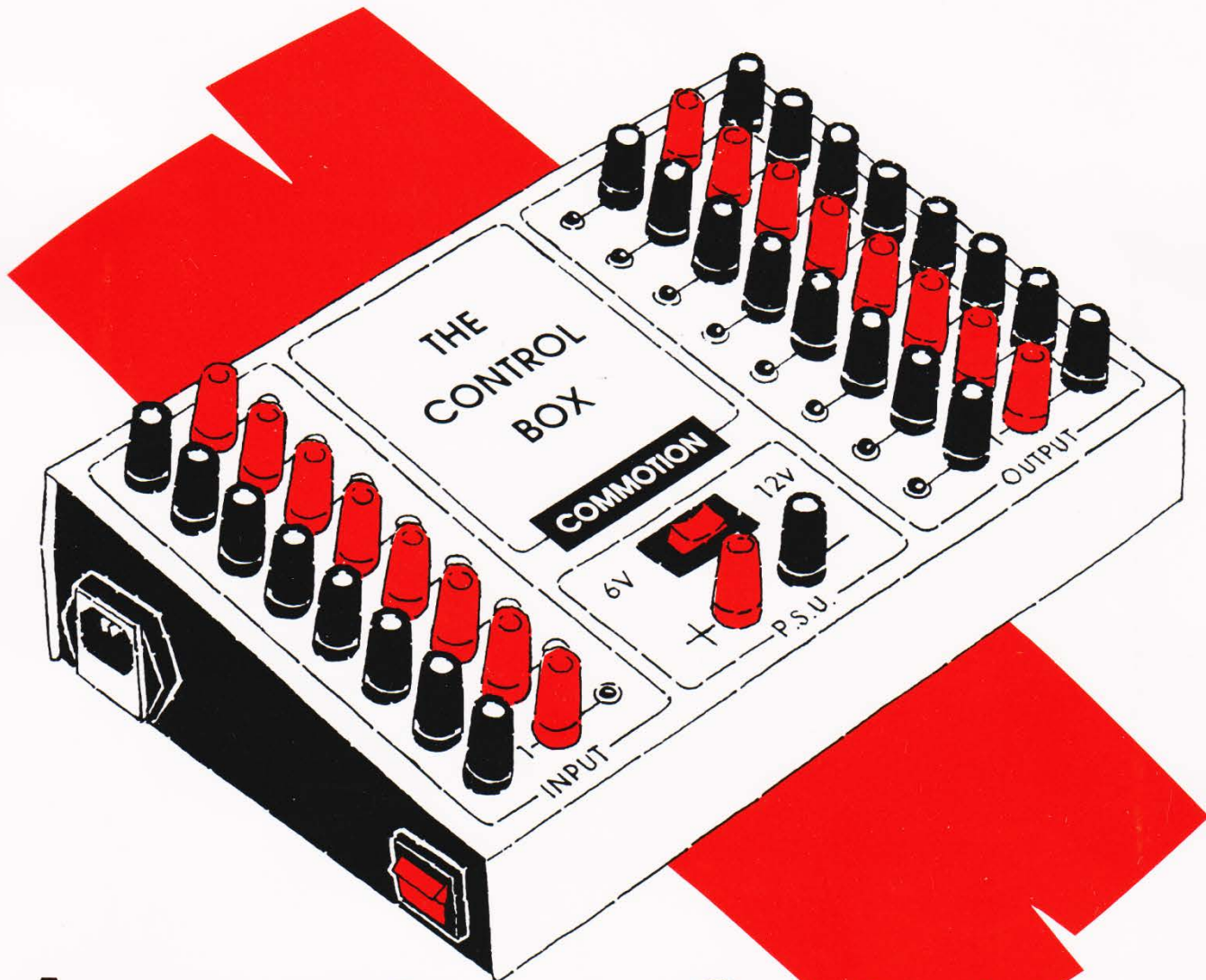


# COMMOTION

*Solutions for Education*

A User guide to

**'CONTROL'** for the BBC  
& Master 128



## An easy to use Control Language for schools

Designed by Ron Allen

Programmed by Sean Bennett



# COMMOTION "COMTROL"

A program that allows you to explore the world of  
computer control for BBC B, B+ and Master

Designed by Ron Allen

Commotion Ltd  
Redburn House  
Stockingswater Lane  
Enfield  
EN3 7TD

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# 1. INTRODUCING CONTROL

## 1.1 What is control?

Today's computers can carry out many of the functions that would normally have to be done by humans. To achieve this the computer has to be able to switch on and off electrical devices such as a washing machine. To do this a computer has to know what the temperature of the water is, and how long the wash should last. This action of switching on and off devices is known as OUTPUT. The sensing of temperature is called INPUT. A simple understanding of this concept together with the computer's ability to STORE - REMEMBER - and OBEY gives the teacher a very useful automatic control system capable of use in the classroom. When connected to the Commotion Control Box, which has its own power supply, motors, buzzers, bulbs etc. can be switched on and off. The computer will respond to a variety of sensors such as light and pressure. This is computer control.

## 1.2 Why control?

Control offers scope for open ended problem solving for children of all ages. It is a valuable way of extending pupils' learning experiences for it provides the learner with first hand concrete experiences and encourages them to learn and practice a variety of skills.

The language used in this program has been developed over several years and is designed to make complex control tasks easy to perform in a language that is as near to written and spoken English as possible. It can therefore be used by all pupils, supporting the elements of good language development and classroom practice through a cross curricular approach.

Computer control:

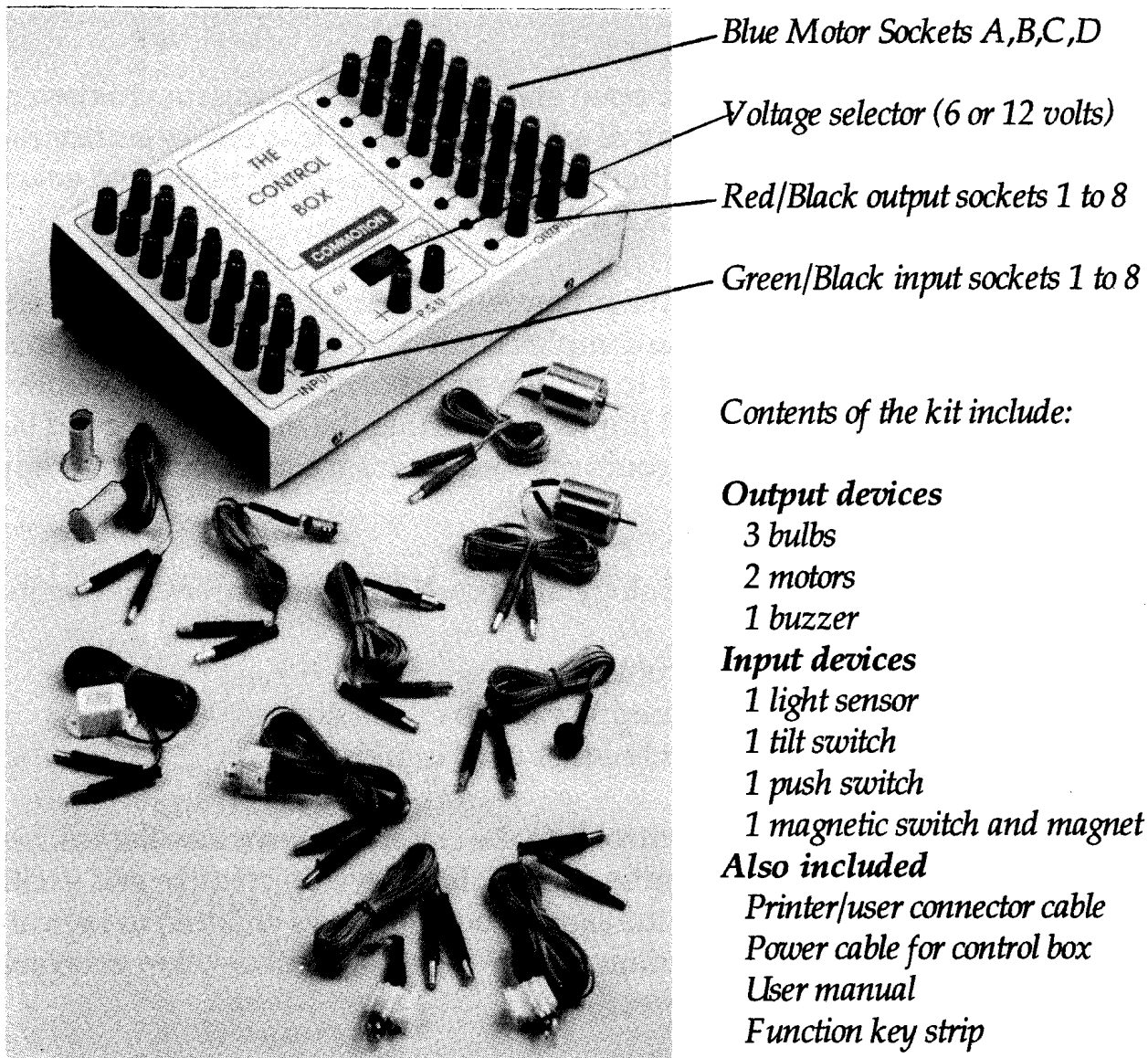
- a. introduces technology and practical science investigation into education
- b. involves true problem solving
- c. shows what a computer is capable of doing
- d. demonstrates techniques used in industry
- e. is enjoyable

The introduction of control into the classroom provides the teacher with a wide range of opportunities in which to develop creative and exciting learning situations. At the same time it involves children in logical thinking and investigating situations from which they will develop good scientific principles and procedures.

### 1.3 The Commotion Control Box

The control box which plugs into the PRINTER and USER ports of the computer provides protection against accidental damage. It allows for eight electrical devices to be controlled from the outputs and eight switches to be sensed from the inputs. Each of these have a indicator light on the box to show what they are doing.

Look at the outputs on the control box. There are eight pairs of black and red sockets labelled 1 to 8 and eight blue sockets arranged in pairs, labelled A,B,C and D. Each pair of output channels can switch on an electrical device either individually or all together, or the paired blue sockets can drive a motor forward and reverse. This allows the possibility of driving four motors from the box. A switch allows the teacher to select 6 or 12 volts for all outputs.



*Contents of the kit include:*

#### **Output devices**

- 3 bulbs
- 2 motors
- 1 buzzer

#### **Input devices**

- 1 light sensor
- 1 tilt switch
- 1 push switch
- 1 magnetic switch and magnet

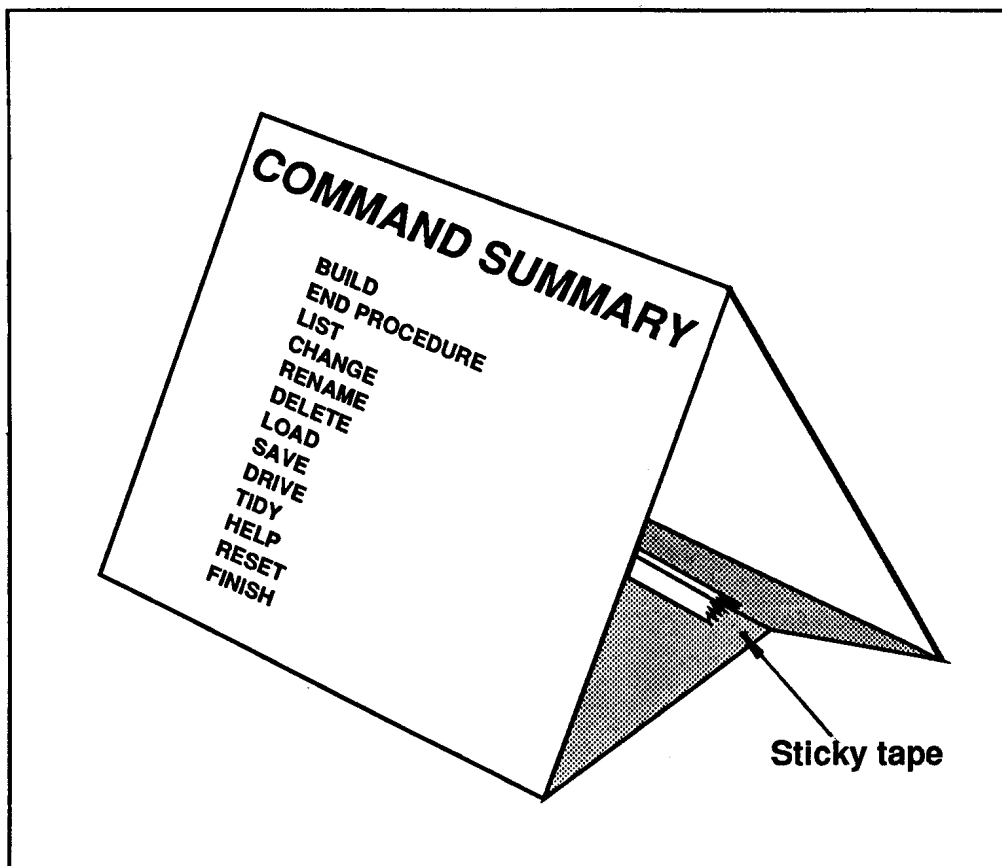
#### **Also included**

- Printer/user connector cable
- Power cable for control box
- User manual
- Function key strip
- Command summary

