WY-100 Display Terminal

Maintenance Manual

WYSE

WY-100 DISPLAY TERMINAL

MAINTENANCE MANUAL

Wyse No. 88-009-01

PUBLICATION HISTORY

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10-82	Initial Publication (Preliminary)
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RELATED PUBLICATIONS

Wyse No.	Title
88-003-01	WY-100 Display Terminal Reference Manual

TRADEMARKS

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SAFETY WARNING

The terminal power cable is supplied with a safety ground. Do not use the terminal with an ungrounded outlet. Disconnect the power cable from the terminal before removing the top cover for any reason.

Dangerous voltages are present when the terminal is on and may remain after the power is off. Be extremely cautious. Do not work alone.

The internal phosphor of the CRT (cathode ray tube) is toxic. Wear safety goggles and rubber gloves whenever the CRT is handled. If the tube breaks, exposing skin or eyes to the phosphor, immediately rinse the affected area with cold water and consult a physician.

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Section I

LOGIC BOARD MODULE

1.0 INTRODUCTION

The logic board module performs all of the terminal logic functions. These can be divided into four major parts: microprocessor controller, video timing, communication interface, and keyboard interface.

The microprocessor controller contains program ROM, display and buffer RAM, I/O, and address I/O selections.

The video timing fetches data from the display memory, converts it into a displayable format, and generates all the necessary timing signals for interfacing with the monitor/power supply module.

The communication interface does serial-to-parallel data format conversion, provides baud rate generation and control signals for an RS-232 modem port and a serial printer port.

The keyboard interface is the link between the microprocessor and the keyboard module. It allows the microprocessor to scan the key matrix and the DIP switch settings on the keyboard.

2.0 OPERATING PARAMETERS

2.1 PHYSICAL DIMENSIONS

Size (L x W x D) = 6" x 7" x 0.05" (15.38cm x 17.95cm x 0.13cm)

2.2 POWER SUPPLY REQUIREMENTS

DC POWER:

Standard:

+5 VDC +- 5% @ 1A
+12 VDC +- 10% @ 20 MA
-12 VDC +- 10% @ -0.001 MA

With 2nd Page Option:

+ 5 VDC +- 5% @ 1.25 A
+12 VDC +- 10% @ 20 MA
-12 VDC +- 10% @ -0.001 MA

With 20 MA Current Loop Option:

+5 VDC +- 5% @ 1 A
+12 VDC +- 10% @ 50 MA
-12 VDC +- 10% @ -0.001 MA

With 20 MA Current Loop Option:

+5 VDC +- 5% @ 1.25 A
+12 VDC +- 10% @ 50 MA
-12 VDC +- 10% @ -0.001 MA

AC POWER:
120 VAC @ 1 A
240 VAC @ 0.5 A

2.3 CONNECTOR INFORMATION

J1 = RS-232 MODEM PORT

Connector and Pin Assignment	Signal Name	Description
J1-1	GND (AA)	Shield Ground
J1-2	TXD (BA)	Transmit Data
J1-3	RXD (BB)	Receive Data
J1-4	RTS (CA)	Request to Send
J1-5	CTS (CB)	Clear to Send
J1-6		N/C
J1-7	GND (AB)	Signal Ground
J1-8	DCD (CF)	Data Carrier Detect
J1-9	+12 V	+12 VDC
J1-10	+12 VA	20 MA Current Source
J1-11	DINRET	Data In Return
J1-12	DOUTRET	Data Out Return
J1-13	+12 VA	20 MA Current Source
J1-14	+12 V	+12 VDC
J1-15		N/C
J1-16		N/C
J1-17		N/C
J1-18		N/C
J1-19		N/C
J1-20	DTR (CD)	Data Terminal Ready
J1-21		N/C
J1-22		N/C
J1-23		N/C
J1-24		N/C
J1-25		N/C

J2 = PRINTER PORT

Connector and Pin Assignment	Signal Name	Description
J2-1	PGND	Shield Ground
J2-2		N/C
J2-3	PRXD	Transmit Data
J2-4		N/C
J2-5		N/C
J2-6		N/C
J2-7	PGND	Signal Ground
J2-8		N/C
J2-9		N/C
J2-10		N/C
J2-11		N/C
J2-12		N/C

Connector and Pin Assignment	Signal Name	Description
J2-13		N/C
J2-14		N/C
J2-15		N/C
J2-16		N/C
J2-17		N/C
J2-18		N/C
J2-19		N/C
J2-20	PDTR	Data Terminal Ready
J2-21		N/C
J2-22		N/C
J2-23		N/C
J2-24		N/C
J2-25		N/C

J3 = KEYBOARD INTERFACE

Connector and Pin Assignment	Signal Name	Description
J3-1	GND	Shield Ground
J3-2	GND	Signal Ground
J3-3	+5 V	+5 V
J3-4	SCAN 2	Scan Line 2
J3-5	SCAN 1	Scan Line 1
J3-6	SCAN 0	Scan Line 0
J3-7	SCAN 3	Scan Line 3
J3-8	SCAN 5	Scan Line 5
J3-9	SCAN 6	Scan Line 6
J3-10	SCAN 4	Scan Line 4
J3-11	KEY IN	Key Input

J4 = MONITOR/POWER SUPPLY INTERFACE

Connector and Pin Assignment	Signal Name	Description
J4-1	GND	Shield Ground
J4-2	GND	Shield Ground
J4-3	+12 V	+12 VDC
J4-4	-12 V	-12 VDC
J4-5	GND	Signal Ground
J4-6	+5 V	+5 VDC
J4-7	VDR	Vertical Synch
J4-8	GND	Signal Ground
J4-9	HDR	Horizontal Synch
J4-10	VIDEO	Video Signal

3.0 FUNCTIONAL DESCRIPTION

The logic board is functionally divided into four parts: microprocessor controller, video timing, communication interface, and keyboard interface. See Figure 1 for a block diagram of the logic board.

3.1 MICROPROCESSOR CONTROLLER

The microprocessor controller consists of an 8039 microcomputer, display and buffer memory, program memory, I/O and address decoder, and support circuits that are connected directly to the processor bus. (See Figure 2 for the timing diagrams and Figure A-1 for the schematic).

3.1.1 8039 Microcomputer (9B)

The 8039 microcomputer is an 8-bit microprocessor with 128 bytes of internal RAM, two 8-bit I/O ports and an on-chip timer/counter. It operates with a 10.376 MHz crystal (X1) which is also used for baud rate generation in the data communication interface section, resulting in a 1.48 microsecond instruction time for one-cycle instructions.

The data bus lines DB0 through DB7 are used for transfer instructions and data bytes betwen 8039 (9B) and program ROM (2B/3B), display and buffer RAM (4A-13A), CRT controllers (7B, 8B) and UART (4B). They are multiplexed into address lines during instruction fetch and external memory access.

I/O ports P10 through P16 are used for outputting row and column addresses during keyboard scan. P17 is a bell enable signal. It is used by the microprocessor to sound the bell. It is also used to provide an audio feedback effect to the keyboard by generating a click when a key is pressed on the keyboard.

The second I/O port is used for I/O and memory devices selection. The lower four lines P20-P23 also contains the four high order bits of address A8-A11 during external memory access. In device selection mode, P20 indicates whether the data byte on the bus is a command or a data byte when accessing the CRT controllers. In memory selection mode, P20 contains the address bit A8. P21-P23 contain the address bits A9-A11, respectively; and they are meaningful only in the memory selection mode. P24 selects either the display RAM (6A-13A) or buffer RAM (4A, 5A) for external RAM access. P25 enables the read/write operation of the UART. P27 selects the output data from UART to be transmitted through either the RS-232 modem port (J1) or the serial printer port (J2).

$\overline{ALE}$, $\overline{PSEN}$, $\overline{RD}$, and $\overline{WR}$ are output control signals. $\overline{ALE}$ is a clock signal used to latch the address bits during a memory or I/O cycle. $\overline{PSEN}$ occurs only during a fetch to external program

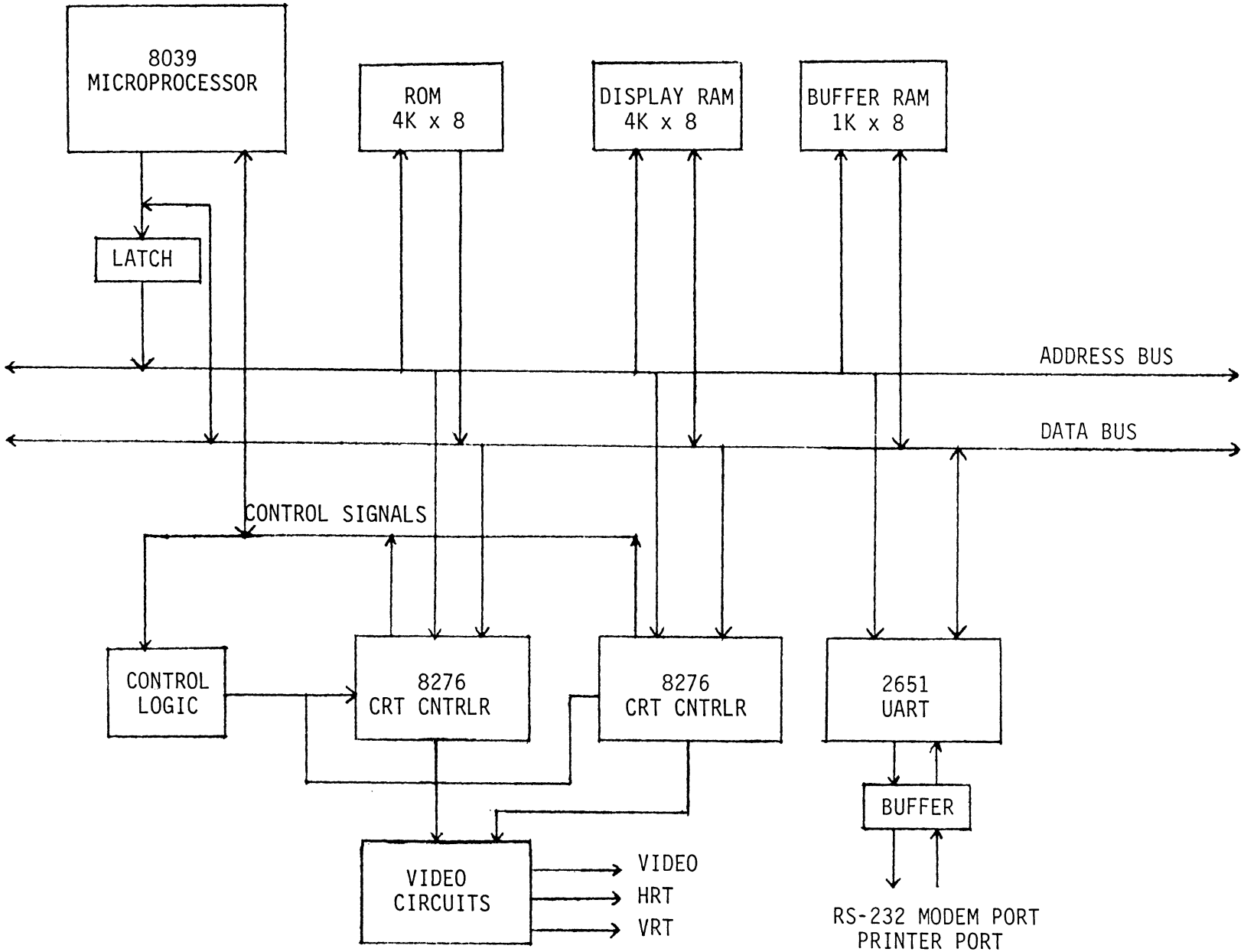


Figure 1. LOGIC BOARD BLOCK DIAGRAM

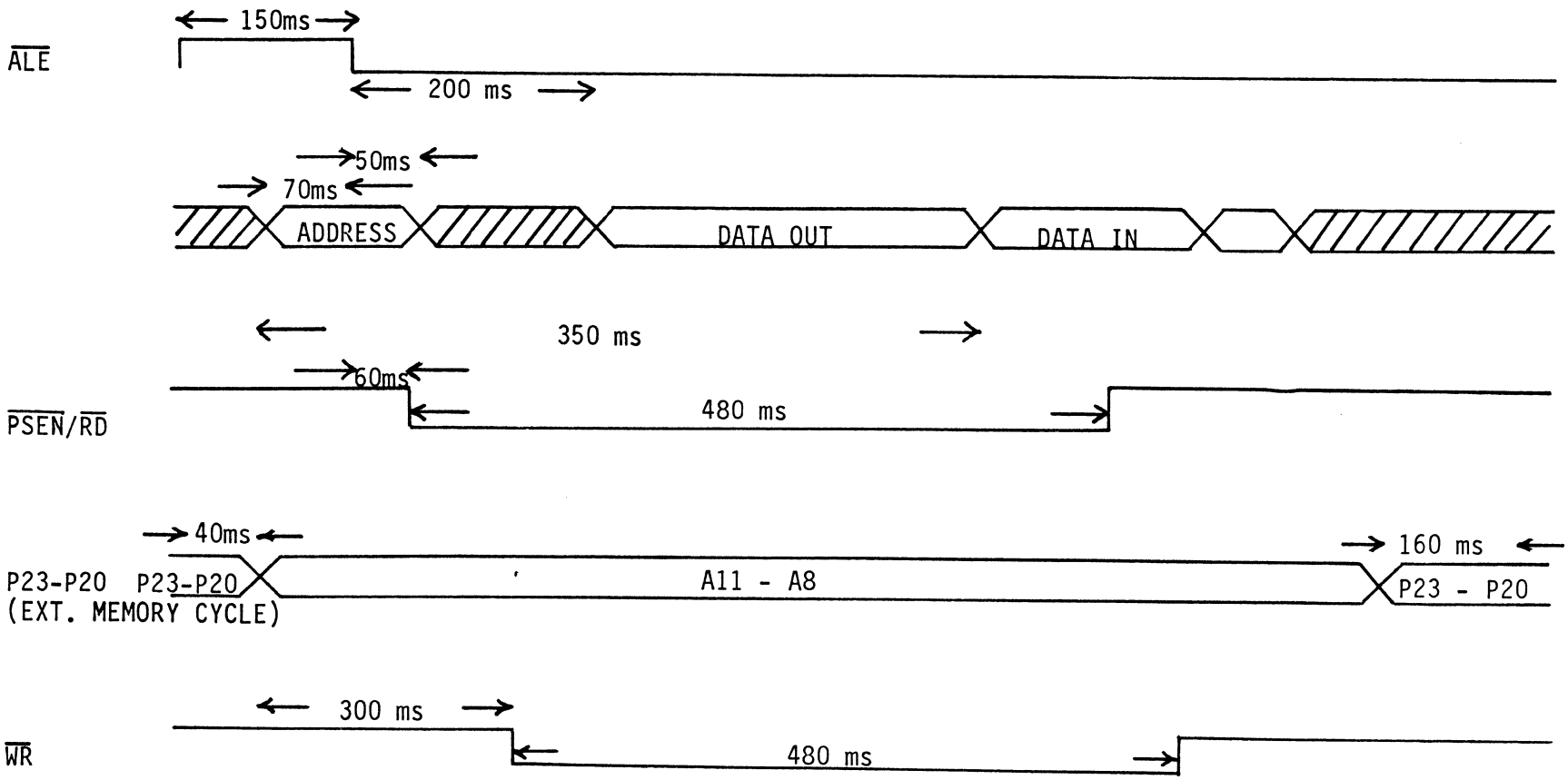


Figure 2. MICROPROCESSOR TIMING

memory. $\overline{RD}$, $\overline{WR}$, are the read and write signals for strobing data onto the bus.

$\overline{T0}$ is a feedback signal from the keyboard indicating whether a particular key is being depressed. It is an active high signal.

$\overline{T1}$ is a status signal randomly monitored by the processor. When this signal is inserted, it indicates that a character has been received by the UART (8B) and is ready to be fetched by the processor.

$\overline{INT}$ is an interrupt request signal asserted by the CRT controller (7B) when screen refresh is required. The processor responds to the interrupt request by initiating a DMA process which transfers a block of 80 characters from the display RAM (6A-13A) to the CRT controllers (7B, 8B).

$\overline{RESET}$ input signal provides a means for initializing the processor upon power-on. It is held at logic low for at least 30 milliseconds after the power supply is in tolerance.

3.1.2 Display Memory (6A-13A)

The display memory consists of 2K (4K) bytes of memory, or 4 (8) 2114 1K x 4 static memory components (6A-13A) external to the processor. It is accessed by the processor to refresh the screen and to update the text. The lower address lines are latched by an 8-bit latch (3A) on the rising edge of $\overline{ALE}$ during each external memory cycle. A two-to-four decoder (5B) is used to decode the upper address lines A10 and A11 into a 1K byte memory block, and to select a pair of 2114 memory components.

3.1.3 Program Memory (2B/3B)

The terminal program is stored in a 4K x 8 2732 (2B) EPROM. It contains the display driver, the communication interface firmware and the keyboard scanner. Alternatively, the 2732 can be substituted with two 2716s (2B, 3B) by slightly modifying the control line VPP/A11 and address line CE.

3.1.4 Communications and Data Buffer

A 1K byte buffer consists of two 2114 static memory chips (4A, 5A) used as a buffer RAM area for storing characters received from communication ports, soft function key codes and descriptions on the screen. This 1K memory address space overlaps the 4K display RAM area. The I/O port P24 of 8039 is used to select either the buffer RAM or display RAM access.

3.2 VIDEO CIRCUITS

The video circuits can be divided into four parts: CRT controllers; clock, characters clock, and dot serializer; character ROM; and attribute synchronization and generation. For detailed video timing information see Figures 3 and 4.

3.2.1 CRT Controllers (7B, 8B)

Two Intel 8276 CRT controllers are used to generate the scan line count, the character count, the horizontal and vertical timing signals, and the visual attributes. The 8276 CRT controller contains two 80-character on-chip row buffers: one is used as a circulating row buffer during each scan line display; the other is used to store prefetched characters for the next display row.

