COMMOTION

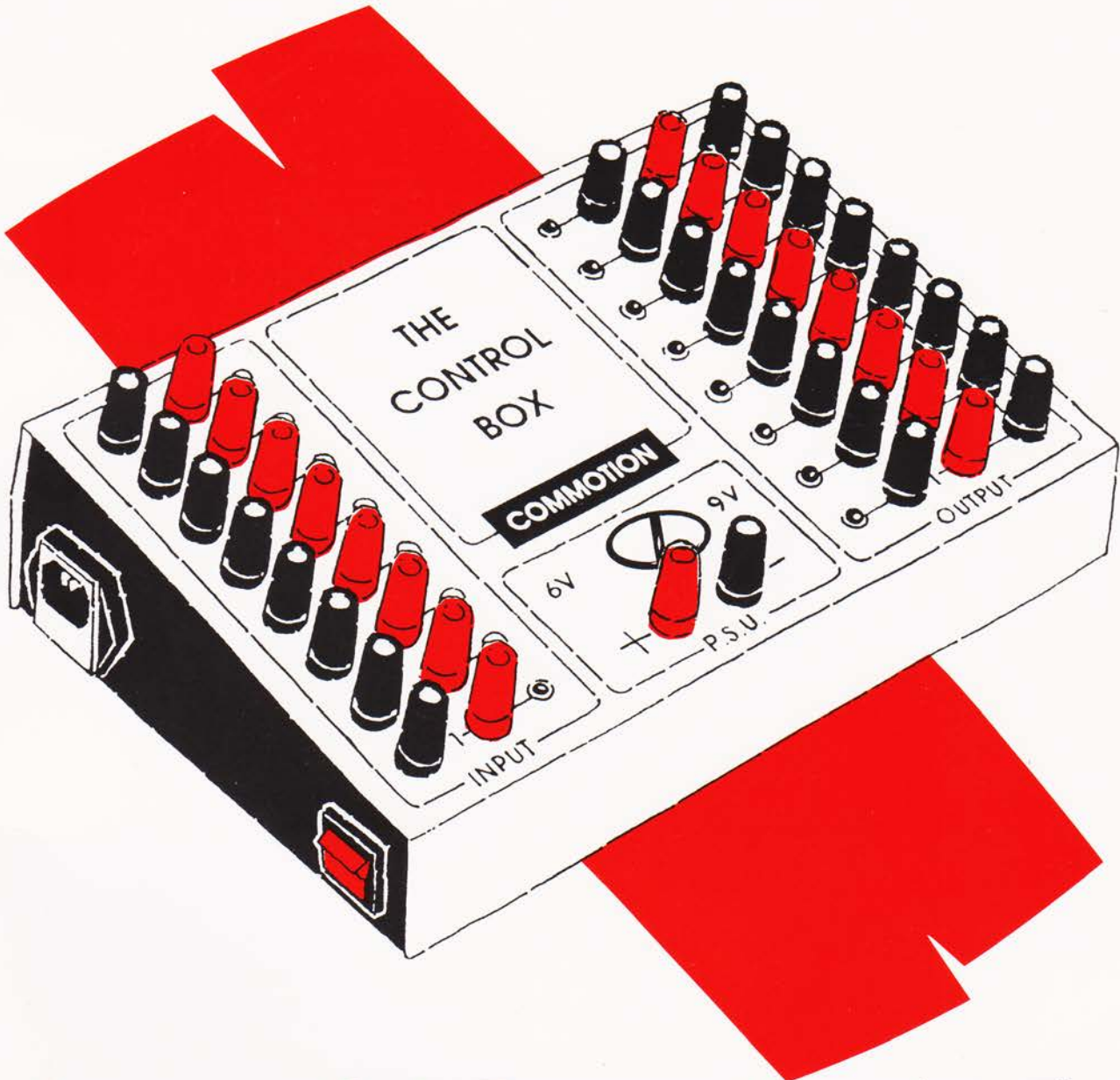## Solutions for Education

CoCo Control on the Archimedes

A program that allows you to explore the world of computer control.

Designed by Ron Allen.
Programmed by Ting Kuei.

THE CoCo CONTROL SYSTEM

A program that allows you to explore the
world of computer control on the Archimedes.

Designed by   Ron Allen
Programmed by   Ting Kuei

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Speech! module
© Superior Software 1991

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Contents

1. GETTING STARTED

HELLO FROM CoCo

The CoCo Control program is designed to make computer control easy and accessible to all. The full power of the Archimedes is used to make the program user-friendly and yet offer a very powerful and versatile tool to the user. It is able to offer full on-screen mouse control, as well as a language from which you can build up, new and more complex procedures.

GET YOUR PODULE FITTED!

Before connecting up your control box you must make sure you have a suitable analogue/user podule fitted to your computer. If you have not purchased one with this pack it can be obtained from Commotion. Fit the podule according to the manufacturers instructions.
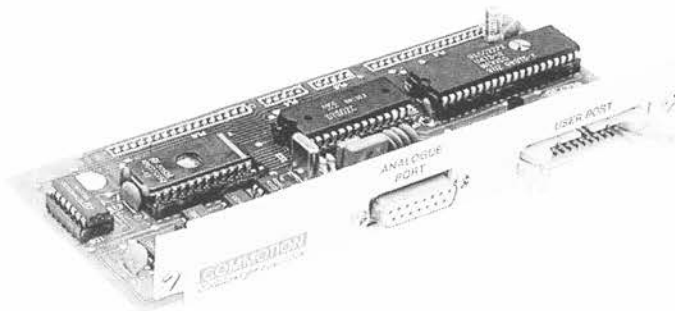
The Commotion Analogue/User Podule

THE CONTROL PACK

You should have the following material with the pack.

The control box.
Power cable.
Printer/User connector cable.

The CoCo Control disk.
A guide to using CoCo.
Function key strip.

OUTPUT DEVICES

3 light bulbs
2 motors
1 buzzer

INPUT DEVICES

1 push switch
1 light switch
1 tilt switch
1 magnetic switch
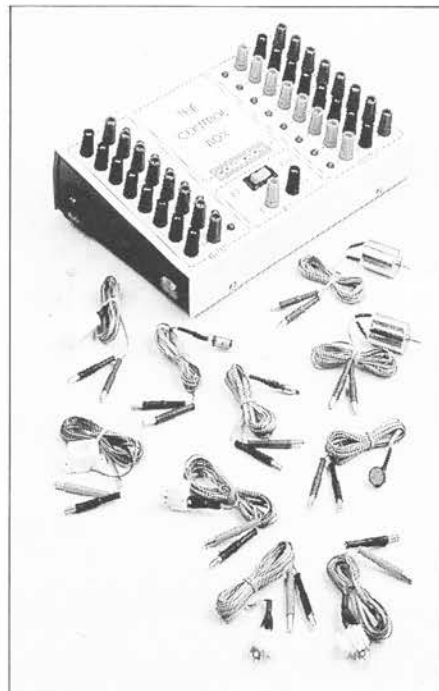
WARNING

Always remember to turn off your Computer before plugging in the Control Box

CONNECTING YOUR CONTROL BOX

Plug in the "D" connector of the grey ribbon cable to the control box. THIS WILL ONLY CONNECT THE CORRECT WAY AROUND. Now plug in the two leads, one to the **Printer Parallel Port** and the other to the **User Port** . Both ports are found on the back of the Archimedes. Again the plugs are different so it is not possible to confuse them or fit them incorrectly. Plug the power cable into the side of the Control Box and plug into the Mains supply.

Now you may switch on the computer.

Cable connections to the Archimedes - Commotion Podule fitted

COMMOTION   User Port

ECONET NOT FITTED

220-240 V~
50 Hz 0.2 A

Parallel Printer

Cable connection to the Commotion Control Box

Before loading CoCo you should be familiar with the Archimedes desktop. If you are uncertain refer to the Welcome Guide supplied with the computer.

Now double click on the !CoCo icon

PERSONALISING YOUR DISK

You will be unable to use the control disk until it has been personalised. Place the CoCo disk into the drive and load by clicking on the disk drive icon. You will get a disk contents window which will look like this:

ADFS::CoCo.$

!CoCo

Run adfs::CoCo.$.!CoCo.!Run

Welcome to the wonderful Commotion Control System.

Please register your name below. (20 chars max)

Name : |..................|

Now type in the name of your school or organisation eg.

Newtown School

and then press the <Return> key.

After a few moments the title screen will appear with your name registered on it.

COMMOTION
CONTROL

Version 1.00

Designed by:
Ron Allen

Programmed by:
Ting Kuei

Registered User:
Newtown School

OK
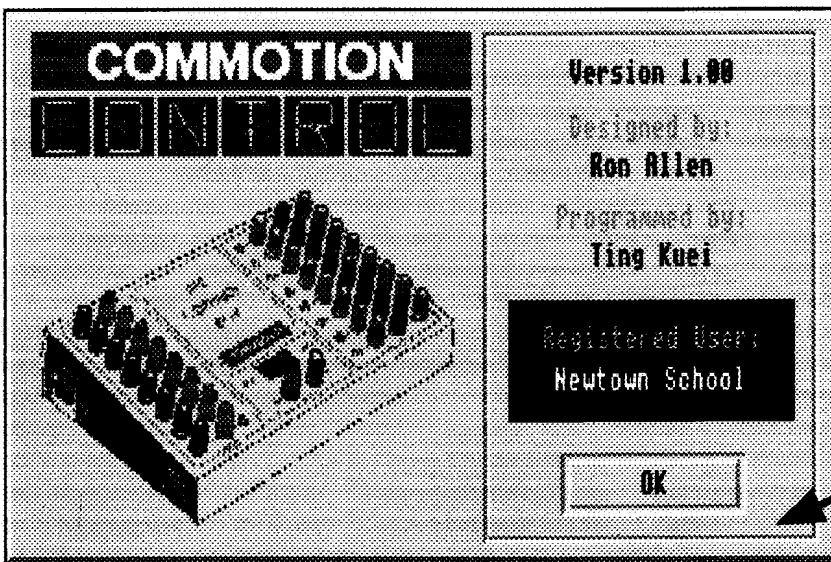
After some time the program will load itself onto the icon bar, but a click on the [OK] button will speed up this process. When loaded correctly the screen should look something like this:
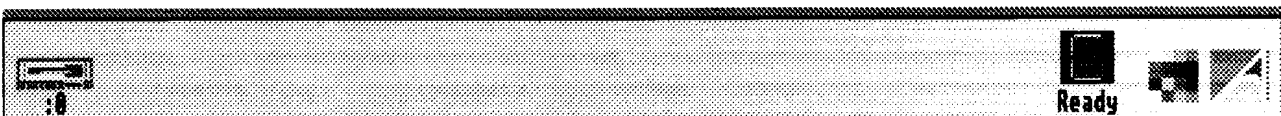
Ready

You may now get rid of the contents window by clicking on the 'X' at the top left of the window. CoCo is now installed and ready for you to use.

