DynaByte

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DYNABYTE NAKED TERMINAL

MODEL 57

OPERATING MANUAL

DATA PORT SELECTION

The NAKED TERMINAL uses two I/0 ports for communications with the S-100 bus host system. One of these ports presents the terminal STATUS to the host system; the other is used to transmit DATA to the terminal for display or to input data from the on-board keyboard port. To access these ports the 8080 host system issues an "IN" or "OUT" instruction followed by the port address, a number between 0 and 255_{10}, A single address is used for both input and output of DATA. The DATA PORT may be configured to appear at any port address by setting the Port Address 8-bit dipswitch to the binary representation of the desired address.

EXAMPLE: Selection of the DATA PORT address 57_{10}

1. Convert the desired address to binary...

   57_{10} = 00111001

2. Set this binary number into the Port Address dipswitch located at the bottom center of the NAKED TERMINAL (see Figure 1.). The least significant bit is the top switch, labeled "1" on the body of the dipswitch. To install a "1", leave the switch in the "open" position; for a "0", close the switch.

STATUS PORT SELECTION

The STATUS PORT reports the status of the NAKED TERMINAL to the host system. The status should be tested prior to any data transfer between the NAKED TERMINAL and the host system. The STATUS WORD consists of two pieces of information:

a) DATA READY: If the keyboard has sent a character to the NAKED TERMINAL, it signals the host system that is has DATA READY for the host system.

b) BUSY: After the NAKED TERMINAL receives data from the system, the NAKED TERMINAL goes BUSY until it has dealt with the data. When it is again open to receiving new data from the host system, the BUSY flag is reset.

SETTING UP THE STATUS PORT ADDRESS AND THE STATUS WORD

The address of the STATUS PORT is determined by the DATA PORT address. The user does not need to switch it into the NAKED TERMINAL. The address of the STATUS PORT is determined by complimenting the LSB of the DATA PORT address. The number that results is the address of the STATUS PORT.

EXAMPLE: Determining the STATUS PORT address using the previous example

DATA PORT ADDRESS = 57_{10} = 00111001

STATUS PORT ADDRESS = 00111000

Note that the LSB was complimented (from a 1 to a 0) and all the other bits remain exactly the same.

The STATUS WORD contains the DATA READY and BUSY information. Two 10-bit dipswitches located at the top of the NAKED TERMINAL are used to configure the STATUS WORD for communication to the host system. The dipswitch on the left, closest to the KEYBOARD PORT connector, is the switch that controls the DATA READY signal output (see Figure 2). The top eight switches (S10 to S17) relate to the 8-bit STATUS WORD. The user may choose any one of the 8 bits of the STATUS WORD to represent the DATA READY signal by simply closing the appropriate switch.

The DATA READY signal may be configured as "active high" or "active low." The bottom two switches of the DATA READY 10-bit dipswitch control whether DATA READY is represented as a logical "1" (S1+) or as a logical "0" (S1-). Either switch S1- or switch S1+ (not both!) must be closed to couple the signal to the STATUS WORD.

The STATUS WORD also contains the terminal BUSY flag. The BUSY flag is also configurable to appear on any chosen bit of the STATUS WORD. This is controlled by the setting of the right-hand 10-bit dipswitch at the top of NAKED TERMINAL (see Figure 2). The BUSY signal is switched into the STATUS WORD by closing one of the top eight switches on the BUSY signal dipswitch (S20 to S27). It may also be configured as "active high" (S2+) or "active low" (S2-) by the bottom two dipswitches just like the DATA READY signal.

Note: Do not try to switch both DATA READY and BUSY onto the same bit of the STATUS WORD. You must use different bits.

Note: Do not close both S1+ and S1- (active low and active high) at the same time. Erroneous status data will result. Likewise, do not close both S2+ and S2- at the same time.

