

Qume®

QVT

101 PLUS™

Maintenance Guide

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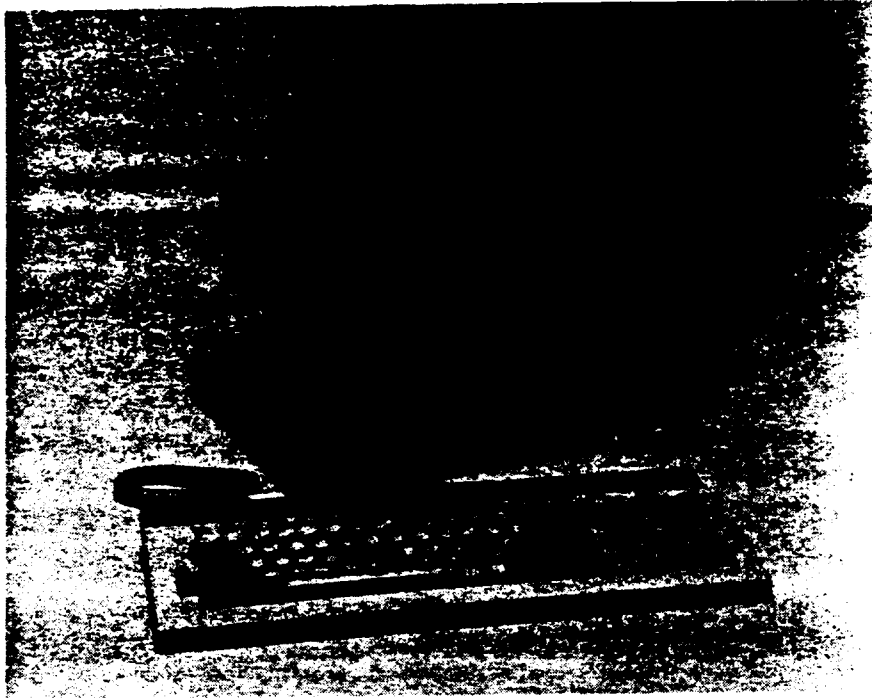
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PREFACE

The QVT 101 PLUS™ Maintenance Guide has been designed to allow maintenance personnel to service the QVT 101 PLUS™ Terminals by quickly isolating a fault to the assembly level and taking corrective action in a minimum amount of time. It is assumed that all service personnel who may use this guide have rudimentary knowledge of video display terminals and related maintenance practices.

The QVT 101 PLUS™ Maintenance Guide is divided into the following sections:

- **Section 1: Troubleshooting** for isolating a fault to a subassembly.
- **Section 2: Subassembly Removal and Replacement** procedures for removing and replacing a defective subassembly.
- **Section 3: Alignment** procedures for performing any necessary video alignment after replacing a subassembly.
- **Section 4: Parts** information for identification of replaceable parts and recommended spare parts.
- **Section 5: Circuits and Diagrams** reference material.
- **Appendix A: Current Loop/RS-422** procedures for installing a Current Loop board or an RS-422 board.

ASSOCIATED PUBLICATIONS

For general User Information:

QVT 101 PLUS™ Setup Guide.....	Reorder Number 35143
QVT 101 PLUS™ Technical Reference Manual.....	Reorder Number 35153
QVT 101 PLUS™ Quick Reference Card.....	Reorder Number 35108

TABLE OF CONTENTS

Page No.

SECTION 1: TROUBLESHOOTING	1-1
INTRODUCTION.....	1-1
TROUBLESHOOTING TECHNIQUE.....	1-1
TROUBLESHOOTING FLOWCHARTS.....	1-1
Tools and Equipment Required.....	1-1
Rear Connector Pin Designations.....	1-2
Fault Isolation Flowchart #1.....	1-7
Fault Isolation Flowchart #2.....	1-8
Fault Isolation Flowchart #3.....	1-10
Fault Isolation Flowchart #4.....	1-11
Fault Isolation Flowchart #5.....	1-12
SELF-DIAGNOSTICS.....	1-13
SECTION 2: SUBASSEMBLY REMOVAL AND REPLACEMENT	2-1
INTRODUCTION.....	2-1
SAFETY SUMMARY.....	2-1
REQUIRED TOOLS.....	2-1
UPPER MONITOR ASSEMBLY.....	2-2
Removing and Replacing the Back Cover.....	2-3
Discharging the CRT High-Voltage Circuit.....	2-4
Removing and Replacing the Video/Power Supply PCB Assembly.....	2-6
Removing and Replacing the CRT and Yoke Assembly.....	2-8
Removing and Replacing the Front Bezel.....	2-12
Removing and Replacing the Green LED On/Off Light.....	2-12
Removing and Replacing the Transformer.....	2-13
LOWER MONITOR ASSEMBLY.....	2-14
Removing and Replacing the Bottom Cover.....	2-14
Removing and Replacing the Logic Board.....	2-15
Removing and Replacing the RAM Back-Up Battery.....	2-17
Removing and Replacing the Brightness Control Assembly.....	2-17
Removing and Replacing the Power Switch/Fuse/ Filter Assembly.....	2-19
Removing and Replacing the Keyboard Connector Assembly.....	2-20
KEYBOARD ASSEMBLY.....	2-21
Disassembling and Reassembling the Keyboard Assembly.....	2-21
Replacing the Coiled Cable Assembly.....	2-22
Removing and Replacing Keyboard Keycaps.....	2-23
SECTION 3: ALIGNMENT	3-1
INTRODUCTION.....	3-1
TOOLS AND EQUIPMENT REQUIRED.....	3-1
ALIGNMENT CONDITIONS.....	3-2
VIDEO ALIGNMENT PROCEDURES.....	3-4
Horizontal Display Width (Line Width).....	3-5
Vertical Display Height.....	3-6
Brightness.....	3-7
Focus.....	3-8
Display Centering (Raster Position).....	3-7

TABLE OF CONTENTS (Cont.)

	Page No.
SECTION 4: PARTS	4-1
INTRODUCTION.....	4-1
RECOMMENDED SPARE PARTS.....	4-1
EXPLODED VIEW DRAWINGS.....	4-3
SECTION 5: CIRCUITS AND DIAGRAMS	5-1
APPENDIX A: INSTALLATION OF CURRENT LOOP OR RS-422 BOARD	A-1

LIST OF ILLUSTRATIONS

Figure		Page No.
1-1	QVT 101 PLUS Rear Connector Panel.....	1-2
2-1	QVT 101 PLUS Upper Monitor Assembly.....	2-3
2-2	Removal of Back Cover.....	2-4
2-3	Discharging the CRT High-Voltage Circuit.....	2-5
2-4	Disconnecting the CRT Anode Cap.....	2-6
2-5	Removal of Video/Power Supply PCB Assembly.....	2-7
2-6	Removal of CRT and Yoke Assembly	2-8
2-7	Removing the CRT and Yoke Assembly from the Main Chassis.....	2-10
2-8	Removing the CRT and Yoke Assembly from the Bezel.....	2-11
2-9	Locating and Installing the Ground Wire and Spring.....	2-12
2-10	Removing the Green LED ON/Off Light	2-15
2-11	Replacing the Transformer.....	2-18
2-12	Removal of the Rear Connector Cables and Bottom Cover.....	2-19
2-13	Removal of the Logic Board.....	2-20
2-14	Removal of the Keyboard Connector Assembly.....	2-21
2-15	Removal of the Logic Board RAM Back up Battery.....	2-22
2-16	Removing and Replacing the Brightness Control Assembly.....	2-24
2-17	Keyboard Bottom Cover.....	2-25
2-18	Keyboard with Top Cover Removed.....	2-26
2-19	Removal of Keyboard Keycaps.....	2-27
2-20	Replacement of Keyboard Keycaps.....	2-27
3-1	The "H" Test Pattern.....	3-3
3-2	Location of Video Alignment Components.....	3-4
4-1	Upper Monitor Area (2 sheets).....	4-3
4-2	Lower Monitor Area (2 sheets).....	4-9
4-3	Keyboard Top Assembly.....	4-11
5-1	Functional Block Diagram.....	5-3
5-2	Overall Interconnect Diagram.....	5-5
5-3	Power Supply Control PCB Schematic	5-7
5-4	Video/Power Supply PCB Schematic	5-9
5-5	Logic PCB Schematic (7 Sheets).....	5-11
5-6	Keyboard PCB Schematic	5-25
5-7	RS-422 Current Loop Schematic.....	5-27
A-1	Installation of Current Loop or RS-422 Board.....	A-4

LIST OF TABLES

Table		Page No.
1-1	AUXILIARY (EIA RS-232-C Interface DCE) Connector, J9.....	1-2
1-2	EIA (System Interface RS-232-C DTE) Connector, J8.....	1-3
1-3	Power Troubleshooting.....	1-4
1-4	Logic Board Troubleshooting.....	1-5
1-5	Keyboard Troubleshooting.....	1-6
4-1	Recommended Spare Parts.....	4-1
4-1	QVT 101 PLUS Replaceable Parts List.....	4-4
4-2	QVT 101 PLUS Keyboard Exploded Parts List.....	4-8
A-2	Current Loop and RS-422 Installation.....	A-2

TROUBLESHOOTING

INTRODUCTION

This section provides a troubleshooting method for isolating most QVT 101 PLUS terminal failures to an easily replaced subassembly, by systematically advancing through a series of troubleshooting flowcharts and checking the results of the self-diagnostic test.

TROUBLESHOOTING TECHNIQUE

Effective troubleshooting technique should always begin with a thorough visual inspection. Look for obvious things that may adversely effect the performance of the terminal, such as:

- Is the brightness control properly adjusted;
- Is the AC line fuse OK;
- Is the AC power source supplying adequate power;
- Are all connectors making good contact;
- Is there a compatibility problem between the terminal and the host?

TROUBLESHOOTING FLOWCHARTS

When using the following troubleshooting flowcharts, always begin with Fault Isolation Flowchart #1. Although each flowchart is more or less tailored to troubleshoot a general area, it should be noted that they have been purposefully arranged to quickly isolate a fault to a replaceable subassembly. It is not recommended that the flowcharts be used out of sequence.

Refer to the Circuits and Diagrams Section for more specific information as necessary.

Tools and Equipment Required

- DB25 Loopback Connector
- Phillips Screwdriver
- Multimeter
- High Voltage Probe
- Extender, PCB (Qume Part Number 302152-01)
- Long Nose Pliers
- Terminal Extraction Tool (Qume Part Number 302156-01)
- Interconnect Wiring Diagram and Schematics (refer to Section 5)

TROUBLESHOOTING

Rear Connector Pin Designations

Tables 1-1 and 1-2 list the pin designations for the connectors on the rear panel (see Figure 1-1 for identification and location of connectors for the QVT 101 PLUS Terminal). Tables 1-3 through 1-5 provide information for troubleshooting power, logic PCB and keyboard malfunctions.

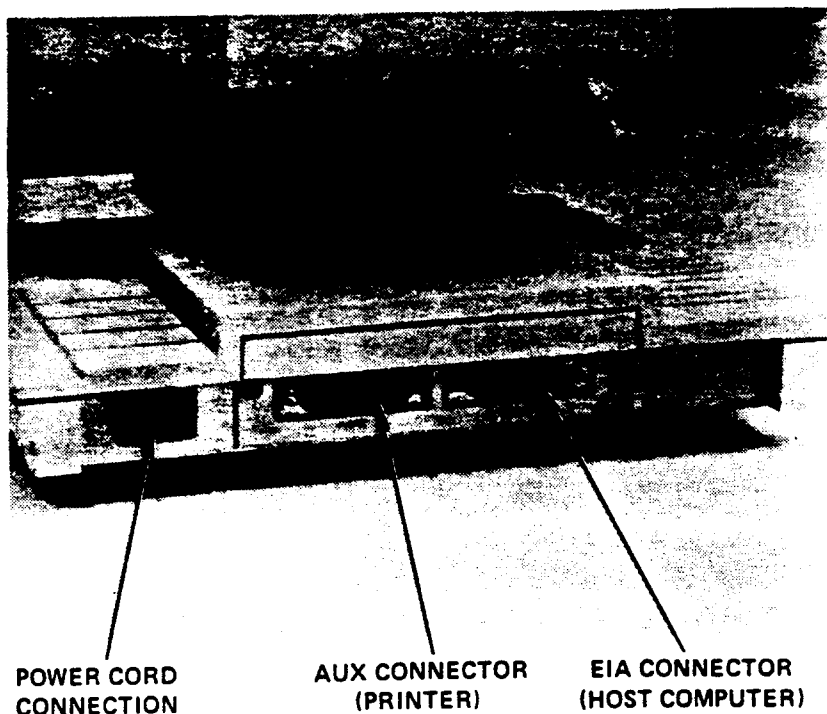


Figure 1-1. QVT-101 PLUS Rear Connector Panel

Table 1-1. AUXILIARY (EIA RS-232-C Interface DCE) Connector, J9

Pin Number	Description	Signal Direction
1	Chassis Ground	-----
2	Receive Data	To Terminal
3	Transmit Data	From Terminal
6	Data Set Ready	To Terminal
7	Signal Ground	-----
20	Data Terminal Ready	To Terminal

Table 1-2. EIA (System Interface RS-232-C DTE) Connector, J8

Pin Number	Description	Signal Direction
1	Chassis Ground	-----
2	Transmit Data	From Terminal
3	Receive Data	To Terminal
4	Request-to-Send	From Terminal
5	Clear-to-Send	To Terminal
6	Data Set Ready	To Terminal
7	Signal Ground	-----
8	Data Carrier Detect	To Terminal
12*	Current Loop, + Receive, or RS-422-A Receive -)	-----
13*	Current Loop, - Transmit, RS-422-A Transmit +)	-----
20	Data Terminal Ready	From Terminal
24*	Current Loop, - Receive, or RS-422-A Receive +)	-----
25*	Current Loop, + Transmit, or RS-422-A Transmit -)	-----

* Optional

NOTE: When the Current Loop/RS422-A option board is installed, Pins 12, 13, 24, and 25 will become active when RS422/CL is selected in Setup. Pins 2 and 3 (RS232) will become inactive when RS422/CL is selected in Setup.

TROUBLESHOOTING

Table 1-3. Power Troubleshooting

SYMPTOM	PROBABLE CAUSE	REMEDY
No power to terminal when power On/Off switch is On.	1. Blown AC fuse (under the terminal).	Replace fuse with one of proper rating.
	2. Defective Power Switch/Fuse/Filter Assembly	Perform continuity check on the Power Switch and the Filter Assy. If defective, replace the assembly. Refer to Section 2.
	3. Defective Video/Power Supply PCB Assembly	Replace Video/Power Supply PCB Assembly. Refer to Section 2.
	4. Defective Power Supply Control PCB	Replace (see Section 2)
No raster on CRT when brightness control is moved across its entire range.	1. Defective Video/Power Supply PCB Assembly.	Replace the Video/Power Supply PCB Assy. Refer to Section 2
	2. Defective CRT	Replace CRT. Refer to Section 2, Removing and Replacing CRT.
Brightness cannot be varied	Brightness control assy. problem	Perform resistance check across control. If defective, replace brightness control assy. Refer to Section 2, Removing and Replacing Brightness Control Assembly.

Table 1-4. Logic Board Troubleshooting

SYMPTOM	PROBABLE CAUSE	REMEDY
Self-test fails. (ESC V)	1. Weak or defective RAM back-up battery.	Replace RAM back-up battery on logic PCB. Refer to Section 2, Removing and Replacing RAM Back-Up Battery.
	2. Defective logic PCB	Replace logic PCB. Refer to Section 2, Removing and Replacing Logic Board.
	3. Check for loose interconnect cables	If loose, tighten.
	4. Defective Video/Power Supply PCB Assembly.	Check power supply voltages. If defective, replace Video/Power Supply PCB Assembly. Refer to Flowchart #5.

TROUBLESHOOTING

Table 1-5. Keyboard Troubleshooting

SYMPTOM	PROBABLE CAUSE	REMEDY
Incorrect character shown on screen.	1. Faulty coiled keyboard cable	Perform continuity check. Replace cable if defective. Refer to Section 2, Replacing the Keyboard Coiled Cable.
	2. Faulty connector/receptacle assembly.	Perform continuity check. Refer to Section 2, Removing and Replacing Keyboard Cable Connector/Receptacle Assembly.
	3. Defective microprocessor.	Replace microprocessor. Refer to Section 2, Removing and Replacing Keyboard Microprocessor (302080-001).
	4. Defective keyboard	Replace keyboard.

Fault Isolation Flowchart #1

Power on unit.

Does unit display an error code? ---YES---> Proceed to Table 1-6, Error Codes Summary at end of this Section.

-NO

Perform Self-Test (enter Setup Mode. Select Local Mode. Issue Escape V.

Does unit perform self-test? ---NO---> Proceed to Flowchart #2.

-YES

Exit self-test (press Shift Break then Clear) while in Local mode. Press each key on keyboard.

Are characters displayed as keys are pressed? ---NO---> Proceed to Flowchart #3.

-YES

Exit Local mode, enter full duplex mode. Install loopback connector to EIA port. Press each key on keyboard.

Are characters displayed as keys pressed? ---NO---> Logic PCB defective. Replace Logic PCB (refer to Section 2).

-YES

Connect printer to AUX port. Exit Full Duplex & enter Local mode. Print.

TROUBLESHOOTING

Fault Isolation Flowchart #1 (Cont)

Is screen
data printed? ---NO---> Logic PCB defective. Replace
Logic PCB (refer to Section 2)
-YES
Unit checks OK.

Fault Isolation Flowchart #2

From Flowchart #1.

Is AC line fuse good? ---NO---> Replace bad fuse. Continue.

-YES

Does fuse fail at power on? ---NO---> Return. Begin Flowchart #1.

-YES

Verify operation of ON/OFF switch.

Is switch defective? ---NO---> Proceed to Transformer Measurement

-YES

Replace Power Switch/Fuse/Filter Assembly (refer to Section 2). Continue.

Does fuse fail again at power on? ---NO---> Return. Begin Flowchart #1.

-YES

Replace fuse. Disconnect P3 on Power Supply Control PCB to isolate power transformer.
Measure transformer output on P3 and verify voltage (23 volts AC \pm 10%).

Is voltage present? ---NO---> Power transformer is defective.
Replace power transformer (refer to
Section 2).

-YES

Fault Isolation Flowchart #2 (Cont)

Power transformer checks OK. Power off and reconnect P3 on the Power Supply Control PCB. Disconnect the keyboard connector from the Lower Monitor Assembly and remove the Logic PCB Assembly.

Power On the unit

Does fuse fail again at power on?-----NO---->Video/Power Supply PCB Assembly checks OK

YES

Power Supply Control PCB or Video/Power Supply PCB Assembly is defective. Disconnect the Power Supply Control PCB

Replace fuse and Power On the terminal

Does fuse fail again?--->NO---->Power Supply Control PCB is OK. Video/Power Supply PCB Assembly is defective. Remove and replace the Video/Power Supply PCB. Reconnect the Power Supply Control PCB and install the Logic PCB.

Yes

Power Supply Control PCB is defective. Remove and Replace

Replace fuse. Does fuse blow?-----NO---->Video/Power Supply Control PCB and Logic PCB check OK.

YES

Logic PCB is defective. Remove and Replace. Reconnect Keyboard

Replace fuse. Power On unit. Does fuse blow?----->No---->Begin Flowchart #1

YES

Keyboard or Keyboard cable is defective. Proceed to Flowchart #3.

TROUBLESHOOTING

Fault Isolation Flowchart #3

From Flowchart #1.

Is +5 Vdc present between pin 1 (Sig. GND) and pin 2 (+5 VDC) on the Keyboard PCB (P1) ---NO---> Perform continuity check on coiled keyboard cable. If defective, replace keyboard cable (refer to Section 2).

-YES

Is the correct character displayed? ---NO---> Proceed to Flowchart #4.

-YES

Unit checks OK. Proceed to the System Test (Host)

Fault Isolation Flowchart #4

From Flowchart #3.

Check the following voltages (with respect to GND) on the Logic PCB edge Connector P1:

Pin 9 +5VDC
 Pin 2 +5VDC
 Pin 21 +12VDC
 Pin 22 -12VDC
 Pin 6 GND

Are all voltages present? ---NO---> Defective Video/Power Supply PCB Assy. Replace.

-YES

Verify proper operation of the brightness control. Rotate control full CCW, then full CW. Observe a 3VDC voltage change between pins 13 and 14 of P1 (Logic PCB 22 pin connector).

Does voltage change approx. 3VDC? ---NO---> Brightness control is defective. Replace Brightness control (refer to Section 2).

-YES

Blank screen (enter Clear). At P1, pin 19 (Logic PCB) observe for an AC RMS voltage. Display self-test (enter in Local Mode-Escape V.). At P1, pin 19 observe for an AC RMS voltage.

Did voltage increase approximately 500mVac RMS when self-test was displayed? ---NO---> Logic PCB is defective. Replace Logic PCB (refer to Section 2).

-YES

Proceed to Flowchart #5.

TROUBLESHOOTING

Fault Isolation Flowchart #5

From Flowchart #4.

Display "H" Test Pattern (enter Shift/Setup-0).

Check voltages on Video/Power Supply PCB Assembly.

D-104 Anode +12 Vdc
D-102 Anode GND

Are voltages present? ---NO---> Defective Video/Power Supply PCB Assembly. Replace.

-YES

With brightness control
full CW, check Video (P6 Pin 7)
for approximately
400 mVac RMS.

Is approx. 400 mVac RMS present? ---NO---> Defective Video/Power Supply PCB Assembly.
Replace.

-YES

With a high voltage probe,
check the CRT anode cap
for approx. 13 KVdc.

< WARNING: HIGH VOLTAGE

Is there approximately 13 KVdc present at CRT
anode cap? ---NO---> Video/Power Supply PCB Assembly defective. Replace (refer to
Section 2).

-YES

Fault Isolation Flowchart #5 (Cont.)

Check the following voltages on the Video/Power Supply PCB Assembly (tolerance \pm 25%):

P4	Pin 1(Brown)	4.49 VAC RMS	G2	550 VDC
P4	Pin 2(Red)	27.0 VAC RMS	D154	Cathode 45 VDC
P4	Pin 3(Yellow)	0.40 VAC RMS	G4	175 VDC
P4	Pin 4(Blue)	1.5 VAC RMS	H	12 VDC
G1	-30 VDC			

Are all voltages present? ---NO---> Video/Power Supply PCB Assembly defective. Replace. (refer to Section 2).

-YES

CRT defective. Replace CRT (refer to Section 2).

SELF-DIAGNOSTICS

Each time the terminal is powered on, the terminal automatically performs a self-test that checks the integrity of four critical areas: the Program ROM, System RAM, Video RAM, and the Keyboard. A successful self-test displays OK in each tested area, and a failed self-test displays as a blinking NG (No Good) as shown in Table 1-6.

Table 1-6. Error Codes Summary

Correct	Self-Test--	Program ROM:OK	System RAM:OK	Video RAM:OK	Keyboard:OK
Error		NG	NG	NG	NG

OK: No error detected
 NG: No Good, error detected

SUBASSEMBLY REMOVAL AND REPLACEMENT

INTRODUCTION

This section describes how to remove and replace the major subassemblies of the QVT 101 PLUS™ Terminal. Before beginning, place the Power On/Off switch in the OFF (zero) position and disconnect the power cord. Thoroughly read each procedure before attempting any subassembly removal and replacement. Observe all safety regulations when discharging the CRT. The Video/Power Supply PCB Assembly consists of two boards; the small board plugged into the large board is called the Power Supply Control PCB and the large primary board is called the Video/Power Supply PCB. The combination of the two boards is called the Video/Power Supply PCB Assembly.

