

# GPS Commentary Delivery Unit

## Technical Description

### Overview

The Turning Points Soundscape GPS commentary delivery unit ("the unit") is designed to play audio commentaries at pre-defined geographical locations.

### Operation

The GPS sub-system reports the location of the unit to the application once every second. The GPS also reports heading and speed.

Based on the data from the GPS, the software decides whether and/or when to play an audio string. The software is based on the concept of "events".

In its simplest form, an event contains a latitude and longitude and a range. If the unit's location is within the specified range of the specified location, the audio string will play.

Once an audio string has played, it will not be repeated until the system is reset. A system reset is not the same as restarting the unit. The software maintains a non-volatile record of events played.

**There are more aspects to event definition, eg:**

**Direction:** An event will only trigger if the unit is moving in a certain direction, within a specified tolerance (eg  $187^\circ \pm 45^\circ$ )

**Location:** The geographical location may indicate the start of the audio string, or the end of it or even a mid-point

**Speed:** An event will only trigger at above or below a specific speed

**Time:** An event will only trigger before or after a specified time

**Date:** An event will trigger on, before or after a specified date, or will only trigger on certain days of the month, or months of the year or days of the week.

Events may be "linked" together. That is, one event can be set to only play if another event has already occurred. Or, vice versa, the playing of one event can prevent the playing of specified other events.

The audio associated with an event may be one, two or three individual audio strings, which are seamlessly concatenated. The audio may also have an introductory or an outro "sting".

The software uses a "predictive load" function to ensure that the audio is delivered at the correct time. This allows for the intervals between successive GPS data reports.

Any event may perform other actions, for example, resetting the system. The system maintains a continuous log of the location, speed and heading of the unit, as well as recording the time and location of system events (such as an audio event playing or a button being pushed or the system powering up).

### Hardware

#### Power

The unit runs from an external power supply, at either 12v or 24v DC.

#### Output

The unit provides audio output at Line or Speaker level for connection to an external amplifier.

#### GPS

The unit uses an external GPS antenna, usually mounted on or just under the roof of a vehicle.

#### Multiple Languages (option)

The basic unit can be configured to deliver two languages (using the left and right channel separately). As an option, up to 10 multiple simultaneous languages can be used. The system can store many languages from which the 2, 6, 8 or 10 languages can be selected.

#### Audio input (option)

The unit has an audio input which can be directed to the output, or can be faded down to be replaced by the system-generated audio narratives.

#### Inside the box

The unit uses a single-board PC with a National Semiconductors Geode GX1 6x86 processor and an ET-102 Global Positioning System sub-circuit.



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## Technical Description (continued)

### Content format

Audio narrative content files are stored in either WAV or MP3 format.

### Data storage

The audio files, event list and the application itself are all stored, in an encrypted format, on a removable "data key". This key can be externally accessed to allow easy removal and replacement for different applications (or routes), or can be totally contained, thus restricting access.

There is also a version using a hard drive as an alternative to the data key – allowing far greater storage capacity. This option is needed for multiple languages. The hard drives are designed for mobile use and can withstand g-forces in excess of 250g and high levels of vibration.

### User interaction

There is no user interaction required for operation of the unit. In coach applications, the unit is connected to the battery supply and thus switches on whenever the coach is in use. The system does not require the driver to reset it (this is done automatically based on events) nor press any button or lever or pedal in order to activate an audio narrative.

There are two buttons available on the unit which may be software programmed to perform, for example, a manual reset or a repeat function.

### Optional user interface

A small (17cm) touch screen can be provided to allow interaction with the system. (Requires 12v supply).

The screen can be used for selection of routes – where one location may have different events according to subject matter – or for language selection.

### Software

The unit runs the Microsoft Windows operating system and a bespoke application developed in the C++ programming language.

### Mounting

The unit can be shelf or panel mounted (similar to on-board video, CD or DVD players). The unit has 4 x M4 threaded clinch-nuts for mounting.

### Dimensions

Basic unit:	285mm x 185mm x 58mm
Multi-language unit:	285mm x 185mm x 95mm



- 1 Basic delivery unit
- 2 Multiple language delivery unit with optional touch screen monitor



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