Easytrak Pyxis
Fused INS + USBL

The Easytrak Pyxis USBL takes the best of Applied Acoustic Engineering’s USBL technology and combines it with a highly advanced inertial navigation system (INS) from one of the most respected names in the industry, to create a state of the art, inertially aided Ultra Short Baseline system capable of accurate subsea tracking with survey grade performance.

The high precision combination of AAE’s Sigma 2 acoustic protocols and SBG Systems’ OEM version of the Navsight Apogee INS brings together two leading names in the field of marine technology, resulting in AAE’s most accurate and long range positioning system, providing many time, cost and performance benefits to global survey operators.

As a tightly coupled, factory fitted package, Easytrak Pyxis is a calibration free system able to immediately operate from any vessel as soon as the work site has been reached. The MEMS based INS does not fall under ITAR regulations, and the range restricted option means the whole system can be shipped unhindered and without export control to almost anywhere in the world.

Available with omni-directional and directional transceiver options, and boasting an accuracy of up to 0.1% of slant range, the versatility and enhanced capabilities of Easytrak Pyxis will see it become a common feature on the survey vessels of the world.

Key features:
- Fused INS + USBL
- Survey grade ITAR free INS
- Vessel calibration free
- Directional and omni-directional options

Technical Specification

EASYTRAK PYXIS CONSOLE, MODEL 3690

This provides DC power, high speed digital communications to the transceiver and INS with an embedded graphical navigation interface. Supplied with monitor, keyboard and mouse.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>19” Rack mount. 3U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>7.5kg</td>
</tr>
<tr>
<td>Power requirements</td>
<td>90 – 250 Vac</td>
</tr>
<tr>
<td>Connection to transceiver</td>
<td>Rear panel connector for 3700 Series transceivers</td>
</tr>
<tr>
<td>Built-in PC</td>
<td>Industrial I5 board running embedded Win 10, 64GB HD</td>
</tr>
<tr>
<td>Temperature</td>
<td>Operating: -10° to +40°C</td>
</tr>
<tr>
<td></td>
<td>Storage: -20° to +50°C</td>
</tr>
<tr>
<td>Front panel indicators</td>
<td>LED indicators for power and system status</td>
</tr>
<tr>
<td>Serial communications</td>
<td>2 x RS232/RS485 External Input port</td>
</tr>
<tr>
<td></td>
<td>3 x Individual INS Data Out ports</td>
</tr>
<tr>
<td></td>
<td>2 x Positional Data Out ports</td>
</tr>
<tr>
<td>GNSS Antenna</td>
<td>2 x TNC connection</td>
</tr>
<tr>
<td></td>
<td>2 x GNSS Antenna</td>
</tr>
<tr>
<td></td>
<td>2 x 25m Antenna Cable</td>
</tr>
<tr>
<td>Data Output</td>
<td>AAE format V1 and V2, TP-II2EC, TP-EC/W/PR, Simrad 300P, Simrad 309, Simrad SPSIMSSB, Pseudo SGPMMC, NMEA 5PGGGA, NMEA SGPVTG, NMEA 5GPTLL, Pseudo SGPAGA, KLEIN 3000 (Quick set) Multiple outputs available.</td>
</tr>
<tr>
<td>INS Data Output</td>
<td>SBG spec MMEA, ASCIL, BINARY, TSS, SIMRAD</td>
</tr>
<tr>
<td>INS Aiding</td>
<td>2 x GNSS, RTCM</td>
</tr>
<tr>
<td>Ext Compass Input</td>
<td>SGB-HTDS, SGB-HTDN, NMEA HDT,HDM, HDG</td>
</tr>
<tr>
<td>Ext VRU Input</td>
<td>$HCXDR, TSS1</td>
</tr>
<tr>
<td>Ext GNSS Input</td>
<td>NMEA; GLL, GGA, RMC</td>
</tr>
<tr>
<td></td>
<td>Geo Referenced Graphical Overlay. GeoTiff, DXF</td>
</tr>
<tr>
<td>Target Heading Input</td>
<td>NMEA HDM, HDT, HDG, PNI TCM2</td>
</tr>
<tr>
<td>Target Depth Input</td>
<td>NMEA DBT, DBK, DBS, DPT, AAE</td>
</tr>
<tr>
<td>Responder Output</td>
<td>4 x Positive 12V pulse 5ms long, BNC</td>
</tr>
<tr>
<td>NAV IN</td>
<td>External Trigger, BNC</td>
</tr>
<tr>
<td>USB</td>
<td>4 ports available, 2 on front panel</td>
</tr>
<tr>
<td>PPS</td>
<td>5v Pulse</td>
</tr>
<tr>
<td>Ethernet</td>
<td>2 x 1Gbps standard RJ45 jack, ethernet UDP Data Port</td>
</tr>
</tbody>
</table>

Pyxis Transceiver, type 3781
**EASYTRAK PYXIS TRANSCEIVER, TYPE 3781**

Factory calibrated multi-element transceiver head complete with integral IMU, depth sensor and temperature sensor.

**EZT-3781-N**  Range limited, non-export controlled model.

**EZT-3781-C**  Export controlled model.

- **Material**: Stainless steel as standard
- **Weight in air**: 15.5kg
- **Dimensions**: 200mm Ø reducing to 152mm Ø x 432mm
- **Temperature**:
  - Operating: -10° to +40°C
  - Storage: -20° to +50°C
- **Depth rating**: 30m
- **Electrical supply**: 48Vdc (from console)
- **Depth sensor (Pressure sensor)**: 5 bar, accuracy 0.25% between -10° to +40° C
- **Temperature sensor**: 1° resolution between -10° and +40° C
- **Cable**: 50m standard (20-100m options). 12.8mm Ø

**ACCURACY/PERFORMANCE**

Accuracy is based on the correct speed of sound being entered, no ray bending and an acceptable S/N ratio.