SAFETY SUMMARY

Always remember that the terminal modules contain extremely high voltages. If proper precautions are not taken, contact with these voltages can result in injury. Observe the following precautions.

- Unless otherwise instructed by procedures in this manual, always turn the terminal power off and disconnect it from the power source. Unplug the power cord from its power source before removing the back cover or attempting subassembly removal or replacement.
- Always fully read the removal and replacement instructions before attempting the removal of any subassembly.
- Take special precaution when working in the vicinity of the CRT. Do not scratch or strike the CRT, or subject it to unusual pressure. The CRT contains a high vacuum; breaking the CRT may cause injury from flying glass and high voltages.

REQUIRED TOOLS

The tools required for removal and replacement of subassemblies are listed below.

- Phillips screwdriver, medium (No. 2 tip)
- Soldering equipment
- Keycap extraction tool (Qume Part Number 84873-01)
- Extender Board for the Logic PCB (Qume Part Number-302152-01)
- Needle Nose pliers
- Terminal Pin Extraction Tool (Qume Part Number 302156-01)
- IC Puller Tool
- Small Adjustable wrench
- 7/16 inch Deep Socket Wrench and Ratchet
- 5/16 and 7/32 inch Nut Drivers

SUBASSEMBLY REMOVAL AND REPLACEMENT

UPPER MONITOR ASSEMBLY

The Upper Monitor Assembly of the QVT 101 PLUS Terminal consists of the following major subassemblies (refer to Figure 2-1):

Back Cover
Power Supply Control PCB
Bezel

Video/Power Supply PCB
CRT and Yoke subassembly
Transformer

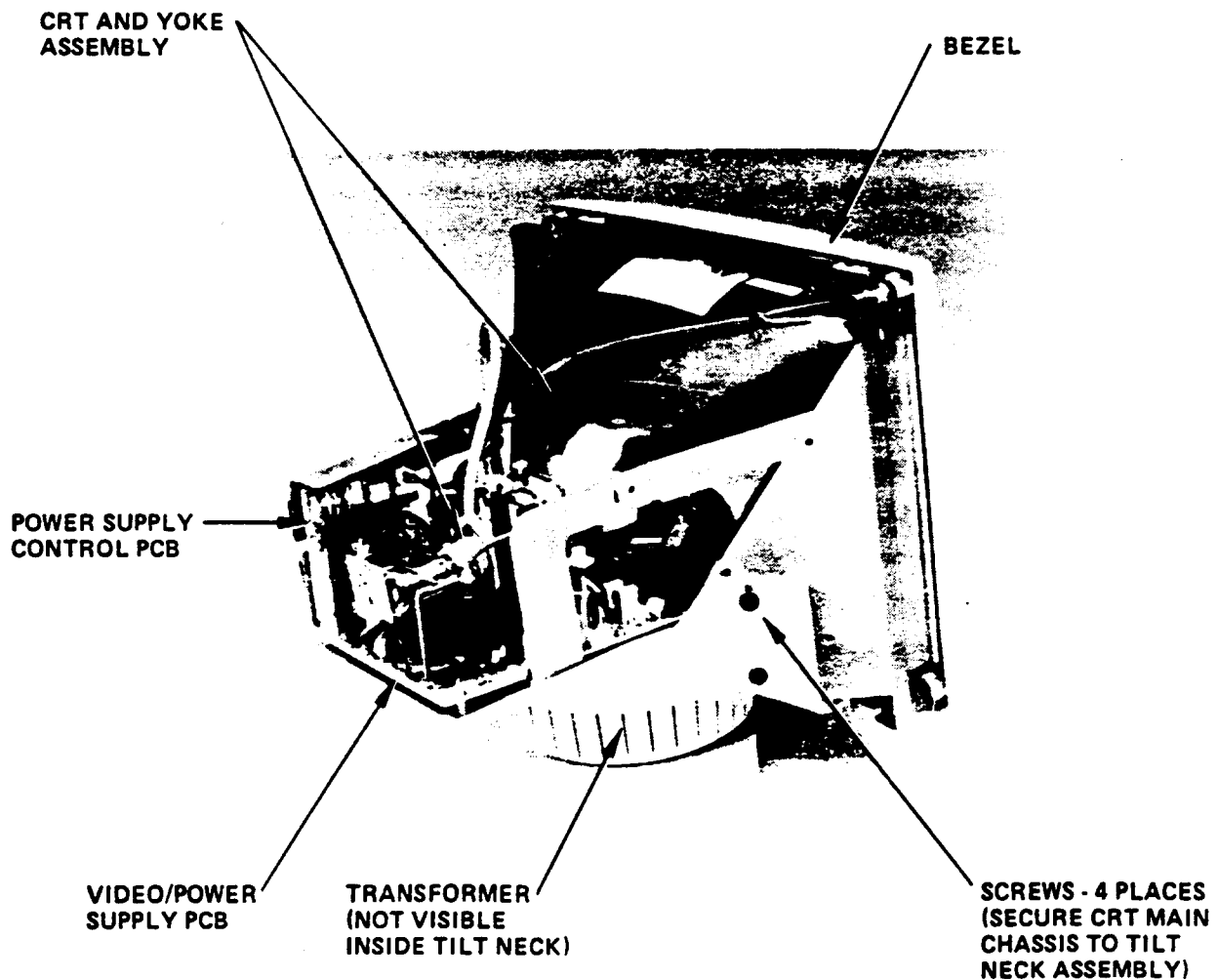


Figure 2-1. Upper Monitor Assembly

Removing and Replacing the Back Cover

REMOVAL

Removing the Back Cover is the first step for many removal and replacement procedures. Before removing the Back Cover, verify that the terminal is turned off, and that the terminal is unplugged. Note the location of all screws, washers, and other parts that are removed from the terminal and save them; these parts will be needed to reassemble the terminal. To remove the Back Cover, proceed as follows:

1. Remove the four screws securing the Back Cover to the Bezel as shown in Figure 2-2.
2. Remove the Back Cover by sliding it back.

REPLACEMENT

To replace the Back Cover, repeat the removal instructions in reverse order.

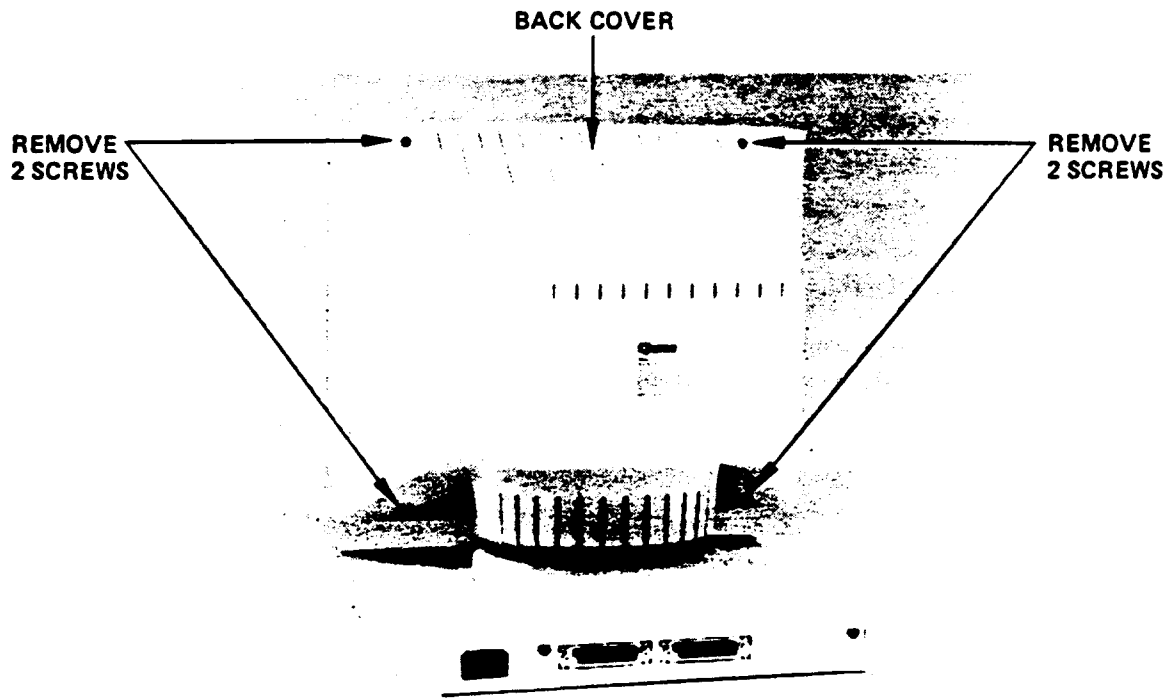


Figure 2-2. Removal of Back Cover

SUBASSEMBLY REMOVAL AND REPLACEMENT

Discharging the CRT High-Voltage Circuit

Before attempting to remove the Video/Power Supply PCB Assembly or the CRT and Yoke Assembly, the CRT anode must first be discharged.

WARNING

Take special precaution when working in the general area of the CRT. **DO NOT** scratch or strike the CRT or subject it to unusual pressure. The CRT contains a high vacuum and breakage of the tube can result in injury from flying glass. As a safety precaution, wear suitable clothing and **eye protection.**

Even when power is removed from the video terminal, a hazardously high residual voltage of several thousand volts may always be present in the CRT. This static charge can accidentally be contacted at the CRT's anode connector or at the flyback transformer. To prevent electrical shock, always discharge the CRT by connecting its anode contact to ground before doing any work in the monitor area (refer to the CRT discharging instructions presented here). **Observe all applicable safety regulations when discharging the CRT.**

1. **Discharge the CRT and the high voltage circuit, in a terminal only after the power cord has been disconnected either from the wall power source or from the terminal's power connector, by connecting the CRT anode contact to ground for several seconds. It is **recommended** to bleed the charge off slowly by using a well insulated high voltage discharge probe with an internal resistance of about 100Kohms connected between the CRT ground spring and the anode contact (see Figure 2-3). Maintain contact with the anode for several seconds. **Observe all applicable safety regulations when discharging the CRT.****

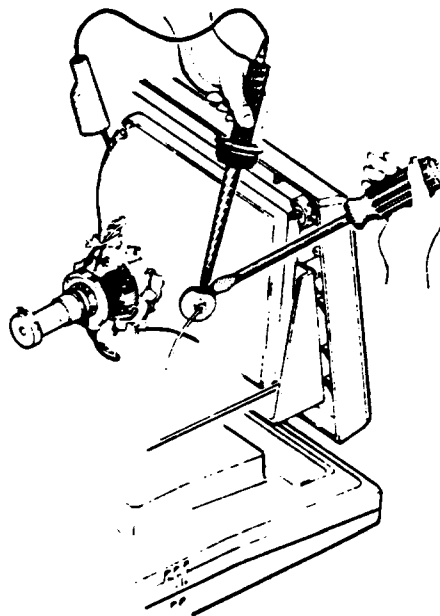


Figure 2-3. Discharging the CRT High-Voltage Circuit

SUBASSEMBLY REMOVAL AND REPLACEMENT

2. Disconnect the anode cap and cable from the CRT anode contact (to avoid damage to the CRT, do not use tools for this procedure):
 - First, after discharging the CRT, lift the full circle of the anode cap's plastic flange up from the CRT glass (with time, the plastic tends to stick to the glass);
 - While holding the flange folded upwards between thumb and index finger, push against one side of the anode cap near its base (as shown in Figure 2-4) until the cap's prong on that side disengages from the CRT's anode contact;
 - Finally, unhook the anode cap's other contact prong to completely disengage the anode cap from the CRT.

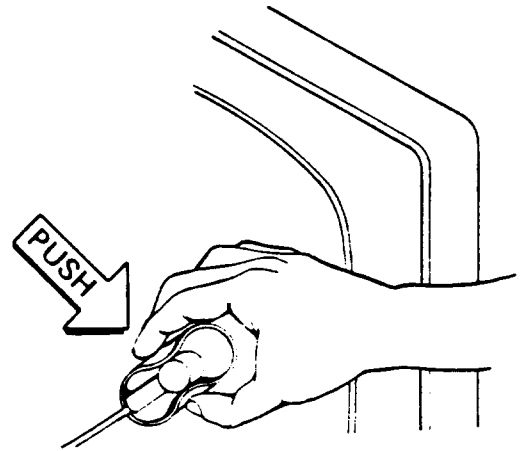


Figure 2-4. Disconnecting the CRT Anode Cap

SUBASSEMBLY REMOVAL AND REPLACEMENT

Removing and Replacing the Video/Power Supply PCB and the Power Supply Control PCB

REMOVAL

1. Remove the Back Cover in accordance with the removal instructions in the paragraph "Removing and Replacing the Back Cover."
2. Prior to removing the Video/Power Supply PCB Assembly, discharge the CRT anode as described in the previous paragraph.
3. Disconnect the anode cap as described in the previous paragraph.
4. Remove the chassis ground (black wire) from the CRT Socket Assembly (refer to Figure 2-5 for this step and the following steps).
5. Remove the CRT Socket Assembly from the yoke of the CRT.
6. Remove the four screws that hold the Video/Power Supply PCB onto the chassis (refer to Figure 2-5). Slide the PCB back a few inches to facilitate the removal of the connectors.
7. Remove the 4-pin connector (P4) from the Video/Power Supply PCB.
8. Remove the 2-pin connector (P5) from the Video/Power Supply PCB.
9. Remove the 12-pin connector (P6) from the Video/Power Supply PCB.
10. On the Power Supply Control PCB, remove the 2-pin connector (P3).
11. Remove the two screws that hold the board to the brackets and unplug the Power Supply Control PCB from P1 and P2 on the Video/Power Supply PCB.
12. Remove the Video/Power Supply PCB and the Power Supply Control PCB.

REPLACEMENT

To replace the Video/Power Supply PCB and the Power Supply Control PCB, repeat the removal instructions in reverse order.

SUBASSEMBLY REMOVAL AND REPLACEMENT

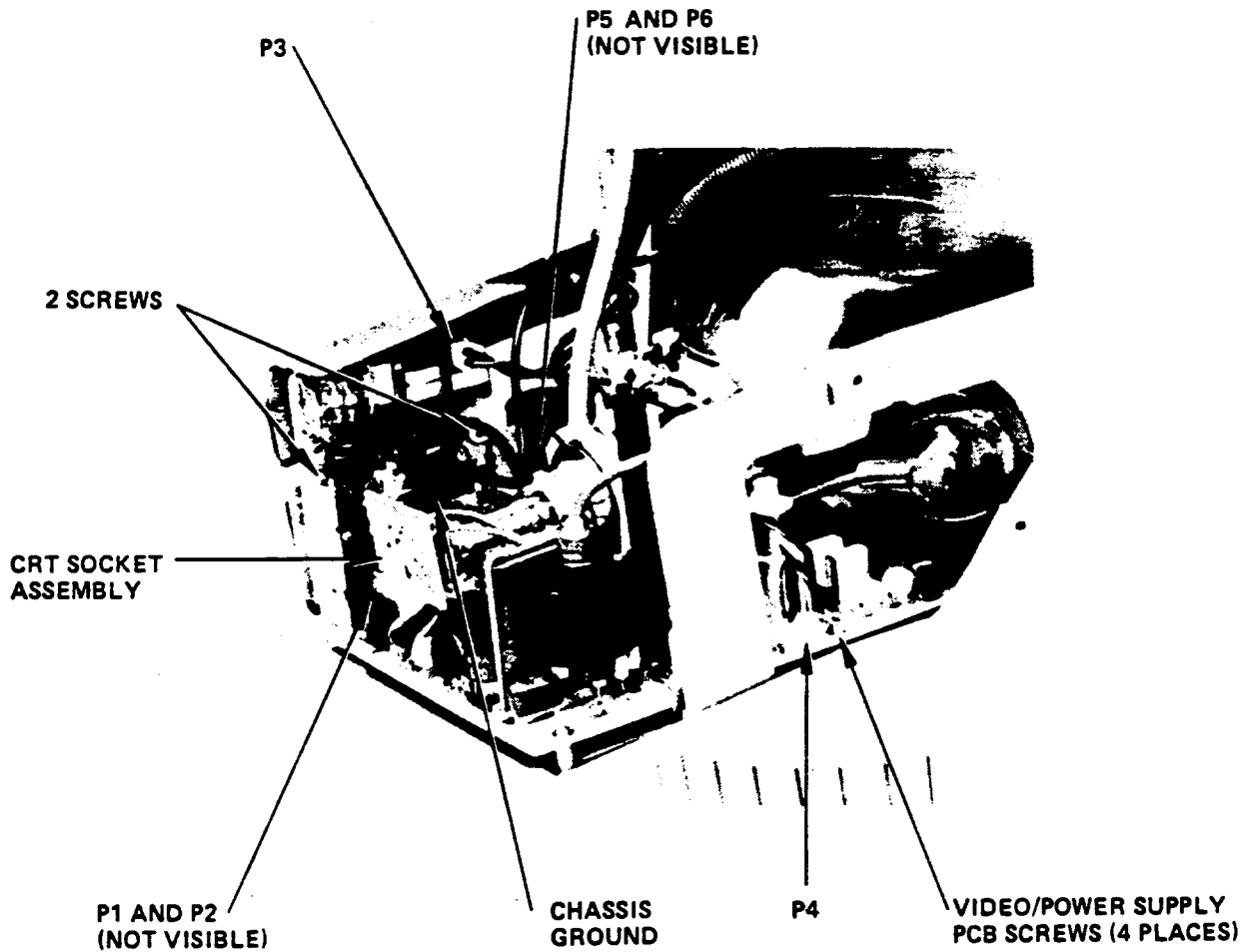


Figure 2-5. Removal of the Video/Power Supply PCB and the Power Supply Control PCB

SUBASSEMBLY REMOVAL AND REPLACEMENT

Removing and Replacing the CRT and Yoke Assembly

REMOVAL

1. Remove the Back Cover in accordance with removal instructions in the Paragraph "Removing and Replacing the Back Cover."
2. Before removing the CRT and Yoke Assembly, first remove the Video/Power Supply PCB Assembly in accordance with removal instructions in "Removing and Replacing the Video/Power Supply PCB and the Power Supply Control PCB" in this Section of the manual.
3. After removing the Video/Power Supply PCB Assembly remove the four small nuts and the four washers that secure the Bezel and CRT/Yoke Assembly to the panel supports and main chassis (refer to Figure 2-6). The removal of the four nuts and washers is most easily done by placing the CRT and Yoke Assembly face downward as shown in Figure 2-6. Put a piece of foam rubber or some other soft material underneath the screen so as not to damage the CRT. Lift the CRT/Yoke Assembly off the Main Chassis as shown in Figure 2-7.

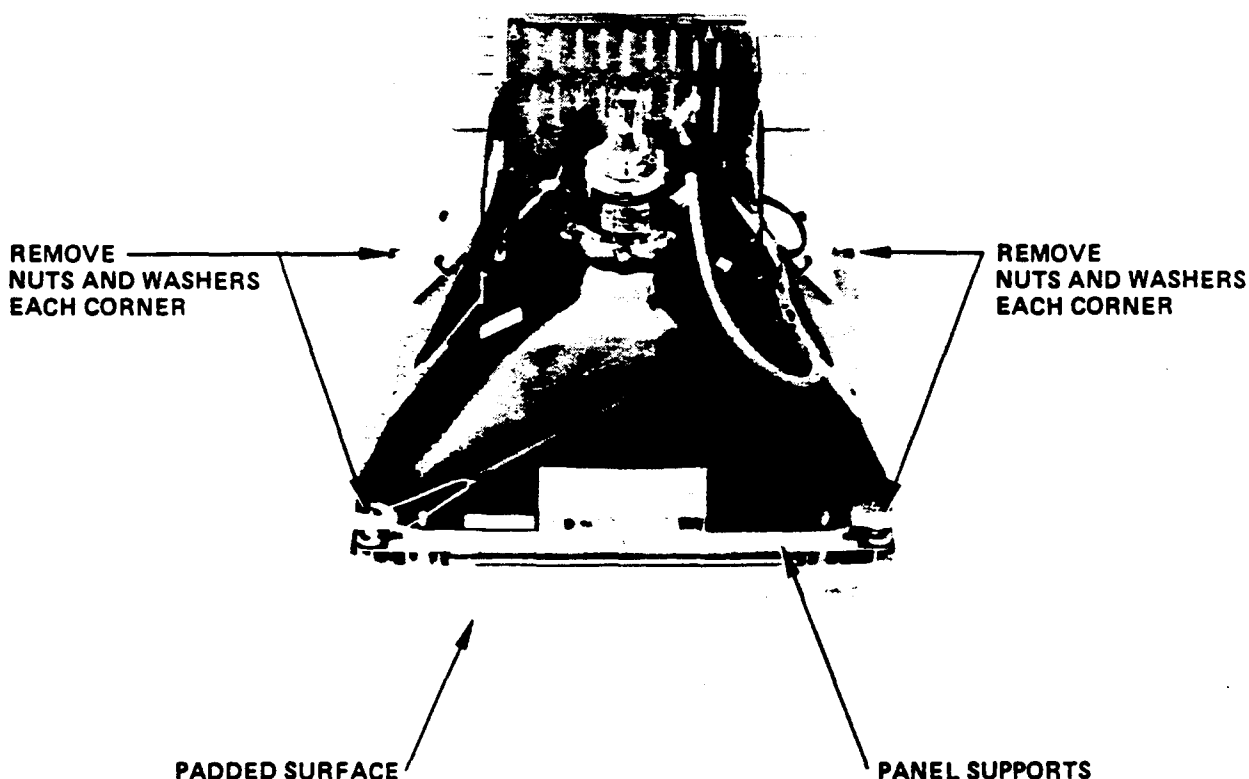


Figure 2-6. Removal of the CRT and Yoke Assembly

SUBASSEMBLY REMOVAL AND REPLACEMENT

4. Remove the four retaining washers (one on each corner of the CRT) as shown in Figure 2-7. Remove the four larger nuts and washers from the CRT tabs (use a 5/16 inch nut driver).

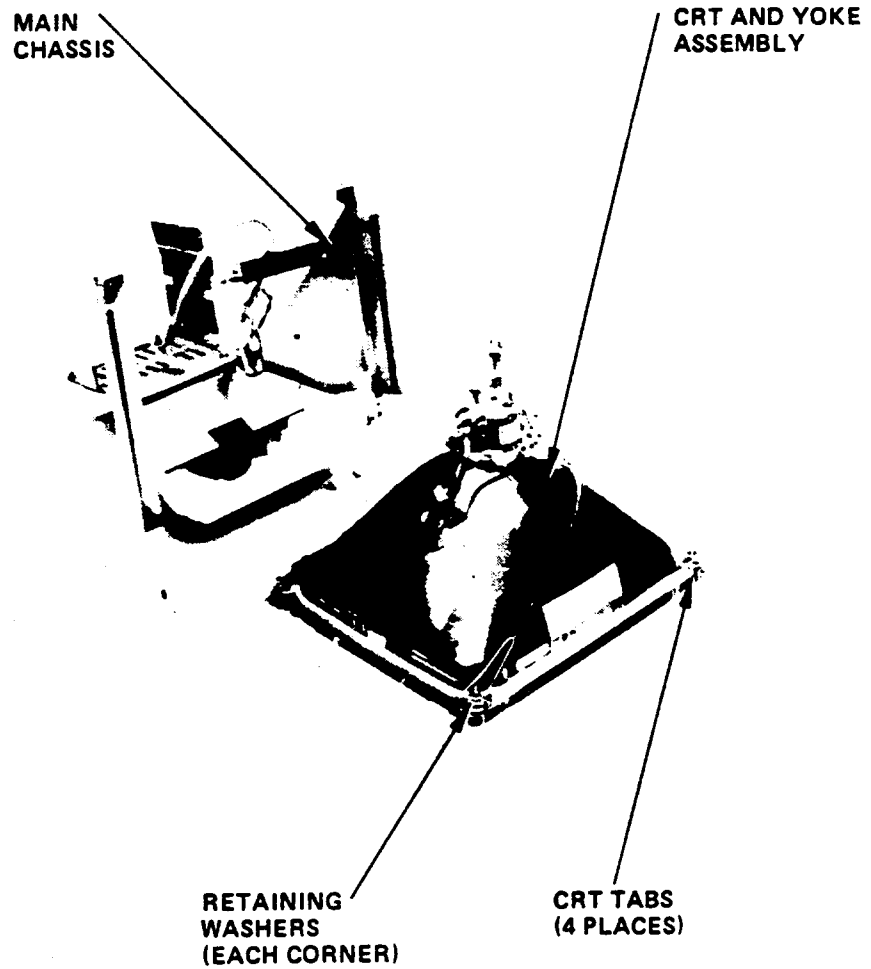


Figure 2-7. Removing the CRT and Yoke Assembly from the Main Chassis

SUBASSEMBLY REMOVAL AND REPLACEMENT

5. Lift the CRT and Yoke Assembly directly upward from the Bezel and panel supports. Place the CRT screen down on a soft surface, such as a towel. See Figure 2-8.
6. Remove the ground wire and spring from the 2 corners of the CRT (refer to Figure 2-8).

