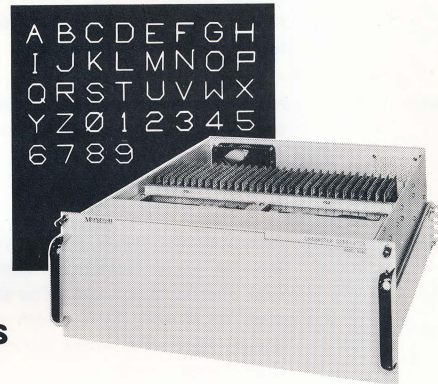


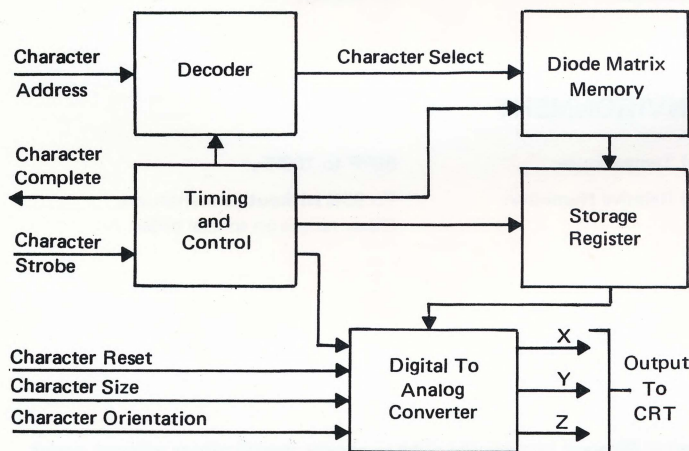


## 8040 CHARACTER GENERATOR For Direct Stroke Writing Graphic Systems



### DESIGN FEATURES

- Up to 20 strokes per character
- Uniform intensity throughout character
- Maximum character writing time to 2 microseconds
- Asynchronous operation—write time is a function of the character being generated.
- 4—programmable character sizes
- Programmable character orientation—horizontal or vertical
- Repertoire of 64 alphanumeric characters and symbols
- Diode matrix memory easily reprogrammed to generate special characters (can be done by user).



### FUNCTIONAL DESCRIPTION

The incoming CHARACTER ADDRESS consists of six binary lines that are decoded into 64 character select lines.

The CHARACTER STROBE triggers an internal clock that advances a shift register to produce a timing sequence of 20 discrete

pulses, each of which corresponds to a character stroke. As each timing segment is enabled through the shift register, a portion of the addressed character is examined to determine the X, Y and Z components of the stroke. The components specified by the diode memory are stored in a register. The storage register is strobed each clock time, which is synchronous with the segment, or stroke period. The outputs of the storage register are level shifted and integrated to produce the CRT deflection voltages and intensification signal.

At the end of a character cycle a CHARACTER COMPLETE signal is generated.

A CHARACTER ORIENTATION signal causes the displayed character to be rotated ninety degrees counterclockwise. Two character size signals are decoded to yield one of four possible character sizes.

The standard character repertoire is shown in Figure 1. This repertoire is equivalent to the 64-symbol ASCII set as defined in American National Standard publication USASX 3.4-1968.

FIGURE 1 — CHARACTER REPERTOIRE

```

A B C D E F G H
I J K L M N O P
Q R S T U V W X
Y Z Ø 1 2 3 4 5
6 7 8 9 [ \ ] ^
- ! " # $ % & '
( ) * + , - . /
: ; < = > ? @ SP
    
```

↑ May be substituted for ^  
← May be substituted for \_

Other symbols are available on special request.

## SPECIFICATIONS

All digital input and output signal levels and impedances are compatible with conventional TTL integrated-circuit logic.

### Inputs

- (a) **Character Address:** 6-bit parallel word selects 1 of 64 characters. Lines are high when true. Lines must not change while character is being drawn.
- (b) **Character Reset:** Negative-going pulse used to reset digital-to-analog converter. Pulse width should be 100 nanoseconds minimum. Must precede the character strobe.
- (c) **Character Strobe:** Negative-going pulse used to synchronize internal clock. Generation starts on the first internal clock edge after the leading edge of strobe. Pulse width should be greater than one stroke period but less than 2 stroke periods.
- (d) **Character Orientation:** A high level on this line causes the character to be drawn in a horizontal orientation. This signal should not change during the time a character is being drawn. 100 nanoseconds are required for the orientation circuitry to settle to the new value.
- (e) **Character Size:** Two signal lines that are used to select 1 of 4 character sizes. Four microseconds are required for the size select circuitry to settle.

### Outputs

- (a) **Character Complete:** Negative-going pulse 500 nanoseconds wide. Leading edge indicates that character is complete.
- (b) **Character Deflection Voltages:**  $\pm 1.5$  volts @ 20 mA (measured at the input to any display when terminated with 75 OHMS.)
- (c) **Character Intensification Voltage:** Digital signal TTL compatible, low during blanking, high during writing.

## CHARACTER AND SYMBOL CHARACTERISTICS

- (a) **Number of Characters and Symbols:** 64. Standard set, per figure 1. Any other characters which are derivable using up to 20 strokes (including retrace) may be ordered optionally to replace any of the 64 standard characters.
- (b) **Type of Strokes:** 7 including  $\pm X$ ,  $\pm Y$ ,  $\pm X/2$ , Z.
- (c) **Writing Time:** Function of the character being generated and the model ordered.

MODEL	MAXIMUM	AVERAGE
8040-10	10 Microseconds	6.25 Microseconds
8040-8	8 Microseconds	5.0 Microseconds
8040-6	6 Microseconds	3.75 Microseconds
8040-4	4 Microseconds	2.5 Microseconds
8040-2	2 Microseconds	1.25 Microseconds

- (d) **Number of Strokes:** 20 Maximum
- (e) **Character Size:** Four programmed character sizes are available. Nominal character sizes are listed below:

SIZE	HEIGHT	WIDTH
1	1/8"	3/32"
2	3/16"	9/64"
3	1/4"	3/16"
4	3/8"	9/32"

- (f) **Aspect Ratio:** 4:3. Other ratios optional.
- (g) **Uniformity:**  $\pm 5\%$  of character height.

## POWER REQUIREMENT

- (a) **Input Power:** 115V  $\pm 10\%$ , 60 Hz  $\pm 5\%$ , 1A

## MECHANICAL CONFIGURATION

- (a) **Size:** 19" relay rack drawer, 7" high, 20 1/2" deep.
- (b) **Weight:** 50 pounds.

## ENVIRONMENT

- (a) **Temperature:** 50°F to 100°F.
- (b) **Relative Humidity:** To 95% without condensation. Other ranges on special order.

8040 4-70 10M

Monitor Displays reserves the right to change specifications without notice.

**MONITOR DISPLAYS**  
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