GARMIN

GNS 500W Series Installation Manual

GPS 500W and GNS™ 530W/530AW/TAWS

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RECORD OF REVISIONS

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A	12/11/09	Initial Release
B	2/5/10	Update for main SW version 4.00 and adding of HTAWS.
C	6/14/10	Add main software version 4.01.

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This manual is applicable for units with main software version 3.00 or later and includes changes for software version 4.00.

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GNS 500W SERIES HARDWARE MOD LEVEL HISTORY

The following table identifies hardware modification (Mod) Levels for the GPS 500W and GNS 530W. Mod Levels are listed with the associated service bulletin number, service bulletin date, and the purpose of the modification. The table is current at the time of publication of this manual (see date on front cover) and is subject to change without notice. Authorized Garmin Sales and Service Centers are encouraged to access the most up-to-date bulletin and advisory information on the Garmin Dealer Resource web site at www.garmin.com using their Garmin-provided user name and password.

MOD LEVEL	SERVICE BULLETIN NUMBER	SERVICE BULLETIN DATE	PURPOSE OF MODIFICATION

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1. GENERAL DESCRIPTION

1.1 Introduction

This manual describes the physical, mechanical, and electrical characteristics, as well as instructions and other conditions and limitations for installation and approval of the 500W Series panel-mounted units. The 500W Series includes the GPS 500W (with or without Terrain Awareness and Warning System (TAWS) or Terrain)), and GNS 530W and GNS 530AW (with or without TAWS or Terrain) panel-mounted units. Refer to Section 7, Limitations, for additional information and other considerations.

NOTE

Except where specifically noted, references made to the GNS 530W will equally apply to the GNS 530AW. Also, except where specifically noted, references made to the GPS 500W or GNS 530W will apply equally to the TAWS version of these units.

Table 1-1. 500W Series Units

MODEL	PART NUMBER	COLOR	NOTES
GPS 500W	011-01062-00	BLACK	
	011-01062-10	GRAY	
	011-01062-40	BLACK	NOTE 1
	011-01062-50	GRAY	NOTE 1
GPS 500W w/TAWS	011-01063-00	BLACK	
	011-01063-10	GRAY	
	011-01063-40	BLACK	NOTE 1
	011-01063-50	GRAY	NOTE 1
GNS 530W	011-01064-00	BLACK	
	011-01064-10	GRAY	
	011-01064-40	BLACK	NOTE 1
	011-01064-45	BLACK	28 VDC UPGRADE UNIT
	011-01064-50	GRAY	NOTE 1
GNS 530W w/TAWS	011-01065-00	BLACK	
	011-01065-10	GRAY	
	011-01065-40	BLACK	NOTE 1
	011-01065-45	BLACK	28 VDC UPGRADE UNIT
	011-01065-50	GRAY	NOTE 1
GNS 530AW	011-01066-00	BLACK	
	011-01066-10	GRAY	
	011-01066-40	BLACK	NOTE 1
	011-01066-50	GRAY	NOTE 1
GNS 530AW w/TAWS	011-01067-00	BLACK	
	011-01067-10	GRAY	
	011-01067-40	BLACK	NOTE 1
	011-01067-50	GRAY	NOTE 1

Designations: A = 28 VDC Unit with 16w COM transmitter

Note 1: The unit is an upgrade of the non-WAAS unit.

1.2 RESERVED

1.3 Equipment Description

The 500W Series units are 6.25 inches wide and 4.60 inches high. The display is a 320 by 234 pixel color LCD. The units include two removable data cards, one with a Jeppesen database (to be inserted in the left most card slot), and the second being a terrain/obstacle database (to be inserted in the right most card slot).

The GPS 500W is a GPS/WAAS unit that meets the requirements of Technical Standard Order (TSO)-C146a (specified in Table 1-3) and may be approved for IFR en route, terminal, non-precision, and precision approach operations.

The GNS 530W includes all the features of the GPS 500W and also includes an airborne VHF communications transceiver and airborne VOR/localizer (LOC) and glideslope (G/S) receivers. The "AW" model is a 28 VDC unit with a 16 Watt COM transmitter. The GNS 530W/(AW) meets the requirements of TSOs specified in Table 1-3.

CAUTION

The 500W Series unit product lens is coated with a special anti-reflective coating which is very sensitive to skin oils, waxes and abrasive cleaners. CLEANERS CONTAINING AMMONIA WILL HARM THE ANTI-REFLECTIVE COATING. It is very important to clean the lens using an eyeglass lens cleaner, which is specified as safe for anti-reflective coatings and a clean, lint-free cloth.

CAUTION

The use of ground-based cellular telephones while aircraft are airborne is prohibited by FCC rules. Due to potential interference with onboard systems, the use of ground-based cell phones while the aircraft is on the ground is subject to FAA regulation 14 CFR §91.21.

FCC regulation 47 CFR §22.925 prohibits airborne operation of ground-based cellular telephones installed in or carried aboard aircraft. Ground-based cellular telephones must not be operated while aircraft are off the ground. When any aircraft leaves the ground, all ground-based cellular telephones on board that aircraft must be turned off. Ground-based cell phones that are on, even in a monitoring state, can disrupt GPS performance.

1.4 Technical Specifications

1.4.1 Physical Characteristics

Bezel Height	4.58 in. (116 mm)
Bezel Width	6.25 in. (159 mm)
Rack Height (Dimple-to-Dimple)	4.60 in. (117 mm)
Rack Width	6.32 in. (161 mm)
Depth Behind Panel with Connectors (Measured from face of aircraft panel to rear of connector backshells)	11.00 in. (279 mm)
GPS 500W Weight (Unit only)	5.7 lbs. (2.59 kg)
GPS 500W Weight (With rack and back plate)	6.8 lbs. (3.08 kg)
GNS 530W Weight (Unit only)	7.0 lbs. (3.18 kg)
GNS 530W Weight (With rack and back plate)	8.2 lbs. (3.72 kg)

1.4.2 General Specifications

Operating Temperature Range	-20°C to +55°C. For more details see Environmental Qualification Form on the Dealers Only page on www.garmin.com. See Appendix A for part numbers.
Humidity	95% non-condensing
Altitude Range	-1,500 ft to 50,000 ft
Input Power Requirements	
Input Voltage Range - All Units (Main Connector)	10 to 33.2 VDC
Input Voltage Range (COM Connector) GNS 530W	11 to 33 VDC
Input Voltage Range (COM Connector) GNS 530AW	24.1 to 33 VDC
GPS 500W (Main Connector)	800 mA @ 28 VDC (maximum) 1.6 A @ 14 VDC (maximum)
GNS 530W, GNS530AW (Main Connector)	1.4 A @ 28 VDC (maximum) 3.0 A @ 14 VDC (maximum)
GNS 530W (COM Connector)	15 mA @ 28 VDC (receive) 3.0 A @ 28 VDC (transmit) 15 mA @ 14 VDC (receive) 6.0 A @ 14 VDC (transmit)
GNS 530AW (COM Connector)	15 mA @ 28 VDC (receive) 3.0 A @ 28 VDC (transmit)
Superflag Power Requirements	500 mA maximum per superflag output
Environmental Testing	See Environmental Qualification Form on the Dealers Only page on www.garmin.com. See Appendix A for part numbers.

The display on the 500W Series unit is a sunlight readable LCD display.

Display Size	5.0 inch diagonal
Active Area	4.02 inches (W) x 2.95 inches (H)
Resolution	320 x 234 pixels
Viewing Angle (with a 5:1 contrast ratio, min)	Left/Right: 60° Up: 35° Down: 60°
Viewing Distance	36 inches maximum

1.4.3 GPS Specifications

Number Of Channels	15 (12 GPS and 3 GPS/WAAS/SBAS)
Frequency	1575.42 MHz L1, C/A code
Sensitivity (Acquisition, No Interference)	-134.5 dBm GPS -135.5 dBm WAAS
Sensitivity (Drop Lock)	-144 dBm
Dynamic Range	> 20 dB
Lat/Lon Position Accuracy	<1.25 meter RMS horizontal, <2 meter vertical, with WAAS
Velocity	1000 knots maximum (above 60,000 ft)
TTFF (Time To First Fix)	1:45 min. typical with current almanac, position, and time
Reacquisition	10 seconds typical
Position Update Interval	0.2 sec (5 Hz)
1 PPS (Pulse Per Second)	±275 Nsec of UTC second
Datum	WGS-84
SATCOM Compatibility	SATCOM compatibility is dependent upon antenna selection. See Section 1.4.8 for additional information.
Antenna Power Supply	35 mA typical, 40 mA max at 4.7 VDC

1.4.4 COM Transceiver Specifications (GNS 530W Only) **

Audio Output	100 mW minimum into a 500Ω load.
Audio Response	Less than 6 dB of Variation between 350 and 2500 Hz.
Audio Distortion	The distortion in the receiver audio output does not exceed 15% at all levels up to 100 mW.
AGC Characteristics	The audio output does not vary by more than 6 dB when the level of the RF input signal, modulated 30% at 1000 Hz, is varied from 5 μV to 450,000 μV.
Sensitivity	(S+N)/N on all channels is greater than 6 dB when the RF level is 2 μV (hard) modulated 30% at 1000 Hz at rated audio.
Squelch	2 μv ±6 dB for 25 kHz channels. 3 μv ±6 dB for 8.33 kHz channels.
Selectivity	6 dB BW is greater than ±8 kHz for 25 kHz channeling. 60 dB BW is less than ±25 kHz for 25 kHz channeling. 6 dB BW is greater than ±2.778 kHz for 8.33 kHz channeling. 60 dB BW is less than ±7.37 kHz for 8.33 kHz channeling.
Spurious Response	Greater than 85 dB.
Modulation	AM Double sided, Emission Designator 6K00A3E
Frequency Band	118.00 to 136.99 MHz 25 kHz and 8.33 kHz channel spacing
Transmitting Power	GNS 530W 10 watts minimum, 15 watts maximum GNS 530AW 16 watts minimum, 20 watts maximum
Transmitter Duty Cycle	Recommended 10% maximum.
Modulation Capability	The modulation is not less than 70% and not greater than 98% with a standard modulator signal applied to the transmitter.
Carrier Noise Level	At least 45 dB (S+N)/N.
Frequency Stability	0.0005%
Demodulated Audio Distortion	Less than 10% distortion when the transmitter is modulated at least 70%.
Sidetone	1.4 V_{RMS} into a 500Ω load when the transmitter is modulated at least 70%.
Demodulated Audio Response	Less than 6 dB when the audio input frequency is varied from 350 to 2500 Hz.

* C37d Class 4 and 6 may not provide suitable COM transmit range for some high-altitude aircraft.

** Specifications shown apply at nominal input voltages of 14 VDC or 28 VDC, as applicable, and with a nominal 50 ohm resistive load at the antenna connector.

1.4.5 VOR Specifications (GNS 530W Only)

Receiver Audio Sensitivity	At -103.5 dBm (S+N)/N is not less than 6 dB.
Course Deviation Sensitivity	-103.5 dBm or less for 60% of standard deflection.
Flag	The VOR Course Deviation Flag must be flagged: a) in the absence of an RF signal. b) in the absence of the 9960 Hz modulation. c) in the absence of either one of the two 30 Hz modulations. d) When the level of a standard VOR deviation test signal produces less than a 50% of standard deflection.
AGC Characteristics	From -99 dBm to -13 dBm input of a Standard VOR Audio Test Signal, audio output level does not vary more than 3 dB.
Spurious Response	Greater than 80 dB.
VOR OBS Bearing Accuracy	The bearing information as presented to the pilot does not have an error in excess of 2.7° as specified by RTCA DO-196 and EuroCAE ED-22B.
Audio Output	A minimum 100 mW into a 500Ω load.
Audio Response	Less than 6 dB of variation between 350 and 2500 Hz. Except the 1020 Hz Ident Tone is at least 20 dB down in voice mode.
Audio Distortion	The distortion in the receiver audio output does not exceed 10% at all levels up to 100 mW.

1.4.6 LOC Specifications (GNS 530W Only)

Receiver Audio Sensitivity	At -103.5 dBm (S+N)/N is not less than 6 dB.
Course Deviation Sensitivity	-103.5 dBm or less for 60% of standard deflection.
Flag	The LOC Course Deviation Flag must be flagged: a) In the absence of an RF signal. b) When either the 90 or 150 Hz modulating signals is removed and the other is maintained at its normal 20%. c) In the absence of both 90 and 150 Hz modulation. d) When the level of a standard localizer deviation test signal produces less than a 50% of standard deflection.
AGC Characteristics	From -86 dBm and -33 dBm input of a Standard VOR Audio Test Signal, audio output level does not vary more than 3 dB.
Selectivity	Nose Bandwidth: The input signal level required to produce the reference AGC voltage does not vary more than 6 dB over the input signal frequency range of ± 9 kHz from the assigned channel frequency. Skirt Bandwidth: The input signal level required to produce reference AGC voltage is at least 70 dB greater than the level required to produce reference AGC voltage at the assigned channel frequency at ± 36 kHz from the assigned channel frequency.
Spurious Response	Greater than 80 dB.
Centering Accuracy	Typical 0 ± 3 mV (Max error 9.9 mV per RTCA DO-195).
Audio Output	A minimum 100 mW into a 500Ω load.
Audio Response	Less than 6 dB of Variation between 350 and 2500 Hz. Except the 1020 Hz Ident Tone is at least 20 dB down in voice mode.
Audio Distortion	The distortion in the receiver audio output does not exceed 10% at all levels up to 100 mW.

1.4.7 Glideslope Specifications (GNS 530W Only)

Sensitivity	-87 dBm or less for 60% of standard deflection.
Centering Accuracy	0 ±.0091 ddm or 0 ±7.8 mV.
Selectivity	The course deviation is 0 ddm ± .0091 ddm when using the Glideslope Centering Test Signal as the RF frequency is varied ±17 kHz from the assigned channel. At frequencies displaced by ±132 kHz or greater, the input signal is at least 60 dB down.
Standard Deflection	a) With a standard deflection 'FLY DOWN' condition (90 Hz dominant), the output is -78 mV ±7.8 mV. b) With a standard deflection 'FLY UP' condition (150 Hz dominant), the output is +78 mV ±7.8 mV.
Flag	The unit Flags: a) When the level of a standard deviation test signal produces 50% or less of standard deflection of the deviation indicator. b) In the absence of 150 Hz modulation. c) In the absence of 90 Hz modulation. d) In the absence of both 90 Hz and 150 Hz modulation. e) In the absence of RF.

1.4.8 GPS Antenna Requirements

Antenna performance is critical to the GPS/WAAS operation. The antennas listed in Table 1-2 are approved for installation with the 500W Series units.

Table 1-2. Approved GPS Antennas

Model/Description	Mount Style	Conn Type	Mfr	Part Number	Garmin Order Number
GA 35, GPS/WAAS	Screw mount, Teardrop footprint [1]	TNC	Garmin	013-00235-00	013-00235-00
			Aero Antenna	AT575-93GW -TNCF-000-RG-27-NM	013-00235-00
GA 36, GPS/WAAS	Screw mount, ARINC 743	TNC	Garmin	013-00244-00	013-00244-00
			Aero Antenna	AT575-126GW-TNCF-000-RG-27 NM	013-00244-00
GA 37, GPS/WAAS +XM	Screw mount, ARINC 743	TNC TNC	Garmin	013-00245-00	013-00245-00
			Aero Antenna	AT2300-126GW-TNCF-000-RG-27-NM	013-00245-00
Comant , GPS/WAAS+VHF	Screw mount, Teardrop COM	TNC BNC [2]	Comant	CI-2580-200 [4]	N/A
Comant GPS/WAAS +VHF	Screw mount, Teardrop	TNC BNC [2]	Comant	CI-2728-200 [4]	N/A
Comant GPS/WAAS +XM+VHF	Screw mount, Teardrop COM	TNC TNC BNC [3]	Comant	CI-2728-410 [4]	N/A

[1] Same mounting hole pattern as GA 56, but GA 35 antenna has a physically larger footprint.

[2] The GPS/WAAS connector is a TNC type. The VHF connector is a BNC type.

[3] The GPS/WAAS connector is a TNC type. The XM connector is a TNC type. The VHF connector is a BNC type.

[4] It is the installer's responsibility to ensure the antenna complies with Antenna Minimum Performance Specification for Garmin's GPS/WAAS Receiver System Antenna (004-00287-00) by communicating the requirement to the supplier and obtaining a certificate of compliance to 004-00287-00 from the supplier. An antenna that complies only with TSO-C144 requirements is not adequate for this installation.

1.5 License Requirements

The Telecommunications Act of 1996, effective February 8, 1996, provides the FCC discretion to eliminate radio station license requirements for aircraft and ships. The GNS 530W, GNS 530AW, GNS 530W with TAWS, and 530AW with TAWS installations must comply with current transmitter licensing requirements. In the US, to find out the specific details on whether a particular installation is exempt from licensing, please visit the FCC web site http://wireless.fcc.gov/aviation. If an aircraft license is required, make application for a license on FCC form 404, Application for Aircraft Radio Station License. The FCC also has a fax-on-demand service to provide forms by fax. Outside the US, contact the responsible telecommunication authority. The GNS 530W, GNS 530AW, GNS 530W with TAWS, and 530AW with TAWS owner accepts all responsibility for obtaining the proper licensing before using the transceiver. The maximum transmitting power, modulation identification, and frequency band information may be required for licensing and are detailed in Section 1.4.4.

CAUTION

The VHF transmitter in this equipment is guaranteed to meet Federal Communications Commission acceptance over the operating temperature range. Modifications not expressly approved by Garmin could invalidate the license and make it unlawful to operate the equipment.

1.6 Regulatory Compliance

1.6.1 TSO Authorization and Advisory Circular References

The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only in compliance with 14 CFR part 43 or the applicable airworthiness requirements.

Table 1-3. TSO Authorization

GPS 500W	GPS 500W w/TAWS	GNS 530W	GNS 530AW	GNS 530W w/TAWS	GNS 530AW w/TAWS	Function	TSO	Category	Software Part Number
		•	•	•	•	ILS Glideslope	TSO-C34e ETSO-2C34f RTCA/DO-192 EUROCAE ED-47B		Included in unit level part number
		•	•	•	•	ILS Localizer	TSO-C36e ETSO-2C36f RTCA/DO-195 EUROCAE ED-46B		Included in unit level part number
		•		•		VHF COM Transmitter	TSO-C37d ETSO-2C37e RTCA/DO-186A EUROCAE ED-23B	Class 4 and 6 100nm	Included in unit level part number
			•		•			Class 3 and 5 200nm	
		•	•	•	•	VHF COM Receiver	TSO-C38d ETSO-2C38e RTCA/DO-186A EUROCAE ED-23B	Class C and E	Included in unit level part number
		•	•	•	•	VOR Receiver	TSO-C40c ETSO-2C40c RTCA/DO-196 EUROCAE ED-22B		Included in unit level part number
•	•	•	•	•	•	Multipurpose Display	TSO-C113 ETSO-C113 SAE AS 8034		006-B0448-02 thru 006-B0448-0( ) 006-B1144-1( )
•	•	•	•	•	•	GPS/WAAS	TSO-C146a ETSO-C146 RTCA/DO-229C	Class 3	006-B0408-04 thru 006-B0408-0( ) 006-B0448-02 thru 006-B0448-0( ) 006-B1144-1( )
	•			•	•	TAWS	TSO-C151b ETSO-C151a	Class B	006-B0448-02 thru 006-B0448-0( ) 006-B1144-1( )
•	•	•	•	•	•	HTAWS [1]	TSO-C194 RTCA/DO-309 Non-ETSO function		006-B1144-1( )

Notes:

[1] Main SW (006-B1144-1( )) version 4.00 or later required for HTAWS.

Table 1-4. Main Software Part Number and Version

Software Part Number	Software Version
006-B0448-02	3.00
006-B0448-03	3.10
006-B0448-04	3.11
006-B0448-05	3.20
006-B0448-06	3.30
006-B0448-07	3.40
006-B1144-10	4.00
006-B1144-11	4.01

Table 1-5. GPS/WAAS Software Part Number and Version

Software Part Number	Software Version
006-B0408-04	3.0
006-B0408-05	3.1
006-B0408-06	3.2

NOTE

For main or GPS software versions previous to those listed Table 1-4 or Table 1-5, contact Garmin for assistance.

System Function	DO-178B Level
Operating System	B
GPS Navigation Information	B
VOR Information	C
LOC/Glideslope Information	C
VHF Communication	C
TAWS (Class B) Function	C
Display of altitude, heading, course, speed, and track	C
Display of other information - moving map, terrain, flight plan overlay and flight mode, TAS/TIS traffic information, XM Weather data, data from passive lightning detection equipment, checklist and timer	D
Terrain (Fixed Wing)	D
Terrain Prox (Helicopter)	D
HTAWS (Helicopter)	C

NOTE

Unauthorized changes or modifications to any 500W Series unit product may void the compliance to required regulations and authorization for continued equipment usage. All 500W Series unit functions are design approved under the TSO.

1.6.2 TSO Deviations

TSO	Deviation
TSO-C34e	1. Garmin was granted a deviation from TSO-C34e to use RTCA/DO-178B minimum software level C instead of RTCA/DO-178A level 2 to demonstrate compliance for the verification and validation of the computer software.
	2. Garmin was granted a deviation from TSO-C34e to use RTCA/DO-160C instead of RTCA/DO-160B as the standard for Environmental Conditions and Test Procedures of Airborne Equipment.
TSO-C36e	1. Garmin was granted a deviation from TSO-C36e to use RTCA/DO-178B minimum software level C instead of RTCA/DO-178A level 2 to demonstrate compliance for the verification and validation of the computer software.
	2. Garmin was granted a deviation from TSO-C36e to use RTCA/DO-160C instead of RTCA/DO-160B as the standard for Environmental Conditions and Test Procedures of Airborne Equipment.
TSO-C37d	1. Garmin was granted a deviation from TSO-C37d to use RTCA/DO-178B instead of RTCA/DO-178A to demonstrate compliance for the verification and validation of the computer software.
	2. Garmin was granted a deviation from TSO-C37d paragraph (a)(1) to allow using RTCA /DO-186A instead of RTCA/DO-186 to specify minimum performance standards.
	3. Garmin was granted a deviation from TSO-C37d to allow a 6dB reduction of transmitter power during the Normal Operating Conditions – Emergency Operation Voltage as described in RTCA/DO-186A paragraph 2.5.13.1 and RTCA/DO-160C paragraph 16.5.2.1.
	4. Garmin was granted a deviation from TSO-C37d paragraph (a)(5) to allow 8.33 kHz channel spacing in addition to the 25 kHz spacing.
	5. Garmin was granted a deviation from TSO-C37d paragraph (b)(1) to allow marking to call our 8.33 kHz channel spacing in addition to the 25 kHz spacing.
TSO-C38d	1. Garmin was granted a deviation from TSO-C38d to use RTCA/DO-178B instead of RTCA/DO-178A to demonstrate compliance for the verification and validation of the computer software.
	2. Garmin was granted a deviation from TSO-C38d paragraph (a)(1) to allow using RTCA /DO-186A instead of RTCA/DO-186 to specify minimum performance standards.
	3. Garmin was granted a deviation from TSO-C38d paragraph (a)(5) to allow 8.33 kHz channel spacing in addition to the 25 kHz spacing.
TSO-C40c	1. Garmin was granted a deviation from TSO-C40c to use RTCA/DO-178B instead of RTCA/DO-178A to demonstrate compliance for the verification and validation of the computer software.
	2. Garmin was granted a deviation from TSO-C40c to use RTCA/DO-160C instead of RTCA/DO-160B as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.
TSO-C113	1. Garmin was granted a deviation from TSO-C113 section 2.1.2 (4) to use RTCA/DO-178B instead of RTCA/DO-178A to demonstrate compliance for the verification and validation of the computer software.
	2. Garmin was granted a deviation from TSO-C113 section 2.1.2 (3) to use RTCA/DO-160D instead of RTCA/DO-160B as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.
TSO-C146a	1. Garmin was granted a deviation from TSO-C146a for the requirement to use as a specific “NAV” labeled key. RTCA/DO-229c Table 2-5 lists the function “Access to primary navigation display (Section 2.2.1.4.1)” with a label “NAV”.
	2. Garmin was granted a deviation from TSO-C146a not to implement RTCA/DO-229C paragraph 2.2.3.2.2 which states “The equipment shall allow the pilot to initiate the missed approach with manual action. It shall be possible to take this action before crossing the MAWP, in which case the equipment shall automatically initiate the missed approach procedure at the MAWP.”
	3. Garmin was granted a deviation from TSO-C146a not to implement RTCA/DO-229C paragraph 2.2.4.2.3 which states “If the aircraft is past the FPAP – (length offset), and the pilot has not already activated the missed approach, the receiver shall automatically transition to missed approach guidance.” This requirement is being eliminated in DO-229D.
	4. Garmin was granted a deviation from TSO-C146a from RTCA/DO-229C paragraphs 2.2.4.6.4 and 2.2.5.6.4 not to use the low altitude alerting function when the 500W series unit has TERRAIN or TAWS enabled and is not in one of the following states: FAIL, N/A, TEST, or INHIBIT. When neither TERRAIN nor TAWS is enabled, or when one is enabled but the current state is FAIL, N/A, TEST, or INHIBIT, the low altitude alert described in DO-229C 2.2.4.6.4 and 2.2.5.6.4 is used.
	5. Garmin was granted a deviation from TSO-C146a not to implement RTCA/DO-229C paragraph 2.2.1.4.9.c which states “BRG to or from a VOR: The bearing is based on the true-to-magnetic conversion at the waypoint location, using the same magnetic conversion as used to define the path.” Instead, the “user” (current) location will be used. The RTCA/DO-229C paragraph 2.2.1.4.9.c requirement is being eliminated in DO-229D.
	6. Garmin was granted a deviation from TSO-C146a paragraph 4.b. which defines “each separate component that is easily removable (without hand tools), each interchangeable element, and each separate subassembly of the article that the manufacturer determines may be interchangeable must be permanently and legibly marked with at least the name of the manufacturer, manufacturer’s subassembly part number, and the TSO number.”

TSO	Deviation
C146a cont'd	7. Garmin was granted a deviation from TSO-C146a paragraph 2.1.1.9 to use 20 seconds (instead of 10 seconds) to reacquire a dropped satellite under the conditions described in the paragraph. The 20 second period is the time period specified by the new DO-229d.
TSO-C194	1. Garmin was granted a deviation from TSO-C194 to list this secondary TSO in the installation manual rather than on the article itself.
	2. Garmin was granted a deviation from TSO-C194 not to mark each removable item with part number and TSO.
	3. Garmin was granted a deviation from TSO-C194 not to display the software part number on the outside of the unit.
	4. Garmin was granted a deviation from TSO-C194 to use RTCA/DO-160D instead of RTCA/D0-160F as the standard for Environmental Conditions and Test Procedures for Airborne Equipment.

1.6.3 ETSO Deviations

The 500W Series unit meets the requirements of the listed ETSOs with the following deviations.

ETSO	Deviation
ETSO-2C34f	Garmin was granted a deviation from ETSO-2C34f to use RTCA/DO-160C instead of RTCA/DO-160D.
ETSO-2C36f	Garmin was granted a deviation from ETSO-2C36f to use RTCA/DO-160C instead of RTCA/DO-160D.
ETSO-2C37e	Garmin was granted a deviation from ETSO-2C37e to use RTCA/DO-160C instead of RTCA/DO-160D.
ETSO-2C38e	Garmin was granted a deviation from ETSO-2C38e to use RTCA/DO-160C instead of RTCA/DO-160D.
ETSO-2C40c	Garmin was granted a deviation from ETSO-2C40c to use RTCA/DO-160C instead of RTCA/DO-160D.
ETSO-C113	Garmin was granted a deviation from ETSO-C113 to use RTCA/DO-160C instead of RTCA/DO-160D.
ETSO-C146	1. Garmin was granted a deviation from ETSO-C146 to use RTCA/DO-160C instead of RTCA/DO-160D.
	2. Garmin was granted a deviation from ETSO-C146 to use RTCA/DO-229C instead of RTCA/DO-229B for minimum operating specifications.
	3. Garmin was granted a deviation from RTCA/DO-229C for the requirement to use as a specific "NAV" labeled key. RTCA/DO-229C Table 2-5 lists the function "Access to primary navigation display (Section 2.2.1.4.1)" with a label "NAV". The GNS 500W does not have a key with this nomenclature.
	4. Garmin was granted a deviation from RTCA/DO-229C not to implement paragraph 2.2.3.2.2 which states "The equipment shall allow the pilot to initiate the missed approach with manual action. It shall be possible to take this action before crossing the MAWP (Missed Approach Waypoint), in which case the equipment shall automatically initiate the missed approach procedure at the MAWP."
	5. Garmin was granted a deviation from RTCA/DO-229C not to implement paragraph 2.2.4.2.3 which states "If the aircraft is past the FPAP – (length offset), and the pilot has not already activated the missed approach, the receiver shall automatically transition to missed approach guidance."
	6. Garmin was granted a deviation from RTCA/DO-229C paragraphs 2.2.4.6.4 and 2.2.5.6.4 not to use the low altitude alerting function when the GNS 500W Series unit has TERRAIN enabled and is not in one of the following states: FAIL, N/A, TEST, or INHIBIT. When TERRAIN is not enabled, or when it is enabled but the current state is FAIL, N/A, TEST, or INHIBIT, the low altitude alert described in DO-229C 2.2.4.6.4 and 2.2.5.6.4 is used.
	7. Garmin was granted a deviation from RTCA/DO-229C not to implement paragraph 2.2.1.4.9.c which states "BRG to or from a VOR: The bearing is based on the true-to-magnetic conversion at the waypoint location, using the same magnetic conversion as used to define the path." Instead, the "user" (current) location will be used.
	8. Garmin was granted a deviation from RTCA/DO-229C paragraph 2.1.1.9 to allow the unit up to 20 seconds (instead of 10 seconds) to reacquire a dropped satellite under the conditions described in the paragraph.
ETSO-C151a	Garmin was granted a deviation from ETSO-C151a to use RTCA DO-160C instead of DO-160D.

1.6.4 FCC Grant of Equipment Authorization

Model	FCC ID
GNS 530W, GNC 530W w/TAWS	IPH-0021400 (10W VHF COM)
GNS 530AW, GNS 530AW w/TAWS	IPH-0061100 (16W VHF COM)

1.7 Database Options and Updates

1.7.1 Aviation Database

The aviation database resides on a database card that is inserted in the left card slot on the unit front panel.

The database is generated on periodic cycles from current Jeppesen data and converted to the format used by the 500W Series unit products. The data conversion process is performed using software that is developed and maintained under Garmin document control processes according to RTCA/DO-200A, Standards for Processing Aeronautical Data.

The database can be updated by purchasing a database subscription from Jeppesen. The database updates include either replacing or re-programming the database card and inserting the updated card in the left card slot on the unit front panel. Contact Jeppesen at 800-621-5377 or www.jeppesen.com for more information and instructions.

Contact Garmin for more information on databases available for the GPS 500W/GNS 530W.

1.7.2 Terrain/Obstacle Database

The terrain/obstacle database resides on a database card that is inserted in the right card slot on the unit front panel.

The terrain/obstacle database is used for the terrain/obstacle display. For units configured for TAWS or HTAWS, it provides the database for the TAWS or HTAWS function. The terrain/obstacle databases are available for updating on periodic cycles and are available from Garmin. Terrain/obstacle database updates can be downloaded via the internet and the card programmed using a USB programmer available from Garmin. Contact Garmin at 800-800-1020 or www.garmin.com for more information or instructions.

See Section 3.2.3 for a listing of the data cards available.

1.8 Fault Detection and Exclusion (FDE)

The 500W Series unit, when installed as defined in this manual, complies with the requirements for GPS primary means navigation in oceanic and remote airspace when used in conjunction with the FDE Prediction program included with the GNS 400W/500W Series Trainer CD.

The 500W Series unit includes fault detection and exclusion (FDE), which is active for all flight phases including oceanic and remote operations, en route and terminal, and precision and non-precision approaches, and does not require any pilot interaction. The FDE consists of two parts:

1. The fault detection function detects a satellite failure that can affect navigation; and
2. The exclusion function is the capability to exclude one or more failed satellites and prevent them from affecting navigation.

The FDE Prediction program, included with the GNS 400W/500W Series Trainer CD, is used to predict FDE availability. The FDE Prediction program must be used prior to oceanic or remote area flights for all operators using the 500W Series unit as primary means navigation under FAR parts 91, 121, 125, and 135.

1.9 Limited Warranty

All Garmin avionics products are warranted to be free from defects in materials or workmanship for: two years from the date of purchase for new Remote-Mount and Panel-Mount products; one year from the date of purchase for new portable products and any purchased newly-overhauled products; six months for newly-overhauled products exchanged through a Garmin Authorized Service Center; and 90 days for factory repaired or newly-overhauled products exchanged at Garmin in lieu of repair. Within the applicable period, Garmin will, at its sole option, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts or labor, provided that the customer shall be responsible for any transportation cost. This warranty does not apply to: (i) cosmetic damage, such as scratches, nicks and dents; (ii) consumable parts, such as batteries, unless product damage has occurred due to a defect in materials or workmanship; (iii) damage caused by accident, abuse, misuse, water, flood, fire, or other acts of nature or external causes; (iv) damage caused by service performed by anyone who is not an authorized service provider of Garmin; or (v) damage to a product that has been modified or altered without the written permission of Garmin. In addition, Garmin reserves the right to refuse warranty claims against products or services that are obtained and/or used in contravention of the laws of any country.

THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, INCLUDING ANY LIABILITY ARISING UNDER ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, STATUTORY OR OTHERWISE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, WHICH MAY VARY FROM STATE TO STATE.

IN NO EVENT SHALL GARMIN BE LIABLE FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, WHETHER RESULTING FROM THE USE, MISUSE OR INABILITY TO USE THE PRODUCT OR FROM DEFECTS IN THE PRODUCT. SOME STATES DO NOT ALLOW THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU.

Garmin retains the exclusive right to repair or replace (with a new or newly-overhauled replacement product) the product or software or offer a full refund of the purchase price at its sole discretion. SUCH REMEDY SHALL BE YOUR SOLE AND EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

Online Auction Purchases: Products purchased through online auctions are not eligible for warranty coverage. Online auction confirmations are not accepted for warranty verification. To obtain warranty service, an original or copy of the sales receipt from the original retailer is required. Garmin will not replace missing components from any package purchased through an online auction.

International Purchases: A separate warranty may be provided by international distributors for devices purchased outside the United States depending on the country. If applicable, this warranty is provided by the local in-country distributor and this distributor provides local service for your device. Distributor warranties are only valid in the area of intended distribution. Devices purchased in the United States or Canada must be returned to the Garmin service center in the United Kingdom, the United States, Canada, or Taiwan for service.

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2. INSTALLATION OVERVIEW

2.1 Introduction

Always follow acceptable avionics installation practices per AC 43.13-1B, AC 43.13-2B, or later FAA approved revisions of these documents. The GPS/WAAS installation instructions have been prepared to meet the guidance material contained in AC 20-138A "Airworthiness Approval of Global Navigation Satellite System (GNSS) Equipment". The communications installation instructions have been prepared to meet the guidance material defined by AC 20-67B, "Airborne VHF Communications Equipment Installations".

2.2 Minimum System Configuration

2.2.1 VFR Installation

The minimum 500W Series unit installation requires the following items for a VFR Installation:

- GNS 500W Series unit (installed in the aircraft manufacturer approved location for 6.25" wide avionics equipment)
- GPS antenna is required for GPS navigation functions.
- An external CDI is required for installations using the VOR navigation and glideslope information.
- A NAV antenna is required for VHF NAV functions.
- A COM antenna is required for COM functions.

VFR installations must be placarded "GPS LIMITED TO VFR USE ONLY" in clear view of the pilot.

2.2.2 IFR GPS Installation

In order for the 500W Series unit to be utilized for IFR GPS Navigation, the criteria in Section 2.2.1 must be met in addition to the following:

- An External CDI/HSI indicator must be installed in the pilot's primary field-of-view (or in the aircraft manufacturer approved mounting location). The indicator must have a vertical deviation indicator (GS) in order to perform VNAV operations/approaches.
- Any annunciation required for Source Selection or IFR GPS Navigation must meet the acceptable field-of-view requirements.

NOTE

To take full advantage of the 500W Series unit capabilities, an optional barometric altitude source is recommended for automatic sequencing of fix-to-altitude (FA) and hold-to-altitude (HA) leg types. If no barometric altitude data is provided to the 500W Series unit, FA and HA legs must be manually sequenced.

2.2.3 IFR VOR/LOC/GS Installation

The minimum GNS 530W installation requires the following items for an IFR VOR/LOC/GS installation:

- GNS 530W (installed in the aircraft manufacturer approved location)
- GPS antenna, VOR/LOC antenna, glideslope antenna, and COM antenna.
- An External CDI/HSI indicator must be installed in the pilot's primary field-of-view (or in the aircraft manufacturer approved mounting location). The indicator must have a vertical deviation indicator for glideslope and VNAV operations/approaches.
- Any annunciation required for Source Selection or IFR GPS Navigation must meet the acceptable field-of-view requirements.

2.3 External Sensors

When the 500W Series unit is installed with external sensors, these sensors must be installed in accordance with the manufacturer's data. This manual does not provide information for the installation of specific external sensors.

The 500W Series unit can accept data from multiple altitude, heading, and baro correction sources. If multiple sources are used, the 500W Series unit will accept data as described below.

NOTE

Barometric altitude is not required by the 500W Series unit to meet the requirements of TSO-C146a.

2.3.1 Multiple Uncorrected Pressure Altitude Sources

The 500W Series unit can accept altitude from a Gray Code or RS-232 altitude encoder, fuel/air data computer (FADC), ARINC 429 air data computer (ADC), ARINC 429 EFIS, and ARINC 429 traffic advisory system.

If multiple sources of altitude data are supplied to the GPS 500W/GNS 530W, only valid data from the highest priority source is used (input priority cannot be configured). If the highest priority source becomes unavailable, data is taken from the next-highest priority source. The priorities of the altitude sources are as follows (from highest to lowest):

1. ARINC 429 ADC
2. ARINC 429 EFIS
3. ARINC 429 Traffic Advisory System
4. RS-232 FADC
5. RS-232 Altitude Encoder
6. Parallel Altitude Encoder (Gray Code)

2.3.2 Multiple Baro-Corrected Altitude Sources

The 500W Series unit can accept baro-corrected altitude from an ARINC 429 ADC, ARINC 429 EFIS, RS-232 FADC, and GTX 33/330 transponder.

If multiple sources of baro-corrected altitude data are supplied to the GPS 500W/GNS 530W, only valid data from the highest priority source is used. If the highest priority source becomes unavailable, data is taken from the next-highest priority source. The priorities of the baro-corrected altitude sources are as follows (from highest to lowest):

1. ARINC 429 ADC
2. ARINC 429 EFIS
3. ARINC 429 from GTX 33/330
4. RS-232 FADC

2.3.3 Multiple Heading Sources

The 500W Series unit can accept heading data from an ARINC 429 INS/IRU, ARINC 429 EFIS, GAD 42, EHSI, GTX 33/330 transponder, ARINC 429 traffic advisory system, RS-232 FADC, and RS-232 WX-500 Stormscope®.

If multiple sources of heading data are supplied to the GPS 500W/GNS 530W, only valid data from the highest priority source is used – preference is given to true heading (ARINC 429 label 314) if both true heading (label 314) and magnetic heading (label 320) are received. If the highest priority source becomes unavailable, data is taken from the next-highest priority source. The priorities of the heading sources are as follows (from highest to lowest):

1. ARINC 429 INS/IRU
2. ARINC 429 EFIS
3. ARINC 429 from GAD 42
4. ARINC 429 from Sandel EHSI
5. ARINC 429 from GTX 33/330
6. ARINC 429 Traffic Advisory System
7. RS-232 FADC
8. RS-232 WX-500 Stormscope

2.4 Antenna Considerations

This section contains mounting location considerations for the antennas required for the 500W Series units.

The 500W Series unit requires a GPS/WAAS antenna and the GNS 530W and GNS 530AW require four antennas: a GPS/WAAS antenna, a COM antenna, a NAV antenna, and a Glideslope antenna.

2.4.1 GPS Antenna Location

The GPS antenna is a key element in the overall system performance and integrity for a GPS/WAAS navigation system. The mounting location, geometry, and surroundings of the antenna can affect the system performance and/or availability. The following guidance provides information to aid the installer in ensuring that the most optimum location is selected for the installation of the GPS antenna. The installation guidelines presented here meet the intent of AC 20-138A section 16. The greater the variance from these guidelines, the greater the chance of decreased availability. Approach procedures with vertical guidance are the most sensitive to these effects. LNAV only approaches, terminal operations, and enroute operations may also be affected. Because meeting all of these installations guidelines may not be possible on all aircraft, these guidelines are listed in order of importance to achieve optimum performance. Items 3 below are of equal importance and their significance may depend on the aircraft installation. The installer should use their best judgment to balance the installation guidelines.

1. Mount the antenna as close to level as possible with respect to the normal cruise flight attitude of the aircraft. If the normal flight attitude is not known, substitute the waterline, which is typically referenced as level while performing a weight and balance check.
2. The GPS antenna should be mounted in a location to minimize the effects of airframe shadowing during typical maneuvers. Typically mounting farther away from the tail section reduces signal blockage seen by the GPS antenna.

3a. The GPS antenna should be mounted no closer than two feet from any VHF COM antenna or any other antenna which may emit harmonic interference at the L1 frequency of 1575.42 MHz. An aircraft EMC check (reference VHF COM interference check in Post Installation Checkout procedures) can verify the degradation of GPS in the presence of interference signals. If an EMC check reveals unacceptable interference, insert a GPS notch filter in line with the offending VHF COM or the (re-radiating) ELT transmitter.

Note: When mounting a combination antenna (ex. GPS and COM, GPS and XM), the recommended distance of two feet or more is not applicable to the distance between the antenna elements provided the combination antenna is TSO authorized and has been tested to meet Garmin's minimum performance standards.

3b. The GPS antenna should be mounted no closer than two feet from any antennas emitting more than 25 watts of power. An aircraft EMC check can verify the degradation of GPS in the presence of interference signals.

3c. To minimize the effects of shadowing at 5° elevation angles, the GPS antenna should be mounted no closer than 6" (edge to edge) from other antennas, including passive antennas such as another GPS antenna or XM antenna.

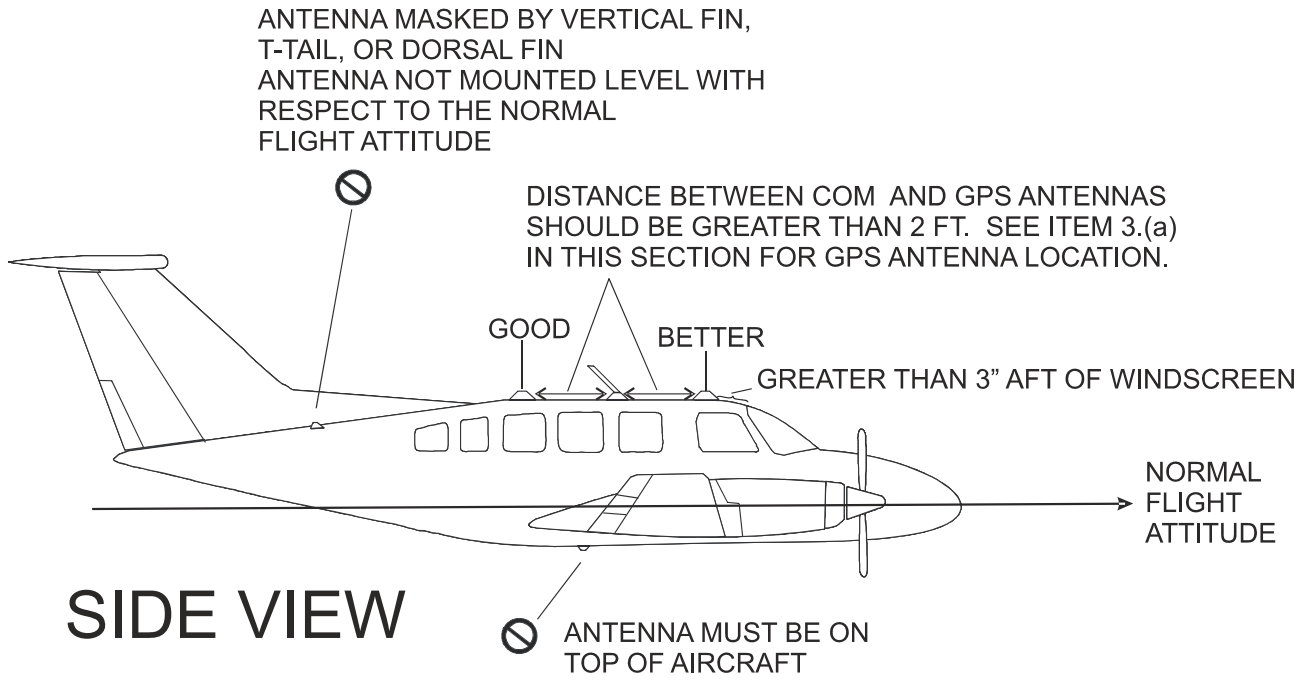
4. To maintain a constant gain pattern and limit degradation by the windscreen, avoid mounting the antenna closer than 3 inches from the windscreen.
5. For multiple GPS installations, the antennas should not be mounted in a straight line from the front to the rear of the fuselage. Also varying the mounting location will help minimize any aircraft shading by the wings or tail section (in a particular azimuth, when one antenna is blocked the other antenna may have a clear view).

Figure 2-1 shows the recommended placement of antennas.

2.4.2 COM Antenna Location

The GNS 530W COM antenna should be well removed from all projections, engines and propellers. The ground plane surface directly below the antenna should be a flat plane over as large an area as possible (18" square, minimum). The antenna should be mounted a minimum of six feet from any DME or other COM antennas, four feet from any ADF sense antennas, and two feet from the 500W Series unit and its GPS antenna. The COM antenna should also be mounted as far apart as practical from the ELT antenna. Some ELTs have exhibited re-radiation problems generating harmonics that may interfere with GPS signals. This can happen when the COM (500W Series unit or any other COM) is transmitting on certain frequencies such as 121.15 or 121.175 MHz, which may cause the ELT output circuit to oscillate from the signal coming in on the ELT antenna coax.

If simultaneous use of two COM transceivers is desired (split-COM or simul-comm), use of the TX interlock function is mandatory. In addition, the COM antennas should be spaced for maximum isolation. A configuration of one topside antenna and one bottom side antenna is recommended.



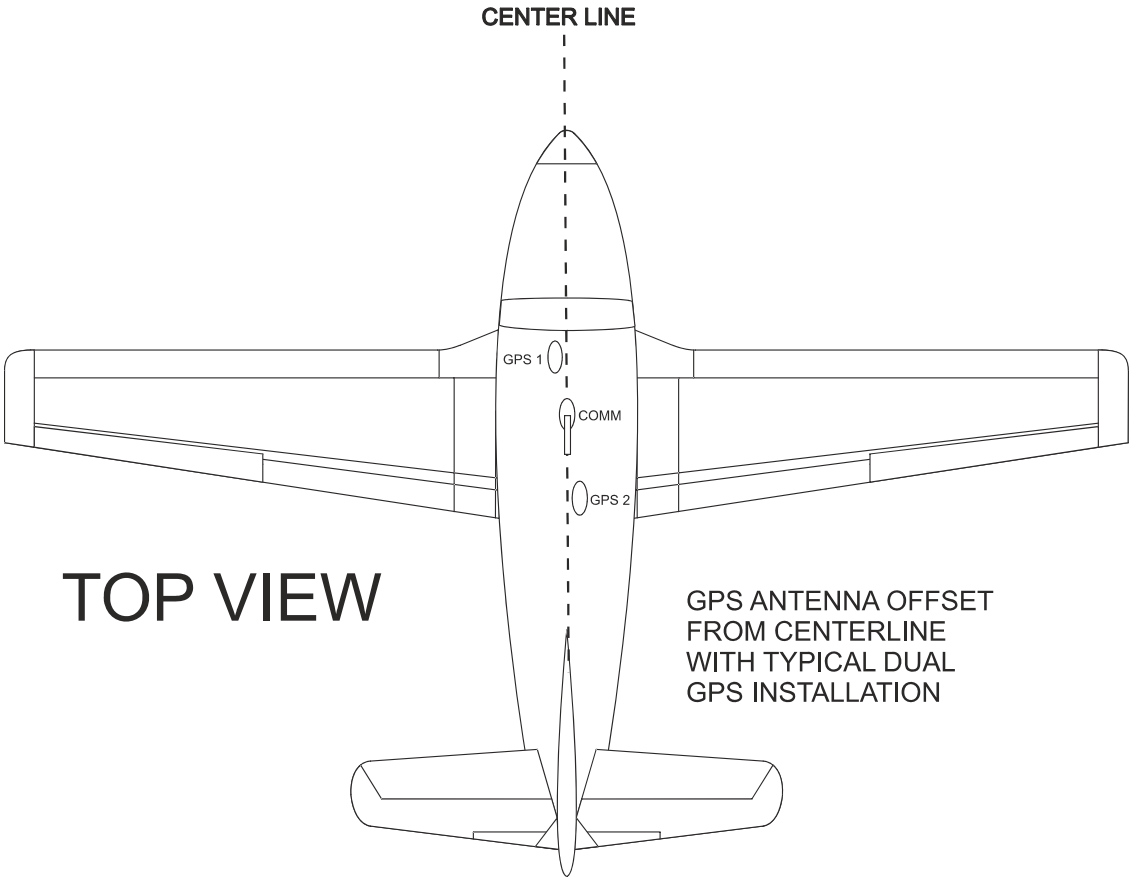


Figure 2-1. GPS Antenna Installation Considerations

2.4.3 VOR/LOC Antenna Location

The GNS 530W VOR/LOC antenna should be well removed from all projections, engines and propellers. It should have a clear line of sight if possible. The antenna must be mounted along the centerline of the aircraft, minimizing the lateral offset.

2.4.4 Glideslope Antenna Location

The GNS 530W Glideslope antenna should be well removed from all projections, engines and propellers. It should have a clear line of sight if possible.

2.4.5 Electrical Bonding

No special precautions need to be taken to provide a bonding path between the GPS antenna and the aircraft structure. Follow the manufacturers' instructions for the COM, VOR/LOC and Glideslope antennas.

2.4.6 Interference of GPS

On some installations, VHF COM transceivers, Emergency Locator Transmitter (ELT) antennas, and Direction Finder (DF) receiver antennas can re-radiate through the GPS antenna. The 500W Series unit COM does not interfere with its own GPS section. However, placement of the GPS antenna relative to a COM transceiver and COM antenna (including the GNS 530W COM antenna), ELT antenna, and DF receiver antenna is critical.

Use the following guidelines, in addition to others in this document, when locating the 500W Series unit and its antennas.

- GPS Antenna—Locate as far as possible from all COM antennas and all COM transceivers (including the 500W Series unit COM), ELT antennas, and DF receiver antennas. The GPS antenna is less susceptible to harmonic interference if a 1.57542 GHz notch filter is installed on the COM transceiver antenna output.
- Locate the 500W Series unit as far as possible from all COM antennas.

If a COM antenna is found to be the problem, a 1.57542 GHz notch filter (Garmin P/N 330-00067-00) may be installed in the VHF COM coax, as close to the COM as possible. This filter is not required for the GNS 530W transmitter.

If a COM is found to be radiating, the following can be done:

1. Replace or clean VHF COM rack connector to ensure good coax ground.
2. Place a grounding brace between the 500W Series unit, VHF COM and ground.
3. Shield the VHF COM wiring harness.

