DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols

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.

The overline on a signal name indicates that the signal performs its intended function when it is in the low state.

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.

American National Standard Institute
1430 Broadway
New York, New York 10018

Component Values

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

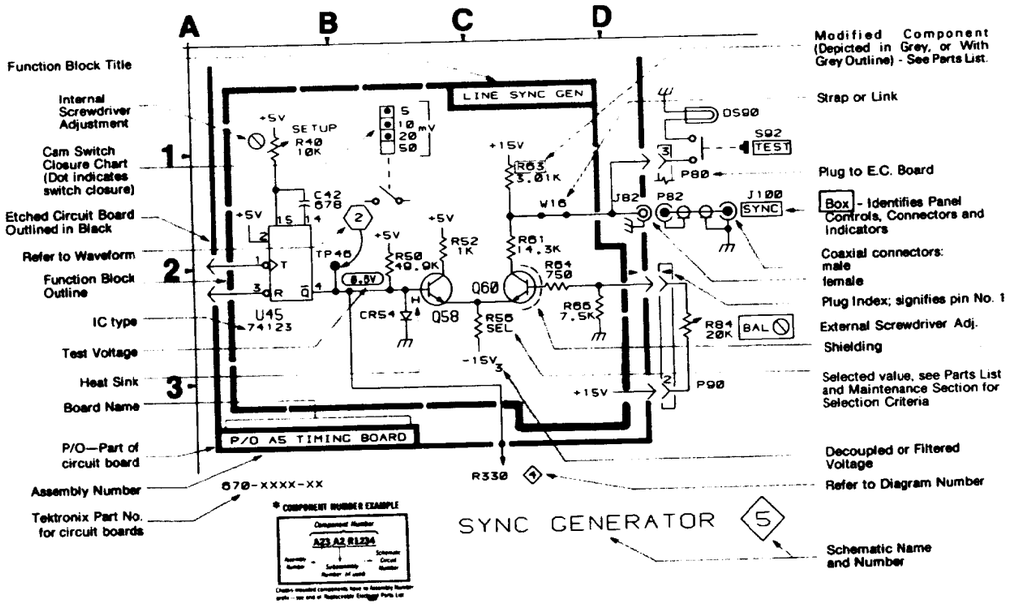
Capacitors = Values one or greater are in picofarads (pF). Values less than one are in microfarads (μF).
Resistors = Ohms (Ω).

The information and special symbols below may appear in this manual.

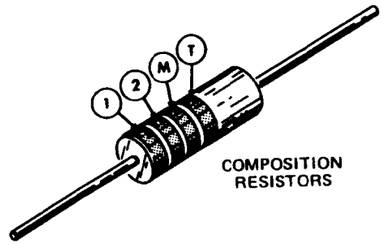
Assembly Numbers and Grid Coordinates

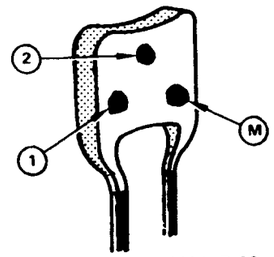
Each assembly in the instrument is assigned an assembly number (e.g., A20). The assembly number appears on the circuit board outline on the diagram, in the title for the circuit board component location illustration, and in the lookup table for the schematic diagram and corresponding component locator illustration. The Replaceable Electrical Parts list is arranged by assemblies in numerical sequence; the components are listed by component number *(see following illustration for constructing a component number).

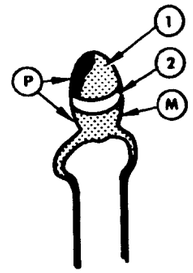
The schematic diagram and circuit board component location illustration have grids. A lookup table with the grid coordinates is provided for ease of locating the component. Only the components illustrated on the facing diagram are listed in the lookup table. When more than one schematic diagram is used to illustrate the circuitry on a circuit board, the circuit board illustration may only appear opposite the first diagram on which it was illustrated; the lookup table will list the diagram number of other diagrams that the circuitry of the circuit board appears on.

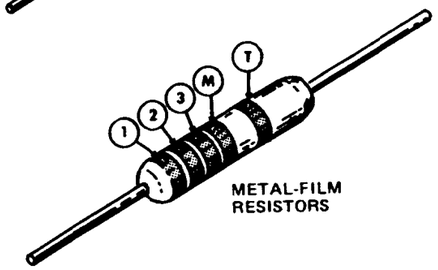


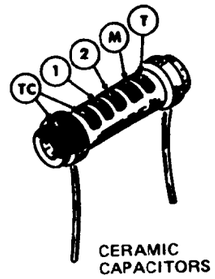
COLOR CODE











(1) (2) and (3) – 1st, 2nd, and 3rd significant figures
(M) –multiplier (T) –tolerance
(TC) –temperature coefficient
(P) –polarity and voltage rating