The $\overline{RD}$ input signal is never used by the 8039 processor and is permanently tied to logic high.

The $\overline{C/P}$ input signal when used in conjunction with $\overline{CS}$ indicates whether the input information on DB0-DB7 is a command or data byte.

The data lines DB0-DB7 are linked to the 8039 processor bus for transferring program parameters and display characters from the processor to the two CRT controllers.

The $\overline{CS}$ signal is asserted when the 8276s are selected by the processor for setting timing parameters. It is also used to reset the J-K flipflop (5E) after each character row refresh.

$\overline{BRDY}$ is an interrupt request signal asserted by the 8276 (7B) at the beginning of each row refresh. The processor responds to $\overline{BRDY}$ by initiating a DMA process which transfers a block of 80 characters from the display RAM to the row buffers inside of the two 8276s. The $\overline{BRDY}$ signal, when asserted, causes the following CPU read operations to become write operations to the 8276s.

The $\overline{WR}$ signal is derived from two signal sources: the write signal from the CPU when the screen is not being refreshed, or the read signal from the CPU when the screen is being refreshed. It is a control signal used either to strobe data into the row buffers or to set the command/data parameters.

The ASCII codes of the row buffers are outputted on signal lines CC0-CC6. Signals $\overline{CC0}$ through $\overline{CC6}$ and the scan line count LC0-LC3 index into the character ROM, and convert an ASCII code into its corresponding dot pattern to be displayed on the screen.

$\overline{BS}$ is the buffer selection signal. It enables the current write operation to access the character row buffers inside the 8276s. GPA0, GPA1, VSP, RVV, and HLGT are the visual attributes valid during each character display cycle. They are used for

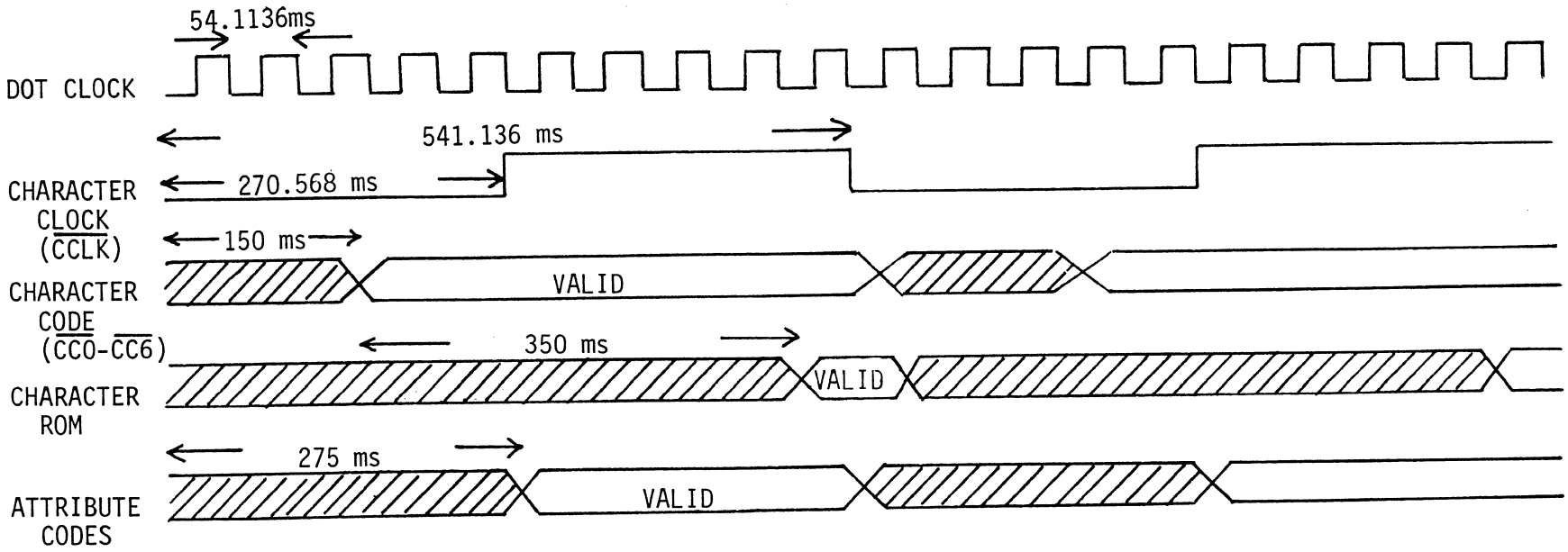


Figure 3. DOT VIDEO TIMING

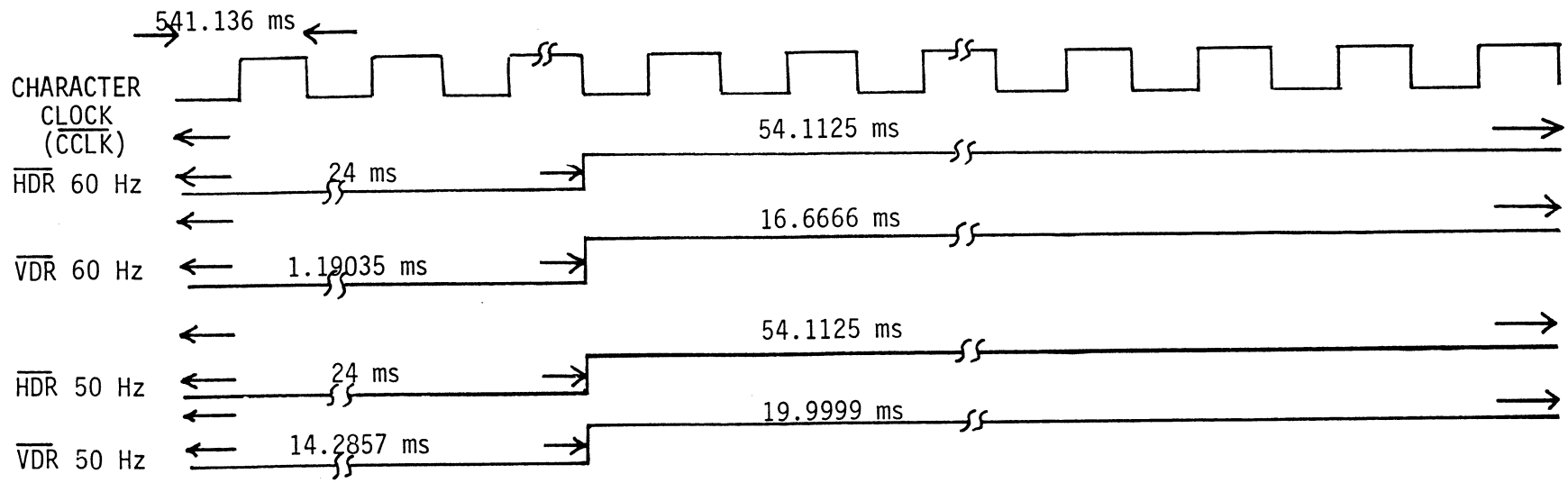


Figure 4. FRAME VIDEO TIMING

blanking, underlining, video suppression, reverse video, and highlighting display characters.

$\overline{\text{HRTC}}$ and $\overline{\text{VRTC}}$ are the horizontal and vertical drive signals. They are used by the monitor/power supply module to control the sweep of the light beam on the screen. The $\overline{\text{HRTC}}$ pulse is triggered by a 555 one-shot (18) which generates an approximate blanking time of 24 microseconds independent of AC operating frequency. The $\overline{\text{HRTC}}$ signal has a period of 54.1125 ms. The $\overline{\text{VRTC}}$ duty-cycle is programmed by the CPU. It has a blanking time of 1.19035 ms when the screen is refreshed at 60 Hz rate, and 14.2857 ms when the screen is refreshed at 50 Hz rate.

The $\overline{\text{CCLK}}$ is a 50% duty-cycle, 1.848 MHz character clock used by the 8276s and the synchronizer (3D). It is the basic timing signal for synchronizing the internal circuitry of the two 8276s.

3.2.2 Dot Clock and Dot Serializer

The character dot timing is generated by an oscillator circuit using an 18.48 MHz crystal. This 18.48 MHz, 50% duty-cycle signal is the clock source for both the dot serializer (7D) and the character clock generator (9D). The character clock generator (9D) divides the dot clock by 10 since each character cell is 10 dots wide. It also provides the appropriate timing signal to reload the dot serializer (7D) with the next character pattern, and to reinitialize itself.

The dot serializer (7D) converts an 8-bit pattern of a character matrix from the character ROM (8D) into 10 serial dots to be displayed on each scan line. The two extra dots are generated by repeating the first dot twice after the eighth dot is displayed. This scheme allows horizontal lines of two adjacent graphic characters to be connected.

3.2.3 Character ROM (8D)

The basic character cell is a 10-dot by 11-scan line rectangle. Within the cell is the 7 x 8 character, surrounded by one dot on the left side for horizontal spacing, two scan lines below for lower case descending, and one scan line above for row-to-row spacing.

All dots and all character scan lines in the matrix are used for graphics characters. Each character scan line segment is stored in ROM as an 8-bit word. Seven of the bits (D1 through D7) are used for the character dots, and the eighth (D0) is used to specify dot-extension for graphic characters. If a graphic character scan is extended, two dots are jammed into the dot serializer (7D) after the first eight bits are loaded. This results in a continuous line across the entire scan line of the character cell.

3.2.4 Attributes Synchronization and Generation

The attributes associated with each character are valid during the character cycle. They must be latched by an 8-bit latch (6B) however, because the character ROM access time exceeds one character cycle time and the outputs of the character ROM must be synchronized with the attribute signals.

The output signal $\overline{CCO}$ of the second 8276 (8B) is OR'd with the half-intensity attribute from the first 8276 (7B). This signal is used as a protect character mark for each ASCII code stored in the display RAM. This results in every protected character being displayed as dim.

3.3 ASYNCHRONOUS COMMUNICATIONS INTERFACE

The terminal data communcations are centered around the 2651 UART (4B). This chip performs the serial-to-parallel data conversion for RS-232 data communication, as well as detecting parity, framing, and overrun errors. In addition, signals $\overline{RTS}$, $\overline{CTS}$, $\overline{DTR}$, $\overline{DSR}$, $\overline{DCD}$ are handled by the 2651.

Buffers 1488 (2E) and 1489A (1E) provide the necessary level conversions for the RS-232 data communications. The 470pf capacitors used on each driver and receiver are used for slew rate control, and allow the datacomm lines to be driven to 9600 baud.

3.3.1 Baud Rate Generation

The baud rates are generated by the 2651 UART from a 10.1376 MHz clock source. The programmable baud rates supported by the 2651 and their respective error rates are as follows:

Baud Rate	Percent Error
50	--
70	--
110	--
134.5	0.016
150	--
300	--
600	--
1200	--
1800	--
2000	0.253
2400	--
3600	--
4800	--
7200	--
9600	--

Note: The percent error does not include the crystal error.

Section II

KEYBOARD MODULE

1.0 INTRODUCTION

The keyboard module scans the keys and DIP switches, and returns their status to the logic board module (see Figure 5).

2.0 OPERATING PARAMETERS

2.1 PHYSICAL DIMENSIONS

Size (L x W x D) = 20.5" x 7.1" x 1.3" (20.5cm x 18.20cm x 3.33cm)

2.2 POWER SUPPLY REQUIREMENTS

DC POWER:
+5 VDC + 5% @ 20 MA

2.3 CONNECTOR INFORMATION

Connector and Pin Assignment	Signal Name	Description
J5-1	GND	Shield Ground
J5-2	GND	Signal Ground
J5-3	+5 V	+5 V
J5-4	SCAN 2	Scan Line 2
J5-5	SCAN 1	Scan Line 1
J5-6	SCAN 0	Scan Line 0
J5-7	SCAN 3	Scan Line 3
J5-8	SCAN 5	Scan Line 5
J5-9	SCAN 6	Scan Line 6
J5-10	SCAN 7	Scan Line 4
J5-11	KEY In	Key Input

3.0 FUNCTIONAL DESCRIPTION

The keyboard module consists of two 3-to-8 decoders, an 8-to-1 data selector, a voltage comparator, three 8-position DIP switches with diode, a 14-pin male connector, and 105 mechanical momentary key switches.

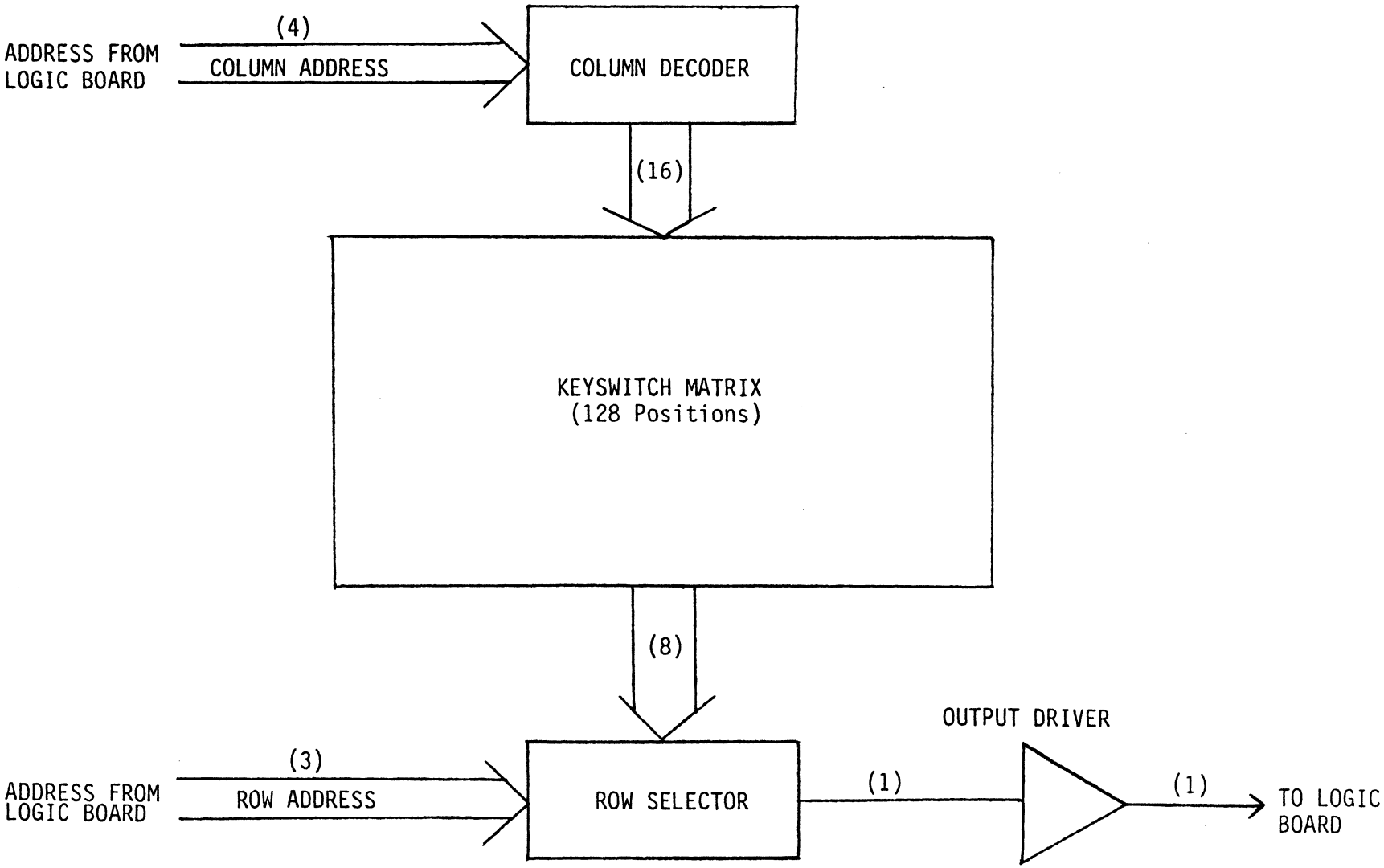


Figure 5. KEYBOARD BLOCK DIAGRAM

3.1 COLUMN DECODER

The signals presented on J5-7 through J5-10 are decoded into 1-of-16 column signals.

3.2 ROW SELECTOR

One of the eight rows of the keyboard matrix is selected by the three encoded signals on J5-4 through J5-6. The eight rows are pulled up by 10K resistors to +5 V. If a key switch is pressed or a DIP switch is closed and its row and column position is selected by the code presented on J5-4 through J5-10, a logic 0 is fed back to the logic board on J5-11.

3.3 KEY SWITCH MATRIX

The keyboard has 105 keys and three 8-position DIP switches. Left **SHIFT** and right **SHIFT** are electrically tied together on the key switch matrix. Each of the 24 DIP switches, the shift keys, and **CTRL** has a diode attached to it. The diodes are to prevent ghost keys when more than three keys are pressed simultaneously.

Section III

MONITOR/POWER SUPPLY BOARD

1.0 THEORY OF OPERATION

The monitor/power supply unit of the WY-100 display terminal consists of a CRT, a power transformer, a printed circuit board and various harnesses. See Figure 6: System Wiring Diagram and Figure D-2: Circuit Diagram.