2.4.7 COM, VOR/LOC, and Glideslope Antenna Installation Instructions

Install the COM, VOR/LOC, and Glideslope antennas according to the manufacturer's recommendations. Avoid running other wires and coaxial cables near the VOR/LOC antenna cable.

2.5 Mounting Considerations

The 500W Series unit is designed to mount in the avionics stack in the aircraft instrument panel within view and reach of the pilot. The primary unit location should minimize pilot head movement when transitioning between looking outside of the cockpit and viewing/operating the GPS 500W/GNS 530W. The location should be such that the 500W Series unit is not blocked by the glare shield on top, or by the throttles, control yoke, etc. on the bottom.

2.6 Cabling and Wiring Considerations

Wiring should be installed in accordance with AC 43.13-1B Chapter 11. For dual 500W Series unit installations, care should be taken to ensure separation between wires of redundant systems to reduce the possibility of loss of navigation due to a single event. When wire separation cannot be achieved, the following issues should be addressed:

- It should not be possible for a cable harness to be exposed to wire chafing in a manner that both GPS units fail simultaneously;
- The cable harness should not be located near flight control cables and controls, high electrical capacity lines or fuel lines;
- The cable harness should be located in a protected area of the aircraft (e.g., isolated from engine rotor burst); and
- Do not route cable near high-energy sources.

NOTE

Wiring which is required to be shielded per Appendix H must be shielded. Pigtail lengths must be less than 3.0 inches.

Refer to Section 3.7 and Section 3.8 for connector and tooling information.

Refer to Section 3.10 for recommended coax cable.

Refer to Appendix H for the appropriate wiring connections to assemble the wiring connector.

Once the cable assemblies have been made, attach the cable connectors to the rear connector plate. After installing the mounting tube, attach the assembled connector plate. Route the wiring bundle as appropriate. Use 22 to 24 AWG wire for all connections except for power. See Figure H-4 for power and ground. Avoid sharp bends.

2.7 Air Circulation and Cooling

The 500W Series units meet all TSO requirements without external cooling. However, as with all electronic equipment, lower operating temperatures extend equipment life. On the average, reducing the operating temperature by 15° to 20°C (27° to 36°F) doubles the mean time between failure (MTBF). Recommended airflow rating is 1 CFM (cubic foot per minute) at a pressure equivalent to 0.1 inches of water.

Potential damage to your 500W Series unit may occur by using outside forced air to cool the equipment. Therefore, it is recommended that an electric forced air fan be installed, of the indicated rating, to cool this equipment.

Units tightly packed in the avionics stack heat each other through radiation, convection, and sometimes by direct conduction. Even a single unit operates at a much higher temperature in still air than in moving air. Fans or some other means of moving the air around electronic equipment are usually a worthwhile investment. A 5/8 inch diameter air fitting is provided on the rear of the mounting rack for the purpose of admitting cooling air under such conditions. If a form of forced air cooling is installed, make certain that rainwater cannot enter and be sprayed on the equipment.

2.8 Compass Safe Distance

After reconfiguring the avionics in the cockpit panel, if the 500W Series unit is mounted less than 12 inches from the compass, recalibrate the compass and make the necessary changes for noting correction data.

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3. INSTALLATION PROCEDURES

3.1 Unit and Accessories

For description of units see Table 1-1.

Table 3-1. Catalog Part Numbers

Model	Unit Only Kit	Standard Kit	Unit P/N	Color	COM	NAV	TAWS	Voltage (VDC)	Upgrade
GPS 500W	010-00414-00	010-00414-01	011-01062-00	BLK				14/28	
	010-00414-10	010-00414-11	011-01062-10	GRY				14/28	
	010-00414-40	010-00414-41	011-01062-40	BLK				14/28	X
	010-00414-50	010-00414-51	011-01062-50	GRY				14/28	X
	010-00415-00	010-00415-01	011-01063-00	BLK			X	14/28	
	010-00415-10	010-00415-11	011-01063-10	GRY			X	14/28	
	010-00415-40	010-00415-41	011-01063-40	BLK			X	14/28	X
	010-00415-50	010-00415-51	011-01063-50	GRY			X	14/28	X
GNS 530W	010-00416-00	010-00416-01	011-01064-00	BLK	10W	X		14/28	
	010-00416-10	010-00416-11	011-01064-10	GRY	10W	X		14/28	
	010-00416-40	010-00416-41	011-01064-40	BLK	10W	X		14/28	X
	010-00416-45	010-00416-46	011-01064-45	BLK	10W	X		28	X
	010-00416-50	010-00416-51	011-01064-50	GRY	10W	X		14/28	X
	010-00417-00	010-00417-01	011-01065-00	BLK	10W	X	X	14/28	
	010-00417-10	010-00417-11	011-01065-10	GRY	10W	X	X	14/28	
	010-00417-40	010-00417-41	011-01065-40	BLK	10W	X	X	14/28	X
	010-00417-45	010-00417-46	011-01065-45	BLK	10W	X	X	28	X
	010-00417-50	010-00417-51	011-01065-50	GRY	10W	X	X	14/28	X
GNS 530AW	010-00418-00	010-00418-01	011-01066-00	BLK	16W	X		28	
	010-00418-10	010-00418-11	011-01066-10	GRY	16W	X		28	
	010-00418-40	010-00418-41	011-01066-40	BLK	16W	X		28	X
	010-00418-50	010-00418-51	011-01066-50	GRY	16W	X		28	X
	010-00419-00	010-00419-01	011-01067-00	BLK	16W	X	X	28	
	010-00419-10	010-00419-11	011-01067-10	GRY	16W	X	X	28	
	010-00419-40	010-00419-41	011-01067-40	BLK	16W	X	X	28	X
	010-00419-50	010-00419-51	011-01067-50	GRY	16W	X	X	28	X

Table 3-2. Standard Kit Accessories

Model	Item	Part Number
GPS 500W	Mounting Rack	115-00345-00
	Connector Kit	011-00351-03
	Back Plate Assembly	011-00671-01
	Product Information Kit	K00-00165-00
GNS 530W	Mounting Rack	115-00345-00
	Connector Kit	011-00351-00
	Back Plate Assembly	011-00671-00
	Product Information Kit	K00-00165-00
GNS 530AW	Mounting Rack	115-00345-00
	Connector Kit	011-00351-00
	Back Plate Assembly	011-00671-00
	Product Information Kit	K00-00165-00

3.2 Optional Accessories

3.2.1 GPS Antenna Options

For details regarding antenna selection, refer to Section 1.4.8. Once the antenna type is decided upon, refer to the information below for detailed parts information for antennas available directly from Garmin. Contact manufacturer directly for information on other antennas.

GA 35 Antenna:

GA 35 Antenna Garmin P/N 013-00235-00 contains the following items:

ITEM	PART NUMBER	QTY
GA 35 GPS/WAAS Antenna [1]	013-00235-00 (Garmin) AT575-93G (Aero Antenna)	1

[1] Antenna includes 8-32 UNC-2A x 1.00" SS 303 mounting screws (qty 4) and O-ring (qty 1).

An antenna doubler may also be required. Refer to the appropriate antenna installation data.

To secure the antenna #8 washers (qty 4) and #8 (qty 4) self-locking nuts are required in addition to the antenna, or suitable nutplates may be installed on the doubler.

To connect the GPS antenna coaxial cable to the antenna a TNC plug is required.

GA 36 Antenna:

GA 36 Antenna Garmin P/N 013-00244-00 contains the following items:

ITEM	PART NUMBER	QTY
GA 36 GPS/WAAS Antenna [1]	013-00244-00 (Garmin) AT575-126G (Aero Antenna)	1

[1] Antenna includes 8-32 UNC-2A x 1.00" SS 303 mounting screws (qty 4) and O-ring (qty 1).

An antenna doubler may also be required. Refer to the appropriate antenna installation data.

To secure the antenna #8 washers (qty 4) and #8 (qty 4) self-locking nuts are required in addition to the antenna, or suitable nutplates may be installed on the doubler.

To connect the GPS antenna coaxial cable to the antenna a TNC plug is required.

GA 37 Antenna:

GA 37 Antenna Garmin P/N 013-00245-00 contains the following items:

ITEM	PART NUMBER	QTY
GA 37 GPS/WAAS + XM Antenna [1]	013-00245-00 (Garmin) AT2300-126G (Aero Antenna)	1

[1] Antenna includes 8-32 UNC-2A x 1.00" SS 303 mounting screws (qty 4) and O-ring (qty 1).

An antenna doubler may also be required. Refer to the appropriate antenna installation data.

To secure the antenna #8 washers (qty 4) and #8 (qty 4) self-locking nuts are required in addition to the antenna, or suitable nutplates may be installed on the doubler.

To connect the GPS antenna coaxial cable to the antenna a TNC plug is required.

3.2.2 Other Accessories

ITEM	GARMIN P/N
P5050 I/O Connector Kit (for TAWS units)	011-00558-00

3.2.3 Enable Cards

HTAWS is an optional function with the 500W Series units, and requires the enable card listed in the following table.

ITEM	GARMIN P/N
Data Card, HTAWS Enable, Std (Note 1) (Note 2)	010-00882-00
Data Card, HTAWS Enable, Upgrade (Note 1) (Note 2)	010-00882-01
Data Card, HTAWS Enable (Note1) (Note 3)	010-00882-10

Note 1: The card will be serialized to the unit once it is used and therefore cannot be used with other units.
Note 2: Use this card with non-TAWS GNS 500W Series units.
Note 3: Use this card with 500W Series TAWS units.

3.3 Database Options

ITEM	GARMIN P/N
Data Card, World Wide (Aviation Database)	010-10546-00
Data Card, Americas (Aviation Database)	010-10546-01
Data Card, International (Aviation Database)	010-10546-02
Data Card, Terrain/Obstacle (128 MB) (Note 1)	010-10201-20
Data Card, Terrain/Obstacle (256 MB) (Note 1)	010-10201-21
Data Card, Terrain/Obstacle, Helo, Americas North (2GB) (Note 2)	010-00874-01
Data Card, Terrain/Obstacle, Helo, Americas South (2GB) (Note 2)	010-00874-02
Data Card, Terrain/Obstacle, Helo, Atlantic North (2GB) (Note 2)	010-00874-03
Data Card, Terrain/Obstacle, Helo, Atlantic South (2GB) (Note 2)	010-00874-04
Data Card, Terrain/Obstacle, Helo, Pacific North (2GB) (Note 2)	010-00874-05
Data Card, Terrain/Obstacle, Helo, Pacific South (2GB) (Note 2)	010-00874-06
Data Card, Americas, Helicopter (Aviation Database)	010-00875-01

Note 1: Data cards 010-10201-20 and 010-10201-21 are functionally equivalent.

Note 2: Data card 010-00874-( ) is required for HTAWS operation, optional for other.

3.4 Miscellaneous Options

ITEM	GARMIN P/N
Connector, BNC, Male, Clamp	330-00087-00
GPS 1.57542 GHz Notch Filter	330-00067-00

3.5 Optional Reference Material

ITEM	GARMIN P/N
GNS 530W Pilot's Guide	190-00357-00
GNS 530W Quick Reference Guide	190-00357-01
Addendum – 400W/500W Series Display Interfaces	190-00356-31
Addendum – 400W/500W Series Garmin Optional Displays	190-00356-30
GNS 400W/500W Series Training CD	010-10601-00

3.6 Installation Materials Required but Not Provided

3.6.1 Optional Accessories Not Supplied (GNS 530W Only)

The following installation accessories are required but not provided.

ITEM	REQUIREMENTS
COM Antenna	Shall meet TSO C37( ) and C38( ). Broad band, 50 Ω, vertically polarized with coaxial cable
VOR/LOC Antenna	Shall meet TSO C40( ) and C36( ). Broad band, 50 Ω, horizontally polarized with coaxial cable
Glideslope Antenna	Shall meet TSO C34( ). Broad band, 50 Ω, horizontally polarized with coaxial cable or low-loss splitter used with the VOR/LOC antenna
Headphones	500Ω nominal impedance
Microphone	Low impedance, carbon or dynamic, with transistorized pre-amp

3.6.2 Materials Required But Not Supplied (New Installations Only)

The 500W Series is intended for use with the standard aviation accessories. The following items are required for installation, but not supplied:

- Wire (MIL-W-22759/16 or equivalent)
- Shielded Wire (MIL-C-27500 or equivalent)
- Mounting Screws (8 minimum – AN577 6-32 screw with 100° countersink)
- Circuit Breakers
- Tie Wraps or Lacing Cord
- Ring Terminals (for grounding)
- Coaxial Cable (RG-400, RG-142B or equivalent – Refer to Section 3.10 for additional information).

3.7 Special Tools Required

Some of the connectors use crimp contacts. The table below identifies crimp tools required to ensure consistent, reliable crimp contact connections for the rear D-sub connectors.

Table 3-3. Recommended Crimp Tools (or Equivalent)

Connector Type		High Density		Standard Density			
Wire Gauge		22-24 AWG		18 AWG		20-24 AWG	
	Hand Crimping Tool	Positioner	Insertion/ Extraction Tool	Positioner	Insertion/ Extraction Tool	Positioner	Insertion/ Extraction Tool
Military P/N	M22520/2-01	M22520/2-09	M81969/1-04	N/A	M81969/1-02	M22520/2-08	M81969/1-02
Positronic	9507	9502-3	M81969/1-04	9502-11	M81969/1-02	9502-5	M81969/1-02
ITT Cannon	995-0001-584	995-0001-739	N/A	N/A	N/A	995-0001-604	980-2000-426
AMP	601966-1	601966-6	91067-1	N/A	N/A	601966-5	91067-2
Daniels	AFM8	K42	M81969/1-04	K774	M81969/1-02	K13-1	M81969/1-02
Astro	615717	615725	M81969/1-04	N/A	M81969/1-02	615724	M81969/1-02

NOTE

Insertion/extraction tools from ITT Cannon are all plastic; others are plastic with metal tip.

3.8 Cable Installation

Follow the steps below for installation of the coax cables:

1. Route the coaxial cable to the rack location keeping in mind the recommendations of Section 2.6. Secure the cable in accordance with good aviation practice.
2. Trim the coaxial cable to the desired length and install the BNC connector (330-00087-00) per the cabling instructions on Figure 3-1. If the connector is provided by the installer, follow the connector manufacturer's instructions for cable preparation.

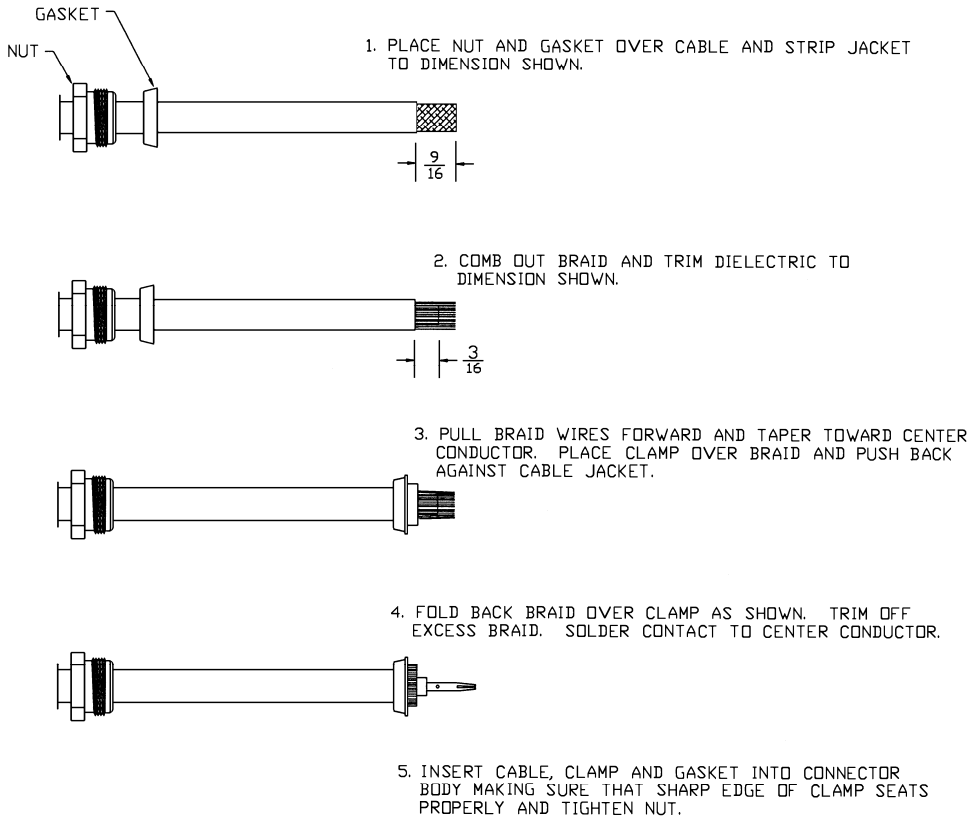


Figure 3-1. Coaxial Cable Installation

The card-edge connector may be used to terminate shield grounds to the 500W Series unit back plate.

Feed wires through the connector backshells **before** insertion into the 25-, 44-, and 78-pin connectors. Contacts for the 25-, 44-, and 78-pin connectors must be crimped onto the individual wires of the aircraft wiring harness. The following table lists contact part numbers (for reference). See Table 3-3 for recommended crimp tools.

Table 3-4. Pin Contact Part Numbers

	78-pin Connector (P5001/5050)	44-pin Connector (P5006)	25-pin Connector (P5002)		Shield Ground Connector
Connector Type	**High Density Pin Contact**		**Standard Density Socket Contact**		**.1" Pitch Card-Edge**
Wire Gauge	**22-24 AWG**		**18 AWG**	**20-24 AWG**	**20-24 AWG**
Garmin P/N	336-00021-00		336-00023-00	336-00022-00	336-00029-00
Military P/N	M39029/58-360		N/A	M39029/63-368	N/A
AMP	204370-2		N/A	205090-1	583853-4
Positronic	M39029/58-360		FC6018D	M39029/63-368	N/A
ITT Cannon	030-2042-000		See Note 2	031-1007-042	N/A

NOTES

1. Non-Garmin part numbers shown are not maintained by Garmin and consequently are subject to change without notice.
2. Alternate contacts for 18 AWG wire: As an alternative to the Positronic contacts listed (and provided in the installation kit), the installer may use contacts made by ITT Cannon under P/N 031-1007-001. These contacts require the use of a different crimp tool positioner than shown in the table, with the part numbers as follows: Daniels P/N K250, Astro P/N 616245, or ITT Cannon P/N 980-0005-722.
3. For the card-edge connector pin contacts, use AMP part number 90272-1 or equivalent crimping tool.

To prevent a possible short across the pins in the wiring harness, Teflon shrink tubing P/N 312-00005-05, provided in Connector Kit 011-00351-00 (P5002) covers the oversized power and ground pin contacts P/N 336-00023-00 (pins 11, 12, 21, 22) that protrude from the back of the connector shell. Before crimping the pins onto the wire:

1. Cut the tubing (312-00005-05) into 4 equal lengths.
2. Slide a short piece of the tubing over the wire.
3. Strip the wire and crimp the pin (336-00023-00) onto the wire.
4. Insert the pin into the connector shell.
5. Slide the tubing over the exposed portion of the pin and shrink using a heat gun.

3.9 Equipment Mounting

3.9.1 Rack Installation

Use the dimensions shown in Figure F-1 to prepare the mounting holes for the 500W Series unit. You may also use the 500W Series unit mounting rack itself as a template for drilling the mounting holes.

1. The back plate of the rack may optionally be removed for ease of mounting in the aircraft panel. To do so, remove the two #4-40 screws, tilt the back plate away from the tray, and then slide the back plate to the side.
2. Figure F-1. shows outline dimensions for the aviation rack for the various 500W Series units. Install the rack in a rectangular 6.320" x 4.600" hole (or gap between units) in the instrument panel (see Figure F-4). The lower-front lip of the rack should be flush with, or extend slightly beyond, the finished aircraft panel.

NOTE

If the front lip of the mounting rack is behind the surface of the aircraft panel, the 500W Series unit connectors may not fully engage.

Make sure that no screw heads or other obstructions prevent the unit from fully engaging in the rack (see the "Connector Engagement Test," Section 5.1.2). Exercise caution when installing the rack into the instrument panel. The rack is designed to facilitate removal of the 500W Series unit for use in Demo Mode outside the aircraft. Deformation of the rack may make it difficult to install and remove the 500W Series unit.

3. Install the rack in the aircraft panel using six #6-32 flat head screws and six self-locking nuts. The screws are inserted from the inside through the holes in the sides of the rack.
4. If the back plate was previously removed (see Step 1), replace the back plate by positioning the tabs on the back plate in the slots of the left side of the rack (viewing it from the cockpit) and attaching it by replacing the two #4-40 screws.

3.9.2 500W Series Unit Insertion and Removal

It may be necessary to insert the hex drive tool into the access hole and rotate the mechanism 90° counterclockwise to insure correct position prior to placing the unit in the rack. The 500W Series unit is installed in the rack by sliding it straight in until it stops, about 1 inch short of the final position. A 3/32-inch hex drive tool is then inserted into the access hole at the bottom of the unit face. Rotate the hex tool clockwise while pressing on the left side of the bezel until the unit is firmly seated in the rack.

To remove the unit from the rack, insert the hex drive tool into the access hole on the unit face and rotate counterclockwise until the unit is forced out about 3/8 inches and can be freely pulled from the rack.

Be sure not to over tighten the unit into the rack. The application of hex drive tool torque exceeding 15 in-lbs can damage the locking mechanism.

3.9.3 Unit Replacement

Whenever the 500W Series unit is removed or reinstalled, verify that the unit power-up self-test sequence is successfully completed and no failure messages are annunciated. Section 5.5.1 outlines the power-up self-test sequence.

3.10 Antenna Installation and Connections

3.10.1 GPS Antenna

This section provides information on the antenna cable installation. Refer to 2.4.1 herein for installation location considerations.

NOTE

The internal 500W Series unit COM does not interfere with its own GPS receiver. However, placement of the 500W Series unit antenna relative to other COM transceivers and antennas (including the 500W Series unit COM antenna) is critical.

Suggestion: *Temporarily locate the GPS antenna with coax connected to the 500W Series unit and check the GPS performance as described in Section 5.5.2 and Section 5.5.3. Once a suitable location has been verified, then permanently mount the antenna.*

Once the antenna mounting position has been prepared, route the coax cable from the antenna to the 500W Series unit. Proper selection of coax cable and assembly of connectors is critical to GPS signal performance. **The cable loss from the GPS antenna shall be between 1.5 dB and 6.5 dB in order to maintain proper rejection to interference signals.**

The coaxial connectors and adapters, such as TNC to BNC, add additional loss to the cable and should be considered when computing the cable loss. A typical loss of 0.2 dB can be used for each connection. To maintain integrity of the WAAS signal, the GPS antenna coaxial cable must have a minimum of two shields (e.g. RG-400 or RG-142B).

NOTE

If RG-142B or RG-400 is used, 1.5 dB equates to a length of approximately 6.5 feet of cable with a connector on each end. RG-142B or RG-400 cable can be used as long as the length is less than 35 feet. For longer lengths, use low-loss double or triple shielded 50Ω coax.

For very short runs, where the loss is less than 1.5 dB, additional cable should be used to increase the loss to within 1.5 dB to 6.5 dB. This additional cable may be coiled, taking into account the minimum bend radius of the cable.

During the post-installation checkout, susceptibility to harmonics of VHF COM transmitters will be evaluated. If problems arise, then better isolation, or distance, may be required between the GPS and COM antennas, or a 1575.42 MHz notch filter may be installed in series with the antenna coax of the VHF COM transceiver to reduce or eliminate the harmonic interference. A notch filter for this use (P/N 330-00067-00) is available from Garmin.

If a VHF COM transmitter causes problems with the GPS on the selected frequencies as listed in the post-installation checkout, the problem may be due to the ELT. This can be verified by disconnecting the ELT antenna coax at the ELT unit. If the ELT is found to cause the problem, then contact the ELT manufacturer or replace the ELT.

3.10.2 COM Antenna

The 500W Series unit requires a standard 50Ω vertically polarized antenna. Follow the antenna manufacturer's installation instructions for mounting the antenna.

The antenna should be mounted on a metal surface or a ground plane with a minimum area of 18 inches x 18 inches. Refer to Section 2.4.2 for installation location considerations.

The antenna coax cable should be made of RG-142B, RG-400 or a comparable quality 50Ω coax.

Check for insertion loss and VSWR (voltage standing wave ratio). VSWR should be checked with an in-line type VSWR/wattmeter inserted in the coaxial transmission line between the transceiver and the antenna. The VSWR should be inserted as close to the transceiver as possible. When rack and harness buildup is performed in the shop, the coax termination may be provisioned by using a 6-inch inline BNC connection. This would be an acceptable place to insert the VSWR. Any problem with the antenna installation is most likely seen as high reflected power. A VSWR of 3:1 may result in up to a 50% loss in transmit power.

3.10.3 NAV Antenna

The NAV antenna is a standard 50Ω horizontally polarized NAV/VOR/Localizer/Glideslope antenna (the glideslope may be a separate antenna in some aircraft) that receives VOR frequencies between 108 and 117.95 MHz, and localizer frequencies between 108 and 112 MHz, and glideslope information between 328.6 and 335.4 MHz. Follow the antenna manufacturer's installation instructions for mounting antennas. It is recommended that the installer use RG-142B, RG-400 or equivalent 50Ω coax for the NAV antenna(s).

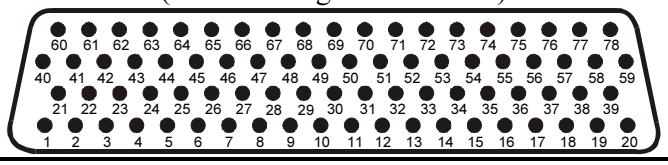
The GNS 530W has a separate VOR/LOC and Glideslope inputs requiring some installations to use a standard external diplexer or triplexer.

4. SYSTEM INTERCONNECT

4.1 Pin Function List

4.1.1 P5001 Main Connector

(View looking at rear of unit)



Pin	Pin Name		I/O
	Standard Function [1]	Alternate Function [1]	
1	VLOC ANNUNCIATE		Out
2	GPS ANNUNCIATE		Out
3	WAYPOINT ANNUNCIATE		Out
4	TERMINAL ANNUNCIATE		Out
5	APPROACH ANNUNCIATE		Out
6	MESSAGE ANNUNCIATE		Out
7	OBS ANNUNCIATE	REDUCED PROTECTION (RP MODE) [4]	Out
8	SPARE ANNUNCIATE	TERRAIN CAUTION ANNUNCIATE [4]	Out
9	INTEGRITY ANNUNCIATE		Out
10	ANNUNCIATE D		Out
11	ANNUNCIATE E		Out
12	RESERVED	TERRAIN WARNING ANNUNCIATE [4]	Out
13	GPS SELECT	TERRAIN NOT AVAILABLE ANNUNCIATE [4]	Out
14	ILS/GPS APPROACH		Out
15	AIRCRAFT POWER 2		In
16	TIME MARK OUT		Out
17	MAIN LATERAL SUPERFLAG		Out
18	MAIN VERTICAL SUPERFLAG		Out
19	AIRCRAFT POWER 1		In
20	AIRCRAFT POWER 1		In
21	MAIN +LEFT		Out
22	MAIN +RIGHT		Out
23	MAIN LATERAL +FLAG		Out
24	MAIN LATERAL –FLAG (GROUND)		Out
25	MAIN +TO		Out
26	MAIN +FROM		Out
27	MAIN +UP		Out
28	MAIN +DOWN		Out
29	MAIN VERTICAL +FLAG		Out
30	MAIN VERTICAL -FLAG (GROUND)		Out
31	MAIN OBS ROTOR C		Out
32	MAIN OBS ROTOR H (GROUND)		Out
33	MAIN OBS STATOR D		In
34	MAIN OBS STATOR E (2.5V COMMON OBS)		Out
35	MAIN OBS STATOR F		In
36	MAIN OBS STATOR G (2.5V COMMON OBS)		Out
37	AUDIO 1 HI	HTAWS AUDIO OUTPUT	Out
38	AUDIO 1 LO (GROUND)	HTAWS AUDIO GROUND	Out
39	LIGHTING BUS HI		In
40	LIGHTING BUS LO		In
41	GPS RS-232 OUT 3		Out

Pin	Pin Name		I/O
	Standard Function [1]	Alternate Function [1]	
42	GPS RS-232 IN 3		In
43	MAIN OBI CLOCK	RESERVED	Out
44	MAIN OBI DATA	HTAWS AUDIO ACTIVE [4]	Out
45	MAIN OBI SYNC	RESERVED	Out
46	GPS ARINC 429 OUT A		Out
47	GPS ARINC 429 OUT B		Out
48	GPS ARINC 429 IN 1 A		In
49	GPS ARINC 429 IN 1 B		In
50	GPS ARINC 429 IN 2 A		In
51	GPS ARINC 429 IN 2 B		In
52	AUDIO 2 HI		Out
53	AUDIO 2 LO		--
54	GPS RS-232 OUT 4		Out
55	GPS RS-232 IN 4		In
56	GPS RS-232 OUT 1		Out
57	GPS RS-232 IN 1		In
58	GPS RS-232 OUT 2		Out
59	GPS RS-232 IN 2		In
60	ALTITUDE COMMON (GROUND)		Out
61	ALTITUDE C4 [2]	REDUCED PROTECTION (RP MODE) [4]	In
62	ALTITUDE C2 [2]	AURAL SUPPRESSION [4]	In
63	ALTITUDE C1 [2]	TERRAIN INHIBIT [4]	In
64	ALTITUDE B4 [2]	HTAWS AUDIO INHIBIT [4]	In
65	ALTITUDE B2 [2]	RESERVED	In
66	ALTITUDE B1 [2]	RESERVED	In
67	ALTITUDE A4 [2]	RESERVED	In
68	ALTITUDE A2 [2]	RESERVED	In
69	ALTITUDE A1 [2]	RESERVED	In
70	ALTITUDE D4 [2]	AIR/GROUND [3]	In
71	OBS MODE SELECT		In
72	AIRCRAFT POWER 2		In
73	CDI SOURCE SELECT		In
74	COM REMOTE RECALL		In
75	DEMO MODE SELECT		In
76	RESERVED		--
77	AIRCRAFT GROUND		--
78	AIRCRAFT GROUND		--

[1] When the airframe is configured for helicopter (see Section 5.3.3) and HTAWS is enabled, the alternate functions are available, and the standard I/O functions on those pins are not available.

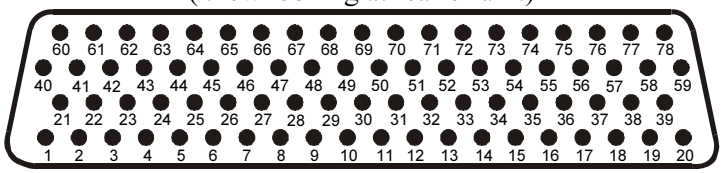
[2] The altitude input is not available when the airframe is configured for helicopter.

[3] When the airframe is configured for helicopter, the Air/Ground input is available and can be enabled or disabled. See Section 5.3.3.

[4] For use on 500W Series non-TAWS units. For 500W Series TAWS units, use connection on P5050.

4.1.2 P5050 I/O (with TAWS)

(View looking at rear of unit)



Pin	Pin Name		I/O
	Standard Function [1]	Alternate Function [1]	
1	TAWS INHIBIT IN	TERRAIN INHIBIT	In
2	TAWS AUDIO INHIBIT IN	HTAWS AUDIO INHIBIT	In
3	SPARE INPUT 4	REDUCED PROTECTION (RP MODE)	In
4	SPARE INPUT 3	AURAL SUPPRESSION	In
5	SPARE INPUT 2		In
6	SPARE INPUT 1		In
7	RESERVED		--
8	RESERVED		--
9	TERRAIN NOT AVAILABLE ANNUNCIATE	TERRAIN NOT AVAILABLE ANNUNCIATE	Out
10	TERRAIN WARNING ANNUNCIATE	TERRAIN WARNING ANNUNCIATE	Out
11	TERRAIN CAUTION ANNUNCIATE	TERRAIN CAUTION ANNUNCIATE	Out
12	TAWS INHIBIT ANNUNCIATE	TERRAIN INHIBIT ANNUNCIATE	Out
13	SPARE ANNUN 2	REDUCED PROTECTION (RP MODE)	Out
14	SPARE ANNUN 1		Out
15	TAWS AUDIO ACTIVE OUT	HTAWS AUDIO ACTIVE	Out
16	RESERVED		--
17-21	GROUND		--
22-59	NO CONNECT		--
60	RS-232_OUT_5		Out
61	RS-232_IN_5		In
62	NO CONNECT		--
63	NO CONNECT		--
64	GROUND		--
65-78	NO CONNECT		--

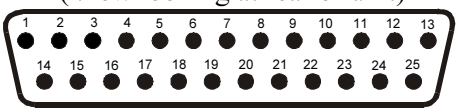
[1] When the airframe is configured for helicopter (see Section 5.3.3) and HTAWS is enabled, the alternate functions are available, and the standard I/O functions on those pins are not available.

4.1.3 P5050 I/O (without TAWS)

Pin	Pin Name	I/O
1-59	SPARES	--
60	GPS RS-232 OUT 5	Out
61	GPS RS-232 IN 5	In
62	GPS RS-232 OUT 6	Out
63	GPS RS-232 IN 6	In
64-78	SPARES	--

4.1.4 P5002 COM Connector (GNS 530W Only)

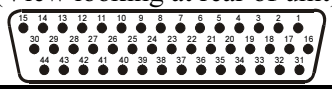
(View looking at rear of unit)



Pin	Pin Name	I/O
1	RESERVED	--
2	RESERVED	--
3	RESERVED	--
4	COM MIC KEY	In
5	INTERCOM MIC HI	In
6	COM MIC AUDIO HI	In
7	500Ω COM AUDIO HI	Out
8	RESERVED	--
9	RESERVED	--
10	RESERVED	--
11	AIRCRAFT POWER	In
12	AIRCRAFT POWER	In
13	RESERVED	--
14	TRANSMIT INTERLOCK	In
15	COM REMOTE TRANSFER	In
16	SPARE	--
17	INTERCOM MIC LO	In
18	COM MIC AUDIO LO	In
19	500Ω COM AUDIO LO	Out
20	RESERVED	--
21	AIRCRAFT GROUND	--
22	AIRCRAFT GROUND	--
23	RESERVED	--
24	RESERVED	--
25	RESERVED	--

4.1.5 P5006 NAV Connector (GNS 530W Only)

(View looking at rear of unit)



Pin	Pin Name	I/O
1	VOR/LOC +TO	Out
2	VOR/LOC +FROM (VOR/LOC COMMON)	Out
3	VOR/LOC +FLAG	Out
4	VOR/LOC -FLAG (VOR/LOC COMMON)	Out
5	VOR/LOC +LEFT	Out
6	VOR/LOC +RIGHT (VOR/LOC COMMON)	Out
7	RESERVED	--
8	VOR/LOC COMPOSITE OUT	Out
9	VOR OBS ROTOR C	Out
10	VOR OBS ROTOR H (GROUND)	Out
11	VOR OBS STATOR E/G (VOR/LOC COMMON)	In
12	VOR OBS STATOR F	In
13	VOR OBS STATOR D	In
14	PARALLEL DME - 8MHZ	Out
15	VOR/LOC SUPERFLAG	Out
16	500Ω VOR/ILS AUDIO HI	Out
17	500Ω VOR/ILS AUDIO LO	Out
18	SERIAL DME CLOCK	Out
19	SERIAL DME DATA	Out
20	SER DME - CHAN REQ/PAR DME - 4MHZ	I/O
21	SER DME - RNAV MODE/PAR DME - 2MHZ	I/O
22	DME COMMON	In
23	VOR/ILS ARINC 429 OUT B	Out
24	VOR/ILS ARINC 429 OUT A	Out
25	VOR OBI CLOCK	Out
26	VOR OBI SYNC	Out
27	VOR OBI DATA	Out
28	VLOC REMOTE TRANSFER	In
29	ILS ENERGIZE	Out
30	GLIDESLOPE +FLAG	Out
31	GLIDESLOPE +DOWN/-FLAG (GLIDESLOPE COMMON)	Out
32	GLIDESLOPE +UP	Out
33	PARALLEL DME - 1MHZ	Out
34	RESERVED	--
35	VOR/ILS ARINC 429 IN B	In
36	VOR/ILS ARINC 429 IN A	In
37	PARALLEL DME - 800KHZ	Out
38	GLIDESLOPE SUPERFLAG	Out
39	PARALLEL DME - 400KHZ	Out
40	PARALLEL DME - 200KHZ	Out
41	AIRCRAFT GROUND	--
42	PARALLEL DME - 100KHZ	Out
43	PARALLEL DME - 50KHZ	Out
44	AIRCRAFT POWER	In

4.2 Power, Lighting, And Antennas

This section covers the power input requirements, lighting bus input, and antenna connections. See Figure H-4 for interconnect information.

4.2.1 Power

Pin Name	Connector	Pin	I/O
AIRCRAFT POWER 1 (MAIN)	P5001	19	In
AIRCRAFT POWER 1 (MAIN)	P5001	20	In
AIRCRAFT POWER 2 (MAIN)	P5001	15	In
AIRCRAFT POWER 2 (MAIN)	P5001	72	In
AIRCRAFT POWER (COM)	P5002	11	In
AIRCRAFT POWER (COM)	P5002	12	In
AIRCRAFT POWER (NAV SUPERFLAG)	P5006	44	In
AIRCRAFT GROUND	P5001	77	--
AIRCRAFT GROUND	P5001	78	--
AIRCRAFT GROUND	P5002	21	--
AIRCRAFT GROUND	P5002	22	--
AIRCRAFT GROUND	P5006	41	--

For the main power input, a 14 VDC installation requires two aircraft power and two aircraft ground connections be used for each main power input used. A 28 VDC installation requires a minimum of one each power and ground connection, but two are recommended.

A power connection on P5006-44 is only required if NAV SUPERFLAG or G/S SUPERFLAG is utilized.

The power inputs P5001-19 and P5001-20 provide power for all functions of the 500W Series unit except the COM transmitter and the NAV and G/S SUPERFLAG outputs.

4.2.2 Lighting Bus

CAUTION

Connection of the lighting bus to incorrect pins can cause damage to the unit that will require return to the factory for repair. Ensure that the lighting bus is connected to the correct pins and does not short to any adjacent pins prior to applying power to the unit, including the lighting bus.

Pin Name	Connector	Pin	I/O
LIGHTING BUS HI	P5001	39	In
LIGHTING BUS LO	P5001	40	In

The 500W Series unit can be configured to track 28 VDC, 14 VDC, 5 VDC or 5 Vac lighting buses using these inputs. Alternatively, the 500W Series unit can automatically adjust for ambient lighting conditions based on the photocell. Refer to Section 5.3.6 for configuring the lighting inputs.

4.2.3 Antennas

Pin Name	Connector	I/O
GPS ANTENNA	P5003	In
COM ANTENNA	P5004	I/O
VOR/LOC ANTENNA	P5005	In
GLIDESLOPE ANTENNA	P5007	In

4.3 Altitude Gray Code

Altitude input is useful for advisory vertical navigation (VNAV) calculations.

Pin Name	Connector	Pin	I/O
ALTITUDE D4	P5001	70	In
ALTITUDE A1	P5001	69	In
ALTITUDE A2	P5001	68	In
ALTITUDE A4	P5001	67	In
ALTITUDE B1	P5001	66	In
ALTITUDE B2	P5001	65	In
ALTITUDE B4	P5001	64	In
ALTITUDE C1	P5001	63	In
ALTITUDE C2	P5001	62	In
ALTITUDE C4	P5001	61	In
ALTITUDE COMMON	P5001	60	In

NOTE

The altitude gray code input is not available when the airframe is configured for helicopter.

These inputs are considered active if either the voltage to ground is <1.9 V or the resistance to ground is <375 Ω. These inputs are considered inactive if the voltage to ground is 11-33 VDC.

NOTE

Some transponders and other altitude encoder receivers do not have internal isolation diodes to prevent the unit from pulling the encoder lines to ground when the unit is off. These units require a diode added to the installation harness for each encoder line. The anode should be connected on the receiving unit's side and the cathode should be connected on the encoder side. A set of diodes is required for each unit without internal diodes. The 500W Series unit includes internal diodes for isolation of the encoder lines.

Refer to Section 5.3.8 for the altitude gray code checkout.

Refer to Figure H-5 for the altitude gray code interconnect.

4.4 Main Indicator

4.4.1 Main Indicator Function

The main indicator displays both lateral and vertical deviation from selected course, To/From indications, lateral and vertical flags and superflags.

The "CDI" button on the bezel of the GNS 530W takes the place of remote "NAV/GPS" switches, and is used to toggle between display of GPS and VOR/ILS navigation display on a remote indicator. The Navigation source is annunciated on the display above the 'CDI' button. The Navigation method is optionally annunciated externally by connecting to the VLOC ANNUNCIATE output (P5001-1) and GPS ANNUNCIATE output (P5001-2). GPS and VOR/ILS navigation may be toggled externally when the CDI SOURCE SELECT input (P5001-73) is momentarily grounded. See Section 4.5 for more information on the external annunciators and switches.

An OBS resolver connection to the GPS is preferred, but not required. For the GNS 530W, an OBS resolver typically is connected to the MAIN OBS inputs for use with the GNS 530W VOR receiver.

4.4.2 Main Indicator Electrical Characteristics

4.4.2.1 Deviation

Pin Name	Connector	Pin	I/O
MAIN +LEFT	P5001	21	Out
MAIN +RIGHT (1.65V COMMON)	P5001	22	Out
MAIN +UP (1.65V COMMON)	P5001	27	Out
MAIN +DOWN	P5001	28	Out

The deviation output is capable of driving up to three 1000 Ω meter loads with ±150 mVDC ±10% for full-scale deflection. The drive circuit provides for more than full-scale deflection with a maximum course deviation output voltage of ±300 mVDC ±10%.

4.4.2.2 TO/FROM

Pin Name	Connector	Pin	I/O
MAIN +TO (1.65V COMMON)	P5001	25	Out
MAIN +FROM	P5001	26	Out

The output is capable of driving up to three 200 Ω meter loads. When indicating TO, MAIN +TO is +250 ±40 mVDC with respect to MAIN +FROM. When indicating FROM, MAIN +TO is -250 ± 40 mVDC with respect to MAIN +FROM. When invalid information is present (Flag IN VIEW) the TO/FROM output is 0 ±10 mVDC.

4.4.2.3 Flags

Pin Name	Connector	Pin	I/O
MAIN LATERAL +FLAG	P5001	23	Out
MAIN LATERAL -FLAG (GROUND)	P5001	24	Out
MAIN VERTICAL +FLAG	P5001	29	Out
MAIN VERTICAL -FLAG (GROUND)	P5001	30	Out

The Flag outputs are capable of driving up to three 1000 Ω meter loads. When valid information is present (Flag OUT OF VIEW) the Flag output is 375 ±80 mVDC. When invalid information is present (Flag IN VIEW) the Flag output is 0 ±25 mVDC.

4.4.2.4 Superflags

Pin Name	Connector	Pin	I/O
MAIN LATERAL SUPERFLAG	P5001	17	Out
MAIN VERTICAL SUPERFLAG	P5001	18	Out

The output supplies not less than 500 mA on a 28 volt system and 250 mA on a 14 volt system with the output voltage not less than (AIRCRAFT POWER –1.5 VDC) when the flag is to be OUT OF VIEW. The output voltage with respect to ground is less than 0.25 VDC when the flag is to be IN VIEW.

NOTE

The superflag outputs are internally fused. Connections to equipment that exceeds the specified current must be avoided, or return to the factory or an authorized service center may be required for repair.

4.4.2.5 OBS

Pin Name	Connector	Pin	I/O
MAIN OBS ROTOR C	P5001	31	Out
MAIN OBS ROTOR H (GROUND)	P5001	32	Out
MAIN OBS STATOR D	P5001	33	In
MAIN OBS STATOR E (2.5V COMMON OBS)	P5001	34	Out
MAIN OBS STATOR F	P5001	35	In
MAIN OBS STATOR G (2.5V COMMON OBS)	P5001	36	Out

MAIN OBS ROTOR C and H are a buffered output that is intended to drive the OBS rotors. MAIN OBS STATOR D and MAIN OBS STATOR F are each phase and amplitude shifted version of the MAIN ROTOR C output. Each pair is intended to read one of the two windings of the indicator's OBS stator.

4.4.3 Main Indicator Configuration

None.

4.4.4 Main Indicator Calibration and Checkout

Refer to Section 5.3.9 for the main CDI/OBS checkout.

4.4.5 Main Indicator Interconnect

Refer to Appendix H for the navigation indicator interconnect information.

4.5 Annunciators/Switches

4.5.1 Annunciators/Switches Function

4.5.1.1 Message Annunciate

When a new status message is available, the Message Annunciator flashes. When status messages remain effective, the Message Annunciator illuminates continuously.

4.5.1.2 Waypoint Annunciate

The waypoint annunciator output is driven in the following manner:

1. When the aircraft is within 10 seconds of reaching the turning point for a course change, the waypoint annunciator flashes.
2. When the aircraft is in a turn, the waypoint annunciator illuminates and remains illuminated until the turn is completed.
3. When a user arrival alarm is set and the aircraft is within the circle defined by the arrival alarm radius at the arrival waypoint, the waypoint annunciator flashes for 10 seconds.
4. When a user arrival alarm is not set and the aircraft is within 10 seconds of reaching the arrival waypoint, the waypoint annunciator flashes.

4.5.1.3 CDI SOURCE SELECT (GNS 530W Only)

The CDI Source Select discrete input may be used to toggle between display of GPS and VOR/LOC/Glideslope information on the MAIN external CDI/HSI. A momentary low on this pin performs the same function as pressing the 'CDI' key on the GNS 530W bezel.

4.5.1.4 VLOC ANNUNCIATE (GNS 530W Only)

The VLOC annunciate output is driven when the unit is configured with a single CDI/HSI and the VOR/ILS data is being displayed on the CDI/HSI. This output parallels the VLOC annunciator on the display.

4.5.1.5 GPS ANNUNCIATE (GNS 530W Only)

The GPS annunciate output is driven when the unit is configured with a single CDI/HSI and the GPS data is being displayed on the CDI/HSI. This output parallels the GPS annunciation on the display.

4.5.1.6 OBS MODE SELECT

The OBS Mode Select discrete input may be used to toggle between GPS OBS and GPS AUTO modes of operation. A momentary low on this pin performs the same function as pressing the 'OBS' key on the 500W Series unit.

4.5.1.7 OBS ANNUNCIATE

The OBS annunciate output is driven to indicate GPS OBS mode of operation. This output is active when the OBS or SUSP annunciation is on the display.

4.5.1.8 TERMINAL ANNUNCIATE

When performing approach navigation, the terminal annunciator is illuminated when operating within 30 nautical miles of the departure or arrival airport and the CDI scale is the equivalent or 1.0 nm or less.

4.5.1.9 APPROACH ANNUNCIATE

When performing approach navigation, the approach annunciator illuminates when approach is active.

4.5.1.10 INTEGRITY ANNUNCIATE

The integrity annunciator illuminates when the GPS receiver detects a position error, or is unable to calculate the integrity of the position.

4.5.1.11 ILS/GPS APPROACH Output

The ILS/GPS Approach Output sinks 500 mA when:

- GPS navigation is selected and either a GPS approach mode is active or 0.3 nmi is selected for the CDI full scale deflection; or
- VLOC navigation is selected and an ILS channel has been selected.

This output may be connected to the ILS Engage input of an autopilot or flight director to provide higher autopilot gain while the 400W Series unit is operating in the ILS or GPS Approach modes of operation.

4.5.1.12 DEMO MODE SELECT

The Demo Mode Select discrete input may be used to select Demo Mode on the 500W Series unit. A low on this pin at time of unit power-up invokes the Demo Mode. Demo Mode allows the 500W Series unit to simulate reception of GPS satellite signals.

CAUTION

Do not connect DEMO MODE SELECT in an aircraft installation.

4.5.1.13 GPS SELECT

The GPS Select Output is driven low when GPS data is being displayed on the CDI/HSI and the ILS/GPS Approach Output is not active. It is intended for use with autopilots having a GPS Select input (such as the Bendix/King KAP 140 and KFC 225), so that the autopilot can capture vertical guidance while GPS data is being displayed on the CDI/HSI.

4.5.1.14 TIME MARK OUT

Time Mark Out is a time reference pulse output once per second, derived from GPS satellite signals.

4.5.1.15 ANNUNCIATE 'D' AND ANNUNCIATE 'E'

These annunciate outputs are used to control compatible traffic systems.

- Annunciate D: Self Test
- Annunciate E: Operate/Standby

4.5.1.16 COM REMOTE RECALL

This discrete input may be used to scroll through a list of preset COM frequencies. A momentary low on this pin will load the next preset frequency into the standby COM frequency.

4.5.1.17 AIR/GROUND INPUT

This discrete input may be used to control the air/ground status of the GNS 500W Series unit. When the airframe is configured for helicopter, the air/ground input is available and can be enabled or disabled.

4.5.2 Annunciators/Switches Electrical Characteristics

4.5.2.1 Annunciators

Pin Name	Connector	Pin	I/O
VLOC ANNUNCIATE	P5001	1	Out
GPS ANNUNCIATE	P5001	2	Out
WAYPOINT ANNUNCIATE	P5001	3	Out
TERMINAL ANNUNCIATE	P5001	4	Out
APPROACH ANNUNCIATE	P5001	5	Out
MESSAGE ANNUNCIATE	P5001	6	Out
OBS ANNUNCIATE	P5001	7	Out
SPARE ANNUNCIATE	P5001	8	Out
INTEGRITY ANNUNCIATE	P5001	9	Out
GPS SELECT [1]	P5001	13	Out
ILS/GPS APPROACH	P5001	14	Out

[1] The Operation of the GPS SELECT can be configured. Refer to Section 5.3.3.

All outputs sink up to 500 mA when activated.

4.5.2.2 Switch Inputs

Pin Name	Connector	Pin	I/O
OBS MODE SELECT	P5001	71	In
CDI SOURCE SELECT	P5001	73	In
COM REMOTE RECALL	P5001	74	In
DEMO MODE SELECT	P5001	75	In
AIR/GROUND	P5001	70	In

These inputs are considered active if either the voltage to ground is <1.9 V or the resistance to ground is <375 Ω. These inputs are considered inactive if the voltage to ground is 11-33 VDC.

4.5.2.3 TIME MARK OUT

Pin Name	Connector	Pin	I/O
TIME MARK OUT	P5001	16	Out

TIME MARK OUT outputs a 1 ms ± 1 µs wide pulse once every second. TIME MARK OUT is a logic level output, capable of sourcing 1 mA at greater than 3.8 V and sinking 1 mA at less than 0.4 V.

4.5.3 Annunciators/Switches Configuration

Refer to Section 5.3.3 for configuration of the GPS SELECT output and AIR/GROUND input.

4.5.4 Annunciators/Switches Calibration and Checkout

Refer to Section 5.3.8 for the annunciators/switches checkout.

4.5.5 Annunciators/Switches Interconnect

Refer to Appendix H for annunciators/switches interconnect information.

4.6 Serial Data

4.6.1 Serial Data Function

4.6.1.1 RS-232

The 500W Series unit is capable of interfacing with other aviation instruments by transmitting RS-232 Type 1 (often known as ARNAV format) and Type 2 (often known as Northstar format) data on the GPS RS-232 OUT 1 port. The data consists of the following (refer to Appendix D for a detailed data format description):

- Current latitude, longitude, and GPS altitude in feet (see Note below)
- Current velocity vector (ground speed and direction of velocity vector over the ground)
- Distance to waypoint
- Cross track error
- Desired track
- Destination waypoint identifier
- Bearing to destination waypoint
- Magnetic variation
- Navigation and warning status
- Waypoint sequence in route
- Waypoint position (latitude and longitude) and magnetic variation

NOTE

Aviation RS-232 data may be transmitted with or without the current GPS altitude in feet. Refer to Section 5.3.2.