GETTING CONTROL

Once the software is installed on the icon bar you can run it by simply pointing to the CoCo icon with the mouse pointer and pressing select (left hand button).
It looks like this:
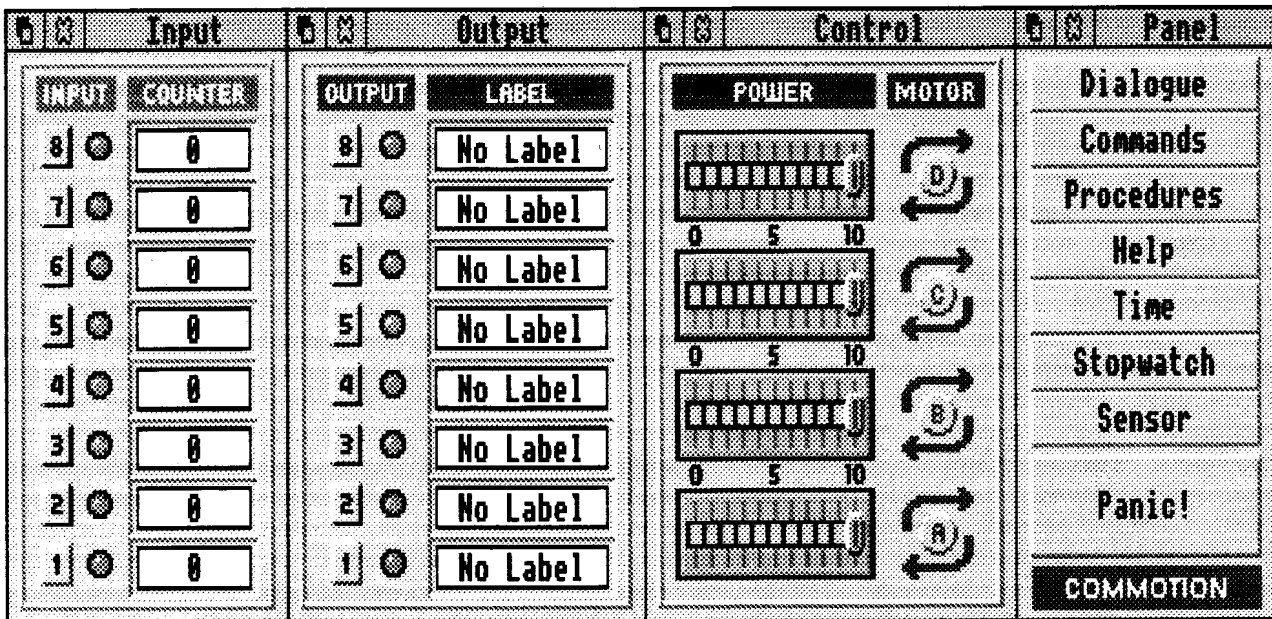
The full control panel is made up of 4 separate windows
> a. Input
> b. Output
> c. Control
> d. Panel window

Each window can be moved, overlayed or clicked off as desired following the Archimedes windows convention.

Experiment now with the windows. Move them about and switch them on or off as you wish. Do not worry if the screen looks a mess or all your windows have gone. Just click again on the CoCo icon and the default screen appears all tidied up for you.

Note: Teachers are able to re-configure the above start-up display which is stored on the disk as a text file within the application !CoCo. Users who wish to do this should have some knowledge of how to use !Edit supplied with your Archimedes and if in doubt consult the Acorn applications/User Guide.

Here is a brief summary:
> *1. Load the application !Edit.*
> *2. Using your CoCo backup disk open-up the application !CoCo by pointing to it and whilst holding down the <Shift> key double click the [Select] button.*
> *3. Open-up the directory Resources and load the text file Messages.*
> *4. In SECTION 1 you will see "default windows opened:" To change the start-up so that the Input window will not appear after* setup0: *alter the* ON *to* OFF.
> *5. Repeat this for the other windows if you wish and save the file back to the disk.*

This will be a default start-up next time you load CoCo from this disk.

GET PLUGGED IN!

Take a look at the control box. You will notice there are 2 rows of paired sockets coloured green/black, red/black and a single row of blue sockets. At this stage don't worry about the green and the blue rows. The red/black sockets are known as outputs and allow for eight electrical devices (numbered 1 to 8) to be controlled from the computer. Each of these have an indicator light on the box to show if they are on or off.

Green/black input sockets
(Numbered 1 to 8)

4 Blue motor sockets labelled
A,B,C and D

Voltage selector
switch (6 or 9 volts)
(On some control
boxes this may be a
key switch)

Red/black output sockets
(numbered 1 to 8)

Mains power switch
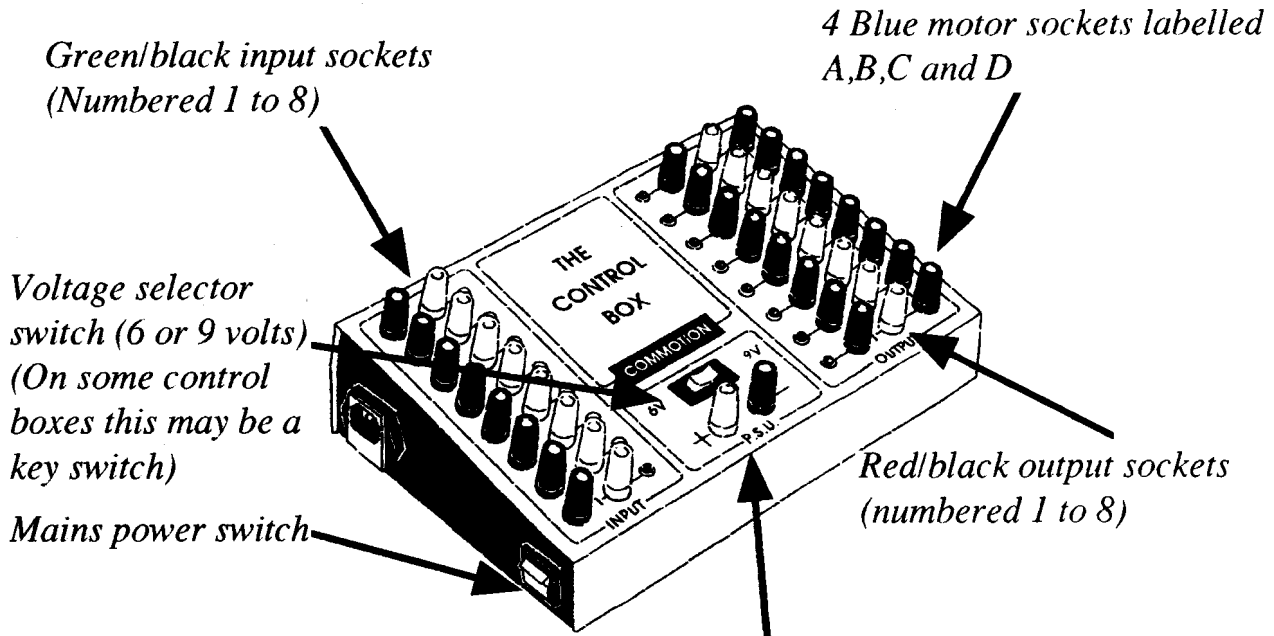
Note: The Power Supply Unit (PSU) provides constant 6 or 9 volts which can be used for the checking and running of electrical devices.

Before making output connections to the box make certain that you have selected the correct voltage for the device you are using (6 or 9 volts). Switch on the mains power to the box (the red neon switch will illuminate).

MOUSE CONTROL

Using one of the bulbs supplied connect one lead to one of the RED output channels (say into socket number 1) and the other lead to the BLACK socket. To begin control simply press select on the small circle (LED) next to button number 1 or the button itself. This will light up in red and your light bulb should also SWITCH ON. To turn the bulb off press select again on the icon and the bulb will SWITCH OFF. Now plug in as many output devices into the sockets numbered 1 to 8 as you wish and turn them on and off.
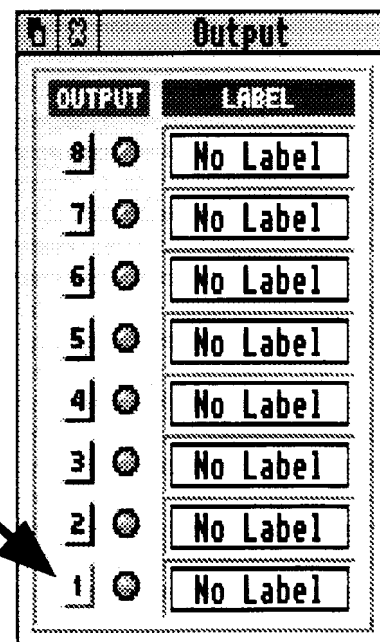
Try the buzzer supplied. You will need to make certain that the red plug is in the red socket and the black plug is in the black socket.

DIM THE LIGHTS

Plug a bulb into socket 1 and a bulb into socket 2. Switch them on as above. You can dim the bulbs by reducing the POWER to the sockets and this is achieved by pointing to the POWER SLIDER A, holding down select and moving the mouse. Now drag the slider to the left and watch the bulb dim. Now move it back and see the bulb brighten again. You will notice that the power levels go from 10 which is full power down to 0 which is the same as off.

Note: You need not drag the slider to reduce the power.
Just point to the level you desire and press select.

The slider will move directly to that
value.
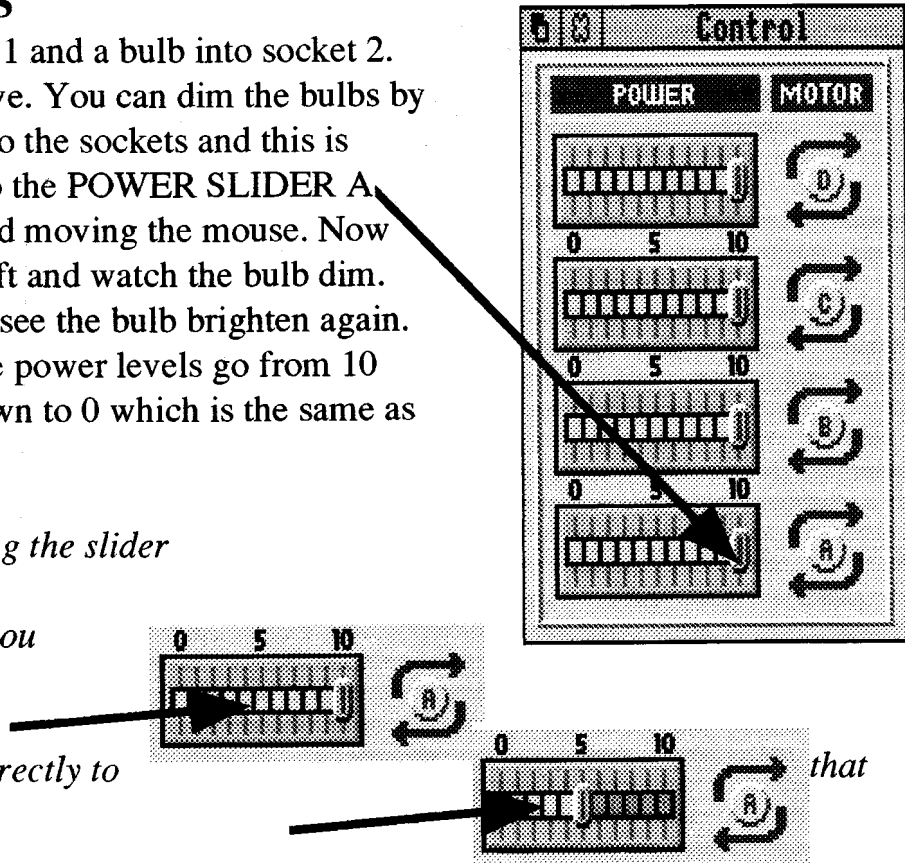
MOTOR ON

On the left hand side of the box is a set of 4 paired blue motor sockets. Plug one of the motors supplied into the pair of sockets labelled C. To turn the motor on just point to button C and press select. On it comes!

