

# NEWSLETTER

3rd issue 1998 edition

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## We have moved

On the 15th December, 1998 we moved. Our postal address has remained the same but our telephone and fax numbers have changed. They are:

Phone: 03 98306288

Fax: 03 98306481

Our old telephone number will be diverted to the new number for a few months after this date.

## Walking Robot

The fischertechnik fan-club sheet No. 12 describes how to construct a Walking Robot or 'Mobile Walker' (shown above). This project requires the Mobile Robots kit (30400), the Profi I'm Walking Kit (30493) and a few additional parts.

The assembly sheet explains how to make a six legged walking robot that is controlled by the intelligent interface unit (30402). This allows the model complete mobile freedom after a program is 'downloaded' from the computer. The creature is driven by two motors; one motor drives the three right legs, whilst the other motor drives the three left legs. The left and right legs are synchronized by two switches E1 and E2. If the switch on one side activates then the associated

motor stops until the other motor catches up and activates its switch. Only then is the next step started. If the model is required to turn it simply runs the motors in opposite directions.

Full construction details and an example program is available from our website. Procon Technology will provide the construction sheet, sample program and the additional parts required free-of-charge when ordering kits 30400 and 30493 together.

## On the Net

Don't forget to check our website for the latest information, free software and specials.

[www.procontechonology.com.au](http://www.procontechonology.com.au)

If you'd like more information on robots, check out this site:

[www.robotbooks.com](http://www.robotbooks.com)

## New Software

New 16 bit and 32 bit drivers for the intelligent interface unit (30402) is now available for Windows 3.1, Windows 95 and Windows NT! This new interface operates through any serial port (as described in our last newsletter). Our new drivers provide upward compatibility with the drivers for the parallel port interface unit

(30520) and hence converting programs written for one interface to the other interface is easy.

Windows software is now available, ready to run, for the Profi Computing Kit using the 30402 interface. Likewise software for the Turtle Kit (30632) and Mobile Robots Kit (30400) is also available. Source code is provided on the diskettes in VisualBASIC version 3/4 or

VisualBASIC version 5 or greater and Delphi v3 and VisualC++ v4.

Learning to program with fischertechnik is made easy by standard procedures and functions that control the interface unit without the need to concern yourself with serial or parallel i/o operations (unless you ready, ready want to). The following program in QBASIC or VisualBASIC operates the 'sliding door' model in the Mobile Robots Kit.

```
Motor M2, MCW
Delay 1000
DO
    DO UNTIL SwitchIn(E2)
        'DoEvents
        Motor M1, MCCW
    LOOP
    Motor M1, MOFF

    DO WHILE SwitchIn(E3)
        'DoEvents
    LOOP

    DO UNTIL SwitchIn(E1)
        'DoEvents
        Motor M1, MCW
    LOOP
    Motor M1, MOFF
    Delay 1000
LOOP
```

Note, the procedure 'delay' was defined in a previous newsletter and provides a fixed delay in the program of one second. The procedure call to 'DoEvents' is necessary in VisualBASIC for Windows only.

The new driver provides automatic recovery if there is an interruption in the serial communications to the interface (i.e. if there is a power failure or lost connection). A new configuration program also provides the ability to easily select the communications port (COM1 ... COM9) - all programs will then use this port.

## Turtle Mania

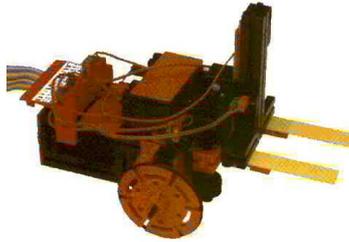
The Turtle or Buggy Kit (30632) provides a fascinating low-cost introduction to the world of computer control. Constructed with this kit is a mobile robot with fork lift - one of the most interesting projects from the Profi Computing Kit (30330).

The COMPLETE kit (30632-1) includes the 200+ construction parts, an interface unit, power supply and Windows software ready-to-run. If you are interested in doing your own programming, source code is provided in QBASIC, TurboPascal, C and VisualBASIC. For a limited time, a free light sensor is included that allows you to search for the brightest source of light in the room and move towards it!

Included in the kit is; 3 mini-motors and gearboxes, 4 micro-switches, a 1.2m ribbon cable and a 28 pole plug unit. Plus a laminated sheet showing the construction details and a 22 page manual explaining, in detail, how it works.

An extension pack (30632-2) provides the parts and further details on how to add a pen holder for drawing interesting patterns, a bumper switch for detecting obstacles and a read head for following a line drawn on the floor.

Other software available for this kit includes; LLWIN a flowchart



*Turtle with fork lift*

style language (30403 or 30407CD), PC-LOGO from Harvard-Associates (30555CD) and 32 bit software with source code in VisualBASIC v5 (30521WIN32). Finally, a special adapter (30399) is available to allow the serial interface unit (30402) to connect to the turtle and other projects in the Profi Computing Kit. Software is now available to drive the Turtle from this new interface.

## Hints & Tips

The following programming tips should be remembered irrespective of language used. These examples are in QBASIC.

1. When initializing a model remember to test the switch first then activate the motor if necessary. e.g.

```
DO UNTIL SwitchIn(E1)
    Motor M1, MCW
LOOP
Motor M1, MOFF
```

Finally, don't forget to turn the motor off at the end of the loop.

2. When a large number of inputs must be tested during a program loop (e.g. the diagnostic program) why not use 'InputWord' rather than a whole sequence of 'SwitchIn'. The 'InputWord' function only needs to communicate with the interface once. e.g.

```
E = InputWord
SwE1 = E AND 1
SwE2 = E AND 2
SwE3 = E AND 4
...
SwE8 = E AND 128
Also use OutputWord(&H55)
```

to turn all four motors on in the counterclockwise direction rather than using four 'Motor' calls. By minimizing the number of times the computer communicates with the interface unit, higher speed operations can be performed - this is particularly important with the new serial interface unit (30402).

3. Detecting an off to on transition of an input is easy, simply use the following program sequence:

```
DO WHILE SwitchIn(E1)
    Motor M1, MCW
LOOP
DO UNTIL SwitchIn(E1)
    Motor M1, MCW
LOOP
Motor M1, MOFF
```

To detect the on to off transition reverse the DO-LOOPS. To count off to on transitions on a number of inputs use:

```
E = InputWord
DO
    L = E
    E = InputWord
    S = E AND NOT L
    IF S AND 1 THEN C1 = C1 + 1
    IF S AND 2 THEN C2 = C2 + 1
    IF S AND 4 THEN C3 = C3 + 1
    ...
LOOP
```

To count on to off transitions, use: S = L AND NOT E. To count all transitions, use: S = E XOR L.

## SPECIAL DEAL!

Until further notice any Australian school that organizes a demonstration of fischertechnik or purchases any kit (goods may be purchased 'on approval') will receive the fork lift kit (value \$30) free-of-charge even if the goods are returned. And with any Mobile Robots kit (30400) six batteries and charger will be included free-of-charge - another \$30 value! Please mention this deal when booking your demonstration or placing an order.