



4006-1
COMPUTER DISPLAY
TERMINAL

SERVICE MANUAL

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Fig. 1-1. 4006-1 Computer Display Terminal.

Section 1

CHARACTERISTICS

Introduction

This manual provides the necessary information for servicing the 4006-1 Computer Display Terminal. Only basic operating information is provided for the service technician; detailed operating information is contained in the 4006-1 Computer Display Terminal Users Manual (070-1891-00). The technical information in this manual is divided into seven sections:

Characteristics	A basic description of the terminal and its operation, characteristics, and requirements.
Servicing	Contains mechanical component removal and replacement procedures, as well as Performance Check and Adjustment Procedures.
Circuit Descriptions	A description of the functional operation of the terminal logic and display circuitry. Also includes a description of the standard computer/terminal interface.
Half-Duplex Option	A complete description of the optional Half-Duplex interface.
EPL	A complete listing of the electrical parts.
Schematics	Complete schematic diagrams of the 4006-1 Computer Display Terminal.
MPL	Mechanical parts information.

Description

The 4006-1 Computer Display Terminal permits rapid communication between an operator and a computer, providing Alphanumeric and Graphic display of data. Inputs to the computer can be initiated at the terminal keyboard. Data received by the terminal can be written on the Display Unit or can control other functions in the terminal. In addition, the 4006-1 can produce a facsimile copy of the display on a Hard Copy Unit.

The 4006-1 has three principal operating modes: Alpha (Alphanumeric), Graph (Graphic Display), and Hard Copy

(HCU). Alpha Mode permits receipt and display of alphanumeric data on the crt. Graph Mode permits control of the input data which causes vectors (graphics) to be written on the display. The HCU mode allows a Hard Copy Unit to make a copy of the displayed data. Data can be entered from the terminal keyboard or transmitted to or from the computer under all modes except HCU mode.

The terminal consists of the keyboard, the display storage crt, the power supply, and control circuits.

Accessories

The 4006-1 Users manual is shipped with each unit. The Service manual, a Half-Duplex Interface, and the Viewing Hood are optional accessories which can be ordered from Tektronix. (See the Mechanical Parts List.)

The 4006-1 is compatible with the Tektronix 4631 Hard Copy Unit. The Hard Copy Unit provides the user with the ability to make permanent copies of the displayed information at the touch of a switch. The hard copy of the display screen can also be initiated by a computer command.

OPERATING MODES

The 4006-1 has three basic operating modes: Alpha, Graph, and Hard Copy. The Alpha mode permits the display, transmission and receipt of alpha characters and special symbols. Graph mode permits the display of graphic vectors and pictures, while the Hard Copy mode allows making of permanent copies of the information on the Display Screen.

Alpha Mode

In Alpha mode the terminal can display 63 printing characters. On the display screen, the terminal can display up to 74 characters per line, and up to 35 lines per page. The characters displayed are formed by a 5 X 7 matrix. The matrix size is .074 X .13 inch. The actual character size (within the matrix) is .06 X .114 inch.

The valid display characters are shown in Fig. 1-2. All displayed characters are upper case; any lower case characters received from the computer will be displayed

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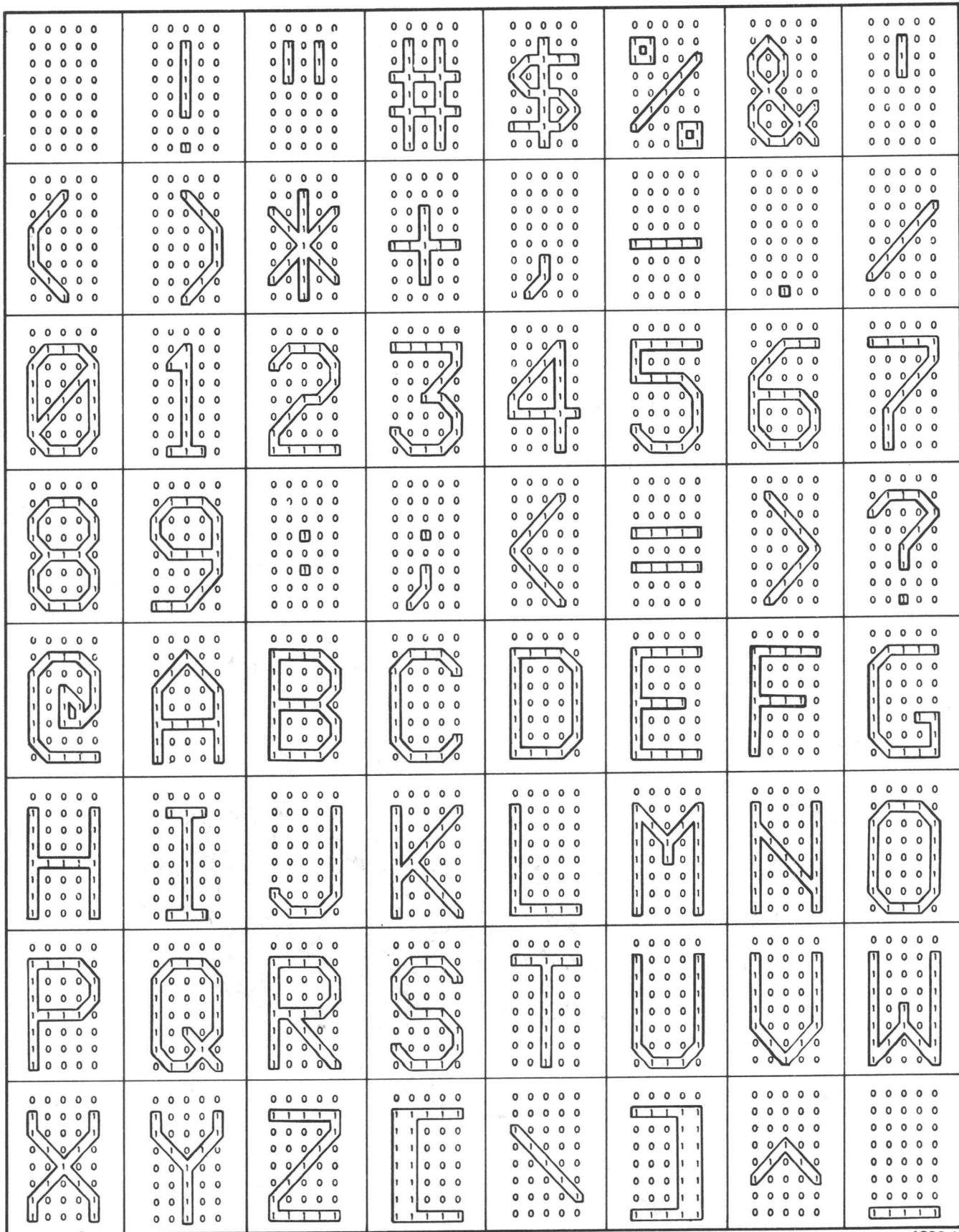


Fig. 1-2. Written character set.

as upper case. The display characters are converted to ASCII code for transmission to and receipt from the computer.

During Alpha mode operation, an automatic carriage return/line feed is performed when the right-hand margin is detected. This occurs after the 74th character has been written in a line. In addition to the 63 printing characters, the space causes the cursor to move one space to the right on the screen. The next writing position on the screen is indicated by an Alpha Cursor. The cursor is displayed any time the terminal is in Alpha mode and is automatically moved each time a character is written.

Graph Mode

Graphic display (Graph mode) is entered upon receipt of the GS control character; it may be sent from the keyboard or the computer. In Graph mode, the terminal draws vectors in response to graphic address inputs. The vectors may be written on the display screen, or may be unwritten "dark" vectors. The graphic address bytes are explained in detail later in this section.

While in Graph mode, the terminal can still respond to control characters and control character sequences as explained in Table 1-3. Graph mode ends, and the terminal

is reset to Alpha mode, upon receipt of control characters US or CR, or the control character sequence ESC FF. Graph mode can also be ended by pressing the PAGE key on the keyboard, which erases the screen and resets to Alpha mode with the cursor in the home position.

Hard Copy Mode

Hard Copy mode permits a paper "hard copy" of the display to be made if a Hard Copy Unit is connected to the terminal. Hard Copy mode can be initiated by computer command (ESC ETB), by the MAKE COPY key on the terminal keyboard, or by the COPY button on the Hard Copy Unit.

INDICATORS AND CONTROLS

General

With exception of the Power switch, Baud Rate select switch, and the Hard Copy Intensity adjustment knob, the indicators and controls are located on the keyboard section of the display unit, as shown in Fig. 1-3. The Power, Hard Copy Intensity Adjustment, and Baud Rate switches are located on the rear of the display unit.

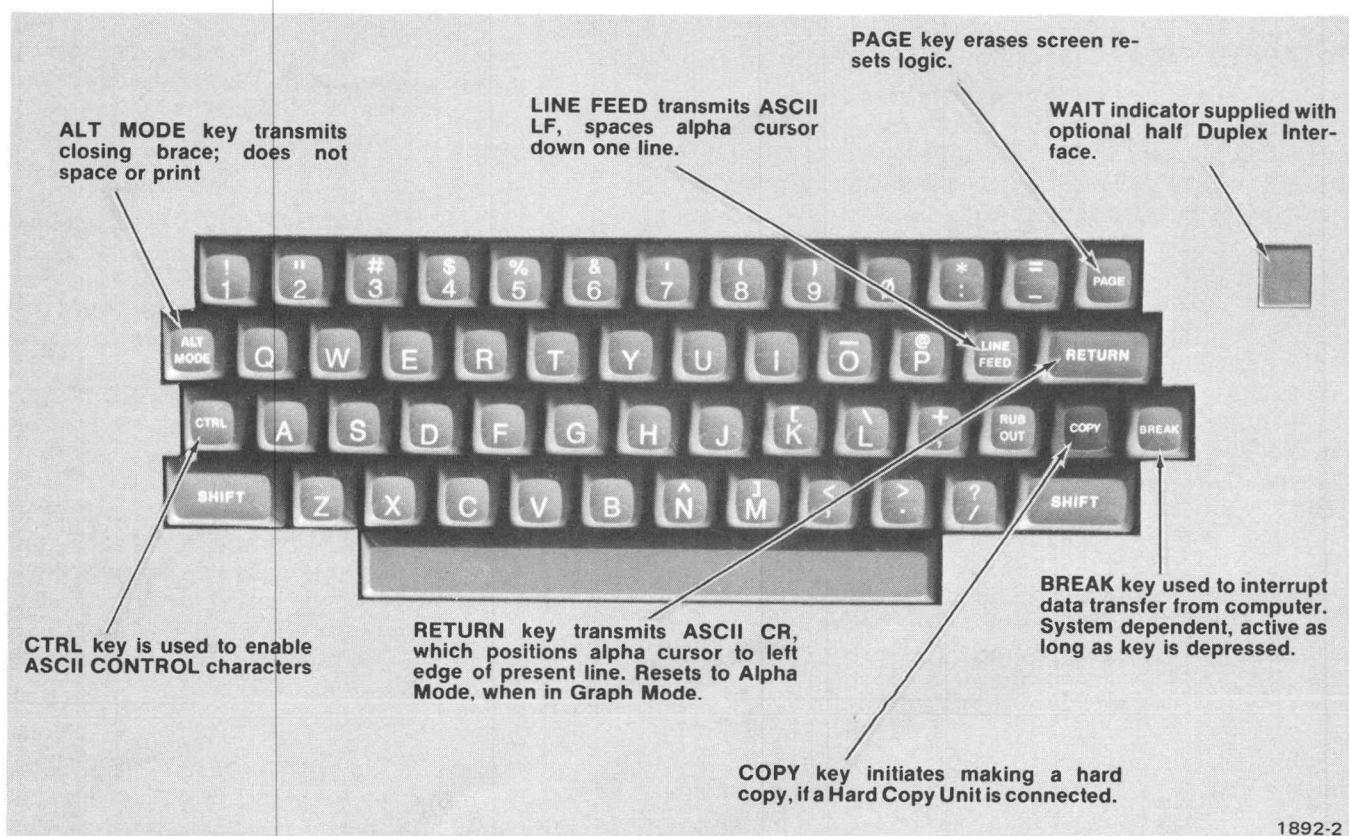


Fig. 1-3. Keyboard Controls.

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Fig. 1-4. Keys with Special Shift Functions. Pressing one of these keys while the SHIFT key is depressed causes transmission of the character or symbol above the standard character.

Multiple Key Entry

Special functions or alternate characters can be performed using multiple keys for entry. The Shift key can be used with any one of a number of other keys. The ASCII-coded characters sent are then as indicated on the upper section of the keys, as shown in Fig. 1-4.

The CTRL key can be used with any one of the alphabet keys to change their transmitted code to that required for ASCII control characters. The keys are shown in Fig. 1-3 and listed in Table 1-1, along with the ASCII-coded character that is sent when the key is pushed while the CTRL key is held down.

Certain ASCII control character codes require that the CTRL and SHIFT keys both be held down before they can be transmitted in response to pressing a third key. The key combination and resultant characters are as listed in Table 1-2.

BAUD RATE

The BAUD RATE select switch is a dual rotary switch located on the back of the unit. Each switch is a 7-position switch which is used to

select the Transmit or Receive baud rates. The switch allows selection of 75, 110, 300, 600, 1200, 2400, or 4800 BAUD.

ECHO

The ECHO switch (with optional Half-Duplex interface only) is located on the back of the unit. The switch allows local echo of transmitted data for display. The ECHO function is enabled by a jumper strap on the logic card for the standard interface.

MODE

The MODE switch is a 3-position slide switch on the rear panel (optional Half-Duplex interface only) which selects FULL DUPLEX, HALF DUPLEX NORMAL, or HALF DUPLEX SUPERVISOR interface operations.

WAIT

The WAIT indicator (Half-Duplex interface only) is mounted on the front of the display module. The WAIT indicator indicates the terminal/interface status.

TABLE 1-1

CONTROL and Alpha Key Combinations

Alphanumeric Key	Control Character ¹	Alphanumeric Key	Control Character ¹
A	SOH	N	SO
B	STX	O	SI
C	ETX	P	DLE
D	EOT	Q	DC1
E	ENQ	R	DC2
F	ACK	S	DC3
G	BEL	T	DC4
H	BS	U	NAK
I	HT	V	SYN
J	LF	W	ETB
K	VT	X	CAN
L	FF	Y	EM
M	CR	Z	SUB

TABLE 1-2

CONTROL, SHIFT and Alpha Key Combinations

Alphanumeric Key	Control Character ²
K	ESC
L	FS
M	GS
N	RS
O	US
P	NUL

TABLE 1-3

Control Character Effect on Terminal

Keyboard ASCII	Effect	
BEL	CONTROL G	A burst of 1200 hertz tone on the speaker. Its length is 75 ± 25 ms.
CR	RETURN or CONTROL M	Causes carriage return by clearing the X register. Clears Graph mode (returns to Alpha mode).
LF	LINE FEED or CONTROL J	Y (Alpha cursor count) moves down one line (count down by 22). If Y underflows, margin is complemented and Y counts down to 767 (top of display).
GS	CONTROL SHIFT M	Sets the terminal for Graph mode. The first vector after a GS is a dark vector.
US	CONTROL SHIFT O	Clears the terminal from Graph mode (resets to Alpha mode). Will terminate a vector short of the end point if received before a vector is completed.
HT	CONTROL I	Causes the terminal's Alpha cursor to space one character space to the right.

¹Resultant transmission when CONTROL key held down while Alpha key is pressed.²Resultant transmission when CONTROL and SHIFT keys are held down while Alpha key is pressed.

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TABLE 1-3 (cont.)

Control Character Effect on Terminal

ASCII Equiv.	Keyboard Equiv.	Effect
ESC	CONTROL SHIFT K	First character of a special two-character sequence (see ESC FF and ESC ETB).
ESC FF	CONTROL SHIFT K CONTROL L	Same as the PAGE signal from the keyboard, except that ESC FF is transmittable. Erases the screen. Reset X to 0; resets Y to 1023. Y then counts down to 767 at 1.2 MHz. Resets margin and Graph mode.
ESC ETB	CONTROL SHIFT K CONTROL W	MAKE COPY is asserted.

TABLE 1-4

Alpha Mode Specifications

Display Area Character Writing Position	35 lines of 74 characters per line. Lower left area (5 X 7 dot matrix) of cursor (8 X 8 dot matrix).
Character Matrix Size Stored Character Size	.074 ($\pm .008$) X .130 ($\pm .013$) inch. .060 ($\pm .006$) X .114 ($\pm .012$) inch (center-to-center of outside boundary dots).
Character Recognition Character Writing	Complete ASCII code is recognized. Lower case is written as upper case, providing 63 different printing characters.
Characters per Line Number of Lines LINE FEED Spacing SPACE	74 35 22 Tekpoints, equal to 0.168 ($\pm .017$) inch. 14 Tekpoints, equal to 0.105 ($\pm .011$) inch between corresponding points in adjacent characters.
Home Position	Top, left corner of display (X=0, Y=767).
Carriage Return/ Line Feed	Automatically occurs after last character is written at the end of each line (74th character). Carriage Return also occurs when RETURN key is pressed, or when CR is received. A strap option allows each keyboard or programmed Carriage Return to cause an automatic Line Feed.

TABLE 1-4 (cont.)
Alpha Mode Specifications

Margin	Left Margin (left edge of quality display area) and Center Margin 1 (horizontal center of quality display area) occur alternately when executing a Line Feed past the 35th line.
Rubout	Does not print or space; transmits ASCII DEL.
Alt Mode	Does not print or space; transmits ASCII closing brace ()}.
Alpha Mode set by	PAGE from the keyboard, receipt of ESC FF, CR, or US.
Cursor	Non-storing 8 X 8 dot matrix.
Hold	Reduced display intensity status, occurs after about 90 seconds of inactivity. Hold mode is reset by any printing data, SHIFT key, DRBUSY, or any Control Character.
View	Normal viewing status.

TABLE 1-5
Graph Mode Specifications

Mode Function	Display graphic information.
Mode Entered by	ASCII GS.
Mode Ended by	ASCII US, CR, ESC FF, or keyboard PAGE.
Basic Unit of Measurement	Point (Tekpoint)
Address Capability	1024X by 1024Y points.
Display Capability	1024X by 780Y points.
Display Address Orientation	0,0 at bottom-left corner of display; 1023X,780Y at (top-right corner of display).
Vector Length Error	Does not exceed 1% of true vector length.

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TABLE 1-5 (cont.)

Graph Mode Specifications

Vector Dynamic Geometry Error	Does not exceed 1.5% from mean straight line, worst case (45° line). (Dynamic geometry error is the deviation from the ideal straight line path, divided by the total vector length.)
Vector Drawing Time	3.6 ± 0.2 ms, all vectors.
Display Scale Factor	Approximately 0.18 mm (.07 inch) point center to point center. (Equal to about 54.5 points per centimeter or 139 points per inch.)
Dark Vectors	The first vector following a GS is unwritten; GS can be repeated at any time. The second vector following GS, and all subsequent Vectors, are written.
Hold Mode	Display intensity is reduced after about 90 seconds of inactivity. View mode is reset by any printing data, SHIFT key, or DRBUSY.
Vector Drawing Commands	Refer to Tables 1-6 and 1-7.
Anti-burn Circuit	Chops the Z-axis at 77 kHz if neither axis changes more than 35 ± 15 Tekpoints.

TABLE 1-6 (cont.)

TABLE 1-6

Graph Mode Vector Drawing

1. GS places the terminal in Graph (vector) mode.
2. The terminal can be addressed to any position within 0-1023X and 0-1023Y, as follows:
 - a. Convert the Y coordinate to ten binary digits; convert the X coordinate to ten binary digits.
 - b. Form a HIY byte by affixing 01 (as bits 7 and 6) to the five most significant bits of the Y coordinate.
 - c. Form a LOY byte by affixing 11 (as bits 7 and 6) to the five least significant bits of the Y coordinate.
 - d. Form a HIX byte by affixing 01 (as bits 7 and 6) to the five most significant bits of the X coordinate.
 - e. Form a LOX byte by affixing 10 (as bits 7 and 6) to the five least significant bits of the X coordinate.
 - f. Send the four bytes as formed in b through e.

Graph Mode Vector Drawing

3. The LOX byte completes the sequence and causes the writing beam to move to the new position. The first vector after a GS is used for positioning only, and is a dark (unwritten) vector. Subsequent movement in response to a LOX byte is written to form a vector between the two points. GS can be sent at any time to cause the next vector to be dark. (780Y — 1023Y is outside the viewing area of the display.)
4. Address transmission can consist of all four bytes, or can be shortened to three, two, or even one byte(s). Omitted bytes are assumed to be unchanged from the previous address. Table 1-7 specifies the minimum byte transmission required under all addressing situations. (If the terminal is being operated at 4800 baud, and one byte address changes are being used, a 2 ms pause is required between bytes.)

TABLE 1-6 (cont.)**Graph Mode Vector Drawing**

5. HIY, LOY, and HIX bytes received in the last address are "remembered" by the terminal if switched to Alpha mode. The terminal requires only the LOX byte, when switched back to Graph mode, to return to its last address.
6. Graph mode is ended by US, CR, or ESC FF, which reset the terminal to Alpha mode. Graph mode, can also be ended by the PAGE key, from the keyboard.

TABLE 1-7**Bytes Required For Graphic Addressing**

Bytes Which Change				Byte Transmission Required			
HIY	LOY	HIX	LOX	HIY	LOY	HIX	LOX
		#					#
	#				#	#	#
#					#		#
#				#			#
	#	#			#	#	#
	#	#			#		#
#		#		#			#
#	#				#	#	#
#	#				#	#	#
#	#	#			#	#	#
#	#	#		#	#	#	#
#	#	#		#	#		#
#	#	#		#	#	#	#
#	#	#		#	#	#	#
SENDING INITIAL ADDRESS				#	#	#	#
RETURNING TO REMEMBERED ADDRESS							#

TABLE 1-8**Local Operation Characteristics³**

GENERAL	The terminal is isolated from the computer.
ALPHA MODE	The terminal accepts keyboard data as though it were coming from a computer, writing alphanumeric characters and executing control characters.
GRAPH MODE	Can be obtained by entering CTRL SHIFT M at the keyboard. Terminal will then write vectors in response to keyboard entries of graphic addresses as explained in Tables 1-5, 1-6, and 1-7. The addresses must be converted to alphanumerics before knowing which keys send which address bytes. Low order Y bytes are limited to RUBOUT (DEL) and ALT MODE (closing brace) since the keyboard does not have lower case capability. Dark vectors will follow any CTRL SHIFT M entries. The terminal retains the ability to execute control characters.

³Local operation refers to terminal operation while the Terminal/Computer interface is not connected. If the normal connection is direct (interface cable from Terminal to Computer) the cable must be disconnected. If communications are through modems (telephone line) local operation is enabled by breaking the telephone link. The ECHO/NORM strap (or switch) must be in ECHO and the Transmit and Receive baud rates must be the same to display data on the screen.

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TABLE 1-9

Hard Copy Mode Specifications

FUNCTION	Display is scanned by signals from the Hard Copy Unit, providing readout information to the Hard Copy Unit.
INITIATED BY	READ signal from Hard Copy Unit. (READ occurs in response to a COPY command from the

TABLE 1-9 (cont.)

Hard Copy Mode Specifications

	keyboard, a Copy command from the Hard Copy Unit, or an ESC ETB sequence from the computer.)
ALPHA CURSOR	Inhibited.
HOLD MODE	Inhibited.
DISPLAY UNIT	Under control of Hard Copy Unit.

TABLE 1-10

Display Unit Specifications

Characteristics	Performance Requirements	Supplemental Information
Display Quality Area	7.5 inches horizontal by 5.625 inches, the center of which is within 0.25 inch of the crt faceplate center.	
Deflection Factors Center of Screen Edge of Screen	Zero V ($\pm .2$ V) $+7.75$ V, left or up ($\pm .25$ V) -7.75 V, right or down ($\pm .25$ V)	
Usable Storage Time		Up to fifteen minutes in View status, or up to one hour in Hold status, without permanent damage to the storage surface. If a residual image is retained after a long viewing period, the target may be returned to normal condition by repeated erasures.

TABLE 1-10 (cont.)

Characteristics	Performance Requirements	Supplemental Information
Line Straightness	Within 0.5% deviation from mean straight line (inside the specified display area).	
Geometry Orthogonality Parallelism	$\leq 1^\circ$ Within $\pm 2\%$	Condition for Test: Draw a rectangle on edge of specified area. Vertical line lengths should be within 2%, and horizontal line lengths should be within 2%.

TABLE 1-11**Power Supply Specifications**

Characteristics	Performance Requirements		Supplemental Information
Line Voltage Ranges (-10% to +5%)	115 V range Low Med High	230 V range 100 Vac 115 Vac 120 Vac	200 Vac 230 Vac 240 Vac
Power Consumption	105 watts maximum		
Line Frequency Range	1.1 amps maximum current 48 to 66 Hz (voltage input +5% to -10%) 66 to 440 Hz (voltage input $\pm 5\%$)		
Fuses Line +5 volt	1.6 amp (slow-blow) 100 — 120 Vac .8 amp (slow-blow) 200 — 240 Vac 2.5 amp (fast-blow)		

Characteristics—4006-1 Service**TABLE 1-12****Physical Characteristics**

Finish	Metal and plastic painted cabinet
Weight	Approximately 50 lbs. (23 kg) 60 lbs. (27 kg) maximum shipping weight
Dimensions (See Fig. 1-3)	
Height	12 3/8 inches
Width	15 1/4 inches
Length	27 1/2 inches

TABLE 1-13**ENVIRONMENTAL SPECIFICATIONS**

Temperature Non-operating Operating	-40°C to +65°C +10°C to +40°C
Altitude Non-operating Operating	To 50,000 feet To 15,000 feet
Vibration	Complete 4006-1: 0-50-0 cps .015" displacement
Shock (Non-operating)	To 30 g's, 1/2 sine, 11 ms duration
Humidity	0 — 95% non-condensing
Transportation	Meets National Safe Transit Committee type of test when packaged as shipped by factory.

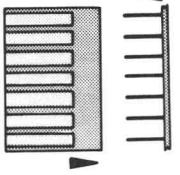
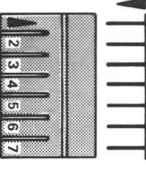
TABLE 1-14

BASIC 4006-1 STRAPPABLE OPTIONS

STRAP	DESCRIPTION	REMARKS									
CR-LF OUT IN	A two-position strap which can allow the terminal to perform a Line Feed each time a CR is detected.										
LINE VOLTAGE	A three-position strap which adapts the Terminal to the existing line voltage. The strap positions for the line voltage are as follows: <table> <tr> <td>HI</td> <td>MED</td> <td>LOW</td> </tr> <tr> <td>120 V</td> <td>115 V</td> <td>100 V</td> </tr> <tr> <td>240 V</td> <td>230 V</td> <td>200 V</td> </tr> </table>	HI	MED	LOW	120 V	115 V	100 V	240 V	230 V	200 V	Two jumper straps are provided, one for the 100 — 200 Vac range and one for the 200 — 240 Vac range. The unused strap is stored on the upper right-hand corner of the logic card.
HI	MED	LOW									
120 V	115 V	100 V									
240 V	230 V	200 V									
ECHO	A two-position strap that, when in the IN position, enables a local screen copy of the data transmitted from the terminal. The OUT position disables the local copy.	This strap is replaced by a rear panel switch if the optional Half-Duplex interface is installed in the terminal. The transmit and receive baud rates must be set to the same position to obtain local ECHO.									

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TABLE 1-15
DATA COMMUNICATIONS INTERFACE STRAPPABLE OPTIONS

STRAP	DESCRIPTION	REMARKS
Modem/Computer	Data Communications Interface, top center (7-pin output connector)	<p>Direct-to-computer connection</p>  <p>Modem Connection</p> 
Data Strap	A two-position strap that controls bit 8. The DATA position selects bit 8 as a data bit. The PARITY position selects bit 8 as a parity bit.	See Data Select Strap
Data Select	With the data Strap set to DATA, this strap sets bit 8 high or low. With the Data Strap set to PARITY, this strap selects even or odd parity.	

Section 2

SERVICING

INTRODUCTION

Beyond the need for occasional cleaning of the face of the display and other outer surfaces of the terminal, there is virtually no need for routine servicing of the terminal. It has no lubrication points, no air filters, and (with the exception of the crt) no vacuum tubes. The solid-state components provide stable operation, with little need for routine adjustment.

However, if a routine schedule and procedure is desired, a one-year interval and the following sequence is recommended. The disassembly and assembly instructions contained in this section should be referred to as necessary.

Servicing Procedure

1. Disconnect the line cord from the power source.
2. Remove the top from the terminal.
3. Using a vacuum cleaner, remove dust accumulation from within the unit. Use a soft-bristled brush to loosen dust which won't otherwise vacuum out. A soft cloth and a mild soap and water solution can be used to remove any really stubborn dirt.
4. Inspect the interior of the unit for broken leads, loose connections, heat-damaged components, etc. Correct as necessary. Investigate the cause of any heat-damaged components.
5. Remove the filter from the front of the display screen. (Refer to the procedure later in this section.) Then wash the face of the crt and the back surface of the filter, using a soft cloth and a mild soap and water solution. Then replace the filter. **THIS STEP SHOULD NOT NORMALLY BE NECESSARY, SINCE A NEOPRENE MOUNTING RING SEALS THE SPACE BETWEEN THE FACE OF THE CRT AND THE FILTER. IT IS RECOMMENDED ONLY IF DIRT IS VISIBLE BETWEEN THE TWO SURFACES, OR IF THE DISPLAY APPEARS EXCESSIVELY DIM AND DIRT ACCUMULATION IS SUSPECTED.**

6. Perform the check-out procedure found in this manual. Perform the adjustment procedure if the check-out procedure indicates that it is necessary.

7. Put the cover back on the terminal.

8. Clean the outside of the unit, using a soft cloth and a mild soap and water solution. Use particular care in cleaning the external surface of the display filter.

TROUBLESHOOTING INFORMATION

Troubleshooting of the terminal can be done best if the various features of this manual are used to their fullest advantage. These features and recommended usage are listed here.

Controls and Operation. This information located in the Characteristics section, ensures operator understanding of the terminal features and operation. Operation is described in detail in the 4006-1 Users manual.

Specification. A complete explanation of the terminal capabilities is contained in the Specification section, along with explanations of how to put the capabilities into use.

Performance Check. This provides a rapid means of checking for proper operation in a logical sequence under normal equipment configuration.

Adjustment. The procedure follows a logical sequence of adjusting the basic terminal.

Block Overlays and Circuit Diagrams. These diagrams and their associated descriptions provide an understanding of terminal operation at the circuit and component level. The information contained therein is essential to efficient location of trouble.

Component Layout Illustrations. These appear in the Diagrams section and can be used as aids for locating components.

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Semiconductor Information. An illustration of semiconductors appears near the beginning of the Diagrams section, and can be used for pin identification. An integrated circuit test clip is recommended for use in troubleshooting the in-line integrated circuits, since it makes their leads easily accessible.

Troubleshooting Procedure

To troubleshoot the basic terminal, check operation by doing the Performance Check. Stop where the terminal fails to respond properly, and troubleshoot the referenced area, using schematics, and associated descriptions.

Obviously, not all troubles can be high-lighted by the Performance Check or Calibration Procedure. However, they should prove beneficial in most cases, and should go a long way in guiding a technician to the trouble area.

Recommended Troubleshooting Equipment

A -25 V to +400 V dc voltmeter and a 10 MHz frequency response oscilloscope are recommended test equipment for troubleshooting low-voltage and logic circuits. A -4000 V dc meter is required for troubleshooting the high voltage circuits.

WARNING

Dangerous voltages exist within the display unit. Normal electrical safety precautions should be observed at all times when working around exposed circuits within the unit.

When troubleshooting the Power Supply circuits, J37 on the Power Supply/Logic board may be disconnected to isolate the Power Supply from the logic circuits on the same board. This avoids accidental damage to these other circuits. In addition, the power supply may be completely isolated by disconnecting all of the power supply output connectors (refer to the Low Voltage Power Supply schematic diagram). If this is done, however, it will be necessary to connect a resistive dummy load (40Ω , 10 W) to the +20 volt supply in place of the terminal circuits.

CAUTION

If a resistive load is not used when the +20 volt supply is disconnected, damage to components may occur.

DISASSEMBLY AND ASSEMBLY

Removing the Top Cover

For access to the Display, Logic, and Power Supply circuits within the terminal, remove the screws at the rear of the top cover. Then lift the top cover forward and up (refer to Fig. 2-1). To replace the cover, reverse the above procedure.



1892-4

Fig. 2-1. Removing the Cover.

Access to the Keyboard Circuitry

Perform the following procedure to gain access to the keyboard circuits:

1. Remove the two screws from underneath the front of the keyboard. Disconnect J20 of the Half-Duplex board, if that option is installed.

2. Lift the keyboard out as far as the cables will allow. Then turn the keyboard over.

3. The top surface of the circuit board can be accessed by removing the six screws which hold the keyboard assembly to keyboard panel.

Key caps can be removed by pulling them directly away from the keyboard.

Keys can be removed by unsoldering the two contacts which hold them to the circuit board, and lifting them out of their access slots.

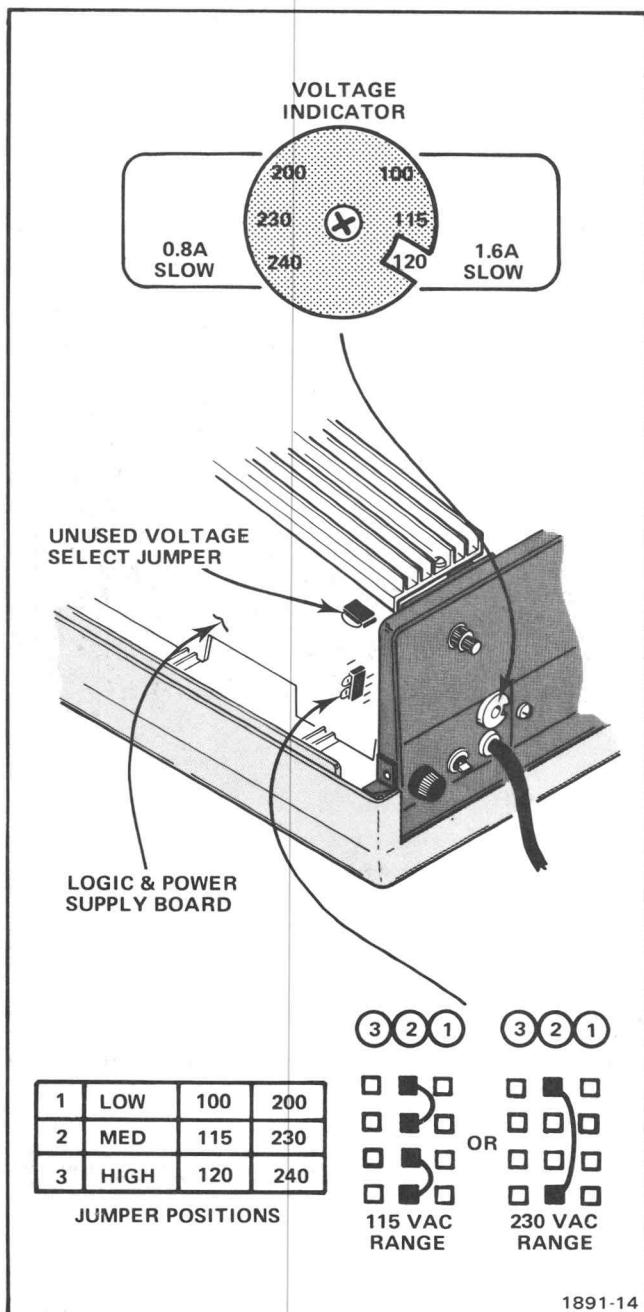


Fig. 2-2. Line Voltage Selection.

Power Transformer Information

The power transformer (located in the bottom of the unit) can be wired for use with 115 V ac or 230 V ac nominal line voltage, and can be set for any of three ranges within the nominal setting. The nominal line voltage selection is accomplished by jumper selection (the 115 V jumper makes two connections; the 230 V jumper makes only one). Selection of the particular range within the nominal line voltage is accomplished by jumper position.

Basically, this consists of selecting from the high (120 or 240), medium (115 or 230), or low (100 or 200) ranges. (Refer to Fig. 2-2.) Note that the line fuse must also be changed when changing between 115 and 230 volt operation. A 1.6 A fuse is used for the 115 V ac range; a 0.8 A fuse is used for the 230 V ac range.

Display Filter Removal, Cleaning, and Installation

Removal. Remove the crt mask after removing the top cover.

1. Place a small piece of tape on the surface of the filter, outside of the display area. This will be used as a reference during replacement. If a new filter is to be installed, it will be used for comparison.

2. Remove the four screws that attach the front casting, then remove the casting.



When the front casting is removed, the crt is not supported. Handle the terminal carefully when the casting is removed.

3. Lift the filter out of the neoprene mounting ring. It may be necessary to use a thin-blade device to aid in removal. Use caution to avoid scratching or breaking the filter.

Cleaning. Clean the face of the crt and the under-side of the filter, using a soft cloth and a mild soap and water solution. Note that the under-side can be distinguished from the outer surface by the masking tape if the original is being re-installed. If the old filter is being replaced with a new one, the under-side can be determined by comparing it with the old filter. Note that less glare from reflected light is apparent on the outer surface than on the under surface of the filter.

Installation. Put the filter in place in the recess in the neoprene mounting ring. The outer surface should be flush with the edge of the frame when properly installed. It may be necessary to use a non-abrasive device (such as a toothpick) to work the filter into place.

Install the front casting, and secure it with the four attaching screws.

Clean the outer surface of the filter, using a soft cloth and a mild soap and water solution.

Servicing—4006-1 Service

Crt and Deflection Yoke Removal and Installation

WARNING

The crt may implode if it is scratched or struck severely. Do not handle the crt by its neck. Wear protective clothing and a face shield when handling the crt.

Crt Removal. Refer to the illustration in the Mechanical Parts List as necessary during this procedure. Remove the top from the display unit cabinet.

1. Disconnect the plug from the rear of the neck by pulling gently and evenly. Disconnect the flood gun connector which is attached to the leads coming through an opening at the rear of the large crt shield.

2. Loosen (but do not remove) the nuts that secure the crt shield holder to the crt shield (Fig. 2-3).

NOTE

Some instruments do not have the crt shield holder at the rear of the crt shield. If no shield holder is present, delete step 2.

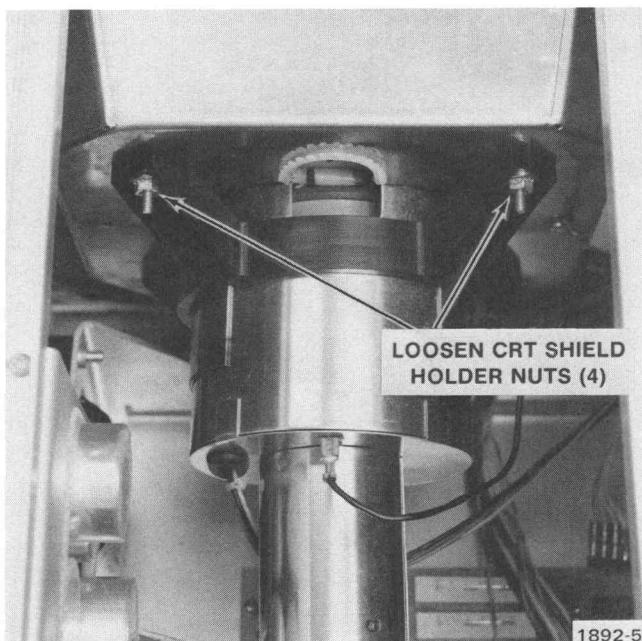


Fig. 2-3. Shield Holder.

3. Remove the four screws that attach the implosion shield frame to the terminal frame (Fig. 2-4). Remove the implosion shield frame and the implosion shield.

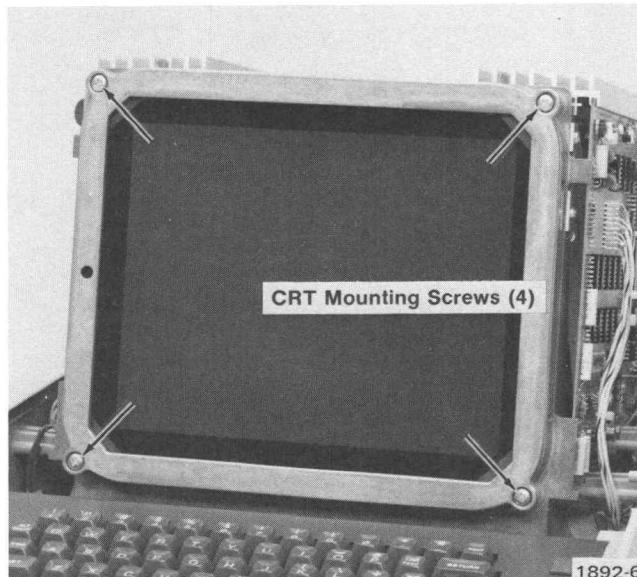


Fig. 2-4. Crt Mounting Screws.

4. Hold onto the neoprene mounting ring and slide the crt out of the front of the unit, avoiding side pressure which may break the neck of the crt. DO NOT HOLD THE CRT BY ITS NECK. Set the crt face-down on a flat surface. The neoprene mounting ring will keep the faceplate from contacting the surface. If the crt yoke is to be removed, continue with steps 5 and 6. If only the crt is being replaced, proceed to step 7.

5. To remove the yoke, first disconnect the ground lead. From the rear, push the shield through the shield holder; the yoke will come with it.

6. Place the new yoke into the shield, and insert it, from the front, back through the shield holder. Reconnect the ground lead.

7. Before installing the crt, make sure the yoke liner is installed in the yoke. Coat the inside of the yoke liner with a solution of soap and water to aid in reassembly.

8. To complete the crt installation, follow steps 4 through 1 in reverse order.

PERFORMANCE CHECK

General. This procedure can be used under normal operating conditions with all circuit cards installed. Since it uses the ECHO operation, no computer connection is required. Checks are referenced to a circuit to permit rapid

evaluation of incorrect results. Steps requiring position measurement should be made without parallax. That is, the line of sight should be perpendicular to the viewing area; this can be achieved by closing one eye and checking that the reflection of the viewing eye is in line with the point being observed.

Activity	Results	Circuit/Adjustment
Turn the terminal on		Power Supply
Wait 30 seconds	Face of display becomes bright	Storage circuits
Press PAGE	Erase cycle occurs	Storage circuits
Wait 5 seconds	Alpha cursor appears in top-left of display, approximately 1.4 cm from left edge and 1.2 cm from top edge of display area.	High voltage and Z Axis circuits; Deflection circuits; Logic circuits
Wait about 90 seconds	Cursor disappears	View/Hold circuits
Press SHIFT	Cursor reappears	View/Hold circuits
Enter the character 8 ten times.	The characters entered are written in line and remain stored on display	Keyboard; Deflection circuits; Character Generator; Storage circuits
Wait 5 minutes and press SHIFT (after approximately 1 1/2 minutes terminal enters Hold mode)	Check for fade-positive and drop-out effects (Fig. 2-5)	Storage circuits, crt
Enter LINE FEED	Cursor moves vertically to next line	Control logic
Enter 8's to complete a line (74 characters)	Cursor resets to next line and to margin at left of display	Control logic
Press PAGE	Erase cycle occurs; cursor goes home	
Enter 34 LINE FEEDs	Cursor goes to bottom-left corner of display	
Enter 35th LINE FEED	Cursor moves to center margin position at top-center of display	Control logic
Enter thirty-seven 8's	8's written and stored; cursor moves to next line and back to center margin.	Control logic
Enter 5 Space commands	Cursor moves 5 spaces to right	Control logic
Enter RETURN	Cursor moves to margin at center of display	Control logic

Servicing—4006-1 Service

Activity	Results	Circuit/Adjustment
Enter PAGE	Display erases; Alpha cursor goes home	
Enter each written character indicated on keyboard	Check for proper writing and focus of selected character	Keyboard
Enter PAGE	Display erases; cursor goes home	
Enter CTRL SHIFT M (GS)	Cursor disappears	Control logic
Enter Space RUBOUT Space _	No apparent effect	Control logic
Enter _	Dot appears in lower-left corner	Control logic
Enter 7 RUBOUT 7 _	45° diagonal line appears, starting from bottom-left corner	
Check line straightness	All points on the line should be within 2% of length of mean straight line (Fig. 2-6)	
Press PAGE	Alpha cursor appears at top-left	Control logic
Enter CTRL G (BEL)	Rings bell	Control logic
Enter CTRL I (HT)	Cursor moves one space to right	
Enter CTRL J (LF)	Cursor moves down one line	Control logic
Enter CTRL SHIFT M (GS)	Selects Graph mode; cursor disappears	Control logic
Enter Space RUBOUT Space _ +RUBOUT Ø @	Vector appears	Control logic
Enter CTRL SHIFT K CTRL W (ESC ETB)	Copy of display is made if Hard Copy Unit is attached and energized	Hard Copy TARSIG Amp; Hard Copy Selector; High Voltage and Z Axis circuit; Storage circuit
Enter CTRL SHIFT K CTRL L (ESC FF)	Display erases; Alpha cursor homes	Control logic
Enter CTRL SHIFT M (GS)	Cursor disappears	Control logic
Enter @ @	Dot appears near display center	Control logic
Enter CTRL SHIFT 0 (US)	Alpha cursor appears with bottom-left corner at dot	Control logic
Enter CTRL SHIFT M (GS)	Cursor disappears	Control logic
Enter @ _	A line is written near display center	Control logic
Enter CTRL M (CR)	Alpha cursor appears at left margin opposite the line	Control logic
Performance Check completed.		

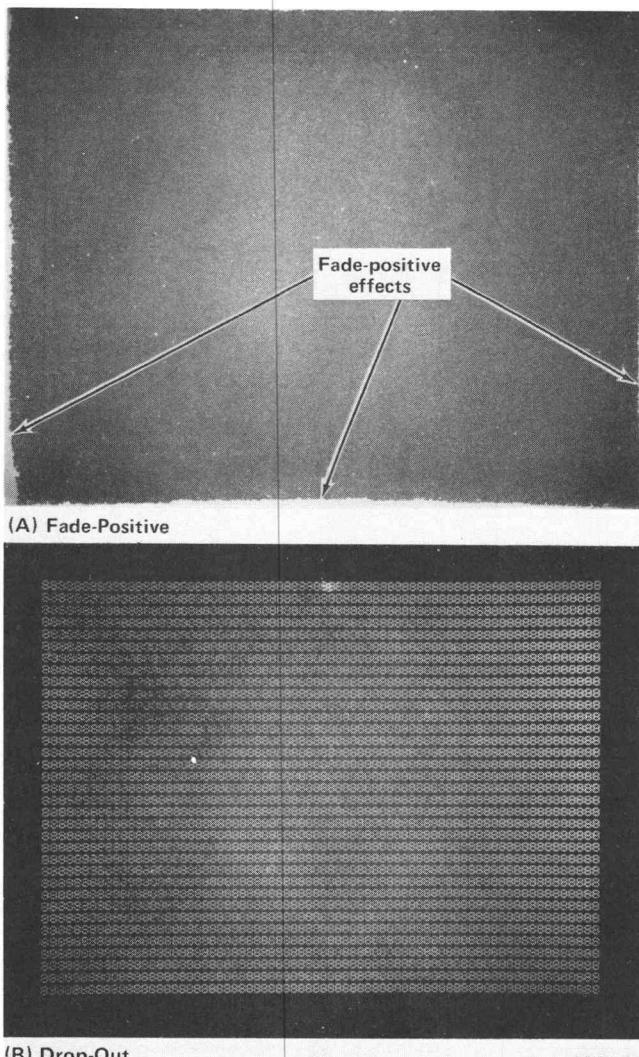


Fig. 2-5. Display Conditions. Fade Positive (a) and Drop-out (b) effects.

