Overview of the CircuitShell GPC1 Board

The GPC1 board is a bare printed circuit board offered by CircuitShell to demonstrate use of CircuitShell enclosures in a microcontroller application. The board is specifically designed for the Philips P89C66X line of 8051 type microcontrollers. These devices were chosen because of their powerful peripherals and an integrated boot loader which allows programming of flash memory directly through the serial port using FlashMagic, which is a free download from Embedded Systems Academy (ESacademy.com). The GPC1 board is designed using mostly through-hole parts for ease of hand assembly. Complete documentation for the GPC1 is posted at CircuitShell.com. A FlashMagic compatible GPC1TEST1 file can be downloaded from CircuitShell.com to test the basic features of the assembled board. The microcontroller can be RESET or put into PROGRAM MODE either by using the board mounted ON switch or by a 'break' condition on the serial port received data line. A Windows program BREAKGEN can be downloaded from CircuitShell.com to generate breaks allowing remote control of RESET or PROGRAM MODE. The GPC1 board was designed with special attention to power management, using the alarm feature of a battery-backed Real-Time Clock to turn power on for scheduled or periodic tasks, after which the processor can turn power off again. Assembly of the board will require considerable soldering skill and knowledge of electronic hardware. Regrettably, CircuitShell does not have adequate staff to offer support if problems arise during assembly and testing of the GPC1 board. CircuitShell will feature selected user applications of the CircuitShell Enclosures and the GPC1 board in its Application Gallery at CircuitShell.com.

Principal Features of the CircuitShell GPC1 Board

- Hand-Held or Wall-Mounted board, 5.5 inches square, for clear or opaque CircuitShell covers
- 7-16VDC input to 2.1mm power jack; self-resetting fuse; brownout and reverse polarity protected
- On board 7.2V, six AAA battery holder with charger and ADC sensing of battery condition
- Supports standard 2x16 or 4x20 LCD displays including photocell or port-controlled backlight
- LCD can be operated as either a memory or port device
- Board-mounted ON and OFF switches, with off current less than one microamp from battery
- User prototype and daughter-board area with user DB15 connector
- User buss provides access to power, port pins, on/reset, sound, ADC, DAC, interrupts, spare input
- Versatile 4 channel ADC and single channel DAC using I2C connected Philips PCF8591
- Battery or super-cap backed-up I2C Real-Time Clock(RTC) in either DIP or SO8 package
- Port controlled sound generator also signals entry of PROGRAM MODE
- Board-mounted LEFT, RIGHT, INC, DEC cursor control switches can interrupt or be polled
- RS-232 transceiver supports two serial com ports for P89C669 compatibility
- Spare input to 74HC14 available on serial connector for GPS pulse-per-second or other use
- Both fused input power and 5VDC available on serial connector for external devices
- RESET or PROGRAM MODE can be remotely controlled by a serial port input break condition
- RTC Alarm turns power on for scheduled or periodic tasks, after which processor can turn power off
- ON switch doubles as RESET if power on, and activates PROGRAM MODE if held for one second