

440B Video Board

Description:

The OSI 440B Video Graphics Board is a versatile high performance computer to video (TV) interface. The 440 Board can be very economically populated as a terminal for a 500 or Challenger computer providing up to 32 by 32 characters on a screen and a keyboard input port. It can maximally be populated for 32 by 32 alphabetic, 128 by 128 graphics, and four color alphabetic. The 440 uses a dedicated memory which is accessed as conventional RAM memory by the computer. The result is that the 440 has ultra-high speed random access capability, allowing elaborate real-time animation!

Applications:

An alphabetic equipped 440 Board together with a 500 board is a complete computer and terminal. The ultra-high speed loading and random access features of the screen provide full animation capability in both alphabetic and graphics mode for elaborate video games and animation. Color can optionally enhance these features. In conjunction with a 430 Board's A/D converter, the graphics feature allows an OSI computer to act as an intelligent storage oscilloscope up to audio frequencies. The system operates particularly well with biological signals which are traditionally difficult to display. The graphics display can be used with a parallel input port as a logic analyzer since eight traces can easily be displayed on a conventional TV set!

Specifications:

Mechanical: 8" X 10" G-10 double-sided plated through hole board;
16-pin (IC type) keyboard connector. Optional 420 "slave" memory for graphics connects via three 16-pin ribbon cables.

Electrical: +5V at 800ma
-9V at 30ma

Output: 0 to 2V video into hi-Z termination. Composite video or separated sync (TTL level).

Vertical Frame Rate: 60.0Hz

Horizontal Frequency: 15,450Hz

Character Font: 5 X 7 characters upper-case ASCII

Format: 32 rows of 32 characters maximum. Unmodified TV sets typically display 24 rows of 24 columns of characters. 128 rows of 128 dots (graphics option) maximum

Keyboard Input: seven-bit parallel ASCII with continuous strobe or at least 50 usec. long-pulsed strobe. Strobe can be negative or positive going.

OHIO SCIENTIFIC

product name/number

440B/446/A-101

date

8/77

revision

B

page

22

status

Production

sheet 1 of 1

OSI MODEL 440 PARTS LIST

For Alphabetics Use Only

- ___ 1 - 440 Video Graphics Board
- ___ 2 - 7403
- ___ 2 - 7404
- ___ 3 - 7408
- ___ 5 - 7420
- ___ 2 - 74123 Texas Instruments or ITT units only.
- ___ 2 - 74125
- ___ 3 - 74157
- ___ 4 - 74163
- ___ 1 - 74165
- ___ 2 - 8T26
- ___ 1 - 2513N CM 2140 font recommended. Use ONLY Signetics Units.
- ___ 6 - 2102 type memories. "zero data hold time" 650ns. worst case for 1MHz operation, 350 ns. worst case for 2MHz operation.
- ___ 1 - 1N914

NOTE: Use only standard TTL since propagation delays are important

Resistors All $\frac{1}{4}$ Watt 10% or Better

- ___ 4 - 220 ohm
- ___ 1 - 470 ohm
- ___ 7 - 1K
- ___ 1 - 2.2K
- ___ 2 - 4.7K
- ___ 1 - 10K
- ___ 2 - 5K pots
- ___ 1 - 10K pots

Capacitors 10V. Rating or Better 20% Tolerance

- ___ 1 - 6.8pf NPO (temperature stable)
- ___ 1 - 68pf NPO (temperature stable)
- ___ 1 - .001uf
- ___ 1 - .1uf stable (mylar or polycarbonate)
- ___ 1 - 25uf (optional)
- ___ 18- .1uf bypass capacitors

Graphics Parts Included in 446 Kit

- ___ 3 - 74157
- ___ 1 - 74165

Required Parts Not Supplied in 446 Kit

- ___ Sockets: at least one at keyboard connector
- ___ 4 - Female Molex Connectors
- ___ Jumper Wire
- ___ Solder

