K	TCAS
RBP7K	RBP Program Pin Common	Program Pin	Shelf	TCAS
RBP8A	On Ground Audio Level Program Pin No. 1	Program Pin	RBP7K	TCAS
RBP8B	On Ground Audio Level Program Pin No. 2	Program Pin	RBP7K	TCAS
RBP8C	On Ground Audio Level Program Pin No. 3	Program Pin	RBP7K	TCAS
RBP8D	Spare Alternate Antenna Select Program Pin	Program Pin	NA	TCAS
RBP8E	Self Test Inhibit Program Pin	Program Pin	RBP7K	TCAS
RBP8F	TA/RA Display Intruder Limit 16 Program Pin	Program Pin	RBP7K	TCAS
RBP8G	TA/RA Display Intruder Limit 8 Program Pin	Program Pin	RBP7K	TCAS
RBP8H	TA/RA Display Intruder Limit 4 Program Pin	Program Pin	RBP7K	TCAS
RBP8J	TA/RA Display Intruder Limit 2 Program Pin	Program Pin	RBP7K	TCAS
RBP8K	TA/RA Display Intruder Limit 1 Program Pin	Program Pin	RBP7K	TCAS

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RBP9A	ATE D0 Discrete Output	Discrete Output	TCAS	ATE
RBP9B	ATE D1 Discrete Output	Discrete Output	TCAS	ATE
RBP9C	ATE D2 Discrete Output	Discrete Output	TCAS	ATE
RBP9D	ATE D3 Discrete Output	Discrete Output	TCAS	ATE
RBP9E	ATE D4 Discrete Output	Discrete Output	TCAS	ATE
RBP9F	ATE D5 Discrete Output	Discrete Output	TCAS	ATE
RBP9G	ATE D6 Discrete Output	Discrete Output	TCAS	ATE
RBP9H	ATE D7 Discrete Output	Discrete Output	TCAS	ATE
RBP9J	ATE CK Discrete Output	Discrete Output	TCAS	ATE
RBP9K	ATE Log Video Discrete Output	Discrete Output	TCAS	ATE
RBP10A	ATE A0 Discrete Output	Discrete Output	TCAS	ATE
RBP10B	ATE A1 Discrete Output	Discrete Output	TCAS	ATE
RBP10C	ATE A2 Discrete Output	Discrete Output	TCAS	ATE
RBP10D	ATE R1 Discrete Output	Discrete Output	TCAS	ATE
RBP10E	ATE R2 Discrete Output	Discrete Output	TCAS	ATE
RBP10F	ATE R3 Discrete Output	Discrete Output	TCAS	ATE
RBP10G	ATE R4 Discrete Output	Discrete Output	TCAS	ATE
RBP10H	ATE R5 Discrete Output	Discrete Output	TCAS	ATE
RBP10J	ATE R6 Discrete Output	Discrete Output	TCAS	ATE
RBP10K	ATE Common	Discrete Output	TCAS	ATE
RMP1A	Reserved Discrete Output 1	Discrete Output	NA	NA
RMP1B	Reserved Discrete Output 2	Discrete Output	NA	NA
RMP1C	Reserved Discrete Output 3	Discrete Output	NA	NA
RMP1D	Reserved Discrete Output 4	Discrete Output	NA	NA
RMP1E	TA Display Enable Discrete Output	Discrete Output	TCAS	PPI or TA Display
RMP1F	Aural Advisory Discrete Output (Corrective)	Discrete Output	TCAS	Warning System/ Tone Generator
RMP1G	Reserved Discrete Output 5	Discrete Output	NA	NA
RMP1H	Reserved Discrete Output 6	Discrete Output	NA	NA
RMP1J	Climb Inhibit No. 1 Discrete Input	Discrete Input	Aircraft System	TCAS
RMP1K	Aural Advisory Discrete Output (Preventative)	Discrete Output	TCAS	Warning System/ Tone Generator

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RMP2A	Aural Advisory Discrete Output (Traffic Alert)	Discrete Output	TCAS	Warning System/ Tone Generator
RMP2B	Spare	Spare	NA	NA
RMP2C	Spare	Spare	NA	NA
RMP2D	Advisory/Announce Common	Discrete Output	Shelf	TCAS
RMP2E	Spare	Spare	NA	NA
RMP2F	TCAS Audio Output (8 ohms) (High)	Audio	TCAS	Speaker
RMP2G	TCAS Audio Output (8 ohms) (Low)	Audio	TCAS	Speaker
RMP2H	Radio Altimeter No. 1 ARINC 552/552A +	ARINC 552/552A	RA No.1	TCAS
RMP2J	Radio Altimeter No. 1 ARINC 552/552A -	ARINC 552/552A	RA No.1	TCAS
RMP2K	Radio Altitude No. 1 552/552A Valid Discrete Input	Discrete Input	RA No.1	TCAS
RMP3A	Visual Annunciator Discrete Output (Corrective)	Discrete Output	TCAS	Warning System/ Annunciator Lamps
RMP3B	Visual Annunciator Discrete Output (Preventative)	Discrete Output	TCAS	Warning System/ Annunciator Lamps
RMP3C	Visual Annunciator Discrete Output (Traffic Alert)	Discrete Output	TCAS	Warning System/ Annunciator Lamps
RMP3D	Advisory/Annunciator Cancel Discrete Input	Discrete Input	Aircraft System	TCAS
RMP3E	Spare	Spare	NA	NA
RMP3F	TCAS Audio Output (600 ohms) (High)	Audio	TCAS	Phone
RMP3G	TCAS Audio Output (600 ohms) (Low)	Audio	TCAS	Phone
RMP3H	Spare	Spare	NA	NA
RMP3J	Spare	Spare	NA	NA
RMP3K	Reserved Discrete Input 1	Discrete Input	NA	NA

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RMP4A	Pitch Attitude Synchro Input X	Synchro	Unused	XPDR
RMP4B	Pitch Attitude Synchro Input Y	Synchro	Unused	XPDR
RMP4C	Pitch Attitude Synchro Input Z	Synchro	Unused	XPDR
RMP4D	Spare TCAS Installed Discrete Input	Discrete Input	NA	
RMP4E	Roll Attitude Synchro Input X	Synchro	Unused	XPDR
RMP4F	Roll Attitude Synchro Input Y	Synchro	Unused	XPDR
RMP4G	Roll Attitude Synchro Input Z	Synchro	Unused	XPDR
RMP4H	Attitude Reference (High)	Synchro	Unused	XPDR
RMP4J	Attitude Reference (Low)	Synchro	Unused	XPDR
RMP4K	Attitude Valid Discrete Input	Discrete Input	NA	TCAS
RMP5A	Mag Heading Synchro Input X	Synchro	Unused	XPDR
RMP5B	Mag Heading Synchro Input Y	Synchro	Unused	XPDR
RMP5C	Mag Heading Synchro Input Z	Synchro	Unused	XPDR
RMP5D	Reserved Discrete Input 2	Discrete Input	NA	NA
RMP5E	ADS-B (Intruder File Enable) Program Pin	Program Pin	RBP7K	TCAS
RMP5F	Reserved GP Bus Enable Program Pin	Program Pin	RBP7K	TCAS
RMP5G	Reserved ADS-B Program Pin	Program Pin	RBP7K	TCAS
RMP5H	Mag Heading Reference (High)	Spare	Unused	XPDR
RMP5J	Mag Heading Reference (Low)	Spare	Unused	XPDR
RMP5K	Air/Ground Discrete Input	Discrete Input	Air/Ground Relay	TCAS
RMP6A	Performance Limit - A429 Input A	LS/HS 429 Input	FMC	TCAS
RMP6B	Performance Limit - A429 Input B	LS/HS 429 Input	FMC	TCAS
RMP6C	Mag Heading Valid Discrete Input	Discrete Input	NA	TCAS
RMP6D	Performance Limit Discrete Input	Discrete Input	Performance Source (FMC)	
RMP6E	Altitude Limit Program Pin 2000 ft	Program Pin	RMP6K	TCAS
RMP6F	Altitude Limit Program Pin 4000 ft	Program Pin	RMP6K	TCAS
RMP6G	Altitude Limit Program Pin 8000 ft	Program Pin	RMP6K	TCAS
RMP6H	Altitude Limit Program Pin 16000 ft	Program Pin	RMP6K	TCAS
RMP6J	Altitude Limit Program Pin 3200 ft	Program Pin	RMP6K	TCAS
RMP6K	Altitude Limit Program Pin Common	Program Pin	Shelf	TCAS

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RMP7A	Mag Heading/Attitude - A429 Input A	LS/HS 429 Input	IRS	TCAS
RMP7B	Mag Heading/Attitude - A429 Input B	LS/HS 429 Input	IRS	TCAS
RMP7C	TA/RA Display No. 1 - A429 Output A	HS 429 Output	TCAS	TA/RA Display No.1
RMP7D	TA/RA Display No. 1 - A429 Output B	HS 429 Output	TCAS	TA/RA Display No.1
RMP7E	TA Display No. 1 Status Discrete Input	Discrete Input	TA Display No. 1	TCAS
RMP7F	Spare	Spare	NA	NA
RMP7G	TA/RA Display No. 2 - A429 Output A	HS 429 Output	TCAS	TA/RA Display No.2
RMP7H	TA/RA Display No. 2 - A429 Output B	HS 429 Output	TCAS	TA/RA Display No.2
RMP7J	TA Display No. 2 Status Discrete Input	Discrete Input	TA Display No. 2	TCAS
RMP7K	Spare	Spare	NA	NA
RMP8A	Data Loader - A429 Input A	HS 429 Input	Data Loader	TCAS
RMP8B	Data Loader - A429 Input B	HS 429 Input	Data Loader	TCAS
RMP8C	Reserved TA/RA Display Control No. 1 - A429 Input A	LS 429 Input	TA/RA Display No. 1	TCAS
RMP8D	Reserved TA/RA Display Control No. 1 - A429 Input B	LS 429 Input	TA/RA Display No. 1	TCAS
RMP8E	Reserved General Purpose No. 1 429 Input A	LS/HS 429 Input	NA/ADS-B LRU	TCAS
RMP8F	Reserved General Purpose No. 1 429 Input B	LS/HS 429 Input	NA/ADS-B LRU	TCAS
RMP8G	Reserved TA/RA Display Control No. 2 - A429 Input A	LS 429 Input	TA/RA Display No. 2	TCAS
RMP8H	Reserved TA/RA Display Control No. 2 - A429 Input B	LS 429 Input	TA/RA Display No. 2	TCAS
RMP8J	Reserved General Purpose No. 2 429 Input A	LS/HS 429 Input	NA/ADS-B LRU	TCAS
RMP8K	Reserved General Purpose No. 2 429 Input B	LS/HS 429 Input	NA/ADS-B LRU	TCAS
RMP9A	Data Loader - A429 Input A	HS 429 Output	TCAS	Data Loader
RMP9B	Data Loader - A429 Input B	HS 429 Output	TCAS	Data Loader
RMP9C	Spare Data Bus Output No. 1 - A429 Output A	LS/HS 429 Output	TCAS	NA
RMP9D	Spare Data Bus Output No. 1 - A429 Output B	LS/HS 429 Output	TCAS	NA

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

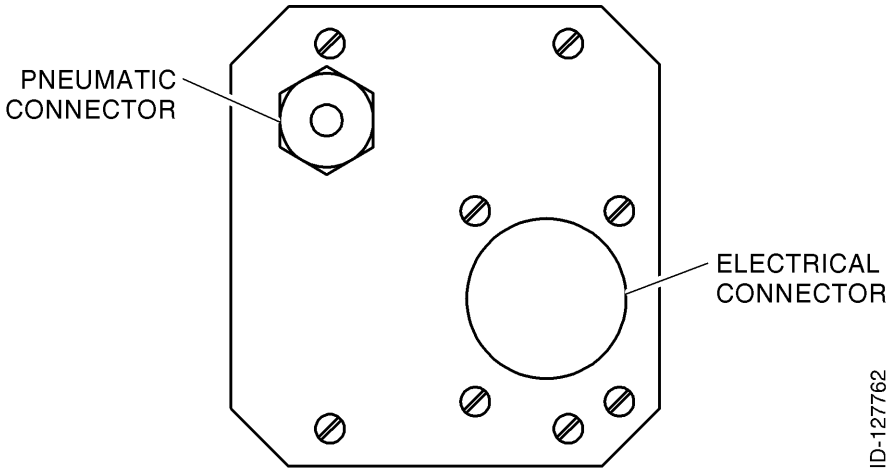
Pin	Description	Data Type	Source	Destination
RMP9E	Spare Data Bus Output 2 - A429 Output A	LS/HS 429 Output	TCAS	NA
RMP9F	Spare Data Bus Output 2 - A429 Output B	LS/HS 429 Output	TCAS	NA
RMP9G	Reserved General Purpose No. 1 - A429 Output A	LS/HS 429 Output	TCAS	ADS-B LRU
RMP9H	Reserved General Purpose No. 1 - A429 Output B	LS/HS 429 Output	TCAS	ADS-B LRU
RMP9J	Reserved General Purpose No. 2 - A429 Output A	LS/HS 429 Output	TCAS	ADS-B LRU
RMP9K	Reserved General Purpose No. 2 - A429 Output B	LS/HS 429 Output	TCAS	ADS-B LRU
RMP10A	Reserved Discrete Input 3	Discrete Input	TCAS	NA
RMP10B	Reserved Discrete Input 4	Discrete Input	TCAS	NA
RMP10C	Reserved Discrete Input 5	Discrete Input	TCAS	NA
RMP10D	Reserved Discrete Input 6	Discrete Input	Unused	NA
RMP10E	Reserved Discrete Input 7	Discrete Input	Unused	NA
RMP10F	Reserved Discrete Input 8	Discrete Input	Unused	NA
RMP10G	Reserved Discrete Input 9	Discrete Input	Unused	NA
RMP10H	Reserved Discrete Input 10	Discrete Input	Unused	NA
RMP10J	Reserved Discrete Input 11	Discrete Input	Unused	NA
RMP10K	Reserved Discrete Input 12	Discrete Input	Unused	NA
RMP11A	Reserved Discrete Input 13	Discrete Input	Unused	NA
RMP11B	Spare	Spare	Unused	NA
RMP11C	Spare UD 01	User Defined	Unused	Unused
RMP11D	Spare UD 02	User Defined	Unused	Unused
RMP11E	Spare UD 03	User Defined	Unused	Unused
RMP11F	Spare UD 04	User Defined	Unused	Unused
RMP11G	Spare UD 05	User Defined	Unused	Unused
RMP11H	Spare UD 06	User Defined	Unused	Unused
RMP11J	Spare UD 07	User Defined	Unused	Unused
RMP11K	Spare UD 08	User Defined	Unused	Unused

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RMP12A	Radio Altimeter Type Strap Program Pin A	Program Pin	RBP7K	TCAS
RMP12B	Radio Altimeter Type Strap Program Pin B	Program Pin	RBP7K	TCAS
RMP12C	Radio Altimeter Type Strap Program Pin C	Program Pin	RBP7K	TCAS
RMP12D	Spare UD 09	User Defined	Unused	Unused
RMP12E	Spare UD 10	User Defined	Unused	Unused
RMP12F	Spare UD 11	User Defined	Unused	Unused
RMP12G	A615-A Data Load Input A	Ethernet	615-A Data Loader	TCAS
RMP12H	A615-A Data Load Input B	Ethernet	615-A Data Loader	TCAS
RMP12J	A615-A Data Load Output A	Ethernet	615-A Data Loader	TCAS
RMP12K	A615-A Data Load Output B	Ethernet	615-A Data Loader	TCAS
RMP13A	RA Display No. 1 - A429 Output A	LS 429 Output	TCAS	RA Display No.1, FDR
RMP13B	RA Display No. 1 - A429 Output B	LS 429 Output	TCAS	RA Display No.1, FDR
RMP13C	RA Display No. 2 - A429 Output A	LS 429 Output	TCAS	RA Display No.2 FDR
RMP13D	RA Display No. 2 - A429 Output B	LS 429 Output	TCAS	RA Display No.2, FDR
RMP13E	RA Display No. 2 Status Discrete Input	Discrete Input	RA Display No. 2	TCAS
RMP13F	Landing Gear Discrete Input	Discrete Input	Landing Gear Relay	TCAS
RMP13G	Climb Inhibit No. 2 Discrete Input	Discrete Input	Aircraft System	TCAS
RMP13H	Radio Altimeter No. 1 - A429 Input A	LS 429 Input	Radio Alt No.1	TCAS
RMP13J	Radio Altimeter No. 1 - A429 Input B	LS 429 Input	Radio Alt No.1	TCAS
RMP13K	TCAS System Status Discrete Output	Discrete Output	TCAS	System Monitoring TCAS

Table 2001. TPA-100A TCAS Processor Description of Aft Connector Pins (cont)

Pin	Description	Data Type	Source	Destination
RMP14A	TX Coordination No. 2 - A429 Output A	HS 429 Output	TCAS	XPDR
RMP14B	TX Coordination No. 2 - A429 Output B	HS 429 Output	TCAS	XPDR
RMP14C	RA Display No. 1 Status Discrete Input	Discrete Input	RA Display No. 1	TCAS
RMP14D	Reserved ETCAS Control/Selected Altitude - A429 Input A	LS 429 Input	ETCAS Controller	TCAS
RMP14E	Reserved ETCAS Control/Selected Altitude - A429 Input B	LS 429 Input	ETCAS Controller	TCAS
RMP14F	XT Coordination No. 1 - A429 Input A	HS 429 Input	XPDR	TCAS
RMP14G	XT Coordination No. 1 - A429 Input B	HS 429 Input	XPDR	TCAS
RMP14H	XT Coordination No. 2 - A429 Input A	HS 429 Input	XPDR	TCAS
RMP14J	XT Coordination No. 2 - A429 Input A	HS 429 Input	XPDR	TCAS
RMP14K	Reserved Discrete Input 14	Discrete Input	NA	NA
RMP15A	Reserved EGPWC to TCAS - A429 Input A	HS 429 Input	EGPWC	TCAS
RMP15B	Reserved EGPWC to TCAS - A429 Input B	HS 429 Input	EGPWC	TCAS
RMP15C	Reserved WXR to TCAS - A429 Input A	HS 429 Input	WXR	TCAS
RMP15D	Reserved WXR to TCAS - A429 Input B	HS 429 Input	WXR	TCAS
RMP15E	Reserved TCAS to EGPWC - A429 Output A	HS 429 Output	TCAS	EGPWC
RMP15F	Reserved TCAS to EGPWC - A429 Output B	HS 429 Output	TCAS	EGPWC
RMP15G	Reserved TCAS to WXR - A429 Output A	HS 429 Output	TCAS	WXR
RMP15H	Reserved TCAS to WXR - A429 Output B	HS 429 Output	TCAS	WXR
RMP15J	TX Coordination No. 1 A429 Output A	HS 429 Output	TCAS	XPDR
RMP15K	TX Coordination No. 1 A429 Output B	HS 429 Output	TCAS	XPDR

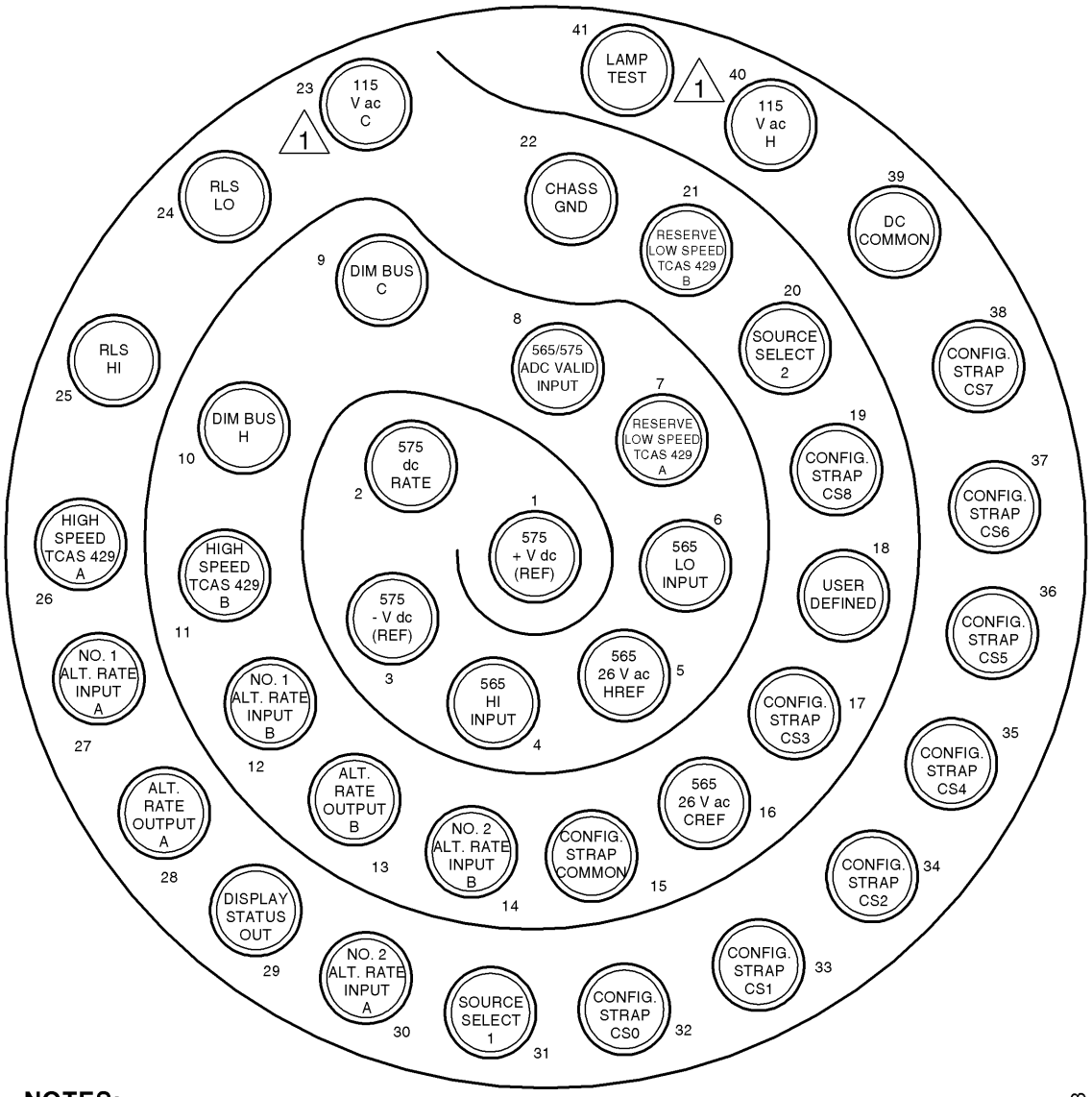


IVA-81A/D, TA/VSI and IVA-81B, RA/VSI Aft Connector Locations
Figure 2002

As specified in Figure 2002 , the pneumatic connector attaches to a pneumatic tube from a static pressure source in the aircraft. The 41-pin electrical connector in Figure 2003 connects to the TCAS processor, aircraft power sources, configuration straps, and connects to one of two optional vertical rate analog sources or one of three optional vertical rate digital sources (if pneumatic input is not used).

Electrical connector keying on the units energized by 115 V 400 Hz is different from keying on the units energized by 28 V dc to prevent accidental installation of an incorrect unit. Keying is also different between those 28 V dc units adapted for 5 V ac or the dc panel lighting, and those adapted for 28 V dc panel lighting.

The pins and abbreviated signal names for the electrical connector are shown on Figure 2003 and Interwiring diagram Figure 2015. The Table 2002 gives the abbreviated signal names. Outline drawings Figures 2011, 2012, and 2013, and the related Component Maintenance Manuals give the connector part numbers and more data.



NOTES:

1. For indicators that use 28 Vdc input power, Pin 40 connects to 28 V dc and Pin 23 to ground.

ID-127763

TA/VSI and RA/VSI Electrical Connector Pin I/O
Figure 2003

Table 2002. TA/VSI, RA/VSI Electrical Connector Pin Name Definitions

Pin	Signal Name	I/O	Description
40 23	H or + C or -	I I	115 V 400 Hz or 28 V dc
22	Chassis Ground	O	TA/VSI Case Ground
39	dc Common	O	Ground
25 24	Hi Lo	I I	Remote Light Sensor Input
10 9	H C	I I	Dimming Power Input V ac
27 12	A B	I I	Digital Primary Vertical Speed Input No. 1 Low Speed/High Speed 429 ADC/IRS
8	+28 V dc/Open	I	Vertical Speed Valid Input ADC/IRS, ARINC 565, 575
30 14	A B	I I	Digital Secondary Vertical Speed Input No. 2 Low Speed/High Speed 429 ADC/IRS
4 6 5 16	Hi Lo H C	I I I I	ARINC 565 Vertical Speed Input 26 V ac Reference 26 V ac Reference
1 3 2	+V dc Ref. -V dc Ref. dc Rate Signal	I I I	ARINC 575 Analog Input
26 11	A B	I I	TCAS Data Input High Speed 429
29	Open/Ground (Valid=Ground)	O	Display Status Output

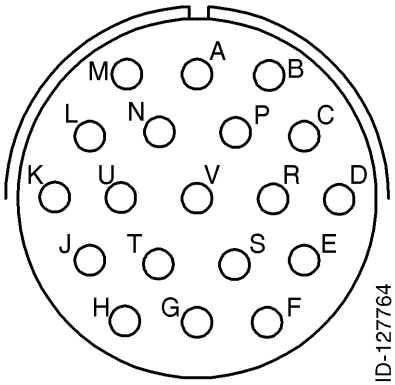
Table 2002. TA/VSI, RA/VSI Electrical Connector Pin Name Definitions (cont)

Pin	Signal Name	I/O	Description
20	+28 V dc/Open	I	Source Select Strap No. 2
18			Spare
41			Lamp Test
15		O	Strap Common
31	Gnd/Open	I	Source Select Strap No. 1
28	A	O	Altitude Rate Output
13	B	O	Low Speed ARINC 429
7	A	I	Reserved Input
21	B	I	Low Speed ARINC 429
32	CS0	I	BIT 0 Configuration Strap
33	CS1	I	BIT 1 Configuration Strap
34	CS2	I	BIT 2 Configuration Strap
17	CS3	I	BIT 3 Configuration Strap
35	CS4	I	BIT 4 Configuration Strap
36	CS5	I	BIT 5 Configuration Strap
37	CS6	I	BIT 6 Configuration Strap
38	CS7	I	BIT 7 Configuration Strap
19	CS8	I	BIT 8 Configuration Strap

NOTE: For additional connector pin information, See TCAS Interwiring Diagram Figure 2015.

(d) ITA-81A Traffic Display

The electrical connector for the TCAS traffic display is attached on the rear panel of the unit. The connector is shown in Figure 2004 and the signals connected to each pin are specified in Table 2003.



ITA-81A Aft Connector
Figure 2004

Table 2003. Dedicated TCAS Traffic Display Connector Pin Name Definitions

Pin	Signal Name	I/O	Description
A	A	I	TCAS Data (High-Speed 429)
B	B	I	
P	A	I	ACARS Data (Reserved)
C	B	I	
D	Ground	O	dc Ground
E	Ground	O	Chassis Ground
F	Return	I	5 V ac Panel Light
G	H	I	
H	H	I	115 V 400 Hz
K	C	I	
M	Open/Ground (Valid = Ground)	O	TD Valid
N	Open/Ground (Enable = Ground	I	TAD Enable
R	Open/Ground	I	ACARS Discrete (Reserved)
J			Spares
L			Spares
S			Spares
T			Spares
U			Spares
V			Spares

(e) PPI Radar/TCAS Display Connectors

See PPI Radar/TCAS display manuals given in Table 5 of the DESCRIPTION AND OPERATION section of this manual.

(f) Omni Antenna Connector

Connectors for the coaxial cable connection from the TCAS processor to the omni antenna can be N-type female or blade type connectors dependent on user installation specifications.

D. Wire Strapping Options

CAS-100 wire strapping options are implemented by externally connecting pins on the CAS-100 unit connectors. The configurations of the straps are identified by the software in the applicable unit. In most cases, the selected strap is connected to a common ground pin on the related connector, but in some conditions can be connected to aircraft ground.

(1) TPA-100A TCAS Processor Straps

(a) Cable Delay Program Straps

These three straps, on RBP pins 7G, 7H, and 7J, are selectively connected to a common on RBP pin 7K, to adjust for the differences in coaxial cable lengths between the top and the bottom TCAS antennas (a maximum of 300 nanoseconds). See Interwiring diagram Figure 2015 and paragraph 6.B. for strapping details.

(b) Aircraft Altitude Limit Program Straps

Some aircraft can not get a 0.25 G vertical acceleration to a 1500 FPM climb rate for an altitude increase of 750 feet above a specific altitude in all conditions. The CAS logic is made aware of these conditions by the altitude limit straps until an applicable resolution advisory, for example DON'T CLIMB can be issued. These program pins are for selecting the CAN'T CLIMB altitude in 2000 foot increments until 62,000 feet. The jumper wires from the pins RMP-6E through RMP-6J to RMP-6K are necessary to program the necessary altitude. The limits set by the pins show the worst case. The limits set by the pins must be used as a default when the flight management computer shows that the climb must be limited. If no jumpers are installed the altitude will be zero feet.

The five strap pins on RMP-6E, 6F, 6G, 6H, and 6J are selectively jumpered to the same, RMP pin 6K, to program the set altitude limit as follows:

Pin	Altitude Limit (Feet)
RMP - 6E	2000
RMP - 6F	4000
RMP - 6G	8000
RMP - 6H	16000
RMP - 6J	32000

(c) Type of Analog Radio Altimeter Select Straps

The TCAS processor can accept radio altitude input from digital radio altimeters and a variety of analog radio altimeters.

These three straps, on RMP pins 12A, 12B, and 12C, are selectively connected to a common on RMP-6K, to identify the type of analog radio altimeter to the TCAS processor software. Refer to Interwiring diagram Figure 2015 for strapping details.

(d) TA/RA Display Symbol Maximum Program

These five straps, on RBP pins 8F, 8G, 8H, 8J, and 8K, are selectively connected to a common on RBP pin 7K, to show the maximum number of intruder aircraft that can come into view on those display units that can not display the CAS-100 maximum of 30 intruders (for example, the TA/VSI display unit).

The TCAS processor reads these straps and sends their control data to the displays. The display unit software uses this strap controlled data to control the maximum number of intruder symbols that can come into view on the traffic display.

Refer to Interwiring diagram, Figure 2015 for strapping details.

(e) Ground Display Mode

This strap on RBP pin 7E controls if traffic is shown on the TCAS traffic display while own aircraft is on-the-ground. To keep this strap input open lets traffic display on-the-ground. Grounding this strap input prevents traffic displays on the ground (puts TCAS in STANDBY mode). Refer to Interwiring diagram, Figure 2015 for more details.

(f) Display All/Threat Traffic Program

This strap on RBP pin 7F controls if all traffic is shown all the time on the TCAS traffic display or when a TA or RA is present. To keep this strap open lets all proximity, nonthreat, TA, and RA category traffic to be displayed at all times. Grounding this strap input prevents the display of aircraft symbols unless a TA or RA is present. Refer to Interwiring diagram, Figure 2015, for more details.

(g) Functional Test Inhibit

The strap on RBP pin 8E controls if the functional test can be performed while the aircraft is airborne. To keep this strap open lets functional test during the flight. Grounding this pin will prevent functional test while the aircraft is off the ground. Refer to Interwiring diagram, Figure 2015, for more details.

(h) Audio Tone Enable Program

The strap on RBP pin 7D is supplied for applications where the aural advisory output are used to supply tones with synthesized voice advisories. When this pin is grounded, the synthesized voice output is delayed by 1 second to be correctly phased with the aural advisories. When this pin is open, there is no delay of the voice output. Refer to Interwiring diagram, Figure 2015, for more details.

(i) Audio Level Program

Two sets of strap pins are supplied for adjusting audio level. Three strap pins, on RBP pins 7A, 7B and 7C, are selectively connected to a common on RBP pin 7K to adjust the audio output to the desired level when the aircraft is airborne. The second set of three straps pins, on RBP pins 8A, 8B, and 8C, let the adjustment of audio level for when the aircraft is on the ground. See Interwiring diagram Figure 2015 for strapping details.

(j) Transponder Interface Select

This strap on RBP pin 6J is supplied to show to the TCAS processor if one or two transponders are installed in the system. When this pin strapped (connected to RBP pin 7K), only the No. 1 transponder is installed. When open, it shows that the No. 1 and No. 2 transponders are installed.

(k) Radio Altimeter Interface Select

This strap on RBP pin 6K is supplied to show to the TCAS processor if one or two radio altimeters are installed. When this pin is strapped (connected to RBP pin 7K) it shows that only the No. 1 radio altimeter is installed. When open, the No. 1 and No. 2 radio altimeters are installed.

(l) RA status Inhibit

This strap on RBP pin 4G controls if RA display status is active or inhibited. When this pin is strapped (connected to RBP pin 7K), RA display status is inhibited.

(m) On Ground Intruder Disable

This strap on RBP pin 4F controls if intruders found to be ON GROUND will be shown when own aircraft is below 1750 feet (radio altitude). When strapped (connected to RBP pin 7K) intruders on the ground will not be shown when own aircraft is below 1750 feet.

(2) IVA-81A/D TA/VSI and IVA-81B RA/VSI Straps

See I.B. 1181 for IVA-81A/D TA/VSI and IVA-81B RA/VSI strapping data.

6. Equipment Installation

A. TPA-100A TCAS Processor Installation

Mounting of the TCAS processor is accomplished by use of its associated mounting tray, which is available with a fan assembly. This fan operates from 115 V 400 Hz or 28 V dc. Operating power for the 115 V 400 Hz fan is received from the TCAS processor when power is applied to the TCAS processor unit.

The mounting tray connector must be wired in accordance with the Interwiring diagram, Figure 2015 and the manufacturer's instructions.