1892-7

ADJUSTMENT

Introduction

Adjustment of the terminal normally is required only when it ceases to properly perform its intended functions, or after circuit repairs have been made. However, if

adjustment is to be performed on a routine schedule, an interval of one year between adjustments is recommended. Adjustment should be preceded by a through cleaning and inspection as outlined earlier. Adjustment should be performed in a +20°C to +30°C environment and should be preceded by a thirty minute warmup period.

Table 2-1 provides an index of adjustments in the order in which they occur in the Adjustment Procedure. This may also be copied and used as a record of adjustments.

Equipment Required

The following equipment is required in this procedure:

NOTE

The tolerances noted for the test equipment may, in some cases, be considerably tighter than that of the 4006-1. This is necessary to maintain the accuracy of the measurement.

Oscilloscope. Dual trace with vertical deflection factors of 5 mV and 2 V per division, and sweep rates of 0.1 μ s, 0.5 μ s, 1 ms and 10 ms per division; frequency response should include dc to at least 10 MHz.

Voltmeter. Range at least -25 V dc to +400 V dc; accuracy within at least .05% at +15 V, 0.1% at -15 V, 0.2% at +5 V and at least 1% at all other voltages. High voltage range to -4000 V dc, accurate to within at least 0.5% at -3850 V dc.

Tektronix 4631 Hard Copy Unit. Required only for verification of Hard Copy mode.

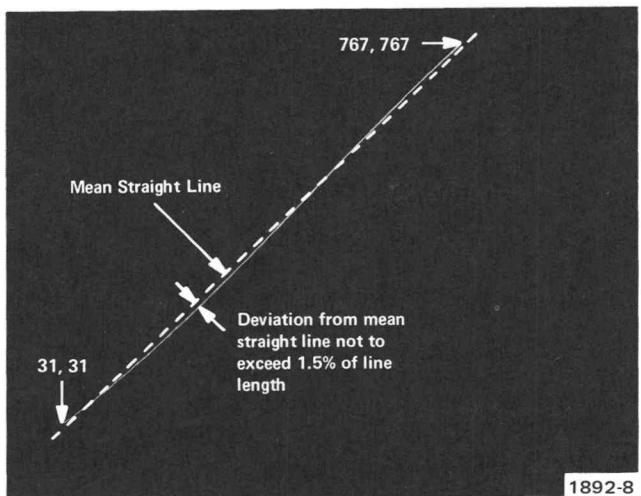


Fig. 2-6. Vector Dynamic Geometry Error.

Adjustment Procedure

Power Supply Calibration. The only adjustment in the Low Voltage Power Supply adjusts the +15 Volt, which is a reference supply for the +5 V supply and the -12 V supply. The power supply should only be adjusted during a complete adjustment procedure.

To adjust the +15 Volt supply, connect the voltmeter probe to pin 3 of J36. Ground to the chassis, or to the power supply ground pin. Power Up, and adjust R66 for 15 V dc ± 75 mV (+14.925 V to +15.075).

Display Calibration. To adjust the terminal display, use the following procedure.

WARNING

For adjustments to the High Voltage circuitry, a plastic-bladed screwdriver should always be used to avoid shock hazard.

1. Power down. Connect a high voltage probe to TP102, at the rear of the Display Board. Ground to the chassis or to the power supply ground pin. Power up, and adjust R224 for approximately -3850 V dc. Power down and remove the probe.

2. Place a voltage probe on pin 3 of J58. Power up and adjust R359 (CE) for a Collimation Electrode voltage of about 100 V (or as specified on the crt shield).

TABLE 2-1
Index of Adjustments

Adjustment	Circuit Number	Location
+15 Volt Supply	R66	Logic/Power Supply Fig. 2-7
High Voltage	R224	Display Board Fig. 2-8A&B
CE (Collimation Electrode)	R359	" " " Fig. 2-8A&B
Op Level	R248	" " " Fig. 2-8A&B
Bias	R129	" " " Fig. 2-8A&B
Cursor Brightness	R2	Logic/Power Supply Fig. 2-7
Focus	R13	Display Board Fig. 2-8A&B
Dynamic Focus	R36	" " " Fig. 2-8A&B
X Position	R271	" " " Fig. 2-8A&B
X Gain	R270	" " " Fig. 2-8A&B
Y Position	R273	" " " Fig. 2-8A&B
Y Gain	R272	" " " Fig. 2-8A&B
X Geometry	R393	" " " Fig. 2-8A&B
Y Geometry	R392	" " " Fig. 2-8A&B
X HC Position	R687	" " " Fig. 2-8A&B
X HC Gain	R686	" " " Fig. 2-8A&B
Y HC Position	R695	" " " Fig. 2-8A&B
Y HC Gain	R691	" " " Fig. 2-8A&B
HCU Intensity	R1050	Back Panel Fig. 2-9
Threshold	R252	Display Board Fig. 2-8A&B

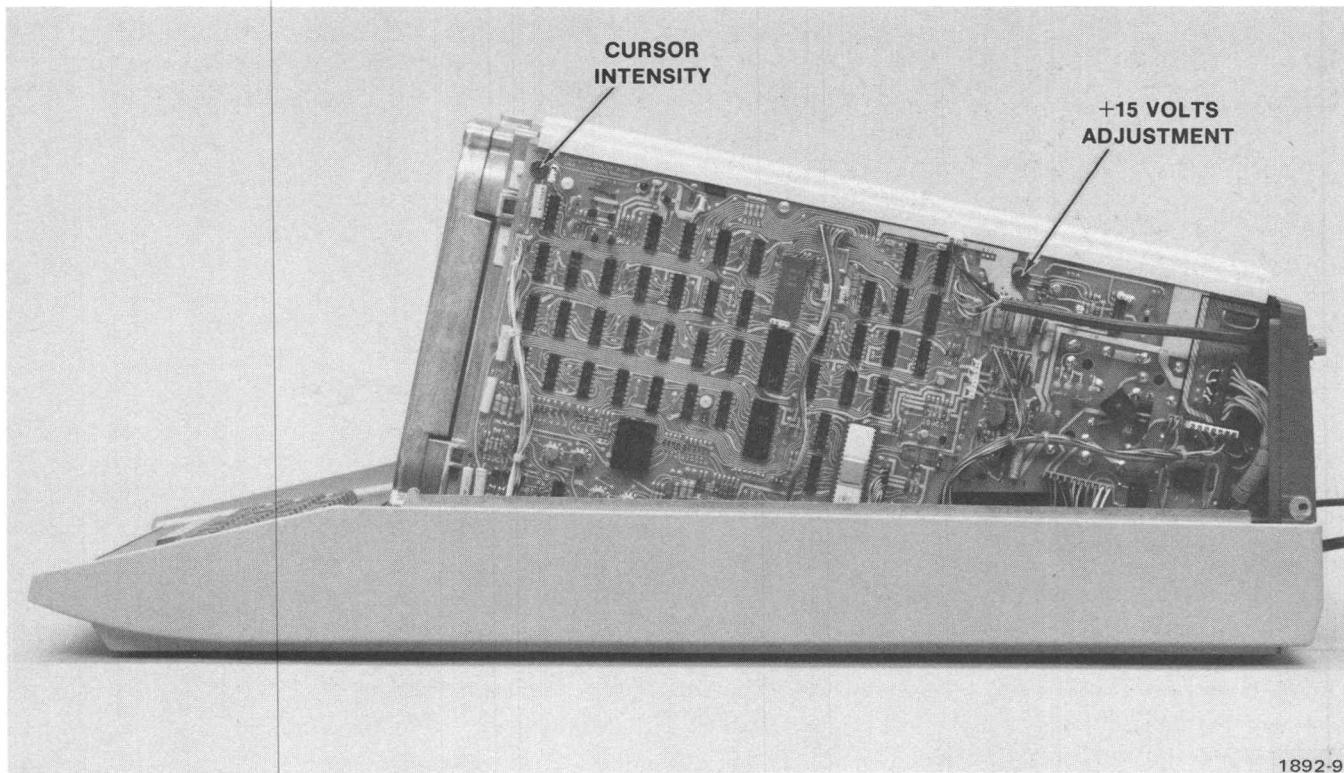


Fig. 2-7. Logic Board Adjustments.

3. Page and enter a GS (Ctrl Shift M). Adjust R129 (BIAS LEVEL) until a dot is seen in the upper left of the display. Back off R129 just enough that the dot no longer occurs.

4. Adjust R2 (CURSOR BRIGHTNESS) on the Logic board to achieve optimum cursor brightness without causing the cursor to store. To check for storage, press the SPACE bar repeatedly while adjusting intensity.

5. Connect a jumper between pins 6 and 10 of U255. Push the "8" key on the keyboard (once if the Half-Duplex option is installed; push and hold if no Half-Duplex is installed.), and note that the screen begins to fill with 8s. Check the focus and adjust R13 (FOCUS) at the rear of the Display board, as the lines are printing, until optimum focus is achieved. You may wish to press the PAGE key occasionally to clear the screen and re-check focus. Press RUBOUT or ALT MODE to stop.

6. Press PAGE, and repeat the previous step, this time adjusting R36 (DYNAMIC FOCUS). This adjustment affects the difference in focus between the center of the screen and the screen corners. Adjust for approximately even focus at the corners and screen center. Remove the jumper from U255.

7. Before adjusting deflection move the ORIGIN SHIFT strap (just above J56) to the CAL position, then enter the following Graph commands. If local storage is available (such as 4923 Option 1 Digital Cartridge Tape Recorder, a 4921/4922 Flexible Disc Memory, or even local minicomputer), you may wish to temporarily store this data so that it may be conveniently recalled. Enter:

CTRL SHIFT M (GS)

SPACE RUBOUT SPACE @

7 @

RUBOUT ? _

SPACE _

RUBOUT SPACE @

7 RUBOUT ? _

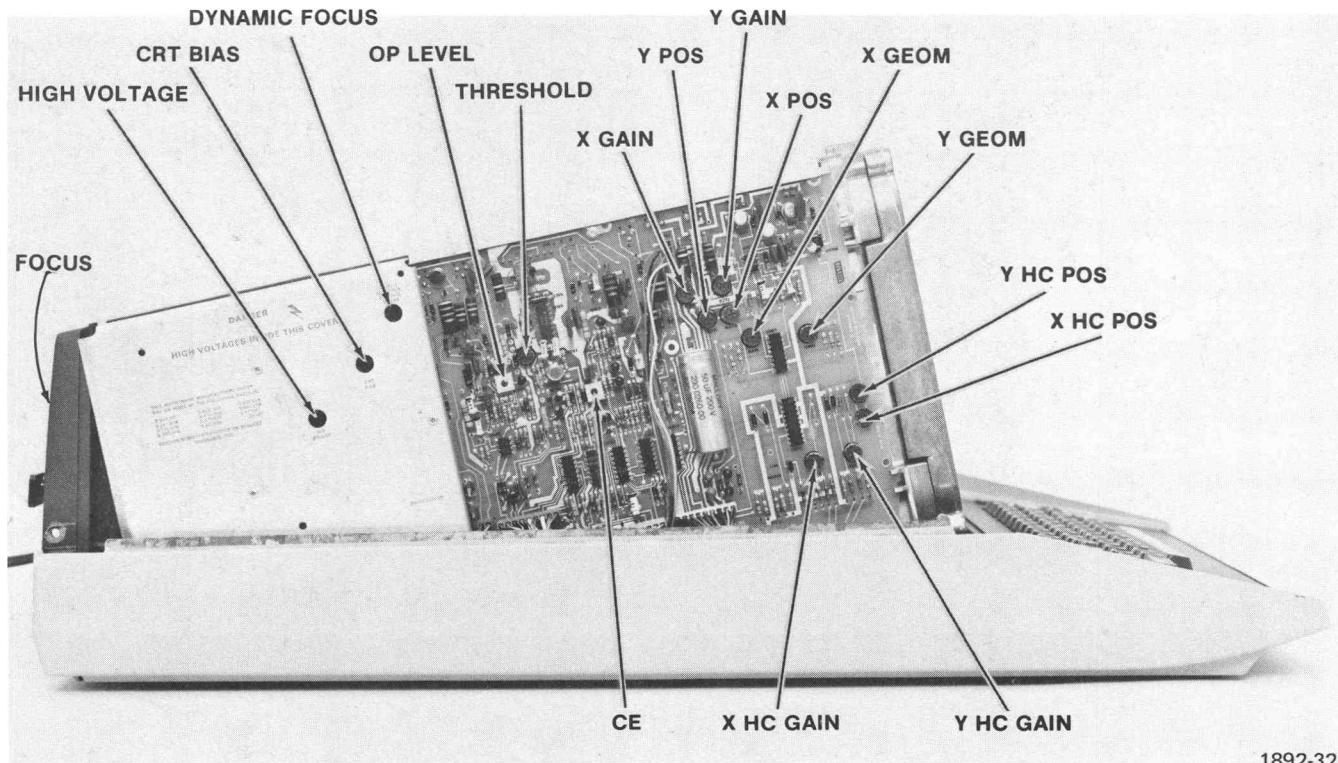
CTRL SHIFT M (GS)

SPACE _

7 RUBOUT SPACE @

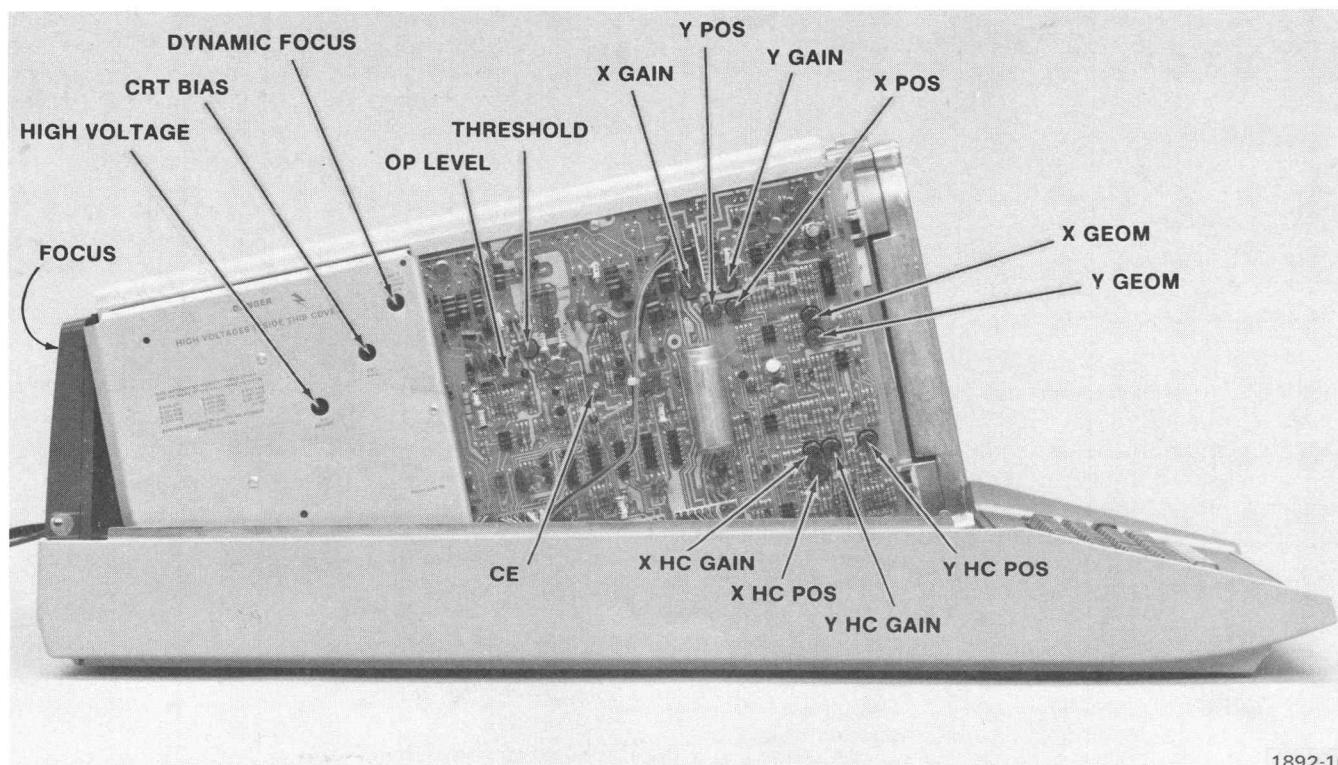
You should see a rectangle bisected by two intersecting diagonal lines from corner to corner.

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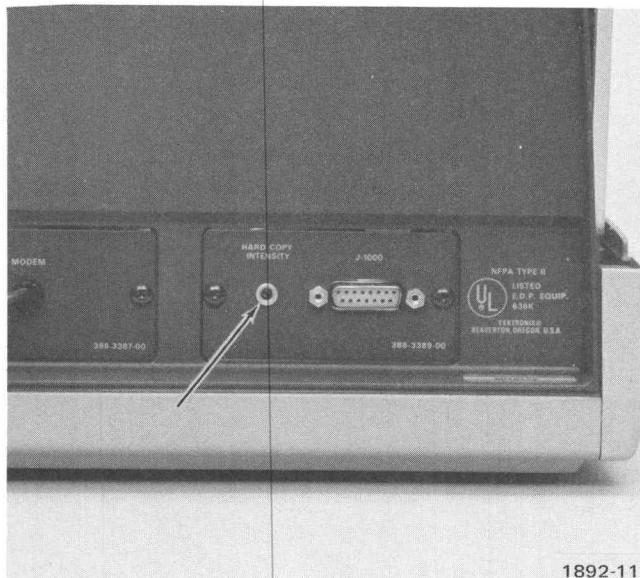
1892-32

Fig. 2.8A. Display Board Adjustments.



1892-10

Fig. 2.8B. Display Board Adjustments.



1892-11

Fig. 2-9. HCU Intensity Adjustment.

8. If the display pattern is tilted, the yoke must be rotated. This is accomplished by grasping the shield behind the shield holder, and rotating it.

Press PAGE, then re-enter the test pattern from step 88. Repeat until the displayed pattern is straight on the screen. Fasten the securing nuts, being careful not to disturb the yoke position in doing so.

9. Using the same test pattern (step 8), adjust X POSITION, X GAIN, Y POSITION and Y GAIN (R271, R270, R273, R272 respectively) to obtain the maximum dimensions of 7.25 inches horizontal (\approx 18.5 cm) by 5.375 inches vertical (\approx 13.7 cm). Adjust to bring the display center within 0.25 inch (0.635 cm) of the display center, and note that position and gain are interactive.

10. Adjust R393 (X GEOMETRY) and R392 (Y GEOMETRY) to straighten the test pattern vectors. Readjustment of position and gain may be required.

11. Connect the 4610 or 4631 Hard Copy Unit to the terminal, and press the COPY key. Adjust the X HARD COPY RAMP POSITION (XHCP, R687) and X HARD COPY RAMP GAIN (XHCG, R686) to overlap the test pattern by .5 cm on the left and right sides, as shown on the graticule.

Adjust the Y HARD COPY POSITION (R695) and Y HARD COPY GAIN (R691) to achieve the same overlap in the vertical direction.

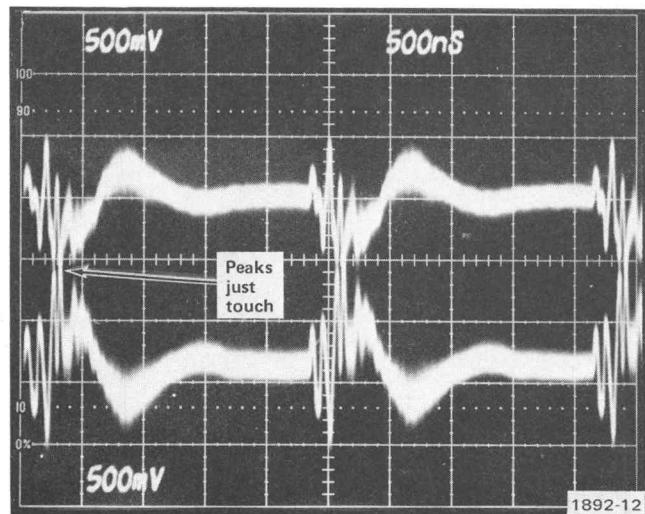


Fig. 2-10. Threshold Adjustment.

12. Make another copy, and this time adjust the scanning line intensity to a point just below storage. Adjust R1050 (Hard Copy INTENSITY) on the terminal back panel, adjacent to the Hard Copy Unit jack (J1000).

13. Connect the scope probes to TP255 and TP257. Set Vert Defl. to 0.5 V/cm non-inverted. Set sweep to 0.5 μ s/cm. Set both inputs to ground, and position both traces to the second horizontal graticule line from the bottom. Switch both inputs to dc.

Connect external trigger probe to the Z-axis signal, on TP 339. Press PAGE, then COPY and check for a display resembling Fig. 2-10. Adjust R252 (THRESHOLD) until the peaks almost touch, but no overlapping occurs.

Final adjustment of the threshold should be made after inspection of the copy for noise, appearing as black specks.

14. Power down, and replace the ORIGIN SHIFT strap to the GND (or NORM) position. Replace the cover; calibration is complete.

Running Time Meter

Some units may have a running time meter installed in the bottom of the unit. The running time meter assembly does not change the cost or functional operation of the 4006-1.



Section 3

CIRCUIT DESCRIPTION

Introduction

This section provides a description of 4006-1 concepts and circuit operations. Provided here are a discussion of basic terminal operating concepts, block diagrams, a listing of which circuitry blocks are located on each circuit board, and a functional description of each circuit block. The functional descriptions will also refer to the schematic diagram sheet on which the circuit block is found. Also in this section is a Dictionary of Line Titles, describing the various signals in the 4006-1. It is suggested that you read the Dictionary of Line Titles prior to reading further in the circuit descriptions. In doing so, you will become acquainted with terms used later in this section.

DICTIONARY OF LINE TITLES

The following is a description of interconnecting signals and an explanation of their purpose and operation. On the schematic diagrams, each signal is followed by a one or a zero (for example, HIY-0). The one represents a high-active signal; the zero (as in the example) is a low-active signal.

BIT 1-BIT 8 Data to and from the Terminal/computer.

TSTRB Strobes data into the Terminal to be displayed on the screen, etc. 1.6 microsecond pulse synchronized to the 614 kHz clock.

LCE Indicates last character sent to Terminal was the ESC (Escape) control character.

Z Z axis information (beam intensity).

**DOWN
RIGHT** Counting pulses for X and Y registers.

EOL

Indicates that the X Register is counting past the right margin (end of line). Used by the Automatic Carriage Return/Line Feed logic. When in the Alpha Mode, EOL going active causes an Automatic Carriage Return (CR)/Line Feed (LF) function.

**HIY
LOY
HIX
LOXE**

Used to load data into the Y or X data latches and (LOXE) to draw vectors.

GRAPH

Asserting a low on GRAPH will set Graph mode.

DRBUSY

If not during an erase cycle:

Asserted by the Hard Copy Unit to set up the display for hard copy readout.

DRBUSY should be asserted before the trailing edge of MAKE COPY in order to hold the Terminal in BUSY during the scan.

HCU

A low indicates that the Hard Copy Unit is capable of accepting a MAKE COPY request.

PAGE

Set active when the FF Control Character is preceded by ESC; also Page key. Causes the display to erase the screen. 1.6 microseconds wide minimum.

Circuit Description—4006-1 Service

CR	Causes the X register to set back to the left margin or center margin of the display.	LF	Line Feed. In Alpha mode, causes Y to move down one line (counts down by 22). If Y underflows (indicating the bottom of the display) margin is complemented and Y counts down to 767.
BREAK	Signal from the keyboard to the interface for computer signaling.	ERASE	Results from PAGE key or ESC FF. Causes the screen to erase (Page), resets to Alpha mode and resets the X and Y position counters.
XMAT YMAT	Analog signals representing the writing beam location within the character matrix. These are currents and may be difficult to measure.	COPY	This command causes the Hard Copy Unit to initiate a Hard Copy operation.
X Y	Analog signals to display. -7.75 to +7.75 volts covers the screen. Positive signals correspond to left or up deflection. 0 volts represents the physical center of the screen.	CIP	Character in Progress, inhibits other activity until the character is completed.
1.2 MHz 1.2 kHz 38 kHz 77 kHz	Clock signals.	SHIFT	Causes generation of the shifted character (i.e. % rather than 5). Resets to View mode.
VIEW	Controls the flood guns in the crt display. A high turns the guns on. View is in a steady high condition for about 90 seconds after the last information is received. After about 90 seconds, the display is placed in "hold mode" by the application of a 1200 Hz signal with a 12.5% duty factor on VIEW.	Y MOVE X MOVE	Signals used to determine whether or not the anti-burn circuit will activate during a vector.
HOLD	When the display is in VIEW mode (normal viewing status), HOLD is high. When the display goes to "hold mode" (about 90 seconds after the receipt of the last data), HOLD goes low.		
ALPHA	ALPHA is low when the Terminal is in Alpha mode, and high when in Graph mode.		
ALPHA STB	This signal strobes the character generator to produce each character, in Alpha mode.		
GS	Set by the GS control character to place the Terminal in Graph mode.		

BASIC CONCEPTS OF COMPUTER/TERMINAL COMMUNICATIONS

General

The 4006-1 Computer Display Terminal is a device that permits a person to deal directly with a computer. By using the Keyboard, which is similar to a typewriter keyboard, a person can question or instruct the computer and the computer's response is returned to that person by way of the display screen, either alphanumerically or graphically (charts, graphs, pictures, etc.).

The Terminal/Computer Communications block diagram is shown in Fig. 3-1. The different sections are the Computer, the Terminal (which includes the Keyboard, the Display Unit, and the Terminal Control circuitry) and the Communication Link.

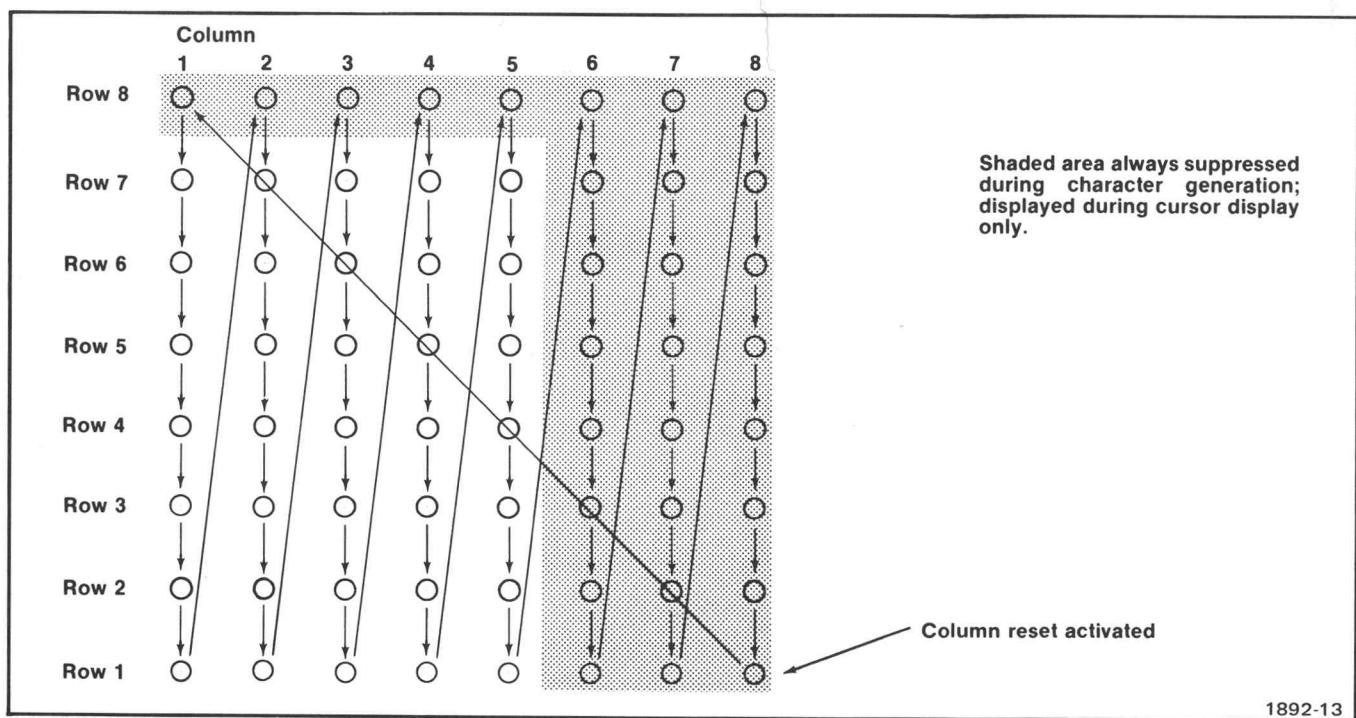


Fig. 3-1. Character Generator Matrix.

1892-13

Computer

The Computer can speak and act only through the use of binary numbers. The job of the Computer then, is to accept the data from the Terminal (commands from the Keyboard or other input devices), act on it by performing the indicated instruction and return its response to the Terminal.

Terminal

The Terminal acts as a translator between the operator and a computer. Its job is to take the data from the computer and translate it into a language or graphic form that makes the data understandable to the operator. This is the function of the 4006-1 Computer Terminal.

Display Unit. The Display Unit presents data visually for both alphanumeric and graphic operation by accepting X and Y (writing beam position) and Z (writing beam on or off) signals from the Terminal Control circuitry. These signals combine in the Display Unit to give a visual representation on the display screen of the data interchange between the operator and the Computer.

The 4006-1 Display Unit contains a storage-type crt (cathode-ray tube). The data being displayed has only to be written once. The characteristics of the storage tube allow the image of the data to be retained for a long period of time (up to one hour without damage to the display

screen) without having to continually redraw it, as would be necessary if a television-type crt were used.

Keyboard. The Keyboard provides the operator with a readily understandable means of inputting data to the Computer. It is an electromechanical device which, as a result of the operator's depressing any one of its keys, produces a binary data word that is distinctive for that key. This binary representation of the key depressed provides the Terminal Control Logic and the Computer circuits with a form of data they can understand.

Terminal Control Logic. This circuitry accepts data from either the Computer or the Keyboard. This circuitry also provides synchronization so that the data is handled in the proper sequence. When data is accepted by the Terminal Control Logic circuits, it routes this data to the Computer and/or the Terminal Display Unit, depending upon the data source and the function requested by the data. The Terminal Control Logic circuits interpret this data as either an alphabetic character or number, as coordinate points on an X-Y axis (for beam positioning), as a special function to be performed (ring bell, etc.) or as mode control information.

Communication Link

Direct. When the Computer is located near the Terminal (as in the same building), a direct hook-up is the most practical. This type of communication link can best

Circuit Description—4006-1 Service

be thought of as simply plugging the Terminal into the Computer, just as you would plug a radio into a wall socket.

Modem (telephone hook-up). In most cases the computer will be located a considerable distance from the Terminal, making a direct connection impractical. In such cases, the transfer of information between the Computer and Terminal must be by other means. The most convenient and readily available means of transmission is the standard telephone and telephone lines. However, the Terminal and Computer cannot be hooked directly to the telephone because telephone lines cannot transmit DC levels; therefore, the telephone hook-up consists of a modulator-demodulator (MODEM) which enables (modulates) the data on a voice frequency tone for transmission over the lines and decodes (demodulates) the data at the receiving end. Both the computer end and the Terminal end of the telephone line have MODEMS. Both ends operate the same. Thus, by the use of telephone lines and the MODEM, the distant computer can be reached as easily as dialing your next door neighbor.

CIRCUIT BLOCK LISTING

This section lists the blocks of circuitry found on each circuit board within the 4006-1. Since each circuit board (with the exception of the Keyboard) is divided into several schematics, the blocks are listed with reference to the schematic on which they are found. The list is presented in the order in which the schematics are found, and in which the descriptions of the functional operation of the circuit blocks occur later in this section.

Power Supply/Logic Board

The Power Supply/Logic board contains the following functional blocks.

1-1 Transmit/Receive and Clock Generation

Transmit
Receive
Master Clock Generation

1-2 Control Logic

Control Character Decoder
LCE
Alpha/Graph Flip-Flop
X — Y Register Control
Graph Byte Control
BEL/ETB Decode
Copy Command Decode
Bel (Speaker) Driver
View/Hold Control

1-3 X & Y Axis

X Register
Y Register
X Deflection Counter
Y Deflection Counter
EOL Decoder
X D to A Converter
Y D to A Converter
X Amplifier
Y Amplifier

1-4 Z Axis

Character Generator
Character-in Progress
Cursor Control
Graph Mode Z Enable
Anti-Burn Control

1-5 Low Voltage Power Supply

+15 Volts
+5 Volts
-12 Volts
-20 Volts (unregulated)
+20 Volts (unregulated)
+185 Volts (unregulated)
+320 Volts (unregulated)

Display Board

The Display board contains the following functional blocks.

2-1 Deflection Multiplexer

HCU Control
Switch Driver
X Amp and Switch
Y Amp and Switch
Origin Shifter
Make Copy Amp

2-2 Crt Readout, Storage, and +175 Volts Regulator

+175 Supply
Erase Pulse Generator
Flood Gun Control
Erase and Storage Back-plate Control
Collimation Control
CRT Readout Amp

2-3 Deflection Amps

|X| Amp
|Y| Amp
 X^2 Amp
 Y^2 Amp
 $X^2 + Y^2$ Amp
X Geometry Correction
Y Geometry Correction
X Deflection Amp
Y Deflection Amp

2-4 High Voltage and Z Axis	High Voltage Supply Control Grid Supply Intensity Control Focus Supply Filament Supply Z Signal Amplifier Regulator Oscillator
3-1 Keyboard	Oscillator 4 LSB Counter Strobe Generator Character Decoder Character Keys Character Detector 3 MSB Counter Bit 7 Control and Control Key Bit 5 Control and Shift Key Character Output Gates

The Transmit block also contains the ECHO IN/OUT strap. Note that when ECHO is strapped IN, the Serial Data Output (pin 25) of U455B is connected to the Serial Input of U455A, which is the Receiver half of the UAR/T.

Q460 and Q462, with associated resistors and supplies, combine to form an output level shifter to convert from the TTL levels present within the 4006-1 to the levels defined by EIA Standard RS-232-C. These levels are defined as being more negative than -3 volts for a mark (binary one), and more positive than +3 volts for a space (binary zero), the outer limit of voltage is further defined as not exceeding 25 volts; the voltage will not exceed -12 or +15 volts, respectively, in the 4006-1.

Receive. The Receive block centers around U455A, which is the Receiver half of the UAR/T. It receives data in its Serial Input (pin 20), either through the ECHO IN path or from the RCV DATA (J32-7) through Q260. Q260 serves both as a level shifter, converting back from RS-232-C levels to TTL levels, and also as an inverter. Note that the UAR/T has internal pull-up resistors.

U345 suppresses printing or spacing when any character is received with bits 3, 4, 5, 6 and 7 all high; these are RUBOUT (DEL), ~, }, and]. U255A is used to create the pulse (CDAV) that is gated to become TSTRB. CDAV is also used (on schematic 1-2) to reset the LCE flip-flop.

Control Logic (1-2)

The following blocks are located on schematic 1-2. Refer to the Schematic Diagrams section for circuit details.

Control Character Decoder. The Control Character Decoder consists of U341, which is a 4-line to 16-line decoder. The inputs consists of bits 1, 2, 3 and 5. Bit 4 is inverted to produce a low (when bit 4 is true) on the pin 19 enable input (G_1). The other enabling input is pin 18 (G_2), which is clocked when bits 6 and 7 and TSTRB are low. One of the outputs goes low for each of the decoded Control Characters to which the Terminal responds. These are LF, CR, GS, HT, US, ESC and FF, as labeled on the schematic.

LCE. The LCE block consists of U355, a flip-flop which is cleared each time an Escape (ESC) Control Character is decoded. This causes a high on the pin 8 (LCE) output, signifying that the last character received was an Escape character. This is used when particular Control Characters must be preceded by ESC to initiate a function. These are ESC FF (page, or erase the screen) and ESC ETB (which initiates production of a Hard Copy). The LCE flip-flop is reset by CDAV after the second character is received.

POWER SUPPLY/LOGIC BOARD

Transmit/Receive and Clock Generation (1-1)

The following blocks are found on schematic 1-1, pertaining to data transmission and receipt, and the generation of clock signals within the 4006-1.

Transmit. The Transmit block oversees all data transmission from the 4006-1 to the modem and/or computer. Its operation is centered around U455B, which is the transmitter half of a Universal Asynchronous Receiver/transmitter (UAR/T). Strap options external to the UAR/T allow for selection of parity generation or no parity generation, odd or even parity (when parity is selected), or high or low bit 8 when bit 8 is used for "data". All of these features are internal to the UAR/T. Pin 40 of the UAR/T is the transmit clock. For operations internal to the UAR/T, this clock must run at sixteen times the desired transmission rate.

U355A and U255B combine to form a strobe generator for the data strobe input to the UAR/T (U455B, pin 23).

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Alpha/Graph Flip-Flop. The Alpha/Graph Flip-Flop determines whether the Terminal is in Alpha mode or Graph mode. A GS (low) from the Control Character Decoder places a high on the Alpha line, which is low-true, and a low on the Graph line, thus enabling Graph mode. The flip-flop is reset to the opposite (Alpha mode) configuration by any of the inputs to U231B. These are CR or US (U331C), or either of the screen erasure conditions (U331D).

X and Y Register Control. The X and Y Register Control block is used primarily to generate pulses for control of the writing location, when in Alpha mode. (Note that when Graph is true, U215A is disabled.) It generates either 14 pulses (character space) or 22 pulses (Line Feed). U225D and U221D, with the flip-flop formed by U225B and C, form a multiplexer. When CIP goes low, or when an HT is decoded, U221A enables counting through the RIGHT gate (U221D), causing the alpha cursor to move one space (14 counts) to the right. EOL or LF, on the other hand, enable combining through the DOWN gate (U225D), causing the alpha cursor to move down one line (22 counts).

Any of the above conditions (that determine either a RIGHT or DOWN count) also clear U211A and B, U215A, and also load a preset count into U311. U211A and U211B are both dividing by two. The output of U211A provides the counting pulses, and is counting at twice the rate that U311 is clocked. For a DOWN count (22 pulses), a count of 13 is loaded into U311, allowing it to count 11 times before turning off U215A and disabling the count. (Recall that its count is half of the output pulse count; its 11 counts equals 22 output pulses.) For a RIGHT count, U311 is preset with a one, counting 7 times (14 output pulses from U211A) until it is disabled.

Graph Byte Control. The Graph Byte control block consists of U235 and associated gates. U235 is functioning as a 3-line to 8-line decoder. Its inputs are bits 6 and 7 and Graph, gated in by TSTRB (pins 2, 14). When bits 6 and 7 are both low, a Control Character is indicated. A low is produced on pins 7 or 9 (open collector outputs, tied together), to enable the Control Character Decoder.

If Graph is high, a low will be produced on pin 4, 5, or 6, which becomes an Alpha Strobe. If Graph is low, a low will be produced on pin 10, 11, or 12. Pin 11 produces LOXE, while pin 12 produces LOY. Pin 10 goes low for both HIX and HIY; the multiplexer consisting of U231C; U225A, U335A and U201C determines whether the byte is HIX or HIY, depending on whether a GS or LOXE or a LOY has been previously decoded.

BEL/ETB Decoder. U351A samples bits 1-4 and the Control Character indicator (U351A, pin 2) to detect both BEL and ETB Control Characters.

Copy Command Decode. If U351A has decoded the BEL/ETB characters, a high is placed on pins 8 and 9. If LCE is also high, and if bit 5 is high (U351B, pin 12), a copy command is decoded. This command is processed through a pulse stretcher (on the Display board, schematic 2-1), prior to output to the Hard Copy Unit.

BEL (Speaker) Driver. If U351A has decoded the BEL/ETB characters, a high is present on pin 10 of U161B. If bit 5 is low (U161B, pin 9), 75 ms one-shot U161B fires, gating the 1.2 kHz clock through driver Q20 to speaker LS 1001.

View/Hold Control. The View/Hold Control consists of 80 second one-shot U161A. It is re-triggered by TSTRB with each character received. If no character is received for about 80 seconds, the one-shot times out, placing a low on HOLD (pin 13), and gating the 12.5% duty factor VIEW CLOCK through U131D to place the display in Hold mode. The one-shot can be triggered again to place the display in View mode by any character (TSTRB), or by the SHIFT key or DRBUSY.

X and Y Axis (1-3)

The following blocks are located on schematic 1-3. Refer to the Schematic Diagrams section for circuit details.

X and Y Registers. The Y Register consists of U441; the X Register consists of U401 and U301B. These registers are used in Graph mode to provide storage for three of the four five-bit coordinate address bytes. In Graph mode, data is sent from the computer to draw graphics on the display screen. It takes twenty bits of data to establish a new coordinate address. However, only seven bits of data can be received from the computer at any one time; therefore, each coordinate address is divided into four seven-bit bytes. Two of the bits in each byte are used to develop load signals (HIY, LOY, HIX and LOXE), which are decoded in the Graph Byte Control block (Schematic 1-2). Each load signal latches its respective five bits of coordinate data into the appropriate register. The High Order Y

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bits are the first sent from the computer. The HIY signal (decoded from the two most significant code bits) loads the remaining five bits into the five Most Significant Bit (MSB) portion of the Y Register. The same operation takes place for the Low Order Y bits and the High Order X bits. When the fourth and final byte (Low Order X) is received from the computer, LOXE parallel loads all 20 bits into the X and Y Deflection Counters. Note that the Low Order X bits are presented directly to the Low Order X inputs of the X Deflection Counter. No storage is needed because they are the last bits received to complete the coordinate address.

X Deflection Counter. The X Deflection Counter is a ten-bit counter/latch. It is loaded either serially by the RIGHT signal or it is loaded in parallel by the ten parallel inputs that contain the X coordinate address in Graph and Mode operation. In Alpha, the Register is loaded serially. Each low-going RIGHT signal will decrement the output one count. The ten outputs provide a count from 0 to 1023. Each count represents one Tekpoint, which simply means that the display beam can be positioned to any one of 1024 separate locations in the X Axis.

Either the CR (Carriage Return) or ERASE signal will reset the X Register to zero. ERASE goes active when the Page key is pressed or Control characters ESC plus FF are received by the Terminal.

Y Deflection Counter and Top-of-Page Detect. Like the X Deflection Counter, the Y Deflection Counter is loaded either in series (by DOWN) or in parallel when receiving ten bits of data from the Y Register. This register is also capable of outputting a count of 0 to 1023. In the X Register, all 1024 of the separate Tekpoints are viewable. In the Y Axis only 780 of the 1024 Tekpoints are viewable. When an ERASE signal zeros the Y Register the Alpha Cursor positions off the top of the screen in the Y Axis. Therefore, circuitry is needed to bring the alpha cursor in view, to the Home position (upper left). This is accomplished by the Top-of-Page Detect Circuit.

When the Y Register is zeroed by ERASE, the outputs position the display beam off-screen at a count of 1023. The two most significant bits are sensed by the Top-of-Page Detect Circuit (U325C). When both go high, the Top-of-Page Detect circuit places the 1.2 MHz clock on the DOWN line, and immediately the display beam begins moving in the down direction. When the count from the Y Register has incremented 256 counts, the 2nd MSB goes low, inhibiting the Top-of-Page Detector circuit and removing the signal from the DOWN line. Thus, the count is stopped at 767 (1023 minus 256 = 767). Note that the count is a binary up count, but relates to downward beam positioning.

EOL Decode. The EOL Decode block uses an 11th bit of the X Deflection Counter (U425 pin 2), which constitutes a count of 1024. It goes high when the X Deflection Counter reaches the edge of the page (1023). The EOL Decode block uses this signal to enable the AutoCR circuit when a count of 1023 (left margin) or 511 (10th bit, for center margin) is reached. The margin circuit looks at the 11th bit of the Y Deflection counter and forces the 10th X bit high after the bottom of the page is reached.

X and Y Digital to Analog (D/A) Circuits. These circuits convert the digital outputs of the Deflection Counters into their respective analog values. Both consists of a diode and resistor switching network. Depending upon the logic state of the Deflection Counters, the diodes turn on or off their associated resistor, allowing current to flow into the current rail. From there, the current flows into the inverting input of Op Amp U715A (Y Axis) or U605A (X Axis). Notice also, that the X and Y Matrix signals (X MAT, Y MAT) from the Character Generator (on schematic 1-4) are summed in their respective D/A circuit.

X and Y Amplifiers. The outputs of the X and Y D/A Analog circuits are input to their respective filter. When operating in the Alpha mode, the X and Y analog voltages pass directly through the circuit; U715B and U605B are effectively out of the circuit.

The Filter circuits (U705B and U715B) are switched in by Q704, Q706 and Q708 when in Graph mode.

When LOXE simultaneously loads the 20 bits of data into the X and Y Registers, it causes an almost instantaneous change in voltage to occur at the outputs of the X and Y Digital to Analog circuits. This sudden change in voltage cannot be sent directly to the Display Amplifiers because the rate of change is non-linear. In other words, the vector drawn might be very fast at the start and very slow at the end; thus, hardly storing at the beginning and storing very bright at the end, or maybe even overshooting the defined end point. The filter network overcomes these problems. It provides a linear rate of change in the X and Y output voltage to feed the Display circuit.

Z Axis (1-4)

The following blocks are located on schematic 1-4. Refer to the Schematic Diagrams section for circuit details.

Character Generator General Description. The Character Generator performs its function by cycling through a dot matrix. See Fig. 3-1. Although the matrix is formed by the coordinates of eight rows and columns, the

Circuit Description—4006-1 Service

eighth (or upper) row is always blanked during character writing.

Characters are formed by cycling through each of the matrix positions and writing a dot in each of the positions required for forming a character. A cycling sequence consists of selecting column one, rippling through rows 8 through 1, then selecting column 2, repeating the row selection, etc. For example, if the letter L were to be written, dots would be written for row positions seven through one in column 1. Only the row 1 dots would be written when the character generators cycles through the eight rows of the remaining four columns. The last three columns are blanked during character writing.

In the absence of a character input, the Character Generator continuously cycles through the matrix, pulsing all dots in rows 8 through 1, forming a non-storing cursor. When a character is ordered written, the matrix is scanned, dots are written to store the character, and then a pulse is sent to advance the X Register one character position to prepare for the next character.

The principal circuits which perform these functions within the Character Generator are as follows:

1. Read Only Memory or ROM (U141)—Programmed by the character being processed; emits each of eight sets of data on five parallel lines, the set being determined by the Row Counter; the five parallel lines represent the five columns of the character writing matrix. The ROM has 64-character selection capability. This consists of the middle four columns of the ASCII Code Chart. None of the lower case alphanumeric symbols can be generated; although eliminating character BIT 6 from the ROM permits characters from the right two columns of the ASCII Code Chart to be accepted and written as characters from an equivalent position in the two columns to the left.
2. Column Counter (U55B)—sequentially selects columns one through five, causing the crt beam to deflect in the X direction; selects the appropriate column out of the five outputs of the ROM for Z axis control.
3. Row Counter (U151)—cycles through the eight rows at each column selection; its output causes the crt beam to deflect in the Y direction; it also causes the ROM to emit five bits of writing information consistent with the selected row.
4. Z Multiplexer (U135)—emits an output controlled by one of the five signals from the ROM. The selection is controlled by the inputs from the Column Decoder.