Required Parts for Graphics Not Supplied by OSI

- ___ 1 - 420B or 420C Memory Board
- ___ 16- 2102 Memories; specifications as above
- ___ 3 - Sockets (minimum)
- ___ 3 - 4" or longer 16 pin jumper cables
- ___ 1 - Female Molex Connector
- ___ Approximately 8 - Bypass Capacitors (.1uf)

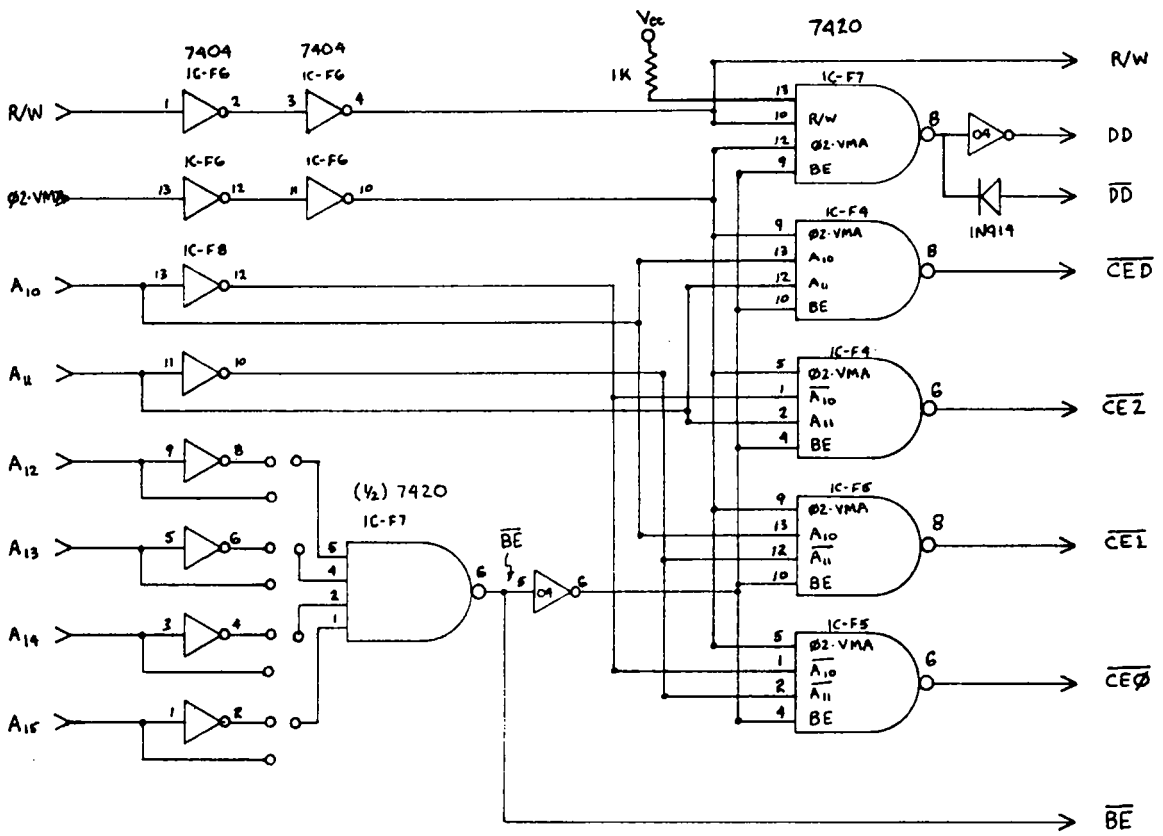


Diagram B. 440 Board Address Decoding

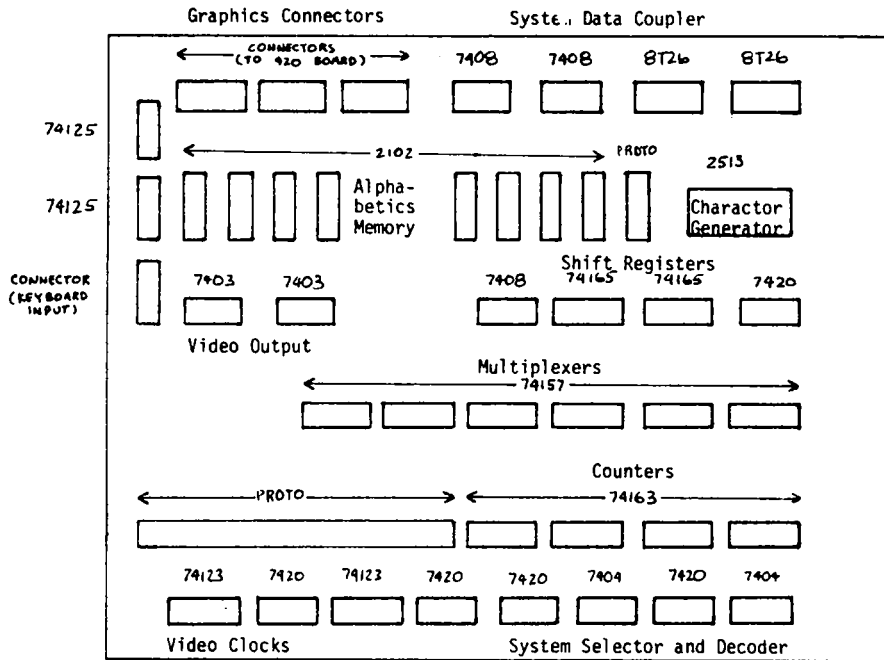


Diagram A. 440 Board Layout