The 500W Series unit can receive pressure altitude, air data, and fuel data from certain systems on the GPS RS-232 IN 1 port.

The 500W Series unit can communicate with a Ryan TCAD 9900B system using the GPS RS-232 OUT 2 and GPS RS-232 IN 2 lines to display traffic information on the 500W Series unit.

If two 400W or 500W Series units are installed in an aircraft, the GPS RS-232 OUT 3 and GPS RS-232 IN 3 lines may be cross-connected to crossfill flight plans and user-defined waypoints from one 400W or 500W Series unit to the other.

NOTE

The GPS 500W/GNS 530W will crossfill with other GNS 400W/500W Series units only. It will not crossfill with the GNS 480 or older GNS 400/500 Series units.

The 500W Series unit can communicate with an L3 Communications WX-500 Stormscope using the GPS RS-232 OUT 4 and GPS RS-232 IN 4 lines to display lightning strike information on the 500W Series unit.

4.6.1.2 ARINC 429

The data output on the GPS ARINC 429 OUT port depends on the configuration (see Section 5.3.1). Below is a list of the configurations and the labels output for each one:

1. ARINC 429
2. GAMA 429
3. GAMA 429 Graphics
4. GAMA 429 Graphics w/Int
5. GAMA 429 Pro Line 21
6. GAMA 429 Sextant
7. GAMA 429 Bendix King

NOTE

Additional output settings may be available on units installed via OEM TC.

Label #	Parameter Name	1	2	3	4	5	6	7
001	Distance to Go (BCD)	●	●	●	●	●	●	●
002	Time to Go (BCD)	●	●	●	●	●	●	●
012	Ground Speed (BCD)	●	●	●	●	●	●	●
074G	Data Record Header		●	●	●	●	●	●
075G	Active Wpt From/To Data		●	●	●	●	●	●
100	Selected Course 1	●						
100P	Selected Course 1		●	●	●	●	●	●
113G	Message Checksum		●	●	●	●	●	●
114	Desired Track (True)	●	●	●	●	●	●	●
115	Waypoint Bearing (True)	●	●	●	●	●	●	●
116	Cross Track Distance	●						
116G [2]	Cross Track Distance		●	●	●	●	●	●
117G [1]	Vertical Deviation		●	●	●	●	●	
117P [1]	Vertical Deviation							●
121	Horizontal Command (to Autopilot)	●	●	●	●	●	●	●
125	Greenwich Mean Time (BCD)	●	●	●	●	●	●	●
147G	Magnetic Variation		●	●	●	●	●	●
251	Distance to Go	●						
251G	Distance to Go		●	●	●	●	●	●
252	Time to Go	●	●	●	●	●	●	●
260G	Date (BCD)		●	●	●	●	●	●
261G	GPS Discrete Word 1		●	●	●	●	●	●
275G	LRN Status Word		●	●	●	●	●	●
300G	Station Declination, Type, and Class		●	●	●	●	●	●
303	Message Length/Type/Number		●	●	●	●	●	●
304G	Message Characters 1-3		●	●	●	●	●	●
305G	Message Characters 4-6		●	●	●	●	●	●
306G	NAV/Waypoint/Airport Latitude		●	●	●	●	●	●
307G	NAV/Waypoint/Airport Longitude		●	●	●	●	●	●
310	Present Position Latitude	●	●	●	●	●	●	●
311	Present Position Longitude	●	●	●	●	●	●	●
312	Ground Speed	●	●	●	●	●	●	●
313	Track Angle (True)	●	●	●	●	●	●	●
314	True Heading	●	●	●	●	●	●	●
315	Wind Speed	●	●	●	●	●	●	●

Label #	Parameter Name	1	2	3	4	5	6	7
316	Wind Angle (True)	●	●	●	●	●	●	●
320	Magnetic Heading	●	●	●	●	●	●	●
321	Drift Angle	●	●	●	●	●	●	●
326G [2]	Lateral Scale Factor		●	●	●	●	●	●
327G [1]	Vertical Scale Factor		●	●	●	●	●	
330	Conic Arc Inbound Course			●	●			
331	Conic Arc Radius			●	●			
332	Conic Arc Course Change Angle			●	●			
333	Airport Runway Azimuth			●	●			
334	Airport Runway Length in Feet			●	●			
335	Left/Right Hand Holding Pattern Azimuth			●	●			
340	Left/Right Hand Procedure Turn Azimuth			●	●			
351G	Distance to Destination (Via Flight Plan)		●	●	●	●	●	●
352G	Estimated Time to Destination (Via Flight Plan)		●	●	●	●	●	●
371G	Specific Equipment ID		●	●	●	●	●	●
377	Equipment Hex ID Code	●	●	●	●	●	●	●

[1] Labels 117G/117P and 327G are not transmitted in the default configurations. There is a configuration setting that can be used to enable the transmission of these labels for the indicated ARINC 429 output types. Refer to Section 5.3.1 for additional details.

[2] Label 116G and 326G utilize the optional resolution extension bits (bits 11-13).

The following labels are output on the VOR/ILS ARINC 429 OUT port:

Label #	Parameter Name
034G	VOR/ILS Frequency (BCD)
035G	DME Frequency (BCD)
100G	Selected Course #1
173	Localizer Deviation
174	Glideslope Deviation
222	VOR Omnibearing
371G	Specific Equipment ID
377	Equipment Hex ID Code

The labels recognized on the GPS ARINC 429 IN 1 or GPS ARINC 429 IN 2 ports depend on the configuration (see Section 5.3.1).

The 500W Series unit can receive traffic data from a Garmin GTX 330 or an L3 Communications SKY497 SkyWatch system using the GPS ARINC 429 IN 1 or GPS ARINC 429 IN 2 ports, in order to display traffic information on the 500W Series unit.

4.6.2 Serial Data Electrical Characteristics

4.6.2.1 RS-232

Pin Name	Connector	Pin	I/O
GPS RS-232 OUT 1	P5001	56	Out
GPS RS-232 IN 1	P5001	57	In
GPS RS-232 OUT 2	P5001	58	Out
GPS RS-232 IN 2	P5001	59	In
GPS RS-232 OUT 3	P5001	41	Out
GPS RS-232 IN 3	P5001	42	In
GPS RS-232 OUT 4	P5001	54	Out
GPS RS-232 IN 4	P5001	55	In
RS-232 OUT 5	P5050	60	Out
RS-232 IN 5	P5050	61	In

The RS-232 outputs conform to EIA Standard RS-232C with an output voltage swing of at least ±5 V when driving a standard RS-232 load.

4.6.2.2 ARINC 429

Pin Name	Connector	Pin	I/O
GPS ARINC 429 OUT A	P5001	46	Out
GPS ARINC 429 OUT B	P5001	47	Out
GPS ARINC 429 IN 1 A	P5001	48	In
GPS ARINC 429 IN 1 B	P5001	49	In
GPS ARINC 429 IN 2 A	P5001	50	In
GPS ARINC 429 IN 2 B	P5001	51	In
VOR/ILS ARINC 429 OUT A	P5006	24	Out
VOR/ILS ARINC 429 OUT B	P5006	23	Out
VOR/ILS ARINC 429 IN A	P5006	36	In
VOR/ILS ARINC 429 IN B	P5006	35	In

The GPS and VOR/ILS ARINC 429 outputs conform to ARINC 429 electrical specifications when loaded with up to 5 standard ARINC 429 receivers.

4.6.3 Serial Data Configuration

Refer to Section 5.2 for serial data configuration information.

4.6.4 Serial Data Calibration and Checkout

Refer to Section 5.2 and Section 5.5.7 for the serial data checkout information.

4.6.5 Serial Data Interconnect

Refer to Appendix H for serial data interconnect information.

4.7 COM/VOR/ILS Audio (GNS 530W only)

4.7.1 COM/VOR/ILS Audio Function

Activation of COM MIC KEY enables COM MIC AUDIO and causes the transceiver to transmit.

500Ω COM AUDIO and 500Ω VOR/ILS AUDIO are 100 mW audio outputs that are intended to drive a headset or an audio panel.

Momentarily depressing the COM REMOTE TRANSFER button toggles the active and standby COM frequencies. Momentarily depressing the VLOC REMOTE TRANSFER button toggles the active and standby VLOC frequencies.

The COM REMOTE TRANSFER input may be used for EMERGENCY operation of the COM transmitter. If the remote transfer switch is depressed for two seconds, the active COM frequency changes to 121.50 MHz. Once the emergency frequency is activated through COM REMOTE TRANSFER, GNS 530W COM transceivers with COM software 4.01 or later, ignore inputs from the front panel controls for COM selections only. The pilot may exit this independent mode—restoring COM selection control to the front panel knobs and buttons—by momentarily depressing the COM REMOTE TRANSFER switch.

When TRANSMIT INTERLOCK is active, the GNS 530W COM receiver sensitivity is decreased. This input is intended to reduce interference from other transmitters in the aircraft. The TRANSMIT INTERLOCK input should be connected to the PTT input of other transmitters in the aircraft. If connected to multiple PTT inputs, these connections must include diode isolation or multiple radios transmit simultaneously.

4.7.2 COM/VOR/ILS Audio Electrical Characteristics

4.7.2.1 COM MIC KEY

Pin Name	Connector	Pin	I/O
COM MIC KEY	P5002	4	In

This input is considered active if either the voltage to ground is <1.9 V or the resistance to ground is <375 Ω. This input is considered inactive if the voltage to ground is 11-33 VDC.

4.7.2.2 COM MIC AUDIO, INTERCOM MIC AUDIO

Pin Name	Connector	Pin	I/O
COM MIC AUDIO HI	P5002	6	In
COM MIC AUDIO LO	P5002	18	In
INTERCOM MIC HI	P5002	5	In
INTERCOM MIC LO	P5002	17	In

COM MIC AUDIO and INTERCOM MIC each have a 520 Ω AC input impedance and supply the microphone with a 9 V bias through 620 Ω.

COM MIC AUDIO is set in the factory so that 275 mVRMS modulates the transmitter to 80% nominally. The microphone gain adjustment is made through Configuration Mode.

When a 125 mVRMS signal at 1000 Hz is applied to the INTERCOM MIC input, the level on the COM AUDIO output is not less than 7.07 VRMS.

4.7.2.3 COM AUDIO, VOR/ILS AUDIO

Pin Name	Connector	Pin	I/O
500Ω COM AUDIO HI	P5002	7	Out
500Ω COM AUDIO LO	P5002	19	Out
500Ω VOR/ILS AUDIO HI	P5006	16	Out
500Ω VOR/ILS AUDIO LO	P5006	17	Out

500Ω COM AUDIO and 500Ω VOR/ILS AUDIO each supply 100 mW into a 500Ω load. These are balanced outputs and the LO output must be connected.

500Ω COM AUDIO is the summation of the COM receiver audio, COM sidetone audio, and INTERCOM MIC audio.

4.7.2.4 DISCRETE INPUTS

Pin Name	Connector	Pin	I/O
TRANSMIT INTERLOCK	P5002	14	In
COM REMOTE TRANSFER	P5002	15	In
VLOC REMOTE TRANSFER	P5006	28	In

These inputs are considered active if either the voltage to ground is <1.9 V or the resistance to ground is <375 Ω. These inputs are considered inactive if the voltage to ground is 11-33 VDC.

COM REMOTE TRANSFER and VLOC REMOTE TRANSFER are momentary inputs.

4.7.3 COM/VOR/ILS Audio Configuration

None.

4.7.4 COM/VOR/ILS Audio Calibration and Checkout

Refer to Section 5.3.10 for the COM calibration.

4.7.5 COM/VOR/ILS Audio Interconnect

Refer to Figure H-18 for the audio panel interconnect.

4.8 VOR/ILS Indicator (GNS 530W Only)

4.8.1 VOR/ILS Indicator Function

NOTE

Because the GNS 530W includes a "CDI" button that performs switching between GPS and VOR/ILS on a remote indicator, it is seldom necessary to use these outputs to drive an indicator. It is only necessary when it is desired for a separate indicator to display VOR/ILS deviation full-time (regardless of the "CDI" button status).

The VOR/ILS indicator displays both lateral and vertical, To/From indications, lateral and vertical flags and superflags. GNS 530W connector 5006 always outputs the VOR/Localizer/Glideslope navigation information. The VOR/ILS pins on GNS 530W connector 5006 are used to drive an indicator that displays VOR/ILS information at all times, regardless of the CDI selection on the GNS 530W.

VOR/LOC COMPOSITE OUT is a standard VOR/Localizer Composite output signal which may be used to drive the Left/Right, TO/FROM, and Flag indications of certain navigation indicators that contain an internal converter.

The ILS ENERGIZE output goes low when the VLOC frequency is channeled to a localizer channel.

4.8.2 VOR/ILS Indicator Electrical Characteristics

4.8.2.1 Superflags

Pin Name	Connector	Pin	I/O
VOR/LOC SUPERFLAG	P5006	15	Out
GLIDESLOPE SUPERFLAG	P5006	38	Out

The output supplies not less than 500 mA on a 28 volt system and 250 mA on a 14 volt system with the output voltage not less than (AIRCRAFT POWER -3 VDC) when the flag is to be OUT OF VIEW. The output voltage with respect to ground is less than 3 VDC when the flag is to be IN VIEW.

4.8.2.2 Deviation

Pin Name	Connector	Pin	I/O
VOR/LOC +LEFT	P5006	5	Out
VOR/LOC +RIGHT (VOR/LOC COMMON)	P5006	6	Out
GLIDESLOPE +UP	P5006	32	Out
GLIDESLOPE +DOWN/-FLAG (GLIDESLOPE COMMON)	P5006	31	Out

The deviation outputs are each capable of driving up to three 1000 Ω meter loads with ±150 mVDC ±10% with respect to 2.5V Common for full-scale deflection. The drive circuit provides for more than full-scale deflection with a maximum course deviation output voltage of ±300 mVDC ±10%.

4.8.2.3 TO/FROM

Pin Name	Connector	Pin	I/O
VOR/LOC +TO	P5006	1	Out
VOR/LOC +FROM (VOR/LOC COMMON)	P5006	2	Out

The output is capable of driving up to three 200 Ω meter loads. When indicating TO, the output is +225 ±75 mVDC. When indicating FROM, output is -225 ±75 mVDC. When invalid information is present (Flag IN VIEW) the TO/FROM output is 0 ±10 mVDC.

4.8.2.4 Flag

Pin Name	Connector	Pin	I/O
VOR/LOC +FLAG	P5006	3	Out
VOR/LOC -FLAG (VOR/LOC COMMON)	P5006	4	Out
GLIDESLOPE +FLAG	P5006	30	Out
GLIDESLOPE +DOWN/-FLAG (GLIDESLOPE COMMON)	P5006	31	Out

The Flag output is capable of driving up to three 1000 Ω meter loads. When valid information is present (Flag OUT OF VIEW) the Flag output is 375 ±80 mVDC. When invalid information is present (Flag IN VIEW) the Flag output is 0 ±25 mVDC.

4.8.2.5 OBS

Pin Name	Connector	Pin	I/O
VOR OBS ROTOR C	P5006	9	Out
VOR OBS ROTOR H (GROUND)	P5006	10	Out
VOR OBS STATOR D	P5006	13	In
VOR OBS STATOR F	P5006	12	In
VOR OBS STATOR E/G (VOR/LOC COMMON)	P5006	11	Out

VOR OBS ROTOR C and H are a buffered 500 Hz output that is intended to drive the OBS rotors. VOR OBS STATOR D and VOR OBS STATOR F are each phase and amplitude shifted version of the VOR ROTOR C output. Each pair is intended to read one of the two windings of the indicator's OBS stator.

4.8.2.6 VOR/LOC COMPOSITE

Pin Name	Connector	Pin	I/O
VOR/LOC COMPOSITE OUT	P5006	8	Out

With a Standard VOR Test Signal applied, VOR/LOC COMPOSITE OUT is 0.5 ± 0.1 VRMS into a 10 kΩ load. With a Standard Localizer Centering Test Signal applied, VOR/LOC COMPOSITE OUT is 0.350 ±0.05 VRMS into a 10 kΩ load.

4.8.2.7 ILS ENERGIZE

Pin Name	Connector	Pin	I/O
ILS ENERGIZE	P5006	29	Out

The driver output voltage is not more than 1.0 V when sinking 20 mA. The maximum off state leakage current with respect to GND is less than 10 μA.

4.8.3 VOR/ILS Indicator Configuration

None.

4.8.4 VOR/ILS Indicator Calibration and Checkout

Refer to Sections 5.3.12 and 5.3.13 for the VOR/LOC/GS checkout.

4.8.5 VOR/ILS Indicator Interconnect

Refer to Figure H-19 for the VOR/ILS indicator interconnect.

4.9 RMI/OBI

4.9.1 RMI/OBI Function

The MAIN OBI output provides bearing information from the active waypoint for Bendix/King Serial OBI devices based upon the 500W Series unit's GPS navigation. For the GNS 530W, the MAIN OBI output may be configured so that it sends VOR/ILS bearing information when VLOC is selected by the GNS 530W CDI key.

The VOR OBI output provides bearing information from the currently tuned VOR station for Bendix/King Serial OBI devices based upon the GNS 530W VOR receiver. When a localizer channel is tuned on the VLOC window, there is a bit in the data stream set to indicate that a localizer frequency is tuned which stows the needle or drive it to the 3 o'clock position.

4.9.2 RMI/OBI Electrical Characteristics

Pin Name	Connector	Pin	I/O
MAIN OBI CLOCK	P5001	43	Out
MAIN OBI SYNC	P5001	45	Out
MAIN OBI DATA	P5001	44	Out

Pin Name	Connector	Pin	I/O
VOR OBI CLOCK	P5006	25	Out
VOR OBI SYNC	P5006	26	Out
VOR OBI DATA	P5006	27	Out

The output driver is active low. The driver output voltage is not more than 1.0 V when sinking 20 mA. The maximum off state leakage current with respect to ground is less than 10 μA.

4.9.3 RMI/OBI Configuration

For the GNS 530W, see Section 5.3.9 for the MAIN OBI source configuration.

4.9.4 RMI/OBI Calibration and Checkout

Refer to Section 5.5.7.11 for calibration and checkout.

4.9.5 RMI/OBI Interconnect

Refer to Figure H-20 for the RMI/OBI interconnect.

4.10 DME Tuning (GNS 530W Only)

4.10.1 DME Tuning Function

The GNS 530W can channel a DME based on the tuned VLOC frequency. The GNS 530W outputs 2 of 5, BCD or Slip parallel DME and King Serial DME channeling format. When DME COMMON is held low, the GNS 530W actively tunes the DME.

4.10.2 DME Tuning Electrical Characteristics

4.10.2.1 Parallel DME Tuning

Pin Name	Connector	Pin	I/O
NAV PAR DME - 8MHZ	P5006	14	Out
SER DME – CHAN REQ/PAR DME - 4MHZ	P5006	20	Out*
SER DME – RNAV MODE/PAR DME – 2MHZ	P5006	21	Out*
NAV PAR DME - 1MHZ	P5006	33	Out
NAV PAR DME - 800KHZ	P5006	37	Out
NAV PAR DME - 400KHZ	P5006	39	Out
NAV PAR DME - 200KHZ	P5006	40	Out
NAV PAR DME - 100KHZ	P5006	42	Out
NAV PAR DME - 50KHZ	P5006	43	Out
NAV DME COMMON	P5006	22	In

* These pins are outputs when the GNS 530W is configured for 2 of 5 parallel DME tuning.
For each of the parallel DME tuning discrete outputs, the driver output voltage is not more than 1.0 V while sinking 20 mA. The maximum off state leakage current with respect to ground is less than 10 μA.

NAV DME COMMON must be pulled low to indicate to the NAV module that it is the device channeling the DME.

NAV DME COMMON is considered active if either the voltage to ground is <1.9 V or the resistance to ground is <375 Ω. These inputs are considered inactive if the voltage to ground is 11-33 VDC.

4.10.2.2 King Serial DME Tuning

Pin Name	Connector	Pin	I/O
NAV SER DME – DATA	P5006	19	Out
NAV SER DME – CLOCK	P5006	18	Out
SER DME – CHAN REQ/PAR DME - 4MHZ	P5006	20	In*
SER DME – RNAV MODE/PAR DME – 2MHZ	P5006	21	In*
NAV DME COMMON	P5006	22	In

* These pins are inputs when the GNS 530W is configured for King Serial DME tuning

When NAV SER DME – DATA or NAV SER DME – CLOCK is asserted high and driving a 360 Ω load, the driver output voltage is not less than 8 V, and when asserted low is not greater than 10 mV.

SER DME – CHAN REQ/PAR DME – 4MHZ, SER DME – RNAV MODE/PAR DME – 2MHz, and NAV DME COMMON are considered active if either the voltage to ground is <1.9 V or the resistance to ground is <375 Ω. These inputs are considered inactive if the voltage to ground is 11-33 VDC.

NAV DME COMMON must be pulled low to indicate to the NAV module that it is the device channeling the DME.

4.10.3 DME Tuning Configuration

Refer to Section 5.3.12 for the DME tuning configuration.

4.10.4 DME Tuning Calibration and Checkout

None.

4.10.5 DME Tuning Interconnect

Refer to Appendix H for interconnect information.

NOTE

For the GNS 530W to tune a Narco DME 890 or IDME 891 or an ARC (Cessna) RTA-476A using parallel 2 of 5, unique wiring and configuration are required. Refer to Section 5.3.12 and Figure H-23.

4.11 TAWS/HTAWS Interfaces

This section explains the TAWS/HTAWS interfaces. The interface connections are dependent upon the unit and whether HTAWS is enabled.

- TAWS Interfaces
  For 500W Series units with TAWS
- HTAWS Interfaces (Non-TAWS Units)
  For 500W Series units with non-TAWS units with HTAWS enabled.
- HTAWS Interfaces (TAWS Units)
  For 500W Series TAWS units with HTAWS enabled.

4.11.1 Audio

Pin Name	Connector	Pin	I/O
AUDIO 1 HI	P5001	37	Out
AUDIO 1 LO (GROUND)	P5001	38	Out
AUDIO 2 HI	P5001	52	Out
AUDIO 2 LO	P5001	53	Out

The audio output 1 is a low impedance output and is capable of driving approximately 100 mW into a 500-ohm load.

The audio output 2 has an output impedance of approximately 240 ohms and is capable of driving 100mW into a 500-ohm load.

4.11.2 Annunciators

4.11.2.1 TAWS Interfaces

Pin Name	Connector	Pin	I/O
TERRAIN NOT AVAILABLE ANNUNCIATE	P5050	9	Out
TERRAIN WARNING ANNUNCIATE	P5050	10	Out
TERRAIN CAUTION ANNUNCIATE	P5050	11	Out
TAWS INHIBIT ANNUNCIATE	P5050	12	Out

4.11.2.2 HTAWS (For Non-TAWS Units)

Pin Name	Connector	Pin	I/O
REDUCED PROTECTION (RP MODE)	P5001	7	Out
TERRAIN CAUTION ANNUNCIATE	P5001	8	Out
TERRAIN WARNING ANNUNCIATE	P5001	12	Out
TERRAIN NOT AVAILABLE ANNUNCIATE	P5001	13	Out

4.11.2.3 HTAWS (TAWS Units)

Pin Name	Connector	Pin	I/O
TERRAIN NOT AVAILABLE ANNUNCIATE	P5050	9	Out
TERRAIN WARNING ANNUNCIATE	P5050	10	Out
TERRAIN CAUTION ANNUNCIATE	P5050	11	Out
TERRAIN INHIBIT ANNUNCIATE	P5050	12	Out
REDUCED PROTECTION (RP MODE)	P5050	13	Out

The TERRAIN NOT AVAILABLE ANNUNCIATE sinks up to 500 mA when not active indicating the terrain function is not available.

The following annunciator outputs sink up to 500 mA when active:

The TERRAIN WARNING ANNUNCIATE output is active when an HTAWS warning is active.

The TERRAIN CAUTION ANNUNCIATE output is active when an HTAWS caution is active.

The REDUCED PROTECTION (RP MODE) output is active when HTAWS is functioning in the reduced protection mode (RP MODE).

The TAWS INHIBIT ANNUNCIATE output is active when TAWS is inhibited.

The TERRAIN INHIBIT ANNUNCIATE output is active when HTAWS is inhibited.

4.11.3 Discrete I/O

4.11.3.1 TAWS Interfaces

Pin Name	Connector	Pin	I/O
TAWS INHIBIT	P5050	1	In
TAWS AUDIO INHIBIT	P5050	2	In
TAWS AUDIO ACTIVE	P5050	15	Out

4.11.3.2 HTAWS (For Non-TAWS Units)

Pin Name	Connector	Pin	I/O
HTAWS AUDIO ACTIVE	P5001	44	Out
REDUCED PROTECTION (RP MODE)	P5001	61	In
AURAL SUPPRESSION	P5001	62	In
TERRAIN INHIBIT	P5001	63	In
HTAWS AUDIO INHIBIT	P5001	64	In

4.11.3.3 HTAWS (TAWS Units)

Pin Name	Connector	Pin	I/O
TERRAIN INHIBIT	P5050	1	In
HTAWS AUDIO INHIBIT	P5050	2	In
REDUCED PROTECTION (RP MODE)	P5050	3	In
AURAL SUPPRESSION	P5050	4	In
HTAWS AUDIO ACTIVE	P5050	15	Out

The TAWS INHIBIT input when toggled momentarily low, may be used to inhibit TAWS alerts.

The TAWS AUDIO INHIBIT input is used to inhibit TAWS audio. This can be connected to output lines of another unit whose audio is higher in priority.

The TAWS AUDIO ACTIVE/HTAWS AUDIO ACTIVE output is active low when the GNS 500W is playing an HTAWS alert. This output can be connected to the Audio Inhibit input of other units with audio that is a lower priority than HTAWS.

The inputs are active low, by a voltage to ground < 1.9V or the resistance to ground < 375 ohms. The inputs are considered inactive if the voltage to ground is > 11 VDC.

The REDUCED PROTECTION (RP MODE) input may be used to activate the HTAWS reduced protection mode (RP MODE).

The AURAL SUPPRESSION input may be used to suppress HTAWS audio from the GNS 500W Series unit. Connect this input to a momentary switch, which can be used to suppress the currently playing HTAWS caution aurals.

The TERRAIN INHIBIT input when toggled momentarily low, may be used to inhibit HTAWS alerts.

The HTAWS AUDIO INHIBIT input is used to inhibit HTAWS audio. This can be connected to inhibit output lines of another unit whose audio is higher in priority.

NOTE

TAWS functions can also be inhibited via the 500W Series user interface.

4.11.4 TAWS/HTAWS Configuration

Refer to Sections 5.3.21 and 5.3.22 for the TAWS configuration.

4.11.5 TAWS/HTAWS Calibration and Checkout

Refer to Section 5.4.7 and 5.5.6 for the TAWS checkout.

4.11.6 External TAWS/HTAWS Annunciator Interconnect (optional)

Refer to Figure H-24 for external TAWS annunciator interconnect. Refer to Figure H-38 and Figure H-39 for external HTAWS annunciator interconnect.

5. POST INSTALLATION CONFIGURATION AND CHECKOUT PROCEDURES

5.1 Installation Check

5.1.1 Mounting and Wiring Check

Verify that all cables are properly secured and shields are connected as the install drawings indicate. Installation may require that you check the movement of the aircraft controls to verify that there is no interference.

5.1.2 Connector Engagement Check

Prior to the configuration and checkout of the 500W Series unit the connector engagement should be checked as described below:

1. Turn on the 500W Series unit, and turn on the avionics master switch (if applicable).
2. Place the 500W Series unit in the rack and engage the pawl mechanism.
3. Turn the Allen screw of the locking pawl slowly clockwise until the 500W Series unit just comes on. A "T" handle makes the turns easy to count, but do not over-tighten.
4. Count the number of complete revolutions you can turn the Allen screw until it can not turn any more (but take care not to over-tighten). Three turns is the minimum for proper installation. If fewer than three turns are possible, the mounting rack should be moved aft (toward the pilot) such that the aircraft panel does not obstruct the unit from engaging in the rack.

5.2 Unit Options

5.2.1 Unit Identification

On the 500W series units, the (H) is displayed behind the model number when HTAWS is enabled, but not selected as the Terrain Type. HTAWS is displayed when the HTAWS is enabled and is selected.

5.2.2 HTAWS Enable Instructions

NOTE

The enablement card is serialized to the unit, therefore cannot be used on any other unit.

Perform the following steps to enable HTAWS:

1. With power off to unit, insert enablement card into left card slot. Turn on the 500W Series unit, and turn on the avionics master switch (if applicable).
2. Screen will contain the unit serial number and a question, “Upgrade HTAWS?”
3. Press CLR for NO and ENT for YES.
4. Power off the system to reboot.
5. After power up, verify that the serial number of the card matches the serial number of the unit. Also verify HTAWS is shown on start up screen.

5.3 Configuration Mode Operations

With power applied to the aviation rack and the 500W Series unit turned off, press and hold the ENT key and turn the unit on. Release the ENT key when the display activates. After the Data Base and Instrument Panel Self-test pages, the first page displayed is the MAIN ARINC 429 CONFIG page. While in configuration mode, pages can be selected by ensuring the cursor is off and rotating the small right knob.

To change data on the displayed configuration page, press the small right knob (CRSR) to turn on the cursor. Rotate the large right knob to change between data fields. Rotate the small right knob to change a field that the cursor is on. Once you have made the desired selection, press the ENT key to accept the entry.

The configuration pages described in the following sections are in the order found when rotating the right small knob clockwise starting at the MAIN ARINC 429 CONFIG page.

NOTE

The configuration pages shown here reflect main software version 4.00. Some differences in operation may be observed when comparing the information in this manual to later software versions. All configuration pages shown apply to the GNS 530W, but not all apply to the GPS 500W. Those pages and fields that apply only to certain 500W Series units are denoted as such.

NOTE

If any changes made in configuration mode are done on ARINC 429 or RS-232 pages, the unit must be reset for the changes to take effect. This is accomplished by powering the unit off and then back on.

5.3.1 MAIN ARINC 429 CONFIG Page

Select the MAIN ARINC 429 CONFIG page (see Figure 5-1). This page configures the GPS ARINC 429 output port and the two GPS ARINC 429 input ports. The two input ports can each be configured independently for the desired function(s).

Figure 5-1. MAIN ARINC 429 CONFIG Page

SPEED

Selection	Description
Low	Standard low-speed ARINC 429 (nominally 12.5 Kb per second)
High	High-speed ARINC 429 (nominally 100 Kb per second)

DATA IN 1, DATA IN 2

Selection	Description
Off	No unit connected to this ARINC 429 input
Airdata	Altitude, temperature, and speed information from the following Air Data systems: *B & D 2600, 2601, 2800, 90004-003* *Bendix/King KAD 280/480, Shadin ADC 2000*
Airdata/AHRS	Heading, altitude, temperature, and speed information from an Air Data/AHRS system.
EFIS	Selected course, heading, and joystick waypoint information from the following EFIS systems: *Bendix/King EFS 40/50* *Certain versions of Collins EFIS may also be compatible with this format.*
EFIS/Airdata	Selected course, heading, joystick waypoint, altitude, temperature, and speed information from the following systems: *Collins Pro Line 21* *Bendix/King EFS 40/50 (with SW 1201 or later)*
Flight Control	Selected course information from the following Flight Control systems: *Bendix/King KFC 400*
Garmin GAD 42	Selected course, heading, and true airspeed data from the Garmin GAD 42.
Garmin GDU [1]	Selected course, heading, altitude, temperature and speed information from the following systems: *Garmin GDU 620 (G500/G600)*
Garmin GTX 330	Garmin and Garmin w/TIS This is a Garmin data concentration format. Only high speed ARINC 429 should be used. *Garmin GTX 330*
Honeywell EFIS	Selected course, heading, and joystick waypoint information from the following EFIS systems: *Honeywell Primus 1000*
INS/IRU	Heading information from the following Inertial systems: *Bendix/King KAH 460* *Collins AHC 85* *Honeywell Laseref* *Litef LTR 81* *Litton LTN 90-100, LTN 91, LTN 92*
RADAR Graphics	Joystick waypoint information from a RADAR graphics unit.
Sandel EHSI	Selected course and heading information from the following EHSI system: *Sandel SN3308* *Sandel SN3500*
Traffic Advisory	Traffic information from the following traffic advisory systems: *L3 Communications SKY497 SkyWatch* *L3 Communications SKY899 SkyWatch HP* *Bendix/King KTA-870, KMH880* *Garmin GTS 800/820/850*

[1] Main software version 3.10 or later.

DATA OUT

NOTE

Additional output settings may be available on units installed via OEM TC.

Selection [1]	DESCRIPTION
Off	No unit(s) connected to ARINC 429 output
ARINC 429	Standard ARINC 429 output data (non-GAMA).
GAMA 429	ARINC 429 data as defined by the *General Aviation Manufacturers' Association (GAMA) General Aviation Subset, 2nd Edition*. The output data includes navigation and flight plan information to the following systems: *Garmin GAD 42 Interface Adapter* *Bendix/King EFS 40/50* (No GPS vertical guidance provided) *Collins EFIS 84* Certain other versions of Collins EFIS may also be compatible with this format.
GAMA 429 Bendix King	ARINC 429 data as defined by the GAMA *General Aviation Subset, 2nd Edition.* The output data includes navigation, flight plan and GPS vertical guidance information to the following systems: *Bendix/King EFS 40/50* (GPS vertical guidance provided on EFIS)
GAMA 429 Graphics	ARINC 429 data as defined by the *GAMA General Aviation Subset, 2nd Edition* including GAMA Graphics Protocol 'A'. This format outputs intersection symbols as generic waypoint symbols. The output data includes navigation and flight plan information (including graphical representation of flight plan procedures) to the following EFIS systems: *Honeywell Primus 1000*
GAMA 429 Graphics w/Int	ARINC 429 data as defined by the *GAMA General Aviation Subset, 2nd Edition* including GAMA Graphics Protocol 'A'. The output data includes navigation and flight plan information (including graphical representation of flight plan procedures) to the following systems: *Sandel SN3308* *Sandel SN3500*
GAMA 429 Pro Line 21	ARINC 429 data as defined by the *GAMA General Aviation Subset, 2nd Edition*. The output data includes navigation and flight plan information to the following EFIS systems: *Collins Pro Line 21*
GAMA 429 Sextant	ARINC 429 data as defined by the *GAMA General Aviation Subset, 2nd Edition*. The output data includes navigation and flight plan information to the following EFIS systems: *Sextant SMD 45*

[1] Garmin GTX 330 will work with any output setting

SDI

Selection	Description
Common	RX: Accepts all 429 inputs TX: Generates all 429 outputs with SDI = 0.
LNAV 1	Number 1 (Pilot) long-range navigator RX: Accepts 429 inputs with SDI = 0 or 1. TX: Generates all 429 outputs with SDI = 1.
LNAV 2	Number 2 (Copilot) long-range navigator RX: Accepts 429 inputs with SDI = 0 or 2. TX: Generates all 429 outputs with SDI = 2.

VNAV

Selection	Description
Disable Labels	ARINC 429 labels associated with GPS-based vertical guidance (labels 117G and 327G) are not transmitted in the output data stream.
Enable Labels	ARINC 429 labels associated with GPS-based vertical guidance (labels 117G and 327G) are transmitted in the output data stream. ARINC 429 vertical guidance labels are used by the following systems: *Sandel SN3500* Other systems may also use these labels.

5.3.2 MAIN RS-232 CONFIG Page

Select the MAIN RS-232 CONFIG page (see Figure 5-2). Change the selectable RS-232 inputs and/or outputs to match that of the equipment installed in the aircraft.

Figure 5-2. MAIN RS-232 CONFIG Page

CHANNEL INPUTS

Selection	Description
Off	No unit(s) connected to input of this channel.
Arnav/ei-fuel	Serial fuel flow information from the following units: *ARNAV FC-10, FT-10* *Electronics International FP-5L*
Crossfill	Serial transfer of flight plans and user waypoints between two 400W/500W Series units
GDL 69	Serial data input for in-flight access to weather and messaging from the following units: *Garmin GDL 69/69A*
Icarus-alt	Serial altitude data from the following units: *Icarus Instruments 3000* *Sandia SAE5-35* *Garmin GTX 327 Transponder* *Trans-Cal Industries IA-RS232-X, SSD120* *ACK Technologies A-30 (Mod 8 and above)*
Ryan TCAD	Traffic information from a Ryan TCAD 9900B or 9900BX Series system.
Shadin-adc	Serial air data information from the following units: *Shadin ADC 200, 200+, 2000*
Shadin-alt	Serial altitude data from the following units: *Shadin 8800T, 9000T, 9200T*
Shadin-fadc	Serial air data and fuel flow information from the following units: *Shadin 9628XX-X Fuel/Air Data Computer* *INSIGHT TAS 1000 Air Data Computer*
Shadin-fuel	Serial fuel flow information from the following units: *Shadin 91053XM Digital Fuel Management System* *Shadin 91204XM Digital Fuel Management System* *JP Instruments EDM-700 or EDM-760 Engine Monitor*
WX-500	Lightning strike information from an L3 Communications WX-500 Stormscope.

CHANNEL OUTPUTS

Selection	Description
Off	No unit(s) connected to output of this channel.
ADS-B OUT	Serial communication to Garmin GTX 33/330 ES or 33D/330D ES Transponders. [4]
Aviation	Serial position, altitude, velocity, and navigation data to the following units: *Argus 3000, 5000, or 7000 Moving Map* *Electronics International FP-5L Fuel Flow Computer (non-TSO'd)* *Garmin MX20 (V5.6 or later), GMX 200* [1] *Garmin GPSMAP 195, GPSMAP 295 or GPS III Pilot* *Garmin GPSMAP 196, GPSMAP 296, and GPSMAP 396* *Garmin GTX 327 Transponder* *JP Instruments EDM-700 or EDM-760 Engine Monitor* *Shadin 91204XM Digital Fuel Management System* *Shadin 91053XM Digital Fuel Management System* *Shadin 9628XX-X Fuel/Air Data Computer* *Stormscope Series II (with NAVAID) Moving Map*
Avtn no alt	Serial position, velocity, and navigation data to the following units: *Garmin MX20 (V5.5 or earlier)* *Horizon DDMP* *INSIGHT TAS 1000 Air Data Computer*
Crossfill	Serial transfer of flight plans and user waypoints between two 400W/500W Series units.
GDL 69	Serial communication to a Garmin GDL 69/69A.
HW EGPWS [3]	Serial communication to a Bendix/King (Honeywell) KGP 560 EGPWS.
MapMX [2] [3]	Serial position, altitude, velocity, and navigation data to the following units: *Garmin MX20 (V5.7 or later), GMX 200* [2]
Ryan TCAD	Serial communication with a Ryan TCAD 9900B Series system.
WX-500	Serial communication to an L3 Communications WX-500 Stormscope.

[1] The MX20 will not use GPS altitude from the 400W Series unit. The GMX200 will use the GPS altitude.

[2] Use of the MapMX protocol supports enhanced flight plan depiction and automatic loading of charts on the MX20 and GMX 200. MapMX is only available with main software version 3.10 or later.

[3] Due to hardware limitations, selecting MapMX or HW EGPWS on an RS-232 output port prevents anything from being configured on the corresponding input port.

[4] ADS-B OUT is only available with main software version 3.20 or later.

5.3.3 MAIN SYSTEM CONFIG

Select the MAIN SYSTEM CONFIG page (see Figure 5-3). This page allows you to configure the Fuel, Terrain, Discretes, and Airframe options.

Figure 5-3. MAIN SYSTEM CONFIG Page

FUEL

Select **Fuel** in the **CONFIGURE** field to select the FUEL TYPE (**AV Gas, Jet A, or Jet B)**.

Selection	Description
AV gas	The aircraft is using Aviation gas (5.8 lbs./gal.)
Jet A	The aircraft is using Jet A or Jet A-1 fuel (6.7 lbs./gal.)
Jet B	The aircraft is using Jet B (JP-4) fuel (6.5 lbs./gal.)

TERRAIN

Select **Terrain** in the **CONFIGURE** field to select the TERRAIN TYPE (**NONE, TERRAIN PROX,** or **HTAWS**).

To test the terrain data card, highlight the **TEST CARD** field and press the ENT key. Verify that the **TEST CARD** field indicates "PASS". A "FAIL" condition indicates that the terrain data card is unusable.

To run the terrain card test, the unit may have to be turned off then on again if the airframe or terrain configurations have changed.

Note that if "TAWS" does not appear in the **HW CONFIG** field, then the unit is not a TAWS capable unit.

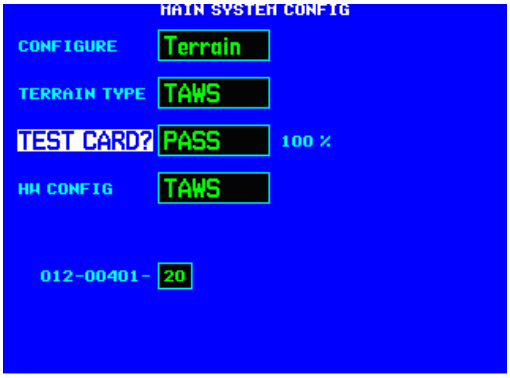


Figure 5-4. MAIN SYSTEM CONFIG Page

Selection	Description
None	No terrain functionality is configured.
TERRAIN PROX	Unit configured for terrain proximity capability. Available when airframe is configured for helicopter.
HTAWS	Unit configured for HTAWS capability. Available when airframe is configured for helicopter **and** HTAWS is enabled.
TERRAIN	The unit is configured for TERRAIN capability. Available when airframe is configured for fixed wing.
TAWS	The unit is configured for TAWS capability.

DISCRETES

Select **Discretes** in the **CONFIGURE** field to configure the operation of specific discrete outputs.

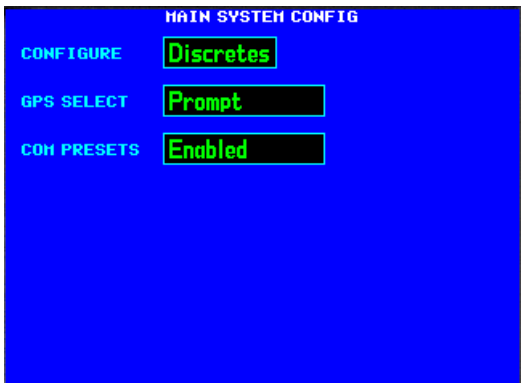


Figure 5-5. MAIN SYSTEM CONFIG Page

GPS SELECT

Selection	Description
Auto	When in GPS mode, the GPS Select discrete is unasserted (open) whenever a GPS approach mode is active – no associated messages appear and no pilot action is required. The pilot is also allowed to select automatic or manual GPS to ILS CDI transitions on the AUX CDI/ALARMS page.
Prompt	When in GPS mode, the GPS Select discrete is unasserted (open) whenever a GPS approach mode is active **and** the pilot has enabled the A/P APR Outputs (an associated message is displayed telling the pilot to enable the A/P APR Outputs). This setting will not allow the pilot to select automatic GPS to ILS CDI transitions on the AUX CDI/ALARMS page (only manual transitions are permitted). *For Honeywell (Bendix/King) KFC 225 and KAP 140 autopilots.*

NOTE

The GPS SELECT setting affects autopilot mode transitions and should be reflected in the AFMS.

COM PRESETS

Selection	Description
Disabled	The COM Configuration Aux page is not available to the pilot.
Enabled	The COM Remote Recall discrete input is connected in the installation (refer to 4.5.1.16 for additional details). When COM presets are enabled, the user is able to preset COM frequencies and load them into the standby COM frequency using a remote switch.

AIRFRAME

Select **Airframe** in the **AIRFRAME** field to select the aircraft type.

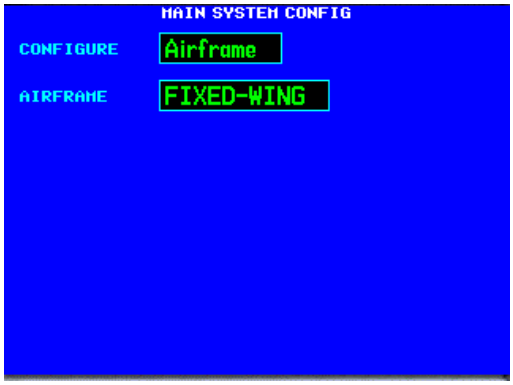


Figure 5-6. MAIN SYSTEM CONFIG Page

Selection	Description
Fixed Wing	Select for Fixed Wing installations.
Helicopter	Select for Helicopter installations.

AIR/GROUND

When **HELICOPTER** is selected as airframe type, the **AIR/GROUND** option will be available.

Select **Air/Ground** in the **AIR/GROUND** field to enable or disable the air/ground option.

Figure 5-7. MAIN SYSTEM CONFIG Page

Selection	Description
Enabled	The Air/Ground input is enabled.
Disabled	The Air/Ground input is disabled.

5.3.4 MAIN INPUTS Page

Select the MAIN INPUTS page (see Figure 5-8). This page allows you to monitor the data on ARINC 429, RS-232 and other electrical inputs. This is used for verifying electrical interfaces during installation and troubleshooting. Information that is not being received by the 500W Series unit is dashed out.

Field	Description
OAT	Outside Air Temperature
SAT	Static Air Temperature
TAT	Total Air Temperature
IAS	Indicated Airspeed
TAS	True Airspeed
W SPD	Wind Speed
HDG	True Heading
W DIR	Wind Direction
GPS SC	GPS Selected Course
VLC SC	VOR/LOC Selected Course (GNS 530W Only)
CDI	Status of the CDI key (GNS 530W Only).
B ALT	Barometric-corrected Altitude
D ALT	Density Altitude
P ALT	Pressure Altitude
L FF	Left Engine Fuel Flow
R FF	Right Engine Fuel Flow
T FF	Total Fuel Flow
T FOB	Total Fuel on Board
JOYSTICK WPT	Latitude and longitude of a joystick waypoint sent by an EFIS or RADAR indicator.

Figure 5-8. MAIN INPUTS Page

5.3.5 INSTRUMENT PANEL SELF-TEST Page

Select the INSTRUMENT PANEL SELF-TEST page (see Figure 5-9). This page allows verification that the 500W Series unit is communicating properly with other instruments. Compare on-screen indications with the information depicted on connected instruments, such as the CDI, HSI, RMI and/or external annunciators. It also displays fuel capacity, amount on-board, and flow.

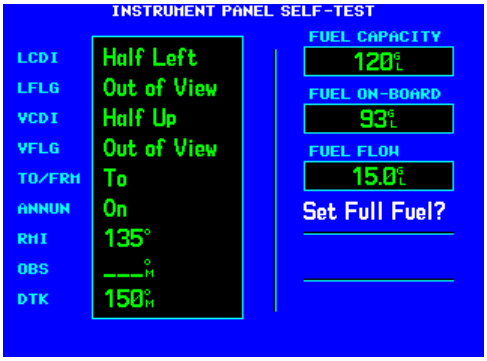


Figure 5-9. INSTRUMENT PANEL SELF-TEST Page

5.3.6 MAIN LIGHTING Page

Select the MAIN LIGHTING page (see Figure 5-10) This page allows you to set display parameters that affect the display backlight and key lighting brightness. The DISPLAY and KEY lighting characteristics are adjusted separately, each with the following fields:

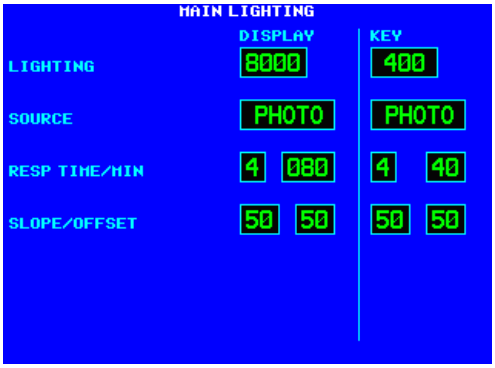


Figure 5-10. MAIN LIGHTING Page

LIGHTING

Shows the current level of display backlighting, based on the lighting input source (lighting bus voltage, or the ambient light if the source is **PHOTO**) and the settings on this configuration page. This field has a range of 0 (zero) to 9999.

SOURCE

Selection	Description
PHOTO	Backlight level is determined by the ambient light level as measured by the photocell on the 500W Series unit.
14V DC	Backlight level tracks a 14 volt DC aircraft lighting bus.
28V DC	Backlight level tracks a 28 volt DC aircraft lighting bus.
5V DC	Backlight level tracks a 5 volt DC aircraft lighting bus.
5V AC	Backlight level tracks a 5 volt AC aircraft lighting bus.

RESP TIME - (Response Time)

Sets the speed with which the brightness responds to the input level (bus voltage or ambient light) changes. The higher the number the slower the display responds. This field has a range of 3 to 7, and is set to 4 at the factory.

MIN - (Minimum)

Sets the minimum brightness of the display. The higher the number, the brighter the minimum brightness. Display minimum brightness has a range of 18 to 999, and is set to 80 at the factory. Key minimum brightness has a range of 20 to 99, and is set to 40 at the factory. It is prudent to verify that display and key lighting characteristics match those of other equipment in the panel under night lighting conditions.

SLOPE

Sets the sensitivity the brightness of the display has to changes in the input level. The higher the number, the brighter the display for a given increase in the input level. This field has a range of 0 (zero) to 99, and is set to 50 at the factory.

OFFSET

Adjusts the lighting level up or down for any given input level. This field has a range of 0 (zero) to 99, and is set to 50 at the factory. This may also be used to match lighting curves with other equipment in the panel.

NOTE

If a lighting bus (any selection other than **PHOTO**) is selected, and the lighting bus control is turned to its minimum (daytime) setting, the display brightness tracks the 500W Series unit's photocell using additional parameters (PHOTO TRANS % and PHOTO SLP/OFST) described below and shown in Figure 5-11.

PHOTO TRANS % - (Photocell Transition Percentage)

When a lighting bus is used to control the lighting of the display (see Figure 5-11), this parameter sets the point on the lighting bus control below which the display brightness tracks the 500W Series unit's photocell. This field has a range of 0 (zero) to 99, and is set to 25 at the factory.

PHOTO SLP/OFFST - (Photocell Slope/Offset)

These fields are equivalent to the **SLOPE/OFFSET** fields described above, with the exception that they only control the display lighting characteristics when the lighting bus control is below the level specified in the **PHOTO TRANS %** field. Both fields have a range of 0 (zero) to 99, and are set to 50 at the factory.

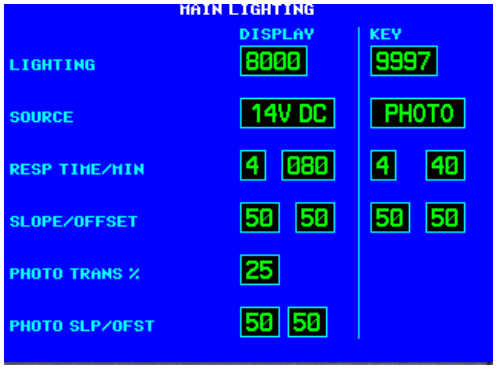


Figure 5-11. Main Lighting Page with Alternate Source

5.3.7 GPS DATE/TIME Page

This page displays the GPS date and time. See Figure 5-12.

Figure 5-12. GPS DATE/TIME Page

5.3.8 MAIN DISCRETE I/O Page

Select the MAIN DISCRETE I/O page (see Figure 5-13).

GRAY CODE

If the encoding altimeter input is used, verify that the **DECODED ALTITUDE** field indicates the correct altitude.

Figure 5-13. MAIN DISCRETE I/O Page

EXTERNAL SWITCH STATE

This allows you to verify the operation of any external switches that are present in the installation.