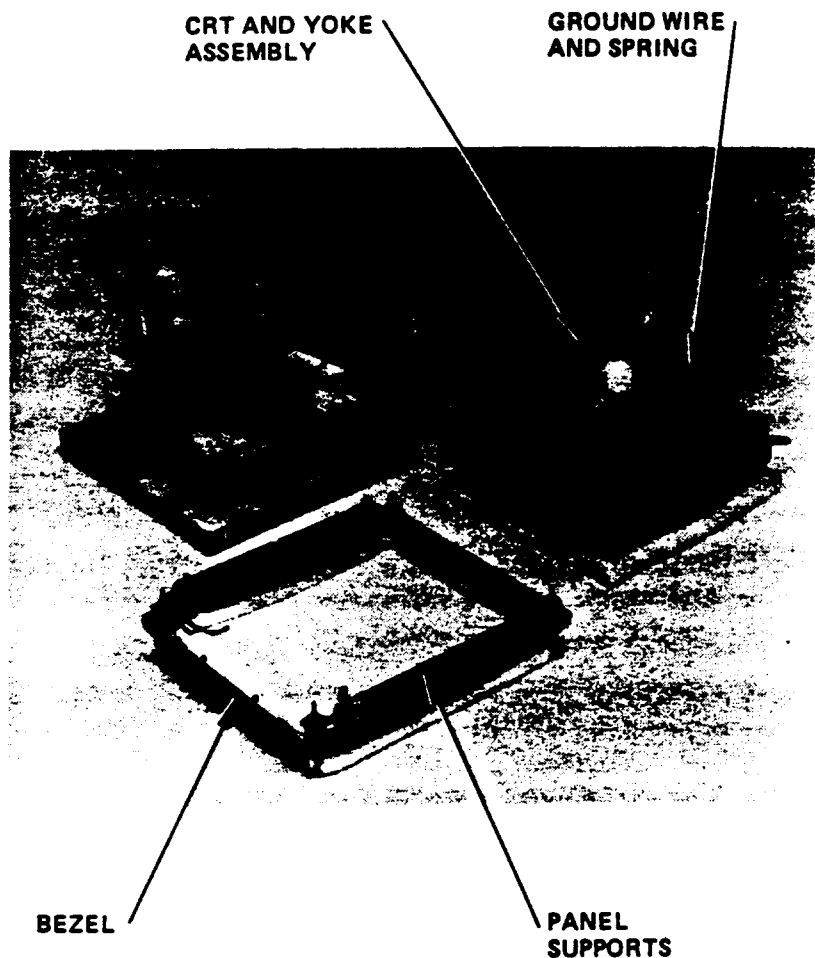


Figure 2-8. Removing the CRT and Yoke Assembly from the Bezel

SUBASSEMBLY REMOVAL AND REPLACEMENT

7. Transfer the ground wire and spring assembly to the replacement CRT and Yoke assembly. Verify that the black ground wire is on the ground spring of the new CRT and Yoke assembly as shown in Figure 2-9.

REPLACEMENT

To replace the CRT and Yoke Assembly repeat the removal instructions in reverse order. Note correct orientation of the ground wire as shown in Figure 2-9, and verify that the four rubber washers are not defective before installing the replacement CRT.

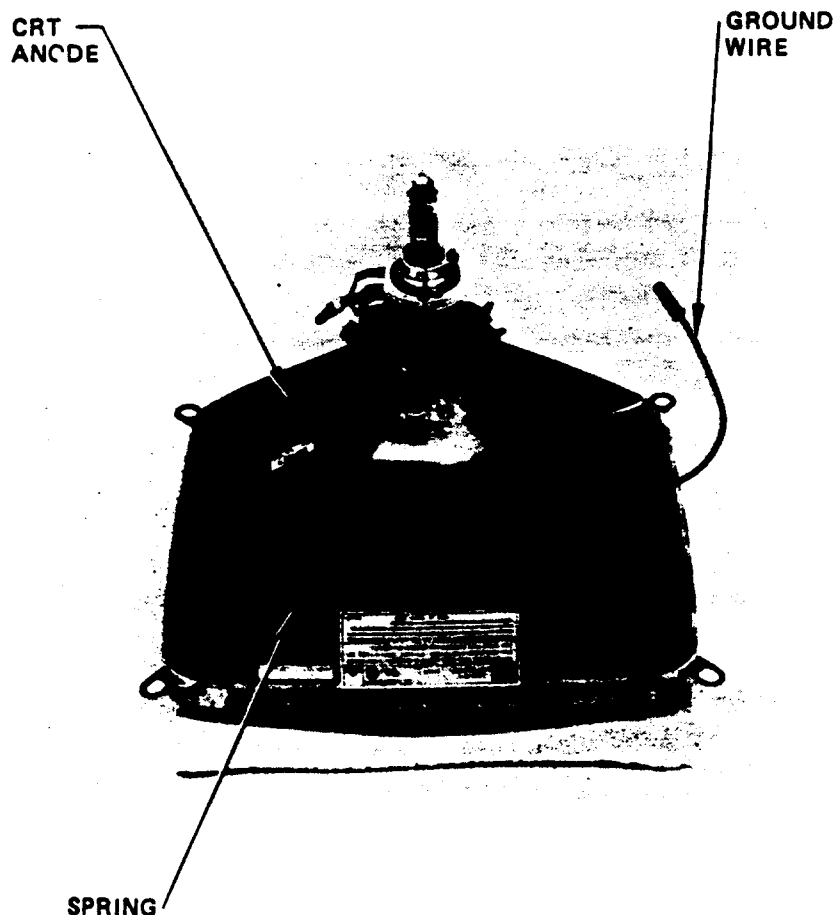


Figure 2-9. Locating and Installing the Ground Wire and Spring

SUBASSEMBLY REMOVAL AND REPLACEMENT

Removing and Replacing the Front Bezel

REMOVAL

1. Remove the Back Cover as previously described in this Section of the manual.
2. Remove the Video/Power Supply PCB Assembly as previously described.
3. Remove the CRT and Yoke Assembly as previously described.
4. Remove the Bezel by pulling it away from the panel supports (refer to Figure 2-8).
5. Remove the LED Assembly by removing one screw as described in the paragraph below.

REPLACEMENT

To replace the front Bezel, repeat removal instructions in reverse order. If necessary, refer to Figure 4-1 to verify the correct location of all parts.

Removing and Replacing the Green LED On/Off Light

REMOVAL

1. Remove the CRT and Yoke Assembly as previously discussed in this manual.
2. Remove the screw that secures the small PCB, green LED, and pigtail assembly to the Bezel (refer to Figure 2-10).

REPLACEMENT

To replace the LED and PCB assembly, repeat the removal instructions in reverse order.

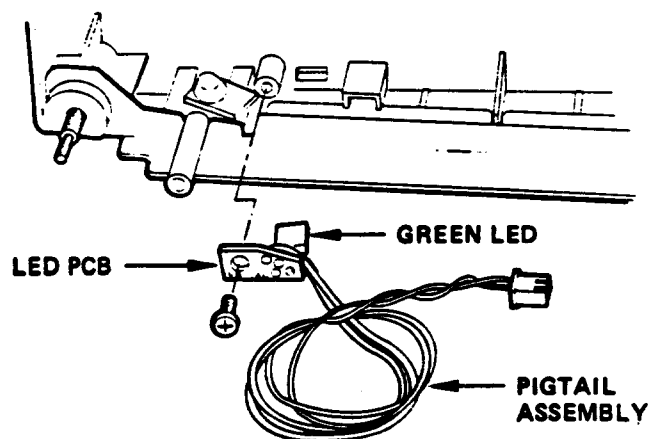


Figure 2-10. Removing the Green LED On/Off Light

Removing and Replacing the Transformer

REMOVAL

1. Remove the four black screws that hold the tilt neck assembly to the main chassis (refer to figures 2-1 and 2-11).
2. Lift off the main chassis, CRT and Yoke Assembly and expose the interior of the tilt neck assembly. Rotate 90 degrees and set the CRT and Yoke Assembly on a padded surface (refer to Figure 2-11).
3. Remove the four black screws and star washers holding the Transformer to the tilt neck assembly.
4. Disconnect the ground strap and the plastic connector (black and white wires to the Power Switch/Fuse/Filter Assembly).
5. Disconnect P3 (Red and Black wires) that go to the Power Supply Control PCB.

REPLACEMENT

To replace the Transformer, perform the removal instructions in the reverse order. When installing the tilt neck assembly over the main chassis be sure to tuck the tilt neck assembly flange under the Bezel before replacing the 4 screws (refer to Figure 2-11).

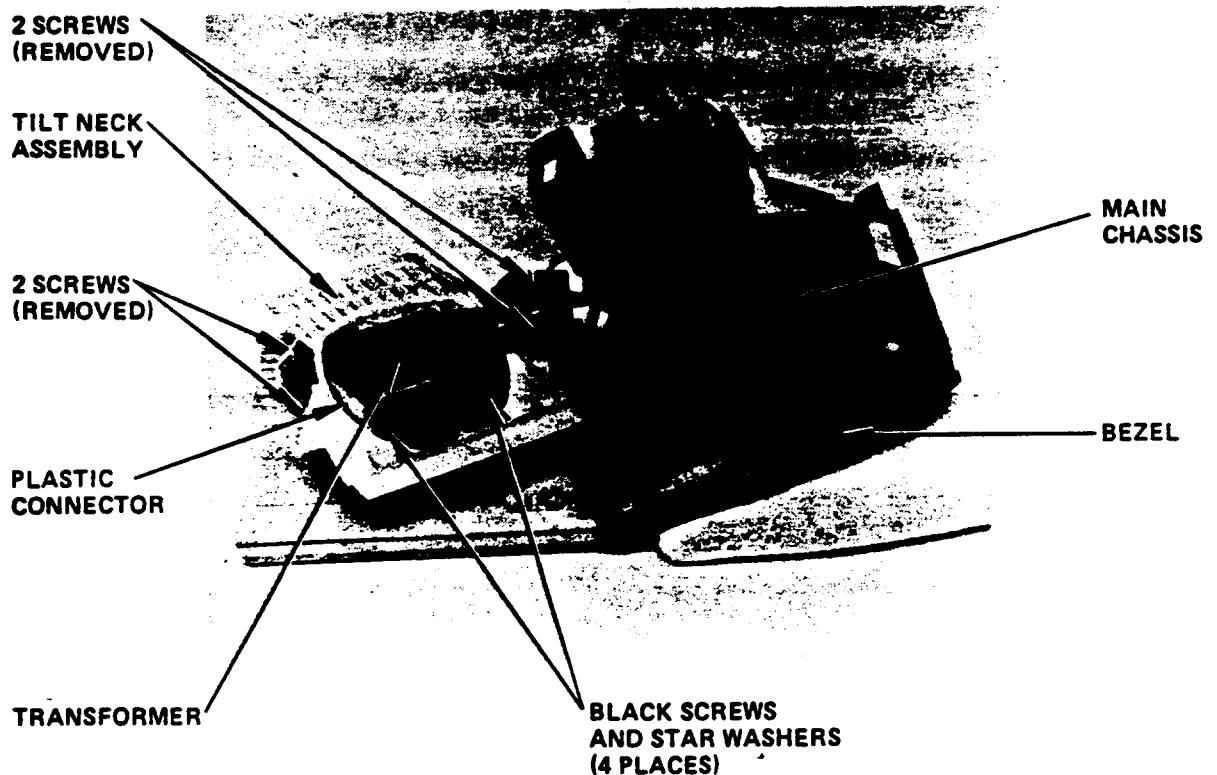


Figure 2-11. Replacing the Transformer

SUBASSEMBLY REMOVAL AND REPLACEMENT

LOWER MONITOR ASSEMBLY

The Lower Monitor Assembly of the QVT 101 PLUS terminal consists of the following subassemblies that will be removed and/or replaced:

Bottom Cover	Logic Board
Current Loop Board or RS 422 Board	Brightness Control
Power Switch/Fuse/Filter Assembly	RAM Backup Battery
Speaker Assembly	Keyboard Connector Assembly
Video to Logic PCB Cable	

Removing and Replacing the Bottom Cover

REMOVAL

1. Disconnect the keyboard connector and all cables connected to the rear connector panel of the terminal (refer to Figures 1-1 and 2-12).
2. Turn the terminal on its side, so that the keyboard connector receptacle is located on the top right hand side, as shown in Figure 2-12.
3. Remove the rear connector panel (2 screws) and slide out the Logic Board (refer to Figure 2-13).
4. Remove the eight screws holding the bottom cover to the lower cabinet top. Note that the center 4 screws are threaded into the plastic base and the outside 4 screws are threaded into metal inserts.
5. Pull the bottom cover away from the lower monitor assembly and remove the keyboard connector assembly (refer to Figure 2-14).

REPLACEMENT

To replace the bottom cover, repeat removal instructions in reverse order. Be sure to replace the four outer screws and the four inner screws in the proper locations (four screws on the outside go into metal inserts).

CAUTION

When replacing the Bottom Cover make sure that all wires from the Keyboard Connector and the Speaker are in front of the 22-pin connector. After replacing the Back Cover inspect the 22-pin connector to make sure no wires are in the way of the fingers on the Logic PCB.

SUBASSEMBLY REMOVAL AND REPLACEMENT

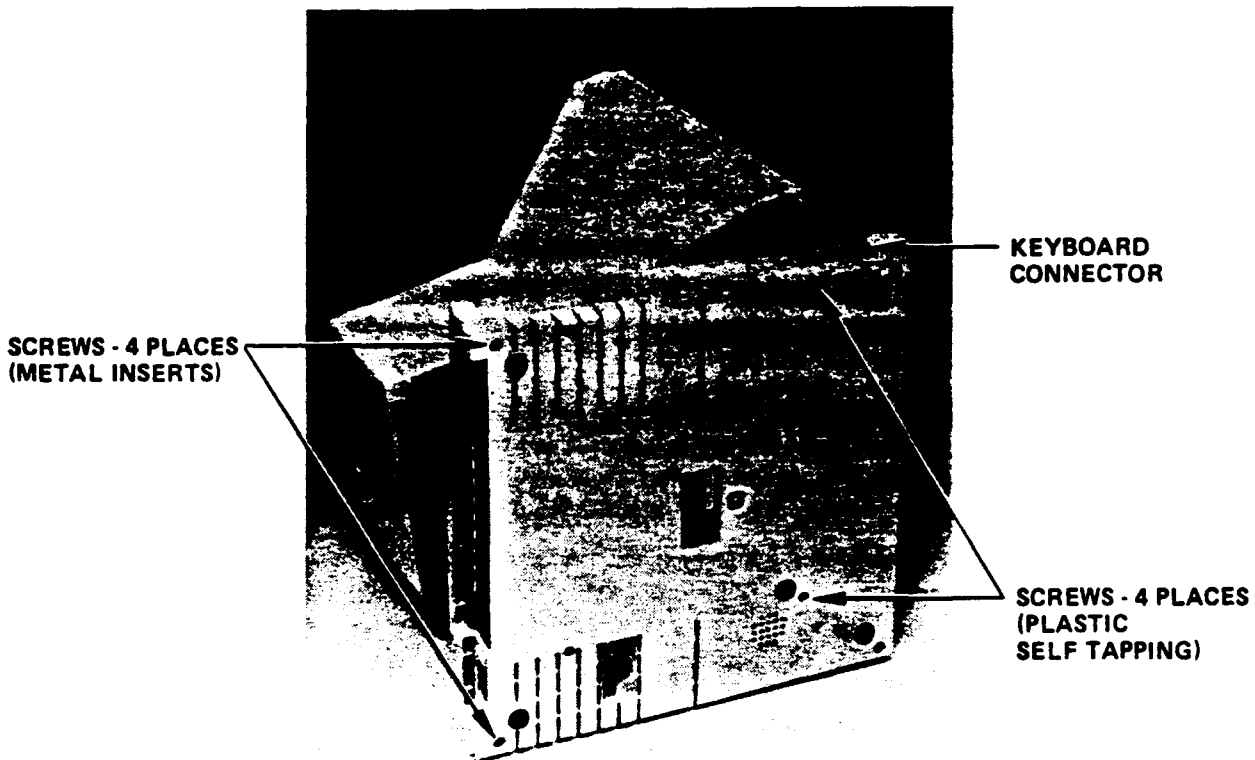


Figure 2-12. Removal of the Rear Connector Cables and Bottom Cover

Removing and Replacing the Logic Board

REMOVAL

1. After removing the cables connected to the terminal, unscrew the two Phillips head screws and remove the rear connector panel (refer to Figure 2-13).
2. Insert needle nose pliers into the two small holes in the center of the plate as shown in Figure 2-13.
3. Using the needle nose pliers, slide out the Logic Board on its tracks.

REPLACEMENT

Slide the Logic Board back into the Lower Monitor Assembly. Replace the rear connector panel and make sure that the Logic Board is flush down on the terminal posts. Replace the 2 screws into the rear connector panel. Make sure that the three tabs on the bottom cover are seated properly.

SUBASSEMBLY REMOVAL AND REPLACEMENT

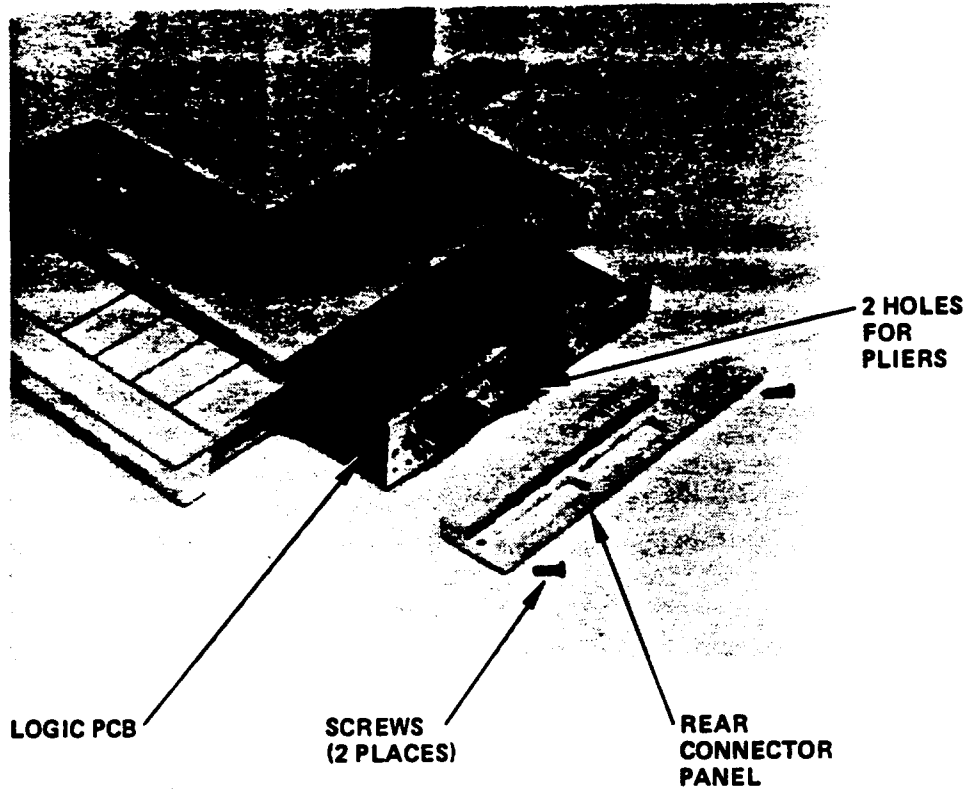


Figure 2-13. Removal of the Logic Board

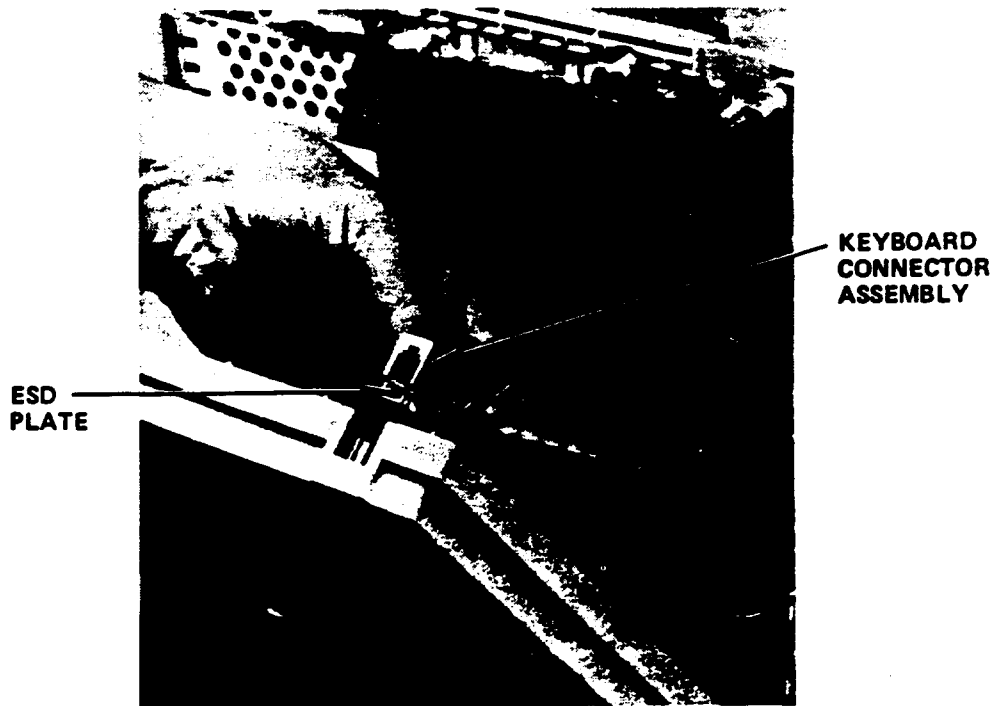


Figure 2-14. Removal of the Keyboard Connector

Removing and Replacing the RAM Back-Up Battery

1. Remove the Logic Board as described previously.
2. To remove or replace the battery, lift the tab of the retainer up, then slide the battery in or out of the retainer clip. See Figure 2-15. Verify that the battery is oriented properly; the + side of the battery must face upward.