#### 1.4 This reference manual

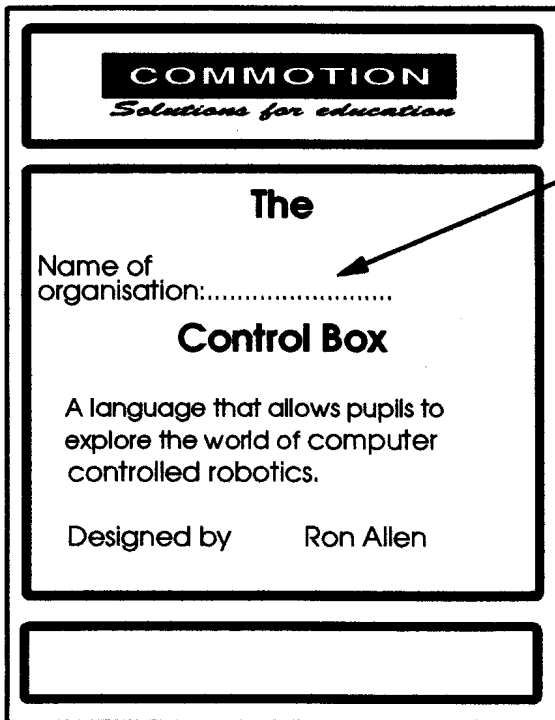
This manual provides an introduction to the facilities available using the control package. Chapter 1 of this guide introduces you to control, explains how to connect up the parts and includes details of setting up and personalising your disk. Once everything is set up chapters 2, 3 and 4 tells you about the control language. It does not matter if you have not experienced control before, the language is easy to use and you need only know a few simple commands to get started. Included within the guide are a few ideas to try which may help, but in the main it will be up to you to use the control system to control the things you want. Having familiarised yourself with the language including procedures, chapters 5 and 6 deal with the filing of procedures both on a disk as well as a printer.

The reference section at the end of the guide includes getting a print out of your procedures, an explanation of the helpful messages that control issues, a command summary and a keystrip which may be photocopied as appropriate.



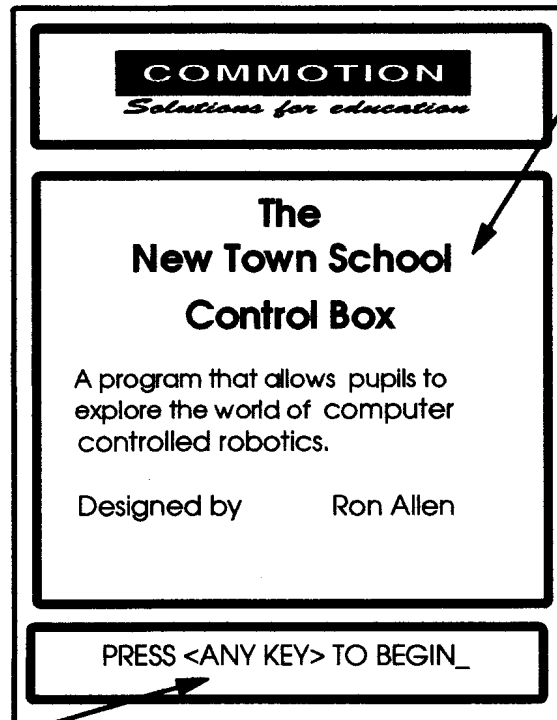
## 1.5 Personalising your disc

Place the sensor disk into the computer and hold down the <SHIFT> key whilst you tap the <BREAK> key. You will get a title screen which should look like this:



Type in the name of your school, authority or organisation. eg New Town School and press <RETURN>

The disk will initialise and display the title screen with the name of your organisation eg.



Pressing any key to continue will offer the control menu.



## 1.6 Disc management

Once you have personalised your disc, we suggest that you make a back up disc from which to work. Start by formatting a new working disc to use during your sessions. Most schools use a 40 track system. If you are using a BBC Master 128 it is easy to format a disc. Place a new disc in drive 0 and type in:

\*FORM 40 and press the <RETURN> key.

The computer will ask you which drive you wish to format. You reply '0'. It may then ask you if you are sure or ready. When you press 'Y' for yes the machine will proceed to format the disc. It is possible to abbreviate the initial instructions by telling the machine which disc drive you are using at the same time as giving the initial instructions. You simply type in:

\*FORM 40 0 and press the <RETURN> key

If you are using a BBC B you will need a formatting disk to format a new disc with. Place the formatter disc in the drive and follow instructions given.

Make a "backup" copy of the sensor disk to work on. To do this first make sure that the master control disc is write protected. Then you put the master control disc in drive 0 and type:

\*ENABLE and press <RETURN>  
\*BACKUP 0 0 and press <RETURN>

The computer will prompt you alternatively to insert and remove the two disks, eg.

'INSERT THE SOURCE DISK INTO DRIVE 0 AND HIT A KEY'  
'INSERT DESTINATION DISK INTO DRIVE 0 AND HIT A KEY'

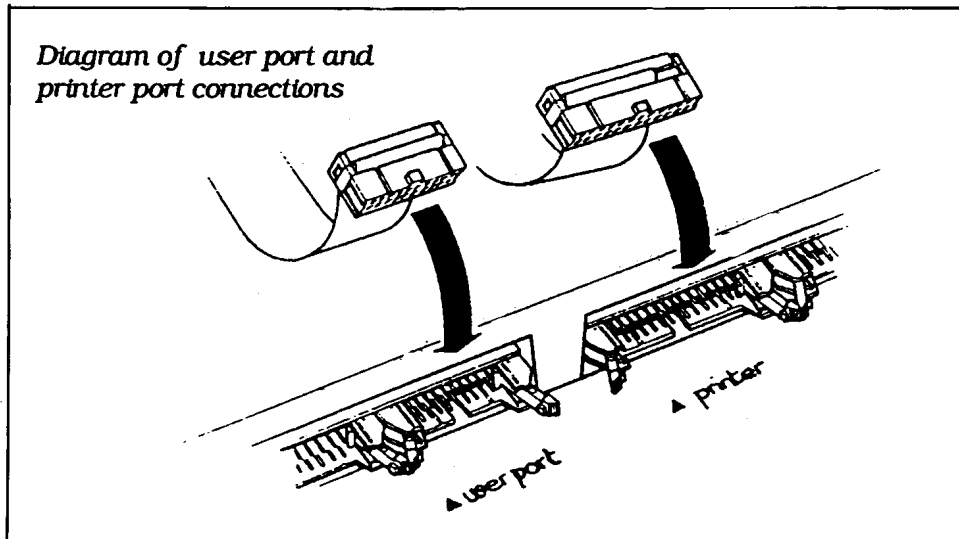
For dual drive users things are much easier. Simply place the master disk into drive 0 and the destination disk in drive 1. Now type in the following:

\*ENABLE and press <RETURN> key  
\*BACKUP 0 1 and press <RETURN> key

The computer will ask you to confirm that you are copying from drive 0 to 1 and display the PROMPT sign when finished. Label your new disc and place the master safely away.

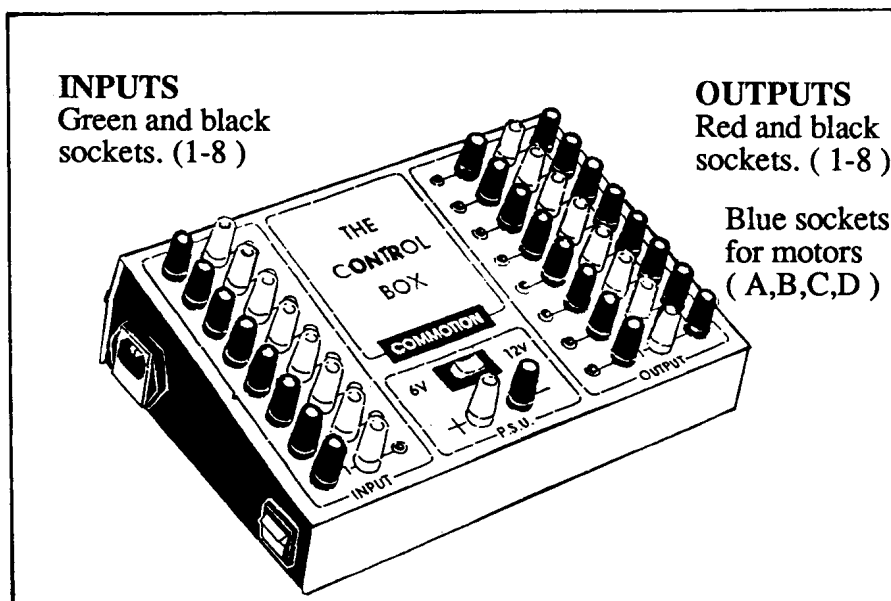
### 1.7 Connecting the control box to the computer

To connect the control box to the computer, plug the two connectors from the box, into the USER PORT and PRINTER PORT which are found underneath the computer. The plugs are of different size and so you cannot connect them in the wrong sockets. Be careful to match the notches on the connectors with the grooves in the User/Printer sockets on the computer. Plug in the mains plug into a 240 volts supply and switch on the computer and control box.



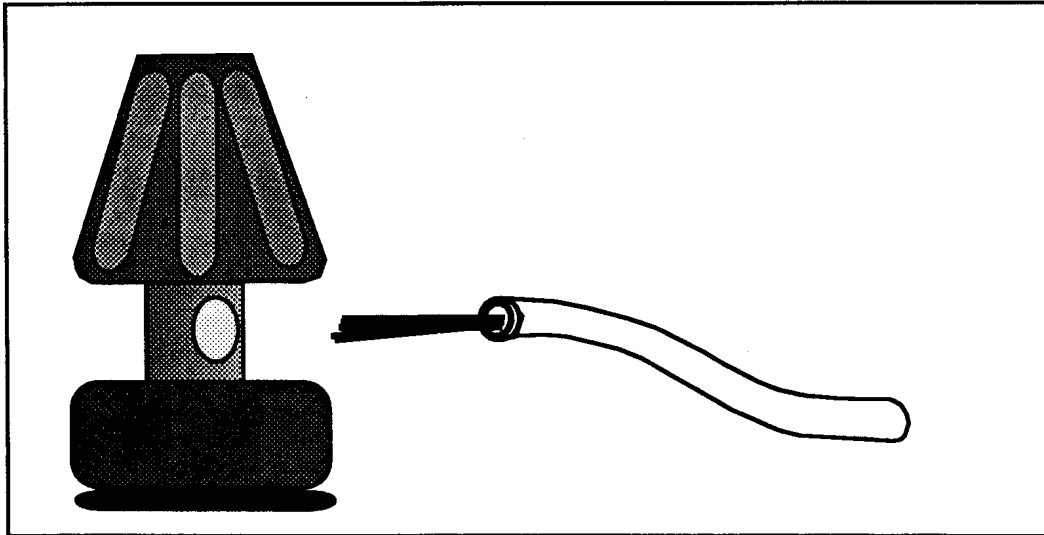
### 1.8 Connecting devices to the box

Before making output connections to the box make certain that you have selected the the correct voltage for the device you are using. Connect one lead of the device to one of the RED output channels (numbered 1 to 8) and the other lead to the BLACK socket. Connect motors to the blue sockets which are in pairs and lettered 'A' to 'D' Up to four motors can be attached in this way. When connecting input devices plug one lead into the GREEN input socket and the other into the BLACK socket numbered 1 to 8.

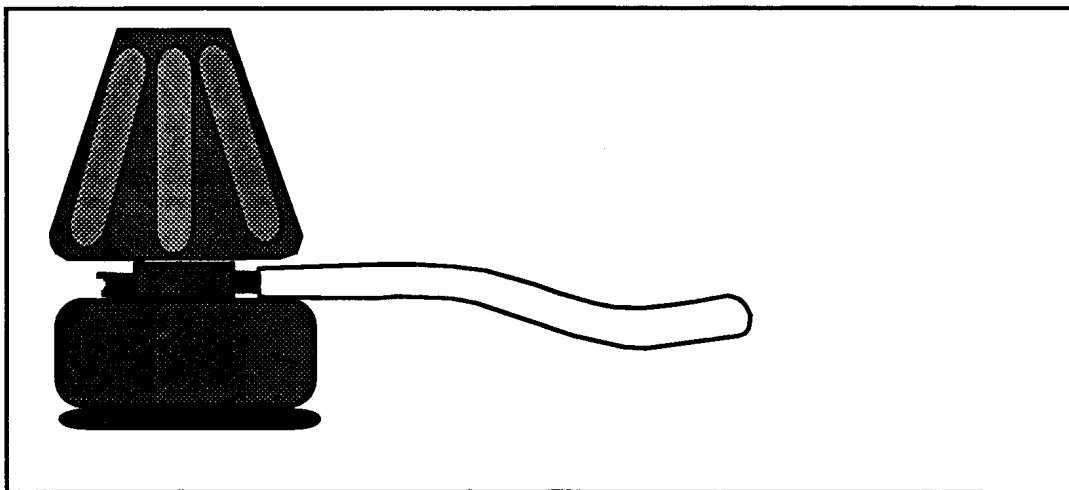


Should you wish to devise and use components of your own with the box bared wires can be connected directly. Unscrew the coloured terminals and connect your wires. They can be held in place by screwing the terminals back down again.