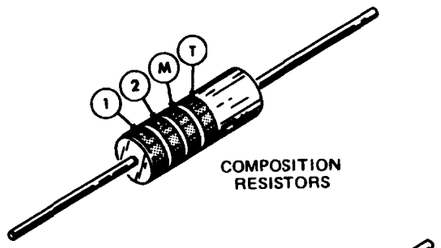
(T) and/or (TC) color code may not be present on some capacitors

COLOR	SIGNIFICANT FIGURES	RESISTORS		CAPACITORS			DIPPED TANTALUM VOLTAGE RATING
		MULTIPLIER	TOLERANCE	MULTIPLIER	TOLERANCE		
					over 10 pF	under 10 pF	
BLACK	0	1	---	1	±20%	±2 pF	4 VDC
BROWN	1	10	±1%	10	±1%	±0.1 pF	6 VDC
RED	2	10^2 or 100	±2%	10^2 or 100	±2%	---	10 VDC
ORANGE	3	10^3 or 1 K	±3%	10^3 or 1000	±3%	---	15 VDC
YELLOW	4	10^4 or 10 K	±4%	10^4 or 10,000	+100% –9%	---	20 VDC
GREEN	5	10^5 or 100 K	±½%	10^5 or 100,000	±5%	±0.5 pF	25 VDC
BLUE	6	10^6 or 1 M	±¼%	10^6 or 1,000,000	---	---	35 VDC
VIOLET	7	---	±1/10%	---	---	---	50 VDC
GRAY	8	---	---	10^{-2} or 0.01	+80% –20%	±0.25 pF	---
WHITE	9	---	---	10^{-1} or 0.1	±10%	±1 pF	3 VDC
GOLD	–	10^{-1} or 0.1	±5%	---	---	---	---
SILVER	–	10^{-2} or 0.01	±10%	---	---	---	---
NONE	–	---	±20%	---	±10%	±1 pF	---

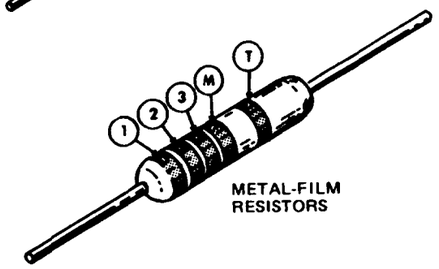
(1861-20A) 2662-48

Fig. 9-1. Color codes for resistors and capacitors.

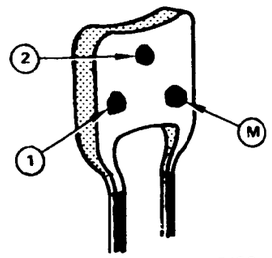
COLOR CODE



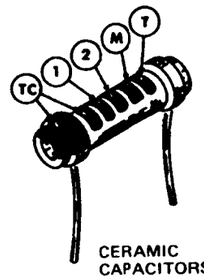
COMPOSITION RESISTORS



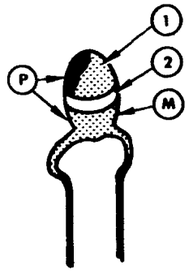
METAL-FILM RESISTORS



SMALL DISC CAPACITORS



CERAMIC CAPACITORS



DIPPED TANTALUM ELECTROLYTICS

(1) (2) and (3) – 1st, 2nd, and 3rd significant figures

(M) –multiplier (T) –tolerance

(TC) –temperature coefficient

(P) –polarity and voltage rating

(T) and/or (TC) color code may not be present on some capacitors

COLOR	SIGNIFICANT FIGURES	RESISTORS		CAPACITORS			DIPPED TANTALUM VOLTAGE RATING
		MULTIPLIER	TOLERANCE	MULTIPLIER	TOLERANCE		
					over 10 pF	under 10 pF	
BLACK	0	1	---	1	±20%	±2 pF	4 VDC
BROWN	1	10	±1%	10	±1%	±0.1 pF	6 VDC
RED	2	10^2 or 100	±2%	10^2 or 100	±2%	---	10 VDC
ORANGE	3	10^3 or 1 K	±3%	10^3 or 1000	±3%	---	15 VDC
YELLOW	4	10^4 or 10 K	±4%	10^4 or 10,000	+100% –9%	---	20 VDC
GREEN	5	10^5 or 100 K	±½%	10^5 or 100,000	±5%	±0.5 pF	25 VDC
BLUE	6	10^6 or 1 M	±¼%	10^6 or 1,000,000	---	---	35 VDC
VIOLET	7	---	±1/10%	---	---	---	50 VDC
GRAY	8	---	---	10^{-2} or 0.01	+80% –20%	±0.25 pF	---
WHITE	9	---	---	10^{-1} or 0.1	±10%	±1 pF	3 VDC
GOLD	–	10^{-1} or 0.1	±5%	---	---	---	---
SILVER	–	10^{-2} or 0.01	±10%	---	---	---	---
NONE	–	---	±20%	---	±10%	±1 pF	---

(1861-20A) 2662-48

Fig. 9-1. Color codes for resistors and capacitors.