Q Can you think of how you can get the motor to go in reverse?
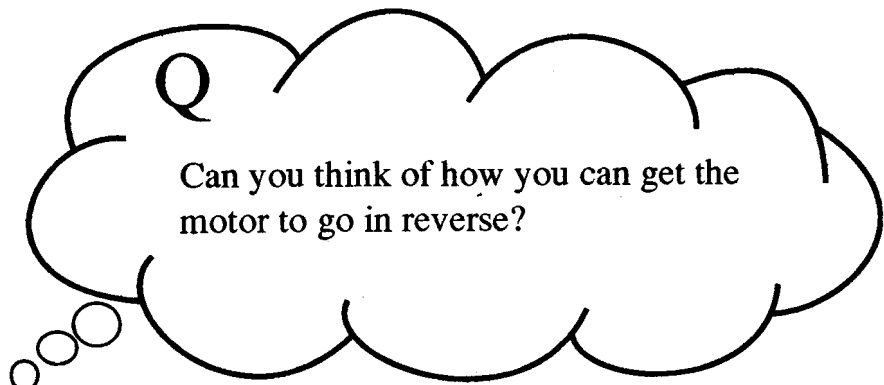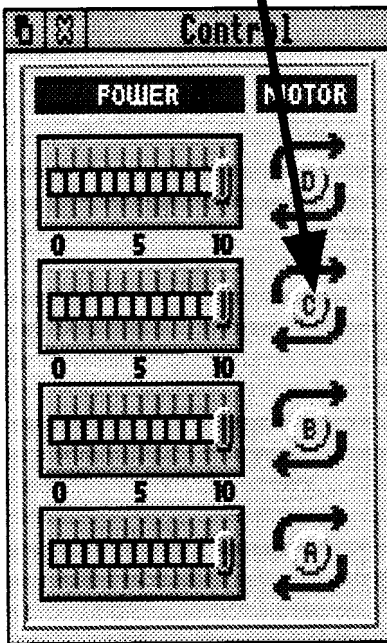
A Well, this time just point to the arrows that surround button C and press select. Notice that the arrows change direction and take my word for it so has the motor. Adding a card, disk or a propeller will help you see this more clearly.

You can of course change the speed of the motor, but I will let you work out how to do it yourself.

Clue: Remember how to dim a light bulb?

What have we done so far?
1. We have switched on and off two light bulbs and a buzzer.
2. Dimmed and brightened them by reducing and increasing the power levels.
3. Had motors going forward and reverse and at different speeds.

Not bad in just 10 minutes!

Have a bit of fun!
Want to know the time?
Look at the control PANEL
on the right of your screen.
There is a series of buttons.
Point to the 'Time' button
and press [Select] on the mouse and up pops a digital clock.
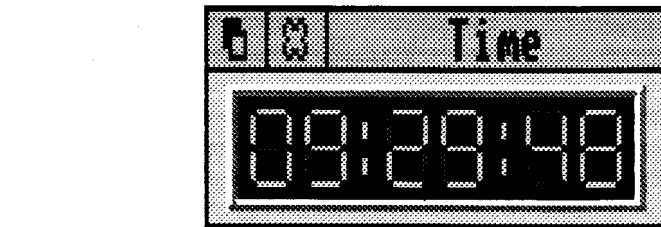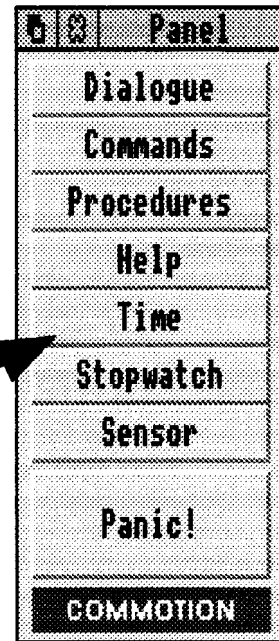
To make the time disappear point to the X and press select. As with Arcon convention.

KEEPING TIME

The time will be set to the Archimedes own built-in clock. If you wish to alter your clock, point to the time window and press the middle mouse button <Menu> and the menu window will allow you to choose what time the clock is set to. You can change the time by either clicking in the appropriate box and deleting the current time and typing in a new time, or by pressing the + and - signs.
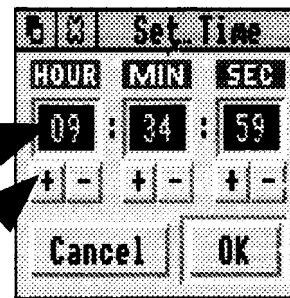
Pressing <OK> confirms the changes.

You may like to note that setting the clock in this way does not change the internal clock of the computer!

Stop all this
Try calling up the Stopwatch!
Can you make it work?
No need to tell you how eh!
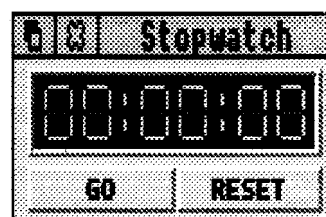
Now for some real fun! plug in all your lights, motors and buzzers and switch them on and off as you like. Dim, brighten or slow them as appropriate, but above all don't PANIC. But if you do we have just the button for you.
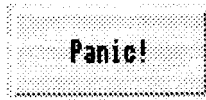
Just point to the **Panic!** button and press [Select]

All the outputs are turned off, the power set back to 10 and the motor outputs set back to their starting position.

THE DIALOGUE WINDOW

Pressing select on this icon

Panel
Dialogue
Commands
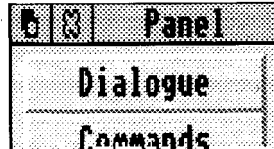
will bring about a small dialogue box with a cursor in it.

It is through this window that you can talk to the computer and send commands to the control box in English. Select this button and a small window appears. Making certain that your pointer is in the window, type in capitals: SWITCH ON 5 and press <Return>. You will see that output 5 will come on.

Dialogue

SWITCH ON 5

OK   Cancel   **Show Commands**

Remember!
be careful with spaces between words
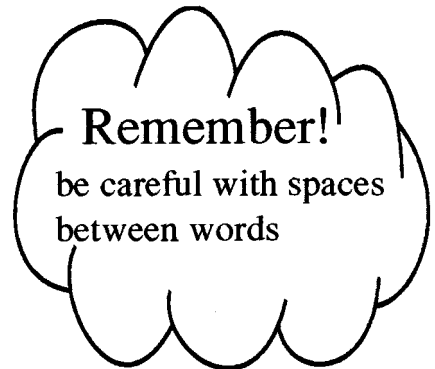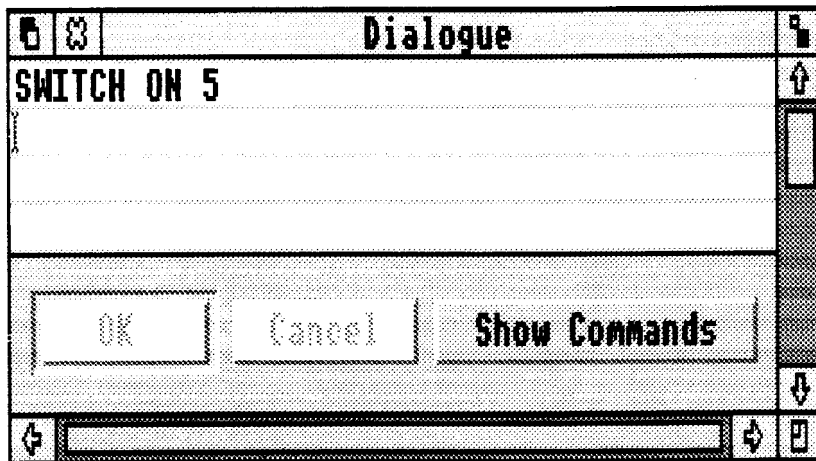
Note: This may be a good time to place the Key Strip supplied on the panel above the red function keys numbered F1 to F12.

2. COMMANDS

THE LANGUAGE STRUCTURE

Much time has been devoted to developing a suitable language that will allow children to communicate with the computer. Particular attention was given to young children who are at an influential stage of their language development. All areas of the school curriculum were considered and teachers consulted. The result of this consultation process has been to get as close to English as possible. For example, to switch on a device the, command SWITCH ON is used in preference to SETBIT1 or even SWITCHON which lacks spaces between words. This is something that many teachers felt very strongly about particularly whilst younger children are developing their language structure.

GETTING SWITCHED ON

Plug in any devices that you want and see what happens after entering the following commands in the dialogue box. Remember to press the <Return> key after each line.


```
SWITCH ON 1
SWITCH OFF 1
SWITCH ON 1 AND 2
SWITCH ON 3,4,5 AND 6
SWITCH OFF ALL
```

OK   Cancel   Show Commands

3 No Label
2 No Label
1 No Label
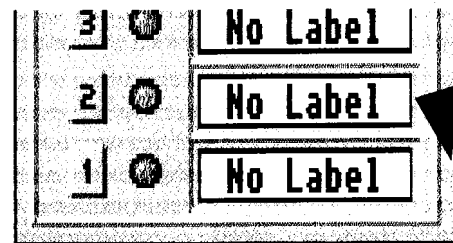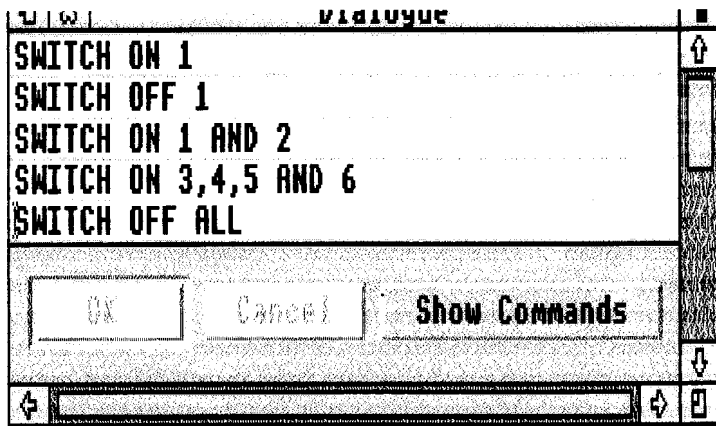
You will notice that all outputs have a box at the side of them saying - No Label. Point to the label box for output 2 and press select. The 'No label' will vanish leaving it free to be labelled as you wish.
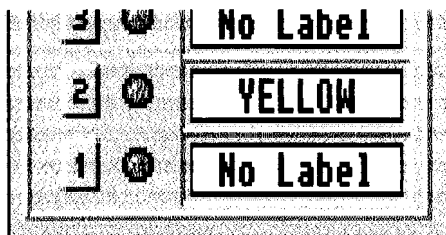
Now type in the word YELLOW. You have given output 2 the name YELLOW.