The I/0 program in the following example is typical of the simple I/0 programs used currently in microcomputer software. **CONIN** is a subroutine that inputs data from the NAKED TERMINAL into the host system. The **CONOUT** subroutine outputs data to the NAKED TERMINAL from the host system.

```
STAT      EQU     00          ;WE CHOSE THE FIRST TWO PORTS AS THE STATUS
DATA      EQU     01          ;AND DATA PORTS

CONIN     IN      STAT        ;INPUT THE STATUS WORD
          ANI     02          ;MASK THE STATUS WORD TO LOOK AT DATA READY
                              ;ON THE SECOND BIT

          JZ      CONIN       ;IF DATA READY IS 0, LOOP TO LOOK AGAIN
          IN      DATA        ;IF DATA READY IS 1, INPUT DATA
          RET                 ;RETURN WITH DATA IN THE ACCUMULATOR

CONOUT    PUSH    PSW         ;SAVE THE DATA ON THE STACK
CONOUT1   IN      STAT        ;INPUT THE STATUS WORD
          ANI     04          ;MASK THE STATUS WORD TO LOOK AT THE BUSY FLAG
                              ;ON THE THIRD BIT
          JZ      CONOUT1     ;IF "BUSY, LOOP; IF NOT, FALL THROUGH
          POP     PSW         ;RECOVER DATA OFF STACK
          OUT     DATA        ;OUTPUT THE DATA TO THE NAKED TERMINAL
          RET                 ;RETURN TO MAIN PROGRAM
```

To use these programs, the NAKED TERMINAL would be set up as follows:

1. Set the DATA PORT address to 01 by setting SI to OPEN and S2 thru S7 CLOSED.
2. Set the DATA READY signal onto the second bit of the STATUS WORD by CLOSING S1 and OPENING all the others on the left-hand 10-bit dipswitch.
3. Set the DATA READY logical sense to positive logic by CLOSING SI+. Make sure S1- is OPEN.
4. Set the BUSY signal onto the third bit of the STATUS WORD by CLOSING S22 and OPENING all the others on the right-hand 10-bit dipswitch.
5. Set the BUSY logical sense to negative logic (for our example) by CLOSING S2-. Make sure that S1+ is OPEN.

HOOKUP

VIDEO

The NAKED TERMINAL is designed to be used with an inexpensive black and white video monitor. The video output signal is approximately 1.75V P-P, with the sync signals negative going and white video positive going.

The composite video signal appears on the center terminal of the 3-pin video connector. The mating cable connector is available from MOLEX under these designations:

TYPE KK-100
2695 SERIES, ENG. NO. 2695-3
ORDER NUMBER 22-01-2031

The crimp-type terminals that go with this connector housing (three are needed) are called:

ENG. NO. 2759T
ORDER NUMBER 08-50-014

A length of 75 ohm coaxial cable can easily be attached to this connector, and a connector appropriate to the TV monitor can be connected to the other end.
Note: A video cable kit is available from Dynabyte (order #9800200).

VIDEO MONITOR SET-UP

Virtually all monitors have vertical height adjustments. It may be necessary to adjust the vertical height of the display on the monitor to display all 1920 characters. It is best to fill the screen with characters and then adjust the height until the most pleasing display results.

It is not usually necessary to adjust the horizontal centering of the monitor. If, however, the monitor is badly misaligned, some adjustment may be necessary. If the monitor has a horizontal position control, fill the screen with characters and adjust the horizontal position for the most pleasing display. Check that the horizontal hold control is approximately centered in its stable range. Many monitors use the horizontal hold control as a horizontal position control. By adjusting the horizontal hold, the horizontal position can be varied considerably without affecting the stability of the picture. If your monitor is extremely misaligned, you may shift the horizontal position of the display by using the left-hand tap of the horizontal position jumper on the NAKED TERMINAL (figure 3).

KEYBOARD

The keyboard port connector is located at the top of the NAKED TERMINAL board (Figure 4). Following is a listing of the pin numbers for the keyboard signals:

PIN NUMBER	SIGNAL
1	no connection
2	-12VDC
3	GND
4	no connection
5	no connection
6	+5
7	no connection
8	no connection
9	BIT 5
10	BIT 3
11	BIT 2
12	BIT 4
13	BIT 6
14	BIT 7, MSB
15	BIT 1, LSB
16	STROBE

The keyboard port expects 7-bit ASCII codes with positive logic. The keyboard must hold the data latched between keystrokes. The STROBE from the keyboard must signal that data is valid by a positive-going transition.

The keyboard port provides +5VDC and -12VDC for the keyboard.