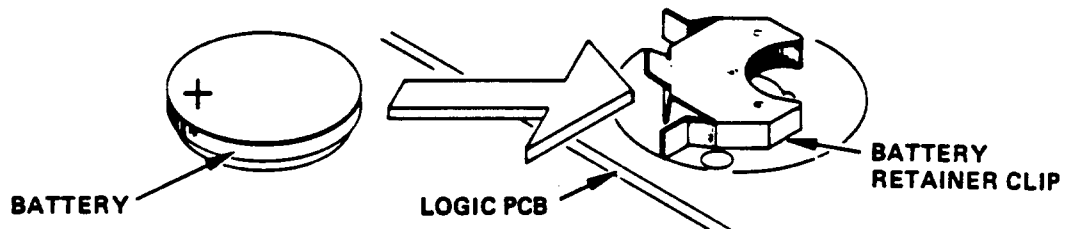


Figure 2-15. Removal of the Logic Board RAM Back-Up Battery

Removing and Replacing the Brightness Control Assembly

REMOVAL

CAUTION

Hazardous voltages are exposed in the general area of the Power Switch/Fuse/Filter Assembly. Before performing any service in this area, power OFF the terminal and disconnect the power cord.

1. Gain access to the lower monitor area by removing the Bottom Cover. Refer to the Bottom Cover Removal and Replacement procedure.
2. Remove the brightness control knob, using a screwdriver to pry it loose.
3. Remove the retaining nut, using a 7/16 inch deep socket and socket wrench.
4. Remove the black, white and red wires (pins 12, 13, 14) from the Logic Board Edge Connector, using the special terminal pin extraction tool (Qume Part Number-302156-01). Refer to Figure 2-16.
5. Lift out the Brightness Control Assembly

REPLACEMENT

To replace the Brightness Control, perform removal instructions in reverse order.

SUBASSEMBLY REMOVAL AND REPLACEMENT

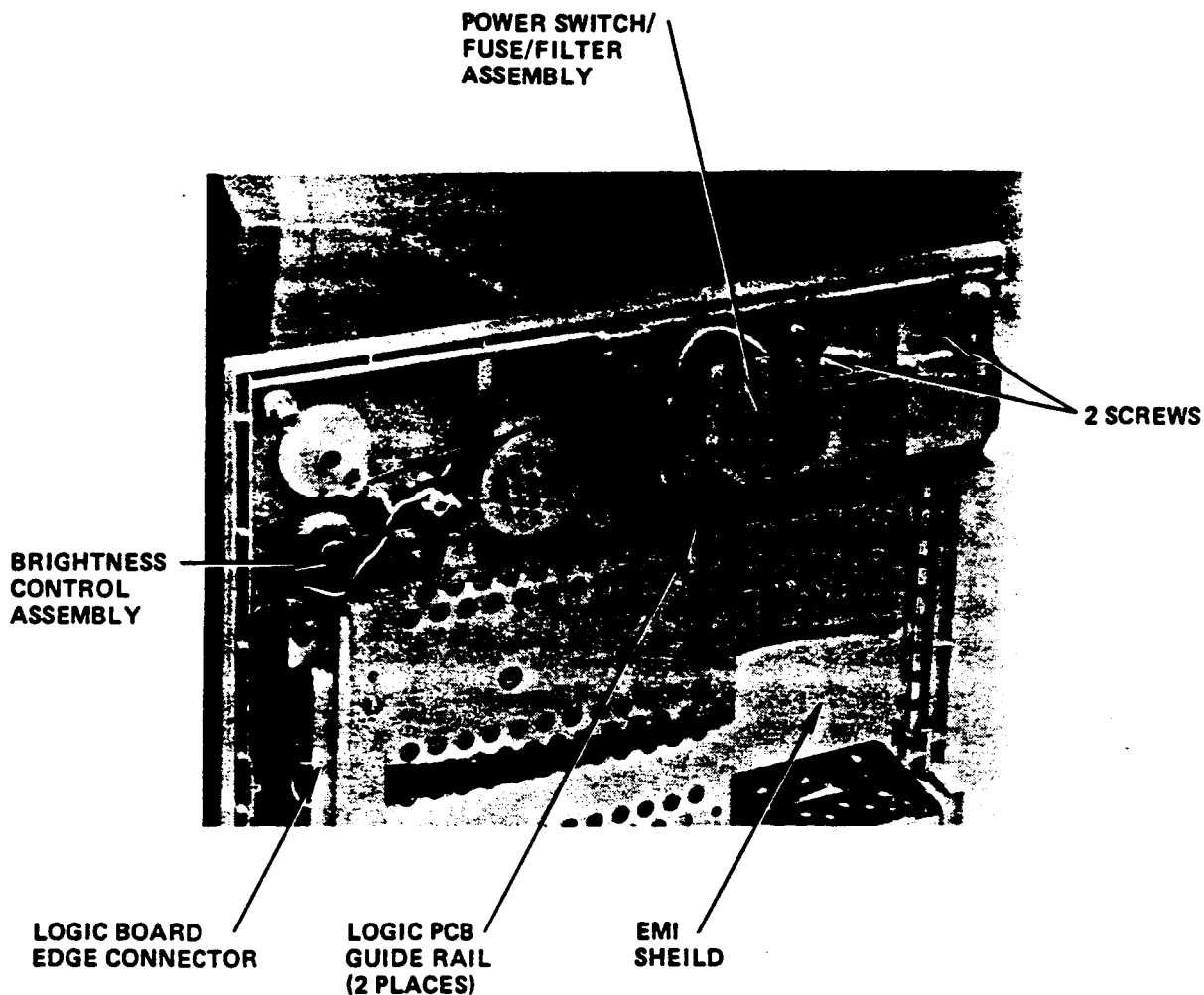


Figure 2-16. Removing and Replacing the Brightness Control Assembly and the Power Switch/Fuse/Filter Assembly

Removing and Replacing the Power Switch/Fuse/Filter Assembly

REMOVAL

CAUTION

Hazardous voltages are exposed in the general area of the power supply. Before performing any service in this area, power OFF the terminal and disconnect the power cord.

1. Gain access to the lower monitor area by removing the Bottom Cover (refer to the Bottom Cover Removal and Replacement procedure).
2. Remove the EMI Shield and the Logic PCB guide rails.
3. Remove the two screws, lock washers and washers that secure the assembly to the Lower Monitor Assembly (see Figure 2-16).
4. Pull the Jnit away from the Lower Monitor Assembly. The black and white wires are common to the transformer; refer to the Transformer Removal and Replacement procedure to disconnect the power switch/fuse/filter assembly from the transformer (refer to Figure 2-16).
5. Disconnect the white plastic connector. Pull the black and white wires through the neck of the terminal and remove the unit.

REPLACEMENT

To replace the unit, perform the removal instructions in reverse order. Before tightening the screws all the way, insert the Power Switch guide rod into the base of the power knob assembly (refer to Figure 2-16).

SUBASSEMBLY REMOVAL AND REPLACEMENT

Removing and Replacing the Keyboard Connector Assembly

REMOVAL

1. Remove the Bottom Cover in accordance with the procedures in this manual.
2. Remove the Keyboard Connector Assembly (jack and jack ESD plate) from the Bottom Cover (refer to Figure 2-14).
3. Disconnect the 4 wires (Pins 1, 2, 3, 4) from the Logic Board Edge Connector (22 position connector) using the terminal extraction tool (refer to Figure 2-15).

REPLACEMENT

To replace the Keyboard Connector Assembly, perform the removal steps in reverse order.

KEYBOARD ASSEMBLY

Disassembling and Reassembling the Keyboard Assembly

DISASSEMBLY

1. Disconnect the keyboard coiled cable from the terminal.
2. Turn the keyboard upside down and remove the eight screws from the bottom cover (refer to Figure 2-17). Turn the keyboard over. Remove the keyboard top cover (two pieces). Refer to Figure 2-18. Be sure not to lose any of the 16 function keys when the keyboard is turned upside down.
3. Remove the four screws (two on each side) from the keyboard metal plate. Lift the the Keyboard PCB Assembly away from the bottom cover (see Figure 2-18).

REASSEMBLY

Reassemble by repeating removal instructions in reverse order. Set down the 16 function keys on the Keyboard PCB (over the circles). Replace the main keyboard top cover. Replace the identification strip cover assembly over the 16 function keys, carefully locking it in so it fits. Secure the assemblies with the screws.

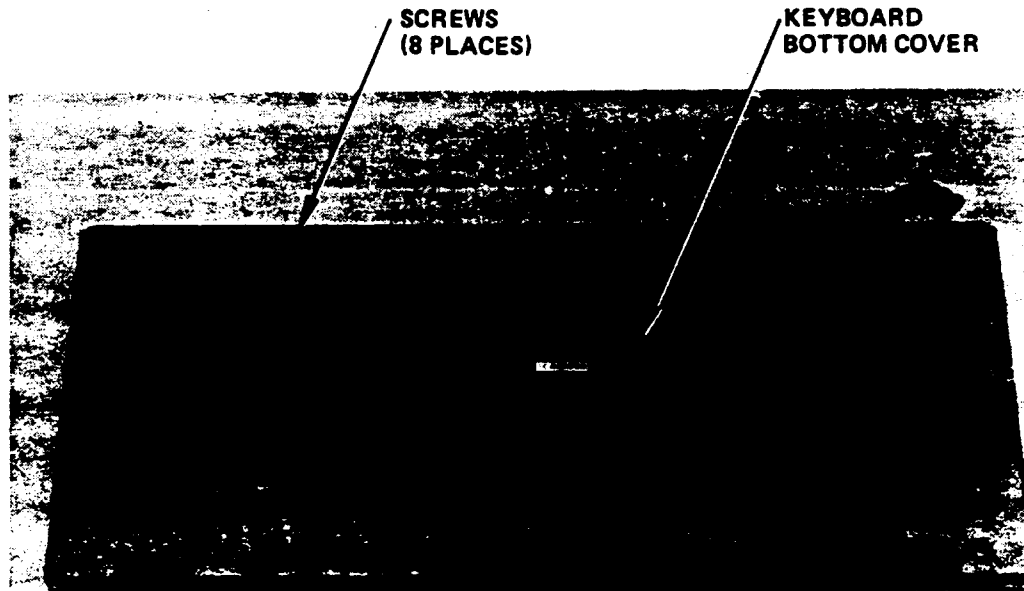


Figure 2-17. Keyboard Bottom Cover

SUBASSEMBLY REMOVAL AND REPLACEMENT

Replacing the Coiled Cable Assembly

1. Disassemble the keyboard in accordance with the disassembly procedures in the preceding paragraph.
2. Remove the green ground wire from the keyboard assembly by removing one screw.
3. Pull back the metallic shield from the glued strip.
4. Disconnect the keyboard coiled cable from connector P1 on the Keyboard PCB, and remove the cable from its retainer on the inside of the bottom cover. Be careful not to damage the cable by crimping or over stressing the tensile strength (see Figure 2-18).
5. Install the keyboard coiled cable assembly (Qume Part Number 10244) by plugging the cable into connector P1 on the Keyboard PCB and routing the straight end of the coiled cable in the keyboard bottom cover as illustrated in Figure 2-18.

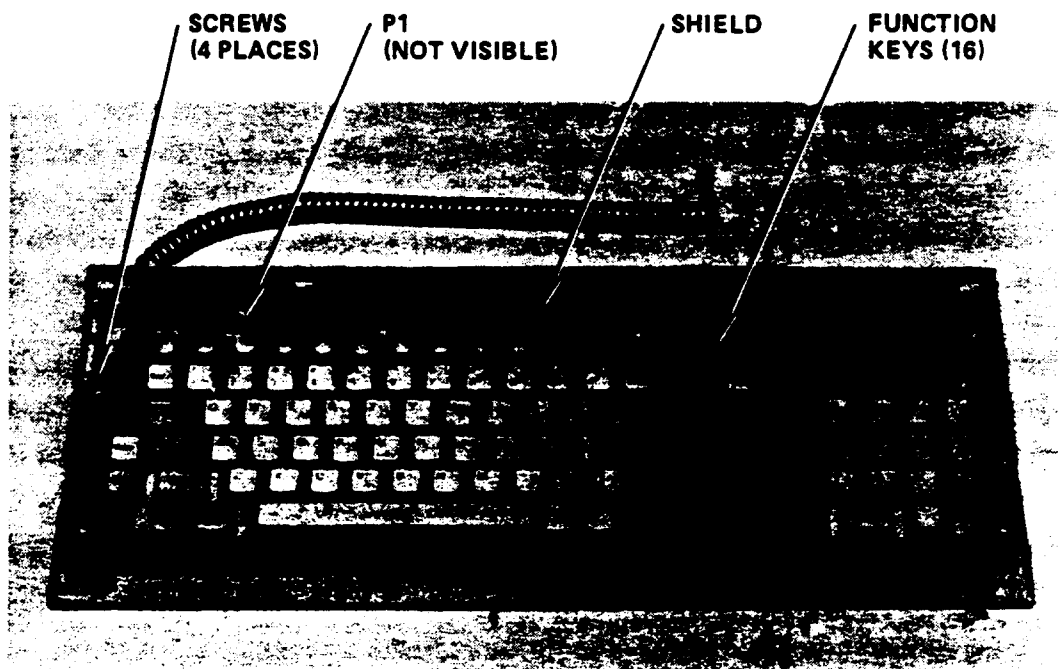
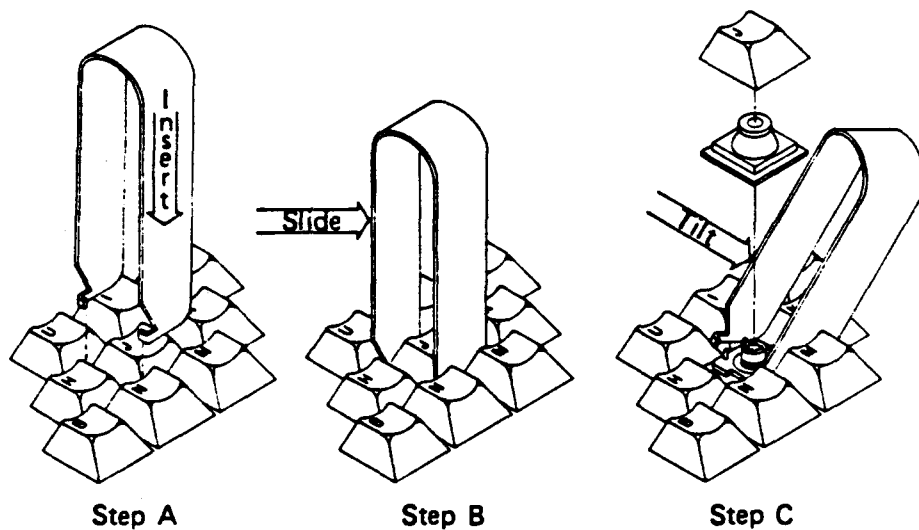


Figure 2-18. Keyboard with the Top Cover Removed

Removing and Replacing Keyboard Keycaps**REMOVAL**

1. Insert the keycap extraction tool (Qume part number 84873-01) directly down over the keycap to be removed as shown in Figure 2-19. Verify that the two keycap extraction tool prongs are inserted into the gap between keycap sides.
2. Lower the keycap tool until it rests against the keyboard metal plate below the keys and its prongs clear the underside of the keycap (step A).
3. While holding the tool vertically, slide it sideways to center the prongs beneath the keycap to be removed (step B).
4. Tilt the tool so that the prongs push upward, prying the keycap from the keyboard as shown (step C).

**Figure 2-19. Removal of Keyboard Keycaps**

SUBASSEMBLY REMOVAL AND REPLACEMENT

REPLACEMENT

To replace a keyboard keycap, place the new keycap directly over the socket as shown in Figure 2-20, and push gently into place, until the key is firmly held.

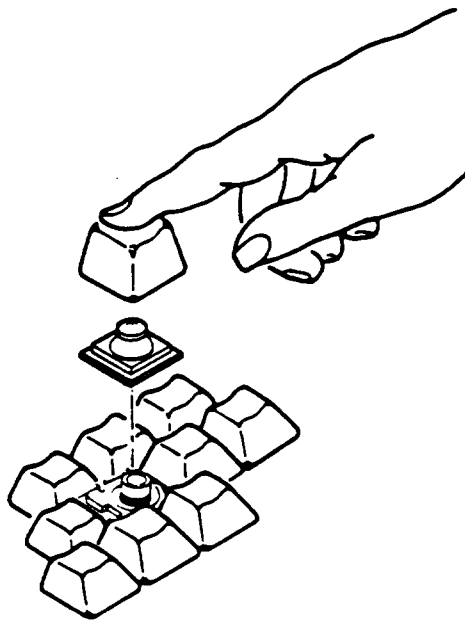


Figure 2-20. Replacement of Keyboard Keycaps

ALIGNMENT

INTRODUCTION

The alignment parameters presented in this section are to be regarded as guidelines only and not as specifications.

Video alignment of the QVT 101 PLUS™ terminal is divided into the following alignment procedures. These alignment procedures may be performed in any order.

- Horizontal Display Width (Line Width)
- Vertical Display Height
- Brightness
- Focus
- Display Centering (Raster Position)

TOOLS AND EQUIPMENT REQUIRED

The following tools are required to perform video alignment of the QVT 101 PLUS terminal:

- Phillips screwdriver (No. 2)
- Multimeter (for brightness alignment procedure)
- A metric ruler may be used in lieu of the template listed below
- QVT 101 Plus Field Service Tool Kit (Qume Part Number 84841-07), which consists of:
 - Non-metallic alignment tool, 7/64-inch Hex tip (Qume Part Number 10348-01)
 - Non-metallic screwdriver, 3/16-inch flat tip (Qume Part Number 10349-01)
 - Display Alignment Template, 14-inch CRT (Qume Part Number 10350-06)
 - Keycap Extraction Tool (Qume Part Number 84873-01)

ALIGNMENT

ALIGNMENT CONDITIONS

Before attempting an alignment, the applicable alignment procedure should be thoroughly read and understood. Perform alignment procedures under the following conditions:

- Warm-up. Allow the terminal to stabilize at its operating temperature; approximately ten minutes.
- Remove the Terminal Back Cover as explained in Section 2.
- Local Mode. Enter Setup Mode and configure the terminal for local mode operation.
- Normal Video Mode. Perform all alignment procedures in the terminal's normal video display, i.e., not in reverse video mode.
- "H" Test Pattern displayed. The terminal has a built-in test pattern that displays a full screen of upper case "H"s. To display the full "H" test pattern, enter Setup Mode and press 0. Figure 3-1 shows a typical "H" Pattern (25 lines, 80 columns) with display dimensions. Figure 3-2 shows the location of alignment components on the Video/Power Supply PCB. A Qume Display Alignment Template (Qume Part Number 10350-06) may be used over the "H" pattern for easy video alignment.

CAUTION

Take precaution when working in the general area of the CRT. Do not scratch or strike the CRT or subject it to unusual pressure. The CRT contains a high vacuum and breakage of the tube may result in injury from flying glass.

Hazardous voltages are present in the general area of the flyback transformer lead and the CRT anode cap. Exercise caution to avoid electrical shock when performing any video alignment procedure. Remember that the terminal is powered ON when the alignment procedures are made.

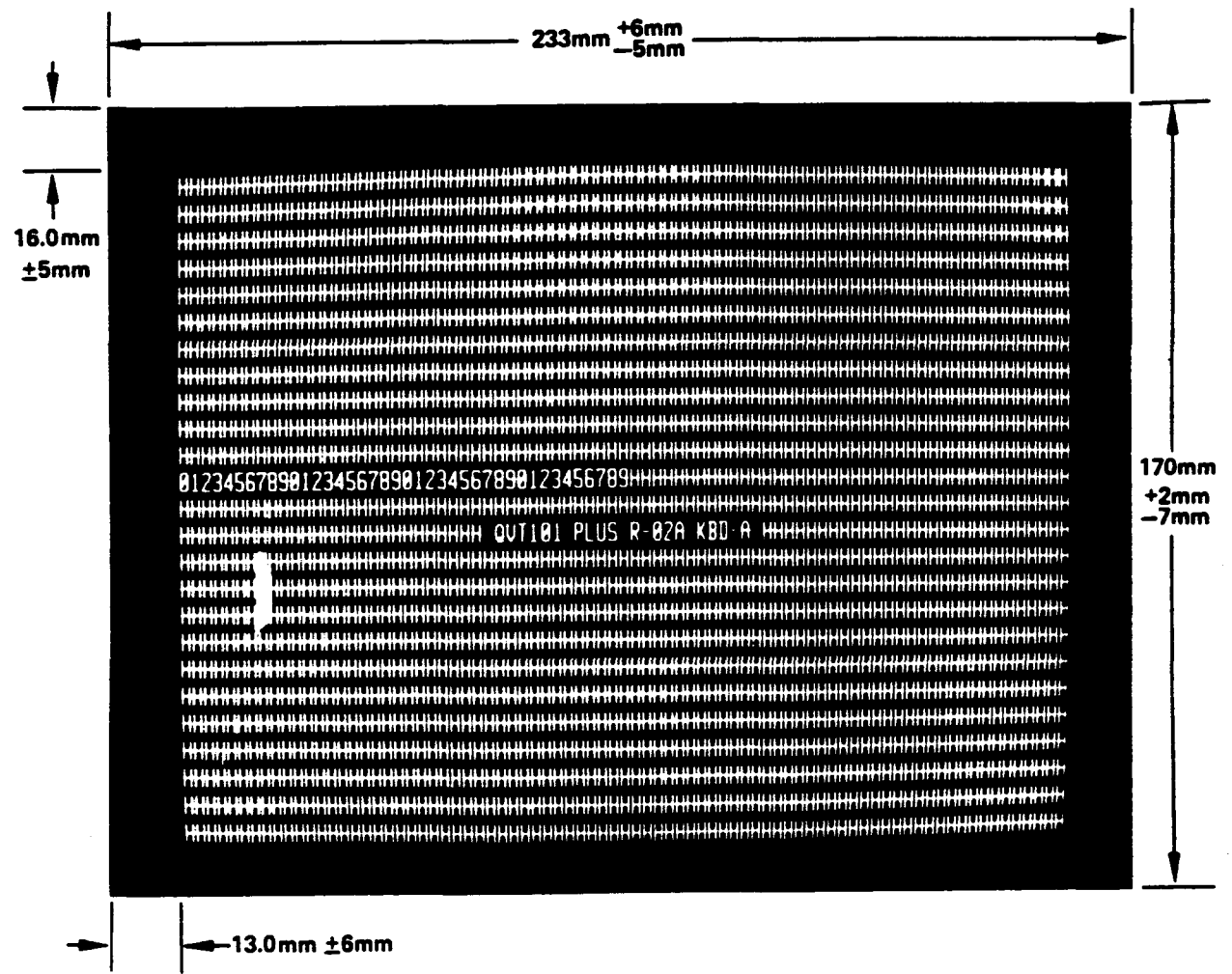
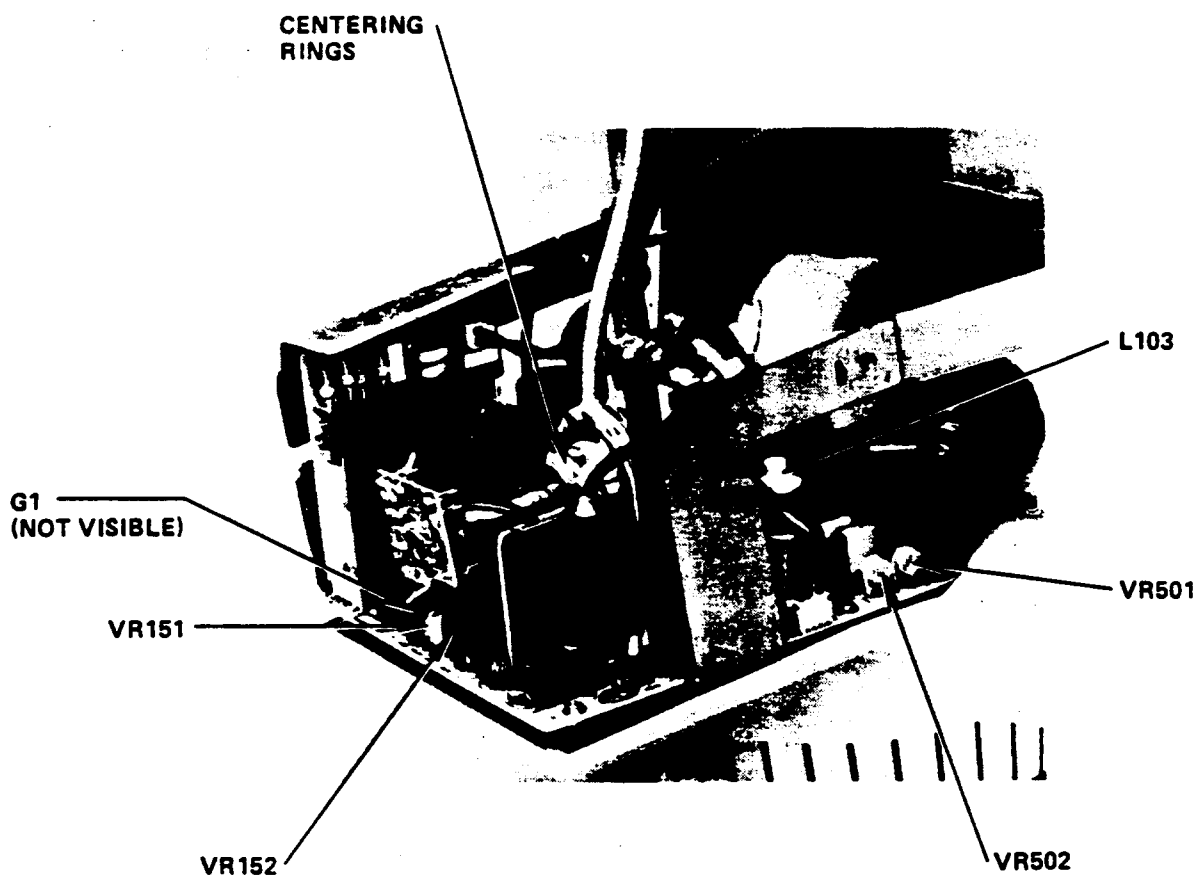


Figure 3-1. The "H" Test Pattern

ALIGNMENT

VIDEO ALIGNMENT PROCEDURES

Video alignment of the QVT 101 PLUS™ Terminal is accomplished by adjusting one or more of the adjustment components shown in Figure 3-2. Each alignment procedure is described below.