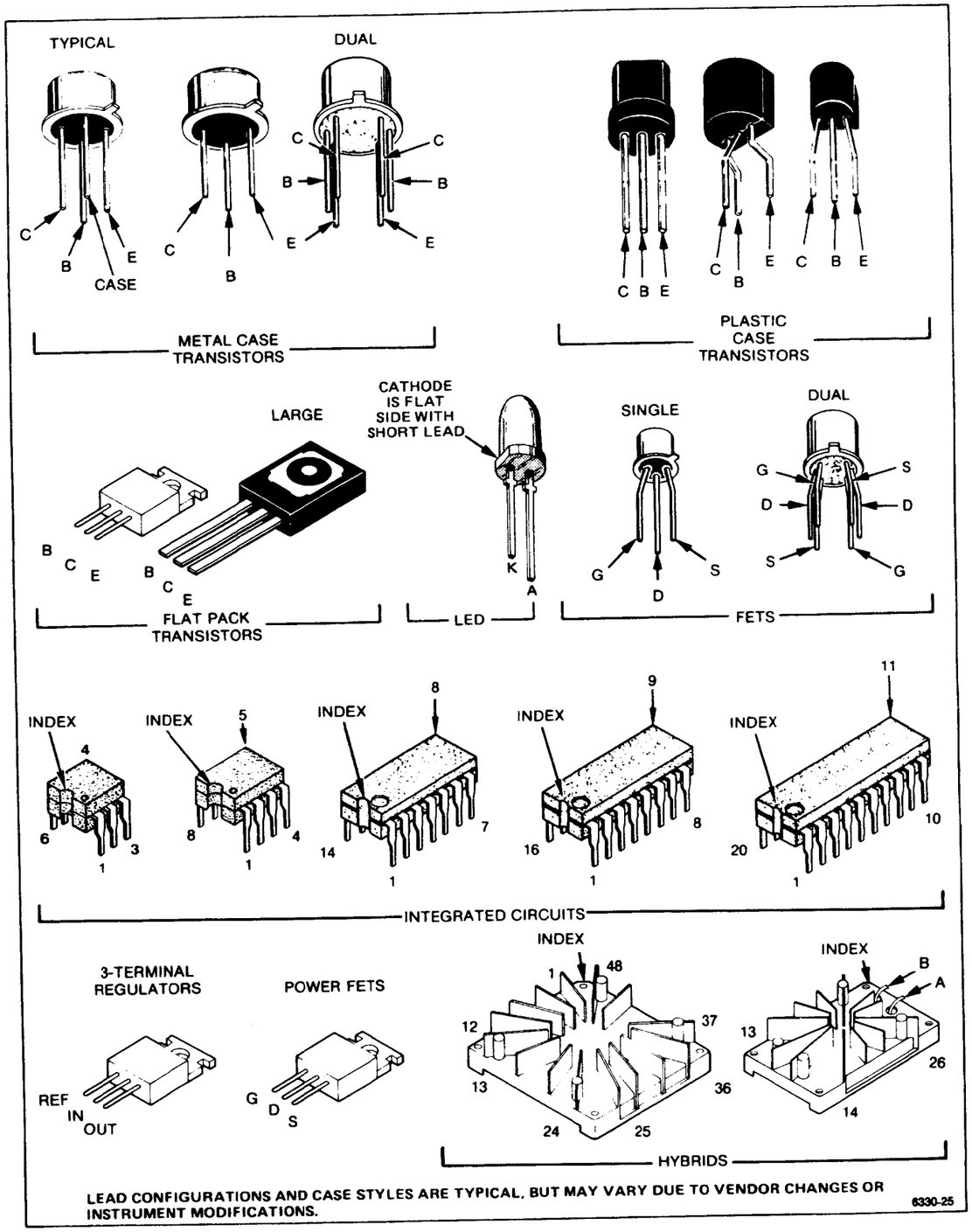


Fig. 9-2. Semiconductor lead configurations.

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d with its illustration and locate
area and shape on the illustra-

the Circuit Board Illustration and
f the desired component.

c Diagram Number in which the

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and circuit board illustrations.

3. Locate the Component on the Schematic Diagram

a. Locate and pull out tabbed page whose number and title correspond with the Schematic Diagram Number just determined in the table. Schematic diagram nomenclature and numbers are printed on the front side of the tabs (facing the front of the manual).

b. Scan the Component Location Table adjacent to the schematic diagram and find the Circuit Number of the desired component.

c. Under the SCHEM LOCATION column, read the grid coordinates for the desired component.

d. Using the Circuit Number and grid coordinates, locate the component on the schematic diagram.