POWER AVAILABLE TO THE KEYBOARD: +5V 50ma MAX
-12V 100ma MAX

Note: DYNABYTE offers both a video cable and a keyboard cable at a small additional charge. Ask for the "NAKED TERMINAL cable package". (Order #9800200)

OPTIONS CONTROL SWITCHES (see figure 5)

DISPLAY RATE

Three rates of internal delay to reduce the display writing rate are available on the NAKED TERMINAL. S31, S32, and S33 are the display rate select switches.

ALL SWITCHES OPEN:	FULL SPEED, approximately 12000 BAUD ←
S31 CLOSED:	approximately 4800 BAUD DISPLAY RATE
S32 CLOSED:	approximately 1200 BAUD DISPLAY RATE
S33 CLOSED:	approximately 300 BAUD DISPLAY RATE

If more than one of these three switches is closed, the terminal uses the slowest indication.

DUPLEX MODE

FULL DUPLEX OPERATION: CLOSE S34 ←
HALF DUPLEX OPERATION: OPEN S34

BLOCK MODE

NORMAL HALF OR FULL DUPLEX OPERATION:	CLOSE S35 ←
BLOCK MODE (OFF LINE):	OPEN S35

CONTROL CHARACTER PRINT OPTION

The character generators in the NAKED TERMINAL have thirty-two special characters (see Figure 6) that are keyed to the ASCII control codes. Whether or not these are printed on the screen is controlled by S36.

PRINT CONTROL CHARACTERS:	OPEN S36
DO NOT PRINT CONTROL CHARACTERS:	CLOSE S36 ←

VIDEO REVERSE

WHITE CHARACTERS ON BLACK BACKGROUND,	CLOSE VREV switch ←
BLACK CHARACTERS ON WHITE BACKGROUND,	OPEN VREV switch

CURSOR BLINK

STEADY CURSOR:	CLOSE CURS switch
BLINKING CURSOR:	OPEN CURS switch ←

SPECIAL CODE IMPLEMENTATION

Several useful control codes are implemented in the NAKED TERMINAL. A listing of these follows:

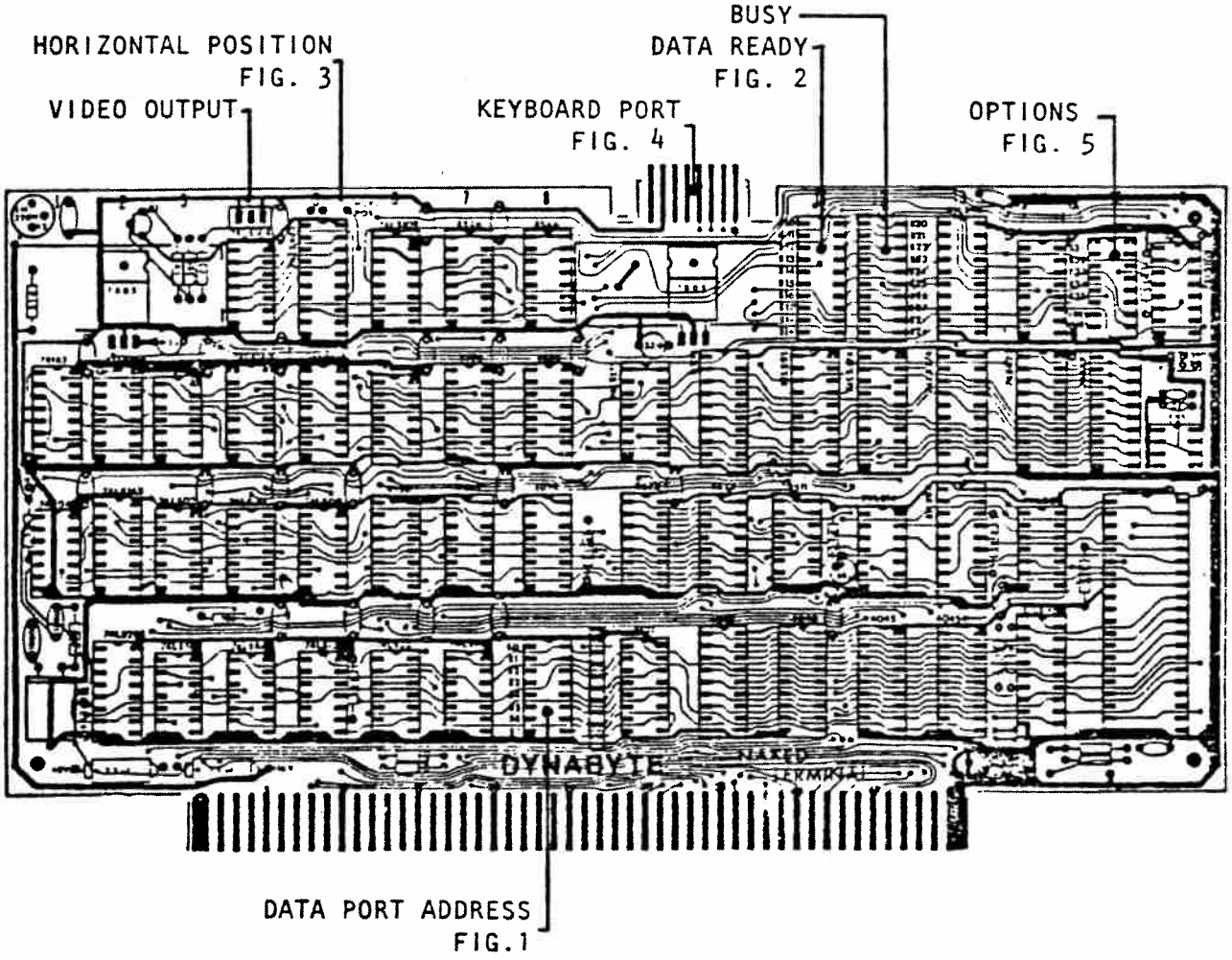
CTL CODE	*ASCII CODE*	*NAME*	*FUNCTION*
CTL-H	08	BACKSPACE	moves cursor to left one space
CTL-I	09	HORIZONTAL TAB	moves cursor to right, modulo 8
CTL-J	0A	LINEFEED	moves cursor down one 1 line
CTL-K	0B	VERTICAL TAB	moves cursor up one line
CTL-L	0C	FORMFEED	clear screen, home cursor
CTL-M	0D	CARRIAGE RETURN	moves cursor to first position on current line
DEL	7F	DELETE, RUBOUT	writes space over character to left of cursor, moves cursor back one space