LEGEND

VR501	Vertical Display Height
VR502	Vertical Linearity
VR151	Brightness
VR152	Focus
L103	Horizontal Display Width
G1	Test Point (just to the left of VR151)
Centering Rings	Display Centering

Figure 3-2. Location of the Video Alignment Components

Horizontal Display Width (Line Width)

The horizontal display width may be checked for accuracy and adjusted in one of two ways as described below:

1. Display the "H" Test Pattern (enter Setup Mode, and press 0; exit test pattern by pressing the Clear key). There should be 25 rows of "H"'s on the screen at this time.
- 2a. Using the Display Alignment Template (Qume Part Number 10350-06), proceed as follows:

Place the Display Alignment Template against the front of the CRT. The horizontal display width window is properly aligned when the outer edges of the "H" characters in the test pattern lie in or on the window lines as shown in the Display Alignment Template.

When taking this measurement of the test pattern, be careful to minimize parallax distortion, i.e., move the position of "head and eyes" so that each reading is taken at a 90 degree angle to the screen (straight on).

- 2b. Using a Metric Ruler:

The distance between the inner edge of the front bezel and the outer edge of the first (last) character "H" can be measured using a metric ruler with accurate fine graduations. Near all four corners of the front bezel, this distance should be the same and lie within 13.0 ± 6.0 mm as shown on the "H" Test Pattern (Figure 3-1).

When taking this measurement of the test pattern, be careful to minimize parallax distortion, i.e., move the position of "head and eyes" so that each reading is taken at a 90 degree angle to the screen (straight on).

3. If adjustment is required, rotate L103 (Horizontal Display Width) on the Video PCB (see Figure 3-2) with a non-metallic 7/64-inch Alignment Tool (Qume Part Number 10348-01) until the display has the proper width. Clockwise rotation increases the display width and counterclockwise rotation reduces display width.
4. Verify that the horizontal display width is still correct. If necessary, readjust.

ALIGNMENT

Vertical Display Height

The vertical display height may be checked for accuracy and adjusted in one of two ways as described below, proceed as follows:

1. Display the "H" test pattern (enter Setup Mode and press \emptyset ; exit the test pattern by pressing the Clear key). There should be 25 rows of "H"'s on the screen at this time.

- 2a. Using the Display Alignment Template (Qume Part Number 10350-06), proceed as follows:

Place the Alignment Template against the front of the CRT. The vertical display width window is properly aligned when the upper edges of the "H" characters in the test pattern lie in or on the window lines as shown on the Display Alignment Template.

When taking this measurement of the test pattern, be careful to minimize parallax distortion, i.e., move the position of "head and eyes" so that each reading is taken at a 90 degree angle to the screen (straight on).

- 2b. Using a Metric Ruler:

The distance between the inner edge of the front bezel and the top edge of the first line of "H" characters may be measured using a metric ruler with accurate fine graduations. Near all four corners of the front bezel, this distance should be the same and lie within 16.0 ± 5 mm as shown on the "H" Test Pattern (Figure 3-1).

When taking this measurement of the test pattern, be careful to minimize parallax distortion, i.e., move the position of "head and eyes" so that each reading is taken at a 90 degree angle to the screen (straight on).

3. If adjustment is required, change the setting of the VR501 control (Vertical Display Height) on the Video PCB (see Figure 3-2). Using a small non-metallic standard flat blade screwdriver, (Qume Part Number 10349-01) clockwise adjustment of VR501 increases display height; counterclockwise rotation reduces display height.
4. Verify that vertical display height is still correct. If necessary, readjust.

Brightness

Display brightness can be adjusted as follows:

1. Display the Reverse Video, (enter Setup Line, Change to Reverse Video Press Setup again to Exit.
2. Rotate the external brightness control on the display module pedestal fully counterclockwise (CCW).
3. Locate pot VR151 on the Video PCB (see Figure 3-2), and with a small non-metallic flat blade screwdriver (Qume Part Number 10348-01) adjust VR151 until the background raster is just visible.
4. Locate test point G1 on the Video PCB (see Figure 3-2) and measure the DC voltage between G1 and ground. **Note:** This voltage may be a positive or negative voltage. Record the voltage observed.
5. Adjust VR151 to increase the negative voltage observed between G1 and ground by a proximately 11 +3,-1 VDC.

Focus

The Display focus can be adjusted as follows:

1. Display the "H" Test Pattern (enter Setup Mode and press 0).
2. Locate VR152 on the Video PCB (see Figure 3-2), and with a small non-metallic flat blade screwdriver, adjust VR152 for optimum focus at the center of the display. Optimum focus occurs when the individual dots that form a character are well defined and clear. Note the setting of VR152.
3. Observe a corner area of the display and change the setting of VR152 for optimum focus there. Note the setting of VR152.
4. Carefully adjust VR152 for optimum focus compromise setting between the center and corner of screen areas.

Display Centering (Raster Position)

The display is considered to be centered when the bottom edge of the first line of "H"'s and the top edge of the first line of "H"s in the "H" Test Pattern are parallel to, and visible between the parallel maximum and minimum lines on the Display Alignment Template (Qume Part No. 10350-06). The raster position may be changed by rotating the centering rings on the back end of the CRT yoke (see Figure 3-2). These rings are Glyptaled in place to prevent a change in position from vibrations and should only be broken loose if a raster adjustment is really necessary. If an adjustment is required, proceed as follows:

ALIGNMENT

1. Display the "H" Test Pattern (enter Setup Mode and press 0).
- 2a. Position the Display Template (Qume Part Number 10350-06) over the "H" test pattern. (Tape the template to the front bezel so that it is securely held in place.) If the display is correctly centered, the edges of the "H" Test Pattern will be visible between the parallel maximum and minimum lines on the display template. If a template is not available proceed with step 2b.
- 2b. On a sheet of paper with straight edges, make two sets of marks along the edges near a corner at the distances and tolerances from the corner shown by the "H" Test Pattern on Figure 3-1. By holding this paper scale directly against the CRT surface, use the marks to measure and to adjust the display centering. A flexible metric ruler with accurate divisions may be used in place of the paper scale.

When measuring the display position of the test pattern, be careful to minimize parallax distortion, i.e., move the position of "head and eyes" so that each reading is taken at a 90-degree angle to the screen surface (straight on).

3. Only if a display centering adjustment is required, use a knife to carefully cut the Glyptal on the centering rings on the yoke of the CRT and rotate the rings as required to center the display.

NOTE

Do not loosen the deflection yoke clamp; the yoke position has been fixed at the factory and should not be changed in the field.

4. Check for proper display size and linearity if the setting of the centering rings has been changed.
5. Apply some Glyptal (or equivalent) on the centering rings after adjustment to prevent inadvertent movement of the rings due to vibration.

PARTS

INTRODUCTION

This section presents a listing of recommended spare parts, illustrated assemblies, and corresponding parts listings for the QVT 101 PLUS terminal. The parts quantities shown in the table of Recommended Spare Parts are based on the number of service supported monitors. The illustrations may be used as assembly guides and for identification of missing or broken parts when repairing a terminal. Some parts may be shown for clarity only. Parts not illustrated or listed are not available for replacement. Parts replacement may be at a next higher level.

Table 4-1. QVT 101 PLUS Recommended Spare Parts

PART NUMBER	DESCRIPTION	QTY PER 1000	QTY PER 10,000
302136-01	Fuse 1 Amp, 250 Volts (5mm)	10	50
301861-01	Fuse .5 Amp. 250 Volts (5mm)	10	50
302250-03	Video PCB Assembly	20	100
302053-01	Brightness Control Assembly w/wiring	10	30
302037-01	CRT & Yoke Assembly, Green 14" CRT	5	20
302037-02	CRT & Yoke Assembly, Amber 14" CRT	5	20
302041-01	Power Supply Control PCB	10	30
302029-01	Keyboard Assembly (USA)	20	100
302030-01	Function Key Identifier Strip	2	100
302055-01	Speaker Assembly (PLUS products)	5	10
302057-01	Logic PCB to Video PCB Cable Assy (PLUS products)	5	10
302046-03	Transformer 115V/60 Hz (QVT 101 PLUS only)	10	30
302046-02	Transformer 230V/50 Hz (PLUS products)	10	30
391210-200	Logic PCB Assembly w/firmware (QVT 101 PLUS only)	20	150
302087-01	Brightness Control Knob	10	50
302056-01	Keyboard Connector Assy, w/wiring (PLUS products)	5	10
10244	Coiled Cable Assembly, Keyboard	5	20
302054-01	Power Switch/Fuse/Filter Assy. 115V	5	10
302054-02	Power Switch/Fuse/Filter Assy. 230V	5	10
84806-01	Battery, RAM Back-Up, 3V (Lithium)	10	25
391210-100	QVT 101 PLUS Firmware Kit	5	15

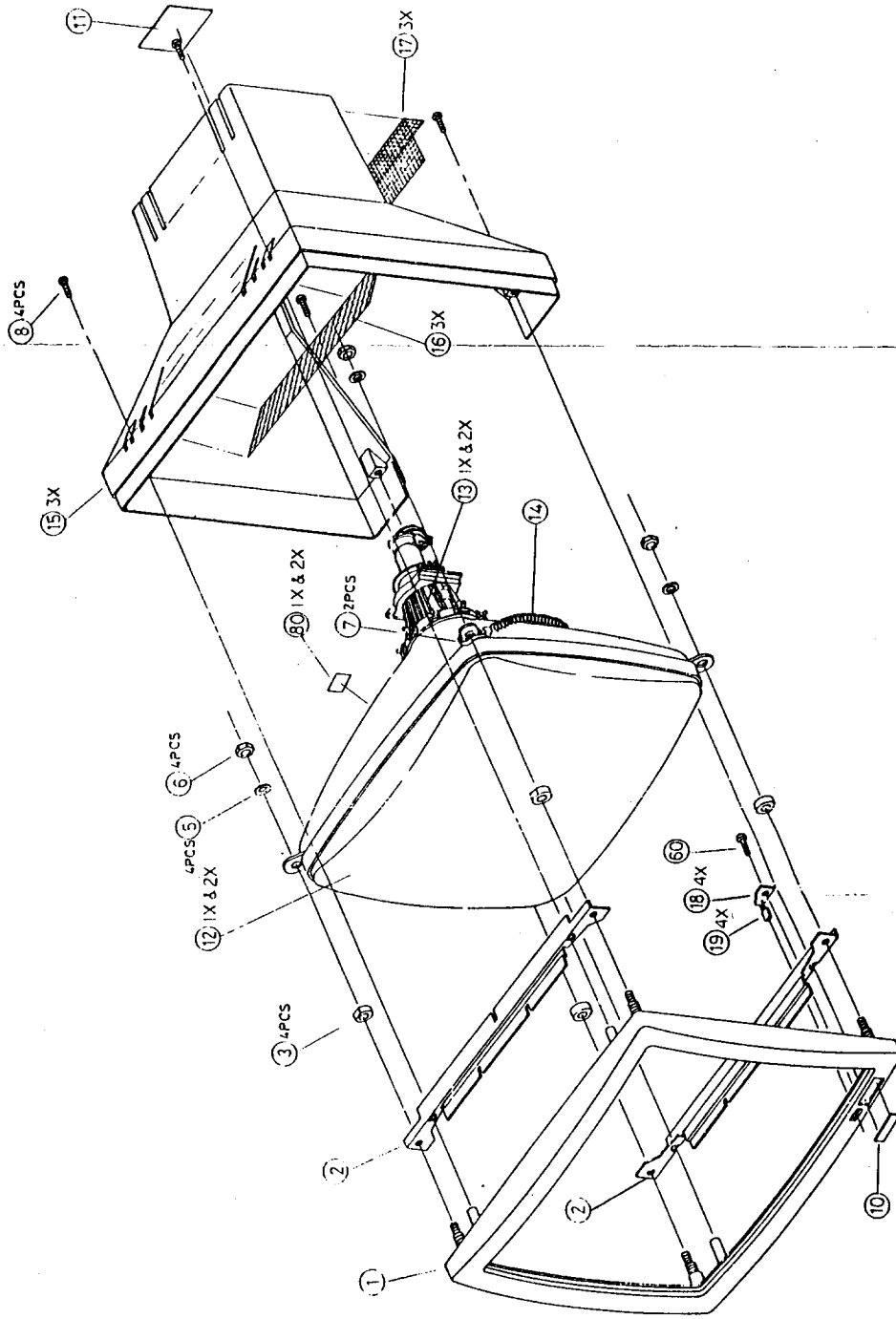


Figure 4-1. QVT 101 Plus Upper Monitor Area (Sheet 1 of 2)

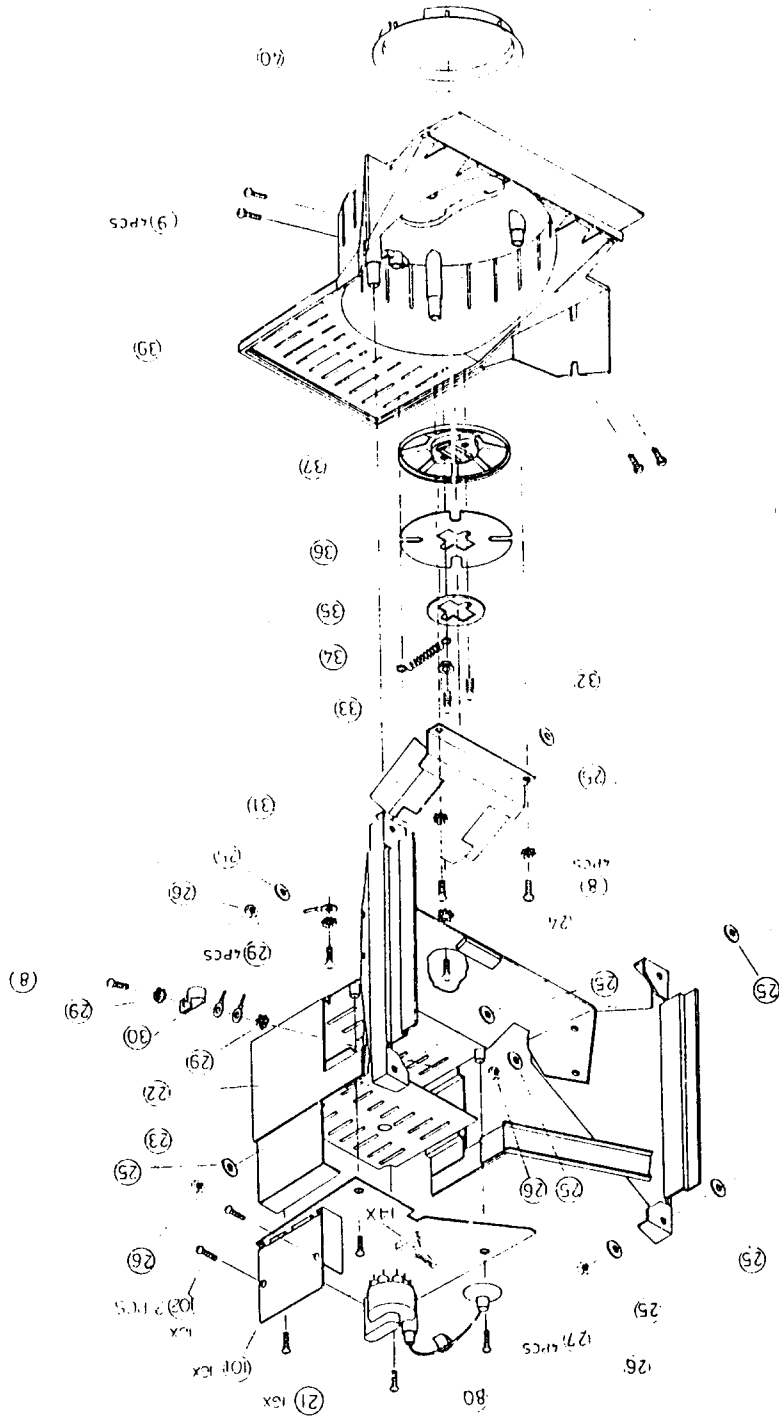


Figure 4-1. QVT 101 Plus Upper Monitor Area (Sheet 2 of 2)

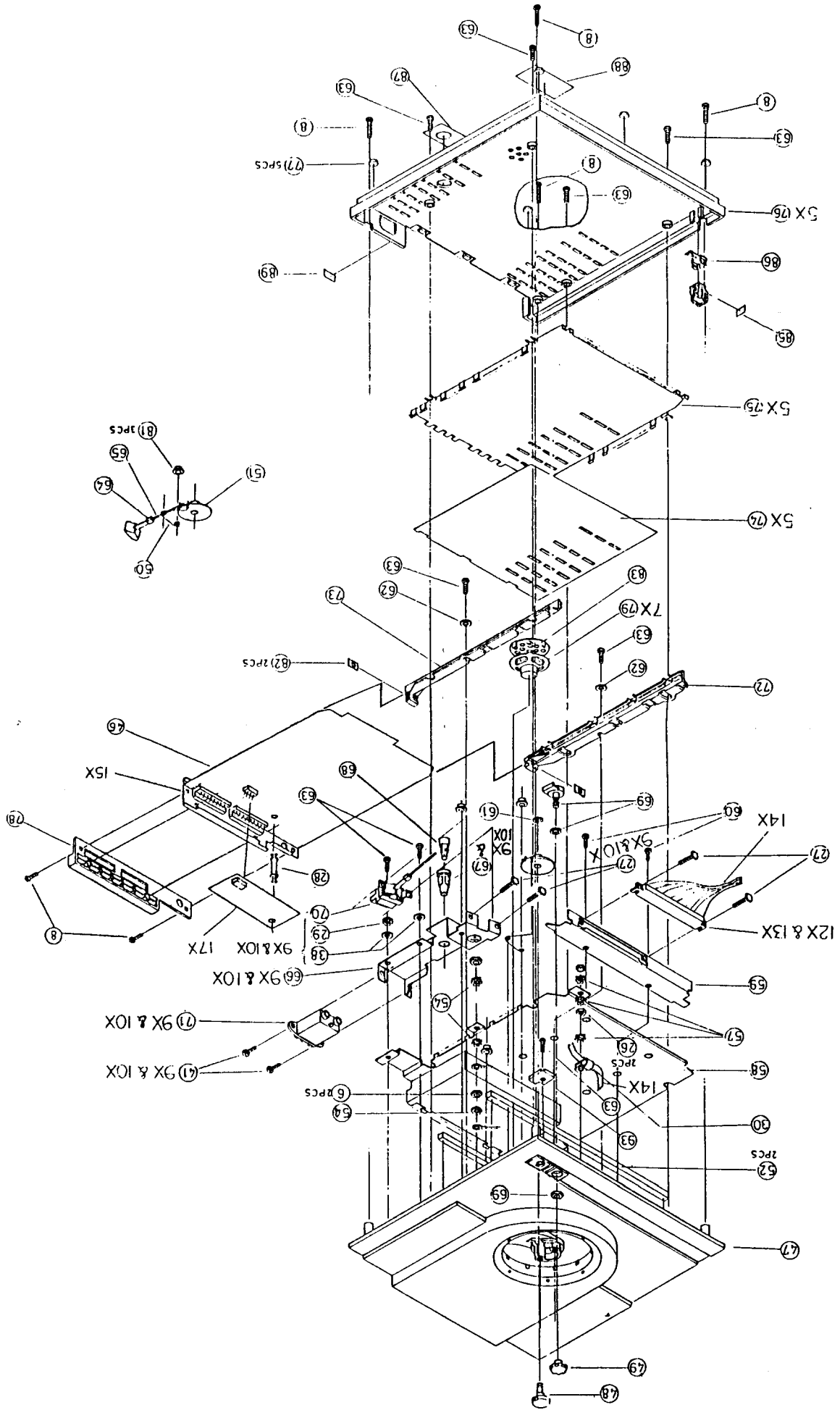


Figure 4-2. QVT 101 Plus Lower Monitor Area

Table 4-1. QVT 101 PLUS Exploded Parts List

ITEM	PART NUMBER	DESCRIPTION
1	302088-01	QVT PLUS Bezel
2	302089-01	Panel Support
3	302090-01	CRT Rubber Washer
5	302091-01	Washer/Flat M5XD14XT1
6	302092-01	Nut M5XB8XH4
7	10384-01	Locking Cable Tie
8	302093-01	Screw M4X0.7
9	302094-01	Screw M4-0.7+12P SEMS
10	302095-01	Qume LOGO (PLUS)
11	302096-01	Rating NP QVT 101 PLUS 120V
11	302096-02	Rating NP QVT 101 PLUS 230V
14	10007	Ground Spring
21		Replaced by 16x
22	302103-01	Chassis Assembly
23	302104-01	Chassis Insulation
24	302105-01	Rubber Pad
25	302106-01	Washer/Flat 3.2X12X1.6
26	10325-01	Nut M3B5.5XH2.4
27	302107-01	Screw M3X0.5+8P
28	302108-01	Nylon Post
29	301195-01	Washer (Ex Lock)
30	302109-01	Cable Clip
31	302046-03	Transformer 115V QVT 101 PLUS
31	302046-02	Transformer 220V (PLUS Products)