Selection	Verify That:
RMT CDI	The box is filled in while a remote CDI source select switch is pressed.
RMT OBS	The box is filled in while a remote OBS switch is pressed.
TER INHB	The box is filled in while a remote TERRAIN INHIBT switch is pressed.
RMT RCL	The box is filled in while the COM REMOTE RECALL switch is pressed.

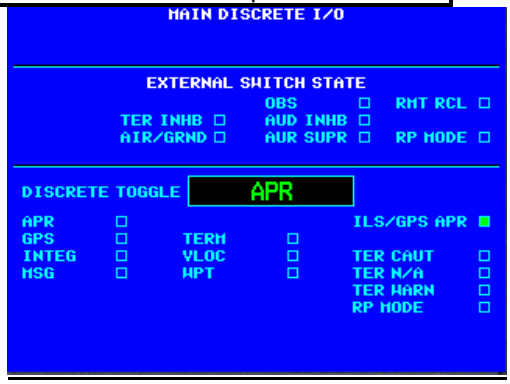


Figure 5-13a. MAIN DISCRETE I/O Page (HTAWS)

EXTERNAL SWITCH STATE (HTAWS)

This allows you to verify the operation of any external switches that are present in the installation.

Selection	Verify That:
OBS	The box is filled in while a remote OBS switch is pressed.
RMT RCL	The box is filled in while the COM REMOTE RECALL switch is pressed.
TER INHB	The box is filled in while a remote TERRAIN INHIBT switch is pressed.
AUD INHB	The box is filled in while the HTAWS Audio Inhibit input is pulled low.
AIR/GRND	The box is filled in when the Air/Ground switch is in use
AUR SUPR	The box is filled in while the Aural Suppression switch is pressed.
RP MODE	The box is filled in while the RP Mode switch is pressed.

DISCRETE TOGGLE

This allows you to verify the operation of any external annunciators that are present in the installation.

Selection	Verify That:
APR	The APR annunciator is active and inactive as selected on this page.
GPS	The GPS source select annunciator is active and inactive as selected on this page.
INTEG	The INTEG annunciator is active and inactive as selected on this page.
MSG	The MSG annunciator is active and inactive as selected on this page.
OBS	The OBS annunciator is active and inactive as selected on this page.
TERM	The TERM annunciator is active and inactive as selected on this page.
VLOC	The VLOC source select annunciator is active and inactive as selected on this page.
WPT	The WPT annunciator is active and inactive as selected on this page.
ILS/GPS APR	The ILS/GPS APR output is active and inactive as selected on this page (NOTE: This output is connected to the autopilot ILS ENGAGE input, not to an annunciation, and therefore this is for bench testing purposes only).
GPS SELECT	The GPS SELECT output is active and inactive as selected on this page (NOTE: This output is connected to the autopilot GPS SELECT input, not to an annunciation, and therefore this is for bench testing purposes only).
TER CAUT	The TER CAUT annunciator is active and inactive as selected on this page.
TER INHB	The TER INHB annunciator is active and inactive as selected on this page.
TER N/A	The TER N/A annunciator is active and inactive as selected on this page.
TER WARN	The TER WARN annunciator is active and inactive as selected on this page.
RP MODE	The RP MODE annunciator is active and inactive as selected on this page.

5.3.9 MAIN CDI/OBS CONFIG Page

Select the MAIN CDI/OBS CONFIG page (see Figure 5-14). This page allows you to verify the MAIN CDI outputs, both lateral (**LAT**) and vertical (**VERT**), and verify and calibrate the MAIN OBS input. Using the controls on the 500W Series unit front panel, make the selections below and verify the interfaces as appropriate:

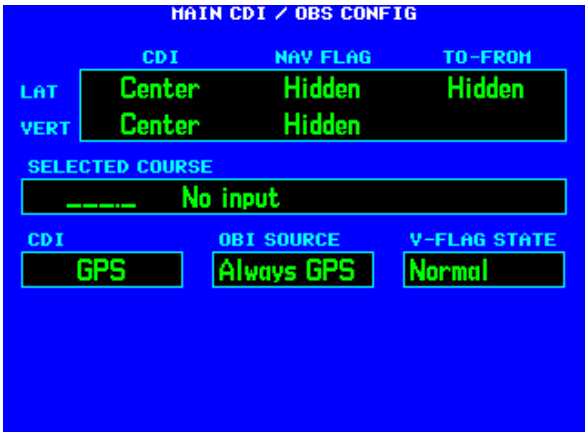


Figure 5-14. MAIN CDI/OBS CONFIG Page

CDI (LAT/VERT)

Selection	Verify That:
Max left	The CDI is "pegged" to the left/up.
Full left	The CDI is deflected full scale to the left/up.
Center	The CDI is centered.
Full right	The CDI is deflected full scale to the right/down.
Max right	The CDI is "pegged" to the right/down.

NAV FLAG (LAT/VERT)

Selection	Verify That:
Hidden	The LAT/VERT flag is hidden.
In view	The LAT/VERT flag is in view.

TO-FROM

Selection	Verify That:
From	The FROM flag is in view.
Hidden	The TO/FROM flag is hidden.
To	The TO flag is in view.

SELECTED COURSE

Select 150° on the CDI/HSI that is connected to the 500W Series unit's MAIN OBS inputs. The **SELECTED COURSE** field should indicate near to 150° and a **Calibrate to 150°?** field appears. Selecting this field calibrates the 500W Series unit to match the input source. Verify OBS operation by checking that the course displayed on the 500W Series unit is within 2° of the selected course. Do this at 30° intervals around the OBS card.

NOTE

If it is desired to ignore a selected course input (either analog resolver or ARINC 429) for GPS operation in OBS mode, press MENU on the MAIN CDI/OBS CONFIG page and select "Ignore SEL CRS for GPS?". When OBS mode is selected, the selected course is entered on the controls of the 500W Series unit. If ignoring the selected course input such that the VOR valid flag is dependent only on a valid VOR signal, with lateral deviation calculated by another display device, press MENU on the MAIN CDI/OBS CONFIG page and select "Ignore SEL CRS for VLOC?".

CDI (GNS 530W Only)

Selection	Description
GPS	The GNS 530W CDI button is in the GPS state, and the GPS ANNUNCIATE output is active. This annunciator output may be required to be active for some installations.
VLOC	The GNS 530W CDI button is in the VLOC state, and the VLOC ANNUNCIATE output is active.
GPS Only	The GNS 530W CDI button has been disabled.

NOTE

If it is desired to disable the GNS 530W CDI key, press MENU on the MAIN CDI/OBS CONFIG page and select "Ignore CDI key?". This causes the field above the CDI key to always display GPS, regardless of CDI key presses. This may be necessary for certain EFIS systems where navigation sensor selection must be accomplished on the EFIS or its control panel.

OBI SOURCE (GNS 530W Only)

Selection	Description
Always GPS	The MAIN King Serial OBI outputs are always GPS. This is useful if it is desired to switch a Bendix/King KI 229 or KNI 582 RMI pointer independently from the GNS 530W CDI button.
Track CDI	The MAIN King Serial OBI outputs are GPS or VOR, and switchable by the GNS 530W CDI button. This is useful if it is desired the Bendix/King KI 229 or KNI 582 RMI pointer to display the same navigation source as the GNS 530W CDI outputs.

V-FLAG STATE

Selection	Description
Declutter	Whenever vertical deviation is invalid, the vertical deviation bar is parked in the maximum UP position and the vertical flag is removed from view, except in the following cases: (i) the CDI is in VLOC mode and an ILS frequency is tuned, or (ii) the CDI is in GPS mode and a GPS approach with vertical guidance is active. In these cases, whenever the vertical deviation is invalid, the vertical deviation bar parks in the centered position and the vertical flag is shown.
Normal	Whenever vertical deviation is invalid the vertical deviation bar parks in the centered position and the vertical flag is shown.

5.3.10 COM SETUP Page (GNS 530W Only)

Select the COM SETUP page (see Figure 5-15). These values are set at the factory and seldom require calibration. Older versions of software will not show all choices.

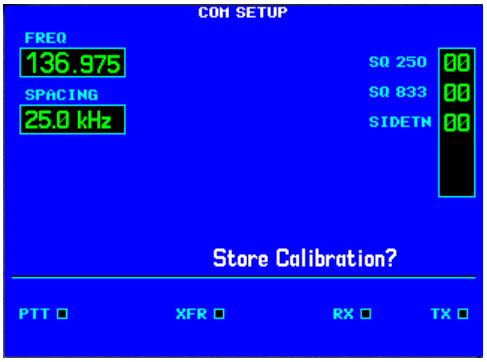


Figure 5-15. COM SETUP Page

FREQ

Selects a VHF communication frequency. For purposes of setting the squelch and sidetone levels, only the frequencies 118.000, 127.000, and 136.975 MHz can be used.

SPACING

Selection	Description
25.0 kHz	Selects traditional 25 kilohertz spacing (760 channel).
8.33 kHz	Selects 8.33 kilohertz channel spacing, which is required in some areas of the world.

CAUTION

8.33 kHz channels are not authorized for use in the United States.

SQ 250

Sets the squelch threshold for 25 kHz channel spacing operation. May be set to any value between 0 (zero) and 63. The higher the number, the less signal is required to break squelch.

NOTE

For GNS 530W units with COM software 2.00 or earlier, the operation of the SQ 250 setting is reversed. The higher the SQ 250 number, the more signal is required to break squelch.

SQ 833

Sets the squelch threshold for 8.33 kHz channel spacing operation. May be set to any value between 00 (zero) and 63. The higher the number, the more signal is required to break squelch.

SIDETN

Sets the sidetone audio output level. May be set to any value between 00 (zero) and 63.

NOTE

The sidetone audio output level is independent of the COM volume knob on the 500W Series unit.

STORE CALIBRATION?

Select this field and press the ENT key to accept the squelch, threshold, and sidetone audio settings on this page. If you wish for the squelch and sidetone settings to return to their previous values, *do not* select this field. Simply change to the next configuration page, or turn off the unit if you are done with configuration.

Selection	Verify That:
PTT	The box is filled in while the COM push-to-talk switch is pressed.
XFR	The box is filled in while a remote COM transfer switch is pressed.
RX	The box is filled in while the COM is receiving a signal.
TX	The box is filled in while the COM push-to-talk switch is pressed.

5.3.11 VOR DISCRETE INPUTS Page (GNS 530W Only)

Select the VOR DISCRETE INPUTS page (see Figure 5-16). This page allows you to verify the operation of an external VLOC transfer switch that may be present in the installation.

Figure 5-16. VOR DISCRETE INPUTS Page

Selection	Verify That:
REMOTE XFR	The box is filled in while a remote VLOC transfer switch is pressed.

5.3.12 VOR/LOC/GS CDI Page (GNS 530W Only)

Select the VOR/LOC/GS CDI page (see Figure 5-17). This page allows you to verify and calibrate the CDI outputs, both lateral (**LAT**) and vertical (**VERT**) from the VOR/LOC/Glideslope receiver, as well as the OBS resolver input to the VOR receiver. It also allows you to select the format for DME tuning data. Using the controls on the GNS 530W front panel, make the selections below and verify the interfaces as appropriate:

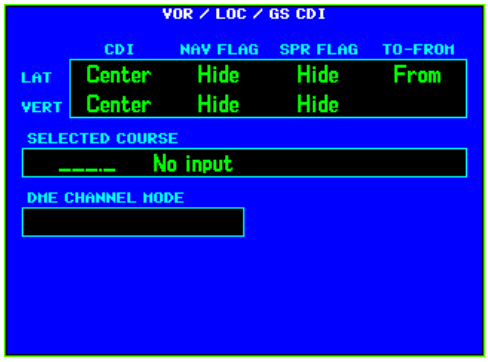


Figure 5-17. VOR/LOC/GS CDI Page

NOTE

The LAT, VERT, and SELECTED COURSE configurations only apply to installations where a CDI/HSI is connected to the VOR/LOC/GLIDESLOPE pins on connector P5006.

CDI (LAT/VERT)

Selection	Verify That:
Max left	The CDI is “pegged” to the left.
Full left	The CDI is deflected full scale to the left.
Std. left	The CDI is deflected left of center.
Center	The CDI is centered.
Std. right	The CDI is deflected right of center.
Full right	The CDI is deflected full scale to the right/down.
Max right	The CDI is “pegged” to the right/down.

NAV FLAG (LAT/VERT)

Selection	Verify That:
Hide	The LAT/VERT flag is hidden.
View	The LAT/VERT flag is in view.

SPR-FLG (LAT/VERT)

Selection	Verify That:
Hide	The LAT/VERT superflag is hidden.
View	The LAT/VERT superflag is in view.

TO-FROM (LAT)

Selection	Verify That:
FROM	The FROM flag is in view.
Hide	The TO/FROM flag is hidden.
TO	The TO flag is in view.

SELECTED COURSE

Select 150° on the CDI/HSI that is connected to the 500W Series unit VOR/LOC/GS OBS inputs. The **SELECTED COURSE** field should indicate near to 150° and a **Calibrate to 150°?** field appears. Selecting this field calibrates the 500W Series unit to match the input source. Verify OBS operation by checking that the course displayed on the 500W Series unit is within 2° of the selected course. Do this at 30° intervals around the OBS card.

DME CHNL MODE

This configuration allows you to set the format for DME tuning data output.

Selection	Description
King serial	King Serial DME tuning data
Parallel 2x5	2 of 5 parallel DME tuning.
Parallel BCD	Shifted BCD (Binary Coded Decimal) parallel DME tuning
Parallel slip	Slip-code parallel DME tuning
Narco 890/891	2 of 5 parallel DME tuning, compatible with the following DME units: *Narco DME 890* *Narco DME 891* *ARC (Cessna) RTA-476A*

5.3.13 VOR/LOC/GS ARINC 429 CONFIG Page (GNS 530W Only)

Select the VOR/LOC/GS ARINC 429 CONFIG page (see Figure 5-18). This page configures the VOR/ILS ARINC 429 output and input ports.

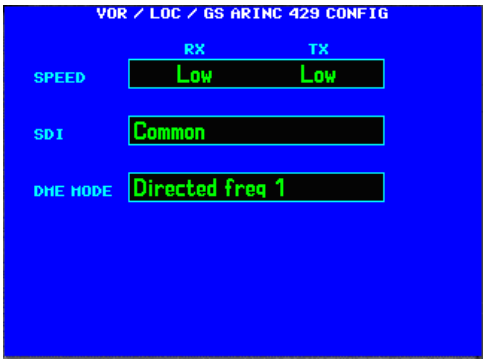


Figure 5-18. VOR/LOC/GS ARINC 429 CONFIG Page

SPEED (RX and TX)

Selection	Description
Low	Standard low-speed ARINC 429 (nominally 12.5 kilobits per second)
High	High-speed ARINC 429 (nominally 100 kilobits per second)

SDI

Selection	Description
Common	RX: Accepts all 429 inputs TX: Generates all 429 outputs with SDI = 0.
VOR/ILS 1	Number 1 (Pilot) VOR/ILS Receiver RX: Accepts 429 inputs with SDI = 0 or 1. TX: Generates all 429 outputs with SDI = 1.
VOR/ILS 2	Number 2 (Copilot) VOR/ILS Receiver RX: Accepts 429 inputs with SDI = 0 or 2. TX: Generates all 429 outputs with SDI = 2.

DME MODE

Selection	Description
Directed freq 1	If the GNS 530W is connected to a multi-channel ARINC 429 DME, channel 1 of that DME is tuned. "Directed freq 1" should be selected if a single-channel ARINC 429 DME is to be tuned.
Directed freq 2	If the GNS 530W is connected to a multi-channel ARINC 429 DME, channel 2 of that DME is tuned.

5.3.14 GPS Vertical Offset

The GPS Vertical Offset setup function is used to enter the height above ground of the GPS antenna. Prior to proceeding, measure the GPS antenna vertical offset (to the nearest foot) as shown in Figure 5-19.

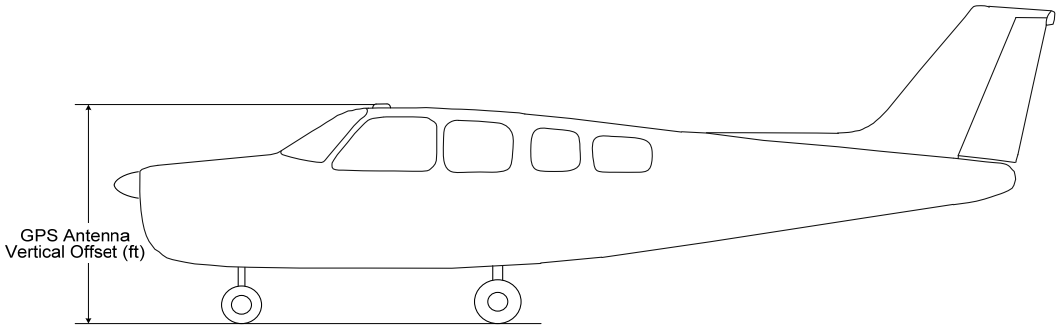


Figure 5-19. Measurement of GPS Vertical Offset

Use the large and small knobs to enter the offset value and press ENT to save.

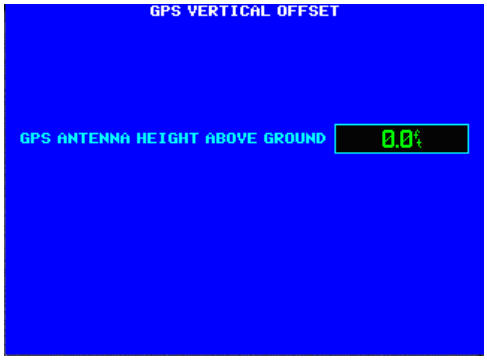


Figure 5-20. GPS Vertical Offset Page

5.3.15 STORMSCOPE® CONFIG Page

NOTE

The Stormscope pages are only available if one of the RS-232 inputs is configured for the WX-500.

Select the STORMSCOPE CONFIG page (see Figure 5-21). This page shows the L3 Communications WX-500 Stormscope configuration as reported by the WX-500 through RS-232 data.

Verify that the **STATUS** field indicates "Ok", and that the other displayed parameters are correct. Verify that all the boxes in the lower portion of the page are green.

When a 500W Series unit is used with a WX-500 Stormscope, the "Synchro" or "Serial" heading formats may be used. If another heading format is used, lightning strike information is visible on the Weather Page, but not the Map Page or Arc Page.

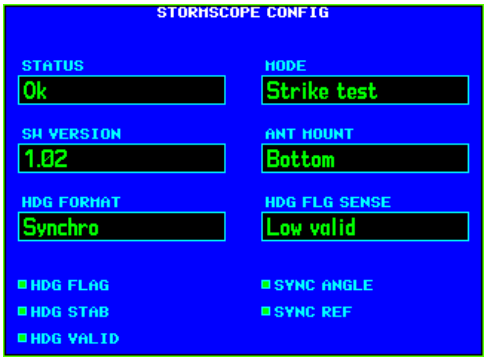


Figure 5-21. STORMSCOPE CONFIG Page

5.3.16 STORMSCOPE® TEST Page

Select the STORMSCOPE TEST page (see Figure 5-22). This page shows current strike activity, WX-500 status, and the heading supplied by the WX-500. The WX-500 mode may be changed to 'Demo', 'Noise monitor', 'Self test', 'Strike test', or 'Weather'.

Verify that the WX-500 mode can be changed. Refer to the WX-500 manual for specific installation test procedures for the WX-500, using this page to view strike data, change the WX-500 mode, view WX-500 status, trigger count, and heading.

Figure 5-22. STORMSCOPE TEST Page

5.3.17 STORMSCOPE® DOWNLOAD DATA Page

Select the STORMSCOPE DOWNLOAD DATA page (see Figure 5-23). This page shows raw data downloadable from the WX-500. Optional sets of data include WX-500 software version, environmental conditions, configuration, and fault data.

Verify that the configuration data is correct as intended. To request which packet of data to display, highlight the data group title and use the small right knob to select the desired group.

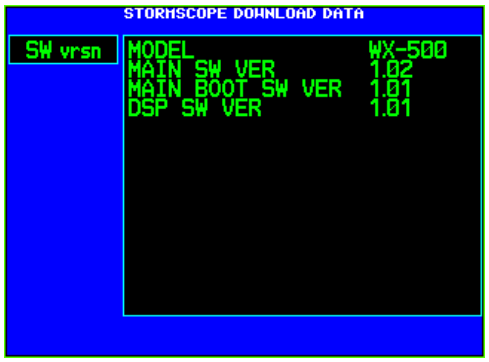


Figure 5-23. STORMSCOPE DOWNLOAD DATA Page

5.3.18 TRAFFIC Page

NOTE

The following pages are only available if one of the RS-232 inputs is configured for the Ryan TCAD or one of the ARINC 429 inputs is configured for Traffic Advisory.

Select the TRAFFIC page (see Figure 5-24). This page shows the modes of operation and current traffic situation for traffic systems connected using an ARINC 429 interface.

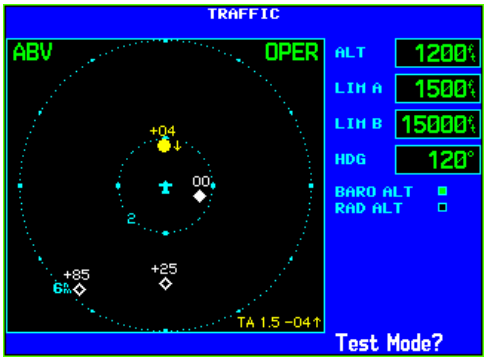


Figure 5-24. TRAFFIC Page (ARINC 429 Traffic Interface)

For traffic systems connected via ARINC 429, this page shows:

1. The altitude mode—below (BLW), normal (NORM), above (ABV), or unrestricted (UNR)
2. The operating mode—standby (STBY) or operating (OPER)
3. Current altitude (ALT)
4. Altitude limits being imposed (LIM A and LIM B)
5. Heading, and barometric (BARO) and radio (RAD) altitude status.

For traffic systems connected via ARINC 429 (see Figure 5-24), verify that the 500W Series unit can change the traffic system operating mode (STBY or OPER). In standby mode, verify that the traffic system may be placed in self-test mode by highlighting "Test Mode?" and pressing ENTER on the 500W Series unit. Refer to the appropriate traffic installation manual for system checkout.

For Ryan TCAD (see Figure 5-25) systems connected using an RS-232 interface, this page shows the current shield mode and altitude. Verify that the TCAD shield mode may be changed—Ground (GND), Terminal (TML), Standard (STD), En Route (ENR), or Unrestricted (UNR), and that the TCAD is reporting the correct altitude. Refer to the Ryan TCAD installation manual for system checkout.

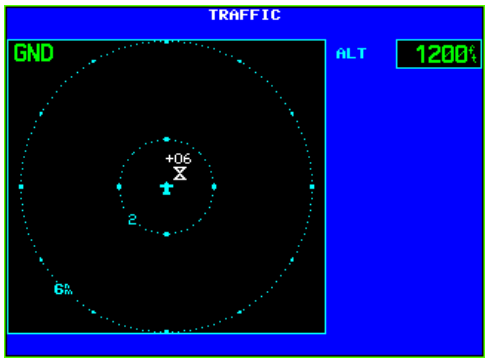


Figure 5-25. TRAFFIC Page (TCAD using RS-232 Interface)

NOTE

For main software version 3.20 or later, an alternate traffic color is available by pressing the MENU key while on the TRAFFIC page and selecting "Use Alternate Trfc Color?" Selection of this option causes non-TA traffic to be displayed in cyan instead of white, which is the default color.

5.3.19 RYAN TCAD CONFIG Page

Select the RYAN TCAD CONFIG page (see Figure 5-26). This page shows the TCAD's current shield settings for the selected mode, approach mode status, volume, mute status, mute duration, voice alert selection, and system status.

Verify that the TCAD system status is GREEN. Also, verify that shield settings and volume, mute duration, and voice alert selection can be modified. Verify that changes in mute (if a mute switch is installed) are shown. Refer to the Ryan TCAD installation manual for system checkout.

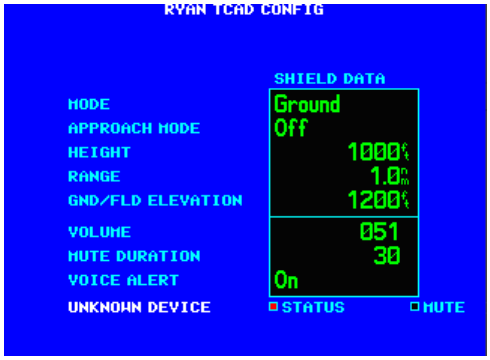


Figure 5-26. RYAN TCAD CONFIG Page

5.3.20 GAD 42 CONFIG Page

The following page is only available if a ARINC 429 input is configured for the GAD 42.

Select the GAD 42 CONFIG page (see Figure 5-27). This page allows remote configuration of a GAD 42 Interface Adapter Unit. For details of this function, please see Section 5 of the GAD 42 Installation Manual (P/N 190-00159-00).

Figure 5-27. GAD 42 CONFIG Page

5.3.21 TAWS AUDIO CONFIG 1 Page

(Only if TAWS/HTAWS is installed)

Select the TAWS AUDIO CONFIG 1 page (see Figure Figure 5-28). This page allows configuration of TAWS audio.

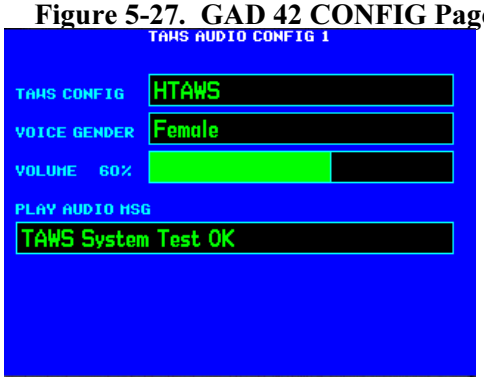


Figure 5-28. TAWS AUDIO CONFIG 1 Page

5.3.21.1 VOICE GENDER Field

Selection	Description
Female	Select the female voice to annunciate TAWS alerts. (Default)
Male	Select the male voice to annunciate TAWS alerts.

5.3.21.2 VOLUME Field

The **VOLUME** field sets the volume of the TAWS alerts from 0% volume (left side) to 100% volume (right side). The default value is 60% of the maximum value. The TAWS volume needs to be set so as to ensure that aural alerts are audible under all anticipated noise environmental conditions. Refer to Section 5.4.7 for the TAWS Audio Check procedure.

5.3.21.3 PLAY AUDIO MSG Field

The **PLAY AUDIO MSG** field allows the playback of all the individual TAWS/HTAWS alert messages. It is not used to control the configuration of the messages.

5.3.22 TAWS AUDIO CONFIG 2 Page

Select the TAWS AUDIO CONFIG 2 page. This page allows configuration of TAWS audio. This page allows display and configuration of the TAWS/HTAWS audio alert messages.

Figure 5-29. TAWS AUDIO CONFIG 2 Page

5.3.22.1 TAWS Alert Messages

Alert	Caution/Warning	Audio Message Selection
Reduced Terrain Clearance	Caution	Caution, Terrain (2x)
		Terrain Ahead (2x)
	Warning	Terrain (2x); Pull-Up (2x)
		Terrain Ahead, Pull-Up (2x)
Reduced Obstacle Clearance	Caution	Caution, Obstacle (2x)
		Obstacle Ahead (2x)
	Warning	Obstacle (2x); Pull-Up (2x)
		Obstacle Ahead, Pull-Up (2x)
Imminent Terrain Impact	Caution	Terrain Ahead (2x)
		Caution, Terrain (2x)
	Warning	Terrain Ahead, Pull-Up (2x)
		Terrain (2x); Pull-Up (2x)
Imminent Obstacle Impact	Caution	Obstacle Ahead (2x)
		Caution, Obstacle (2x)
	Warning	Obstacle Ahead, Pull-Up (2x)
		Obstacle (2x); Pull-Up (2x)
Premature Descent Rate	Caution	Too Low Terrain
Excessive Descent Rate	Caution	Sink Rate
	Warning	Pull Up
Negative Climb Rate	Caution	Don't Sink
		Too Low Terrain
Voice Call Out	500'	Five Hundred

5.3.22.2 HTAWS Alert Messages

Alert	Caution/Warning	Audio Message Selection
Reduced Terrain Clearance	Caution	Caution; Terrain (2x)
	Warning	Warning; Terrain (2x)
Reduced Obstacle Clearance	Caution	Caution; Obstacle (2x)
	Warning	Warning; Obstacle (2x)
Imminent Terrain Impact	Caution	Caution; Terrain (2x)
	Warning	Warning; Terrain (2x)
Imminent Obstacle Impact	Caution	Caution; Obstacle (2x)
	Warning	Warning; Obstacle (2x)
Voice Call Out	500’	Five Hundred
	400’	Four Hundred
	300’	Three Hundred
	200’	Two Hundred
	100’	One Hundred

5.3.23 GDL CONFIG Page

This page allows the user to set the attenuation and model of the GDL 69. It is only available if one of the RS-232 ports is configured for the GDL 69/69A.

The GDL 69A XM must be activated before use. If the XM activation has not already been done, see the GDL 69/69A Installation Manual (190-00355-02) and the GDL 69/69A XM Activation Instructions (190-00355-04).

Figure 5-30. GDL CONFIG Page

Selection	Description
Attenuation	Sets the attenuation value for the GDL 69/69A. Refer to the GDL 69/69A Installation manual (190-00355-02) to determine the correct attenuation value.
Model	Sets the model to either GDL 69 (weather only) or GDL 69A (weather and audio).

5.3.24 DATA LINK DIAGNOSTICS Page

The 8-character test word returned from the GDL 69 is displayed on the DATA LINK DIAGNOSTICS page for each of the following parameters:

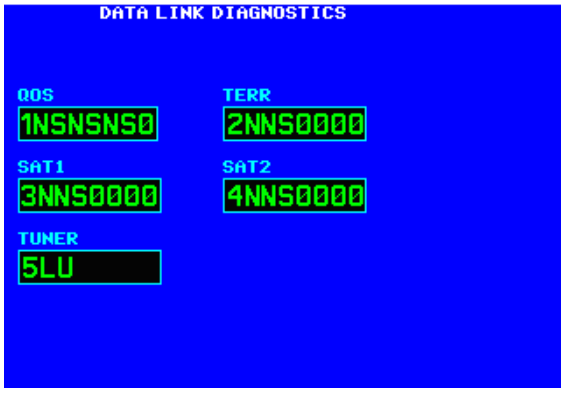


Figure 5-31. Data Link Diagnostics

Display	Description
QOS	Quality of Service Test
TERR	Terrestrial Error Status
SAT1	Satellite 1 Error Status
SAT2	Satellite 2 Error Status
TUNER	Tuner Status

5.4 Ground Checks (Configuration Mode)

5.4.1 Main Indicator (Analog Only)

NOTE

If the GNS 500W Series unit is interfaced to an electronic HSI and the main indicator analog output is not used, this check is not required.

If the GNS 500W Series unit is interfaced to an analog indicator on the main CDI/OBS, perform the following steps:

1. Go to the MAIN CDI/OBS CONFIG page.
2. Verify correct operation of the lateral deviation, flag and TO/FROM flag using the corresponding selections.
3. Verify correct operation of the vertical deviation and flag using the corresponding selections.
4. Verify correct operation of the OBS knob using the SELECTED COURSE display. At 30° increments around the OBS card, ensure that the indicated value is within 2° of the value set on the indicator.

5.4.2 VOR/ILS Indicator (GNS 530W Only)

If the GNS 530W unit is interfaced to an analog indicator on the VOR/ILS Indicator output, perform the following steps:

1. Go to the VOR/LOC/GS CDI configuration page.
2. Verify correct operation of the lateral deviation, flag and TO/FROM flag using the corresponding selections.
3. Verify correct operation of the vertical deviation and flag using the corresponding selections.

5.4.3 Discrete Inputs and Annunciator Outputs Checkout

If the GNS 500W Series unit is connected to external annunciators/systems or external switches, perform the following steps:

1. Go to the MAIN DISCRETE I/O page.
2. For each external switch that is connected, exercise the switch and use the EXTERNAL SWITCH STATE section to verify that the input is functioning correctly.
3. Go to the MAIN DISCRETE OUTPUTS page.
4. For each annunciator output that is connected to an external system or annunciator, toggle the output ON (corresponding box is filled/green) and OFF (corresponding box is not filled/blue) using the DISCRETE TOGGLE field. Verify that the appropriate external annunciator illuminates when the output is set to ON and extinguishes when the output is set to OFF. If the output is not connected to an annunciator but provides an input to another system, verify that the other system receives the signal.

5.4.4 ADC, Altitude Encoder, Fuel Sensor and Fuel/Air Data Computer

NOTE

This check does not apply to parallel connections to an altitude encoder. If the gray code interface to an altitude encoder is used, the check in Section 5.4.5 must be completed.

The GNS 500W Series unit can receive altitude or fuel/air data from an external source. This check verifies that the GNS 500W Series unit is receiving data from these units. Ensure that the GNS 500W Series unit is turned on and in configuration mode. If the following steps do not perform correctly, check the electrical connections and configuration setup.

1. Go to the Main Inputs page.
2. If there are multiple altitude sources providing data to the GNS 500W Series unit, remove power from all but one altitude source.
3. Verify that pressure altitude (P ALT) data is being displayed and agrees with the active altitude source.

NOTE

After applying power to an altitude source it may take several minutes to warm up. During the warm-up period the altitude display on the GNS 500W Series unit will be dashed out.

4. If there are multiple altitude sources, remove power from the currently active source and apply power to another source that has not been checked.
5. Repeat steps 3 and 4 until all available altitude sources have been checked.

5.4.5 Altitude Encoder (Gray Code Connection)

The GNS 500W Series unit can receive altitude from an external gray code encoder or encoding altimeter. This check verifies all of the connections in the parallel gray code interface. If the following steps do not perform correctly, check the electrical connections and configuration setup.

1. Go to the Main Discrete I/O page.
2. Using a pitot-static test set, set the altitude to the values specified below:

Pitot-Static Test Set Altitude	Tolerance (ft)
400	± 20
800	± 20
2000	± 30
10,000	± 80
16,000	± 110
30,800	± 180

3. Verify that decoded altitude data is being displayed is equal to the test set altitude, within the tolerance specified.

5.4.6 AHRS/IRU Interface Check

The GNS 500W Series unit can receive heading data from an external source. This check verifies that the GNS 500W Series unit is receiving data from these units. Ensure that the GNS 500W Series unit is turned on and in configuration mode. If the following steps do not perform correctly, check the electrical connections and configuration setup.

1. Go to the Main Inputs page.

NOTE

If a Sandel EHSI or an ARINC 429 EFIS is also installed, ensure that it is turned off so that it does not supply heading to the GNS 500W Series unit.
Verify that the HDG field displays valid heading data.

2. Remove power from the heading source and verify that the heading in the HDG field is dashed out.

5.4.7 TAWS/HTAWS Audio Check

NOTE

The audio panel should also be turned on for this test.

The TAWS/HTAWS audio volume has an initial default of 60% of the maximum volume value. The volume needs to be set so as to ensure that aural alerts are audible under all anticipated noise environmental conditions.

1. Select the configuration page labeled 'TAWS AUDIO CONFIG 1'.
2. Go to the **PLAY MSG** field. Rotate the small right knob to play the various TAWS audio messages. The audio clips are the various system, caution, and warning messages.
3. Select and play a number of the audio messages. Adjust the volume so the messages are audible under all anticipated noise environmental conditions.
   - Evaluate the audio messages for acceptable volume and intelligibility during both low and high cockpit noise levels (idle descent at low speed and high power at Vmo).
   - Adjust the audio volume by moving the cursor to the **VOLUME** field and rotating small right knob. Turn the knob to the right to increase the volume and to the left to decrease the volume.

5.4.8 GAD 42 Interface Check

This check verifies that the GNS 500W Series unit is interfaced with the GAD 42. For the 400W Series units, the GAD 42 CONFIG page is implemented in main software version 3.11 or higher.

1. Go to the GAD 42 CONFIG page.
2. Verify that STATUS is ACTIVE.
3. Change any of the options to a different number.
4. Verify that after pressing ENT the STATUS field will change to SENDING then change back to ACTIVE. If the entry reverts to the previous number when ACTIVE is displayed, then refer to the GAD 42 Installation Manual (P/N 190-00159-00).

5.4.9 Lighting Bus Interface Check

The display and key backlighting on the 500W Series unit can track an external lighting/dimmer bus input and use it to vary the display and key backlight levels accordingly. This check verifies that the interface is connected correctly.

CAUTION

When 14 VDC or 28 VDC lighting buses are connected to the 500W Series unit, connection of the aircraft lighting bus to the incorrect input pins can cause damage to the 500W Series unit. Always start this test with the dimming bus at the lowest setting, and slowly increase the brightness. If it is noticed that the LIGHTING level displayed on the 500W Series unit does not increase as the lighting is increased in brightness, verify that the wiring is correct before proceeding.

1. Ensure the lighting bus is set to its minimum setting.
2. Go to the Main Lighting page.
3. Slowly vary the lighting bus that is connected to the 500W Series unit. Verify that the LIGHTING value displayed on the configuration screen tracks the lighting bus setting. Continue to maximum brightness and verify proper operation.

5.5 Ground Checks (Normal Mode)

Turn the 500W Series unit off and bring the unit back up in normal mode for the following checks.

5.5.1 Display of Self-Test Data

Following normal power-up, the Data Base Pages are displayed followed by the Instrument Panel Self-Test Page. Pressing the ENT key once then displays the Instrument Panel Self-Test page (see Figure 5-9). During this time, the electrical outputs are activated and set to the values listed below. Press the ENT key to acknowledge the self test page. This is not a required check, although this page can be useful in troubleshooting installation problems.

NOTE

Electronic displays which monitor the 500W Series unit's ARINC 429 output may vary in how and where annunciations are displayed.

Parameter	Self-Test Value
Course Deviation	Half-scale left deviation, TO indication, flag pulled
Glideslope/Vert. Deviation	Half-scale up deviation, flag pulled
Annunciators	All On
Bearing to Waypoint (RMI)	135°
Selected Course (OBS)	500W Series unit displays the OBS value (149.5° if interfaced to an HSI with driven course pointer).
Desired Track	149.5° (Displayed as 150°)
Items below are not displayed on the INSTRUMENT PANEL SELF-TEST page	
Distance to Go	10.0 nautical miles
Time to Go	4 minutes
Active Waypoint	"GARMN"
Groundspeed	150 knots
Present Position	N 39°04.05', W 94°53.86'
Waypoint Alert	Active
Phase of Flight	En Route
Message Alert	Active
Leg/OBS Mode	Leg Mode
GPS Integrity	Invalid
Roll Steering (if applicable)	Flight Director commands 0° bank (level flight) for 5 seconds; commands increasing right bank at 1°/second for 5 seconds; commands 5° right bank for 5 seconds; commands decreasing right bank at 1°/second for 5 seconds, until command is 0° bank again. This cycle repeats continuously.

5.5.2 Signal Acquisition Check

NOTE

All other avionics should be turned off at the start of this test. Turn on the GNS 500W Series unit.

Upon acknowledgement of the Instrument Panel Self-Test Page, the Satellite Status Page is displayed. If the unit is unable to acquire satellites, move the aircraft away from obstructions which might be shading GPS reception. If the situation does not improve, check the GPS antenna installation.

NOTE

After installation, the initial acquisition of position can take up to 20 minutes. Subsequent acquisitions will not take that long.

Once GPS position information is available, perform the following steps:

1. On the Satellite Status Page, verify that the LAT/LON agree with a known reference position.
2. While monitoring the Satellite Status Page, turn on other avionics one at a time and check the GPS signal reception to make sure it is not affected (no significant signal degradation).
3. Before proceeding with the VHF COM interference check, ensure that any connected equipment is transmitting and/or receiving data from the 500W Series unit and is functioning properly.

5.5.3 VHF COM Interference Check

NOTE

The interference check must be completed on all IFR installations.

NOTE

It is known that certain non-aviation radios, including marine transceivers, can interfere with civil aviation navigation and surveillance equipment including the Garmin GNS 500W Series. When installing GNS 500W Series equipment, it is the responsibility of the installer to ensure that the GNS 500W Series unit modification is compatible with all previous aircraft modifications. Garmin recommends that whenever a GNS 500W Series unit is installed in an aircraft that has been modified with non-aviation radios, particular care should be exercised to verify that these do not interfere with proper function of the GNS 500W Series unit. Special care should also be taken to ensure that there is no interference with the GNS 500W Series unit if non-aviation radios are installed in an aircraft after a GNS 500W Series unit has been installed. If interference is found, it can be addressed by relocating antennas, rerouting cables, using filters to attenuate unintentional harmonic frequency transmissions, or using various other techniques for elimination of the interference. It may be necessary to remove or replace the interfering radio with a model that does not interfere with the proper functioning of the GNS 500W Series unit.

If you are testing a transmitter from a non-aviation device, each frequency must be verified by transmitting for at least 30 seconds on each channel.

Once the Signal Acquisition Test has been completed successfully, perform the following steps:

1. View the Satellite Status Page and verify that at least 7 satellites have been acquired on the 500W Series unit.
2. Verify that the GPS "INTEG" flag is out of view.
3. Select 121.150 MHz on the COM transceiver to be tested.
4. Transmit for a period of 35 seconds.
5. Verify that the GPS "INTEG" flag does not come into view.
6. Repeat steps 4 and 5 for the following frequencies:

   25 kHz COM Channel Spacing

   - 121.150 MHz
   - 121.175 MHz
   - 121.200 MHz
   - 121.225 MHz
   - 121.250 MHz
   - 131.200 MHz
   - 131.225 MHz
   - 131.250 MHz
   - 131.275 MHz
   - 131.300 MHz
   - 131.325 MHz
   - 131.350 MHz

NOTE

For VHF radios with 8.33 kHz channel spacing, include the following frequencies in addition to those listed above.

8.33 kHz COM Channel Spacing

- 121.185 MHz
- 121.190 MHz
- 130.285 MHz
- 131.290 MHz

7. Repeat steps 3 through 6 for all remaining COM transceivers installed in the aircraft.
8. If aircraft is TCAS-equipped, turn on the TCAS system and verify that GPS position remains valid (if position is lost, the status on the Satellite Status page will change to "ACQUIRING").
9. If aircraft is SATCOM-equipped, use the SATCOM system and verify that GPS position remains valid (if position is lost, the status on the Satellite Status page will change to "ACQUIRING").
10. If the GPS "INTEG" flag comes into view, see Section 2.4.6 for options to improve performance.

5.5.4 VHF NAV Checkout (GNS 530W)

Press the CDI key to select VLOC mode (indicated by a white VLOC in the lower left corner of the display). Check the VOR reception with ground equipment, operating VOT or VOR, and verify audio and Morse code ID functions (if possible). Tune a Localizer frequency and verify the CDI needle and NAV flag, and VDI needle and GS flag operation.

5.5.5 VHF COM Checkout (GNS 530W)

5.5.5.1 Antenna Check

If desired, the antenna VSWR can be checked using an inline wattmeter in the antenna coax using frequencies near both ends of the band. The VSWR should be < 2:1, and is not to exceed 3:1. A VSWR of 2:1 will cause a drop in output power of approximately 12%, and 3:1 causes approximately a 26% drop.

5.5.5.2 Receiver/Transmitter Operation

Tune the unit to a local VHF frequency and verify the receiver output produces a clear and understandable audio output. Verify the transmitter functions properly by contacting another station and getting a report of reliable communications.

5.5.6 TAWS/HTAWS System Check

While on the ground turn the 500W Series unit on following normal power-up procedures. The audio panel should also be turned on.

NOTE

A 3D GPS position fix is required to conduct this check.

1. Select the TAWS page.
2. Press the MENU key.
3. Select the **Test Terrain?** Or **Test HTAWS?** field and press the ENT key.
4. Wait until the TAWS self-test completes (10-15 seconds) to hear the TAWS system status aural message.
   - The aural message “TAWS System Test OK” or “HTAWS System Test OK” will be annunciated if the TAWS/HTAWS system is functioning properly.
   - The aural message “TAWS System Failure” or “HTAWS System Failure” will be annunciated if the TAWS/HTAWS system is NOT functioning properly.

If no audio message is heard, then a fault exists within the audio system and the TAWS/HTAWS capability must be considered non-functional.

5.5.7 Interface Checkout

This section describes checks that must be carried out to verify that systems interfacing to the GNS 500W Series unit are communicating properly. Only those interfaces that are connected to the GNS 500W Series unit must be verified.

5.5.7.1 Honeywell (Bendix/King) EFS40/50 Interface Check

If a Honeywell EFS40/50 has been connected to GNS 500W Series unit the interface should be verified as described in this section.

1. Cycle power to the first GNS 500W Series unit and acknowledge the prompts until it gets to the self test page (see Section 5.5.1).
2. Ensure that GPS1 data is displayed by pressing the "1-2" key on the EFS40/50 control panel.
3. While the GNS 500W Series unit is displaying the self test page, verify that the EFS40/50 is displaying data from the GPS source. Note that vertical deviation will not be displayed.
   - Course Deviation: Half-scale left deviation, TO indication, flag pulled
   - Active Waypoint: GARMN
   - Vertical Deviation: Half-scale up deviation (only if installation is setup to display GPS vertical deviation)
4. On the GNS 500W Series unit verify that an OBS value is displayed (and not dashed out).
5. Using a VOR test set verify that the CDI deviation on the EFS40/50 is displayed correctly.
6. Cycle power to the second GNS 500W Series unit and acknowledge the prompts until it gets to the self test page (see Section 5.5.1).
7. Switch to GPS2 data by pressing the "1-2" key on the EFS40/50 control panel and repeat steps 3 through 5 with the second GNS 500W Series unit.

5.5.7.2 Sandel SN3308 Interface Check

If a Sandel SN3308 EHSI has been connected to the GNS 500W Series unit, the interface should be verified as described in one of the following sections, as appropriate for the installation.

5.5.7.2.1 One 500W Series Unit/One SN3308

1. Cycle power to the GNS 500W Series unit and acknowledge the prompts until it gets to the self test page (see Section 5.5.1).
2. Ensure that the SN3308 is receiving valid heading.

NOTE

The Vertical Deviation Indication will not be displayed unless the SN3308 is receiving valid heading.

3. While the GNS 500W Series unit is displaying the self test page, verify that the SN3308 is displaying the following data from the GPS source.
   - Course Deviation: Half-scale left deviation, TO indication, flag pulled
   - Vertical Deviation: Half-scale up deviation, flag pulled
   - Active Waypoint: GARMN
4. On the GNS 500W Series unit verify that an OBS value is displayed (and not dashed out).
5. Acknowledge the self test on the GNS 500W Series unit by pressing the ENT key.

6. Select VLOC on the GNS 500W Series unit and verify that the SN3308 displays NAV 1 or NAV 2 (depending on what navigation source the GNS 500W is).
7. Using a VOR test set verify that the CDI deviation on the SN3308 is displayed correctly.

5.5.7.2.2 Two 500W Series Units/One SN3308

The checkout for two 500W Series units also applies to one 400W Series unit and one 500W Series unit.

1. Remove power from the second (no. 2) 500W Series unit.
2. Cycle power to the first GNS 500W Series unit and acknowledge the prompts until it gets to the self test page (see Section 5.5.1).
3. Select GPS1 as the navigation source by pressing the NAV key on the SN3308.
4. Ensure that the SN3308 is receiving valid heading.

NOTE

The Vertical Deviation Indication will not be displayed unless the SN3308 is receiving valid heading.

5. While the first GNS 500W Series unit is displaying the self test page, verify that the SN3308 is displaying the following data from GPS1.
   - Course Deviation: Half-scale left deviation, TO indication, flag pulled
   - Vertical Deviation: Half-scale up deviation, flag pulled
   - Active Waypoint: GARMN
6. On the first GNS 500W Series unit verify that an OBS value is displayed (and not dashed out).
7. Acknowledge the self test on the first GNS 500W Series unit by pressing the ENT key.
8. Select VLOC on the first GNS 500W Series unit and verify that the SN3308 displays NAV 1 or NAV 2 (depending on what navigation source the GNS 530W is).
9. Using a VOR test set verify that the CDI deviation on the SN3308 is displayed correctly.
10. Remove power to the first 500W Series unit and apply power to the second GNS 500W Series unit and acknowledge the prompts until it gets to the self test page (see Section 5.5.1).
11. Select GPS2 by pressing the NAV key on the SN3308.
12. Repeat steps 4-9 with the second GNS 500W Series unit.

5.5.7.3 Sandel SN3500 Interface Check

If a Sandel SN3500 EHSI has been connected to a 500W Series unit, the interface should be verified as described in this section.

1. Cycle power to the GNS 500W Series unit and acknowledge the prompts until it gets to the self test page (see Section 5.5.1).
2. Ensure that the SN3500 is receiving valid heading.

NOTE

The Vertical Deviation Indication will not be displayed unless the SN3500 is receiving valid heading.

3. While the GNS 500W Series unit is displaying the self test page, verify that the SN3500 is displaying data from the GPS source.
   - Course Deviation: Half-scale left deviation, TO indication, flag pulled
   - Vertical Deviation: Half-scale up deviation, flag pulled
   - Active Waypoint: GARMN

NOTE

If the Vertical Deviation Indication is not displayed ensure that the Main ARINC 429 Config (See Section 5.3.1) is set to Enable Labels for VNAV.

4. On the GNS 500W Series unit verify that an OBS value is displayed (and not dashed out).
5. Acknowledge the self test on the GNS 500W Series unit by pressing the ENT key.
6. Select VLOC on the GNS 500W Series unit and verify that the SN3308 displays NAV 1 or NAV 2 (depending on what navigation source the GNS 530W is).
7. Ensure that the NAV1 (or NAV2) indication does not have a red line through it.

5.5.7.4 EHSI Deviation Scaling (If HSI/CDI Is Driven by the 500W Series Unit Via Serial Data)

If the GNS 500W Series unit has a serial connection to an EFIS display, proper scaling of the EFIS CDI and VDI must be verified.

1. Cycle power to the GNS 500W Series unit and acknowledge the prompts until it gets to the self test page (see Section 5.5.1).
2. With the self test page displayed on the GNS 500W Series unit, look on the EHSI/EFIS and verify that the lateral deviation is not flagged and half-scale left.
3. With the self test page displayed on the GNS 500W Series unit, look on the EHSI/EFIS and verify that the vertical deviation is not flagged and half-scale up.

NOTE

If the deviations are not as described, the EHSI/EFIS does not scale the GNS 500W Series unit deviations properly and cannot be certified for GPS-based guidance. Contact Garmin for further assistance.

5.5.7.5 ARINC 429 Traffic System Interface Check

If an L3 Communications SKY497/SKY899 SkyWatch® sensor or a Honeywell (Bendix/King) KTA 810 TAS/KMH 820 IHAS has been connected to the GNS 500W Series unit, the traffic interface should be verified as described in this section.

1. Go to the Traffic page on the GNS 500W Series unit (in the NAV page group).
2. Verify that NO DATA is not displayed in yellow on the center of the traffic page.
3. Verify that the traffic system mode can be changed from STBY to OPER.
4. Switch the traffic system mode to STBY, and then run the traffic self test from the Menu.
5. Verify that the traffic system executes a self test and a self-test pattern is displayed on the GNS 500W Series unit.

5.5.7.6 Ryan TCAD Traffic System Interface Check

If a Ryan TCAD has been connected to the GNS 500W Series unit, the traffic interface should be verified as described in this section.

1. Go to the Traffic page on the GNS 500W Series unit (in the NAV page group).
2. Verify that NO DATA is not displayed in yellow on the center of the traffic page.
3. Using the SETUP selection under the Traffic Menu, verify that the shield mode can be changed.

5.5.7.7 Stormscope® Interface Check

If an L3 Communications WX-500W Stormscope has been connected to the GNS 500W Series unit, the Stormscope interface should be verified as described in this section.