The NAKED TERMINAL implements several useful special key sequences. These ESCAPE SEQUENCES are started with an ESC (ASCII 1B) followed by one or more other characters. Both the host system and the keyboard may originate ESC sequences.

DIRECT CURSOR ADDRESSING: The cursor may be placed anywhere on the screen by the following code sequence:

ESC C N1, N2 (CR)	***C*** is a capital C for "cursor" mode. ***N1*** is a decimal number (0 to 23) indicating the desired row number. , is a comma, indicating completion of the N1 entry. The logic of the NAKED TERMINAL takes the last two digits of the entered numbers for the N1 value if more than two digits are entered. ***N2*** is a decimal number (0 to 79) indicating the desired column (character) number. ***(CR)***, a carriage return, signals the completion of the N2 entry and moves the cursor to its new position.
ESC H	Homes cursor to the upper left-hand corner position.
ESC R	Reads the character at the current cursor position and transmits it to the host system.

ESC U	Forces normal mode (full or half duplex) when the Block Mode switch is in the Block Mode position (see ESC-B).
ESC B	When in Block Mode, clears the ESC-U override and puts the terminal back in Block Mode (see ESC-U).
ESC P	While in Block Mode, transmits the page on the screen from the home position to the cursor position. A full 80 characters per line are transmitted, ASCII spaces filling out each line where there are no visible characters. A special character → appears above the cursor while the terminal is transmitting.