NOTE: To allow for inspection or repair of the connector assembly wiring, sufficient lead length must be left to pull the rear connector assembly forward some inches when the assembly hardware for the rear connector assembly is removed. Also, a bend must be made in the harness (at the rear connectors) to allow possible small drops of water to drip at the bend and not collect in the connector.

When locating the mount in the aircraft, let a minimum two inches free space on the top and the sides of unit to give the sufficient clearance for sway and easy removal of the TCAS processor. Clean all assembly surfaces before placing the mount in position.

When the mounting tray is installed, the TCAS processor unit is easily installed into the mounting tray. Put the TPA-100A on the mounting base and slide it forward until the electrical connector is fully engaged. Then attach the front of the unit to the mount by tightening the two knurled screw clamps (found on the front of the mount) until they are tightly installed on the hold-down hooks on the front of the TCAS processor.

B. TCAS Directional Antenna Installation

(1) Directional Antenna Positioning and Wiring Specifications

Refer to paragraph 5.B.(2), 5.C.(5), and 5.C.(6)(b).

(2) Directional Antenna Footprints Drilling and Mounting

For Directional Antenna Footprints Drilling and Mounting see the outline or installation drawings, Figures 2007, 2008, 2009, or 2010.

(3) Directional Antenna Adapter Installation for 8-hole, Flat Base Antenna

This procedure outlines the installation of the Adapter Plate (Part No. 047-50357-0001 through -004) to the skin of the aircraft. The gap between the adapter plate and the skin determines whether Procedure A or B is required for the installation of the adapter plate.

(a) General Information

The ANT-81A Adapter is available in four different versions to accomodate a broad range of aircraft skin curvatures. The following list describes the range of radial curvatures that each adapter plate will fit:

Detail Part No.	Skin Curvature (Radial)
047-50357-0001	29 to 35 inches
-0002	36 to 45 inches
-0003	46 to 65 inches
-0004	66 to 95 inches

The installation prodedure requires the use of the adapter plate as the fixture to locate the pilot holes on the proposed centerline for the antenna location.

The adapter plate is mounted in place on the skin with cleco fasteners so a determination can be made as to which installation procedure, A or B, will be required.

If the edge gap between the adapter plate and the aircraft skin can be closed without stressing the aircraft skin or distorting the flat section of the adapter plate in excess of ± 0.010 inches follow Procedure A. If the installer is unable to comply with the above criteria, measure the outboard centerline gap for use in Procedure B.

(b) Installation Procedure A

- Attach the adapter plate and complete the drilling and cleco attachment. If corrosion or damage is detected on the mounting surface, mask off area adjacent to adapter plate and strip paint from skin on suspect area. Treat corrosion and/or damage in accordance with approved practices regarding pressurized structures. Upon approval of skin preparation, attach the adapter plate and complete the drilling and riveting attachment.
- Drill and cleco for final rivet diameter from the centerline outboard.
- Drill the attachment holes for the four nut plates.
- With a 1.125 inch transfer punch, locate the centers for the four connectors and cut out the connector clearance (F holes).
- Remove adapter plate to countersink and de-burr all holes. Clean and brush alodine on all exposed metal surfaces of adapter plate.

- De-burr all holes on aircraft and clean mounting surface in accordance with application of BMS 5-95 sealant. Clean and brush alodine on all exposed surfaces on aircraft skin.

- Apply a faying surface seal of BMS 5-95 to the faying surfaces of skin and adapter. Apply BMS 5-95 to fasteners and install wet. Complete the riveting operation and install nut plates per installation drawing. Remove excess sealant from edges, exposed surfaces, and connector holes to expose sheet metal adjacent to the connector clearance holes to allow inspection for cracks and corrosion.

(c) Installation Procedure B

This installation procedure provides for shims to be added between adapter plate and aircraft skin. The shims are used to fill edge gaps created by a mismatch in curvature between the adapter plate and the aircraft skin.

- Fabricate the edge gap shims of 2024-T3 Alclad per drawing within T ± .010 inch thickness and identify as L, R.

- Fabricate 0.125 inch stiffener plate per drawing dimensions. Attach stiffener plate to adapter with eight 3/32 flush rivets per stiffener drawing dimensions. Transfer stiffener holes to adapter plate. Drill and countersink back side of adapter plate so rivets will mount flush with adapter plate.

- Attach adapter, stiffener plate and shims to skin, drill and cleco at centerline and edge. If corrosion or damage is detected on the mounting surface, mask off area adjacent to adapter and strip paint from sheetmetal. Treat corrosion and/or damage in accordance with approved practices regarding pressurized structures.

- Prepare the mounting surface and adjacent area of aircraft skin to the adapter plate with aluminum duct tape (see Figure 2005 for the adapter and moldable shim assembled on the airframe), re-drill holes identified in Figure 2010 and apply MS122 release material to duct tape surface. Prepare adapter plate surface and shims by cleaning with acetone followed by application of BR127.

  NOTE: Caution should be taken not to get BR127 on antenna mounting surface of adapter plate. Apply sufficient quantity of DMS4-828, moldable shim material to the adapter plate and shims to fill the measured gap. If a compound gap exists, apply additional DMS4-828 to close the gap. An approximate material application is illustrated in the installation drawing.

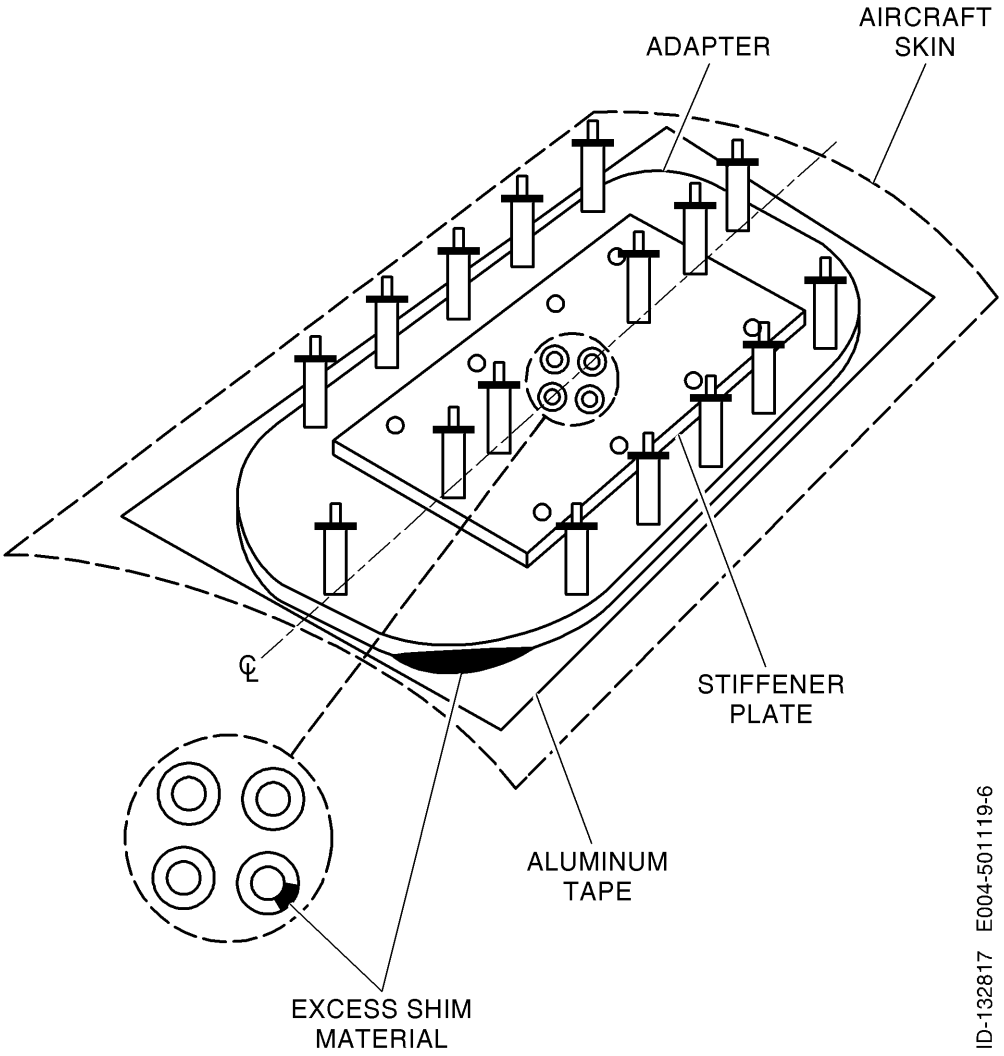
- Attach the adapter with stiffener plate to the aircraft skin with cleco fasteners at the centerline rivet holes. Carefully cleco the left and right shim to the outboard edge rivet holes. Allow several minutes for the pressure of assembly to flow out excessive DMS4-828 material. After DMS4-828 has stopped flowing, remove all excessive material, clean with MEK and blend edges as indicated on installation drawing. A plastic knife is recommended to remove excessive material and blend along the edge of the adapter plate and edges of the 1.125 inch connector holes.
- After the specified cure time of DMS4-828, drill and cleco for final rivet diameter from the centerline outboard.
- Drill the attachment holes for the four nut plates.
- Using a 1.125 inch transfer punch, locate the centers for the four connectors and cut out the connector clearance (F holes) through aircraft skin.
- Remove adapter plate to countersink and de-burr all holes. Carefully drill out 3/32 rivet tails to remove stiffener plate. Clean and brush alodine on all exposed surfaces including shims. Allow specified cure time for DMS4-828 material.
- De-burr all holes on aircraft skin and clean mounting surface in accordance with BMS 5-95 sealant specification. Clean and brush alodine on all exposed metal surfaces.
- Apply a faying surface seal of BMS 5-95 to the faying surfaces of aircraft skin and adapter plate. Install fasteners wet with BMS 5-95 sealant. Complete the riveting operation and install nut plates per installation drawing. Remove excess sealant from edges, exposed surfaces, and connector holes to expose sheet metal surrounding each hole to allow for physical inspection of cracks and corrosion.

(d) Recommended Materials

- DMS4-828, Moldable Shim Material, Dynamold, Inc.
- MS122, Release Material, Miller Stevenson or DC-4, Dow Corning
- BR127, Metal Preparation, American Cynamid
- BMS 5-95, Aircraft Sealant, PRC Corporation
- Alodine per MIL-C-5541
- Acetone
- MEK (Methyl Ethyl Keytone)

(e) Bonding Requirements

The dc resistance between the adapter plate surface and the adjacent skin surface must measure less than 10 milli ohms.



Adapter and Moldable Shim Assembled on the Airframe
Figure 2005

C. TCAS Omni Antenna Installation

(1) Antenna Positioning and Wiring Specifications

Refer to paragraph 5.B.(1) and 5.C.(5).

(2) Mounting

Refer to manufacturer's installation documentation.

D. TA/VSI and RA/VSI Unit Installation

The TA/VSI or RA/VSI display units must be installed in a applicable location in the aircraft cockpit, giving careful thought to see and easy operation. Both the TA/VSI and RA/VSI use customer supplied screw clamp fasteners to attach them to the instrument panel. Use the outline drawings Figures 2011, 2012, and 2013 for reference to position the display units and to cut and drill the instrument panel.

Attach the electrical connector to the aft of the units. If an optional aircraft pressure source is used as an input to the TA/VSI or RA/VSI attach the pneumatic tube to the aft of the units.

E. Dedicated TCAS Traffic Display

The ITA-81A Traffic Display must installed in a applicable location in the aircraft cockpit, in available reach and view of the personnel. Four Dzus fasteners (Type PPSC35-44A), one found at each corner of the front panel, attach the display to the aircraft instrument panel. All electrical connections between the system and the display are made through the connector plug found at the aft of the unit. Make sure that there is sufficient clearance permitted at the aft of the unit for the connecting cable assembly. The total mounting space necessary can be determined from the dimension data contained on Figure 2014.

F. Mode S Transponder System Component Installation

Refer to applicable Mode S transponder system maintenance manual.

7. Inspection, System Checkout, and Flight Test Procedures

A. Inspection

(1) Individual Unit Inspection

The Table 2004 is a visual inspection/check procedure that must be done after system installation as part of a system do a test. The procedure must used as a periodic maintenance inspection check.

NOTE: For TCAS units not included in this manual, refer to the installation section of the associated maintenance manual for correct inspection procedures.

Table 2004. Inspection/Check Procedure

Equipment	Inspection/Check Procedure
TPA-100A TCAS Processor	(1) Examine for some sign of damage. (2) Check that unit is correctly installed and retaining mechanism and connectors are correctly tightened.
Directional Antenna	(1) Examine for some sign of damage. (2) Check that antenna has been correctly installed and all mounting screws are tightened. (3) Make sure that the four coaxial connectors are all correctly connected to antenna.
TA/VSI, RA/VSI, PPI, and/or Dedicated Display	(1) Examine for some sign of damage. (2) Examine the face of the unit for cracks or scratches. (3) Make sure that the unit attaches correctly against the instrument panel when the locking clamps are engaged. (4) Make sure that connector assemblies are correctly connected to the aft of the unit.
OMNI Antenna	(1) Examine antenna for some sign of damage. (2) Check that antenna has been correctly installed and all mounting screws are tightened. (3) Make sure that rf connector is correctly tightened.

B. System Checkout

(1) General

The installation of the CAS-100 system requires three steps of test to make sure of the correct operation of the CAS-100 system components. Before installation of the TCAS processor and display units, a system interwiring check is done. This check makes sure that the aircraft and all TCAS system intra-connections are correct, before the power is applied. After the units are installed, a visual inspection of the equipment and the connections is made. The postinstallation test is to apply the power and the function examination of the system. Correct end of the post-installation test verifies the correct operation of the CAS-100 Collision Avoidance System.

(2) System Interwiring Check

To check the aircraft and transponder system inter-connections, continue as follows:

(a) Check that all cables and wiring are installed to the Interwiring and Cable Fabrication instructions (paragraph 5.C.).

(b) Check that the following functions are correctly strapped to reflect the aircraft system configuration (paragraph 5.D.).

1 Cable Delay Program.

2 Aircraft Altitude Limit Program.

3 Type of Analog Radio Altimeter Select.

4 TA/RA Display Symbol Maximum Program.

5 Ground Display Mode.

6 Display All/Threat Traffic Program.

7 Functional Test Inhibit.

8 Audio Tone Enable Program.

9 Audio Level Program.

10 Transponder Interface Select.

11 Radio Altimeter Interface Select.

12 RA Status Inhibit.

13 On Ground Intruder Disable.

14 Configuration Straps.

15 Rate Source Select Strap.

(c) Using the interconnect diagrams (Figure 2015), check wiring for correct locations, opens, and shorts.

(d) Examine all rf cables for indication of incorrect crimps and connectors not tightened. Also, the rf connectors on the ARINC 600 trays are spring loaded and must move back smoothly when pushed and released, to make a positive connection with the TCAS processor.

(e) Check rf cables for insertion loss and Voltage Standing Wave Radio (VSWR).

(3) Visual Inspection

With the system installation, do the visual inspection/check procedure (Table 2004).

(4) Postinstallation Test Using Self-Test Function

This test makes sure the correct operation of the CAS-100 Collision Avoidance System that uses the self-test function. This procedure is used after the system units have been initially installed and as an operational check. This procedure has a pretest setup, self-test, and manual test. The following tests are done on the ground. The Mode S transponder system post-installation test is contained in the related Mode S transponder maintenance manual.

(a) Pretest Setup

The following steps apply/check the CAS-100 system input power, set the serviceable controls, and make sure that the system is prepared for test.

1 Do the Mode S transponder system post-installation test.

2 Make sure that aircraft 115 V 400 Hz or 28 V dc and 26 V ac power sources are serviceable; for example, check power bus meter.

3 Check that aircraft 5 V ac or dc or 28 V dc panel background lighting power source and dimmer control are serviceable by adjusting the cockpit dimmer switch for correct cockpit panel background illumination.

4 Select transponder No. 1 and put transponder No. 1 and No. 2 in STANDBY mode as follows:

a If CTA-81A Control Unit is used, set ATC 1/2 switch to ATC 1 position (sets Mode S transponder No. 1) and turn function selector switch to STBY.

b If CTA-81B Control Unit is used, turn function selector switch to ATC1 STBY.

c If KFS-578A Control Unit is used, push 1/2 pushbutton, if necessary, until transponder No. 1 is shown in the LCD display and turn function select switch to STBY.

5 Operate applicable aircraft circuit breakers to apply the power to TCAS processor, traffic and resolution advisory displays, Mode S transponder subsystem, and all other aircraft equipment connected to the TCAS processor and Mode S transponder subsystem. Check that circuit breakers stay closed.

6 Let enough time for the equipment warm-up. The equipment in the TCAS system requires one minute for the equipment warm-up. The external sensors can necessary more than one minute warm-up time

(b) Manual Test

1 On the traffic display screen, TCAS STBY mode annunciation must be visible.

2 Check that the brightness of the traffic display can be controlled by the applicable control. Intensity of the traffic display on the TA/VSI is controlled by the aircraft dimmer switch. Intensity of the traffic display on the PPI or dedicated display is controlled by the BRT control on the display control panel.

3 On the transponder/TCAS control unit, the ATC FAIL lamp must extinguished.

4 On transponder/TCAS control unit, turn the function selector switch to TA position. The following conditions must be:

a Traffic display shows TA ONLY.

b RA OFF flag is present on RA/VSI.

c Transponder/TCAS control panel ATC FAIL lamp is extinguished.

d TA/VSI and RA/VSI red and green eyebrows are extinguished.

e No fault or fail annunciations are present on the traffic display.

f TA/VSI and RA/VSI vertical speed needle shows 0 vertical speed.

g The traffic can be shown on the traffic display is necessary for TCAS processor strapping configuration and if traffic is in the area:

- Nonthreat Traffic, shown as an open white diamond.
- Proximity Intruder traffic, shown as a filled white diamond.
- Traffic Advisory (TA) traffic, shown as a filled yellow circle.

NOTE: Other than for the TEST mode, Resolution Advisory (RA) traffic is never shown while the aircraft is on the ground. The RA symbol is a solid red square.

5 If CTA-81A Control Unit is used, select the Mode S transponder No. 2 by setting ATC 1/2 switch to ATC 2 position. If KFS-578A Control Unit is used push 1/2 pushbutton until transponder No. 2 is shown in the LCD display. Note that the same conditions as given in paragraph 4 above exist.

6 At transponder/TCAS control unit set ABOVE/NORM/BELOW switch as follows:

a Set the ABOVE-NORM-BELOW switch on transponder/TCAS control unit to ABOVE. On the traffic display screen, ABOVE must be shown.

b Set the switch to BELOW. The traffic display screen must show BELOW as an alternative the ABOVE annunciation.

c Set the switch to NORM. The traffic display screen area that shown ABOVE and BELOW must be clear.

7 On the transponder/TCAS control unit, turn the function selector switch to the TA/RA position.

(c) Self-Test

On the transponder/TCAS control unit, start the TCAS system functional test by a turn of the spring-loaded function selector switch to the TEST (TST on KFS-578A) position for one second and then release the switch. Refer to paragraph 2.B. in the TESTING AND FAULT ISOLATION section of this manual for a description of the functional test sequence.

(5) Ramp Test (Optional)

This optional test requires the use of a TCAS Ramp Tester and other equipment. In the systems with two transponders, change the system to check each function. Use the ATC 1/2 switch to select transponders. Using the TCAS Ramp Tester, exercise the TCAS with the different intruder aircraft scenarios. Monitor the displays and aural messages to make sure that system response is correct.

CAUTION: INSTRUMENT FLIGHT RULES TCAS RAMP TEST EQUIPMENT SHOULD BE CALIBRATED TO COMPENSATE FOR DISTANCE FROM THE AIRCRAFT PER MANUFACTURING INSTRUCTIONS.

The following ramp test uses specific test equipment. If a different ramp tester is used, see applicable operator manual for specified instructions to operate the ramp tester.

(a) Test Equipment Required:

- Pitot-Static Test Set
- Radio Altimeter Ramp Test Set
- IFR TCAS-201 Ramp Test Set (or suitable replacement)

(b) On the Transponder/TCAS Control Unit the ATC FAIL lamp must be extinguished.

(c) On both TA/VSIs all red and green circumference arcs must be extinguished and all flags must be out of view.

(d) On the Transponder/TCAS Control Unit, put the Transponder select switch to the ATC 1 position, and the function selector knob to the STBY position. Set an applicable ATC Transponder code for the local area. Set the Above/Normal/Below switch to the NORMAL position and set a range of 5 nautical miles.

(e) On the Transponder/TCAS Control Unit, turn and hold the spring loaded function selector knob counterclockwise to the TEST position for approximately one second.

(f) Make sure that on both TA/VSIs the red and green circumference arcs come on to show a red arc from +2000 FPM to +6000 FPM, a green arc from 0 FPM to +300 FPM, and a red arc from -6000 FPM to 0 FPM. Make sure the word TEST is shown in the lower left corner of the display.

(g) On each TA/VSI indicator make sure of the following:

- Resolution Advisory (red square) comes into view at 3 o'clock, a range of 2 miles, and 1000 feet below flight level.
- Traffic Advisory (yellow circle) comes into view at 9 o'clock, a range of 2 miles, and 200 feet below and climbing.
- Proximity traffic (solid white diamond) comes into view at 1 o'clock, a range 3.6 miles, and 200 feet above and descending.
- Nonthreat traffic (open white diamond) comes into view at 11 o'clock, a range of 3.6 miles, and a flight level of 1000 feet above.

(h) At the end of the test, make sure of the synthesized voice announcement TCAS SYSTEM TEST OK.

(i) On the Transponder/TCAS Control Unit, turn the function selector knob clockwise to theTA/TA position.

(j) Radio Altimeter Tests

1 Pull the No. 1 and No. 2 Radio Altimeter circuit breakers.

2 Make sure that the amber TCAS flag is in the view on both TA/VSIs.

3 Reset the No. 1 Radio Altimeter circuit breakers.

4 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

5 Pull the No. 1 circuit breaker again

6 Make sure the amber TCAS flag is in the view on both TA/VSIs.

7 Reset the No. 2 Radio Altimeter circuit breaker

8 Make sure the amber TCAS flag is extinguished on both TA/VSIs

9 Reset the No. 1 circuit breaker.

10 Pull the 2 amp No. 1 ATC XPDR circuit breaker.

11 Make sure that the amber TCAS flag is in the view on both TA/VSIs. If the radar indicator is for display of traffic, make sure the fault message No. 1 XPDR DATA BUS and No. 1 XPDR ALT DATA comes into view on the display.

12 Reset the No. 1 ATC XPDR circuit breaker.

13 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

14 On the Transponder/TCAS Control Unit, put the transponder select switch to the ATC-2 position.

15 Pull the 2 amp ATC-2 circuit breaker.

16 Make sure that the amber TCAS flag is in the view on both TA/VSIs. If the radar indicator is for display of traffic, make sure the fault message No. 2 XPDR DATA BUS and No. 2 XPDR ALT DATA comes into view on the display.

17 Reset the ATC-2 circuit breaker.

18 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

19 Pull the 5 amp TCAS circuit breaker.

20 Make sure the amber TCAS flag is in the view on both TA/VSIs.

21 Reset the TCAS circuit breaker.

22 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

23 Connect the Pitot-Static Test Set to the No. 1 Air Data Systems. Apply static pressure to the aircraft to get a pressure altitude of 1,000 feet.

(k) Gillham Altitude Tests

This test is for TCAS systems that uses Gillham code as source for the altitude data to XPDR No. 1 and XPDR No. 2. Note that the altitude comparison monitor discrete to the TCAS must be set to logic 1 for this type of installation. If the altitude between air data source 1 and 2 is different by more than 500 feet, the altitude miscompare bit gets set. This forces transponder No. 1 to send NCD altitude data to TCAS which sets TCAS invalid flag to come into view in amber on IVSI.

Make sure that the amber TCAS flag is in the view on both TA/VSIs.

1 Decrease the aircraft static pressure to field elevation.

2 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

3 On the TCAS/Mode S Control Unit select ATC-2 .

4 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

5 Apply static pressure to No. 1 probes on the aircraft to get a pressure altitude of 1,000 feet.

6 Make sure that the amber TCAS flag is in the view on both TA/VSIs.

7 Decrease the aircraft static pressure to field elevation.

8 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

9 Connect the Pitot-Static Test Set to the No. 2 Air Data Systems. Apply static pressure to the aircraft to get a pressure altitude of 1,000 feet.

10 Make sure that the amber TCAS flag is in the view on both TA/VSIs.

11 Decrease the aircraft static pressure to field elevation.

12 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

13 On the TCAS/Mode S Control Unit select ATC-1.

14 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

15 Apply static pressure to the aircraft to get a pressure altitude of 1,000 feet.

16 Make sure that the amber TCAS flag is in the view on both TA/VSIs.

17 Decrease the aircraft static pressure to field elevation.

18 Make sure that the amber TCAS flag is extinguished on both TA/VSIs.

(l) Traffic Alert and Resolution Advisory Testing

1 Simulate an airborne condition to the TCAS processor by overriding the aircraft landing gear system. Connect the Pitot-Static Test Set to the No. 1 and No. 2 Air Data Systems. Apply static pressure to the aircraft to get a pressure altitude of 5,000 feet.

2 To use a Radio Altimeter Test Set (or applicable replacement) apply a signal to the No. 1 Radio Altimeter to simulate a radio altitude more than 2,500 feet.

3 On the Transponder/TCAS Control Unit, put the transponder select switch to the ATC-1 position and turn the function selector knob clockwise to the TA/RA position. Set the 10 nautical mile range for each TA/VSIs. Make sure the range and a blank message in the TCAS mode display in each TA/VSI.

4 Elevate the TCAS Ramp Test Set antenna above the aircraft and turn the top TCAS directional antenna at a relative bearing of zero degrees.

5 To use the TCAS Ramp Test Set, make scenario 1 to simulate an approaching Mode C transponder equipped aircraft beginning at 10 nautical miles, at an altitude of 5,100 feet, at a closure rate of +450 knots, and an altitude rate of 0 feet per minute.

6 Operate the scenario.

7 Make sure on the TA/VSIs, that the simulated intruder aircraft is shown as an open white diamond (nonthreat traffic) with a relative altitude tag of +01 and approaching the own aircraft symbol at a relative bearing of approximately zero degrees.

8 Make sure on the TA/VSIs, that the simulated intruder aircraft is shown as a filled white diamond (proximity intruder traffic) at approximately 6 nautical miles from the own aircraft symbol.

9 Make sure on the TA/VSIs, that the simulated intruder aircraft is shown as a filled yellow circle (traffic advisory) at approximately 4 nautical miles and also make sure the synthesized voice announcement is TRAFFIC, TRAFFIC.

10 Make sure on the TA/VSIs, that the simulated intruder aircraft is shown as a solid red square (resolution advisory) at approximately 2 nautical miles. Make sure that the red and green circumference arcs on both TA/VSIs come on to show a descend resolution advisory command of 1,500 feet for each minute and make sure the synthesized voice announcement is DESCEND, DESCEND.

11 After the descend resolution advisory occurs and there is no response to the resolution advisory from own aircraft, verify, while the simulated intruder aircraft is still approaching own aircraft, that the red and green circumference arcs on both TA/VSIs change illumination to indicate a descend resolution advisory command of -2,500 feet per minute. Make sure the synthesized voice announcement is INCREASE DESCENT, INCREASE DESCENT.

12 Remove the Radio Altimeter Test Set (or applicable replacement) from the No. 1 Radio Altimeter and reconnect to the No. 2 Radio Altimeter. Apply a signal to the No. 2 Radio Altimeter to simulate a radio altitude more than 2,500 feet.

13 Make sure each TA/VSI TCAS mode display returns to the TA/RA mode.

14 Using the TCAS Ramp Test Set, create scenario 2 to simulate an approaching Mode C transponder equipped aircraft beginning at 10 nautical miles, at an altitude of 4,900 feet, at a closure rate of +450 knots and an altitude rate of 0 feet per minute.

15 Verify aircraft flaps are set to zero degrees and then run the scenario.

16 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as an open white diamond (nonthreat traffic) with a relative altitude tag of -01 and approaching the own aircraft symbol at a relative bearing of approximately zero degrees.

17 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as a filled white diamond (proximity intruder traffic) at approximately 6 nautical miles from the own aircraft symbol.

18 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as a filled yellow circle (traffic advisory) at approximately 4 nautical miles and also verify the synthesized voice announcement TRAFFIC, TRAFFIC.

19 Verify on the TA/VSIs that the simulated intruder aircraft is shown as a solid red square (resolution advisory) at approximately 2 nautical miles. Verify that the red and green circumference arcs on both TA/VSIs illuminate to indicate a climb resolution advisory command of 1,500 feet per minute and verify the synthesized voice announcement CLIMB, CLIMB.

20 After the climb resolution advisory occurs and there is no response to the advisory from own aircraft, verify while the simulated intruder aircraft is still approaching own aircraft, that the red and green circumference arcs on both TA/VSIs change illumination to indicate a climb resolution advisory command of +2,500 feet per minute. Verify the synthesized voice announcement INCREASE CLIMB, INCREASE CLIMB.

(m) Performance Inhibit Testing

Select the aircraft flaps to Take-off (18 degrees) position then run scenario 2. This test applies to BAE-146 aircraft and evaluate climb inhibit logic functions when flaps are deployed at various settings. Operator should evaluate climb inhibit constraints for their own aircraft types and use this test for reference only.

1 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as an open white diamond (nonthreat traffic) with a relative altitude tag of -01 and approaching the own aircraft symbol at a relative bearing of approximately zero degrees.

2 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as a filled white diamond (proximity intruder traffic) at approximately 6 nautical miles from the own aircraft symbol.

3 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as a filled yellow circle (traffic advisory) at approximately 4 nautical miles and also verify the synthesized voice announcement TRAFFIC, TRAFFIC.

4 Verify on the TA/VSIs that the simulated intruder aircraft is shown as a solid red square (resolution advisory) at approximately 2 nautical miles. Verify that the red and green circumference arcs on both TA/VSIs illuminate to indicate a climb

resolution advisory command of 1,500 feet per minute and verify the synthesized voice announcement CLIMB, CLIMB.

5 Verify no INCREASE CLIMB, INCREASE CLIMB is generated by TCAS.

6 Repeat scenario 2 for Approach flap (24 degrees) position and Landing flap (30 degree) position and verify no INCREASE CLIMB, INCREASE CLIMB is generated by TCAS.

7 Set the aircraft flaps to any setting greater than 30 degree position then run scenario 2.

8 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as an open white diamond (nonthreat traffic) with a relative altitude tag of -01 and approaching the own aircraft symbol at a relative bearing of approximately zero degrees.

9 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as a filled white diamond (proximity intruder traffic) at approximately 6 nautical miles from the own aircraft symbol.

10 Verify, on the TA/VSIs, that the simulated intruder aircraft is shown as a filled yellow circle (traffic advisory) at approximately 5 nautical miles and also verify the synthesized voice announcement TRAFFIC, TRAFFIC.

11 Verify no CLIMB, CLIMB or INCREASE CLIMB, INCREASE CLIMB is generated by TCAS.

12 Return aircraft flaps to the up (0 degree) position.

(n) Flight Level Mode Testing

The following test is applicable on those control panels incorporating this function.

Select and hold the inner right concentric push button switch and verify FLIGHT LEVEL (FL_XX_) on both TA/VSIs (Flight Level shown is based on altimeter barometric setting to 29.92 in. Hg and will show own aircraft altitude above 18,000 feet). Verify aircraft intruder's altitude tag changes from –01 to 049 and that FL049 appears on the traffic displays. Also, verify that after approximately 15 seconds the simulated aircraft intruder's altitude changes back from 049 to –01 and that FL049 extinguishes from the display.

(o) Audio Inhibit Testing

On the Transponder/TCAS Control Panel, turn function selector knob counter-clockwise to the TST position and simultaneously operate the GPWS self test. Verify that while the TCAS visual test annunciation is present and the GPWS aural annunciation is present, the TCAS audio is inhibited.

1 Connect Flight Data Recorder test equipment to the FDR in accordance with the current maintenance manual procedure.

2 Using the appropriate maintenance manual procedure, push and hold the FDEP EVENT switch, for 1 second minimum, in the cockpit and verify on the FDR test set the Bit 1 lamp illuminates.

3 Release the FDEP EVENT switch and make sure on the FDR test set the Bit 1 lamp extinguishes.

4 Run scenario 2. During the Resolution Advisory, verify on the FDR test set the Bit 1 lamp illuminates.

5 On the Transponder/TCAS Control Unit, put the transponder select switch to ATC 2 position.

6 Using the TCAS Ramp Test Set, create scenario 3 to simulate a Mode C transponder equipped aircraft beginning at 5 nautical miles, at an altitude of 7,500 feet, at a closure rate of 0 knots and an altitude rate of 0 feet per minute.

(p) Antenna Bearing Reasonableness, Intruder Altitude Tag Testing

Locate the aircraft over a ground reference point that supports 360 degrees of compass heading, such as a compass rose, for the following TCAS bearing accuracy checks. For each of the relative bearing ground references listed in the following tables, elevate the TCAS Ramp Test Set antenna above the aircraft, facing the top TCAS directional antenna and aligned with each heading in Table 2005. On the TCAS Ramp Test Set, run scenario 3 and evaluate the position and track of the simulated aircraft intruder on the Traffic Display. A permissible relative bearing error of plus or minus 15 degrees forward of own aircraft's wings and greater error aft of own aircraft wings is acceptable.

Table 2005. Upper TCAS Antenna Bearing Accuracy Chart

Ground Reference	Relative Bearing	Error
0 Degrees		
30 Degrees		
60 Degrees		
90 Degrees		
120 Degrees		
150 Degrees		
180 Degrees		
210 Degrees		
240 Degrees		
270 Degrees		
300 Degrees		
330 Degrees		

1 Verify the aircraft landing gear remains in a position to simulate a gear up condition to the TCAS Processor.

2 Using the TCAS Ramp Test Set, create scenario 4 to simulate a Mode C transponder equipped aircraft beginning at 5 nautical miles, at an altitude of 2,500 feet, at a closure rate of 0 knots and an altitude rate of 0 feet per minute.