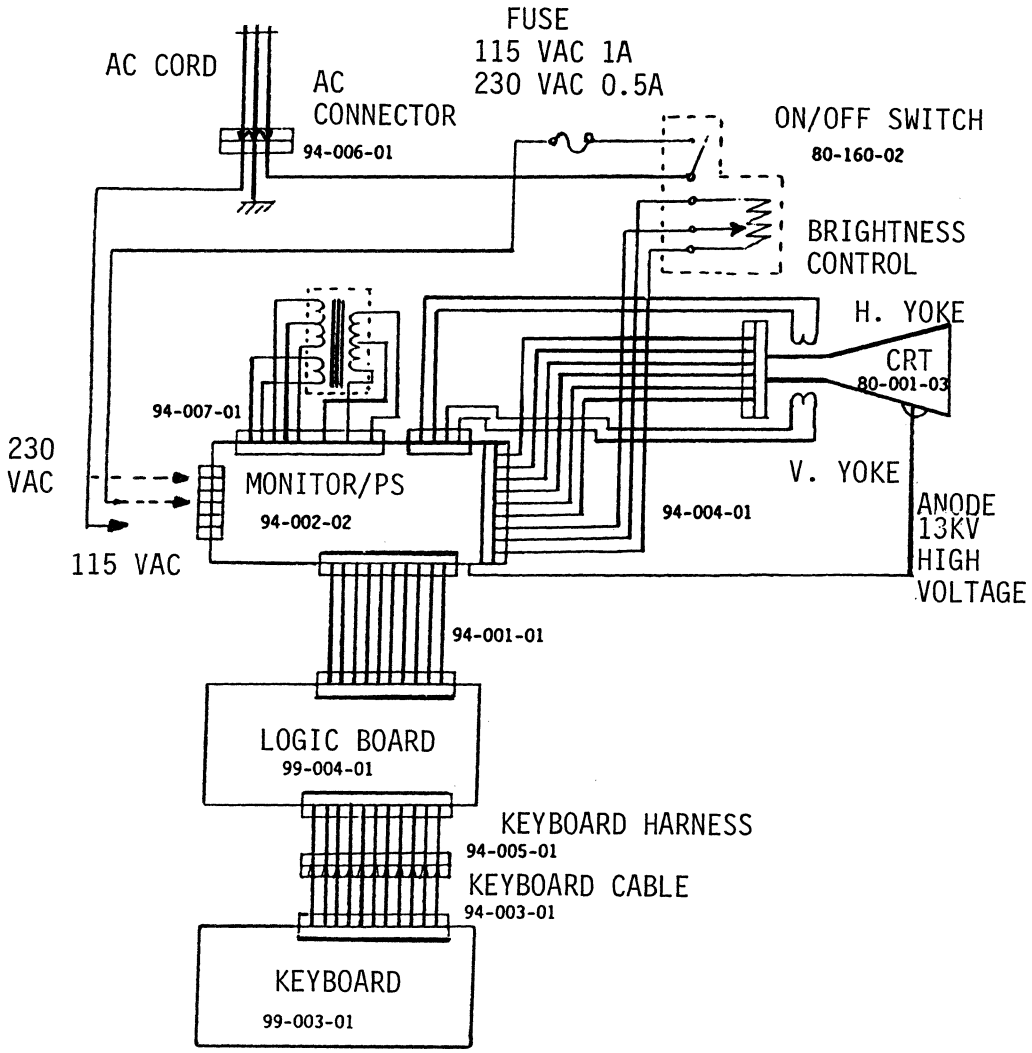


Figure 6. SYSTEM WIRING DIAGRAM

2.0 CRT

The CRT is a 12-inch 90-degree inflection tube with a 20mm neck diameter. It is mounted directly to the bezel of the terminal via four screws.

3.0 POWER TRANSFORMER

The power transformer, mounted to the right-rear of the terminal chassis, accepts 115 VAC (or 230 VAC) from the power line and transforms these voltages to lower levels required by the power supply section of the monitor/power supply pcb.

The transformer has two low voltage windings. One of them supplies the +5 volt power supply consisting of U2, Q2 and other components. The second low voltage winding supplies the +13.5 volt power supply consisting of U1, Q1 and other components as well as the +12 V supply (U3) and the -12 V supply (U4).

4.0 MONITOR/POWER SUPPLY PCB

The monitor/power supply pcb is mounted vertically on the right side of the display unit chassis. This pcb contains the power supply, horizontal and vertical deflection circuits and the video circuits of the terminal.

4.1 +5 VOLT SUPPLY

This circuit consists of U2 (see Appendix G), Q2 and other miscellaneous components. U2 is an integrated circuit voltage regulator. VR1 is used to adjust the output of this circuit to +5 VDC at pin 6, J4. Q2 is the output transistor of the power supply. R23, R24 and R31 limit the output and protect the voltage regulator under short-circuit conditions.

4.2 +13.5 VOLT SUPPLY

This circuit consists of U1 (see Appendix G), Q1, and other components. U1, is also an integrated circuit voltage regulator. VR2 is used to adjust the ouput of the supply to 13.5 volts. R3, R27, R32, and R33 form a current limiting circuit that protects the power supply under short-circuit conditions.

4.3 +12 VOLT SUPPLY

This circuit consists of U3 (see Appendix G), a three-terminal voltage regulator IC0. It supplies +12 volt DC (at pin 3, J4) to the logic board assembly.

4.4 -12 VOLT SUPPLY

This circuit consists of U4, (see Appendix G), a three-terminal voltage regulator IC. It supplies - 12 Volt DC (at pin 4, J4) to the logic board assembly.

5.0 HORIZONTAL DEFLECTION CIRCUITS

A horizontal drive signal is supplied by the logic board assembly to pin 9 of J4. This signal drives Q3 and T1 which in turn supply the driving signal for the horizontal ouput transistor Q5. Q5, with its associated components, provide horizontal deflection and other operating voltages for the CRT.

For the deflection functions, L1 provides width adjustments, L2 is the linearity correction coil and C20 is the S-shaping capacitor.

T2 is the flyback transformer and is used to generate the high voltage (+12 KV) for the CRT anode, as well as the biasing and focusing voltages for the tube. The supply voltage of the video amplifier is also generated by T2.

6.0 VERTICAL DEFLECTION CIRCUIT

U5 is an integrated vertical deflection circuit (see Appendix G). A vertical drive signal is provided by the logic board assembly at pin 7, J4. This signal provides the vertical synchronization signal required by U5. The vertical deflection yoke is driven directly by U5 and its associated circuitry. VR5 provides adjustment for raster height. VR4 is used to adjust the holding range of the circuit. VR3 is used to adjust vertical linearity.

7.0 VIDEO AMPLIFIER

The video signals generated by the logic board assembly at pin 10, J4 is amplified by Q4 to the levels required by the CRT. VR6 is used to adjust the video contrast of the display.

7.1 PROCEDURE FOR DISCONNECTING THE MONITOR/POWER SUPPLY PCB

(See Figure 6: System Wiring Diagram and Figure D-1: Loading Diagram.)

1. Disconnect the AC power cord from the AC power connector located at the rear of the terminal.

2. Disconnect the logic board from the monitor/power supply board by separating the 10-wire harness from J3 of the monitor/power supply.

3. Discharge the CRT anode to the terminal chassis by inserting a long flat blade screwdriver under the high volatge anode cup of flyback transformer 2 and shorting the shaft of the screwdriver to the top of the metal bezel. **Care should be taken so you are not in contact with the metal chassis or to the screwdriver shaft, since high voltage is present.**

4. Disconnect the anode cup of T2 from the CRT.

5. Disconnect all other connectors from the monitor/power supply board.

6. Disconnect the board from the terminal chassis by unfastening the two screws that attach head sink HS1 of the monitor/power supply to the chassis.

7.2 PROCEDURE FOR INSTALLING THE MONITOR/PS TO THE TERMINAL BASE

(See Figure 6: System Wiring Diagram and Figure D-2: Circuit Diagram.)

1. Power is supplied to the unit through a 5-pin molex connector attached to two insulated wires connected to the AC power connector and the ON/OFF switch mounted on the terminal chassis. By connecting these two wires to pins 3 and 5 (first and third pins from the lower end of the monitor/power supply pcb) of J2 of the power supply/display board, the product is set for 115 VAC operation. By reversing the molex connector so that these wires are connected to pins 1 and 3 of J2, the product is configured to operate at 230 VAC.

2. The power transformer mounted on the terminal chassis is connected to the board via a 12-pin molex connector to J1.

3. Attach the monitor/power supply board to the terminal chassis with two screws.

4. The six-circuit CRT/monitor harness is attached to pins 1 through 6 of J4.

5. The bezel mounted brightness control is connected to pins 7 through 9 of J4.

6. The yoke assembly is connected to pins 11 through 14 of J4.

7. The high voltage connector of T2 is attached to the anode button located on the top surface of the CRT.

7.3 PROCEDURE FOR ADJUSTING THE MONITOR/PS

(See Figure D-1: Loading Diagram).

1. Connect the AC power cord to the AC connector on the right-rear of the terminal before turning it on.

2. Power is applied to the power supply/display by turning the bezel-mounted ON/OFF switch clockwise.

3. Adjust VR1 so that pin 6 of J3 measures 5 VDC with a PC voltmeter.

4. Adjust VR2 so that the upper leg of VR1 measures 13.5 VDC.

5. Shut off the power by turning the bezel-mounted ON/OFF switch fully counterclockwise.

6. Connect the logic board to the 10-circuit harness through J3.

7. Set the logic board in the self-test mode:

   a. Connect pins 2 and 3 of the modem D-connector.

   b. Connect pins 3 and 20 of the printer D-connector.

   c. Set all the switches of the left-most DIP switch to a 0 or OFF position.

8. Turn on the terminal again, setting the ON/OFF switch at approximately the fully clockwise position for a high level of brightness.

9. Adjust the contrast control (VR6) to a midway setting.

10. Hold down the space bar on the keyboard until a stationary display appears on the CRT screen.

11. Adjust VR6 again so that a bright and a barely useable display is obtained.

12. Turn the brightness control (ON/OFF switch) counterclockwise to obtain a quality display on the screeen.

13. Adjust the focus control (VR7) to obtain a good focus setting for the entire screen.

14. The vertical hold control (VR4) can be used to lock the display to the vertical frame rate.

15. The height control (VR5) can be used to obtain the desired height.

16. The width of the display can be adjusted by turning the ferrite lug of L2.

17. The vertical linearity control (VR3) can be used to obtain uniform row heights.

18. Check the +5 VDC and 13.5 VDC outputs by repeating steps 3 and 4 above.

7.4 PROCEDURE FOR DISPLAY GEOMETRY ADJUSTMENT

1. The yoke is attached to the neck of the cathode ray tube with a metal ring secured by a screw. By loosening this screw, the display can be rotated to the required orientation on the screen.

2. Attached to the yoke are two concentric magnet rings each with its own adjustment tab. By rotating these two magnet rings the display can be centered on the screen.

3. Around the periphery of the yoke are eight magnets, each of which are attached to a plastic post. By rotating a magnet around the plastic post, the geometry of a specific portion of the display is affected. By adjusting the orientation of these magnets in turn, you can obtain the desired display geometry. After this alignment procedure, fix the orientation of each magnet with glue.

Appendix A

PC ASSY LOGIC BOARD 99-004-01 REV E PART NUMBER AND DESCRIPTION

Itm	Qty/ Assy	Part No.	Description	Remarks
1	6	80-430-00	2114L 1K X 4 Static RAM	4A-9A, (10A-13A)
2	1	80-431-00	8039 Microprocessor	9B
3	2	80-431-02	8276 Controller	7B, 8B
4	1	80-431-03	2651 USART	4B
5	1	23-004-01	Program ROM [EROM] 2732A	2B
6	1	23-002-01	Character Generator ROM 2716-1	8D
7	3	80-400-00	74LS00	2D, 5D, 2C
8	1	80-400-02	74LS02	6E
9	1	80-400-04	74LS04	8E
10	2	80-400-05	74LS08	3C, 4E
11	1	80-400-06	74LS32	6D
12	1	80-400-07	74LS86	7E
13	1	80-400-08	74LS112	5E
14	1	80-400-09	74LS139	5B
15	1	80-400-10	74LS166	7D
16	1	80-400-12	74LS373	3A
17	1	80-400-14	74LS157	3E
18	1	80-410-15	74LS374	6B
19	2	80-410-00	74S04	4D, 10D
20	1	80-410-01	74S161	9D
21	1	80-410-02	74S74	3D
22	1	80-432-02	555 Timer	1B
23	1	80-432-00	1488	2E
24	1	80-432-01	1489A	1E
25	1	80-300-02	Sonalert (Starmicronics)	B1
26	1	80-690-01	Crystal, 10.1376 MHz	X1
27	1	80-690-02	Crystal, 18.480 MHz	X2
28	3	80-170-01	IN914B Diode	CR1, CR11, CR12
29	1	80-920-01	68pf 50V, Ceramic Capacitor	C2
30	20	80-920-00	.01uF 50VDC Ceramic Capacitor	C1, C16-19, C21-C36
31	9	80-920-02	470pF 50VDC Ceramic Capacitor	C5-C13
32	1	80-930-00	10uF 16 VDC Electrolytic Capacitor	C3
33	1	80-930-01	47uF 25 VDC/16VDC Electrolytic Capacitor	C15
34	1	80-900-30	160 ohm 5% 1/4W Carbon Film Resistor	R7

Itm	Qty/ Assy	Part No.	Description	Remarks
35	5	80-900-02	470 ohm 5% 1/4W Carbon Film Resistor	R3, R4, R8, R10, R11
36	2	80-900-07	2K ohm 5% 1/4W Carbon Film Resistor	R1, R9
37	5	80-900-08	10K ohm 1/4W Carbon Film Resistor	R5, R6, R12, R20, R21
38	1	80-900-04	680 ohm 5% 1/4W Carbon Film Resistor	R2
39	2	80-150-05	25-Pin D Connector	01, J2
40	1	80-121-12	12-Pin Header, 0.156" Center	J3
41	1	80-121-10	10-Pin Header, 0.156" Center	J4
42	2	80-151-24	24-Pin Socket, IC	2B, 8D
43	1	80-151-28	28-Pin Socket, IC	4B
44	3	80-151-40	40-Pin Socket, IC	7B, 8B, 9B
45	2	50-014-01	D Connector Mounting Hardware	
46	1	98-004-01	PCB, Logic	
47	1	80-190-01	LED	CR13
48	1	80-940-00	0.01uF, 630V Polyester Capacitor	C4
49	2	80-900-09	8.2K ohm 1/4W 5% Resistor	W1, W2

Note: QTY per ASSY for two-page is the same as QTY per ASSY for single-page with one exception; item 1, QTY is 10 not 6.

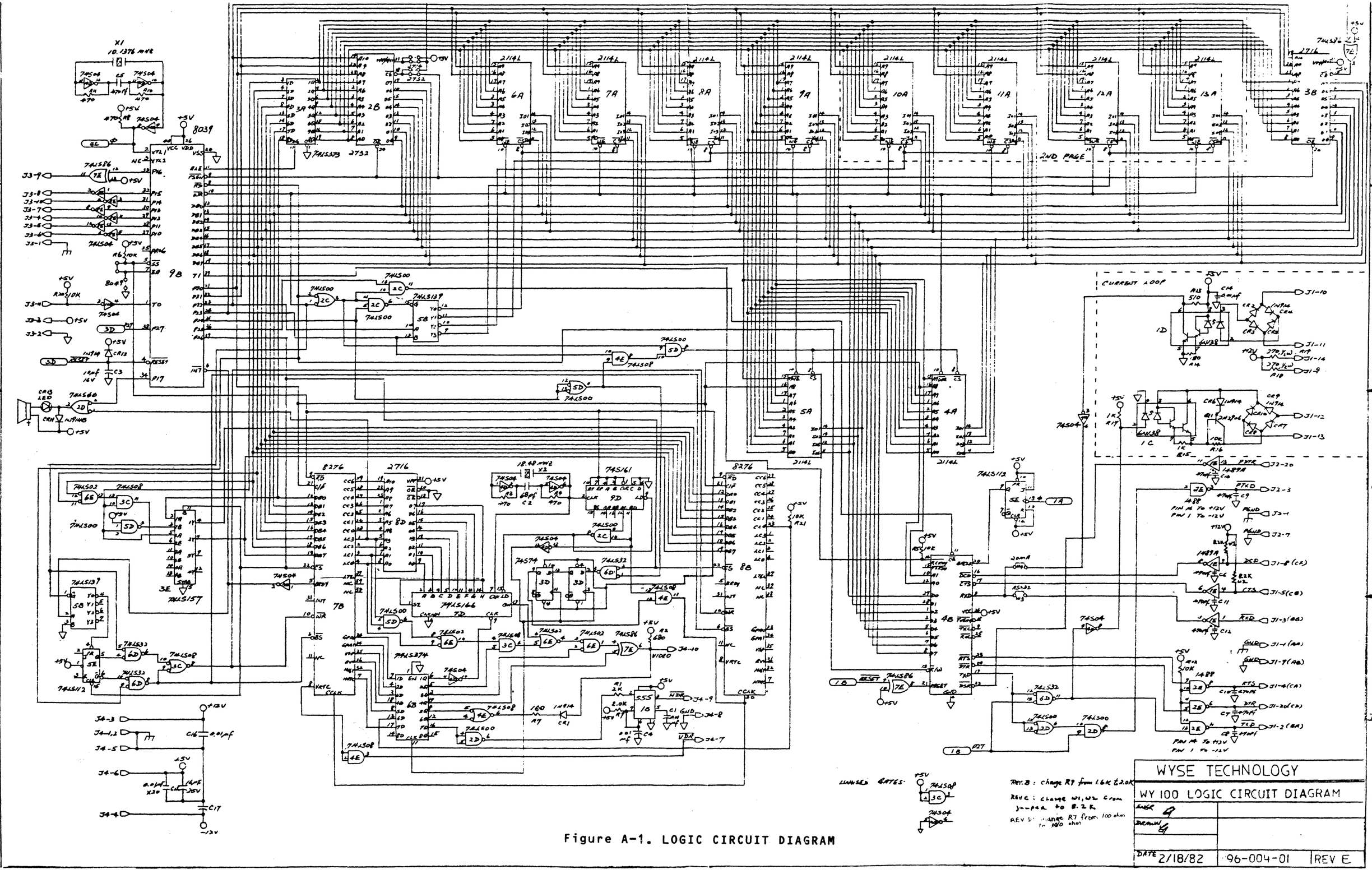
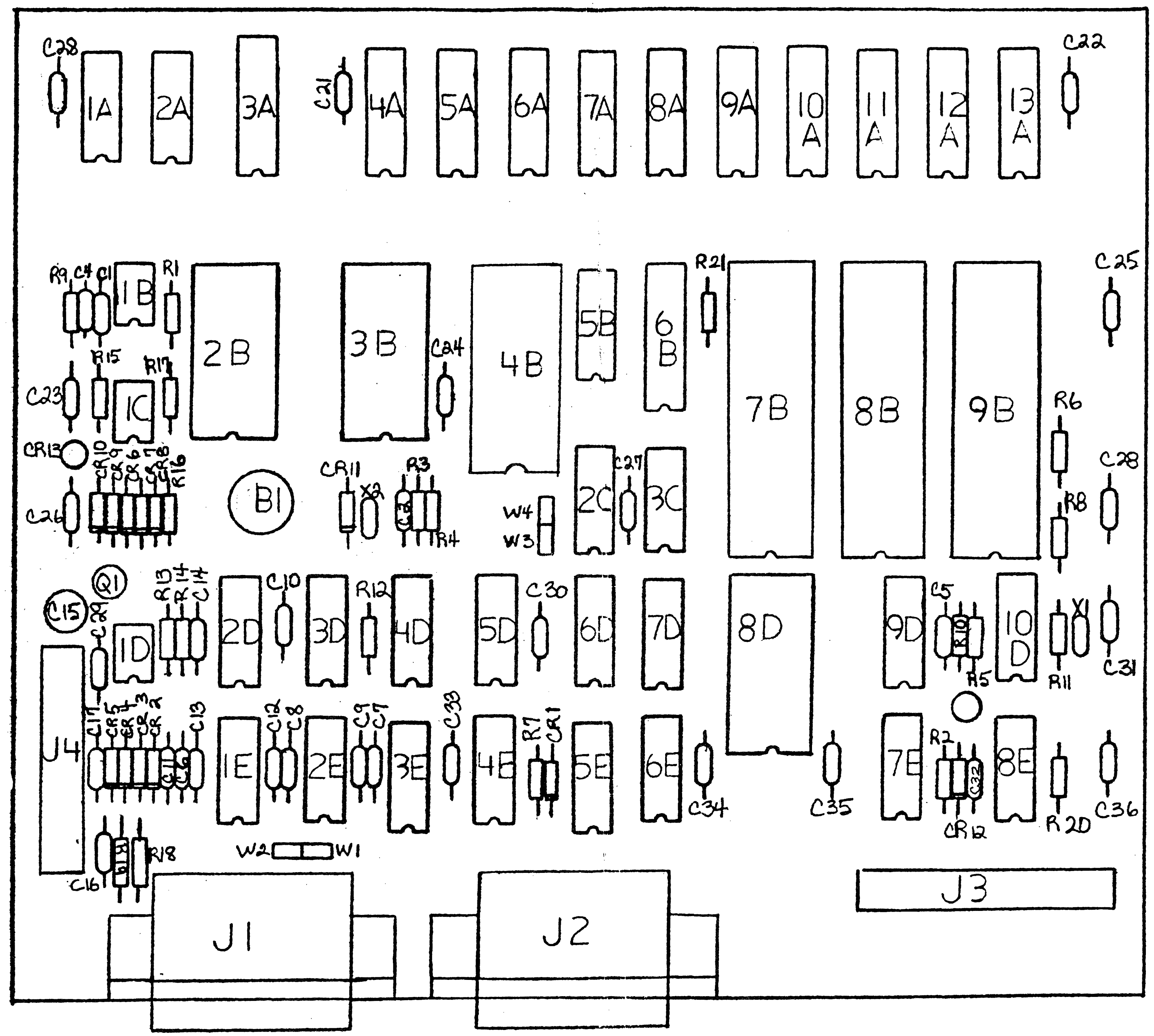


