

Tacktick Limited T070 Race Master Operational Description

Introduction

This document is to be read in conjunction with the 'Tacktick Limited T070 Race Master Block Diagram'. The functionality of each block shown on the diagram is expanded in this document.

Microprocessor

This device stores the operating software in its on board flash and system data in its on board RAM. The software controls the operation of the T070 Race Master. The software can be upgraded in circuit by connecting the programming port to a PC running the appropriate development environment.

The microprocessor uses a precision voltage reference against which to measure inputs through its built in 8 channel ADC.

An external supervisor chip is used to ensure that the microprocessor is reset if it fails to produce a periodic strobe signal.

Batteries and Recharging Circuit

The unit runs from four internal, rechargeable lithium coin cells. These cells can be recharged using the integral solar cell.

Flux Gate Compass

The microprocessor provides an output signal that excites the flux gate compass. This circuit interacts with the earth's magnetic field. The flux gate compass produces signals that are read through ADC inputs on the microprocessor. This data is used to determine the current heading with respect to the earth's magnetic field.

Backlight Circuitry

The display and keys on the unit are backlit using LEDs. The microprocessor provides a PWM waveform to the backlighting circuit. The illumination level used is determined by the user.

Key Drive and Read Circuitry

The unit has 4 keys. The circuitry for these keys is driven by the microprocessor and the corresponding key read signals are decoded by the microprocessor.

Buzzer Drive Circuitry

The buzzer drive circuit is driven by a PWM output from the microprocessor.

LCD Drivers and Displays and Associated Interface Circuitry

The LCD drivers and displays are driven from a different voltage to the microprocessor circuitry, therefore an interface circuit is required to connect the two circuit blocks. A closed loop controller run by the microprocessor regulates the LCD voltage rail. The microprocessor outputs the control and data signals required by the LCD drivers.

Radio Transceiver Circuit and PCB Antenna

The unit communicates with other units in the network across a wireless data link. The microprocessor sends configuration sentences to the radio transceiver chip. The data link between the microprocessor and the radio chip is half duplex. The RF signals are transmitted / received using a PCB track antenna.