Assessment

Teams

This assessment is to be carried out by teams of students completing and combining workpackages to produce a single shared product. A student remains in one team and works on one workpackage throughout. There are four assessment points for each team: three *sprints* and a final *peer assessment*:

1. *Sprint 1* (30%): **Friday February 23rd 2017** (Week 6);
2. *Sprint 2* (30%): **Friday March 9th 2017** (Week 8);
3. *Sprint 3* (30%): **Friday March 23rd 2017** (Week 10);
4. *Peer Assessment* (10%): **Friday March 23rd 2017** (Week 10).

Sprints

A sprint submission consists the product *source code* and a *showcase*. The source code is all of the Java source code needed to build the product. The showcase is a short film in a common video format such as MP4 that gives a good idea of how the product operates — no more than two minutes per student, perhaps shot on a mobile phone. It should be made clear who is responsible for which part of the source code and the showcase. Each sprint submission should be made electronically, using the link provided on the module page to the Harrison E-submit system. A submission should be a single ".zip" file for the team, whose name is of the form "Team*X*Sprint*Y*.zip' [1].

Half of each student sprint mark is for the product as a whole at the point of submission (that is, for all work packages), and the other half is for their particular contribution (that is, for a single workpackage).

Peer Assessment

At the end of the project each team member will be asked to anonymously rate the contribution of every other team member to the project (but not themselves). These ratings will be used to calculate a peer assessment mark.

1 Please use the traditional ZIP format, rather than other formats such as 7Zip, GZIP, BZIP2, etc.

Requirement

The requirement is to implement an on-screen simulation of a hand-held GPS device, loosely modelled on the Garmin eTrex 20x and called the XTrek. See Figure 1. The XTrek is a hand-held device measuring 54mm × 103mm × 33mm. On the front, it has an LCD display; on the left it has +/- and Select buttons; on the right it has a Menu button; and at the top it has an On/Off Button. The implementation of the simulation is to be organised into five work packages, as outlined below.

Work Package 1: On/Off and Menu Modes

Work Package 1 is to implement the **On/Off** and **Menu** modes of the simulation.

Initially, the XTrek is in **On/Off Mode**. In **On/Off Mode**, the LCD display is blank. The On/Off button is enabled and all other buttons are disabled. In this mode, when the On/Off button is pressed the XTrek continues to **Menu Mode**.

In **Menu Mode**, the LCD display shows six menu tiles. See Figure 2. The +/- buttons,