PARTS

Table 4-1. QVT 101 PLUS Exploded Parts List (Cont)

ITEM	PART NUMBER	DESCRIPTION
32	10314	Screw M4X0.7X16
33	302112-01	Spring Bushing
34	302113-01	Tension Spring
35	302114-01	Slide Block Washer
36	302115-01	Press Spring
37	302116-01	Retaining Cup
38	301234-01	Flat Washer 4.2X12X1-N1
39	302117-01	Tilt Neck
40	302118-01	Slide Ring
41	10053	Screw M3X0.5X6
46	391210-200	QVT 101 PLUS Logic BD. W/Firmware
47	302119-01	Lower Cabinet Top Cover (PLUS)
48	302120-01	Power Knob (LT.GRN)
49	302087-01	Brightness Knob (Lt. Blue)
50	302122-01	Switch Push Spring
51	302123-01	Swivel Table
52	302124-01	Straight Support Bar
54	302125-01	Washer (EX. Lock) M5
57	10033	Washer (EX. Lock) M3
58	302126-01	Top Plate Shield
59	302127-01	Connector Bracket
60	302128-01	Taping Screw TPB-3.5 +8
61	302129-01	Tilt Axle E. Ring
62	302130-01	Washer/Flat 3.7X8X0.8
63	302131-01	Taping screw TBP-3.5 +16P

Table 4-1. QVT 101 PLUS Exploded Parts List (Cont)

ITEM	PART NUMBER	DESCRIPTION
64	302132-01	Switch Cap Lock
65	302133-01	Switch Link Shaft
66	302134-01	Power Switch Support Bracket
67	302135-01	Fuse Holder (PLUS Model)
68	302136-01	Fuse 1.0 Amp/S1o 5mm 115V
68	301861-01	Fuse 0.5 Amp/S1o 5mm 230V
70	301163-01	A.C. Switch 115V
70	301501-01	A.C. Switch 230V (VDE)
71	301160-01	Line Filter
72	302138-01	PCB Guide (L)
73	302139-01	PCB Guide (R)
77	302143-01	Rubber Foot
78	302144-01	Rear Panel PCB Cover
80	301850-01	Danger Label-High Voltage
81	302145-01	Locking Cap
82	302146-01	PCB Guide Nut Plate
83	302147-01	Speaker Cover
85	10046	Insulation Film
86	302148-01	Phone Jack ESD Plate
87	302149-01	Fuse Name Plate 1 Amp 250V
89	302110-01	Label/Power Cord 115V
89	302111-01	Label/Power Cord 230V
93	302121-01	Cable Bracket

PARTS

Table 4-1. QVT 101 PLUS Exploded Parts List (Cont)

ITEM	PART NUMBER	DESCRIPTION
101	302041-01	Power Supply Control Board 101 PLUS
102	10053	Screw M3X0.5X6
1X	302037-01	CRT/Yoke Assy. GRN (PLUS)
2X	302037-02	CRT W/Yoke Amber (PLUS)
3X	302058-01	Upper Cabinet Cover w/Screen
4X	302153-01	Power On LED Cable Assembly
5X	302060-01	QVT 101 PLUS Lower Cabinet Bottom Cover Assy.
6X	302056-01	Keyboard Connector Assy.
7X	302055-01	Speaker Assy. (PLUS Products)
8X	302053-01	Brightness Control Assy. (PLUS products)
9X	302054-01	Power Switch/Fuse/Filter Assy. 115V
10X	302054-02	Power Switch/Fuse/Filter Assy. 230V
12X	302154-01	Molex Connector 22P
13X	302155-01	Molex Terminal Pin
14X	302057-01	LR to VB Cable (PLUS products)
15X	302245-01	Logic PCB Port Bracket
16X	302250-03	QVT 101 PLUS Video/Power Supply PCB Assembly
17X	302085-01	Current Loop PCB (option)
17X	302085-02	RS422 PCB (option)

Table 4-2. QVT 101 PLUS Keyboard Exploded Parts List

ITEM	PART NUMBER	DESCRIPTION
107	302179-01	Key Housing
109	301955-01	Space Bar Guide
110	301370-01	Space Bar Wire
111	10342-08	Axle Bar
112	10342-06	Axle Spring (A)
113	10342-07	Axle Spring (B)
114	302243-01	Adj. Foot (A) Gray
115	302244-01	Adj. Foot (B) Gray
116	10342-02	Axle Spring Lock
117	10342-03	Washer Flat M3X7X0.5T
118	10245	Keyboard Foot Pad Black
119	302030-01	Function Strip (PLUS Products)
121	301157-01	Taping Screw
122	302182-01	Screw TPS-3 + 6P-NI
123	302183-01	Tap Screw TPP-4.0 + 10F-NI
124	302184-01	Tap Screw TPP-4.0 + 10P-NI
125	302185-01	ESD Film Keyboard (PLUS Products)
126	10244	Coil Cable Assy.
127	301814-01	Locating Clamp
131	302187-01	Function Key Spacer (Knob)
132	302188-01	Function Key Spring
137	302190-01	Keyboard Top Cover (PLUS)
140	302192-01	Std. Rubber Dome
141	302193-01	Space Bar Rubber Dome

PARTS

Table 4-1. QVT 101 PLUS Keyboard Exploded Parts List (Cont)

142	301153-01	Space Bar Wire Support
188	302195-01	Insulation Film
189	10033	Washer EX.M3XD6.5XT0.45
190	301195-01	Washer EX.M4XD8.5XT0.45
191	301959-01	Guide Bushing Keyboard
196	302241-01	Function Key Cap
197	302256-01	Dust Mask Function Keycap
1X	302235-01	101 PLUS Strip/Holder Cover Assy.
2X	302236-01	STD. Key Plunger/Sponge
3X		Replaced by 4x
4X	302238-01	Function Key Switch Assy.
5X	302239-01	Keyboard Bottom Cover Assy (PLUS)
6X	302240-01	Keyboard Assy. w/o Covers (PLUS Products)

CIRCUITS AND DIAGRAMS

The following circuits and diagrams of the QVT 101 PLUS Terminal are provided for reference:

- QVT 101 PLUS Functional Block Diagram..... 5-3
- QVT 101 PLUS Overall Interconnect Diagram..... 5-5
- QVT 101 PLUS Video/Power Supply Control PCB Schematic..... 5-7
- QVT 101 PLUS Video/Power Supply PCB Schematic..... 5-9
- QVT 101 PLUS Logic PCB Schematic..... 5-13
- QVT 101 PLUS Keyboard PCB Schematic Diagram..... 5-25
- QVT 101 PLUS RS-422/Current Loop PCB Schematic Diagram..... 5-27

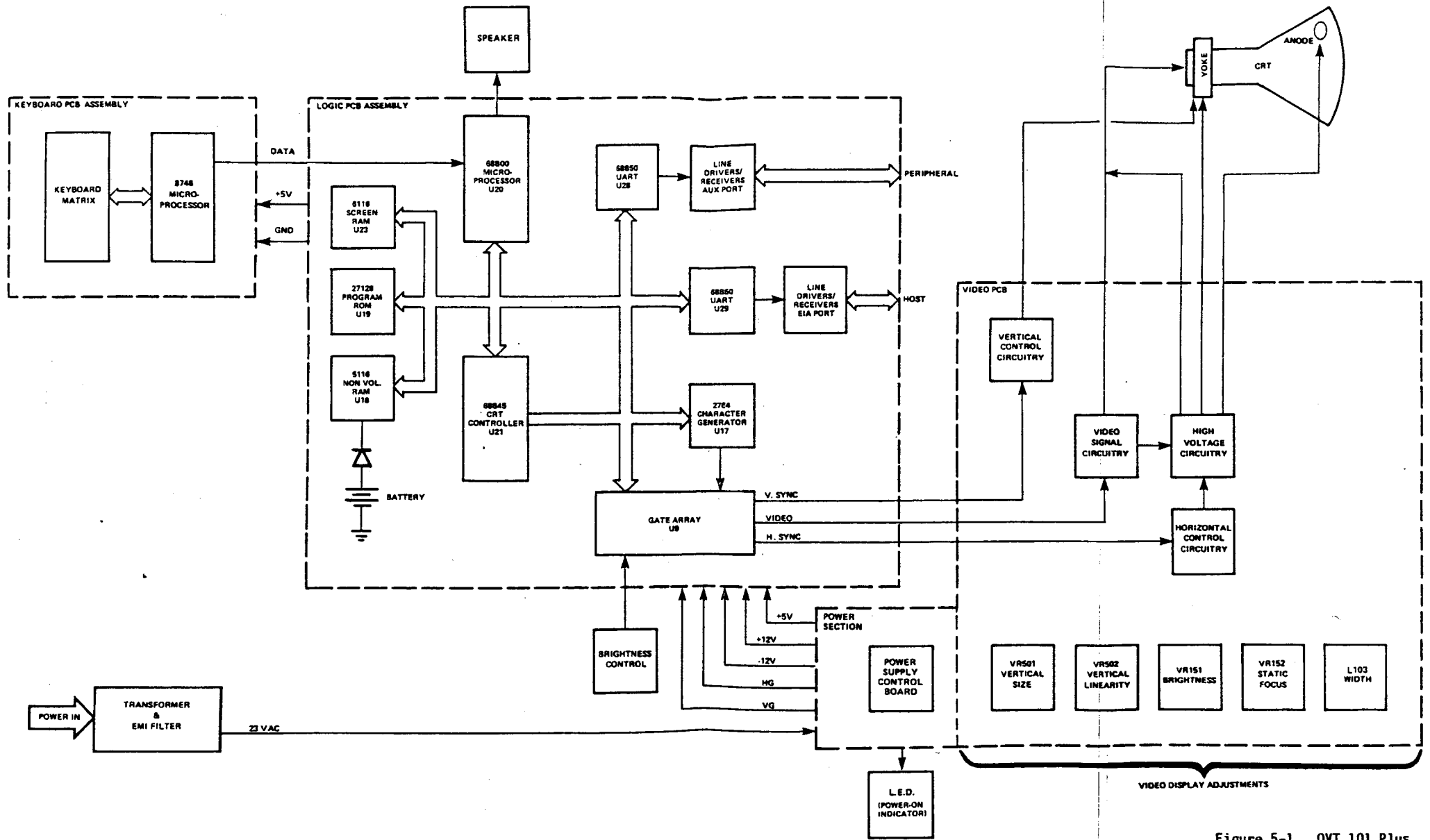


Figure 5-1. QVT 101 Plus Functional Block Diagram

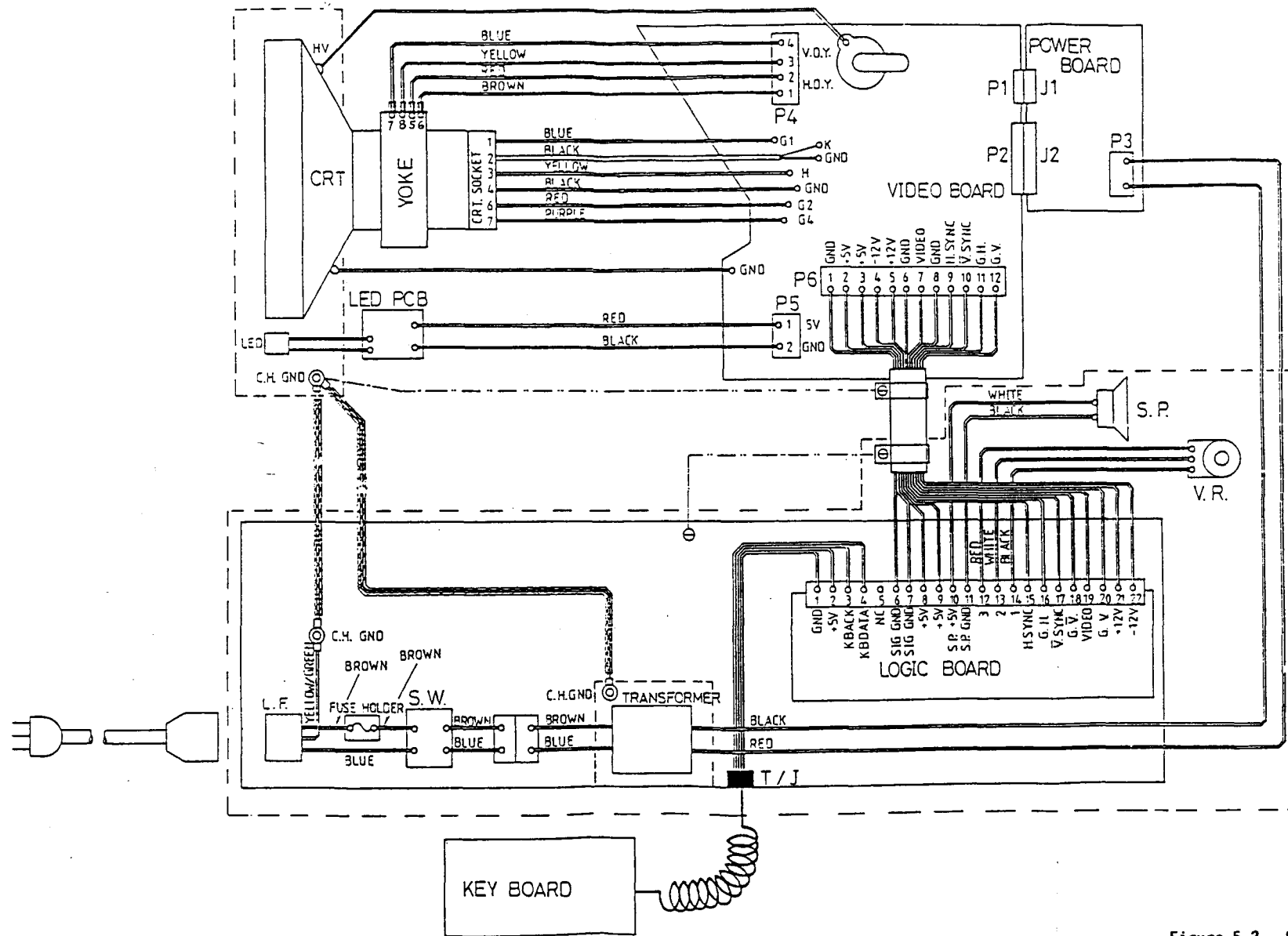


Figure 5-2. QVT 101 Plus Overall Interconnect Diagram

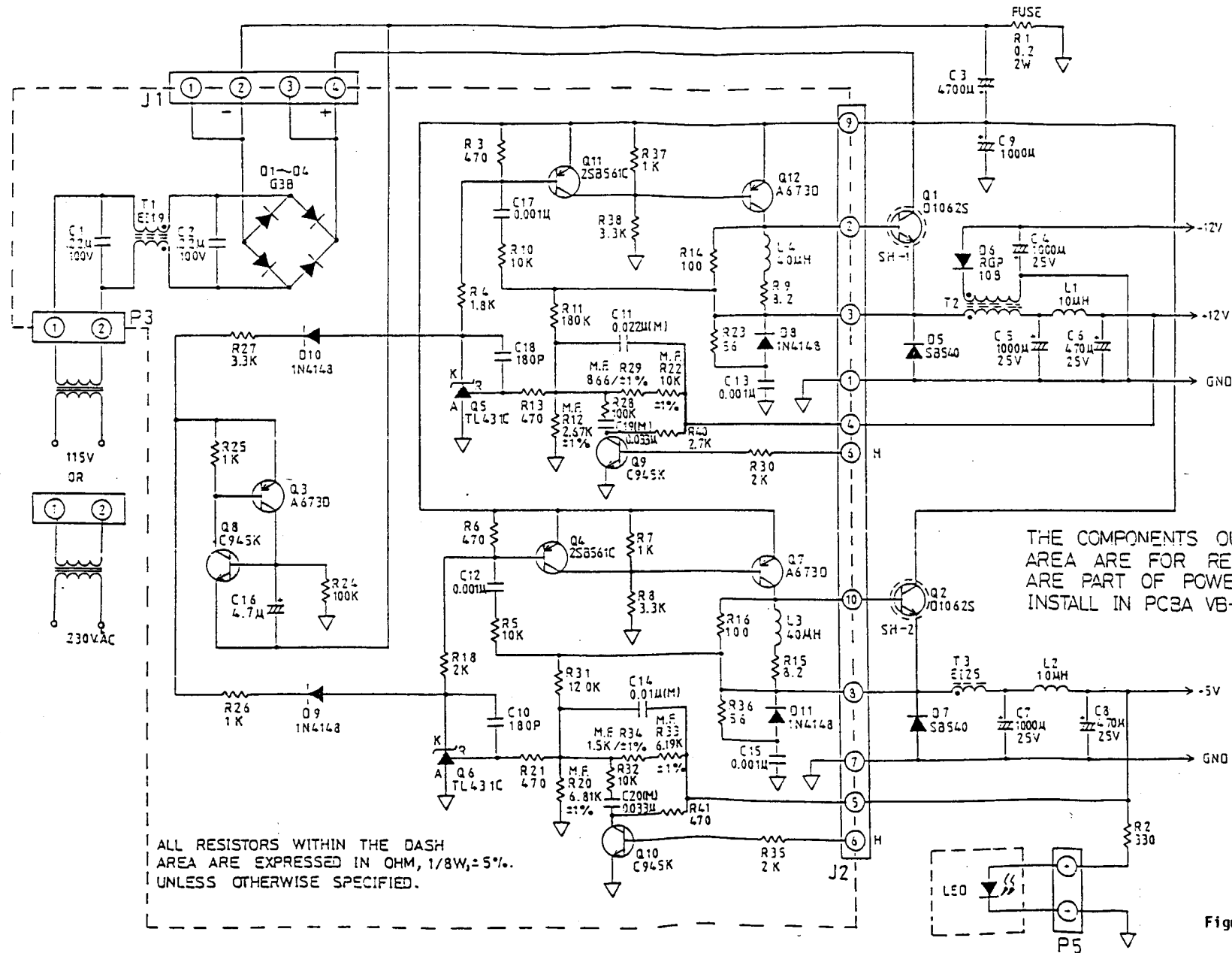


Figure 5-3. QVT 101 Plus Video/Power Supply Control PCB Schematic

NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL RESISTORS ARE EXPRESSED IN OHMS, 1/4W, ±5%.
2. ALL CAPACITORS ARE EXPRESSED IN FARADS, 50V.
3. VOLTAGES ARE DIRECT CURRENT.
4. DIFFERENCES BETWEEN EACH -XX

	T201N(-01)	T119N(-02)	T101N(-03)
R106	24K / 1/8W	18K / 1/8W	18K / 1/8W
C109	0.047μ / 400V	0.03μ / 400V	0.033μ / 400V
C108	15μ / 25V	12μ / 25V	12μ / 25V
L103	5~36μH	3.5~20μH	6~36μH
T4	VT-544	VT-543	VT-543
C156	0.01μ / 400V	0.0056μ / 630V	0.0068μ / 500V