5. Z Enable Gate (U155A)—sends 77 kHz Z ENABLE pulses to the Z Multiplexer.

6. Y Matrix Digital to Analog Converter—converts the digital output of the Row Counter into its analog equivalent for display beam positioning. Consists of resistor array with output Y MAT.

7. X Matrix Digital to Analog Converter—converts the digital output of the Column Counter into its equivalent analog voltage for display beam positioning. Consists of resistor array with output X MAT.

Scanning the Matrix. BIT 1-BIT 5 and BIT 7 applied to the data inputs of the ROM select the writing signals pertaining to the character being input. The BCD, ROW, inputs from the Row Counter, sequentially scan the matrix rows in the ROM at a 38 kHz rate. The combination of data select and Row scanning inputs results in dot disclosure information on the five output lines of the ROM to the Z Multiplexer circuit. The five lines represent each of the five columns of the matrix. With this information in mind, let's follow the Character Generator through the scanning sequence.

The output of the X and Y Matrix Digital to Analog circuits starts the display beam to the column 1, Row 8 position of the matrix. The eighth row of dots is not used since ROM has no information for that row. Since only seven counts of Row information is present, the eighth row is thus suppressed from writing. When a dot is to be written, the column 1 dot output is high. When the combined 77 and 38 kHz signals cause the output of the Z Multiplexer to go low, causing the Z Axis circuit to output a Z signal to write the dot. This is a 25% duty factor pulse.

The above process repeats itself; the 38 kHz pulses cause the Row Counter to count from 1 to 8, selecting row 8 to row 1 respectively; with each advance of the Row counter the Y Matrix Digital to Analog will change accordingly, positioning the display beam to follow the scanning sequence.

When the Row Counter resets state 0, the state 4 goes low. This causes the Column Counter output to advance to column 2. The output of the X Digital to Analog circuit changes and positions the display beam to the column 2 position. The last three columns are suppressed by grounding pins 12, 13, and 14 of U135.

Character-in-Progress. This flip-flop activates during generation of a character and is used by the X and Y Register control (upon completion of a character) to move the character matrix to the next character position.

Cursor Control. The Cursor Control allows the Alpha Cursor to be displayed when in Alpha mode. It prevents the cursor from being displayed in Hold mode, Graph mode, and when DRBUSY is low. Because of the timing characteristics of U101A, CR126, R22, and C23 have been provided to assure that the CURSOR BRIGHTNESS control varies the pulse width. The CURSOR BRIGHTNESS control is adjusted to allow the dots in the cursor to be viewable without storing. The minimum pulse output is 30 ns.

Graph Mode Z Enable. This block allows the Z signal to occur except when a dark vector should occur. A GS clears U301A, which prevents LOXE from enabling one-shot U101B. The first LOXE then clocks U301A, which allows U101B to cause the Z signal in Graph mode on all subsequent vectors, unless a GS clears U301A again, for another dark vector. The one-shot allows the Z signal for just long enough to complete a vector.

Anti-Burn. The Anti-Burn circuit interprets the X MOVE and Y MOVE steps to determine if either is 35 \pm 15 Tekpoints. If either is long enough, positive or negative, one of the four transistors will cause Q17 to reset the flip-flop formed by U121B and U121C. The Z signal will then pass undisturbed. If neither move is long enough to cause this switching action, the CHOP IT signal will pulse the Z signal at 77 kHz. This prevents short vectors from damaging the screen.

Low Voltage Power Supply (1-5)

Refer to the Low Voltage Power Supply, schematic 1-5 and the drawing showing the component locations for the supply.

Line Voltage Straps

Power is supplied to the instrument from J1001 through the power switch, fuse, and line voltage straps to the transformer primary. The diagram is drawn showing the 100- to 130-volt strap plugged into the MED position for 115-volt (+5%, -10%) line voltage. For 200- to 240-volt operation, use the 200- to 240-volt strap plugged into the appropriate position as shown on the diagram instructions.

General Information. As shown on the overlay blocks on the schematic diagram, this supply has regulated outputs of -12 volts, +5 volts, and +15 volts. It also contains unregulated outputs of -20 volts, +20 volts, +185 volts, and +320 volts.

Regulated Supplies. Voltage reference for the +15 and +5 volt regulated supplies is supplied by U81 and set by R66. The +15 regulated output supplies the voltage reference for the -12 volt supply.

+15 Volt. U81 regulator drives Q1085 series pass transistor. Current limiting is provided by the voltage across the current sense resistor R70 to drive the current limit input of U81.

U81 compares the +5-volt reference set by R66 and the +5 volts (from the +15-volt output through divider resistors R77 and R78). U81 output at pin 10 drives Q1085 to regulate the +15-volt output.

Supply current through R70 is limited to 400 milliamperes by U81.

+5 Volt. Regulation is accomplished by U375B, Q72, and Q1075. Current limiting uses current sense resistor R170 and Q72. For overvoltage protection, a crowbar circuit is used consisting of VR267 and Q171.

U375B compares the +5 volt reference set by R66 through R371 to the +5 volt supply voltage through R372. C371 is active on power up to prevent overshoot of the +5 volts. U375B output drives the series pass transistor Q1075.

When the current through R170 exceeds about 2 amperes, Q72 turns on to limit the drive to Q1075 to decrease the output voltage.

Overvoltage reference for the crowbar circuit is provided by the 6.2-volt zener VR267. Should the +5 volt supply exceed 6.2 volts, VR267 conducts to turn on the crowbar SCR Q171 which pulls the +5 volts supply down to about 1 volt. Once the crowbar SCR is turned on, the power must be turned off and back on to release and restore the circuit.

-12 Volt. Variations in the -12-volt supply are monitored by the R266/R367 divider resistor and cause U375A to regulate the -12-volt supply through Q465 and the series pass transistor Q1065.

Current limiting is provided by Q470 and the current sense resistor R471. Q470 starts current limiting the supply at about 230 milliamperes and reduces the conduction of Q465, and Q1065 to lower the output voltage.

DISPLAY BOARD

Deflection Multiplexer

Refer to the block diagram overlay on the Deflection Multiplexer schematic. These circuits allow the Hard Copy Unit to control the deflection amplifier circuits.

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Deflection ramps from the Hard Copy Unit are switched to the X and Y Amplifiers when a hard copy is desired. At the same time the Z axis is interrogated, and the copy signal (TARSIG) from the crt is enabled.

The Make Copy Amp amplifies and stretches the COPY signal to output MAKE COPY.

Also the position information is modified to enhance the life of the crt.

HCU Control. Either the READ or the WAIT signal generate READ at the output of U552A to accomplish the following: (1) Enable U552B to allow the TARSIG signal output to the HCU. (2) The output of U552A is inverted by U555B to disable U552D, blocking the Z signal from the Z MPX output. (3) Enable U557B multivibrator and U552C gate so that INTERR signal will control the Z MPX signal to the crt. (4) Activate the Switch Driver circuit through inverter U555A. (This in turn will allow the X and Y RAMP signals, from the HCU, to control the X and Y AMP signals.)

When both the READ and the WAIT signals are high, the Control circuitry enables the X, Y and Z circuits from the terminal.

Switch Driver. The Switch Driver circuit includes inverter U555A, Q552, and Q551.

When the Terminal X deflection is enabled (READ signal must be low), Q552 is off and Q551 is on. This provides a negative voltage to reverse bias CR775 and a negative voltage to forward bias CR781.

When the X Hard Copy deflection is enabled, READ signal must be high causing Q552 to conduct and Q551 to be off. This provides positive voltage to forward bias CR775 and a positive voltage to reverse bias CR781.

X Amp and Switch. The circuit consists of two operational amplifiers; U777B is used for the X Hard Copy deflection and U777A for the terminal X deflection. The Switch Driver circuit, through diodes CR775 and CR781 turn one operational amplifier on and the other off as required.

When the terminal X deflection is required, CR775 is reverse biased, and the X signal is amplified by U777A, and output through CR677 to the X AMP signal out. At the same time CR781 is conducting to place a negative signal on U777B pin 5 causing CR678 to be reverse biased and thereby disconnect U777B output.

When the X Hard Copy deflection is used, CR781 is reverse biased, and the X RAMP signal is amplified by U777B and output through CR678 to the X AMP signal out. Note that the input signal can be attenuated by X HC GAIN control, R686, and a position adjustment can be made using the X HC POS control, R687. Also, CR775 is forward biased, and the positive voltage on pin 2 of U777A disconnects the output through diode CR677.

Q674 provides a constant current source for the X amplifier. Bias for Q674 (shown on diagram 2-3) is about 5.1 V above the -20 volts (unregulated).

Y AMP and SWITCH. The Y Amp and Switch has the same operational characteristics as the X Amp and switch circuit already discussed.

Origin Shift. The Origin Shifter circuit modifies the X and the Y position information to enhance the life of the crt. U791 is an eight position binary counter clocked by ORIGIN signal. ORIGIN is a logic pulse that is concurrent with the erase cycle. The output of the counter is fed through current dividers then added to the X and Y signals to modify the deflection reference position whenever the crt is erased. For calibration, the CAL-NORMAL strap is changed to the CAL position to clear the counter.

Make Copy Amp. The Make Copy circuit consists of Q354 and Q355. The circuit amplifies and stretches the input COPY signal and outputs MAKE COPY signal.

Crt Readout, Storage & +175 Volts Regulator

Refer to the overlay blocks on the schematic diagram. Input control signals are ERASE, READ, and VIEW. The signals control the blocks for the crt functions of view, erase, storage, and readout. The +175 Volt supply is a separate function shown on the diagram.

+175 Volt Supply. Regulation is accomplished by U445, Q244, and Q1036. U445 compares the reference +15 volts through dividers R444 and R443 (about 8 volts) with about 8 volts from the +175 volt supply through dividers R341 and R342 to drive Q244. Q244 collector current, through R242, R41 and R140, drives the series pass transistor Q1036 to regulate the supply.

Erase Pulse Generator. The circuit consists of a 14-millisecond multivibrator followed by a 950 millisecond multivibrator U557A and U566B. The ERASE signal triggers U557A which, after about 14 milliseconds, triggers U566B. Output of both multivibrators are combined to generate a DRBUSY signal, and to control the crt Flood Gun anode and the crt Anode #2 through the Flood

Gun Control circuitry. The output of U557A generates ORIGIN signal and controls the Flood Gun Anode and Cathode through the Flood Gun Control circuitry. The output of U566B controls the crt collimation electrodes through the Collimation Control circuitry. The signal also controls the Storage Backplate (STB) voltage through the Erase-Storage Backplate control circuitry.

Flood Gun Control. The circuit includes Q364, Q366, and Q1067. Inputs to the circuit come from the Erase Pulse Generator circuit (DRBUSY and ORIGIN) and the READ and VIEW signals.

Quiescently, the circuit holds the flood gun anode at about 150 V and the flood gun cathode at about zero volt. Assume Q364 and Q366 are at cut-off. Zener diodes VR266 and VR265 conduct to raise the base of Q1067 to about 150 V. Then Q1067 emitter sets the flood gun anode and Anode #2 to about 150 V. CR264 is conducting to hold the flood gun cathode at about zero volts.

Erase & Storage Backplate Control. The circuit includes Q251 for control with output voltage adjustment and feedback amplifier Q247, Q143, Q41, Q47, Q1039, and Q1044. The amplifier determines the backplate (STB) voltage. Quiescent output voltage is set by the R248 (OP LEVEL) to the appropriate voltage to store data on the screen.

Due to an ERASE signal, the output of U566B places a low signal (about 950 milliseconds duration) to inverter U561A. The inverted signal drives waveform generating circuits C353, R352 and Q251. This causes the output of the feedback amplifier to drop to about zero volts and then ramp back to its quiescent voltage, in about 700 milliseconds.

T154, connected between Q1039 emitter and Q1044 collector, provides a means of signal pickoff from the crt backplate (STB). The secondary of this transformer drives the crt Readout Amplifier.

Collimation Control. The circuit includes Q361 and Q362 for control and output voltage adjusting, and feedback amplifier Q162, Q165, and Q159. Quiescent conditions with Q361 OFF and Q362 ON provide current to the feedback amplifier. Adjustment for the current to the feedback amplifier is provided by R359 to set the output of the operational amplifier at about 90 volts. This places the CE1 and CE2 electrodes at about 90 volts.

Due to an ERASE signal, the output of U566B places a low signal (about 950 milliseconds duration) on Q361 base. Conduction of Q361 sets the output of the feedback amplifier and the CE1 and CE2 at about 35 volts.

When READ-1 signal is high and the screen is not being erased, Q362 is cut off to set the output of the feedback amplifier at about 175 volts.

Crt Readout Amplifier. Crt backplate signals from STB are coupled via T154 to the differential amplifier U155. The output of U155 is ac coupled to comparator U255. U255 provides a negative output pulse in response to STB signals of an amplitude determined by R252 (THRESHOLD). U255 output pulses are applied to one-shot multivibrator U566A, which responds by generating positive-going 20 μ s pulses TARSIG.

Deflection Amplifiers

Refer to the overlay blocks on the schematic diagram. The Deflection amplifier circuit uses the X and Y analog voltages and amplifies them to provide the drive signals to the X and Y deflection coils.

The X and Y signals are each applied to three circuits within the deflection amplifiers. The X signal goes to the X Absolute Value amplifier to generate a negative output signal regardless of the polarity of the X input signal. Then it is squared in the X^2 circuit and applied to the $X^2 + Y^2$ amplifier.

The X input and the output signal from the $X^2 + Y^2$ circuit drive the X Geometry Correction circuit. The Geometry signal is fed to the X Deflection amplifier. The X input signal also drives the X Deflection amplifier through R281. The X signal, X Geometry signal, and a feedback signal from the X Deflection amplifier combine at the input to the X Deflection amplifier. The output of the X Deflection amplifier provides the drive for the X Deflection coil. The Y Deflection amplifier circuit functions in a similar manner.

X Absolute Amplifier. The X Absolute amplifier consists of operational amplifier U496A. When a negative signal is applied, CR597 conducts to apply a negative signal to the positive input of the operational amplifier, and to the negative input of the operational amplifier. The amplifier operates as a follower to apply a negative-going unity gain signal at the anode of CR395. When a positive input signal is applied, CR597 is reverse biased, and the operational amplifier operates as a unity gain inverter (R493/R592) and develops a negative-going signal at the anode of CR395. CR395 provides a fixed offset voltage allowing pin 1 of U496A to operate at about 0.7 volt more negative than the absolute value signal.

X^2 Amplifier. The absolute value of the X input signal from U496A is applied to the X^2 amplifier Q481, a dual transistor transconductance multiplier. The offset signal from pin 1 of U496A is applied to the emitters of Q481 via

Circuit Description—4006-1 Service

R485. The absolute value of X from the anode of CR395 is applied to one base through divider network R483 and R482. Under these conditions, Q481 collector current difference is proportional to the square of the input (absolute) voltage. The output signals at Q481 collectors are combined with the signals from Q482 (the Y^2 signal); with the resultant signal being applied to the differential inputs of U381A.

$X^2 + Y^2$ Amplifier. The $X^2 + Y^2$ amplifier consists of U381A. U381 operates as differential amplifier to produce $X^2 + Y^2$ output which it applies to the emitters of U296A.

X Geometry Correction. The circuit consists of U296A, a monolithic transistor array operating as a transconductance multiplier. A portion of the X signal, set by R393 (X GEOM), is applied to one base of U296A and the $X^2 \times Y^2$ signal is applied to the emitters of U296A. This causes different voltages at the collectors of U296A to be approximately equal to $KX(X^2 + Y^2)$. These signals are applied to the Deflection amplifier as a geometry correction signal.

X Deflection Amplifier. X Deflection amplifier consists of U184A, Q84, Q186, Q1069, and Q1074. The signals from X, X Geometry Correction, X Position (adjusted by R271), X GAIN are summed differentially by U184A. U184A develops an output signal at pin 1, which Q84 inverts and amplifies applying it to complementary emitter-followers Q1069 and Q1074. The current from the emitter-followers drives the X deflection coil and develops feedback voltage across R270, R74C and R74D. Overall feedback and gain are adjusted by gain control R279. Q186 operates as a current source to provide the necessary negative-going current drive for the output emitter-followers.

Y Absolute Value Amplifier, Y^2 Amplifier, Y Geometry Correction, and Y Deflection Amplifier. The function of each of these circuits is directly comparable to its X counterpart.

High-Voltage and Z Axis (2-4)

Refer to the overlay blocks as shown on the schematic diagram 2-4. These circuits control the supplies for the writing gun of the crt. A Regulator-oscillator drives a transformer to produce the various voltages required by the circuits. The Regulator receives drive from one of the secondary windings, and also receives biasing voltage for its control amplifier from a secondary winding. In addition, a high voltage feedback signal is applied to the Regulator to keep the high voltage at a given value.

Transformer T314, driven by the Regulator-oscillator, provides power for Focus, Filament, High Voltage, and

Control Grid supplies. Intensity control sets the signal output amplitude of the Z Signal amplifier. Z Signal amplifier output is coupled to the crt control grid, by way of a DC Restorer circuit.

Dynamic Focus signal changes the crt Focus voltage. This compensates for defocusing due to the writing beam deflection from crt center to crt edge.

High Voltage Supply. Voltage from T314 secondary winding (pins 8 & 9) is doubled by C312, CR312, CR203, and C215. This voltage is used to elevate the filament supply and with further filtering provides the high voltage for the crt cathode measured at TP102. A portion of the voltage is used for feedback (back to the Regulator-oscillator circuit) to regulate the supply. This feedback voltage is set by R224 HV ADJ.

Control Grid Supply The supply operates from an additional tap on T314 secondary High Voltage winding through R18. With the bias set by R129, the circuit causes a negative voltage on the crt grid in relation to the cathode via a Dc Restorer circuit consisting of C12, C110, CR103, CR4, CR121, and CR24. In addition to this bias, the Intensity Control and the Z Signal amplifier circuits change the crt grid bias via Q122.

Intensity control. With the READ signal low, Q231 base is set by divider resistors R132 and R235 to output about +65 volts to the Z Signal amplifier circuit at Q123 collector. When READ-1 signal goes high, additional divider, including R1050 the Hard Copy Intensity adjustment, is inserted into the circuit. This allows the output voltage to Q123 collector to be adjusted lower for a hard copy.

Z Signal Amplifier. The circuit amplifies the ZMPX signal and applies it to the crt grid. Q123 amplifies the signal with a maximum positive collector voltage set by the Intensity Control circuit. Emitter follower Q122 drives the crt grid through C110.

Focus Supply. Voltage from T324 secondary winding (pins 7 & 8) is doubled by C311, CR311, CR204, and C113. This supply is elevated by the Dynamic Focus circuit. The Dynamic Focus circuit is adjusted by R36. Focus control is R13.

The voltage is about the same as the output of the High Voltage supply. A portion of the voltage is selected by the FOCUS control to drive the crt focus anode.

Dynamic Focus circuit consists of feedback amplifier Q31 and Q29 which adds from +35 to +90 volts to the

focus voltage. The added focus voltage at Q29 collector is a result of Dynamic Focus signal input and R36 setting (Dynamic Focus adjustment).

Filament Supply. T314 secondary winding from pins 11 and 12 supply the crt filaments. The filaments are elevated to the same voltage as the crt cathode by R208 and R209.

KEYBOARD

General Description

The overlay blocks on the schematic diagram 3-1 show the Keyboard principal circuits. These circuits combine to generate a coded character output on data bit lines KB1-1 through KB7-1, and to develop a strobe pulse labeled KSTRB-1 to accompany the data bits.

Keyboard Description

Assume that no character keys are pressed, so no characters are being entered. The oscillator generates a symmetrical output pulse that is applied to Z9D (the input gate), to the 4 LSB Counter Z2, and to Z4 and Z7C in the Strobe generator. Z9D enables the counter to continuously cycle through its 16 counts. Each time it completes a cycle, it feeds a pulse to Z3, the 3 MSB Counter, causing it to advance one. The 3 MSB Counter continuously cycles through its 8 counts. During this operation (when no character keys are pressed), the W output of the Character Detector Z6, inhibits the one shot timer Z4, which in turn inhibits the Character output gates (Z8A,B,C,D and Z9A,B,C). The other inputs of the Character Detector are the A, B, C inputs ($\div 2, 4, 8$) from the 3 MSB counter Z3.

When a character key is pressed, contact is made between an output of the Character Decoder Z5 and an input of the Character Detector Z6. The counters continue to count until the closed key is selected. The W output of the Character Detector then goes high. This high enables the Strobe Generator Z4 to produce a character enable pulse of at least 7 milliseconds. The Q output from the Strobe Generator Z4 disables the 4 LSB Counter to prevent additional clock pulses from affecting the Counter. At the same time, this low goes to the Control latch Z7B (Bit 7 Control Gates and CNTL Key block) and the shift latch Z7A (Bit 5 Control Gates and Shift Key block) to gate through either the low or high from those devices, as determined by the position of the Shift or Control keys. The high from the Q output of the Strobe

Generator Z4 goes to the Character Output Gates, placing data on the K1 through K7 lines. When the Oscillator Z13B output again goes low, it toggles Z7C in the Strobe Generator to develop a high strobe signal labeled KSTRB-1, which accompanies the data bits. The lows from Z13B are applied continuously to Z4, and maintain it in its one-set condition while the character key is held down. When the key is released, the high from the Character Detector (Z6 pin W) is removed from the Strobe Generator Z4, which permits Z4 to return to its zero-set state. This ends the K1 through K7 output signals. Then, the next negative-going output of Z13B terminates the strobe (KSTRB-1) output.

Note that the Bit 5 Control circuitry connects to some keys, the Counters, and the Shift key latch Z7A to affect the Bit 5 output. The Bit 7 Control circuitry connects from the Counters, and CNTL key latch Z7A to affect the Bit 7 output.

Keyboard Troubleshooting. The Keyboard diagram is useful to isolate the trouble if the trouble is on the circuit board. Try to isolate the Keyboard part by the operation of the Terminal. If the keys do not operate at all, check the following in order:

Location	Check
1. J80, pin 4 or 5	+5 Volts.
2. Z13B, pin 6	Oscillator output.
3. TP1, 2, 3 & 4	$\div 2, 4, 16$ the 4 LSB Counter (no character keys pressed).
4. TP5, 6 & 7	$\div 2, 4, 8$ the 3 MSB Counter signal (no character keys pressed).
5. TP8	Low signal (no character keys pressed).
6. J80, pin 6.	Strobe output signal, KSTRB-1.
7. J80, pins 9 through 15	Data output signals. KB1-1 through KB7-1 (high until keys are depressed).



Section 4

OPTIONS

OPTION 1 — HALF DUPLEX

What Is the Half-Duplex Option?

The Half-Duplex Option is a circuit board, a wait indicator, a half-duplex rear panel, and various cables and jumpers. The circuit board is mounted with spacers on the 4006-1 Logic Board. An ECHO switch, mounted on the rear panel, produces either local echo of transmitted data for display, or reflected echo from the host computer.

What's It For?

The 4006-1 can communicate with a host computer at baud rates of from 75 to 4800 baud. With Option 1, either one-channel (Half-Duplex Normal), two-channel (Full Duplex), or one-channel with computer supervision (Half-Duplex With Supervisor) communications are available. Full-duplex mode requires both a receive and a transmit channel. Most modems and telephone channels are capable of operating at baud rates of 600 baud or less. Half-duplex mode is often used so that baud rates of 1200 and above can be achieved.

In half-duplex mode, the computer and terminal take turns using one data channel. When transmitting data in the half-duplex normal mode, the terminal or computer ends each line of text with a line-turnaround character. This character causes the terminal or computer RTS (Request To Send) line to go low, allowing the other party to bring its RTS line up and begin sending data.

In half-duplex with supervisor, the host computer supervises line turnaround. When data transmission from the host is completed, the computer initiates line turnaround by dropping RTS. The advantage of this mode is that there is a means of asking the computer to stop sending. During computer transmission, RTS is sent, and the terminal responds by sending an SRTS (Secondary Request To Send) signal back to the computer. This SRTS signal is interrupted by means of the terminal BREAK key. Whether the computer does indeed stop sending when this key is pressed depends on whether it is programmed to do so.

In half-duplex normal, with no reverse channel for the SRTS signal, there is no such means of telling the computer to stop. Line turnaround characters are required to turn the line around, and if the computer should begin an infinite loop, there would never be such a character sent. It would then be necessary for the terminal operator to contact the computer operator on an independent channel to request shutdown.

In supervisor mode, the computer sends a secondary, "supervisory" carrier from its modem over the telephone line. Sending this SRTS signal results in a "Secondary Data Carrier Detect" signal from the modem to the terminal at the terminal end of the line. This puts the terminal in its transmit state, and it remains in that state until the computer drops its SRTS signal and either raises RTS or becomes idle. Thus the computer controls the direction of data transfer. If the computer sends neither primary nor secondary carrier, the 4006-1 alternates between transmit and receive states, and the wait indicator is alternately lit and extinguished.

HALF DUPLEX OPTION

Installation

The half-duplex option may be ordered from the factory installed in a terminal or as a kit to be installed in the field. The following procedure describes field installation of the half-duplex option.

1. Turn off ac power and disconnect the power cord.
2. Remove the top cover from the 4006-1.
3. Remove the two screws which mount the interface cable panel to the back of the terminal (see Fig. 4-1).
4. Remove the interface cable panel and interface cable assembly.
5. Install the half-duplex rear panel using existing hardware.

6. Route the cable assembly from the rear panel under the Logic card.

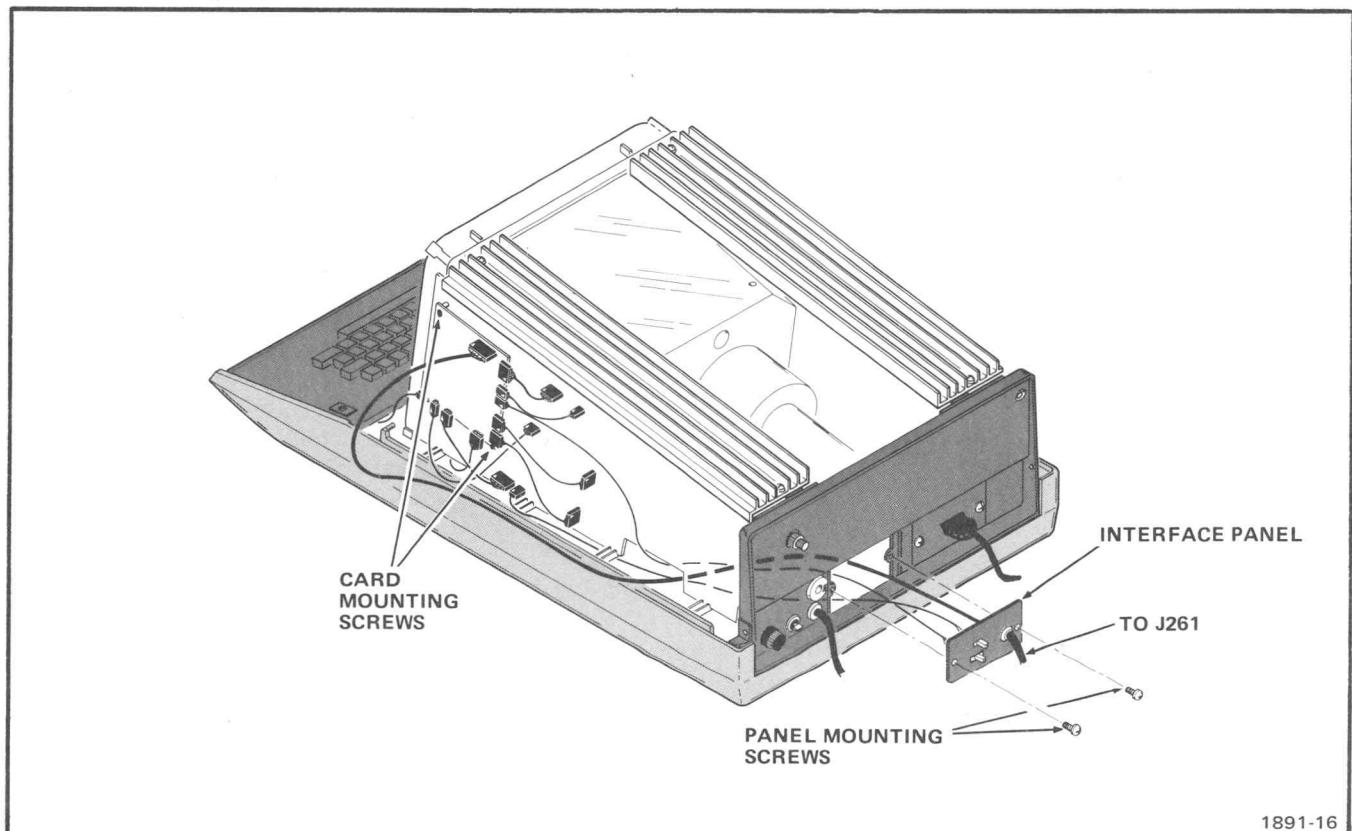
7. Position the Half-Duplex card on the spacers and secure the card using two screws. (See Fig. 4-1).

8. Remove the keyboard LED plug (by inserting a fingernail under the edge of the plug and lifting up or by reaching under the back of the keyboard and pushing up on the plug). Install the LED (WAIT) indicator assembly by pressing it into the keyboard cutout.

9. Connect the cables from the Half-Duplex card to the Logic card (see Fig. 4-1, 4-2, and Table 4-2) as follows:

10. Remove the jumper from the ECHO/NORM strap and connect the ECHO cable from the rear panel to the ECHO strap pins (J46).

11. Set the strap options as indicated in Table 4-1 and Fig. 4-2.



1891-16

Fig. 4-1. Half Duplex Installation.

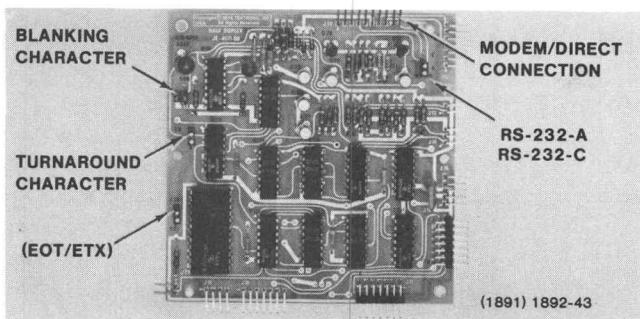


Fig. 4-2. Half Duplex Strap Options.

Testing. To test the half-duplex after it is installed:

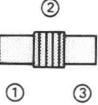
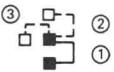
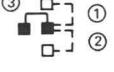
- a. Set the ECHO/NORM switch to ECHO.
- b. Short pins 4 and 5 of J261.
- c. Set the mode switch to HALF DUPLEX SUPER-VISOR. The WAIT light on the keyboard should blink.
- d. Set the mode switch to HALF DUPLEX NORMAL, and enter the selected turnaround character from the keyboard. The WAIT light should come on and stay on. Enter any character from the keyboard, and the light should go off.

**TABLE 4-1
CABLES AND JACKS**

Half-Duplex Card	Description
J11	Interface cable from back panel to J261 (modem connector).
J12	To J32 on Logic card.
J13	To J33 on Logic card (jumper must be removed from J33).
J14	To Mode switch cable from rear panel.
J15	To J44 (power connector) on Logic card.
J16	To J45 (Interlogic connector) on Logic card.
J17	Cable from keyboard connector assembly.
J18	To J47 on Logic card.
J19	To J31 on Logic card (jumper must be removed from J31).
J20	To LED cable assembly.

HALF DUPLEX OPTION

TABLE 4-2
HALF-DUPLEX STRAP OPTIONS

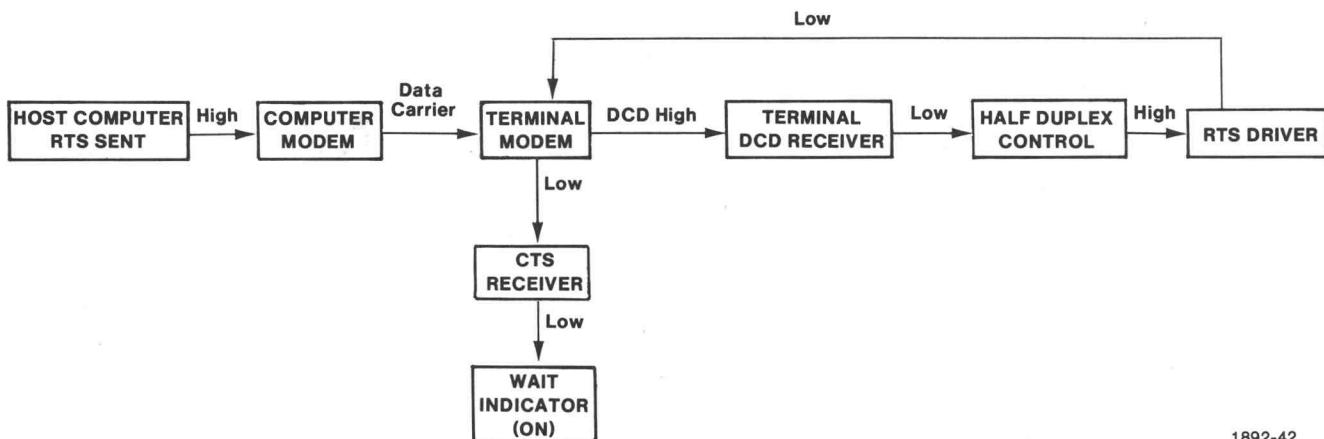
Options	Positions ²	Description
MODE SWITCH		<ol style="list-style-type: none"> Full-Duplex operation. Half-Duplex Normal operation. Half-Duplex Supervisor operation.
TURNAROUND CHARACTER		<ol style="list-style-type: none"> Carriage Return and EOT or ETX. Line Feed and EOT or ETX. Neither.
BLANKING CHARACTER		<ol style="list-style-type: none"> SOH (Control A). STX (Control B). Non-Blanking.
MODEM TYPE		<ol style="list-style-type: none"> RS-232-A. RS-232-C.
EOT/ETX (END OF TRANSMISSION)		<ol style="list-style-type: none"> ETX Turn around Character. EOT

²The straps are shown in the positions they are normally set to when the card is shipped from the factory.

How It Works.

Half Duplex Normal. (See Fig. 4-3) The host transmits an RTS signal to its modem when data is to be sent to the terminal, and the modem transmits a data carrier to the terminal modem. The terminal modem in turn sends a DCD (Data Carrier Detect) signal to the terminal half-duplex DCD receiver as a high. The receiver inverts this signal to a low to turn off the half-duplex control flip-flop, turn on the wait indicator, and inhibit DSCLKA and TSTRBA. Thus only the computer can transmit data.

When the host computer sends a line turnaround character, it drops RTS (See Fig. 4-5), and the terminal DCD receiver output goes high, turning on the half-duplex control flip-flop and raising terminal RTS. When terminal RTS comes up, it is transmitted to the terminal modem, which, after about 200 milliseconds, sends a CTS (Clear-To-Send) signal back to the terminal half-duplex CTS receiver. This receiver sends a low to an inverter in the Half-Duplex Control, resulting in the wait indicator being extinguished, a high at DSCLK, and a low at TSTRBA. Thus the line is turned around, and the terminal can transmit data.

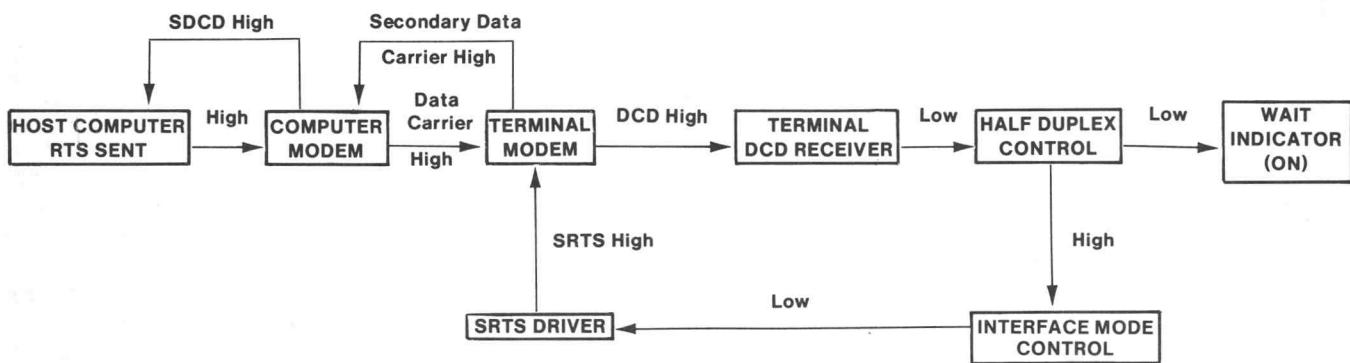


1892-42

Fig. 4-3. Half Duplex Normal with Host RTS Sent
(Only Host Can Transmit Data).

Half Duplex With Supervisor. In this mode, with computer RTS being sent to its modem (See Fig. 4-4), the terminal modem will send DCD to the half-duplex DCD receiver. The Half-Duplex Control will thus be clocked low, the wait indicator will be lit, and the terminal SRTS will be sent, indicating that the terminal is in receive mode. The Supervisory Timing circuit now inhibits the Half-Duplex Control for 200 milliseconds, after which, if DCD is still being received, the terminal will remain in the receive mode, and data can now be transmitted to it.

If the terminal BREAK key is pressed while the terminal is in receive mode, a low is sent to the Interface Mode Control, resulting in a high at the SRTS driver and a low at the output, thus "breaking" the terminal SRTS for as long as the key is pressed. If the computer is programmed for it, the break in terminal SRTS will stop data transmission by the host, and line turnaround will be initiated.



1892-40

Fig. 4-4. Half Duplex with Supervisor — Host RTS Being Sent
(Only Host Can Transmit Data).

HALF DUPLEX OPTION

When the computer drops RTS (See Fig. 4-5), the half-duplex DCD receiver will receive a low, and the Half-Duplex control will be turned on. When this happens, the RTS driver goes high, and, after a short interval, CTS is received. Also at this time, the Supervisory Timing circuit sends a one-second pulse to inhibit data transmission. If after this time the host SRTS is high, the line will complete turnaround, and the terminal can transmit data.

In this mode, no End-Of-Transmission character need be sent by the terminal operator. Line turnaround is effected only when the host SRTS is dropped, at which time the terminal will respond by sending SRTS, and the terminal interface will not wait 200 milliseconds, as described above, before looking for DCD from the computer.

Keyboard Buffer. In Half-Duplex With Supervisor, line turnaround from terminal receive to terminal transmit mode can only be completed when keyboard characters are typed and transmitted. The Keyboard Buffer prevents the loss of an essential character while the line is being turned around. The Buffer stores one character until terminal SDCD goes high, then releases it for transmission.

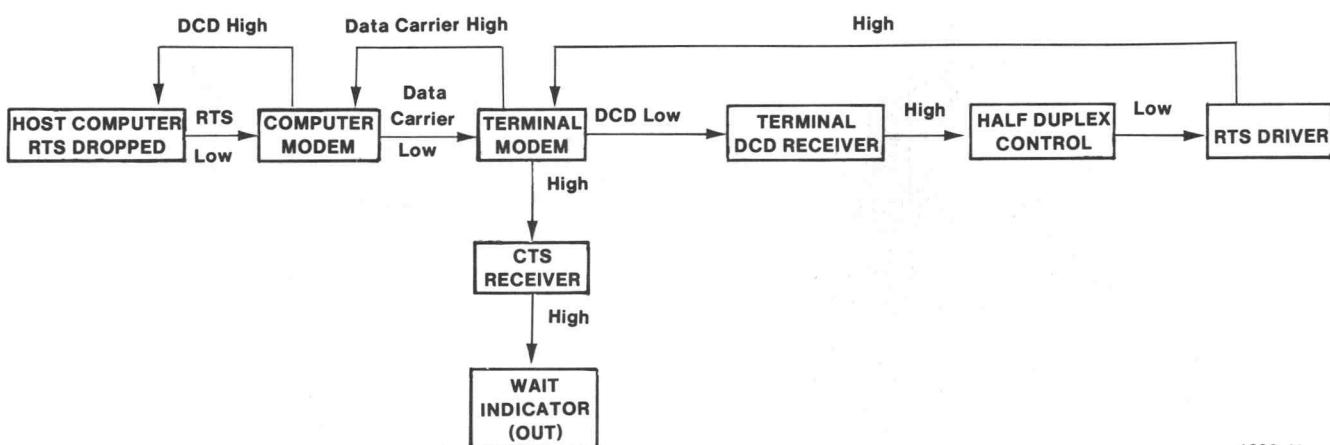
When the Half-Duplex option is installed, connection between the terminal and the host computer is through a modem. The modem connector (P261) is attached to the Half-Duplex board (J11) through a cable. The cable (J11/J261) connections are shown in Table 4-3.

TABLE 4-3

MODEM CONNECTIONS

J11 (Half-Duplex Board)	J261 (Modem Connector)
1 CTS (CB)	5
2 SDCD (SCF)	12
3 DCD (CF)	8
4 SRTS (SCA1)	19*
5 RTS (CA)	4
6 Not used	
7 REC DATA	3
8 DTR	20
9 XMIT DATA (A)	2
20 SRTS (SCA2)	22*

*Strap option on Half-Duplex board selects J11-4 (RS-232A) or J11-10 (RS-232C) for Secondary Request To Send (SRTS).



1892-41

Fig. 4-5. Half Duplex Normal or with Supervisor — Host RTS Dropped
(Terminal Can Transmit Data).

REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number

00X Part removed after this serial number

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

ACTR	ACTUATOR	PLSTC	PLASTIC
ASSY	ASSEMBLY	QTZ	QUARTZ
CAP	CAPACITOR	RECP	RECEPTACLE
CER	CERAMIC	RES	RESISTOR
CKT	CIRCUIT	RF	RADIO FREQUENCY
COMP	COMPOSITION	SEL	SELECTED
CONN	CONNECTOR	SEMICOND	SEMICONDUCTOR
ELECTLT	ELECTROLYTIC	SENS	SENSITIVE
ELEC	ELECTRICAL	VAR	VARIABLE
INCAND	INCANDESCENT	WW	WIREWOUND
LED	LIGHT EMITTING DIODE	XFMR	TRANSFORMER
NONWIR	NON WIREWOUND	XTAL	CRYSTAL

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
01121	ALLEN-BRADLEY COMPANY	1201 2ND STREET SOUTH	MILWAUKEE, WI 53204
01295	TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP	P O BOX 5012, 13500 N CENTRAL EXPRESSWAY	DALLAS, TX 75222
03508	GENERAL ELECTRIC COMPANY, SEMI-CONDUCTOR PRODUCTS DEPARTMENT	ELECTRONICS PARK	SYRACUSE, NY 13201
03888	KDI PYROFILM CORPORATION	60 S JEFFERSON ROAD	WHIPPANY, NJ 07981
04222	AVX CERAMICS, DIVISION OF AVX CORP.	P O BOX 867, 19TH AVE. SOUTH	MYRTLE BEACH, SC 29577
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E MCDOWELL RD, PO BOX 20923	PHOENIX, AZ 85036
05347	ULTRONIX, INC.	461 N 22ND STREET	GRAND JUNCTION, CO 81501
07109	OAKTRON INDUSTRIES, INC.	704 30TH STREET	MONROE, WI 53566
07263	FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP.	464 ELLIS STREET	MOUNTAIN VIEW, CA 94042
14099	SEMTECH CORP.	652 MITCHELL RD.	NEWBURY PARK, CA 91320
14433	ITT SEMICONDUCTORS	3301 ELECTRONICS WAY	
14752	ELECTRO CUBE INC.	P O BOX 3049	WEST PALM BEACH, FL 33402
18324	SIGNETICS CORP.	1710 S. DEL MAR AVE.	SAN GABRIEL, CA 91776
27014	NATIONAL SEMICONDUCTOR CORP.	811 E. ARQUES	SUNNYVALE, CA 94086
27193	CUTLER-HAMMER, INC.	2900 SEMICONDUCTOR DR.	SANTA CLARA, CA 95051
32159	SPECIALTY PRODUCTS DIVISION	4201 N. 27TH ST.	MILWAUKEE, WI 53216
32293	WEST-CAP ARIZONA	2201 E. ELVIRA ROAD	TUCSON, AZ 85706
32997	INTERSIL, INC.	10900 N. TANTAU AVE.	CUPERTINO, CA 95014
33096	BOURNS, INC., TRIMPOT PRODUCTS DIV.	1200 COLUMBIA AVE.	RIVERSIDE, CA 92507
50522	COLORADO CRYSTAL CORPORATION	2303 W 8TH STREET	LOVELAND, CO 80537
50558	MONSANTO CO., ELECTRONIC SPECIAL PRODUCTS	3400 HILLVIEW AVENUE	PALO ALTO, CA 94304
53944	ELECTRONIC CONCEPTS, INC.	526 INDUSTRIAL WAY WEST	EATONTOWN, NJ 07724
54590	ELT INC., GLOW LITE DIVISION	BOX 698	PAULS VALLEY, OK 73075
56289	RCA CORP., ELECTRONIC COMPONENTS DIV.	415 S. 5TH STREET	HARRISON, NJ 07029
71400	SPRAGUE ELECTRIC CO.		NORTH ADAMS, MA 01247
72982	BUSSMAN MFG., DIVISION OF MCGRAW-EDISON CO.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
73138	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
75042	BECKMAN INSTRUMENTS, INC., HELIPOT DIV.	2500 HARBOR BLVD.	FULLERTON, CA 92634
76493	TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION	401 N. BROAD ST.	PHILADELPHIA, PA 19108
80009	BELL INDUSTRIES, INC., MILLER, J. W., DIV.	19070 REYES AVE., P O BOX 5825	COMPTON, CA 90224
81483	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
82389	INTERNATIONAL RECTIFIER CORP.	9220 SUNSET BLVD.	LOS ANGELES, CA 90069
83003	SWITCHCRAFT, INC.	5555 N. ELSTON AVE.	CHICAGO, IL 60630
84411	VARO, INC.	P O BOX 411, 2203 WALNUT STREET	GARLAND, TX 75040
90201	TRW ELECTRONIC COMPONENTS, TRW CAPACITORS	112 W. FIRST ST.	OGALLALA, NE 69153
91418	MALLORY CAPACITOR CO., DIV. OF P.R. MALLORY AND CO., INC.	3029 E. WASHINGTON STREET	INDIANAPOLIS, IN 46206
91637	RADIO MATERIALS COMPANY, DIV. OF P.R. MALLORY AND COMPANY, INC.	P. O. BOX 372	CHICAGO, IL 60646
	DALE ELECTRONICS, INC.	4242 W BRYN MAWR	COLUMBUS, NE 68601
		P. O. BOX 609	

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	DScont	Name & Description	Mfr Code	Mfr Part Number
CIRCUIT BOARD ASSEMBLIES						
A1	672-0526-00	B010100	B033999	CKT BOARD ASSY:PWR SPLY AND LOGIC W/HT SINK	80009	672-0526-00
A1	672-0526-01	B034000		CKT BOARD ASSY:PWR SPLY AND LOGIC W/HT SINK	80009	672-0526-01
A2	672-0537-00			CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-00
A2	672-0537-01			CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-01
A2	672-0537-02			CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-02
A2	672-0537-03		B021759	CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-03
A2	672-0537-04	B021760	B022614	CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-04
A2	672-0537-05	B022615	B022703	CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-05
A2	672-0537-06	B022704	B035553	CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-06
A2	672-0537-07	B035554	B035829	CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-07
A2	672-0537-09	B035830	B036209	CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-08
A2	672-0537-10	B036210		CKT BOARD ASSY:DISPLAY W/HT SINK	80009	672-0537-10
A3	119-0304-02			KEYBOARD:	80009	119-0304-02
A4	670-4092-00		7801	CKT BOARD ASSY:HALF DUPLEX	80009	670-4092-00
A4	670-4092-01	7802		CKT BOARD ASSY:HALF DUPLEX (A4-OPTION 1, 021-0173-00 ONLY)	80009	670-4092-01
A1 POWER SUPPLY AND LOGIC W/HEAT SINK						
A1	672-0526-00	B010100	B033999	CKT BOARD ASSY:PWR SPLY AND LOGIC W/HT SINK	80009	672-0526-00
A1	672-0526-01	B034000		CKT BOARD ASSY:PWR SPLY AND LOGIC W/HT SINK	80009	672-0526-01
C3	281-0576-00			CAP., FXD, CER DI:11PF,5%,500V	72982	301-000COG0110J
C18	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C23	281-0637-00			CAP., FXD, CER DI:91PF,5%,500V	72982	301000Z5D910J
C65	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C74	281-0525-00			CAP., FXD, CER DI:470PF,+/-94PF,500V	04222	7001-1364
C81	281-0525-00			CAP., FXD, CER DI:470PF,+/-94PF,500V	04222	7001-1364
C102	285-1133-00			CAP., FXD, PLSTC:0.33UF,1%,100V	50558	MH12D334F
C107	283-0000-00			CAP., FXD, CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C108	283-0000-00			CAP., FXD, CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C131	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C136	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C140	283-0177-00	XB034000		CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C143	281-0549-00			CAP., FXD, CER DI:68PF,10%,500V	72982	301-000U2J0680K
C144	283-0000-00			CAP., FXD, CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C145	281-0549-00			CAP., FXD, CER DI:68PF,10%,500V	72982	301-000U2J0680K
C146	281-0523-00	XB034000		CAP., FXD, CER DI:100PF,+/-20PF,500V	72982	301-000U2M010M
C151	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C162	290-0530-00			CAP., FXD, ELCTLT:68UF,20%,6V	90201	TDC686M006NLF
C166	290-0145-00			CAP., FXD, ELCTLT:10UF,+75-10%,50V	56289	30D106G050CB9
C168	290-0301-00			CAP., FXD, ELCTLT:10UF,10%,20V	56289	150D106X9020B2
C172	290-0145-00			CAP., FXD, ELCTLT:10UF,+75-10%,50V	56289	30D106G050CB9
C188	290-0508-00			CAP., FXD, ELCTLT:18,000UF,+100-10%,15V	56289	68D10444
C195	290-0636-00			CAP., FXD, ELCTLT:7500UF,+100-10%,25V	56289	68D10501
C206	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C217	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C221	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C226	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C246	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C262	290-0536-00			CAP., FXD, ELCTLT:10UF,20%,25V	90201	TDC106M025FL
C268	283-0023-00			CAP., FXD, CER DI:0.1UF,+80-20%,12V	91418	MX0104Z1205R5
C306	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C321	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C365	283-0104-00			CAP., FXD, CER DI:2000PF,5%,500V	72982	811-565B202J

Replaceable Electrical Parts—4006-1 Service

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Serial/Model No. Dscont	Name & Description	Mfr Code	Mfr Part Number
C366	283-0000-00			CAP., FXD, CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C371	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C372	283-0000-00			CAP., FXD, CER DI:0.001UF,+100-0%,500V	72982	831-516E102P
C373	283-0104-00			CAP., FXD, CER DI:2000PF,5%,500V	72982	811-565B202J
C388	290-0509-00			CAP., FXD, ELCLTLT:3000UF,+100-10%,50V	56289	68D10454
C395	290-0549-00			CAP., FXD, ELCLTLT:150UF,400VDC/250VDC	56289	68D20193
C401	285-0596-00			CAP., FXD, PLSTC:0.01UF,1%,100V	14752	410B1B103F
C412	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C421	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C425	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C451	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C456	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C472	290-0145-00			CAP., FXD, ELCLTLT:10UF,+75-10%,50V	56289	30D106G050CB9
C501	285-0596-00			CAP., FXD, PLSTC:0.01UF,1%,100V	14752	410B1B103F
C646	281-0773-00			CAP., FXD, CER DI:0.01UF,10%,100V	72982	8005H9AADW5R103K
C701	285-0596-00			CAP., FXD, PLSTC:0.01UF,1%,100V	14752	410B1B103F
C703	285-0596-00			CAP., FXD, PLSTC:0.01UF,1%,100V	14752	410B1B103F
C710	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C711	283-0177-00			CAP., FXD, CER DI:1UF,+80-20%,25V	72982	8131N039 E 105Z
C714	281-0525-00			CAP., FXD, CER DI:470PF,/-94PF,500V	04222	7001-1364
CR126	152-0075-00			SEMICOND DEVICE:GE,25V,40MA	14433	G866
CR203	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR261	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR262	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR275	152-0198-00			SEMICOND DEVICE:SILICON,200V,3A	03508	1N5624
CR278	152-0198-00			SEMICOND DEVICE:SILICON,200V,3A	03508	1N5624
CR279	152-0198-00			SEMICOND DEVICE:SILICON,200V,3A	03508	1N5624
CR280	152-0198-00			SEMICOND DEVICE:SILICON,200V,3A	03508	1N5624
CR283	152-0406-00			SEMICOND DEVICE:SILICON,200V,3A	80009	152-0406-00
CR495	152-0200-00			SEMICOND DEVICE:SILICON,400V,1500MA	80009	152-0200-00
CR498	152-0200-00			SEMICOND DEVICE:SILICON,400V,1500MA	80009	152-0200-00
CR508	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR509	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR510	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR511	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR512	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR513	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR514	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR515	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR516	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR517	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR524	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR525	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR526	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR527	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR528	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR529	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR530	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR531	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR532	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR533	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR559	152-0075-00			SEMICOND DEVICE:GE,25V,40MA	14433	G866
F170	159-0126-00			FUSE,CARTRIDGE:3AG,2.5A,250V,0.65 SEC	71400	AGC2-1/2
L141	108-0317-00			COIL,RF:FIXED,15UH	32159	71501M
L147	108-0317-00			COIL,RF:FIXED,15UH	32159	71501M

Ckt No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
Q17	151-1025-00				TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1025-00
Q20	151-0190-02				TRANSISTOR:SILICON,NPN	80009	151-0190-02
Q62	151-0192-00				TRANSISTOR:SILICON,NPN,SEL FROM MPS6521	04713	SPS801
Q72	151-0302-00				TRANSISTOR:SILICON,NPN	07263	S038487
Q112	151-0190-02				TRANSISTOR:SILICON,NPN	80009	151-0190-02
Q113	151-0190-02				TRANSISTOR:SILICON,NPN	80009	151-0190-02
Q114	151-0188-00				TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q115	151-0188-00				TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q171	151-0506-00				SCR:SILICON	03508	C106B2X283
Q261	151-0302-00				TRANSISTOR:SILICON,NPN	07263	S038487
Q460	151-0302-00				TRANSISTOR:SILICON,NPN	07263	S038487
Q462	151-0188-00				TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q465	151-0134-00				TRANSISTOR:SILICON,PNP	80009	151-0134-00
Q470	151-0188-00				TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q704	151-0188-00				TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q706	151-1078-00				TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1078-00
Q708	151-1078-00				TRANSISTOR:SILICON,JFE,N-CHANNEL	80009	151-1078-00
Q1065	151-0323-00				TRANSISTOR:SILICON,NPN,SEL FROM MJE521	80009	151-0323-00
Q1075	151-0405-00				TRANSISTOR:SILICON,NPN,SEL FROM MJE800	80009	151-0405-00
Q1085	151-0323-00				TRANSISTOR:SILICON,NPN,SEL FROM MJE521	80009	151-0323-00
R2	311-1558-00				RES.,VAR,NONWIR:20K OHM,20%,0.50W	73138	91-80-0
R19	315-0150-00				RES.,FWD,CMPSN:15 OHM,5%,0.25W	01121	CB1505
R22	315-0822-00				RES.,FWD,CMPSN:8.2K OHM,5%,0.25W	01121	CB8225
R30	315-0472-00				RES.,FWD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R31	315-0472-00				RES.,FWD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R32	315-0472-00				RES.,FWD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R33	315-0472-00				RES.,FWD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R64	315-0273-00				RES.,FWD,CMPSN:27K OHM,5%,0.25W	01121	CB2735
R66	311-1564-00				RES.,VAR,NONWIR:TRMR,500 OHM,0.5W	73138	91A R500
R70	308-0058-00				RES.,FWD,WW:1.5 OHM,10%,1W	75042	BW20-1R500K
R75	321-0181-00				RES.,FWD,FILM:750 OHM,1%,0.125W	91637	MFF1816G750R0F
R76	321-0226-00				RES.,FWD,FILM:2.21K OHM,1%,0.125W	91637	MFF1816G22100F
R77	321-0603-00				RES.,FWD,FILM:15K OHM,0.25%,0.125W	91637	MFF1816D15001C
R78	321-0604-00				RES.,FWD,FILM:30K OHM,0.25%,0.125W	91637	MFF1816D30001C
R79	315-0332-00				RES.,FWD,CMPSN:3.3K OHM,5%,0.25W	01121	CB3325
R101	321-0308-00				RES.,FWD,FILM:15.8K OHM,1%,0.125W	91637	MFF1816G15801F
R106	315-0512-00				RES.,FWD,CMPSN:5.1K OHM,5%,0.25W	01121	CB5125
R109	315-0681-00				RES.,FWD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R110	315-0303-00				RES.,FWD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
R114	315-0303-00				RES.,FWD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
R115	315-0681-00				RES.,FWD,CMPSN:680 OHM,5%,0.25W	01121	CB6815
R116	315-0203-00				RES.,FWD,CMPSN:20K OHM,5%,0.25W	01121	CB2035
R117	315-0473-00				RES.,FWD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R164	315-0102-00				RES.,FWD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R165	315-0475-00				RES.,FWD,CMPSN:4.7M OHM,5%,0.25W	01121	CB4755
R170	308-0244-00				RES.,FWD,WW:0.3 OHM,10%,2W	91637	RS2B162ER3000K
R231	315-0472-00				RES.,FWD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R247	315-0472-00				RES.,FWD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R263	315-0303-00				RES.,FWD,CMPSN:30K OHM,5%,0.25W	01121	CB3035
R264	315-0472-00				RES.,FWD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725
R266	321-1296-03				RES.,FWD,FILM:12K OHM,0.25%,0.125W	91637	MFF1816D12001C
R268	315-0102-00				RES.,FWD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R269	315-0470-03				RES.,FWD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R284	305-0104-00				RES.,FWD,CMPSN:100K OHM,5%,2W	01121	HB1045
R317	315-0102-00				RES.,FWD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R347	315-0472-00				RES.,FWD,CMPSN:4.7K OHM,5%,0.25W	01121	CB4725

Replaceable Electrical Parts—4006-1 Service

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Name & Description	Mfr Code	Mfr Part Number
R359	315-0302-00		RES., FXD, CMPSN: 3K OHM, 5%, 0.25W	01121	CB3025
R360	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R361	315-0432-00		RES., FXD, CMPSN: 4.3K OHM, 5%, 0.25W	01121	CB4325
R362	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R363	315-0471-00		RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R364	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R365	315-0471-00		RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R367	321-0603-00		RES., FXD, FILM: 15K OHM, 0.25%, 0.125W	91637	MFF1816D15001C
R371	315-0103-00		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R372	315-0332-00		RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
R374	315-0202-00		RES., FXD, CMPSN: 2K OHM, 5%, 0.25W	01121	CB2025
R399	308-0429-00		RES., FXD, WW: 22K OHM, 1%, 3W	91637	RS2B-B22001F
R443	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R444	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R445	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R457	315-0222-00		RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R465	315-0471-00		RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R468	315-0682-00		RES., FXD, CMPSN: 6.8K OHM, 5%, 0.25W	01121	CB6825
R469	315-0332-00		RES., FXD, CMPSN: 3.3K OHM, 5%, 0.25W	01121	CB3325
R470	315-0101-03		RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R471	308-0741-00		RES., FXD, WW: 2.6 OHM, 5%, 0.50W	80009	308-0741-00
R503	322-0694-00		RES., FXD, FILM: 517K OHM, 1%, 0.25W	91637	MFF1421G51702F
R504	322-0695-00		RES., FXD, FILM: 258K OHM, 1%, 0.25W	91637	MFF1421G25802F
R505	322-0696-00		RES., FXD, FILM: 129K OHM, 1%, 0.25W	91637	MFF1421G12902F
R506	322-0697-02		RES., FXD, FILM: 64.37K OHM, 0.5%, 0.25W	91637	MFF1421D64371D
R507	315-0205-00		RES., FXD, CMPSN: 2M OHM, 5%, 0.25W	01121	CB2055
R508	315-0105-00		RES., FXD, CMPSN: 1M OHM, 5%, 0.25W	01121	CB1055
R517	321-0440-00		RES., FXD, FILM: 374K OHM, 1%, 0.125W	91637	MFF1816G37402F
R518	321-0411-00		RES., FXD, FILM: 187K OHM, 1%, 0.125W	91637	MFF1816G18702F
R519	321-0382-00		RES., FXD, FILM: 93.1K OHM, 1%, 0.125W	91637	MFF1816G93101F
R520	308-0697-00		RES., FXD, WW: 32.14K OHM, 1%, 0.125W	91637	WWP2258032141B
R521	308-0698-00		RES., FXD, WW: 16.046K OHM, 0.1%, 0.125W	91637	WWP22580-16.046K
R522	308-0699-00		RES., FXD, WW: 8.115K OHM, 0.1%, 0.125W	05347	203PA-80111A
R523	308-0697-00		RES., FXD, WW: 32.14K OHM, 1%, 0.125W	91637	WWP2258032141B
R543	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R544	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R545	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R560	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R561	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R601	315-0683-00		RES., FXD, CMPSN: 68K OHM, 5%, 0.25W	01121	CB6835
R602	315-0472-00		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R603	321-0374-00		RES., FXD, FILM: 76.8K OHM, 1%, 0.125W	91637	MFF1816G76801F
R604	321-0374-00		RES., FXD, FILM: 76.8K OHM, 1%, 0.125W	91637	MFF1816G76801F
R605	321-0416-00		RES., FXD, FILM: 210K OHM, 1%, 0.125W	91637	MFF1816G21002F
R606	315-0396-00		RES., FXD, CMPSN: 39M OHM, 5%, 0.25W	01121	CB3965
R609	321-0230-00		RES., FXD, FILM: 2.43K OHM, 1%, 0.125W	91637	MFF1816G24300F
R620	308-0658-00		RES., FXD, WW: 4K OHM, 0.01%, 0.125W	91637	WWP225-A40000L
R621	308-0699-00		RES., FXD, WW: 8.115K OHM, 0.1%, 0.125W	05347	203PA-80111A
R622	308-0658-00		RES., FXD, WW: 4K OHM, 0.01%, 0.125W	91637	WWP225-A40000L
R623	308-0698-00		RES., FXD, WW: 16.046K OHM, 0.1%, 0.125W	91637	WWP22580-16.046K
R627	322-0697-02		RES., FXD, FILM: 64.37K OHM, 0.5%, 0.25W	91637	MFF1421D64371D
R628	322-0696-00		RES., FXD, FILM: 129K OHM, 1%, 0.25W	91637	MFF1421G12902F
R629	322-0695-00		RES., FXD, FILM: 258K OHM, 1%, 0.25W	91637	MFF1421G25802F
R630	322-0694-00		RES., FXD, FILM: 517K OHM, 1%, 0.25W	91637	MFF1421G51702F
R631	315-0205-00		RES., FXD, CMPSN: 2M OHM, 5%, 0.25W	01121	CB2055
R632	315-0105-00		RES., FXD, CMPSN: 1M OHM, 5%, 0.25W	01121	CB1055
R633	315-0102-00		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025

Ckt No.	Tektronix Part No.	Serial/Model No.	Mfr Code	Mfr Part Number
		Eff	Descont	Name & Description
R634	315-0122-00	RES., FXD, CMPSN: 1.2K OHM, 5%, 0.25W	01121	CB1225
R635	315-0242-00	RES., FXD, CMPSN: 2.4K OHM, 5%, 0.25W	01121	CB2425
R636	315-0272-00	RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
R637	315-0122-00	RES., FXD, CMPSN: 1.2K OHM, 5%, 0.25W	01121	CB1225
R638	315-0242-00	RES., FXD, CMPSN: 2.4K OHM, 5%, 0.25W	01121	CB2425
R704	321-0374-00	RES., FXD, FILM: 76.8K OHM, 1%, 0.125W	91637	MFF1816G76801F
R705	321-0374-00	RES., FXD, FILM: 76.8K OHM, 1%, 0.125W	91637	MFF1816G76801F
R706	321-0416-00	RES., FXD, FILM: 210K OHM, 1%, 0.125W	91637	MFF1816G21002F
R707	315-0396-00	RES., FXD, CMPSN: 39M OHM, 5%, 0.25W	01121	CB3965
R708	321-0204-00	RES., FXD, FILM: 1.3K OHM, 1%, 0.125W	91637	MFF1816G13000F
R709	321-0306-00	RES., FXD, FILM: 15K OHM, 1%, 0.125W	91637	MFF1816G15001F
R710	315-0100-02	RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R711	315-0100-02	RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R712	321-0256-00	RES., FXD, FILM: 4.53K OHM, 1%, 0.125W	91637	MFF1816G45300F
R716	321-0242-00	RES., FXD, FILM: 3.24K OHM, 1%, 0.125W	91637	MFF1816G32400F
R717	321-0243-00	RES., FXD, FILM: 3.32K OHM, 1%, 0.125W	91637	MFF1816G33200F
R725	321-0371-00	RES., FXD, FILM: 71.5K OHM, 1%, 0.125W	91637	MFF1816G71501F
R726	321-0401-00	RES., FXD, FILM: 147K OHM, 1%, 0.125W	91637	MFF1816G14702F
R727	321-0430-00	RES., FXD, FILM: 294K OHM, 1%, 0.125W	91637	MFF1816G29402F
U55	156-0617-00	MICROCIRCUIT, DI:DUAL 4 BIT BIN COUNTER	01295	SN74393N
U61	156-0617-00	MICROCIRCUIT, DI:DUAL 4 BIT BIN COUNTER	01295	SN74393N
U81	156-0071-00	MICROCIRCUIT, LI: VOLTAGE REGULATOR	04713	MC1723CL
U101	156-0706-00	MICROCIRCUIT, DI:DUAL MONOSTABLE MV	01295	SN74221N
U121	156-0030-00	MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
U125	156-0129-00	MICROCIRCUIT, DI:QUAD 2-INPUT GATE	80009	156-0129-00
U131	156-0030-00	MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
U135	156-0075-00	MICROCIRCUIT, DI:SGL 8-BIT DATA SEL MUX	80009	156-0075-00
U141	156-0147-00	MICROCIRCUIT, DI:ROM 64 X 5 X 7 CHAR GEN	80009	156-0147-00
U151	156-0536-00	MICROCIRCUIT, DI:PRESETTABLE DECADE/BIN CNTR	80009	156-0536-00
U155	156-0047-00	MICROCIRCUIT, DI:TPL 3-INPUT POS NAND GATE	80009	156-0047-00
U161	156-0172-00	MICROCIRCUIT, DI:DUAL RETRIG ONE-SHOT W/CLR	80009	156-0172-00
U201	156-0129-00	MICROCIRCUIT, DI:QUAD 2-INPUT GATE	80009	156-0129-00
U211	156-0039-00	MICROCIRCUIT, DI:DUAL J-K FLIP FLOP	80009	156-0039-00
U215	156-0041-00	MICROCIRCUIT, DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U221	156-0129-00	MICROCIRCUIT, DI:QUAD 2-INPUT GATE	80009	156-0129-00
U225	156-0030-00	MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
U231	156-0047-00	MICROCIRCUIT, DI:TPL 3-INPUT POS NAND GATE	80009	156-0047-00
U235	156-0141-00	MICROCIRCUIT, DI:DUAL 2 TO 4 LINE DCDR/DMUX	80009	156-0141-00
U245	156-0058-00	MICROCIRCUIT, DI:HEX. INVERTER	80009	156-0058-00
U251	156-0058-00	MICROCIRCUIT, DI:HEX. INVERTER	80009	156-0058-00
U255	156-0041-00	MICROCIRCUIT, DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U261	156-0117-00	MICROCIRCUIT, DI:SYNC 4-BIT BINARY COUNTER	80009	156-0117-00
U301	156-0041-00	MICROCIRCUIT, DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U311	156-0536-00	MICROCIRCUIT, DI:PRESETTABLE DECADE/BIN CNTR	80009	156-0536-00
U315	156-0047-00	MICROCIRCUIT, DI:TPL 3-INPUT POS NAND GATE	80009	156-0047-00
U321	156-0037-00	MICROCIRCUIT, DI:2-INPUT +AND/OR/INVERT GATE	80009	156-0037-00
U325	156-0043-00	MICROCIRCUIT, DI:QUAD 2-INPUT POS NOR GATE	80009	156-0043-00
U331	156-0129-00	MICROCIRCUIT, DI:QUAD 2-INPUT GATE	80009	156-0129-00
U335	156-0030-00	MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
U341	156-0078-00	MICROCIRCUIT, DI:4 TO 16 LINE DECODER	80009	156-0078-00
U345	156-0035-00	MICROCIRCUIT, DI:SGL 8-INPUT POS NAND GATE	80009	156-0035-00
U351	156-0473-00	MICROCIRCUIT, DI:DUAL 5-INPUT NAND GATE TTL	27014	DM8092N
U355	156-0039-00	MICROCIRCUIT, DI:DUAL J-K FLIP FLOP	80009	156-0039-00
U375	156-0158-00	MICROCIRCUIT, LI:DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00
U401	156-0040-00	MICROCIRCUIT, DI:QUAD LATCH, TTL	80009	156-0040-00
U411	156-0536-00	MICROCIRCUIT, DI:PRESETTABLE DECADE/BIN CNTR	80009	156-0536-00

Replaceable Electrical Parts—4006-1 Service

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U415	156-0536-00			MICROCIRCUIT,DI:PRESETTABLE DECADE/BIN CNTR	80009	156-0536-00
U421	156-0536-00			MICROCIRCUIT,DI:PRESETTABLE DECADE/BIN CNTR	80009	156-0536-00
U425	156-0536-00			MICROCIRCUIT,DI:PRESETTABLE DECADE/BIN CNTR	80009	156-0536-00
U431	156-0536-00			MICROCIRCUIT,DI:PRESETTABLE DECADE/BIN CNTR	80009	156-0536-00
U435	156-0536-00			MICROCIRCUIT,DI:PRESETTABLE DECADE/BIN CNTR	80009	156-0536-00
U441	156-0152-00			MICROCIRCUIT,DI:DUAL 5-BIT BUFFER-REG	18324	N8201N
U451	156-0129-00			MICROCIRCUIT,DI:QUAD 2-INPUT GATE	80009	156-0129-00
U455	156-0361-00			MICROCIRCUIT,DI:UNIV A SYN RCVR XMTR	80009	156-0361-00
U525	307-1054-00			RES.,NETWORK,TF:DIGITAL ANALOG CONVERTER	80009	307-1054-00
U551	156-0129-00			MICROCIRCUIT,DI:QUAD 2-INPUT GATE	80009	156-0129-00
U605	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00
U611	156-0106-00			MICROCIRCUIT,LI:MONOLITHIC,6-DIODE ARRAY	54590	CA3039
U615	156-0106-00			MICROCIRCUIT,LI:MONOLITHIC,6-DIODE ARRAY	54590	CA3039
U715	156-0158-00			MICROCIRCUIT,LI:DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00
U721	156-0106-00			MICROCIRCUIT,LI:MONOLITHIC,6-DIODE ARRAY	54590	CA3039
U725	156-0106-00			MICROCIRCUIT,LI:MONOLITHIC,6-DIODE ARRAY	54590	CA3039
VR90	152-0195-00			SEMICOND DEVICE:ZENER,0.4W,5.1V,5%	80009	152-0195-00
VR267	152-0166-00			SEMICOND DEVICE:ZENER,0.4W,6.2V,5%	80009	152-0166-00
VR441	152-0638-00			SEMICOND DEVICE:ZENER,0.4W,7V,5%	80009	152-0638-00
Y144	158-0072-00			XTAL UNIT,QTZ:4.9152 MHZ,0.05%	33096	OBD

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	DScont	Name & Description	Mfr Code	Mfr Part Number
A2 DISPLAY W/HEAT SINK						
A2	672-0537-00			CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-00
A2	672-0537-01			CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-01
A2	672-0537-02			CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-02
A2	672-0537-03	B021759		CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-03
A2	672-0537-04	B021760	B022614	CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-04
A2	672-0537-05	B022615	B022703	CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-05
A2	672-0537-06	B022704	B035553	CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-06
A2	672-0537-07	B035554	B035829	CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-06
A2	672-0537-09	B035830	B036209	CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-08
A2	672-0537-10	B036210		CKT BOARD ASSY:DISPLAY W/HEAT SINK	80009	672-0537-10
C11	283-0033-00			CAP., FXD, CER DI:0.001UF, +100-0%, 6000V	72982	3906BW200E102P
C12	283-0101-00	B010100	B035553	CAP., FXD, CER DI:4700PF, +80-20%, 6000V	56289	45C11A
C12	285-1137-00	B035554		CAP., FXD, PLSTC:0.0047UF, 10%, 8000V	56289	430P472980
C23	283-0008-00			CAP., FXD, CER DI:0.1UF, 20%, 500V	56289	275C8
C25	283-0008-00			CAP., FXD, CER DI:0.1UF, 20%, 500V	56289	275C8
C29	281-0523-00			CAP., FXD, CER DI:100PF, +/-20PF, 500V	72982	301-000U2M0101M
C44	283-0068-00			CAP., FXD, CER DI:0.01UF, +100-0%, 500V	56289	19C241
C62	281-0550-00			CAP., FXD, CER DI:120PF, 10%, 500V	04222	7001-1373
C64	283-0068-00			CAP., FXD, CER DI:0.01UF, +100-0%, 500V	56289	19C241
C86	283-0092-00			CAP., FXD, CER DI:0.03UF, +80-20%, 200V	72982	845-534E303Z
C96	283-0092-00			CAP., FXD, CER DI:0.03UF, +80-20%, 200V	72982	845-534E303Z
C110	283-0101-00	B010100	B035553	CAP., FXD, CER DI:4700PF, +80-20%, 6000V	56289	45C11A
C110	285-1137-00	B035554		CAP., FXD, PLSTC:0.0047UF, 10%, 8000V	56289	430P472980
C113	283-0101-00	B010100	B035553	CAP., FXD, CER DI:4700PF, +80-20%, 6000V	56289	45C11A
C113	285-1137-00	B035554		CAP., FXD, PLSTC:0.0047UF, 10%, 8000V	56289	430P472980
C136	283-0008-00			CAP., FXD, CER DI:0.1UF, 20%, 500V	56289	275C8
C147	283-0068-00			CAP., FXD, CER DI:0.01UF, +100-0%, 500V	56289	19C241
C148	281-0523-00			CAP., FXD, CER DI:100PF, +/-20PF, 500V	72982	301-000U2M0101M
C151	283-0177-00			CAP., FXD, CER DI:1UF, +80-20%, 25V	72982	8131N039 E 105Z
C158	283-0008-00			CAP., FXD, CER DI:0.1UF, 20%, 500V	56289	275C8
C159	283-0008-00			CAP., FXD, CER DI:0.1UF, 20%, 500V	56289	275C8
C175	281-0605-00			CAP., FXD, CER DI:200PF, 10%, 500V	04222	7001-1375
C177	281-0605-00			CAP., FXD, CER DI:200PF, 10%, 500V	04222	7001-1375
C189	283-0068-00			CAP., FXD, CER DI:0.01UF, +100-0%, 500V	56289	19C241
C190	283-0068-00			CAP., FXD, CER DI:0.01UF, +100-0%, 500V	56289	19C241
C196	290-0525-00			CAP., FXD, ELCTLT:4.7UF, 20%, 50V	56289	196D475X0050KA1
C213	283-0291-00			CAP., FXD, CER DI:25PF, 10%, 6000V	56289	41C426
C214	283-0162-00	B010100	B035553	CAP., FXD, CER DI:0.01UF, +80-30%, 5000V	56289	112C403
C214	285-1138-00	B035554		CAP., FXD, PLSTC:0.01UF, 10%, 8000V	56289	430P558
C215	283-0101-00	B010100	B035553	CAP., FXD, CER DI:4700PF, +80-20%, 6000V	56289	45C11A
C215	285-1137-00	B035554		CAP., FXD, PLSTC:0.0047UF, 10%, 8000V	56289	430P472980
C222	283-0177-00			CAP., FXD, CER DI:1UF, +80-20%, 25V	72982	8131N039 E 105Z
C228	283-0068-00			CAP., FXD, CER DI:0.01UF, +100-0%, 500V	56289	19C241
C232	283-0068-00			CAP., FXD, CER DI:0.01UF, +100-0%, 500V	56289	19C241
C243	283-0000-00			CAP., FXD, CER DI:0.001UF, +100-0%, 500V	72982	831-516E102P
C244	283-0068-00			CAP., FXD, CER DI:0.01UF, +100-0%, 500V	56289	19C241
C255	281-0623-00			CAP., FXD, CER DI:650PF, 5%, 500V	04222	7001-1362
C257	281-0623-00			CAP., FXD, CER DI:650PF, 5%, 500V	04222	7001-1362
C258	283-0177-00			CAP., FXD, CER DI:1UF, +80-20%, 25V	72982	8131N039 E 105Z
C259	283-0177-00			CAP., FXD, CER DI:1UF, +80-20%, 25V	72982	8131N039 E 105Z
C286	281-0605-00			CAP., FXD, CER DI:200PF, 10%, 500V	04222	7001-1375
C291	281-0605-00			CAP., FXD, CER DI:200PF, 10%, 500V	04222	7001-1375
C311	283-0021-00			CAP., FXD, CER DI:0.001UF, 20%, 5000V	72982	848-556-Y5S-102M
C312	283-0021-00			CAP., FXD, CER DI:0.001UF, 20%, 5000V	72982	848-556-Y5S-102M
C325	283-0067-00			CAP., FXD, CER DI:0.001UF, 10%, 200V	72982	835-515B102K

Replaceable Electrical Parts—4006-1 Service

Ckt No.	Tektronix Part No.	Serial/Model No.	Mfr Code	Mfr Part Number	
		Eff			
		Dscont	Name & Description		
C333	281-0525-00		CAP., FXD, CER DI:470PF, +/-94PF, 500V	04222 7001-1364	
C334	283-0177-00		CAP., FXD, CER DI:1UF, +80-20%, 25V	72982 8131N039 E 105Z	
C342	281-0504-00		CAP., FXD, CER DI:10PF, +/-1PF, 500V	72982 301-055C0G0100F	
C343	281-0604-00		CAP., FXD, CER DI:2.2PF, +/-0.25PF, 500V	72982 301-000C0J0229C	
C353	290-0301-00		CAP., FXD, ELCTLT:10UF, 10%, 20V	56289 150D106X9020B2	
C363	283-0000-00		CAP., FXD, CER DI:0.001UF, +100-0%, 500V	72982 831-516E102P	
C364	283-0000-00		CAP., FXD, CER DI:0.001UF, +100-0%, 500V	72982 831-516E102P	
C370	290-0260-00		CAP., FXD, ELCTLT:50UF, +75-10%, 200V	56289 34D506G200GL4	
C427	283-0067-00		CAP., FXD, CER DI:0.001UF, 10%, 200V	72982 835-515B102K	
C432	283-0177-00		CAP., FXD, CER DI:1UF, +80-20%, 25V	72982 8131N039 E 105Z	
C435	290-0316-00		CAP., FXD, ELCTLT:47UF, 20%, 35V	56289 150D476X0035S2	
C437	283-0111-00		CAP., FXD, CER DI:0.1UF, 20%, 50V	72982 8121-N088Z5U104M	
C439	283-0111-00		CAP., FXD, CER DI:0.1UF, 20%, 50V	72982 8121-N088Z5U104M	
C459	290-0534-00		CAP., FXD, ELCTLT:1UF, 20%, 35V	56289 196D105X0035HA1	
C466	281-0549-00		CAP., FXD, CER DI:68PF, 10%, 500V	72982 301-000U2J0680K	
C468	290-0297-00		CAP., FXD, ELCTLT:39UF, 10%, 10V	56289 150D396X9010B2	
C474	281-0584-00	XB036210	CAP., FXD, CER DI:100PF, 5%, 500V	72982 0301000Y5E0101J	
C545	283-0081-00		CAP., FXD, CER DI:0.1UF, +80-20%, 25V	56289 36C600	
C588	281-0584-00	XB036210	CAP., FXD, CER DI:100PF, 5%, 500V	72982 0301000Y5E0101J	
C650	283-0177-00		CAP., FXD, CER DI:1UF, +80-20%, 25V	72982 8131N039 E 105Z	
C659	281-0622-00		CAP., FXD, CER DI:47PF, 1%, 500V	72982 308-000COG0470F	
C664	283-0000-00		CAP., FXD, CER DI:0.001UF, +100-0%, 500V	72982 831-516E102P	
C668	290-0517-00		CAP., FXD, ELCTLT:6.8UF, 20%, 35V	56289 196D685X0035KA1	
C669	290-0517-00		CAP., FXD, ELCTLT:6.8UF, 20%, 35V	56289 196D685X0035KA1	
C671	290-0536-00		CAP., FXD, ELCTLT:10UF, 20%, 25V	90201 TDC106M025FL	
C672	290-0536-00		CAP., FXD, ELCTLT:10UF, 20%, 25V	90201 TDC106M025FL	
CR4	152-0426-00		SEMICOND DEVICE:SILICON, 400V, 400MA	01295 G2017-1	
CR20	152-0426-00		SEMICOND DEVICE:SILICON, 400V, 400MA	01295 G2017-1	
CR21	152-0061-00		SEMICOND DEVICE:SILICON, 175V, 100MA	80009 152-0061-00	
CR22	152-0061-00		SEMICOND DEVICE:SILICON, 175V, 100MA	80009 152-0061-00	
CR23	152-0066-01		SEMICOND DEVICE:SILICON, 400V, 1A	80009 152-0066-01	
CR24	152-0400-00		SEMICOND DEVICE:SILICON, 400V, 1A	80009 152-0400-00	
CR29	152-0141-02	XB022615	SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR40	152-0066-01	XB021760	SEMICOND DEVICE:SILICON, 400V, 1A	80009 152-0066-01	
CR45	152-0141-02		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR59	152-0141-02		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR67	152-0141-02		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR81	152-0141-02		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR82	152-0141-02		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR91	152-0141-02		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR92	152-0141-02		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR103	152-0426-00		SEMICOND DEVICE:SILICON, 400V, 400MA	01295 G2017-1	
CR121	152-0061-00		SEMICOND DEVICE:SILICON, 175V, 100MA	80009 152-0061-00	
CR122	152-0141-02		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02	
CR128	152-0066-01		SEMICOND DEVICE:SILICON, 400V, 1A	80009 152-0066-01	
CR169	152-0040-00		SEMICOND DEVICE:SILICON, 600V, 1A	80009 152-0040-00	
CR203	152-0408-00		SEMICOND DEVICE:SILICON, 10KV, 5MA	83003 H345	
CR204	152-0408-00		SEMICOND DEVICE:SILICON, 10KV, 5MA	83003 H345	
CR264	152-0107-00		SEMICOND DEVICE:SILICON, 400V, 400MA	80009 152-0107-00	
CR311	152-0429-00		SEMICOND DEVICE:SILICON, 5000V, 10MA	14099 SA3282	
CR312	152-0429-00		SEMICOND DEVICE:SILICON, 5000V, 10MA	14099 SA3282	
CR327	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02
CR328	152-0141-02			SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02
CR329	152-0141-02	XB022615		SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02
CR350	152-0141-02			SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02
CR395	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON, 30V, 50NA	80009 152-0141-02

Replaceable Electrical Parts—4006-1 Service

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Serial/Model No. Dscont	Name & Description	Mfr Code	Mfr Part Number
CR396	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR397	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR398	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR429	152-0412-00			SEMICOND DEVICE:SILICON,50V,3A	80009	152-0412-00
CR432	152-0333-00			SEMICOND DEVICE:SILICON,55V,200MA	80009	152-0333-00
CR450	152-0141-02			SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR475	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR476	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR497	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR545	152-0141-02	XB022615		SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR575	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR586	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR593	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR596	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR597	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR677	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR678	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR775	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
CR781	152-0141-02	B010100	B022614X	SEMICOND DEVICE:SILICON,30V,50NA	80009	152-0141-02
DS1	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS2	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS3	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS4	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS18	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS27	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS28	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS31	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS103	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS104	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
DS108	150-0035-00			LAMP ,GLOW:90V,0.3MA	53944	A1B-3
L27	108-0213-00			COIL,RF:2.5MH	76493	8862-2.5
L155	108-0146-00			COIL,RF:5UH	80009	108-0146-00
L432	108-0234-00			COIL,RF:130UH	80009	108-0234-00
L545	120-0382-00	XB022615		XFMR,TOROID:14 TURNS,SINGLE	80009	120-0382-00
Q29	151-0311-01			TRANSISTOR:SILICON,NPN	80009	151-0311-01
Q31	151-0219-00	B010100	B022614X	TRANSISTOR:SILICON,PNP	80009	151-0219-00
Q41	151-0150-00			TRANSISTOR:SILICON,NPN	80009	151-0150-00
Q47	151-0150-00			TRANSISTOR:SILICON,NPN	80009	151-0150-00
Q84	151-0134-00			TRANSISTOR:SILICON,PNP	80009	151-0134-00
Q95	151-0134-00			TRANSISTOR:SILICON,PNP	80009	151-0134-00
Q122	151-0279-00			TRANSISTOR:SILICON,NPN	80009	151-0279-00
Q123	151-0124-00			TRANSISTOR:SILICON,NPN,SEL FROM 2N3501	80009	151-0124-00
Q143	151-0311-01			TRANSISTOR:SILICON,NPN	80009	151-0311-01
Q162	151-0219-00			TRANSISTOR:SILICON,PNP	80009	151-0219-00
Q165	151-0311-01			TRANSISTOR:SILICON,NPN	80009	151-0311-01
Q186	151-0136-00			TRANSISTOR:SILICON,NPN	80009	151-0136-00
Q193	151-0136-00			TRANSISTOR:SILICON,NPN	80009	151-0136-00
Q231	151-0270-00			TRANSISTOR:SILICON,PNP	80009	151-0270-00
Q244	151-0311-01			TRANSISTOR:SILICON,NPN	80009	151-0311-01
Q247	151-0219-00			TRANSISTOR:SILICON,PNP	80009	151-0219-00
Q251	151-0219-00			TRANSISTOR:SILICON,PNP	80009	151-0219-00
Q328	151-1005-00			TRANSISTOR:SILICON,JFE, N-CHANNEL	80009	151-1005-00
Q329	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q338	151-0223-00			TRANSISTOR:SILICON,NPN	80009	151-0223-00
Q354	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
Q355	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677

Replaceable Electrical Parts—4006-1 Service

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Serial/Model No. Dscont	Name & Description	Mfr Code	Mfr Part Number
Q361	151-0219-00			TRANSISTOR:SILICON,PNP	80009	151-0219-00
Q362	151-0219-00			TRANSISTOR:SILICON,PNP	80009	151-0219-00
Q364	151-0311-01			TRANSISTOR:SILICON,NPN	80009	151-0311-01
Q366	151-0311-01			TRANSISTOR:SILICON,NPN	80009	151-0311-01
Q429	151-0190-00			TRANSISTOR:SILICON,NPN	07263	S032677
Q432	151-0256-00			TRANSISTOR:SILICON,NPN	80009	151-0256-00
Q433	151-0334-00			TRANSISTOR:SILICON,NPN	80009	151-0334-00
Q459	151-0219-00			TRANSISTOR:SILICON,PNP	80009	151-0219-00
Q473	151-0190-00	B010100	B022614X	TRANSISTOR:SILICON,NPN	07263	S032677
Q481	151-0353-00	B010100	B022614X	TRANSISTOR:SILICON,NPN	32293	ITS1251
Q482	151-0353-00	B010100	B022614X	TRANSISTOR:SILICON,NPN	32293	ITS1251
Q539	151-0347-00			TRANSISTOR:SILICON,NPN	80009	151-0347-00
Q551	151-0188-00	B010100	B022614X	TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q552	151-0188-00	B010100	B022614X	TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q674	151-0190-00	B010100	B022614X	TRANSISTOR:SILICON,NPN	07263	S032677
Q1036	151-0423-00	B010100	B022614X	TRANSISTOR:SILICON,NPN	01295	EP2970
Q1038	151-0423-00	XB022615		TRANSISTOR:SILICON,NPN	01295	EP2970
Q1039	151-0423-00	B010100	B022614X	TRANSISTOR:SILICON,NPN	01295	EP2970
Q1044	151-0423-00			TRANSISTOR:SILICON,NPN	01295	EP2970
Q1048	151-0423-00	XB022615		TRANSISTOR:SILICON,NPN	01295	EP2970
Q1059	151-0423-00			TRANSISTOR:SILICON,NPN	01295	EP2970
Q1067	151-0423-00			TRANSISTOR:SILICON,NPN	01295	EP2970
Q1069	151-0349-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE2801	80009	151-0349-00
Q1074	151-0373-00			TRANSISTOR:SILICON,PNP	80009	151-0373-00
Q1084	151-0349-00			TRANSISTOR:SILICON,NPN,SEL FROM MJE2801	80009	151-0349-00
Q1096	151-0373-00			TRANSISTOR:SILICON,PNP	80009	151-0373-00
R5	315-0102-03			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R6	315-0102-03			RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R13	311-1312-00			RES.,VAR,NONWIR:5M OHM,20%,1W	01121	73M4G048L505M
R18	305-0125-00			RES.,FXD,CMPSN:1.2M OHM,5%,2W	01121	HB1255
R19	315-0222-00			RES.,FXD,CMPSN:2.2K OHM,5%,0.25W	01121	CB2225
R21	315-0202-00			RES.,FXD,CMPSN:2K OHM,5%,0.25W	01121	CB2025
R25	315-0100-02			RES.,FXD,CMPSN:10 OHM,5%,0.25W	01121	CB1005
R26	315-0103-03			RES.,FXD,CMPSN:10K OHM,5%,0.25W	01121	CB1035
R27	315-0102-00	B010100	B022614	RES.,FXD,CMPSN:1K OHM,5%,0.25W	01121	CB1025
R27	322-0452-00	B022054		RES.,FXD,FILM:499K OHM,1%,0.25W	91637	MFF1421G49902F
R28	322-0452-00	B010100	B022614	RES.,FXD,FILM:499K OHM,1%,0.25W	91637	MFF1421G49902F
R28	321-0193-00	B022615		RES.,FXD,FILM:1K OHM,1%,0.125W	91637	MFF1816G10000F
R29	315-0682-00	B010100	B022614	RES.,FXD,CMPSN:6.8K OHM,5%,0.25W	01121	CB6825
R29	321-0222-00	B022615		RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R30	308-0108-00			RES.,FXD,WW:15K OHM,5%,5W	91637	CW5-15001J
R31	315-0473-00	B010100	B022614X	RES.,FXD,CMPSN:47K OHM,5%,0.25W	01121	CB4735
R32	315-0471-00	B010100	B022614	RES.,FXD,CMPSN:470 OHM,5%,0.25W	01121	CB4715
R32	321-0349-00	B022615		RES.,FXD,FILM:42.2K OHM,1%,0.125W	91637	MFF1816G42201F
R33	321-0346-00	B010100	B022614	RES.,FXD,FILM:39.2K OHM,1%,0.125W	91637	MFF1816G39201F
R33	321-0289-00	B022615		RES.,FXD,FILM:10K OHM,1%,0.125W	91637	MFF1816G10001F
R34	321-0323-00	B010100	B022614	RES.,FXD,FILM:22.6K OHM,1%,0.125W	91637	MFF1816G22601F
R34	321-0366-00	B022615		RES.,FXD,FILM:63.4K OHM,1%,0.125W	91637	MFF1816G63401F
R35	321-0222-00	B010100	B022614	RES.,FXD,FILM:2K OHM,1%,0.125W	91637	MFF1816G20000F
R35	321-0260-00	B022615		RES.,FXD,FILM:4.99K OHM,1%,0.125W	91637	MFF1816G49900F
R36	311-1561-00	B010100	B022614	RES.,VAR,NONWIR:2.5K OHM,20%,0.50W	73138	91A R2500
R36	311-1560-00	B022615		RES.,VAR,NONWIR:5K OHM,20%,0.50W	73138	91A R5K
R37	305-0154-00			RES.,FXD,CMPSN:150K OHM,5%,2W	01121	HB1545
R38	315-0470-03			RES.,FXD,CMPSN:47 OHM,5%,0.25W	01121	CB4705
R39	315-0101-03			RES.,FXD,CMPSN:100 OHM,5%,0.25W (R39 USED ON -00,-01 AND -02 SUFFIX BDS ONLY)	01121	CB1015