3 Position the TCAS Ramp Test Set antenna below the aircraft, facing the bottom TCAS directional antenna and aligned with each bearing point in Table 2006. On the TCAS Ramp Test Set, run scenario 4 and evaluate the position and track of the simulated aircraft intruder on the Traffic Display. A permissible relative bearing error of plus or minus 15 degrees forward of own aircraft's wings and greater error aft of own aircraft's wings is acceptable.

Table 2006. Lower TCAS Antenna Bearing Accuracy Chart

Ground Reference	Relative Bearing	Error
0 Degrees		
30 Degrees		
60 Degrees		
90 Degrees		
120 Degrees		
150 Degrees		
180 Degrees		
210 Degrees		
240 Degrees		
270 Degrees		
300 Degrees		
330 Degrees		

4 Reduce the pitot-static test set to field elevation and disconnect from the aircraft.

5 Reduce the Radio Altimeter test set to zero feet and disconnect from the aircraft.

6 Remove the Flight Data Recorder Test set from the FDR.

7 Return all circuit breakers and switches to their normally operating position.

8 Perform any additional test deemed necessary by the Administrator.

(q) Above/Normal/Below Test

Using the TCAS Ramp Test Set, create scenario 1 to simulate an approaching Mode C transponder equipped aircraft beginning at 10 nautical miles, an altitude of 12,000 feet, a closure rate of +450 knots, a 0 degree bearing, and an altitude rate of 0 feet per minute.

1 Set RA No. 1 to 2500 feet and pressure altitude of No. 1 and No. 2 air data systems to 5000 feet.

2 Set Above/Normal/Below switch to ABOVE.

3 Observe target intruder appear as proximate traffic in 12 o'clock position on TA/VSI +7000 ft.

4 Change the pressure altitude of No. 1 and No. 2 air data system to 10,000 feet. Using the TCAS Ramp test set, create scenario 2 to simulate approaching Mode C transponder equipped aircraft beginning at 10 nautical miles, an altitude of 3000 feet, a closure rate of +450 knots, a 0 degree bearing, and an altitude rate of 0 feet per minute.

5 Set Above/Normal/Below switch to BELOW.

6 Observe target intruder appear as proximate traffic in 12 o'clock position on TA/VSI – 7000 ft.

7 Set Above /Normal/Below switch to NORMAL and observe intruder disappear from display.

8 Change pressure altitude of No. 1 and No. 2 air data systems to 3000 feet and repeat scenario 2 in test 100. Observe intruder on display as proximate traffic in 12 o'clock position, 0 feet.

(r) Power and Frequency Test

The following test measures Peak Pulse Power or Effective Radiated Power (ERP) and Frequency of TCAS interrogator using IFR-201 tester. The UUT distance and antenna information established in the setup menu screen determine the attenuation critical to obtain accurate power measurements, for example, at 500 ft = 0 db attenuation. Refer to setup No. 1 Menu screen.

1 Set the following in Setup No. 1 Menu screen:

- Intruder type: Mode S Squitters: On
- UUT Distance: Horizontal = 150 ft. Vertical = 16 ft.
- ALT Reporting : ON
- Store: 0 Recall: 0
- Gain_1030 = 9.3 db (refers to gain of antenna used with TCAS – 201 Test Set which is typically between 0 – 20.9 db.)
- Loss = 1.0 db (refers to cable loss between test antenna and test set. Nominal values are provided above.)

To average out ramp multipath component in the Power and Frequency function, place the Ramp Tester at a horizontal distance < 12 times the vertical distance (distance between test set antenna and UUT antenna). If condition is not met, Test set displays ** Bad/Horiz/Vert** in fourth line of setup menu No. 1 screen.

2 Push PWR TEST key to go into the Power and Frequency screen. Turn Flat Antenna from the test set to the UUT antenna on the aircraft.

3 Push RUN/STOP key or Antenna Push Button Switch to start Power and Frequency function.

4 Record the results, for example:

** Power and Frequency **

ERP	Freq
Current: 49.4 dbm	1030.00 mhz
Average: 50.2 dbm	1030.00 mhz
Interrs: 1.0	

(6) Antenna Test

Some of the antenna BITE tests are only performed when the aircraft is airborne. To start these tests, exercise the Air/Ground Strut switch or the Landing Gear Retracted/Extended switch in a way to make TCAS think that own aircraft is airborne. Allow the equipment to operate for approximately 20 minutes. This will let the BITE circuits record results of antenna tests in Flight Fault Memory.

(7) ARINC 429 Installation Checkout Data Words

The TCAS Processor sends Installation Checkout ARINC 429 data words (Labels 360, 361, 362, 363, 364, and 365) to the maintenance computer. These words reflect the state of a program pin or input discrete pin. Reviewing the contents of these data words after a TCAS system installation is complete provides a means of checking and debugging the installation. The format of these words is given in TPA-100A TCAS Processor Component Maintenance Manual 012-0739-001.

In Table 2007:

- If the input pin is a program pin and it is tied to the program pin common, the associated bit in Table 2007 will be set to 1, if it is not tied to the program pin it will be set to 0.
- If the input pin is a discrete and has 100,000 ohms or more of resistance from this pin to airframe dc ground, or a voltage between +18.5 and +36 V dc, the associated bit in Table 2007 will be set to 0. If the input pin has a resistance of 10 ohms or less from the pin to aircraft ground, or a voltage of +3.5 V dc, the associated bit will be set to 1.
- All bits not associated with discrete or program pins will be set to 0. ARINC Data Word Label 364 contains Reserved Discretes 01 - 17 and is not listed in Table 2007.

Table 2007. Input Discetes and Program Pin Information

Pin	Name and Type	429 Label	Bit
RBP7A	Airborne Audio Level Program Pin No. 1	270	11
RBP7B	Airborne Audio Level Program Pin No. 2	270	12
RBP7C	Airborne Audio Level Program Pin No. 3	270	13
RBP7F	Display All Traffic/Threat Traffic Program Pin	270	14
RBP8K	TA/RA Display Intruder Limit No. 1 Program Pin	270	15
RBP8J	TA/RA Display Intruder Limit No. 2 Program Pin	270	16
RBP8H	TA/RA Display Intruder Limit No. 4 Program Pin	270	17
RBP8G	TA/RA Display Intruder Limit No. 8 Program Pin	270	18
RBP8F	TA/RA Display Intruder Limit No. 16 Program Pin	270	19
RMP6E	Altitude Limit 2000 Foot Program Pin	270	20
RMP6F	Altitude Limit 4000 Foot Program Pin	270	21
RMP6G	Altitude Limit 8000 Foot Program Pin	270	22
RMP6H	Altitude Limit 16000 Foot Program Pin	270	23
RMP6J	Altitude Limit 32000 Foot Program Pin	270	24
RBP7E	Ground Display Mode Program Pin	270	25
RMP1J	Climb Inhibit No. 1 Discrete	271	11
RMP13G	Climb Inhibit No. 2 Discrete	271	12
RBP5J	Climb Inhibit No. 3 Discrete	271	13
RBP5K	Climb Inhibit No. 4 Discrete	271	14
RBP5E	Increase Climb Inhibit No. 1 Discrete	271	15
RBP5F	Increase Climb Inhibit No. 2 Discrete	271	16
RBP5G	Increase Climb Inhibit No. 3 Discrete	271	17
RBP5H	Increase Climb Inhibit No. 4 Discrete	271	18
RBP7G	Cable Delay Sign Program Pin	271	19
RBP7H	Cable Delay MSB Program Pin	271	20
RBP7J	Cable Delay LSB Program Pin	271	21
RMP6D	Performance Limit Discrete	271	22
RBP8E	Self Test Inhibit Program Pin	271	23
RBP5A	Advisory Inhibit No. 1 Discrete	271	24
RBP5B	Advisory Inhibit No. 2 Discrete	271	25
RBP5C	Advisory Inhibit No. 3 Discrete	271	26
RBP5D	Advisory Inhibit No. 4 Discrete	271	27
RMP3D	Advisory/Annunciator Cancel	271	11
RBP4G	RA Valid Discrete Disable Program Pin	271	12

Table 2007. Input Discretes and Program Pin Information (cont)

Pin	Name and Type	429 Label	Bit
RMP5K	Air/Ground Discrete Input	272	13
RMP13F	Landing Gear Discrete Input	272	14
RMP14C	RA Display No. 1 Status Discrete	272	15
RMP13E	RA Display No. 2 Status Discrete	272	16
RMP7E	TA Display No. 1 Status Discrete	272	17
RMP7J	TA Display No. 2 Status Discrete	272	18
RMP4K	Attitude Valid Discrete	273	11
RBP6A	Data Loader Enable Discrete	273	12
RMP6C	Mag Heading Valid Discrete	273	13
RMP2K	Radio Altitude No. 1 A552/A552A Valid Discrete	273	14
RBP3C	Radio Altitude No. 2 A552/A552A Valid Discrete	273	15
RMP5E	ADS-B (Intruder File Enable) Program Pin	275	11
RMP5F	Reserved GP Bus Enable Program Pin	275	12
RMP5G	Reserved ADS-B Program Pin	275	13
RMP6K	Altitude Limit Program Pin	275	14
RBP7D	Aural Advisory Discrete Program Pin	275	15
RBP8A	On Ground Audio Level No. 1 Program Pin	275	16
RBP8B	On Ground Audio Level No. 2 Program Pin	275	17
RBP8C	On Ground Audio Level No. 3 Program Pin	275	18
RBP6K	Single Radio Altitude Program Pin	275	19
RBP12A	Radio Altimeter Type Straps A Program Pin	275	20
RBP12B	Radio Altimeter Type Straps B Program Pin	275	21
RBP12C	Radio Altimeter Type Straps C Program Pin	275	22
RBP7K	RBP Common Program Pin	275	23
RBP6J	Single Transponder Program Pin	275	24

C. Flight Test

Conduct a flight test of CAS-100 to the specifications of Federal Aviation Administration (FAA) Advisory Circular AC 20-131A, titled *Airworthiness and Operational Approval of TCAS System and Mode S Transponders.*

8. Removal and Replacement

A. TPA-100A TCAS Processor

(1) Removal

(a) Loosen retaining screw clamps, found on the front of the TCAS processor mount that attach the TPA-100A to the mount.

(b) Carefully pull the TPA-100A forward until the unit disconnects from rear connector on the mounting tray and moves out of guide pins on the mount. Remove the unit from the mount.

(2) Reinstall

(a) Move TPA-100A on the mount and carefully push the unit to the rear until guide pins are aligned and the connector is fully engaged.

(b) Engage and tighten retaining screw clamps to attach the unit tightly in position.

B. Directional Antenna

(1) Removal

(a) Remove four coaxial cables from the connectors J1-J4.

(b) Remove four or eight screws that attach the antenna to the airframe. Remove the antenna and the antenna O-ring.

(2) Reinstall

(a) Clean the aircraft antenna assembly surface.

(b) Install new antenna O-ring.

(c) Attach antenna to aircraft with four or eight screws. Apply approved lock-tight sealant to assembly screws.

(d) Connect the four coaxial cables to related connectors J1-J4 on the antenna.

(e) Apply approved sealing silicant around the outer edge of antenna to seal antenna to the aircraft fuselage.

C. TA/VSI and RA/VSI

(1) Removal

(a) Loosen the clamp fasteners on the front of unit.

(b) Pull the unit forward from cockpit panel and disconnect the mating cable connector (and pneumatic tube, if applicable) from aft of the unit.

(2) Reinstall

(a) Reconnect the cable connector (and pneumatic tube, if applicable) to aft of the unit.

(b) Carefully re-insert the unit into the cockpit panel.

(c) Tighten the clamp fasteners on the front of unit.

(d) Do the leakage test of the static line.

(e) Make sure that the unit is tight and check that the rear cable is not twisted or kinked.

D. Dedicated TCAS Traffic Display

(1) Removal

(a) Loosen Dzus fasteners on the front of unit.

(b) Pull the unit forward from the cockpit panel and disconnect the mating cable connector from aft of unit.

(2) Reinstall

(a) Reconnect the cable connector to aft of unit.

(b) Carefully re-insert unit into cockpit panel.

(c) Tighten Dzus fasteners on the front of unit.

(d) Make sure that unit is tight and check that rear cable is not twisted or kinked.

E. TRA-67 ATC Mode S Transponder System Component

(1) Removal and Reinstallation

(a) Refer to TRA-67 ATC Mode S Transponder System Maintenance Manual, I.B. 1167.

F. Omni Antenna

(1) Removal and Reinstallation

(a) Refer to antenna manufacturer documentation.

9. Maintenance Procedures

A. In-Aircraft Adjustments

All alignment and adjustment procedures are done during bench maintenance. When the unit performance shows an adjustment or an alignment is necessary, the technician must remove the unit from the aircraft, then reference must be made to the related Component Maintenance Manual.

B. System Protection

There are no fuses integral to the CAS-100 equipment. The system is protected by the circuit breakers found at the circuit breaker panel in the aircraft.

C. Lubrication

There are no movable parts in the CAS-100. Thus, there is no lubrication necessary.

D. Cleaning

When thought necessary, depending upon the condition to which the equipment is exposed and the intensity of use, periodic cleaning must be done. The exterior of the units must be cleaned with a lint-free cloth moistened with an approved cleaning agent.

NOTE: The cleaning of equipment interiors must be limited to that required when performing overhaul (bench-type) work.

10. Aircraft Maintenance Programs

A. General

The maintenance procedures for TCAS are recorded in FAA Advisory Circular AC 120-55, *Air Carrier Operational Approval and Use of CAS-100*. These procedures include the initial start or return-to service, TCAS-related maintenance records, maintenance training, and other maintenance program responsibilities. Also included in this advisory circular are approaches to get FAA approval to use TCAS in the operations, including airworthiness approval, operational approval, approval procedures, and other serviceable issues.

B. Honeywell TCAS Maintenance Recommendations

The Honeywell CAS-100 system is for ON CONDITION maintenance. Automatic performance monitoring and self-test are continuously performed by the TPA-100A TCAS Processor BITE to find the malfunctions that decrease or prevent TCAS protection to a high degree of confidence. When correctly installed and interfaced with approved aircraft signal sources, it meets or exceeds the FAA System Safety Analyses about the probability of an unmonitored incorrect Resolution Advisory on the order of 1.0 in 100,000 in the route, and 1.0 in 10,000 in the terminal area.

Further approval of satisfactory operation of visual displays and aural annunciations can be determined by periodic operation of the manual self-test function as set by the mode selector switch on the Mode S/TCAS control unit. Refer to paragraph 2.B. in the TESTING AND FAULT ISOLATION section of this manual for a description of the functional test sequence and permitted indications during self-test.

After major aircraft maintenance cycles, additional system operations must be checked with a TCAS Ramp Test Set with which directional antenna accuracy measurements to the standards of FAA Advisory Circular AC 20-131A (or later revisions) can be performed; or in accordance with the Operator's Approved Maintenance Program.

NOTE: Use the drawings in Figure 2006 through Figure 2015 as a maintenance aid. Refer to Table 2008 through Table 2017 for the IVA-81( ) Configuration Matrix.

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NOTES: UNLESS OTHERWISE SPECIFIED,

1. FOR TOP ASSEMBLY DRAWING, SEE 940-0400-001.

2 WEIGHT: 13.0 LBS MAX.

3 FOR POWER CONSUMPTION AND AVAILABLE OPTIONS, SEE TABLE I.

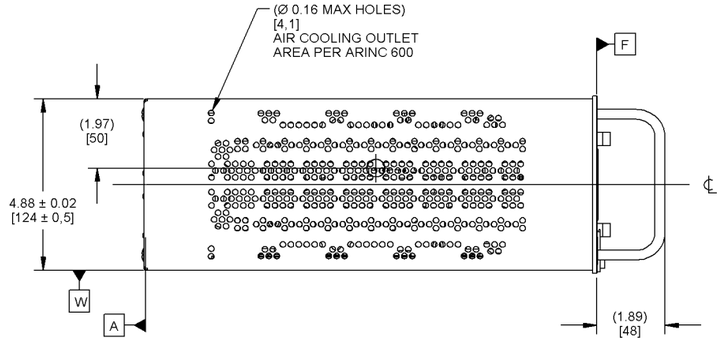
4 BOTTOM SURFACE OF CONNECTOR LOCATOR TAB TO BE FLUSH TO .010 INCHES (0,3MM) BELOW DATUM -B-.

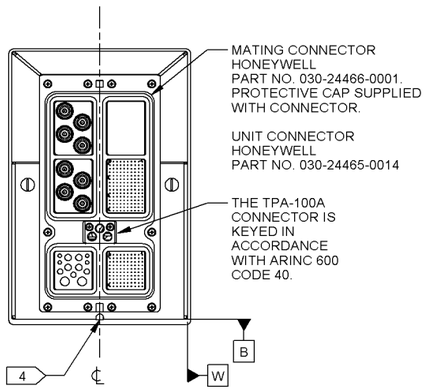
5. FORCED AIR COOLING- BULK AIR SUPPLY CONDITIONS: A) TEMPERATURES LESS THAN 40°C. B) DENSITY RATIO 1. C) PRESSURE DROP THROUGH LRU IS 5±3MM WATER AT FLOW OF 33KG/HR.

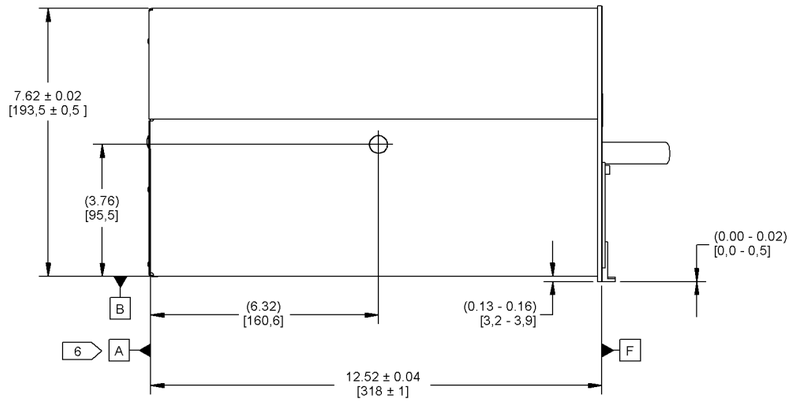
6 DATUM -A- IS ARINC CONNECTOR TAB FACE.

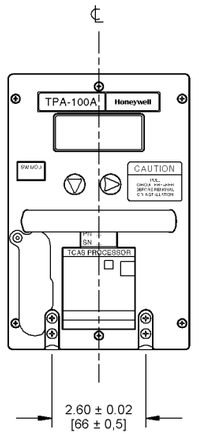
7. CAUTION: THIS ASSEMBLY EITHER CONTAINS OR IS ASSOCIATED WITH ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. HANDLE WITH CARE IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE SERVICE MANUAL.

8. THE SYMBOL ⌖ INDICATES CENTER OF GRAVITY.









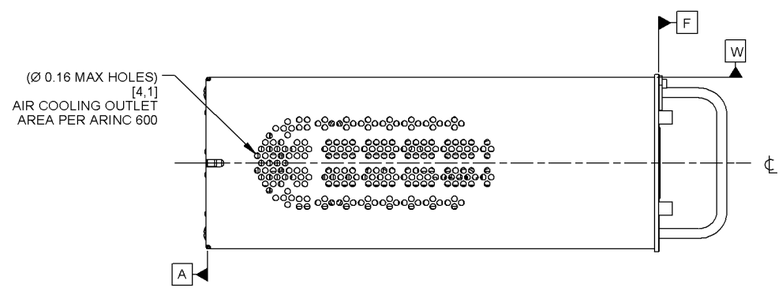


TABLE I 3		
POWER CONSUMPTION TABLE		
PART NUMBER	115 VAC 400 Hz	28Vdc
940-0400-001	60W	60W

ID-130294 E940-0400-201-1-A

4MCU

TPA-100A TCAS Processor Outline Drawing
Figure 2006 (Sheet 1 of 2)

NOTES: UNLESS OTHERWISE SPECIFIED

1. FOR TOP ASSEMBLY DRAWING, SEE 940-0300-001.

2 WEIGHT: 14.0 LBS MAX.

3 FOR POWER CONSUMPTION AND AVAILABLE OPTIONS, SEE TABLE I.

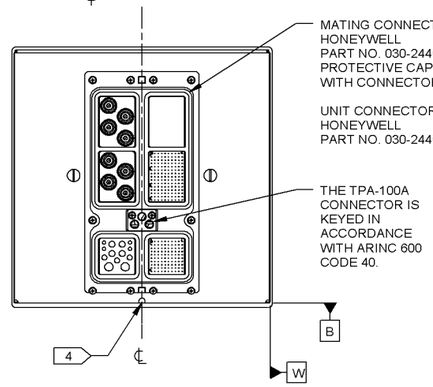
4 BOTTOM SURFACE OF CONNECTOR LOCATOR TAB TO BE FLUSH TO .010 INCHES (0,3MM) BELOW DATUM -B-.

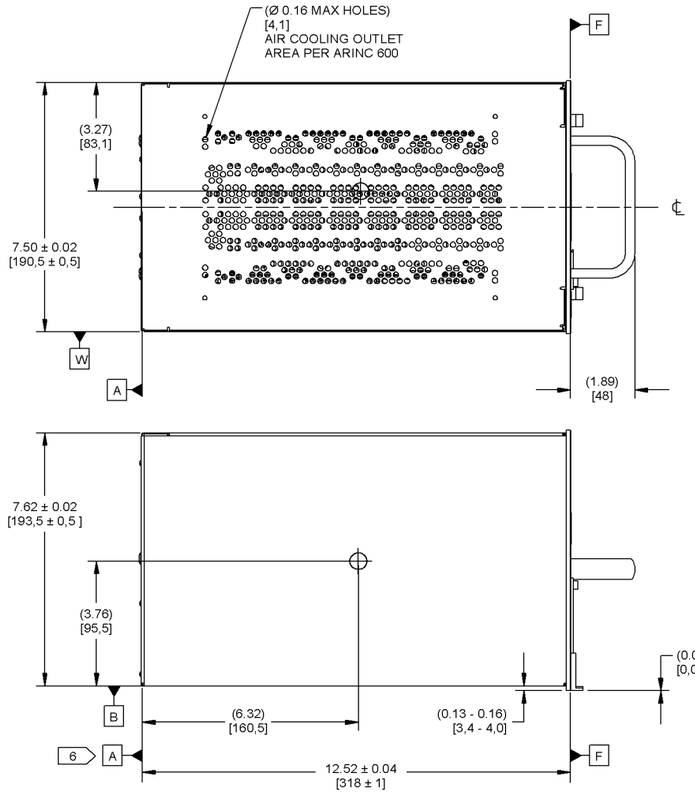
5. FORCED AIR COOLING- BULK AIR SUPPLY CONDITIONS: A) TEMPERATURES LESS THAN 40°C. B) DENSITY RATIO 1. C) PRESSURE DROP THROUGH LRU IS 5±3MM WATER AT FLOW OF 33KG/HR.

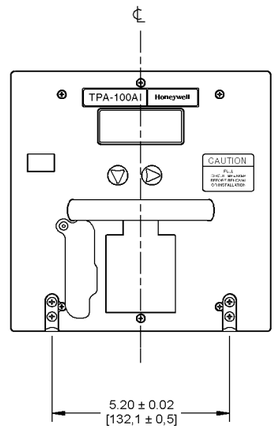
6 DATUM -A- IS ARINC CONNECTOR TAB FACE.

7. CAUTION: THIS ASSEMBLY EITHER CONTAINS OR IS ASSOCIATED WITH ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. HANDLE WITH CARE IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE SERVICE MANUAL.

8. THE SYMBOL ⌖ INDICATES CENTER OF GRAVITY.







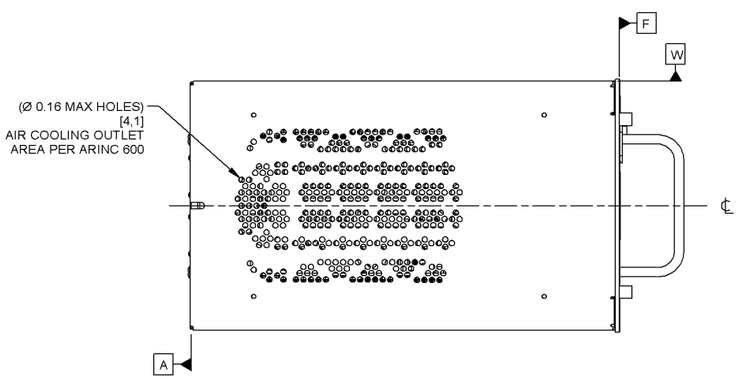


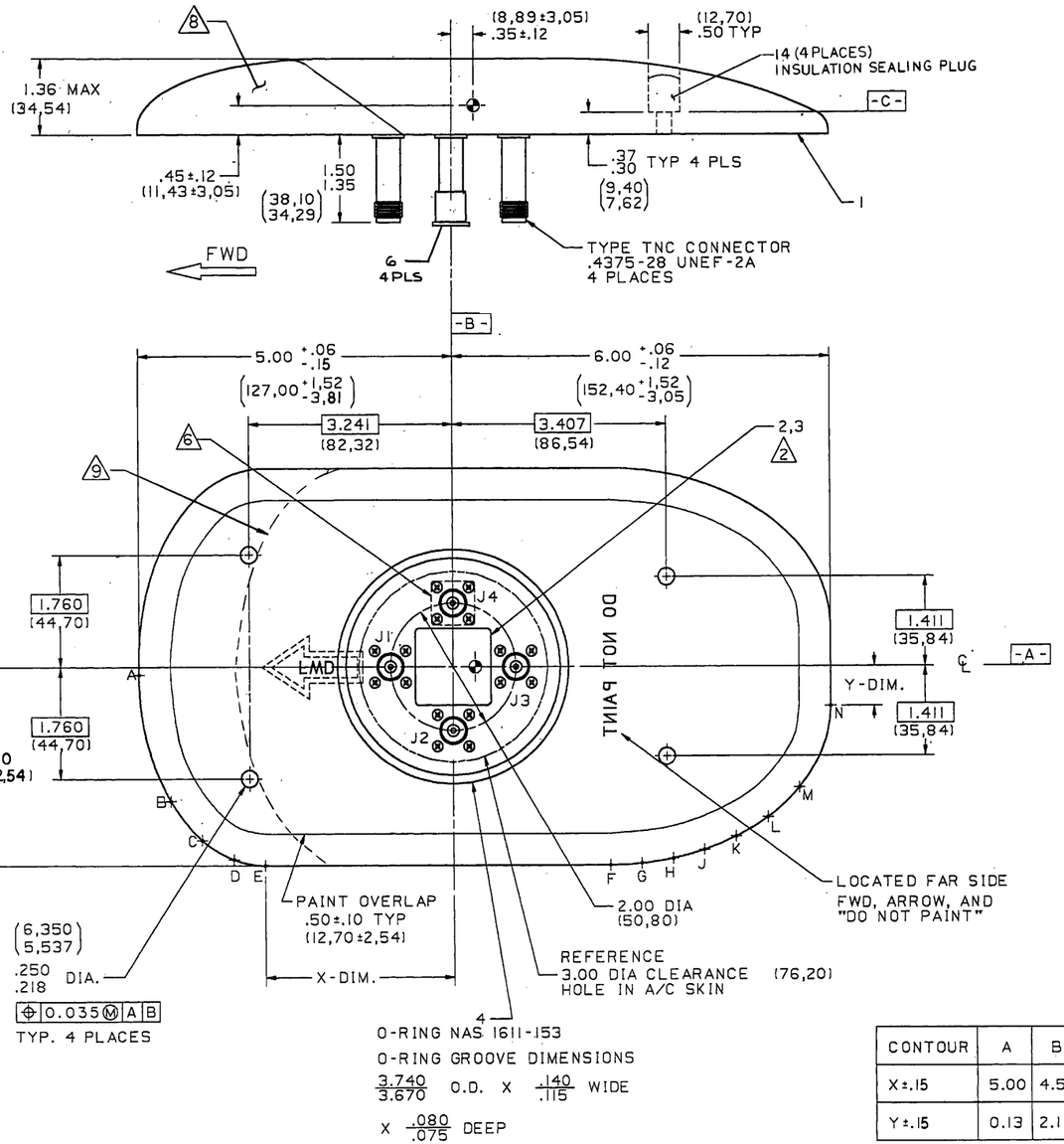
TABLE I 3		
POWER CONSUMPTION TABLE		
PART NUMBER	115 VAC 400 Hz	28Vdc
940-0300-001	60W	60W

ID-127765 E940-0300-201-1-A

6MCU

TPA-100A TCAS Processor Outline Drawing
Figure 2006 (Sheet 2 of 2)

IDENTIFYING NUMBER	MAX WEIGHT LBS	MAX WEIGHT KGS	SHEET	DESCRIPTION
071-50001-8102	2.0	0,9	1	4 HOLE FLAT, WHITE
071-50001-8103	2.0	0,9	2	8 HOLE FLAT, WHITE
071-50001-8104	2.0	0,9	3	8 HOLE, 110 IN RADIUS WHITE WITH TEFLON GASKET
071-50001-8105	2.0	0.9	1	4 HOLE, FLAT GREY PAINT
071-50001-8106	2.0	0.9	1	4 HOLE, FLAT BLUE PAINT
071-50001-8107	2.0	0.9	3	8 HOLE, 146.10 R W/GASKET (A380)



NOTES:

1 - ⊕ DENOTES CENTER OF GRAVITY.

2 - APPROPRIATE DASH NO.,AND SERIAL NO. SHALL BE AFFIXED ON IDENTIFICATION PLATE PRIOR TO SHIPMENT AS FOLLOWS:

HONEYWELL ANTENNAS: IDENT. PLATE (ITEM 2).
SERIAL NUMBERS 1000-4999
SERIAL NUMBERS 20,000-27,999 (DAYTON GRAINGER)
SENSOR ANTENNAS: IDENT. PLATE (ITEM 3).
SERIAL NUMBERS 5000-UP
SERIAL NUMBERS ARE ASSIGNED BY BASE NUMBER.

3 - ANTENNAS TO MEET REQUIREMENTS OF SPECIFICATIONS 004-50013-0001, 0002, 0003.

4 - DIMENSIONS IN PARENTHESES ARE MILLIMETERS.

5 - SURFACE -C- TO BE FREE OF PAINT 4 PLACES.

6 - TYPE TNC CONNECTOR FLANGES EXTERNALLY MOUNTED ON ANTENNAS SUPPLIED BY SENSOR SYSTEMS.

7. WHEN INSTALLING ANTENNA ON A RADIUS SURFACE REFER TO RECOMMENDED INSTALLATION PROCEDURE 004-50119-0001.

8 - RAIN EROSION FILM

9 - RAIN EROSION FILM, FARSIDE

10. FOR MODIFICATION INFORMATION SEE THE IIDS ELECTRONIC MOD SHEET.

TABLE I

CONNECTOR	COLOR CODE
J1	YELLOW
J2	BLACK
J3	BLUE
J4	RED

CONTOUR	A	B	C	D	E	F	G	H	J	K	L	M	N
X±.15	5.00	4.50	4.00	3.50	3.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
Y±.15	0.13	2.11	2.72	3.03	3.12	3.12	3.10	3.02	2.88	2.68	2.38	1.81	0.63

ANT-81A Directional Antenna (Four-Element Array, Curved Base) Outline Drawing
Figure 2007

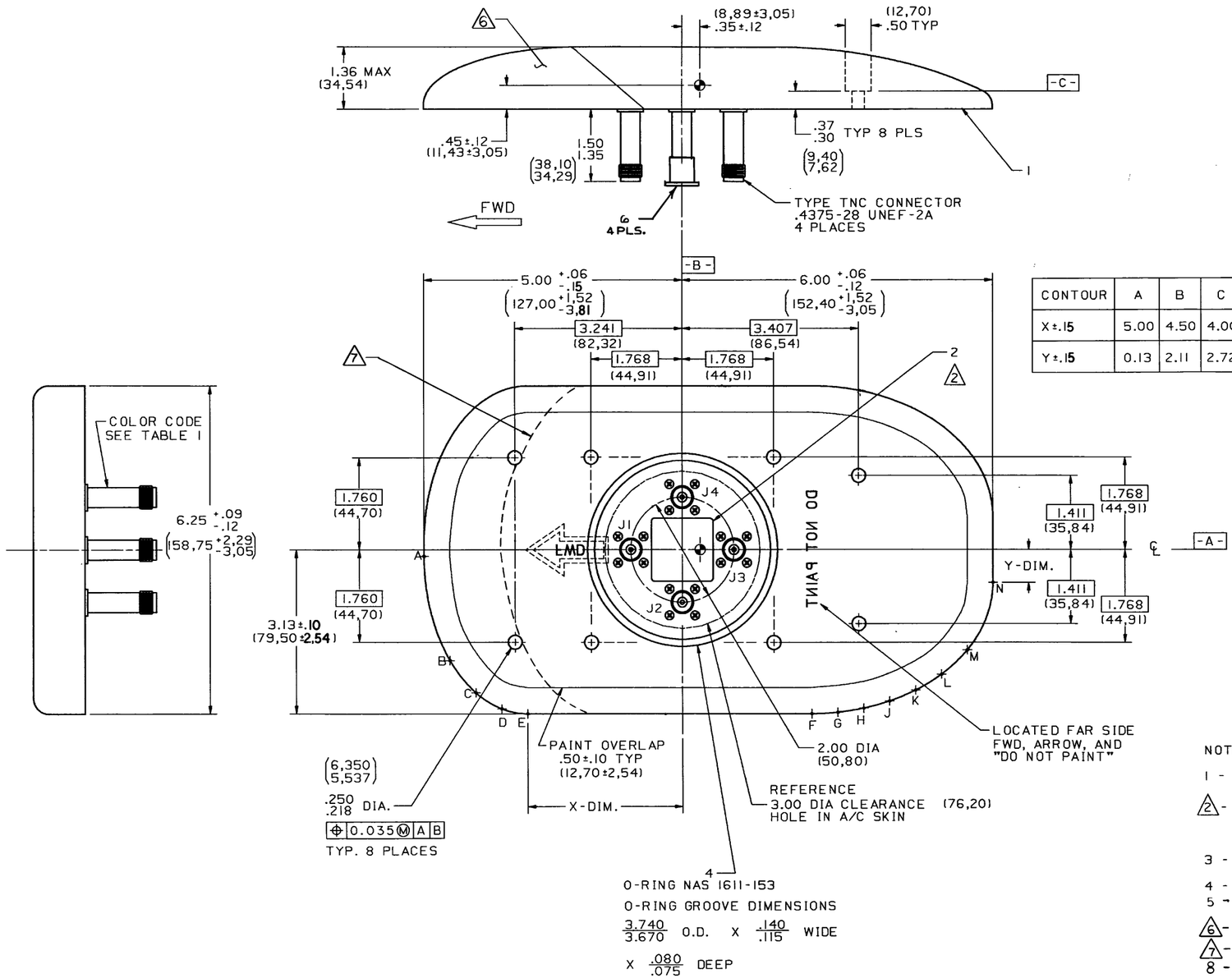


TABLE I

CONNECTOR	COLOR CODE
J1	YELLOW
J2	BLACK
J3	BLUE
J4	RED

CONTOUR	A	B	C	D	E	F	G	H	J	K	L	M	N
X±.15	5.00	4.50	4.00	3.50	3.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
Y±.15	0.13	2.11	2.72	3.03	3.12	3.12	3.10	3.02	2.88	2.68	2.38	1.81	0.63

NOTES:

1 - ⌖ DENOTES CENTER OF GRAVITY.

