

## NOTE 2007.7

If you need more output lines for your project than the Picaxe 08M provides, you can use a dedicated (or slave) micro to interface to a serial shift register and use a single I/O line to receive data commands. Now all you have to do in your MAIN (or master) Picaxe micro is to dedicate a single I/O line to send data to the slave micro which in turn outputs the data to the shift register. Here are sample programs to accomplish the job; and a rough schematic of a couple of I/O expansion situations.

```
'Put these program lines in your Picaxe project micro to send serial data out Pin4
'   to send serial data to a SLAVE micro/CD4094 Shift Register acting as an I/O expander.
```

```
'PICAXE master micro
'serial command output parameters
SYMBOL TRX = Pin4           'serial data line for commands TO the 'slave' micro
SYMBOL CMD = b6             'command data is in variable location b6 NAMED: CMD
```

```
SEND: Serout TRX,T2400_4,("!", CMD)      'send the command: !,data
```

```
'=====
'
'This is the program inside the Picaxe 'SLAVE' micro.
'   Serial data is received on Pin3 and transferred to the CD4094 shift register
```

```
'PICAXE slave micro I/O expander
```

```
'control lines to CD4094
SYMBOL D = Pin0             'data to clock INTO the CD4094
SYMBOL CLK = Pin1          'clock line to CD4094
SYMBOL OE = Pin2           'enable the output register on the CD4094
SYMBOL STB = Pin4          'strobe the serial data INTO the output latch on the CD4094
```

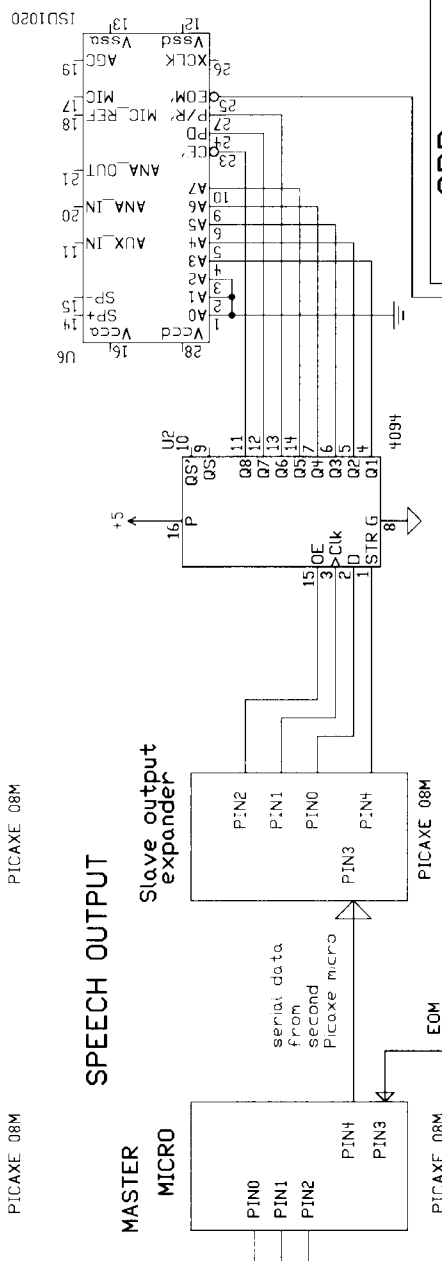
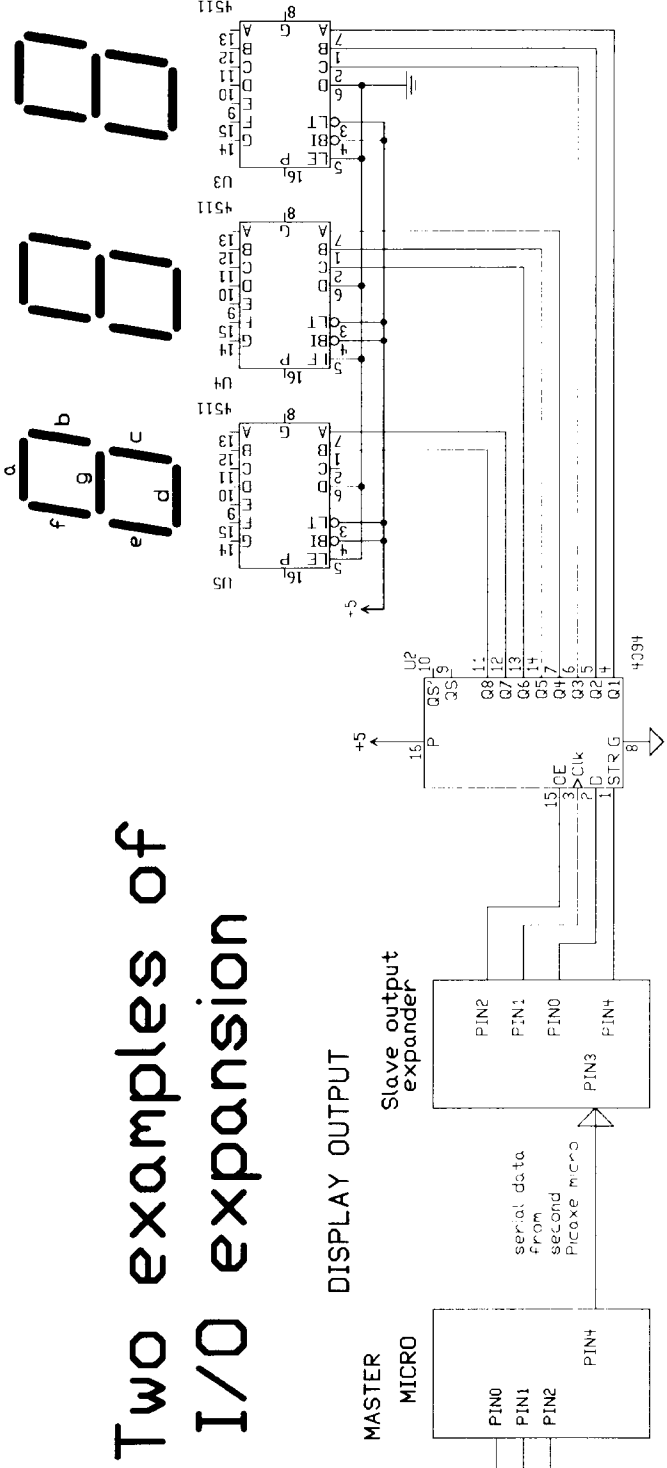
```
'serial command input parameters
SYMBOL SRX = Pin3          'serial data line for commands FROM the 'master' micro
SYMBOL MODE0 = 0           'shift data LS bit first
SYMBOL MODE1 = 1           'shift data MS bit first
SYMBOL CMD = b6            'command data received from 'master'is in variable b6 NAMED: CMD
```

```
'Get I/O command from 'master' micro
'   each 'command' is comprised of 2 charaters of data
'   Character 1 = ! a character to synchronize the micros
'   Character 2 = an 8 bit data byte to send to the CD4094
```

```
WHAT: Serin SRX,T2400_4,("!",CMD)        'Look for 1 byte commands preceded by a ! character
      SPIOUT CLK,D,MODE0,( CMD )         'SHIFT THE DATA OUT TO THE cd4094
      LOW STB: HIGH STB                  'STROBE the data into the CD4094 output latches
      HIGH OE                             'ENABLE the CD4094 output latches
      GOTO WHAT                           'Go get another command
```

```
'=====
```

# Two examples of I/O expansion



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