NOTES & ERRATA FOR PROJECTS PUBLISHED IN SILICON CHIP (2009)

Please note: errata apply primarily to the print edition of SILICON CHIP as online issues are normally changed when an error is identified. However some errata may still apply to the online edition; check carefully before making any changes to a project.

433MHz UHF Remote Switch, January 2009: RCS Design has produced a relay PC board to allow use of board-mounting relays with the 433MHz Remote Switch receiver. You can use the Jaycar SY-6066 3A SPDT relay for low-voltage use and the Jaycar SY 4080 for 250VAC use. The PC board is coded 15101093 (with provision for two SY-4066 relays and one SY-4080 relay) or 15101094 (with provision for one SY-4066 and one SY-4080 relay). Visit **www.rcsradio.com.au** (03/09)

Dual-Booting With Two Hard Drives, January 2009: The command given for opening the menu.lst file in both step 3 on page 15 and step 2 on page 17 is incorrect. It should read: **sudo gedit /boot/grub/menu.lst** (ie, there must be a space after "gedit"). (05/09)

Universal Speed Control, February 2009: The circuit shows the fast recovery diode as STTH3012W (30A/1200V) whereas the parts list shows it as STTH1512W (15A/1200V). The STTH1512W (15A/1200V) is the required device. The 30A diode is in a larger TOP-3 package and so is unsuitable. (03/09)

Time Delay Photoflash Trigger, February 2009: On page 72, the paragraph on step 17, referring to setting links LK1-LK4 should be ignored. This paragraph referred to an earlier version of the circuit. (04/09)

Theremin MK2, March 2009: Two 470uF capacitors are used in the circuit. The 25V capacitor on the parts layout diagram is the one just above REG1. In addition, the 100k resistor shown connected from the base of Q4 to 9V on both the circuit and layout diagrams is incorrect. It should be 330k. This resistor is located between the two top earth terminals of transformers T3 and T4. Finally, the parts list should show 10 100nF MKT capacitors (not 8). (04/09)

GPS Synchronised Clock, March 2009: (1) The circuit for experimenting with the GPS module (Fig.4) should include a 4.7k resistor in series between pin 12 of the MAX232 IC and pin 3 of the GPS module. In addition, there should be a 10k resistor from pin 3 of the GPS module to ground. Without these modifications the EM-408 GPS module may be damaged by excessive voltage on pin 3 (serial data input). Also, the set-up cable for connecting the clock controller to a PC had the tip and ring of the phono plug swapped compared to the standard download cable used by Revolution Education. The PC board and cable shown in Fig.3 will work correctly as described but the cable is not suitable for programming PICAXEs. (04/09)

(2) In Fig.1 & Fig.2, the 3V & 5V markings for the GPS voltage selection are reversed. To set the circuit to 3.3V, to suit the EM-408 module, the jumper must be placed on the pair of pins nearest the PIC microcontroller, ie, opposite to that shown in the photographs. (05/09)

Serviceman's Log, March 2009: On page 56, the web address given to obtain the anti-spyware program "Ad-Aware" is incorrect. It should be **www.lavasoft.com** Note that a freeware version is available. Note also that this software is from Lavasoft, not Grisoft as stated in the article. (05/09)

Temperature Probe For Hot Water System, Circuit Notebook, March 2009: The text on page 76 has the instructions for calibrating VR1 and VR2 transposed. (06/09)

Multi-Function Remote Controlled Lamp Dimmer, April 2009: To further secure the mains wiring, we recommend that an additional cable tie be added to secure the Active, Neutral & Earth leads immediately after the connections to the IEC socket (see photo on page 99 of the May 2009 issue). A second cable tie can then be added to secure the leads going to the GPO socket. (05/09)

School Zone Speed Alert, April 2009: When setting the current time or any of the speed zone start or finish times, take care to end the setting process using a second press of the same pushbutton switch S1-S5 used to begin that setting process.