1. Go to the Lightning page on the GNS 500W Series unit (in the NAV page group).
2. Verify that LIGHTNING FAILED is not displayed in yellow on the center of the Lightning page.
3. Using the Self Test selection under the Lightning Menu, initiate a Stormscope self-test.

5.5.7.8 GMX 200/MX20 Interface Check

If a Garmin GMX 200 or MX20 has been connected to the GNS 500W Series unit, the interface should be verified as described in this section.

1. Ensure that the GNS 500W Series unit has a 3-D fix.
2. Create and activate a flight plan on the GNS 500W Series unit.
3. Verify that the RTE and POS data flags are not displayed on the GMX 200/MX20.
4. Verify that the flight plan is displayed on the GMX 200/MX20 using the flight plan (FPL) function.

5.5.7.9 GDL 69/69A Interface Check

If a Garmin GDL 69 has been connected to the GNS 500W Series unit, the interface should be verified as described Section 5.5.7.9.1. If a Garmin GDL 69A has been connected to the GNS 500W Series unit, the interface should be verified as described Sections 5.5.7.9.1 and 5.5.7.9.2. Each of these procedures involves verifying that the satellite signal is acquired and tracked. Locate the aircraft where there is a clear view of the southeastern or southwestern sky. XM Satellite Radio satellites are located above the equator over the eastern and western coasts of the continental United States.

NOTE

The following sections only verify the correct interface of GDL 69/69A to the GNS 500W Series unit. It does not activate the GDL 69 XM data link radio. Complete instructions for activating the XM data link radio can be found in document 190-00355-04.

5.5.7.9.1 XM® Satellite Radio Weather Checkout Procedure

1. With the 500W Series unit running in the normal mode, go to the XM Information page (in the AUX page group).
2. Verify that the DATA ID field has a valid ID and does not contain "---". For a GDL 69A, the AUDIO ID field should also display a valid ID.
3. Go to the XM WX Timestamp page and verify that timestamp data is displayed. This may take several minutes. (Time stamp data will not be available if the XM subscription has not been activated.)

During XM activation, "Detecting Activation" will be displayed in the SERVICE CLASS field on the XM Information page, and "Aviator" will be displayed once the XM signal is detected.

5.5.7.9.2 XM® Satellite Radio Audio Checkout Procedure

1. Go to the XM Audio page (in the AUX page group).

NOTE

If the XM Satellite Radio audio subscription has not been activated, audio is available only on Channel 1. If the audio subscription has been activated, audio should be available on multiple channels.

2. Ensure that the GDL 69A audio is not muted.
3. Verify that audio can be heard over the headsets. Adjustment of the volume may be required.

5.5.7.10 Crossfill Check (If Dual Units Installed With RS-232 Crossfill Connected)

Turn on both 500W Series units in the aircraft. For each 500W Series unit:

1. Select the first AUX page (titled "FLIGHT PLANNING").
2. Select "CROSSFILL".
3. Verify that the displayed status is "Ready". If "Not Available" is displayed, there may be an RS-232 wiring problem between the two 500W Series units.

5.5.7.11 External RMI/OBI Interface Check

The GNS 500W Series unit RMI/OBI output can be used to drive an RMI (or OBI) navigation indicator. This check verifies that the RMI/OBI is receiving data from the GNS 500W Series unit. If the following steps do not perform correctly, check the electrical connections and configuration setup.

NOTE

The aircraft heading system must be operating properly in order for the RMI needle to point correctly.

5.5.7.11.1 Main OBI Output

If the Main OBI output from the GNS 500W Series unit is connected to an RMI navigation indicator verify the interface as described in this section.

1. Apply power to the equipment and wait for the GNS 500W Series unit to acquire a position.
2. In the GNS 500W Series unit, set a course to a destination waypoint and ensure GPS is selected for display on the CDI.
3. If installed, set the RMI select switch to the GPS position.
4. Verify that the RMI needle swings and points towards the GPS waypoint selected.
5. If the Main OBI Output is configured to "Track CDI," ensure that a valid VOR station is not tuned. Select VLOC on the CDI and verify that the RMI needle is parked at the invalid position.
6. If the Main OBI Output is configured to output "Always GPS," select VLOC on the CDI and verify that the RMI needle still points towards the GPS waypoint selected.

5.5.7.11.2 VOR OBI Output (GNS 530W Only)

If the VOR OBI output from the GNS 530W is connected to an RMI navigation indicator verify the interface as described in this section.

1. Apply power to the equipment.
2. If installed, set the RMI select switch to the VLOC position.
3. Tune a local VOR station, or use a simulated signal from an approved VOR Test System.
4. Verify that the RMI needle swings and points towards the VOR station.

5.5.7.12 DME Tuning Check (GNS 530W Only)

If the GNS 530W is set up to remotely channel a DME, verify the interface as described in this section.

1. Select a VOR/ILS channel that corresponds to (1) a DME station within a 40 nautical mile range, or (2) the frequency of a DME ground tester.
2. Verify that the DME locks on to the signal and a valid distance, ground speed and time are displayed.
3. Tune an invalid VOR station. Verify that the DME changes to an invalid station.

5.5.7.13 GDU 620 (G500/G600) Interface Check

The GNS 500W Series unit can receive data from the GDU 620 system. Verify the interface as part of the GDU 620 installation checkout procedure.

5.5.8 Magnetic Compass Check

Compass swing should be carried out at completion of installation in accordance with AC 43.13-1B, chapter 12, section 3, paragraph 12-37.

5.6 Flight Checks

All system functions that cannot be adequately tested on the ground will require a flight test. Even if all functions can be verified on the ground, a flight test is recommended as final installation verification. Verify system operation as described in the following sections.

NOTE

The analog deviation (LEFT/RIGHT and UP/DOWN), TO/FROM, and FLAG (lateral and vertical) outputs to a CDI or HSI should be verified in flight with potential sources of electrical noise such as autopilot, flaps, gear, heater blowers, etc. operating. Lateral deviation and flags may be checked with either GPS or VOR/ILS, and vertical deviation and flags must be checked with Glideslope. Verify that the flags are hidden at the correct times, and that the flag is in view at the correct times.

5.6.1 GPS Flight Check

1. Verify that GPS position is not lost during normal aircraft maneuvering (e.g. bank angles of up to 30 degrees and pitch angles associated with take-off, departures, approaches, landing and missed approaches as applicable). If GPS position is lost, a "Loss of GPS Navigation" message will be displayed.
2. Enter and activate a flight plan on the GPS 500W/GNS 530W. Fly the flight plan and verify that the display of flight plan data is consistent with the CDI indication (deviation, TO/FROM…) in the pilot's primary field of view.

5.6.2 VHF COM Flight Check (GNS 530W)

After the installation is complete, a flight test is recommended to ensure satisfactory performance. To check the communications transceiver, maintain an appropriate altitude and contact a ground station facility at a range of at least 50 nautical miles. Contact a ground station in close proximity. Press the com volume knob to select manual squelch and listen for any unusual electrical noise, which would increase the squelch threshold. If possible, verify the communications capability on both the high low and mid bands of the VHF COM band. It may be required by the governing regulatory agency to verify operation of the COM transmitter and receiver at the extents of a ground facility's service volume (e.g., FAA AC 23-8A).

5.6.3 VOR Flight Check (GNS 530W)

1. Tune a local VOR station within 50 miles.
2. Verify the audio ident and voice quality and verify that no objectionable electrical interference such as magneto noise is present.
3. Verify the Morse code decoder IDs the station (95% probability).
4. Fly to and from the station.
5. Verify NAV flag, TO/FROM flag, and CDI are operational.
6. Record accuracy in System Log (see manual).

It may be required by the governing regulatory agency to verify operation of the VOR receiver at the extents of a ground facility's service volume (e.g., FAA AC 23-8A).

5.6.4 ILS Flight Check (GNS 530W)

1. Tune an ILS at the local airport.
2. Verify the audio ident and audio quality and verify that no objectionable electrical interference such as magneto noise is present.
3. Verify the Morse code decoder IDs the station (95% probability).
4. Fly the approach.
5. Verify NAV flag, GS flag, and CDI and VDI are operational.
6. Verify BC annunciator.

5.6.5 Autopilot Flight Check

1. Enter and activate a flight plan on the 500W Series unit. For the GNS 530W ensure that GPS is selected on the CDI. Engage the autopilot in the GPSS mode. Verify that the autopilot flies the course.
2. Disengage the autopilot and fly off course. Re-engage the autopilot (in GPSS mode) and verify that it correctly intercepts the course and continues to fly it.
3. Turn off the autopilot GPSS but leave the autopilot engaged in NAV mode. Verify that it maintains the current course.
4. (GNS 530W Only): Reselect the GPSS mode on the autopilot. Press the CDI key to select VLOC on the GNS 530W. Verify that the GPSS mode disengages.

5.6.6 TAWS Audio Flight Check (for units with TAWS only)

NOTE

The TAWS volume needs to be loud enough to ensure that aural alerts are audible under all anticipated noise environmental conditions. This check verifies that TAWS aurals can be heard during flight, but the ambient noise conditions under which it is verified are not worst-case. Consequently, the "Five Hundred" callout should be louder than is required for the conditions under which it is verified.

1. Set up for an approach to the airport.
2. During the approach, at approximately 500 ft AGL, the "Five Hundred" callout will occur. Verify that "Five Hundred" can be easily heard and understood.

5.7 Database Check

Check the aviation database to ensure it is current. The database information is displayed during the unit display start-up sequence. To check the database:

1. Turn off the 500W Series unit and then turn it on. The 500W Series unit will go through its normal start-up sequence.
2. Wait for the Aviation Database page to be displayed.
3. Verify that the expiration date displayed has not passed.

If the database has expired, then remove and replace the aviation database card as described in the following section, and see Section 1.7.1.

5.7.1 Data Card Replacement

CAUTION

Handle the data cards carefully. Do not touch the connector edge of the data card.

To replace the data card do the following:

1. Ensure that the 500W Series unit is turned off.
2. Remove the data card by lifting the tab and pull card to extract from the unit.
3. With the label facing up, insert the new data cards by pushing the card straight into the slot and press until it is inserted fully. The aviation database card inserts into the left slot. The terrain/obstacle database card inserts into the right slot.

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6. RESERVED

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7. LIMITATIONS

7.1 Operations

This installation manual is for main software version 3.00 or later, and GPS/WAAS software version 3.0 or later. Units with main software version 2.xx and GPS/WAAS software version 2.4 require limitations be included in the Aircraft Flight Manual or Aircraft Flight Manual Supplement. Contact the Garmin factory for more information.

7.1.1 HTAWS Operation

For rotorcraft installations with HTAWS enabled, the Rotorcraft Flight Manual Supplement (RFMS) shall contain the following statements as defined for TSO-C194 in RTCA DO-309, section 3.1.6.c:

- The HTAWS shall NOT be used for navigation purposes.
- The HTAWS is an alerting system. The system does NOT guarantee successful recovery from a conflict due to factors such as pilot response, aircraft performance and database limitations. No standardized recovery technique is defined as recovery maneuvers may vary.

7.2 Installation

The conditions and tests required for TSO approval of this article are minimum performance standards. It is the responsibility of those installing this article either on or within a specific type or class of aircraft to determine that the aircraft installation conditions are within the TSO standards. TSO articles must have separate approval for installation in an aircraft. The article may be installed only if performed under 14 CFR part 43 or the applicable airworthiness requirements.

The 500W Series GPS/WAAS receiver, when installed with an appropriate antenna listed in Section 1.4.8, is compatible with aircraft equipped with SATCOM when installed in accordance to this manual.

7.2.1 GPS Antenna

The GPS/WAAS receiver is compatible with the GPS antennas listed in Section 1.4.8.

7.3 Aircraft Radio Station License

An aircraft radio station license is not required when operating in U.S. airspace, but may be required when operating internationally.

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8. PERIODIC MAINTENANCE

8.1 Equipment Calibration

No scheduled servicing tasks are required on the GPS 500W/GNS 530W.

8.2 VOR Checks

Refer to CFR 14 paragraph 91.171. Every 30 days verify the limits of the permissible indicated bearing error.

8.3 Cleaning

The front bezel, keypad, and display can be cleaned with a soft cotton cloth dampened with clean water. DO NOT use any chemical cleaning agents. Care should be taken to avoid scratching the surface of the display.

8.4 Battery Replacement

WARNING

This product contains a Lithium battery that must be recycled or disposed of properly. Battery replacement and removal must be performed by professional services.

The 500W Series unit includes an internal battery that will last 5 to 8 years. The battery is used for internal time clock and GPS system information. Regular planned replacement is not necessary. The 500W Series unit will display a “Low Battery” and “Unit Needs Service” message when replacement is required. Once the low battery message is displayed, the battery should be replaced within 1 to 2 months.

If the battery is not replaced and becomes totally discharged, the 500W Series unit will remain fully operational, but the GPS signal acquisition time will be increased. There is no loss of function or accuracy of the 500W Series unit with a dead battery.

The battery is not user replaceable. To replace the battery, contact the Garmin repair station or factory authorized repair station.

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Appendix A ENVIRONMENTAL QUALIFICATION FORM

For RTCA/DO-160D Environmental Qualification Forms (EQFs) visit the Dealers Only site on http://www.garmin.com. The part numbers for each form are listed below.

Table A-1. Environmental Qualification Form Part Numbers

Unit	EQF Part Number
GPS 500W	005-00221-09
GPS 500W TAWS	005-00221-41
GNS 530W	005-00221-42
GNS 530W TAWS	005-00221-43
GNS 530AW	005-00221-44
GNS 530AW TAWS	005-00221-45

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Appendix B RESERVED

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Appendix C RESERVED

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Appendix D 500W SERIES RS-232 AVIATION DATA FORMAT

D.1 Electrical Interface

The output signals are compatible with RS-232C. Data is generated at 9600 baud with a word length of 8 bits, one stop bit, and no parity.

D.2 General Output Format

The 500W Series RS-232 data has the following general format:

STX - ASCII start-of-text character (02 hex)

t1s - Type 1 output sentences (see following paragraphs for description)

t2s - One or more type 2 output sentences (see following paragraphs for description)

ETX - ASCII end-of-text character (03 hex)

D.3 Output Sentence Type 1

The Type 1 output sentences have the following general format:

id - item designator (single ASCII alphabetic character)

dddd - item data (1 to 10 printable ASCII characters)

CR - ASCII carriage return character (0D hex)

LF - ASCII line feed character (0A hex)*

Each Type 1 sentence is output by the 500W Series unit approximately once every second.

The track, desired track, and bearing to waypoint angles, and the magnetic variation are output according to the current mode of the 500W Series unit (automatic magnetic heading, magnetic variation computed at last known position; true heading, magnetic variation of E00.0°; or user-defined magnetic heading, magnetic variation as entered by user).

Table D-1 describes the Type 1 output sentence item designator (id) and item data (dddd) fields. If data for these sentences is invalid or unavailable, dashes ("-") are used to fill in all non-blank character positions.

Table D-1. Type 1 Output Sentence Format

Ident (1 byte)	Data (10 bytes) 1 2 3 4 5 6 7 8 9 0	Description
z	a a a a a	Current GPS altitude in feet *
A	s d d m m h h	Current latitude, where: s - N (north) or S (south) dd - degrees mm - minutes hh - hundredths of minutes
B	s d d d m m h h	Current longitude, where: s - E (east) or W (west) ddd - degrees mm - minutes hh - hundredths of minutes
C	d d d	Track in whole degrees
D	s s s	Ground speed in knots
E	d d d d d	Distance to waypoint in tenths of nautical miles
G	s n n n n	Cross track error, where: s - L (left) or R (right) of course nnnn - error in hundredths of nautical miles
I	d d d d	Desired track in tenths of degrees
K	c c c c c	Destination waypoint identifier (will be blank filled on right if less than 5 characters in identifier)
L	d d d d	Bearing to destination waypoint in tenths of degrees
Q	s d d d	Magnetic variation, where: s - E (east) or W (west) ddd - tenths of degrees
S	- - - - f	NAV valid flag status, where: f - N (NAV flagged) or - (NAV valid)
T	- - - - - - - - - -	Warnings status, only data transmitted are dashes (-). Used to indicate end of Type 1 sentences.
l (lower case Lima)	d d d d d d	Distance to destination waypoint in tenths of nautical miles.

* The altitude is not output if the RS-232 port is configured as “Avtn no alt”.
* The line feed character is not output if the RS-232 port is configured as “Avtn no alt”.

D.4 Output Sentence Type 2

The 500W Series unit Type 2 output sentence has the following general format:

id - item designator (3 ASCII characters)

seq - sequence number (1 binary byte)

wpt - waypoint identifier (5 ASCII characters)

lat - waypoint latitude (3 binary bytes)

lon - waypoint longitude (4 binary bytes)

mvar - magnetic variation at waypoint (2 binary bytes)

CR - ASCII carriage return character (0D hex)

LF - ASCII line feed character (0A hex)

Each waypoint in the route being navigated by the 500W Series unit has a Type 2 sentence output by the 500W Series unit approximately once every second.

If no route is being navigated by the 500W Series unit (i.e., the active route is empty), the following Type 2 sentence is output approximately once every second:

id - item designator (3 ASCII characters; route sequence number is "01")

seq - sequence number (1 binary byte; last waypoint flag is set; route sequence number is 1)

CR - ASCII carriage return character (0D hex)

LF - ASCII line feed character (0A hex)

Table D-2 describes the Type 2 output sentence item designator (id), sequence number (seq), waypoint identifier (wpt), waypoint latitude (lat), waypoint longitude (lon), and magnetic variation at waypoint (mvar) fields.

Table D-2. Type 2 Output Sentence Format

Field	Byte	Format 7 6 5 4 3 2 1 0	Description
id	1 2-3		ASCII character 'w' (77 hex) Two ASCII numeric characters representing route sequence number of waypoint (01 to 31)
seq	1	x l a n n n n n	x - undefined l - 1 if last waypoint in route a - 1 if active to waypoint nnnnn - route sequence number of waypoint (unsigned binary)
wpt	1-5		Destination waypoint identifier (will be blank filled on right if less than 5 characters in identifier)
lat	1 2 3	s d d d d d d d x x m m m m m m x h h h h h h h	s - 0 (north) or 1 (south) ddddddd - latitude degrees (unsigned binary) xx - undefined mmmmmm x - undefined hhhhhhh - hundredths of latitude minutes (unsigned binary)
lon	1 2 3 4	s x x x x x x x d d d d d d d d x x m m m m m m x h h h h h h h	s - 0 (east) or 1 (west) xxxxxxx - undefined dddddddd - longitude degrees (unsigned binary) xx - undefined mmmmmm x - undefined hhhhhhh - hundredths of latitude minutes (unsigned binary)
mvar	1-2		Two's complement binary in 16ths of degrees. Easterly variation is positive. MSB output first.

Appendix E 500W SERIES RS-232 FUEL/AIR DATA INPUT FORMAT

E.1 Electrical Interface

The input signals are compatible with RS-232C. Data is input at 9600 baud with a word length of 8 bits, one stop bit, and no parity. One message is received per second.

E.2 Shadin Altitude Sentence

The Garmin 500W Series unit is capable of receiving the following 17-byte message from Shadin Altitude Encoders, Altitude Serializers, and Altitude Converters:

RMS<sp><+/->12345T<+/->12ul<CR>

Where:

RMS	ASCII characters
<sp>	space (0x20)
<+/->	sign indicator (0x2b["+"] or 0x2d["-"])
12345	altitude in feet
T	ASCII character
<+/->	sign indicator
12	sensor temperature
ul	checksum of bytes 1 through 14 in hex ASCII (i.e., "FA")
<CR>	carriage return (0x0d)

Note: Checksum is calculated by adding each byte in the message (1 through 14).

E.3 Icarus Altitude Sentence

The Garmin 500W Series unit is capable of receiving the following 10-byte message from the Icarus Altitude Serializer:

ALT<sp>12345<CR>
Where:

ALT	ASCII characters
<sp>	space (0x20)
12345	altitude in feet
<CR>	carriage return (0x0d)

E.4 Shadin Fuel Flow Sentence

The Garmin 500W Series unit is capable of receiving the following 55-byte message from the Shadin Fuel Flow Indicator:

<STX>K0543.2<sp>0100.0<sp>0040.0<sp>0060.0<sp>0123.4<sp>0045.4<sp>0078.0<sp>123<ETX>
Where:

<STX> start-transmit character (0x02)

K units designation (i.e., **G**allons, **L**iters, **K**ilograms, **B**[pounds])

0543.2 total fuel remaining (i.e., ASCII-coded decimal format: 0x30, 0x35, 0x34, 0x33, 0x2e, 0x32)

<sp> space (0x20)

0100.0 fuel flow rate, total (formatted as for total fuel remaining)

0040.0 fuel flow rate, engine one (or asterisks["******"], in the case of single engine aircraft)

0060.0 fuel flow rate, engine two (asterisks, in the case of single engine aircraft)

0123.4 fuel used, total

0045.4 fuel used, engine one (asterisks, in the case of single engine aircraft)

0078.0 fuel used, engine two (asterisks, in the case of single engine aircraft)

123 checksum (of bytes 2 through 51)

<ETX> end-transmit character (0x03)

Note: Checksum is calculated by adding each byte in the message (2 through 51), such that carries are discarded to give a one byte result. The ASCII-coded decimal representation of that byte is given, ranging from 0 (0x30, 0x30, 0x30) to 255 (0x32, 0x35, 0x35).

E.5 ARNAV/EI Fuel Flow Sentence

The Garmin 500W Series unit is capable of receiving the following 13-byte message from the ARNAV or Electronics International (“EI”) Fuel Flow Indicators:

<STX>G0245100550<ETX>

Where:

<STX> start-transmit character (0x02 hex)

G units designation (i.e., **G**allons, **I**mperial gallons, **L**iters, **K**ilograms, **B**[pounds])

0245 total fuel remaining in reverse order (i.e., ASCII-coded decimal format: 0x30, 0x32, 0x34, 0x35)

1 fuel remaining checksum (modulo 10 sum of four "total fuel remaining" digits)

0055 total fuel flow rate in reverse order

0 fuel flow checksum

<ETX> end-transmit character (0x03)

NOTE: Fuel remaining and fuel flow are [∗ 10] when units designation is gallons or imperial gallons. For example, 0245 gallons indicates 542 gallons; 0245 liters indicates 5420 liters. Checksum is the modulo 10 sum of the four fuel flow decimal digits, converted to an ASCII numerical character (e.g., checksum for "5678" would be ASCII "6").

E.6 Shadin Fuel/Air Data Computer Sentence

The Garmin 500W Series unit is capable of receiving the following message strings from the Shadin Fuel/Air Data or Air Data Computer:

SHADIN "z" FORMAT

<STX>

ZA012<CR><LF> "ZA" (ASCII characters); "012" represents indicated Air Speed (knots)

ZB345<CR><LF> "ZB" (ASCII characters); "345" represents true Air Speed (knots)

ZC678<CR><LF> "ZC" (ASCII characters); "678" represents Mach Speed (thousandths)

ZD<+/->9012<CR><LF> "ZD" (ASCII characters); sign; "9012" represents pressure altitude (tens of feet)

ZE<+/->3456<CR><LF> "ZE" (ASCII characters); sign; "3456" represents density altitude (tens of feet)

ZF<+/->78<CR><LF> "ZF" (ASCII characters); sign; "78" represents outside air temperature (Celsius)

ZG<+/->90<CR><LF> "ZG" (ASCII characters); sign; "90" represents true air temperature (Celsius)

ZH123<CR><LF> "ZH" (ASCII characters); "123" represents wind direction (degrees from north)

ZI456<CR><LF> "ZI" (ASCII characters); "456" represents wind speed (knots)

ZJ<+/->78<CR><LF> "ZJ" (ASCII characters); sign; "78" represents rate of turn (degrees per second)

ZK<+/->901<CR><LF> "ZK" (ASCII characters); sign; "901" represents vertical speed (tens of ft/minute)

ZL234<CR><LF> "ZL" (ASCII characters); "234" represents heading (degrees from north)

ZM5678<CR><LF>† "ZM" (ASCII characters); "5678" represents fuel flow, right (tenths gallons/hour)

ZN90123<CR><LF>† "ZN" (ASCII characters); "90123" represents fuel used, right (tenths gallons)

ZO4567<CR><LF>† "ZO" (ASCII characters); "4567" represents fuel flow, left (tenths gallons/hour)

ZP89012<CR><LF>† "ZP" (ASCII characters); "89012" represents fuel used, left (tenths gallons)

ZQ345<CR><LF> "ZQ" (ASCII characters); "345" represents error log/reason indicator

ZR678<CR><LF> "ZR" (ASCII characters); "678" represents checksum

<ETX>

Where:

<STX> start-transmit character (0x02)
<CR> carriage-return character (0x0d)
<LF> line-feed character (0x0a)
<+/-> sign indicator (0x2b["+"] or 0x2d["-"])
<ETX> end-transmit character (0x03)

† Not available from Air Data Computer

Note: Checksum is calculated by adding each byte in the message (including all characters from <STX> up to and including the error log/reason indicator), such that carries are discarded to give a one byte result. The ASCII-coded decimal representation of that byte is given, ranging from 0 (0x30, 0x30, 0x30) to 255 (0x32, 0x35, 0x35).

SHADIN "G" FORMAT

<STX>

GA012<CR><LF>	"GA" (ASCII characters); "012" represents indicated Air Speed (knots)
GB345<CR><LF>	"GB" (ASCII characters); "345" represents true Air Speed (knots)
GC678<CR><LF>	"GC" (ASCII characters); "678" represents Mach Speed (thousandths)
GD<+/->9012<CR><LF>	"GD" (ASCII characters); sign; "9012" represents pressure altitude (tens of feet)
GE<+/->3456<CR><LF>	"GE" (ASCII characters); sign; "3456" represents density altitude (tens of feet)
GF<+/->78<CR><LF>	"GF" (ASCII characters); sign; "78" represents outside air temperature (Celsius)
GG<+/->90<CR><LF>	"GG" (ASCII characters); sign; "90" represents true air temperature (Celsius)
GH123<CR><LF>	"GH" (ASCII characters); "123" represents wind direction (degrees from north)
GI456<CR><LF>	"GI" (ASCII characters); "456" represents wind speed (knots)
GJ<+/->78<CR><LF>	"GJ" (ASCII characters); sign; "78" represents rate of turn (degrees per second)
GK<+/->901<CR><LF>	"GK" (ASCII characters); sign; "901" represents vertical speed (tens of ft/minute)
GL234<CR><LF>	"GL" (ASCII characters); "234" represents heading (degrees from north)
GM5678<CR><LF>†	"GM" (ASCII characters); "5678" represents fuel flow, right (Twin only) (tenths gallons/hour)
GN90123<CR><LF>†	"GN" (ASCII characters); "90123" represents fuel used, right (Twin only) (tenths gallons)
GO4567<CR><LF>	"GO" (ASCII characters); "4567" represents fuel flow, left (or Single) (tenths gallons/hour)
GP89012<CR><LF>	"GP" (ASCII characters); "89012" represents fuel used, left (or Single) (tenths gallons)
GQ001<CR><LF>	"GQ" (ASCII characters); "001" represents error log/reason indicator (001 = temp. sensor error, 000 = no errors)
GR6789.0<CR><LF>†	"GR" (ASCII characters); "6789.0" represents fuel remaining (gallons)
Ga<+/->1234<CR><LF>	"Ga" (ASCII characters); sign; "12.34" represents barometric corrected altitude (tens of feet)
Gb56.78<CR><LF>	"Gb" (ASCII characters); "56.78" represents current barometric pressure setting (inches Hg)
G*901<CR><LF>	"G*" (ASCII characters); "901" represents checksum

<ETX>

Where:

- <STX> start-transmit character (0x02)
- <CR> carriage-return character (0x0d)
- <LF> line-feed character (0x0a)
- <+/-> sign indicator (0x2b["+"] or 0x2d["-"])
- <ETX> end-transmit character (0x03)

† Not available from Airdata Computer

Note: Checksum is calculated by adding each byte in the message (including all characters from <STX> up to and including the error log/reason indicator), such that carries are discarded to give a one byte result. The ASCII-coded decimal representation of that byte is given, ranging from 0 (0x30, 0x30, 0x30) to 255 (0x32, 0x35, 0x35).

SHADIN "S" FORMAT

<STX>

SA012<CR><LF>	"SA" (ASCII characters); "012" represents indicated Air Speed (knots)
SB345<CR><LF>	"SB" (ASCII characters); "345" represents true Air Speed (knots)
SC678<CR><LF>	"SC" (ASCII characters); "678" represents Mach Speed (thousandths)
SD<+/->9012<CR><LF>	"SD" (ASCII characters); sign; "9012" represents pressure altitude (tens of feet)
SE<+/->3456<CR><LF>	"SE" (ASCII characters); sign; "3456" represents density altitude (tens of feet)
SF<+/->78<CR><LF>	"SF" (ASCII characters); sign; "78" represents outside air temperature (Celsius)
SG<+/->90<CR><LF>	"SG" (ASCII characters); sign; "90" represents true air temperature (Celsius)
SH123<CR><LF>	"SH" (ASCII characters); "123" represents wind direction (degrees from north)
SI456<CR><LF>	"SI" (ASCII characters); "456" represents wind speed (knots)
SJ<+/->78<CR><LF>	"SJ" (ASCII characters); sign; "78" represents rate of turn (degrees per second)
SK<+/->901<CR><LF>	"SK" (ASCII characters); sign; "901" represents vertical speed (tens of ft/minute)
SL234<CR><LF>	"SL" (ASCII characters); "234" represents heading (degrees from north)
SM5678<CR><LF>	"SM" (ASCII characters); "5678" represents fuel flow, right (tenths gallons/hour)
SN90123<CR><LF>	"SN" (ASCII characters); "90123" represents fuel used, right (tenths gallons)
SO4567<CR><LF>	"SO" (ASCII characters); "4567" represents fuel flow, left (tenths gallons/hour)
SP89012<CR><LF>	"SP" (ASCII characters); "89012" represents fuel used, left (tenths gallons)
SQ345<CR><LF>	"SQ" (ASCII characters); "345" represents error log/reason indicator
SR67890<CR><LF>	"SR" (ASCII characters); "67890" represents fuel remaining (tenths gallons)
SS123<CR><LF>	"SS" (ASCII character); "123" represents ground speed (knots)
ST456<CR>LF>	"ST" (ASCII character); "456" represents track (degrees)
SU789012<CR><LF>	"SU" (ASCII character); "789012" represents distance to waypoint (hundredths nautical miles)
SV<E/W>345<CR><LF>	"SV" (ASCII character); "E" represents East, "W" represents West; "345" represents magnetic variation (tenths degrees)
SW<N/S>67 8901<CR><LF>	"SW" (ASCII character); "N" represents North, "S" represents South; "67 8910" represents current latitude (degrees, minutes, hundredths of minutes)
SX<E/W>234 5678<CR><LF>	"SX" (ASCII character); "E" represents East, "W" represents West; "234 5678" represents current longitude (degrees, minutes, hundredths of minutes)
SY<L/R>90<CR><LF>	"SY" (ASCII character); "L" represents Left, "R" represents Right; "90" represents drift angle (degrees)
Sa<+/->1234<CR><LF>	"Sa" (ASCII character); sign; "1234" represents barometric corrected altitude (tens of feet)
Sb56.78<CR><LF>	"Sb" (ASCII character); "56.78" represents current barometric pressure setting (inches Hg)
S*901<CR><LF>	"S*" (ASCII character); "901" represents checksum

<ETX>

Where:

<STX> start-transmit character (0x02)
<CR> carriage-return character (0x0d)
<LF> line-feed character (0x0a)
<+/-> sign indicator (0x2b["+"] or 0x2d["-"])
<ETX> end-transmit character (0x03)

Note: Checksum is calculated by adding each byte in the message (including all characters from <STX> up to and including the error log/reason indicator), such that carries are discarded to give a one byte result. The ASCII-coded decimal representation of that byte is given, ranging from 0 (0x30, 0x30, 0x30) to 255 (0x32, 0x35, 0x35).

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Appendix F MECHANICAL DRAWINGS

F.1 Drawing List

The following drawings are included in this section.

- Figure F-1. GNS 530W Mounting Rack Dimensions
- Figure F-2. GNS 530W Mounting Rack Installation
- Figure F-3. GPS 500W Mounting Rack Assembly
- Figure F-4. 500W Series Unit Recommended Panel Cutout Dimensions

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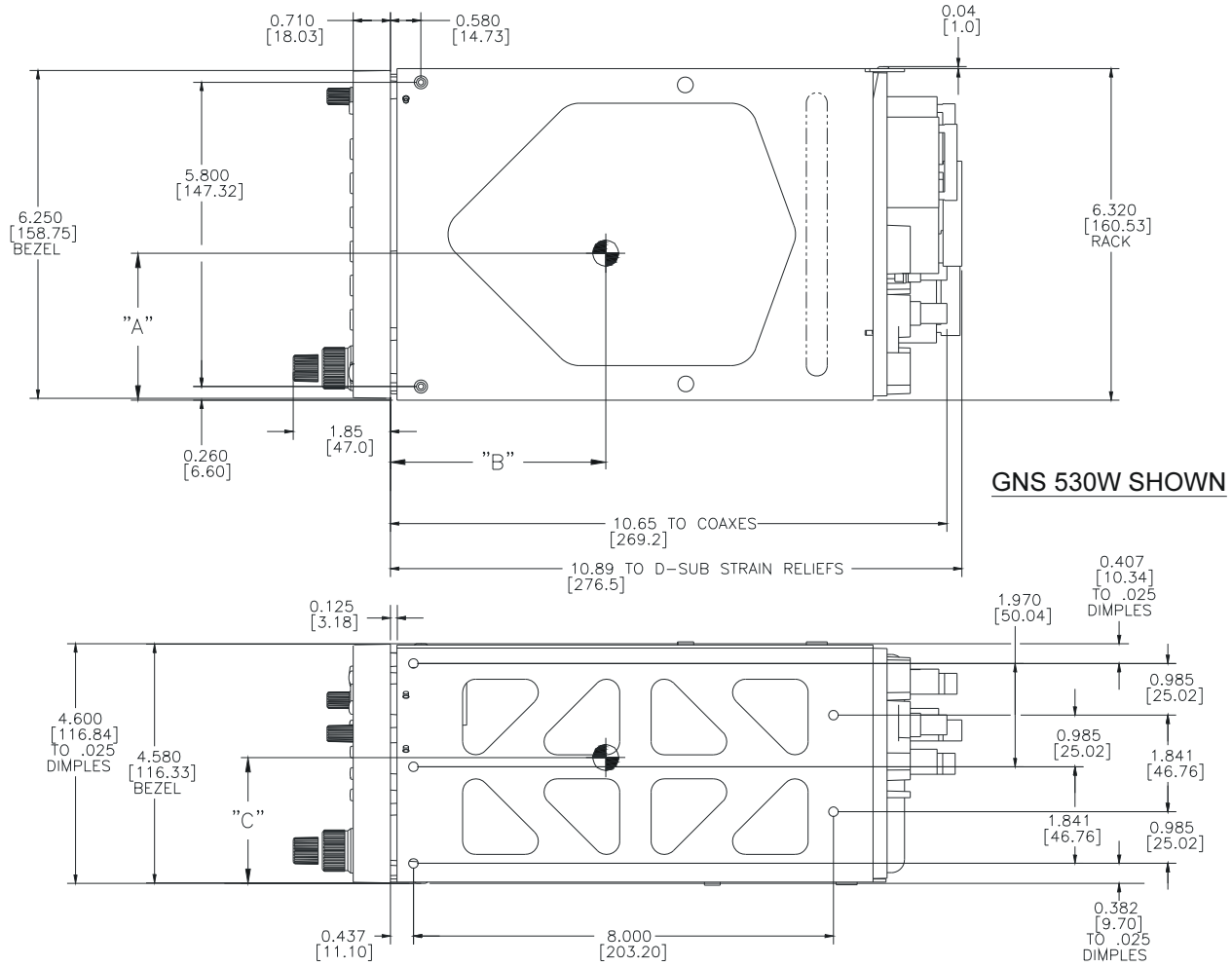


	DIMENSIONS		
MODEL	A	B	C
GPS 500W	2.9 [73.7]	4.5 [114]	2.3 [58.4]
GNS 530W	3.1 [78.7]	4.7 [119]	2.6 [66]

NOTES:

1. DIMENSIONS: INCH [mm].
2. CG LOCATION INCLUDES UNIT WITH MOUNTING RACK AND BACK PLATE ASSEMBLY.

Figure F-1. GNS 530W Mounting Rack Dimensions

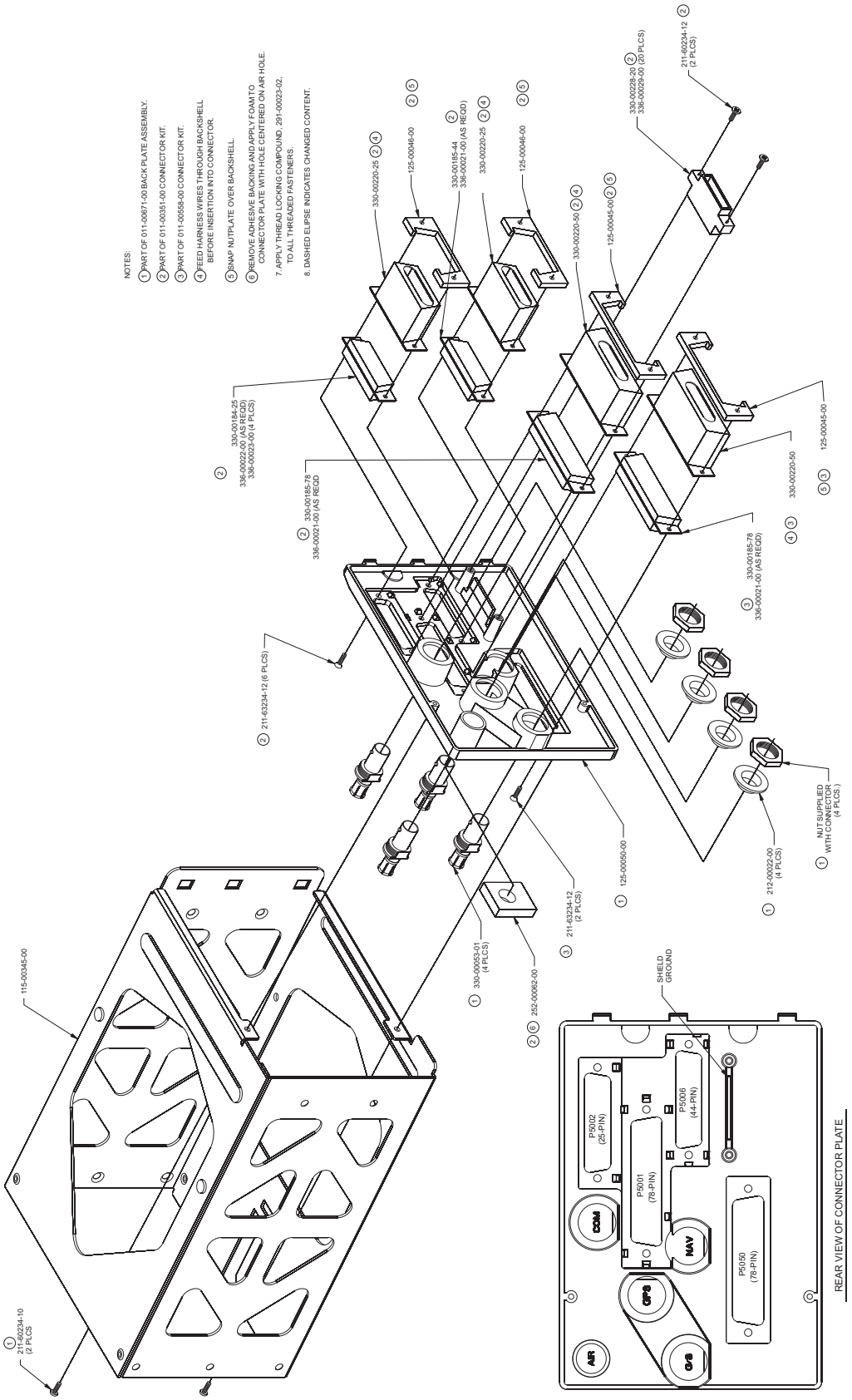


Figure F-2. GNS 530W Mounting Rack Installation

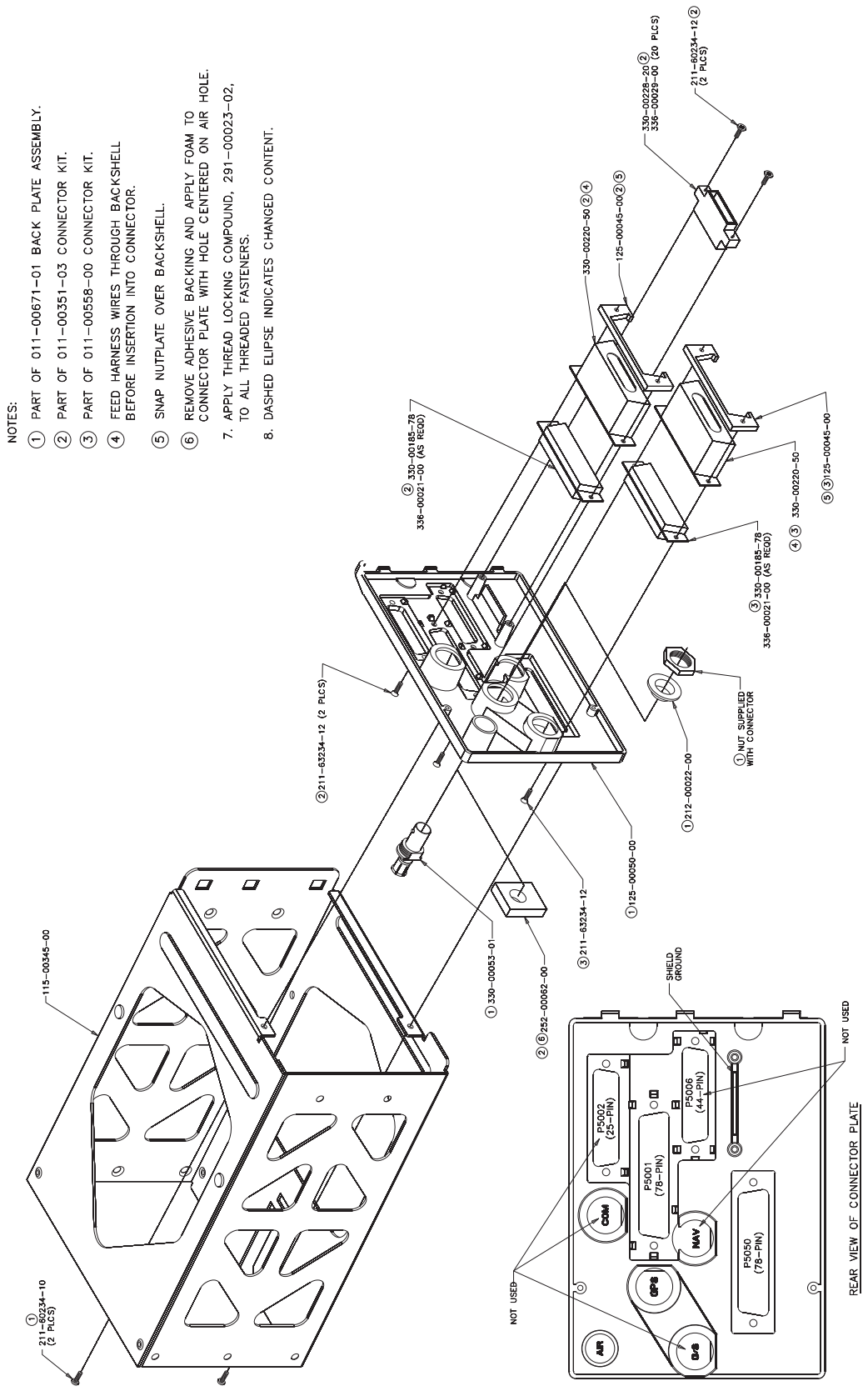
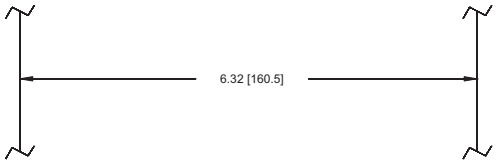
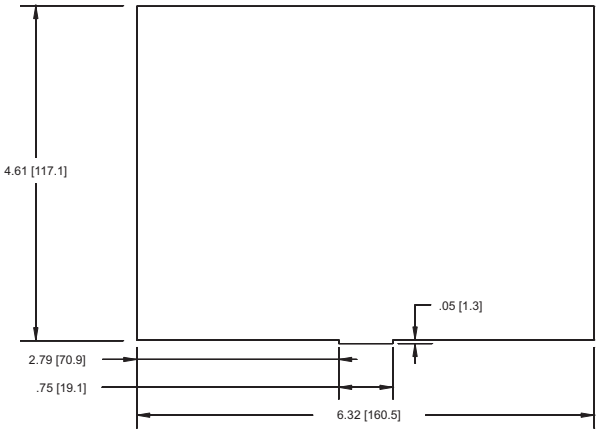


Figure F-3. GPS 500W Mounting Rack Assembly

OPTION 1:
STACK CUTOUT (RACK INSTALLED
FROM FRONT OF AIRCRAFT PANEL)



OPTION 2:
RADIO CUTOUT (RACK INSTALLED
FROM FRONT OF AIRCRAFT PANEL)



NOTES:
1. DIMENSIONS: INCH (mm).
2. IF THE FRONT LIP OF THE MOUNTING RACK IS BEHIND THE SURFACE OF THE AIRCRAFT PANEL, THE 500W SERIES UNIT CONNECTORS MAY NOT FULLY ENGAGE.

OPTION 3:
RADIO CUTOUT (RACK INSTALLED
FROM BACK OF AIRCRAFT PANEL ONLY)
MAXIMUM AIRCRAFT PANEL THICKNESS
IS .125 INCH [3.2 mm]

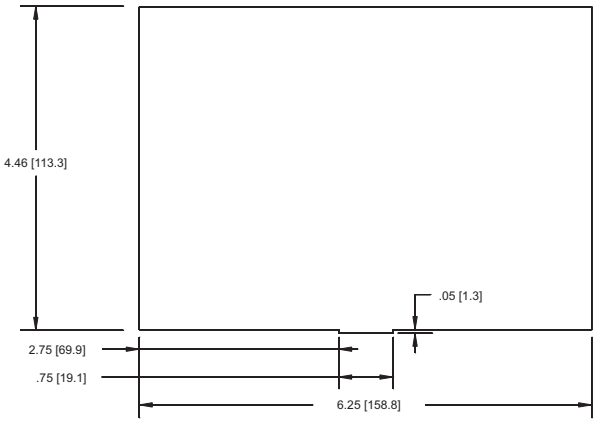


Figure F-4. 500W Series Unit Recommended Panel Cutout Dimensions

Appendix G RESERVED

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Appendix H INTERCONNECT DIAGRAMS

H.1. Drawing List

The following drawings are included in this section:

- Figure H-1. 500W Series Unit System Interface Diagram
- Figure H-2. GNS 530W Typical Installation
- Figure H-3. GPS 500W Typical Installation
- Figure H-4. Power, Lighting, and Antennas Interconnect
- Figure H-5. Gray Code Encoding Altimeter/Blind Encoder Interconnect
- Figure H-6. Not Used
- Figure H-7. Not Used
- Figure H-8. Not Used
- Figure H-9. RS-232 Serial Data Interconnect
- Figure H-10. ARINC 429 EFIS Interconnect
- Figure H-11. ARINC 429 Sandel EHSI Interconnect (One 500W Series Unit, One Sandel SN3308)
- Figure H-12. ARINC 429 Sandel EHSI Interconnect (Two GNS 530W, One Sandel SN3308)
- Figure H-13. Not Used
- Figure H-14. ARINC 429/RS-232 Air Data/IRU/AHRS Interconnect
- Figure H-15. Traffic Advisory System Interconnect
- Figure H-16. GTX 330 Interconnect
- Figure H-17. Weather and Terrain Interconnect
- Figure H-18. Audio Panel Interconnect
- Figure H-19. VOR/ILS Indicator Interconnect
- Figure H-20. RMI/OBI Interconnect
- Figure H-21. King Serial Panel DME Tuning Interconnect
- Figure H-22. King Serial Remote DME Tuning Interconnect
- Figure H-23. Parallel 2 of 5 DME Tuning Interconnect
- Figure H-24. TAWS Interconnect
- Figure H-25. Autopilot Interconnect
- Figure H-26. Not Used
- Figure H-27. Not Used
- Figure H-28. ARINC 429 Sandel EHSI Interconnect (One 500W Series Unit, One Sandel SN3500)
- Figure H-29. External Navigation Source and GPS Annunciators
- Figure H-30. Parallel Slip Code DME Tuning Interconnect
- Figure H-31. Not Used
- Figure H-32. Not Used
- Figure H-33. Switches Interconnect
- Figure H-34. Not Used
- Figure H-35. Not Used
- Figure H-36. Garmin GAD 42 Interconnect
- Figure H-37. Garmin GDU 620 Interconnect
- Figure H-38. HTAWS Annunciator Interconnect – Non-TAWS Units
- Figure H-39. HTAWS Annunciator Interconnect – TAWS Units
- Figure H-40. Mid-Continent HTAWS Annunciator Interconnect – Non-TAWS Units
- Figure H-41. Mid-Continent HTAWS Annunciator Interconnect – TAWS Units

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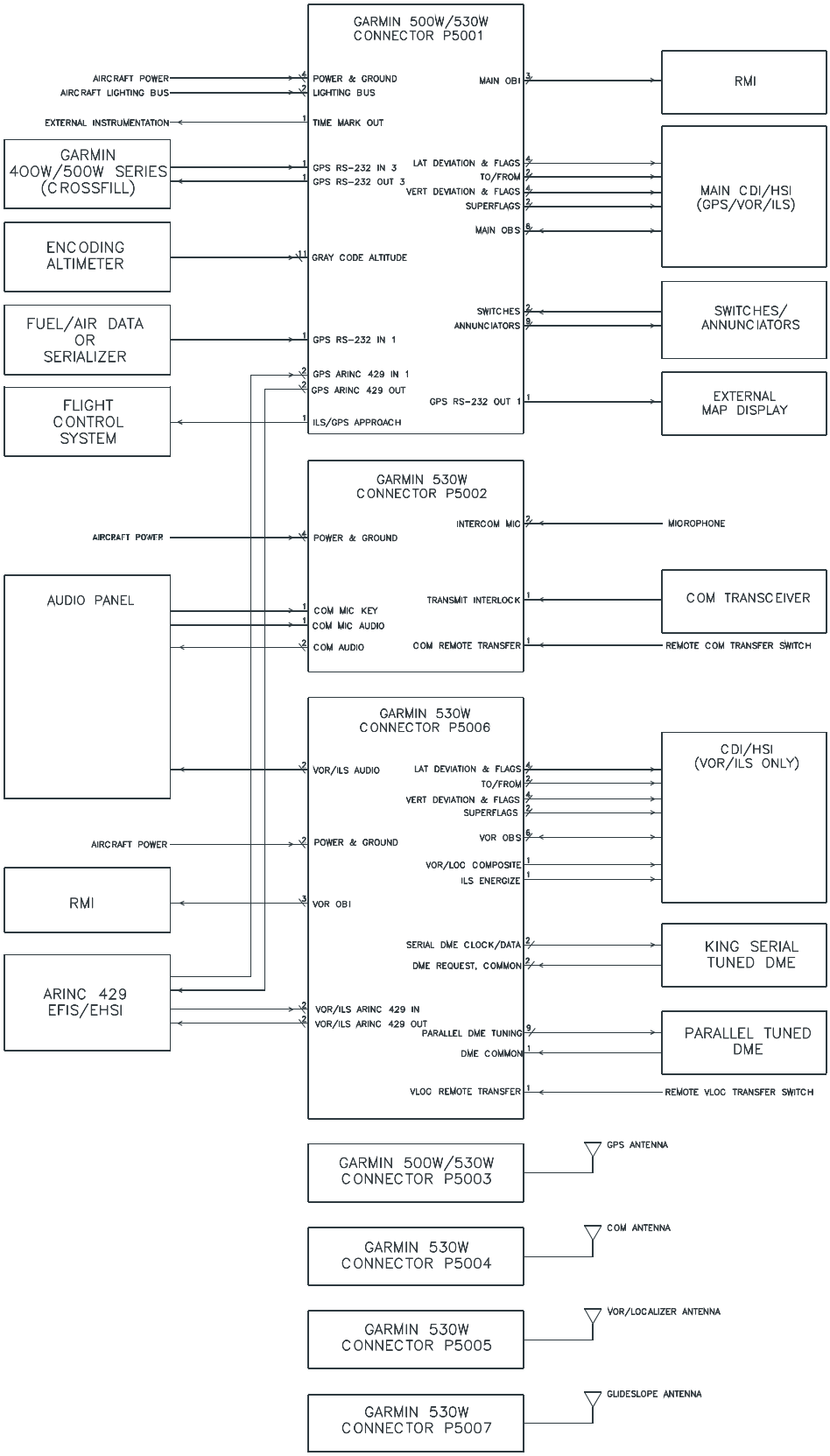


Figure H-1. 500W Series Unit System Interface Diagram

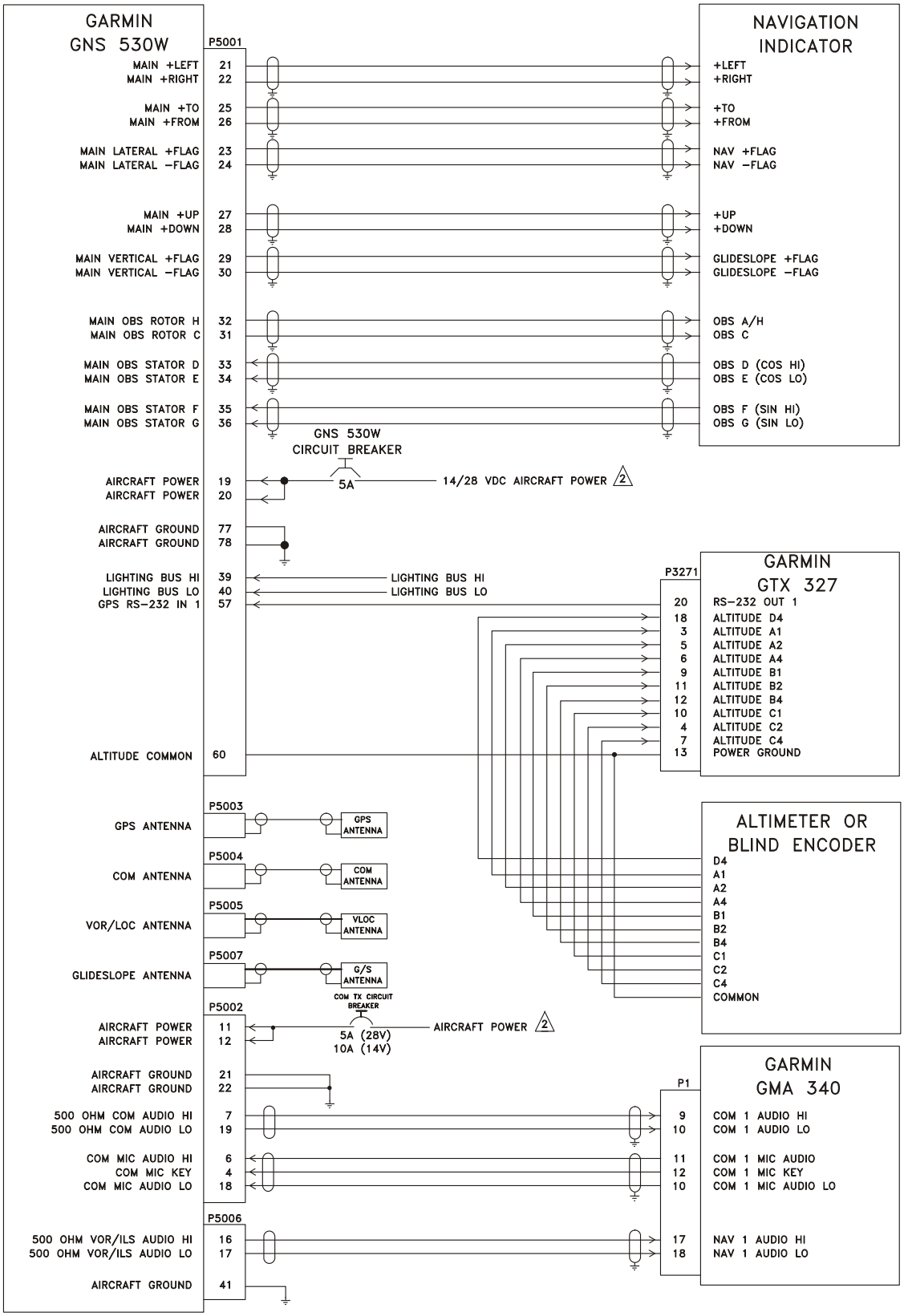


Figure H-2. GNS 530W Typical Installation
Sheet 1 of 2

NOTES:

1. THIS DIAGRAM PROVIDES AN OVERVIEW OF A TYPICAL GNS 530W/(AW) INSTALLATION. REFER TO APPROPRIATE INTERCONNECT DIAGRAMS FOR SPECIFIC EQUIPMENT.

