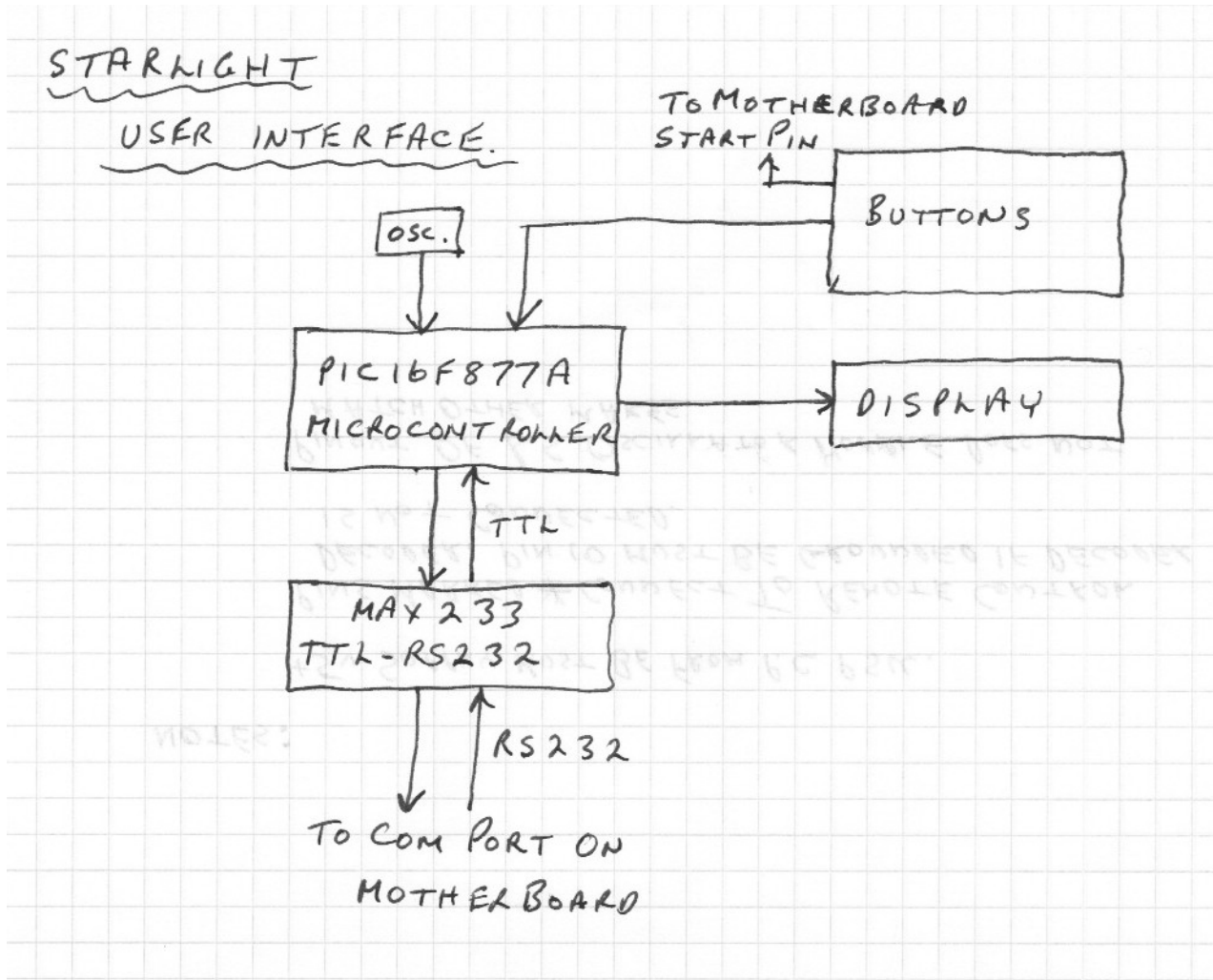


Starlight User-Interface Description

Outline

The user interface uses a 40 pin PIC16F877A with a 3.6864MHz clock oscillator, a 2 line x 16 character LCD, a MAX233 to convert the PIC 5v TTL output levels to $\pm 12v$ RS232 levels, and some push-to-make buttons.