Figure A-1. LOGIC CIRCUIT DIAGRAM



									3
									2
									1
-50	-40	-30	-20	-10	PART NUMBER	PART NAME	DESCRIPTION SPECIFICATION		ITEM

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED

DO NOT SCALE DRAWING
REMOVE ALL BURRS AND SHARP EDGES
DIMENSIONS ARE IN INCHES AND APPLY OVER ADDED FINISHES EXCEPT PAINT
SURFACE ROUGHNESS ✓

TOLERANCE
DIMENSIONAL .X ± .1 ANGLES .XX ± .020 ±1° .XXX ± .010
HOLE SIZE 0-.599 ± .003 .600-.999 ± .004 1.000-1.499 ± .005

BEND RADIUS

FINISH

DASH NO.	NUMBER	QTY
	NEXT ASSEMBLY	

	DATE
DRAWN	2/23/82
CHECKED	
ENGINEER G1	2/23/82
MANUFACTURING	
QUALITY ASSUR	

WYSE TECHNOLOGY

TITLE 99-004-01 LOADING DIAGRAM

SCALE	SIZE	PART NUMBER	REV
	C	99-004-01	E

CODE | SHEET | OF

DWG. NO. | SH | REV

Figure A-2. LOGIC BOARD LOADING DIAGRAM

Appendix B

KEYBOARD PCB 99-003-01 REV B PART NUMBER AND DESCRIPTION

Itm	Qty/ Assy	Part No.	Description	Remarks
1	1	98-003-01	FAB PCB	
2	3	80-802-01	DIP Switch 8 Pos	DS1-3
3	1	80-432-08	IC MC14051B	U3
4	1	80-432-09	IC LM339	U4
5	2	80-400-13	IC 74LS156	U1, U2
6	1	80-122-12	Conn., 12 POS	J1
7	26	80-170-01	Diode, IN914B	D1-D26
8	1	46-001-01	Frame, KB	
9	104	80-801-01	Keyswitch, Straight	
10	1	80-801-02	Keyswitch, Angle	
11	1	80-803-01	Bar, Torsion	
12	2	80-804-01	Holder, Keycap	
13	2	80-805-01	Holder, Frame	
14	1	80-800-01	Keycap Set	
15	88	50-015-01	Jumpers 0.5"	
16	9	80-900-08	10K ohm, 1/4W, 5% Resistor	R1-R8, R11
17	2	80-900-02	470 ohm, 1/4W, 5% Resistor	R9, R10
18	1	80-930-09	33uf 16V Capacitor, Electrolytic	C1
19	3	80-920-07	.01uf 50V, Capacitor, Ceramic	C2-C4

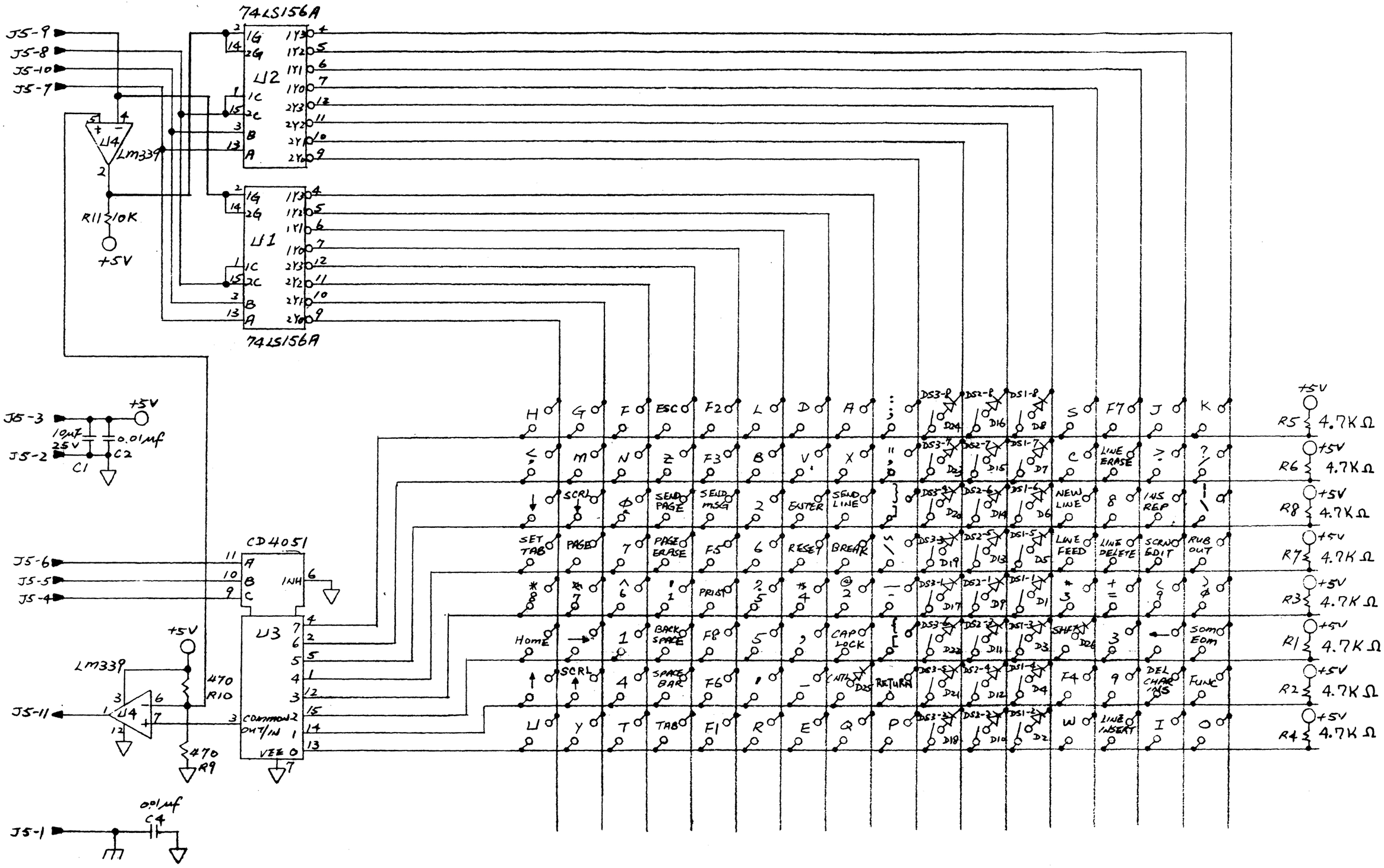
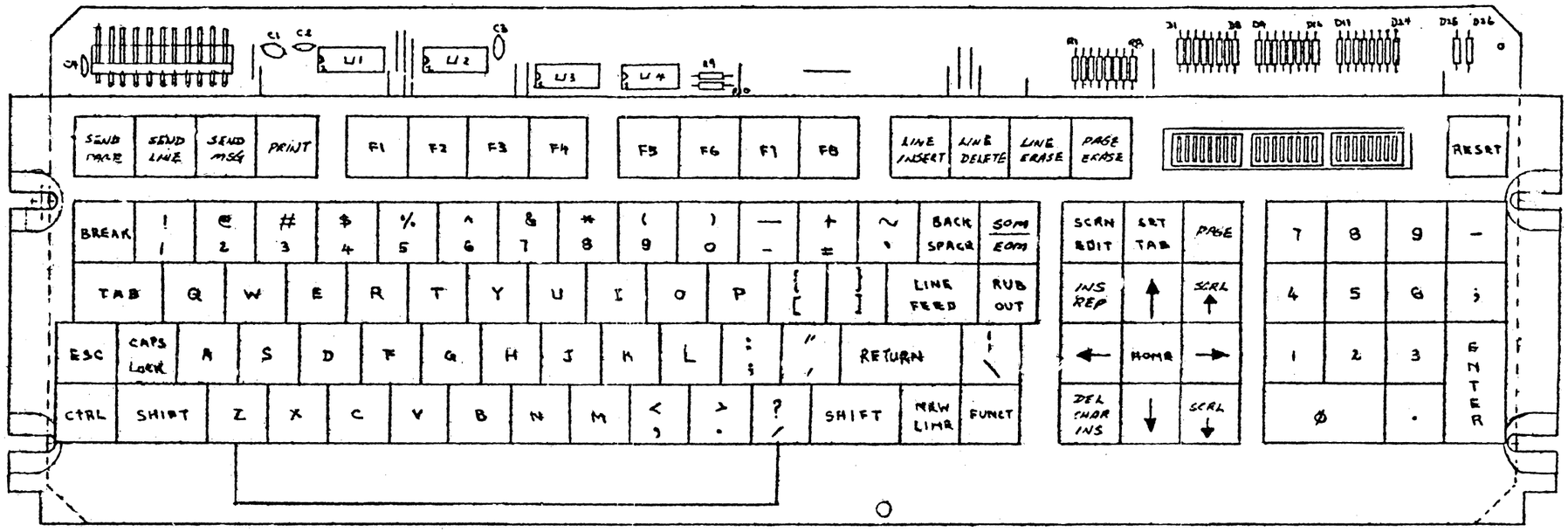


Figure B-1. KEYBOARD SCHEMATIC



ENGR. CHANGE				WYSE
REV	DATE			
1	6/15/80			LOADING DIAGRAM
2	8/14/80			
3	9/11/81			
				99-003-01 Rev B
				Sh 3 of 3

Figure B-2. KEYBOARD LOADING DIAGRAM

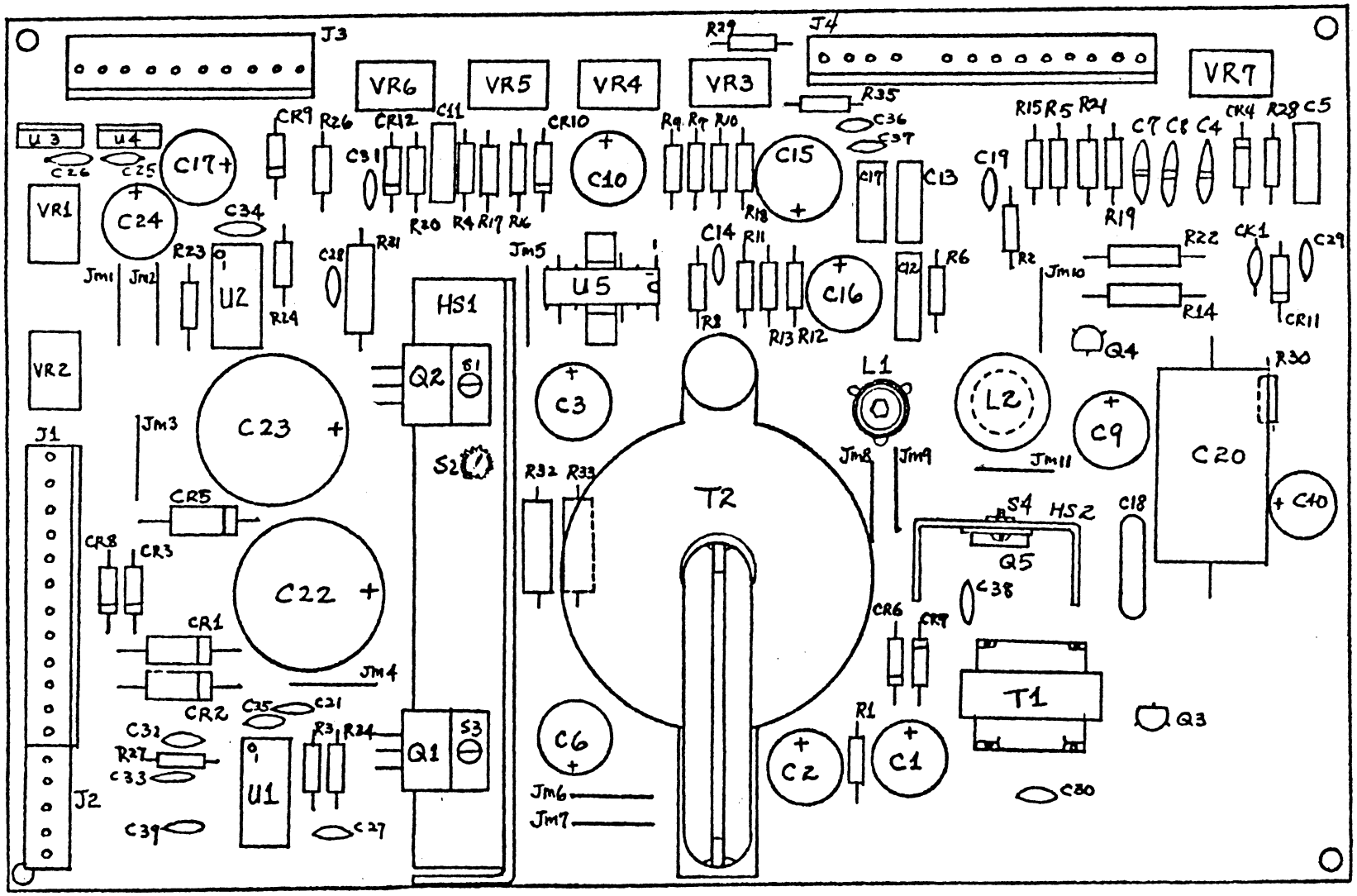
Appendix C

MONITOR/PS PCB 99-002-01 REV T PART NUMBER AND DESCRIPTION

Itm	Qty/ Assy	Part No.	Description	Remarks
1	1	80-432-04	TDA 1170 Vertical Deflection IC	U5
2	6	80-170-02	IN4002 Diode	CR3, CR7-CR11
4	1	80-432-10	BU407D Horizontal Deflection IC	Q5
5	3	80-170-04	IN5401 Diode	CR1, CR2, CR6
6	2	80-432-05	LM723C Voltage Regulator IC	U1, U2
7	1	80-432-06	MC7812 CT, LM340T-12	U3
8	1	80-432-07	MC7912 CT, LM320T-12	U4
9	1	80-180-03	2N5830 Transistor	Q4
10	1	80-180-02	PN2222	Q3
11	2	80-180-01	TIP 120	Q1, Q2
12	1	80-170-01	IN914B	CR12
13	1	80-011-02	Heat Sink, TDA 1170	U5
14	1	80-004-01	Flyback Transformer	T2
15	1	80-007-01	Linearity Coil	L2
16	1	80-006-01	Width Adjustment Coil	L1
17	1	80-005-01	Driver Transformer	T1
18	1	80-432-11	Rectifier Varo VS048	CR5
19	1	98-002-01	PCB	
20	1	80-011-01	Heat Sink (Transistor)	HS2
21	1	80-010-01	Heat Sink L-Shaped	HS1
22	4	50-002-02	#4-40 3/8 inch Screw	S1-S4
23	4	50-012-04	#4 Hex Nut w/Star Washer	S1-S4
24	4	80-806-02	Insulator Pad, Mica	Apply to Q1, Q2
25	1	80-121-05	5-Pin Molex Wafer, Non-Polarized, Non-Locking	J2
26	1	80-121-10	10-Pin Molex Wafer, Polarized	J3
27	1	80-121-12	12-Pin Molex Wafer, Polarized	J1
28	1	80-120-14	14-Pin Molex Wafer, Locking	J4 (pull out pin 5)
29	11	50-015-01	Jumpers, 0.5"	JM1-JM11
30	4	80-806-01	Nylon Insulating Bushing	Apply to S1, S3
31	5	80-161-02	100K ohm Variable Resistor	VR1-VR5
32	1	80-161-01	500 ohm Variable Resistor	VR6
33	1	80-161-03	2M ohm Variable Resistor	VR7

