DRAGON SLAYER

In the last instalment of the course we published four sprite bit maps suitable for use with Commodore 64 LOGO. Continuing our investigation of its sprite facilities, we develop the 'curve of pursuit' algorithm through the three bugs problem and a pursuit game using the sprites, and a sophisticated interception strategy.

We give here the procedures for a game that uses LOGO sprites. You control a dragon that attempts to reach and destroy a city. The defence of the city is in the hands of a flying knight (under the control of the computer), who will try to kill the dragon. You control the dragon's direction of movement with the joystick. If you do evade the knight and get close enough, the city will burst into flames from the dragon's breath.

To run the game you will need to read in the SPRITES file, define your shapes, type in the procedures and then type GAME. After performing various set up tasks, the GAME procedure then calls PLAY, which is the central procedure. PLAY moves the dragon and the knight in turn, and checks to see if the dragon has reached the city, or if the knight has hit the dragon. The remaining procedures carry out other parts of PLAY's actions.

The available colour commands are very straightforward. To set the background colour use BACKGROUND followed by a colour number, and to set a sprite colour (and the colour of the line it draws if the pen is down) use PENCOLOR. The colour numbers are given names in INIT. VARIABLES, so that we can then specify colours by name, using commands such as PENCOLOR :RED.

In the procedure PLAY, the line:

```
IF HIT? THEN DRAGON. DESTROYED
```

is used to test if the knight has hit the dragon. The procedure HIT? illustrates the way in which we can write our own test conditions in LOGO. It returns a value of "TRUE or "FALSE, and this is used as an input to the IF statements. The result "TRUE would then cause the conditional action to be carried out.

HIT? uses a procedure from the SPRITES file, TS?, which returns "TRUE if a sprite is touching the

Knights And Dragons

The Game In Progress

City In Flames

Dragon Defeated

IAN McKINNELL

Knight Vs Dragon

```
TO GAME
   INIT. VARIABLES
   SET.SCREEN
   PLAY
END

TO INIT.VARIABLES
   MAKE "FLAME 1
   MAKE "FLAME1 2
   MAKE "DRAGON 3
   MAKE "KNIGHT 4
   MAKE "CITY 5
   MAKE "CITY1 6
   MAKE "RED 2
   MAKE "BLACK 0
   MAKE "BLUE 6
   MAKE "ORANGE 8
   MAKE "YELLOW 7
END

TO SET.SCREEN
   DRAW
   FULLSCREEN
   BACKGROUND :BLUE
   TELL 0
   PU
   HT
   TELL :FLAME1
   HT
   HT
   TELL :FLAME
   HT
   POSITION :DRAGON 100 100 :RED
   BIGX BIGY
   POSITION :CITY (-52) (-80) :BLACK
   BIGX BIGY
   POSITION :CITY1 (-100) (-80) :BLACK
   BIGX BIGY
   TELL 4
   PU
   POSITION :KNIGHT (100) (-100) :YELLOW
   SMALLX SMALLY
END

TO PLAY
   DRAGON.MOVE
   IF DISTANCE :DRAGON :CITY < 50 THEN CITY.
      DESTROYED STOP
   IF DISTANCE :DRAGON :CITY1 < 50 THEN CITY.
     DESTROYED STOP
   KNIGHT.MOVE
   IF HIT? THEN DRAGON.DESTROYED STOP
   PLAY
END

TO DRAGON.MOVE
   TELL :DRAGON
   MOVEJOY JOYSTICK 1
   FD 10
END

TO MOVEJOY :DIR
   IF :DIR < 0 STOP
   SETH :DIR * 45
END

TO DISTANCE :A :B
   TELL :A
   MAKE "X1 XCOR
   MAKE "Y1 YCOR
   TELL :B
```