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 to replace gyroscopes such as the SBU-23 and MD-1, the VRS-3000 utilizes 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 environmental standards assures it will be ready for the task. When paired with an Air Data Computer, the system is capable of providing attitude, altitude, airspeed, vertical speed and slip/skid information.
The GH-series of Electronic Standby Instrument Systems (ESIS) combines all the important flight cues – attitude, 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-3000 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-3000 model has an integrated air data sensor card with pilot 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-3000 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 GH-3100 with built in Air Data Computer combines electronic precision with ease of installation, eliminating the need for a remote ADC.

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.

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.

**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
- Designed to DO-160D
- Flat-panel AMLCD/sunlight readable
- Solid state design
- Modes for FMS, NAV, VOR, ILS and TACAN

**IT’S ALL IN HERE.**

**GH-3000 & 3100 Functionality**

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

**ESIS GH-3001**

Military Reinforcements.
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-A7I 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 “wrap-around” 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 3 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.

**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 ft display luminance
- 20 Hz display update rate

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

<table>
<thead>
<tr>
<th>Weight - Display</th>
<th>EHSI</th>
<th>VRS-3000</th>
<th>CH-3000</th>
<th>CH-3001</th>
<th>CH-3100</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 3 lbs. 13 ATI case</td>
<td>3.5 lbs. max</td>
<td>3.6 lbs. 13 ATI 240+240</td>
<td>4 lbs.</td>
<td>4 lbs.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical Characteristics</th>
<th>EHSI</th>
<th>VRS-3000</th>
<th>CH-3000</th>
<th>CH-3001</th>
<th>CH-3100</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 VDC @ 1.5 amps</td>
<td>26 VAC 400 Hz</td>
<td>26 VAC 400 Hz single phase</td>
<td>28 VDC</td>
<td>28 VDC</td>
<td>28 VDC</td>
</tr>
<tr>
<td>0.5 VAC/DC bus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Software Compliance</th>
<th>EHSI</th>
<th>VRS-3000</th>
<th>CH-3000</th>
<th>CH-3001</th>
<th>CH-3100</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO-178B level A</td>
<td>DO-178B</td>
<td>N/A</td>
<td>DO-178B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental Characteristics</th>
<th>EHSI</th>
<th>VRS-3000</th>
<th>CH-3000</th>
<th>CH-3001</th>
<th>CH-3100</th>
</tr>
</thead>
<tbody>
<tr>
<td>tested to MIL-STD-462</td>
<td>DO-160D</td>
<td>DO-160D</td>
<td>DO-160D</td>
<td>DO-160D</td>
<td></td>
</tr>
<tr>
<td>MIL-STD-461</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIL-STD-810</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brightness</th>
<th>EHSI</th>
<th>VRS-3000</th>
<th>CH-3000</th>
<th>CH-3001</th>
<th>CH-3100</th>
</tr>
</thead>
<tbody>
<tr>
<td>NVIS display brightness mode switch</td>
<td>integral/dimmable from 150L-0.4f</td>
<td>integral/dimmable from 150L-0.4f</td>
<td>integral/dimmable from 150L-0.4f</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Certifications - Government</th>
<th>EHSI</th>
<th>VRS-3000</th>
<th>CH-3000</th>
<th>CH-3001</th>
<th>CH-3100</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSO-4c, Do-1600 17 Cat. A 18 Cat. E, 19 Cat. Z, 20 Cat. EE, 21 Cat. L, 22 Cat. AIE4</td>
<td>TSO-C26, TSO-C4c, TSO-C6, TSO-C69, TSO-C10b, TSO-C34c, TSO-C36, TSO-C40, TSO-C6, TSO-C119, TSO-C115b</td>
<td>TSO-C26, TSO-C4c, TSO-C6, TSO-C10b, TSO-C34c, TSO-C36, TSO-C40, TSO-C6, TSO-C119, TSO-C115b</td>
<td>TSO-C26, TSO-C4c, TSO-C6, TSO-C10b, TSO-C34c, TSO-C36, TSO-C40, TSO-C6, TSO-C119, TSO-C115b</td>
<td>TSO-C26, TSO-C4c, TSO-C6, TSO-C10b, TSO-C34c, TSO-C36, TSO-C40, TSO-C6, TSO-C119, TSO-C115b</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>- Military</th>
<th>EHSI</th>
<th>VRS-3000</th>
<th>CH-3000</th>
<th>CH-3001</th>
<th>CH-3100</th>
</tr>
</thead>
<tbody>
<tr>
<td>outputs 429 digital bus only, ARINC 407 (Synchron only)</td>
<td>2-CDDB inputs, 4-ARINC 429 inputs, 1 RS-422 input</td>
<td>2-CDDB inputs, 4-ARINC 429 inputs, 1 RS-422 input</td>
<td>2-CDDB inputs, 4-ARINC 429 inputs, 1 RS-422 input</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This material describing L-3 Avionics Systems general capabilities has been released in the Public Domain through unlimited distribution at conferences, meetings, seminars, trade shows or exhibitions and is generally accessible to the public in the United States.