A6 CRT BOARD

COMPONENTS LOCATED ON SCHEMATIC DIAGRAM 10

C602	C632	Q668	R625
C603	C641		R626
C609	C643	R604	R627
C671	C651	R605	R630
C615		R608	R632
C616	Q606	R609	
C617	Q610	R610	
C618	Q615	R614	
C619	Q645	R616	
C624	Q656	R623	
C626	Q665	R624	

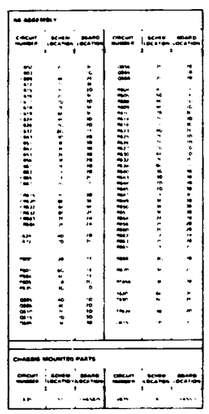
COMPONENTS LOCATED ON SCHEMATIC DIAGRAM 11

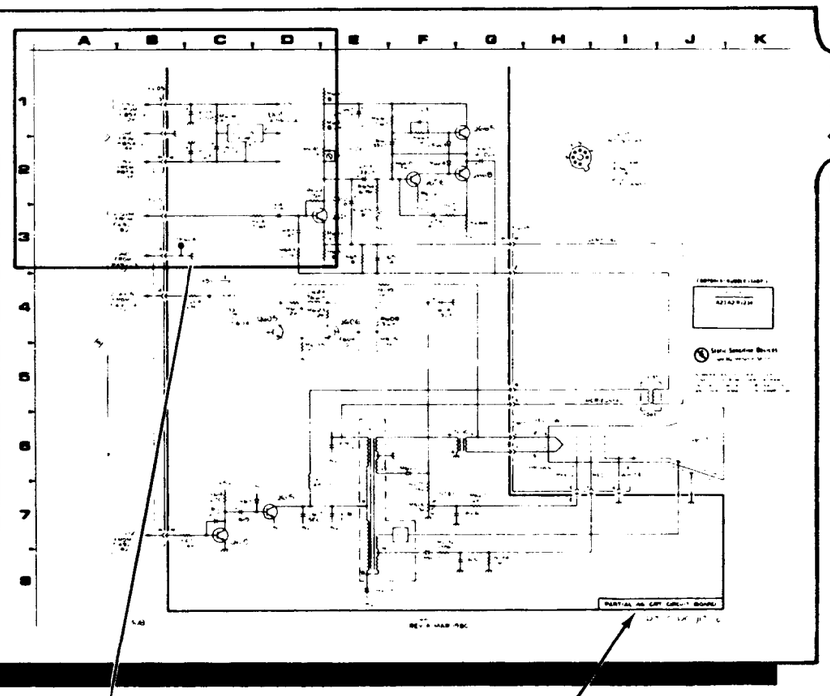
C670	Q670	R677	
C671	Q672	R679	
C673	Q673	R680	
C680			
C681	R671	U617	
P603	R673	U618	
P607	R674	U619	
Q669	R675		

CRT CIRCUIT DIAGRAM 10

MANUAL BINDER

COMPONENT LOCATION TABLE





PULL OUT PAGE TABS FOR SCHEMATIC DIAGRAMS

CRT CIRCUIT 10

MANUAL BINDER

PARTIAL A6 CRT CIRCUIT BOARD

CRT CIRCUIT 10

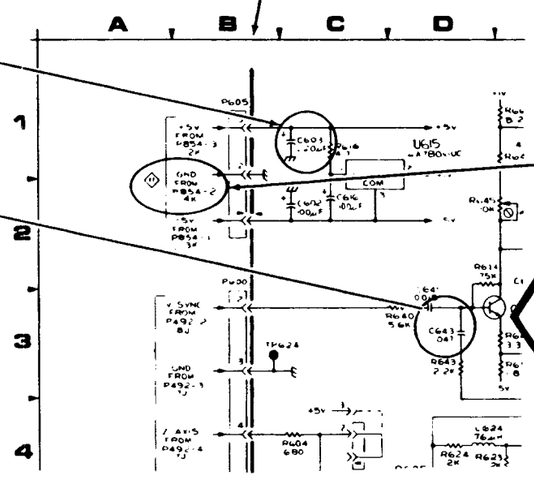
SCHEMATIC DIAGRAM NAME AND NUMBER

A6 ASSEMBLY

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C602	2C	3C	Q656	2F	2B
C603	1C	1G	Q665	1G	1B
C609	4E	[illegible]	Q668	2G	2B
C612	7C	3E			
C615	7C	3D	R604	4C	1E
C616	2C	3C	R605	5D	1E
C617	7D	3D	R608	4E	1D
C618	7E	3E	R609	4E	2D
C619	6E	3C	R610	7B	3E
C624	4F	3D	R614	7C	3D
C626	7G	2D	R616	1C	3D
C632	8G	1F	R623	4D	2E
C643	3D	4B	R625	7F	2D
C651	3E	3B	[illegible]	7F	2D
		3B	R627	7G	1D
			R630	4F	1D
[illegible]					
Q606	4E	2D			
Q610	7C	3D	TP624	3B	2D
Q615	7D	3D			
Q645	3E	3B	U615	1D	3C

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
L635	5I	CHASSIS	V635	6J	CHASSIS



Numeral and letter at signal lines to or from other diagrams indicates the grid coordinates on another schematic (for example: 4K)

To identify any component in a schematic diagram and to locate that component on its respective circuit board.