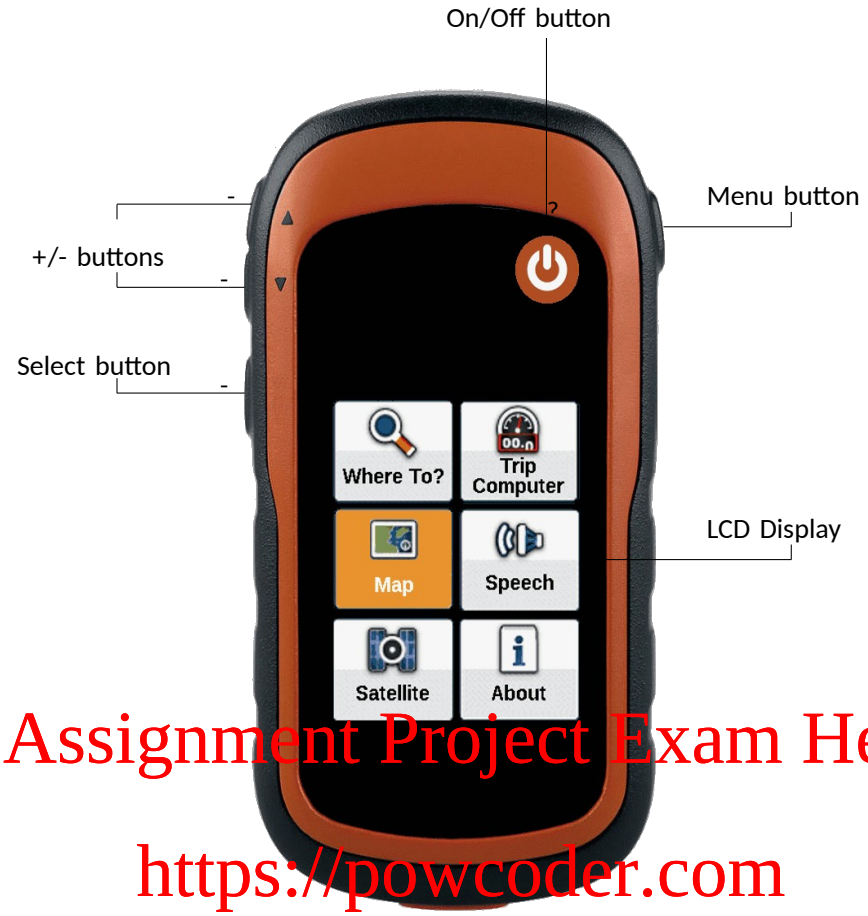

Figure 1: The XTrex

Figure 2: On/Off Menu mode. the Select button and the On/Off buttons are all enabled. All other buttons are

disabled. In this mode, when the +/- buttons are pressed, the menu tile highlighted cycles forwards or backwards through the tiles. In this mode, when the Select button is pressed and the tile highlighted is “Where To?”, the XTrek continues to **Where To? Mode**; when the tile highlighted is “Trip Computer”, it continues to **Trip Computer Mode**; when the tile highlighted is “Map”, it continues to **Map Mode**; when the tile highlighted is “Speech”, it continues to **Speech Mode**; when the tile highlighted is “Satellite”, it continues to **Satellite Mode**; and when the tile highlighted is “About”, it continues to **About Mode**. In this mode, when the On/Off button is pressed the XTrek continues to **On/Off Mode**.

Work Package 2: Where To? and Trip Computer Modes

Work Package 2 is to implement the **Where To?** and **Trip Computer** modes of the simulation.

In **Where To?** mode, the LCD display shows the current destination address (which may be either a place name, such as “CHAGFORD”, or a postcode, such as “TQ13 8AH”), and either a virtual alphabetic or a virtual numeric keyboard. See Figure 3. The +/-

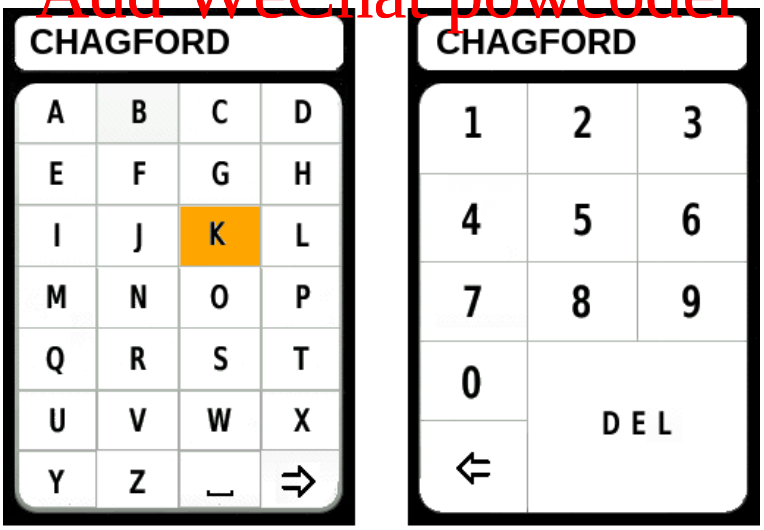

Figure 3: Where To? mode.

buttons, the Select button, the Menu button and the On/Off buttons are all enabled. All other buttons are disabled. In this mode, when the +/- buttons are pressed, the virtual key highlighted cycles forwards or backwards; when the Select button is pressed, the virtual key highlighted is added to the current destination address, unless it is the '⇒' key or the '⇐' key, in which case the virtual keyboards are swapped, or the 'DEL' key, in which case the last key added to the current destination address (if any) is removed. In this mode, when the Menu button is pressed, the XTrex continues to **Menu Mode**, and when the On/Off button is pressed, it continues to **On/Off Mode**.