NB. Don't forget to bare the wires before making the connections and remember some components such as buzzers may need to be connected to the box the right way round (red to positive and black to negative) in order to make them work.



To connect a bare wire to the control box simply unscrew the post mounted on top of the box and thread the wires through the hole.

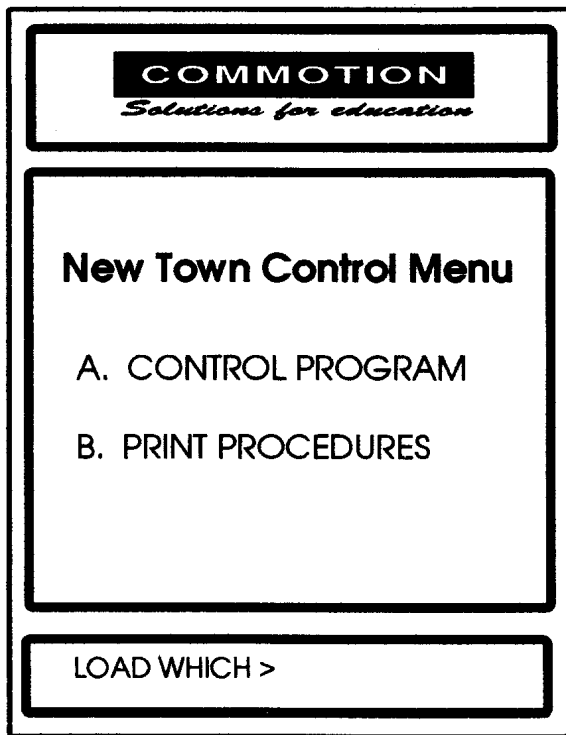


Screw down the plastic top of the post to secure the wire in place. this will ensure a good electrical contact.

## 2. THE CONTROL LANGUAGE

### 2.1 Loading your disk

The language is designed to make control simple, even for very young children, yet flexible enough for use by all students. Set up your interface box as described on page 6 of this manual. Place your backup copy of the 'control' disk in the disk drive, and press SHIFT and BREAK together, releasing BREAK first.



The 'Control Menu' title should appear. The screen will show a display like this:

Select CONTROL LANGUAGE by pressing key A

(The PRINT PROCEDURE option will be dealt with in section 6 of this manual).

After loading, the title screen will look like this:

	A		B		C		D	
MOTORS								
SWITCHES	0	0	0	0	0	0	0	0
NUMBER	1	2	3	4	5	6	7	8
INPUTS	0	0	0	0	0	0	0	0
→								

## **2.2 Language structure**

Much time has been devoted to researching a suitable language for children to communicate with the computer. All areas of the primary school curriculum were considered and teachers consulted. Somewhat rather glibly we now say that after such research we decided to use English as our language and follow conventional usage as far as possible. Thus to switch on a device the command SWITCH ON is used in preference to SETBIT1 or even SWITCHON which lacked spaces between words. This is something that many teachers felt very strongly about particularly whilst younger children were developing their language structure.

The following notes provide a brief introduction to the facilities available on the control box. They include the control language instructions needed to use the box together with the diagrams of how to connect to the box. There is a summary of the COMMAND words of the control language at the end of these notes.

## 3. CONTROL COMMANDS

### 3.1 Switch on / off

Connect a light to 'output 1', and type:

**SWITCH ON 1 <Return>**

The light should then go on, and you are now into computer control! If it does not - check that the control box is properly connected to the computer and switched on.

Try connecting some lights to the other outputs. They can be switched on too. Pressing red function key 'f0' will print SWITCH ON on the screen for you. Pressing a number between 1 and 8 followed by RETURN will switch on the appropriate light. If you haven't got enough lights, don't worry, as the screen display and the little 'LED' lights on the interface box will show whether the outputs are on or off.

If you press ESCAPE, all the lights will be turned off. In an emergency this can act as a panic button. It switches off all outputs and resets the power to 10. However procedures in memory are not lost.

Another version of the 'SWITCH ON' command is:

**SWITCH ON ALL <Return>**

-try it, to see what happens.

There is also a command to switch off lights, and sensibly enough this is called 'SWITCH OFF', and can be found on function key 'f1'.

**SWITCH OFF 1 <Return>**  
**SWITCH OFF ALL <Return>** will work too.

You can SWITCH ON or OFF more than one light at a time. Try:

**SWITCH ON 1 AND 2 <Return>**  
**SWITCH ON 4,5,6 <Return>**  
**SWITCH OFF 4,5 AND 6 <Return>**

Any number of components may be switched on or off with this method, not only lights but buzzers, motors and other devices. Remember to press the <Return> key after each command line.

### 3.2 Motor

Motors can be plugged into the 'paired' BLUE sockets on the 'Control' box. Plug a motor into the pair of sockets 'A'. It can be controlled with the MOTOR command, simply:-

<b>MOTOR A ON</b>	<b>&lt;RETURN&gt;</b>	will turn it on,
<b>MOTOR A OFF</b>	<b>&lt;RETURN&gt;</b>	will turn it off, and
<b>MOTOR A REVERSE</b>	<b>&lt;RETURN&gt;</b>	will turn it on in the reverse direction.

The MOTOR command is on function key 'f2'.

### 3.3 The <ESCAPE> key

This can be regarded as the emergency stop button! Pressing <ESCAPE> cleans the screen, switches off all the outputs and sets the power level back to 10. It is also the way to escape from long running or repeat procedures. The escape key does not lose the procedures you have built.

