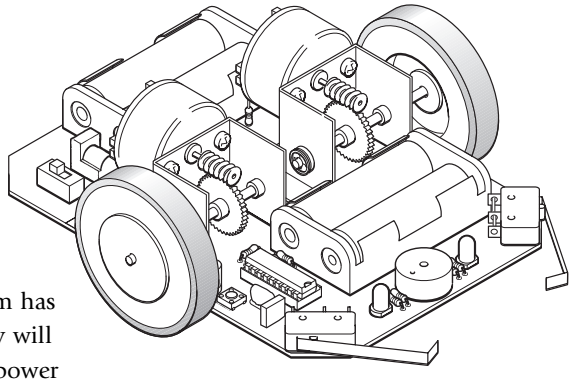
BUGGY (TECHNOLOGICAL STUDIES COURSES)

MOD001 Buggy (Technological Studies Courses)

Contents:

- CHI007 Buggy Kit
- Programming Editor software on CDROM
- PICAXE Download Cable

Also required - computer running Windows 95/98/2000/ME/NT
The buggy is not compatible with the Acorn software.



Description:

The MOD001 buggy is designed for schools teaching Standard Grade Technological Studies.

The buggy is different to all other models, in that it is battery powered (4xAA cells) and has the microcontroller 'on-board'. This makes it totally 'remote' - once the program has been downloaded the cable can be removed and the buggy will work without any connection to the computer or external power supply.

The buggy is pre-fitted with a PICAXE-18 microcontroller. This mimics the Stamp Controller behaviour so that students can write BASIC programs and download them directly into the buggy, without having to wire the buggy to the Stamp Controller by an 'umbilical cord'. Therefore the Stamp Controller **is not used** when programming the buggy.

Instructions:

1. Assemble the CHI007 buggy has per instructions in the kit.
2. Install the Programming Editor software from the CDROM.
3. Run the Programming Editor software. Make sure the software is in PICAXE-18 mode (from the View-Options menu).
4. Connect the cable to the serial port of the computer. Make sure the correct serial port (COM1 to COM4) is selected within the software (from the View>Options menu).
5. Type in a BASIC program (example overleaf)
6. Make sure the buggy is fitted with the PICAXE-18 microcontroller. Connect the cable to the buggy, and make sure the buggy is switched on (note that it may be necessary to prop up the buggy to stop it moving if an existing program is already in memory).
7. Click Run from the PICAXE menu to start the program download.

FOR FURTHER NOTES ON HOW TO USE THE PICAXE-18 BASIC PROGRAMMING LANGUAGE SEE THE MANUALS PROVIDED ON THE CDROM.

Important Notes:

- Ensure you have installed the **latest version** of the Programming Editor from the CDROM enclosed. The system will not work with older versions of the software.
- When using the software the **'PICAXE-18'** microcontroller mode (View menu > Options) **must be selected** when programming the buggy. The BASIC language is identical to the Stamp Controller BASIC.
- Follow the assembly instructions for the buggy given in the leaflet. However use **LK3** for the wire link for the piezo sounder.
- The motor connections on the buggy are identical to the push-pull driver motor connections on the Output Driver board.
- DO NOT reprogram the PICAXE-18 microcontroller in a PIC programmer. This will render it un-useable within the buggy.
- The **buggy download cable** can be safely connected to the end of the Stamp Controller download cable, so students **do not** have to swap cables at the back of the computer.
- If desired the buggy can be used with a PIC16F84A in Advanced Higher courses. However in this case a 3-pin 4MHz ceramic resonator must be soldered in position X1. This does not affect normal operation with the PICAXE-18 microcontroller in the socket.

Buggy Connections:

output pin allocation
(using binary notation %76543210)
76 = motor B (same as Output Driver module)
54 = motor A (same as Output Driver module)
3 = not used
2 = LED B
1 = LED A
0 = piezo sounder (make sure LK3 is used on buggy PCB)

input pin allocation
pin1 = micro-switch sensor B
pin0 = micro-switch sensor A

Sample BASIC Programs:

The first sample program uses the binary notation "let pins =" for controlling outputs. If desired these commands can be replaced by multiple "high" and "low" commands as in example 2.

Example 1

```
'start going forwards
'testing switches as you go

main:
      let pins = %01010000
      if pin0 = 1 then left
      if pin1 = 1 then right
      goto main


'left switch hit
'so stop, light LED, beep, reverse, turn

left:
      let pins =%00000100
      sound 0,(100,150)
      let pins =%10100100
      pause 2000
      let pins =%10010100
      pause 1500
      goto main

'right switch hit
'so stop, light LED, beep, reverse, turn other way

right:
      let pins =%00000010
      sound 0,(50,150)
      let pins =%10100010
      pause 2000
      let pins =%01100010
      pause 1500
      goto main
```

Example 2

```
'start going forwards
'testing switches as you go

main:
      low 7        ' motor forwards
      high 6
      low 5
      high 4
      low 2        ' leds off
      low 1
      if pin0 = 1 then left
      if pin1 = 1 then right
      goto main


'left switch hit
'so stop, light LED, beep, reverse, turn

left:
      low 6
      low 4
      high 2
      sound 0,(100,150)
      high 5
      high 7
      pause 2000
      low 5
      high 4
      pause 1500
      goto main

'right switch hit
'so stop, light LED, beep, reverse, turn other way

right:
      low 6
      low 4
      high 1
      sound 0,(50,150)
      high 5
      high 7
      pause 2000
      low 7
      high 6
      pause 1500
      goto main
```