2 - APPROPRIATE DASH NO. AND SERIAL NO. SHALL BE AFFIXED ON IDENTIFICATION PLATE PRIOR TO SHIPMENT, PER NOTE 2 SHEET 1.

3 - DIMENSIONS IN PARENTHESES ARE MILLIMETERS.

4 - SURFACE -C- TO BE FREE OF PAINT 8 PLACES.

5 - ANTENNAS TO MEET REQUREMENTS OF SPECIFICATIONS 004-50013-0001,-0002,-0003.

6 - RAIN EROSION FILM

7 - RAIN EROSION FILM, FAR SIDE

8 - FOR MODIFICATION INFORMATION SEE THE IIDS ELECTRONIC MOD SHEET.

ID-133103 E071-50001-2-W

ANT-81A Directional Antenna (Four-Element Array, Flat Base, Four Mounting Screws) Outline Drawing
Figure 2008

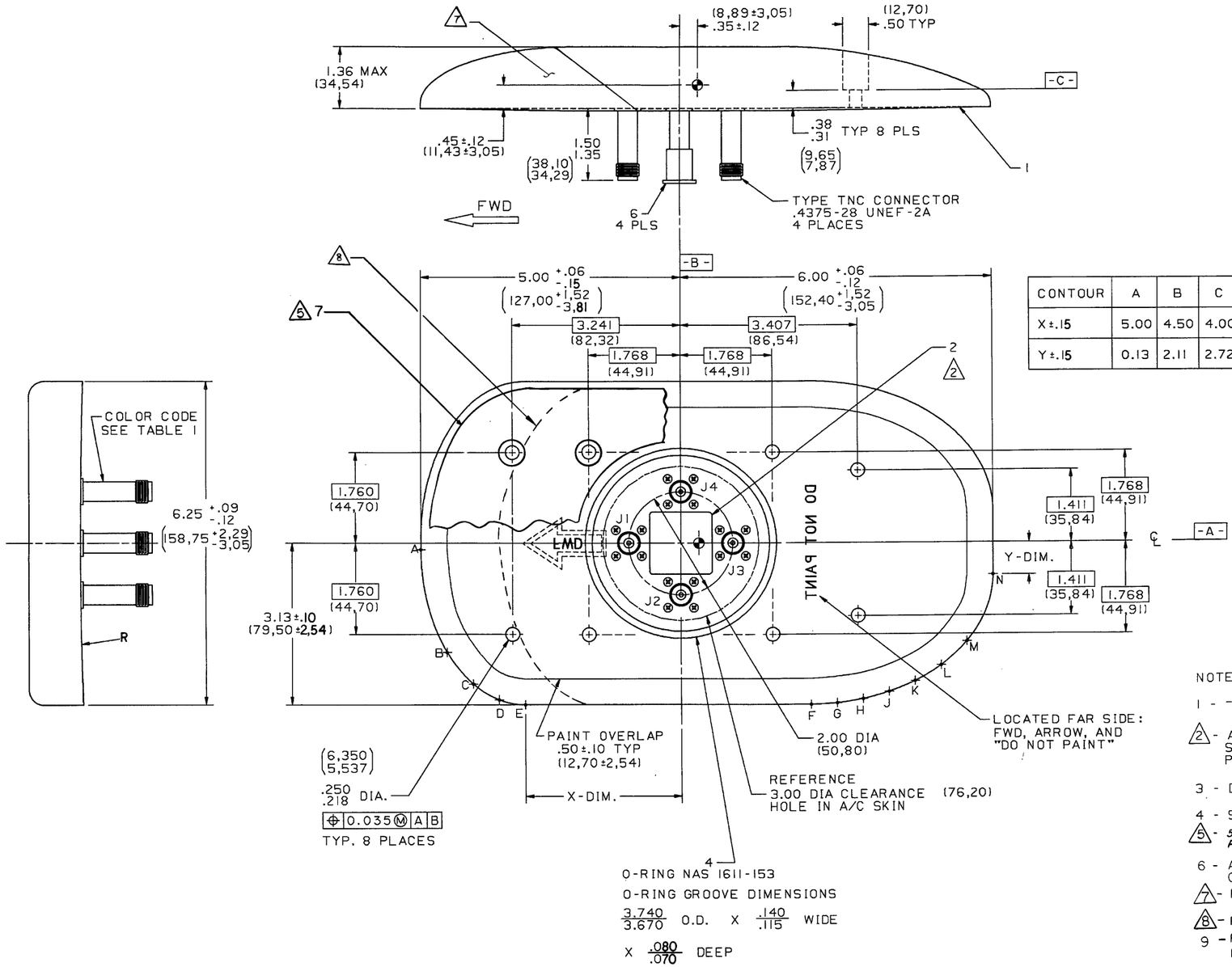


TABLE I

CONNECTOR	COLOR CODE
J1	YELLOW
J2	BLACK
J3	BLUE
J4	RED

CONTOUR	A	B	C	D	E	F	G	H	J	K	L	M	N
X±.15	5.00	4.50	4.00	3.50	3.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00
Y±.15	0.13	2.11	2.72	3.03	3.12	3.12	3.10	3.02	2.88	2.68	2.38	1.81	0.63

NOTES:

1 - ⊕ DENOTES CENTER OF GRAVITY.

2 - APPROPRIATE DASH NO. AND SERIAL NO. SHALL BE AFFIXED ON IDENTIFICATION PLATE PRIOR TO SHIPMENT, PER NOTE 2 SHEET 1.

3 - DIMENSIONS IN PARENTHESES ARE MILLIMETERS.

4 - SURFACE -C- TO BE FREE OF PAINT 8 PLACES.

5 - 5 MIL TEFLON GASKET SUPPLIED UNATTACHED. ASSEMBLE BETWEEN ANTENNA AND AIRCRAFT.

6 - ANTENNAS TO MEET REQUIREMENTS OF SPECIFICATIONS 004-50013-0001,-0002,-0003.

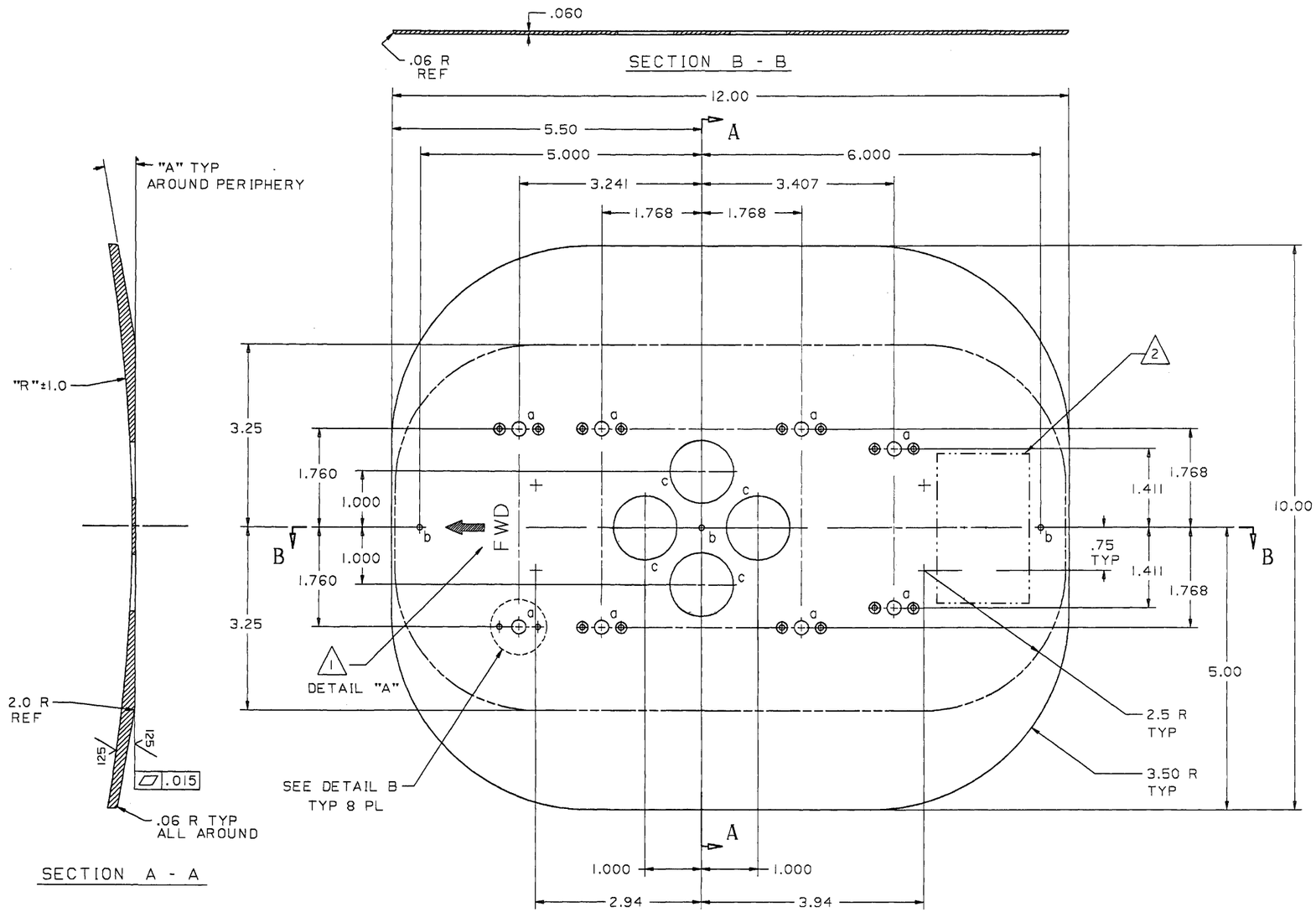
7 - RAIN EROSION FILM.

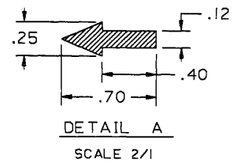
8 - RAIN EROSION FILM, FAR SIDE.

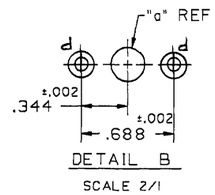
9 - FOR MODIFICATION INFORMATION SEE THE IIDS ELECTRONIC MOD SHEET.

ID-133104 E071-50001-3-W

ANT-81A Directional Antenna (Four-Element Array, Flat Base, Eight Mounting Screws) Outline Drawing
Figure 2009







HOLE DATA:

a - .250±.003 DIA THRU

b - .098 $^{+.003}_{-.001}$ DIA THRU

c - 1.125 DIA THRU

d - .098 $^{+.003}_{-.001}$ DIA THRU
100° C'SINK X .177 DIA

NOTES:

1 - MARK CHARACTERS .25 HIGH FUTURA MEDIUM COLOR BLACK PER FED-STD-595 #37038. APPLY IN ANY PERMANENT AND LEGIBLE MANNER. MARKING TO WITHSTAND TAPE PULL TEST. LOCATE APPROXIMATELY AS SHOWN.

2 - THE FOLLOWING MARKING REQUIREMENTS ARE TO BE LOCATED IN APPROXIMATE AREA SHOWN:

P/N	SAMPLE: 047-50357-0001
TSO	C118, C119a
MFG NAME (HOLDER OF TSO)	HONEYWELL INTERNATIONAL INC.
MFG ADDRESS	OLATHE, KANSAS USA
DATE CODE	1200

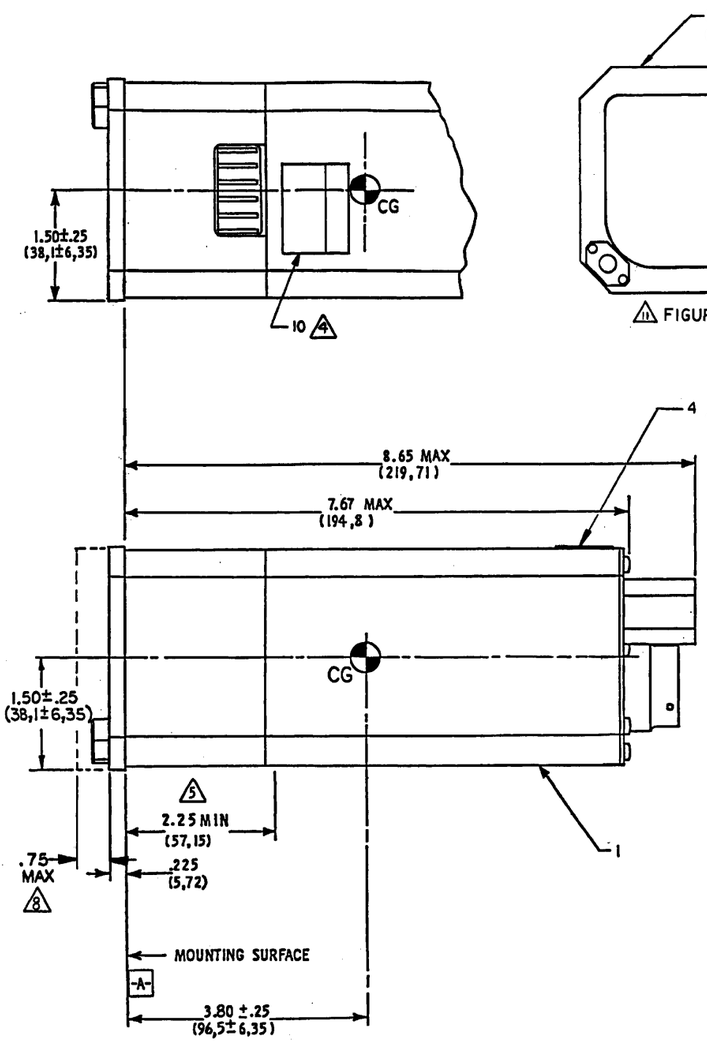
THE MARKING REQUIREMENTS ABOVE HAVE TO BE DONE AT HONEYWELL AND SHOULD BE LEGIBLY MARKED WITH PERMANENT, NON-CORROSIVE INK OR PAINT.

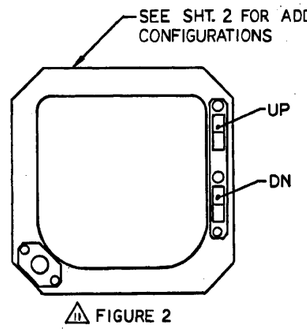
3 - BREAK ALL SHARP EDGES

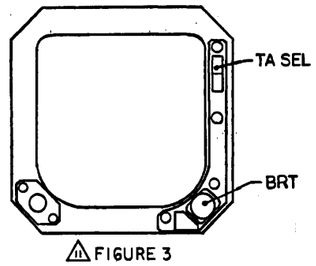
IDENTIFYING NUMBER	RADIUS "R"	ANGLE "A"	HOLE "C"
047-50357-0001	35.0	10.0°	INCLUDE
047-50357-0002	45.0	10.0°	INCLUDE
047-50357-0003	65.0	5.0°	INCLUDE
047-50357-0004	95.0	5.0°	INCLUDE

ID-132433 F047-50357-0000-1-C

ANT-81A Directional Antenna Adapter for 8-Hole, Flat Base Antenna Installation Drawing
Figure 2010

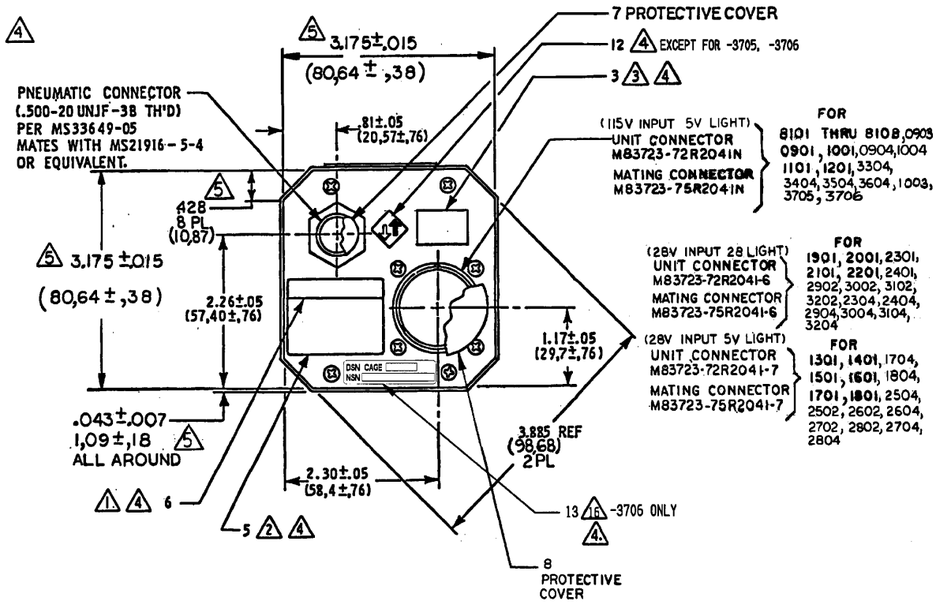






NOTES:
1. APPROPRIATE DASH NUMBER (FROM TABLES) TO BE STAMPED ON ITEM 6 IN AREA PROVIDED.
2. SERIAL NUMBER TO BE STAMPED ON ITEM 5 IN AREA PROVIDED.
3. ADD APPLICABLE SOFTWARE VERSION NUMBER TO LABEL, ITEM 3, (PER TABLE ON MOD SHEET) USING ANY PERMANENT AND LEGIBLE METHOD.
4. CLEAN MOUNTING SURFACE WITH ALCOHOL PRIOR TO ATTACHING LABELS.
5. 3.175,.043&.428 DIMENSIONS APPLY TO ZONE THAT EXTENDS 2.25 FROM DATUM A. OTHER AREAS BEYOND THIS DIMENSION WILL NOT EXCEED MAXIMUM CASE DIMENSIONS
6. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) COMPONENTS.
7. DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.
8. DIMENSION IS FOR MAXIMUM PROTRUSION

NOTES CONTINUED ON SHEET 2



ID-132434 E066-50001-1-V

IVA-81A Traffic Advisory/Vertical Speed Indicator (TA/VSI) Outline Drawing
Figure 2011 (Sheet 1 of 3)

IDENTIFYING NUMBER	COLOR													
066-50001	BLACK 9	GRAY 9	BROWN 10	BLUE 9	RANGE CONT UP + DOWN	TA SELECT BUTTON	DIMMER (POT)	115V PWR	28V PWR	5V LTG BUS	28V LTG BUS	11	BRT KNOB	
-8101	X							X		X		1		
-8102		X						X		X		1		
-8103			X					X		X		1		
-8104				X				X		X				
-8105	X				X			X		X		2		
-8106		X			X			X		X		2		
-8107			X		X			X		X		2		
-8108				X	X			X		X				
-0901, -0904	X					X	X	X		X		3	13	
-1001, -1004		X				X	X	X		X		3	13	
-1101			X			X	X	X		X		3	13	
-1201				X		X	X	X		X				
-1301	X								X	X		1		
-1401		X							X	X		1		
-1501	X				X				X	X		2		
-1601		X			X				X	X		2		
-1701, -1704	X					X	X		X	X		3	13	
-1801, -1804		X				X	X		X	X		3	13	
-1901	X							X			X	1		
-2001		X						X			X	1		
-2101	X				X			X			X	2		
-2201		X			X			X			X	2		
-2301, -2304	X					X	X			X	X	3	13	
-2401, -2404		X				X	X			X	X	3	13	
-2502, -2504	X						X			X	X	6	13	
-2602, -2604		X					X			X	X	6	13	
-2702, -2704	X				X		X			X	X	5	13	
-2802, -2804		X			X		X			X	X	5	13	
-2902, -2904	X						X			X	X	6	13	
-3002, -3004		X					X			X	X	6	13	
-3102, -3104	X				X		X			X	X	5	13	
-3202, -3204		X			X		X			X	X	5	13	
-0903	X					X	X	X		X		3	13	
-3304	X						X			X	X	6	13	
-3404		X					X			X	X	6	13	
-3504	X				X		X			X	X	5	13	
-3604		X			X		X			X	X	5	13	

OBSOLETE

066-50001	COLOR													
	BLACK 9	GRAY 9	BROWN 10	BLUE 9	RANGE CONT UP + DOWN	TA SELECT BUTTON	DIMMER (POT)	115V PWR	28V PWR	5V LTG BUS	28V LTG BUS	11	BRT KNOB	NV COMPAT
-1003		X				X	X	X		X		3	13	
-3705	X				X		X	X		X		4	14	12
-3706	X				X		X	X		X		4	15	12

MAX UNIT WEIGHT	
LBS	KG
2.75	1,25

(WEIGHT TYP FOR ALL DASHES)

NOTES CONTINUED FROM SHEET 1:

9 - PAINT COLOR SPEC PER FED-STD-595:
BLACK - 37038
GRAY - 36118
BLUE - 35164

10 - PAINT PER BOEING FLAT COLOR SPEC:
BROWN - 8328

11 - REFER TO APPLICABLE FIGURE NUMBER FOR SPECIFIC DASH NUMBER FRONT BEZEL VIEW.

12 - NVIS COMPATIBLE FOR USE WITH TYPE I, CLASS B, GENERATION III GOGGLES.
1 - LCD DISPLAY MEETS CHROMACITY AND RADIANCE REQUIREMENTS PER MIL-L 85762A.
2 - EDGELIGHT PANEL MEETS NVIS GREEN CLASS A CHROMACITY AND RADIANCE REQUIREMENTS PER MIL-L-85762A.

13 - MANUAL BRIGHTNESS CONTROL IS A LOW-PROFILE CIRCULAR PRESSURE ACTUATED KNOB WITH PROTECTIVE COLLAR.

14 - MANUAL BRIGHTNESS CONTROL IS A .45 INCH LONG CYLINDRICAL FINGER GRIP TYPE KNOB WITHOUT PROTECTIVE COLLAR.

15 - MANUAL BRIGHTNESS CONTROL IS A .42 INCH LONG CYLINDRICAL FINGER GRIP TYPE KNOB WITH INTERNAL FEATURES WHICH PROVIDE:
A - PERMANENT KNOB RETENTION AND
B - PROTECTION OF BRIGHTNESS POTENTIOMETER FROM DAMAGE.

16 - REFER TO DRAWING 05750016 FOR MARKINGS.

ID-132435 E066-50001-2-V

IVA-81A Traffic Advisory/Vertical Speed Indicator (TA/VSI) Outline Drawing
Figure 2011 (Sheet 2 of 3)

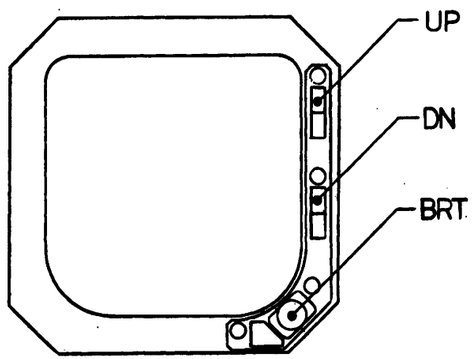


FIGURE 4

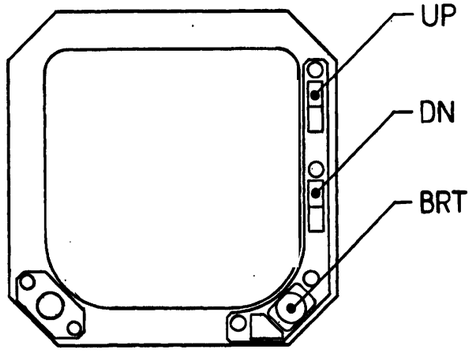


FIGURE 5

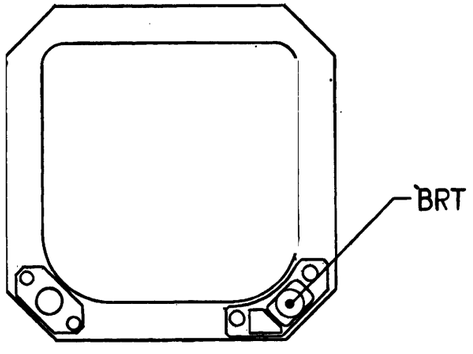


FIGURE 6

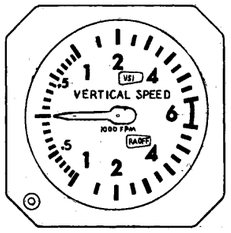
ID-132441 E066-50001-3-V

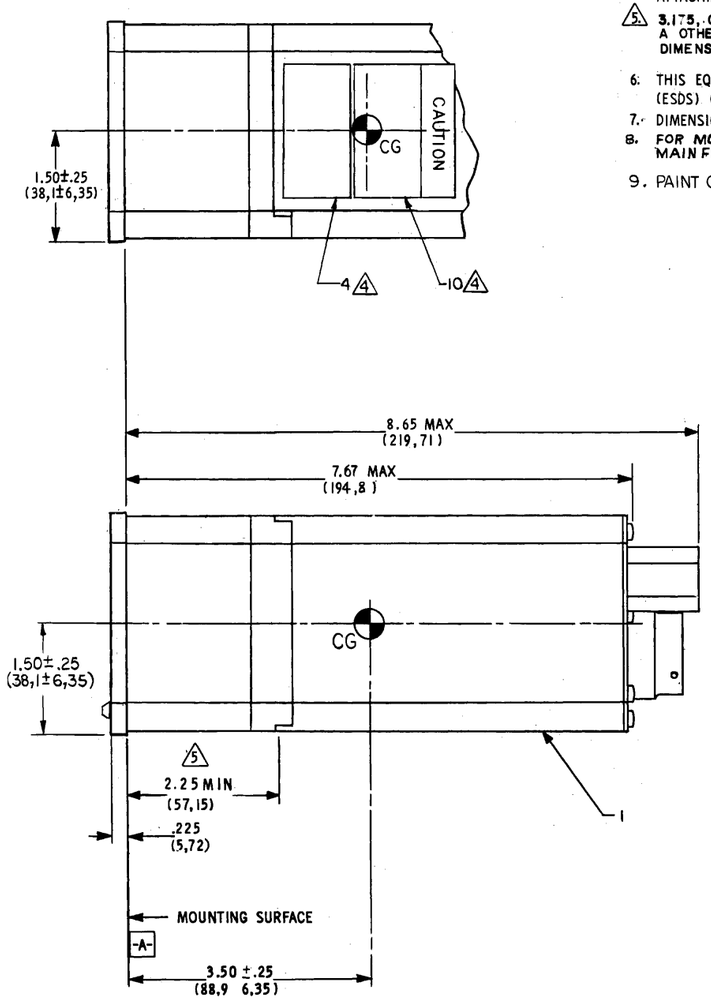
IVA-81A Traffic Advisory/Vertical Speed Indicator (TA/VSI) Outline Drawing
Figure 2011 (Sheet 3 of 3)

BENDIX AVIONICS PART OR IDENTIFYING NUMBER	COLOR (SEE NOTE 8)				115V PWR	28V PWR	5V LTG BUS	28V LTG BUS
	BLK	GRY	BRN	BLU				
066-50002-8101	X				X		X	
066-50002-8102		X			X		X	
066-50002-8103			X		X		X	
066-50002-8104				X	X		X	
066-50002-0501	X					X	X	
066-50002-0601		X				X	X	
066-50002-0701	X					X		X
066-50002-0801		X				X		X
066-50002-0901		X			X		X	
066-50002-1001			X		X		X	

MAX UNIT WEIGHT	
LBS	KG
2.9	1,3

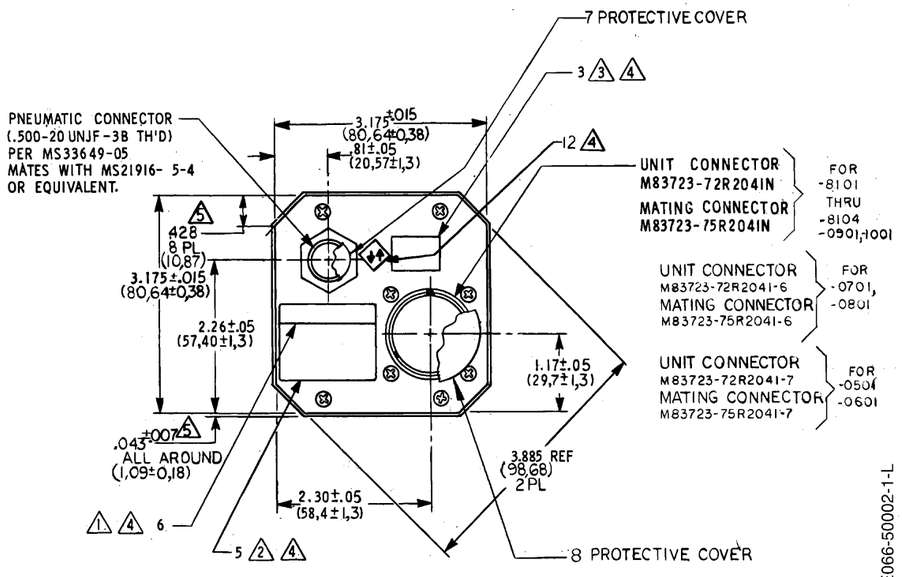
(WT. TYP. FOR ALL DASHES)





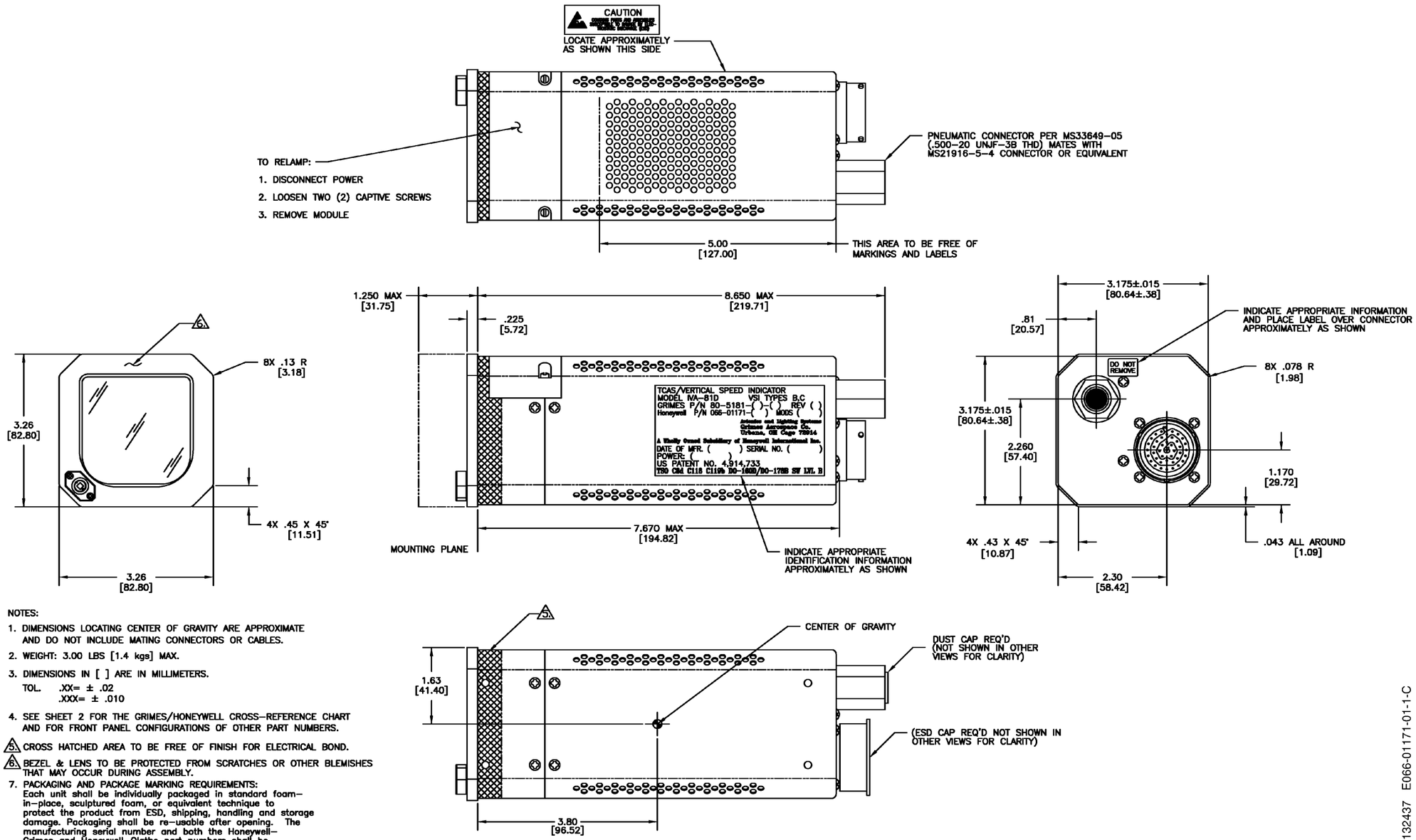
NOTES:

1. APPROPRIATE DASH NUMBER (FROM TABLES) TO BE STAMPED ON ITEM 6 IN AREA PROVIDED.
2. **SERIAL NUMBER TO BE STAMPED ON ITEM 5 IN AREA PROVIDED.**
3. ADD APPLICABLE SOFTWARE VERSION NUMBER TO LABEL, ITEM 3, (PER TABLE ON MOD SHEET) USING ANY PERMANENT AND LEGIBLE METHOD.
4. CLEAN MOUNTING SURFACE WITH ALCOHOL PRIOR TO ATTACHING LABELS.
5. **3.175,.0438&.428 DIMENSIONS APPLY TO ZONE THAT EXTENDS 2.25 FROM DATUM A OTHER AREAS BEYOND THIS DIMENSION SHALL NOT EXCEED MAX CASE DIMENSIONS.**
6. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) COMPONENTS.
7. DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.
8. *FOR MODIFICATION INFORMATION SEE THE ENOI FILE IN THE MAIN FRAME COMPUTER.*
9. PAINT COLOR SPEC: BLACK -37038, GRAY -36118, BLUE -35164 } PER FED-STD-595; BROWN-8328 PER BOEING FLAT COLOR SPEC



ID-132436 E066-50002-1-L

IVA-81B Resolution Advisory/Vertical Speed Indicator (RA/VSI) Outline Drawing
Figure 2012



NOTES:

1. DIMENSIONS LOCATING CENTER OF GRAVITY ARE APPROXIMATE AND DO NOT INCLUDE MATING CONNECTORS OR CABLES.
2. WEIGHT: 3.00 LBS [1.4 kgs] MAX.
3. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
   TOL. .XX= ± .02
   .XXX= ± .010
4. SEE SHEET 2 FOR THE GRIMES/HONEYWELL CROSS-REFERENCE CHART AND FOR FRONT PANEL CONFIGURATIONS OF OTHER PART NUMBERS.