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To identify any component mounted on a circuit board and to locate that component in the appropriate schematic diagram

1. Locate the Circuit Board Illustration

a. Identify the particular circuit board that the component is located on by using the Circuit Board Location illustration (Figure 9-5) to determine the Assembly Number.

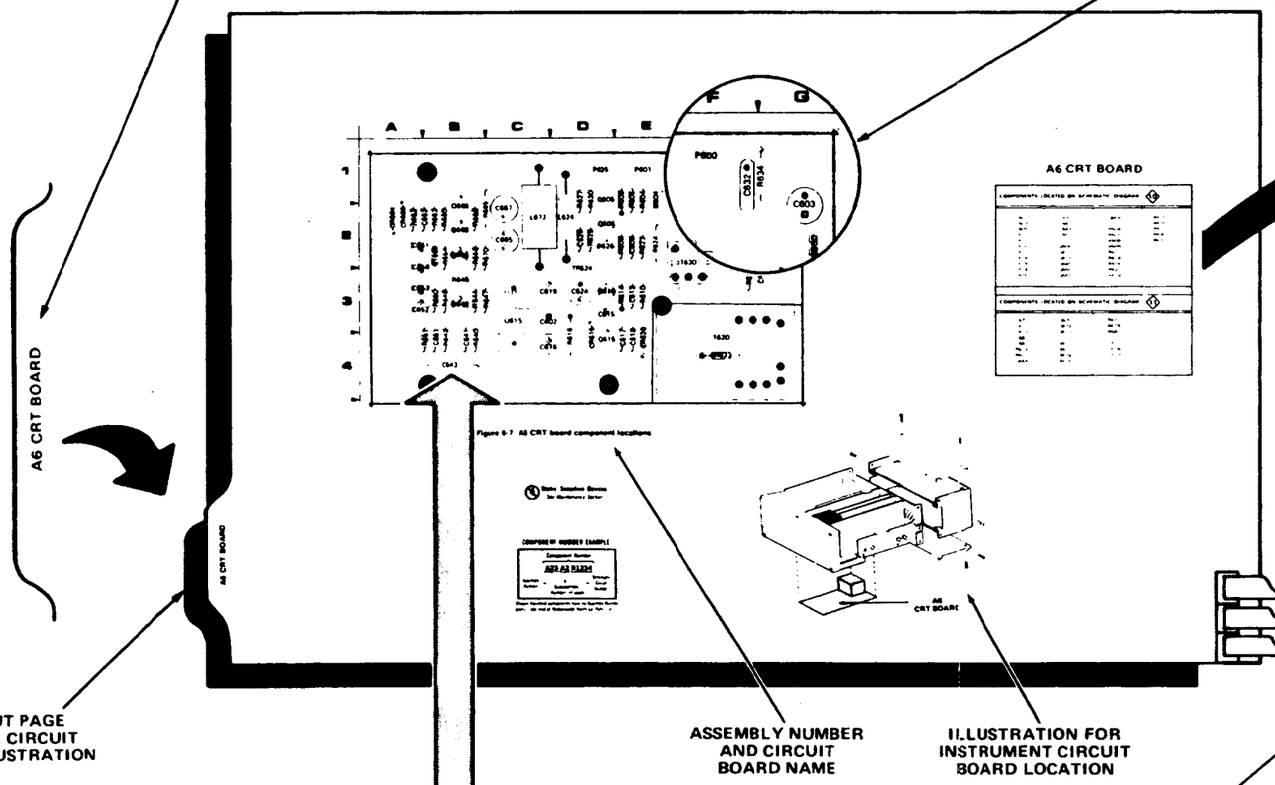
b. In the manual locate and pull out tabbed page whose title corresponds with the Assembly Number of the circuit board. Circuit board assembly numbers and board nomenclature are printed on the back side of the tabs (facing the rear of the manual).

2. Determine the Circuit Number

a. Compare the circuit board with its illustration and locate the desired component by area and shape on the illustration.

b. Scan the table adjacent to the Circuit Board Illustration and find the Circuit Number of the desired component.

c. Determine the Schematic Diagram Number in which the component is located.