### 3.4 Power

This command can change the power level to all the outputs. Put a light bulb in output 1 and try the following:

<b>SWITCH ON 1</b>	<b>&lt;RETURN&gt;</b>
<b>POWER 5</b>	<b>&lt;RETURN&gt;</b>
<b>POWER 2</b>	<b>&lt;RETURN&gt;</b>
<b>POWER 8</b>	<b>&lt;RETURN&gt;</b>

You will see that the bulb dims and brightens according to how much POWER you give it. The POWER can range from 1 to 10.

Plug a motor into MOTOR socket B and type:

<b>MOTOR B ON</b>	<b>&lt;RETURN&gt;</b>
<b>POWER 10</b>	<b>&lt;RETURN&gt;</b>
<b>POWER 2</b>	<b>&lt;RETURN&gt;</b>

This time the motor speeds up or slows down depending upon how much POWER there is.

### 3.5 Clean

The command CLEAN will clear the screen of all your typing. This is useful when creating a display using the WRITE command.

### 3.6 Write

This prints out text on the screen and is useful for writing messages or making displays within procedures. Eg.

```
WRITE Please press a switch when ready <RETURN>
```

### 3.7 Alarm

Produces a siren type sound which lasts a few seconds. Just type:

```
ALARM <RETURN>
```

### 3.8 Wait / For

The wait command has two functions. Firstly it acts as a pause and will cause the computer to wait for a certain length of time before going to the next instruction. Hence

```
WAIT 1
```

will cause a delay, in this case 1 second, before moving onto the next command. The wait command must be followed by a number which indicates the number of seconds to delay. Any valid number is acceptable including decimals. ie 1.3 = 1.3 seconds.

The computer can also detect if a switch is either 'on' or 'off'. Connect the push switch to the green and black socket 'input 3', and press the switch down. It is now 'on', and the green 'O' on the screen will turn to a yellow block and the green LED on the box will light. Releasing the switch will turn it back to green again. Other types of simple switches are light sensors, magnet detectors and 'tilt' switches.

The second use of WAIT is to cause the computer to WAIT FOR an input to be pressed. Try typing the following:

```
WAIT FOR 3 ON <Return>
```

The computer will appear to stop. It is waiting for input 3 to be switched on!



Now press the switch plugged into input 3 down again. The -> prompt should then re-appear.

```
WAIT FOR 3 OFF <Return>
```

will cause the same event to happen until a switch plugged into input 3 goes off.

### **3.9 Repeat / End repeat**

The command 'REPEAT' tells the computer to execute a number of commands over and over again. Repeat must be followed by a number which indicates the number of times the instructions are to be executed. All commands up to the End repeat are included.

Try the following sequence:-

```
REPEAT 5  
SWITCH ON 1  
WAIT .5  
SWITCH OFF 1  
WAIT .5  
END REPEAT
```

### **3.10 If Input / Then**

```
IF INPUT 1 OFF THEN SWITCH ON ALL
```

This means simply, IF the switch connected to 'INPUT 1' is OFF, THEN SWITCH ON ALL. You already know what 'SWITCH ON ALL' does. Unless you are pressing down the switch, all the lights will go on.

How about this:

```
REPEAT FOREVER  
IF INPUT 1 ON THEN SWITCH ON ALL  
IF INPUT 1 OFF THEN SWITCH OFF ALL  
END REPEAT
```

You can interrupt a repeat command by pressing ESCAPE.

### **3.11 Count**

The COUNT command counts input changes. For example, switching a switch from on to off is one change, and switching it back is another. Try the command:-

**COUNT 2**

Now press any switch down; nothing happens as this is only a count of 1 event. Now release it and the prompt will reappear as this is the second event.

The count command can be useful to count for example the number of times a crane goes up and down before turning off, or the number of times a train goes round a track before stopping.

## 4. PROCEDURES

### 4.1 Commands

It may appear somewhat tedious at having to type each instruction from the keyboard every time you want the computer to do something. Fortunately there is a way round this. The control language has a built in vocabulary of about 20 words. Type

**COMMANDS <RETURN>**

and this will display all the words the computer knows. It will look something like this:

```
MOTORS      ⌈A⌋  ⌈B⌋  ⌈C⌋  ⌈D⌋
SWITCHES    0   0   0   0   0   0   0   0
NUMBER      1   2   3   4   5   6   7   8
INPUTS      0   0   0   0   0   0   0   0
➔ Words I know are:

SWITCH      FINISH
MOTOR       COMMANDS
POWER       BUILD
WAIT        CHANGE
IF INPUT    LIST
COUNT     DELETE
REPEAT     RENAME
CLEAN      LOAD
END        SAVE
WRITE      TIDY
ALARM     CAT
          DRIVE
          HELP

➔
```

For your convenience all the red function keys have been designated as a command word. A function key strip is provided with this manual and should be inserted under the hood of the BBC computer. Thus pressing <f0> will type for you the command words SWITCH ON followed by the necessary space. The function keys are as follows:

f0	SWITCH ON	f5	REPEAT
f1	SWITCH OFF	f6	BUILD
f2	MOTOR	f7	END PROCEDURE
f3	IF INPUT	f8	CHANGE
f4	WAIT	f9	END REPEAT

#### 4.2 Build/End Procedure

You can add to this list of commands by teaching the computer new words. This is done by BUILDing them up from existing ones. Plug a light bulb into socket number 1 and suppose you wish to make the bulb flash. You can do this by typing:

```
BUILD FLASH <RETURN>  
REPEAT 10  
SWITCH ON 1  
WAIT 0.5  
SWITCH OFF 1  
WAIT 0.5  
END REPEAT  
END PROCEDURE
```

BUILD can be found on key 'f6', and 'END PROCEDURE' on 'f7'.  
Now type:-

```
FLASH <RETURN>
```

You will see that the light bulb will flash 10 times all by itself. This is because the computer now knows the word FLASH. Type COMMANDS again, and you will see that 'FLASH' has been added to the list of known words. FLASH is known as a procedure, because you have told the computer what procedure to follow when you want it to FLASH. You cannot of course use a name that already exists, that would confuse everybody including the computer.

Now try BUILDing a procedure of your own. Call it by a suitable name, which can be up to seven letters long.

NB. Procedures can be up to twenty lines long (including the 'END PROCEDURE').