Ckt No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R39	315-0470-03				RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R40	315-0184-00	XB021760			RES., FXD, CMPSN: 180K OHM, 5%, 0.25W	01121	CB1845
R41	305-0433-00				RES., FXD, CMPSN: 43K OHM, 5%, 2W	01121	HB4335
R43	303-0134-00				RES., FXD, CMPSN: 130K OHM, 5%, 1W	01121	GB1345
R44	303-0134-00				RES., FXD, CMPSN: 130K OHM, 5%, 1W	01121	GB1345
R48	303-0224-00				RES., FXD, CMPSN: 220K OHM, 5%, 1W	01121	GB2245
R59	315-0470-03				RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R61	315-0470-03				RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R64	305-0683-00				RES., FXD, CMPSN: 68K OHM, 5%, 2W	01121	HB6835
R66	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R67	315-0470-03				RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R71	303-0391-00				RES., FXD, CMPSN: 390 OHM, 5%, 1W	01121	GB3915
R74	307-0344-00				RES., FXD, FILM: 3 SECT, 1.5 OHM EA SECT	80009	307-0344-00
R75	303-0331-00				RES., FXD, CMPSN: 330 OHM, 5%, 1W	01121	GB3315
R86	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R97	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R104	301-0395-00				RES., FXD, CMPSN: 3.9M OHM, 5%, 0.50W	01121	EB3955
R106	301-0104-00				RES., FXD, CMPSN: 100K OHM, 5%, 0.5W	01121	EB1045
R108	301-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.50W	01121	EB1035
R109	315-0102-03				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R112	307-0316-00				RES., FXD, FILM: VOLTAGE DIVIDER	80009	307-0316-00
R121	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R122	301-0333-00				RES., FXD, CMPSN: 33K OHM, 5%, 0.50W	01121	EB3335
R123	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R126	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R127	315-0333-00				RES., FXD, CMPSN: 33K OHM, 5%, 0.25W	01121	CB3335
R128	322-0336-00				RES., FXD, FILM: 30.9K OHM, 1%, 0.25W	75042	CEBT0-3092F
R129	311-1556-00				RES., VAR, NONWIR: 50K OHM, 20%, 0.50W	73138	91A R50K
R131	321-0193-00				RES., FXD, FILM: 1K OHM, 1%, 0.125W	91637	MFF1816G10000F
R132	323-0362-00				RES., FXD, FILM: 57.6K OHM, 1%, 0.50W	75042	CECT0-5762F
R133	305-0223-00				RES., FXD, CMPSN: 22K OHM, 5%, 2W	01121	HB2235
R135	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R140	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R146	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R148	322-0452-00				RES., FXD, FILM: 499K OHM, 1%, 0.25W	91637	MFF1421G49902F
R149	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R152	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R153	315-0100-02				RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R154	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R159	323-0398-00				RES., FXD, FILM: 137K OHM, 1%, 0.50W	91637	MFF1226G13702F
R167	305-0124-00				RES., FXD, CMPSN: 120K OHM, 5%, 2W	01121	HB1245
R168	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R169	305-0154-00				RES., FXD, CMPSN: 150K OHM, 5%, 2W	01121	HB1545
R176	321-0214-00	B010100	B022614		RES., FXD, FILM: 1.65K OHM, 1%, 0.125W	91637	MFF1816G16500F
R176	321-0234-00	B022615	B035829		RES., FXD, FILM: 2.67K OHM, 1%, 0.125W	91637	MFF1816G26700F
R176	321-0244-00	B035830			RES., FXD, FILM: 3.4K OHM, 1%, 0.125W	91637	MFF1816G34000F
R178	321-0214-00	B010100	B022614		RES., FXD, FILM: 1.65K OHM, 1%, 0.125W	91637	MFF1816G16500F
R178	321-0243-00	B022615	B035829		RES., FXD, FILM: 3.32K OHM, 1%, 0.125W	91637	MFF1816G33200F
R178	321-0249-00	B035830			RES., FXD, FILM: 3.83K OHM, 1%, 0.125W	91637	MFF1816G38300F
R189	315-0100-02				RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R190	315-0100-02				RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R191	315-0511-00				RES., FXD, CMPSN: 510 OHM, 5%, 0.25W	01121	CB5115
R192	315-0511-00				RES., FXD, CMPSN: 510 OHM, 5%, 0.25W	01121	CB5115
R196	301-0472-00				RES., FXD, CMPSN: 4.7K OHM, 5%, 0.50W	01121	EB4725
R198	321-0253-00	B010100	B022614X		RES., FXD, FILM: 4.22K OHM, 1%, 0.125W	91637	MFF1816G42200F
R199	315-0222-00	B010100	B022614X		RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R208	301-0101-00				RES., FXD, CMPSN: 100 OHM, 5%, 0.50W	01121	EB1015

Replaceable Electrical Parts—4006-1 Service

Ckt No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
R209	301-0101-00				RES., FXD, CMPSN: 100 OHM, 5%, 0.50W	01121	EB1015
R212	307-0314-00	B010100	B022703		RES., FXD, FILM: VOLTAGE DIVIDER	80009	307-0314-00
R212	307-0314-01	B022704			RES., FXD, FILM: VOLTAGE DIVIDER	80009	307-0314-01
R221	315-0100-02				RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R223	321-0452-00				RES., FXD, FILM: 499K OHM, 1%, 0.125W	91637	MFF1816G49902F
R224	311-1556-00				RES., VAR, NONWIR: 50K OHM, 20%, 0.50W	73138	91A R50K
R227	315-0681-00				RES., FXD, CMPSN: 680 OHM, 5%, 0.25W	01121	CB6815
R228	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R229	315-0100-02				RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R235	322-0338-00				RES., FXD, FILM: 32.4K OHM, 1%, 0.25W	75042	CEBT0-3242F
R236	321-0289-00				RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R237	306-0272-00				RES., FXD, CMPSN: 2.7K OHM, 10%, 2W	01121	HB2721
R242	301-0103-00	B010100	B022614		RES., FXD, CMPSN: 10K OHM, 5%, 0.50W	01121	EB1035
R242	301-0272-00	B022615			RES., FXD, CMPSN: 2.7K OHM, 5%, 0.50W	01121	EB2725
R244	315-0682-00				RES., FXD, CMPSN: 6.8K OHM, 5%, 0.25W	01121	CB6825
R246	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R248	311-1228-00				RES., VAR, NONWIR: 10K OHM, 20%, 0.50W	32997	3386F-T04-103
R249	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R252	311-1559-00				RES., VAR, NONWIR: 10K OHM, 20%, 0.50W	73138	91A-10001M
R253	315-0272-00				RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
R254	315-0471-00				RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R255	315-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R257	315-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R260	321-0260-00				RES., FXD, FILM: 4.99K OHM, 1%, 0.125W	91637	MFF1816G49900F
R261	321-0294-00				RES., FXD, FILM: 11.3K OHM, 1%, 0.125W	91637	MFF1816G11301F
R262	321-0353-00				RES., FXD, FILM: 46.4K OHM, 1%, 0.125W	91637	MFF1816G46401F
R263	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R264	315-0682-00				RES., FXD, CMPSN: 6.8K OHM, 5%, 0.25W	01121	CB6825
R267	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R270	311-1731-00				RES., VAR, NONWIR: 20 OHM, 0.5W	73138	91A R2
R271	311-1560-00				RES., VAR, NONWIR: 5K OHM, 20%, 0.50W	73138	91A R5K
R272	311-1731-00				RES., VAR, NONWIR: 20 OHM, 0.5W	73138	91A R2
R273	311-1560-00				RES., VAR, NONWIR: 5K OHM, 20%, 0.50W	73138	91A R5K
R279	321-0385-00	XB036210			RES., FXD, FILM: 100K OHM, 1%, 0.125W	91637	MFF1816G10002F
R280	321-0387-00				RES., FXD, FILM: 105K OHM, 1%, 0.125W	91637	MFF1816G10502F
R281	321-0328-00				RES., FXD, FILM: 25.5K OHM, 1%, 0.125W	91637	MFF1816G25501F
R282	321-0318-00	B010100	B022614X		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R284	321-0214-00	B010100	B022614		RES., FXD, FILM: 1.65K OHM, 1%, 0.125W	91637	MFF1816G16500F-
R284	321-0234-00	B022615			RES., FXD, FILM: 2.67K OHM, 1%, 0.125W	91637	MFF1816G26700F
R286	321-0318-00	B010100	B022614		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R286	321-0328-00	B022615			RES., FXD, FILM: 25.5K OHM, 1%, 0.125W	91637	MFF1816G25501F
R287	321-0318-00	B010100	B022614X		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R289	321-0387-00				RES., FXD, FILM: 105K OHM, 1%, 0.125W	91637	MFF1816G10502F
R290	321-0328-00				RES., FXD, FILM: 25.5K OHM, 1%, 0.125W	91637	MFF1816G25501F
R291	321-0318-00	B010100	B022614X		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R292	321-0214-00	B010100	B022614		RES., FXD, FILM: 1.65K OHM, 1%, 0.125W	91637	MFF1816G16500F
R292	321-0243-00	B022615			RES., FXD, FILM: 3.32K OHM, 1%, 0.125W	91637	MFF1816G33200F
R293	321-0317-00	B010100	B022614		RES., FXD, FILM: 19.6K OHM, 1%, 0.125W	91637	MFF1816G19601F
R293	321-0328-00	B022615			RES., FXD, FILM: 25.5K OHM, 1%, 0.125W	91637	MFF1816G25501F
R294	321-0318-00	B010100	B022614X		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R295	321-0306-00	B010100	B022614X		RES., FXD, FILM: 15K OHM, 1%, 0.125W	91637	MFF1816G15001F
R297	321-0253-00	B010100	B022614X		RES., FXD, FILM: 4.22K OHM, 1%, 0.125W	91637	MFF1816G42200F
R298	321-0253-00	B010100	B022614X		RES., FXD, FILM: 4.22K OHM, 1%, 0.125W	91637	MFF1816G42200F
R299	321-0253-00	B010100	B022614X		RES., FXD, FILM: 4.22K OHM, 1%, 0.125W	91637	MFF1816G42200F
R321	315-0224-00				RES., FXD, CMPSN: 220K OHM, 5%, 0.25W	01121	CB2245
R322	315-0824-00				RES., FXD, CMPSN: 820K OHM, 5%, 0.25W	01121	CB8245
R323	315-0824-00				RES., FXD, CMPSN: 820K OHM, 5%, 0.25W	01121	CB8245

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R324	315-0104-00				RES., FXD, CMPSN: 100K OHM, 5%, 0.25W	01121	CB1045
R326	315-0822-00				RES., FXD, CMPSN: 8.2K OHM, 5%, 0.25W	01121	CB8225
R329	315-0222-00				RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R330	315-0221-00				RES., FXD, CMPSN: 220 OHM, 5%, 0.25W	01121	CB2215
R331	315-0152-00				RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
R332	315-0221-00				RES., FXD, CMPSN: 220 OHM, 5%, 0.25W	01121	CB2215
R333	315-0471-00				RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R334	315-0301-00				RES., FXD, CMPSN: 300 OHM, 5%, 0.25W	01121	CB3015
R335	315-0100-02				RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R336	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R339	315-0470-03				RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R341	323-0396-00				RES., FXD, FILM: 130K OHM, 1%, 0.50W	75042	CECTO-1303F
R342	321-0269-00				RES., FXD, FILM: 6.19K OHM, 1%, 0.125W	91637	MFF1816G61900F
R343	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R344	315-0472-00				RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R345	315-0222-00				RES., FXD, CMPSN: 2.2K OHM, 5%, 0.25W	01121	CB2225
R346	321-0316-00				RES., FXD, FILM: 19.1K OHM, 1%, 0.125W	91637	MFF1816G19101F
R347	321-0309-00				RES., FXD, FILM: 16.2K OHM, 1%, 0.125W	91637	MFF1816G16201F
R348	321-0289-00				RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R351	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R352	321-0385-00				RES., FXD, FILM: 100K OHM, 1%, 0.125W	91637	MFF1816G10002F
R353	315-0201-02	XB022615			RES., FXD, CMPSN: 200 OHM, 5%, 0.25W	01121	CB2015
R355	315-0201-02	XB022615			RES., FXD, CMPSN: 200 OHM, 5%, 0.25W	01121	CB2015
R356	315-0471-00				RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R357	315-0471-00				RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R358	315-0103-03				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R359	311-1228-00				(R358 USED ON -01, -02, -03 AND -04 SUFFIX BDS)		
R360	321-0260-00				RES., VAR, NONWIR: 10K OHM, 20%, 0.50W	32997	3386F-T04-103
R361	321-0260-00				RES., FXD, FILM: 4.99K OHM, 1%, 0.125W	91637	MFF1816G49900F
R361	321-0260-00				RES., FXD, FILM: 4.99K OHM, 1%, 0.125W	91637	MFF1816G49900F
R369	315-0105-00				RES., FXD, CMPSN: 1M OHM, 5%, 0.25W	01121	CB1055
R374	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R375	321-0193-00	B010100	B022614X		RES., FXD, FILM: 1K OHM, 1%, 0.125W	91637	MFF1816G10000F
R376	321-0301-00	B010100	B022614X		RES., FXD, FILM: 13.3K OHM, 1%, 0.125W	91637	MFF1816G13301F
R377	321-0301-00	B010100	B022614X		RES., FXD, FILM: 13.3K OHM, 1%, 0.125W	91637	MFF1816G13301F
R382	321-0280-00	B010100	B022614X		RES., FXD, FILM: 8.06K OHM, 1%, 0.125W	91637	MFF1816G80600F
R384	321-0306-00	B010100	B022614X		RES., FXD, FILM: 15K OHM, 1%, 0.125W	91637	MFF1816G15001F
R385	311-1555-00	XB036210			RES., VAR, NONWIR: 100K OHM, 20%, 0.50W	73138	91-77-0
R390	321-0309-00	B010100	B022614X		RES., FXD, FILM: 16.2K OHM, 1%, 0.125W	91637	MFF1816G16201F
R391	321-0309-00	B010100	B022614X		RES., FXD, FILM: 16.2K OHM, 1%, 0.125W	91637	MFF1816G16201F
R392	311-1567-00	B010100	B022614		RES., VAR, NONWIR: TRMR, 100 OHM, 0.50W	73138	91-89-0
R392	311-1559-00	B022615			RES., VAR, NONWIR: 10K OHM, 20%, 0.50W	73138	91A-10001M
R393	311-1567-00	B010100	B022614		RES., VAR, NONWIR: TRMR, 100 OHM, 0.50W	73138	91-89-0
R393	311-1559-00	B022615			RES., VAR, NONWIR: 10K OHM, 20%, 0.50W	73138	91A-10001M
R398	321-0306-00	B010100	B022614X		RES., FXD, FILM: 15K OHM, 1%, 0.125W	91637	MFF1816G15001F
R427	315-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R428	315-0122-00				RES., FXD, CMPSN: 1.2K OHM, 5%, 0.25W	01121	CB1225
R429	315-0272-00				RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
R430	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R432	315-0272-00				RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
R433	308-0244-00				RES., FXD, WW: 0.3 OHM, 10%, 2W	91637	RS2B162ER3000K
R434	308-0244-00				RES., FXD, WW: 0.3 OHM, 10%, 2W	91637	RS2B162ER3000K
R435	307-0103-00				RES., FXD, CMPSN: 2.7 OHM, 5%, 0.25W	01121	CB27G5
R436	315-0472-00				RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R438	315-0100-02				RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R439	315-0100-02				RES., FXD, CMPSN: 10 OHM, 5%, 0.25W	01121	CB1005
R443	321-0280-00				RES., FXD, FILM: 8.06K OHM, 1%, 0.125W	91637	MFF1816G80600F

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R444	321-0274-00				RES., FXD, FILM: 6.98K OHM, 1%, 0.125W	91637	MFF1816G69800F
R446	315-0335-00				RES., FXD, CMPSN: 3.3M OHM, 5%, 0.25W	01121	CB3355
R447	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R448	315-0152-00				RES., FXD, CMPSN: 1.5K OHM, 5%, 0.25W	01121	CB1525
R449	315-0154-00				RES., FXD, CMPSN: 150K OHM, 5%, 0.25W	01121	CB1545
R450	315-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R451	315-0473-00				RES., FXD, CMPSN: 47K OHM, 5%, 0.25W	01121	CB4735
R452	315-0103-00	B010100	B022614X		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R453	315-0472-00				RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R454	315-0472-00				RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R455	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R456	315-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R457	315-0102-03	B010100	B022614		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R457	321-0315-00	B022615			RES., FXD, FILM: 18.7K OHM, 1%, 0.125W	91637	MFF1816G18701F
R458	315-0102-03				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R459	321-0315-00	B010100	B022614		(R458 USED ON -01, -02, -03 AND -04 SUFFIX BDS)		
R459	315-0102-00	B022615			RES., FXD, FILM: 18.7K OHM, 1%, 0.125W	91637	MFF1816G18701F
R459	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R460	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R461	315-0182-00	B010100	B022614		RES., FXD, CMPSN: 1.8K OHM, 5%, 0.25W	01121	CB1825
R461	315-0103-00	B022615			RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R462	315-0103-00	B010100	B022614		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R462	315-0182-00	B022615			RES., FXD, CMPSN: 1.8K OHM, 5%, 0.25W	01121	CB1825
R463	315-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R464	315-0182-00				RES., FXD, CMPSN: 1.8K OHM, 5%, 0.25W	01121	CB1825
R465	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R466	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R467	315-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R468	321-0339-00				RES., FXD, FILM: 33.2K OHM, 1%, 0.125W	91637	MFF1816G33201F
R471	321-0392-00	XB022615			RES., FXD, FILM: 118K OHM, 1%, 0.125W	91637	MFF1816G11802F
R472	315-0102-00	B010100	B022614		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R472	321-0306-00	B022615			RES., FXD, FILM: 15K OHM, 1%, 0.125W	91637	MFF1816G15001F
R473	315-0103-00	B010100	B022614		RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
R473	321-0280-00	B022615	B035829		RES., FXD, FILM: 8.06K OHM, 1%, 0.125W	91637	MFF1816G80600F
R473	321-0816-07	B035830			RES., FXD, FILM: 5K OHM, 0.1%, 0.125W	91637	MFF1816G50000B
R475	315-0102-00	XB036210			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R477	321-0253-00	B010100	B022614X		RES., FXD, FILM: 4.22K OHM, 1%, 0.125W	91637	MFF1816G42200F
R478	321-0253-00	B010100	B022614X		RES., FXD, FILM: 4.22K OHM, 1%, 0.125W	91637	MFF1816G42200F
R482	315-0470-03	B010100	B022614X		RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R483	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R485	321-0309-00	B010100	B022614X		RES., FXD, FILM: 16.2K OHM, 1%, 0.125W	91637	MFF1816G16201F
R491	315-0470-03	B010100	B022614X		RES., FXD, CMPSN: 47 OHM, 5%, 0.25W	01121	CB4705
R492	321-0301-00	B010100	B022614X		RES., FXD, FILM: 13.3K OHM, 1%, 0.125W	91637	MFF1816G13301F
R493	321-0318-00	B010100	B022614		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R493	321-0280-00	B022615			RES., FXD, FILM: 8.06K OHM, 1%, 0.125W	91637	MFF1816G80600F
R494	321-0318-00	B010100	B022614		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R494	321-0405-00	B022615			RES., FXD, FILM: 162K OHM, 1%, 0.125W	91637	MFF1816G16202F
R495	321-0321-00	B010100	B022614		RES., FXD, FILM: 21.5K OHM, 1%, 0.125W	91637	MFF1816G21501F
R495	321-0341-00	B022615	B035829		RES., FXD, FILM: 34.8K OHM, 1%, 0.125W	91637	MFF1816G34801F
R495	321-0338-00	B035830			RES., FXD, FILM: 32.4K OHM, 1%, 0.125W	91637	MFF1816G32401F
R496	311-1560-00	XB035830			RES., VAR, NONWIR: 5K OHM, 20%, 0.50W	73138	91A R5K
R498	321-0402-00	B010100	B022614X		RES., FXD, FILM: 150K OHM, 1%, 0.125W	91637	MFF1816G15002F
R544	307-0103-00				RES., FXD, CMPSN: 2.7 OHM, 5%, 0.25W	01121	CB27G5
R545	307-0103-00				RES., FXD, CMPSN: 2.7 OHM, 5%, 0.25W	01121	CB27G5
R546	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R547	315-0472-00	B010100	B022614X		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R548	315-0273-00	B010100	B022614		RES., FXD, CMPSN: 27K OHM, 5%, 0.25W	01121	CB2735

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R548	315-0102-00	B022615			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R551	315-0103-00				RES., FXD, CMPSN: 10K OHM, 5%, 0.25W	01121	CB1035
	-----				(R551 USEDS ON -00 AND -01 SUFFIX BOARD ONLY)		
R572	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R573	321-0288-00	B010100	B022614X		RES., FXD, FILM: 9.76K OHM, 1%, 0.125W	91637	MFF1816G97600F
R574	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R576	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R578	321-0346-00	B010100	B022614X		RES., FXD, FILM: 39.2K OHM, 1%, 0.125W	91637	MFF1816G39201F
R581	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R582	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R583	321-0348-00	B010100	B022614X		RES., FXD, FILM: 41.2K OHM, 1%, 0.125W	91637	MFF1816G41201F
R585	321-0339-00	B010100	B022614X		RES., FXD, FILM: 33.2K OHM, 1%, 0.125W	91637	MFF1816G33201F
R585	315-0102-00	XB036210			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R587	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R588	321-0289-00	B010100	B022614		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R588	321-0314-00	B022615			RES., FXD, FILM: 18.2K OHM, 1%, 0.125W	91637	MFF1816G18201F
R591	321-0402-00	B010100	B022614X		RES., FXD, FILM: 150K OHM, 1%, 0.125W	91637	MFF1816G15002F
R592	321-0318-00	B010100	B022614X		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R594	321-0402-00	B010100	B022614		RES., FXD, FILM: 150K OHM, 1%, 0.125W	91637	MFF1816G15002F
R594	321-0236-00	B022615	B035553		RES., FXD, FILM: 2.8K OHM, 1%, 0.125W	91637	MFF1816G28000F
R594	321-0242-00	B035554	B035829X		RES., FXD, FILM: 3.24K OHM, 1%, 0.125W	91637	MFF1816G32400F
R595	321-0289-00	B010100	B022614		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R595	321-0314-00	B022615			RES., FXD, FILM: 18.2K OHM, 1%, 0.125W	91637	MFF1816G18201F
R597	321-0402-00	B010100	B022614X		RES., FXD, FILM: 150K OHM, 1%, 0.125W	91637	MFF1816G15002F
R598	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R599	321-0318-00	B010100	B022614X		RES., FXD, FILM: 20K OHM, 1%, 0.125W	91637	MFF1816G20001F
R651	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R652	315-0471-00				RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R654	315-0472-00				RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R655	315-0102-00	B010100	B035553		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R655	315-0331-00	B035554			RES., FXD, CMPSN: 330 OHM, 5%, 0.25W	01121	CB3315
R656	315-0472-00				RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R657	315-0272-00				RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
R658	315-0272-00				RES., FXD, CMPSN: 2.7K OHM, 5%, 0.25W	01121	CB2725
R659	321-0247-00	B010100	B022614		RES., FXD, FILM: 3.65K OHM, 1%, 0.125W	91637	MFF1816G36500F
R659	315-0102-00	B022615			RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R660	315-0102-00				RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R661	315-0472-00	B010100	B022614		RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R661	321-0247-00	B022615			RES., FXD, FILM: 3.65K OHM, 1%, 0.125W	91637	MFF1816G36500F
R662	315-0101-03				RES., FXD, CMPSN: 100 OHM, 5%, 0.25W	01121	CB1015
R663	315-0472-00				RES., FXD, CMPSN: 4.7K OHM, 5%, 0.25W	01121	CB4725
R670	307-0103-00				RES., FXD, CMPSN: 2.7 OHM, 5%, 0.25W	01121	CB27G5
R672	307-0103-00				RES., FXD, CMPSN: 2.7 OHM, 5%, 0.25W	01121	CB27G5
R673	315-0102-00	B010100	B022614X		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R678	321-0346-00	B010100	B022614X		RES., FXD, FILM: 39.2K OHM, 1%, 0.125W	91637	MFF1816G39201F
R679	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R681	321-0289-00	B010100	B022614X		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R682	321-0348-00	B010100	B022614X		RES., FXD, FILM: 41.2K OHM, 1%, 0.125W	91637	MFF1816G41201F
R686	311-1554-00	B010100	B022614		RES., VAR, NONWIR: 200K OHM, 20%, 0.50W	73138	91-76-0
R686	311-1555-00	B022615	B035829		RES., VAR, NONWIR: 100K OHM, 20%, 0.5W	73138	91-77-0
R686	311-1560-00	B035830			RES., VAR, NONWIR: 5K OHM, 20%, 0.50W	73138	91A R5K
R687	311-1555-00				RES., VAR, NONWIR: 100K OHM, 20%, 0.5W	73138	91-77-0
R688	315-0102-00	B010100	B022614X		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R691	311-1554-00	B010100	B022614		RES., VAR, NONWIR: 200K OHM, 20%, 0.50W	73138	91-76-0
R691	311-1561-00	B022615	B035829		RES., VAR, NONWIR: 2.5K OHM, 20%, 0.50W	73138	91A R2500
R691	311-1560-00	B035830			RES., VAR, NONWIR: 5K OHM, 20%, 0.50W	73138	91A R5K
R693	321-0270-00	B010100	B022614X		RES., FXD, FILM: 6.34K OHM, 1%, 0.125W	91637	MFF1816G63400F

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Descont	Name & Description	Mfr Code	Mfr Part Number
R694	321-0385-00	B010100	B022614X	RES., FXD, FILM: 100K OHM, 1%, 0.125W	91637	MFF1816G10002F
R695	311-1555-00			RES., VAR, NONWIR: 100K OHM, 20%, 0.5W	73138	91-77-0
R696	315-0912-00	B010100	B022614X	RES., FXD, CMPSN: 9.1K OHM, 5%, 0.25W	01121	CB9125
R697	315-0912-00	B010100	B022614X	RES., FXD, CMPSN: 9.1K OHM, 5%, 0.25W	01121	CB9125
R698	315-0471-00	B010100	B022614X	RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R699	315-0471-00	B010100	B022614X	RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R770	321-0222-00	XB022615		RES., FXD, FILM: 2K OHM, 1%, 0.125W	91637	MFF1816G20000F
R772	321-0289-00	B010100	B022614	RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R772	321-0244-00	B022615	B035829	RES., FXD, FILM: 3.4K OHM, 1%, 0.125W	91637	MFF1816G34000F
R772	321-0222-00	B035830		RES., FXD, FILM: 2K OHM, 1%, 0.125W	91637	MFF1816G20000F
R773	321-0288-00	B010100	B022614X	RES., FXD, FILM: 9.76K OHM, 1%, 0.125W	91637	MFF1816G97600F
R774	321-0289-00	B010100	B022614X	RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R775	321-0222-00	XB022615		RES., FXD, FILM: 2K OHM, 1%, 0.125W	91637	MFF1816G20000F
R776	321-0289-00	B010100	B022614	RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R776	321-0217-00	B022615	B035829	RES., FXD, FILM: 1.78K OHM, 1%, 0.125W	91637	MFF1816G17800F
R776	321-0222-00	B035830		RES., FXD, FILM: 2K OHM, 1%, 0.125W	91637	MFF1816G20000F
R777	321-0283-00	XB022615		RES., FXD, FILM: 8.66K OHM, 1%, 0.125W	91637	MFF1816G86600F
R778	321-0339-00	B010100	B022614X	RES., FXD, FILM: 33.2K OHM, 1%, 0.125W	91637	MFF1816G33201F
R781	315-0102-00	XB022615		RES., FXD, CMPSN: 1K OHM, 5%, 0.25W	01121	CB1025
R782	321-0289-00	B010100	B022614	RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R782	321-0276-00	B022615	B035829	RES., FXD, FILM: 7.32K OHM, 1%, 0.125W	91637	MFF1816G73200F
R782	321-0230-00	B035830		RES., FXD, FILM: 2.43K OHM, 1%, 0.125W	91637	MFF1816G24300F
R783	321-0289-00			RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R784	321-0193-00	XB022615		RES., FXD, FILM: 1K OHM, 1%, 0.125W	91637	MFF1816G10000F
R785	321-0193-00	XB022615		RES., FXD, FILM: 1K OHM, 1%, 0.125W	91637	MFF1816G10000F
R786	321-0270-00	B010100	B022614X	RES., FXD, FILM: 6.34K OHM, 1%, 0.125W	91637	MFF1816G63400F
R787	321-0385-00	B010100	B022614X	RES., FXD, FILM: 100K OHM, 1%, 0.125W	91637	MFF1816G10002F
R789	321-0283-00	XB022615		RES., FXD, FILM: 8.66K OHM, 1%, 0.125W	91637	MFF1816G86600F
R791	321-0193-00	XB022615		RES., FXD, FILM: 1K OHM, 1%, 0.125W	91637	MFF1816G10000F
R792	315-0183-00	B010100	B022614X	RES., FXD, CMPSN: 18K OHM, 5%, 0.25W	01121	CB1835
R793	315-0183-00	B010100	B022614	RES., FXD, CMPSN: 18K OHM, 5%, 0.25W	01121	CB1835
R793	321-0193-00	B022615		RES., FXD, FILM: 1K OHM, 1%, 0.125W	91637	MFF1816G10000F
R794	315-0471-00	B010100	B022614	RES., FXD, CMPSN: 470 OHM, 5%, 0.25W	01121	CB4715
R794	321-0289-00	B022615		RES., FXD, FILM: 10K OHM, 1%, 0.125W	91637	MFF1816G10001F
R795	315-0393-00	B010100	B022614X	RES., FXD, CMPSN: 39K OHM, 5%, 0.25W	01121	CB3935
R796	315-0393-00	B010100	B022614X	RES., FXD, CMPSN: 39K OHM, 5%, 0.25W	01121	CB3935
R797	321-0134-00	B010100	B022614X	RES., FXD, FILM: 243 OHM, 1%, 0.125W	91637	MFF1816G243ROF
R798	321-0134-00	B010100	B022614X	RES., FXD, FILM: 243 OHM, 1%, 0.125W	91637	MFF1816G243ROF
T154	120-1026-00			XFMR, RF: TOROID, 2 WINDINGS	80009	120-1026-00
T314	120-1028-00			XFMR, PWR, SDN&SU: HIGH VOLTAGE	80009	120-1028-00
U31	156-0067-00	XB022615		MICROCIRCUIT, LI: OPERATIONAL AMPLIFIER	80009	156-0067-00
U155	156-0162-00			MICROCIRCUIT, LI: DIFFERENTIAL VIDEO AMPL	80009	156-0162-00
U184	156-0158-00			MICROCIRCUIT, LI: DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00
U255	156-0096-00			MICROCIRCUIT, LI: VOLTAGE COMPARATOR	27014	LM311H
U296	156-0048-00	B010100	B022614X	MICROCIRCUIT, LI: FIVE NPN TRANSISTOR ARRAY	80009	156-0048-00
U381	156-0158-00	B010100	B022614X	MICROCIRCUIT, LI: DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00
U445	156-0067-00			MICROCIRCUIT, LI: OPERATIONAL AMPLIFIER	80009	156-0067-00
U485	155-0152-00	XB022615	B035829	MICROCIRCUIT, LI: GEOMETRY & FOCUS CORRECTION	80009	155-0152-00
U485	155-0152-01	B035830		MICROCIRCUIT, LI: GEOMETRY & FOCUS CORRECTION	80009	155-0152-01
U496	156-0158-00	B010100	B022614X	MICROCIRCUIT, LI: DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00
U552	156-0145-00			MICROCIRCUIT, DI: QUAD 2-INPUT POS NAND BFR	80009	156-0145-00
U555	156-0093-00			MICROCIRCUIT, DI: HEX. INVERTER	80009	156-0093-00
U557	156-0706-00			MICROCIRCUIT, DI: DUAL MONOSTABLE MV	01295	SN74221N
U561	156-0093-00			MICROCIRCUIT, DI: HEX. INVERTER	80009	156-0093-00
U566	156-0706-00			MICROCIRCUIT, DI: DUAL MONOSTABLE MV	01295	SN74221N
U577	156-0158-00	B010100	B022614X	MICROCIRCUIT, LI: DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00

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Ckt No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
U585	155-0154-00	XB022615			MICROCIRCUIT, LI:CHANNEL SWITCH	80009	155-0154-00
U777	156-0158-00	B010100	B022614X		MICROCIRCUIT, LI:DUAL OPERATIONAL AMPLIFIER	80009	156-0158-00
U791	156-0032-00	B010100	B022614X		MICROCIRCUIT, DI:4-BIT BINARY COUNTER	80009	156-0032-00
VR196	152-0195-00				SEMICOND DEVICE:ZENER, 0.4W, 5.1V, 5%	80009	152-0195-00
VR265	152-0394-00				SEMICOND DEVICE:ZENER, 1W, 47V, 5%	81483	1N3036B
VR266	152-0087-00				SEMICOND DEVICE:ZENER, 1W, 100V, 5%	04713	SZ1627
VR358	152-0278-00				SEMICOND DEVICE:ZENER, 0.4W, 3V, 5%	80009	152-0278-00
VR573	152-0166-00	XB022615			SEMICOND DEVICE:ZENER, 0.4W, 6.2V, 5%	80009	152-0166-00
VR575	152-0166-00	XB022615			SEMICOND DEVICE:ZENER, 0.4W, 6.2V, 5%	80009	152-0166-00
VR592	152-0166-00	XB022615			SEMICOND DEVICE:ZENER, 0.4W, 6.2V, 5%	80009	152-0166-00
VR593	152-0166-00	XB022615			SEMICOND DEVICE:ZENER, 0.4W, 6.2V, 5%	80009	152-0166-00



Ckt No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
A3 KEYBOARD							
A3	119-0304-02				KEYBOARD:	80009	119-0304-02
C2	285-0917-00				CAP., FXD, PLSTC:0.0022UF, 5%, 200V	84411	TEK36-222-5-2
C3	290-0136-00				CAP., FXD, ELCLTLT:2.2UF, 20%, 20V	56289	162D225X0020CD2
C5	290-0136-00				CAP., FXD, ELCLTLT:2.2UF, 20%, 20V	56289	162D225X0020CD2
R1	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
R2	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
R3	316-0103-00				RES., FXD, CMPSN:10K OHM, 10%, 0.25W	01121	CB1031
R4	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
R5	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
R6	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
R7	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
R8	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
R9	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
R10	316-0472-00				RES., FXD, CMPSN:4.7K OHM, 10%, 0.25W	01121	CB4721
S1-S53	-----				SWITCH PUSH:(SEE FIG. 3 INDEX 7,8 MPL)		
Z1	156-0169-00				MICROCIRCUIT, DI:HEX. INVERTER	04713	MC836P
Z2	156-0032-00				MICROCIRCUIT, DI:4-BIT BINARY COUNTER	80009	156-0032-00
Z3	156-0032-00				MICROCIRCUIT, DI:4-BIT BINARY COUNTER	80009	156-0032-00
Z4	156-0081-00				MICROCIRCUIT, LI:SGL RETRIGGERABLE MV	80009	156-0081-00
Z5	156-0078-00				MICROCIRCUIT, DI:4 TO 16 LINE DECODER	80009	156-0078-00
Z6	156-0075-00				MICROCIRCUIT, DI:SGL 8-BIT DATA SEL MUX	80009	156-0075-00
Z7	156-0040-00				MICROCIRCUIT, DI:QUAD LATCH, TTL	80009	156-0040-00
Z8	156-0030-00				MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
Z9	156-0030-00				MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
Z10	156-0043-00				MICROCIRCUIT, DI:QUAD 2-INPUT POS NOR GATE	80009	156-0043-00
Z11	156-0030-00				MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
Z12	156-0030-00				MICROCIRCUIT, DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
Z13	156-0062-00				MICROCIRCUIT, DI:QUAD 2-INPUT EXCL-OR GATE	80009	156-0062-00

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Ckt No.	Tektronix Part No.	Serial/Model No. Eff	DScont	Name & Description	Mfr Code	Mfr Part Number
A4 HALF DUPLEX						
A4	670-4092-00		7801	CKT BOARD ASSY:HALF DUPLEX	80009	670-4092-00
A4	670-4092-01	7802		CKT BOARD ASSY:HALF DUPLEX	80009	670-4092-01
C1	290-0531-00			CAP., FXD, ELCLTLT:100UF, 20%, 10V	90201	TDC107M010WLC
C12	290-0512-00			CAP., FXD, ELCLTLT:22UF, 20%, 15V	56289	196D226X0015KA1
C17	281-0773-00			CAP., FXD, CER DI:0.01UF, 10%, 100V	72982	8005H9AADW5R103K
C36	281-0773-00			CAP., FXD, CER DI:0.01UF, 10%, 100V	72982	8005H9AADW5R103K
C37	281-0773-00			CAP., FXD, CER DI:0.01UF, 10%, 100V	72982	8005H9AADW5R103K
C211	281-0773-00			CAP., FXD, CER DI:0.01UF, 10%, 100V	72982	8005H9AADW5R103K
C237	281-0773-00			CAP., FXD, CER DI:0.01UF, 10%, 100V	72982	8005H9AADW5R103K
C247	283-0212-00			CAP., FXD, CER DI:2UF, 20%, 50V	72982	8141N064Z5U205M
C313	281-0773-00			CAP., FXD, CER DI:0.01UF, 10%, 100V	72982	8005H9AADW5R103K
C329	281-0773-00			CAP., FXD, CER DI:0.01UF, 10%, 100V	72982	8005H9AADW5R103K
CR18	152-0075-00			SEMICOND DEVICE:GE, 25V, 40MA	14433	G866
CR22	152-0141-02			SEMICOND DEVICE:SILICON, 30V, 50NA	80009	152-0141-02
CR23	152-0141-02			SEMICOND DEVICE:SILICON, 30V, 50NA	80009	152-0141-02
CR24	152-0141-02			SEMICOND DEVICE:SILICON, 30V, 50NA	80009	152-0141-02
Q23	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q28	151-0188-00			TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q29	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q41	151-0188-00			TRANSISTOR:SILICON,PNP	80009	151-0188-00
Q42	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q123	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
Q124	151-0302-00			TRANSISTOR:SILICON,NPN	07263	S038487
R14	315-0243-00		7801	RES., FXD, CMPSN:24K OHM, 5%, 0.25W	01121	CB2435
R14	315-0203-00	7802		RES., FXD, CMPSN:20K OHM, 5%, 0.25W	01121	CB2035
R18	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R19	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R21	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R31	315-0471-00			RES., FXD, CMPSN:470 OHM, 5%, 0.25W	01121	CB4715
R32	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R33	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R34	315-0471-00			RES., FXD, CMPSN:470 OHM, 5%, 0.25W	01121	CB4715
R103	315-0303-00		7801	RES., FXD, CMPSN:30K OHM, 5%, 0.25W	01121	CB3035
R103	315-0223-00	7802		RES., FXD, CMPSN:22K OHM, 5%, 0.25W	01121	CB2235
R112	315-0102-00			RES., FXD, CMPSN:1K OHM, 5%, 0.25W	01121	CB1025
R127	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R128	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R129	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R131	315-0302-00			RES., FXD, CMPSN:3K OHM, 5%, 0.25W	01121	CB3025
R132	315-0432-00			RES., FXD, CMPSN:4.3K OHM, 5%, 0.25W	01121	CB4325
R133	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R134	315-0103-00			RES., FXD, CMPSN:10K OHM, 5%, 0.25W	01121	CB1035
R137	315-0103-00			RES., FXD, CMPSN:10K OHM, 5%, 0.25W	01121	CB1035
R138	315-0302-00			RES., FXD, CMPSN:3K OHM, 5%, 0.25W	01121	CB3025
R139	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R141	315-0432-00			RES., FXD, CMPSN:4.3K OHM, 5%, 0.25W	01121	CB4325
R143	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R144	315-0472-00			RES., FXD, CMPSN:4.7K OHM, 5%, 0.25W	01121	CB4725
R301	315-0221-00			RES., FXD, CMPSN:220 OHM, 5%, 0.25W	01121	CB2215
U111	156-0706-00			MICROCIRCUIT,DI:DUAL MONOSTABLE MV	01295	SN74221N
U121	156-0129-00			MICROCIRCUIT,DI:QUAD 2-INPUT GATE	80009	156-0129-00
U211	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
U221	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Serial/Model No. Dscont	Name & Description	Mfr Code	Mfr Part Number
U231	156-0129-00			MICROCIRCUIT,DI:QUAD 2-INPUT GATE	80009	156-0129-00
U241	156-0030-00			MICROCIRCUIT,DI:QUAD 2-INPUT POS NAND GATE	80009	156-0030-00
U251	156-0120-00			MICROCIRCUIT,DI:SINGLE 4-BIT R/L SHIFT REG	80009	156-0120-00
U311	156-0078-00			MICROCIRCUIT,DI:4 TO 16 LINE DECODER	80009	156-0078-00
U321	156-0047-00			MICROCIRCUIT,DI:TPL 3-INPUT POS NAND GATE	80009	156-0047-00
U331	156-0058-00			MICROCIRCUIT,DI:HEX. INVERTER	80009	156-0058-00
U341	156-0041-00			MICROCIRCUIT,DI:DUAL D-TYPE FLIP-FLOP	27014	DM7474N
U351	156-0120-00			MICROCIRCUIT,DI:SINGLE 4-BIT R/L SHIFT REG	80009	156-0120-00

Replaceable Electrical Parts—4006-1 Service

Ckt No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
CHASSIS PARTS							
C1000	283-0358-00	XB010573			CAP., FXD, CER DI:0.01UF,+80-20%, 1.4KV	91418	AU0103Z1421R0
C1001	283-0358-00	XB010573			CAP., FXD, CER DI:0.01UF,+80-20%, 1.4KV	91418	AU0103Z1421R0
DS1040	150-1014-00				LAMP, LED: RED, 50MA	50522	MV5054-1
F1000	159-0034-00	B010100	B035399		FUSE, CARTRIDGE: 3AG, 1.6A, 125V, SLOW-BLOW	71400	MDL 1 6/10
F1000	159-0018-00	B035400			FUSE, CARTRIDGE: 3AG, 0.8A, 250V, SLOW-BLOW	71400	MDL 8/10
LS1001	119-0305-00				LOUDSPEAKER, PM: PERMANENT MAGNET, 45 OHM, 2W	07109	35A45C
R1001	307-0413-00	XB010573			RES, NTK, FXD, FI: 3.3M OHM, 10%, 1W	03888	FL1-3304K-10%
R1050	311-1099-00				RES., VAR, NONWIR: 100K OHM, 0.5W	01121	WAIG04S104AZ
S1000	260-1113-00				SWITCH, TOGGLE: DPST, 6A, 125V	27193	870K-24H
S1010	260-1770-00				SWITCH, ROTARY: TYPE F, 2 SECT, 9 POS, 30 DEG	80009	260-1770-00
S1012	260-0449-00				SWITCH, SLIDE: SPDT, 0.5A, 125VA-DC (S1012-OPTION 1, 021-0173-00 ONLY)	82389	11A-1030A
S1040	260-0448-00				SWITCH, SLIDE: 2P3P, 0.5A, 125V (S1040-OPTION 1, 021-0173-00 ONLY)	82389	11D1002A
T1001	120-1029-00				XFMR, PWR, SDN&SU:	80009	120-1029-00
V1	154-0740-00				ELECTRON TUBE: CRT	80009	154-0740-00

Section 6

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols and Reference Designators

Electrical components shown on the diagrams are in the following units unless noted otherwise:

Capacitors = Values one or greater are in picofarads (μF).
Values less than one are in microfarads (μF).
Resistors = Ohms (Ω).

Graphic symbols and class designation letters are based on ANSI Standard Y32.2-1975.

Logic symbology is based on ANSI Y32.14-1973 in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

Abbreviations are based on ANSI Y1.1-1972.

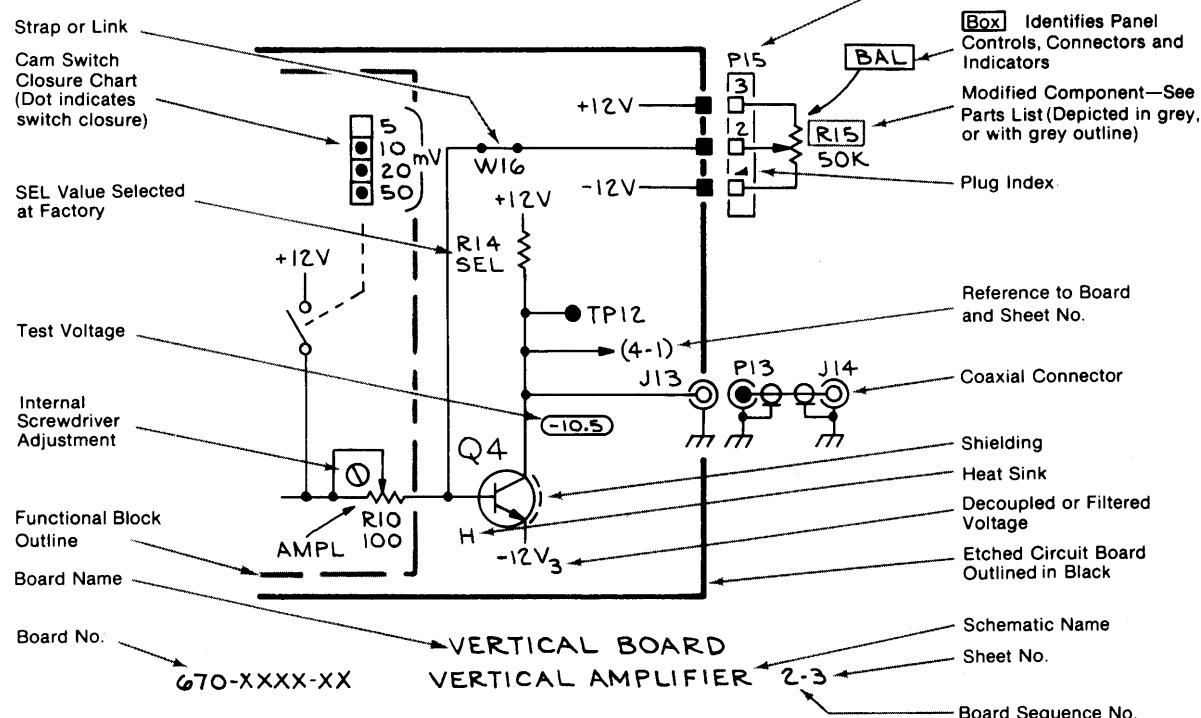
Other ANSI standards that are used in the preparation of diagrams by Tektronix, Inc. are:

- Y14.15, 1966 Drafting Practices.
- Y14.2, 1973 Line Conventions and Lettering.
- Y10.5, 1968 Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering.