A6 CRT BOARD

COMPONENTS LOCATED ON SCHEMATIC DIAGRAM 10			
C602	C632	Q668	R625
C603	C641		R626
C609	C643	R604	R627
C671	C651	R605	R630
C615		R608	R632
C616	Q606	R609	
C617	Q610	R610	
C618	Q615	R614	
C619	Q645	R616	
C624	Q656	R623	
C626	Q665	R624	

COMPONENTS LOCATED ON SCHEMATIC DIAGRAM 11			
C670	Q670	R677	
C671	Q672	R679	
C673	Q673	R680	
C680			
C681	R671	U617	
P603	R673	U618	
P607	R674	U619	
Q669	R675		

COMPONENT LOCATION TABLE

CRT CIRCUIT DIAGRAM 10

MANUAL BINDER

A6 ASSEMBLY

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
C602	2C	3C	Q656	2F	2B
C603	1C	1G	Q665	1G	1B
C609	4E	2E	Q668	2G	2B
C612	7C	3E			
C615	7C	3D	R604	4C	1E
C616	2C	3C	R605	5D	1E
C617	7D	3D	R608	4E	1D
C618	7E	3E	R609	4E	2D
C619	6E	3C	R610	7B	3E
C624	4F	3D	R614	7C	3D
C626	7G	2D	R616	1C	3D
C632	8G	1E	R623	4D	2E
C643	3D	4B	R625	7F	2D
C651	3E	3B	R626	7F	2D
		3B	R627	7G	1D
			R630	4E	1D
Q606	4E	2D			
Q610	7C	3D	TP624	3B	2D
Q615	7D	3D			
Q645	3E	3B	U615	1D	3C

CHASSIS MOUNTED PARTS

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
L635	5I	CHASSIS	V635	6J	CHASSIS

4. Determine the Circuit Board Illustration and Component Location

a. From the schematic diagram, determine the Assembly Number of the circuit board on which the component is mounted. This information is boxed and located in a corner of the heavy line that distinguishes the board outline.

b. Scan the Component Location Table for the Assembly Number just determined and find the Circuit Number of the desired component.

c. Under the BOARD LOCATION column, read the grid coordinates for the desired component.

5. Locate the Component on the Circuit Board

a. In the manual, locate and pull out the tabbed page whose title and Assembly Number correspond with the desired circuit board. This information is on the back side of the tabs.

b. Using the Circuit Number and grid coordinates, locate the component on the Circuit Board Illustration.

c. In the circuit board location illustration, determine the location of the circuit board in the instrument.

d. Find the circuit board in the instrument and compare it with its illustration in the manual to locate the desired component on the board.

Figure 9-3. Locating components on schematic diagrams and circuit board illustrations.