- **Position accuracy**: 0.45% of slant range, acoustic repeatability 0.25° DRM at > 10° depression angle
- **Range resolution**: Calculated to 0.01m resolution
- **Max range**: Up to 2000m, range limited version available (995m)
- **Frequency band (MF)**: 18 - 32 kHz
- **Tracking beam pattern**: 150°
- **Transmitter**: Variable, typical max 192dB re 1µPa at 1m
- **Beacon types**: AAE Sigma 1, Sigma 2 Digital spread spectrum and MiQ telemetry. AAE V-NAV channels.
- **Series Beacons**: Digital depth transponders, AAE Release Beacons.
- **Interrogation rate**: >2Hz refresh rate. Internally set or external key (NAV IN). Multi-Fire up to 10 common interrogate beacons

5cm Heave, 2cm Delayed Heave

Options:
- Post-processing with Qinertia PPK

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**EASYTRAK PYXIS TRANSCEIVER, TYPE 3780**

Factory calibrated multi-element transceiver head complete with integral IMU, depth sensor and temperature sensor.

**EZT-3780-N**  Range limited, non-export controlled model.

**EZT-3780-C**  Export controlled model.

- **Material**: Stainless steel as standard
- **Weight in air**: 20.0kg
- **Dimensions**: 200mm Ø reducing to 152mm Ø x 432mm
- **Temperature**:
  - Operating: -10° to +40°C
  - Storage: -20° to +50°C
- **Depth rating**: 30m
- **Electrical supply**: 48Vdc (from console)
- **Depth sensor (Pressure sensor)**: 5 bar, accuracy 0.25% between -10° to +40° C
- **Temperature sensor**: 1° resolution between -10° and +40° C
- **Cable**: 50m standard (20-100m options). 12.8mm Ø

**ACCURACY/PERFORMANCE**

Accuracy is based on the correct speed of sound being entered, no ray bending and an acceptable S/N ratio.

- **Position accuracy**: 0.1% of slant range, acoustic repeatability 0.07° DRM at > 10° depression angle
- **Range resolution**: Calculated to 0.01m resolution
- **Max range**: Up to 3000m, range limited version available (995m)
- **Frequency band (MF)**: 18 - 32 kHz
- **Tracking beam pattern**: 180°
- **Transmitter**: Variable, typical max 192dB re 1µPa at 1m
- **Beacon types**: AAE Sigma 1, Sigma 2 Digital spread spectrum and MiQ telemetry. AAE V-NAV channels.
- **Series Beacons**: Digital depth transponders, AAE Release Beacons.
- **Interrogation rate**: >2Hz refresh rate. Internally set or external key (NAV IN). Multi-Fire up to 10 common interrogate beacons

5cm Heave, 2cm Delayed Heave

Options:
- Post-processing with Qinertia PPK

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### Integrated Navsight Apogee INS

#### Roll / Pitch over 360°
- RTK (Real Time Kinetic): 0.008° rms
- PPK (Post Processed Kinetic): 0.005° rms

#### Heading 2m / 4m (baseline)
- 0.04 / 0.025° rms
- 0.02 / 0.02° rms

#### Position x, y / altitude (z)
- 0.01m / 0.02m
- 0.01m / 0.02m

5cm Heave, 2cm Delayed Heave

Options:
- Post-processing with Qinertia PPK

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### TRANSEIVER PERFORMANCE

<table>
<thead>
<tr>
<th>Transceiver Model</th>
<th>Console Model</th>
<th>Beam Pattern</th>
<th>Acoustic Precision Degrees</th>
<th>Acoustic % Slant Range</th>
<th>INS Precision</th>
<th>Position Stability % Range</th>
<th>Max Range</th>
<th>Range Resolution</th>
<th>UK Export Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>3781 - N</td>
<td>EZT-3790</td>
<td>180°</td>
<td>0.25° DRM</td>
<td>0.45%</td>
<td>0.025° H</td>
<td>0.008° P&amp;R</td>
<td>0.49%</td>
<td>995m</td>
<td>0.01m</td>
</tr>
<tr>
<td>3781 - C</td>
<td>EZT-3790</td>
<td>180°</td>
<td>0.25° DRM</td>
<td>0.45%</td>
<td>0.025° HDG</td>
<td>0.008° P&amp;R</td>
<td>0.49%</td>
<td>2000m</td>
<td>0.01m</td>
</tr>
<tr>
<td>3780 – N</td>
<td>EZT-3790</td>
<td>150°</td>
<td>0.07° DRM</td>
<td>0.12%</td>
<td>0.025° HDG</td>
<td>0.008° P&amp;R</td>
<td>0.12%</td>
<td>995m</td>
<td>0.01m</td>
</tr>
<tr>
<td>3780 – C</td>
<td>EZT-3790</td>
<td>150°</td>
<td>0.07° DRM</td>
<td>0.12%</td>
<td>0.025° HDG</td>
<td>0.008° P&amp;R</td>
<td>0.12%</td>
<td>3000m</td>
<td>0.01m</td>
</tr>
</tbody>
</table>

Accuracy is based on the correct speed of sound being entered, no ray bending and an acceptable S/N ratio. Position repeatability, calibrated and measured with SNR > 20dB rel. 1µPa in a controlled test environment.

*Specification subject to change without notice Applied Acoustic Engineering Ltd September 2020.*