The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc)	H	Heat dissipating device (heat sink, heat radiator, etc)	S	Switch or contactor
AT	Attenuator, fixed or variable	HR	Heater	T	Transformer
B	Motor	HY	Hybrid circuit	TC	Thermocouple
BT	Battery	J	Connector, stationary portion	TP	Test point
C	Capacitor, fixed or variable	K	Relay	U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
CB	Circuit breaker	L	Inductor, fixed or variable	V	Electron tube
CR	Diode, signal or rectifier	M	Meter	VR	Voltage regulator (zener diode, etc.)
DL	Delay line	P	Connector, movable portion	W	Wirestrap or cable
DS	Indicating device (lamp)	Q	Transistor or silicon-controlled rectifier	Y	Crystal
E	Spark Gap, Ferrite bead	R	Resistor, fixed or variable	Z	Phase shifter
F	Fuse	RT	Thermistor		
FL	Filter				

The following special symbols may appear on the diagrams:



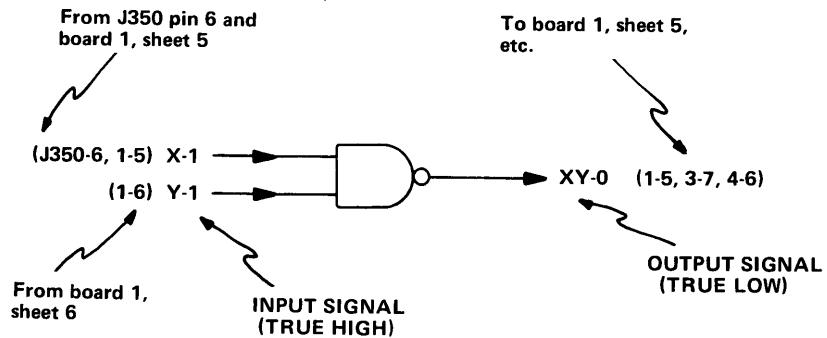
1. TRUE HIGH and TRUE LOW Signals

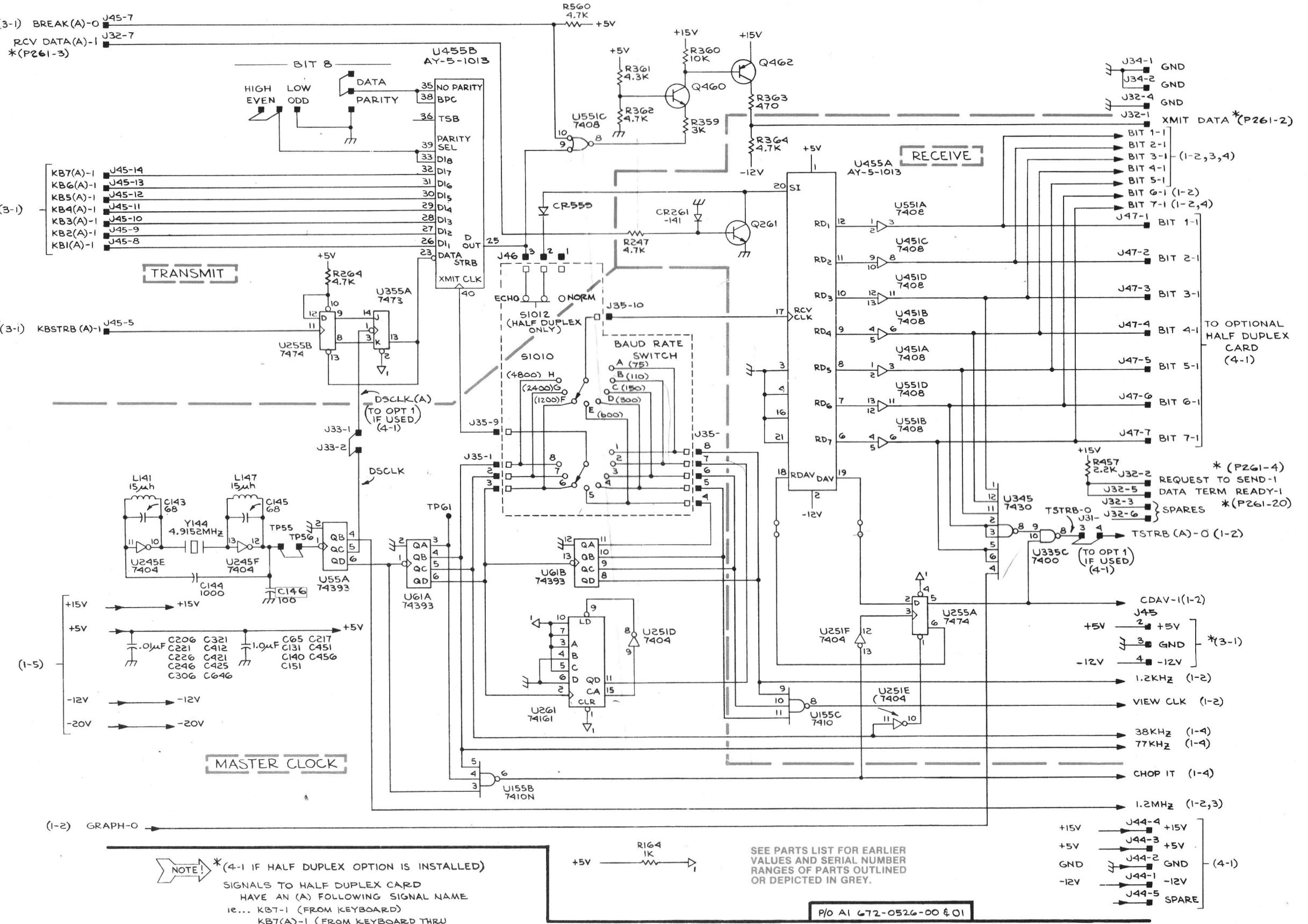
Signal names on the schematics are followed by -1 or -0. A TRUE HIGH signal is indicated by -1, and a TRUE LOW signal is indicated by -0.

SIGNAL-1 = TRUE HIGH
SIGNAL-0 = TRUE LOW

2. Cross-References

Schematic cross-references (from/to information) are included on the schematics. The "from" reference only indicates the signal "source," and the "to" reference lists all loads where the signal is used. All from/to information will be enclosed in parentheses.





4006-1

1892-20
REV C, FEB 1979

TRANSMIT/RECEIVE & CLOCK GENERATION ◊ SH 1

4006-1 Service

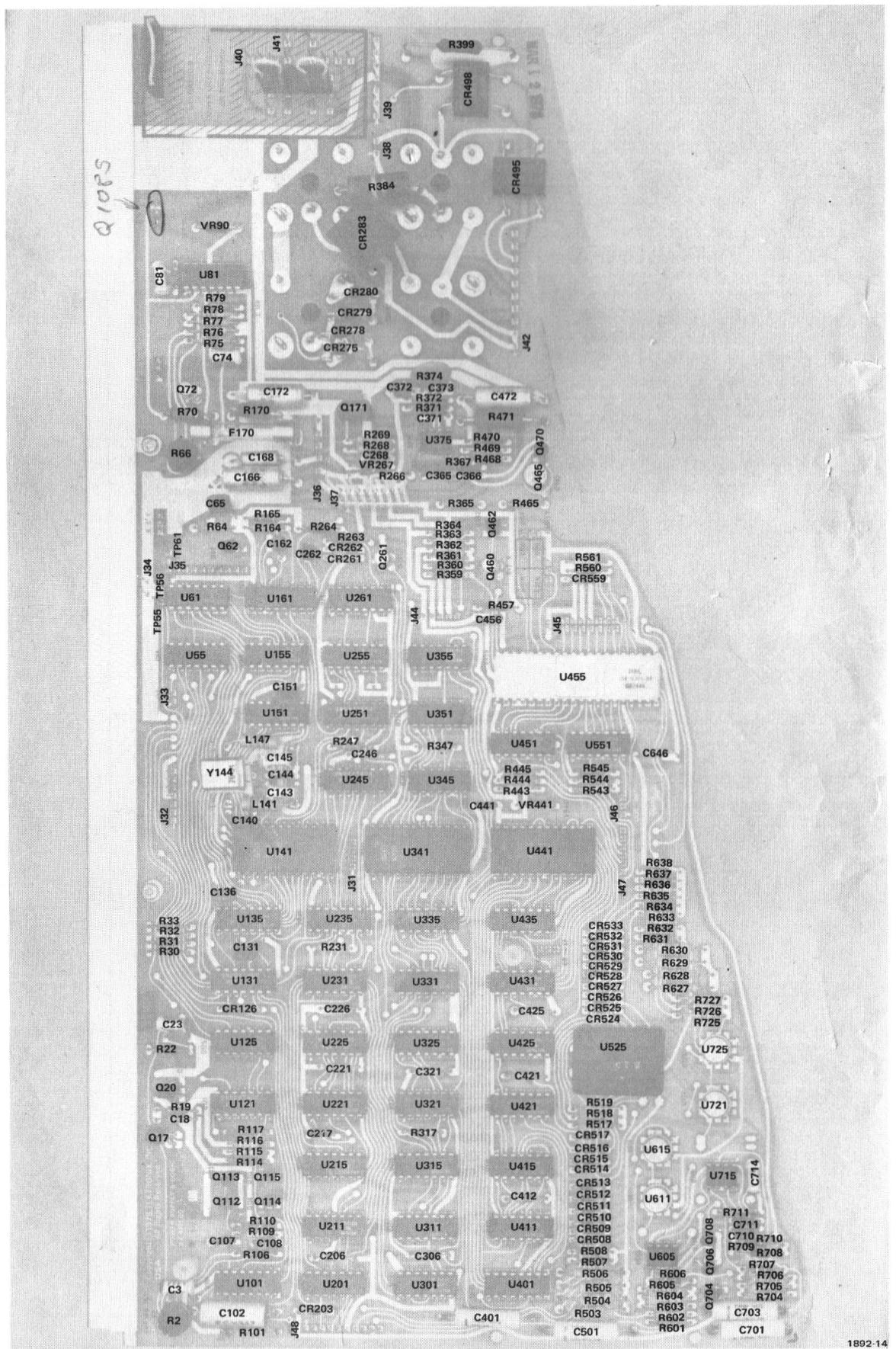


Fig. 6-1. 672-0526-00 Power Supply and Logic Board Components (Front View).

REV. A OCT 1977

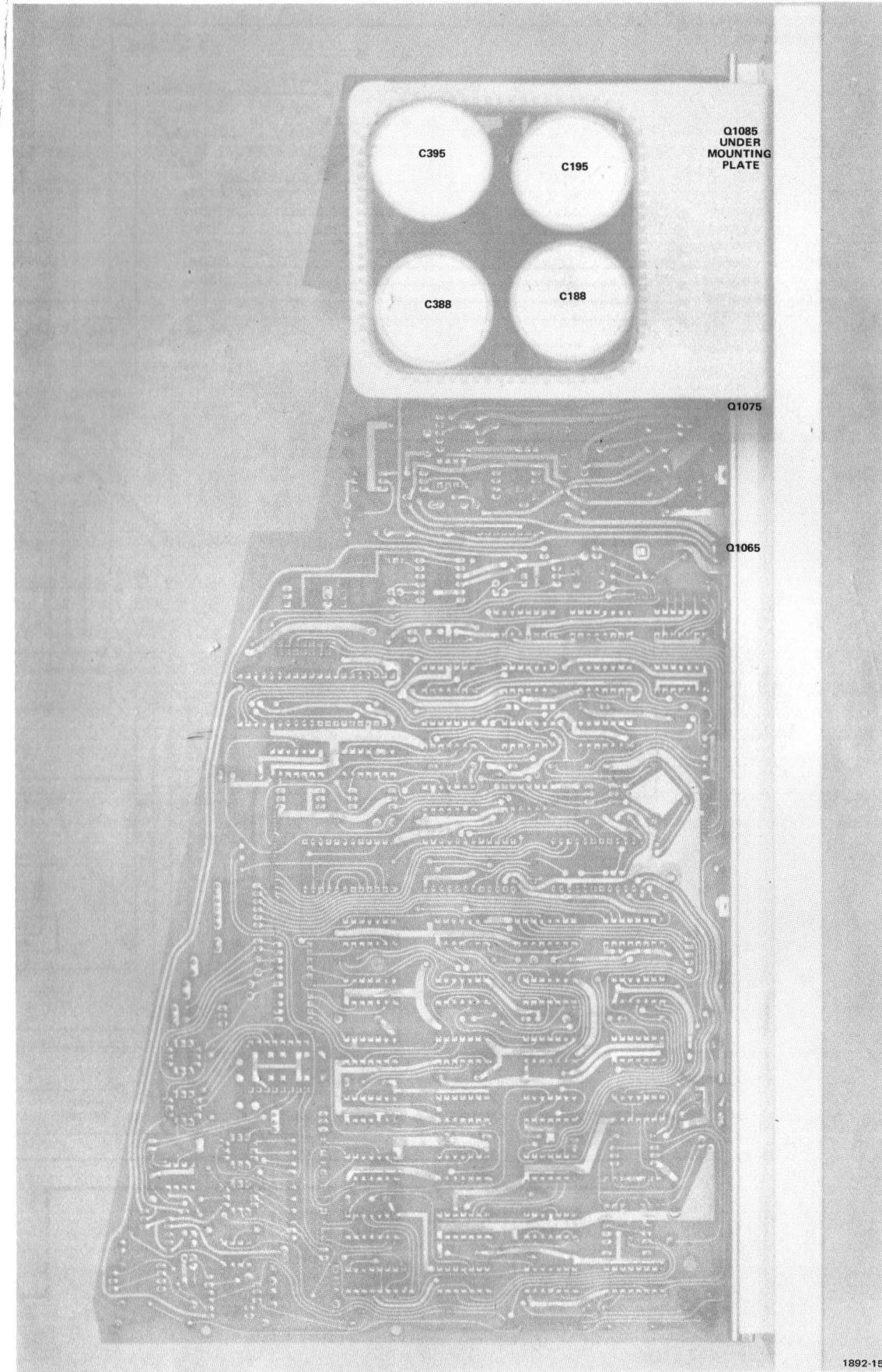
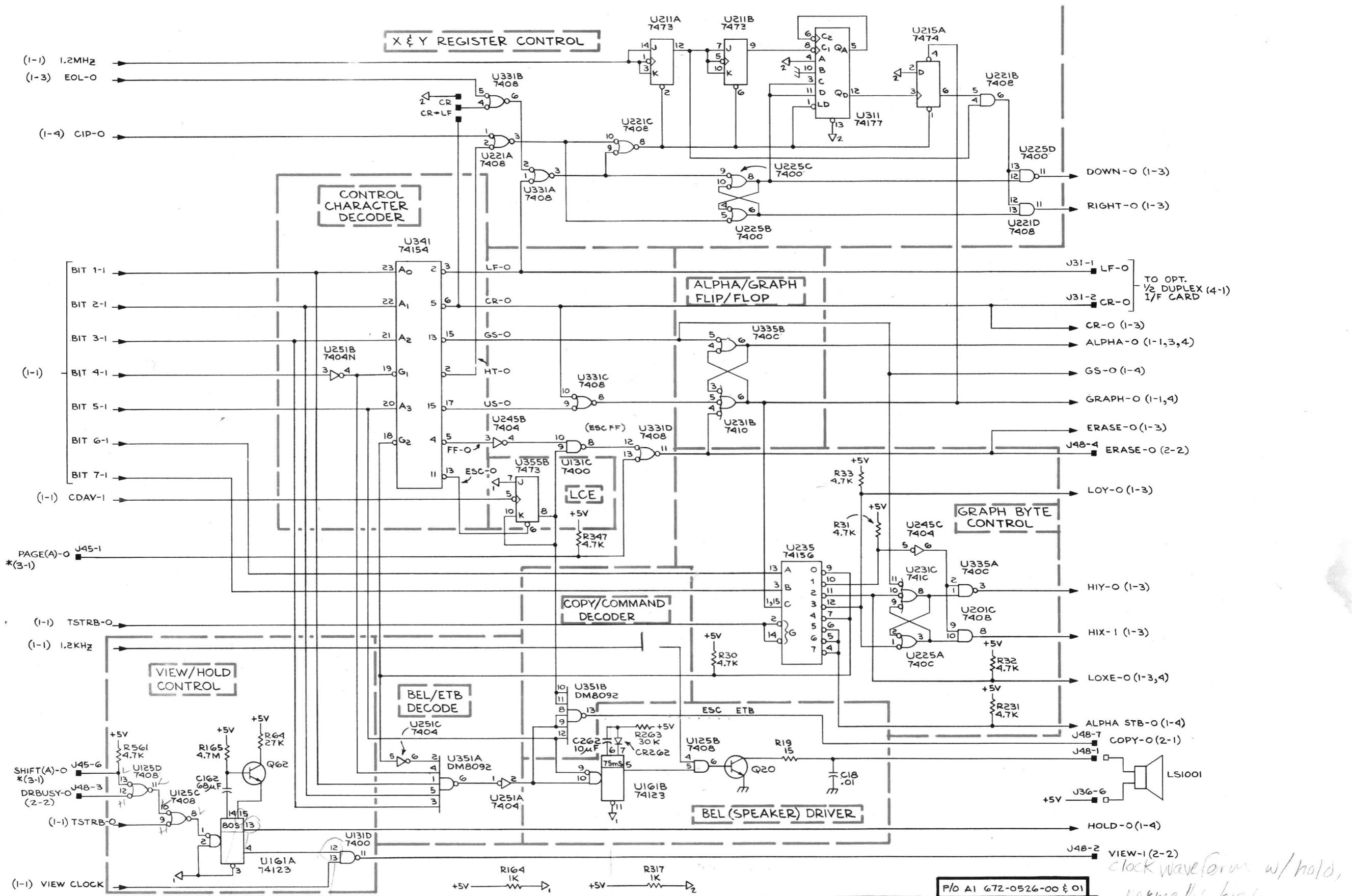


Fig. 6-2. 672-0526-00 Power Supply and Logic Board Components (Rear View).

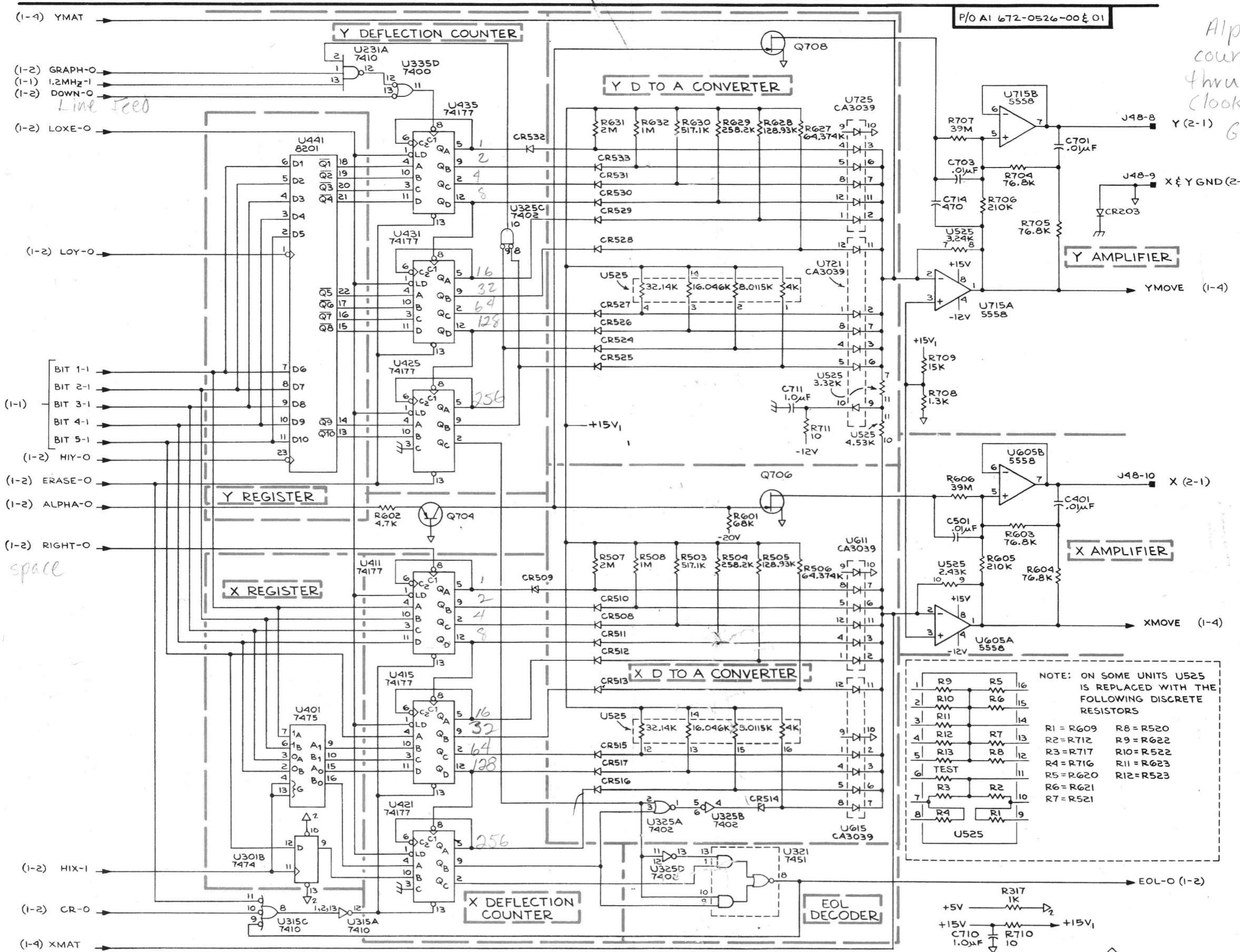


4006-1

1892-21
REV B, FEB 197

CONTROL LOGIC

-1 1.5v, goes to 1.25v w/hold
② H, goes low w/hold



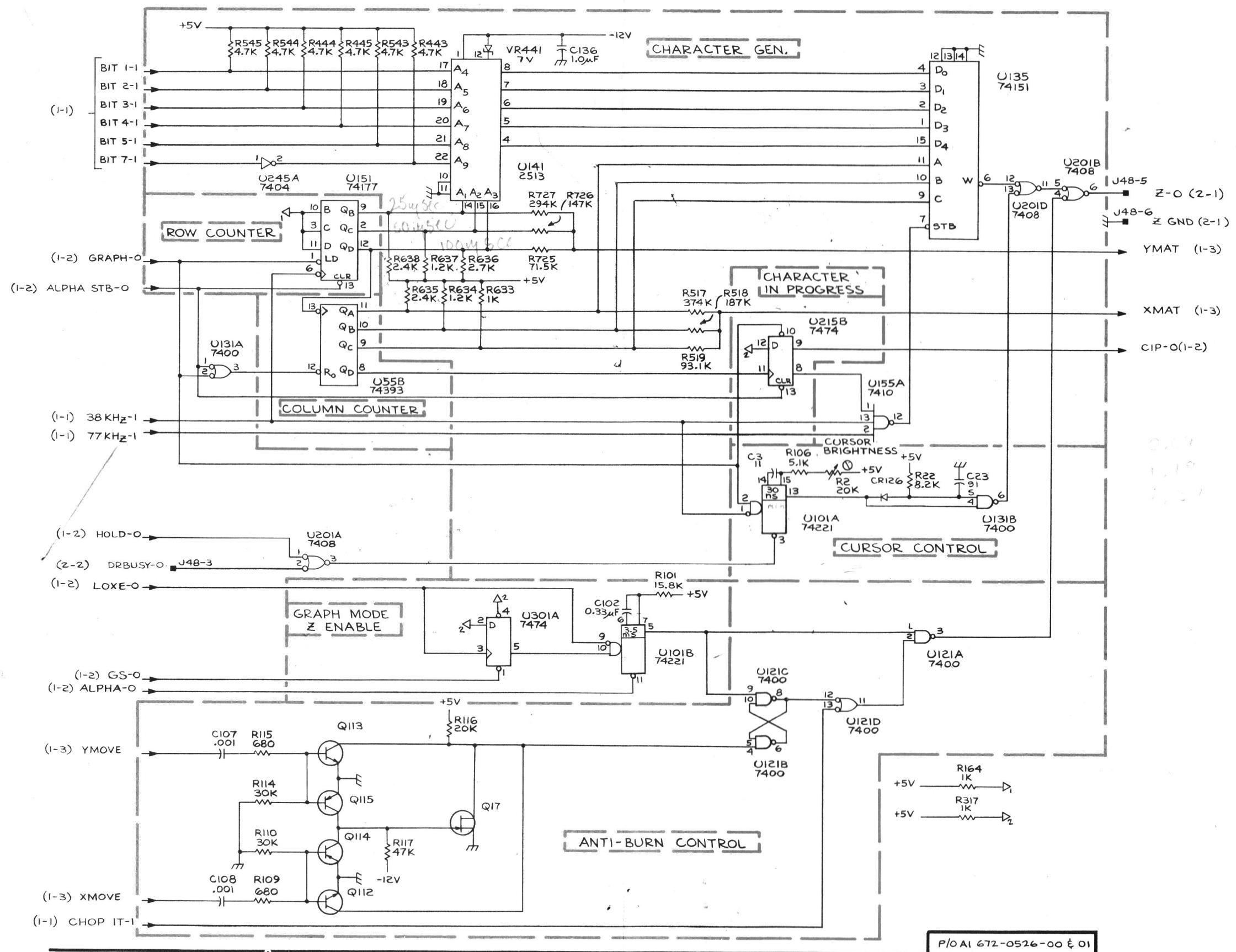
Alpha
counts down
thru all the counts
(look for missing count)

Graphics
- like D/A con

16 NOTE: ON SOME UNITS U525
15 IS REPLACED WITH THE
FOLLOWING DISCRETE
RESISTORS

<u>14</u>	R1 = R609	R8 = R520
<u>13</u>	R2 = R712	R9 = R622
<u>12</u>	R3 = R717	R10 = R522
<u>11</u>	R4 = R716	R11 = R623
<u>10</u>	R5 = R620	R12 = R523
	R6 = R621	
	R7 = R521	

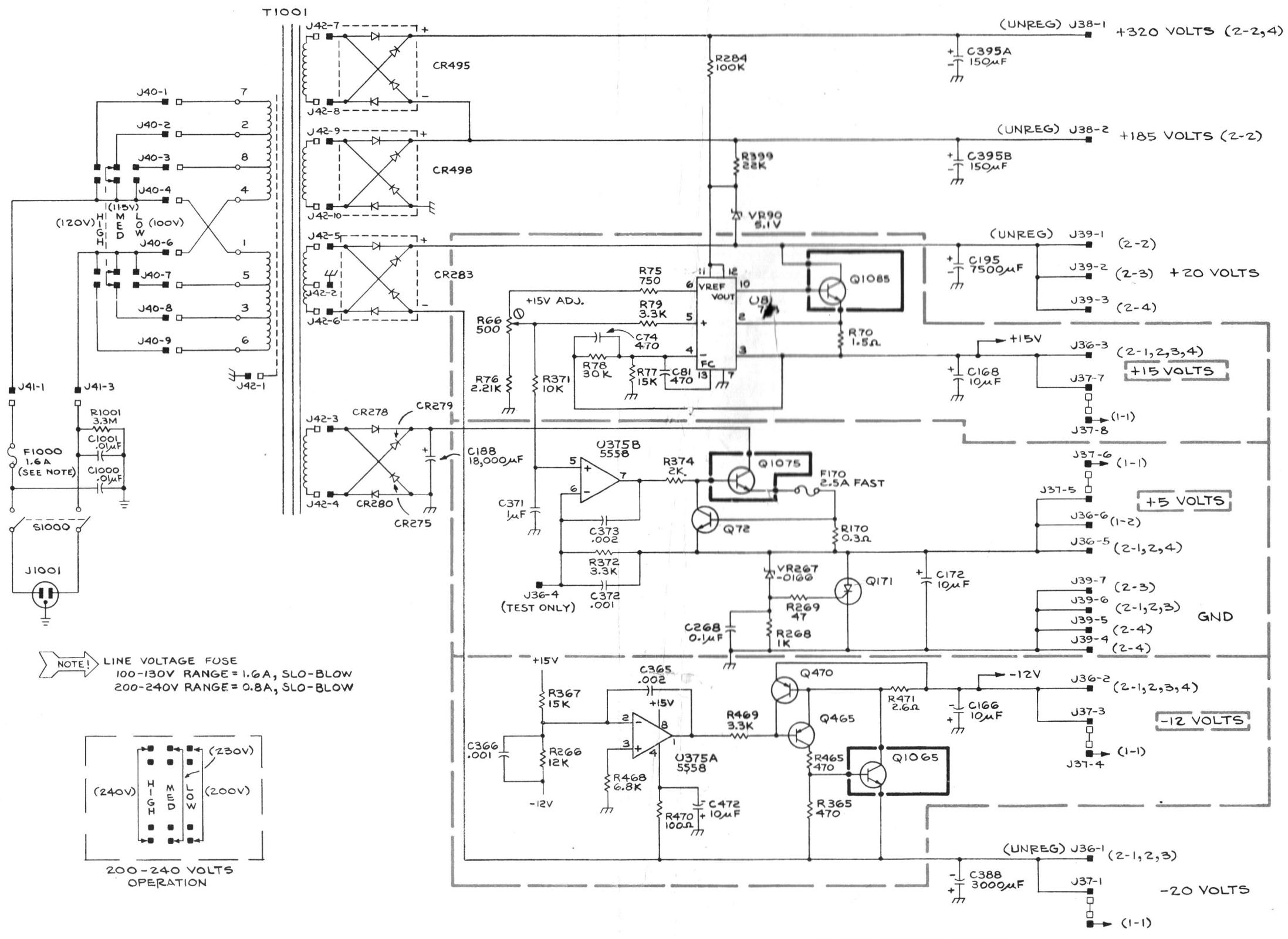
X & Y AXIS ◇ SH 3

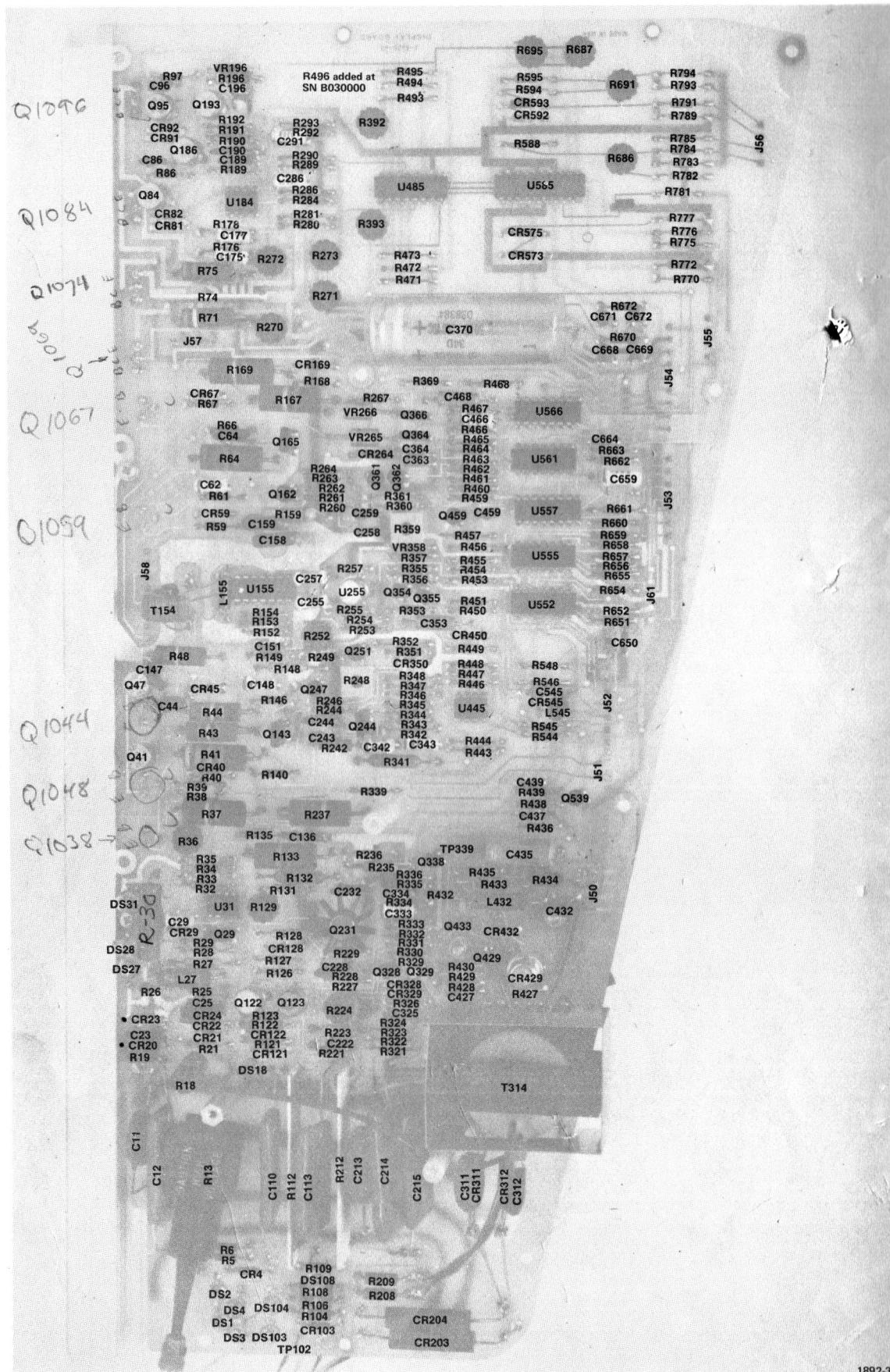


4006-1

1892-23
REV B, FEB 1979

Z AXIS SH 4





REV A, JUN 1979

Fig. 6-3a. 672-0537-05 & up Display Board Components (Front View).

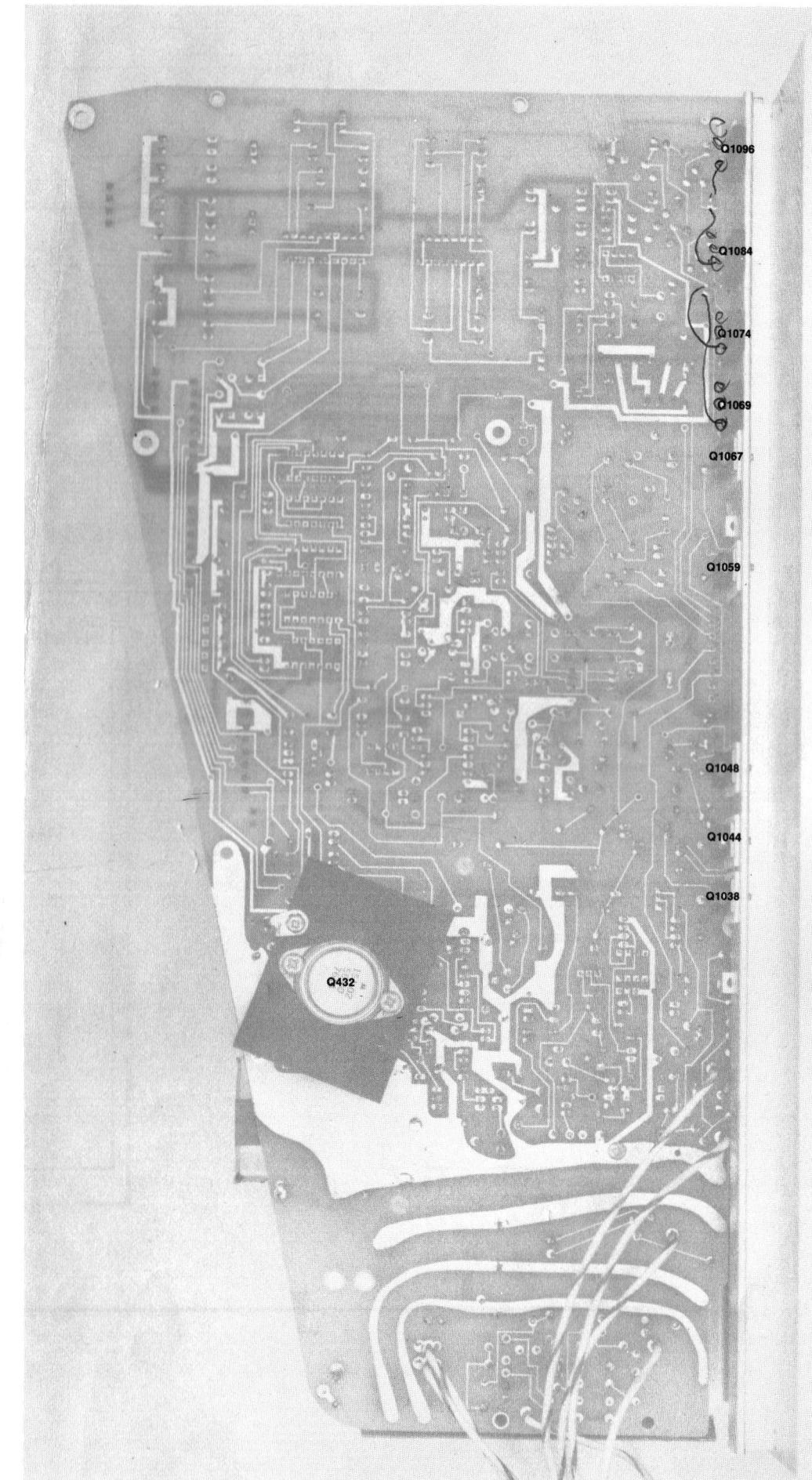
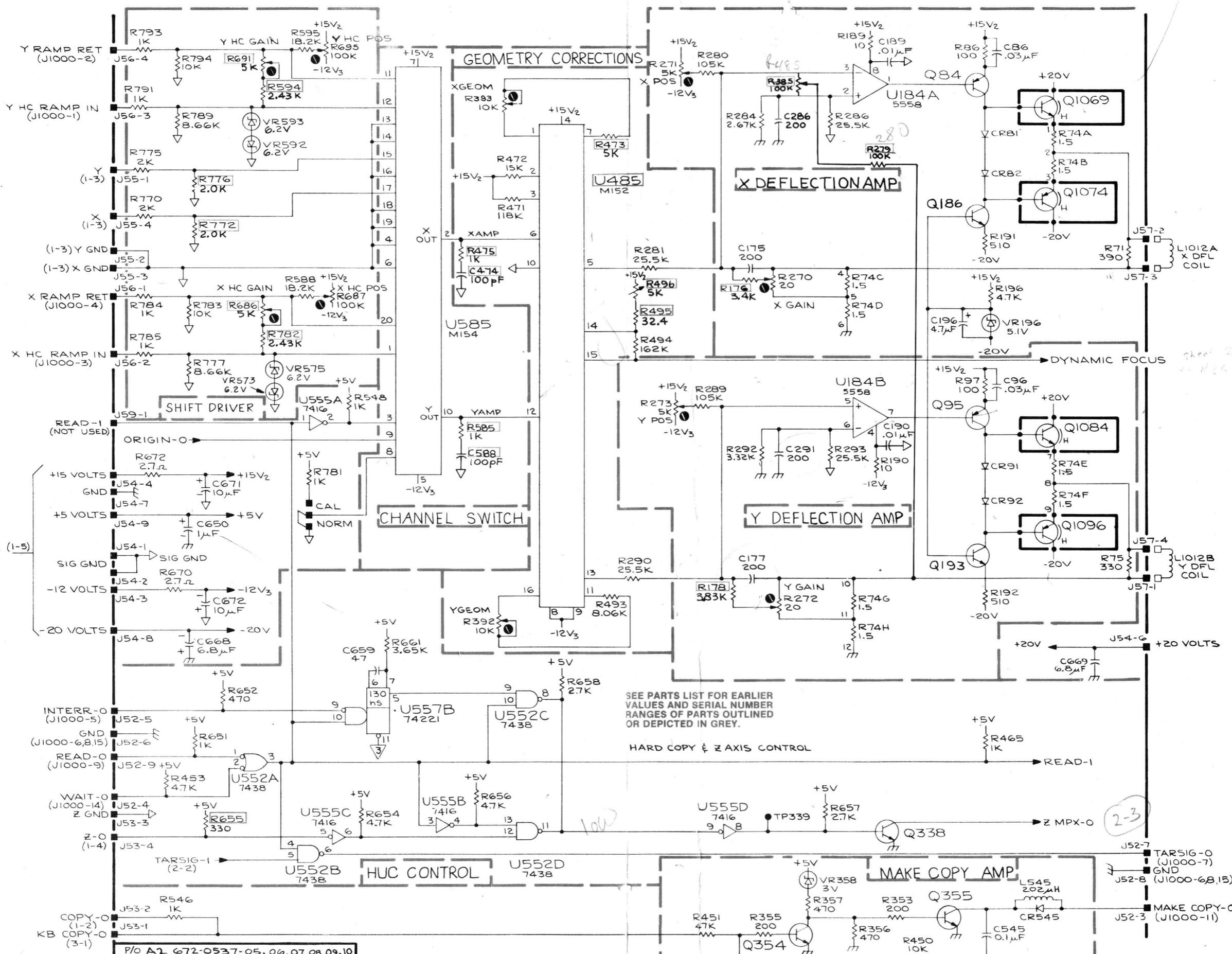
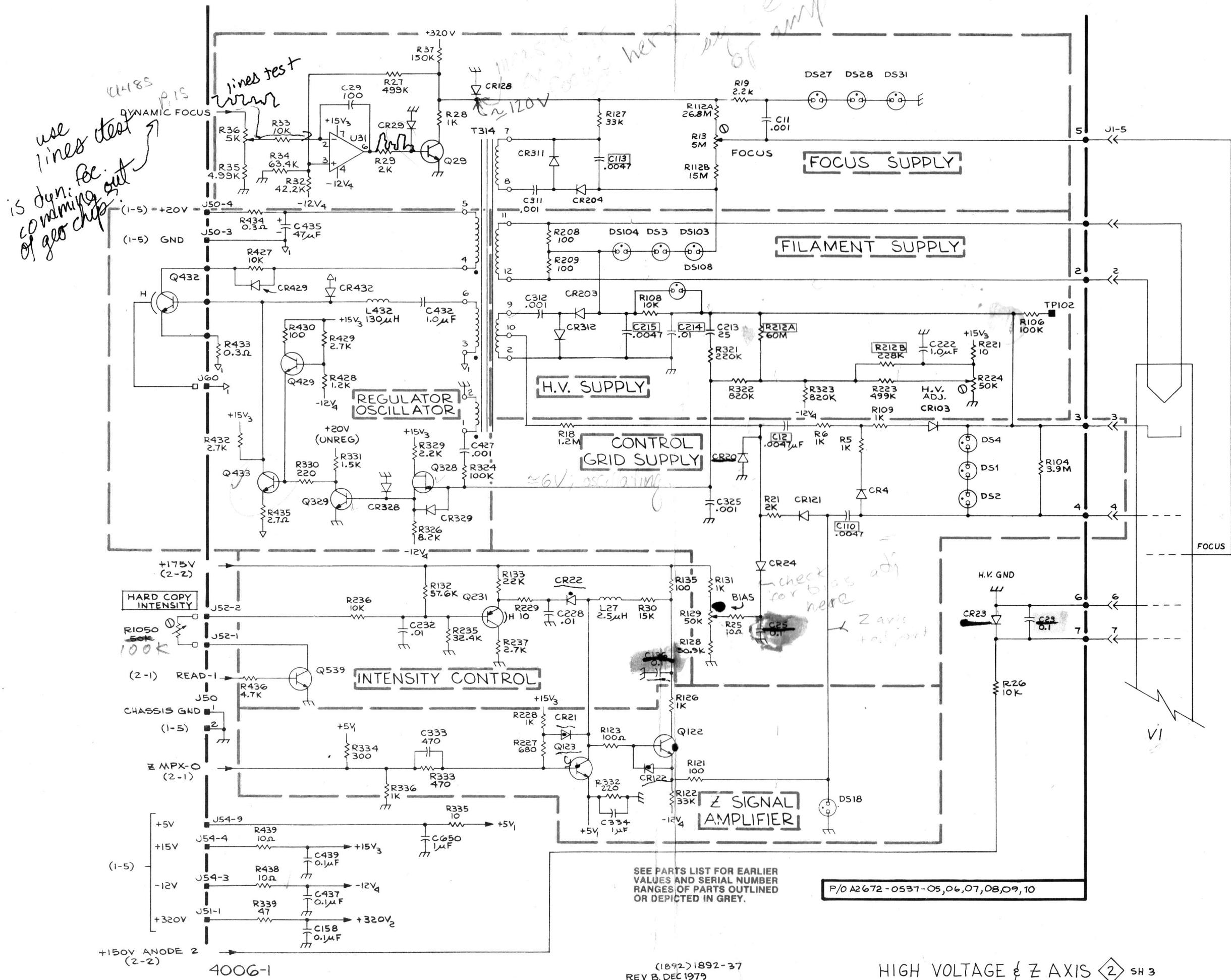


Fig. 6-3b. 672-0537-05 & up. Display Board Components (Rear View)