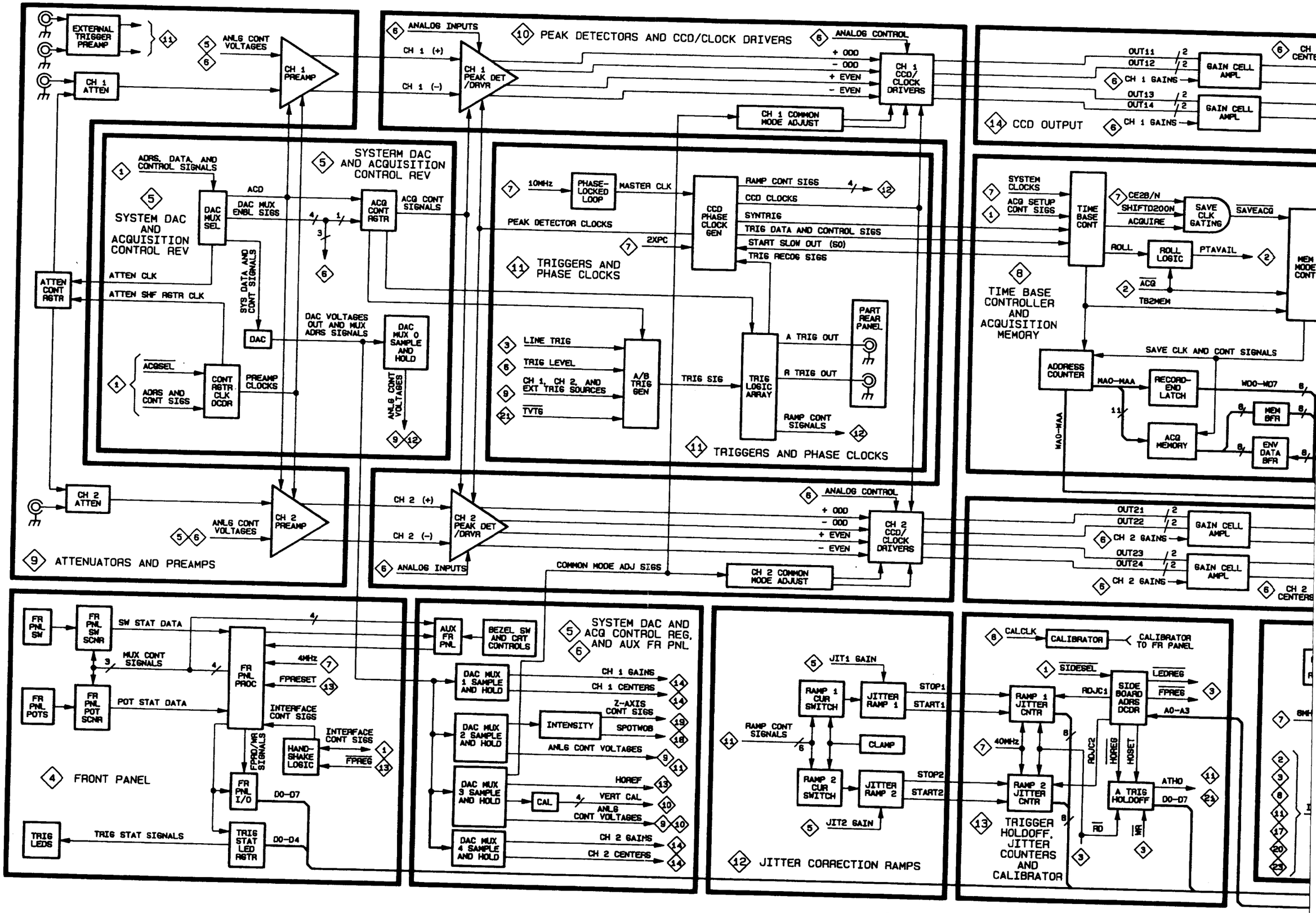


Figure 9-4a. 2440 Block diagram—part 1.

