Remote Greenhouse Monitor

Design Brief

Design a remote monitoring system for a greenhouse to show the light and temperature values in a house 100m away.

Circuit Explanation

This circuit uses two separate circuits which communicate via an AM transmitter/receiver pair. The first PICAXE chip is connected to an LDR light sensor and a thermistor temperature sensor. It reads the analogue values from these sensors and then transmits the values to the second circuit, which decodes the values and and displays them on a serial LCD module.

The recommended radio modules are a Quasar QAMT2 transmitter and QMR1 receiver, which work at 433MHz AM and do not require a license in the UK.

Program Explanation

The transmitter program reads the two sensor values using the 'readadc' command and then transmits them via use of the 'serout' command. Note that the serout command uses an encoding system to synchronise the system for increased reliability, and so extra 'synchronisation' bytes are also transmitted.

The receiver program uses the 'serin' command to read the transmitted signals, decodes them, and then displays the values on a serial LCD module via use of the 'serout' command.
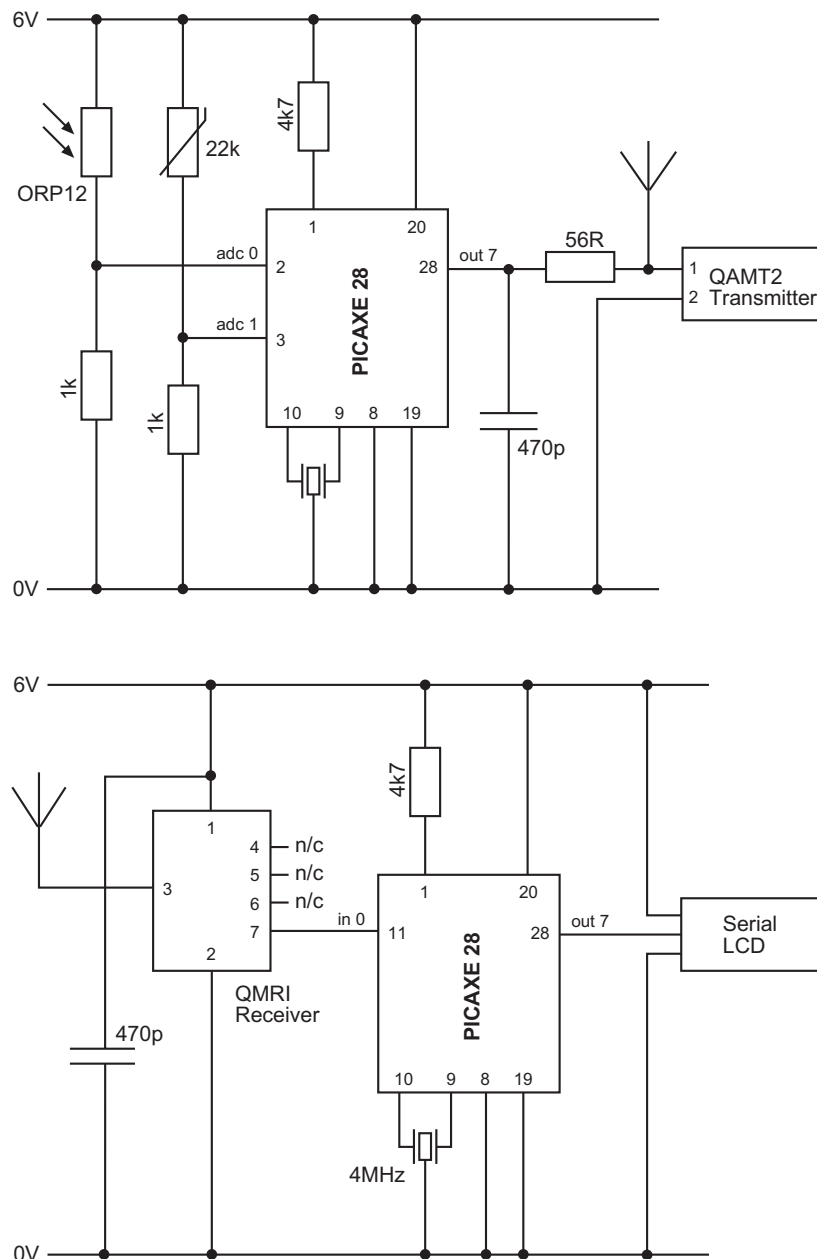
Program Listing

```
'Greenhouse Transmitter
'For PICAXE-28

'This program reads two analogue inputs of the PICAXE28
'and transmits according to TEPs 'PICtalk' system protocol

'Light sensor on analogue 0
'Temp sensor on analogue 1
'Radio transmitter on output 7

main:

        ' read the analogue channel
          readadc 0,b1

        ' transmit according to PICTalk protocol
          serout 7, T1200,($AA, $AA, $AA, $AA, $00, $00,
$99, 1, b1)
          pause 50
          serout 7, T1200,($66, $66)
          pause 50


        ' read the next analogue channel
          readadc 1,b2

        ' transmit according to PICTalk protocol
          serout 7, T1200,($AA, $AA, $AA, $AA, $00, $00,
$99, 2, b2)
          pause 50
          serout 7, T1200,($66, $66)
          pause 50


        ' wait half a second then loop
        pause 500

        goto main
```

```
'Greenhouse receiver
'For PICAXE-28

'This program receives light and temp values from a
'transmitting PICAXE28 microcontroller and displays them
'on a serial LCD module.

'Radio receiver on input 0
'Serial LCD on output 7

symbol addr = b0
symbol data = b1


' blank off LCD
init:
     pause 30
     serout 7,N2400,(254,1)


'main program loop

' first receive the data

main:serin 0, T1200, ($99), addr, data



'PICTalk test data method
repeat1:
     if addr = $66 then finish1
        gosub alloc
        serin 0, T1200, addr, data
     goto repeat1
finish1: let addr = 0
         goto main



'test for type
alloc:   if addr = 1 then LIGHT
       if addr = 2 then TEMP

          return



' data type 1 so transmit to serial LCD

LIGHT:    serout 7,N2400,(254,128,"Light Level= ",#data,"   ")
     goto main


' data type 1 so transmit to serial LCD

TEMP:serout 7,N2400,(254,192,"Temperature= ",#data,"   ")
     goto main
```