SOLID-STATE SYSTEMS

L3 Avionics Systems

Reliable technology for reliable reference.

Accurate flight cues are everything to a pilot. Your flight safety depends on getting the right reference information, right when you need it. For reliable cues, look to solid-state technology. Designed to replace mechanical or electro-mechanical technology, solid-state products utilize "strap down" digital technology for improved reliability and reduced operating costs. Relying on sensors, these systems don't contain moving parts that are costly to repair and replace. For reliable reference systems you just can't afford to live without, look to L-3 Avionics Systems.

Engineered to outperform and outlast conventional spinning-mass vertical gyroscopes, the L-3 Vertical Reference System model **VRS-3000** reduces costly mechanical repairs while providing superior reliability. Designed for **115VAC platforms,** the VRS-3000 replaces gyroscopes such as the SBU-23 and MD-1, utilizing solid-state rate and level sensor technology to provide accurate attitude and rate measurements. With software that is qualified to DO-178B Level A, the VRS-3000 is designed to drive primary and secondary flight displays as well as flight controls (autopilot). And with its multiple output formats, it is compatible with both analog and solid-state attitude indicators. Whether the application is a rotary or fixed-wing aircraft, Unmanned Aerial Vehicle or watercraft, the VRS-3000's certification to RTCA DO-160D environmentals assures it will be ready for the task.

The **VRS-4000** features the same capabilities of the VRS-3000 but is a non-certified version used in **28VDC platforms.** When paired with an Air Data Computer, both the VRS-3000 and VRS-4000 models are capable of providing attitude, altitude, airspeed, vertical speed and slip/skid information.
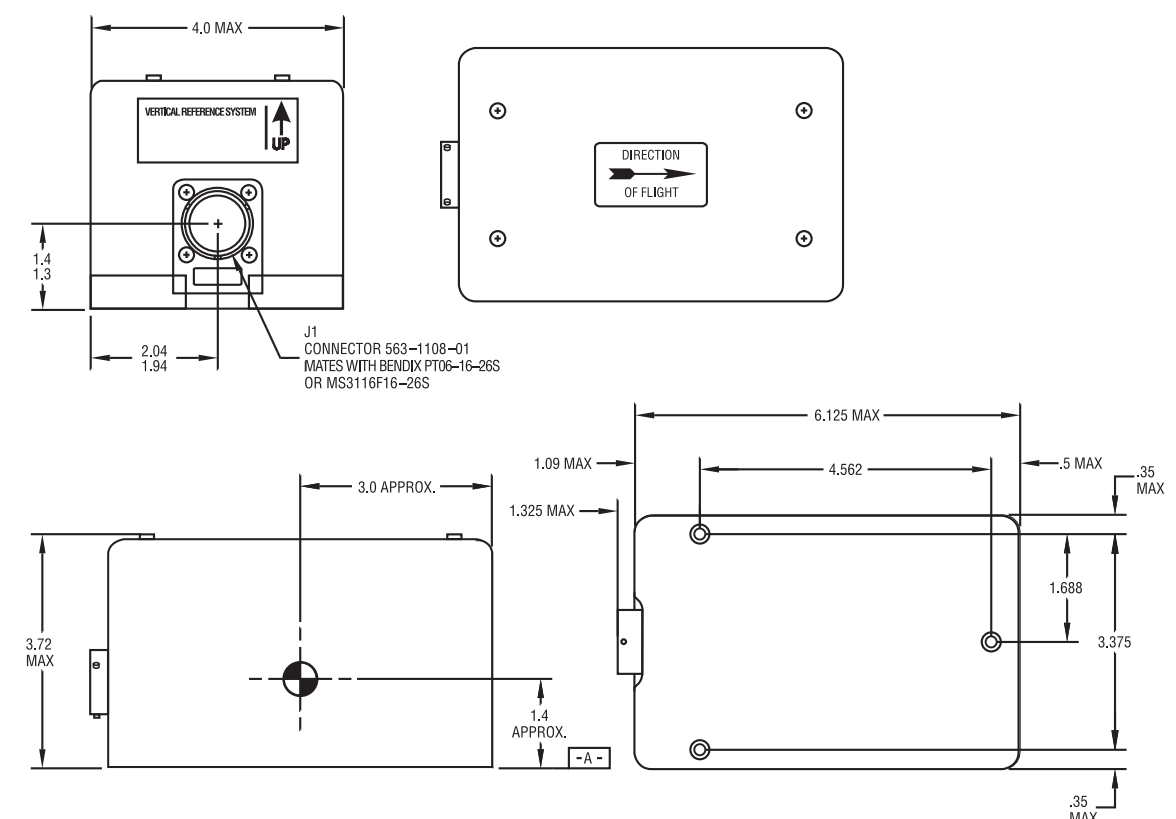
ESIS GH-3000 & 3100

