

Cyperpet

Design Brief

Design an electronic pet game.

Electronic Circuit

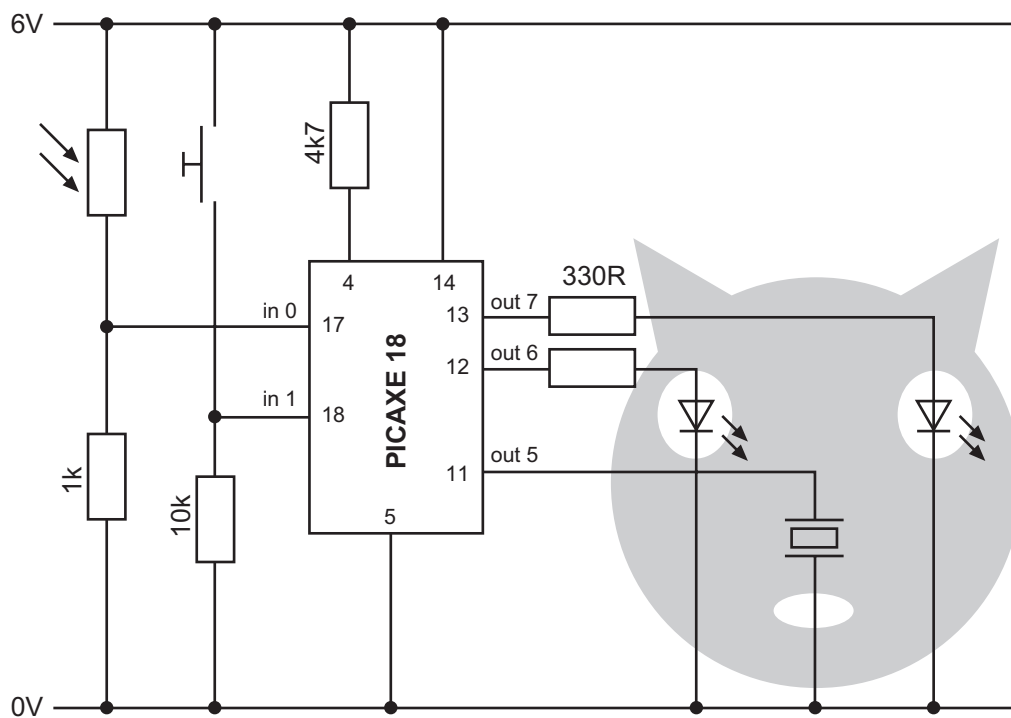
The circuit consists of two eyes that can light up, and a piezo sounder that generates sounds. By pressing the switch or altering the light level the actions of the pet can be altered.

Program Explanation

The program has a main loop which fades the LED eyes on and off, and also checks the light sensor and the push switch. When the push switch is pressed a sound is generated on the piezo by use of the sound command. After three switch pushes (counted by a variable called pet), a tune is played.

If the LDR light sensor is covered the pet will 'go to sleep'.

The program makes use of a technique called pwm (pulse width modulation) to allow the eyes to 'fade' on and off, rather than just being full on or full off as would be achieved with the high or low commands. PWM works by switching the output on and off very quickly, quicker than the human eye can see. By varying the mark (on-time) to the space (off-time) the brightness of the LED can be altered.



Program Listing

```

` Cyper Pet
` For PICAXE-18

` LDR on input 0
` Push switch on input 1
` LEDs on outputs 6 and 7
` Piezo sounder on output 5

symbol bright = b0
symbol light = b1
symbol pet = b2
symbol mark = b3
symbol space = b4

symbol LDR = 2
symbol piezo = 5

` first reset the pet count to 0
` and the PWM off time to 15
main:
    let pet = 0
    let space = 15

` loop here flashing lights
` and checking switch and light sensor

loop:

`first make LED brighter in 8 steps
    for mark = 0 to 8
        gosub flash
    next mark

`LED full on and test sensors
    high 7
    high 6

    readadc LDR,light
    if light < 80 then bed
    if pin0 = 1 then addpet
    pause 200

`LED gets dimmer
    for mark = 8 to 0 step -1
        gosub flash
    next mark

`LED full off and check sensors
    readadc LDR,light
    if light < 80 then bed
    if pin0 = 1 then addpet
    pause 250

    goto loop

` switch has been pressed so add
` 1 to the petted value

addpet:
    pet = pet + 1
    sound piezo,(120,50)
    pause 200

` check pet value to see if it is three yet
    if pet < 3 then loop

` pet value is 3 so play a tune
    high 6
    high 7
    sound
    piezo,(80,50,100,50,120,50,100,50,120,50)
    goto main

`in dark so switch off LEDs and wait till
light again

bed:
    low 6
    low 7
    readadc LDR,light
    if light > 80 then main
    goto bed

` sub procedure to output PWM on LEDs

flash:
    for b0 = 1 to 10
        high 6
        high 6
        pause mark
        low 6
        low 7
        pause space
    next b0
    return

```