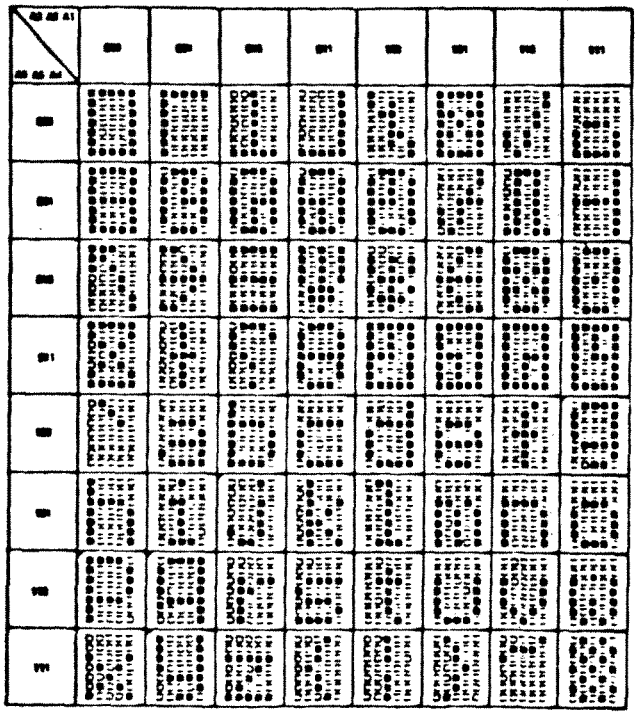


DYNABYTE NAKED TERMINAL REFERENCE FIGURES

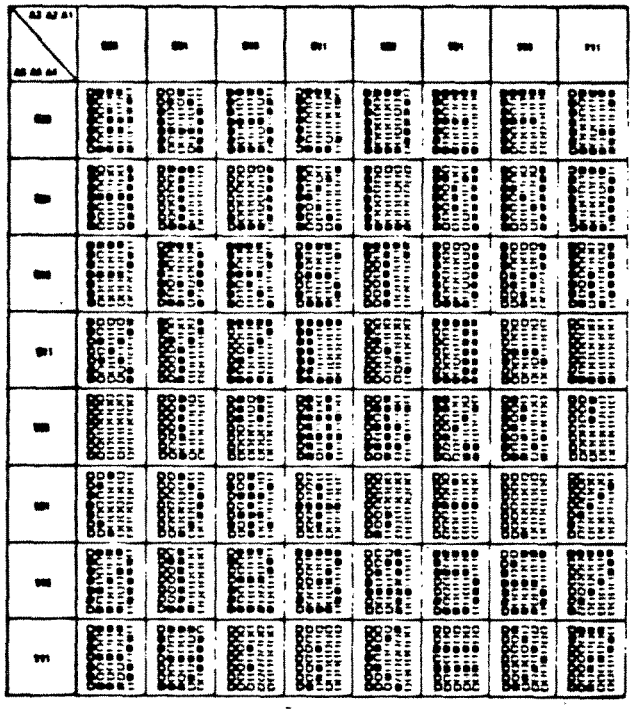
FIG. 6

CHARACTER FONT 5X7 dot matrix

DM8678CAB



DM8678CAH

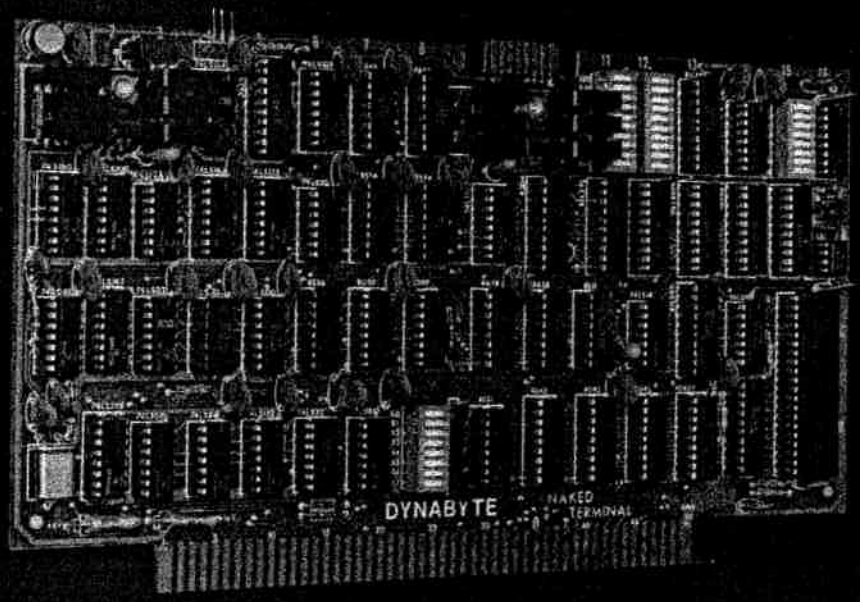


SPECIFICATIONS:

	Model 57	Model 79
Font	5 X 7 Dot matrix	7 x 9 Dot matrix
Characters Per Line	80	80
Numbers of Lines	24	16
Total Number of Characters	1920	1210
Software Required	None	None
Code Required	ASCII	ASCII
Data Pod Address	Switch Selectable	Switch Selectable
Status Pod Address	An address adjacent to the Data Port Address *(LSB* of Data Port) address is complemented)	
Power Consumption	1.6A @ 8VDC (nominal)	
Supply Voltage Range	Minimum- 7.0 volts (instantaneous) Maximum-10.0 volts @ 70° C (See derating curves in manual)	
Maximum Ambient Operating Temperature	70° C	

80 CHARACTER NAKED TERMINAL (S100 BUS)

24 LINES, UPPER & LOWER CASE, BLOCK MODE EDITING, ADDRESSABLE CURSOR, COMPLETE FLEXIBILITY OF PORT ADDRESSING & STATUS BIT SELECTION



Fully Assembled • Tested Burned In • Guaranteed 1 Year

FEATURES & BENEFITS

- Industry standard 80 character by 24 line format (Model 57)
- Completely self contained terminal electronics, just add CCTV monitor and keyboard.
- No support software required.
- Can be configured to "drop in" to an existing system configured for a serial I/O port and a stand alone terminal with NO changes to software.
- Switch selectable modes: Half Duplex, Full Duplex, Block mode.
- Status bits may be positive true or negative true and may be assigned to any bit of the status word. The status port may be addressed anywhere.
- Block mode allows editing before transmit.
- Cursor addressable by means of simple, easy to use "coordinate" format: ESC "C" followed by line number (in decimal) and column position (in decimal), separated by a comma.

  Industry standard composite video output.
- Designed for use with inexpensive CCTV monitors.
- Keyboard interface provided, including regulated +5 volts and −12 volts.
- Model 79 also available (7 × 9 character font, 80 characters, 16 lines).
- Switch selectable display rate.
- Underline cursor may be switch selected as blinking or non-blinking.
- Video is switch selectable as "Black-on-White" or "White-on-Black."
- Fully assembled, socketed, tested, burned-in, and guaranteed for a full year from date of purchase.