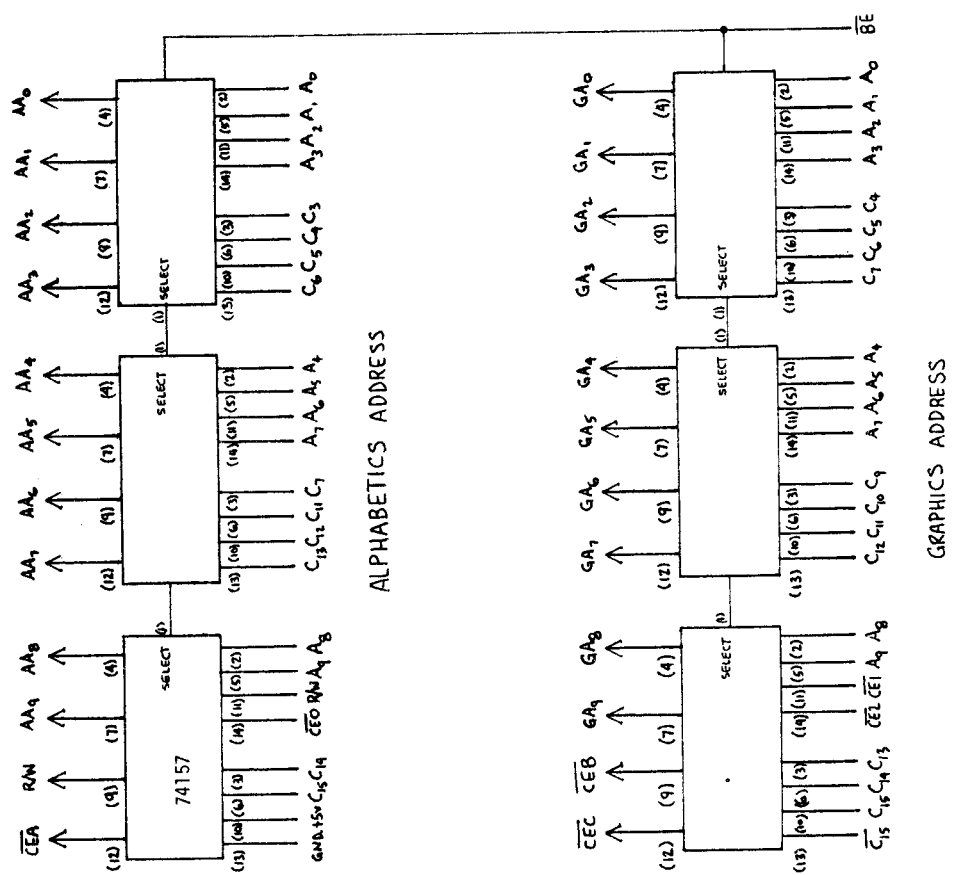


Diagram D. 440 Address Multiplexer

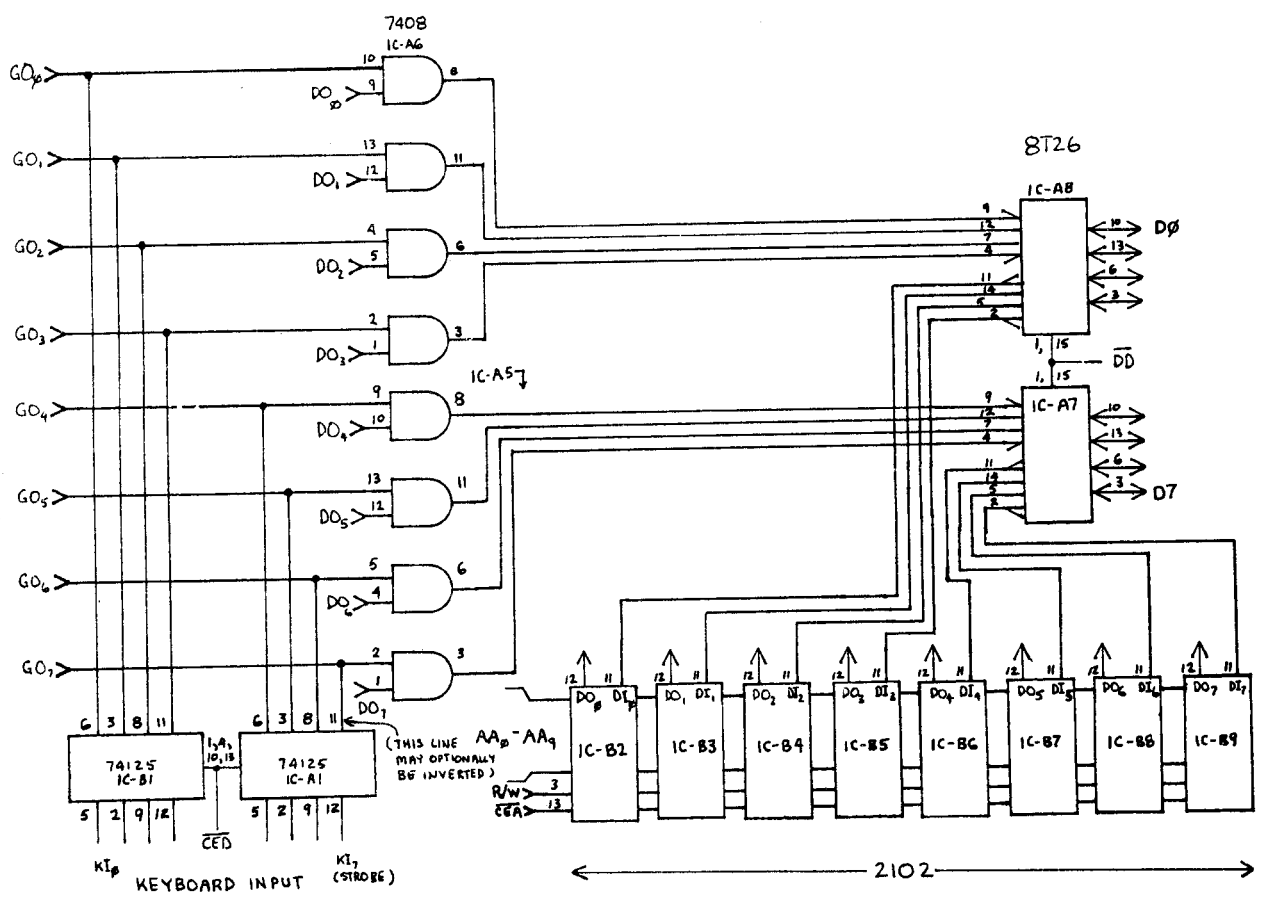
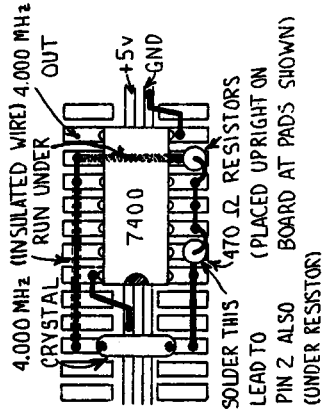
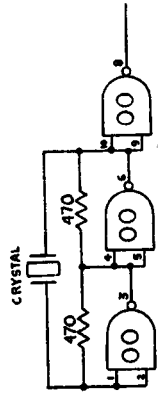