Itm	Qty/ Assy	Part No.	Description	Remarks
34	1	80-930-08	4700uF 35V Capacitor, Electrolytic	C22
35	1	80-930-07	4700uF 25V/35V Capacitor, Electrolytic	C23
36	1	80-930-06	1000uF 25V Capacitor, Electrolytic	C15
37	1	80-930-05	470uF 35V Capacitor, Electrolytic	C24
38	7	80-930-04	220uF 25V Capacitor, Electrolytic	C1, C2, C3, C6, C10, C16, C17
39	2	80-930-03	47uF 25V Capacitor, Electrolytic	C9, C40
40	4	80-940-02	0.1uF 100 V Metalized Polyester	C11-C13, C17
41	1	80-940-03	0.22uF 400V Metalized Polyester	C5
42	1	80-940-01	0.022uF 400V Metalized Polyester	C18
43	1	80-940-04	10uF 100 V Metalized Polyester	C20
44	6	80-920-05	.01uF, Ceramic 100V	C25-C30
45	2	80-920-08	470pF, Ceramic 100V	C14, C19
46	11	80-920-06	.1uF, Ceramic 50V	C21, C31-C39 between J3-1 and J3-4
47	3	80-920-03	.01uF Ceramic Capacitor Spark Gap	C4, C7, C8
48	1	80-900-27	2 ohm, 1/4 W, 5% Resistor	R12
49	1	80-900-11	3.3 ohm, 1/4 W, 5% Resistor	R11
50	1	80-900-26	11 ohm, 1/4W, 5% Resistor	R30
51	1	80-900-28	16 ohm, 1/4W, 5% Resistor	R15
52	1	80-900-12	47 ohm, 1/4W, 5% Resistor	R29
53	2	80-900-13	68 ohm, 1/4W, 5% Resistor	R2, R35
54	1	80-900-29	120 ohm, 1/4W, 5% Resistor	R1
55	1	80-900-30	160 ohm, 1/4W, 5% Resistor	R3
56	1	80-900-25	200 ohm, 1/4W, 5% Resistor	R5
57	1	80-900-03	510 ohm, 1/4W, 5% Resistor	R26
58	3	80-900-05	1000 ohm, 1/4W, 5% Resistor	R23, R24, R27
59	1	80-900-31	4700 ohm, 1/4W, 5% Resistor	R34

Itm	Qty/ Assy	Part No.	Description	Remarks
60	1	80-900-32	11K ohm, 1/4W, 5% Resistor	R20
61	1	80-900-17	39K ohm, 1/4W, 5% Resistor	R18
62	3	80-900-35	100K ohm, 1/4W, 5% Resistor	R9, R10, R4
63	1	80-900-34	62K ohm, 1/4W, 5% Resistor	R13
64	4	80-900-33	120K ohm, 1/4W, 5% Resistor	R17, R19, R21, R28
65	1	80-900-21	150K ohm, 1/4W, 5% Resistor	R16
66	1	80-900-22	270K ohm, 1/4W, 5% Resistor	R8
67	2	80-900-23	470K ohm, 1/4W, 5% Resistor	R6, R7
68	1	80-900-06	1.6K ohm, 1/4W, 5% Resistor	Rework back of board
69	2	80-905-00	680 ohm, 2W, 5% Resistor	R14, R22
70	3	80-905-02	1.2 ohm, 2W, 5% Resistor	R31-R33
71	1	80-432-12	6.8uH Choke, 100 mA	CK1
72	1	80-900-14	220 ohm, 1/4W, 5% Resistor	Between U2-10 (LM 723) and the base of Q2 (TIP 120)



1. APPLY INSULATION PAD (80-806-02) TO Q1, Q2, (TWO EACH, BETWEEN Q2/Q1 AND HS1)
2. APPLY NYLON INSULATION PUSHING TO S1, S3, (TWO EACH, ABOVE Q2/Q1 AND ON SOLDER SIDE)
3. PULL OUT PINS OF J4 BEFORE ASSEMBLE ONTO THE PCB.

Figure C-1. MONITOR/POWER SUPPLY BOARD 99-002-01 LOADING DIAGRAM

wyse TECHNOLOGY	
99-002-01	REV T

1 OF 2

96-002-01 REV T

WYSE TECHNOLOGY

MONITOR POWER SUPPLY SCHEMATIC DIAGRAM

H. YOKE

80-

BRIGHTNESS 100K

94-006-01

CR7 IN4002

C20 10UF 100V

L2 H LIN.

L1 WIDTH

120 R1

C30 .01

T1

C2 220 25V

C38 .1

Q5 BLI 407 D

C18 .022 400V

MR851 220 UF 25V C1

CR6

12 .1 SG

10 GND

9 HEATER

13

14 G2

120K R21

IN4002 CR11

120K R28

.22 C5 100V

T2

CR4 IN4007

C8 .1 SG

120K R19

2.0M FOCUS VR7

C4 .1 SG

Q3 2N2222 (PN2222)

510 R26 H.D.

R30 11Ω

C40 .47UF 100V

C9 47 UF 100V

R15 16

3.5 IDC

220UF 25V

VIDEO

CR10 IN4002

220UF 25V C10

R8 270K

22pf C14

C3 220 UF 25V

U5 TDA 1170

R9 100K

4.7 UF C16

100K R10

R7 470K

R13 62K

R12 2.2

R18 39K

C12 .1

100K V DIN. VR3

C13 .1

R6 470K

C11 .1

R17 100. K

R16 150 K

100K VR5 HT

100 K VR 4 V HOLD

100K R4

C31 1.5K

R20 11K

IN 4148 CR12

V.D

CK1 6.8 uH

R22 680 2W

200Ω

680 2W R14

R29 470

VR6 500 CONTRAST

2N5830 Q4

68 R2

470 pf C19

3.3 R11

.1 C17

C15 1000UF 16V

2 OF 2

96-002-01

80-

IN5401 CR2

IN5401 CR1

C22 4700 UF 35V

IN4002 CR8

470 UF 35V C24

IN4002 CR3

BR1 V304B

4700 UF 25V C23

U1 723

2.7K R34

.01 C28

R32 1.2

TIP120 Q1

+13.5 VDC

160 R3

1K R27

1.2 4W R33

100K VR2

.1 C21

.1 C35

U2 723

.01 C39

220 R24

1K R24

TIP120 Q2

R31 1.2 4W

+5 VDC

CR9 IN 4002

220UF 25V C17

1K R23

100K VR1

.1 C34

ON/OFF

1A 110V

3A 220V FUSE

110V

220V

.1 1KV

94-006-01

99-002-01

U3 LM340T12

.01 C26

+12 VDC

U4 LM320T-12

.01 C25

-12 VDC

.1UF

Figure C-2. MONITOR/POWER SUPPLY 99-002-01 SCHEMATIC DIAGRAM

Appendix D

MONITOR/POWER SUPPLY PCB ASSY 99-002-02 REV N

Itm	Qty/ Assy	Part No.	Description	Remarks
1	2	80-170-04	Diode IN5401	D601, D602
2	7	80-170-02	Diode IN4002	D402, D501, D504, D505, D603, D604, D606
3	1	80-170-03	Diode IN4007	D503
4	1	80-170-01	Diode IN914B	D401
5	2	80-432-05	IC LM723C	Q601, Q603
6	2	80-180-01	Transistor, TIP 120	Q602, Q604
7	1	80-432-06	IC, LM7812	Q605
8	1	80-432-07	IC, LM7912	Q606
9	1	80-180-02	Transistor, PN2222	Q501
10	1	80-432-10	IC, BU407D	Q502
11	1	80-432-04	IC, TDA 1170	Q401
12	1	80-180-03	Transistor, 2N5830	Q301
13	1	80-432-11	Rectifier, VARO VS048	D605
14	1	80-006-01	Coil, Width Adjustment	L501
15	1	80-007-01	Coil, Linearity	L502
16	1	80-005-01	Transformer, Driver	T501
17	1	80-004-02	Transformer, Flyback	T502
18	1	80-432-12	Choke, 6.8uH, 100mA	L301
18	1	80-930-08	Capacitor, Electrolytic 4700uF, 35V	C601
20	1	80-930-07	Capacitor, Electrolytic 4700uF, 25V	C603
21	1	80-930-06	Capacitor, Electrolytic 1000uF, 25V	C410
22	1	80-930-05	Capacitor, Electrolytic 470uF, 35V	C602
23	6	80-930-04	Capacitor, Electrolytic 220uF, 25V	C402, C403, C501, C506, C511, C612
24	2	80-930-03	Capacitor, Electrolytic 47uF, 100V	C510, C514
25	1	80-930-02	Capacitor, Electrolytic 4.7uF, 25V	C409
26	3	80-920-03	Capacitor, Spark Gap .01uF	C508, C512, C513
27	4	80-940-02	Capacitor, Metalized Polyester, .1uF, 250V	C404, C406, C407, C408
29	1	80-940-03	Capacitor, Metalized Polyester, .22uF, 100V	C507

Itm	Qty/ Assy	Part No.	Description	Remarks
30	1	80-940-01	Capacitor, Metalized Polyester, .022uF, 400V	C504
31	1	80-940-04	Capacitor, Metalized Polyester, 10 uF, 100V	C505
32	1	80-920-05	Capacitor, Ceramic, .01uF 500V	C509
33	9	80-920-06	Capacitor, Ceramic .1uF, 50V	C401, C411, C412, C503, C604-6, C610, between J3-1 and J3-4
34	7	80-920-07	Capacitor, Ceramic, .01uF 50V	C502, C607-9, C611, C613, C614
35	2	80-920-08	Capacitor, Ceramic 470pf 50V	C301, C405
36	5	80-161-02	Trimpot, 100K ohm	VR401-VR403, VR601
37	1	80-161-01	Trimpot, 500 ohm	VR301
38	1	80-161-03	Trimpot, 2M ohm	VR502
39	1	80-900-10	2.2 ohm, 1/4W, 5% Resistor	R413
40	1	80-900-11	3.3 ohm, 1/4W, 5% Resistor	R412
41	1	80-900-12	47 ohm, 1/4W, 5% Resistor	R301
42	2	80-900-13	68 ohm, 1/4W, 5% Resistor	R304, R414
43	2	80-900-14	220 ohm, 1/4W 5% Resistor	R602, between U2-10 (LM 723) and the base of Q2 (TIP 120)
44	1	80-900-03	510 ohm, 1/4W, 5% Resistor	R501
45	3	80-900-05	1K ohm, 1/4W, 5% Resistor	R603, R606, R607
46	1	80-900-15	1.5K ohm, 1/4W, 5% Resistor	R415
47	1	80-900-16	6.8K ohm, 1/4W, 5% Resistor	R601
48	1	80-900-09	8.2K ohm, 1/4W, 5% Resistor	R605
49	1	80-900-17	39K ohm, 1/4W, 5% Resistor	R408
50	1	80-900-33	120K ohm, 1/4w, 5% Resistor	R404
51	3	80-900-35	100K ohm, 1/4W, 5% Resistor	R409, R411, R402
52	1	80-900-34	62K ohm, 1/4W, 5% Resistor	R410
53	1	80-900-21	150K ohm, 1/4W, 5% Resistor	R403
54	1	80-900-22	270K ohm, 1/4W, 5% Resistor	R406

Itm	Qty/ Assy	Part No.	Description	Remarks
55	2	80-900-23	470K ohm, 1/4W, 5% Resistor	R405, R407
56	1	80-900-24	12K ohm, 1/4W, 5% Resistor	R401
57	1	80-900-25	200 ohm, 1/4W, 5% Resistor	R305
58	2	80-905-01	1.2 ohm, 4W, 5% Resistor	R604, R608
59	1	80-904-01	15 ohm, 1/2W, 5% Resistor	R508
60	1	80-904-02	120 ohm, 1/2W, 5% Resistor	R502
61	1	80-900-26	11 ohm, 1/4W, 5% Resistor	R507
62	2	80-904-03	120K ohm, 1/2W, 5% Resistor	R504, R506
63	2	80-905-00	680 ohm, 2W, 5% Resistor	R302, R303
64	1	80-120-09	Connector, 9-Pin	J4
65	1	80-120-05	Connector, 5-Pin	J4, pull out pin 5
66	1	80-011-02	Heat Sink, TDA 1170	
67	1	98-002-01	FAB, PCB	
68	1	80-011-01	Heat Sink, Transistor	HS2
69	1	80-010-01	Heat Sink	HS1
70	4	50-002-02	Screw 4-40 x 3/8	S1-S4
71	4	50-012-04	Nut, Hex #4 w/Star Washer	S1-S4
72	4	80-806-01	Pad, Insulation	Apply to Q602, Q604
73	1	80-121-05	Connector, 5-Pin	J2
74	1	80-121-10	Connector, 10-Pin	J3
75	1	80-121-12	Connector, 12-Pin	J1
76	12	50-015-01	Jumper, 0.5"	J401, J501-J503 J505-J508, J601-J604
77	4	80-806-02	Bushing, Nylon	Apply to S1, S3
78	1	80-170-05	Diode MOT. #MR851	D502