3 No Label
2 YELLOW
1 No Label

Dialogue

```
SWITCH ON YELLOW
SWITCH OFF 2
SWITCH ON 1 AND YELLOW
SWITCH OFF ALL
```

OK   Cancel   Show Commands
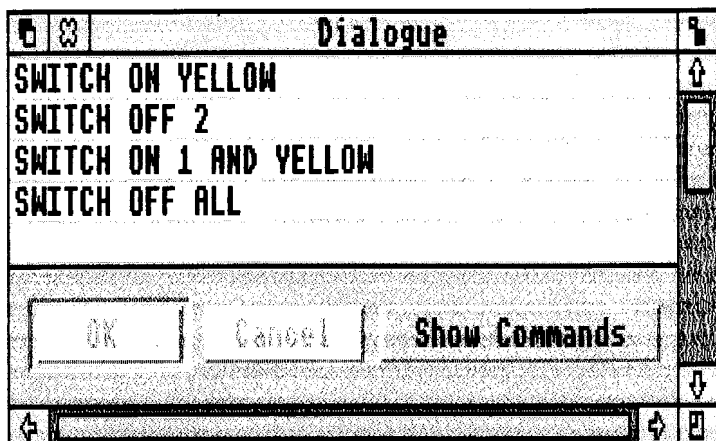
Note: You need not keep typing SWITCH ON and SWITCH OFF. Pressing red function key F1 or F2 will do this for you.

MOTOR CONTROL

Connect a motor into the pair of Blue sockets marked D and type in the following in the Dialogue window.

	Dialogue	
MOTOR D ON		
MOTOR D REVERSE		
MOTOR D OFF		

OK   Cancel   Show Com
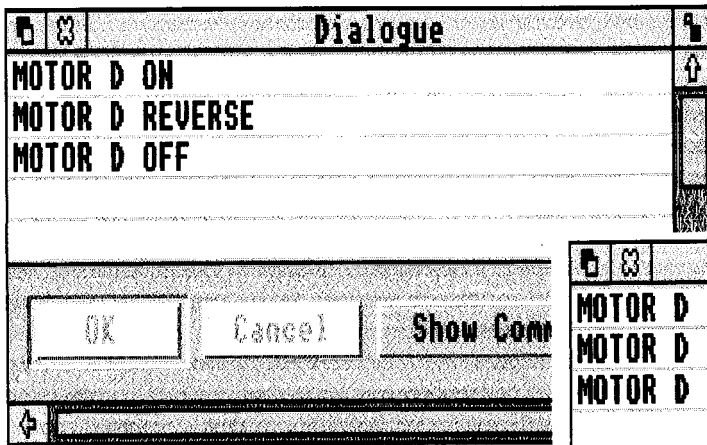
You may notice the motor change direction!
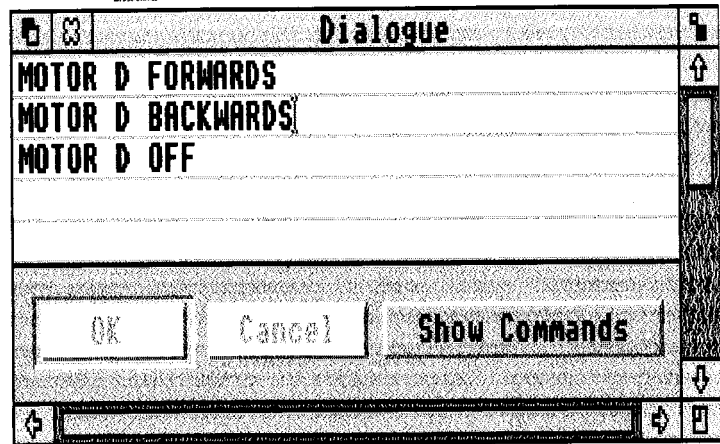
Yes you can type the instruction either way and it will have the same effect. Don't forget to press the <Return> key after each instruction.

	Dialogue	
MOTOR D FORWARDS		
MOTOR D BACKWARDS		
MOTOR D OFF		

OK   Cancel   Show Commands

THE COMMAND WINDOW

Did you know that to control the bulbs and motors you need not even touch the keys? Press select on the Show Commands button and a new window showing all the commands will attach itself to the dialogue window. Plug in the supplied bulbs into sockets 1,2 and 3

Point to the button	SWITCH	<Select>
Now to	ON	<Select>
Next to	1	<Select>
Then finally	Ret	<Select>

Number one should be on.
Now switch on bulbs 2 and 3

A FEELING OF POWER

Try this!

	POWER	<Select>
	A	<Select>
	5	<Select>
	Ret	<Select>

The bulbs in sockets 1 and 2 will now be dimmer but socket 3 will remain the same. Experiment yourself and see how bright and dim you can make your bulbs. Of course, you can slow down or speed up a motor in the same way. Power A not only refers to a motor socket A but also to switch sockets 1 and 2. Likewise Power B to 3 and 4 etc...

	Commands	
SWITCH	TURN	POWER
ON	OFF	ALL
MOTOR	FORWARDS	BACKWARDS
REVERSE	UNTIL	TO
IF	THEN	WAIT
INPUT	OUTPUT	SENSOR
COUNTER	TIME	PROCEDURE
REPEAT	FOREVER	END
BUILD	CHANGE	LIST
RENAME	DELETE	HELP
SHOW	HIDE	RESET
CONTROL	PANEL	DIALOGUE
STOPWATCH	ALARM	LET
GO	STOP	LAP
DISPLAY	WRITE	CLEAN
SAY	QUEUE	SAVE

0	1	2	3	4	5	6	7	8	9
A	B	C	D	,	:	Del	Ret		

NOW HEAR THIS

Now that you are in command of the situation, try this. On a new line type or point to the word SAY and then type any words you like. Eg. ⟶

Well that was a surprise wasn't it? Yes CoCo can talk. The program will say anything you like, just type it in after the command SAY. It may not always be exactly what you wanted but it will try its best.
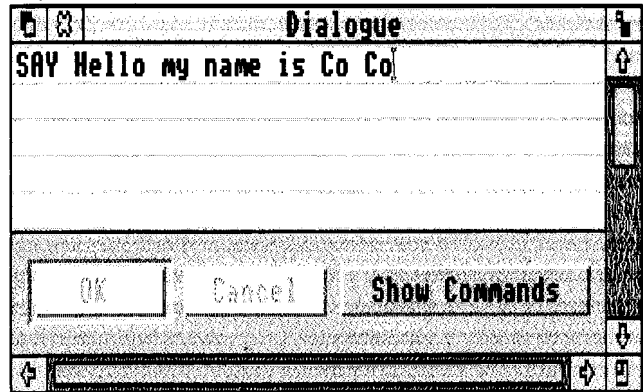
WRITE

Now that you know CoCo can talk you may as well know that it can write too. Type the following in the Dialogue window:

WRITE Here is a message for you   <Return>
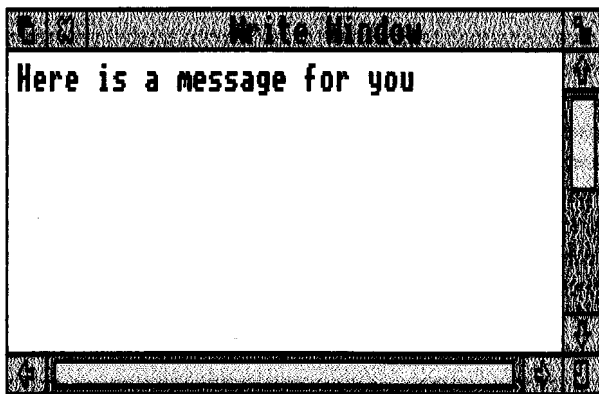
Up pops a Write window with that message written in it.

Now, that is not all. You can change the size of the text by pointing into the window and pressing the menu button on the mouse.

A small Scale view window appears and you can change the display size by either pointing to one of the buttons 100% to 400% or pointing to the arrows which will allow you to scale upto 1000%. Pressing on the OK button will keep this size every time you write until you change it again.
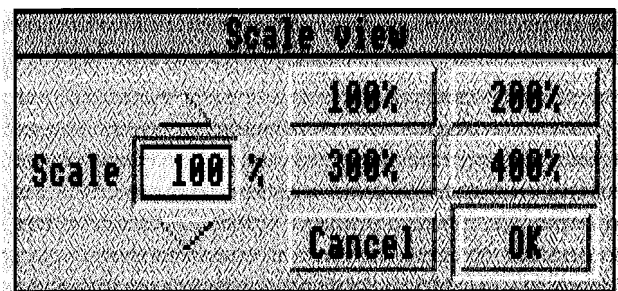
CLEAN AWAY

Before we go on here is a new command for you to know. Type CLEAN <Return>. You will see that both the Dialogue and the Write windows are cleared of all text, so if you want to write, to a clean window, you now know what to do!
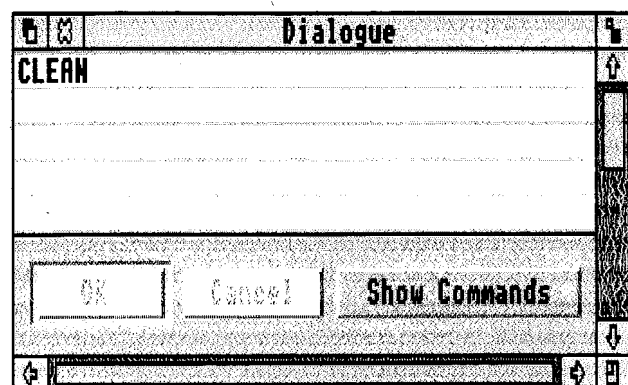
HELP

Are you the sort of person who does not like reading the manual. Well I suppose you don't have to, CoCo can help you. Take your mouse pointer to the Panel window and point to the `Help` button. Up pops another window there to help you. Just type in the command and there it is.

```
┌─────────────────────────────────┐
│ ▣ ▣            Help              │
│ ┌─────────────────────────────┐ │
│ │ STOPWATCH (operation)       │ │
│ │ Controls the built-in       │ │
│ │ stopwatch.                  │ │
│ │                             │ │
│ │ eg. STOPWATCH RESET         │ │
│ │     STOPWATCH STOP          │ │
│ │     STOPWATCH GO            │ │
│ │                             │ │
│ └─────────────────────────────┘ │
│ ┌─────────────┐        ┌──────┐ │
│ │ Command:    │  ↑ ↓   │  OK  │ │
│ └─────────────┘        └──────┘ │
└─────────────────────────────────┘
```
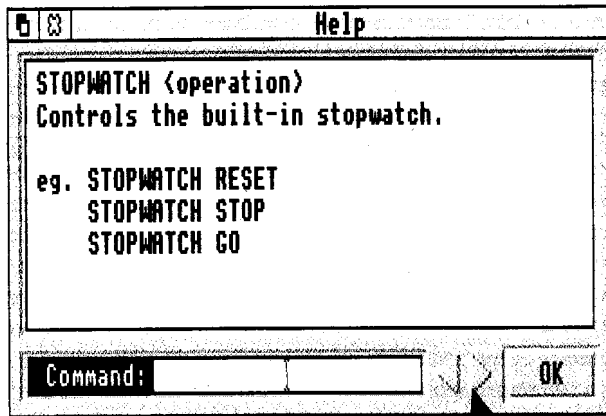
For example type `Command: STOPWATCH` and either press <Return> or click on the [OK] button and help will appear in the window. Read it? Well you could ask for help on another command or you could scroll through all the help messages by pointing to one of the arrows on the bottom of the window.

Now that you have got all the help you want, point to the X on the top left of the Help window and off it goes.

ALARM

A word in your ear. Here is a new command that may be of interest for you.
Type:

> ALARM   <Return>

A repeating noise will come from the computers speakers and last for a few seconds. this may be useful to you later.

