The GAME CLOCK user manual

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Overview

The default GAME CLOCK firmware has 4 modes of operation:

1) Clock mode: displays the current time.
2) Game mode: displays two timers, each for one player.
3) Setup mode: displays setup options for the time, screen brightness, game settings, sound or ZigBee activation.
4) Sleep mode: when in clock mode for a while, the GAME CLOCK enters sleep mode, displaying nothing, in order to conserve energy.

The GAME CLOCK can be powered by two AA batteries or USB. When USB is plugged, it takes priority over the batteries as a source of power. The RTC clock needs a separate CR2032 battery to keep time.

When powering up the GAME CLOCK using the on/off switch, the device starts in Clock Mode. At this point:

- Pressing the left button or the right button immediately starts a game.
- Pressing the center button enters setup mode.

The Game mode can be exited at any time by pressing the central button for 2 seconds and releasing the button. Pressing the central button more briefly pauses the game instead.

Playing a game

The GAME CLOCK software was initially designed for blitz chess, where players are expected to play a game within strict time limits. The GAME CLOCK can, however, be configured for many other types of time-limited games.

The default firmware comes with 5 game programs: a 3-minute, a 5-minute, a 10-minute, a 15-minute, and a 90-minute program. These can be changed through the setup menu to suit any duration.

After powering up the device for the first time and pressing either the right button or the left button, the device starts program 1 by default, a 3-minute program. The display shows:

The left side counter immediately counts down, and the player on the left is expected to make a move and then press the left button. After the button is pressed, the counter of the left player gets a 2-second bonus added to his/her time left. If the left player acts really fast, he may end up with more time left after his move than what he/she had before.

Once the left player has pressed the button, signaling the end of his/her turn, the counter on the right begins to count downwards. The right player is now expected to make a move and press the right button.

Left and right players take turns until one of the players loses by reaching zero time left. Note that during the last minute of gameplay, the time is displayed with fractions of a second for additional excitement!

The game program can be changed through the setup process described in the next section of the manual. The total duration played by each player as well as the bonus time added at each round is fully configurable.

Setting up the game clock

When the GAME CLOCK is in Clock mode, pressing the center button enters setup mode. Repeated presses of the central button allow access to various setup categories of parameters in the order described hereafter. The left and right buttons allow making changes to individual settings. To make setting changes permanent, don't forget to use the "stash" operation described below.

"Prog"

When the screen shows "Prog," you can select one of the 5 games programs available. Each program can be changed by defining game duration (minutes and seconds) and extra bonus time (seconds) added after a turn is completed.

"dAte"

This allows configuring the RTC clock (hour, minutes and seconds).

"Light"

This allows configuring the brightness of the led display (0 to 15).

"node"

This configures whether the onboard 3.3V voltage regulator powering the Zigbee header is activated or not. When no Zigbee daughter board is present, it is recommended to keep this setting to "off" to reduce battery consumption.

"Sound"

This configures whether the GAME CLOCK buzzer is active or not.

"StASh"

Normally all setting changes are lost when the GAME CLOCK is turned off. Use this option to make the setting permanent, keeping them stored in the EEPROM of the microcontroller.

Back connectors

The back of the GAME CLOCK holds the AA batteries and the CR2032 RTC battery. It also features 3 sets of connectors, from left to right:

- A six-pin serial 5V interface, which allows programming the GAME CLOCK using a USB to serial adapter in the Arduino IDE.
- A 2x3 ICSP programming interface that allows programming the GAME CLOCK with an AVR programmer.
- A Zigbee-compatible 2x10 header, to add an optional Zigbee wireless transmitter.

To use the six-pin serial 5V interface, it is recommended to solder a 6 pin angled female header that can easily plug into your USB serial adapter, even with the back transparent acrylic cover.

For more information on hacking the GAME CLOCK see:

http://omzlo.com/articles/the-game-clock

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