The GH-series of Electronic Standby Instrument Systems (ESIS) combines all the important flight cues – attitude, altitude, airspeed, heading and navigation – in one easy-to-read Active Matrix Liquid Crystal Display (AMLCD). It's like having a complete standby EFIS Suite in a single 3-inch display. Certified and flying since 1997, only the GH-series offers an exclusive configuration ability to visually match the look and format of your aircraft's primary EFIS.

Compact in design, the ESIS GH-series instruments fit into a single 3-ATI opening and require minimal power during operation. All ESIS GH models use a full-color, active matrix liquid crystal display that provides exceptional readability in direct sunlight as well as in dark cockpit environments. The multi-function display offers clear off-axis viewing and anti-aliasing of graphics for crisp readouts at any attitude.

The flexible ESIS GH-3000 model utilizes the remote-mounted Air Data Computer ADC-4000 for the display of airspeed and altitude for the instrument. And like all L-3 ESIS models, the GH-3000 features solid-state internal sensors that eliminate the need for a separate spinning mass gyro while increasing reliability and performance.

The ESIS GH-3100 model has an integrated air data sensor card with pitot static connections directly to the unit, eliminating the need for a remote-mounted Air Data Computer. The compact solid-state ADC module adds less than one inch to the total length of the system, saving valuable space and weight. The GH-3100 and the GH-3000 utilize the L-3 MAG-3000 for accurate heading inputs. The GH-3100 has the added flexibility to interface with an ARINC 429 AHRS or INS system.

The ESIS GH-3100 with built in Air Data Computer combines electronic precision with ease of installation, eliminating the need for a remote ADC.

ESIS GH-3001

Designed with military platforms in mind, the ESIS **GH-3001** provides accurate attitude, altitude, airspeed and heading cues in a compact unit that has been certified to higher EMI levels. Customized tape readouts allow the addition of a Vertical Speed Indicator (VSI) and the unit's flexible display boasts the capability to match the aircraft's EFIS displays, easing the transition between primary and standby instrumentation. And because the ESIS **GH-3001** is night vision goggle (NVG) compatible, crews always have the most vital information available to them in the event of an emergency – day or night. Whether utilized in fixed wing or rotorcraft platforms, the **GH-3001's** lightweight and rugged design is perfectly suited for today's high performance and demanding military cockpits.