In **Trip Computer** mode, the LCD display shows progress towards the destination address, in the form of odometer, speed and moving time readings. See Figure 4. The Menu

Figure 4: Trip Computer mode.

and On/Off buttons are enabled. All other buttons are disabled. In this mode, when the Menu button is pressed, the XTrex continues to **Menu Mode**, and when the On/Off button is pressed, it continues to **On/Off Mode**.

Work Package 3: Map Mode

Work package 3 is to implement the **Map Mode** of the simulation.

In **Map Mode**, the LCD display shows a map centred on the position of the XTrek, rotated to reflect its direction of travel. A red dot appears at the centre of the display. See Figure 5. The +/- buttons, the Menu button and the On/Off buttons are all enabled. All other buttons are disabled. In this mode, when the +/- buttons are pressed the magnification of

the map is either increased or decreased; when the Menu button is pressed, the XTrex continues to **Menu Mode**; and when the On/Off button is pressed, it continues to **On/Off Mode**.

Work Package 4: Speech Mode

This work package should not be attempted by a team of four students.

Figure 5: Map mode.

Work Package 4 is to implement the **Speech Mode** of the simulation.

In **Speech Mode**, the XTrex may be set to speak turn-by-turn directions in a chosen language as a journey is made. Examples of such directions might be “Turn right onto Longbrook Street.” or “Slight left towards Prince of Wales Road.”. See Figure 6. The

Figure 6: Speech mode.

+/- buttons, the Select button, the Menu button and On/Off buttons are all enabled. All other buttons are disabled. In this mode, when the +/- buttons are pressed, the chosen language cycles forwards or backwards through the possibilities; when the Select button is pressed, the chosen language is set. In this mode, when the Menu button is pressed, the XTrex continues to **Menu Mode**, and when the On/Off button is pressed, it continues to **On/Off Mode**.

Work Package 5: The Satellite and About Modes

Work Package 5 is to implement the **Satellite** and **About** modes of the simulation.

In **Satellite Mode**, the XTrex displays its position, if possible; otherwise, it displays a message saying that its position cannot determined. See Figure 7. The Menu button and

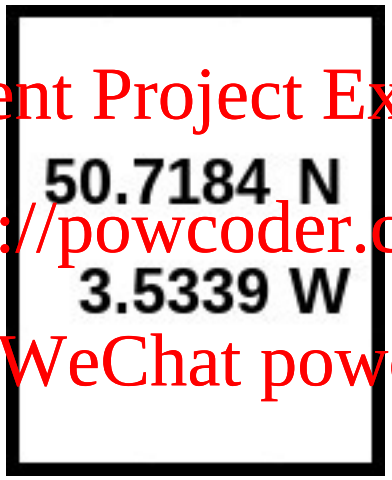

Figure 7: Satellite mode.

the On/Off buttons are both enabled. All other buttons are disabled. In this mode, when the Menu button is pressed, the XTrex continues to **Menu Mode**, and when the On/Off button is pressed, it continues to **On/Off Mode**.

In **About Mode**, the XTrex displays information about the XTrek. See Figure 8. The

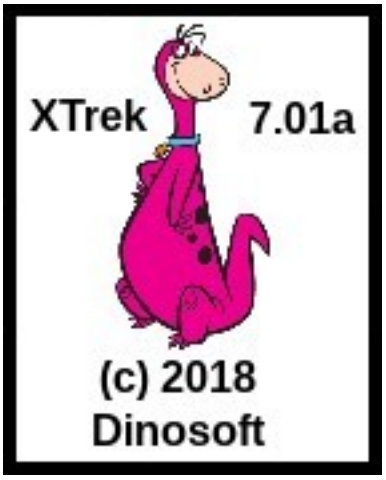

Figure 8: About mode.

Menu button and the On/Off buttons are both enabled. All other buttons are disabled.

In this mode, when the Menu button is pressed, the XTrex continues to **Menu Mode**, and when the On/Off button is pressed, it continues to **On/Off Mode**.