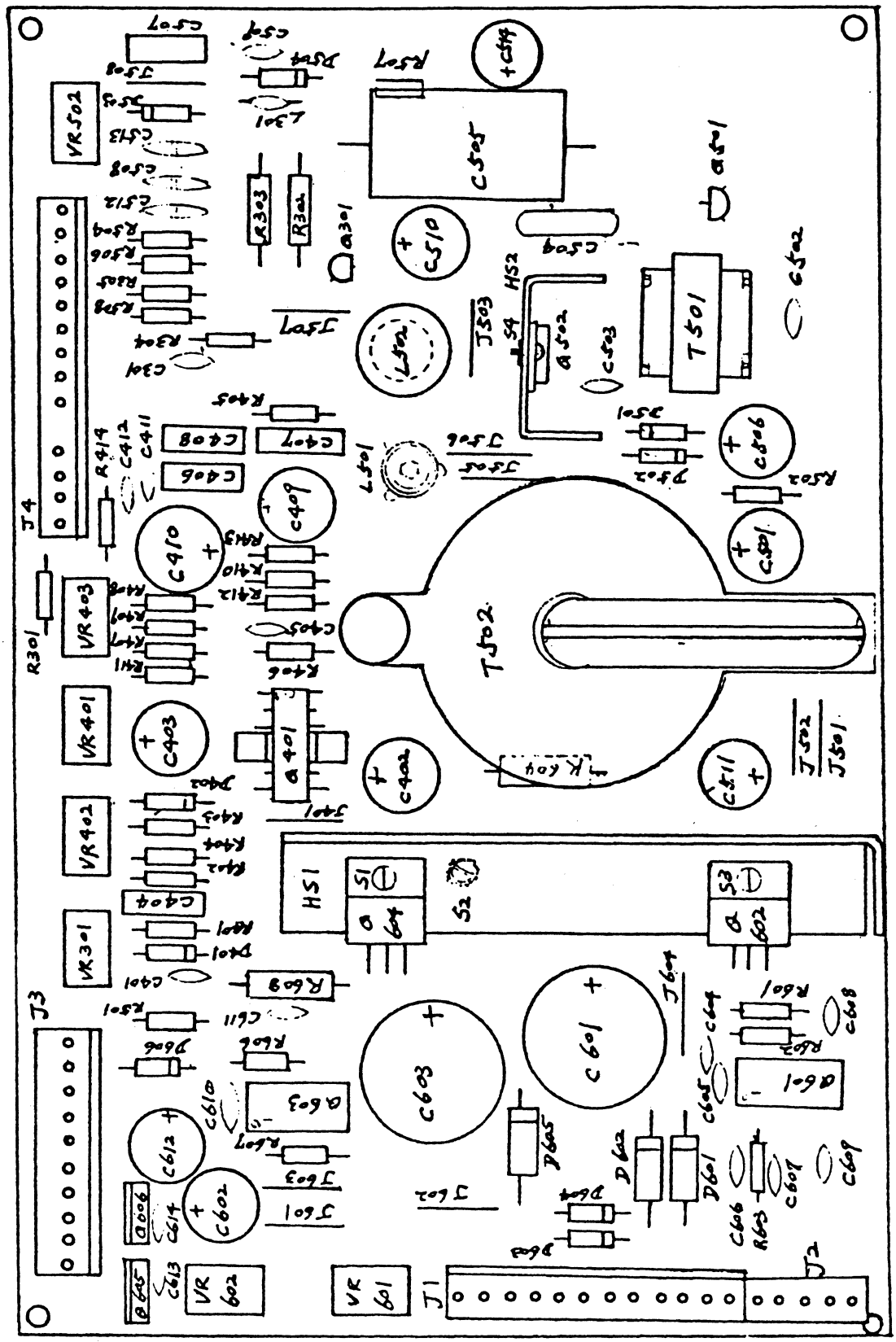


Figure D-1. MONITOR/POWER SUPPLY 99-002-02 LOADING DIAGRAM

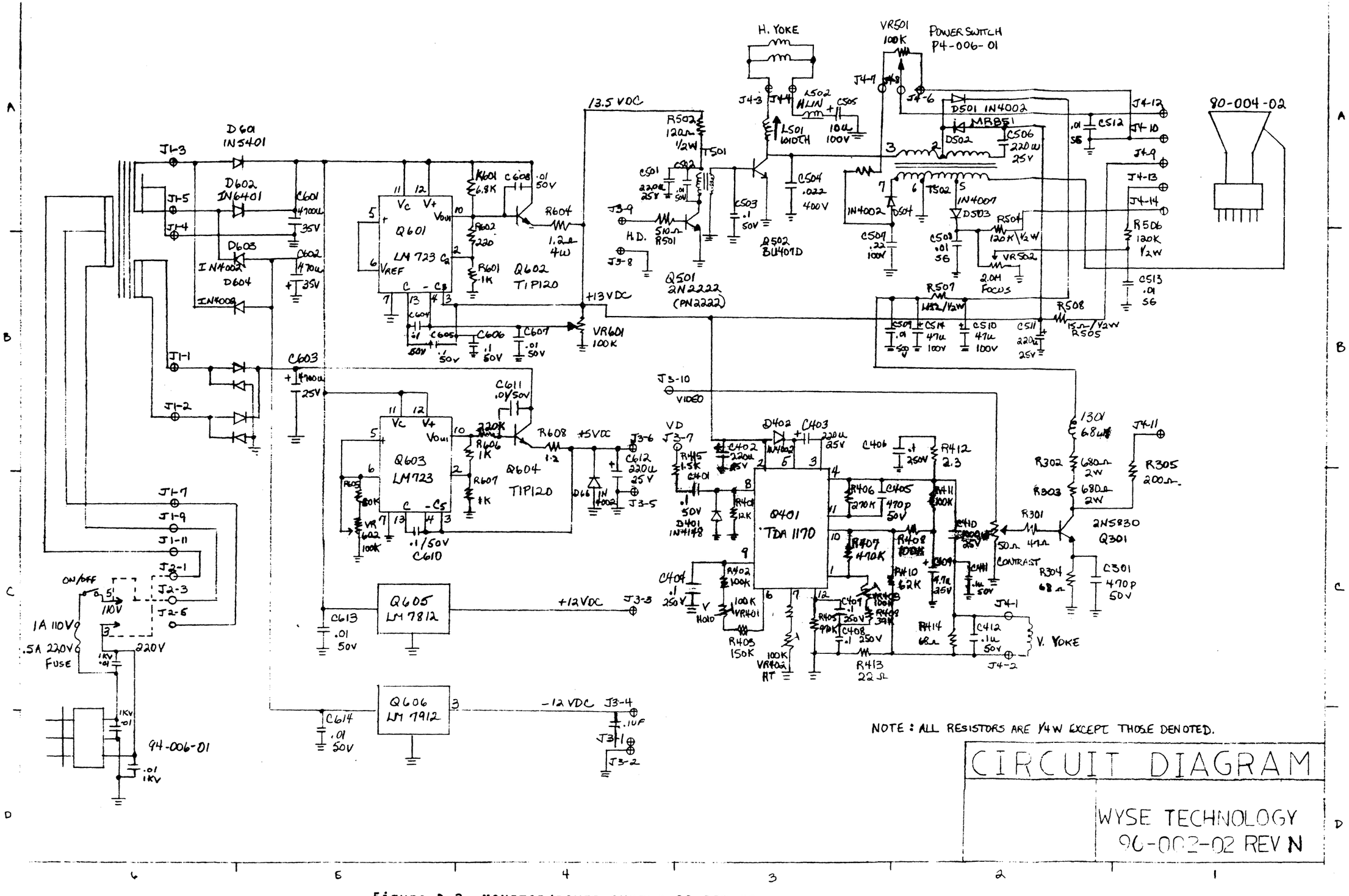


Figure D-2. MONITOR/POWER SUPPLY 99-002-02 CIRCUIT DIAGRAM

Appendix E

MONITOR/POWER SUPPLY PCB ASSY 99-002-03 REV C

Itm	Qty/ Assy	Part No.	Description	Remarks
1	2	80-432-05	IC M723CN/SGS123CN	U101, U102
2	1	80-432-07	IC 7912C	U103
3	1	80-432-20	IC TDA1170-N	U301
4	2	80-180-01	Transistor TIP120	Q101, Q102
5	1	80-180-02	Transistor PN2222	Q201
6	1	80-180-07	Transistor BU406D	Q202
7	2	80-180-08	Transistor BF459	Q203, Q204
8	1	80-180-09	Transistor BF257	Q401
9	1	80-180-10	Transistor BSX-20	Q402
10	2	80-170-08	Diode RGP5100	CR205, CR203
11	1	80-170-09	Diode BY-398	CR201
12	1	80-170-10	Diode BR-851	CR202
13	6	80-170-02	Diode IN4002	CR302, CR103, CR102, CR104, CR204
14	1	80-170-06	Diode IN4148	CR301
15	1	80-170-12	Diode ZENER 6.2V 5W	CR401
16	1	80-170-13	Diode KPBC-802	BR101
17	1	80-900-11	3.3 ohm, 1/4W, 5% Resistor	R310
18	2	80-900-12	47 ohm, 1/4W, 5% Resistor	R403, R407
19	1	80-900-69	62 ohm, 1/4W, 5% Resistor	R404
20	2	80-900-25	200 ohm, 1/4W, 5% Resistor	R110, R406
21	1	80-900-66	390 ohm, 1/4W, 5% Resistor	R401
22	3	80-900-02	470 ohm, 1/4W, 5% Resistor	R102, R111, R223
23	2	80-900-03	510 ohm, 1/4W, 5% Resistor	R202, R402
24	1	80-900-38	750 ohm, 1/4W, 5% Resistor	R107
25	1	80-900-05	1K ohm, 1/4W, 5% Resistor	R109
26	1	80-900-15	1.5K ohm, 1/4W, 5% Resistor	R302
27	1	80-900-39	2.2K ohm, 1/4W, 5% Resistor	R108
28	1	80-900-60	2.7K ohm, 1/4W, 5% Resistor	R206

Itm	Qty/ Assy	Part No.	Description	Remarks
29	1	80-900-40	3.3K ohm, 1/4W, 5% Resistor	R101
30	1	80-900-57	3.9K ohm, 1/4W, 5% Resistor	R217
31	1	80-900-31	4.7K ohm, 1/4W, 5% Resistor	R114
32	1	80-900-09	8.2K ohm, 1/4W, 5% Resistor	R218
33	2	80-900-08	10K ohm, 1/4W, 5% Resistor	R106, R216
34	1	80-900-24	12K ohm, 1/4W, 5% Resistor	R303
35	2	80-900-43	33K ohm, 1/4W, 5% Resistor	R113, R222
36	1	80-900-17	39K ohm,1/4W, 5% Resistor	R309
37	2	80-900-18	47K ohm, 1/4W, 5% Resistor	R205, R215
38	2	80-900-18	56K ohm, 1/4W, 5% Resistor	R311, R312
39	1	80-900-20	68K ohm, 1/4W, 5% Resistor	R313
40	3	80-900-35	100K ohm, 1/4W, 5% Resistor	R209, R210, R220
41	1	80-900-35	200K ohm, 1/4W, 5% Resistor	R304
42	1	80-900-65	220K ohm, 1/4W, 5% Resistor	R305
43	1	80-900-22	270K ohm, 1/4W, 5% Resistor	R307
44	1	80-900-62	330K ohm, 1/4W, 5% Resistor	R319
45	5	80-900-23	470K ohm, 1/4W, 5% Resistor	R213, R214, R306, R308, R207
46	1	80-900-63	680K ohm, 1/4W, 5% Resistor	R221
47	1	80-900-61	2.2M ohm, 1/4W, 5% Resistor	R208
48	1	80-900-68	4.7K ohm, 1/4W, 2% Resistor	R105
49	1	80-900-67	7.5K ohm, 1/4W, 2% Resistor	R104
50	1	80-904-04	5.6K ohm, 1/4W, 5% Resistor	R301
51	2	80-904-05	100 ohm, 1/2W, 5% Resistor	R224, R315
52	1	80-904-06	15K ohm, 1/2W, 5% Resistor	R204
53	2	80-904-03	120K ohm, 1/2W, 5% Resistor	R211, R212

Itm	Qty/ Assy	Part No.	Description	Remarks
54	1	80-905-06	1 ohm, 1W, 5% Resistor	R314
55	1	80-905-07	120 ohm, 1W, 5% Resistor	R203
56	1	80-905-09	.07 ohm, 2W, 5% Resistor	R112
57	1	80-905-08	.2 ohm, 2W, 5% Resistor	R103
58	1	80-905-00	680 ohm, 2W, 5% Resistor	R405
59	1	80-905-10	1 ohm, 3W, 5% Resistor	R225
60	1	80-161-01	Trimpot 1/4W .2% 500 ohm	VR101
61	1	80-161-02	Trimpot 1/4W .2% 100K ohm	VR303
62	3	80-161-04	Trimpot 1/4W .2% 250K ohm	VR201, VR301, VR302
63	1	80-161-03	Trimpot 1/4W .2% 2M ohm	VR203
64	1	80-004-04	Transformer, Flyback	T202
65	1	80-005-01	Transformer, Driver	T201
66	1	80-007-02	Coil, Linearity	L202
67	1	80-006-03	Coil, Width Adjust	L201
68	1	80-930-02	Capacitor, Electrolytic, 4.7mF 25V	C106
69	1	80-930-18	Capacitor, Electrolytic 6.8mF 25V	C205
70	1	80-930-11	Capacitor, Electrolytic, 10mF 25V	C310
71	1	80-930-17	Capacitor, Electrolytic, 22mF 160V	C210
72	1	80-930-01	Capacitor, Electrolytic, 47mF 25V	C216
73	1	80-930-03	Capacitor, Electrolytic, 47mF 100V	C212
74	5	80-930-04	Capacitor, Electrolytic, 220mF 25V	C302, C304, C109, C201, C207
75	2	80-930-16	Capacitor, Electrolytic, 220mF 35V	C208, C113
76	1	80-930-05	Capacitor, Electrolytic, 470mF 35V	C111
77	1	80-930-06	Capacitor, Electrolytic, 1000mF 25V	C311
78	1	80-930-08	Capacitor, Electrolytic, 4700mF 35V	C101
79	1	80-930-10	Capacitor, Electrolytic, 15000mF 25V	C105
80	2	80-920-09	Capacitor, CER, .001mF 50V	C102, C107
81	3	80-920-07	Capacitor, CER, .01mF 50V	C103, C112, C202
82	1	80-920-04	Capacitor, CER, .01mF 1KV	C209
83	5	80-920-06	Capacitor, CER, .1mF 50V	C206, C301, C401, C108, C114
84	1	80-920-17	Capacitor, CER, 33pF 50V	C306
85	1	80-920-18	Capacitor, CER, 180mF 50V	C402

Itm	Qty/ Assy	Part No.	Description	Remarks
86	1	80-940-08	Capacitor, MP, .047mF 600V	C218
87	1	80-940-09	Capacitor, MP, .047mF 800V	C214
88	2	80-940-07	Capacitor, MP, .01mF 250V	C215, C217
89	8	80-940-02	Capacitor, MP, .1mF 250V 5%	C305, C307, C308, C309, C203, C211, C213, C303
90	1	80-940-10	Capacitor, PP, .033mF 200V 5%	C204
91	1	80-120-23	Conn. Lock 3P Molex09-74-1031	J5
92	1	80-120-04	Conn. Lock 4P Molex09-74-1041	J4
93	1	80-120-06	Conn. Lock 6P Molex09-74-1061	J6
94	1	80-103-09	Conn. N-Lock 9P Molex09-67-1093	J2
95	1	80-121-10	Conn. N-Lock 9P Molex09-60-1101	J3
96	1	80-121-12	Conn. N-Lock 9P Molex09-60-1121	J1

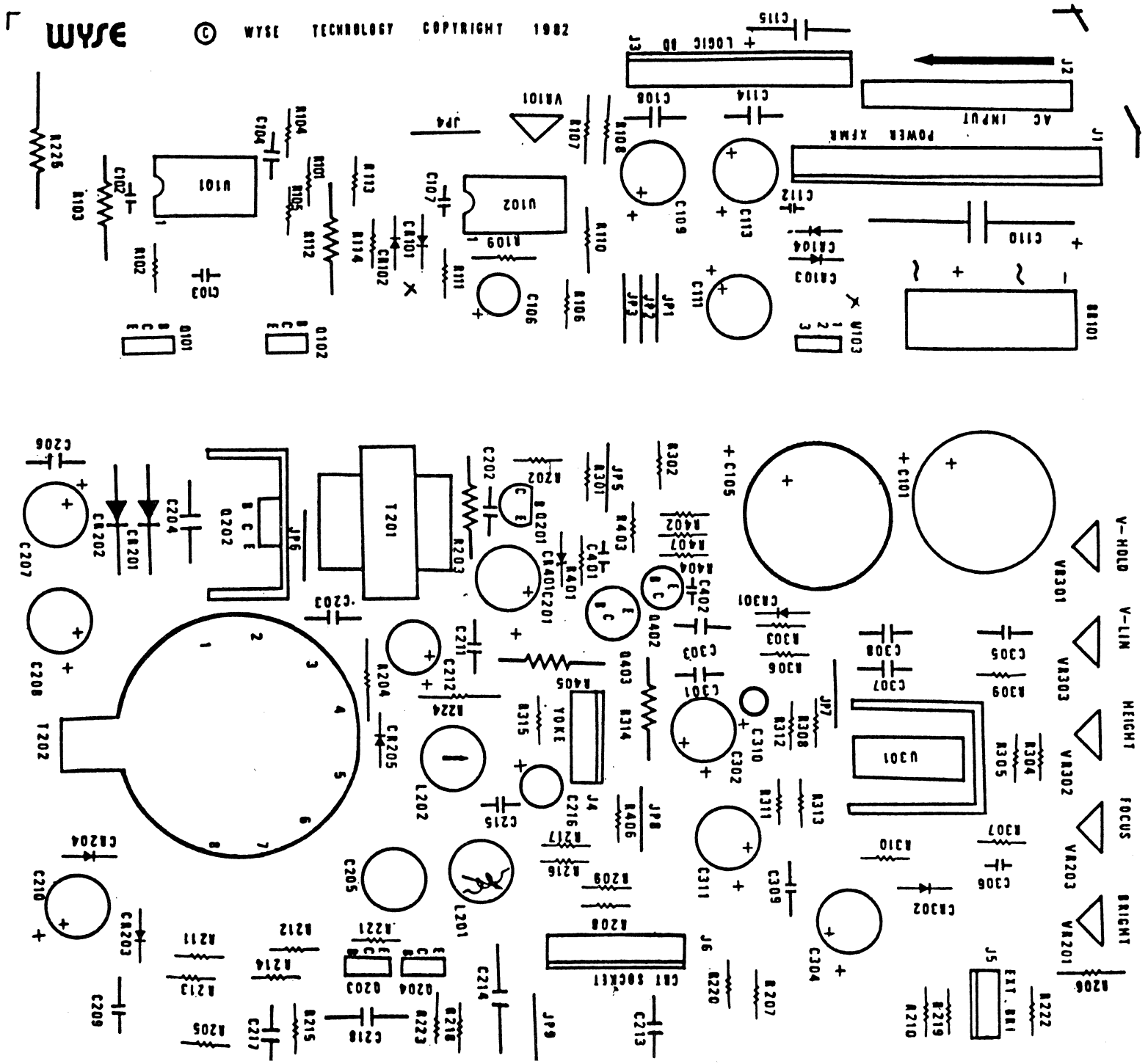


Figure E-1. MONITOR/POWER SUPPLY 99-002-03 LOADING DIAGRAM

99-002-03/04
Rev H

VR ADJUSTMENT:

VR101: +5v, 13v
VR201: SUB-BRT
VR203: FOCUS
VR301: V-HOLD
VR302: V-HEIGHT
VR303: V-LINEAR

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

BR101. KBPC802
C101 4700/35
R101 3.3K
U101 723C
Q101 TIP120
R103 .20, 2W
R102 470
C103 .01/50
C104 .1/100
C102 .001/50
R104 7.5K 2%
R105 1.2K 2%
R113 33K
3Ω, 15W R115
Q102 TIP120
R112 .07, 3W
R111 470
R110 200
U102 723C
R107. 150
R108 2.2K
VR101. 500
R106. 10K
C105 15000/25
C106 4.7/25
C107 .001/50
R109 1K
CR101 IN4002
C110 470/35
CR104. IN4002
U103 7912
C111. 470/35
C112 .1/50
C113 220/25
C114 .1/50
C115 47/25
R114 6.2K
CR102 IN4002
C108 .1/100
C109 220/25
R301 5.5 1/2W
R225. 1. 3W
R202 510
C201 22/25
C202 .1/50
120, 1W R203
Q201 PN2222
T201
C203 1/250
C204 .033/400
CR201 BY398
WIDTH R224
L201 L202
100 1/2W
Q202 BU406
C205. 6.8/25
CR202 BR6.51
C209 22/35
C206 .1/50
C207 220/25
T202
CR203 RGP5100
C209 .01/1KV
CR204 IN4002
R222 33K
C210 22/160
CR205 RGP5100
R204 15K 1/2W
C211 .1/50
C212 47/100
R405 680 2W
R406 200
R401 390
Q401 62V
CR401 62V
C401 .1/50
R403 47
Q402 BSX20
R402 510
C402 180P/50
R404 82
R407 47
C215 .01/250
R216 10K
R217 39K
C216 47/25
R218 8.2K
Q203 BF459
R223 410
R221 680K
R220 100K
C218 .047/400
R214 470K
R213 470K
C217 .1/50
R215 47K
R212 120K 1/2W
R211 120K 1/2W
R319 330K
VR203 2M
R202 2.2M
C214 .047/400
R210 100K
R209 100K
R207 100K
R206 2.7K
VR201 250K
C213 .1/250
R208 470K
VR305 100K
R309 39K
C311 100/25
R314 1W
R313 68K
R312 56K
C310 1/25
R311 56K
C308 .1/250
C307 .1/250
R306 470K
R305 220K
VR302 250K
R304 200K
C305 1/250
CR301 IN4148
R303 1K
R302 1.5K
C301 .1/50
C302 220/25
CR302 IN4002
C303 1/250
R310 3.3
C306 33P/50
R307 270K
U301 TDA1170S
R315 100 1/2W
C309 220/25
R308 470K
R301 5.5 1/2W
R310 3.3
R311 56K
R312 56K
R313 68K
R314 1W
C310 1/25
C311 100/25
R315 100 1/2W
C309 220/25
R308 470K
R309 39K
R305 220K
R306 470K
R307 270K
C306 33P/50
C307 .1/250
C308 .1/250
R303 1K
R302 1.5K
C305 1/250
R304 200K
VR301 250K
C303 1/250
R310 3.3
R311 56K
R312 56K
R313 68K
C310 1/25
C311 100/25
R314 1W
R315 100 1/2W

H-YOKE
EXT-CRT
P5
J5
BRT HARNESS
500-127334-0
MONITOR/CRT HARNESS
94-004-01
J6 P6
BLK
WHT
GRN
BRN
RED
ORG
YEL
BLU
V-YOKE
J4 P4
YCKE HARNESS
500 127837-0

J2
J3
P3
MONITOR/LOGIC HARNESS
94-001-01
115VAC P2 230VAC
AC INPUT HARNESS
500-127835-0
250V 1A
.01 2KV
L G N
J1 P1
POWER XFMR HARNESS
500-127839-0
BLUE
YEL
BLUE
ORG
RED
BRN
BLK

NOTES:
1. ALL RESISTORS ARE 1/4W, 5% UNLESS OTHER SPECIFIED.
2. ALL CAPACITORS ARE IN UF UNLESS OTHER SPECIFIED.

QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
MATERIAL
FINISH
DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN B.H.SHEN	2-18-83
CHECKED C.I CHEN	2-18-83
ISSUED	

WYSE TECHNOLOGY

WY 100/200 MONITOR PS

SIZE	FSCM NO.	DWG. NO.	REV.
B		96-002-03	A

SCALE | SHEET 1 OF 1

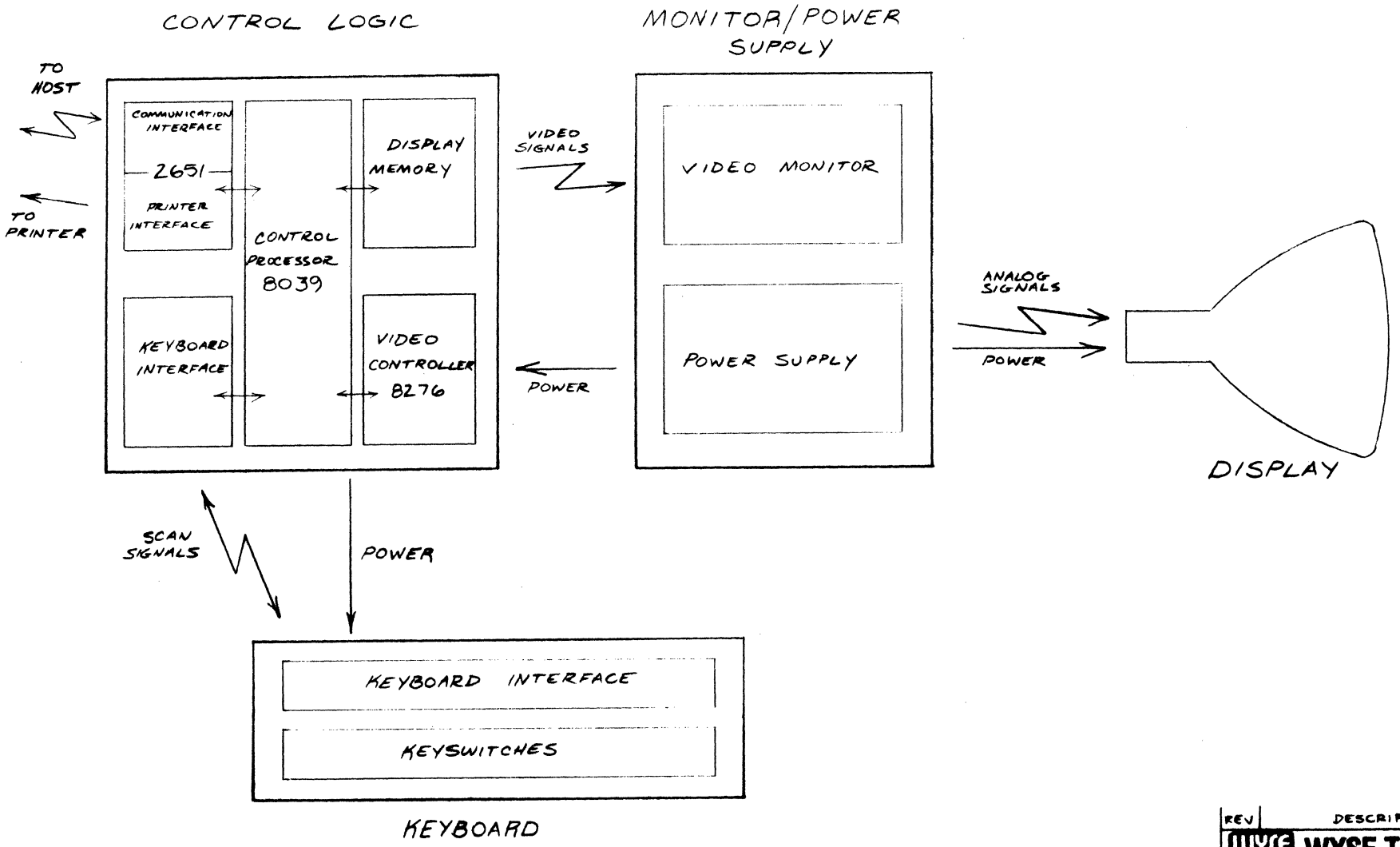
Figure E-2. MONITOR/POWER SUPPLY 99-002-03 SCHEMATIC DIAGRAM

Appendix F

TROUBLESHOOTING FLOW CHARTS

The following flowcharts may be helpful in troubleshooting monitor/power supply part numbers 99-002-01 and 99-002-02. Monitor/power supply part number 99-002-03 has a similar design, but there are differences.

Troubleshooting to the component level is not supported by Wyse Technology. These flowcharts are designed only to assist those who wish to attempt repair of the pcb. If you are unable to repair the pcb, the only alternative is to return it to Wyse Technology for repair.



REV	DESCRIPTION	DATE
WYSE TECHNOLOGY		
WY-100 FAILURE FLOWCHART		
DSGN. H. MILLAR	DRWN. L)K	SHEET 1 OF 8
- -	BLOCK DIAGRAM	

Figure F-1. BLOCK DIAGRAM FOR TROUBLESHOOTING

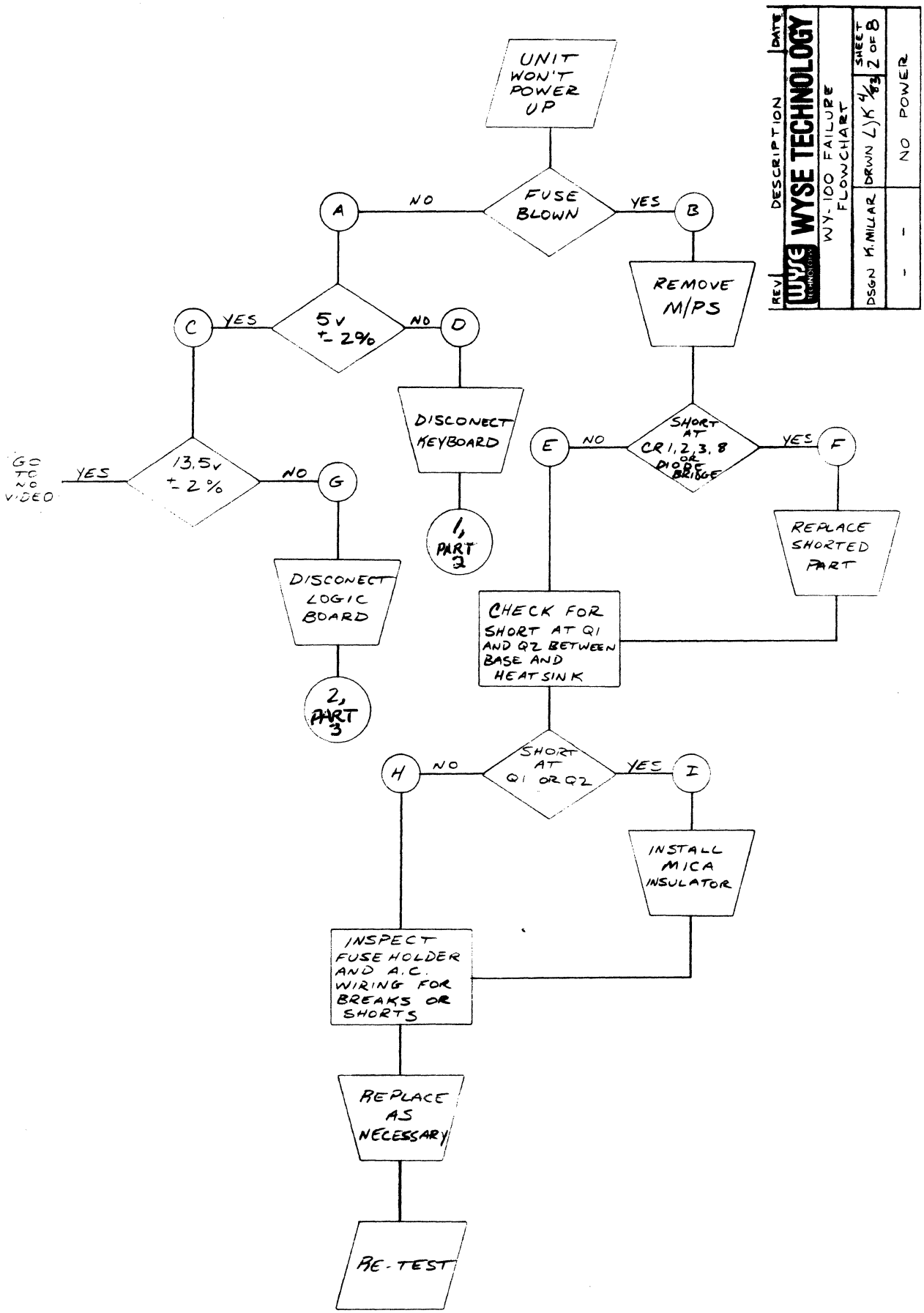
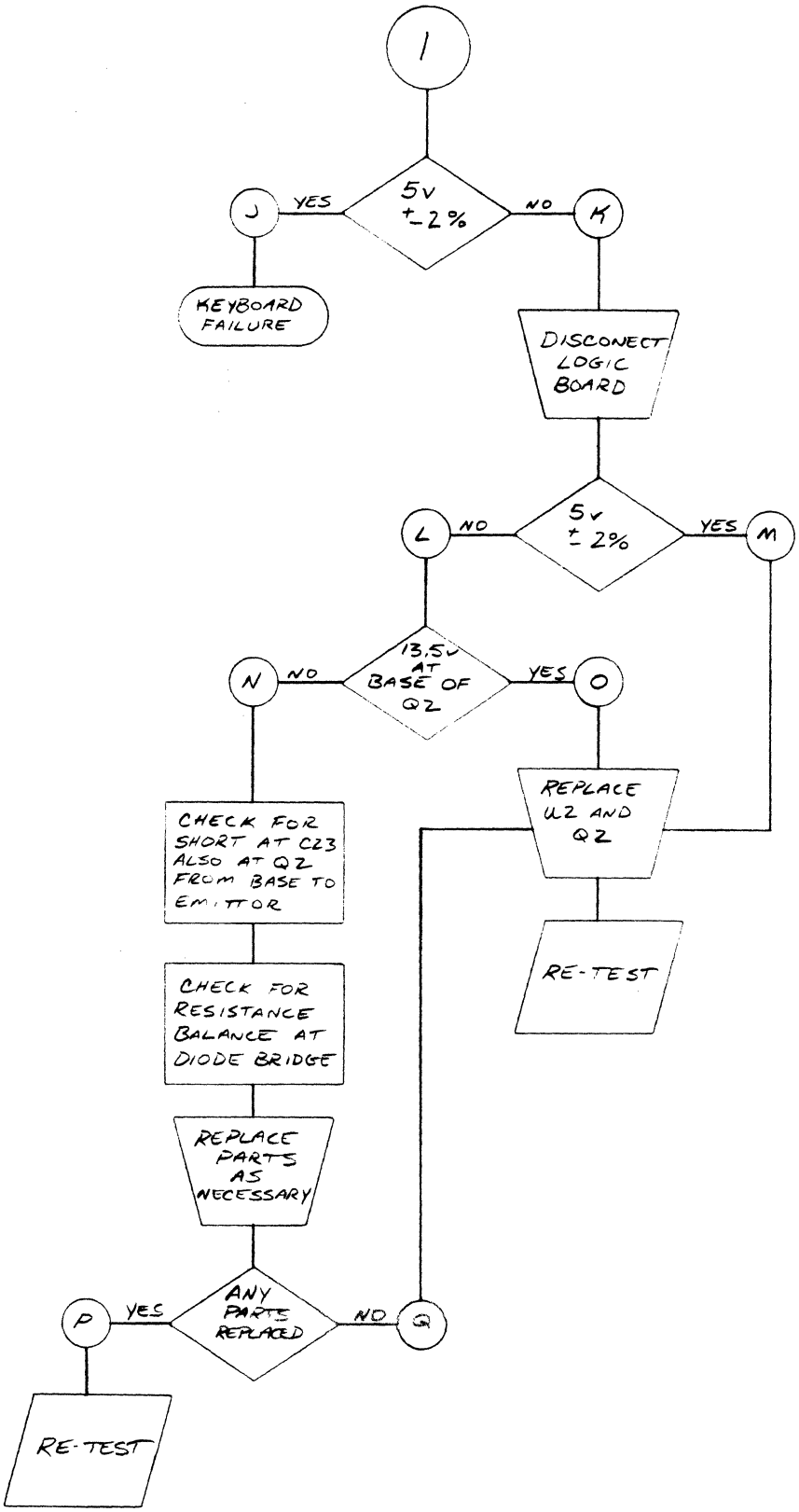