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SPECIFICATIONS

		Model 57	**Model** 79
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Characters Per Line		80	80
Numbers of Lines		24	16
Total Number of Characters		1920	1280
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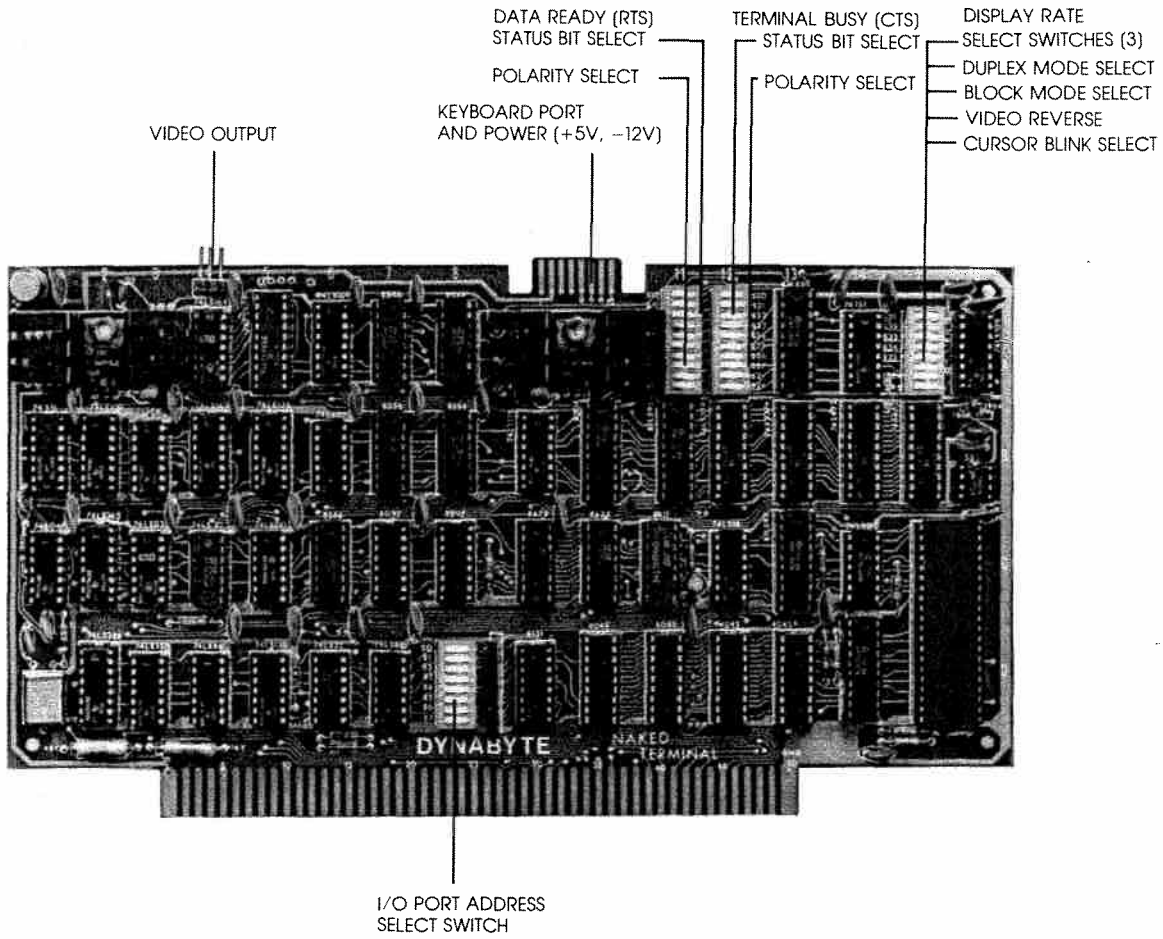
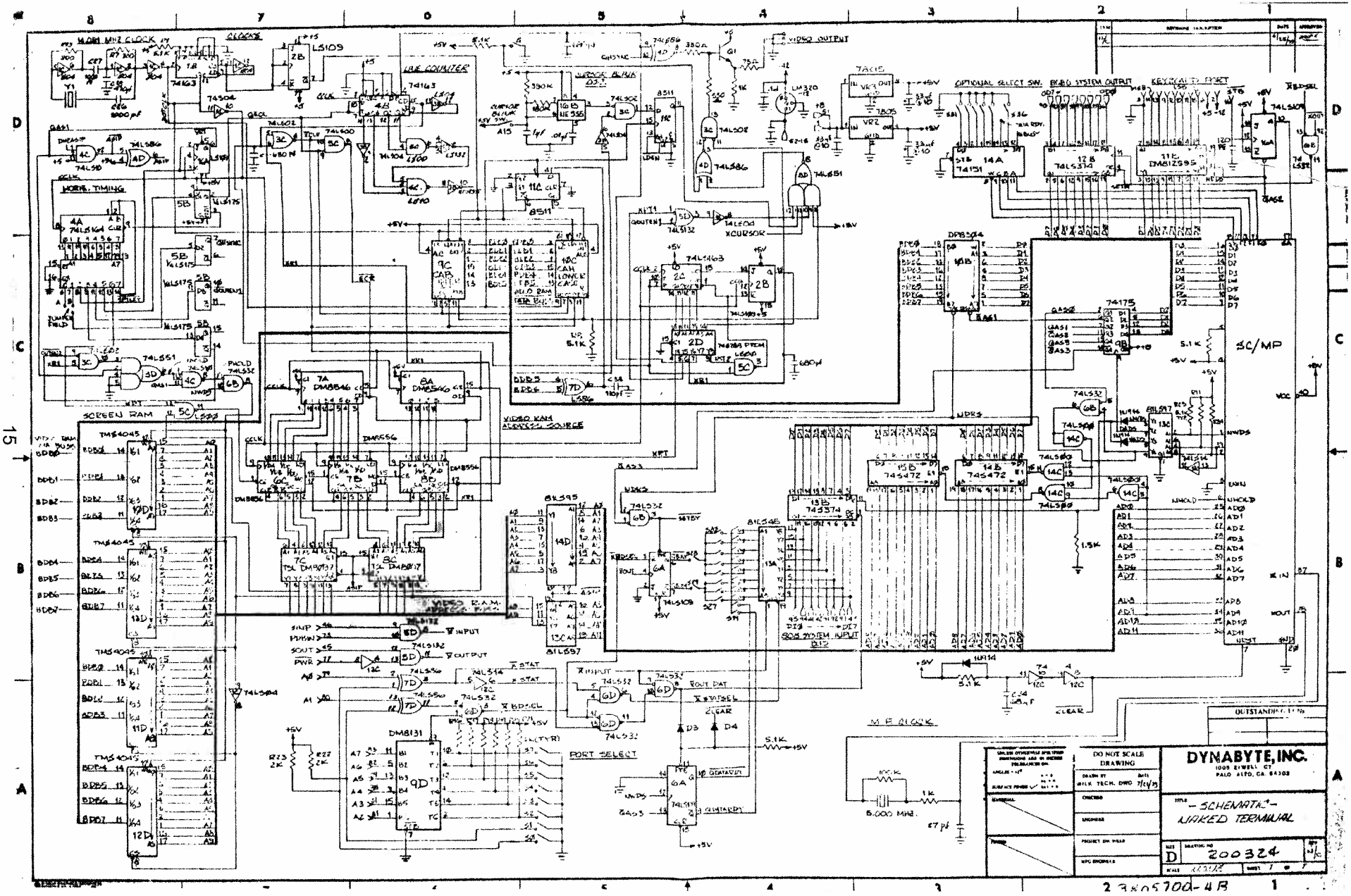
Code Required		ASCII	ASCII
Data Port Address		Switch Selectable	Switch Selectable
Status Port Address		An address adjacent to the Data Port Address (LSB of Data Port address is complemented)	
Power Consumption		1.6A @ 8VDC (nominal)	
Supply Voltage Range	Minimum	7.0 (instantaneous)	
	Maximum	10.0 @ 70'C (See derating curves in manual)	
Maximum Ambient Operating Temperature		70'C	