2 AIRCRAFT POWER INPUT TO THE MAIN BOARD (P5001), AND THE GNS 530W VOR/ILS BOARD (P5006) MAY BE 11–33 VDC. THE AIRCRAFT POWER INPUT ON THE COM BOARD (P5002) IS DEPENDENT ON THE PART NUMBER OF THE UNIT:

GNS 530W P/N 011–01064–00, –10, –40, –50 GNS 530W P/N 011–01065–00, –10, –40, –50	14/28 VOLTS DC
GNS 530W P/N 011–01064–45 GNS 530W P/N 011–01065–45	28 VOLTS DC
GNS 530AW P/N 011–01066–00, –10, –40, –50 GNS 530AW P/N 011–01067–00, –10, –40, –50	28 VOLTS DC

Figure H-2. GNS 530W Typical Installation
Sheet 2 of 2

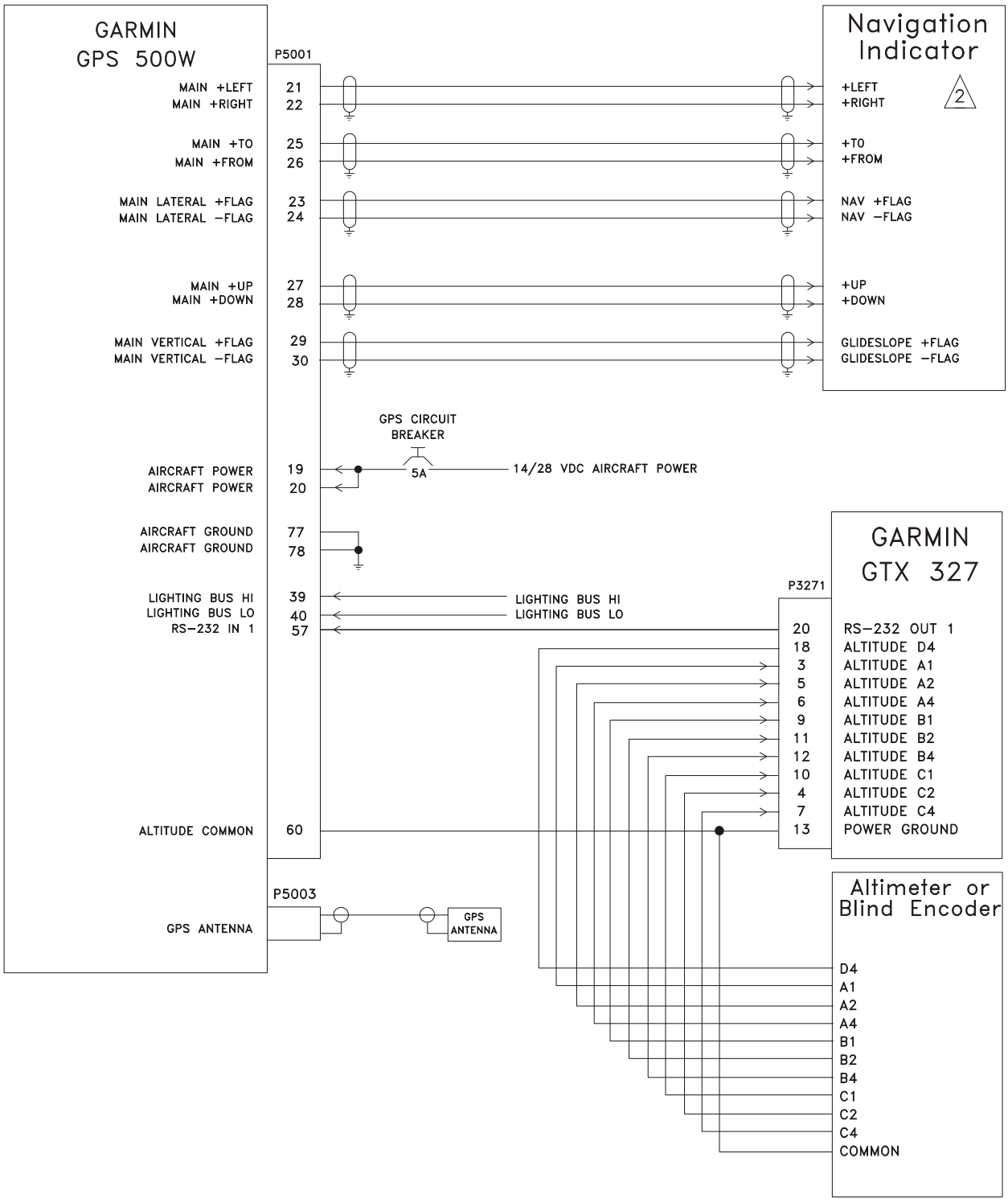


Figure H-3. GPS 500W Typical Installation
Sheet 1 of 2

1. THIS DIAGRAM PROVIDES AN OVERVIEW OF A TYPICAL GPS 500W INSTALLATION. REFER TO THE APPROPRIATE INTERCONNECT DIAGRAMS FOR SPECIFIC EQUIPMENT.

2 IF OBS CONNECTIONS ARE NOT MADE TO THE GPS 500W, THEN ALL OBS COURSE SELECTIONS WILL NEED TO BE MADE USING THE GPS 500W KNOBS. IF AN OBS INTERFACE IS DESIRED, REFER TO THE APPROPRIATE MAIN INDICATOR INTERCONNECT DRAWING.

Figure H-3. GPS 500W Typical Installation
Sheet 2 of 2

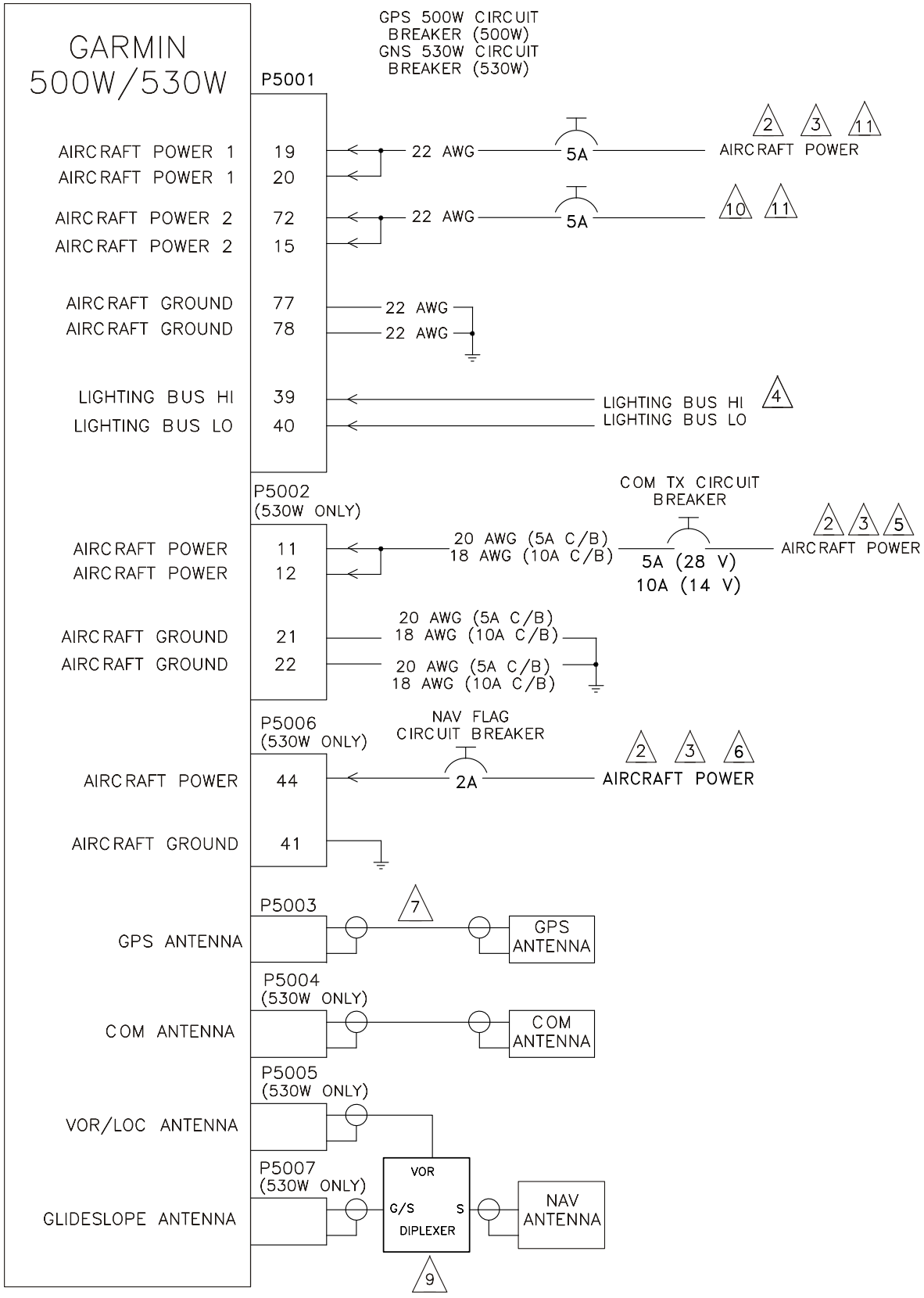


Figure H-4. Power, Lighting, and Antennas Interconnect
Sheet 1 of 3

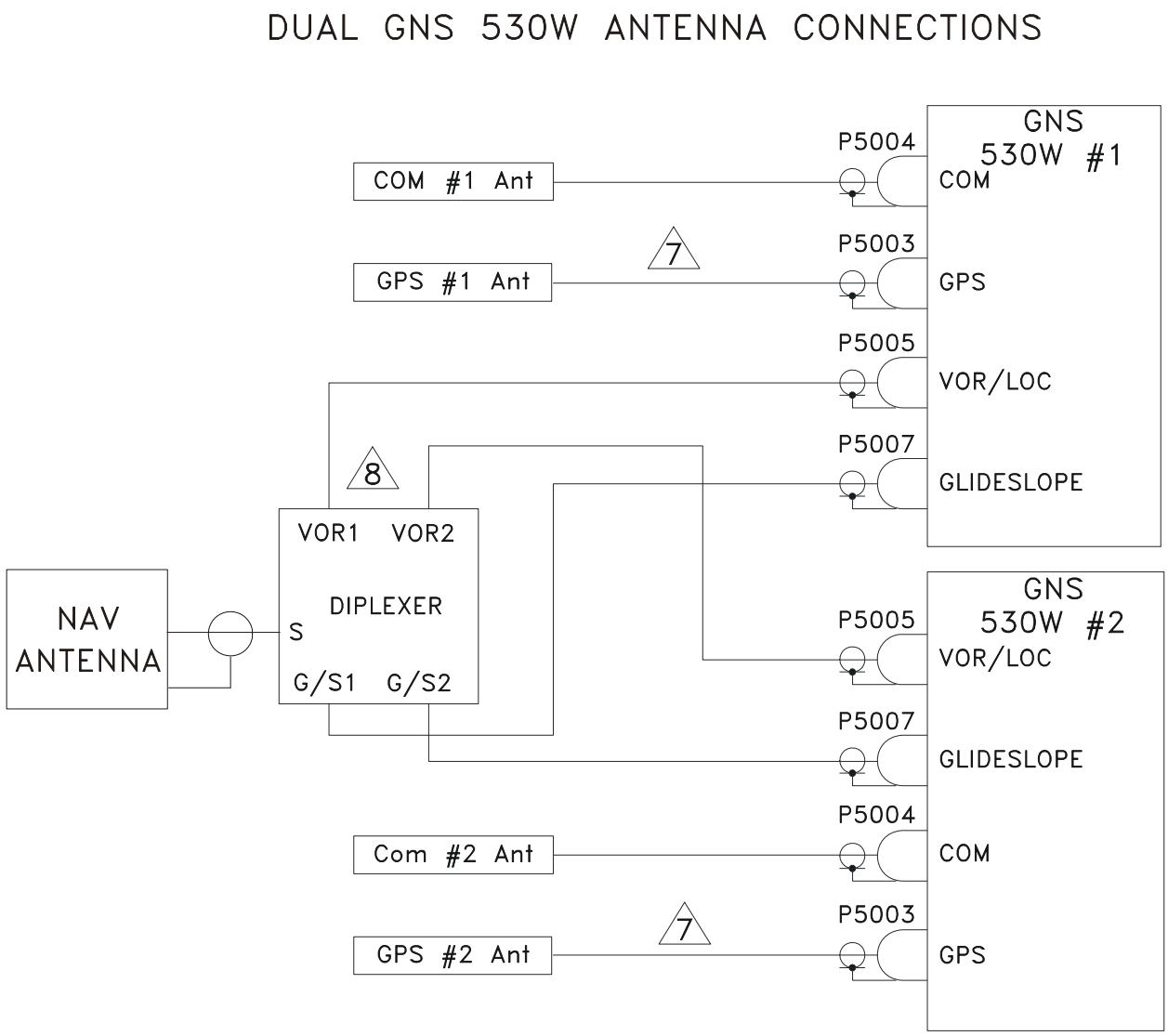


Figure H-4. Power, Lighting, and Antennas Interconnect
Sheet 2 of 3

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED

2. IF THE AIRCRAFT HAS MULTIPLE POWER BUSES, IT IS RECOMMENDED THAT ALL GNS 530W POWER INPUTS BE CONNECTED TO THE SAME POWER BUS.

   THE FOLLOWING TABLE SHOWS WHAT GNS 530W FUNCTIONS DEPEND ON WHICH POWER INPUTS:

P5001	ALL GNS 530W FUNCTIONS DEPEND ON THIS POWER INPUT
P5002	COM TRANSMITTER
P5006	NAV SUPERFLAG, GLIDESLOPE SUPERFLAG

3. AIRCRAFT POWER INPUT TO THE MAIN BOARD (P5001), AND THE GNS 530W VOR/ILS BOARD (P5006) MAY BE 11–33 VDC. THE AIRCRAFT POWER INPUT ON THE COM BOARD (P5002) IS DEPENDENT ON THE PART NUMBER OF THE UNIT:

GNS 530W P/N 011–01064–00, –10, –40, –50 GNS 530W P/N 011–01065–00, –10, –40, –50	14/28 VOLTS DC
GNS 530W P/N 011–01064–45 GNS 530W P/N 011–01065–45 GNS 530AW P/N 011–01066–00, –10, –40, –50 GNS 530AW P/N 011–01067–00, –10, –40, –50	28 VOLTS DC

4. THE 500W SERIES UNIT SHOULD BE CONFIGURED FOR THE CORRECT LIGHTING BUS VOLTAGE (28 VDC, 14 VDC, 5 VDC OR 5 VAC) POST–INSTALLATION. NO DAMAGE WILL OCCUR IF THE UNIT IS CONFIGURED INCORRECTLY. IN ADDITION, LIGHTING CAN BE SET TO AUTOMATICALLY COMPENSATE FOR AMBIENT LIGHTING CONDITIONS USING ITS PHOTOCELL. A MANUAL LIGHTING CONTROL OPTION IS ALSO AVAILABLE. REFER TO THE POST–INSTALLATION CONFIGURATION PROCEDURE.

5. MAXIMUM ALLOWABLE WIRE GAUGE INTO P5002 PINS IS #22 AWG. FOR #18 AWG WIRE USE SPECIAL #18 AWG TERMINATION SOCKET CONTACT (336–00023–00) SUPPLIED WITH CONNECTOR KIT. PROTECT EXPOSED CONDUCTOR ON SPECIAL LARGE TERMINATION CONTACTS WITH 3/8 INCH (1 cm) LENGTH OF SHRINK TUBING SUPPLIED WITH CONNECTOR KIT.

6. THE AIRCRAFT POWER INPUT P5006–44 PROVIDES POWER FOR THE VOR/LOC SUPERFLAG (P5006–15) AND GLIDESLOPE SUPERFLAG (P5006–38) OUTPUTS. NO POWER CONNECTION IS REQUIRED ON P5006–44 IF THESE FLAG OUTPUTS ARE NOT USED.

7. THE GPS ANTENNA COAXIAL CABLE MUST BE DOUBLE OR TRIPLE SHIELDED AND THE LOSS (INCLUDING CONNECTORS) MUST BE GREATER THAN 1.5 dB AND LESS THAN 6.5 dB.

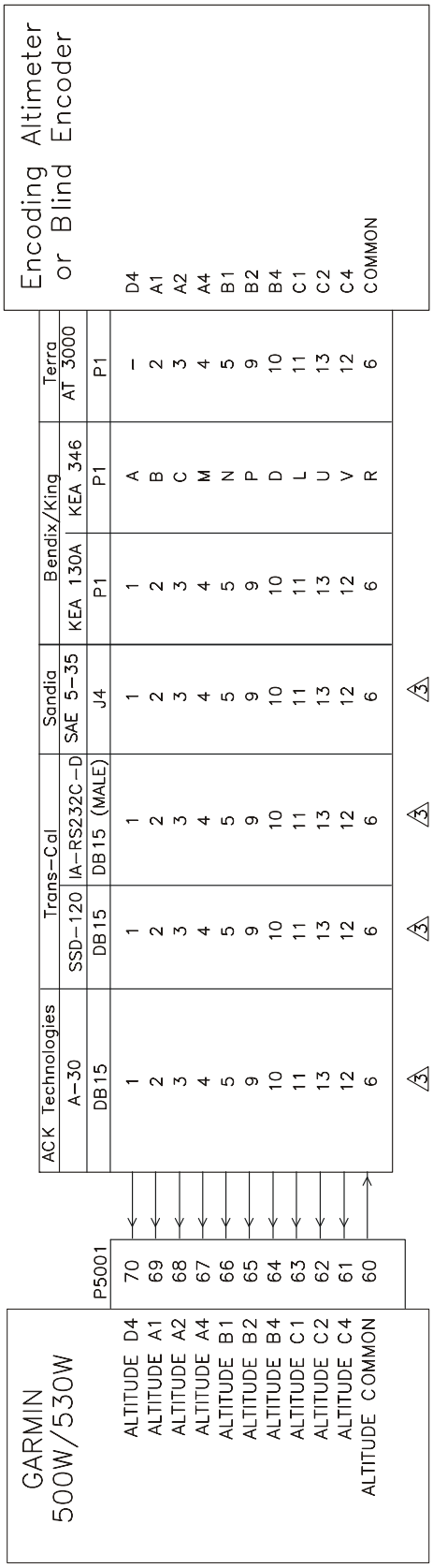
8. COMANT CI1125 DIPLEXER OR EQUIVALENT SHOULD BE USED.

9. COMANT CI507 DIPLEXER OR EQUIVALENT SHOULD BE USED.

10. ACFT PWR 1 IS INTERNALLY DIODE ISOLATED FROM ACFT PWR 2. ONLY ONE POWER INPUT IS REQUIRED FOR NORMAL OPERATION.

11. FOR THE MAIN POWER INPUT, A 14VDC INSTALLATION REQUIRES TWO AIRCRAFT POWER AND TWO AIRCRAFT GROUND CONNECTIONS BE USED FOR EACH MAIN POWER INPUT USED. A 28VDC INSTALLATION REQUIRES A MINIMUM OF ONE EACH POWER AND GROUND CONNECTION, BUT TWO ARE RECOMMENDED.

Figure H-4. Power, Lighting, and Antennas Interconnect
Sheet 3 of 3



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED
2. REFER TO MANUFACTURER S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.
3. THIS ENCODER MAY ALSO BE CONNECTED VIA RS-232.

Figure H-5. Gray Code Encoding Altimeter/Blind Encoder Interconnect

Figure H-6. Not Used
Figure H-7. Not Used
Figure H-8. Not Used

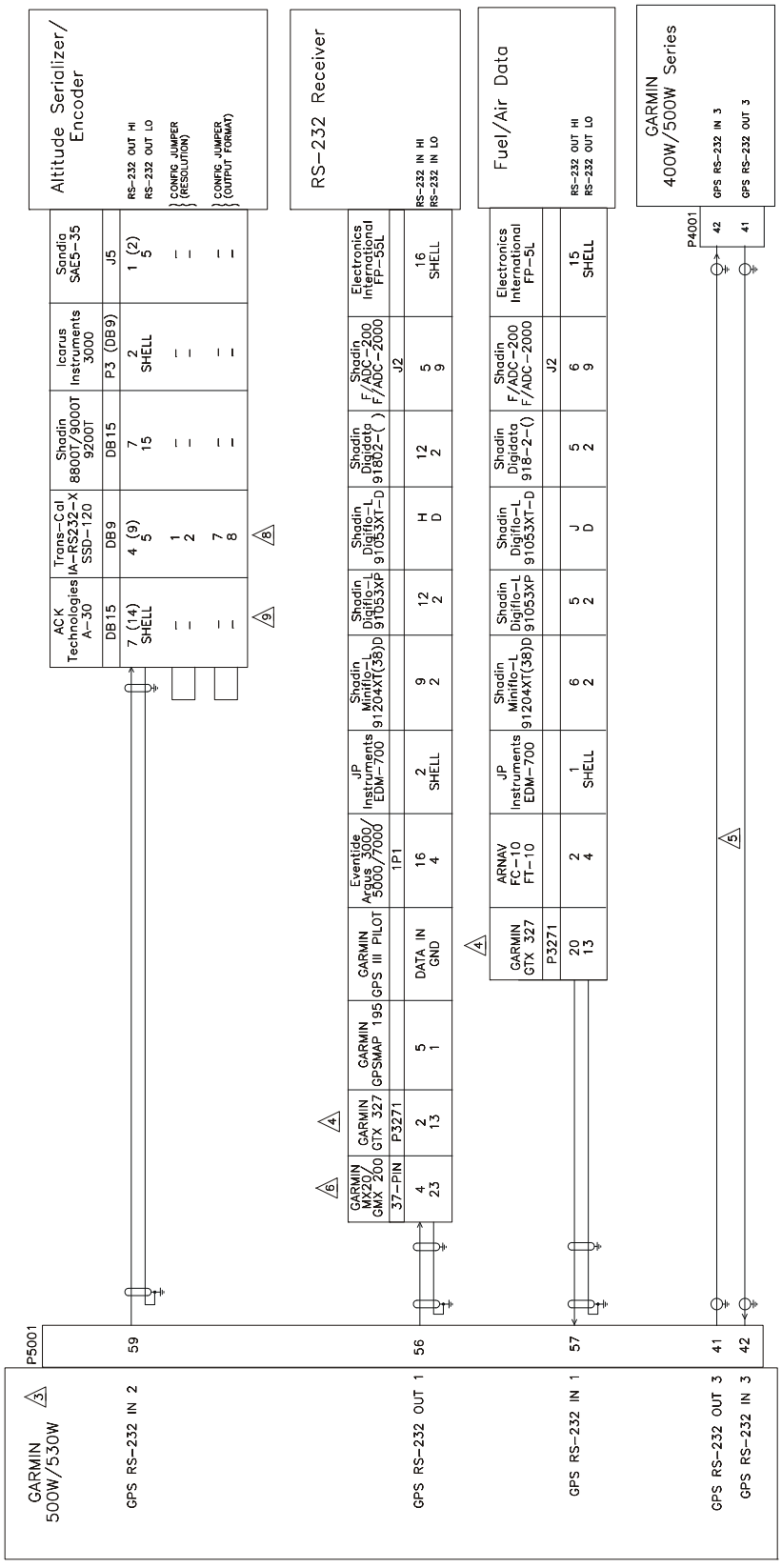


Figure H-9. RS-232 Serial Data Interconnect
Sheet 1 of 2

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED.

2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

△3 REFER TO SECTION 5.3.2 FOR RS-232 CHANNEL SETTINGS. RS-232 PORTS 1 TO 3 ARE SHOWN. ANY AVAILABLE RS-232 PORT MAY BE USED.

△4 REFER TO THE GTX 327 TRANSPONDER INSTALLATION MANUAL, 190-00187-02, FOR COMPLETE INFORMATION.

△5 IF TWO OR MORE 400W/500W SERIES UNITS ARE INSTALLED, THE RS-232 LINES ON P5001-41 AND P5001-42 MAY BE CROSS-CONNECTED TO CROSSFILL FLIGHT PLANS AND USER WAYPOINTS. TO CROSSFILL FLIGHT PLANS, IT REQUIRED THAT BOTH 400W/500W SERIES UNITS HAVE IDENTICAL DATABASE CYCLE DATES AND MAY BE REQUIRED THAT THEY HAVE IDENTICAL VERSIONS OF MAIN SOFTWARE.

△6 MAPMX (MAIN SOFTWARE VERSION 3.10 AND LATER) IS THE PREFERRED COMMUNICATION PROTOCOL FOR THE MX20/GMX200. OTHER INPUT PORTS ON MX20/GMX 200 MAY BE USED INSTEAD OF THE PORT SHOWN. REFER TO APPROPRIATE INSTALLATION MANUAL FOR ADDITIONAL DETAILS.

7. REFER TO MANUFACTURER S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

△8 IF USING THE SERIAL PORT SOFTWARE METHOD TO CONFIGURE THE OUTPUT OF THE ENCODER, ENSURE THAT THE "TRIMBLE/GARMIN 9600 BPS" FORMAT IS SELECTED.

△9 MOD LEVEL 8 (OR HIGHER) IS REQUIRED TO SUPPORT RS-232 INTERFACE. ENSURE THAT JUMPERS ARE SET FOR "TRIMBLE/GARMIN 9600 BPS" AND "10 FOOT RESOLUTION".

Figure H-9. RS-232 Serial Data Interconnect
Sheet 2 of 2

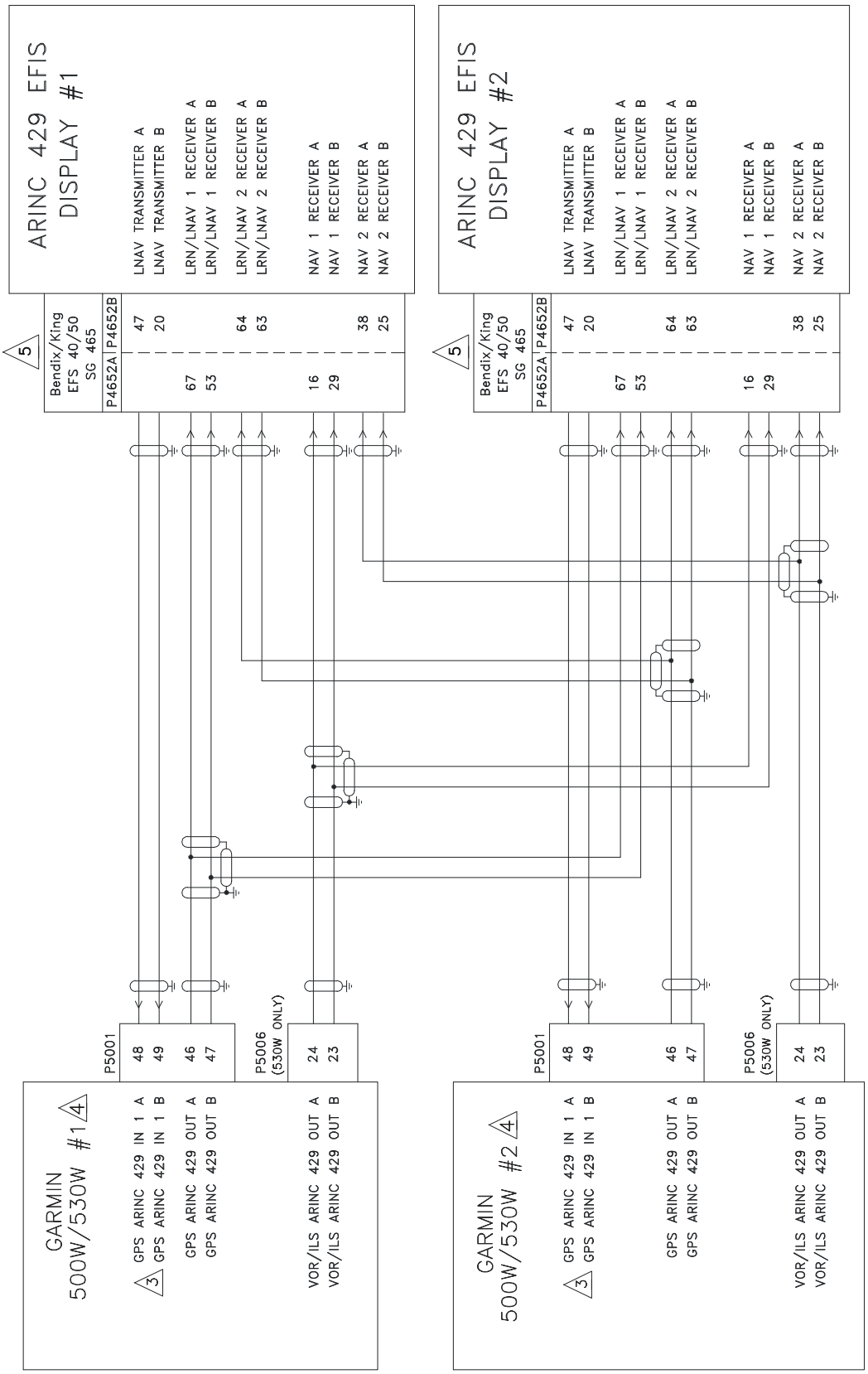


Figure H-10. ARINC 429 EFIS Interconnect
Sheet 1 of 2

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED

2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD–EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

3 (in triangle): IF THE GPS ARINC 429 IN 1 PORT (P5001–48 AND –49) IS ALREADY USED FOR ANOTHER PURPOSE, THE GPS ARINC 429 IN 2 PORT (P5001–50 AND –51) MAY BE CONNECTED INSTEAD.

4 (in triangle): 500w/530W #1 SETUP ITEMS:

MAIN ARINC 429 CONFIG:	IN 1:	LOW, EFIS/AIRDATA*
	OUT:	LOW, GAMA 429 BENDIX KING
	SDI:	LNAV 1
	VNAV:	ENABLE LABELS
MAIN CDI/OBS CONFIG:	PRESS MENU: SELECT "IGNORE CDI KEY?"	
VOR/LOC/GS ARINC 429 CONFIG:	SPEED RX: LOW TX: LOW	
	SDI:	VOR/ILS 1

500W/530W #2 SETUP ITEMS:

MAIN ARINC 429 CONFIG:	IN 1:	LOW, EFIS/AIRDATA*
	OUT:	LOW, GAMA 429 BENDIX KING
	SDI:	LNAV 2
	VNAV:	ENABLE LABELS
MAIN CDI/OBS CONFIG:	PRESS MENU: SELECT "IGNORE CDI KEY?"	

*FOR EFS 40/50 SOFTWARE VERSION 1201 OR LATER. FOR EARLIER SOFTWARE VERSIONS, USE "EFIS" SETTING.

5 (in triangle): VOR/LOC/GS ARINC 429 CONFIG: SPEED RX: LOW TX: LOW
SDI: VOR/ILS 2

SG 465 SOFTWARE 1101 (OR LATER) IS REQUIRED FOR PROPER OPERATION WITH THE GNS 400W SERIES UNIT.

6.

FMS #1/#2 CONFIGURATION:	5: KLN 90–GPS*
FMS VNAV CONFIGURATION:	2: FEET OR ANGLE
VARIABLE LNAV CONFIGURATION:	LNAV 1/2: VAR

*KLN 90–GPS SETTING **MUST** BE USED IN ORDER FOR VERTICAL GPS DEVIATION TO BE DISPLAYED CORRECTLY.

7. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

A 400W SERIES UNIT MAY BE USED IN PLACE OF EITHER #1 OR #2 500W SERIES UNIT. SEE THE 400W INSTALLATION MANUAL.

Figure H-10. ARINC 429 EFIS Interconnect
Sheet 2 of 2

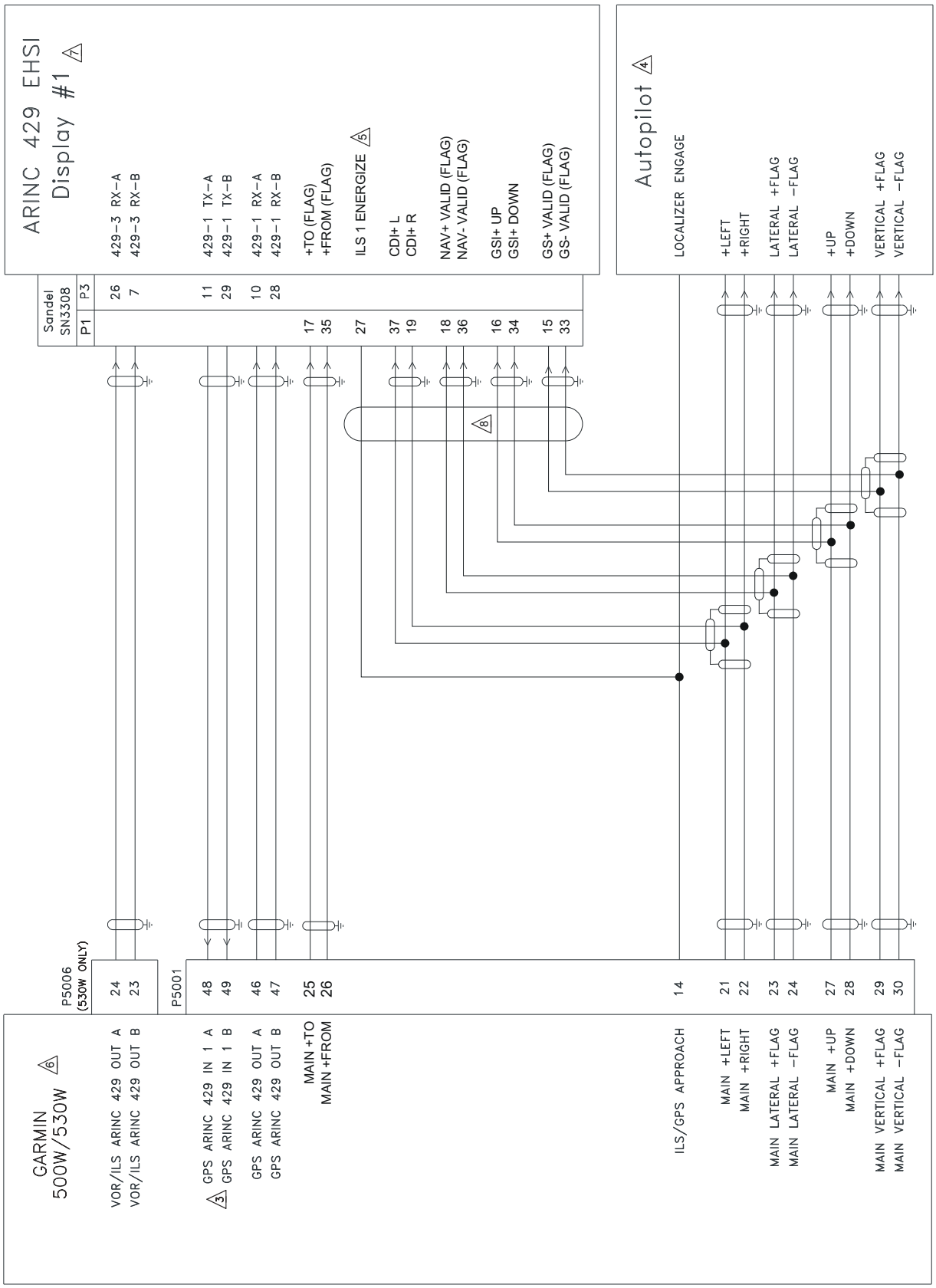


Figure H-11. ARINC 429 Sandel EHSI Interconnect (One 500W Series Unit, One Sandel SN3308)
Sheet 1 of 2

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED

2. AT GNS 400W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

△3 IF THE GPS ARINC 429 IN 1 PORT (P5001-48 AND -49) IS ALREADY USED FOR ANOTHER PURPOSE, THE GPS ARINC 429 IN 2 PORT (P5001-50 AND -51) MAY BE CONNECTED INSTEAD.

△4 AUTOPILOT SHOWN FOR REFERENCE ONLY. REFER TO THE APPROPRIATE INTERCONNECT DIAGRAM.

△5 USE ILS ENERGIZE 2 (P1-8) IF GNS 500W SERIES UNIT IS BEING CONNECTED AS GPS2/NAV2.

△6 GNS 530W SETUP ITEMS:

MAIN ARINC 429 CONFIG:	IN 1:	LOW, SANDEL EHSI
	OUT:	LOW, GAMA 429 GRPH W/INT
	SDI:	LNAV 1
	VNAV:	DISABLE LABELS
VOR/LOC/GS ARINC 429 CONFIG:	SPEED RX:	LOW TX: LOW
	SDI:	VOR/ILS 1

△7 SANDEL SN3308 SETUP ITEMS:

LNAV1/2 SELECT: GNS 430 (ARINC)	ANNUN:	SERIAL	RELAY SENSE:	NAV-2:	OFF
	COURSE:	OBS/LEG		GPS-1:	OFF
	DEVIATION:	ANALOG/IN		GPS-2:	OFF
	OBS ROT:	NORMAL		CDI SRC SEL:	OFF
	OBS CAL:	000.0		RCVR 1/2:	OFF
NAV CHANGE: NAV 1/2 ENABLE:	YES				
PORT:	429 PORT-3*				

* NAV 1/2 MUST TEMPORARILY BE SET TO "ANALOG" AND "ILS" MUST BE SET TO "VALID LOW" FOR PROPER OPERATION OF THE VDI.

△8 ANALOG CONNECTIONS TO THE SN3308 ARE REQUIRED TO ALLOW VERTICAL GUIDANCE TO BE DISPLAYED FOR GPS APPROACHES.

9. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION.

Figure H-11. ARINC 429 Sandel EHSI Interconnect (One 500W Series Unit, One Sandel SN3308)
Sheet 2 of 2

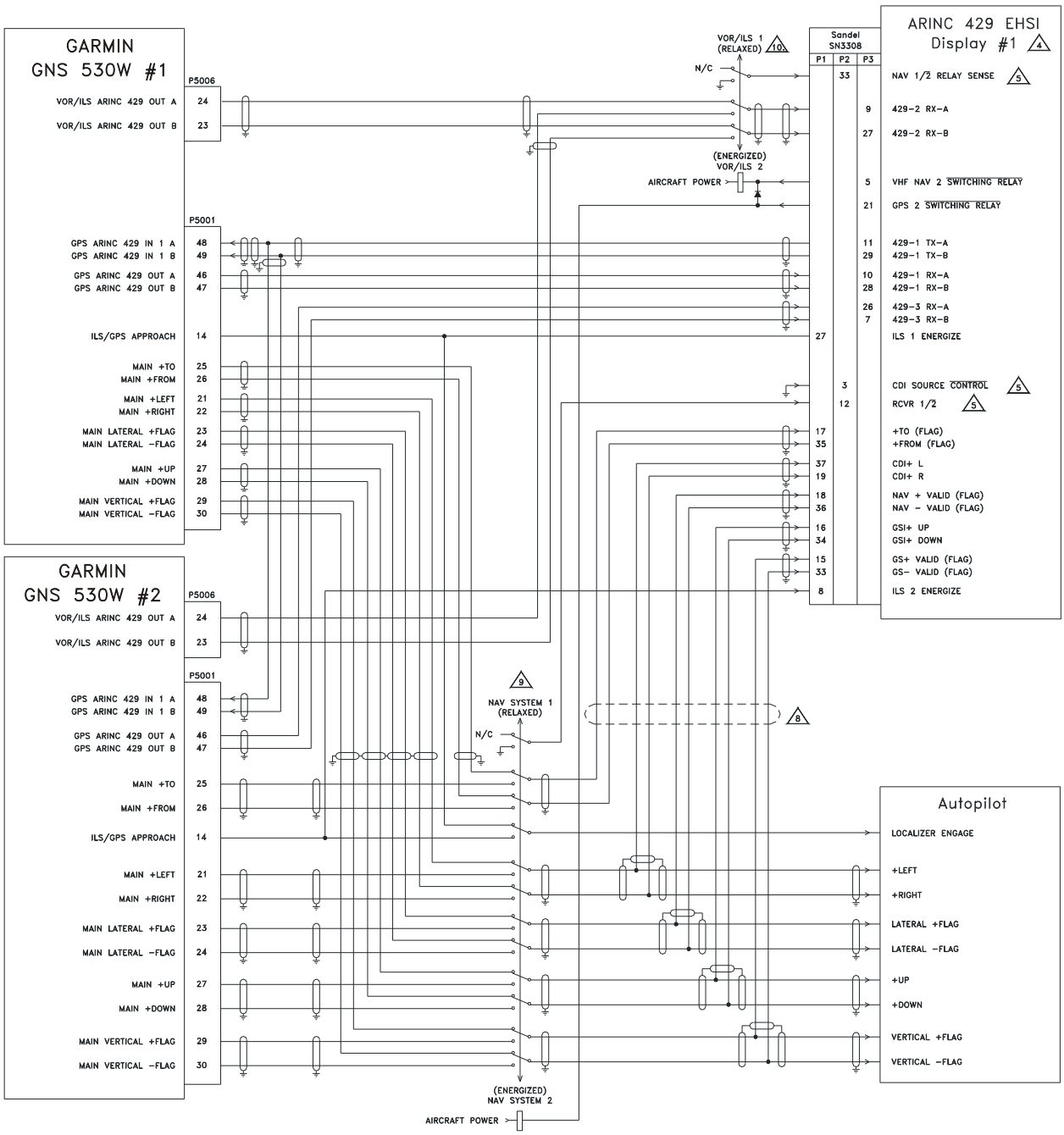


Figure H-12. ARINC 429 Sandel EHSI Interconnect (Two GNS 530W, One Sandel SN3308)
Sheet 1 of 2

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED.

2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

3. GNS 530W #1 SETUP ITEMS:
   MAIN ARINC 429 CONFIG: IN 1: LOW, SANDEL EHSI; OUT: LOW, GAMA 429 GRPH W/INT; SDI: LNAV 1; VNAV: DISABLE LABELS

   VOR/LOC/GS ARINC 429 CONFIG: SPEED RX: LOW TX: LOW; SDI: VOR/ILS 1

   GNS 530W #2 SETUP ITEMS:
   MAIN ARINC 429 CONFIG: IN 1: LOW, SANDEL EHSI; OUT: LOW, GAMA 429 GRPH W/INT; SDI: LNAV 2; VNAV: DISABLE LABELS

   VOR/LOC/GS ARINC 429 CONFIG: SPEED RX: LOW TX: LOW; SDI: VOR/ILS 2

4. SANDEL SN3308 #1 AND #2 SETUP ITEMS:
   LNAV 1/2 SELECT: GNS 530 (ARINC)
   NAV CHANGE: NAV-1 ENABLE: YES; PORT: 429 PORT-2*; NAV-2 ENABLE: YES; PORT: 429 PORT-2*
   LNAV 1/2 CHANGE: ANNUN: SERIAL; COURSE: OBS/LEG; DEVIATION: ANALOG IN; OBS ROT: NORMAL; OBS CAL: 000.0
   RELAY SENSE: NAV-2: P2-33; GPS-1: OFF; GPS-2: OFF; CDI SRC SEL: P2-3; RCVR 1/2: P2-12

   * NAV 1/2 MUST TEMPORARILY BE SET TO "ANALOG" AND ILS MUST BE SET TO "VALID LOW" FOR PROPER OPERATION OF THE VDI.

5. THESE PINS ON THE SANDEL SN3308 ARE CONFIGURABLE AND CAN BE CHANGED TO SUIT THE PARTICULAR INSTALLATION.

6. AUTOPILOT SHOWN FOR REFERENCE ONLY. REFER TO APPROPRIATE AUTOPILOT INTERCONNECT DIAGRAM.

7. IF IT DESIRED TO USE THE NAV RECEIVERS AS A SOURCE FOR THE SN3308 BEARING POINTERS, IT IS RECOMMENDED THAT THE GNS 530W #1/#2 COMPOSITE OUTPUTS (P5006-8) BE CONNECTED TO THE SN3308 COMPOSITE INPUTS (P1-29 AND P1-10, #1 AND #2 RESPECTIVELY) AND THE SN3308 BRG NAV-1/NAV-2 BE SET TO "429+COMP".

8. ANALOG CONNECTIONS TO THE SN3308 ARE REQUIRED TO ALLOW VERTICAL GUIDANCE TO BE DISPLAYED FOR GPS APPROACHES.

9. USE RELAY AMERI-KING P/N AK-950-R12-()V OR EQUIVALENT.

10. USE RELAY LEACH P/N WN460-( ) ( ) ( ) OR EQUIVALENT.

11. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION.