Try some of these

Notice that named windows appear and disappear and that just typing the word TIME will display the time in figures within the dialogue window.

```
┌─────────────────────────────────────┐
│ ▣ ▣           Dialogue            ▣ │
│ HIDE OUTPUT                       ⬆ │
│ SHOW STOPWATCH                      │
│ HIDE PANEL                          │
│ TIME                                │
│ Time = 08:37:37                     │
│                                     │
│ ┌──────┐ ┌────────┐ ┌────────────┐  │
│ │  OK  │ │ Cancel │ │Show Commands│ │
│ └──────┘ └────────┘ └────────────┘  │
│                                   ⬇ │
│ ⬇                               ⬅➡ ▣│
└─────────────────────────────────────┘
```
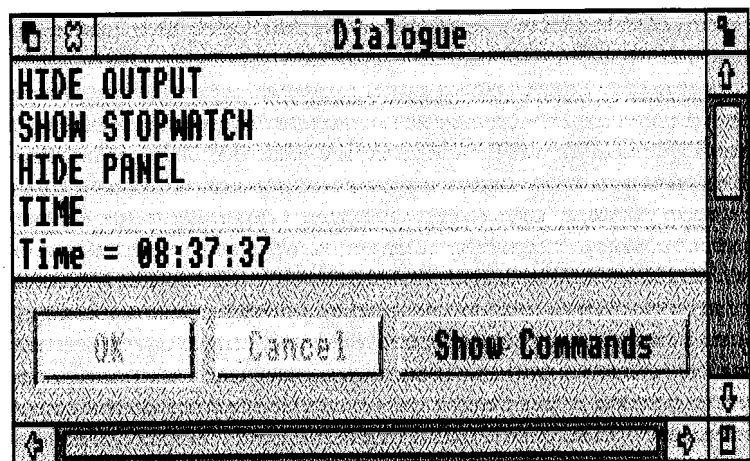
3. THE CONTROL LANGUAGE

BUILDING A PROCEDURE

You can see the command window shown on page 10 shows all of the words the control language understands. This list may at first seem rather limited, but don't worry CoCo has the solution. You can add to the list your own words by teaching the computer new PROCEDURES built from existing commands. This is simply called BUILDing a procedure. Suppose for example you want to tell the computer to switch on a light for 10 seconds and then switch it off again by itself.

Try this: BUILD LAMP   <Return>

```
┌─────────────────────────────────────────┐
│ ▣ ▣           Building LAMP            ▥ │
├─────────────────────────────────────────┤
│ SWITCH ON 1                           ⇧ │
│ WAIT 10                                  │
│ SWITCH OFF 1                             │
│ END PROCEDURE                            │
│  ┌──────┬──────────┬──────────────┐      │
│  │  OK  │  Cancel  │ Show Commands │     │
│  └──────┴──────────┴──────────────┘      │
│                                       ⇩ │
│ ⇦ ▐▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▌ ⇨ ▣ │
└─────────────────────────────────────────┘
```
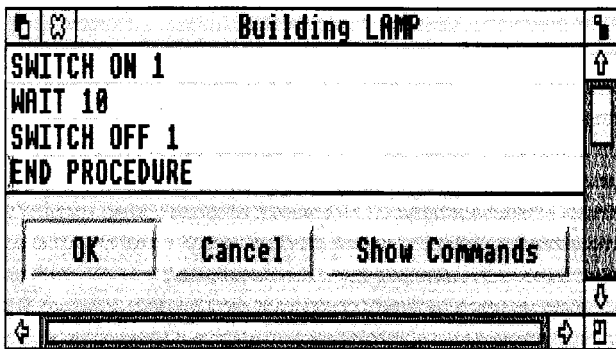
The command window will change to a procedure window and you can type your instructions.

Click OK or press the <Action> key on the computer and you will return to the Dialogue window.

The computer now knows the word LAMP and so plug a light bulb into socket No. 1 and then type:

```
┌─────────────────────────┐
│ ▣▣      Stopwatch      │
├─────────────────────────┤
│  ▯▯ : ▯▯ : ▯▯          │
├─────────────────────────┤
│    GO    │    RESET     │
└─────────────────────────┘
```

          LAMP   <Return>
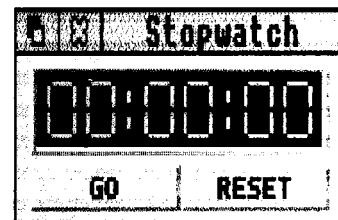
Watch the bulb come on and then go out after 10 seconds. Why not try to time it with the stopwatch?

REPEATING

One of the things that computers are good at is repeating instructions again and again. CoCo can also do this very easily. Try the following:

```
┌─────────────────────────────────────────┐
│ ▣ ▣             Dialogue              ▥ │
├─────────────────────────────────────────┤
│ REPEAT 5                              ⇧ │
│   LAMP                                   │
│ END REPEAT                               │
│                                          │
│  ┌──────┬──────────┬──────────────┐      │
│  │  OK  │  Cancel  │ Show Commands │     │
│  └──────┴──────────┴──────────────┘      │
│                                       ⇩ │
│ ⇦ ▐▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▌ ⇨ ▣ │
└─────────────────────────────────────────┘
```
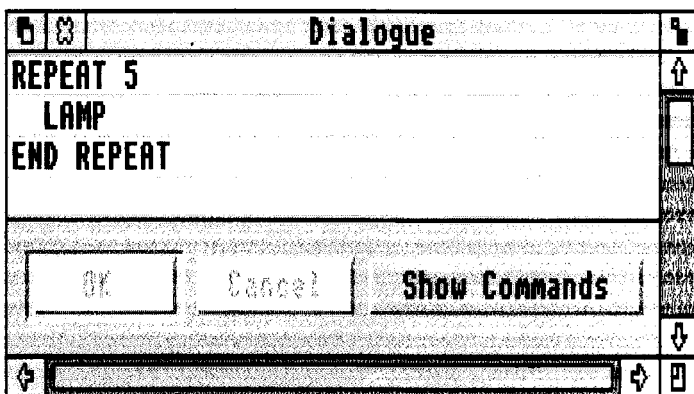
The procedure LAMP will be repeated 5 times. If you can't be bothered to wait that long and accept my word for it, just press <Escape> key or press the [Panic] button. That will interrupt the repeat loop.

Note: Repeat means:- repeat the following actions.

FOREVER AND EVER

Type: BUILD FLASH   <Return>

Two things worth noting:

```
┌─────────────────────────────┐
│ □ ☼ │     Building FLASH    ▲│
│ SAY LOOK AT ME FLASH        ⇧│
│ REPEAT 50                    │
│ SWITCH ON 1                  │
│ WAIT 1                       │
│ SWITCH OFF 1                 │
│ WAIT 1                       │
│ END REPEAT                   │
│ SAY DID YOU LIKE THAT        │
│ END PROCEDURE                │
│                              │
│  ┌────┐ ┌──────┐ ┌─────────┐ │
│  │ OK │ │Cancel│ │Show Commands││
│  └────┘ └──────┘ └─────────┘ ⇩│
│ ⇦│                      │⇨│ ▣│
└─────────────────────────────┘
```
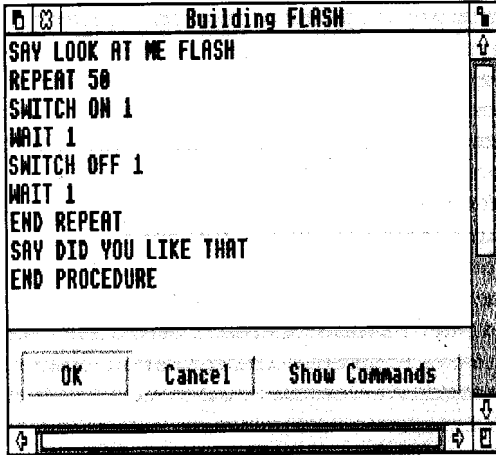
1. You can change the size of the window, so that you can see all your procedure by following the Acorn conventions.

2. For all repeats you need to tell the computer where to END REPEAT. Failure to type END REPEAT will result in the sequence running only once.

Repeat needs to be followed by a condition. This can either be a number, to tell the computer how many times you want the repeat loop to be executed, or the word FOREVER will of course make it go on forever.

To escape from a REPEAT FOREVER loop you may either press the <Escape> key or press the [Panic!] button.

```
┌─────────────────────────────┐
│ □ ☼ │       Dialogue        ▲│
│ REPEAT FOREVER              ⇧│
│    SWITCH ON 1               │
│    SWITCH OFF 1              │
│ END REPEAT                   │
│                              │
│  ┌────┐ ┌──────┐ ┌─────────┐ │
│  │ OK │ │Cancel│ │Show Commands││
│  └────┘ └──────┘ └─────────┘ ⇩│
│ ⇦│                      │⇨│ ▣│
└─────────────────────────────┘
```
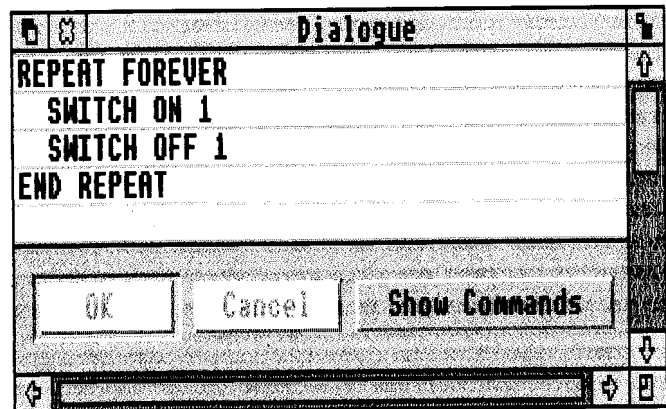
REPEATING WITH A CONDITION

Repeat may also be followed by a condition. Here are some examples:

REPEAT UNTIL INPUT 3 ON

REPEAT UNTIL TIME = 09:30:00

REPEAT UNTIL COUNTER 1 > 30

For further details see the command summary at the end of this manual.

CHANGING PROCEDURES

If you are unhappy with the procedure called FLASH you may make changes to it.
For example you may wish to reduce the number of flashes to 10 and the waiting
time between flashes to just half a second. This is easy.

Type: CHANGE FLASH   <Return>

and you are in a Changing window which is now awaiting your changes.

```
┌───┬──────────────────────┬───┐
│ ▣ │ ▣ │    Changing FLASH  │ ▣ │
├───┴──────────────────────┴───┤
│SAY LOOK AT ME FLASH          │
│REPEAT 50  ◀───────────       │
│SWITCH ON 1                   │
│WAIT 1                        │
│SWITCH OFF 1                  │
│WAIT 1                        │
│END REPEAT                    │
│SAY DID YOU LIKE THAT         │
│                              │
│  ┌────┐ ┌──────┐ ┌───────────┐│
│  │ OK │ │Cancel│ │Show Commands││
│  └────┘ └──────┘ └───────────┘│
└──────────────────────────────┘
```
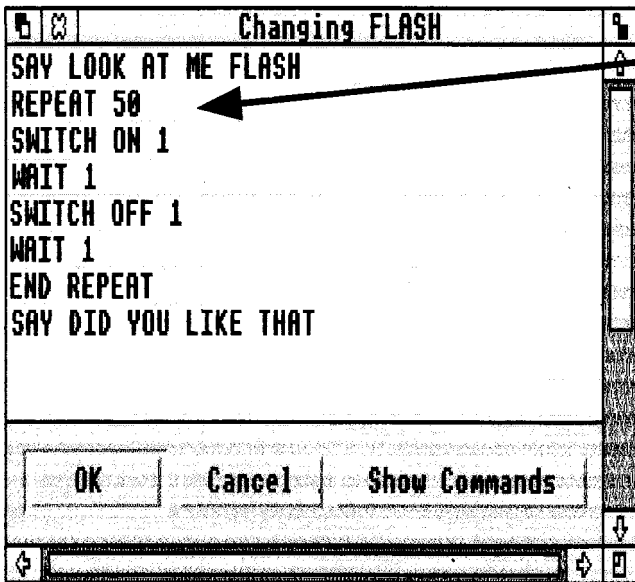
Place the cursor to the right of the
number 50. You can either use the
mouse or the arrow keys to move
the cursor. Using the <Delete>
key, delete the number 50 and type
in 10.
Now move down to WAIT 1 and
in the same way replace the 1 with
0.5 (half a second). Change the
other wait command and you have
completed the changes.

