

APPLICATION NOTE NO. 21.

USE OF EXCEPTION HANDLERS.

When writing a program, it is important that it is as 'crash-proof' as possible.

In a graphics program, for example, you may want to prevent the cursor leaving the bounds of the screen, causing the program to stop and display an error message.

This is known on most computers as 'error-trapping'. Some BASICs have a primitive 'error-trapping' facility using a syntax such as:-

ON ERROR GOTO XXX

IS-BASIC, however, goes several steps further in providing EXCEPTION HANDLING Commands which are well structured and more versatile than the 'ON ERROR' variety. These can not only recognise the error, they can recognise the type of error or interrupt that has occurred and respond differently to each.

This is best described by the following program:-

```

10  PROGRAM "EXCEPTIONS"
20  ! BY GERALD MORGAN
100  WHEN EXCEPTION USE THE_HANDLER
110  DO
120  INPUT A
130  SOUND PITCH A
140  LOOP
150  END WHEN
160  HANDLET THE_HANDLER
170  IF EXTYPE=1000 THEN
180  PRINT "THAT SOUND VALUE WAS WRONG"
190  LET A=127
200  RETRY
210  END IF
220  IF EXTYPE=20034 THEN
230  PRINT "ONLY NUMBERS PLEASE."
240  RETRY
250  END IF
260  IF EXTYPE=1001 THEN
270  PRINT "EVEN THE ENTERPRISE CAN'T HANDLE
    NUMBERS THAT BIG!"
280  RETRY
290  ELSE
300  PRINT "OK I'LL STOP THIS PROGRAM."
310  END IF
320  END HANDLER

```

Explanation of program:-

<u>LINE</u>	<u>EXPLANATION</u>
10	NAMES THE PROGRAM
20	THE AUTHOR!
100 & 150	ENCLOSES MAIN PROGRAM WITH THE EXCEPTION HANDLING.
110 & 140	CAUSES THE STATEMENTS BETWEEN THESE TWO LINES TO REPEAT INDEFINITELY.
120	WAITS FOR INPUT FROM THE KEYBOARD.
130	MAKES A SOUND WHOSE PITCH VARIES AS THE INPUT VALUE.
160	START THE HANDLER BLOCK AND CALL IT 'THE_HANDLER'
170 - 210	IF THE ERROR NUMBER IS 1000 THEN WRITE A SUITABLE ERROR MESSAGE ON SCREEN, MAKE THE VARIABLE 'A' EQUAL TO A SUPERSONIC SOUND VALUE SO IT CANNOT BE HEARD AND TRY AGAIN.
220 - 250	IF THE ERROR NUMBER IS 20034 THEN WRITE A MESSAGE AND TRY AGAIN.
260 - 310	IF THE ERROR NUMBER IS 1001 THEN WRITE A MESSAGE AND TRY AGAIN. OTHERWISE WRITE OUT THE DEFAULT MESSAGE (THIS COVERS EVERY OTHER POSSIBLE ERROR) AND STOP THE PROGRAM.
320	FINISH THE HANDLER BLOCK.

NOTES:-

1. The ERROR NUMBER is the value associated with a particular error. For a list of these, see pages 204-208 in the Programming Guide.
2. Just pressing the 'ENTER' key without having entered any data is an error and in this case the default message is primed.
3. EXLINE is a variable that holds the line of the program where an exception occurred. EXTYPE is a variable that holds the number of the most recent exception.
4. Typing PRINT EXSTRINGS\$(X) where X is a number between 0 and 30000 will print the exception associated with that number.
5. CAUSE EXCEPTION X will cause the exception with number X to occur.
6. The handler-block can be anywhere in the program, but it is better programming practice to put it at the beginning or the end of a program.