12. A 400W SERIES UNIT MAY BE USED IN PLACE OF EITHER #1 OR #2 500W SERIES UNIT. SEE THE 400W INSTALLATION MANUAL.

Figure H-12. ARINC 429 Sandel EHSI Interconnect (Two GNS 530W, One Sandel SN3308)
Sheet 2 of 2

Figure H-13. Not Used

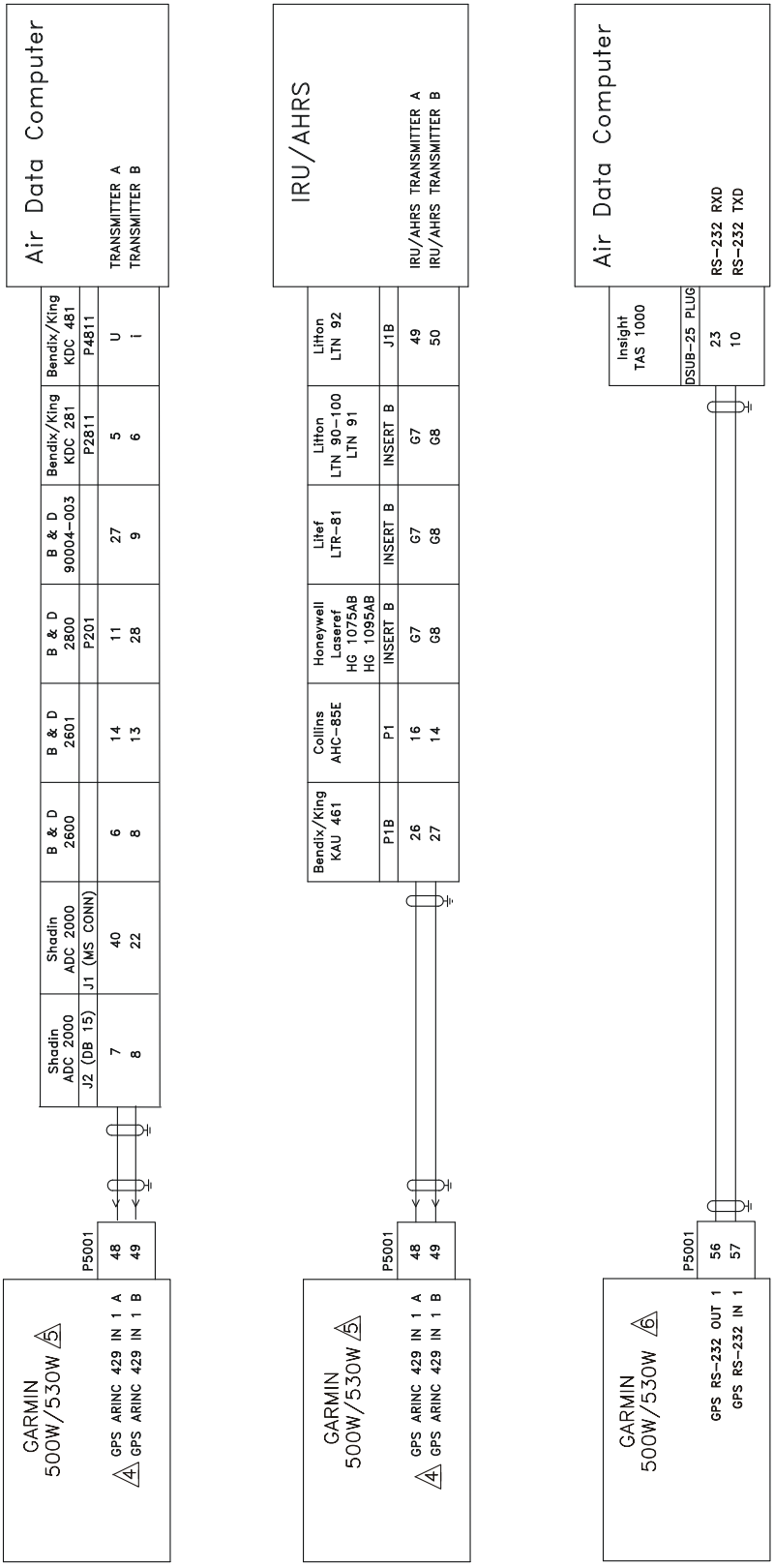


Figure H-14. ARINC 429/RS-232 Air Data/IRU/AHRS Interconnect
Sheet 1 of 2

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED.

2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD–EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

3. LOWER CASE PIN DESIGNATORS ARE SHOWN AS UNDERLINED UPPER CASE LETTERS.

△4 IF THE GPS ARINC 429 IN 1 PORT (P5001–48 AND –49) IS ALREADY USED FOR ANOTHER PURPOSE, THE GPS ARINC 429 IN 2 PORT (P5001–50 AND –51) MAY BE CONNECTED INSTEAD.

△5 REFER TO SECTION 5.3.1 FOR ARINC 429 CHANNEL SETTINGS.

△6 REFER TO SECTION 5.3.2 FOR RS–232 CHANNEL SETTINGS.

7. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

Figure H-14. ARINC 429/RS-232 Air Data/IRU/AHRS Interconnect
Sheet 2 of 2

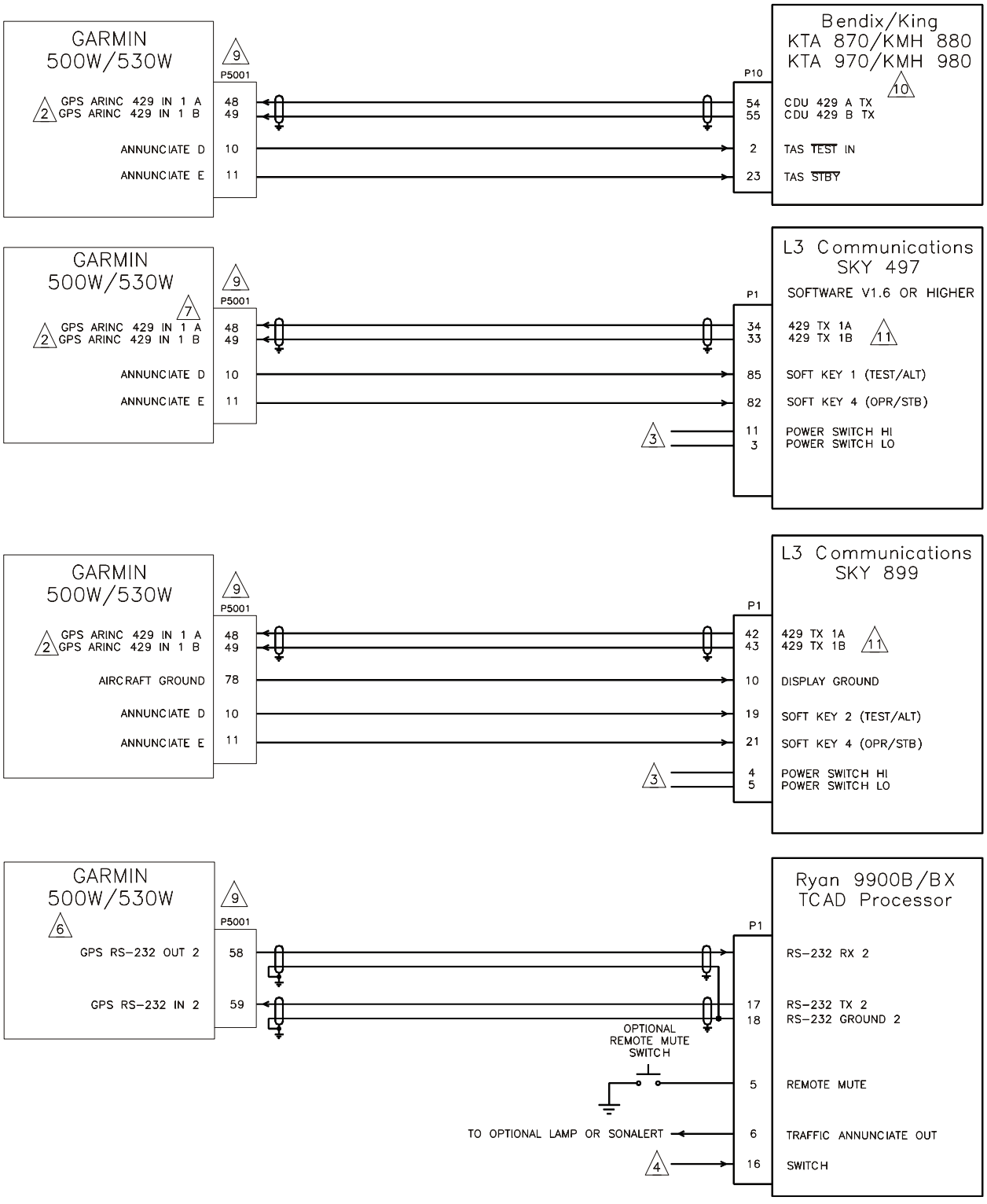
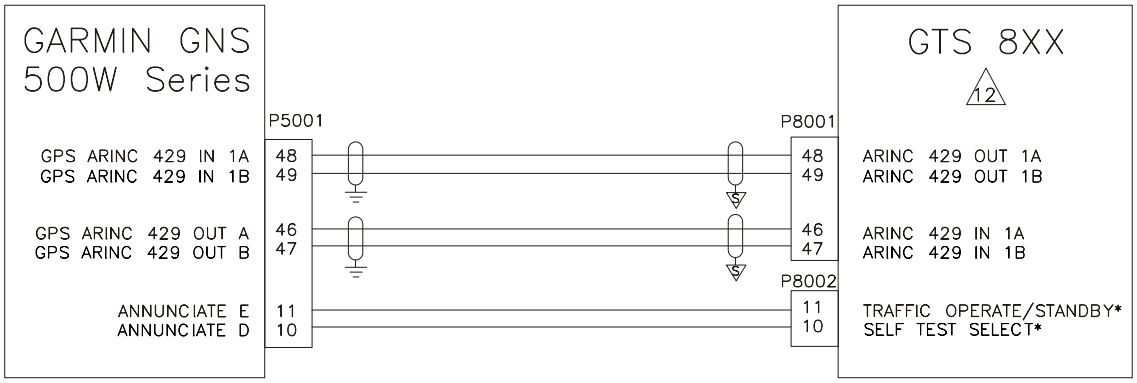


Figure H-15. Traffic Advisory System Interconnect
Sheet 1 of 2



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED

2. IF THE GPS ARINC 429 IN 1 PORT (P4001−48 AND −49) IS ALREADY USED FOR ANOTHER PURPOSE, THE GPS ARINC 429 IN 2 PORT (P4001−50 AND −51) MAY BE CONNECTED INSTEAD.

3. THE SKYWATCH POWER SWITCH PINS, SHOWN ON P1, SHOULD BE CONNECTED TOGETHER TO TURN THE PROCESSOR UNIT ON, AND OPEN TO TURN THIS UNIT OFF. IF A SKYWATCH CONTROL/DISPLAY UNIT IS NOT IN THE INSTALLATION, A DEDICATED SWITCH MAY BE REQUIRED TO TURN THE SKYWATCH PROCESSOR UNIT ON OR OFF.

4. THE RYAN TCAD PROCESSOR SWITCH PIN (P1−16) SHOULD BE GROUNDED TO TURN THE PROCESSOR UNIT ON, AND OPEN TO TURN THIS UNIT OFF. IF A RYAN TCAD DISPLAY UNIT IS NOT IN THE INSTALLATION, A DEDICATED SWITCH MAY BE REQUIRED TO TURN THE TCAD PROCESSOR UNIT ON AND OFF.

5. IF ANY OF THESE TRAFFIC SYSTEMS ARE INSTALLED WITHOUT A CONTROL/DISPLAY UNIT, A PLACARD IS REQUIRED NEAR THE 500W SERIES UNIT, INDICATING THAT A TRAFFIC ADVISORY SYSTEM IS INSTALLED, AND ITS DATA MAY BE DISPLAYED ON THE 500W SERIES UNIT.

6. IN ORDER FOR RYAN TCAD TRAFFIC TO BE DISPLAYED ON THE 400W SERIES UNITS MAP PAGE, THE 500W SERIES MUST HAVE A DIGITAL HEADING SOURCE.

7. IN ORDER FOR SKYWATCH DATA TO BE DISPLAYED ON THE 500W SERIES UNIT S MAP PAGE, THE 500W SERIES UNIT MUST HAVE A DIGITAL HEADING SOURCE, OR THE SKYWATCH MUST HAVE A SYNCHRO OR SERIAL HEADING SOURCE. A STEPPER HEADING SOURCE WILL NOT ALLOW SKYWATCH DATA TO BE DISPLAYED ON THE MAP PAGE.

8. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD−EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE − THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

9. REFER TO SECTION 5.3.1 FOR ARINC 429 CHANNEL SETTINGS AND 5.3.2 FOR RS−232 SETTINGS. IF AN ARINC 429 TRAFFIC SOURCE IS USED, THE CORRESPONDING ARINC 429 INPUT MUST BE SET TO HIGH SPEED.

10. KTA 870/KMH 880/KTA 970/KMH 980 SYSTEMS MUST HAVE TRAFFIC CONFIGURED FOR "CONTROLLER TYPE: DISCRETE" AND "DISPLAY VALID: IGNORE". 500W SERIES MAIN SOFTWARE VERSION 3.00 OR LATER IS REQUIRED FOR OPERATION WITH KTA 970/KMH 980.

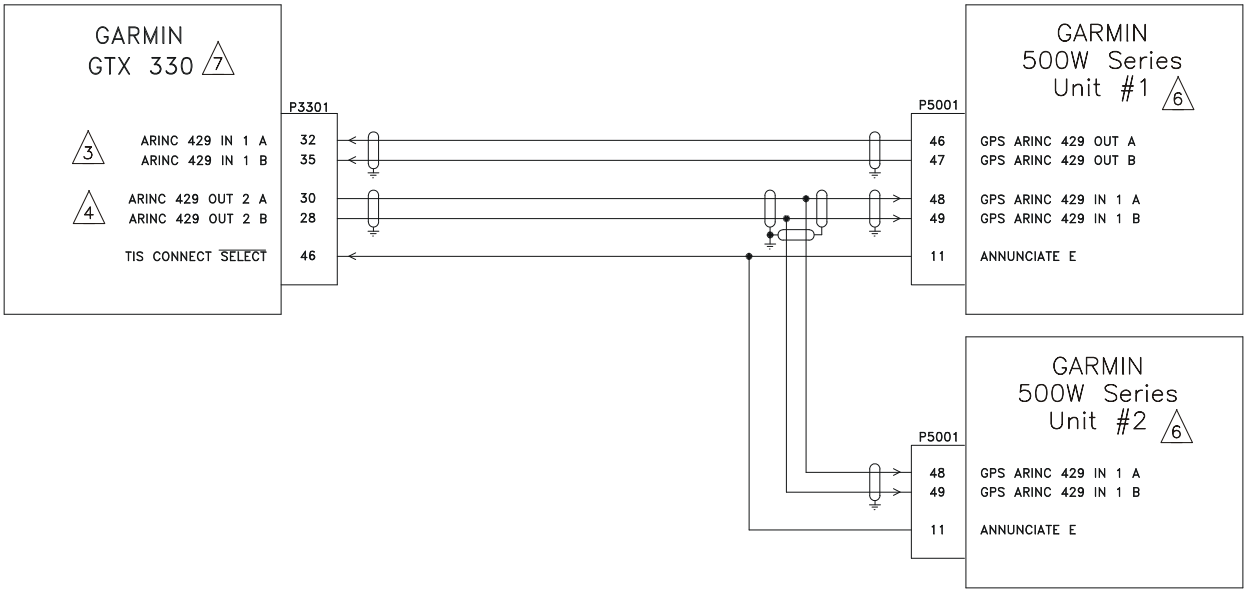
11. SKYWATCH MUST BE CONFIGURED FOR AN ARINC 735 TYPE 1 DISPLAY.

12. FOR GTX 8XX CONFIGURATION SETTINGS, SEE THE GTS 8XX INSTALLATION MANUAL.

13. GROUND DESIGNATIONS: ⏚ SHIELD BLOCK GROUND ⏚ AIRFRAME GROUND

14. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

Figure H-15. Traffic Advisory System Interconnect
Sheet 2 of 2



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED.

2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD–EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

3. ARINC 429 IN 1 (P3301–32 AND –35) INPUT ALLOWS AUTOMATED START AND STOP OF FLIGHT TIMER AND PLACES THE TRANSPONDER IN GROUND (GND) MODE UPON LANDING.

4. IF EXTERNAL STBY SELECT IS CONNECTED IN THIS INSTALLATION USE GTX 330 ARINC 429 OUT 1 A AND 1 B, (PINS 37 AND 34) RATHER THAN ARINC 429 OUT 2 A AND 2 B (PINS 30 AND 28) SHOWN. ALTITUDE DATA WILL NOT BE TRANSMITTED OVER ARINC 429 PORT 2 TO THE 500W SERIES UNIT WHEN EXTERNAL STBY SELECT IS GROUNDED.

5. WHEN TIS IS USED IN THE AIRCRAFT DO NOT CONNECT ANOTHER TRAFFIC SYSTEM TO THE SAME 500W SERIES UNIT.

6. GNS 500W SERIES SETUP ITEMS:
   MAIN ARINC 429 CONFIG: IN 1: HIGH, GARMIN GTX 330
   OUT: SET TO MATCH INSTALLATION

7. GTX 330 SETUP ITEMS:
   429 INPUT CHANNEL 1: GPS (SPEED SET TO MATCH GNS 500W #1 OUTPUT)
   429 OUTPUT CHANNEL 2: GARMIN W/TIS

8. A 400W SERIES UNIT MAY BE USED IN PLACE OF EITHER #1 OR #2 500W SERIES UNIT. SEE THE 400W INSTALLATION MANUAL.

Figure H-16. GTX 330 Interconnect

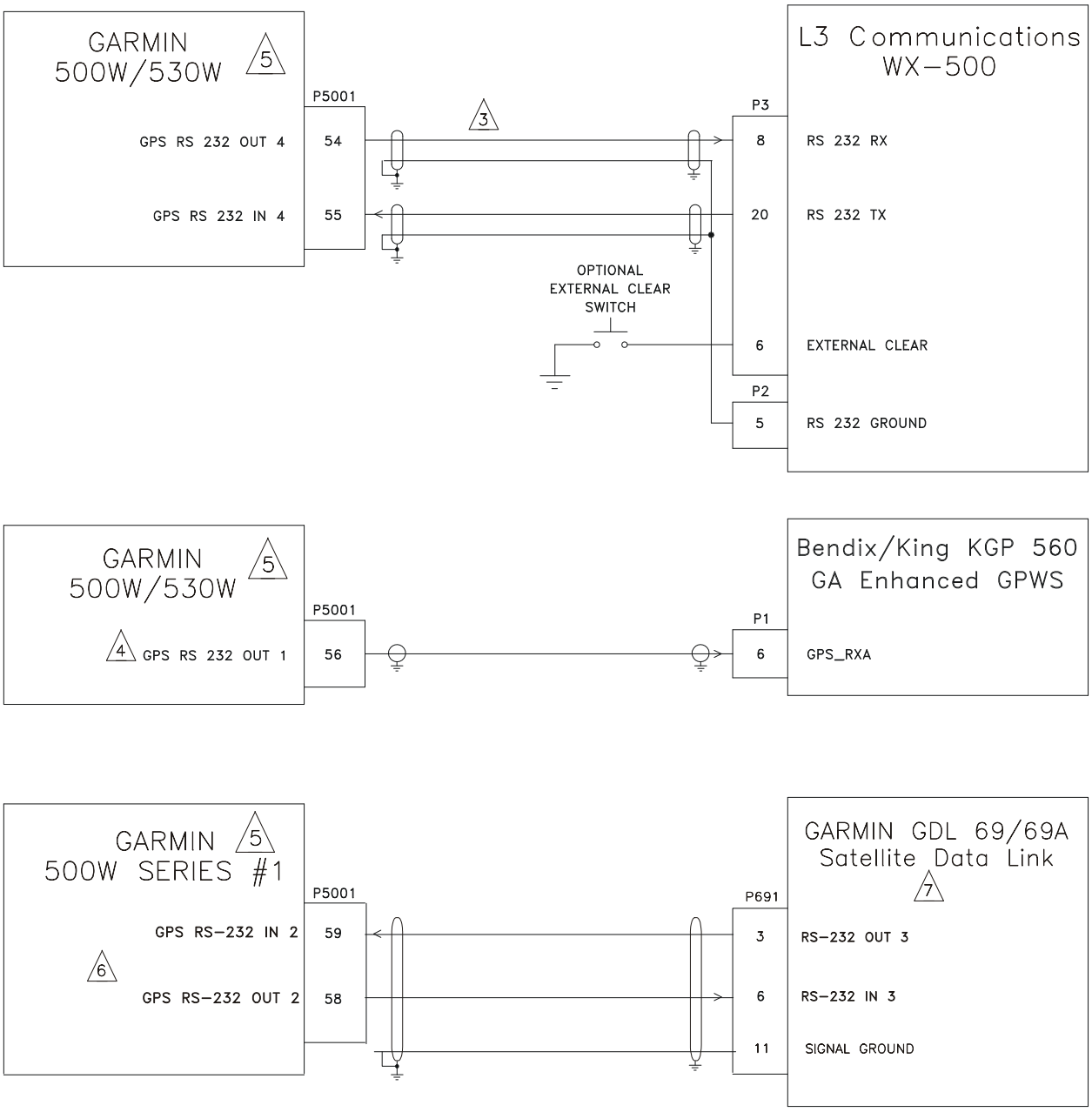


Figure H-17. Weather and Terrain Interconnect
Sheet 1 of 2

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED
2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
3. IN ORDER FOR WX-500 DATA TO BE DISPLAYED ON THE 500W SERIES UNITS MAP PAGE. THE 500W SERIES UNIT MUST HAVE A DIGITAL HEADING SOURCE, OR THE WX-500 MUST HAVE A SYNCHRO OR SERIAL HEADING SOURCE. A STEPPER HEADING SOURCE WILL NOT ALLOW WX-500 DATA TO BE DISPLAYED ON THE MAP PAGE.
4. IF AN RS-232 OUTPUT PORT IS CONFIGURED FOR THE HONEYWELL EGPWS, THE CORRESPONDING RS-232 INPUT OF THE SAME PORT MAY NOT BE USED.
5. REFER TO SECTION 5.3.2 FOR RS-232 CHANNEL SETTINGS.
6. CONNECTION TO RS-232 PORT #2 OF THE 500W SERIES UNIT IS SHOWN. IF PORT #2 IS ALREADY IN USE, ANY OTHER AVAILABLE RS-232 PORT MAY BE USED AS WELL.
7. CONNECTION TO RS-232 PORT #2 OF THE GDL 69/69A MAY BE USED AS WELL.
8. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUT OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

Figure H-17. Weather and Terrain Interconnect
Sheet 2 of 2

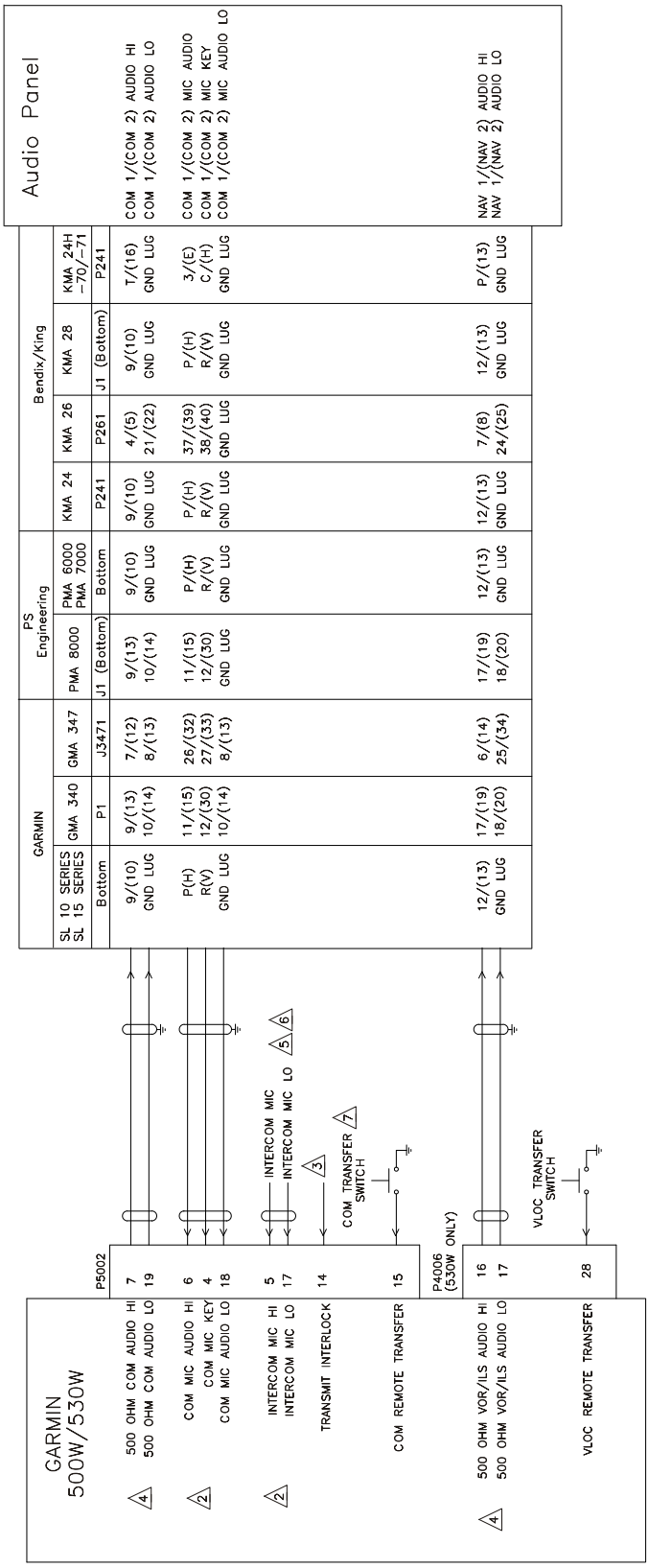


Figure H-18. Audio Panel Interconnect
Sheet 1 of 2

NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED

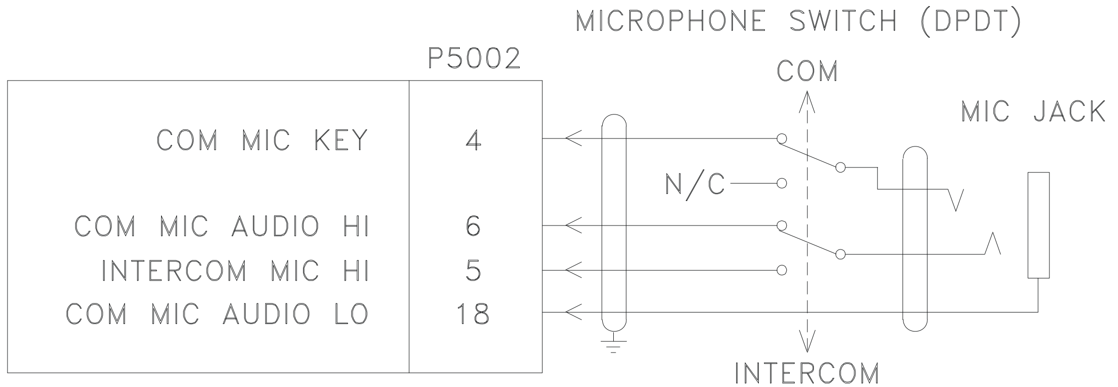
2. CONNECTING TWO MICROPHONES TO MIC AUDIO HI/LO OR INTERCOM MIC HI/LO AT THE SAME TIME MAY RESULT IN WEAK OR DISTORTED AUDIO. MIC ISOLATION RELAYS ARE RECOMMENDED SO THAT ONLY ONE MIC IS ACTIVE AT A TIME.

3. CONNECT TRANSMIT INTERLOCK (P5002-14) TO THE OTHER TRANSCEIVERS MIC KEY TO MINIMIZE SQUELCH BREAKS ON THE GNS 530W COM.

4. THE 500 OHM AUDIO OUTPUTS ARE BALANCED OUTPUTS AND THE LO OUTPUTS MUST BE CONNECTED. IF THE AUDIO PANEL DOES NOT HAVE A LO INPUT, IT SHOULD BE CONNECTED TO A GROUND LUG AT THE AUDIO PANEL.

5. THE GNS 530W INTERCOM FUNCTION SHOULD ONLY BE USED IF THERE IS NO OTHER INTERCOM SYSTEM IN THE AIRCRAFT.

6. INTERCOM WIRING OPTION:

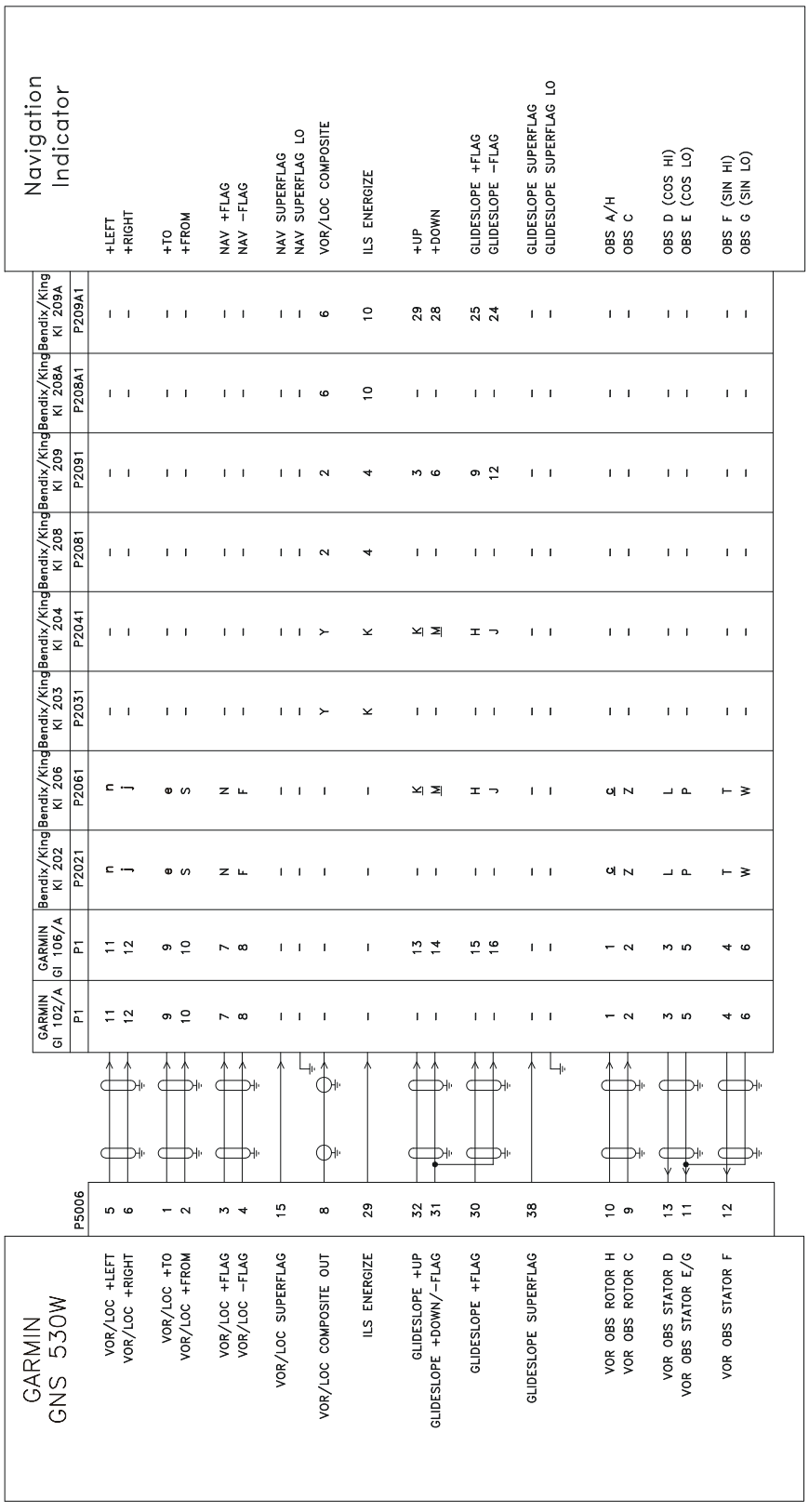


7. THE COM REMOTE TRANSFER INPUT (P5002-15) MAY BE USED FOR EMERGENCY OPERATION OF THE COM TRANSMITTER. IF THE REMOTE TRANSFER SWITCH IS ACTIVE FOR TWO SECONDS, THE ACTIVE COM FREQUENCY WILL CHANGE TO 121.50 MHZ.

8. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

9. SHIELDS FOR AUDIO CABLES SHOULD BE GROUNDED AT ONE END (WITH LEADS LESS THAN 3.0 INCHES) AND LEFT FLOATING AT THE OTHER END. IF SHIELDED AUDIO CABLE IS CARRIED THROUGH DISCONNECT, CARRY SHIELD GROUND THROUGH DISCONNECT ON SEPARATE PIN.

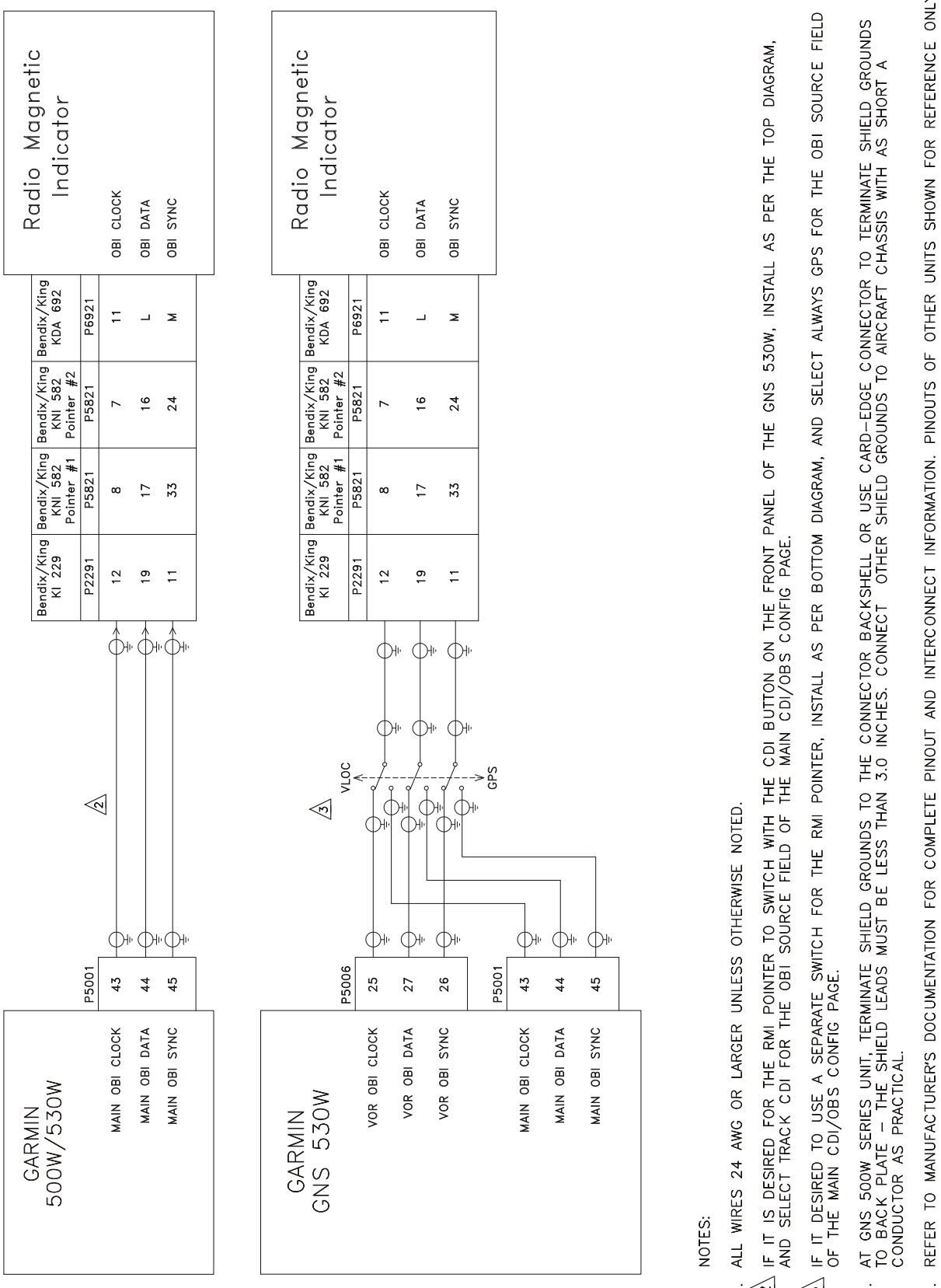
Figure H-18. Audio Panel Interconnect
Sheet 2 of 2



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED
2. LOWER CASE PIN DESIGNATORS ARE SHOWN AS UNDERLINED UPPER CASE LETTERS.
3. THIS INTERCONNECT APPLIES ONLY WHEN IT IS DESIRED FOR A SEPARATE INDICATOR TO DISPLAY GNS 530W VOR/ILS INFORMATION (REGARDLESS OF THE CDI BUTTON STATUS).
4. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.
5. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.

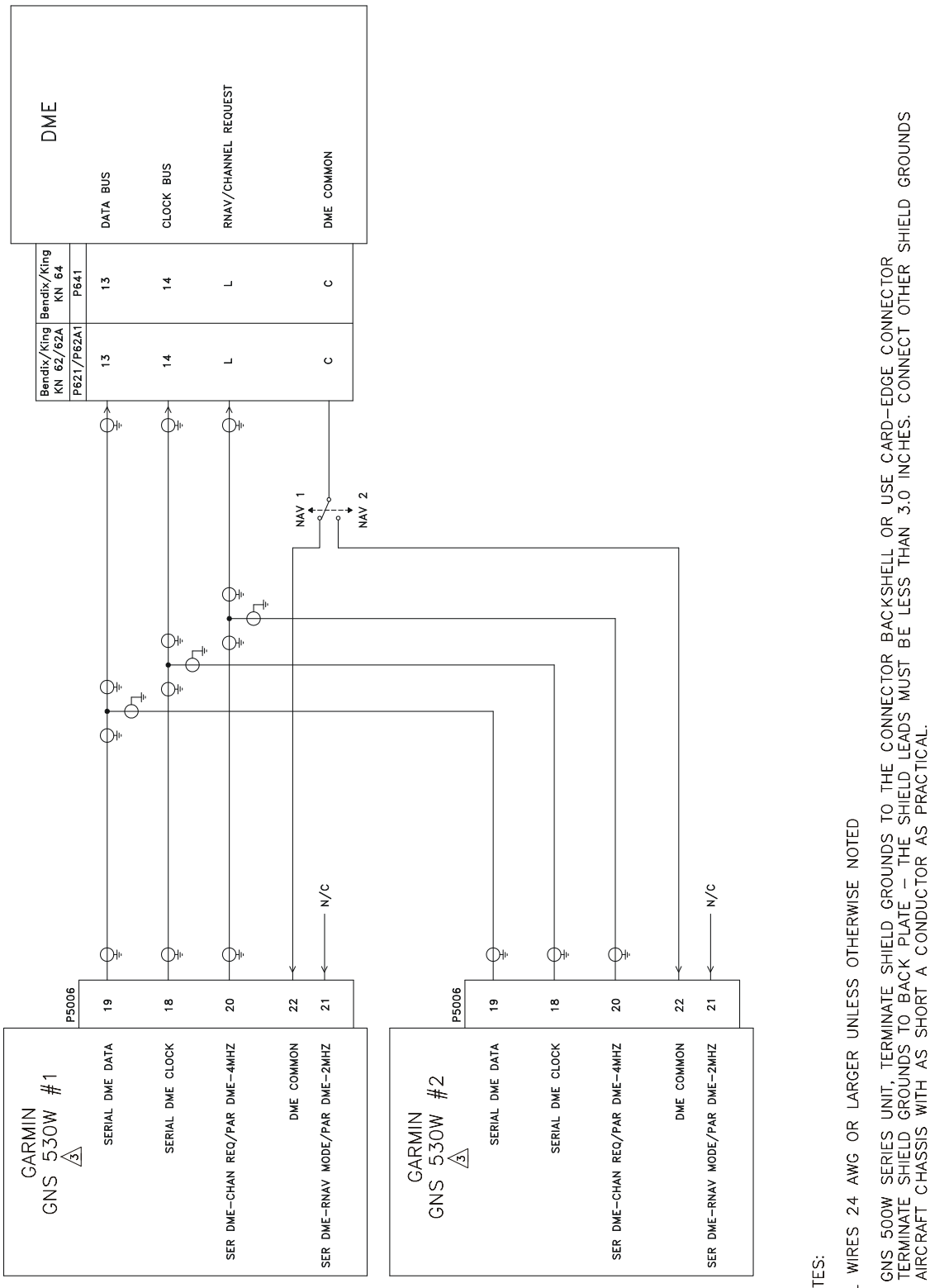
Figure H-19. VOR/ILS Indicator Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED.
2. IF IT IS DESIRED FOR THE RMI POINTER TO SWITCH WITH THE CDI BUTTON ON THE FRONT PANEL OF THE GNS 530W, INSTALL AS PER THE TOP DIAGRAM, AND SELECT TRACK CDI FOR THE OBI SOURCE FIELD OF THE MAIN CDI/OBS CONFIG PAGE.
3. IF IT DESIRED TO USE A SEPARATE SWITCH FOR THE RMI POINTER, INSTALL AS PER BOTTOM DIAGRAM, AND SELECT ALWAYS GPS FOR THE OBI SOURCE FIELD OF THE MAIN CDI/OBS CONFIG PAGE.
4. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
5. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

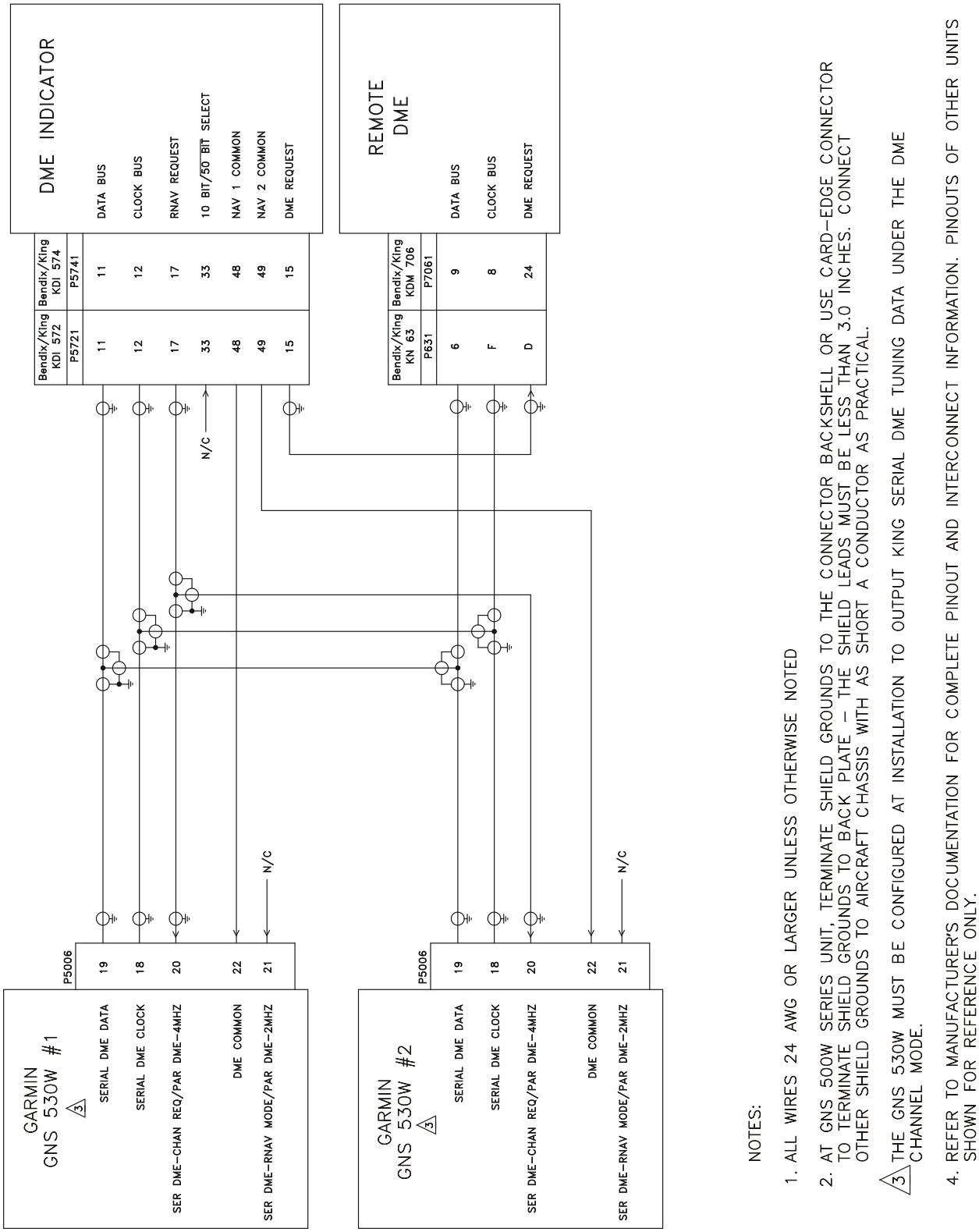
Figure H-20. RMI/OBI Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED
2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
3. THE GNS 530W MUST BE CONFIGURED AT INSTALLATION TO OUTPUT KING SERIAL DME TUNING DATA UNDER THE DME CHANNEL MODE.
4. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

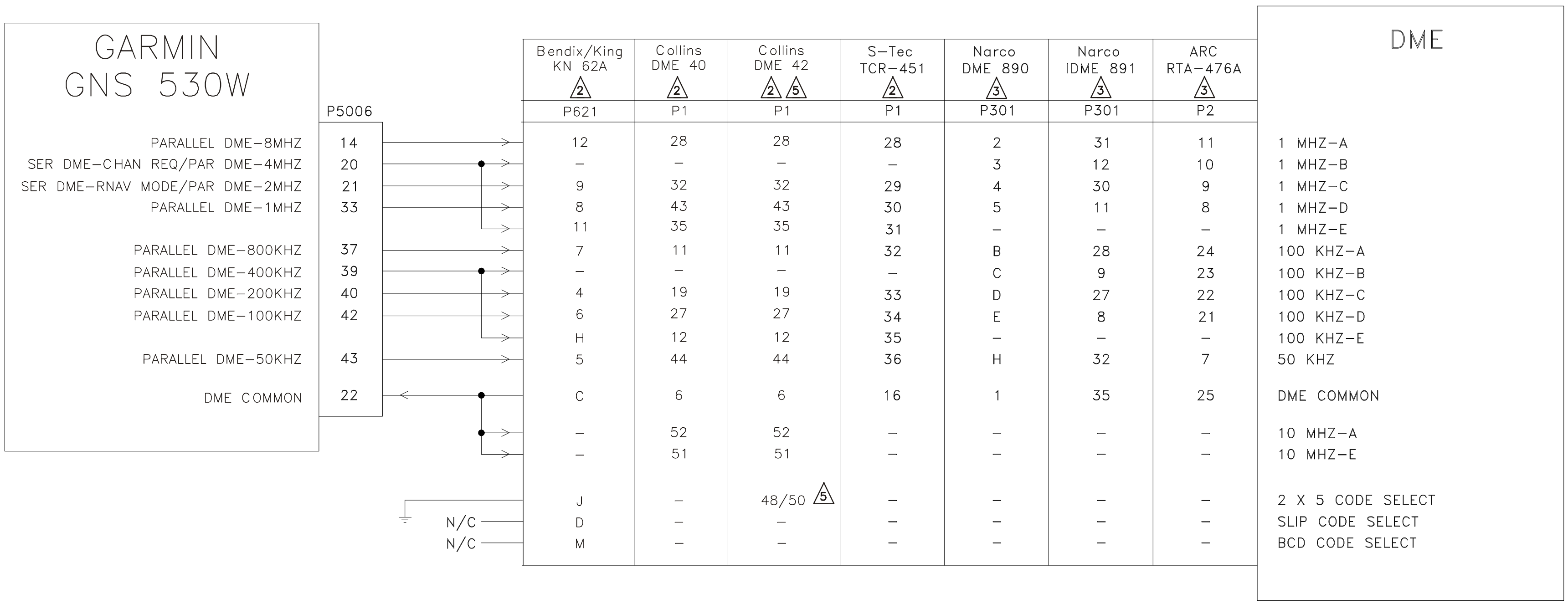
Figure H-21. King Serial Panel DME Tuning Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED
2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
3. THE GNS 530W MUST BE CONFIGURED AT INSTALLATION TO OUTPUT KING SERIAL DME TUNING DATA UNDER THE DME CHANNEL MODE.
4. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

Figure H-22. King Serial Remote DME Tuning Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED

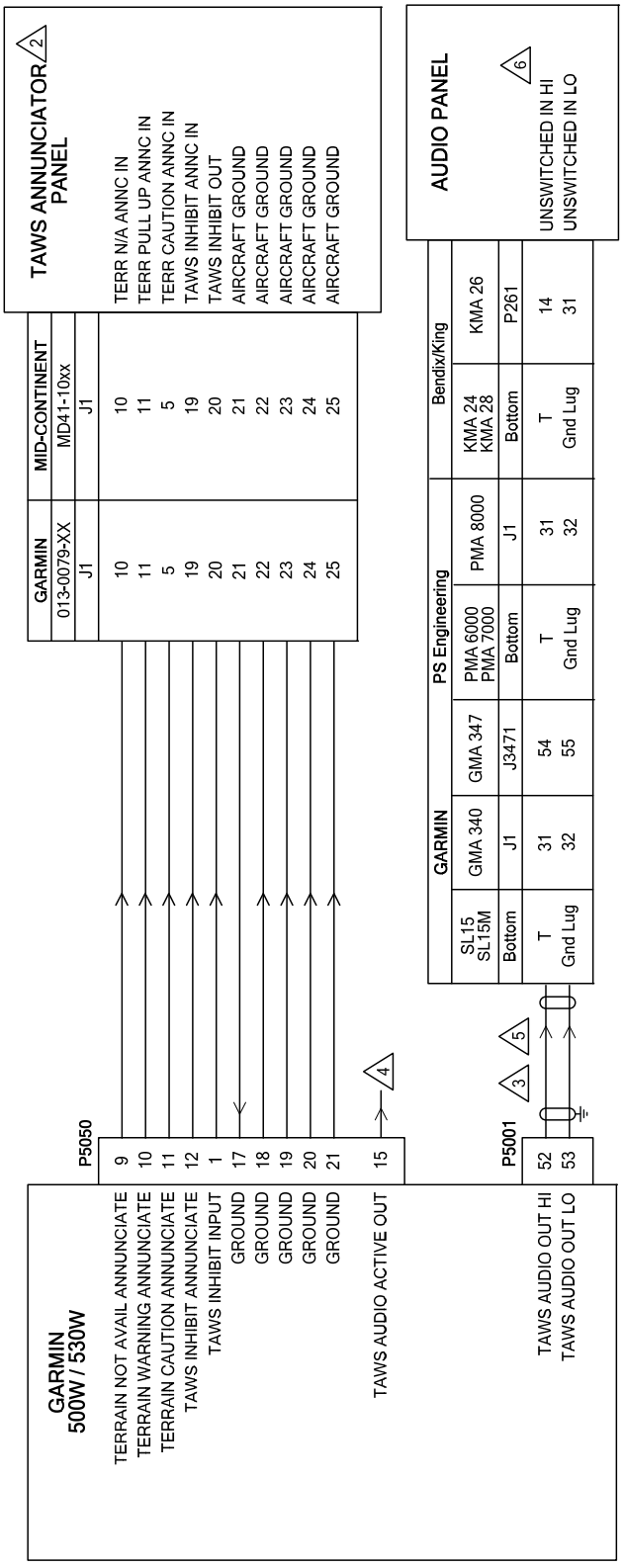
2 THE GNS 530W MUST BE CONFIGURED FOR PARALLEL 2x5 DME CHANNELING MODE FOR PROPER OPERATION WITH THIS MODEL OF DME TRANSCEIVER.

3 THE GNS 530W MUST BE CONFIGURED FOR NARCO 890/891 DME CHANNELING MODE FOR PROPER OPERATION WITH THIS MODEL OF DME TRANSCEIVER.

4. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

5 DME 42 MUST BE STRAPPED FOR 2x5 TUNING. REFER TO DME 42 INSTALLATION MANUAL FOR STRAPPING INFORMATION.

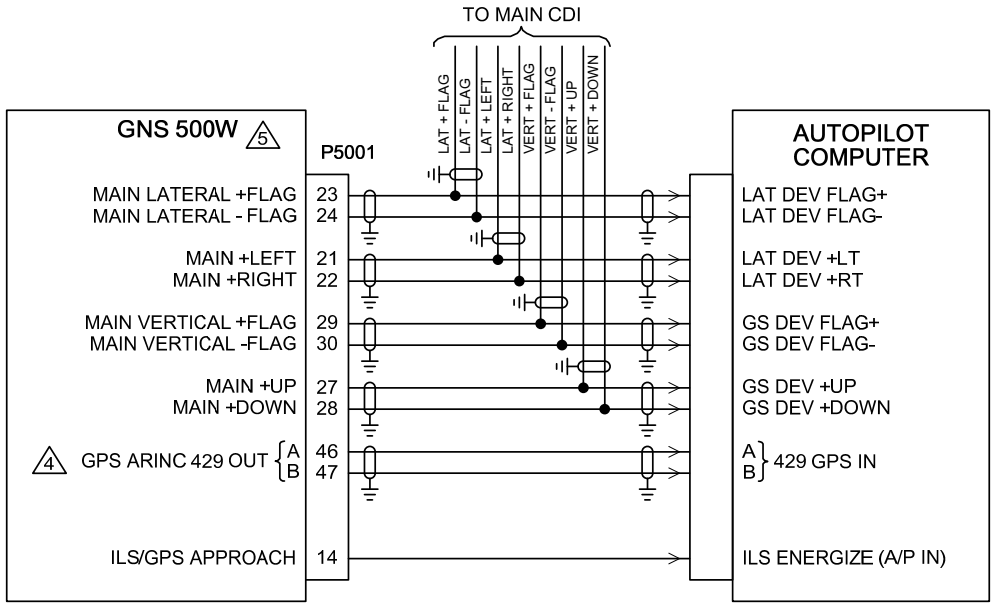
Figure H-23. Parallel 2 of 5 DME Tuning Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. IF EXTERNAL TAWS ANNUNCIATION IS REQUIRED, THE ANNUNCIATOR PANELS ON THIS PAGE ARE SUITABLE TO MEET THE ANNUNCIATION REQUIREMENT.
3. WHEN TWO TAWS-EQUIPPED UNITS ARE INSTALLED IN AN AIRCRAFT, ONLY ONE SHOULD UTILIZE P5001-52/53 TO AVOID COMPETING AUDIO MESSAGES.
4. CONNECT TO THE AUDIO INHIBIT INPUTS OF OTHER SYSTEMS WITH LOWER PRIORITY AURALS THAN TAWS.
5. SHIELDS FOR AUDIO CABLES SHOULD BE GROUNDED AT ONE END (WITH LEADS LESS THAN 3.0 INCHES) AND LEFT FLOATING AT THE OTHER END. IF SHIELDED AUDIO CABLE IS CARRIED THROUGH A DISCONNECT, CARRY SHIELD GROUND THROUGH DISCONNECT ON A SEPARATE PIN.
6. OTHER UNSWITCHED INPUTS ON THE AUDIO PANEL MAY BE USED IN LIEU OF THOSE SHOWN.
7. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS ARE SHOWN FOR REFERENCE ONLY.

Figure H-24. TAWS Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACKPLATE. THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT A CONDUCTOR AS PRACTICAL.
3. ONLY CONNECTIONS SUPPORTED BY THE AUTOPILOT ARE REQUIRED

4. ALL "GAMA 429" CONFIGURATIONS OF THE GPS ARINC 429 OUTPUT PROVIDE DATA REQUIRED BY THE AUTOPILOT FOR GPSS. THE "ARINC 429" CONFIGURATION CANNOT BE USED.

5. GNS 500 SERIES SETUP ITEMS
MAIN SYSTEM CONFIG PAGE: DISCRETES - ILS/GPS APR: APPROACH ONLY

Figure H-25. Autopilot Interconnect

Figure H-26. Not Used
Figure H-27. Not Used

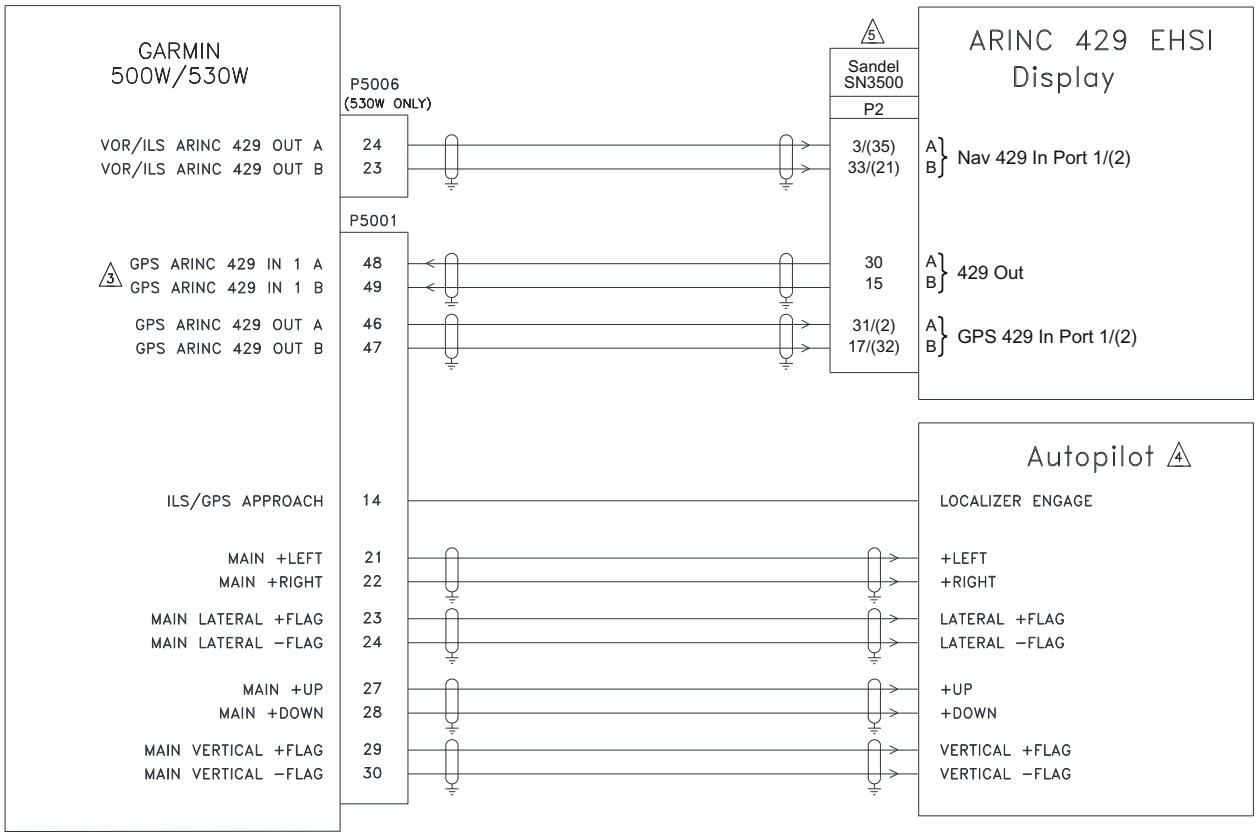


Figure H-28. ARINC 429 Sandel EHSI Interconnect (One 500W Series Unit, One Sandel SN3500)
Sheet 1 of 2

1 ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE NOTED.

2 AT GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD–EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. CONNECT OTHER SHIELD GROUNDS TO AIRCRAFT CHASSIS WITH AS SHORT AS A CONDUCTOR AS PRACTICAL.

△3 IF THE GPS ARINC 429 IN 1 PORT (P5001–48 AND –49) IS ALREADY USED FOR ANOTHER PURPOSE, THE GPS ARINC 429 IN 2 PORT (P5001–50 AND –51) MAY BE CONNECTED INSTEAD.

△4 AUTOPILOT SHOWN FOR REFERENCE ONLY. REFER TO APPROPRIATE AUTOPILOT INTERCONNECT DIAGRAM.

△5 500W SERIES SETUP ITEMS:

MAIN ARINC 429 CONFIG:	IN 1: LOW, SANDEL EHSI
	OUT: LOW, GAMA 429 GRPH W/INT
	SDI: LNAV 1
	VNAV: ENABLE LABELS
GNS 530W ONLY:	
VOR/LOC/GS ARINC 429 CONFIG:	SPEED RX: LOW TX: LOW
	SDI: VOR/ILS 1

△6 SANDEL SN3500 SETUP ITEMS:

GPS 1/2: GNS 500 (ARINC)	ANNUN: SERIAL
	LAT DV: SERIAL
	VERT DV: SERIAL
	VERT ENA: SERIAL
NAV/ILS/DME–1/2:	NAV TYPE: 429 TO

△7 REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.

Figure H-28. ARINC 429 Sandel EHSI Interconnect (One 500W Series Unit, One Sandel SN3500) Sheet 2 of 2

EXTERNAL NAVIGATION SOURCE SELECTION ANNUNCIATORS (3)

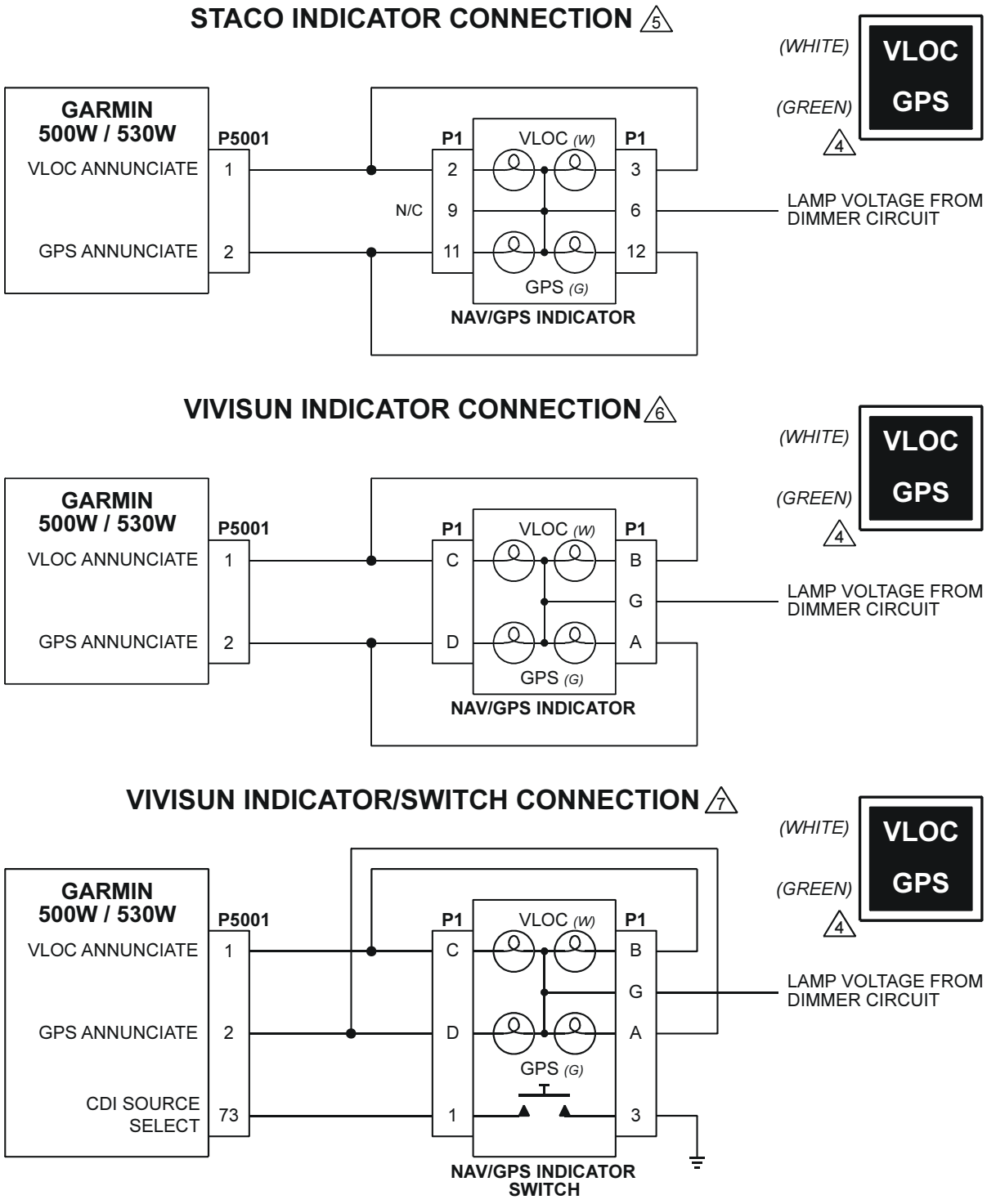
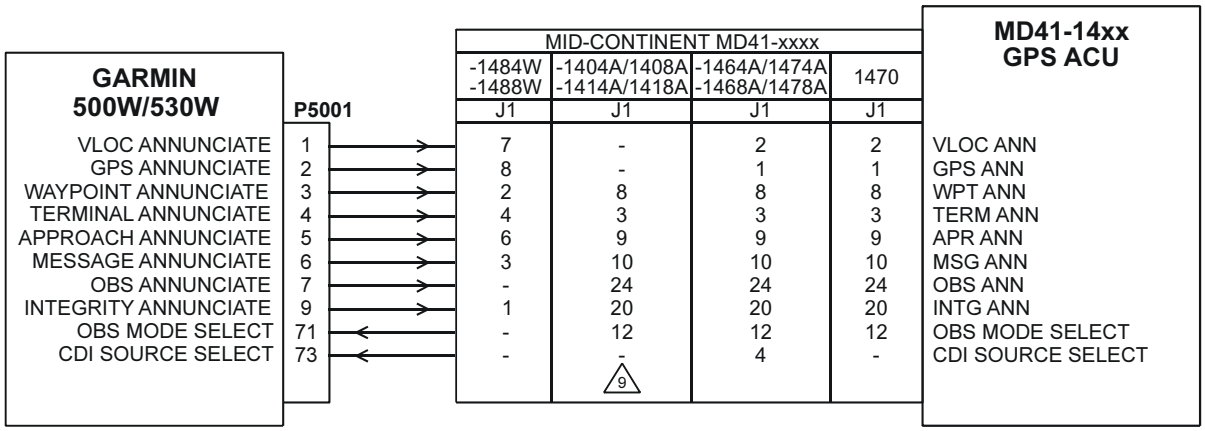


Figure H-29. External Navigation Source and GPS Annunciators
Sheet 1 of 2

EXTERNAL GPS ANNUNCIATIONS

MID-CONTINENT ACU CONNECTION ⚠8



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. IF A CDI/HSI SOURCE SELECTION ANNUNCIATOR IS REQUIRED, INDICATORS ON THIS PAGE ARE SUITABLE TO MEET THE ANNUNCIATION REQUIREMENT.

⚠3 THE PREFERRED ANNUNCIATION IS VLOC / GPS, ALTHOUGH NAV / GPS WILL BE ACCEPTABLE.

⚠4 LEGENDS ARE HIDDEN (BLACK) WHEN NOT ILLUMINATED.

⚠5 STACO SWITCH INDICATOR P/N 992561-1241762200 (14V SYSTEMS) AND P/N 992561-1241862200 (28V SYSTEMS) SHOWN.

⚠6 VIVISUN INDICATOR P/N 95-40-17-B6-AW724 (28V SYSTEMS) SHOWN. INDICATOR MAY BE CONVERTED TO 14V OPERATION BY REPLACING 28V LAMPS WITH 14V LAMPS P/N 14-113.

⚠7 VIVISUN INDICATOR WITH MOMENTARY SWITCH P/N 95-45-11-B6-AW724 (28V SYSTEMS) SHOWN. INDICATOR MAY BE CONVERTED TO 14V OPERATION BY REPLACING 28V LAMPS WITH 14V LAMPS P/N 14-113.

⚠8 THESE UNITS ALSO PROVIDE NAVIGATION SOURCE SELECTION ANNUNCIATION. MID-CONTINENT ANNUNCIATION CONTROL UNITS FOR BOTH 14V AND 28V SYSTEMS SHOWN. THIS DIAGRAM IS PROVIDED TO SHOW INTERCONNECTION BETWEEN GNS 500W SERIES UNIT AND ACU ONLY. REFER TO MID-CONTINENT INSTALLATION MANUALS FOR ADDITIONAL INSTALLATION INFORMATION.

⚠9 CDI SOURCE SELECTION AND ANNUNCIATION IS DONE WITH EXTERNAL RELAYS. REFER TO MID-CONTINENT INSTALLATION MANUAL FOR ADDITIONAL INSTALLATION INFORMATION.

Figure H-29. External Navigation Source and GPS Annunciators
Sheet 2 of 2

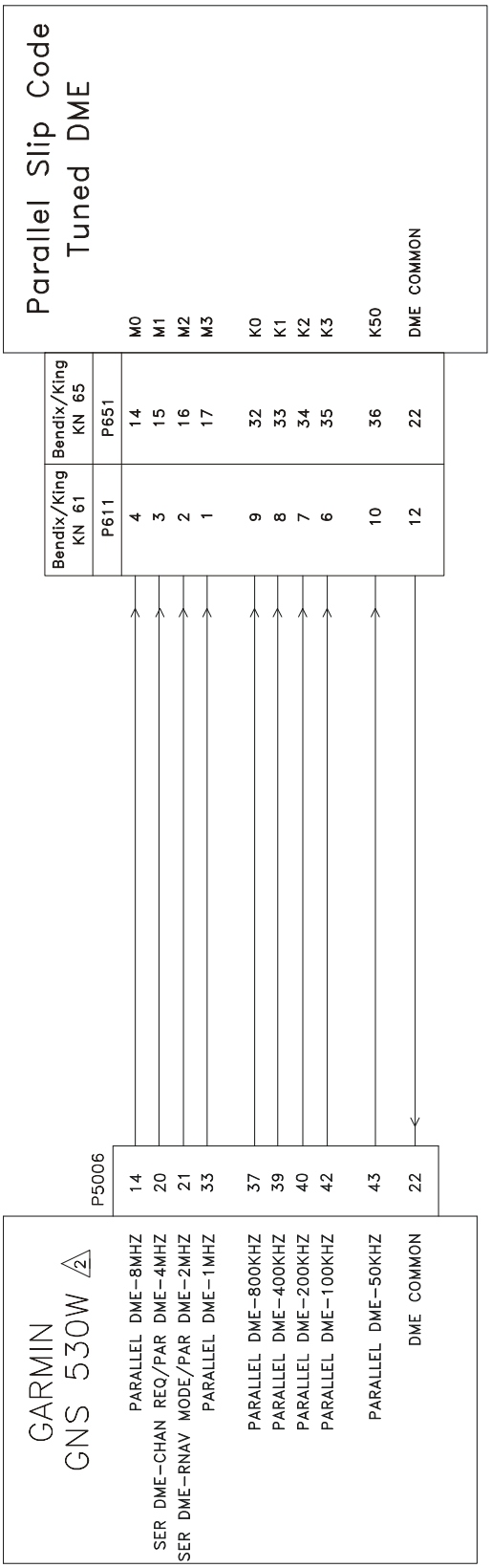


Figure H-30. Parallel Slip Code DME Tuning Interconnect

Figure H-31. Not Used
Figure H-32. Not Used

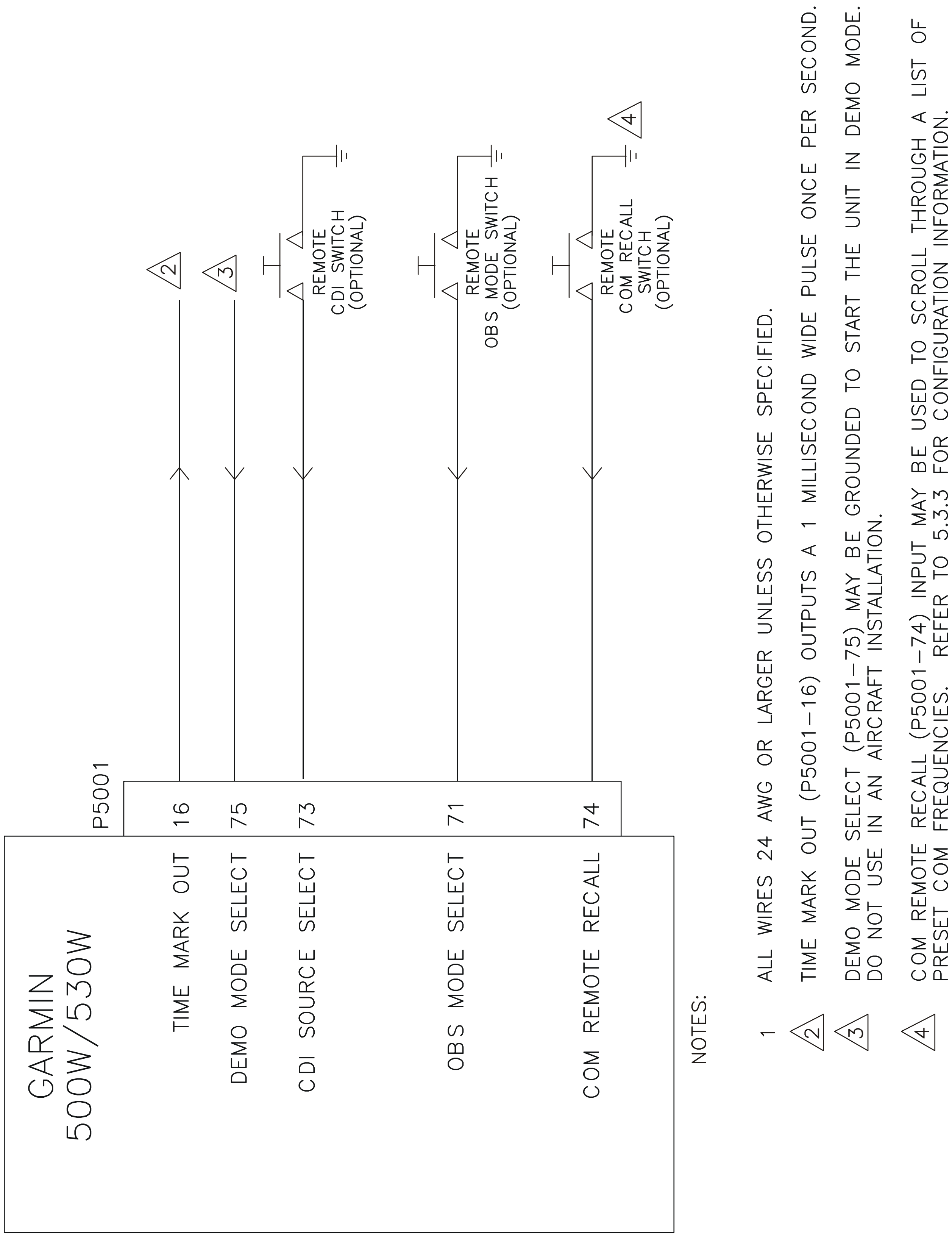


Figure H-33. Switches Interconnect

Figure H-34. Not Used
Figure H-35. Not Used

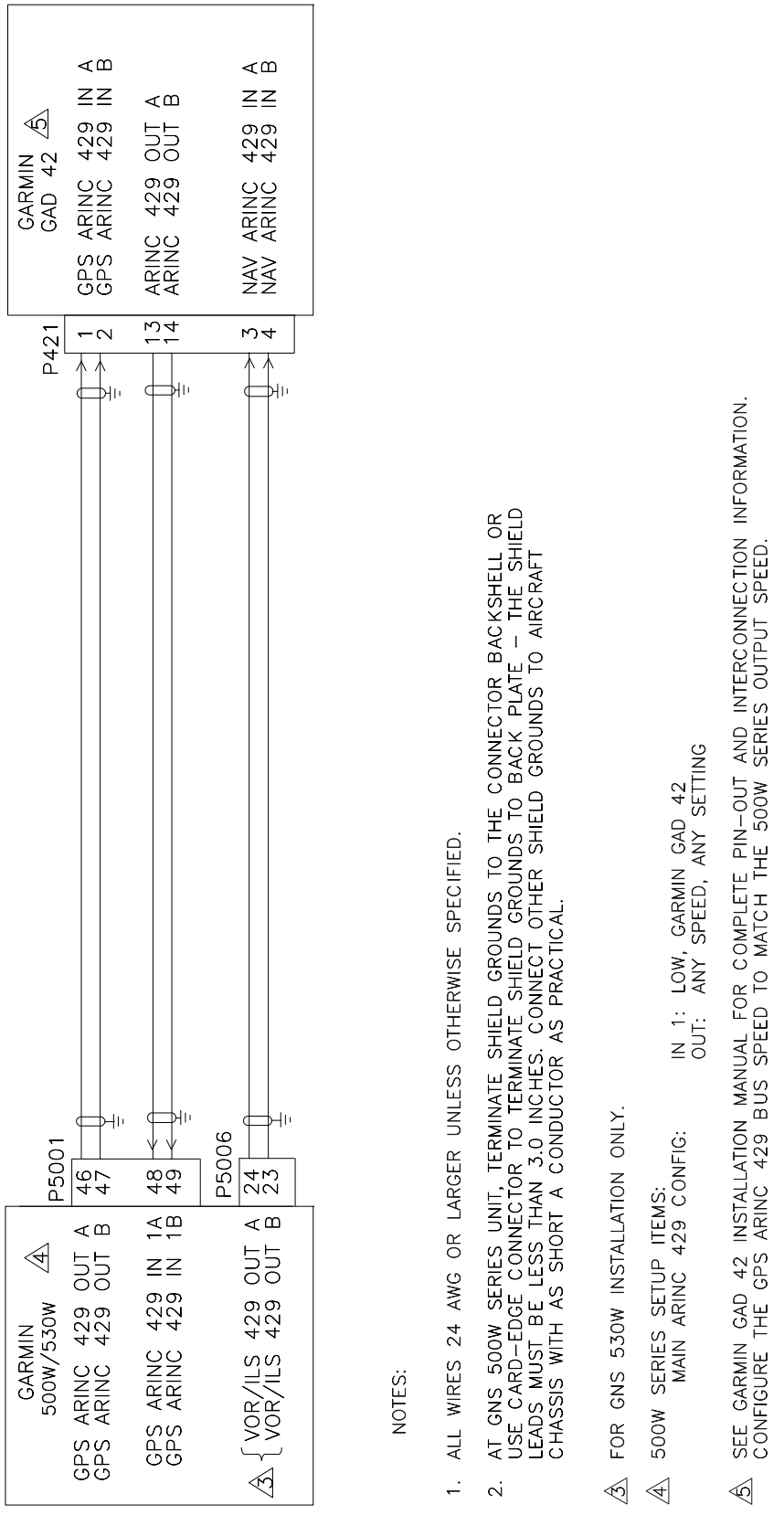
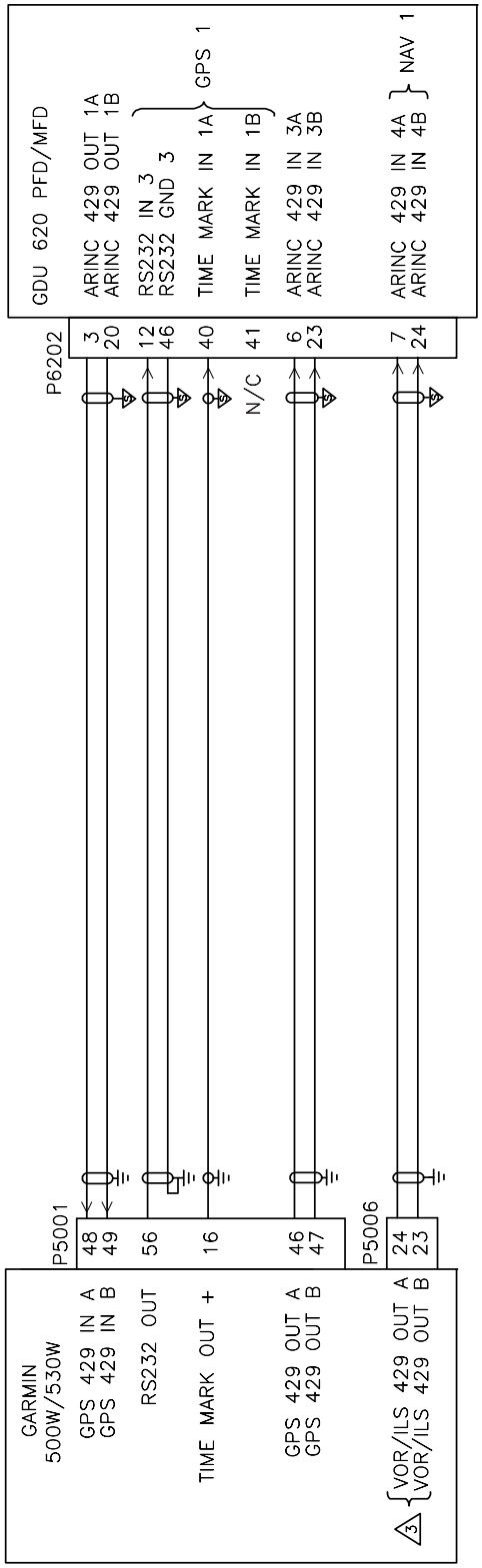


Figure H-36. Garmin GAD 42 Interconnect



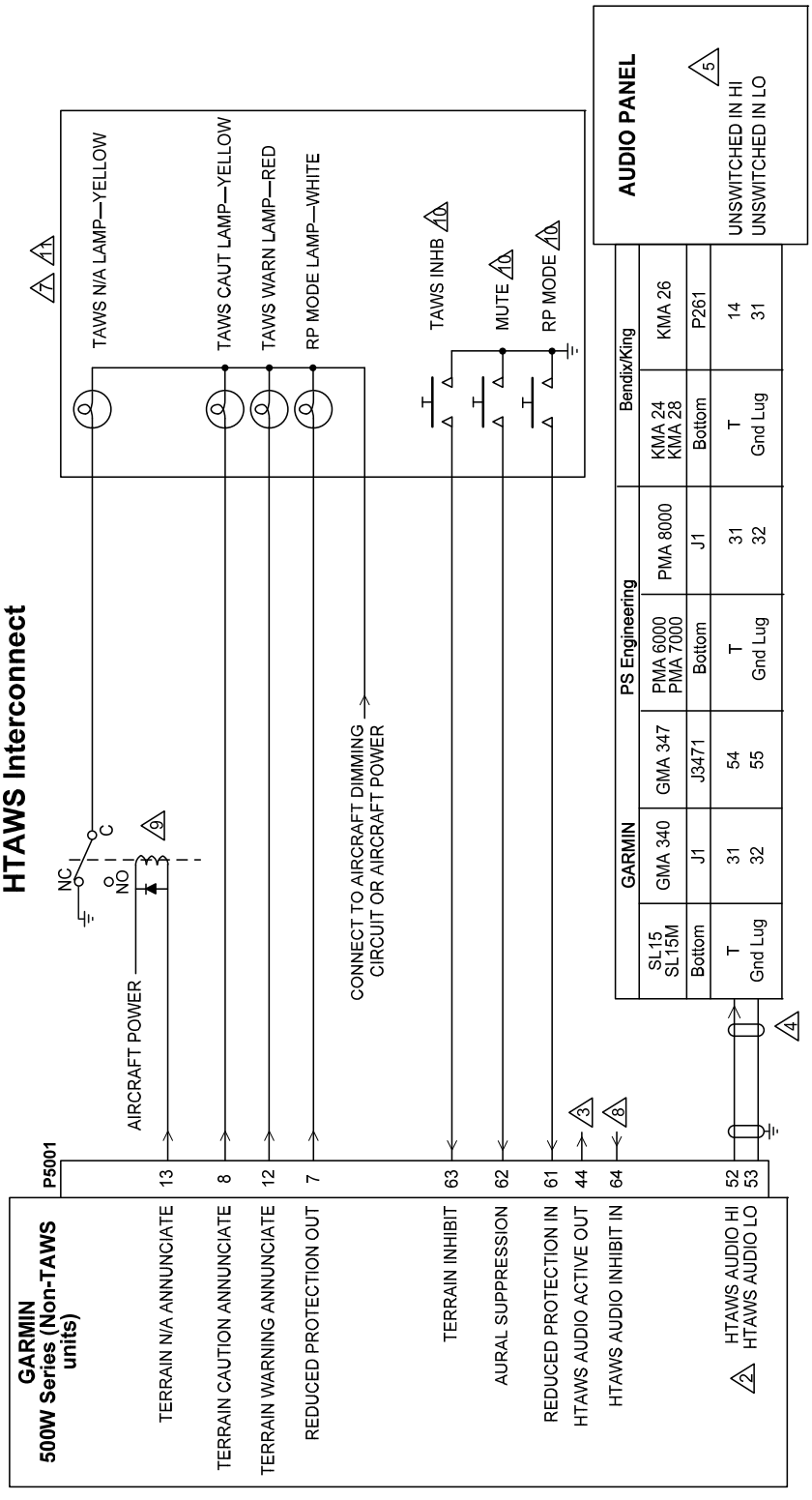
NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. AT THE GNS 500W SERIES UNIT, TERMINATE SHIELD GROUNDS TO THE CONNECTOR BACKSHELL OR USE CARD-EDGE CONNECTOR TO TERMINATE SHIELD GROUNDS TO BACK PLATE – THE SHIELD LEADS MUST BE LESS THAN 3.0 INCHES. AT GDU 620, TERMINATE SHIELD GROUNDS USING SHIELD BLOCKS.

△3 FOR GNS 530W INSTALLATION ONLY.

4. REFER TO THE MANUFACTURER'S DOCUMENTATION FOR COMPLETE PIN-OUT AND INTERCONNECT INFORMATION. PIN-OUTS OF OTHER UNITS SHOWN FOR REFERENCE ONLY.
5. FOR PROPER SETUP TO INTERFACE WITH THE G600, REFER TO THE G600 INSTALLATION MANUAL, APPENDIX E (P/N 190-00601-06).
6. FOR OTHER CONNECTION OPTIONS REFER TO THE G600 INSTALLATION MANUAL.

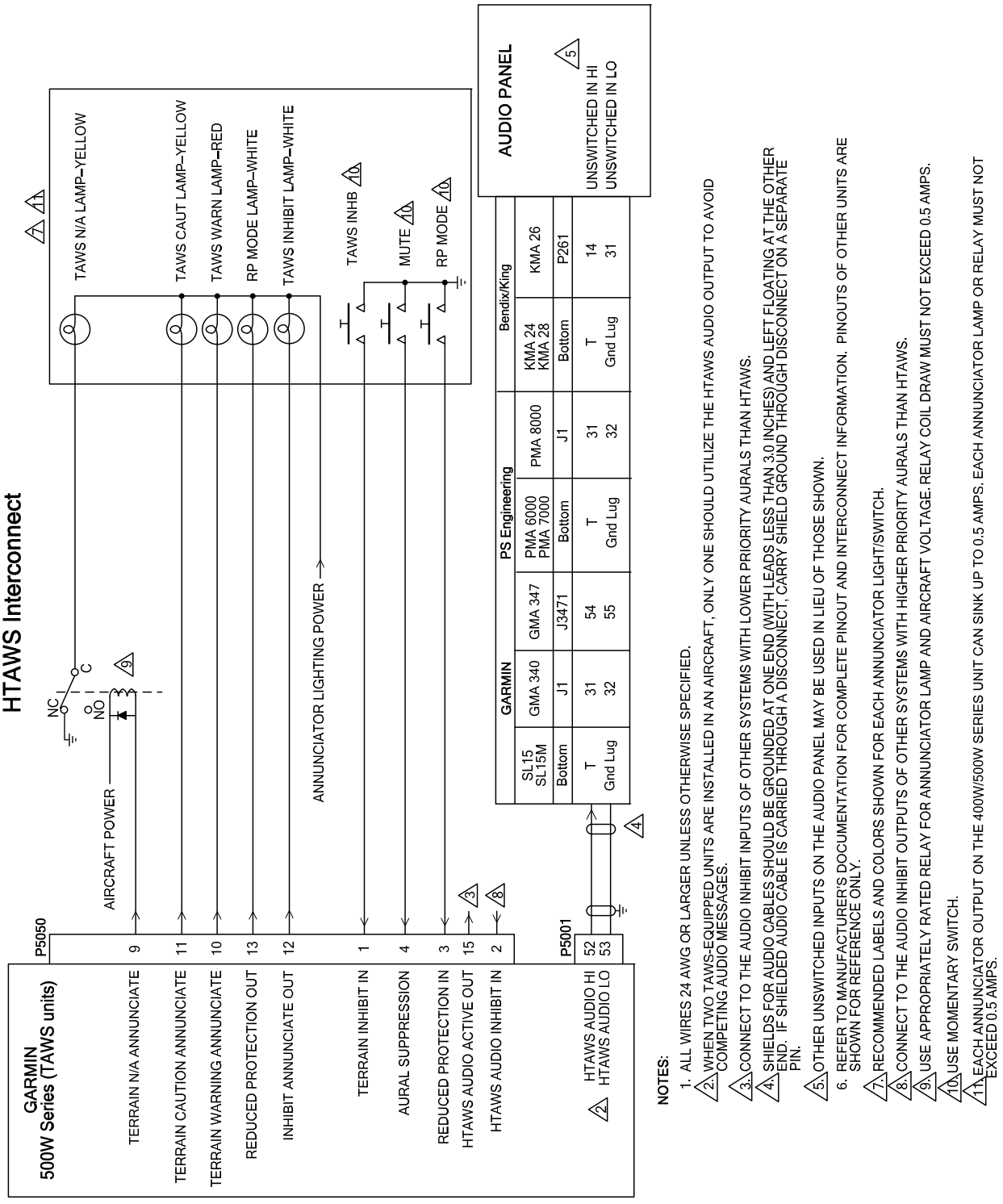
Figure H-37. Garmin GDU 620 Interconnect



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. WHEN TWO TAWS-EQUIPPED UNITS ARE INSTALLED IN AN AIRCRAFT, ONLY ONE SHOULD UTILIZE THE HTAWS AUDIO OUTPUT TO AVOID COMPETING AUDIO MESSAGES.
3. CONNECT TO THE AUDIO INHIBIT INPUTS OF OTHER SYSTEMS WITH LOWER PRIORITY AURALS THAN HTAWS.
4. SHIELDS FOR AUDIO CABLES SHOULD BE GROUNDED AT ONE END (WITH LEADS LESS THAN 3.0 INCHES) AND LEFT FLOATING AT THE OTHER END. IF SHIELDED AUDIO CABLE IS CARRIED THROUGH A DISCONNECT, CARRY SHIELD GROUND THROUGH DISCONNECT ON A SEPARATE PIN.
5. OTHER UNSWITCHED INPUTS ON THE AUDIO PANEL MAY BE USED IN LIEU OF THOSE SHOWN.
6. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS ARE SHOWN FOR REFERENCE ONLY.
7. RECOMMENDED LABELS AND COLORS SHOWN FOR EACH ANNUNCIATOR LIGHT/SWITCH.
8. CONNECT TO THE AUDIO INHIBIT OUTPUTS OF OTHER SYSTEMS WITH HIGHER PRIORITY AURALS THAN HTAWS.
9. USE APPROPRIATELY RATED RELAY FOR ANNUNCIATOR LAMP AND AIRCRAFT VOLTAGE. RELAY COIL DRAW MUST NOT EXCEED 0.5 AMPS.
10. USE MOMENTARY SWITCH.
11. EACH ANNUNCIATOR OUTPUT ON THE 400W/500W SERIES UNIT CAN SINK UP TO 0.5 AMPS. EACH ANNUNCIATOR LAMP OR RELAY MUST NOT EXCEED 0.5 AMPS.

Figure H-38. HTAWS Annunciator Interconnect – Non-TAWS Units

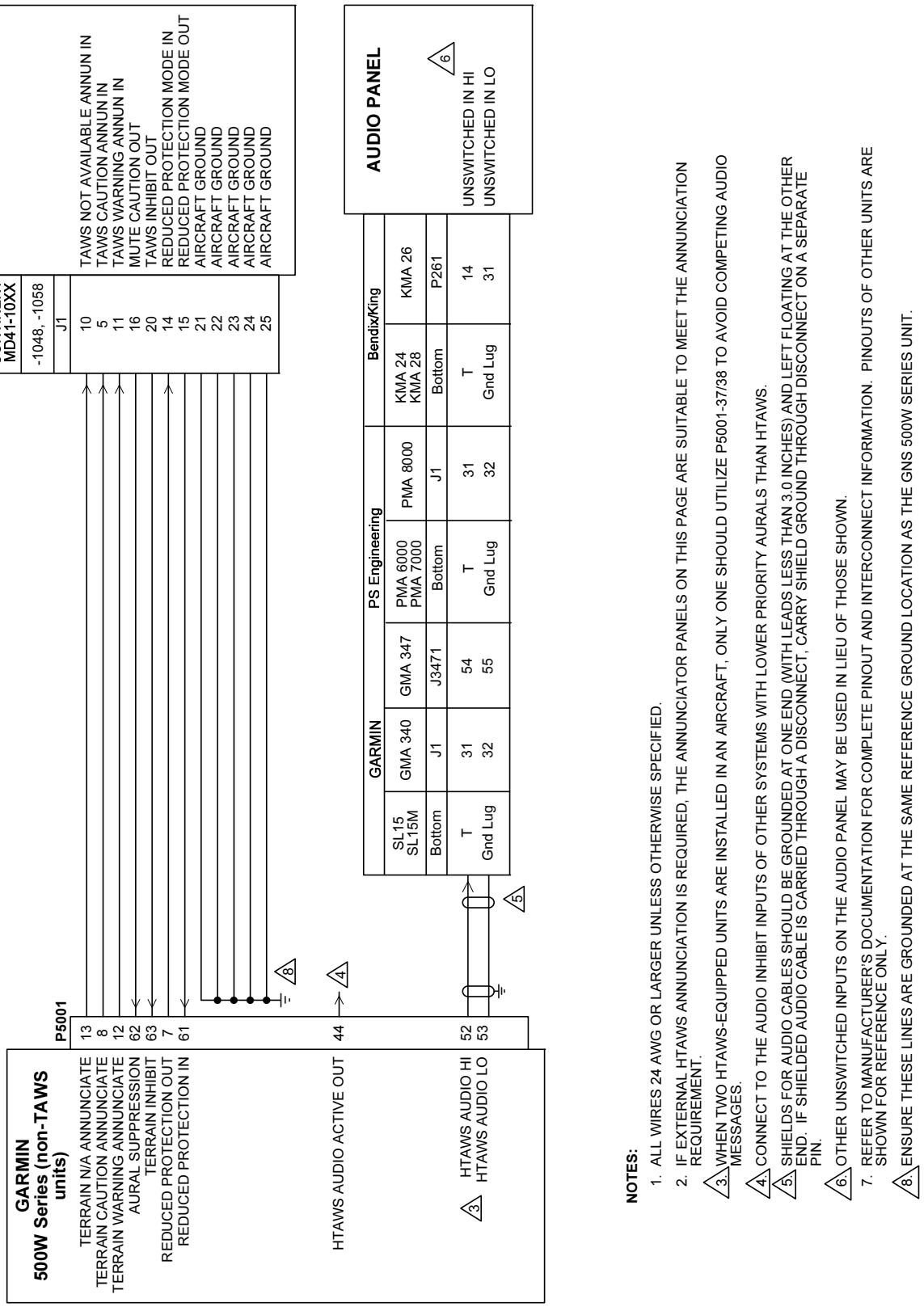


NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. WHEN TWO TAWS-EQUIPPED UNITS ARE INSTALLED IN AN AIRCRAFT, ONLY ONE SHOULD UTILIZE THE HTAWS AUDIO OUTPUT TO AVOID COMPETING AUDIO MESSAGES.
3. CONNECT TO THE AUDIO INHIBIT INPUTS OF OTHER SYSTEMS WITH LOWER PRIORITY AURALS THAN HTAWS.
4. SHIELDS FOR AUDIO CABLES SHOULD BE GROUNDED AT ONE END (WITH LEADS LESS THAN 3.0 INCHES) AND LEFT FLOATING AT THE OTHER END. IF SHIELDED AUDIO CABLE IS CARRIED THROUGH A DISCONNECT, CARRY SHIELD GROUND THROUGH DISCONNECT ON A SEPARATE PIN.
5. OTHER UNSWITCHED INPUTS ON THE AUDIO PANEL MAY BE USED IN LIEU OF THOSE SHOWN.
6. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS ARE SHOWN FOR REFERENCE ONLY.
7. RECOMMENDED LABELS AND COLORS SHOWN FOR EACH ANNUNCIATOR LIGHT/SWITCH.
8. CONNECT TO THE AUDIO INHIBIT OUTPUTS OF OTHER SYSTEMS WITH HIGHER PRIORITY AURALS THAN HTAWS.
9. USE APPROPRIATELY RATED RELAY FOR ANNUNCIATOR LAMP AND AIRCRAFT VOLTAGE. RELAY COIL DRAW MUST NOT EXCEED 0.5 AMPS.
10. USE MOMENTARY SWITCH.
11. EACH ANNUNCIATOR OUTPUT ON THE 400W/500W SERIES UNIT CAN SINK UP TO 0.5 AMPS. EACH ANNUNCIATOR LAMP OR RELAY MUST NOT EXCEED 0.5 AMPS.

Figure H-39. HTAWS Annunciator Interconnect – TAWS Units

EXTERNAL HTAWS ANNUNCIATIONS

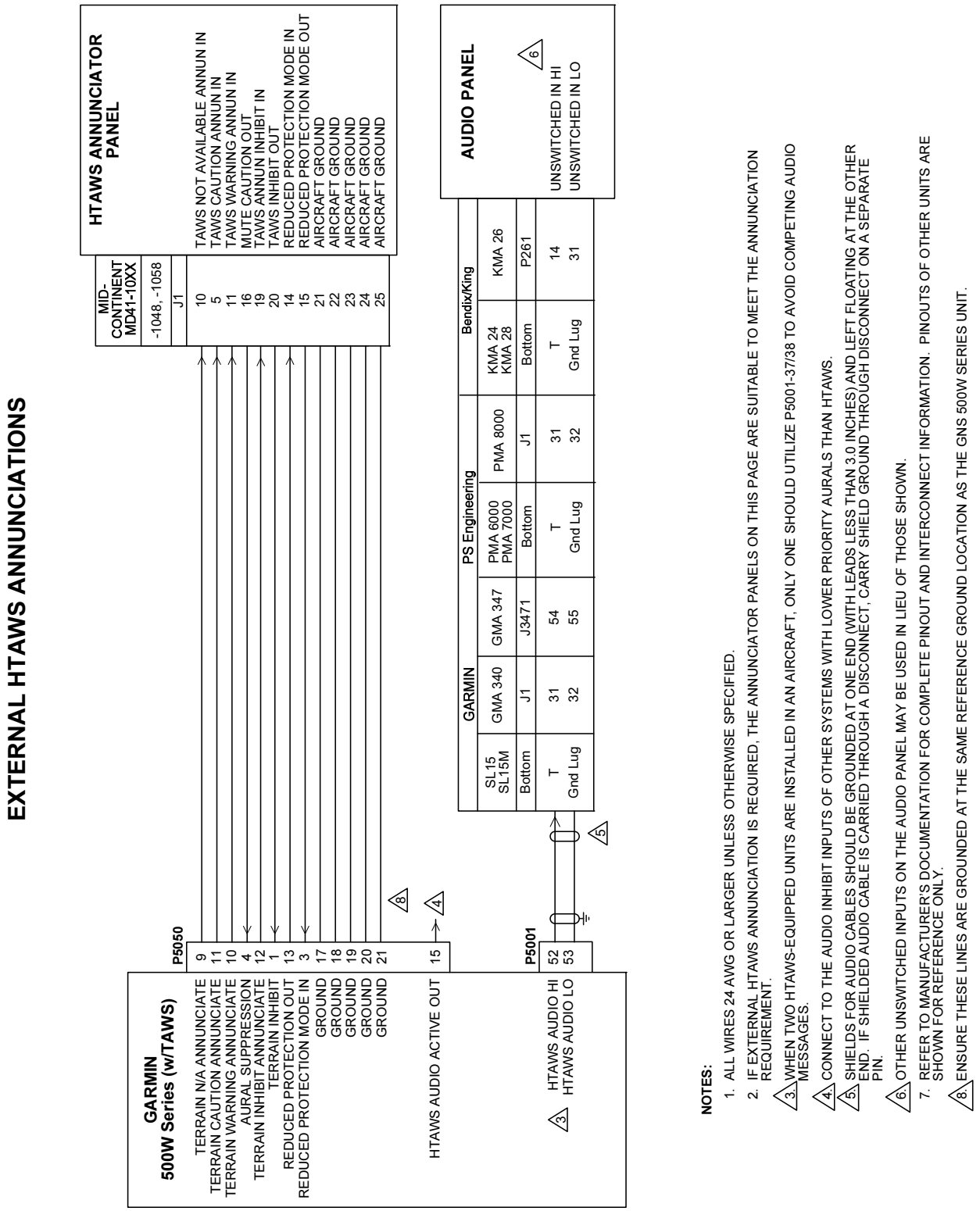


NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. IF EXTERNAL HTAWS ANNUNCIATION IS REQUIRED, THE ANNUNCIATOR PANELS ON THIS PAGE ARE SUITABLE TO MEET THE ANNUNCIATION REQUIREMENT.
3. WHEN TWO HTAWS-EQUIPPED UNITS ARE INSTALLED IN AN AIRCRAFT, ONLY ONE SHOULD UTILIZE P5001-37/38 TO AVOID COMPETING AUDIO MESSAGES.
4. CONNECT TO THE AUDIO INHIBIT INPUTS OF OTHER SYSTEMS WITH LOWER PRIORITY AURALS THAN HTAWS.
5. SHIELDS FOR AUDIO CABLES SHOULD BE GROUNDED AT ONE END (WITH LEADS LESS THAN 3.0 INCHES) AND LEFT FLOATING AT THE OTHER END. IF SHIELDED AUDIO CABLE IS CARRIED THROUGH A DISCONNECT, CARRY SHIELD GROUND THROUGH DISCONNECT ON A SEPARATE PIN.
6. OTHER UNSWITCHED INPUTS ON THE AUDIO PANEL MAY BE USED IN LIEU OF THOSE SHOWN.
7. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS ARE SHOWN FOR REFERENCE ONLY.
8. ENSURE THESE LINES ARE GROUNDED AT THE SAME REFERENCE GROUND LOCATION AS THE GNS 500W SERIES UNIT.

Figure H-40. Mid-Continent HTAWS Annunciator Interconnect – Non-TAWS Units

EXTERNAL HTAWS ANNUNCIATIONS



NOTES:

1. ALL WIRES 24 AWG OR LARGER UNLESS OTHERWISE SPECIFIED.
2. IF EXTERNAL HTAWS ANNUNCIATION IS REQUIRED, THE ANNUNCIATOR PANELS ON THIS PAGE ARE SUITABLE TO MEET THE ANNUNCIATION REQUIREMENT.
3. WHEN TWO HTAWS-EQUIPPED UNITS ARE INSTALLED IN AN AIRCRAFT, ONLY ONE SHOULD UTILIZE P5001-37/38 TO AVOID COMPETING AUDIO MESSAGES.
4. CONNECT TO THE AUDIO INHIBIT INPUTS OF OTHER SYSTEMS WITH LOWER PRIORITY AURALS THAN HTAWS.
5. SHIELDS FOR AUDIO CABLES SHOULD BE GROUNDED AT ONE END (WITH LEADS LESS THAN 3.0 INCHES) AND LEFT FLOATING AT THE OTHER END. IF SHIELDED AUDIO CABLE IS CARRIED THROUGH A DISCONNECT, CARRY SHIELD GROUND THROUGH DISCONNECT ON A SEPARATE PIN.
6. OTHER UNSWITCHED INPUTS ON THE AUDIO PANEL MAY BE USED IN LIEU OF THOSE SHOWN.
7. REFER TO MANUFACTURER'S DOCUMENTATION FOR COMPLETE PINOUT AND INTERCONNECT INFORMATION. PINOUTS OF OTHER UNITS ARE SHOWN FOR REFERENCE ONLY.
8. ENSURE THESE LINES ARE GROUNDED AT THE SAME REFERENCE GROUND LOCATION AS THE GNS 500W SERIES UNIT.

Figure H-41. Mid-Continent HTAWS Annunciator Interconnect – TAWS Units

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