If you accidentally press another of these switches, the firmware may "lock up" and you'll need to unlock it by pressing the reset button S10 and holding it down for about five seconds. You will then have to re-set both the current time and any of the start and finish times that have been customised, because resetting causes a return to all of the default values. (05/09)

230VAC 10A Full-Wave Motor Speed Controller, May 2009: (1) The two 5W resistors shown on the parts overlay (Fig.10, page 42) as 4.7 ohms should both be 4.7k ohms. The photograph, parts list and circuit shows these correctly as 4.7k. In addition, pin 13 for IC2f on the circuit (Fig.9, page 40) should be labelled as pin 15. (06/09)

(2) The references to IC1a & IC1b and to IC3a & IC3b in the text should be swapped to agree with the block diagram on page 39 and circuit diagram on page 40 (the references to IC3a & IC3b for the current monitoring circuit description are correct). (07/09)

(3) Due to a tendency to high-frequency oscillation in comparator IC1b at the moment of switch on for the IGBT (Q1), it is possible that Q1 will be damaged with some types of load. The typical damage to the IGBT is a short circuit between emitter and collector; the motor then runs at full speed. Usually no other components are damaged. The cure involves three small changes to the circuit: (i) Connect a 220pF 50V ceramic capacitor between pin 7 of IC2c and ground; (ii) Connect the collector of transistor Q4 to the wiper of speed pot VR1, instead of to the output of the IC1b. This prevents high-frequency oscillation during over-current events and provides a softer restart after an overload; (iii) Increase the 10k resistor from Q4's base to ground to 100k; the over-current protection now starts at about 26A instead of 48A.

The revised circuit and PC board overlay diagram in the *Ask Silicon Chip* pages of the September 2009 issue show these changes: (i) the 220pF capacitor is installed underneath the PC board between pins 7 & 8 of IC2; (ii) the track from the collector of Q4 to the 4.7k resistor is cut and connected to the "+" side of the adjacent 10uF capacitor using a short length of tinned copper wire; (iii) the 100k resistor is just below IC4 and one end connects to IC4's pin 7 (GND). (09/09)

6-Digit GPS Clock, May-June 2009: (1) A 100uF 16V capacitor has been omitted from the circuit on page 22. It is shown on the PC board overlay and is adjacent to transistor Q14. (07/09)

(2) As Mr Kevin Olds noted in the August 2009 issue (page 9), the seconds display updating was delayed by about 300ms every five seconds when the clock was being driven by the EM-408 GPS receiver module. This was due to the extra "GPGSV" or "GPS satellites in view" data sentences inserted by the EM-408 module into its data stream output every fifth second, ahead of the GPRMC sentence from which we were extracting the UTC time information. The method chosen by Mr Olds to avoid this delay was to reprogram the EM-408 from his PC so that it no longer inserted the GPGSV sentences into the data stream every five seconds. This certainly solves the problem but other readers found the method unappealing because it involves sending commands to the EM-408 module from their PC, via an RS-232 serial link. That being the case, designer Jim Rowe has found another way of solving the problem: by modifying the firmware in the GPS Clock's PIC micro so that it extracts the time information from the GPGGA sentences instead of the GPRMC sentences. This prevents the inserted GPGSV sentences from delaying the seconds display updating, because the EM-408 module sends out the GPGGA sentences at the start of each second's data stream. The revised "Version 3" firmware for the GPS Clock's PIC controller will be available from the *SILICON CHIP* website by the time this note is published, for free downloading. Those who find the "short delay every five seconds" too irritating can therefore remove it, simply by reprogramming their PIC16F877A micro with this new Version 3 firmware. (10/09)

(3) As noted on page 100 of the October 2009 issue, designer Jim Rowe modified the GPS Clock's firmware program to extract the time information from the GPGGA sentences rather than the GPRMC sentences available from the output of the EM-408 receiver module, in order to remove the 300ms delay which occurred in the seconds display every five seconds. This modification (in "Version 3" of the firmware) achieved the desired aim when the clock was displaying local standard time but as a number of readers have later found, there was a still-hidden bug which only made itself known when the clock was switched into displaying daylight saving time: every so often (usually in the very early hours of the morning), it would "hang" – with a blank display apart from the daylight saving mode indicator LED. On investigation, this turned out to be due to a bug in the routine used to calculate and display the hours component of daylight saving time. This routine has now been changed and the resulting "Version 4" of the firmware tested for about 10 days. Version 4 of the firmware will be available for free downloading from the *SILICON CHIP* website by the time this note is published. (12/09)

(4) With some PIC16F877A chips, the local time offset and other data stored in the EEPROM could become corrupted during power down. As a result the clock would not come up with the correct local time when it was powered up again. Merv Thomas VK6BMT and Ben Rampling VK6IC discovered that this was due to a hitherto undiscovered bug in the firmware: the brown-out detector inside the 16F877A was not being enabled. Once the configuration bit BODEN was set, the problem no longer appeared. The firmware has therefore been revised accordingly, and the latest version ('V5') will be available on the *SILICON CHIP* website (0410509E). (03/11)