Once you have built your own procedure it can be used within another procedure. So, for example the procedure below may drive your model connected to MOTOR B whilst at the same time flashing the light bulb.

```
BUILD WHEEL  
MOTOR A ON  
FLASH  
MOTOR A OFF  
END PROCEDURE
```

### 4.3 Change

Once you have built a procedure it can be changed. Type CHANGE followed by the name of the procedure, for example:-

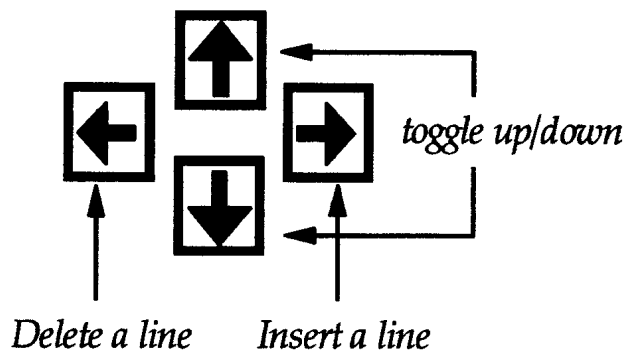
```
CHANGE FLASH <RETURN>
```

The screen will clear and display the editing screen. It will look something like this:-

```
Use UP/DOWN arrow keys to select line.  
Use <- to delete line -> to insert line.  
Press <COPY> key to finish changing.  
Changing procedure FLASH  
-> REPEAT 5  
-> SWITCH ON 1  
-> WAIT 1  
-> SWITCH OFF 1  
-> WAIT 1  
-> END REPEAT  
-> END PROCEDURE
```

You can only change procedures by inserting or deleting a line. The cursor keys are used to move the highlight up and down to which ever option you wish to change.

### CURSOR KEY CONTROL





To delete a line use the cursor keys to move up or down to highlight the line you wish to delete. Press the 'left arrow' to delete the line. You will see that not only is the line deleted but the gap in the procedure is closed for you.



To insert a new line, move the bar above where you want the line to go, and press the 'right arrow'.



When you have made all the changes you wish to make, press <COPY> and the procedure will be changed. If there are any mistakes in the procedure, you will be alerted, and you must fix the mistake before continuing.



If you press <ESCAPE> instead of <COPY>, none of the changes you have made will take effect and the procedure will be left as it was.

*Now try this:-*

*Using the three light bulbs supplied **BUILD** a procedure to make a set of traffic lights. Think up your own name for the procedure and type it in not forgetting to press <RETURN> after each line.*

#### 4.4 List

You can have a look at a procedure by typing LIST, followed by the procedure's name. For example:-

**LIST FLASH            <RETURN>**

The screen will clear and LIST your procedure for you.

#### 4.5 Delete

If you wish to remove a procedure type DELETE followed by the name of the procedure, for example:-

**DELETE FLASH        <RETURN>**

You have to confirm that you really want to delete the procedure by pressing 'Y' when you are asked. It is not possible to delete the build in commands of control.

#### 4.6 Reset

All procedures can be deleted at once by typing RESET <RETURN>. Again you are asked to confirm this rather drastic step and will have to press "Y" if you wish to reset or "N" if you have changed your mind.

## 5. THE FILING SYSTEM

### 5.1 Save/Load

Procedures you have built can be saved on a disk if you wish to use them again later. This is done by typing:-

**SAVE FLASH            <RETURN>**

It can be loaded again at a later date with the command

**LOAD FLASH            <RETURN>**

Try building several procedures and experimenting with them. If you have several procedures defined you are able to save them all in one go. The instruction is:-

**SAVE ALL                <RETURN>**

You are asked the name you wish to give the set of procedures . Up to seven letters is acceptable. Again these procedures can be loaded later with the command:-

**LOAD ALL                <RETURN>**

### 5.2 Cat

Typing CAT (which is short for catalogue) will show you all the procedures that have been saved on the disk. This is useful if you have forgotten the name of the procedure you have saved or wish to check that there is not a procedure of the same name before you save.

### 5.3 Drive

This command provides those who are using a double disk drive and may wish to SAVE and LOAD procedures and not remove the master disk.

Typing:

**DRIVE 1                 <RETURN>**

will ensure that all procedures will be saved or loaded to that drive by default.

## 5.4 Tidy

Continuous building, deleting, loading and saving of procedure may result in memory being used up and the disk becoming full by the presence of blank spaces. Tidy closes up all these spaces both in memory and on the disk so offering you all of the available space. You will be asked to wait a moment.... and then told... Now tidied up

## 5.5 Finish

Finish will leave the Control program and return the computer to basic. So if you wish to quit typing:

**FINISH      <RETURN>**

will return with the message: FINISH are you sure Y/N \_  
Press Y if you wish to finish or N if you want to continue with the program..



## 6. PRINTING PROCEDURES

The Control Box disc can print procedures providing they have been saved to a disk. Make certain that you have a printer connected and place your backup copy of the control disk in the drive and press SHIFT and BREAK together, releasing BREAK first. After the initial title screen the 'Control Menu' will appear.

```
COMMOTION
Solutions for education

NEW TOWN CONTROL MENU

A. CONTROL PROGRAM
B. PRINT PROCEDURES

LOAD WHICH>
```

*Now select option:  
B. PRINT PROCEDURES  
and press <RETURN>*

*When the program has loaded, it will  
automatically display all the procedures  
saved on the disc.*

```
PROCEDURE PRINTER
Procedures on this disk are

FLASH          BRIDGE
HOLD UP       LIGHTS
ADVERT        DISCO

Procedure name: _
```

If there are no procedures on the disk you will get the message:

**No procedures on disk**

and will be asked to insert a procedure disk and:

**PRESS <SPACE BAR> WHEN READY**

If the procedure you wish to print is not listed then insert the disk containing your procedures and press <RETURN>. The program will read the new procedures and display them as above.

Type in the name in full and press <RETURN> the procedure will be printed. You will then be given the following options:

1... to print another  
2... to reprint procedure  
3... to quit  
PRESS 1,2 or 3

- Selecting 1 Will re-read the disc so if you want to print from another disc insert it in the drive before selecting this option.
- Selecting 2 Will re-print your procedure from memory.
- Selecting 3 Will end the program.

## 7. REFERENCES

### 7.1 Command messages

#### What?

The instruction you have types does not have all the necessary information for the computer to carry out the command. For example:

**SWITCH ON                    <RETURN>**

has not told the computer which switch to turn on, and so will produce the error:

**SWITCH ON what?**

#### I don't understand **BOOK**

You have typed a word (highlighted) that the computer does not understand. This could be a misspelling or you have left out necessary spaces. Eg. SWITCHON 2 would produce the error:

**I don't understand SWITCHON 2**

#### IF INPUT needs a **THEN**

An IF INPUT command always requires a THEN

### 7.2 Procedure messages

#### I already know **FLASH**

Attempting to LOAD, BUILD or RENAME a procedure that is already in memory. You cannot use Control commands as procedure names, because the computer will get confused!