Figure F-2. NO POWER TROUBLESHOOTING FLOWCHART, PART 1



REV | DESCRIPTION | DATE

WYSE TECHNOLOGY

WY-100 FAILURE FLOW CHART

SHEET 3 OF 6

DSGN. K. MILLAR | DRWN. CJK

- | - | NO POWER

Figure F-3. NO POWER TROUBLESHOOTING FLOWCHART, PART 2

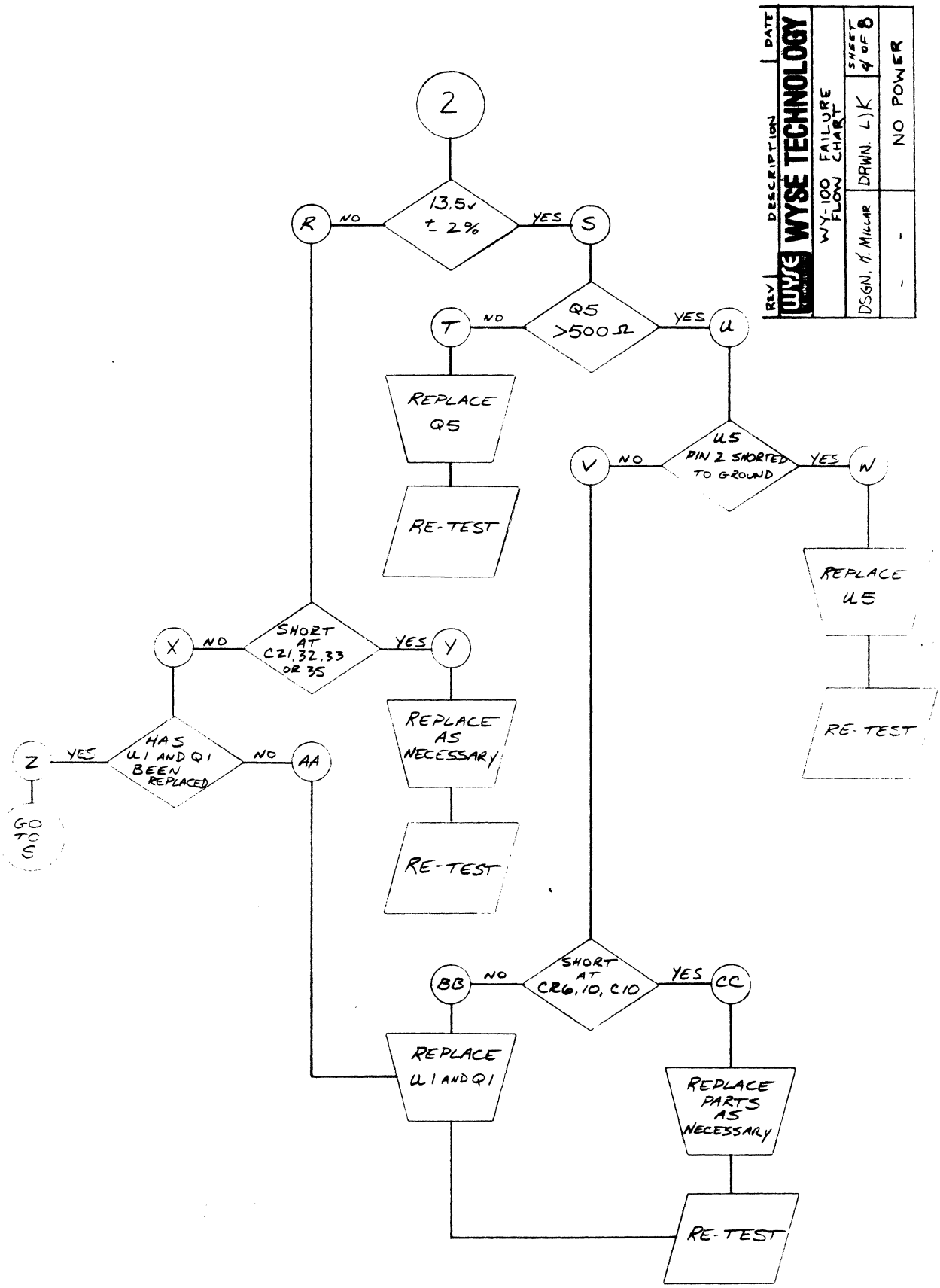


Figure F-4. NO POWER TROUBLESHOOTING FLOWCHART, PART 3

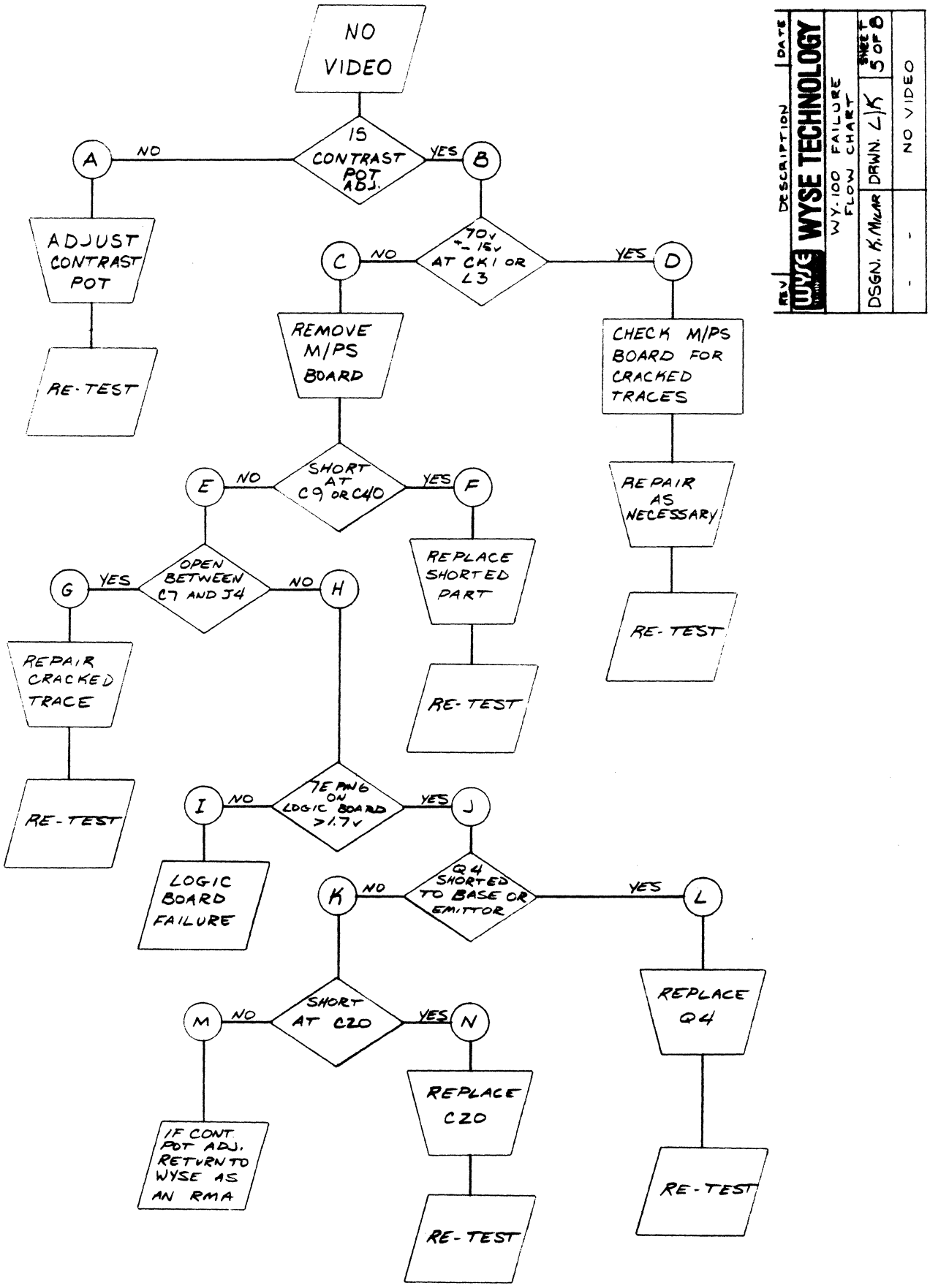


Figure F-5. NO VIDEO TROUBLESHOOTING FLOWCHART

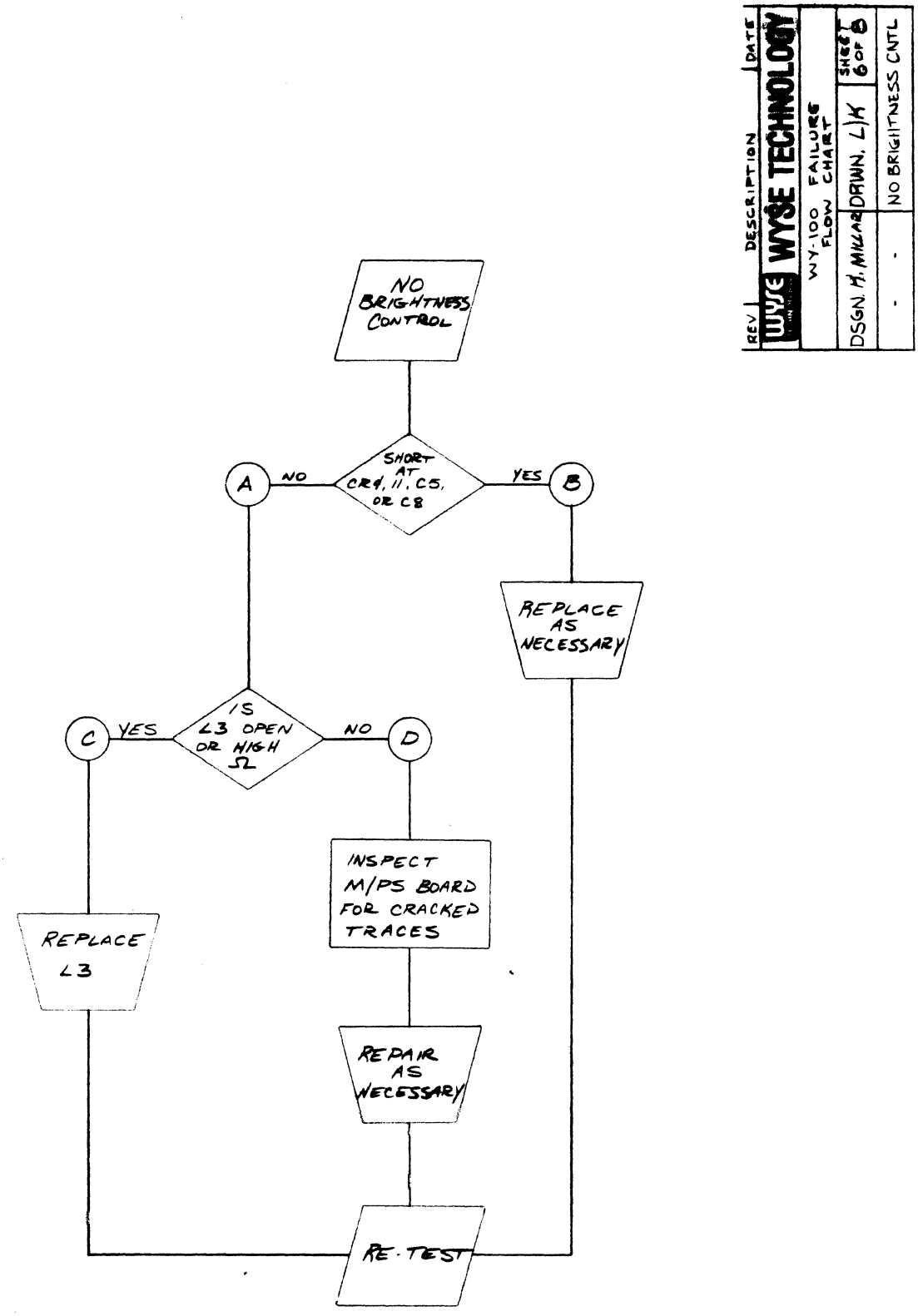


Figure F-6. NO BRIGHTNESS CONTROL TROUBLESHOOTING FLOWCHART

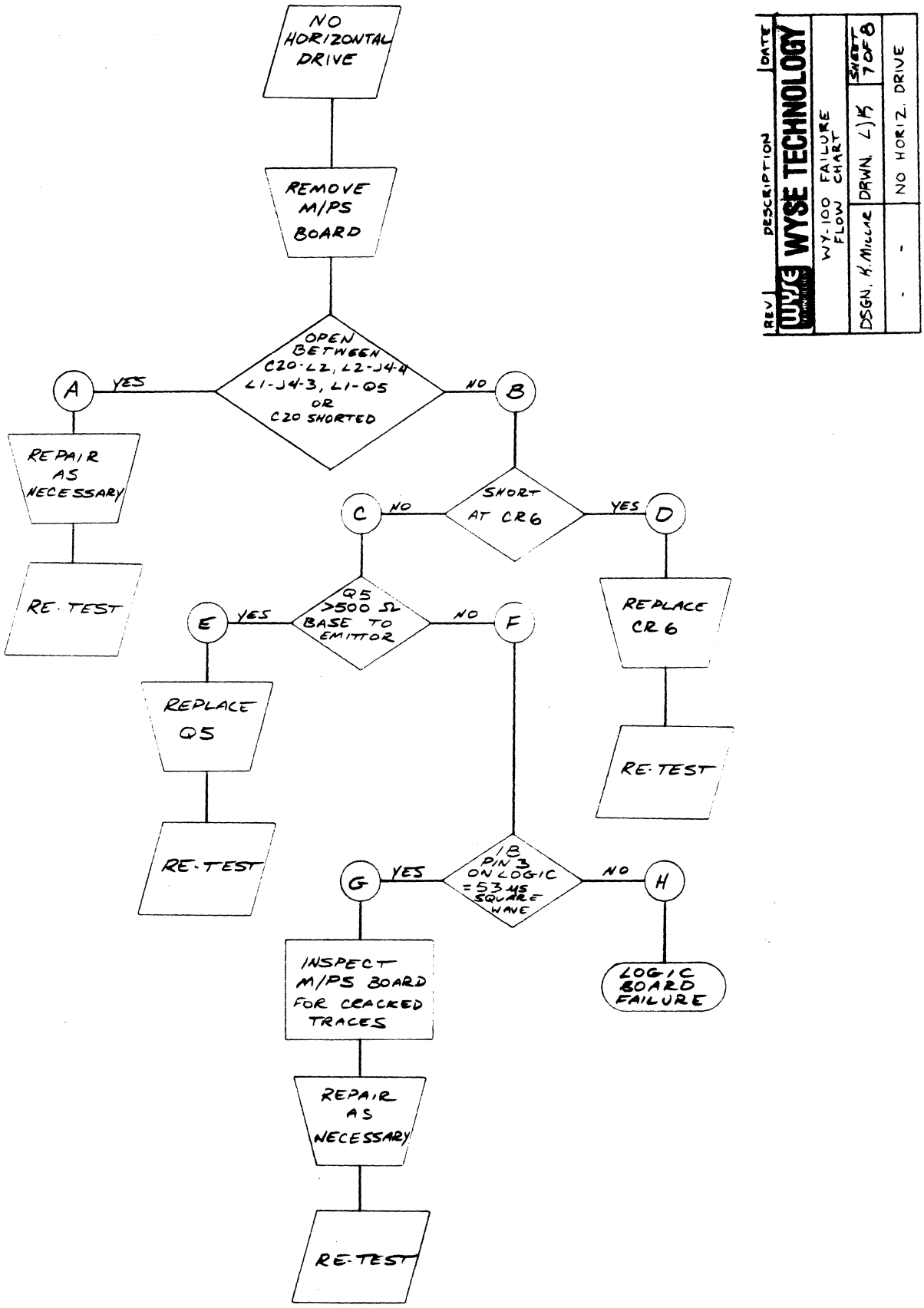


Figure F-7. NO HORIZONTAL DRIVE TROUBLESHOOTING FLOWCHART

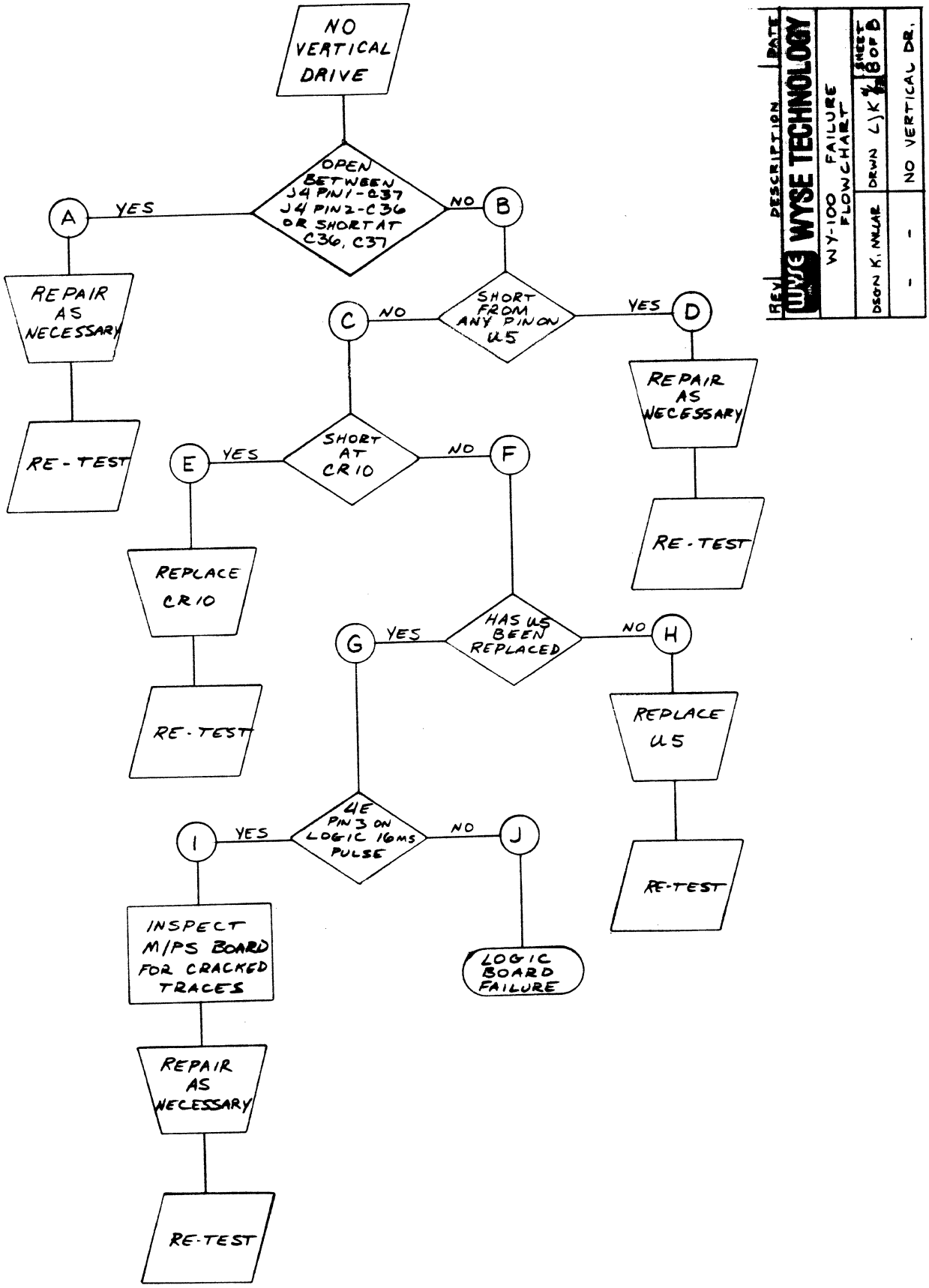


Figure F-8. NO VERTICAL DRIVE TROUBLESHOOTING FLOWCHART

Appendix G

NOTICE

Exact component specification must be obtained from the manufacturers' data book.

appendix G-2

Appendix H

CURRENT LOOP OPTION

The Current Loop option can be implemented in certain fabrications of the WY-100 logic pcb. **This option is not authorized or supported by Wyse Technology.** Implementation of this option makes the pcb irreparable.

To install the Current Loop option:

1. Verify the fabrication revision level.

   It is marked on the bottom of the pcb near the keyboard connector.

   A. If REV B, move the stake pin jumper from W3 to W4.

   B. If REV C, cut the trace at W3 and add jumper wire to W4.

   C. If REV D, the option cannot be implemented.

2. Add the following components:

Qty/ Assy	Description	Remarks
2	Opto-Locator, 6N138	1C, 1D
9	Diode, 1N914 B	CR2-CR10
1	Transistor, 2N2906	Q1
1	Capacitor, Ceramic, .01uF, 50 VDC	C14
1	180 ohm, 1/4W Resistor	R14
1	510 ohm, 1/4W Resistor	R13
2	1K ohm, 1/4W Resistor	R15, R17
1	10K ohm, 1/4W Resistor	R16
2	270 ohm, 1/2W, 10% Resistor	R18, R19

None of the above parts are available from Wyse Technology.

appendix H-2

WYSE

Wyse Technology
3040 North First Street
San Jose, California 95134
TWX 910-338-2251
Telephone 408-946-3075

Eastern Region 516-293-5563
Midwestern Region 313-227-5011
Southern Region 305-862-2221
Southern California 213-340-2013