(5) Some of the resistor values shown on the silk-screened PCB overlay are incorrect. The resistors shown as 120 ohms should be 56 ohms and those shown as 270 ohms should be 330 ohms. The published overlay diagram (Fig.3) is correct. (04/12)

UHF Remote 2-Channel 230VAC Power Switch, May 2009: On page 82, the +12V rail supplying the junctions of the 47 ohms resistors and LED1 via Rs# should come from the cathode of diode D1, not the cathode of D2. (07/09)

Preamplifier For Speed Controller, Circuit Notebook, May 2009: On page 35, the fourth paragraph in the right-hand column makes reference to Q1 & Q2 forming a simple 2-transistor amplifier. This should refer to Q1 & Q3. (07/09)

Over-Voltage Protection For DC Loads, Circuit Notebook, May 2009: In Fig.2, the 3.6M-ohms resistor should be 1.2M-ohms, to ensure the correct degree of hysteresis. (11/09)

Battery Capacity Meter, June 2009: The circuit on page 22 shows pin 15 and 16 of IC1 reversed. The PC board is correct and does not need to be modified. (05/10)

Multi-Function Active Filter, July 2009: The LK1 and LK2 labelling on the overlay diagram (Fig.8) should be reversed. On the circuit (Fig.7) the numbers for pins 5 & 6 of IC3b are shown reversed. Pin 5 should be the non-inverting input and pin 6 the inverting input. In addition, the 10k resistor shown as connecting from pin 3 of IC4 to ground should connect to V- instead. The PC board is correct and requires no changes. (08/09)

Battery Zapper, July 2009: the BY-229 fast recovery diode D3 is wrongly specified as BT229 in the parts list on page 28. (10/09)

SD Card Music & Speech Recorder/Player, August 2009: (1) The two 10uF capacitors in series with the wipers of VR2a & VR2b (volume) are shown with reversed polarity on both the circuit diagram (Fig.1) and parts layout diagram (Fig.3). In addition, the 100uF capacitor in series with the 100-ohms resistor at the output (pin 7) of IC4b is shown with reverse polarity on Fig.1 (but is correct on Fig.3). (09/09)

(2) The two 2.2k-ohms resistors shown dividing the output of IRD1 on page 34 of the circuit should be 27k. They are also incorrectly shown on the component overlay diagram on page 38 of the same issue. (11/09)

(3) A new firmware update allows the recorder to read and write 2Gb SD cards correctly. It also incorporates minor improvements to the interface. The firmware update is Version 2.60 and can be retrieved from the August 2009 download area of the *SILICON CHIP* website. IC1 should be programmed with the latest version according to whether the Jaycar (0110809J.hex) or the Altronics (0110809A.hex) LCD module has been used. (12/09)

UHF Rolling-Code Remote Control, August 2009: On page 77, discussing the BCD switch, it should read: Position 15 (or F) sets all switch outputs at 0V. On the circuit diagram on the same page, the terminal second from bottom on CON2 is of course the common terminal for relay 3. On page 81 the text refers to a seven-way barrier terminal; this should be an eight-way as described and shown in the photographs. (09/09)

Wideband Controller, September & October 2009: (1) There are several mismatches between the circuit in the September issue and the component overlay diagram in the October issue: (i) The 100nF capacitor shown on the circuit connecting between pin 8 and ground is incorrect. It should be shown connecting between pins 8 and 4. The PC board is correct. (ii) The 100uF capacitor shown at the anode of D3 and D4 on the circuit should also be 100uF on the overlay and not 10uF. (iii) TP GND is not shown on the circuit. It connects to GND1 near pin 5 of IC1. (iv) The 220nF capacitor at pin 5 of IC4b is shown connecting to GND1 on the circuit. It should be shown connecting to Vs/Ip, to match the PC board connection. (v) The 100uF bypass capacitor at the collector of Q3 should be shown on the circuit connecting to the GND2 rail. (vi) The 10uF capacitor connecting to the emitters of Q1 and Q2 is shown with the incorrect (reversed) polarity on the overlay. The capacitor is correctly shown on the circuit. (11/09)