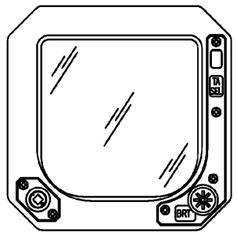
5. CROSS HATCHED AREA TO BE FREE OF FINISH FOR ELECTRICAL BOND.

6. BEZEL & LENS TO BE PROTECTED FROM SCRATCHES OR OTHER BLEMISHES THAT MAY OCCUR DURING ASSEMBLY.

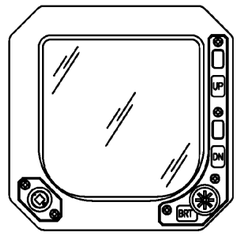
7. PACKAGING AND PACKAGE MARKING REQUIREMENTS:
   Each unit shall be individually packaged in standard foam-in-place, sculptured foam, or equivalent technique to protect the product from ESD, shipping, handling and storage damage. Packaging shall be re-usable after opening. The manufacturing serial number and both the Honeywell-Grimes and Honeywell-Olathe part numbers shall be identified on the exterior of the packaging.

ID-132437 E066-01171-01-1-C

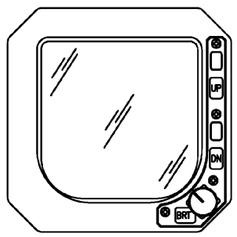
IVA-81D Traffic Advisory/Vertical Speed Indicator (TA/VSI) Outline Drawing
Figure 2013 (Sheet 1 of 2)



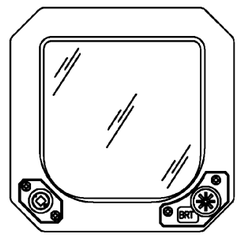
066−01171−0901, −0903, −0904, −1001, −1004, −1101, −1704, −1804, AND −2304 TCAS



066−01171−2702, −2704, −2804, −3104, −3504, AND −3604 TCAS



066−01171−3704, 3706 TCAS (NVIS)



066−01171−3404 TCAS

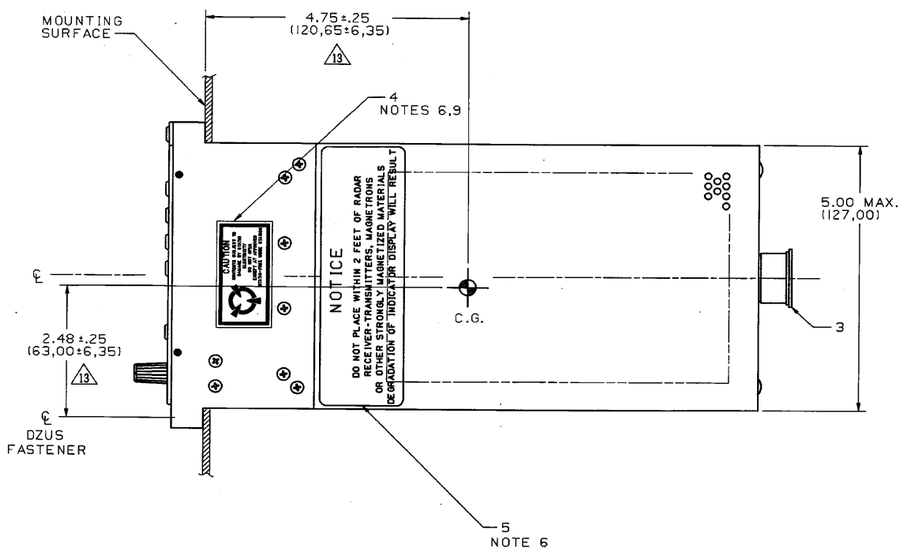
GRIMES/Honeywell PART NO. CROSS REFERENCE		DESCRIPTION
80−5181−2−2	066−01171−8102	115V/GRY
80−5181−3−2	066−01171−0901	115V/BLK
80−5181−3−4	066−01171−0903	115V/BLK
80−5181−3−5	066−01171−0904	115V/BLK
80−5181−4−2	066−01171−1001	115V/GRY
80−5181−4−5	066−01171−1004	115V/GRY
80−5181−5−2	066−01171−1101	115V/BRN
80−5181−6−5	066−01171−1704	28V/BLK
80−5181−7−5	066−01171−1804	28V/GRY
80−5181−8−5	066−01171−2304	28V/BLK
80−5181−9−3	066−01171−2702	28V/BLK
80−5181−9−5	066−01171−2704	28V/BLK
80−5181−10−5	066−01171−2804	28V/GRY
80−5181−11−5	066−01171−3104	28V/BLK
80−5181−12−5	066−01171−3504	115V/BLK
80−5181−13−6	066−01171−3706	115V/BLK
80−5181−14−5	066−01171−3604	115V/5V GRY
80−5181−15−5	066−01171−3404	115V/5V GRY
80−5181−16−6	066−01171−3704	28V/BLK

ID-132438 E066-01171-01-2

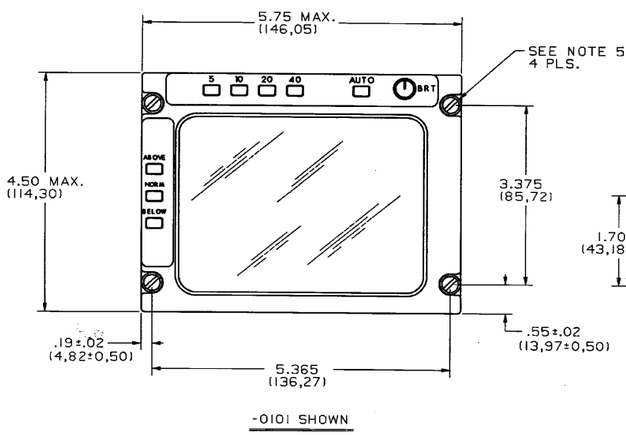
IVA-81D Traffic Advisory/Vertical Speed Indicator (TA/VSI) Outline Drawing
Figure 2013 (Sheet 2 of 2)

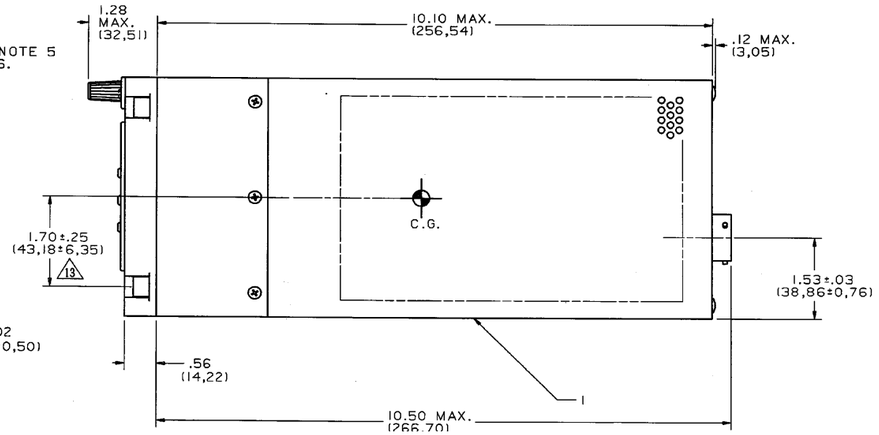
NOTES :

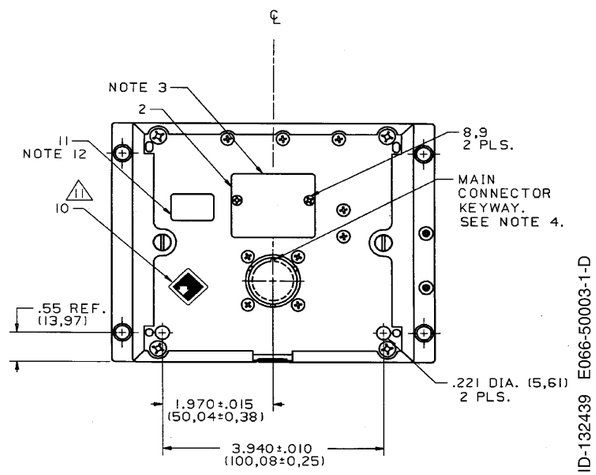
1. NO FORCED AIR COOLING REQUIRED.
2. POWER DISSIPATION : 35W NOM.
3. PRIOR TO SHIPMENT OF ITA-81A, DASH NO. AND SERIAL NO. SHALL BE PERMANENTLY AND LEGIBLY STAMPED IN THE APPROPRIATE SPACE OF THE IDENTIFICATION PLATE.
4. MATING CONNECTOR TYPE : MS3126F-14-19S OR EQUIVALENT.
5. MOUNTING FASTENERS : DZUS TYPE PFSC35-44A MIL-F-25173A APPROVED.
6. CLEAN MOUNTING SURFACES WITH ETHYL ALCOHOL PRIOR TO ATTACHING LABELS.
7. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE COMPONENTS.
8. REFER TO LATEST ISSUE OF PARTS LIST FOR APPLICABLE SHIPPING CARTON.
9. LOCATE DECAL BEHIND MOUNTING SURFACE AS SHOWN. AVOID COVERING SCREWS.
10. DIMENSIONS IN PARENTHESES ARE MILLIMETERS.
11. REMOVE ADHESIVE BACKING AND LOCATE LOGO IN THE APPROXIMATE ORIENTATION SHOWN.
12. PERMANENTLY AND LEGIBLY MARK SOFTWARE MOD DECAL AS FOLLOWS : XX / YY
    - XX - THE LAST TWO DIGITS OF THE UNIT PART NO. DASH
    - YY - THE SOFTWARE VERSION (SEE MOD SHEET, SHEET 3)
13. C.G. DIMENSIONS ARE FOR REFERENCE ONLY.



IDENTIFYING NUMBER	WEIGHT (MAX.) LBS.	WEIGHT (MAX.) KG.	COLOR	SHEET	CONFIGURATION INDEX NUMBER
066-50003-0101	8.0	3,7	GREY	1	700-50006
066-50003-0301	8.0	3,7	GREY	1,2	700-50006
066-50003-0401	8.0	3,7	BROWN	1,2	700-50006
066-50003-0501	8.0	3,7	BROWN	1,2	700-50006
066-50003-0601	8.0	3,7	GREY	1,2	700-50006
066-50003-0701	8.0	3,7	BLACK	1,2	700-50006

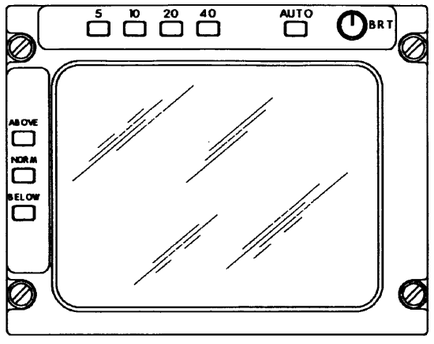




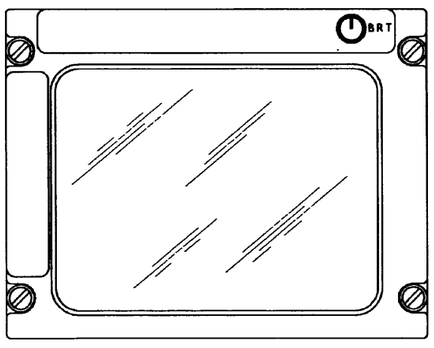


ID-132439 E066-50003-1-D

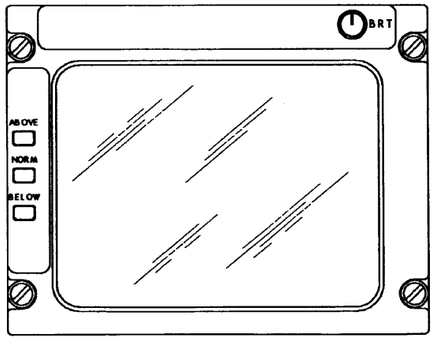
ITA-81A Traffic Display Outline Drawing
Figure 2014 (Sheet 1 of 2)



-0501
-0701



-0301
-0401

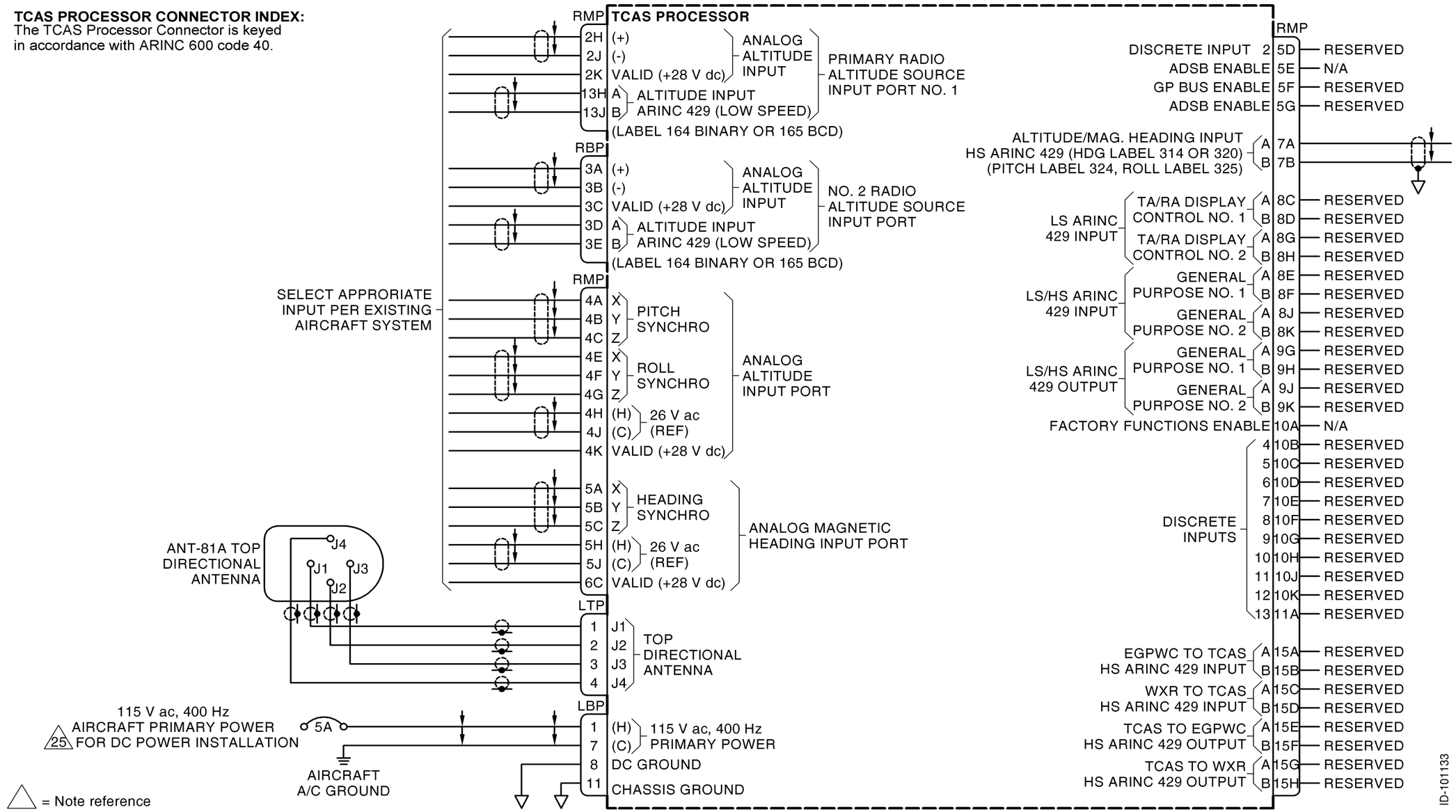


-0601

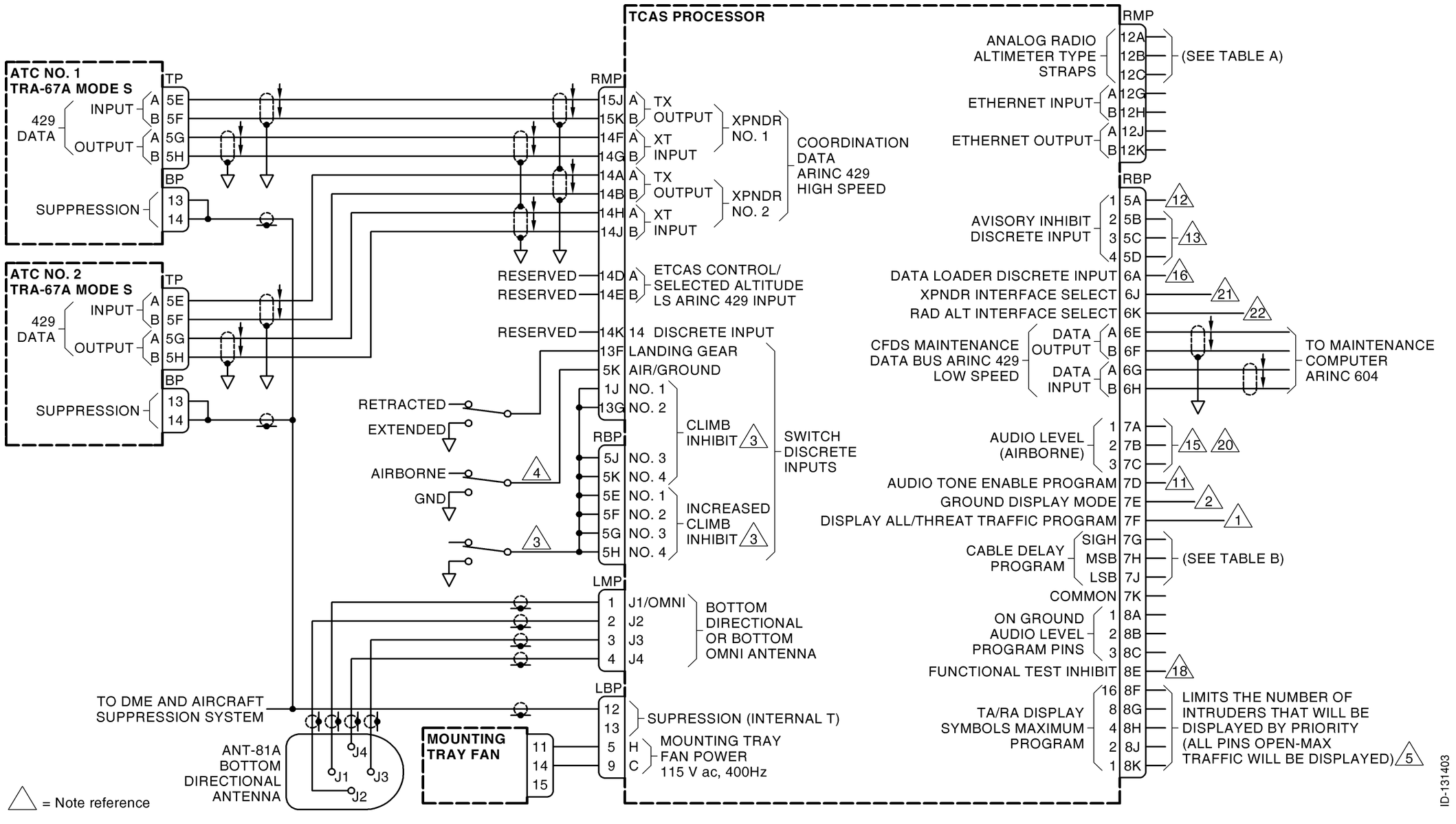
ID-132440 E066-50003-2-D

ITA-81A Traffic Display Outline Drawing
Figure 2014 (Sheet 2 of 2)

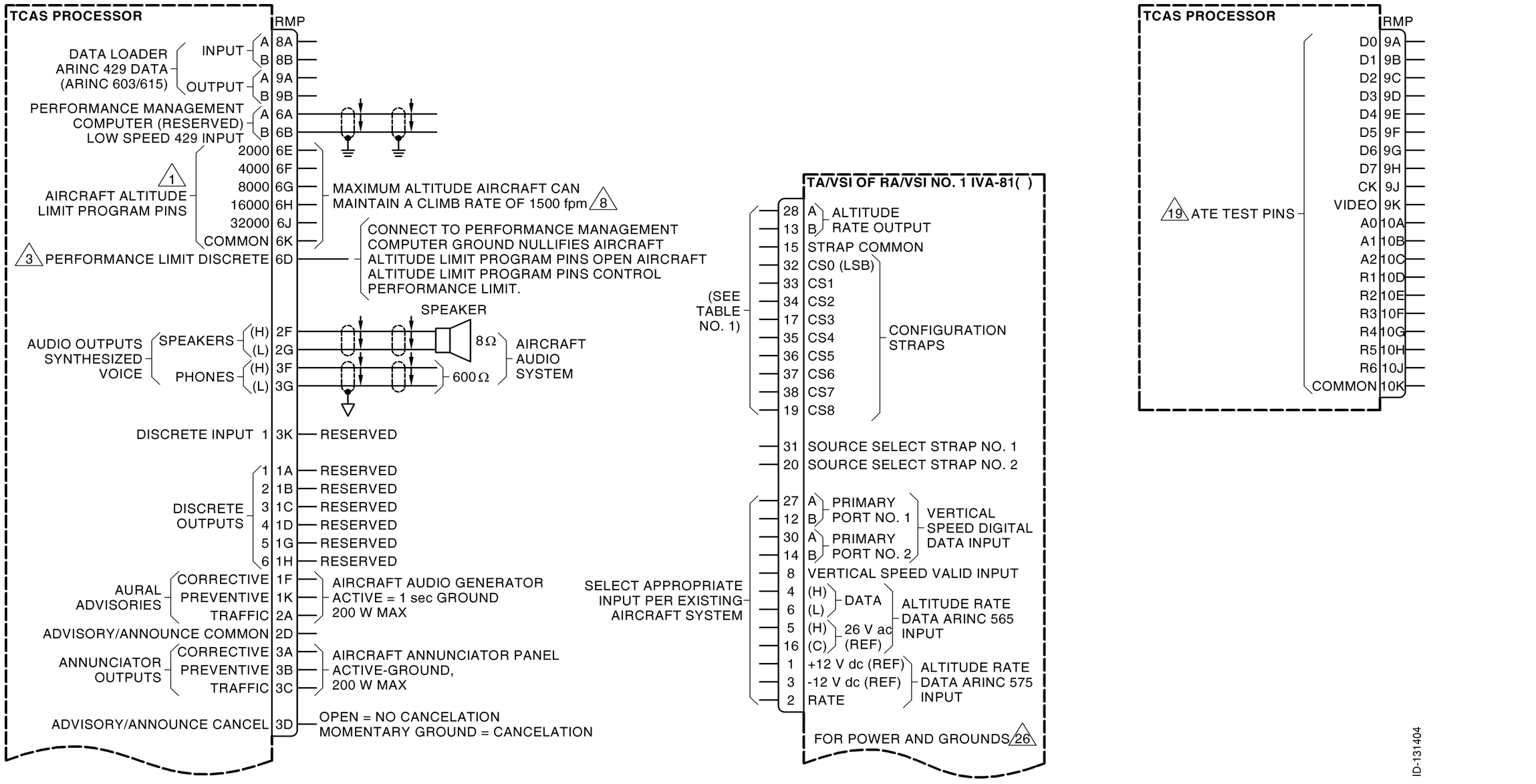
TCAS PROCESSOR CONNECTOR INDEX:
The TCAS Processor Connector is keyed in accordance with ARINC 600 code 40.



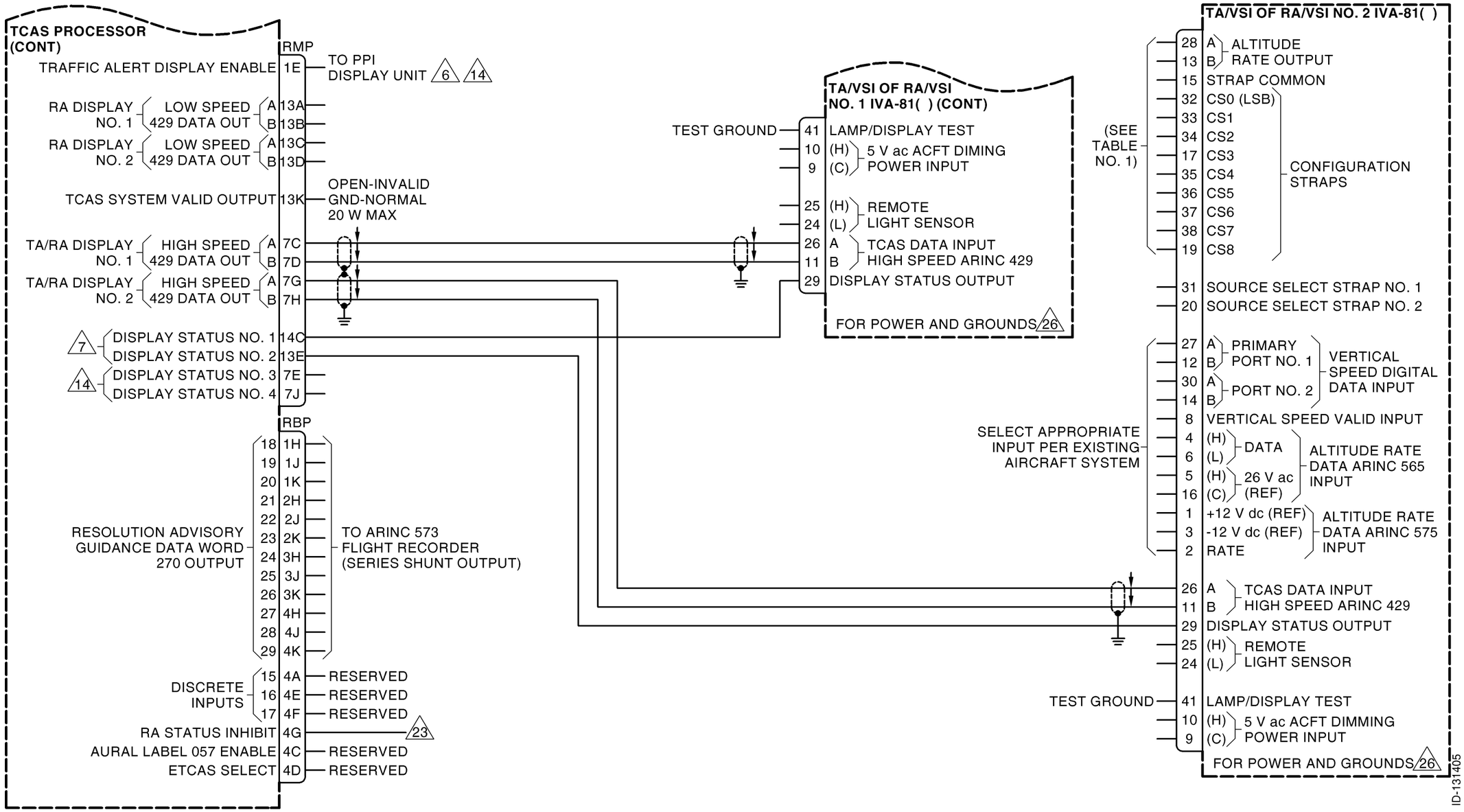
CAS-100 Interwiring Diagram
Figure 2015 (Sheet 1 of 16)



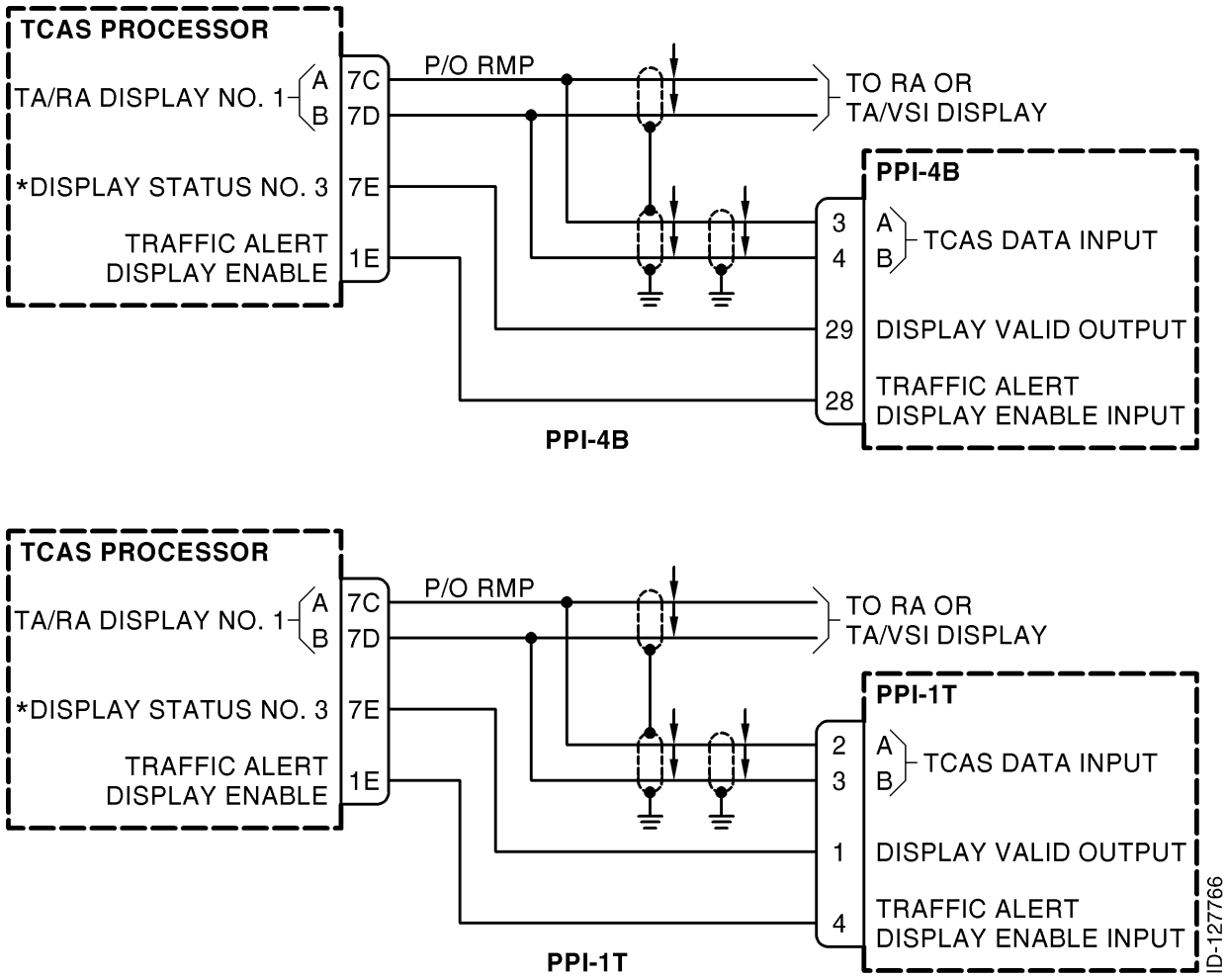
CAS-100 Interwiring Diagram
Figure 2015 (Sheet 2 of 16)



CAS-100 Interwiring Diagram
Figure 2015 (Sheet 3 of 16)

