



# PATRIOT

THE FAST AND AFFORDABLE DIGITAL TRACKER

## THE AFFORDABLE ANSWER

PATRIOT™ is the cost effective solution for six-degrees-of-freedom tracking and 3D digitizing from Polhemus, the pioneer in 3D position/orientation measuring devices. A perfect answer for the position/orientation sensing requirements of 3D applications and environments where cost is a primary concern, it's ideal for head tracking, biomechanical analysis, computer graphics, cursor control, and stereotaxic localization.

## ▶ FEATURES

- ▶ **Cost Effective**  
Provides position/orientation data at a minimum cost.
- ▶ **Ease of Use**  
Install and operate in minutes.
- ▶ **Multiple Output Formats**  
Position in Cartesian coordinates (inches or centimeters); orientation in direction cosines, Euler angles, or quaternions.
- ▶ **Multiple Sensor Operation**  
Permits measurement of up to two sensors with a single system. No additional electronic units are required.
- ▶ **Reliable**  
Factory calibrated, never needs adjustment.

## Two Solutions in One

The PATRIOT is a 3D digitizer and a dual sensor motion tracker, making it perfect for a wide array of applications requiring medium resolution, accuracy, and range. Computing the position and orientation of a small sensor as it moves through space, provides dynamic, real-time measurements of position (X, Y, and Z Cartesian coordinates) and orientation (azimuth, elevation, and roll).

## Real-time Measurement

Measuring position and orientation in real time, the PATRIOT can update data continuously, discretely (point by point), or incrementally. You can mount up to two sensors on head or hands to capture real-time data for virtual reality or simulator environments. With the optional stylus, you can trace the outline of a physical object or collect polygon facets and get pinpoint accuracy of unlimited X, Y, and Z data points.

## A/C Magnetics

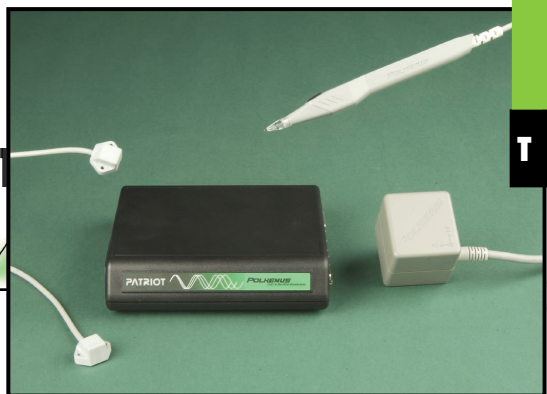
Quiet and stable, the system is essentially unaffected by facility power grids. Update rates are always maintained, as A/C magnetics offer the best signal-to-noise ratios and incorporate sophisticated digital signal processing capabilities. In addition, adaptive filtering is available as a standard feature.

## ▶ APPLICATIONS

- ▶ **Virtual Reality**  
From the beginning, Polhemus 3SPACE® systems have been the top choice for VR head and body tracking. PATRIOT does it all for less.
- ▶ **Head-mounted Displays**  
A high quality military, VR, and simulator solution, PATRIOT is also the most economical.
- ▶ **Biomechanical Analysis**  
Collect real-time relative movement data for gait and limb analysis. Perfect for leg, knee, joint, spinal, or shoulder rotational movement.
- ▶ **Graphics**  
Easily changes and controls the lighting of computer generated images in real time, with the ability to move objects on screen without the loss of environmental changes (i.e., lighting and shadowing).
- ▶ **Stereotaxic Localization**  
Mounted on any non-metallic object (such as a robotic prosthesis), the sensor determines its position and orientation.
- ▶ **CAD Database**  
Perfect low cost tool for developing databases of complex, non-metallic objects for CAD, CAE, computer graphic models, or simulation with optional stylus.
- ▶ **Dimensional Archiving**  
Collect the actual dimensions of artifacts, archaeological items, museum sculptures, and other items.

# PATRIOT

## TECHNICAL SUMMARY



### COMPONENTS

The PATRIOT system includes a System Electronics Unit (SEU), a power supply, one sensor, and one source. You can expand the system's capabilities simply by adding an additional sensor.

#### System Electronics Unit

Contains the hardware and software necessary to generate and sense the magnetic fields, compute position and orientation, and interface with the host computer via an RS-232 or USB 1.1 interface.

#### Source

The source contains electromagnetic coils enclosed in a plastic shell that emit the magnetic fields. The source is the system's reference frame for sensor measurements.

#### Sensor

The sensor contains electromagnetic coils enclosed in a plastic shell that detect the magnetic fields emitted by the source. A lightweight cube, the sensor's position and orientation is precisely measured as it is moved. The sensor is completely passive, having no active voltage applied to it.

### SPECIFICATIONS

#### Position Coverage

The system will provide the specified performance when the sensors are within 30 inches of the standard the TX2 source (42 inches with the TX4). Operation at greater ranges will result in slightly degraded performance.

#### Latency

20 milliseconds (without software filter)

#### Update Rate

60 Hz (fixed)

#### Interface

RS-232 with selectable baud rates up to 115.2 K USB 1.1 (high speed)

#### Static Accuracy

0.1 inches RMS for the X, Y, or Z position; 0.75° RMS for sensor orientation

#### Resolution

0.0015 inches per inch of source and sensor separation; 0.1° orientation

#### Range

Up to five feet with the TX2 source; enhanced signal stability with TX4

#### Synchronization

Measurements cycle may be synchronized to an internal clock pulse

#### Angular Coverage

The sensors are all-attitude

#### Operating Environment

Large metallic objects, such as desks or cabinets, located near the source or sensor, may adversely affect the performance of the system

#### Operating Temperature

10°C to 40°C at a relative humidity of 10% to 95%, noncondensing

#### Communications

System outputs using RS-232 or USB 1.1 interface

#### Physical Characteristics

SEU - 6.75"L x 6.25"W x 1.75"H

Power Supply - 3.5"L x 2.4"W x 1.4"H

Source - 2.3"L x 2.2"W x 2.2"H (standard 2") or (4")

Sensor - 0.9"L x 1.1"W x 0.6"H

#### Power Requirements

10W, 100-240 VAC, 47-63 Hz

PATRIOT is a trademark of Polhemus

**POLHEMUS**  
First in the third dimension®

The systems are not certified for medical or bio-medical use. Any reference to medical or bio-medical use are examples of what medical companies have done with the systems after obtaining all necessary or appropriate medical certifications. The end user/OEM must comply with all pertinent FDS/CE and all other regulatory requirements.

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