Diagram E. 440 Alphabetic memory, data multiplexer, and data buffers



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440 CRYSTAL CLOCK MODIFICATION

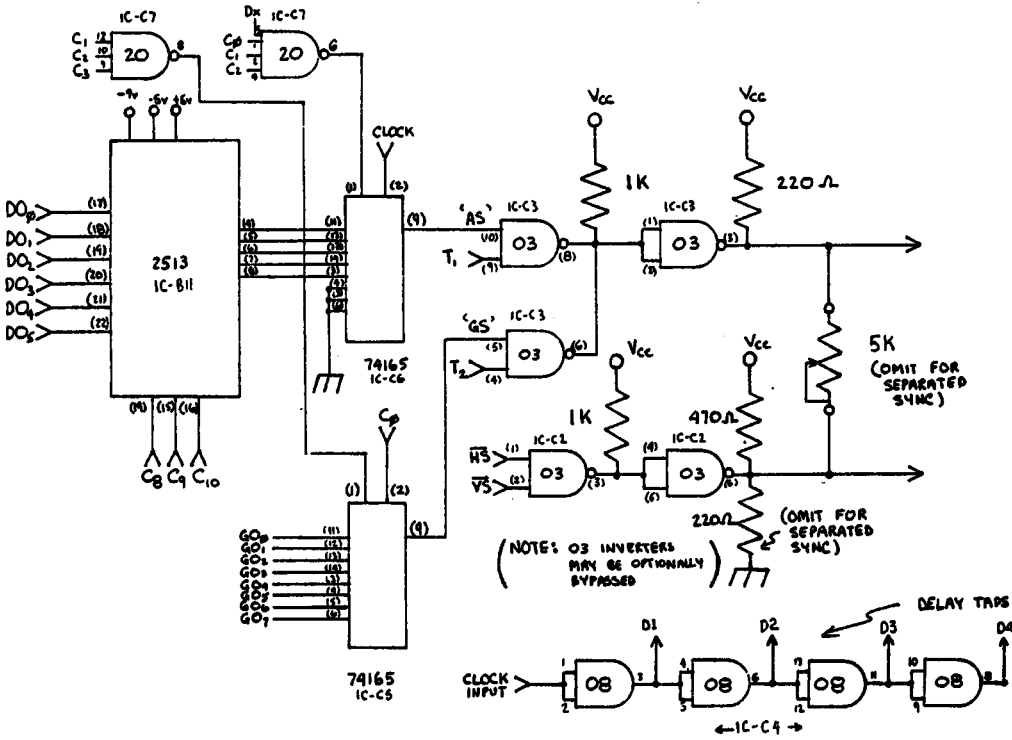
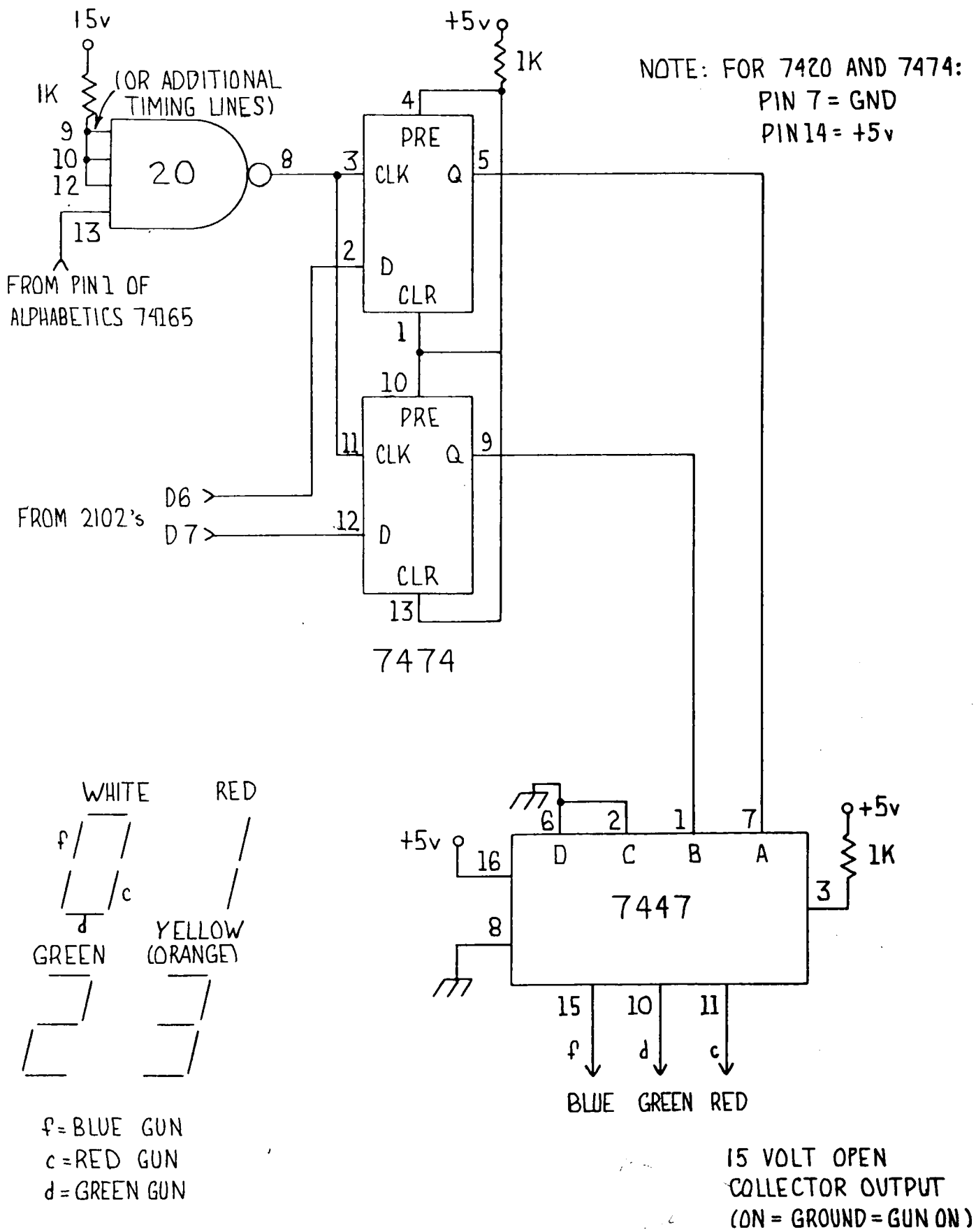


Diagram F. 440 Character generator shift register and video output



COLOR IMPLEMENTATION