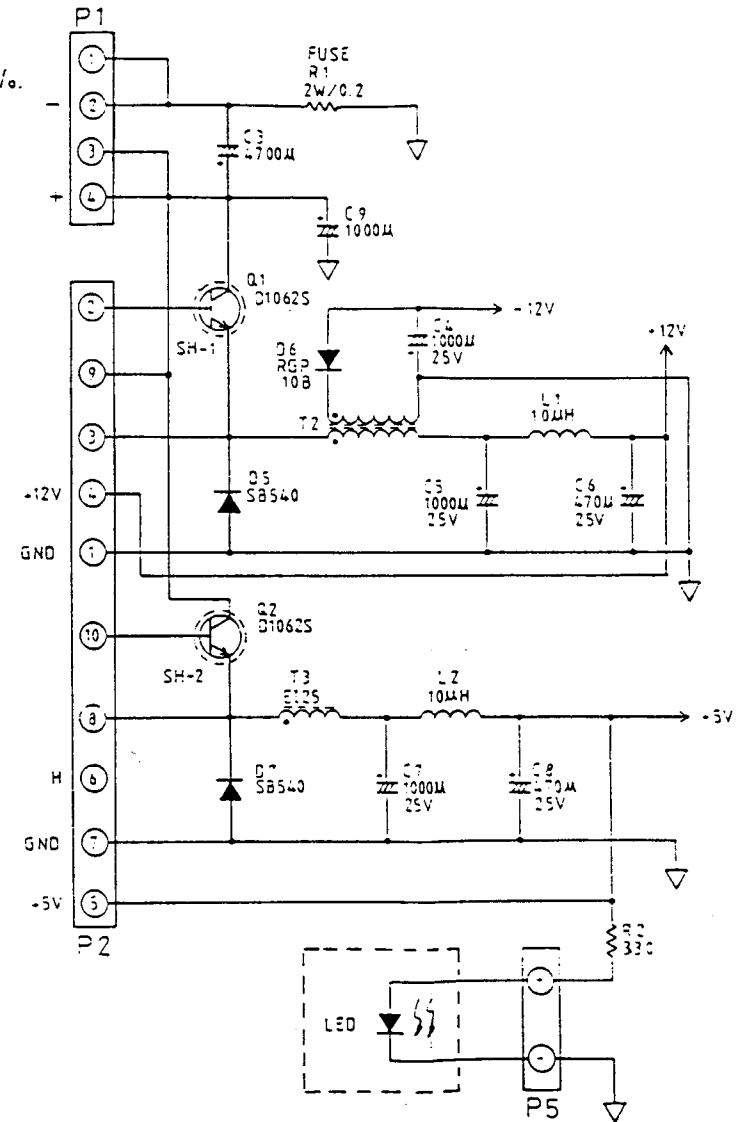


Figure 5-4. QVT 101 Plus Video/
Power Supply PCB
Schematic (Sheet 1 of

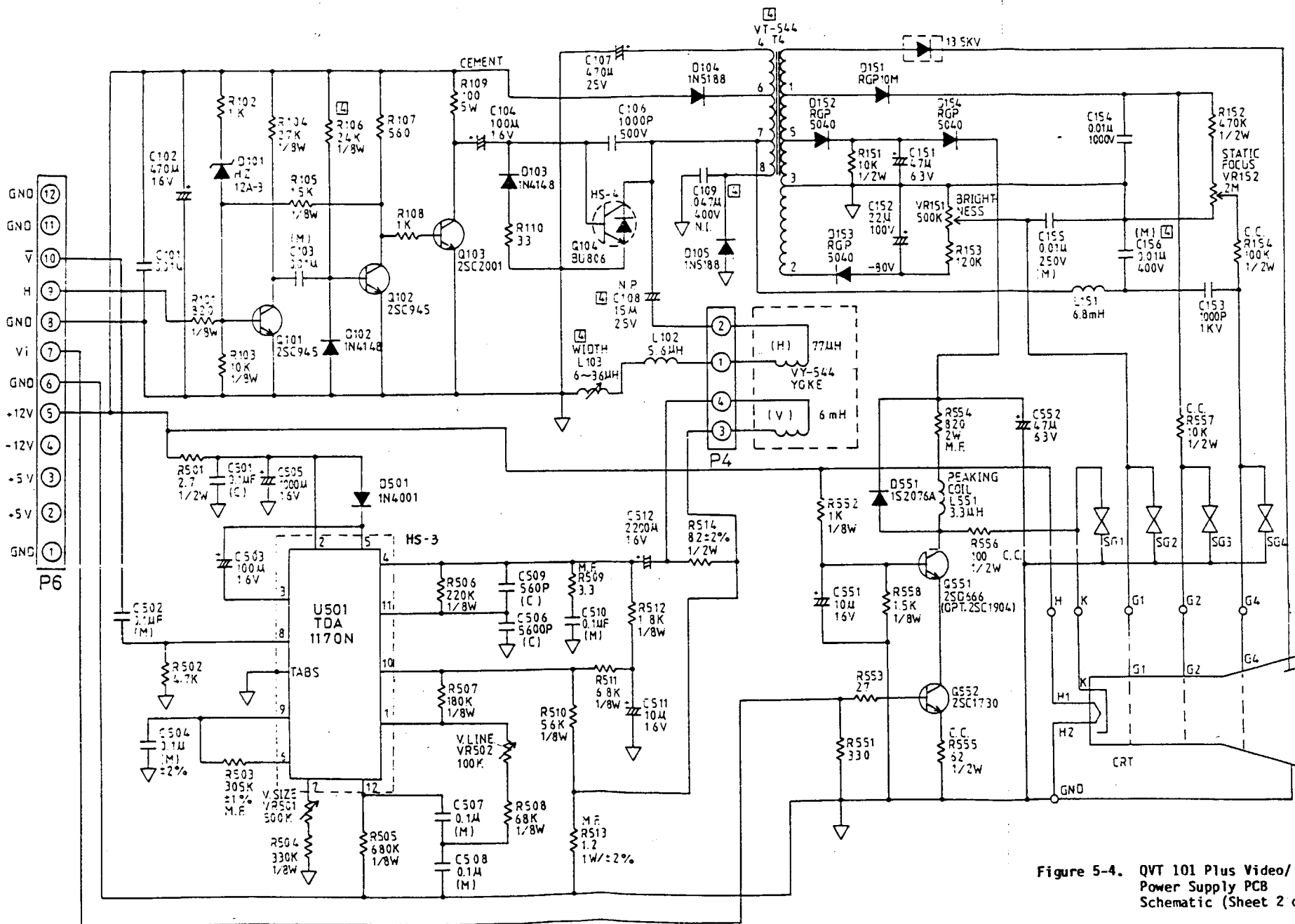
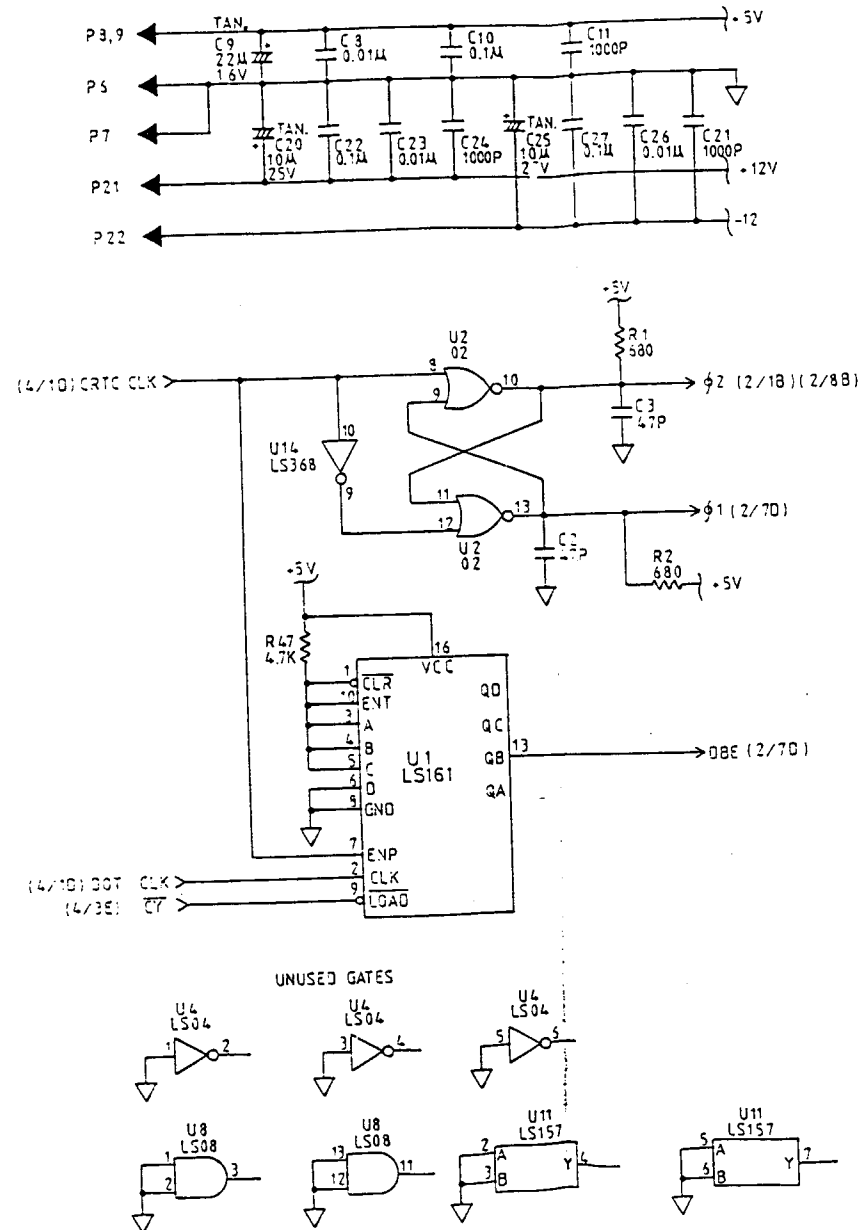


Figure 5-4. QVT 101 Plus Video/Power Supply PCB Schematic (Sheet 2 of 2)



NOTES: UNLESS OTHERWISE SPECIFIED.

1. ALL RESISTORS ARE EXPRESSED IN OHMS, 1/4W, ±5%.
2. ALL CAPACITORS ARE EXPRESSED IN FARADS, 50V.
3. VOLTAGES ARE DIRECT CURRENT.
4. TYPE IDENTIFICATION FOR 7400-SERIES IC'S IS OBTAINED BY PREFIXING NUMBER WITH 74, EXAMPLE: LS04 = 74LS04.
5. JUMPER SELECT:
 - a. CHARACTER GENERATOR W2: 2764(450NS)(DEFAULT). W3: R098648-0017.
 - b. SYSTEM MEMORY SIZE W4: 2K(5516/5517)(DEFAULT). W5: 8K(5564, 250NS).
 - c. TERMINAL'S DCD SOURCE W7: E1A'S DCD (DEFAULT). W6: E1A'S DSR.
 - d. E1A'S DTR SOURCE W9: TERMINAL'S DTR (DEFAULT). W8: TERMINAL'S RTS.
 - e. DISPLAY MEMORY SIZE W10: 2K (6116-3) W11: 8K (5564 250NS).

REFERENCE DESIGNATOR	
LAST USED	NOT USED
U33	---
R49	---
C76	C28
Q13	---
Q6	---
L2	---
Y1	---
W11	---

Figure 5-5. QVT 101 Plus Logic PCB Schematic (Sheet 1 of 6)

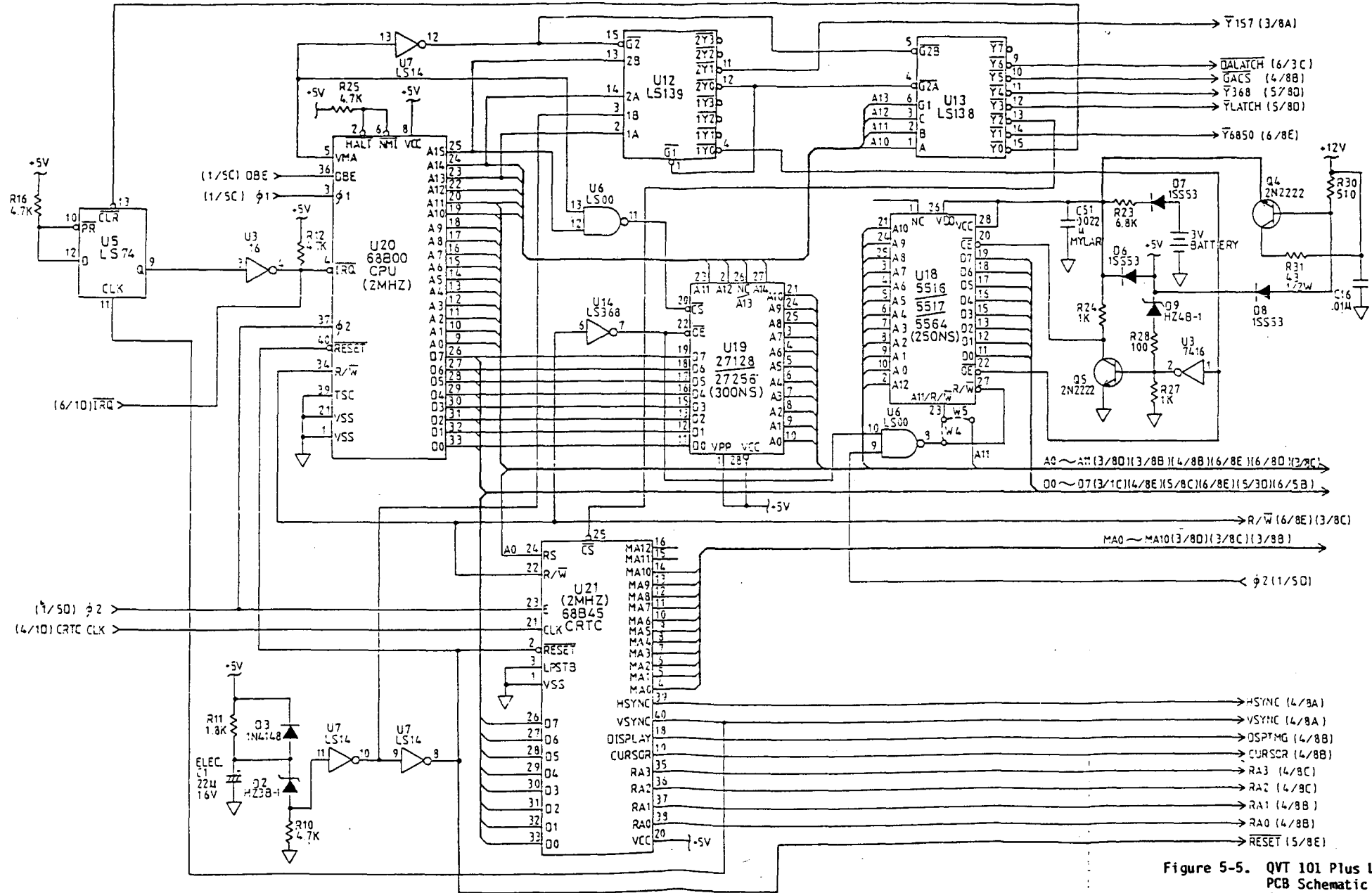


Figure 5-5. QVT 101 Plus Log PCB Schematic (Sheet 2 of 6)

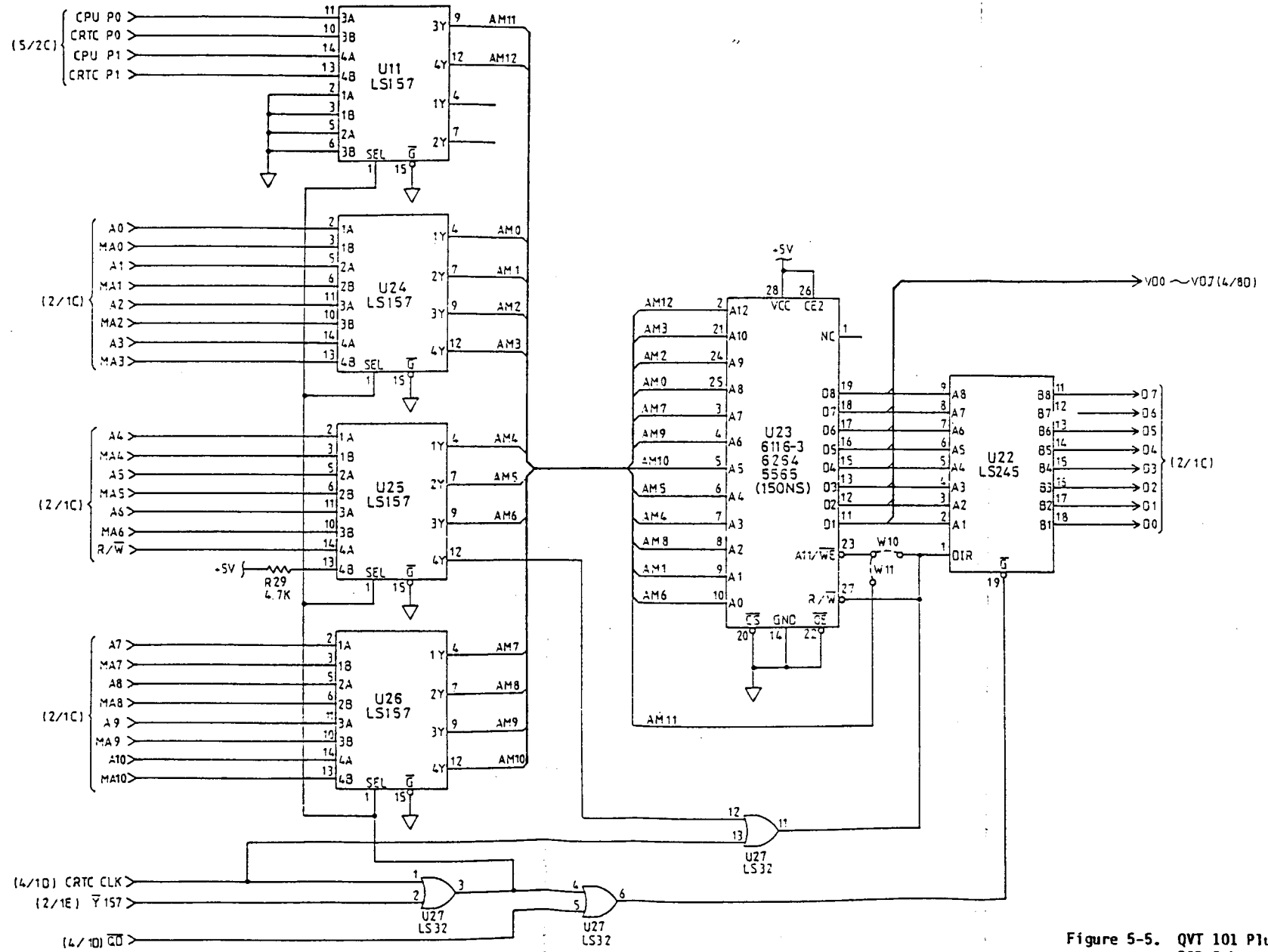


Figure 5-5. QVT 101 Plus Logic PCB Schematic (Sheet 3 of 6)

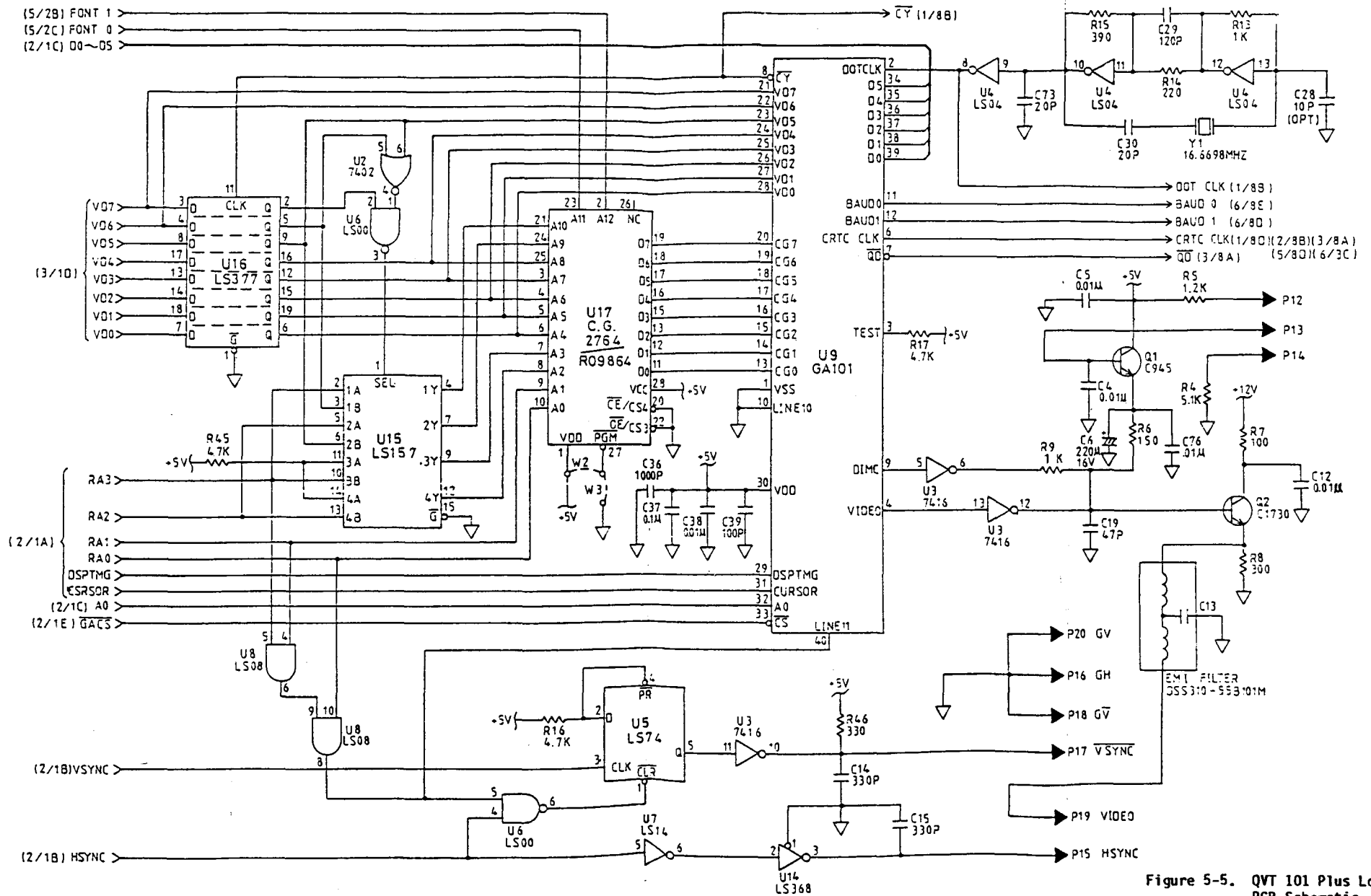


Figure 5-5. QVT 101 Plus Logic PCB Schematic (Sheet 4 of 6)

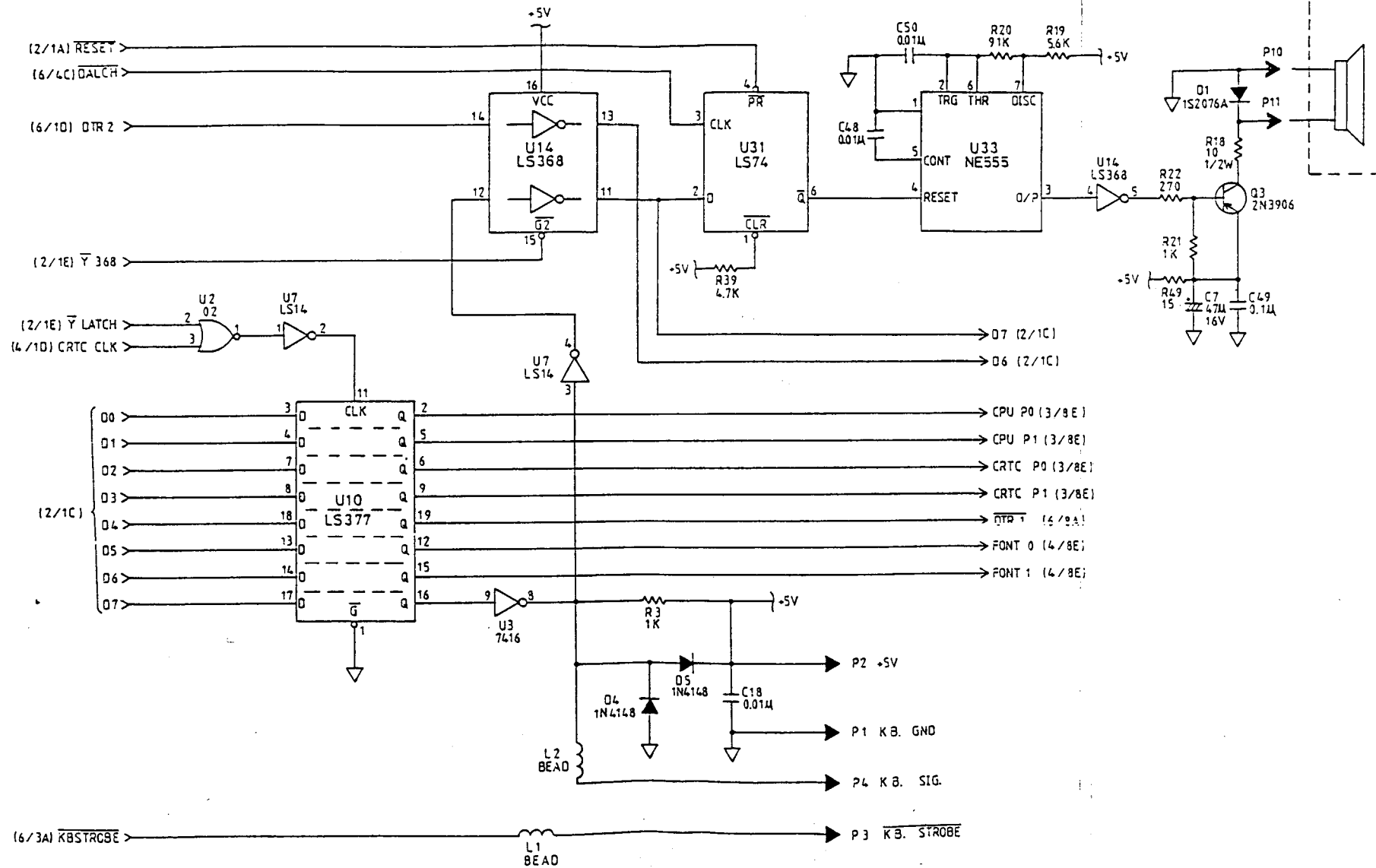


Figure 5-5. QVT 101 Plus Logic PCB Schematic (Sheet 5 of 6)