DYNABYTE, INC.
1008 RIWELL CT
PALO ALTO, CA. 94303
- SCHEMATIC -
WIRED TERMINAL
200324
DO NOT SCALE DRAWING
SC/MP
SCREEN RAM
VIDEO RAM
VIDEO OUTPUT
OPTIONAL SELECT SW.
KEYBOARD PORT
PORT SELECT
M.P. CLOCK
5.000 MHz
23x05700-4B

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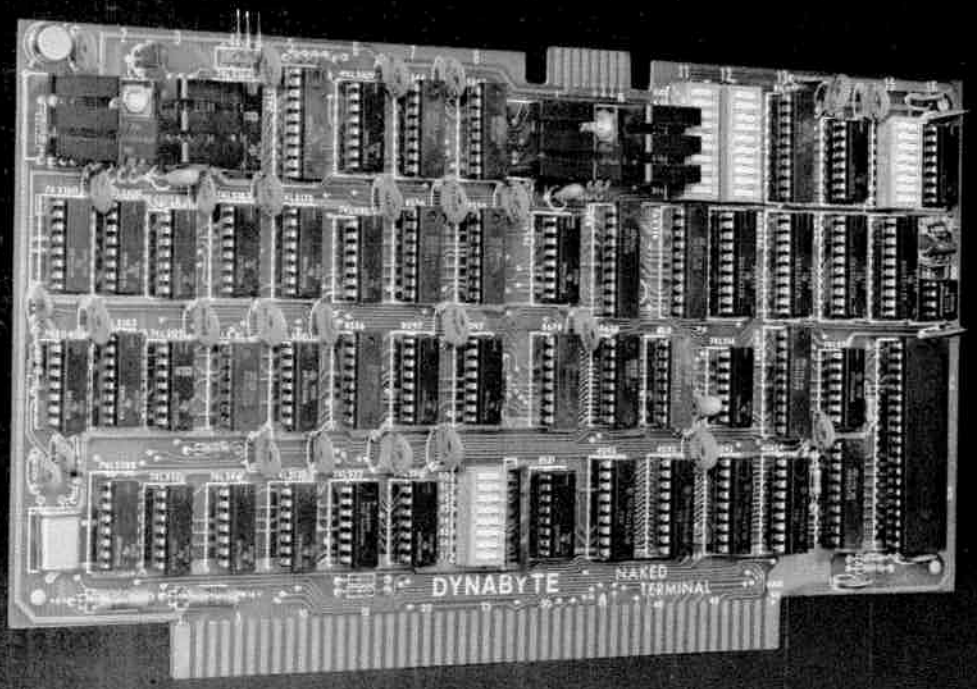

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