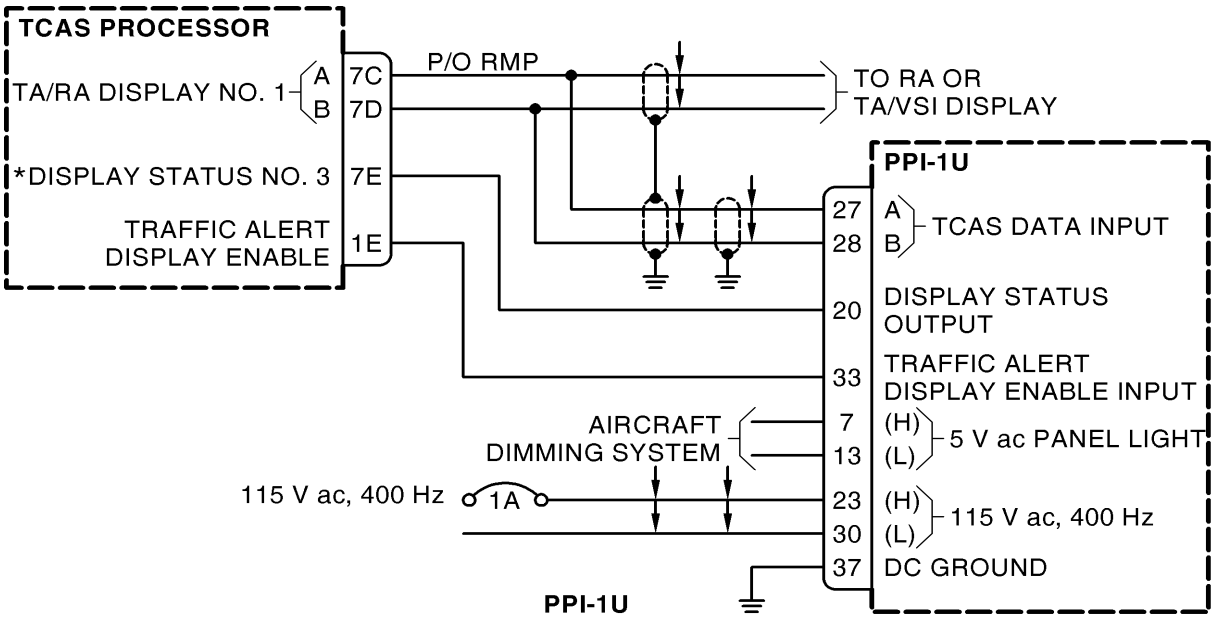


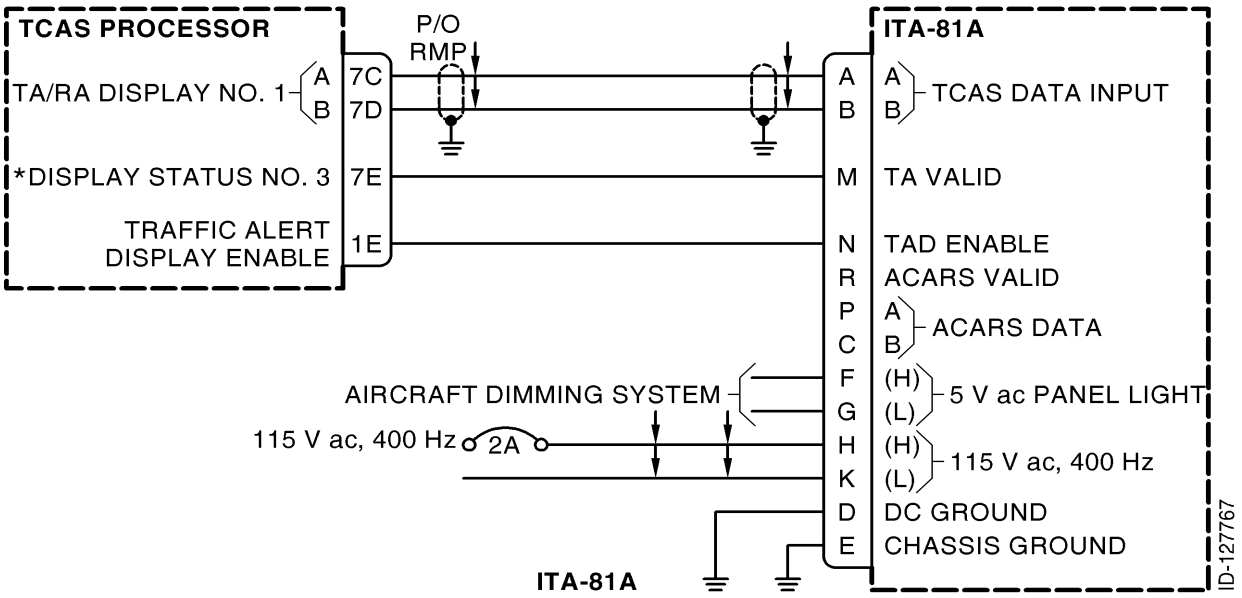
CAS-100 Interwiring Diagram
Figure 2015 (Sheet 4 of 16)



* In the above configurations, the traffic display is shown connected to the TA/RA Bus #1 output, in this case the display status #3 input (RMP-7E) must be used. If a traffic display is connected to the TA/RA Bus #2 output, then its display status output must be connected to the display status #4 input (RMP-7J).
Any unused traffic display status input pins must be grounded to prevent the unwanted failures from being logged in the maintenance data output.

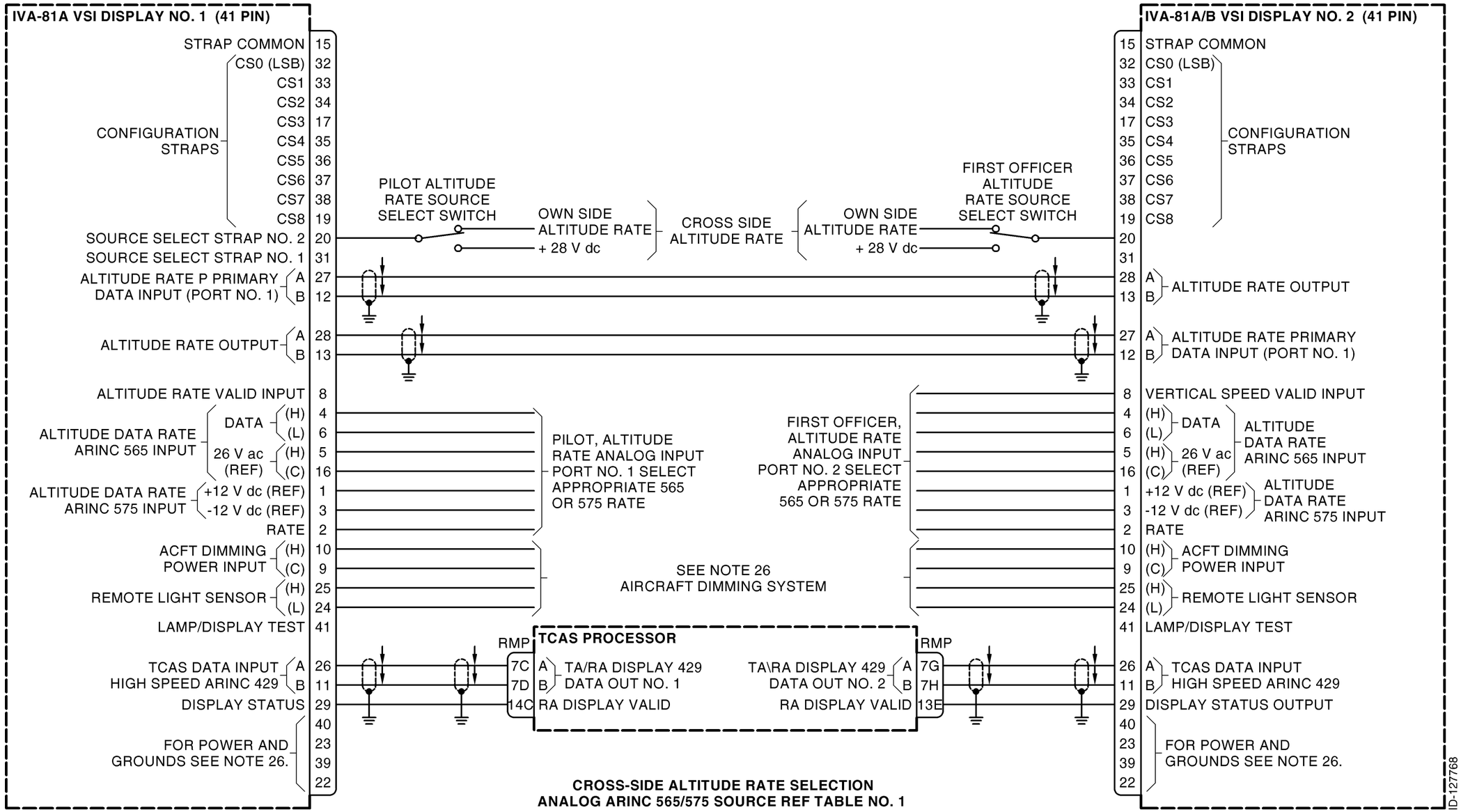
CAS-100 Interwiring Diagram
Figure 2015 (Sheet 5 of 16)



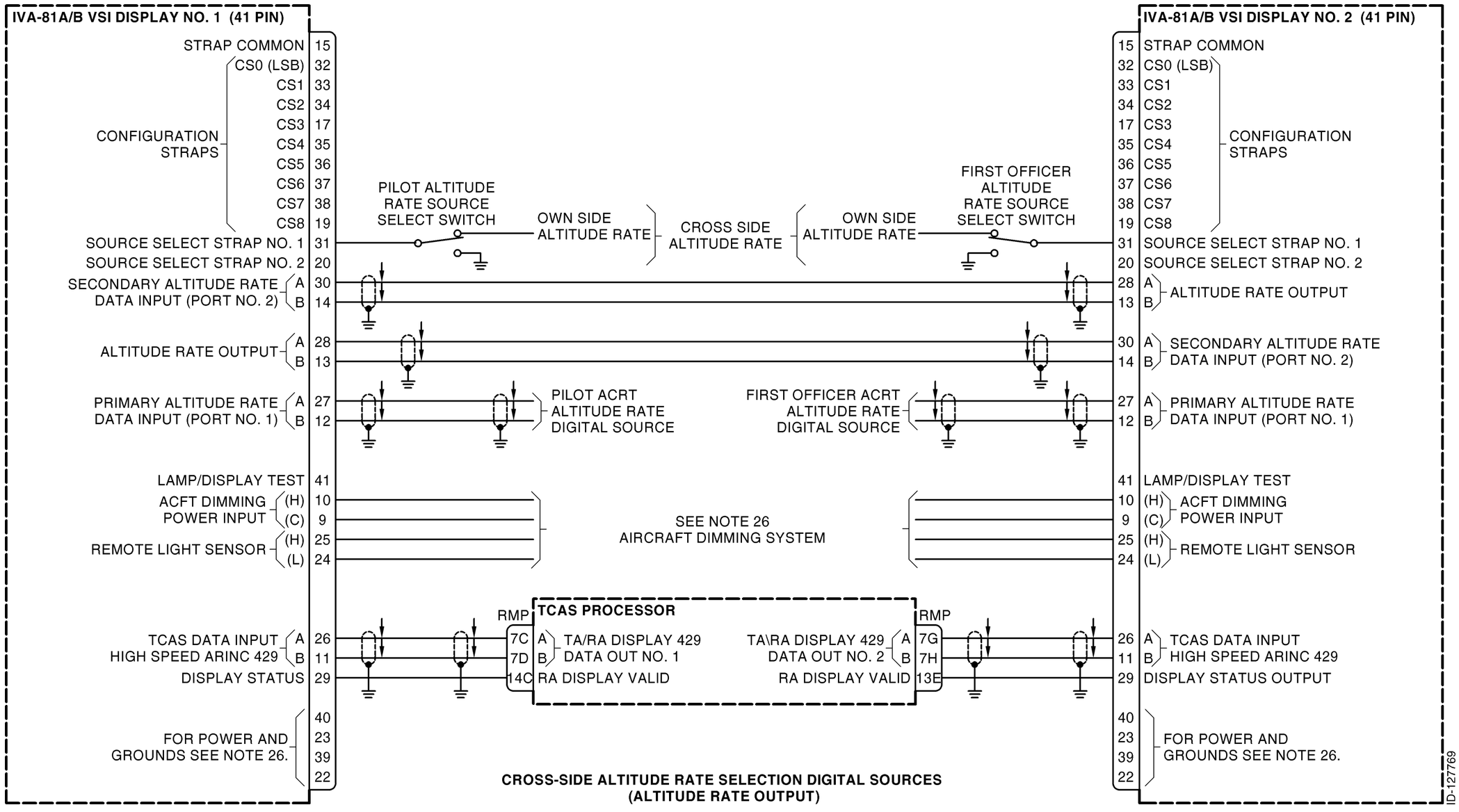


* In the above configurations, the traffic display is shown connected to the TA/RA Bus #1 output, in this case the display status #3 input (RMP-7E) must be used. If a traffic display is connected to the TA/RA Bus #2 output, then its display status output must be connected to the display status #4 input (RMP-7J).
Any unused traffic display status input pins must be grounded to prevent the unwanted failures from being logged in the maintenance data output.

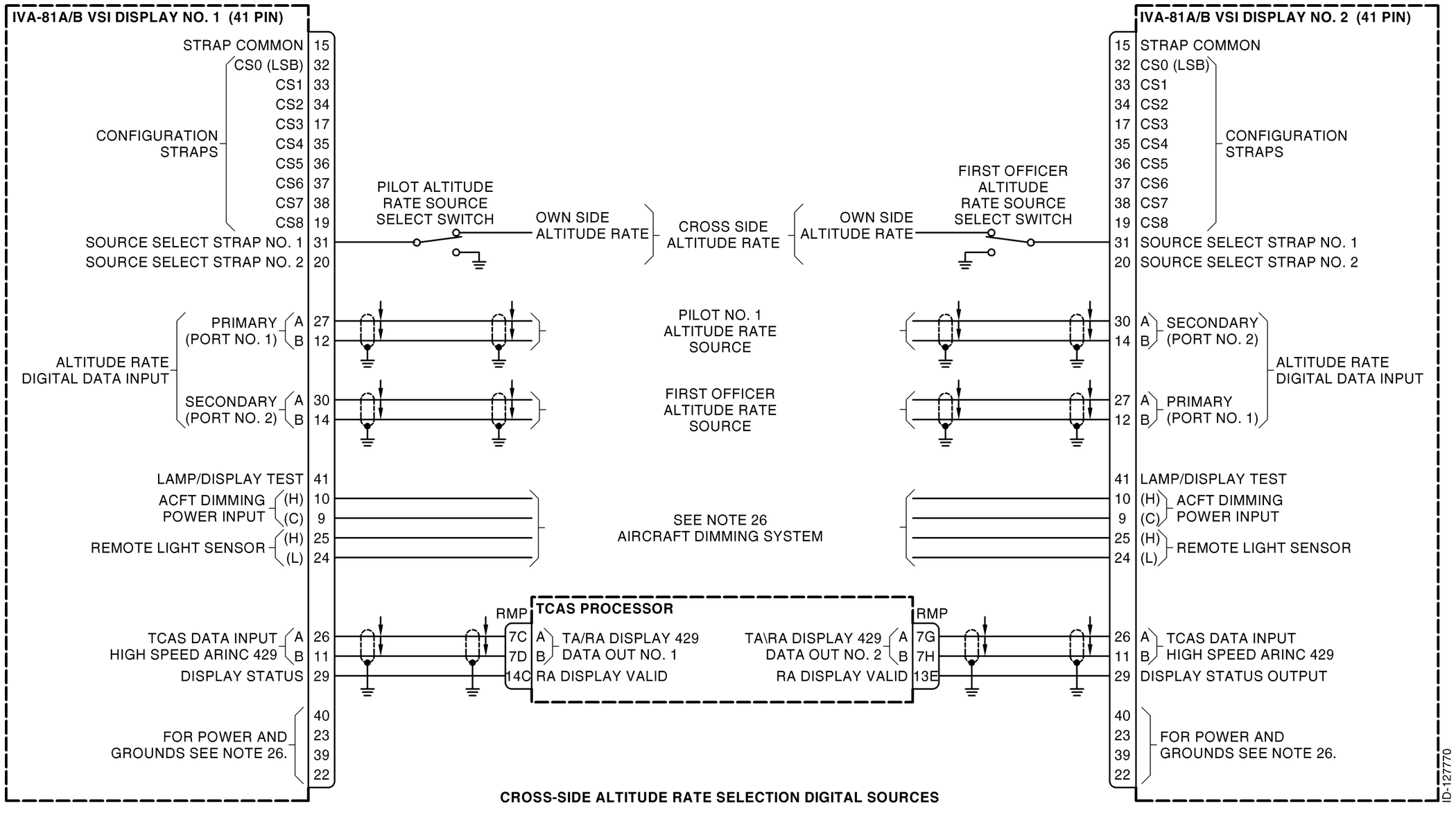
CAS-100 Interwiring Diagram
Figure 2015 (Sheet 6 of 16)



CAS-100 Interwiring Diagram
Figure 2015 (Sheet 7 of 16)

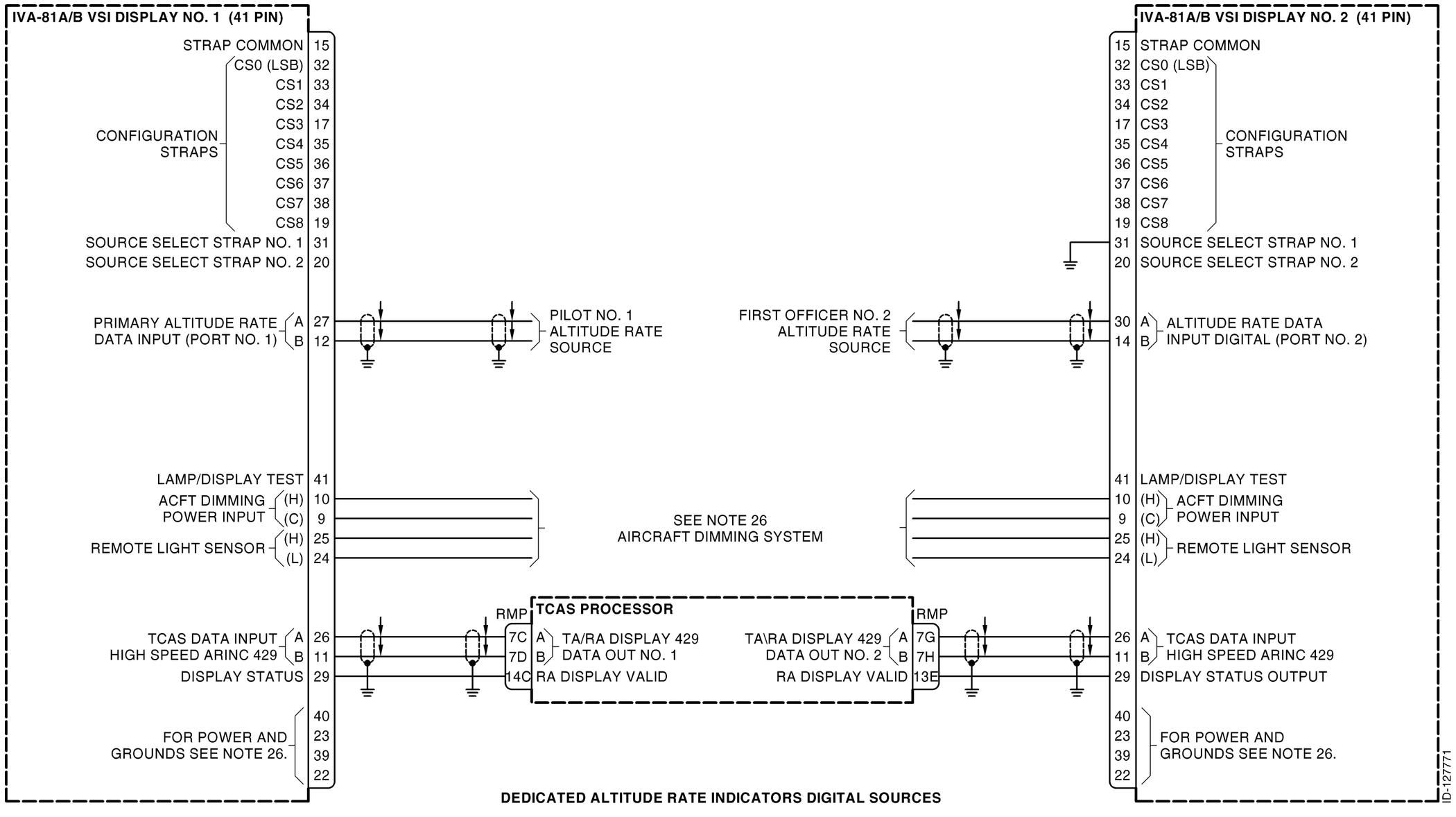


CAS-100 Interwiring Diagram
Figure 2015 (Sheet 8 of 16)



CROSS-SIDE ALTITUDE RATE SELECTION DIGITAL SOURCES

CAS-100 Interwiring Diagram
Figure 2015 (Sheet 9 of 16)



DEDICATED ALTITUDE RATE INDICATORS DIGITAL SOURCES

CAS-100 Interwiring Diagram
Figure 2015 (Sheet 10 of 16)

NOTES:

1. PIN TO RBP-7K = DISPLAY TA/RA/PROXIMITY TRAFFIC (DURING RA OR TA ONLY). OPEN = DISPLAY ALL TRAFFIC (FULL TIME).
2. OPEN = SYSTEM GOES TO TA ONLY MODE (RAs ARE INHIBITED) WHEN THE AIRCRAFT IS ON THE GROUND.

   PIN TO RBP-7K = SYSTEM GOES TO STANDBY WHEN THE AIRCRAFT IS ON THE GROUND.
3. 1500 FPM PERFORMANCE LIMIT IS DETERMINED BY: CLIMB INHIBIT NO. 1 AND NO. 2 = LOW OR CLIMB INHIBIT NO. 3 AND NO. 4 = LOW OR THE AIRCRAFT IS ABOVE THAT OF THE ALTITUDE LIMIT PROGRAM PINS.

   2500 FPM PERFORMANCE LIMIT IS DETERMINED BY: INCREASE CLIMB INHIBIT NO. 1 AND NO. 2 OR NO. 3 AND NO. 4 = LOW

   PERFORMANCE LIMITS ARE DETERMINED BY THE FOLLOWING INPUT:

   CLIMB INHIBIT

   INCREASED CLIMB INHIBIT

   PERFORMANCE LIMIT DISCRETE

   FLIGHT/PERFORMANCE MANAGEMENT COMPUTER

   AIRCRAFT ALTITUDE LIMIT PROGRAM PINS

   IF A 2500 FPM CLIMB RATE IS MORE THAN THE CAPABILITY OF THE AIRCRAFT, EITHER INCREASE CLIMB INHIBIT NO. 1 AND NO. 2 OR NO. 3 OR NO. 4 MUST BE HARDWIRED TO GROUND.

   IF AN AIRCRAFT CONFIGURATION, FOR EXAMPLE FLAPS OR GEAR EXTENDED, DECREASES THE AIRCRAFT PERFORMANCE BELOW 2500 FPM OR 1500 FPM, AN ISOLATED SWITCHED GROUND DISCRETE, SHOWING THAT ACTIVE CONFIGURATION MUST BE CONNECTED TO ONE INHIBIT DISCRETE. FOR EXAMPLE, NO. 1 AND NO. 3. THE REMAINING INHIBIT DISCRETE INPUT, FOR EXAMPLE, NO. 2 OR NO. 4 MUST BE HARDWIRED TO GROUND.

   IF AN AIRCRAFT CAN KEEP 1500 FPM CLIMB RATE REGARDLESS OF THE AIRCRAFT CONFIGURATION, THE "CLIMB INHIBIT" DISCRETES ARE NOT CONNECTED.

   IF THE AIRCRAFT CAN KEEP 2500 FPM CLIMB RATE REGARDLESS OF THE AIRCRAFT CONFIGURATION, THE "INCREASED CLIMB INHIBIT" DISCRETES ARE NOT CONNECTED.
4. SHOWS AIRCRAFT STATUS: AIRBORNE OR GROUND.
5. STRAP LOGIC: OPEN PINS ARE SET. THE PIN JUMPERED TO RBP-7K ARE NOT SELECTED.
6. THIS PIN SUPPLIES A GROUND WHEN XPNDR CTL PANEL IS IN A TCAS OR TEST MODE (TA ONLY, TA/RA) WHICH SETS THE PPI DISPLAY.

CAS-100 Interwiring Diagram
Figure 2015 (Sheet 11 of 16)

NOTES: (cont)

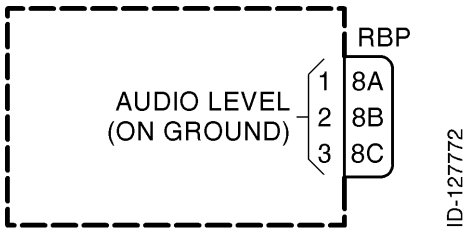
7. DISPLAY STATUS INPUTS NO. 1 (RMP-14C) AND NO. 2 (RMP-13E) MUST BE CONNECTED TO THEIR RELATED RA OR TA VSI [IVA-81 ( )] DISPLAY STATUS OUTPUT (VALID).
8. THE AIRCRAFT ALTITUDE LIMIT IS ENCODED IN BINARY FORM USING A COMBINATION OF THESE STRAPS. STRAP LOGIC: PINS JUMPERED TO THE COMMON, RMP-6K. TOGETHER EQUAL THE ALTITUDE LIMIT. ALL PINS OPEN = 0 FEET
9. RBP-6B GROUND = DATA WILL BE LOADED INTO THE I/O PROCESSOR EEPROM MEMORY
   OPEN = DATA WILL BE LOADED INTO THE DATA PROCESSOR EEPROM MEMORY
10. RBP-6C = SPARE PIN
11. OPEN = DRIVES AURAL ADVISORY DISCRETE OUTPUT
    PIN TO RBP-7K = 1 SECOND DELAY ADDED TO VOICE ADVISORY WITH RESPECT TO AURAL ADVISORY.
12. ACTIVE STATE GROUND WILL PUT TCAS INTO STANDBY (SL = 1).
13. ACTIVE STATE GROUND WILL PUT TCAS INTO "TA ONLY" MODE (SL=2) AND PREVENT VIDEO AND AURAL ADVISORIES DUE TO ADVISORIES FROM OTHER HIGHER PRIORITY SYSTEMS SUCH AS GROUND PROXIMITY AND WIND SHEAR WARNING SYSTEMS.
14. THE DISPLAY STATUS INPUT NO. 3 (RMP-7E) OR NO. 4 (RMP-7J) MUST BE CONNECTED TO THE TRAFFIC DISPLAY STATUS OUTPUT (VALID). IF DISPLAY STATUS NO. 3 OR NO. 4 ARE NOT USED, THEN THOSE PINS MUST BE GROUNDED TO PREVENT THE UNWANTED FAILURES FROM BEING LOGGED IN THE MAINTENANCE DATA OUTPUT.
15. THE AUDIO LEVEL FINDS THE SPEAKER AND PHONES AUDIO OUTPUT LEVEL BY STRAPPING ONE OR MORE OF THESE PROGRAM PINS TO RBP-7K AS SHOWN BELOW.
    1 = OPEN, 0 = CONNECTED TO RBP-7K

1 2 3	Phones Output		Speaker Output	
	DBM	MW	WATTS	DBM
*1 1 1	16	40	4.0	6
1 1 0	13	20	2.0	3
1 0 1	10	10	1.0	0
1 0 0	7	5	0.5	-3
0 1 1	5	3	0.3	-5.2
0 1 0	5	3	0.3	-5.2
0 0 1	5	3	0.3	-5.2
0 0 0	19	80	8.0	9
* Refer to Note 20.				

CAS-100 Interwiring Diagram
Figure 2015 (Sheet 12 of 16)

NOTES: (cont)

16. RBP-6A GROUND = DATA LOADER PROCESS ENABLED, SOFTWARE P/N ON DATA LOADER AND TA/RA DATA BUS.
17. RBP-6D GROUND = SOFTWARE P/N ON DATA LOADER AND TA/RA DATA BUS.
18. FUNCTIONAL TEST INHIBIT (RBP-8E) - PIN CONNECTED TO THE RBP-7K (COMMON) WILL PREVENT TCAS FUNCTION TEST IF THE AIRCRAFT IS AIRBORNE.
19. NOT NECESSARY FOR AIRCRAFT INSTALLATION USE.
20. TCAS PROCESSOR



THERE ARE TWO SETS OF STRAPS, "AUDIO LEVEL (AIRBORNE)" AND "AUDIO LEVEL (ON GROUND)". THE AUDIO LEVEL ON GROUND STRAPS WILL OVERRIDE THE AIRBORNE STRAPS WHEN THE AIRCRAFT IS ON THE GROUND AND THE AIR/GROUND LOGIC IS EQUAL TO THE "GND". THE STRAPPING CONFIGURATION FOR THE "AUDIO LEVEL (ON GROUND)" IS THE SAME AS IN NOTE 15, EXCEPT WHEN ALL STRAPS ARE OPEN THE AUDIO WILL BE EQUIVALENT TO THE AUDIO AIRBORNE STRAP LEVEL.

21. OPEN = BOTH NO. 1 AND NO. 2 TRANSPONDER IS INSTALLED.
    STRAPPED = ONLY NO. 1 TRANSPONDER IS INSTALLED.
    STRAPPED = RBP-6J CONNECTED TO RBP-7K.
22. OPEN = BOTH NO. 1 AND NO. 2 RADIO ALTIMETERS INSTALLED.
    STRAPPED = ONLY NO. 1 AND NO. 2 RADIO ALTIMETER IS INSTALLED.
    STRAPPED = RBP-6K CONNECTED TO RBP-7K.
23. OPEN = RA DISPLAY STATUS ACTIVE.
    STRAPPED = RA DISPLAY STATUS INHIBITED.
    STRAPPED = RBP-4G CONNECTED TO RBP-7K.
24. WHEN STRAPPED AND OWN AIRCRAFT IS BELOW 1750 FT. (RAD. ALT.) INTRUDERS FOUND TO BE "ON GROUND" WILL NOT BE DISPLAYED.
    STRAPPED = RBP-4F CONNECTED TO RBP-7K.
    THIS PIN IS NOT TO MAKE UNSERVICEABLE THE DISPLAY OF ON GROUND INTRUDERS, BECAUSE INTRUDERS FOUND TO BE ON THE GROUND WILL NOT BE PROCESSED OR SHOWN.