(2) Wideband Controller Pt.2, October 2009: under Step 13 on page 77, the article states that "The voltage between TP7 and TP GND should be 2.5V". This sentence should refer to TP1, not TP7. (01/10)

High-Quality Stereo DAC, September-November 2009: (1) The circuit diagram on page 16 of the September issue should show pin 12 of the 14-pin header going to the top of S3, while pin 8 should go to the top of S1. In addition, pin 7 of the 14-pin header should go to the cathode of LED1, while pin 11 should go to the cathode of LED3. The PC board patterns and wiring diagrams are correct. (12/09)

(2) Although not critical, the 6.8k resistor connected to pin 22 of IC3 (DIR9001) should be changed to 680 ohms. This change affects both the circuit diagram in the September 2009 issue and the parts layout diagram in October 2009 (the resistor is just to the left of IC3). (02/10)

(3) The TOSLINK receivers can exhibit instability in some cases, resulting in noise in the audio outputs under no-signal conditions. The cure is to increase the 33pF capacitors between pins 1 & 2 of each TOSLINK receiver to 100pF. Note also that not all Philips remote control codes use the RC5 protocol. If you set a universal remote control to a Philips code but the DAC does not recognise it, try a different code. You may have to go through several before you find one which works. (06/10)

(4) The 300-ohm resistor across CON1 should be changed to 82-ohm for improved coaxial cable termination. This affects Fig.2 and the parts list in the September 2009 issue, as well as Fig.5 and Table 1 in the October issue. (12/11)

Web Server In A Box (WIB), November 2009–January 2010: (1) The metal shield of the ethernet connector module (CON2) should be connected to the GND (ground) pad of CON1 to minimise EMI. The corrected PC pattern has been sent to the kit retailers and is available for download from the *SILICON CHIP* website. (12/09)

(2) There is an error in the IP addressing shown on Fig.9(b) on page 84. The addressing scheme shown will not work because a router will only forward packets between different networks (eg, from 192.168.0.x to 192.168.1.x on a class C network and vice versa). This means that we must use IPs for two different networks on either side of the router, eg, use 192.168.1.1 for the Ethernet port on the modem, 192.168.1.2 on the modem port on the router and leave the switch (or LAN) side of the router at 192.168.0.1. Alternatively, you could assign 10.0.0.1 to the modem, 10.0.0.2 to the modem port on the router and stick with 192.168.0.1 for the LAN side of the router. A corrected diagram is shown in Pt.3 of the WIB on page 87 of the January 2010 issue. (01/10)

(3) The Jaycar PS0024 memory card socket used in this project has been discontinued and is no longer available. There is no equivalent so we have updated the PCBs to suit the Altronics P5722 memory card socket. Note that this socket has a metal shield so if the PCB does not have a solder mask, it will be necessary to place a thin plastic insulator under the socket. We have not tested it but the Amphenol 10100708 socket appears to have the same footprint. (01/12)

(3) See FAQs in the April 2010 issue.

One-of-Nine Switch Position Indicator, December 2009: The right hand and bottom sides of the diagram on page 35 were cropped off, omitting vital information on the IDC cable. A full diagram of the IDC cable, showing how the IDC line sockets are fitted, is shown on page 101 of the January 2010 issue. (01/10)

Voltage Interceptor For Cars With ECUs, December 2009: There are two errors on the circuit diagram – (1) the 10nF capacitor connected to pin 7 of IC1b should be connected between pins 7 & 6 of that IC; and (2) the 470 ohms resistor in series with ZD4 should be connected to V+ instead of V++ (ie, after the 10 ohms resistor). The PC board and parts layout diagram (Fig.5, January 2010) are correct. There are also several errors in the parts list: ZD2 should be a 15V 1W zener diode; ZD4 should be a 5.6V 1W zener diode; there should be six PC stakes (not five); and there should be seven 10nF MKT polyester capacitors (not six). (01/10)

Digital Capacitor Leakage Meter, December 2009: It has been found that this unit reads higher than it should with typical electrolytic capacitors. Similarly, large metal film capacitors do not correctly read zero leakage. This is due to ripple voltage from the switchmode power supply being coupled across the capacitor being tested. The cure is to connect a 100uF 16V low leakage (LL) electrolytic capacitor between the negative test terminal and ground. The positive lead of the capacitor is connected to the negative test terminal. It can be installed on the underside of the PC board. This completely fixes the problem at the 10V and 16V settings and greatly improves leakage readings at higher voltage settings. (04/10)