Press OK when you are satisfied
and your procedure will be
changed.

POINTS TO THE EDITOR

The facilities offered in any write window such as inserting and deleting characters
emulate as far as possible a word processor. Here are some facilities that you may
find useful:

<Delete> key	deletes the character to the left of the cursor.
<Copy> key	deletes the character to the right of the cursor.
<Ctrl/U>	deletes a whole line and leaves a gap for a new line. You may either press <Copy> or <Delete> to close the gap.
<Ctrl/arrow up>	moves to the start of the procedure.
<Ctrl/arrow down>	moves to the end of the procedure.
<Ctrl/arrow left>	moves to the start of the current line.
<Insert>	copies the last line you typed.

The editor includes many standard word processing conventions. Just try them and
see what happens!

4. THE INPUTS

SWITCHING IN?

So far we have only looked at switching things on, eg. bulbs, buzzers and motors. These are the outputs. On the other side of the box is another set of sockets coloured green and black. If you plug in a switch to these sockets, the computer can detect if it is on or not. Have a go!
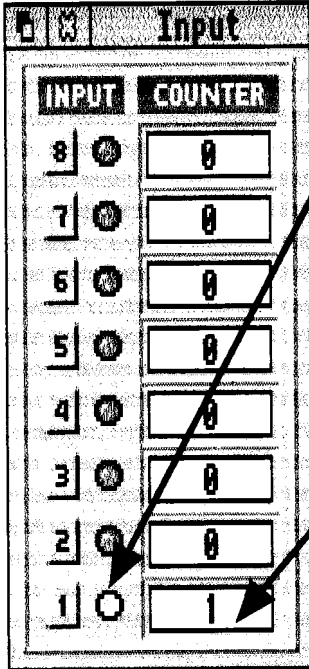
Take the push switch and plug it into green and black input socket No.1. Press and hold down the switch. You will see the LED No.1 in the input window change to green and the counter display the number 1. This tells you that the switch has been pressed once.

Now release the switch and the LED will change back to dark grey showing that the switch is now off.

Press the switch many times and watch the counter ... count.

To reset the counter, point the mouse into the counter box to the right of the number and press select. The cursor will appear. Press the <Delete> key until the number has gone and type in 0. The counter has now been reset.

USING THE INPUTS

You can use the inputs in your procedures to check if a switch is on. Try this. Keep your push switch in input socket No.1 and plug a motor into blue motor socket D and type the following procedure:

BUILD TEST   <Return>
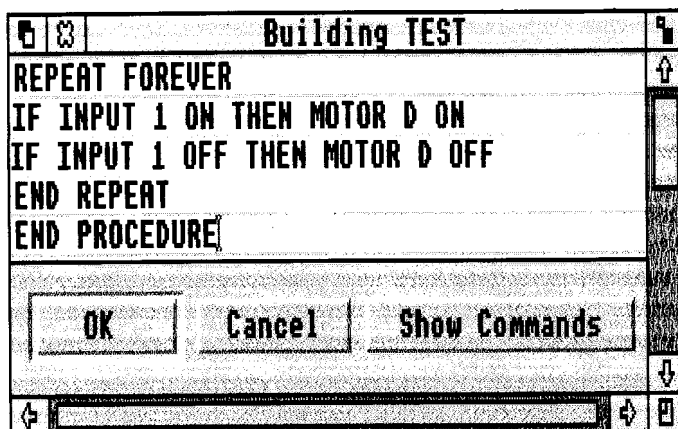
After clicking on [OK], in the dialogue window type the new word TEST <Return>.

Now every time you press the switch the motor will go on.

Good isn't it!

Experiment with the different switches. The motor will come on when:
    the tilt switch is upright,
    the light sensor has enough light and
    the magnetic switch has a magnet near it.

WAIT A MOMENT!

Here is another one for you to try. Plug a light bulb into output No 8, a light sensor into input socket 1 and build the following procedure:

```
┌──┬──┬─────────────────────────┬──┐
│ ▣│ ⊠│      Building JIFFY     │ ▧│
├──┴──┴─────────────────────────┼──┤
│WAIT UNTIL INPUT 1 OFF         │ ⇧│
│SWITCH ON 8                    │▒▒│
│ALARM                          │▒▒│
│END PROCEDURE[                 │▒▒│
│                               │▒▒│
│   ┌────────┬────────┬───────────┐│
│   │   OK   │ Cancel │ Show Commands││
│   └────────┴────────┴───────────┘│
│                               │ ⇩│
│ ⇦│                          ⇨│▣│
└──────────────────────────────────┘
```

Now in the dialogue box type:

LIST JIFFY

Another window will appear at the top of the screen which will be a listing of your procedure.

```
┌──┬──┬─────────────────────────┬──┐
│ ▣│ ⊠│     Procedure JIFFY     │ ▧│
├──┴──┴─────────────────────────┼──┤
│WAIT UNTIL INPUT 1 OFF         │ ⇧│
│SWITCH ON 8                    │ ▬│
│ALARM                          │▒▒│
│END PROCEDURE                  │ ⇩│
│ ⇦│                          ⇨│▣│
└──────────────────────────────────┘
```

Now tell the computer to carry out the procedure by typing the name:

JIFFY

```
┌──┬──┬─────────────────────────┬──┐
│ ▣│ ⊠│     Procedure JIFFY     │ ▧│
├──┴──┴─────────────────────────┼──┤
│█WAIT UNTIL INPUT 1 OFF█       │ ⇧│
│SWITCH ON 8                    │ ▬│
│ALARM                          │▒▒│
│END PROCEDURE                  │ ⇩│
│ ⇦│                          ⇨│▣│
└──────────────────────────────────┘
```
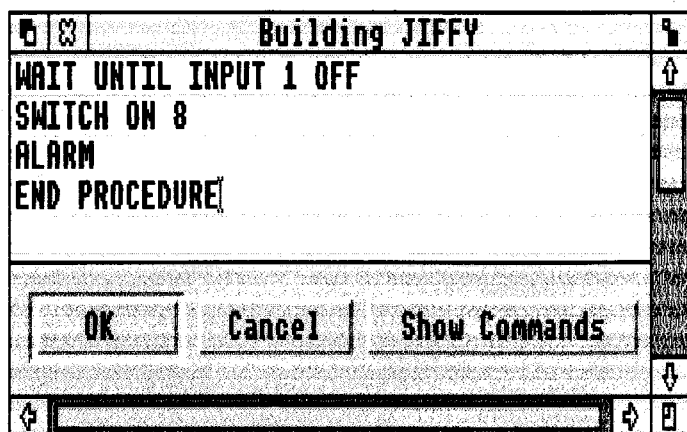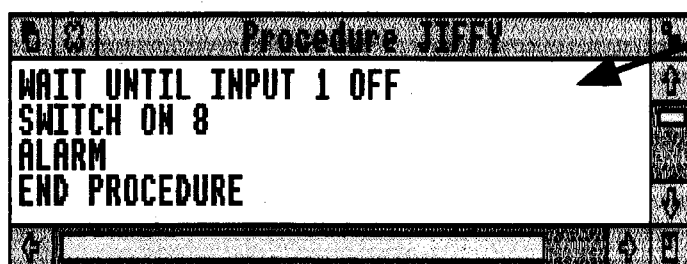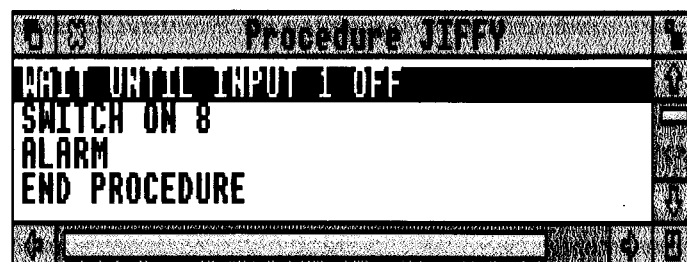
The computer appears to be doing nothing but notice the bar highlighting the WAIT UNTIL command. Yes the computer is waiting until the input at switch 1 is off.

The list command not only lists your procedure, but also highlights the command that is being executed. This will be useful later to check what the computer is doing or to see if your procedures are working correctly etc...

Now stop the light getting to the sensor and you will see the little green LED on input 1 go off, light No. 8 go on and an alarm sound.

Here are some more for you to try!

```
┌──┬──┬─────────────────────┬──┐
│ ▣│ ⊠│    Building DAY    │ ▧│
├──┴──┴─────────────────────┼──┤
│REPEAT UNTIL INPUT 1 ON    │ ⇧│
│WAIT 5                     │▒▒│
│SAY IT IS DARK IN HERE     │▒▒│
│SAY WILL SOMEBODY TURN ON THE LIGHTS│
│END REPEAT                 │▒▒│
│SAY THANK YOU THAT IS BETTER│▒│
│END PROCEDURE[             │▒▒│
│                           │  │
│  ┌──────┬───────┬──────────┐│
│  │  OK  │ Cancel│Show Commands││
│  └──────┴───────┴──────────┘│
│ ⇦│                    ⇨│▣│
└──────────────────────────────┘
```

```
┌──┬──┬─────────────────────┬──┐
│ ▣│ ⊠│   Building FALL    │ ▧│
├──┴──┴─────────────────────┼──┤
│REPEAT FOREVER             │ ⇧│
│WAIT UNTIL INPUT 1 ON      │▒▒│
│SAY I AM STANDING UPRIGHT  │▒▒│
│WAIT UNTIL INPUT 1 OFF     │▒▒│
│SAY I HAVE FALLEN OVER     │▒▒│
│END REPEAT[                │▒▒│
│END PROCEDURE              │▒▒│
│                           │  │
│  ┌──────┬───────┬──────────┐│
│  │  OK  │ Cancel│Show Commands││
│  └──────┴───────┴──────────┘│
│ ⇦│                    ⇨│▣│
└──────────────────────────────┘
```
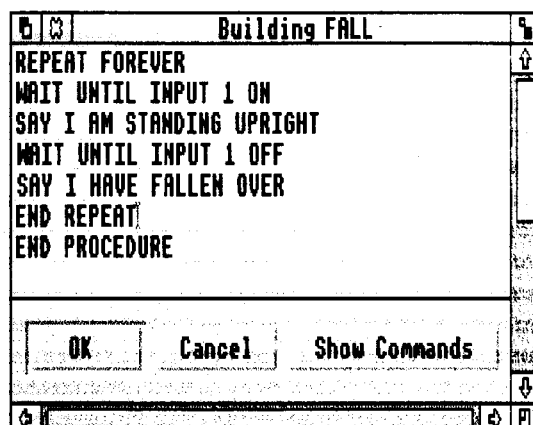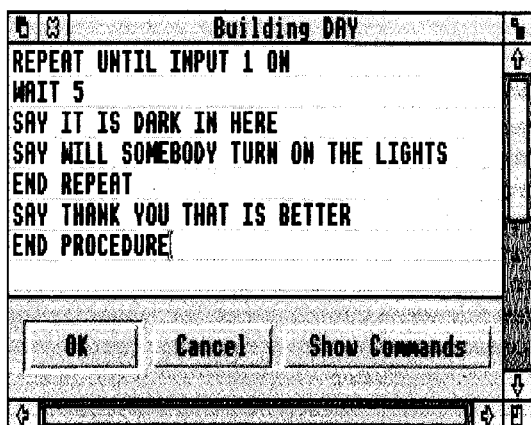
5. THE SENSOR BOX

SENSORED !!