#### I don't know **SALLY**

Trying to LIST or CHANGE a procedure that does not exist will give this response.

#### Name too long

Names of procedures can only be up to seven letters long.

#### I cannot use that as a name

When BUILDing & RENAMEing. Names cannot include a colon, a comma or some other prohibited characters.

#### This cannot be done in a procedure

You cannot, for example, do COMMANDS from within a procedure.

#### Procedure cannot be any longer

This happens when you have typed 19 lines of procedure. You are forced to END PROCEDURE, which the computer does for you.

#### No END PROCEDURE

When CHANGEing a procedure, this message is produced if you have left out the END PROCEDURE

#### Cannot define any more procs

All the procedure-space is used up. In Control up to 30 procedures may be defined. This error is produced when trying to BUILD another procedure.

#### Too many nested procs

Only ten procedures can be 'nested' inside each other.

### 7.3 Repeat messages

**No matching END REPEAT** All REPEATS must finish with an END REPEAT. Repeats can go inside each other and these are called 'nested repeats'. There must be the same number of end repeats as there are repeats. You cannot END PROCEDURE before the numbers match.

**Too many nested REPEATS** Only 8 REPEAT loops can go inside each other. Any more will produce this error.

**Can't LIST in a procedure or repeat** Certain COMMANDS cannot be used within a procedure or repeat. These commands are:

BUILD	CHANGE	LIST
RESET	TIDY	RENAME
COMMANDS	DRIVE	LOAD
SAVE	CAT	HELP
DELETE		

### 7.4 Filing messages

**Not on disk** trying to load a procedure that is not on the disk. Type CAT to see the all procedures. Check that the spelling matches the name on the disk.

**Out of memory** Attempting to load a procedure when the computer has run out of memory! You will have either TIDY or DELETE procedures that are not going to be used.

**Filing error: Try using another disk** This is produced while LOADING, SAVEing or CATALOGing a disk. There may be something wrong with the disk, or it could be a simple mistake eg. trying to SAVE onto a write-protected disk. Try using another disk, as is suggested. But the following details may help:

**Error (number)**

- |     |  |
|-----|--|
| 190 | Catalogue full you have 31 files on the disk already, and will have to SAVE the procedure on another disk.                                   |
| 191 | Can't extend if you SAVE a procedure where one of that name already exists, this error may be generated. RENAME the procedure, then SAVE it. |
| 195 | File locked you have *ACCESSEd the file 'L', so you must RENAME the procedure before SAVEing it.   |
| 197 | Drive fault you have a faulty disk-drive. Try again, preferably with a different disk.   |
| 198 | Disk full use another disk. Disk fault there is something wrong with the disk, so try using another one.                                     |
| 200 | Disk changed you changed the disk whilst LOADING or SAVEing - put the old one back & try again !   |
| 201 | Disk read only the 'write-protect' notch has been covered, so you cannot SAVE any procedures on this disk.                                   |

## 7.5 Trouble shooting

This is a serious error! (number) If it occurs, press ESCAPE, and SAVE all the procedures you are working on. Make a note of the number and the circumstances involved, and tell the person who supplied you with 'Control'. Such an error may not be fatal, but it is advisable to press CTRL/BREAK and start again.



Commotion

THE CONTROL BOX

FNKkeystrip

f0	f1	f2	f3	f4	f5	f6	f7	f8	f9
SWITCH ON	SWITCH OFF	MOTOR	IF INPUT	WAIT	REPEAT	BUILD	END PROCEDURE	CHANGE	END REPEAT

Commotion

THE CONTROL BOX

FNKkeystrip

f0	f1	f2	f3	f4	f5	f6	f7	f8	f9
SWITCH ON	SWITCH OFF	MOTOR	IF INPUT	WAIT	REPEAT	BUILD	END PROCEDURE	CHANGE	END REPEAT

Commotion

THE CONTROL BOX

FNKkeystrip

f0	f1	f2	f3	f4	f5	f6	f7	f8	f9
SWITCH ON	SWITCH OFF	MOTOR	IF INPUT	WAIT	REPEAT	BUILD	END PROCEDURE	CHANGE	END REPEAT

Commotion

THE CONTROL BOX

FNKkeystrip

f0	f1	f2	f3	f4	f5	f6	f7	f8	f9
SWITCH ON	SWITCH OFF	MOTOR	IF INPUT	WAIT	REPEAT	BUILD	END PROCEDURE	CHANGE	END REPEAT

Commotion

THE CONTROL BOX

FNKkeystrip

f0	f1	f2	f3	f4	f5	f6	f7	f8	f9
SWITCH ON	SWITCH OFF	MOTOR	IF INPUT	WAIT	REPEAT	BUILD	END PROCEDURE	CHANGE	END REPEAT

Commotion

THE CONTROL BOX

FNKkeystrip

f0	f1	f2	f3	f4	f5	f6	f7	f8	f9
SWITCH ON	SWITCH OFF	MOTOR	IF INPUT	WAIT	REPEAT	BUILD	END PROCEDURE	CHANGE	END REPEAT





*fold along this dotted line*

**FINISH**  
**RESET**  
**HELP**  
**TIDY**  
**DRIVE**  
**SAVE**  
**LOAD**  
**DELETE**  
**RENAME**  
**CHANGE**  
**LIST**  
**END PROCEDURE**  
**BUILD**

(name of procedure)  
(name of procedure)  
(name of procedure)  
(old name) (new name)  
(name of procedure)  
(name of saved procedure / **ALL**)  
(name of procedure / **ALL**)  
(number 0 to 4)

## **COMMAND SUMMARY**

*fold along this dotted line*

## **COMMAND SUMMARY**

**SWITCH** (ON / OFF) (output numbers between 1 & 8 / **AND** / **ALL**)  
**MOTOR** (sockets **A** to **D**) (ON / OFF / **REVERSE**)  
**POWER** (values between 1 & 10)  
**WAIT** (time in seconds)  
**WAIT FOR** (input numbers between 1 & 8) (ON / OFF)  
**IF INPUT** (ON / OFF) **THEN** (action)  
**COUNT** (any whole number)  
**WRITE** (message in keyboard characters)  
**ALARM**  
**REPEAT** (any whole number / **FOREVER**)  
**END REPEAT**  
**CLEAN**  
**COMMANDS**

*fold along this dotted line*





**COMMOTION  
Redburn House  
Stockingswater Lane  
Enfield  
EN3 7TD**