Customized tape readouts allow the addition of a Vertical Speed Indicator (VSI) and the unit's flexible display boasts the capability to match the aircraft's EFIS displays.
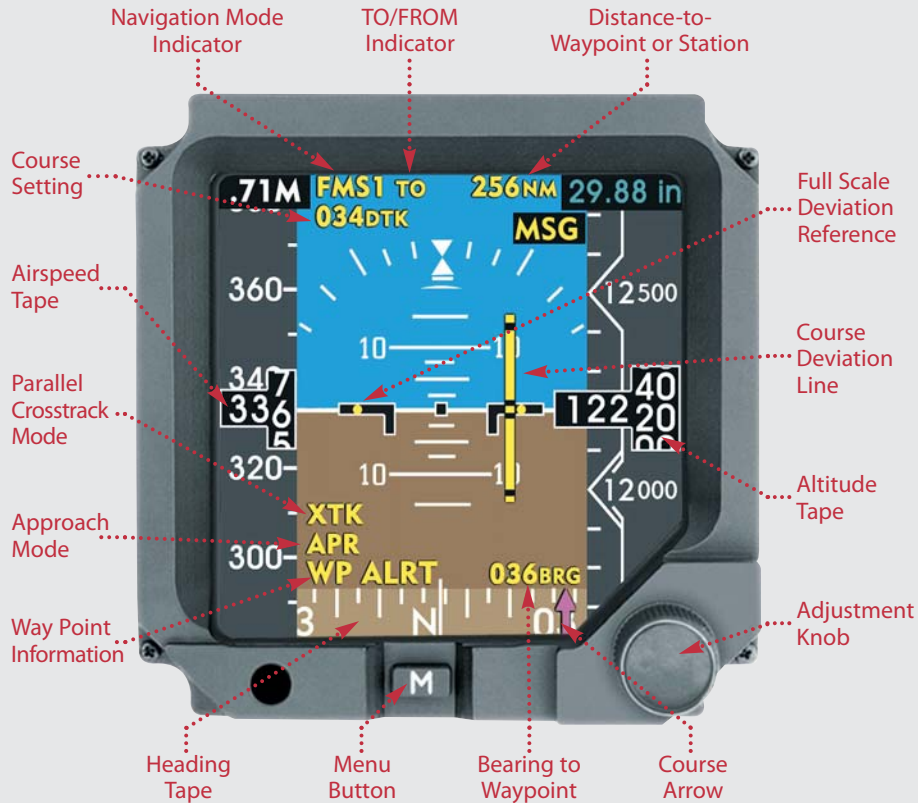
The GH Series ESIS offers today's busy pilots important information when they need it most. And with hundreds of installations to date in every type of aircraft, from corporate jets to military fixed wing and helicopter platforms, the GH-series ESIS from L-3 offers the unmatched reliability and performance pilots demand in a standby system.

IT'S ALL IN HERE

GH-3000 & 3100 Functionality

KEY GH-3000/3100 FEATURES:

> 3-ATI size

> 28 VDC aircraft power

> Weighs 3.6 pounds

> External system interfaces:

  - 2 CSDB inputs

  - 4 ARINC 429 inputs (GH-3000/3001)

  - 6 ARINC 429 inputs (GH-3100)

> Designed to DO-160D

> Flat-panel AMLCD/sunlight readable

> Solid state design

> Modes for FMS, NAV, VOR, ILS and TACAN

Navigation Mode Indicator
TO/FROM Indicator
Distance-to-Waypoint or Station
Course Setting
Full Scale Deviation Reference
Airspeed Tape
Course Deviation Line
Parallel Crosstrack Mode
Altitude Tape
Approach Mode
Adjustment Knob
Way Point Information
Heading Tape
Menu Button
Bearing to Waypoint
Course Arrow

The L-3 **EHSI-4000** is defining a new standard for Electronic Horizontal Situation Indicators by utilizing a fully digital design and flat panel technology. Designed to replace older electro-mechanical horizontal situation indicators, the **EHSI-4000** provides distance, bearing and course information in a 3-ATI size display, yielding a lightweight and compact layout. It combines the advantages of digital precision and solid-state reliability into a unit that is intuitive to operate in any environment.

With the incorporation of a powerful graphics processor and anti-aliased graphics, the **EHSI-4000** provides superior capabilities offering an easy-to-read display as well as high reliability. The unit incorporates an Active Matrix Liquid Crystal Display (AMLCD) that is visible in direct sunlight as well as a dark cockpit. A built-in photocell on the front bezel, when used in conjunction with the setting of the aircraft bus, automatically adapts to ambient lighting conditions.

The **EHSI-4000**, when combined with the **ESIS GH-3000**, provides flight crews with comprehensive backup Air Data, Attitude and Navigation information. The "wraparound" capabilities of this coupled arrangement allow information sharing to insure consistent, reliable and redundant flight information. Sufficient redundancy is designed into this combination so that the loss of either unit will still provide important navigation information.

The L-3 **EHSI-3000** was designed to replace aging analog electro-mechanical HSIs in new or converted aircraft equipped with a MIL-STD-1553B databus architecture. The solid-state design provides improved reliability, enhanced cockpit presentation and additional functionality.