The ability of the computer to detect if a switch is on or off is a very useful feature. You can get the computer to switch on lights if the light detector is off, it can set off an alarm if a pressure switch is being pressed and you can tell if a barrier is up or down by using the tilt switch.

If you have the Commotion Sensor Pack as well as the Control Box then the computer can do much more. With the thermometer, it can measure the temperature, with a light sensor say exactly how much light is present and indeed, measure the volume of noise in the room using the microphone. This is sensing.

If you do not have this pack then the rest of this chapter will be of little value to you except to say that pressing on the sensor button will display a Sensor window with the values fluctuating.

The Commotion Sensor Box and Sensors (CoSe)

MAKING SENSE

Plug in your sensor box to the analogue port at the back of the computer. The 'D' connector will only fit one way round so you will not be able to connect it incorrectly.
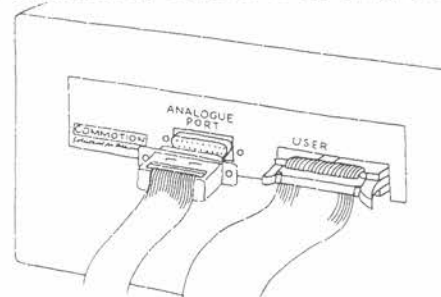
Connecting the Sensor Box to the Analogue Port of the Commotion Podule

Now point to the sensor button on the Panel window and press select. The Sensor window will appear and should look like this:

If the value of the sensors is not zero check that the box is connected correctly and that there are no sensors plugged in.

Plug the light sensor into sensor socket No. 1 and see the value register. Moving it around may change the amount of light entering box sensor. Look at the sensor values. They change according to the levels of light falling on the sensor.
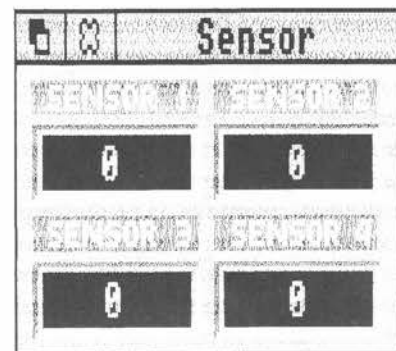
USING YOUR SENSE

There are many applications for using the sensors. This introductory guide will concentrate on the syntax and how to use the sensors within the control language.

Place the light sensor in sensor socket No. 1, check the value (say it is 60). Now draw the curtains or turn the lights out to make the environment darker and note the value (say it is now 20). Turn the lights on and plug in three light bulbs into outputs 1 to 3. Try the following procedure.

```
┌─────────────────────────────────┐
│ ▣ ▣     Building LIGHT         ▪ │
├─────────────────────────────────┤
│ REPEAT FOREVER                 ⇧│
│ IF SENSOR 1 < 50 THEN SWITCH ON 1 TO 3│
│ IF SENSOR 1 > 30 THEN SWITCH OFF 1 TO 3│
│ END REPEAT                      │
│ END PROCEDURE                   │
│                                 │
│                                 │
│                                 │
│                                 │
└─────────────────────────────────┘
   ┌──────┐  ┌────────┐
   │  OK  │  │ Cancel │
   └──────┘  └────────┘
```

Plug in the microphone to sensor socket No. 3 and talk into it. Note the top value (say 80). Now type the procedure below:

```
┌─────────────────────────────────┐
│ ▣ ▣     Building TALK          ▪ │
├─────────────────────────────────┤
│ REPEAT FOREVER                 ⇧│
│ WAIT 2                          │
│ WAIT UNTIL SENSOR 3 > 70        │
│ SWITCH ON 1 TO 3                │
│ SAY THE LIGHTS ARE ON           │
│ WAIT UNTIL SENSOR 3 > 70        │
│ SWITCH OFF 1 TO 3               │
│ SAY THE LIGHTS ARE OFF          │
│ END PROCEDURE                   │
└─────────────────────────────────┘
   ┌──────┐  ┌────────┐  ┌──────┐
   │  OK  │  │ Cancel │  │ Show │
   └──────┘  └────────┘  └──────┘
```

So you can talk to CoCo and CoCo can talk to you. **YOU NEED NEVER BE ALONE!!**

This procedure responds to your voice.

```
┌─────────────────────────────────┐
│ ▣ ▣     Building HOT           ▪ │
├─────────────────────────────────┤
│ REPEAT 10                      ⇧│
│ WAIT UNTIL SENSOR 2 = 50        │
│ SWITCH ON 1 TO 3                │
│ WAIT UNTIL SENSOR 2 = 45        │
│ SWITCH OFF 1 TO 3               │
│ END REPEAT                      │
│ END PROCEDURE                   │
│                                 │
└─────────────────────────────────┘
   ┌──────┐  ┌────────┐  ┌──────────────┐
   │  OK  │  │ Cancel │  │ Show Commands│
   └──────┘  └────────┘  └──────────────┘
```

Plug the temperature probe into sensor socket No. 2. Place the sensor into hot water and watch the value rise (say to 55). Now place it in cold water to make the value drop again and write this procedure:

These are some examples of what the sensors can do. A brief summary of the syntax that can be used are as follows:

|	
Greater than	REPEAT UNTIL SENSOR 3 > 50
Not equal to	WAIT UNTIL SENSOR 1 <> 30
Less than	IF SENSOR 2 < 25 THEN .....
Equal to	WAIT UNTIL SENSOR 4 = 38

6. THE CoCo FILING SYSTEM

SAVING

Procedures you have built can be saved to disk and loaded if you wish to use them again later. It is suggested that you do not use the CoCo master disk for your procedures.

Once you have built some procedures they may be saved in the following ways:

INDIVIDUAL PROCEDURES

Suppose you have built a procedure called TRAIN and wish to save it to disk. Go through the following:

1. Place the disk you wish to save the procedure on in the drive.
    Point to the drive icon and press select button on the mouse.
    You will get a disk window that may look like this.
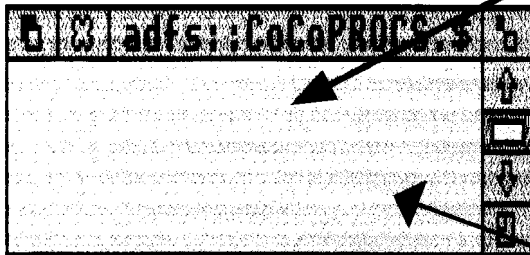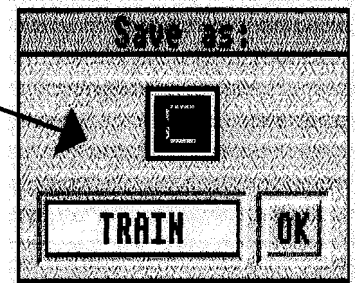
2. In the dialogue box type the following:

    SAVE TRAIN<Return>

    A small Save as window will appear with the procedure name on it and a [C] icon.

3. Point to the [C] icon press select and whilst keeping it pressed drag it onto the disc window and release the select button.

    TRAIN is now saved on the disk

Another way to save individual procedures is to:

1. Call up the Procedures window by pointing to the **Procedures** button and pressing select. A window containing all your procedures will be displayed.

2. Point to the procedure TRAIN and press the menu button.

3. Move through the ⇨ on TRAIN and through the ⇨ on SAVE.

4. This displays the SAVE icon which can be saved as shown in the previous method of saving.

SAVE ALL

If you have more than one procedure then you can either save them individually or all at once. This can be achieved in different ways. Firstly in the Dialogue window type:

SAVE ALL   <Return>

The Save as window appears with a file icon but this time with a group name of <Procedures> If you wish to save your procedures by another name delete the word <Procedures> and replace it with your own. Now drag the blue directory icon to the disk on which you wish to save your procedures as before.
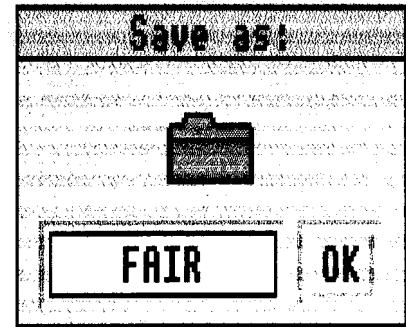
A quicker way of saving all the procedures is to point to the CoCo icon on the bar at the bottom of the screen and press the menu mouse button. Follow through the Save All ⇨ and then save as before.

LOADING A SINGLE PROCEDURE

If you have procedures saved on a disk, and wish to load them, place your disk in the drive and press select on the dive icon. The Disk window may look something like this:
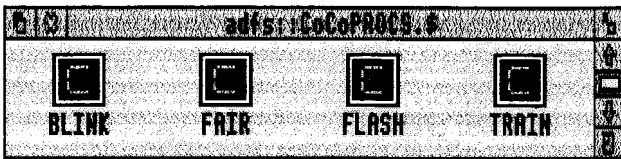
1. To load, point to the procedure you wish to load and press [select].
2. Drag the selected icon onto any CoCo window or the CoCo icon on the bar at the bottom of the screen.

Alternatively you may double click on a procedure icon and it will load automatically. If your procedure is stored in a blue directory folder having used the Save All option, you will need to open the blue directory to see the files inside.

MULTIPLE LOADING

To load more than one procedure, point to each procedure required and press [Adjust] and each procedure will be highlighted. Drag the highlighted procedures onto any CoCo window.

To load a multiple procedure file, drag the blue directory icon onto any CoCo window, or on the CoCo icon on the icon bar.

> *Note: if you load a procedure with the same name as one already in memory then the existing procedure in memory will be over-written.*

To overcome individual procedures over-writing memory, you can load them individually or in groups as described above.

Page 21

PRINTING PROCEDURES

Having taken a lot of trouble to build and develop working procedures you may wish not only to save them on disk for future use but also print them for all to see. you will be dis apointed   I know to hear that this is not straight forward, due mainly to the fact that the printer port is used by the control box and it is not easy to have both connected together. However it is possible to print procedures either directly through the program !Edit or **export** them to any DTP package as a simple text file. Here is what to do.

1. Call up all the procedures you have built through the procedures window (see page 20)

2. Select the procedures you wish to print by pointing to each one in turn and pressing the [Adjust] button. You will notice that all the selected procedures will be highlighted.
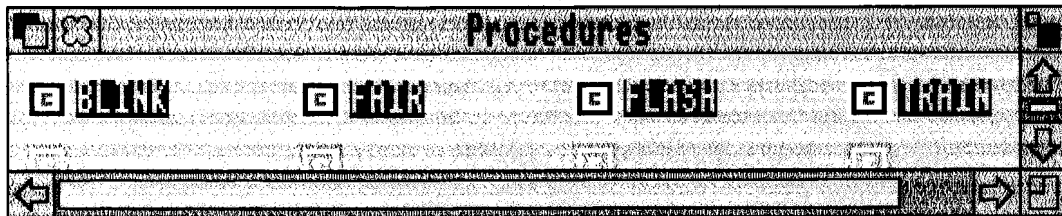
3. Now press the [Menu] button whilst inside the Procedures window. Go through the ⇨ on the Selection option, then the Export ⇨ to the Save as window.