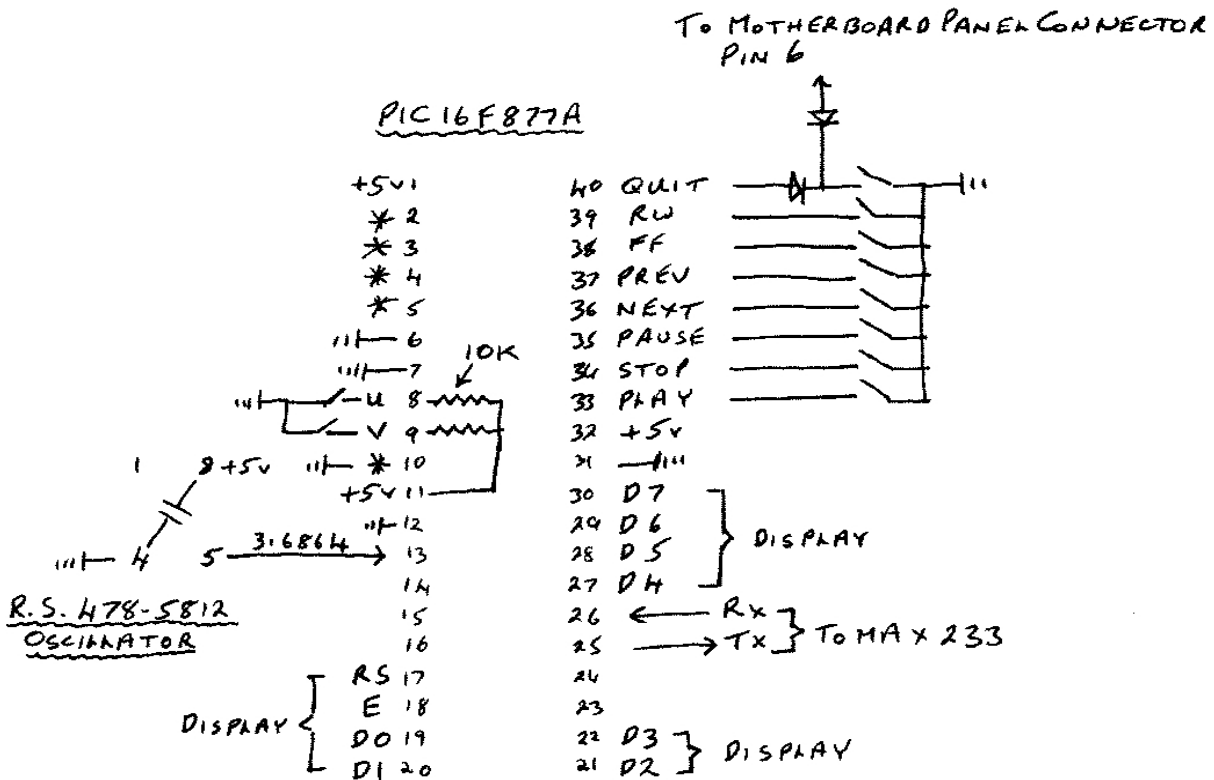
When the power on/off button is pressed, both the quit pin on the PIC and the start pin on the motherboard are grounded. As there is no power to anything other than the motherboard standby function, only the motherboard responds, by turning on the power and starting its boot-up sequence. On power up, the PIC sends a start-up message to the display, and then starts polling the motherboard for track/time and mode information. Once the motherboard responds, the startup message is replaced with the polled information. If the power on/off button is pressed while the system is running, the motherboard pin does not respond, but the PIC does, and sends a "q" character to the com port, which starts the software shutdown sequence.

All communication with the software is via the 9 pin com port on the motherboard, which uses RS232 protocol at 9600 Baud, 8 bits, no parity, 1 stop bit. The odd choice of frequency for the PIC clock oscillator is so that the communication speed is exactly 9600 Baud.

Wiring

PIC

Rather than try and draw a point to point diagram, I have shown the pin allocations for each component, which I hope is understandable. Everything in the user interface is powered from the motherboard 5v supply which also powers the drives.

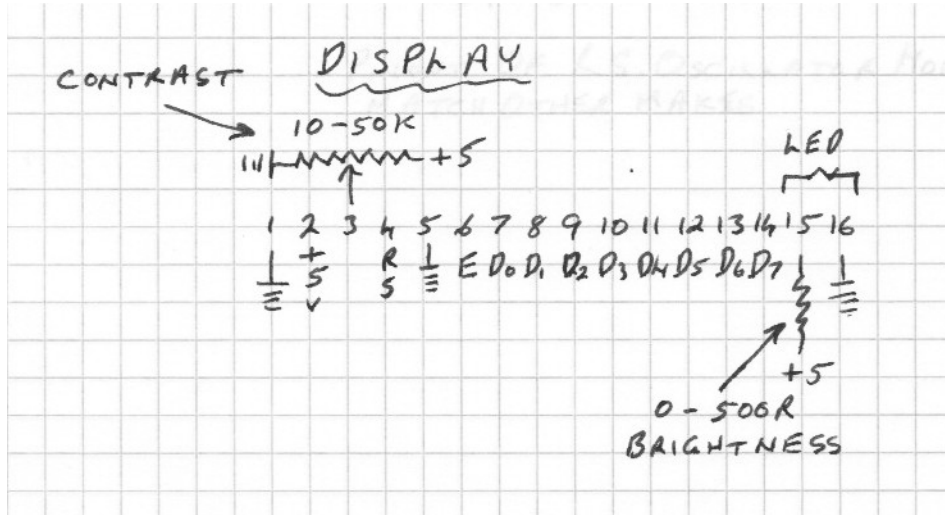


Provide bypass capacitors on the power pins of all chips according to your personal inclination.

Pins 8 and 9 on the PIC need pull-up resistors because these are not provided internally, as they are on the other button inputs. The u and v buttons do not need to be on the front panel, as they are maintenance functions which invoke a software update and display the current software version number respectively. Pin 10 needs grounding if no remote control decoder is connected.

Display

The display just needs connecting to the common 5v power source and the relevant pins on the PIC. The potentiometer on pin 3 will need to be adjusted to get good contrast without the LCD matrix showing. The LED backlight is rather bright at 5v, so you might want to put a resistor in series with it.



MAX233

The MAX233 just converts TTL levels to RS232 $\pm 12v$ levels. Most com ports will work with TTL levels, but a chip would still be needed to change the polarity, so we might as well do it properly. For those not familiar, D9F is a 9 pin "D" type socket.