Designed specifically for rugged military environments, the L-3 **EHSI-3000** requires +28vdc, weighs less than three pounds, interfaces via dual 1553B multiplex busses and is tested to MIL-STD-810 and MIL-STD-461/462 environmental requirements. This easily retrofitted unit features basic functions for selection among four modes: ILS/TACAN, TACAN, NAV and ILS/NAV. The **EHSI-3000** meets TYPE 1 Class B NVG lighting requirements.

The EHSI-3000's total digital design and construction translates into increased reliability, more functionality and a higher level of accuracy.

EASY TO USE – HARD TO BEAT

EHSI Series Functionality

KEY EHSI-3000 FEATURES:

> Aircraft Heading (true or magnetic)

> Range Indicator for:
  - Range to DME/TACAN station
  - Range to INU computer waypoint

> RMI Bearing Pointer and Reciprocal Pointer:
  - Bearing to TACAN station
  - Bearing to INU computer waypoint

> Course Deviation Indicator (CDI) for:
  - TACAN course
  - Instrument Landing System localizer
  - VOR & INU NAV course

> TO/FROM station indication for: TACAN and NAV modes

> Heading Marker (output for autopilot interface)

> .04 to 150 fl display luminance

> 20 Hz display update rate

Source Annunciator (FMS Mode)

FMS Mode Annunciator (Course-CRS or Desired Track DTK)

Waypoint Identifier

ADF Bearing Source Annunciator

Distance Indicator

FMS Message Annunciator

Waypoint Annunciator (flashing)

*Course Deviation Scale

Glide Slope Arrow and Scale

TO/FROM Indicator

Cross Track Annunciator

* (each dot = 1° course deviation when in FMS mode)

SYSTEM SPECIFICATIONS

	VRS-3000/4000	GH-3000	GH-3001	GH-3100	EHSI
Weight • Display	3.5 lbs. max	3.6 lbs. 3" ATI 240*240	4 lbs.	4 lbs.	less than 3lbs. 3" ATI case
Electrical Characteristics	115 VAC (VRS-3000) 400 Hz single phase 28 VDC (VRS-4000)	28 VDC	28 VDC	28 VDC	28 VDC @ 1.5 amps 26 VAC 400 Hz 0-4.5 VAC/DAC bus
Software Compliance	VRS-3000 only: DO-178B level A	DO-178B	N/A	DO-178B	
Environmental Characteristics	VRS-3000 only: DO-160D	DO-160D	DO-160D	DO-160D	tested to MIL-STD-462 MIL-STD-461 MIL-STD-810
Brightness		integral/dimmable from 150fl-.04fl	integral/dimmable from 150fl-.04fl	integral/dimmable from 150fl-.04fl	NVIS display brightness mode switch 150fl-.04fl
Certifications • Government • Military	VRS-3000 only: TSO-4c, Do-160D 17 Cat. A, 18 Cat. E, 19 Cat. Z, 20 Cat. EE, 21 Cat. L, 22 Cat. A3E4	TSO-C2d, TSO-C4c, TSO-C6d, TSO-C9d, TSO-C10b, TSO-C34e, TSO-C36e, TSO-C40c, TSO-C46a, TSO-C66c, TSO-C119, TSO-C115b	MS 24367, MIL-HDBK-454, MIL-STD-1629A, MIL-L-27160C, MIL-L-85762A	TSO-C2d, TSO-C4c, TSO-C6d, TSO-C10b, TSO-C34e, TSO-C36e, TSO-C40c, TSO-C46a, TSO-C66c, TSO-C106, TSO-C113, TSO-C115b, AC No: 25-11, ETSO	
Interfaces	outputs ARINC 429 (digital bus only), ARINC 407 (Synchro only), both ARINC 407/429 additional outputs for radar at 50, 167, 200 mV/Degree	2-CSDB inputs, 4-ARINC 429 inputs, 1 RS-422 input	2-CSDB inputs, 4-ARINC 429 inputs, 1 RS-422 input	2-CSDB inputs, 6-ARINC 429 inputs, 1RS-422 input	

MAG-3000

Magnetometer

ADC-4000

Air Data Computer

L-3 Avionics Systems

5353 52nd Street, S.E.
Grand Rapids, MI 49512
Telephone: 616-949-6600
or 800-253-9525
FAX: 616-285-4224

www.L-3Avionics.com

10/10