Drag this icon to disk, or to a DTP package for printing.
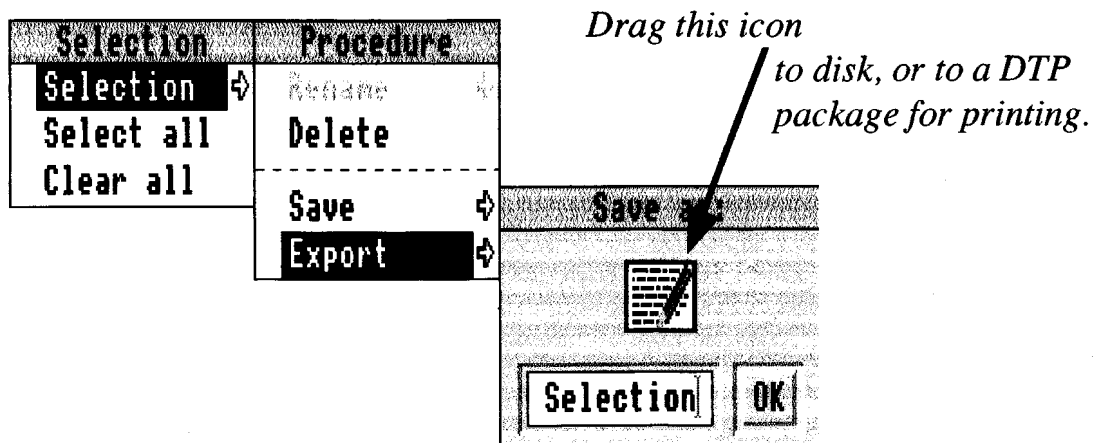
4. Ah!... there it is, the chance to "Export" your procedures either to be saved as a text file on disk, or directly into a Desk Top Publishing package for printing.

   You will of course need to know how to print from your DTP package !!!

7. REFERENCES

COMMAND SUMMARY

This section lists all the CoCo control commands, explains how to use them and their syntax:

ALARM
Makes an alarm noise through the computers' own speaker
eg   ALARM

ALL
All means all if you see what I mean...
Can be used in a multitude of circumstances
eg   SWITCH ON ALL
       HIDE ALL
Try others and see if they work.

BACKWARDS
Command given to specify the direction of the Motor. The opposite of FORWARDS and ON.
eg   MOTOR A BACKWARDS

BUILD <procedure name>
Allows you to add commands or procedures to the control language. This sequence of instructions has to be given a name and can be called upon by simply typing its name.
eg   BUILD FLASH
       SWITCH ON 1
       WAIT 1
       SWITCH OFF 1
       END PROCEDURE
END PROCEDURE should be used to mark the end of the sequence of instructions.

CHANGE <procedure name>
Allows you to make changes to a built procedure.
eg   CHANGE FLASH

CLEAN
Clears the dialogue and write windows
eg   CLEAN

CONTROL
The name given to the window that controls the power and the motors. This command can be used to show or hide the window.
eg   SHOW CONTROL
       HIDE CONTROL

COUNTER <number> <value>
Checks the number of times an input has been pressed.
eg IF COUNTER 3 < 5 THEN SAY GOOD

DELETE <name>
Deletes a named procedure from memory. Can also be used with DELETE ALL which will erase all procedures. Take care with this one!
eg   DELETE BLINK
       DELETE ALL

DISPLAY <name>
Shows in the dialogue window the values assigned to a name. Associated with LET.
eg   LET LIGHT = 5
       DISPLAY LIGHT
will say LIGHT = 5

DIALOGUE
The name given to the window in which all commands are typed in. This command can be used to show or hide the window.
eg   SHOW DIALOGUE
       HIDE DIALOGUE

END
The termination of a series of instructions either in Procedure or a Repeat sequence.
eg.   END REPEAT
       END PROCEDURE

FOREVER used in conjunction with repeat will continue to repeat instructions until the <Escape> key is pressed.

eg   REPEAT FOREVER

FORWARDS

Command given to specify the direction of the Motor. The opposite of BACKWARDS and REVERSE.

eg   MOTOR A FORWARDS

HELP

Displays the help window and awaits which command you want help with.
Can be followed by the command.

eg   HELP
         HELP MOTOR

HIDE <window name>

Clears a named window from the screen.

eg   HIDE PANEL
         HIDE ALL

IF <condition> THEN <statement>

Will carry out the statement after THEN if the condition is met.

INPUT <number> <state>

Allows for the checking if an input is switched on or off.

eg   IF INPUT 6 ON THEN ALARM
         WAIT UNTIL INPUT 7 OFF

LET <name> = <value>

Sets a value to a given name.

eg   LET LIGHT = 5
         SWITCH ON LIGHT
         REPEAT LIGHT

LIST <name>

Lists all the instructions in a named procedure. It will also highlight the line being executed if the procedure is in operation.

eg   LIST BLINK

MOTOR <name> <state>

Turns on a named motor socket in a given direction. Names can be A,B,C or D. States can be FORWARDS or ON,
BACKWARDS or REVERSE and OFF

eg   MOTOR A FORWARDS
         MOTOR A OFF

OUTPUT <number> <state>

Allows for the checking if a switched output is on or off.

eg   IF OUTPUT 6 ON THEN ALARM

POWER <name> <level>

This sets a pair of named outputs to a specified power level. Note that setting the power on A to 5 will also set the ouput power to sockets 1 and 2 to level 5.
Power values can range from 0 which is off to 10 (full power).

eg   POWER A 5

REPEAT <number>

Repeats the following actions the number of times specified.

eg   REPEAT 10
         SWITCH ON 1
         SWITCH OFF 1
         END REPEAT

END REPEAT must be used to signify the end of the repeat sequence. If this is not done the sequence will only be executed once.
REPEAT FOREVER will continue to repeat instructions until the <Escape> key is pressed.
REPEAT UNTIL <condition>
Repeats the following actions UNTIL a given condition is met.

eg   REPEAT UNTIL SENSOR 3 > 50
         SWITCH ON 1
         WAIT 1
         SWITCH OFF 1
         WAIT 1
         END REPEAT

RENAME <old name> <new name>
Gives an already built procedure a new name.
eg   RENAME FLASH BLINK

RESET
Has two functions. By itself will reset all the outputs to off, the power to 10 and counters to zero. It is the same as pressing the <Escape> / [Panic!] button. Used in association with the stopwatch (as above).
eg   RESET

REVERSE
Command given to specify the direction of the Motor. The opposite of FORWARDS and ON and the same as BACKWARDS.
eg   MOTOR A REVERSE

RND <value>
Generates a random value decided by the computer and unknown to the user. The value following is the maximum value of the number and must be enclosed by brackets.
eg   WAIT RND(10)
This will wait for a random period of time up to a maximum of 10 seconds.

SAVE <procedure name>
Saves the named procedure to the disk drive. You will be presented with the save icon and have to drag it to the disk window for filing.
eg   SAVE BLINK

SAY <message>
Speaks any text, numerals and a few other characters typed after the word say
eg   SAY THE LIGHT IS ON
        SAY HOW OLD ARE YOU?
        SAY I AM 15 YEARS OLD
Note: commas and full stops will pause the speech slightly and a question mark will raise the intonation.

SHOW <window name>
Displays named window on the screen.
eg   SHOW STOPWATCH
        SHOW ALL

SENSOR <number> <value>
Checks the value of a given SENSOR. The number range is 1 to 4 and the values between 0 and 100.
eg   IF SENSOR 3 = 30 THEN ON 3

STOPWATCH <operation>
Controls the working of the stopwatch and its operations.
eg   STOPWATCH GO
        STOPWATCH STOP
        STOPWATCH RESET
        STOPWATCH LAP

SWITCH <state> <number>
Switches ON and OFF specified outputs. Allowable numbers are 1 to 8 and ALL Also 1 to 3 or 5 to 7 etc...
Each output must be separated by a comma or an and.
eg   SWITCH ON 1,2,3 AND 4
        SWITCH OFF 1 TO 7
Also   TURN ON 3 or just ON 3
eg IF TIME > 12:30:00 THEN TURN ON 3

TIME
Will print the current time in the Dialogue window or check time before an operation will begin
eg   TIME
        IF TIME > 09:30 THEN TURN ON 2

WAIT <number> or UNTIL <condition>
Waits a specified number of seconds or UNTIL a condition is met before going to the next command.
eg   WAIT 12 (seconds)
        WAIT UNTIL INPUT 5 OFF

WRITE <message>
Displays in a special Write window any message you wish to display.
eg   WRITE The barrier is now open!

COMMAND MESSAGES

CoCo is already running!	An attempt has been made to load CoCo when it is already running.
I do not understand <message>	Typing a word that CoCo does not know.
I do not know how to <command>	CoCo understands the command but does not know how to do it in this context.
I already know <command>	Attempting to build a procedure by giving it a name that it already knows.
This file is not a valid CoCo procedure!	You have tried to load a file into CoCo that is not a procedure file.
There are unsaved procedures, are you sure you want to quit?	When leaving CoCo you will get this warning if there are procedures in memory that have not been saved
Cannot queue anymore procedures!	Because CoCo is multitasking you can type procedure names in the Dialogue window. The program will immediately start to carry out the first one and place the rest in a queue to be carried out in turn.
Label cannot be a reserved word!	Cannot assign an output a label that is already a command word.
This label already exists!	This occurs when you try to label an output with a name that has already been used.
I am waiting ...	Typing wait in direct command will make the computer do just that - and it tells you.
No help entry found!	Asking for HELP on a word for which no information is available or the word does not exist.
Cannot rename to <name>	If you attempt to RENAME a procedure to a name that is used as a command word.
Name too long! (Max. 10 letters)	Giving names to procedures or file name for saving there is a limit to the number of letters you can use.
I am not building anything!	Produced if you type END PROCEDURE before building one.

I am not repeating anything!	Typing END REPEAT where there is no repeat to end.
REPEAT UNTIL what?	Failing to give a condition after a repeat.
WAIT UNTIL what?	Failing to give a condition after a wait.
IF what condition?	Failing to give a condition after an IF statement.
what?	Incomplete command in which the first part is understood.
IF needs a THEN.	Failing to use THEN after an IF condition.
Only outputs 1 to 8 allowed.	Giving an invalid output number when only 1 to 8 is within range.
Only sensors 1 to 4 allowed.	Giving an invalid sensor number when only 1 to 4 is acceptable.
Please specify A,B,C or D. motors	Failure to use the correct label for a motor socket.
Only POWER level 0 to 10 allowed.	Giving an invalid power number when only 0 to 10 is available.
You cannot use BUILD inside a procedure!	Using the word BUILD within a procedure.
REPEATs...END REPEATs do not match!	For every REPEAT there must be an END REPEAT. Here you may have two repeats within a procedure but only one END REPEAT.
I do not know that procedure!	Trying to LIST a procedure that does not exist.
Cannot CHANGE a reserved word!	CoCo's reserved words cannot be accessed
Cannot LIST a reserved word!	and so you cannot CHANGE, LIST, or
Cannot RENAME a reserved word!	RENAME them etc...