4006-



HIGH VOLTAGE & Z AXIS ◇ SH 3

4006-1 Service

DISPLAY PG. 27
6720637-04 & BELOW

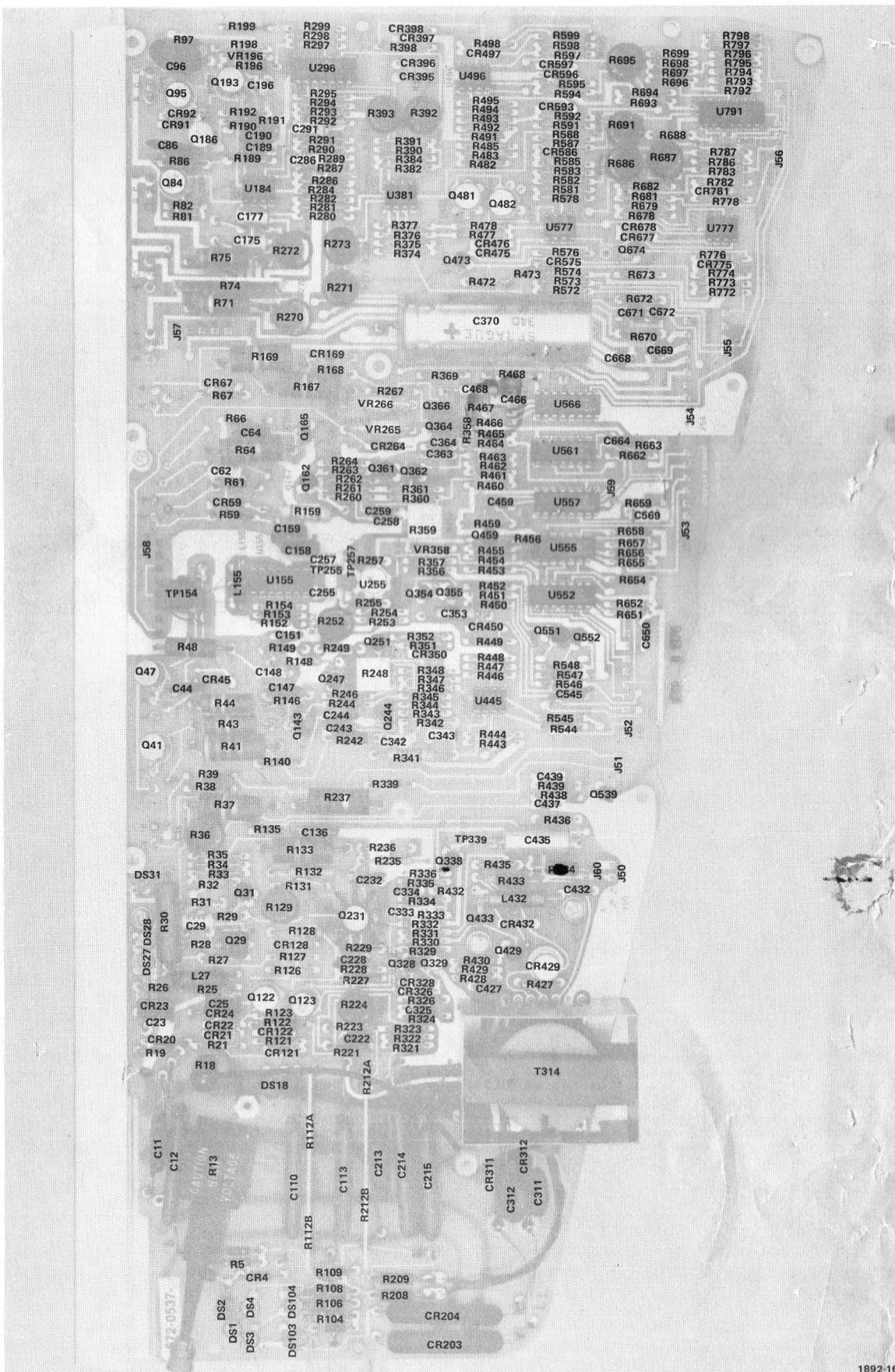
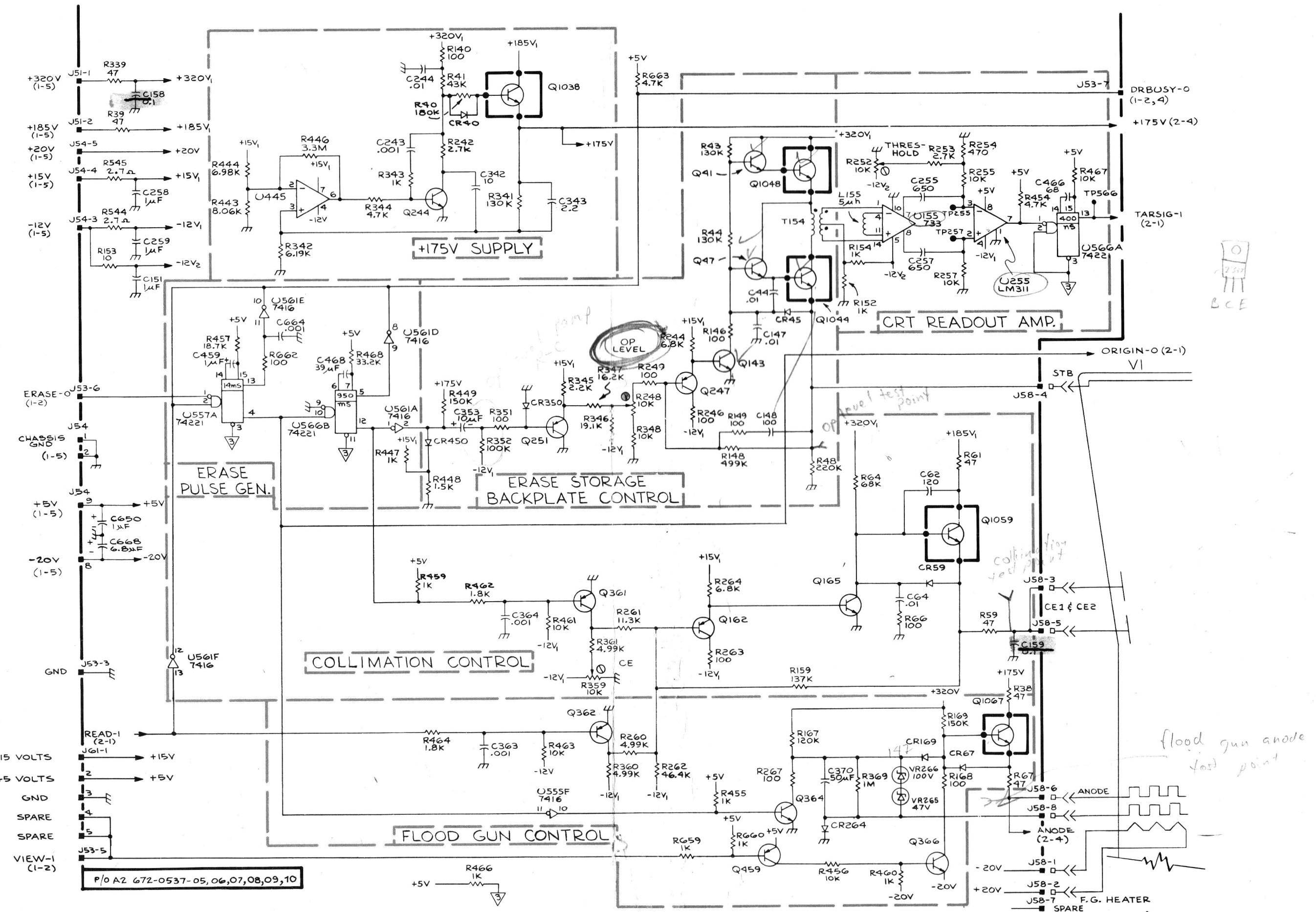
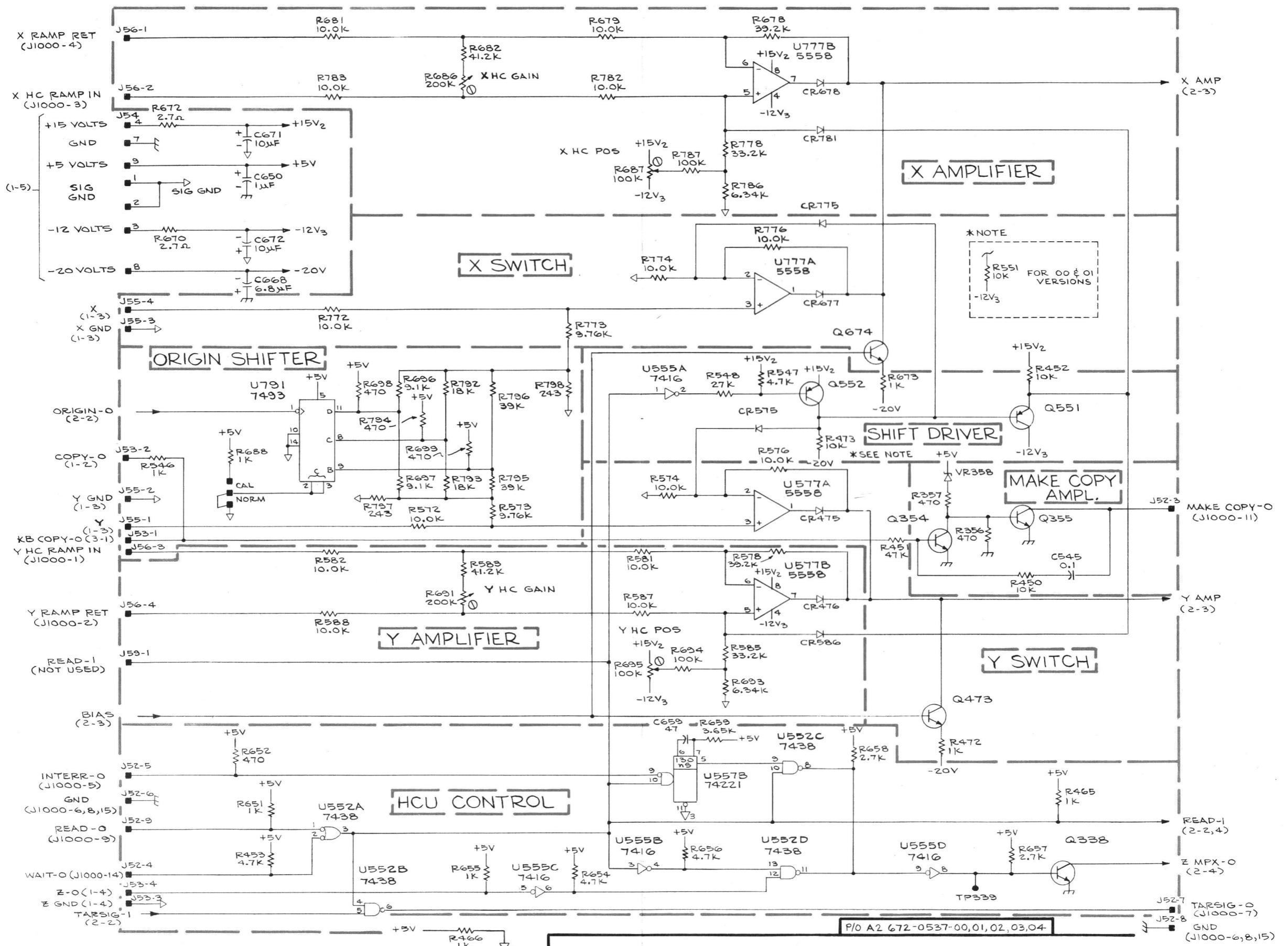


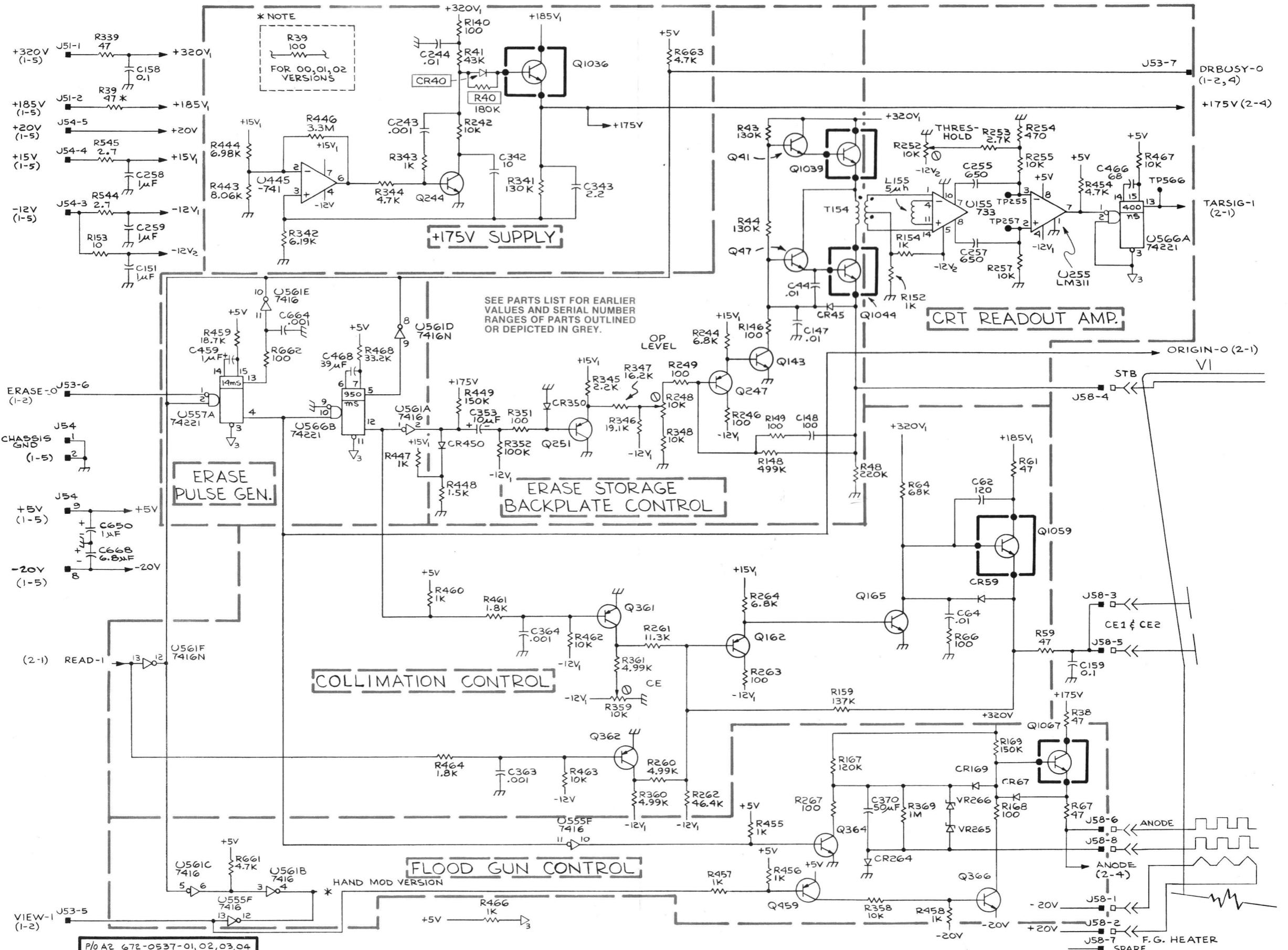
Fig. 6-4a. 672-0537-00-04 Display Board Components (Front View).



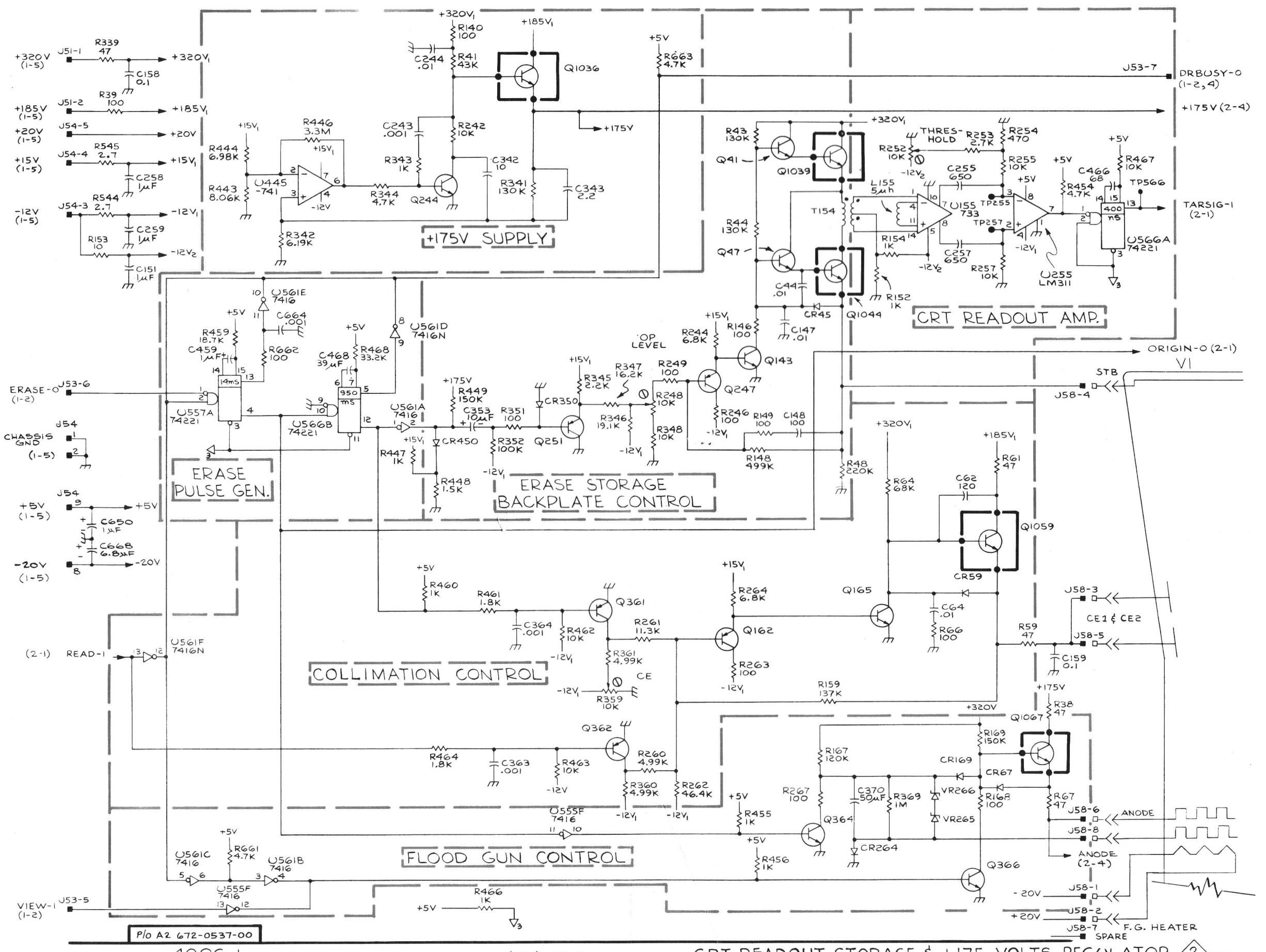
Fig. 6-4b. 672-0537-00-04 Display Board Components (Rear View).

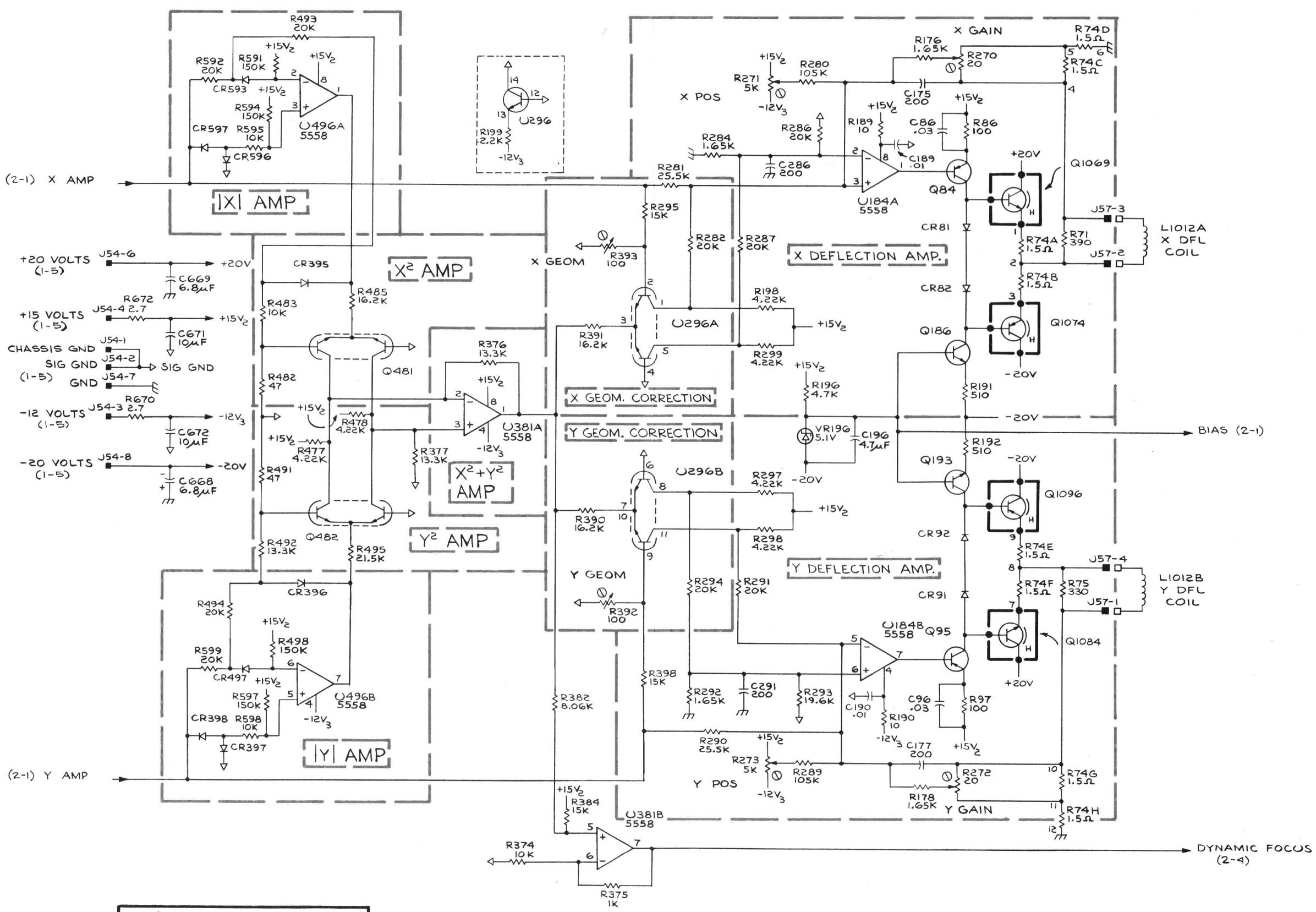






1892-26
REV. B, OCT. 197



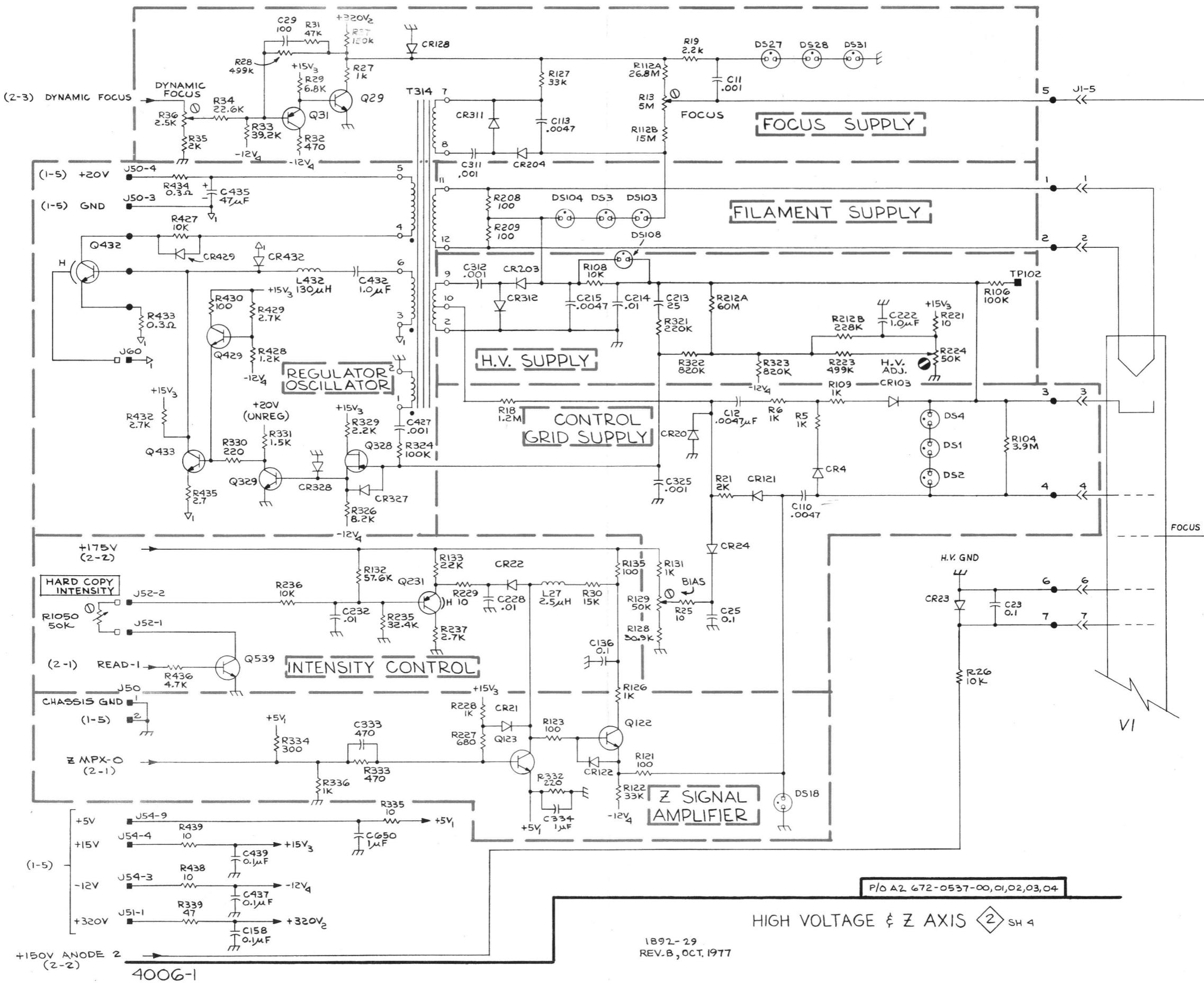


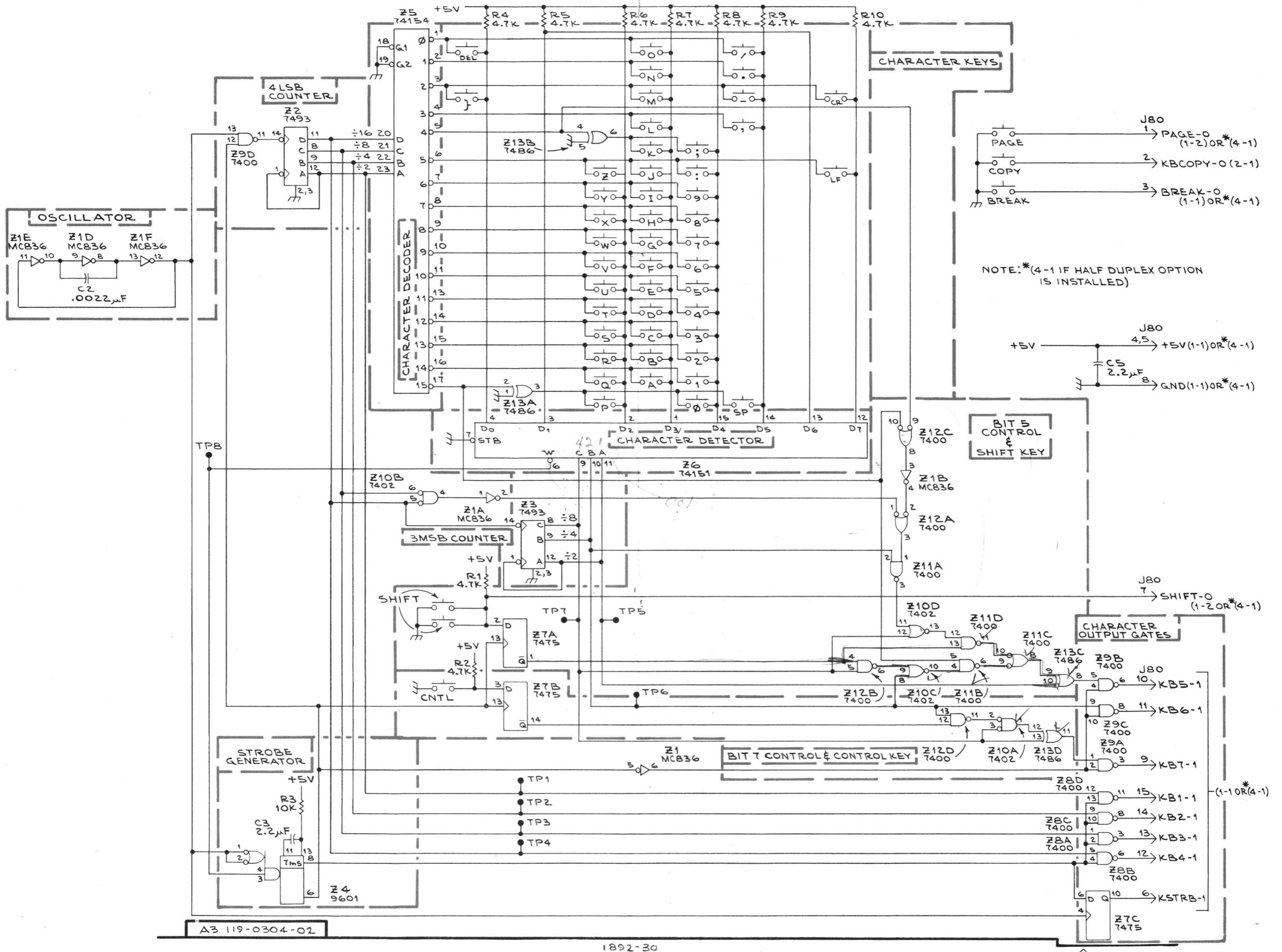
P/O A2 672-0537-00,01,02,03,04

4006-1

1897-2B
REV. B, OCT. 1977

DEFLECTION AMPS 2 SH 3





A3 119-0304-02

1892-30
REV. A, OCT. 1977

KEYBOARD

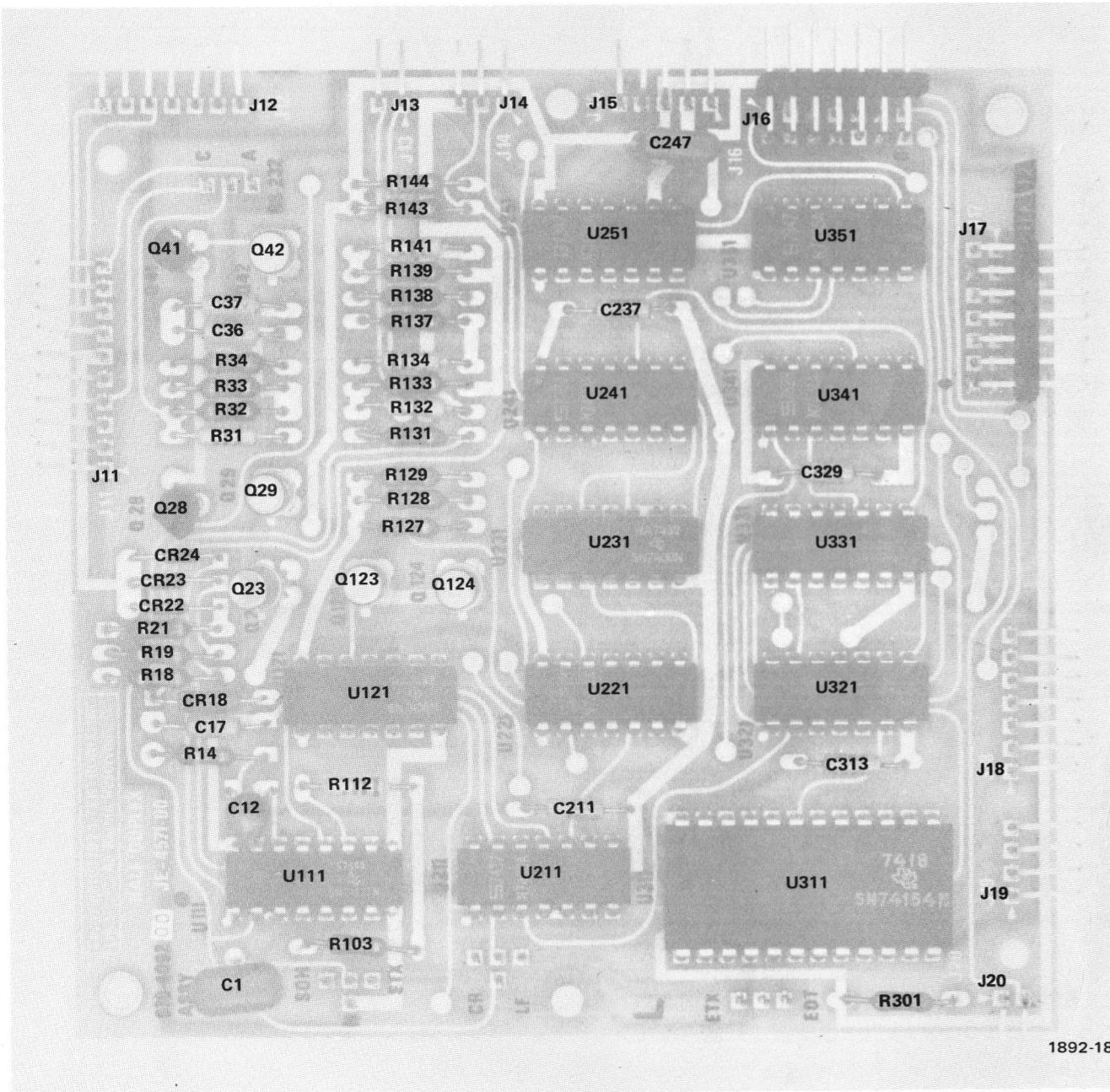
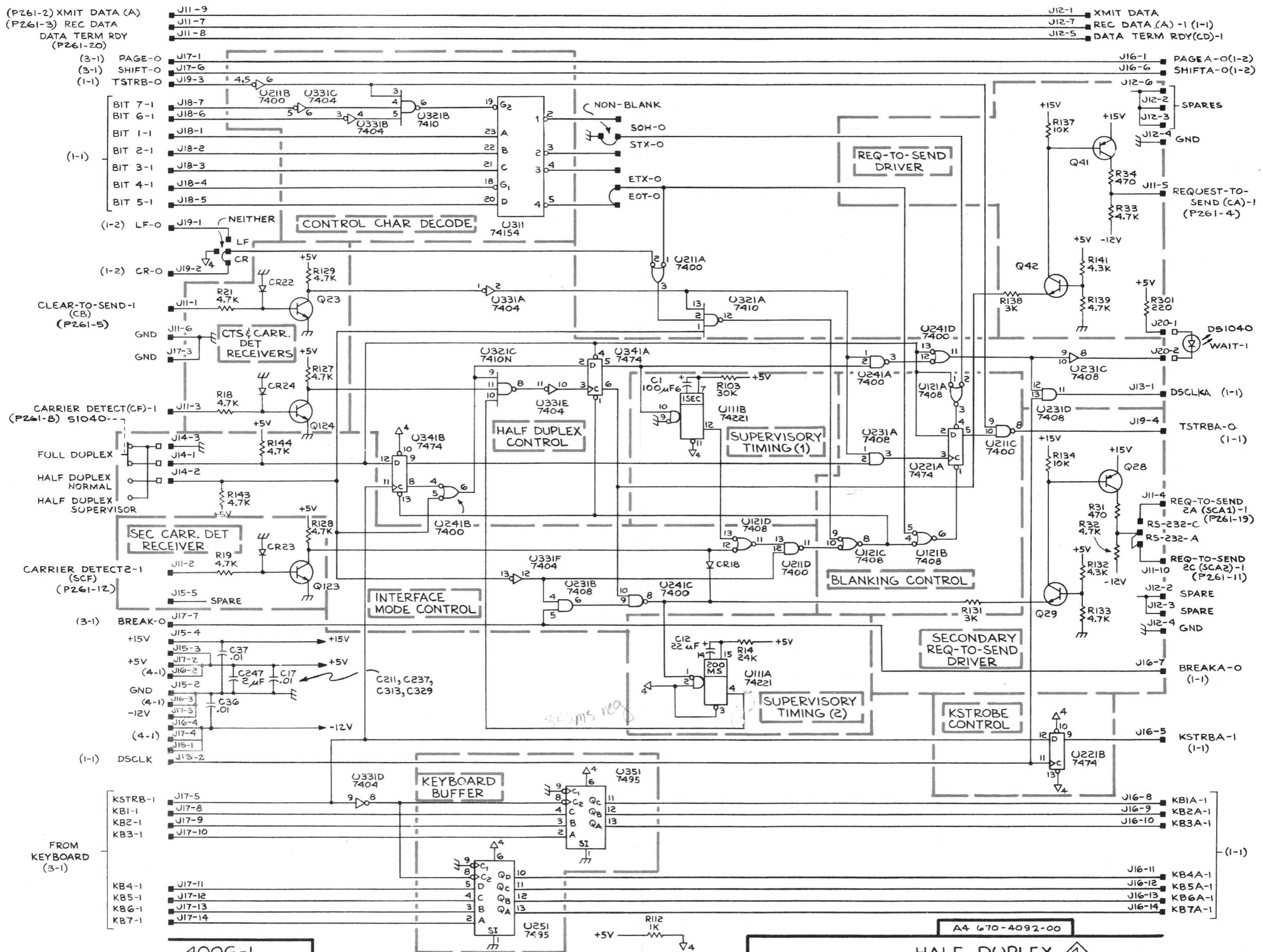


Fig. 6-5. Optional Half-Duplex Board Component.



REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number

00X Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

1 2 3 4 5	Name & Description
	<i>Assembly and/or Component</i>
	<i>Attaching parts for Assembly and/or Component</i>

	<i>Detail Part of Assembly and/or Component</i>
	<i>Attaching parts for Detail Part</i>

	<i>Parts of Detail Part</i>
	<i>Attaching parts for Parts of Detail Part</i>

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol --- * --- indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

"	INCH	ELCTRN	ELECTRON	IN	INCH	SE	SINGLE END
#	NUMBER SIZE	ELEC	ELECTRICAL	INCAND	INCANDESCENT	SECT	SECTION
ACTR	ACTUATOR	ELCLTLT	ELECTROLYTIC	INSUL	INSULATOR	SEMICOND	SEMICONDUCTOR
ADPTR	ADAPTER	ELEM	ELEMENT	INTL	INTERNAL	SHLD	SHIELD
ALIGN	ALIGNMENT	EPL	ELECTRICAL PARTS LIST	LPHLDLR	LAMPHOLDER	SHLDLR	SHOULDERED
AL	ALUMINUM	EQPT	EQUIPMENT	MACH	MACHINE	SKT	SOCKET
ASSEM	ASSEMBLED	EXT	EXTERNAL	MECH	MECHANICAL	SL	SLIDE
ASSY	ASSEMBLY	FIL	FILLISTER HEAD	MTG	MOUNTING	SLFLKG	SELF-LOCKING
ATTEN	ATTENUATOR	FLEX	FLEXIBLE	NIP	NIPPLE	SLVG	SLEEVING
AWG	AMERICAN WIRE GAGE	FLH	FLAT HEAD	NON WIRE	NOT WIRE WOUND	SPR	SPRING
BD	BOARD	FLTR	FILTER	OBD	ORDER BY DESCRIPTION	SQ	SQUARE
BRKT	BRACKET	FR	FRAME or FRONT	OD	OUTSIDE DIAMETER	SST	STAINLESS STEEL
BRS	BRASS	FSTNR	FASTENER	OVH	oval head	STL	STEEL
BRZ	BRONZE	FT	FOOT	PH BRZ	PHOSPHOR BRONZE	SW	SWITCH
BSHG	BUSHING	FXD	FIXED	PL	PLAIN or PLATE	T	TUBE
CAB	CABINET	GSKT	GASKET	PLSTC	PLASTIC	TERM	TERMINAL
CAP	CAPACITOR	HDL	HANDLE	PN	PART NUMBER	THD	THREAD
CER	CERAMIC	HEX	HEXAGON	PNH	PAN HEAD	THK	THICK
CHAS	CHASSIS	HEX HD	HEXAGONAL HEAD	PWR	POWER	TNSN	TENSION
CKT	CIRCUIT	HEX SOC	HEXAGONAL SOCKET	RCPT	RECEPTACLE	TPG	TAPPING
COMP	COMPOSITION	HLCPs	HELICAL COMPRESSION	RES	RESISTOR	TRH	TRUSS HEAD
CONN	CONNECTOR	HLEXT	HELICAL EXTENSION	RGD	RIGID	V	VOLTAGE
COV	COVER	HV	HIGH VOLTAGE	RLF	RELIEF	VAR	VARIABLE
CPLG	COUPLING	IC	INTEGRATED CIRCUIT	RTNR	RETAINER	W/	WITH
CRT	CATHODE RAY TUBE	ID	INSIDE DIAMETER	SCH	SOCKET HEAD	WSHR	WASHER
DEG	DEGREE	IDENT	IDENTIFICATION	SCOPE	OSCILLOSCOPE	XFMR	TRANSFORMER
DWR	DRAWER	IMPLR	IMPELLER	SCR	SCREW	XSTR	TRANSISTOR

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
000CY	NORTHWEST FASTENER SALES, INC.	7923 SW CIRRUS DRIVE	BEAVERTON, OREGON 97005
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
01963	CHERRY ELECTRICAL PRODUCTS CORPORATION	3600 SUNSET AVENUE	WAUKEGAN, IL 60085
03614	BUSSMAN MFG., DIV. OF MCGRAW EDISON CO.	502 EARTH CITY PLAZA	EARTH CITY, MO 63045
04713	MOTOROLA, INC., SEMICONDUCTOR PROD. DIV.	5005 E McDOWELL RD, PO BOX 20923	PHOENIX, AZ 85036
04919	COMPONENT MANUFACTURING SERVICE, INC.	1 COMPONENT PARK WEST	BRIDGEWATER, MA 02379
04963	MINNESOTA MINING AND MFG. CO., ADHESIVES COATINGS AND SEALERS DIVISION	3M CENTER 21001 NORDHOFF STREET	ST. PAUL, MN 55101 CHATSWORTH, CA 91311
05574	VIKING INDUSTRIES, INC.	AUDUBON ROAD	WAKEFIELD, MA 01880
05820	WAKEFIELD ENGINEERING, INC.	17301 RIDGELAND	TINLEY PARK, IL 60477
06383	PANDUIT CORPORATION	7100 LAMPSON AVE.	GARDEN GROVE, CA 92642
08261	SPECTRA-STRIP CORP.	P O BOX 867, 1757 STANFORD ST.	SANTA MONICA, CA 90406
11897	PLASTIGLIDE MFG. CORPORATION	9301 ALLEN DRIVE	CLEVELAND, OH 44125
12327	FREEWAY CORPORATION	12 BENNETT DRIVE	GRANVILLE, NY 12832
12624	NORTON CO., TAPE DIV., SEALANT OPERATION	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
22526	BERG ELECTRONICS, INC.	125 BEECHWOOD AVE.	NEW ROCHELLE, NY 10802
26365	GRIES REPRODUCER CO., DIV. OF COATS AND CLARK, INC.	147 N. MICHIGAN AVE. 20821 DEARBORN STREET	KENILWORTH, NJ 07033 CHATSWORTH, CA 91311
28520	HEYMAN MFG. CO.	30 ROCKEFELLER PLAZA	NEW YORK, NY 10020
31223	MICRO PLASTICS, INC.	5224 NE 42ND AVENUE	PORTLAND, OREGON 97218
49671	RCA CORPORATION	36 BUTLER ST.	ELIZABETH, NJ 07207
52905	SIMPLEX MFG. COMPANY	571 W. POLK ST.	CHICAGO, IL 60607
59730	THOMAS AND BETTS COMPANY	P O BOX 2244, 40 BRISTOL ST.	WATERBURY, CT 06720
70485	ATLANTIC INDIA RUBBER WORKS, INC.	445 CONCORD AVE.	CAMBRIDGE, MA 02138
71159	BRISTOL SOCKET SCREW, DIV. OF AMERICAN CHAIN AND CABLE CO., INC.	2536 W. UNIVERSITY ST.	ST. LOUIS, MO 63107
71279	CAMBRIDGE THERMIONIC CORP.	666 E. DYER RD.	SANTA ANA, CA 92702
71400	BUSSMAN MFG., DIVISION OF MCGRAW- EDISON CO.	400 S. WYMAN ST.	ROCKFORD, IL 61101
71468	ITT CANNON ELECTRIC	446 MORGAN ST.	CINCINNATI, OH 45206
72653	G. C. ELECTRONICS CO., A DIVISION OF HYDROMETALS, INC.	4001 BENEFIT AVE., P O BOX 9 S. MAIN ST.	ASHTABULA, OH 44004 CRYSTAL LAKE, IL 60014
73743	FISCHER SPECIAL MFG. CO.	GLEN ROAD	MOUNTAINSIDE, NJ 07092
74921	ITEN FIBRE CO.,	5700 W. ROOSEVELT RD.	CHICAGO, IL 60650
76854	OAK INDUSTRIES, INC., SWITCH DIV.	200 RICHLAND CREEK DRIVE	PRINCETON, IN 47671
77122	PALNUT CO., A UNITED-CARR DIVISION OF TRW INC.	1800 W. 220TH ST.	TORRANCE, CA 90507
77250	PHEOLL MANUFACTURING CO., DIVISION OF ALLIED PRODUCTS CORP.	ST. CHARLES ROAD	ELGIN, IL 60120
77342	AMF INC., POTTER AND BRUMFIELD DIV.	P O BOX 500	BEAVERTON, OR 97077
77969	RUBBERCRAFT CORP. OF CALIF., LTD.	3225 EXPOSITION PLACE	LOS ANGELES, CA 90018
78189	ILLINOIS TOOL WORKS, INC.	2530 CRESCENT DR.	BROADVIEW, IL 60153
80009	SHAKEPROOF DIVISION	2032 E. WESTMORELAND ST.	PHILADELPHIA, PA 19134
80112	TEKTRONIX, INC.	701 SONORA AVENUE	GLENDALE, CA 91201
83385	G. C. ELECTRONICS COMPANY, A DIVISION OF HYDROMETALS, INC.	225 HOYT	MAMARONECK, NY 10544
86445	CENTRAL SCREW CO.		
86928	PENN FIBRE AND SPECIALTY CO., INC.		
98291	SEASTROM MFG. COMPANY, INC.		
	SEALECTRO CORP.		

Replaceable Mechanical Parts—4006-1 Service

Fig. &
Index
No.