CAS-100 Interwiring Diagram
Figure 2015 (Sheet 13 of 16)

NOTES: (cont)

TABLE A. RADIO ALTIMETER STRAPS

Radio Alt. Type	Electrical Characteristics	Pin 12C	Pin 12B	Pin 12A
0	Soviet IL-62 0 to 2426 ft: 15.25 mV/ft, 0 ft = 0 Volts 0 to 740 meters: 50.0 mV/meter, 0 meters = 0 Volts	0	0	0
1	Soviet IL-86 0 to 5000 ft: 6.1 mV/ft, 0 ft = 0 Volts 0 to 1525 meters: 20.0 mV/meter, 0 meters = 0 Volts	0	0	1
2	CARA (signal RTFAA) 0 to 5400 ft: -8.0 mV/ft, 0 ft = 0 Volts	0	1	0
3	-20 to 2650 ft -10 mV/ft, 0 ft = 0 Volts	0	1	1
4	CARA (signal RTFAAA) 0 to 5400 ft: 5.0 mV/ft, 0 ft = 0 Volts	1	0	0
5	0 to 2650 ft -4 mV/ft, 0 ft = 0 Volts	1	0	1
6	-20 to 2867 ft -20 to 500 ft: 20 mV/ft 500 to 2867 ft: 10.4 V + 3 mV/ft, 0 ft = 0.4 Volts	1	1	0
7	ARINC 552A/429 0 to 480 ft: 0.02 (h + 20) 480 ft to 2857 ft: 10*1n((e(h+20))/500) Where h = height = 500*(e**((V-10)/10) - 20, e = 2.7183	1	1	1

NOTES:
1. The KING KRA-405 outputs 3 and 6 above.
2. The Sperry RT-300 outputs 5 and 7 above.
3. 1 = Pin Open, 0 = Pin Connected to Common (RMP-6K)

CAS-100 Interwiring Diagram
Figure 2015 (Sheet 14 of 16)

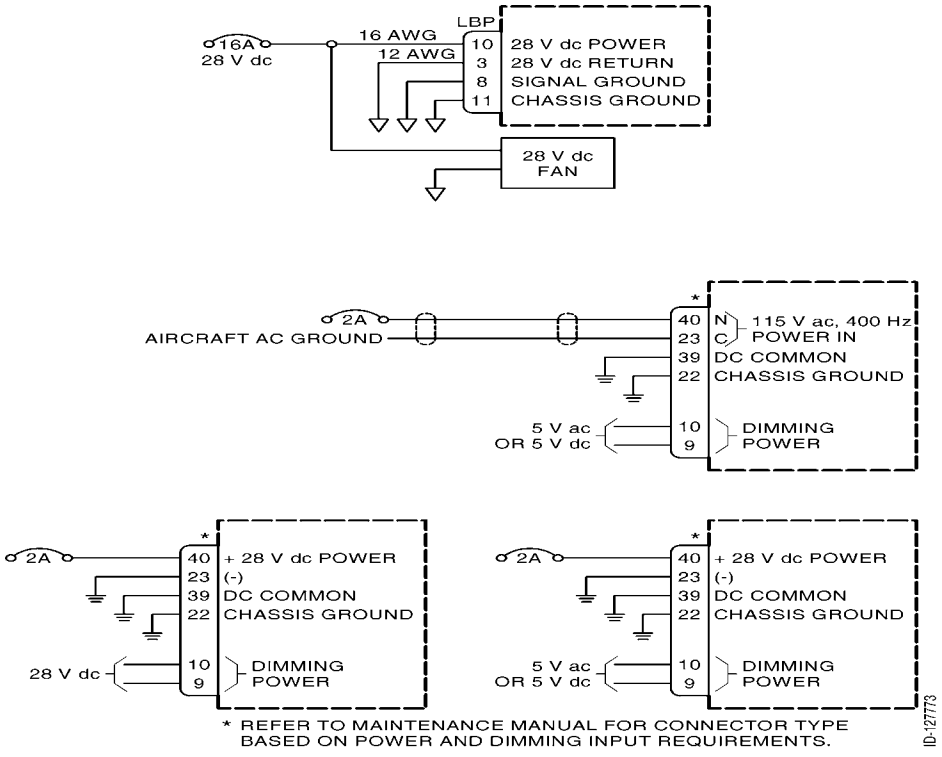
NOTES: (cont)

TABLE B. ANTENNA DELAY PROGRAM STRAPS

Differential	Add		MSB	LSB
Delay (nSec)	**In (nSec)**	**Pin**	**7H**	**7J**
0 - 50	0		0	0
51 - 150	100		0	1
151 - 250	200		1	0
251 - 350	300		1	1
1 = SELECTED PIN CONNECTED TO THE PROGRAM COMMON PIN - 7K 0 = PIN OPEN SIGN PIN RBP - 7G 0 = ADD TIME DELAY TO TOP 1 = ADD TIME DELAY TO BOTTOM				

25. WHEN INSTALLING A 28 V DC PROCESSOR THE 115 V AC INPUT IS NOT USED FOR EITHER PRIMARY OR FAN POWER.

26. IVA-81( ) POWER GROUND AND DIMMING BUS INPUTS



CAS-100 Interwiring Diagram
Figure 2015 (Sheet 15 of 16)

NOTES: (cont)

TABLE C. SOURCE TYPE

PIN	19	38	37	36	35	17	34	33	32	31	20	
BIT	8	7	6	5	4	3	2	1	0	SS	SS	SEE TABLE NOTES 1 AND 2
P	0	0	0	0	0	0	X	X	X	X		TEST
P	C	C	C	C	C	C	0	0	0	X	1	429 LOW SPEED (LABEL 212) SYS 2
P	C	C	C	C	C	C	0	0	1	X	1	429 LOW SPEED (LABEL 212) SYS 1
P	C	C	C	C	C	C	0	1	0	0	2	ARINC 565 (AC ANALOG)
P	C	C	C	C	C	C	0	1	0	1	2	565 BOOTSTRAP DIG. PORT 1
P	C	C	C	C	C	C	0	1	1	X		NOT USED
P	C	C	C	C	C	C	1	0	0	0	2	ARINC 575 (DC ANALOG)
P	C	C	C	C	C	C	1	0	0	1	2	575 BOOTSTRAP DIG. PORT 1
P	C	C	C	C	C	C	1	0	1	X		PNEUMATIC
P	C	C	C	C	C	C	1	1	0	X	1	429 HIGH SPEED (LABEL 365) SYS 2
P	C	C	C	C	C	C	1	1	1	X	1	429 HIGH SPEED (LABEL 365 SYS 1

IVA-81A/B CONFIGURATION STRAPS (CS0 THROUGH CS8), STANDARD STRAPS AND SOURCE SELECT STRAP (SS, PIN 31), 1 = OPEN, 0 = PIN TO COMMON

X = DON'T CARE, P = PARITY, C =CUSTOM CONFIGURATION DEFINITIONS. THESE ENTRIES ARE CUSTOMER SPECIFIC AND ARE DEFINED IN I.B. 1181

TABLE C NOTES:

1. FOR THESE CONFIGURATIONS, AN "OPEN" STATE OF THE SOURCE SELECT LOGIC MAKES THE NO. 1 DIGITAL VERTICAL SPEED INPUT PORT ACTIVE OR A "GROUND" MAKES THE NO. 2 VERTICAL SPEED PORT ACTIVE.
2. FOR THESE CONFIGURATIONS, AN "OPEN" STATE OF THE SOURCE SELECT LOGIC (SS NO. 2) SHALL ALLOW THE ANALOG INPUT TO BE ACTIVE. WHEN THE SOURCE SELECT LOGIC IS "+28 V DC" THE NO. 1 DIGITAL VS INPUT PORT SHALL BE ACTIVE. THE CROSS SIDE DIG. OUTPUT SHALL BE CONNECTED TO THE NO. 1 DIG. INPUT FOR BOTH PILOT AND FIRST OFFICER.
3. THE DIGITAL ALTITUDE RATE OUTPUT FORMAT IS IDENTICAL TO THE DIGITAL ALTITUDE RATE INPUT. THE ALTITUDE RATE OUTPUT FORMATS ARE AS FOLLOWS:

Primary Alt. Rate Input	Alt. Rate Output
ARINC 429, Label 212	ARINC 429, Label 212
ARINC 429, Label 365	ARINC 429, Label 365
Analog ARINC 575 (dc)	ARINC 429, Label 212
Analog ARINC 565 (ac)	ARINC 429, Label 212

CAS-100 Interwiring Diagram
Figure 2015 (Sheet 16 of 16)

Table 2008. IVA-81A Configuration Matrix, Software Version -01 and -03

Configuration Matrix (-01 and -03 Software Only)										
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(5) Flags Config	(6) VS Response	(8) Pneumatic VS Modifier	(7) RLS Type	(9) Range Config	(10) Traffic Display Type
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/H	B	NOMINAL	ACCEL	MDA	3	SWITCHABLE
02	0 0 0 0 1 0	0	429	H/H	B	NOMINAL	ACCEL	BCA	3	SWITCHABLE
03	0 0 0 0 1 1	1	429	H/H	B	NOMINAL	ACCEL	NONE	3	SWITCHABLE
04	0 0 0 1 0 0	0	429	H/H	A	SLOW	ACCEL	NONE	0	TRAFFIC SEL
05	0 0 0 1 0 1	1	429	H/H	A	SLOW	ACCEL	NONE	0	SWITCHABLE
06	0 0 0 1 1 0	1	429	H/H	A	SLOW	ACCEL	BCA	0	TRAFFIC SEL
07	0 0 0 1 1 1	0	429	H/H	A	SLOW	ACCEL	BCA	0	SWITCHABLE
08	0 0 1 0 0 0	0	429	H/H	B	SLOW	ACCEL	NONE	3	NORMAL
09	0 0 1 0 0 1	1	429	H/H	B	SLOW	ACCEL	NONE	3	SWITCHABLE
10	0 0 1 0 1 0	1	429	H/H	A	NOMINAL	ACCEL	NONE	3	SWITCHABLE
11	0 0 1 0 1 1	0	429	H/H	A	NOMINAL	ACCEL	BCA	3	SWITCHABLE
12	0 0 1 1 0 0	1	429	H/H	A	NOMINAL	ACCEL	BCA	0	SWITCHABLE
13	0 0 1 1 0 1	0	429	H/H	B	NOMINAL	ACCEL	BCA	0	SWITCHABLE
14	0 0 1 1 1 0	0	429	H/H	A	FAST	ACCEL	NONE	3	NORMAL
15	0 0 1 1 1 1	1	429	H/H	B	FAST	ACCEL	NONE	3	NORMAL
16	0 1 0 0 0 0	0	429	H/H	A	NOMINAL	ACCEL	MDA	1	NORMAL
17	0 1 0 0 0 1	1	429	H/H	B	NOMINAL	ACCEL	MDA	1	NORMAL
18	0 1 0 0 1 0	1	429	H/H	A	NOMINAL	ACCEL	BCA	1	NORMAL
19	0 1 0 0 1 1	0	429	H/H	B	NOMINAL	ACCEL	BCA	1	NORMAL
20	0 1 0 1 0 0	1	419	H/L	A	NOMINAL	NO ACCEL	NONE	1	NORMAL
21	0 1 0 1 0 1	0	419	H/L	B	NOMINAL	NO ACCEL	NONE	1	NORMAL
22	0 1 0 1 1 0	0	429	H/H	A	NOMINAL	ACCEL	NONE	1	NORMAL
23	0 1 0 1 1 1	1	429	H/H	B	NOMINAL	ACCEL	NONE	1	NORMAL
24	0 1 1 0 0 0	1	429	H/H	A	NOMINAL	ACCEL	MDA	2	NORMAL
25	0 1 1 0 0 1	0	429	H/H	B	NOMINAL	ACCEL	MDA	2	NORMAL
26	0 1 1 0 1 0	0	429	H/H	A	NOMINAL	ACCEL	BCA	2	NORMAL
27	0 1 1 0 1 1	1	429	H/H	B	NOMINAL	ACCEL	BCA	2	NORMAL
28	0 1 1 1 0 0	0	419	H/L	A	NOMINAL	NO ACCEL	NONE	2	NORMAL
29	0 1 1 1 0 1	1	419	H/L	B	NOMINAL	NO ACCEL	NONE	2	NORMAL
30	0 1 1 1 1 0	1	429	H/H	A	NOMINAL	ACCEL	NONE	2	NORMAL
31	0 1 1 1 1 1	0	429	H/H	B	NOMINAL	ACCEL	NONE	2	NORMAL
32	1 0 0 0 0 0	0	429	H/H	B	NOMINAL	ACCEL	MDA	4	NORMAL

Table 2008. IVA-81A Configuration Matrix, Software Version -01 and -03 (cont)

Configuration Matrix (-01 and -03 Software Only)										
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(5) Flags Config	(6) VS Response	(8) Pneumatic VS Modifier	(7) RLS Type	(9) Range Config	(10) Traffic Display Type
33	1 0 0 0 0 1	1	429	H/L	B	NOMINAL	ACCEL	MDA	4	NORMAL
34	1 0 0 0 1 0	1	429	H/H	A	NOMINAL	ACCEL	MDA	0	TRAFFIC SEL
35	1 0 0 0 1 1	0	429	H/H	B	NOMINAL	ACCEL	MDA	0	TRAFFIC SEL
36	1 0 0 1 0 0	1	429	H/H	B	NOMINAL	ACCEL	BCA	4	NORMAL
37	1 0 0 1 0 1	0	429	H/L	B	NOMINAL	ACCEL	BCA	4	NORMAL
38	1 0 0 1 1 0	0	429	H/H	A	NOMINAL	ACCEL	BCA	0	TRAFFIC SEL
39	1 0 0 1 1 1	1	429	H/H	B	NOMINAL	ACCEL	BCA	0	TRAFFIC SEL
40	1 0 1 0 0 0	1	429	H/H	A	NOMINAL	ACCEL	NONE	0	SWITCHABLE
41	1 0 1 0 0 1	0	429	H/H	B	NOMINAL	ACCEL	NONE	0	SWITCHABLE
42	1 0 1 0 1 0	0	429	H/H	B	NOMINAL	ACCEL	NONE	4	NORMAL
43	1 0 1 0 1 1	1	429	H/L	B	NOMINAL	ACCEL	NONE	4	NORMAL
44	1 0 1 1 0 0	0	419	H/L	A	NOMINAL	NO ACCEL	NONE	0	TRAFFIC SEL
45	1 0 1 1 0 1	1	419	H/L	A	NOMINAL	NO ACCEL	NONE	0	SWITCHABLE
46	1 0 1 1 1 0	1	429	H/H	A	NOMINAL	ACCEL	NONE	0	TRAFFIC SEL
47	1 0 1 1 1 1	0	429	H/H	B	NOMINAL	ACCEL	NONE	0	TRAFFIC SEL
48	1 1 0 0 0 0	1	429	H/L	A	NOMINAL	ACCEL	MDA	3	NORMAL
49	1 1 0 0 0 1	0	419	H/L	B	NOMINAL	ACCEL	MDA	3	NORMAL
50	1 1 0 0 1 0	0	419	H/H	A	NOMINAL	ACCEL	MDA	3	NORMAL
51	1 1 0 0 1 1	1	429	H/H	B	NOMINAL	ACCEL	MDA	3	NORMAL
52	1 1 0 1 0 0	0	429	H/L	A	NOMINAL	ACCEL	BCA	3	NORMAL
53	1 1 0 1 0 1	1	429	H/L	B	NOMINAL	ACCEL	BCA	3	NORMAL
54	1 1 0 1 1 0	1	429	H/H	A	NOMINAL	ACCEL	BCA	3	NORMAL
55	1 1 0 1 1 1	0	429	H/H	B	NOMINAL	ACCEL	BCA	3	NORMAL
56	1 1 1 0 0 0	0	429	H/H	A	NOMINAL	ACCEL	MDA	0	SWITCHABLE
57	1 1 1 0 0 1	1	429	H/H	B	NOMINAL	ACCEL	MDA	0	SWITCHABLE
58	1 1 1 0 1 0	1	429	H/L	A	NOMINAL	NO ACCEL	NONE	3	NORMAL
59	1 1 1 0 1 1	0	429	H/L	B	NOMINAL	NO ACCEL	NONE	3	NORMAL
60	1 1 1 1 0 0	1	419	H/L	A	NOMINAL	NO ACCEL	NONE	3	NORMAL
61	1 1 1 1 0 1	0	419	H/L	B	NOMINAL	NO ACCEL	NONE	3	NORMAL
62	1 1 1 1 1 0	0	429	H/H	A	NOMINAL	ACCEL	NONE	3	NORMAL
63	1 1 1 1 1 1	1	429	H/H	B	NOMINAL	ACCEL	NONE	3	NORMAL

Table 2009. IVA-81A Configuration Matrix, Software Version -02

Configuration Matrix (-02 Software Only)									
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(6) VS Response	(8) Pneumatic VS Modifier	(9) Range Config	(10) Traffic Display Type	(11) Dim Knob
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/L	NOMINAL	ACCEL	3	NORMAL	YES
02	0 0 0 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	NO
03	0 0 0 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	YES
04	0 0 0 1 0 0	0	429	H/L	NOMINAL	ACCEL	2	NORMAL	NO
05	0 0 0 1 0 1	1	429	H/L	NOMINAL	ACCEL	2	NORMAL	YES
06	0 0 0 1 1 0	1	429	H/L	SLOW	ACCEL	3	NORMAL	NO
07	0 0 0 1 1 1	0	429	H/L	SLOW	ACCEL	3	NORMAL	YES
08	0 0 1 0 0 0	0	429	H/L	NOMINAL	ACCEL	0	NORMAL	NO
09	0 0 1 0 0 1	1	429	H/L	NOMINAL	ACCEL	0	NORMAL	YES
10	0 0 1 0 1 0	1	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
11	0 0 1 0 1 1	0	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
12	0 0 1 1 0 0	1	429	H/L	SLOW	ACCEL	4	NORMAL	NO
13	0 0 1 1 0 1	0	429	H/L	SLOW	ACCEL	4	NORMAL	YES
14	0 0 1 1 1 0	0	429	H/L	SLOW	ACCEL	3	SWITCHABLE	NO
15	0 0 1 1 1 1	1	429	H/L	SLOW	ACCEL	3	SWITCHABLE	YES
16	0 1 0 0 0 0	0	429	H/L	SLOW	ACCEL	0	NORMAL	NO
17	0 1 0 0 0 1	1	429	H/L	SLOW	ACCEL	0	NORMAL	YES
18	0 1 0 0 1 0	1	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	NO
19	0 1 0 0 1 1	0	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	YES
20	0 1 0 1 0 0	1	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	NO
21	0 1 0 1 0 1	0	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	YES
22	0 1 0 1 1 0	0	429	H/L	SLOW	ACCEL	2	NORMAL	NO
23	0 1 0 1 1 1	1	429	H/L	SLOW	ACCEL	2	NORMAL	YES
24	0 1 1 0 0 0	1	429	H/L	NOMINAL	ACCEL	3	NORMAL	NO
25	0 1 1 0 0 1	0	429	H/L	SLOW	ACCEL	0	SWITCHABLE	YES
26	0 1 1 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
27	0 1 1 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
28	0 1 1 1 0 0	0	429	H/L	NOMINAL	ACCEL	4	NORMAL	NO
29	0 1 1 1 0 1	1	429	H/L	NOMINAL	ACCEL	4	NORMAL	YES
30	0 1 1 1 1 0	1	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	NO
31	0 1 1 1 1 1	0	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	YES
32	1 0 0 0 0 0	0	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	NO

Table 2009. IVA-81A Configuration Matrix, Software Version -02 (cont)

Configuration Matrix (-02 Software Only)									
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(6) VS Response	(8) Pneumatic VS Modifier	(9) Range Config	(10) Traffic Display Type	(11) Dim Knob
33	1 0 0 0 0 1	1	419	H/H	NOMINAL	ACCEL	3	NORMAL	YES
34	1 0 0 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	NO
35	1 0 0 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	YES
36	1 0 0 1 0 0	1	419	H/H	NOMINAL	ACCEL	2	NORMAL	NO
37	1 0 0 1 0 1	0	419	H/H	NOMINAL	ACCEL	2	NORMAL	YES
38	1 0 0 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	NORMAL	NO
39	1 0 0 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	NORMAL	YES
40	1 0 1 0 0 0	1	419	H/H	NOMINAL	ACCEL	0	NORMAL	NO
41	1 0 1 0 0 1	0	419	H/H	NOMINAL	ACCEL	0	NORMAL	YES
42	1 0 1 0 1 0	0	419	H/H	NOMINAL	ACCEL	0	NORMAL	NO
43	1 0 1 0 1 1	1	419	H/H	SLOW	ACCEL	0	TRAFFIC SEL	YES
44	1 0 1 1 0 0	0	419	H/H	SLOW	NO ACCEL	4	NORMAL	NO
45	1 0 1 1 0 1	1	419	H/H	NOMINAL	NO ACCEL	4	NORMAL	YES
46	1 0 1 1 1 0	1	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	NO
47	1 0 1 1 1 1	0	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	YES
48	1 1 0 0 0 0	1	419	H/H	SLOW	NO ACCEL	0	NORMAL	NO
49	1 1 0 0 0 1	0	419	H/H	SLOW	NO ACCEL	0	NORMAL	YES
50	1 1 0 0 1 0	0	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	NO
51	1 1 0 0 1 1	1	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	YES
52	1 1 0 1 0 0	0	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	NO
53	1 1 0 1 0 1	1	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	YES
54	1 1 0 1 1 0	1	419	H/H	SLOW	NO ACCEL	2	NORMAL	NO
55	1 1 0 1 1 1	0	419	H/H	SLOW	NO ACCEL	2	NORMAL	YES
56	1 1 1 0 0 0	0	419	H/H	NOMINAL	ACCEL	3	NORMAL	NO
57	1 1 1 0 0 1	1	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	YES
58	1 1 1 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
59	1 1 1 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
60	1 1 1 1 0 0	1	419	H/H	NOMINAL	ACCEL	4	NORMAL	NO
61	1 1 1 1 0 1	0	419	H/H	NOMINAL	ACCEL	4	NORMAL	YES
62	1 1 1 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	NO
63	1 1 1 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	YES

Table 2010. IVA-81A Configuration Matrix, Software Version -04

Configuration Matrix (-04 Software Only)									
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(6) VS Response	(8) Pneumatic VS Modifier	(9) Range Config	(10) Traffic Display Type	(11) Dim Knob
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/L	NOMINAL	ACCEL	3	NORMAL	YES
02	0 0 0 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	NO
03	0 0 0 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	YES
04	0 0 0 1 0 0	0	429	H/L	NOMINAL	ACCEL	5	NORMAL	NO
05	0 0 0 1 0 1	1	429	H/L	NOMINAL	ACCEL	5	NORMAL	YES
06	0 0 0 1 1 0	1	429	H/L	SLOW	ACCEL	3	NORMAL	NO
07	0 0 0 1 1 1	0	429	H/L	SLOW	ACCEL	3	NORMAL	YES
08	0 0 1 0 0 0	0	429	H/L	NOMINAL	ACCEL	0	NORMAL	NO
09	0 0 1 0 0 1	1	429	H/L	NOMINAL	ACCEL	0	NORMAL	YES
10	0 0 1 0 1 0	1	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
11	0 0 1 0 1 1	0	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
12	0 0 1 1 0 0	1	429	H/L	SLOW	ACCEL	5	NORMAL	NO
13	0 0 1 1 0 1	0	429	H/L	SLOW	ACCEL	5	NORMAL	YES
14	0 0 1 1 1 0	0	429	H/L	SLOW	ACCEL	3	SWITCHABLE	NO
15	0 0 1 1 1 1	1	429	H/L	SLOW	ACCEL	3	SWITCHABLE	YES
16	0 1 0 0 0 0	0	429	H/L	SLOW	ACCEL	0	NORMAL	NO
17	0 1 0 0 0 1	1	429	H/L	SLOW	ACCEL	0	NORMAL	YES
18	0 1 0 0 1 0	1	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	NO
19	0 1 0 0 1 1	0	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	YES
20	0 1 0 1 0 0	1	429	H/L	NOMINAL	ACCEL	5	SWITCHABLE	NO
21	0 1 0 1 0 1	0	429	H/L	NOMINAL	ACCEL	5	SWITCHABLE	YES
22	0 1 0 1 1 0	0	429	H/L	SLOW	ACCEL	5	NORMAL	NO
23	0 1 0 1 1 1	1	429	H/L	SLOW	ACCEL	5	NORMAL	YES
24	0 1 1 0 0 0	1	429	H/L	NOMINAL	ACCEL	3	NORMAL	NO
25	0 1 1 0 0 1	0	429	H/L	SLOW	ACCEL	0	SWITCHABLE	YES
26	0 1 1 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
27	0 1 1 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
28	0 1 1 1 0 0	0	429	H/L	NOMINAL	ACCEL	5	NORMAL	NO
29	0 1 1 1 0 1	1	429	H/L	NOMINAL	ACCEL	5	NORMAL	YES
30	0 1 1 1 1 0	1	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	NO
31	0 1 1 1 1 1	0	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	YES
32	1 0 0 0 0 0	0	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	NO

Table 2010. IVA-81A Configuration Matrix, Software Version -04 (cont)

Configuration Matrix (-04 Software Only)									
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(6) VS Response	(8) Pneumatic VS Modifier	(9) Range Config	(10) Traffic Display Type	(11) Dim Knob
33	1 0 0 0 0 1	1	419	H/H	NOMINAL	ACCEL	3	NORMAL	YES
34	1 0 0 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	NO
35	1 0 0 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	YES
36	1 0 0 1 0 0	1	419	H/H	NOMINAL	ACCEL	5	NORMAL	NO
37	1 0 0 1 0 1	0	419	H/H	NOMINAL	ACCEL	5	NORMAL	YES
38	1 0 0 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	NORMAL	NO
39	1 0 0 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	NORMAL	YES
40	1 0 1 0 0 0	1	419	H/H	NOMINAL	ACCEL	0	NORMAL	NO
41	1 0 1 0 0 1	0	419	H/H	NOMINAL	ACCEL	0	NORMAL	YES
42	1 0 1 0 1 0	0	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
43	1 0 1 0 1 0	1	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
44	1 0 1 1 0 0	0	419	H/H	SLOW	NO ACCEL	5	NORMAL	NO
45	1 0 1 1 0 1	1	419	H/H	SLOW	NO ACCEL	5	NORMAL	YES
46	1 0 1 1 1 0	1	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	NO
47	1 0 1 1 1 1	0	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	YES
48	1 1 0 0 0 0	1	419	H/H	SLOW	NO ACCEL	0	NORMAL	NO
49	1 1 0 0 0 1	0	419	H/H	SLOW	NO ACCEL	0	NORMAL	YES
50	1 1 0 0 1 0	0	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	NO
51	1 1 0 0 1 1	1	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	YES
52	1 1 0 1 0 0	0	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	NO
53	1 1 0 1 0 1	1	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	YES
54	1 1 0 1 1 0	1	419	H/H	SLOW	NO ACCEL	5	NORMAL	NO
55	1 1 0 1 1 1	0	419	H/H	SLOW	NO ACCEL	5	NORMAL	YES
56	1 1 1 0 0 0	0	419	H/H	NOMINAL	ACCEL	3	NORMAL	NO
57	1 1 1 0 0 1	1	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	YES
58	1 1 1 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
59	1 1 1 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
60	1 1 1 1 0 0	1	419	H/H	NOMINAL	ACCEL	5	NORMAL	NO
61	1 1 1 1 0 1	0	419	H/H	NOMINAL	ACCEL	5	NORMAL	YES
62	1 1 1 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	NO
63	1 1 1 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	YES

Table 2011. IVA-81A Configuration Matrix, Software Version -05

Configuration Matrix (-05 Software Only)									
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(6) VS Response	(8) Pneumatic VS Modifier	(9) Range Config	(10) Traffic Display Type	(11) Dim Knob
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/L	NOMINAL	ACCEL	3	NORMAL	YES
02	0 0 0 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	NO
03	0 0 0 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	YES
04	0 0 0 1 0 0	0	429	H/L	NOMINAL	ACCEL	6	NORMAL	NO
05	0 0 0 1 0 1	1	429	H/L	NOMINAL	ACCEL	6	NORMAL	YES
06	0 0 0 1 1 0	1	429	H/L	SLOW	ACCEL	3	NORMAL	NO
07	0 0 0 1 1 1	0	429	H/L	SLOW	ACCEL	3	NORMAL	YES
08	0 0 1 0 0 0	0	429	H/L	NOMINAL	ACCEL	0	NORMAL	NO
09	0 0 1 0 0 1	1	429	H/L	NOMINAL	ACCEL	0	NORMAL	YES
10	0 0 1 0 1 0	1	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
11	0 0 1 0 1 1	0	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
12	0 0 1 1 0 0	1	429	H/L	SLOW	ACCEL	6	NORMAL	NO
13	0 0 1 1 0 1	0	429	H/L	SLOW	ACCEL	6	NORMAL	YES
14	0 0 1 1 1 0	0	429	H/L	SLOW	ACCEL	3	SWITCHABLE	NO
15	0 0 1 1 1 1	1	429	H/L	SLOW	ACCEL	3	SWITCHABLE	YES
16	0 1 0 0 0 0	0	429	H/L	SLOW	ACCEL	0	NORMAL	NO
17	0 1 0 0 0 1	1	429	H/L	SLOW	ACCEL	0	NORMAL	YES
18	0 1 0 0 1 0	1	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	NO
19	0 1 0 0 1 1	0	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	YES
20	0 1 0 1 0 0	1	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	NO
21	0 1 0 1 0 1	0	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	YES
22	0 1 0 1 1 0	0	429	H/L	SLOW	ACCEL	6	NORMAL	NO
23	0 1 0 1 1 1	1	429	H/L	SLOW	ACCEL	6	NORMAL	YES
24	0 1 1 0 0 0	1	429	H/L	NOMINAL	ACCEL	3	NORMAL	NO
25	0 1 1 0 0 1	0	429	H/L	SLOW	ACCEL	0	SWITCHABLE	YES
26	0 1 1 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
27	0 1 1 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
28	0 1 1 1 0 0	0	429	H/L	NOMINAL	ACCEL	6	NORMAL	NO
29	0 1 1 1 0 1	1	429	H/L	NOMINAL	ACCEL	6	NORMAL	YES
30	0 1 1 1 1 0	1	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	NO
31	0 1 1 1 1 1	0	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	YES
32	1 0 0 0 0 0	0	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	NO

Table 2011. IVA-81A Configuration Matrix, Software Version -05 (cont)

Configuration Matrix (-05 Software Only)									
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(6) VS Response	(8) Pneumatic VS Modifier	(9) Range Config	(10) Traffic Display Type	(11) Dim Knob
33	1 0 0 0 0 1	1	419	H/H	NOMINAL	ACCEL	3	NORMAL	YES
34	1 0 0 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	NO
35	1 0 0 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	YES
36	1 0 0 1 0 0	1	419	H/H	NOMINAL	ACCEL	6	NORMAL	NO
37	1 0 0 1 0 1	0	419	H/H	NOMINAL	ACCEL	6	NORMAL	YES
38	1 0 0 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	NORMAL	NO
39	1 0 0 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	NORMAL	YES
40	1 0 1 0 0 0	1	419	H/H	NOMINAL	ACCEL	0	NORMAL	NO
41	1 0 1 0 0 1	0	419	H/H	NOMINAL	ACCEL	0	NORMAL	YES
42	1 0 1 0 1 0	0	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
43	1 0 1 0 1 1	1	419	H/H	NOMINAL	NO ACCEL	0	TRAFFIC SEL	YES
44	1 0 1 1 0 0	0	419	H/H	SLOW	NO ACCEL	6	NORMAL	NO
45	1 0 1 1 0 1	1	419	H/H	SLOW	NO ACCEL	6	NORMAL	YES
46	1 0 1 1 1 0	1	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	NO
47	1 0 1 1 1 1	0	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	YES
48	1 1 0 0 0 0	1	419	H/H	SLOW	NO ACCEL	0	NORMAL	NO
49	1 1 0 0 0 1	0	419	H/H	SLOW	NO ACCEL	0	NORMAL	YES
50	1 1 0 0 1 0	0	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	NO
51	1 1 0 0 1 1	1	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	YES
52	1 1 0 1 0 0	0	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	NO
53	1 1 0 1 0 1	1	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	YES
54	1 1 0 1 1 0	1	419	H/H	SLOW	NO ACCEL	6	NORMAL	NO
55	1 1 0 1 1 1	0	419	H/H	SLOW	NO ACCEL	6	NORMAL	YES
56	1 1 1 0 0 0	0	419	H/H	NOMINAL	ACCEL	3	NORMAL	NO
57	1 1 1 0 0 1	1	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	YES
58	1 1 1 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
59	1 1 1 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
60	1 1 1 1 0 0	1	419	H/H	NOMINAL	ACCEL	6	NORMAL	NO
61	1 1 1 1 0 1	0	419	H/H	NOMINAL	ACCEL	6	NORMAL	YES
62	1 1 1 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	NO
63	1 1 1 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	YES

Table 2012. IVA-81A Configuration Matrix, Software Version -06

Configuration Matrix (-06 Software Only)									
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(6) VS Response	(8) Pneumatic VS Modifier	(9) Range Config	(10) Traffic Display Type	(11) Dim Knob
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/L	NOMINAL	ACCEL	3	NORMAL	YES
02	0 0 0 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	NO
03	0 0 0 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	YES
04	0 0 0 1 0 0	0	429	H/L	NOMINAL	ACCEL	6	NORMAL	NO
05	0 0 0 1 0 1	1	429	H/L	NOMINAL	ACCEL	6	NORMAL	YES
06	0 0 0 1 1 0	1	429	H/L	SLOW	ACCEL	3	NORMAL	NO
07	0 0 0 1 1 1	0	429	H/L	SLOW	ACCEL	3	NORMAL	YES
08	0 0 1 0 0 0	0	429	H/L	NOMINAL	ACCEL	0	NORMAL	NO
09	0 0 1 0 0 1	1	429	H/L	NOMINAL	ACCEL	0	NORMAL	YES
10	0 0 1 0 1 0	1	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
11	0 0 1 0 1 1	0	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
12	0 0 1 1 0 0	1	429	H/L	SLOW	ACCEL	6	NORMAL	NO
13	0 0 1 1 0 1	0	429	H/L	SLOW	ACCEL	6	NORMAL	YES
14	0 0 1 1 1 0	0	429	H/L	SLOW	ACCEL	3	SWITCHABLE	NO
15	0 0 1 1 1 1	1	429	H/L	LOW	ACCEL	3	SWITCHABLE	YES
16	0 1 0 0 0 0	0	429	H/L	SLOW	ACCEL	0	NORMAL	NO
17	0 1 0 0 0 1	1	429	H/L	SLOW	ACCEL	0	NORMAL	YES
18	0 1 0 0 1 0	1	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	NO
19	0 1 0 0 1 1	0	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	YES
20	0 1 0 1 0 0	1	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	NO
21	0 1 0 1 0 1	0	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	YES
22	0 1 0 1 1 0	0	429	H/L	SLOW	ACCEL	6	NORMAL	NO
23	0 1 0 1 1 1	1	429	H/L	SLOW	ACCEL	6	NORMAL	YES
24	0 1 1 0 0 0	1	429	H/L	NOMINAL	ACCEL	3	NORMAL	NO
25	0 1 1 0 0 1	0	429	H/L	SLOW	ACCEL	0	SWITCHABLE	YES
26	0 1 1 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
27	0 1 1 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
28	0 1 1 1 0 0	0	429	H/L	NOMINAL	ACCEL	6	NORMAL	NO
29	0 1 1 1 0 1	1	429	H/L	NOMINAL	ACCEL	6	NORMAL	YES
30	0 1 1 1 1 0	1	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	NO
31	0 1 1 1 1 1	0	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	YES
32	1 0 0 0 0 0	0	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	NO

Table 2012. IVA-81A Configuration Matrix, Software Version -06 (cont)