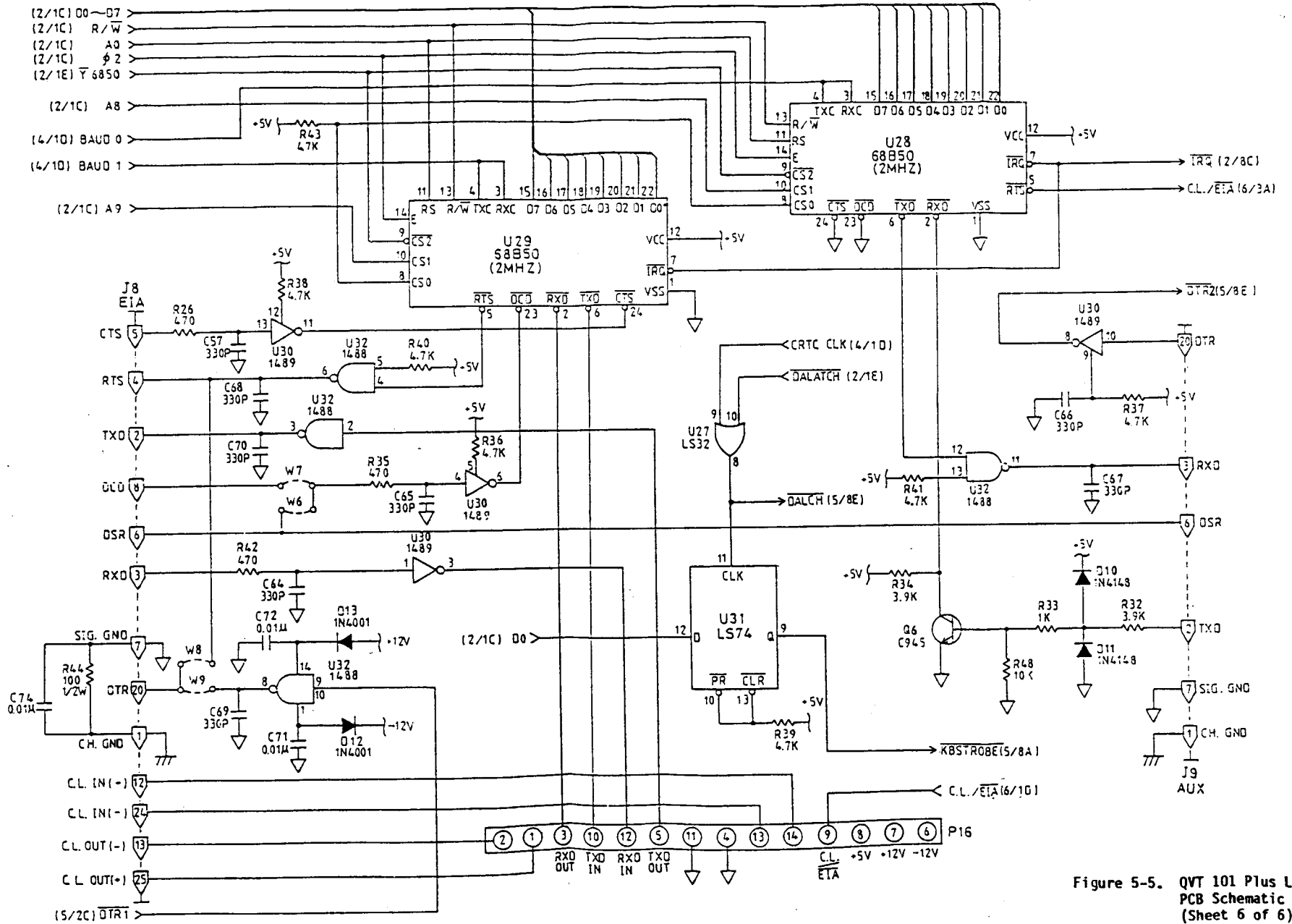


Figure 5-5. QVT 101 Plus Logic PCB Schematic (Sheet 6 of 6)

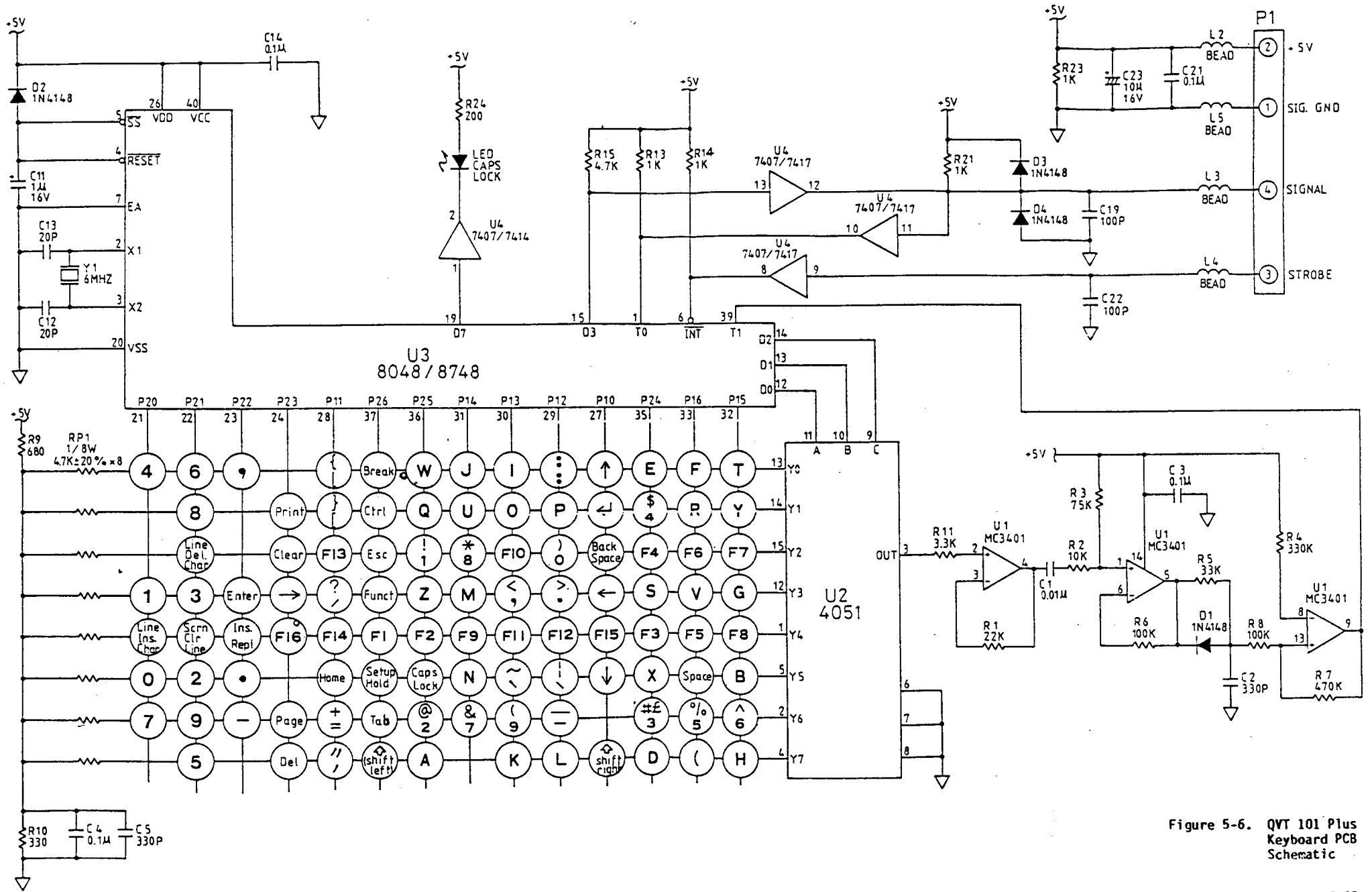


Figure 5-6. QYT 101 Plus Keyboard PCB Schematic

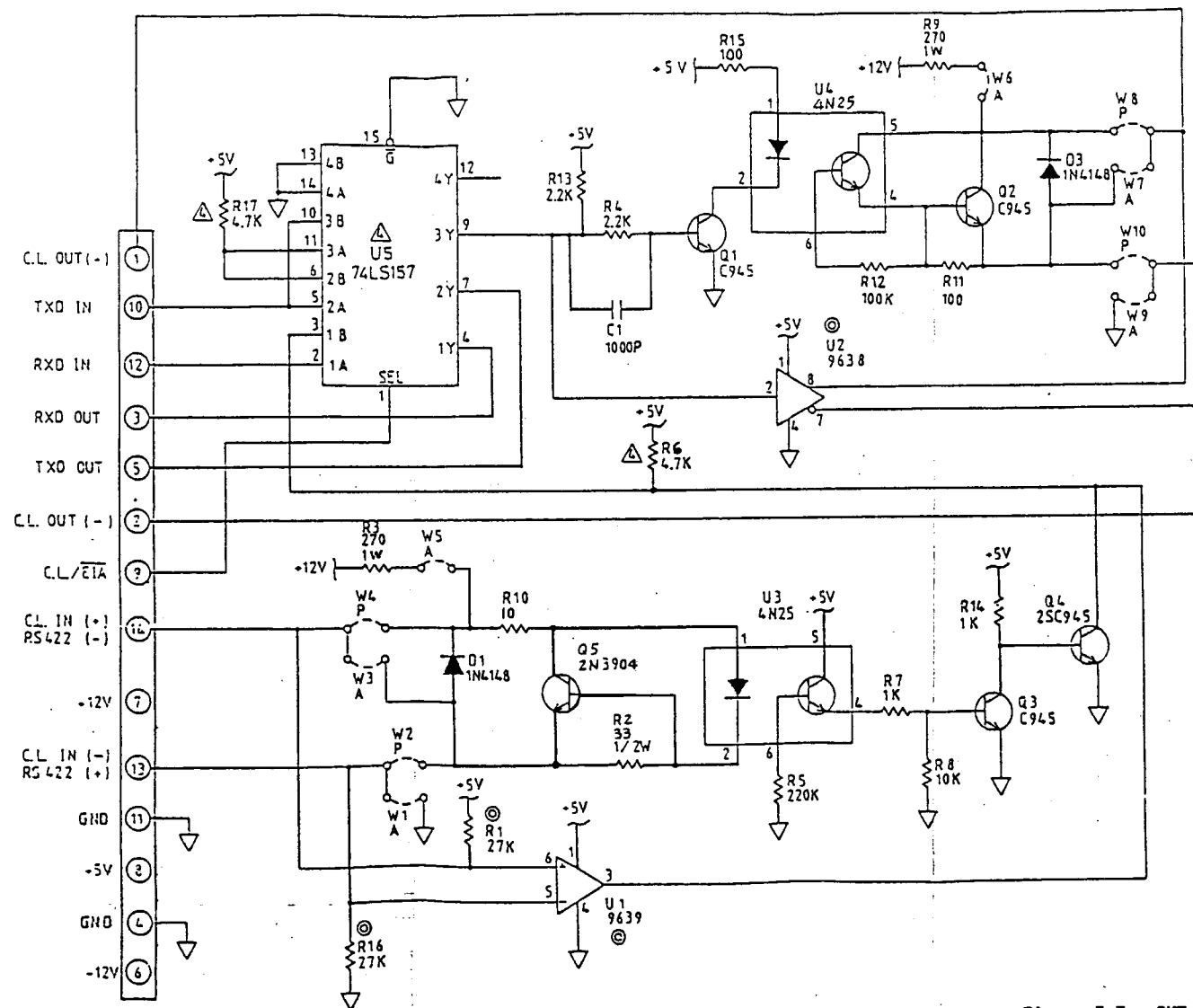


Figure 5-7. QVT 101 Plus RS-422/Current Loop PCB Schematic

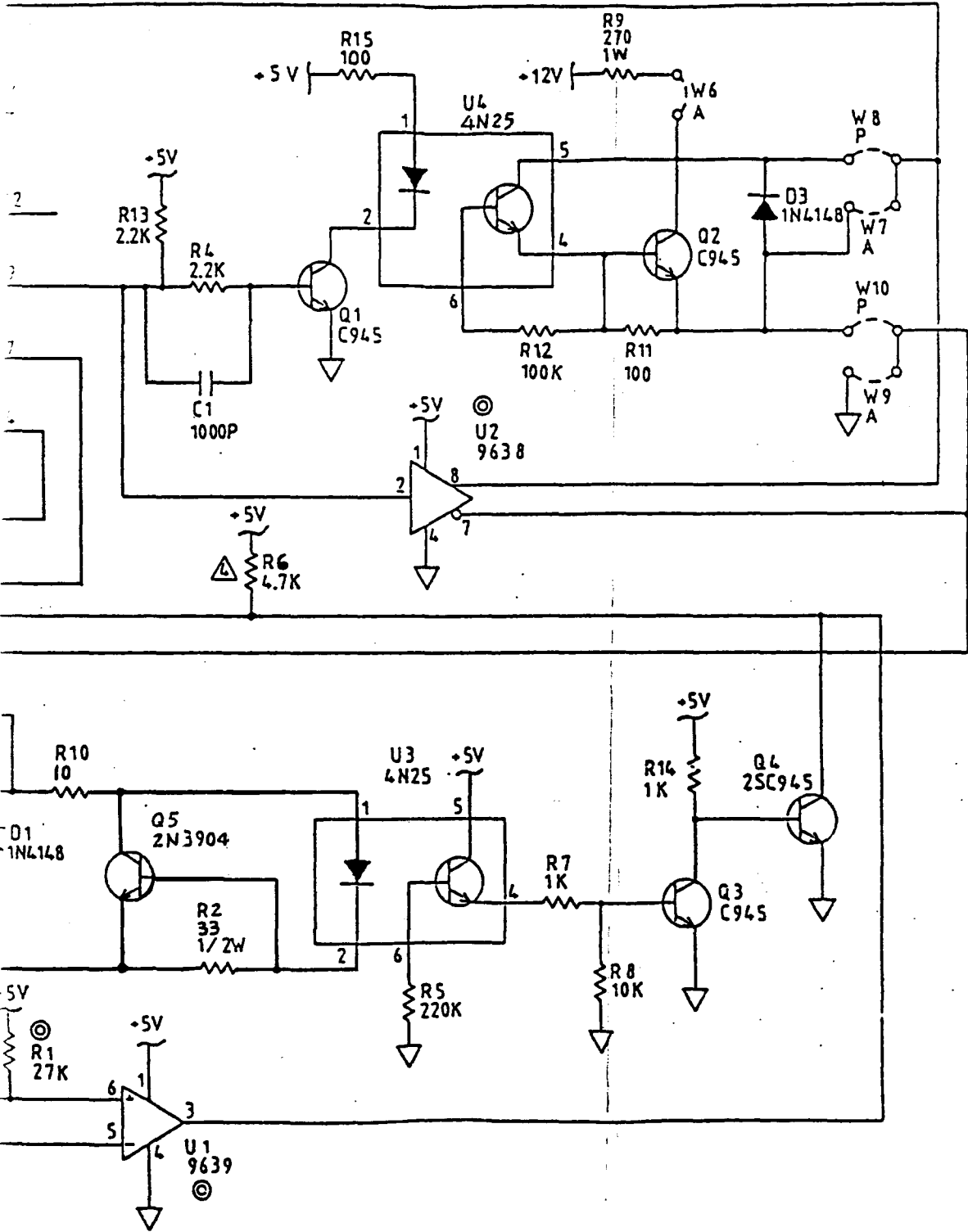


Figure 5-7. QVT 101 Plus RS-422/ Current Loop PCB Schematic

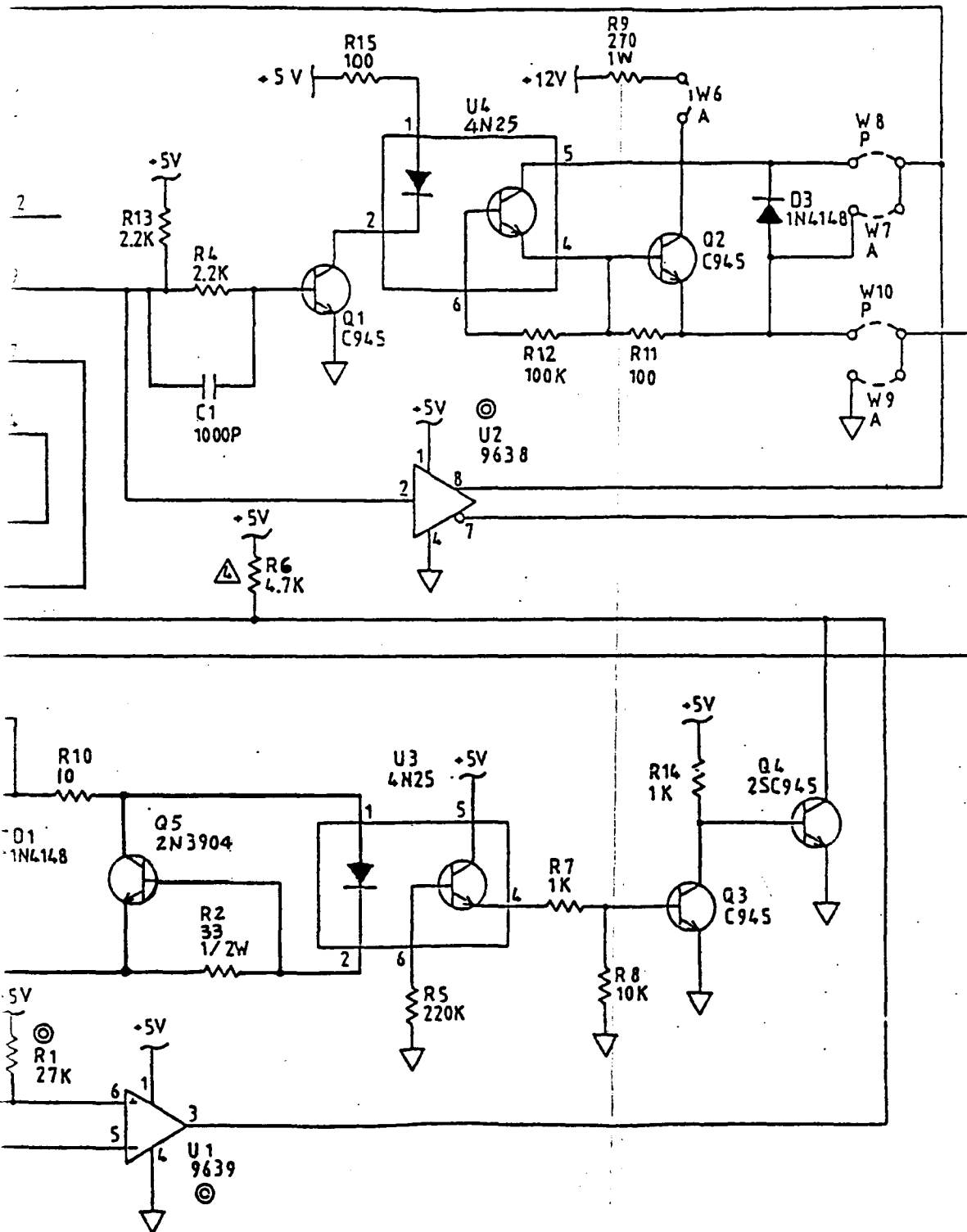


Figure 5-7. QVT 101 Plus RS-422/ Current Loop PCB Schematic

INTRODUCTION

This appendix provides instructions on how to reconfigure (when desired) and install the optional Current Loop PCB, and also how to install the optional RS-422 PCB.

The Current Loop kit is shipped from the factory configured in the Passive mode. To change the Current Loop PCB from the Passive mode to the Active mode, follow the instructions outlined in Table A-1. To configure the RS-232 cable for current loop operation, follow the instructions outlined in Table A-2.

Table A-1. Current Loop Interface Jumper Placement

Jumper	Active Mode	Passive Mode
W1	In	Out
W2	Out	In
W3	In	Out
W4	Out	In
W5	In	Out
W6	In	Out
W7	In	Out
W8	Out	In
W9	In	Out
W10	Out	In

Table A-2. Current Loop and RS-422 Configuration

	PASSIVE MODE*	TO	ACTIVE MODE	
	ACTIVE MODE*	TO	PASSIVE MODE	
	<u>QVT (EIA)</u>		<u>USER SYSTEM</u>	
<u>RS-422</u>	Current Loop	PIN NO.	Current Loop	<u>RS-422</u>
+ XMIT	- XMIT	13 <----->	- RECEIVE	+ RECEIVE
- RECEIVE	+ RECEIVE	12 <----->	+ XMIT	- RECEIVE
+ RECEIVE	- RECEIVE	24 <----->	- XMIT	+ XMIT
- XMIT	+ XMIT	25 <----->	+ RECEIVE	- RECEIVE

* current loop only

CAUTION

Improper cabling can cause damage to your terminal and system.

INSTALLATION

To install the Current Loop board or the RS-422 board, proceed as follows:

1. Turn off the power switch on the terminal.
2. Remove the power cord and all cables from the rear of the terminal.
3. Remove the Logic board in accordance with "Removing and Replacing the Logic board" procedures in Section 2 of this manual.
4. See Figure A-1 for the location of the stand-off(s) on the Logic PCB.
5. After removing the two jumpers on P16 place the Current Loop PCB or the RS-422 PCB (with component side up) on top of the Logic PCB and mate J16 connector on the Current Loop PCB or the RS-422 PCB with P16 on the Logic PCB (see Figure A-1). Press J16 firmly into P16. If the RS-422/CL is removed, the two jumpers must be put back on: P16 pin 3-12 and P16 pin 5-10.
6. Secure the board onto the snap-on standoffs.
7. Replace the Logic PCB and the rear Connector Panel.

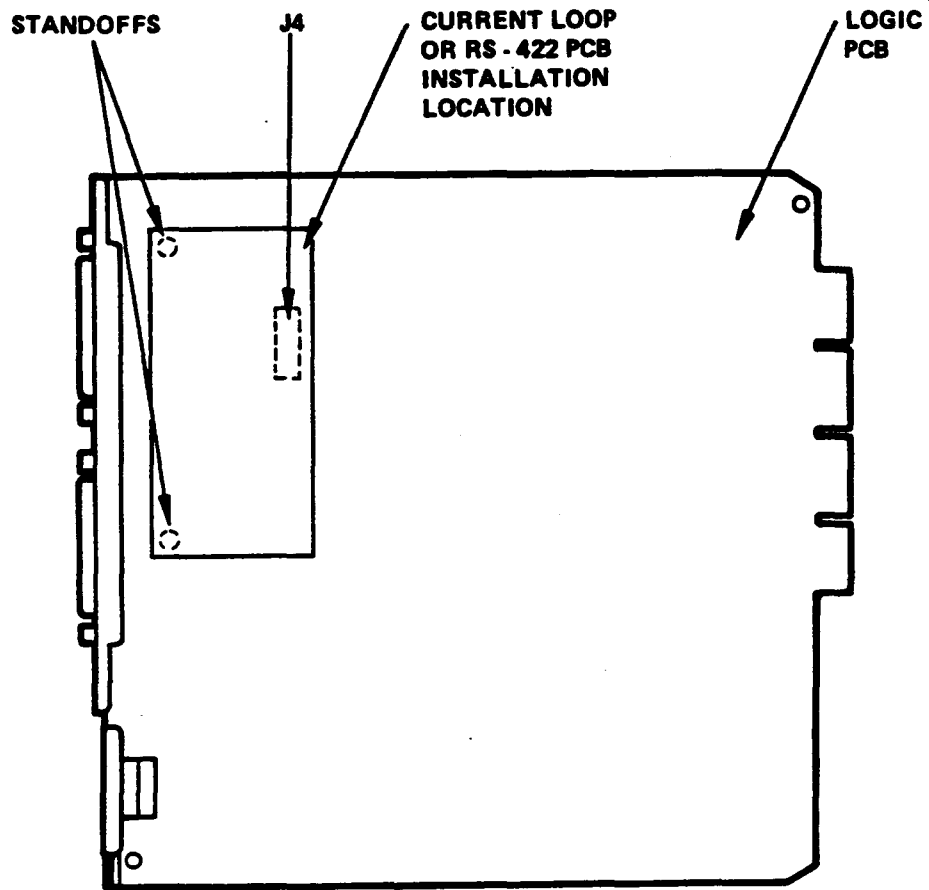


Figure A-1. Installation of Current Loop or RS-422 PCB