Tektronix
Part No.
Serial/Model No.
Eff
Dscont

Qty 1 2 3 4 5

Name & Description

Mfr
Code
Mfr Part Number

1-1	386-3490-00	1 LATCH, PLATE:LEFT	80009	386-3490-00
	386-3491-00	1 LATCH, PLATE:RIGHT (ATTACHING PARTS)	80009	386-3491-00
-2	212-0040-00	2 SCREW,MACHINE:8-32 X 0.375 100 DEG,FLH STL - - - * - - -	83385	OBD
-3	343-0562-00	1 RETAINER,CAB.:RIGHT	80009	343-0562-00
	343-0563-00	1 RETAINER,CAB.:LEFT (ATTACHING PARTS)	80009	343-0563-00
-4	212-0557-00	2 SCREW,MACHINE:10-32 X 0.50 INCH,RDH SST - - - * - - -	83385	OBD
-5	390-0476-01	1 CAB.TOP,TERM: (ATTACHING PARTS)	80009	390-0476-01
	212-0008-00	4 SCREW,MACHINE:8-32 X 0.500 INCH,PNH STL - - - * - - -	83385	OBD
	021-0173-00	1 INTERFACE:HALF DUPLEX	80009	021-0173-00
-----	-----	- (OPTION 1 ONLY)		
	012-0645-00	1 . CABLE,INTCON:196.0 INCH LONG (ATTACHING PARTS)	80009	012-0645-00
-6	211-0581-00	2 . SCREW,MACHINE:6-32 X 0.375 INCH,TRH STL - - - * - - -	83385	OBD
-----	-----	- . . CABLE ASSEMBLY INCLUDES:		
-7	131-1159-00	1 . . TERM,QIK DISC.:14-18 AWG,U/WO.25 X 0.032	00779	60041-2
-8	131-1191-00	1 . . TERM,QIK DISC:0.25 X 0.032 X 0.315 BLADE (ATTACHING PARTS)	00779	42822-2
-9	210-0457-00	1 . . NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL - - - * - - -	83385	OBD
-10	-----	2 . . SWITCH,SLIDE:(SEE S1012,S1040 EPL) (ATTACHING PARTS)		
-11	210-0406-00	4 . . NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-12	210-0003-00	4 . . WASHER,LOCK:EXT,0.123 ID X 0.245" OD,STL - - - * - - -	78189	1104-00-00-0541C
-13	200-1667-00	1 . . SHLD ELEC CONN:25 CONTACT,TYPE HD SIZE 3	80009	200-1667-00
-14	131-1279-00	10 . . CONTACT,ELEC:MALE,28-24 AWG WIRE,0.040 DIA	00779	205310-4
	131-1450-00	1 . . CONTACT,ELEC:MALE,24-30 AWG WIRE,0.040 DIA	00779	205202-6
-15	131-1316-00	1 . . CONNECTOR BODY,:25 MALE-CONT POSITIONS	00779	208076-1
-16	200-0192-00	1 . . BUSH.,STRAIN RE:	80009	200-0192-00
-17	131-0707-00	15 . . CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
-18	352-0161-04	1 . . CONN BODY,PL,EL:3 WIRE YELLOW	80009	352-0161-04
	352-0161-06	1 . . CONN BODY,PL,EL:3 WIRE BLUE	80009	352-0161-06
-19	352-0168-01	1 . . CONN BODY,PL,EL:10 WIRE BROWN	80009	352-0168-01
-20	343-0549-00	1 . . STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY23M
-21	175-0828-00	FT . . WIRE,ELECTRICAL:5 WIRE RIBBON	08261	OBD
-22	358-0161-00	1 . . BSHG,STRAIN RLF:FOR 0.50 INCH HOLE,PLASTIC	28520	SR5P4
-23	175-1157-00	1 . . CABLE,SP ELEC:10 FEET LONG	80009	175-1157-00
-24	386-3386-00	1 . . PANEL,INTERFACE:HALF DUPLEX	80009	386-3386-00
-25	-----	1 . . CKT BOARD ASSY:HALF DUPLEX(SEE A4 EPL) (ATTACHING PARTS)		
-26	211-0207-00	2 . . SCR,ASSEM WSHR:4-40 X 0.312 DOUBLE SEMS - - - * - - -	83385	OBD
-----	-----	- . . CKT BOARD ASSY INCLUDES:		
-27	105-0065-00	2 . . SUPPORT,CKT BD:ACETAL	80009	105-0065-00
-28	361-0007-00	2 . . SPACER,SLEEVE:0.250 INCH DIA,PLASTIC	80009	361-0007-00
-29	210-0870-00	2 . . WASHER,FLAT:0.14 ID X 0.312 INCH OD STL	12327	OBD
-30	131-0589-00	54 . . TERM,PIN:0.46 L X 0.025 SQ.PH BRZ GL	22526	47350
-31	131-1425-00	1 . . CONTACT SET,ELE:R ANGLE,0.150" L,STR OF 36	22526	65521-136
	131-1426-00	1 . . CONTACT SET,ELE:R ANGLE,0.250L,STRIP OF 36	22526	65524-136
-32	131-0993-00	4 . . BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
	175-1687-00	1 . . CA ASSY,SP,ELEC:76,26 AWG,600V,62.0 L	80009	175-1687-00
-33	131-0707-00	71 . . CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
	131-0621-00	7 . . CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	46231
-34	175-0825-00	FT . . WIRE,ELECTRICAL:2 WIRE RIBBON	80009	175-0825-00
-35	175-0827-00	FT . . WIRE,ELECTRICAL:4 WIRE RIBBON	08261	SS-0426-710610C
-36	175-0830-00	FT . . WIRE,ELECTRICAL:7 WIRE RIBBON	08261	SS-0726-710610C
-37	352-0169-00	1 . . HLDR,TERM CONN:2 WIRE BLACK	80009	352-0169-00

Replaceable Mechanical Parts—4006-1 Service

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-	352-0169-03		2	. . .	CONN BODY,PL,EL:2 WIRE ORANGE	80009	352-0169-03
-38	352-0162-01		1	. . .	CONN BODY,PL,EL:4 WIRE BROWN	80009	352-0162-01
	352-0162-09		1	. . .	CONN BODY,PL,EL:4 WIRE WHITE	80009	352-0162-09
-39	352-0163-05		2	. . .	CONN BODY,PL,EL:5 WIRE GREEN	80009	352-0163-05
-40	352-0165-02		2	. . .	CONN BODY,PL,EL:7 WIRE RED	80009	352-0165-02
	352-0165-07		1	. . .	CONN BODY,PL,EL:7 WIRE VIOLET	80009	352-0165-07
-41	352-0165-08		1	. . .	CONN BODY,PL,EL:7 WIRE GRAY	80009	352-0165-08
-42	352-0390-01		2	. . .	CONN BODY,PL,EL:28 WIRE,14 DBL ROW	80009	352-0390-01
	----- -----		1	. . .	LAMP,CARTRIDGE:(SEE DS1040 EPL) (ATTACHING PARTS)		
-43	352-0433-01		1	. . .	HOLDER,LED:MARKED WAIT ----- * -----	80009	352-0433-01
	----- -----		1	. . .	CKT BD ASSY:PWR SPLY,LOGIC W/HT SINK(SEE A1 EPL) (ATTACHING PARTS)		
-44	212-0023-00		2	. . .	SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL ----- * -----	83385	OBD
	----- -----		-	. . .	HEAT SINK ASSEMBLY INCLUDES:		
-45	----- -----		3	. . .	TRANSISTOR:(SEE Q1065,Q1075,Q1085 EPL) (ATTACHING PARTS)		
-46	211-0097-00		3	. . .	SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL	83385	OBD
-47	210-1122-00		3	. . .	WASHER,LOCK:0.228 ID X 0.375 INCH OD,STL ----- * -----	04713	B52200F006
-48	342-0163-00		3	. . .	INSULATOR,PLATE:XSTR,0.675 X 0.625 X 0.001"	80009	342-0163-00
-49	255-0334-00		1	. . .	PLASTIC CHANNEL:12.75 X 0.175X 0.155,NYL	11897	122-37-2500
-50	407-1774-00		1	. . .	BRACKET,CAP.:ALUMINUM (ATTACHING PARTS)	80009	407-1774-00
-51	211-0507-00		2	. . .	SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL ----- * -----	83385	OBD
-52	----- -----		1	. . .	CKT BOARD ASSY:POWER SUPPLY(SEE A1 EPL)		
	----- -----		-	. . .	(AVAILABLE UNDER A1 EPL ONLY) (ATTACHING PARTS)		
-53	211-0207-00		2	. . .	SCR,ASSEM WSHR:4-40 X 0.312 DOUBLE SEMS ----- * -----	83385	OBD
	----- -----		-	. . .	CKT BOARD ASSEMBLY INCLUDES:		
-54	129-0595-00		2	. . .	SPACER,POST:0.38 L,4-40 THRU THD,NYLON (ATTACHING PARTS)	80009	129-0595-00
-55	211-0040-00		2	. . .	SCREW,MACHINE:4-40 X 0.25",BGDH PLSTC ----- * -----	26365	OBD
-56	131-0589-00		133	. . .	TERM,PIN:0.46 L X 0.025 SQ.PH BRZ GL	22526	47350
-57	131-0993-00		4	. . .	BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
	131-0993-09		2	. . .	LINK,TERM.CONNE:2 WIRE WHITE	00779	530153-1
	131-1775-00		1	. . .	LINK,TERM.CONNE:WHITE,2,26 AWG,600V	80009	131-1775-00
-58	131-0707-00		4	. . .	CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
-59	352-0166-00		1	. . .	CONN BODY,PL,EL:8 WIRE BLACK	80009	352-0166-00
	131-1776-00		1	. . .	LINK,TERM.CONNE:BLACK,26 AWG,600V	80009	131-1776-00
	131-0707-00		2	. . .	CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
	352-0166-00		1	. . .	CONN BODY,PL,EL:8 WIRE BLACK	80009	352-0166-00
	131-1777-00		1	. . .	LINK,TERM.CONNE:WHITE,3,26 AWG,600V	80009	131-1777-00
	131-0707-00		8	. . .	CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
	352-0166-09		1	. . .	HLDL,TERM CONN:8 WIRE WHITE	80009	352-0166-09
	131-1845-00		1	. . .	LINK,TERM.CONNE:1.26 AWG,1.25 LONG	80009	131-1845-00
	131-0707-00		2	. . .	CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
-60	352-0162-09		1	. . .	CONN BODY,PL,EL:4 WIRE WHITE	80009	352-0162-09
-61	136-0564-00	B010100 B010539X	1	. . .	SOCKET,PLUG-IN:40 PIN	71279	703-3766-01-0416
-62	166-0418-00		2	. . .	TUBE,SHIELD:0.437 L X 0.094 ID BRASS	76854	3-5152-320
-63	253-0135-00		FT	. . .	PLASTIC STRIP:PRESS,SENS,ADH CTD BS	12624	V592-1/2
-64	344-0154-00		2	. . .	CLIP,ELECTRICAL:FOR 0.25 INCH DIA FUSE	80009	344-0154-00
-65	346-0133-00		1	. . .	STRAP,TIE DOWN:0.091 W X 14.0 L,PLASTIC	59730	TY-234M
-66	361-0749-00		1	. . .	SPACER,CAP:4 ELECTROLYTIC	80009	361-0749-00
-67	----- -----		2	. . .	HEAT SINK,XSTR:STORAGE AND DEFLECTION (AVAILABLE UNDER A1 EPL ONLY)		
	----- -----		-	. . .	SUPPORT,CKT BD:		
-68	386-3378-00		2	. . .	STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	80009	386-3378-00
	343-0549-00		1	. . .	STRAP,TIEDOWN:5.5 L MIN,PLASTIC	59730	TY23M
	346-0120-00		1	. . .	SST 1.5M	06383	SST 1.5M

Replaceable Mechanical Parts—4006-1 Service

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
1-69	337-2251-00			1	SHIELD,ELEC:HIGH VOLTAGE POWER SUPPLY (ATTACHING PARTS)		80009	337-2251-00
-70	211-0008-00			3	SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL		83385	OBD
					- - - * - - -			
-71	252-0571-00			1	. SHIELD INCLUDES:			
				1	. NEOPRENE EXTR:CHAN,0.234 X 0.156		77969	1353
				1	CKT BOARD ASSY:DISPLAY W/HEAT SINK(SEE A2 EPL) (ATTACHING PARTS)			
-72	212-0023-00			2	SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL		83385	OBD
					- - - * - - -			
-73	-----			5	. CKT BOARD ASSEMBLY INCLUDES:			
				5	. TRANSISTOR:(SEE Q1067,1038,1044,1048,1059 EPL) (ATTACHING PARTS)			
-74	211-0097-00			5	. SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL		83385	OBD
-75	210-1171-00	B010100	B010539	5	. WSHR,SHOULDERED:0.116 ID X 0.138 INCH OD		52905	A7148516P2
	210-1181-00	B010540	B035179	5	. WASHER,SHLDR:1.22 ID X 0.20D		31223	OBD
	210-1178-00	B035180		5	. WSHR,SHOULDERED:FOR MTG TO-220 TRANSISTOR		49671	DF 137A
					- - - * - - -			
-76	-----			4	. TRANSISTOR:(SEE Q1069,1084,1074,1096 EPL) (ATTACHING PARTS)			
-77	211-0097-00			4	. SCREW,MACHINE:4-40 X 0.312 INCH,PNH STL		83385	OBD
-78	210-1122-00			4	. WASHER,LOCK:0.228 ID X 0.375 INCH OD,STL		04713	B52200F006
					- - - * - - -			
-79	342-0163-00			8	. INSULATOR,PLATE:XSTR,0.675 X 0.625 X 0.001"		80009	342-0163-00
	342-0328-00			1	. INSULATOR,PLATE:XSTR,ALUMINUM		80009	342-0328-00
-80	200-1327-00			1	. SHIELD,RESISTOR:		80009	200-1327-00
-81	366-0261-00	B010100	B035459	1	KNOB:0.312 OD X 0.406 INCH LONG		80009	366-0261-00
	366-0261-02	B035460		1	KNOB:GRAY,0.129 IDX 0.312 OD		80009	366-0261-02
-82	384-1121-00			1	EXTENSION SHAFT:1.41 INCH LONG		80009	384-1121-00
-83	343-0549-00			1	STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG		59730	TY23M
-84	-----			1	CKT BOARD ASSY:DISPLAY HEAT SINK(SEE A2 EPL)			
				1	(AVAILABLE UNDER A2 EPL ONLY) (ATTACHING PARTS)			
-85	211-0207-00			2	SCR,ASSEM WSHR:4-40 X 0.312 DOUBLE SEMS		83385	OBD
					- - - * - - -			
-86	361-0137-00			1	. . . CKT BOARD ASSEMBLY INCLUDES:			
				1	. . . POST,ELEC-MECH:1.345 INCH,W/4-40 THREAD (ATTACHING PARTS)		80009	361-0137-00
-87	211-0040-00			1	. . . SCREW,MACHINE:4-40 X 0.25",BDGH PLSTC		26365	OBD
	129-0369-00			1	. . . INSULATOR,STDF:1.370 INCH,W/4-40 THREAD (ATTACHING PARTS)		80009	129-0369-00
	211-0040-00			1	. . . SCREW,MACHINE:4-40 X 0.25",BDGH PLSTC		26365	OBD
	131-0993-00	XB022615		1	. . . BUS,CONDUCTOR:2 WIRE BLACK		00779	530153-2
-88	131-0589-00			60	. . . TERM,PIN:0.46 L X 0.025 SQ.PH BRZ GL		22526	47350
-89	131-0993-00			1	. . . BUS,CONDUCTOR:2 WIRE BLACK		00779	530153-2
-90	131-1834-00			2	. . . TERMINAL,STUD:0.89 L,W/NYLON INSULATOR		98291	023-3000-000-689
	136-0647-00			1	. . . SOCKET ASSY:CRT		80009	136-0647-00
-91	136-0278-00			1	. . . SOCKET,PLUG-IN:WITH PINS		80009	136-0278-00
-92	214-0464-00			7	CONTACT,ELEC:CRT		80009	214-0464-00
-93	384-0616-00			1	. . . POST,ELEC-MECH:HEX,0.25 X 1.370 INCH LONG (ATTACHING PARTS)		80009	384-0616-00
-94	211-0008-00			1	. . . SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL		83385	OBD
-95	210-0004-00			1	. . . WASHER,LOCK:#4 INTL,0.015THK,STL CD PL		78189	1204-00-00-0541C
					- - - * - - -			
-96	-----			1	. . . TRANSISTOR:(SEE Q231 EPL) (ATTACHING PARTS)			
-97	210-0561-00			2	. NUT,PLAIN,HEX.:0.188 INCH L,0.188 HEX BRS		80009	210-0561-00
					- - - * - - -			
-98	386-0978-00			1	. . . INSULATOR,PLATE:TRANSISTOR,MICA		80009	386-0978-00
-99	210-0201-00			1	. . . TERMINAL,LUG:SE #4 (ATTACHING PARTS)		86928	A373-157-2
-100	213-0088-00			1	. . . SCR,TPG,THD CTG:4-24 X 0.25 INCH,PNH STL		83385	OBD
	213-0138-00	XB022615		1	. . . SCR,TPG,THD FOR:4-40 X 0.188 INCH,PNH STL		83385	OBD
					- - - * - - -			

Replaceable Mechanical Parts—4006-1 Service

Fig. &

Index
No.

Tektronix
Part No.

Serial/Model No.
Eff
Dscont

Qty 1 2 3 4 5

Name & Description

Mfr
Code

Mfr Part Number

1-101	214-1713-01	1	.. HEAT SINK,XSTR:TO-3,AL (ATTACHING PARTS)	80009	214-1713-01
-102	211-0514-00	2	.. SCREW,MACHINE:6-32 X 0.750 INCH,PNH STL	83385	OBD
-103	210-0561-00	2	.. NUT,PLAIN,HEX.:0.188 INCH L,0.188 HEX BRS	80009	210-0561-00
-104	210-0935-00	2	.. WASHER,NONMETAL:FIBER,0.14 IDX 0.375"OD	74921	OBD
			- - - * - - -		
-105	214-1292-00	1	.. HEAT SINK,ELEC:TRANSISTOR	05820	205-AB
-106	352-0134-00	1	.. HOLDER,COIL:TOROIDAL,0.472 X 0.417 INCH	80009	352-0134-00
-107	214-0506-00	1	.. CONTACT,ELEC:0.045 SQ X 0.375 INCH L	80009	214-0506-00
-108	348-0055-00	1	.. GROMMET,PLASTIC:0.25 INCH DIA	80009	348-0055-00
-109	337-2267-00	1	.. SHIELD,ELEC:HV TRANSFORMER	80009	337-2267-00
-110	131-0621-00	1	.. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	46231
-111	352-0197-00	1	.. CONN BODY,PL,EL:1 WIRE BLACK	80009	352-0197-00
-112	----- -----	1	.. HEAT SINK,XSTR: - . (AVAILABLE UNDER A2 EPL ONLY)		
-113	386-3378-00	2	.. SUPPORT,CKT BD:	80009	386-3378-00
-114	351-0087-04	2	GUIDE,CKT BD:PLASTIC	80009	351-0087-04

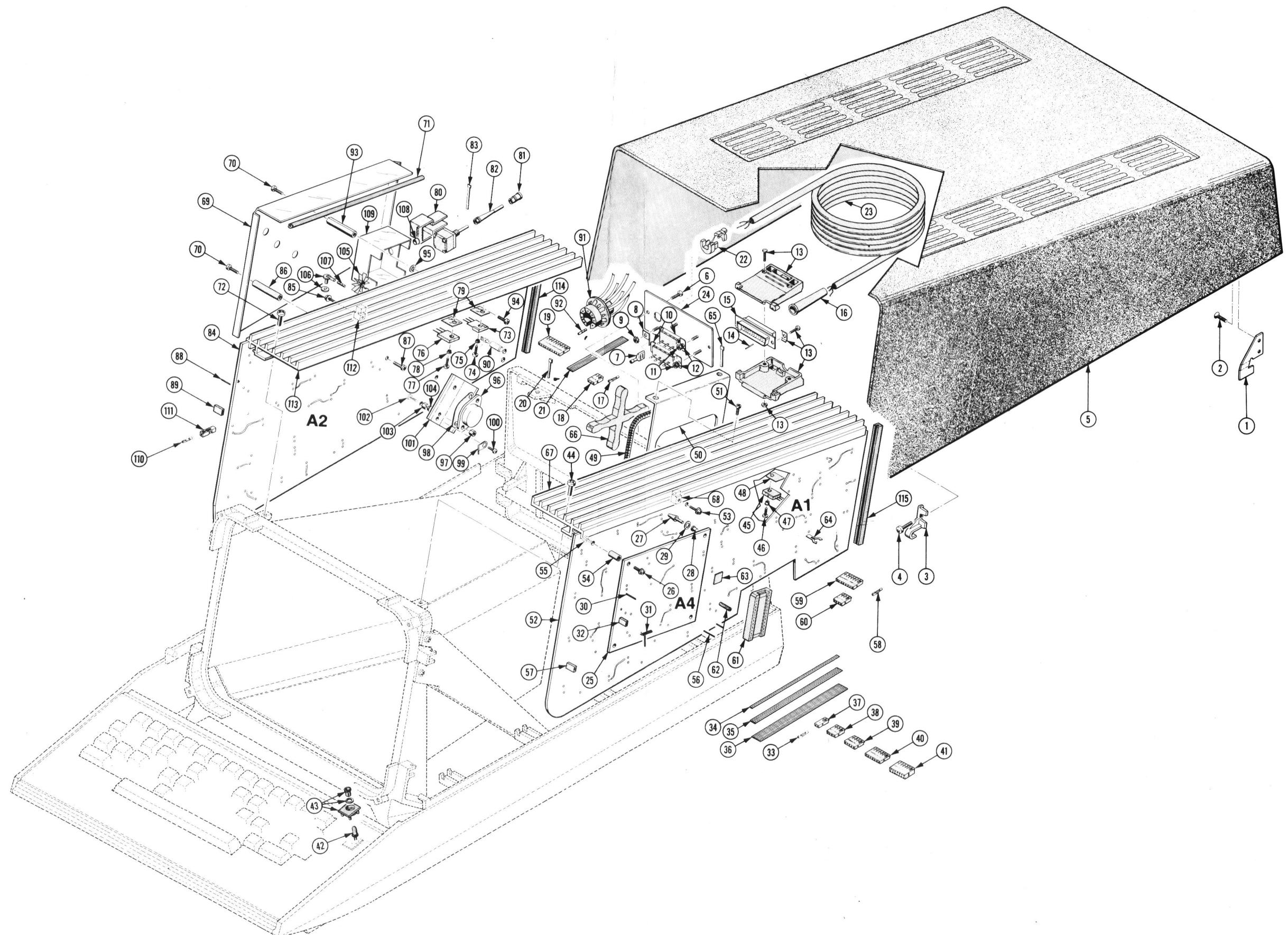
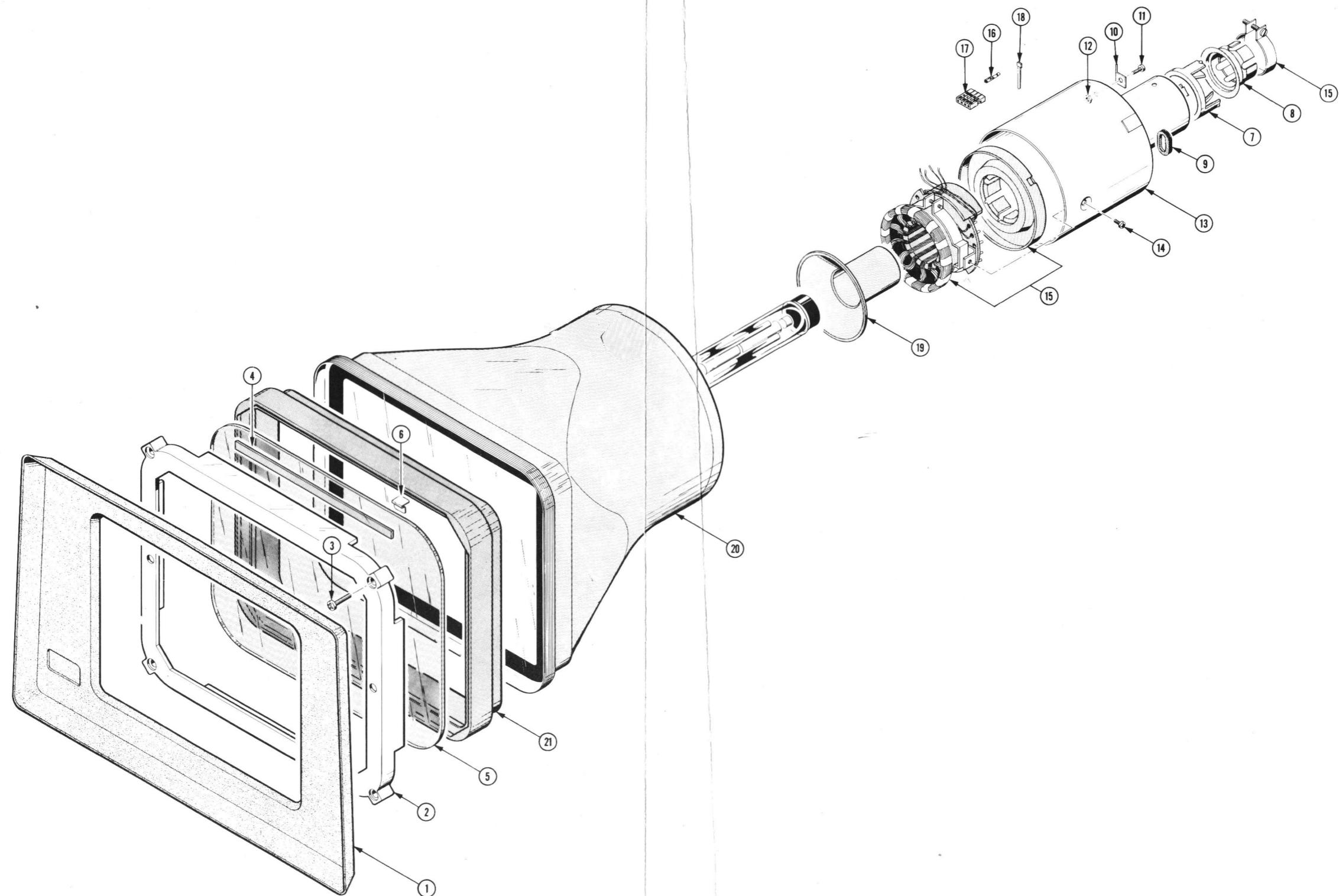


FIG. 2 CRT



Replaceable Mechanical Parts—4006-1 Service

Fig. &
Index
No.

	Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
2-1	331-0401-01			1	MASK,CRT:		80009	331-0401-01
	334-2626-00			1	PLATE, IDENT:		80009	334-2626-00
-2	426-1233-01			1	FR, IMPLOSION SH: (ATTACHING PARTS)		80009	426-1233-01
-3	212-0534-00			4	SCREW,MACHINE:10-32 X 1 INCH,PNH STL ----- * -----		83385	OBD
-4	348-0485-00			-	. SHIELD INCLUDES:			
-5	337-1482-00			2	. STRIP,CUSHION:0.063 THK X 0.25 W X 4.01		80009	337-1482-00
-6	131-1835-00			1	FILTER,LT,CRT:		80009	131-1835-00
-7	386-3392-00	B010100	B019999	4	CONTACT,ELEC:CLIPS		80009	386-3392-00
	386-3567-00	B020000		1	SPRT,CRT SHIELD:		80009	386-3567-00
-8	343-0576-00	B010100	B019999	1	STIFFENER,PLATE:SHIELD HOLDER		80009	343-0576-00
	352-0455-00	B020000		1	CLAMP,COIL:		80009	352-0455-00
-9	348-0012-00			1	HOLDER,CRT SHLD:		72653	1043-1M
-10	131-1247-00			1	GROMMET,RUBBER:0.625 INCH DIA		00779	61664-1
				1	CONTACT,ELEC:QUICK DISCONNECT (ATTACHING PARTS)			
-11	211-0590-00			1	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL		83385	OBD
-12	210-0457-00			1	NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL ----- * -----		83385	OBD
-13	337-2230-00	B010100	B019999	1	SHIELD,CRT:		80009	337-2230-00
	337-2230-01	B020000	B020669	1	SHLD,CRT:		80009	337-2230-01
	337-2230-03	B020670		1	SHIELD,ELEC:CRT (ATTACHING PARTS)		80009	337-2230-03
-14	211-0590-00	B010100	B019999	2	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL		83385	OBD
	211-0590-00	B020000		4	SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL		83385	OBD
	210-0457-00	XB020000		4	NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL		83385	OBD
	210-0949-00	XB020000		4	WASHER,FLAT:0.141 ID X 0.50 INCH OD,BRS ----- * -----		12327	OBD
-15	119-0745-01			1	COIL,TUBE DEFL:		80009	119-0745-01
-16	131-0621-00			4	CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD		22526	46231
-17	352-0200-07			1	CONN BODY,PL,EL:4 WIRE VIOLET		80009	352-0200-07
-18	343-0549-00			3	STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG		59730	TY23M
-19	358-0561-00			1	BUSHING,SLEEVE:1.15 ID X 2.0L,SI,1.2 OD		80009	358-0561-00
-20	-----			1	ELECTRON TUBE:(SEE V1 EPL)			
-21	354-0316-01			1	. RING,CRT MTG:NEOPRENE		80009	354-0316-01

Replaceable Mechanical Parts—4006-1 Service

Fig. &

Index No.	Tektronix Part No.	Serial/Model No.	Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
3-1	386-3394-00				1	PANEL,KEYBOARD: (ATTACHING PARTS)		80009	386-3394-00
-2	212-0023-00				2	SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL ----- * -----		83385	OBD
	200-1889-00				1	COVER, INTFC CAV:GRAY, BLANK		80009	200-1889-00
-3	-----				1	KEYBOARD:(SEE A3 EPL) (ATTACHING PARTS)			
-4	211-0517-00				6	SCREW,MACHINE:6-32 X 1 INCH,PNH,STL ----- * -----		83385	OBD
	-----				-	. KEYBOARD INCLUDES:			
-5	366-1664-00				1	. PUSH BUTTON:SET OF 54		80009	366-1664-00
	366-1525-01				1	. . . PUSH BUTTON:EXCLAMATION POINT/1		01963	028-3081
	366-1525-02				1	. . . PUSH BUTTON:DBL QUOTE/2		01963	028-3082
	366-1525-03				1	. . . PUSH BUTTON:POUND OR NUMBER/3		01963	028-3083
	366-1525-04				1	. . . PUSH BUTTON:PERCENT/5		01963	028-3085
	366-1525-05				1	. . . PUSH BUTTON:APERSAND/6		01963	028-3086
	366-1525-06				1	. . . PUSH BUTTON:SINGLE QUOTE/7		01963	028-3087
	366-1525-07				1	. . . PUSH BUTTON:LEFT PARENTHESIS/8		01963	028-3088
	366-1525-08				1	. . . PUSH BUTTON:RIGHT PARENTHESIS/9		01963	028-3089
	366-1525-09				1	. . . PUSH BUTTON:GRAY,()		01963	028-3090
	366-1525-10				1	. . . PUSH BUTTON:ASTERISK/Colon		01963	028-3091
	366-1525-11				1	. . . PUSH BUTTON:HYPHEN/EQUAL		01963	028-1715
	366-1525-13				1	. . . PUSH BUTTON:ALT MODE		01963	028-3094
	366-1525-14				1	. . . PUSH BUTTON:Q		01963	028-3095
	366-1525-15				1	. . . PUSH BUTTON:W		01963	028-3096
	366-1525-19				1	. . . PUSH BUTTON:Y		01963	028-3100
	366-1525-20				1	. . . PUSH BUTTON:U		01963	028-3101
	366-1525-22				1	. . . PUSH BUTTON:UNDERSCORE/O		01963	028-3103
	366-1525-23				1	. . . PUSH BUTTON:B		01963	028-3104
	366-1525-24				1	. . . PUSH BUTTON:LINE FEED		01963	028-3105
	366-1525-25				1	. . . PUSH BUTTON:RETURN		01963	028-2968
	366-1525-26				1	. . . PUSH BUTTON:CTRL		01963	028-3106
	366-1525-27				1	. . . PUSH BUTTON:A		01963	028-3107
	366-1525-30				1	. . . PUSH BUTTON:F		01963	028-3110
	366-1525-31				1	. . . PUSH BUTTON:G		01963	028-3111
	366-1525-32				1	. . . PUSH BUTTON:H		01963	028-3112
	366-1525-33				1	. . . PUSH BUTTON:J		01963	028-3113
	366-1525-34				1	. . . PUSH BUTTON:LEFT BRACKET/K		01963	028-3114
	366-1525-36				1	. . . PUSH BUTTON:PLUS/SEMI-COLO		01963	028-3116
	366-1525-37				1	. . . PUSH BUTTON:RUB OUT		01963	028-3117
	366-1525-38				1	. . . PUSH BUTTON:RESET		01963	028-3118
-6	366-1525-39				1	. . . PUSH BUTTON:BREAK		01963	028-3119
	366-1525-40				2	. . . PUSH BUTTON:SHIFT		01963	028-2967
	366-1525-41				1	. . . PUSH BUTTON:Z		01963	028-3120
	366-1525-42				1	. . . PUSH BUTTON:X		01963	028-3121
	366-1525-43				1	. . . PUSH BUTTON:C		01963	028-3122
	366-1525-44				1	. . . PUSH BUTTON:V		01963	028-3123
	366-1525-45				1	. . . PUSH BUTTON:B		01963	028-3124
	366-1525-46				1	. . . PUSH BUTTON:TILDE/N		01963	028-3125
	366-1525-47				1	. . . PUSH BUTTON:RIGHT BRACKET/M		01963	028-3126
	366-1525-48				1	. . . PUSH BUTTON:LESS THAN/COMA		01963	028-3127
	366-1525-49				1	. . . PUSH BUTTON:GREATER THAN/PERIOD		01963	028-3128
	366-1525-50				1	. . . PUSH BUTTON:SLASH/QUESTION MARK		01963	028-3129
	366-1525-51				1	. . . PUSH BUTTON:SPACE BAR		01963	028-1232
	366-1525-52				1	. . . PUSH BUTTON:DOLLAR SIGN/4		01963	028-3084
	366-1525-53				1	. . . PUSH BUTTON:E		01963	028-1957
	366-1525-54				1	. . . PUSH BUTTON:R		01963	028-2089
	366-1525-55				1	. . . PUSH BUTTON:S		01963	028-2090
	366-1525-56				1	. . . PUSH BUTTON:I		01963	028-2177
	366-1525-57				1	. . . PUSH BUTTON:D		01963	028-2093
	366-1525-58				1	. . . PUSH BUTTON:L		01963	028-2091
	366-1525-59				1	. . . PUSH BUTTON:T		01963	028-2092
	366-1525-60				1	. . . PUSH BUTTON:DARK GRAY,(COPY)		01963	028-2087
	366-1525-61				1	. . . PUSH BUTTON:GRAY, BLANK		01963	028-3130

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Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
3-7	260-1393-00		50	.	SWITCH, PUSH: SPST, NO KEYBOARD SWITCH	01963	M61-0100
-8	260-1393-01		3	.	SWITCH, PUSH: SPST, NO, KYBD SW, HIGH ACTG F	01963	M51-0101
	-----		-	.	(HEAVY DUTY SWITCH UNDER PAGE, COPY		
	-----		-	.	AND BREAK BUTTON ONLY)		
-9	386-3494-00		1	SUPPORT, FRAME:CRT, RIGHT	(ATTACHING PARTS)	80009	386-3494-00
-10	211-0590-00		2	SCREW, MACHINE: 6-32 X 0.25 INCH, PNH STL		83385	OBD
-11	212-0023-00		1	SCREW, MACHINE: 8-32 X 0.375 INCH, PNH STL		83385	OBD
	-----		- - - * - - -				
-12	386-3495-00		1	SUPPORT, FRAME:CRT, LEFT	(ATTACHING PARTS)	80009	386-3495-00
-13	211-0590-00		2	SCREW, MACHINE: 6-32 X 0.25 INCH, PNH STL		83385	OBD
	212-0023-00		1	SCREW, MACHINE: 8-32 X 0.375 INCH, PNH STL		83385	OBD
	-----		- - - * - - -				
-14	426-1232-01		1	FRAME, CRT MTG:	(ATTACHING PARTS)	80009	426-1232-01
-15	212-0509-00		4	SCREW, MACHINE: 10-32 X 0.625INCH, PNH STL		83385	OBD
-16	211-0590-00		4	SCREW, MACHINE: 6-32 X 0.25 INCH, PNH STL		83385	OBD
	-----		- - - * - - -				
-17	348-0233-00		1	GROMMET, PLASTIC: GRAY, OVAL SHAPE, 0.927 ID		80009	348-0233-00
-18	255-0334-00	FT	PLASTIC CHANNEL: 12.75 X 0.175X 0.155, NYL			11897	122-37-2500
-19	334-1379-00		1	LABEL:CRT, ADHESIVE BACK		80009	334-1379-00
-20	131-1247-00		2	CONTACT,ELEC:QUICK DISCONNECT	(ATTACHING PARTS FOR EACH)	00779	61664-1
-21	211-0590-00		1	SCREW, MACHINE: 6-32 X 0.25 INCH, PNH STL		83385	OBD
-22	210-0457-00		1	NUT, PLAIN, EXT W: 6-32 X 0.312 INCH, STL		83385	OBD
	-----		- - - * - - -				
-23	337-2254-00		1	SHIELD,CRT:FRONT		80009	337-2254-00
	352-0455-00		1	HOLDER,CRT SHLD:SIL GRAY, ABS		80009	352-0455-00
-24	348-0070-01		4	PAD,CUSHIONING: 0.69 INCH, RUBBER		80009	348-0070-01
-25	253-0160-00	FT	.	TAPE, PRESS.SENS:ADHESIVE, 2.124 FT LONG		04963	4116 TYPE A
-26	-----		1	XFMR,PWR,SDN&SU:(SEE T1001 EPL)	(ATTACHING PARTS)		
-27	212-0516-00		4	SCREW, MACHINE: 10-32 X 2 INCH, HEX HD STL		77250	OBD
-28	210-0812-00		4	WASHER, NONMETAL: #10, FIBER		86445	OBD
	166-0227-00		4	INS SLV,ELEC: 0.187 ID X 1.50 INCH LONG		80009	166-0227-00
	-----		- - - * - - -				
-29	131-0621-00		-	. TRANSFORMER INCLUDES:			
-30	352-0205-00		9	. CONNECTOR, TERM: 22-26 AWG, BRS& CU BE GOLD		22526	46231
-31	407-1772-00		1	. CONN BODY, PL, EL: 9 WIRE BLACK		80009	352-0205-00
	-----		1	BRACKET, XFMR:	(ATTACHING PARTS)	80009	407-1772-00
-32	212-0001-00		2	SCREW, MACHINE: 8-32 X 0.250 INCH, PNH STL		77250	OBD
	-----		- - - * - - -				
-33	386-3321-00		1	SUPPORT, XFMR:	(ATTACHING PARTS)	80009	386-3321-00
-34	212-0001-00		4	SCREW, MACHINE: 8-32 X 0.250 INCH, PNH STL		77250	OBD
	-----		- - - * - - -				
-35	200-0582-00		1	CAP, ELECTRICAL:FUSE HOLDER		71400	9435 1/2
-36	352-0010-00		1	FUSEHOLDER:WITH HARDWARE		03614	HKP-L
-37	-----		1	SWITCH, TOGGLE:(SEE S1000 EPL)	(ATTACHING PARTS)		
-38	210-0473-00		1	NUT, PLAIN, DODEC: 0.469-32 X 0.638 INCH, BRS		80009	210-0473-00
-39	210-0902-00		1	WASHER, FLAT: 0.470 ID X 0.656 INCH OD, STL		12327	OBD
-40	210-0021-00		1	WASHER, LOCK: INTL, 0.476 ID X 0.60"OD STL		78189	1222-01-00-0541C
	210-0414-00		1	NUT, PLAIN, HEX.: 0.468-32 X 0.562 INCH, BRS		73743	3167-402
	-----		- - - * - - -				
-41	210-0202-00		1	TERMINAL, LUG: 0.146 ID, LOCKING, BRZ TINNED	(ATTACHING PARTS)	78189	2104-06-00-2520N
-42	211-0504-00		1	SCREW, MACHINE: 6-32 X 0.25 INCH, PNH STL		83385	OBD
	-----		- - - * - - -				
-43	366-1522-00		1	KNOB:LINE VOLTAGE INDICATOR	(ATTACHING PARTS)	80009	366-1522-00
-44	211-0504-00		1	SCREW, MACHINE: 6-32 X 0.25 INCH, PNH STL		83385	OBD
	-----		- - - * - - -				

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Tektronix Part No.	Serial/Model No. Eff	Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
3-	210-0204-00	XB010573	1		TERMINAL,LUG:0.146 INCH DIA DE,45 DEG BEND (ATTACHING PARTS)	78189	2157-06-01-2520N
	211-0504-00	XB010573	1		SCREW,MACHINE:6-32 X 0.25 INCH,PNH STL	83385	OBD
	210-0902-00	XB010573	1		WASHER,FLAT:0.470 ID X 0.656 INCH OD,STL - - - * - - -	12327	OBD
-45	358-0161-00		1		BSHG,STRAIN RLF:FOR 0.50 INCH HOLE,PLASTIC	28520	SR5P4
-46	161-0033-07		1		CABLE ASSY,PWR,:3 WIRE,92 INCH LONG	80009	161-0033-07
	175-1738-00		1		CA ASSY,SP,ELEC:10-26 AWG,10.5 INCH LONG	80009	175-1738-00
-47	131-0707-00		10		. CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
	131-0621-00		1		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	46231
-48	352-0168-05		1		. CONN BODY,PL,EL:10 WIRE GREEN	80009	352-0168-05
-49	352-0198-04		1		. HLDR,TERM CONN:2 WIRE YELLOW	80009	352-0198-04
-50	366-1146-00		1		KNOB:GRAY,IF GAIN	80009	366-1146-00
	213-0246-00		1		. SETSCREW:5-40 X 0.094 STL,BK OXD HEX SKT	71159	OBD
-51	366-1120-00		1		KNOB:GRAY,0.600 INCH HIGH	80009	366-1120-00
	213-0153-00		2		. SETSCREW:5-40 X 0.125,STL BK OXD,HEX	000CY	OBD
-52	-----		1		SWITCH,ROTARY:(SEE S1010 EPL) (ATTACHING PARTS)		
-53	210-0413-00		1		NUT,PLAIN,HEX.:0.375-32 X 0.50 INCH,STL	73743	3145-402
-54	210-0012-00		1		WASHER,LOCK:INTL,0.375 ID X 0.50" OD STL	78189	1220-02-00-0541C
-55	210-0865-00		1		WSHR,SHOULDERED:0.380 ID,0.072 THK,FIBER	80112	6529-M
	210-0814-00		1		WASHER,SHLDR:0.375 ID,FIBER,0.625 OD - - - * - - -	86445	OBD
-56	-----		1		SPEAKER:(SEE LS1001 EPL) (ATTACHING PARTS)		
-57	220-0760-00		4		NUT,THD FORMING:FOR 0.125 DIA STUD,STL,CD - - - * - - -	77122	SC125
	614-0126-00		1		REAR PANEL ASSY: (ATTACHING PARTS)	80009	614-0126-00
-58	211-0581-00		2		SCREW,MACHINE:6-32 X 0.375 INCH,TRH STL - - - * - - -	83385	OBD
	-----		-		. REAR PANEL ASSEMBLY INCLUDES:		
-59	131-0458-00		1		. CONNECTOR,RCPT,:15 PIN,FEMALE	71468	DA15S
-60	129-0260-00		2		. POST,ELEC-MECH:0.255 HEX X 0.500 INCH L	80009	129-0260-00
-61	210-0406-00		2		. NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS	73743	2X12161-402
-62	210-0003-00		1		. WASHER,LOCK:EXT,0.123 ID X 0.245" OD,STL	78189	1104-00-00-0541C
-63	210-0201-00		1		. TERMINAL,LUG:SE #4	86928	A373-157-2
-64	131-0621-00		9		. CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	46231
	131-0622-00		2		. CONTACT,ELEC:0.577" L,28-32 AWG WIRE	22526	46241
	131-0792-00		2		. CONNECTOR,TERM:18-20 AWG,CU BE GOLD PL	22526	46221
-65	343-0549-00		4		. STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY23M
-66	352-0200-06		1		. CONN BODY,PL,EL:4 WIRE BLUE	80009	352-0200-06
-67	352-0205-02		1		. CONN BODY,PL,EL:9 WIRE RED	80009	352-0205-02
-68	-----		1		. RES,VAR,NONWW:(SEE R1050 EPL)		
-69	210-0046-00		1		. WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
-70	129-0290-00		1		. POST,ELEC-MECH:0.635 INCH LONG,HEX (ATTACHING PARTS)	80009	129-0290-00
-71	358-0342-00		1		. BSHG,MACH.THD:0.25 X 32 X 0.352 INCH LONG	80009	358-0342-00
-72	210-0046-00		1		. WASHER,LOCK:INTL,0.26 ID X 0.40" OD,STL	78189	1214-05-00-0541C
-73	386-3389-00		1		. PANEL,HARD COPY:	80009	386-3389-00
	012-0647-00		1		CABLE,INTCON:138.0 LONG (ATTACHING PARTS)	04919	OBD
-74	211-0581-00		2		SCREW,MACHINE:6-32 X 0.375 INCH,TRH STL - - - * - - -	83385	OBD
	-----		-		. CABLE INCLUDES:		
-75	131-1191-00		1		. TERM,QIK DISC:0.25 X 0.032 X 0.315 BLADE	00779	42822-2
-76	131-0707-00		7		. CONNECTOR,TERM.:22-26 AWG,BRS& CU BE GOLD	22526	47439
-77	352-0165-02		1		. CONN BODY,PL,EL:7 WIRE RED	80009	352-0165-02
-78	343-0549-00		1		. STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY23M
-79	131-1215-00		1		. CONTACT,ELEC:CRIMP MT W/RED INS (ATTACHING PARTS)	77342	42599-4
-80	210-0457-00		1		. NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL - - - * - - -	83385	OBD

Fig. &
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3-81	358-0091-00		1 . BSHG, STRAIN RLF:FOR 0.188 INCH DIA CABLE	28520	SR-2M-4
-82	131-1279-00		7 . CONTACT,ELEC:MALE,28-24 AWG WIRE,0.040 DIA	00779	205310-4
	131-1450-00		1 . CONTACT,ELEC:MALE,24-30 AWG WIRE,0.040 DIA	00779	205202-6
-83	131-1316-00		1 . CONNECTOR BODY,:25 MALE-CONT POSITIONS	00779	208076-1
-84	200-1667-00		1 . SHLD ELEC CONN:25 CONTACT,TYPE HD SIZE 3	80009	200-1667-00
-85	348-0020-00		1 . GROMMET,RUBBER:0.25 INCH	70485	374
-86	175-1747-00		FT . CABLE,SP,ELEC:7,26 AWG,0.165 DIA	80009	175-1747-00
-87	386-3387-00		1 . PANEL,INTERFACE:	80009	386-3387-00
	407-0322-02 XB010480		2 BRKT,POWER CA:CHARCOAL GRAY,DELRIN (ATTACHING PARTS FOR EACH)	80009	407-0322-02
	211-0071-00 XB010480		1 SCREW,MACHINE:4-40 X 0.375 INCH,TRH,STL	83385	OBD
	210-0586-00 XB010480		1 NUT,PLAIN,EXT W:4-40 X 0.25 INCH,STL	78189	211-041800-00
			- - - * - - -		
-88	386-3337-01 B010100	B010479	1 PANEL,REAR:	80009	386-3337-01
	386-3337-02 B010480		1 PANEL,REAR: (ATTACHING PARTS)	80009	386-3337-02
-89	212-0023-00		4 SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL - - - * - - -	83385	OBD
-90	390-0474-01		1 CAB. SIDE,TERM:RIGHT (ATTACHING PARTS)	80009	390-0474-01
-91	212-0023-00		5 SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL - - - * - - -	83385	OBD
	131-1247-00		2 CONTACT,ELEC:QUICK DISCONNECT (ATTACHING PARTS FOR EACH)	00779	61664-1
	211-0507-00		1 SCREW,MACHINE:6-32 X 0.312 INCH,PNH STL	83385	OBD
	210-0457-00		1 NUT,PLAIN,EXT W:6-32 X 0.312 INCH,STL - - - * - - -	83385	OBD
-92	390-0475-01		1 CAB. SIDE,TERM:LEFT (ATTACHING PARTS)	80009	390-0475-01
	212-0023-00		5 SCREW,MACHINE:8-32 X 0.375 INCH,PNH STL - - - * - - -	83385	OBD
-93	348-0128-01		4 FOOT,CABINET:POLYURETHANE,BLACK	80009	348-0128-01
-94	390-0473-00		1 CAB,BOT,TERM:FRONT	80009	390-0473-00
-95	390-0497-00 B010100	B022359	1 CAB. BOT,TERM:REAR	80009	390-0497-00
	390-0497-01 B022360		1 CAB. BOT,TERM.:REAR	80009	390-0497-01
-96	179-2370-00		1 WIRING HARNESS,:MAIN	80009	179-2370-00
-97	131-0621-00		26 . CONNECTOR,TERM:22-26 AWG,BRS& CU BE GOLD	22526	46231
	131-0622-00		3 . CONTACT,ELEC:0.577" L,28-32 AWG WIRE	22526	46241
	131-0707-00		21 . CONNECTOR,TERM : 22-26 AWG,BRS& CU BE GOLD	22526	47439
	131-0708-00		3 . CONTACT,ELEC:0.48" L,28-32 AWG WIRE	22526	47437
	131-0792-00		7 . CONNECTOR,TERM:18-20 AWG,CU BE GOLD PL	22526	46221
-98	131-0861-00		2 . TERM,QIK DISC:16-20 AWG,0.22 W X 0.02 THK	00779	42617-2
-99	136-0148-00		1 . CONNECTOR,RCPT,:15 PIN	05574	2VK15S/1-2
-100	343-0549-00		18 . STRAP,TIEDOWN:0.091 W X 3.62 INCH LONG	59730	TY23M
	346-0128-00		1 . STRAP,TIE DOWN:0.1W X 8.0" LONG,NYLON	59730	TY-232M
-101	352-0168-08		1 . CONN BODY,PL,EL:10 WIRE GRAY	80009	352-0168-08
-102	352-0200-00		1 . HLDR,TERM CONN:4 WIRE BLACK	80009	352-0200-00
	352-0200-05		1 . CONN BODY,PL,EL:4 WIRE GREEN	80009	352-0200-05
-103	352-0202-06		1 . CONN BODY,PL,EL:6 WIRE BLUE	80009	352-0202-06
-104	352-0203-09		1 . HLDR,TERM CONN:7 WIRE WHITE	80009	352-0203-09
	352-0203-03		1 . HLDR,TERM CONN:7 WIRE,ORANGE	80009	352-0203-03
-105	352-0205-04		1 . CONN BODY,PL,EL:9 WIRE YELLOW	80009	352-0205-04
-106	352-0390-01		1 . CONN BODY,PL,EL:28 WIRE,14 DBL ROW	80009	352-0390-01

Replaceable Mechanical Parts—4006-1 Service

Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1 2 3 4 5	Name & Description	Mfr Code	Mfr Part Number
STANDARD ACCESSORIES							
	070-1891-00		1	MANUAL, TECH:USERS		80009	070-1891-00
OPTIONAL ACCESSORIES							
	021-0173-00		1	INTERFACE:HALF DUPLEX		80009	021-0173-00
	070-1892-00		1	MANUAL, TECH:SERVICE		80009	070-1892-00
	016-0346-00		1	VISOR,CRT:		80009	016-0346-00
	016-0364-00		1	PEDESTAL KIT:		80009	016-0364-00

FIG. 3 KEYBOARD &
CABINET ASSEMBLY