Configuration Matrix (-06 Software Only)									
	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(6) VS Response	(8) Pneumatic VS Modifier	(9) Range Config	(10) Traffic Display Type	(11) Dim Knob
33	1 0 0 0 0 1	1	419	H/H	NOMINAL	ACCEL	3	NORMAL	YES
34	1 0 0 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	NO
35	1 0 0 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	YES
36	1 0 0 1 0 0	1	419	H/H	NOMINAL	ACCEL	6	NORMAL	NO
37	1 0 0 1 0 1	0	419	H/H	NOMINAL	ACCEL	6	NORMAL	YES
38	1 0 0 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	NORMAL	NO
39	1 0 0 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	NORMAL	YES
40	1 0 1 0 0 0	1	419	H/H	NOMINAL	ACCEL	0	NORMAL	NO
41	1 0 1 0 0 1	0	419	H/H	NOMINAL	ACCEL	0	NORMAL	YES
42	1 0 1 0 1 0	0	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
43	1 0 1 0 1 1	1	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
44	1 0 1 1 0 0	0	419	H/H	SLOW	NO ACCEL	6	NORMAL	NO
45	1 0 1 1 0 1	1	419	H/H	SLOW	NO ACCEL	6	NORMAL	YES
46	1 0 1 1 1 0	1	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	NO
47	1 0 1 1 1 1	0	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	YES
48	1 1 0 0 0 0	1	419	H/H	SLOW	NO ACCEL	0	NORMAL	NO
49	1 1 0 0 0 1	0	419	H/H	SLOW	NO ACCEL	0	NORMAL	YES
50	1 1 0 0 1 0	0	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	NO
51	1 1 0 0 1 1	1	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	YES
52	1 1 0 1 0 0	0	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	NO
53	1 1 0 1 0 1	1	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	YES
54	1 1 0 1 1 0	1	419	H/H	SLOW	NO ACCEL	6	NORMAL	NO
55	1 1 0 1 1 1	0	419	H/H	SLOW	NO ACCEL	6	NORMAL	YES
56	1 1 1 0 0 0	0	419	H/H	NOMINAL	ACCEL	3	NORMAL	NO
57	1 1 1 0 0 1	1	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	YES
58	1 1 1 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
59	1 1 1 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
60	1 1 1 1 0 0	1	419	H/H	NOMINAL	ACCEL	6	NORMAL	NO
61	1 1 1 1 0 1	0	419	H/H	NOMINAL	ACCEL	6	NORMAL	YES
62	1 1 1 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	NO
63	1 1 1 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	YES

Table 2013. IVA-81D Configuration Matrix, Software Version -02 and -04

Configuration Matrix (Grimes -02 and -04 Software Only)										
	System Straps 3 3 3 3 1 3 8 7 6 5 7 4	Parity 1 9	Lo Speed VS Modifier	Hi Speed VS Modifier	Flags Config	VS Response	Pneumatic VS Modifier	RLS Type	Range Config	Traffic Display Type Note: There is no Dim Knob if set to Normal.
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/H	B	NOMINAL	ACCEL	MDA	3	SWITCHABLE
02	0 0 0 0 1 0	0	429	H/H	B	NOMINAL	ACCEL	BCA	3	SWITCHABLE
03	0 0 0 0 1 1	1	429	H/H	B	NOMINAL	ACCEL	NONE	3	SWITCHABLE
04	0 0 0 1 0 0	0	429	H/H	A	SLOW	ACCEL	NONE	0	TRAFFIC SEL
05	0 0 0 1 0 1	1	429	H/H	A	SLOW	ACCEL	NONE	0	SWITCHABLE
06	0 0 0 1 1 0	1	429	H/H	A	SLOW	ACCEL	BCA	0	TRAFFIC SEL
07	0 0 0 1 1 1	0	429	H/H	A	SLOW	ACCEL	BCA	0	SWITCHABLE
08	0 0 1 0 0 0	0	429	H/H	B	SLOW	ACCEL	NONE	3	NORMAL
09	0 0 1 0 0 1	1	429	H/H	B	SLOW	ACCEL	NONE	3	SWITCHABLE
10	0 0 1 0 1 0	1	429	H/H	A	NOMINAL	ACCEL	NONE	3	SWITCHABLE
11	0 0 1 0 1 1	0	429	H/H	A	NOMINAL	ACCEL	BCA	3	SWITCHABLE
12	0 0 1 1 0 0	1	429	H/H	A	NOMINAL	ACCEL	BCA	0	SWITCHABLE
13	0 0 1 1 0 1	0	429	H/H	B	NOMINAL	ACCEL	BCA	0	SWITCHABLE
14	0 0 1 1 1 0	0	429	H/H	A	FAST	ACCEL	NONE	3	NORMAL
15	0 0 1 1 1 1	1	429	H/H	B	FAST	ACCEL	NONE	3	NORMAL
16	0 1 0 0 0 0	0	429	H/H	A	NOMINAL	ACCEL	MDA	1	NORMAL
17	0 1 0 0 0 1	1	429	H/H	B	NOMINAL	ACCEL	MDA	1	NORMAL
18	0 1 0 0 1 0	1	429	H/H	A	NOMINAL	ACCEL	BCA	1	NORMAL
19	0 1 0 0 1 1	0	429	H/H	B	NOMINAL	ACCEL	BCA	1	NORMAL
20	0 1 0 1 0 0	1	419	H/L	A	NOMINAL	NO ACCEL	NONE	1	NORMAL
21	0 1 0 1 0 1	0	419	H/L	B	NOMINAL	NO ACCEL	NONE	1	NORMAL
22	0 1 0 1 1 0	0	429	H/H	A	NOMINAL	ACCEL	NONE	1	NORMAL
23	0 1 0 1 1 1	1	429	H/H	B	NOMINAL	ACCEL	NONE	1	NORMAL
24	0 1 1 0 0 0	1	429	H/H	A	NOMINAL	ACCEL	MDA		NORMAL
25	0 1 1 0 0 1	0	429	H/H	B	NOMINAL	ACCEL	MDA	2	NORMAL
26	0 1 1 0 1 0	0	429	H/H	A	NOMINAL	ACCEL	BCA	2	NORMAL
27	0 1 1 0 1 1	1	429	H/H	B	NOMINAL	ACCEL	BCA	2	NORMAL
28	0 1 1 1 0 0	0	419	H/L	A	NOMINAL	NO ACCEL	NONE	2	NORMAL
29	0 1 1 1 0 1	1	419	H/L	B	NOMINAL	NO ACCEL	NONE	2	NORMAL
30	0 1 1 1 1 0	1	429	H/H	A	NOMINAL	ACCEL	NONE	2	NORMAL
31	0 1 1 1 1 1	0	429	H/H	B	NOMINAL	ACCEL	NONE	2	NORMAL
32	1 0 0 0 0 0	0	429	H/H	B	NOMINAL	ACCEL	MDA	4	NORMAL

Table 2013. IVA-81D Configuration Matrix, Software Version -02 and -04 (cont)

Configuration Matrix (Grimes -02 and -04 Software Only)										
	System Straps 3 3 3 3 1 3 8 7 6 5 7 4	Parity 1 9	Lo Speed VS Modifier	Hi Speed VS Modifier	Flags Config	VS Response	Pneumatic VS Modifier	RLS Type	Range Config	Traffic Display Type Note: There is no Dim Knob if set to Normal.
33	1 0 0 0 0 1	1	429	H/L	B	NOMINAL	ACCEL	MDA	4	NORMAL
34	1 0 0 0 1 0	1	429	H/H	A	NOMINAL	ACCEL	MDA	0	TRAFFIC SEL
35	1 0 0 0 1 1	0	429	H/H	B	NOMINAL	ACCEL	MDA	0	TRAFFIC SEL
36	1 0 0 1 0 0	1	429	H/H	B	NOMINAL	ACCEL	BCA	4	NORMAL
37	1 0 0 1 0 1	0	429	H/L	B	NOMINAL	ACCEL	BCA	4	NORMAL
38	1 0 0 1 1 0	0	429	H/H	A	NOMINAL	ACCEL	BCA	0	TRAFFIC SEL
39	1 0 0 1 1 1	1	429	H/H	B	NOMINAL	ACCEL	BCA	0	TRAFFIC SEL
40	1 0 1 0 0 0	1	429	H/H	A	NOMINAL	ACCEL	NONE	0	SWITCHABLE
41	1 0 1 0 0 1	0	429	H/H	B	NOMINAL	ACCEL	NONE	0	SWITCHABLE
42	1 0 1 0 1 0	0	429	H/H	B	NOMINAL	ACCEL	NONE	4	NORMAL
43	1 0 1 0 1 1	1	429	H/L	B	NOMINAL	ACCEL	NONE	4	NORMAL
44	1 0 1 1 0 0	0	419	H/L	A	NOMINAL	NO ACCEL	NONE	0	TRAFFIC SEL
45	1 0 1 1 0 1	1	419	H/L	A	NOMINAL	NO ACCEL	NONE	0	SWITCHABLE
46	1 0 1 1 1 0	1	429	H/H	A	NOMINAL	ACCEL	NONE	0	TRAFFIC SEL
47	1 0 1 1 1 1	0	429	H/H	B	NOMINAL	ACCEL	NONE	0	TRAFFIC SEL
48	1 1 0 0 0 0	1	429	H/L	A	NOMINAL	ACCEL	MDA	3	NORMAL
49	1 1 0 0 0 1	0	429	H/L	B	NOMINAL	ACCEL	MDA	3	NORMAL
50	1 1 0 0 1 0	0	429	H/H	A	NOMINAL	ACCEL	MDA	3	NORMAL
51	1 1 0 0 1 1	1	429	H/H	B	NOMINAL	ACCEL	MDA	3	NORMAL
52	1 1 0 1 0 0	0	429	H/L	A	NOMINAL	ACCEL	BCA	3	NORMAL
53	1 1 0 1 0 1	1	429	H/L	B	NOMINAL	ACCEL	BCA	3	NORMAL
54	1 1 0 1 1 0	1	429	H/H	A	NOMINAL	ACCEL	BCA	3	NORMAL
55	1 1 0 1 1 1	0	429	H/H	B	NOMINAL	ACCEL	BCA	3	NORMAL
56	1 1 1 0 0 0	0	429	H/H	A	NOMINAL	ACCEL	MDA	0	SWITCHABLE
57	1 1 1 0 0 1	1	429	H/H	B	NOMINAL	ACCEL	MDA	0	SWITCHABLE
58	1 1 1 0 1 0	1	429	H/L	A	NOMINAL	NO ACCEL	NONE	3	NORMAL
59	1 1 1 0 1 1	0	429	H/L	B	NOMINAL	NO ACCEL	NONE	3	NORMAL
60	1 1 1 1 0 0	1	419	H/L	A	NOMINAL	NO ACCEL	NONE	3	NORMAL
61	1 1 1 1 0 1	0	419	H/L	B	NOMINAL	NO ACCEL	NONE	3	NORMAL
62	1 1 1 1 1 0	0	429	H/H	A	NOMINAL	ACCEL	NONE	3	NORMAL
63	1 1 1 1 1 1	1	429	H/H	B	NOMINAL	ACCEL	NONE	3	NORMAL

Table 2014. IVA-81D Configuration Matrix, Software Version -03

Configuration Matrix (Grimes -03 Software Only)									
	System Straps 3 3 3 3 1 3 8 7 6 5 7 4	Parity 1 9	Lo Speed VS Modifier	Hi Speed VS Modifier	VS Response	Pneumatic VS Modifier	Range Config	Traffic Display Type	Dim Knob
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/L	NOMINAL	ACCEL	3	NORMAL	YES
02	0 0 0 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	NO
03	0 0 0 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	YES
04	0 0 0 1 0 0	0	429	H/L	NOMINAL	ACCEL	2	NORMAL	NO
05	0 0 0 1 0 1	1	429	H/L	NOMINAL	ACCEL	2	NORMAL	YES
06	0 0 0 1 1 0	1	429	H/L	SLOW	ACCEL	3	NORMAL	NO
07	0 0 0 1 1 1	0	429	H/L	SLOW	ACCEL	3	NORMAL	YES
08	0 0 1 0 0 0	0	429	H/L	NOMINAL	ACCEL	0	NORMAL	NO
09	0 0 1 0 0 1	1	429	H/L	NOMINAL	ACCEL	0	NORMAL	YES
10	0 0 1 0 1 0	1	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
11	0 0 1 0 1 1	0	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
12	0 0 1 1 0 0	1	429	H/L	SLOW	ACCEL	4	NORMAL	NO
13	0 0 1 1 0 1	0	429	H/L	SLOW	ACCEL	4	NORMAL	YES
14	0 0 1 1 1 0	0	429	H/L	SLOW	ACCEL	3	SWITCHABLE	NO
15	0 0 1 1 1 1	1	429	H/L	SLOW	ACCEL	3	SWITCHABLE	YES
16	0 1 0 0 0 0	0	429	H/L	SLOW	ACCEL	0	NORMAL	NO
17	0 1 0 0 0 1	1	429	H/L	SLOW	ACCEL	0	NORMAL	YES
18	0 1 0 0 1 0	1	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	NO
19	0 1 0 0 1 1	0	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	YES
20	0 1 0 1 0 0	1	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	NO
21	0 1 0 1 0 1	0	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	YES
22	0 1 0 1 1 0	0	429	H/L	SLOW	ACCEL	2	NORMAL	
23	0 1 0 1 1 1	1	429	H/L	SLOW	ACCEL	2	NORMAL	
24	0 1 1 0 0 0	1	429	H/L	NOMINAL	ACCEL	3	NORMAL	
25	0 1 1 0 0 1	0	429	H/L	SLOW	ACCEL	0	SWITCHABLE	
26	0 1 1 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	
27	0 1 1 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	
28	0 1 1 1 0 0	0	429	H/L	NOMINAL	ACCEL	4	NORMAL	
29	0 1 1 1 0 1	1	429	H/L	NOMINAL	ACCEL	4	NORMAL	
30	0 1 1 1 1 0	1	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	
31	0 1 1 1 1 1	0	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	
32	1 0 0 0 0 0	0	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	

Table 2014. IVA-81D Configuration Matrix, Software Version -03 (cont)

Configuration Matrix (Grimes -03 Software Only)									
	System Straps 3 3 3 3 1 3 8 7 6 5 7 4	Parity 1 9	Lo Speed VS Modifier	Hi Speed VS Modifier	VS Response	Pneumatic VS Modifier	Range Config	Traffic Display Type	Dim Knob
33	1 0 0 0 0 1	1	419	H/H	NOMINAL	ACCEL	3	NORMAL	
34	1 0 0 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	
35	1 0 0 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	
36	1 0 0 1 0 0	1	419	H/H	NOMINAL	ACCEL	2	NORMAL	
37	1 0 0 1 0 1	0	419	H/H	NOMINAL	ACCEL	2	NORMAL	
38	1 0 0 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	NORMAL	
39	1 0 0 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	NORMAL	
40	1 0 1 0 0 0	1	419	H/H	NOMINAL	ACCEL	0	NORMAL	
41	1 0 1 0 0 1	0	419	H/H	NOMINAL	ACCEL	0	NORMAL	
42	1 0 1 0 1 0	0	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	
43	1 0 1 0 1 1	1	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
44	1 0 1 1 0 0	0	419	H/H	SLOW	NO ACCEL	4	NORMAL	NO
45	1 0 1 1 0 1	1	419	H/H	SLOW	NO ACCEL	4	NORMAL	YES
46	1 0 1 1 1 0	1	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	NO
47	1 0 1 1 1 1	0	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	YES
48	1 1 0 0 0 0	1	419	H/H	SLOW	NO ACCEL	0	NORMAL	NO
49	1 1 0 0 0 1	0	419	H/H	SLOW	NO ACCEL	0	NORMAL	YES
50	1 1 0 0 1 0	0	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	NO
51	1 1 0 0 1 1	1	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	YES
52	1 1 0 1 0 0	0	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	NO
53	1 1 0 1 0 1	1	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	YES
54	1 1 0 1 1 0	1	419	H/H	SLOW	NO ACCEL	2	NORMAL	NO
55	1 1 0 1 1 1	0	419	H/H	SLOW	NO ACCEL	2	NORMAL	YES
56	1 1 1 0 0 0	0	419	H/H	NOMINAL	ACCEL	3	NORMAL	NO
57	1 1 1 0 0 1	1	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	YES
58	1 1 1 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
59	1 1 1 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
60	1 1 1 1 0 0	1	419	H/H	NOMINAL	ACCEL	4	NORMAL	NO
61	1 1 1 1 0 1	0	419	H/H	NOMINAL	ACCEL	4	NORMAL	YES
62	1 1 1 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	NO
63	1 1 1 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	YES

Table 2015. IVA-81D Configuration Matrix, Software Version -05

Configuration Matrix (Grimes -05 Software Only)									
	System Straps 3 3 3 3 1 3 8 7 6 5 7 4	Parity 1 9	Lo Speed VS Modifier	Hi Speed VS Modifier	VS Response	Pneumatic VS Modifier	Range Config	Traffic Display Type	Dim Knob
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/L	NOMINAL	ACCEL	3	NORMAL	YES
02	0 0 0 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	NO
03	0 0 0 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	YES
04	0 0 0 1 0 0	0	429	H/L	NOMINAL	ACCEL	5	NORMAL	NO
05	0 0 0 1 0 1	1	429	H/L	NOMINAL	ACCEL	5	NORMAL	YES
06	0 0 0 1 1 0	1	429	H/L	SLOW	ACCEL	3	NORMAL	NO
07	0 0 0 1 1 1	0	429	H/L	SLOW	ACCEL	3	NORMAL	YES
08	0 0 1 0 0 0	0	429	H/L	NOMINAL	ACCEL	0	NORMAL	NO
09	0 0 1 0 0 1	1	429	H/L	NOMINAL	ACCEL	0	NORMAL	YES
10	0 0 1 0 1 0	1	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
11	0 0 1 0 1 1	0	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
12	0 0 1 1 0 0	1	429	H/L	SLOW	ACCEL	5	NORMAL	NO
13	0 0 1 1 0 1	0	429	H/L	SLOW	ACCEL	5	NORMAL	YES
14	0 0 1 1 1 0	0	429	H/L	SLOW	ACCEL	3	SWITCHABLE	NO
15	0 0 1 1 1 1	1	429	H/L	LOW	ACCEL	3	SWITCHABLE	YES
16	0 1 0 0 0 0	0	429	H/L	SLOW	ACCEL	0	NORMAL	NO
17	0 1 0 0 0 1	1	429	H/L	SLOW	ACCEL	0	NORMAL	YES
18	0 1 0 0 1 0	1	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	NO
19	0 1 0 0 1 1	0	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	YES
20	0 1 0 1 0 0	1	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	NO
21	0 1 0 1 0 1	0	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	YES
22	0 1 0 1 1 0	0	429	H/L	SLOW	ACCEL	5	NORMAL	NO
23	0 1 0 1 1 1	1	429	H/L	SLOW	ACCEL	5	NORMAL	YES
24	0 1 1 0 0 0	1	429	H/L	NOMINAL	ACCEL	3	NORMAL	NO
25	0 1 1 0 0 1	0	429	H/L	SLOW	ACCEL	0	SWITCHABLE	YES
26	0 1 1 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
27	0 1 1 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
28	0 1 1 1 0 0	0	429	H/L	NOMINAL	ACCEL	5	NORMAL	NO
29	0 1 1 1 0 1	1	429	H/L	NOMINAL	ACCEL	5	NORMAL	YES
30	0 1 1 1 1 0	1	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	NO
31	0 1 1 1 1 1	0	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	YES
32	1 0 0 0 0 0	0	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	NO

Table 2015. IVA-81D Conversion Matrix, Software Version -05 (cont)

Configuration Matrix (Grimes -05 Software Only)									
	System Straps 3 3 3 3 1 3 8 7 6 5 7 4	Parity 1 9	Lo Speed VS Modifier	Hi Speed VS Modifier	VS Response	Pneumatic VS Modifier	Range Config	Traffic Display Type	Dim Knob
33	1 0 0 0 0 1	1	419	H/H	NOMINAL	ACCEL	3	NORMAL	YES
34	1 0 0 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	NO
35	1 0 0 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	YES
36	1 0 0 1 0 0	1	419	H/H	NOMINAL	ACCEL	5	NORMAL	NO
37	1 0 0 1 0 1	0	419	H/H	NOMINAL	ACCEL	5	NORMAL	YES
38	1 0 0 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	NORMAL	NO
39	1 0 0 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	NORMAL	YES
40	1 0 1 0 0 0	1	419	H/H	NOMINAL	ACCEL	0	NORMAL	NO
41	1 0 1 0 0 1	0	419	H/H	NOMINAL	ACCEL	0	NORMAL	YES
42	1 0 1 0 1 0	0	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
43	1 0 1 0 1 1	1	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
44	1 0 1 1 0 0	0	419	H/H	SLOW	NO ACCEL	5	NORMAL	NO
45	1 0 1 1 0 1	1	419	H/H	SLOW	NO ACCEL	5	NORMAL	YES
46	1 0 1 1 1 0	1	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	NO
47	1 0 1 1 1 1	0	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	YES
48	1 1 0 0 0 0	1	419	H/H	SLOW	NO ACCEL	0	NORMAL	NO
49	1 1 0 0 0 1	0	419	H/H	SLOW	NO ACCEL	0	NORMAL	YES
50	1 1 0 0 1 0	0	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	NO
51	1 1 0 0 1 1	1	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	YES
52	1 1 0 1 0 0	0	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	NO
53	1 1 0 1 0 1	1	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	YES
54	1 1 0 1 1 0	1	419	H/H	SLOW	NO ACCEL	5	NORMAL	NO
55	1 1 0 1 1 1	0	419	H/H	SLOW	NO ACCEL	5	NORMAL	YES
56	1 1 1 0 0 0	0	419	H/H	NOMINAL	ACCEL	3	NORMAL	NO
57	1 1 1 0 0 1	1	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	YES
58	1 1 1 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
59	1 1 1 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
60	1 1 1 1 0 0	1	419	H/H	NOMINAL	ACCEL	5	NORMAL	NO
61	1 1 1 1 0 1	0	419	H/H	NOMINAL	ACCEL	5	NORMAL	YES
62	1 1 1 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	NO
63	1 1 1 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	YES

Table 2016. IVA-81D Configuration Matrix, Software Version -06

Configuration Matrix (Grimes -06 Software Only)									
	System Straps 3 3 3 3 1 3 8 7 6 5 7 4	Parity 1 9	Lo Speed VS Modifier	Hi Speed VS Modifier	VS Response	Pneumatic VS Modifier	Range Config	Traffic Display Type	Dim Knob
00	0 0 0 0 0 0	1	429	H/L	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	H/L	NOMINAL	ACCEL	3	NORMAL	YES
02	0 0 0 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	NO
03	0 0 0 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	SWITCHABLE	YES
04	0 0 0 1 0 0	0	429	H/L	NOMINAL	ACCEL	6	NORMAL	NO
05	0 0 0 1 0 1	1	429	H/L	NOMINAL	ACCEL	6	NORMAL	YES
06	0 0 0 1 1 0	1	429	H/L	SLOW	ACCEL	3	NORMAL	NO
07	0 0 0 1 1 1	0	429	H/L	SLOW	ACCEL	3	NORMAL	YES
08	0 0 1 0 0 0	0	429	H/L	NOMINAL	ACCEL	0	NORMAL	NO
09	0 0 1 0 0 1	1	429	H/L	NOMINAL	ACCEL	0	NORMAL	YES
10	0 0 1 0 1 0	1	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
11	0 0 1 0 1 1	0	429	H/L	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
12	0 0 1 1 0 0	1	429	H/L	SLOW	ACCEL	6	NORMAL	NO
13	0 0 1 1 0 1	0	429	H/L	SLOW	ACCEL	6	NORMAL	YES
14	0 0 1 1 1 0	0	429	H/L	SLOW	ACCEL	3	SWITCHABLE	NO
15	0 0 1 1 1 1	1	429	H/L	LOW	ACCEL	3	SWITCHABLE	YES
16	0 1 0 0 0 0	0	429	H/L	SLOW	ACCEL	0	NORMAL	NO
17	0 1 0 0 0 1	1	429	H/L	SLOW	ACCEL	0	NORMAL	YES
18	0 1 0 0 1 0	1	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	NO
19	0 1 0 0 1 1	0	429	H/L	SLOW	ACCEL	0	TRAFFIC SEL	YES
20	0 1 0 1 0 0	1	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	NO
21	0 1 0 1 0 1	0	429	H/L	NOMINAL	ACCEL	0	SWITCHABLE	YES
22	0 1 0 1 1 0	0	429	H/L	SLOW	ACCEL	6	NORMAL	NO
23	0 1 0 1 1 1	1	429	H/L	SLOW	ACCEL	6	NORMAL	YES
24	0 1 1 0 0 0	1	429	H/L	NOMINAL	ACCEL	3	NORMAL	NO
25	0 1 1 0 0 1	0	429	H/L	SLOW	ACCEL	0	SWITCHABLE	YES
26	0 1 1 0 1 0	0	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
27	0 1 1 0 1 1	1	429	H/L	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
28	0 1 1 1 0 0	0	429	H/L	NOMINAL	ACCEL	6	NORMAL	NO
29	0 1 1 1 0 1	1	429	H/L	NOMINAL	ACCEL	6	NORMAL	YES
30	0 1 1 1 1 0	1	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	NO
31	0 1 1 1 1 1	0	429	H/L	SLOW	ACCEL	3	TRAFFIC SEL	YES
32	1 0 0 0 0 0	0	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	NO

Table 2016. IVA-81D Configuration Matrix, Software Version -06 (cont)

Configuration Matrix (Grimes -06 Software Only)									
	System Straps 3 3 3 3 1 3 8 7 6 5 7 4	Parity 1 9	Lo Speed VS Modifier	Hi Speed VS Modifier	VS Response	Pneumatic VS Modifier	Range Config	Traffic Display Type	Dim Knob
33	1 0 0 0 0 1	1	419	H/H	NOMINAL	ACCEL	3	NORMAL	YES
34	1 0 0 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	NO
35	1 0 0 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	SWITCHABLE	YES
36	1 0 0 1 0 0	1	419	H/H	NOMINAL	ACCEL	6	NORMAL	NO
37	1 0 0 1 0 1	0	419	H/H	NOMINAL	ACCEL	6	NORMAL	YES
38	1 0 0 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	NORMAL	NO
39	1 0 0 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	NORMAL	YES
40	1 0 1 0 0 0	1	419	H/H	NOMINAL	ACCEL	0	NORMAL	NO
41	1 0 1 0 0 1	0	419	H/H	NOMINAL	ACCEL	0	NORMAL	YES
42	1 0 1 0 1 0	0	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	NO
43	1 0 1 0 1 1	1	419	H/H	NOMINAL	ACCEL	0	TRAFFIC SEL	YES
44	1 0 1 1 0 0	0	419	H/H	SLOW	NO ACCEL	6	NORMAL	NO
45	1 0 1 1 0 1	1	419	H/H	SLOW	NO ACCEL	6	NORMAL	YES
46	1 0 1 1 1 0	1	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	NO
47	1 0 1 1 1 1	0	419	H/H	SLOW	NO ACCEL	3	SWITCHABLE	YES
48	1 1 0 0 0 0	1	419	H/H	SLOW	NO ACCEL	0	NORMAL	NO
49	1 1 0 0 0 1	0	419	H/H	SLOW	NO ACCEL	0	NORMAL	YES
50	1 1 0 0 1 0	0	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	NO
51	1 1 0 0 1 1	1	419	H/H	SLOW	NO ACCEL	0	TRAFFIC SEL	YES
52	1 1 0 1 0 0	0	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	NO
53	1 1 0 1 0 1	1	419	H/H	NOMINAL	ACCEL	0	SWITCHABLE	YES
54	1 1 0 1 1 0	1	419	H/H	SLOW	NO ACCEL	6	NORMAL	NO
55	1 1 0 1 1 1	0	419	H/H	SLOW	NO ACCEL	6	NORMAL	YES
56	1 1 1 0 0 0	0	419	H/H	NOMINAL	ACCEL	3	NORMAL	NO
57	1 1 1 0 0 1	1	419	H/H	SLOW	NO ACCEL	0	SWITCHABLE	YES
58	1 1 1 0 1 0	1	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	NO
59	1 1 1 0 1 1	0	419	H/H	NOMINAL	ACCEL	3	TRAFFIC SEL	YES
60	1 1 1 1 0 0	1	419	H/H	NOMINAL	ACCEL	6	NORMAL	NO
61	1 1 1 1 0 1	0	419	H/H	NOMINAL	ACCEL	6	NORMAL	YES
62	1 1 1 1 1 0	0	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	NO
63	1 1 1 1 1 1	1	419	H/H	SLOW	NO ACCEL	3	TRAFFIC SEL	YES

Table 2017. IVA-81B Configuration Matrix

	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(5) Flags Config	(6) VS Response	(7) Bright Level	(8) Pneumatic VS Modifier
00	0 0 0 0 0 0	1	TEST	TEST	TEST	TEST	TEST	TEST
01	0 0 0 0 0 1	0	429	NO	A	FAST	LOW	YES
02	0 0 0 0 1 0	0	429	NO	B	FAST	LOW	YES
03	0 0 0 0 1 1	1	429	NO	A	SLOW	LOW	NO
04	0 0 0 1 0 0	0	429	NO	B	SLOW	LOW	NO
05	0 0 0 1 0 1	1	429	YES	A	FAST	LOW	NO
06	0 0 0 1 1 0	1	429	YES	B	FAST	LOW	NO
07	0 0 0 1 1 1	0	419	NO	B	FAST	LOW	NO
08	0 0 1 0 0 0	0	429	NO	A	SLOW	HIGH	NO
09	0 0 1 0 0 1	1	429	NO	B	SLOW	HIGH	NO
10	0 0 1 0 1 0	1	419	NO	A	SLOW	HIGH	N/A
11	0 0 1 0 1 1	0	419	NO	B	SLOW	HIGH	N/A
12	0 0 1 1 0 0	1	429	YES	A	SLOW	HIGH	N/A
13	0 0 1 1 0 1	0	429	YES	B	SLOW	HIGH	N/A
14	0 0 1 1 1 0	0	429	NO	A	SLOW	HIGH	YES
15	0 0 1 1 1 1	1	429	NO	B	SLOW	HIGH	YES
16	0 1 0 0 0 0	0	429	NO	A	FAST	HIGH	NO
17	0 1 0 0 0 1	1	429	NO	B	FAST	HIGH	NO
18	0 1 0 0 1 0	1	419	NO	A	FAST	HIGH	N/A
19	0 1 0 0 1 1	0	419	NO	B	FAST	HIGH	N/A
20	0 1 0 1 0 0	1	429	YES	A	FAST	HIGH	N/A
21	0 1 0 1 0 1	0	429	YES	B	FAST	HIGH	N/A
22	0 1 0 1 1 0	0	429	NO	A	FAST	HIGH	YES
23	0 1 0 1 1 1	1	429	NO	B	FAST	HIGH	YES
24	0 1 1 0 0 0	1	429	NO	A	NOMINAL	LOW	NO
25	0 1 1 0 0 1	0	429	NO	B	NOMINAL	LOW	NO
26	0 1 1 0 1 0	0	419	NO	A	NOMINAL	LOW	N/A
27	0 1 1 0 1 1	1	419	NO	B	NOMINAL	LOW	N/A
28	0 1 1 1 0 0	0	429	YES	A	NOMINAL	LOW	N/A
29	0 1 1 1 0 1	1	429	YES	B	NOMINAL	LOW	N/A
30	0 1 1 1 1 0	1	429	NO	A	NOMINAL	LOW	YES
31	0 1 1 1 1 1	0	429	NO	B	NOMINAL	LOW	YES
32	1 0 0 0 0 0	0	429	NO	A	NOMINAL	HIGH	NO

Table 2017. IVA-81B Configuration Matrix (cont)

	(1) System Straps 3 3 3 3 1 3 8 7 6 5 7 4	(2) Parity 1 9	(3) Lo Speed VS Modifier	(4) Hi Speed VS Modifier	(5) Flags Config	(6) VS Response	(7) Bright Level	(8) Pneumatic VS Modifier
33	1 0 0 0 0 1	1	429	NO	B	NOMINAL	HIGH	NO
34	1 0 0 0 1 0	1	419	NO	A	NOMINAL	HIGH	N/A
35	1 0 0 0 1 1	0	419	NO	B	NOMINAL	HIGH	N/A
36	1 0 0 1 0 0	1	429	YES	A	NOMINAL	HIGH	N/A
37	1 0 0 1 0 1	0	429	YES	B	NOMINAL	HIGH	N/A
38	1 0 0 1 1 0	0	429	NO	A	NOMINAL	HIGH	YES
39	1 0 0 1 1 1	1	429	NO	B	NOMINAL	HIGH	YES
40	1 0 1 0 0 0	1	429	NO	A	SLOW	MEDIUM	NO
41	1 0 1 0 0 1	0	429	NO	B	SLOW	MEDIUM	NO
42	1 0 1 0 1 0	0	419	NO	A	SLOW	MEDIUM	N/A
43	1 0 1 0 1 1	1	419	NO	B	SLOW	MEDIUM	N/A
44	1 0 1 1 0 0	0	429	YES	A	SLOW	MEDIUM	N/A
45	1 0 1 1 0 1	1	429	YES	B	SLOW	MEDIUM	N/A
46	1 0 1 1 1 0	1	429	NO	A	SLOW	MEDIUM	YES
47	1 0 1 1 1 1	0	429	NO	B	SLOW	MEDIUM	YES
48	1 1 0 0 0 0	1	429	NO	A	FAST	MEDIUM	NO
49	1 1 0 0 0 1	0	429	NO	B	FAST	MEDIUM	NO
50	1 1 0 0 1 0	0	419	NO	A	FAST	MEDIUM	N/A
51	1 1 0 0 1 1	1	419	NO	B	FAST	MEDIUM	N/A
52	1 1 0 1 0 0	0	429	YES	A	FAST	MEDIUM	N/A
53	1 1 0 1 0 1	1	429	YES	B	FAST	MEDIUM	N/A
54	1 1 0 1 1 0	1	429	NO	A	FAST	MEDIUM	YES
55	1 1 0 1 1 1	0	429	NO	B	FAST	MEDIUM	YES
56	1 1 1 0 0 0	0	429	NO	A	NOMINAL	MEDIUM	NO
57	1 1 1 0 0 1	1	429	NO	B	NOMINAL	MEDIUM	NO
58	1 1 1 0 1 0	1	419	NO	A	NOMINAL	MEDIUM	N/A
59	1 1 1 0 1 1	0	419	NO	B	NOMINAL	MEDIUM	N/A
60	1 1 1 1 0 0	1	429	YES	A	NOMINAL	MEDIUM	N/A
61	1 1 1 1 0 1	0	429	YES	B	NOMINAL	MEDIUM	N/A
62	1 1 1 1 1 0	0	429	NO	A	NOMINAL	MEDIUM	YES
63	1 1 1 1 1 1	1	429	NO	B	NOMINAL	MEDIUM	YES