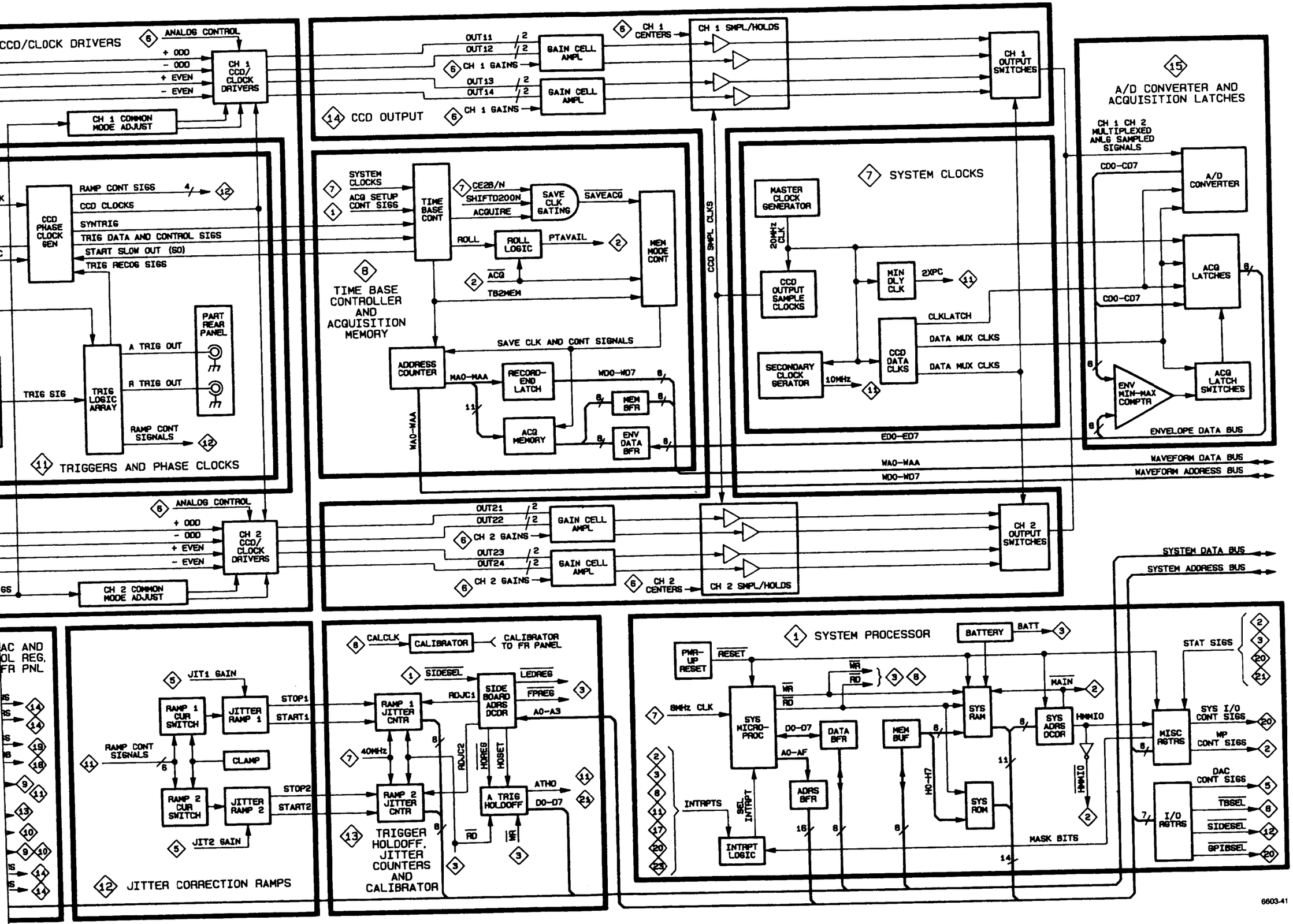


Figure 9-4a. 2440 Block diagram—part 1.

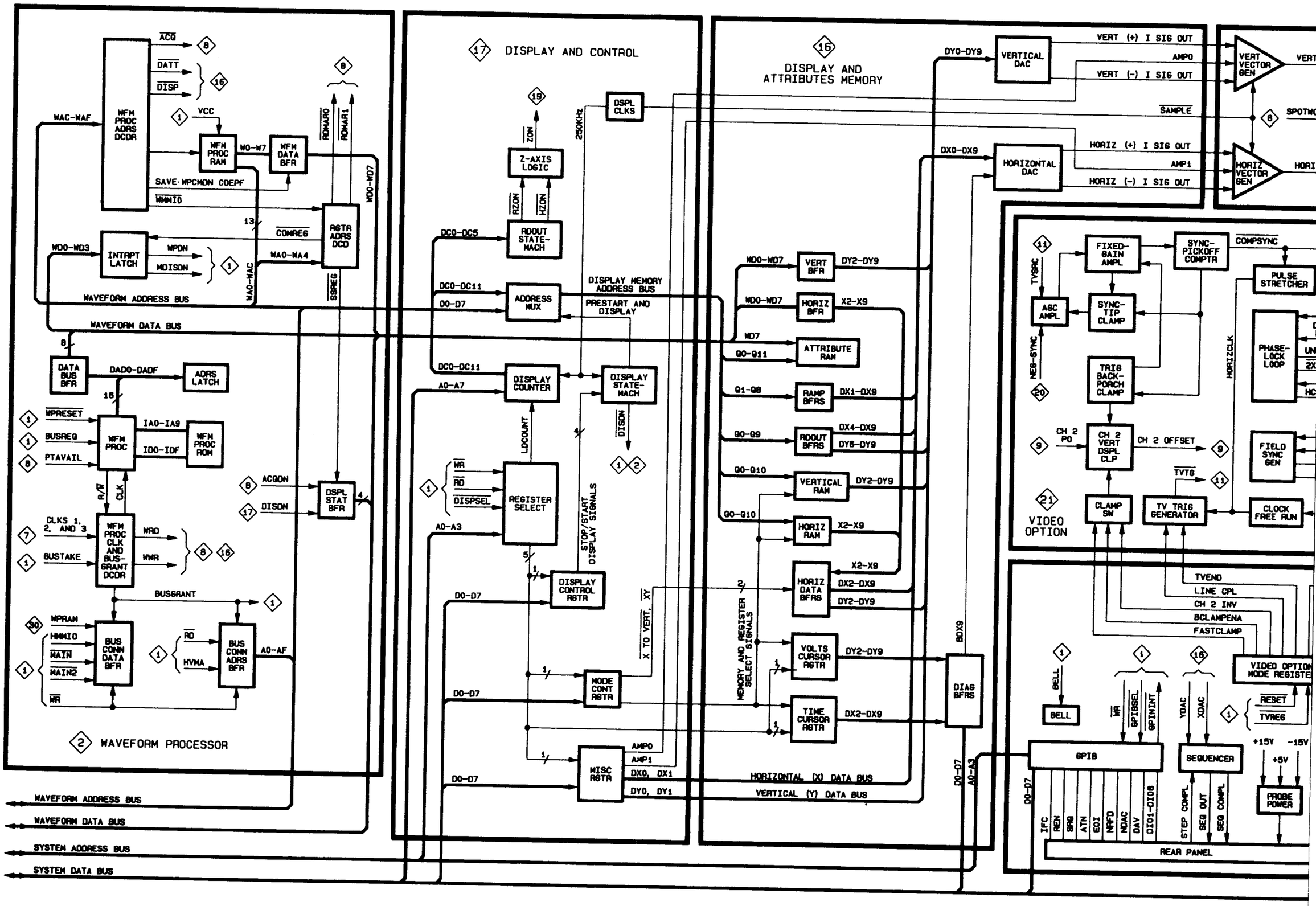


Figure 9-4b. 2440 Block diagram—part 2.

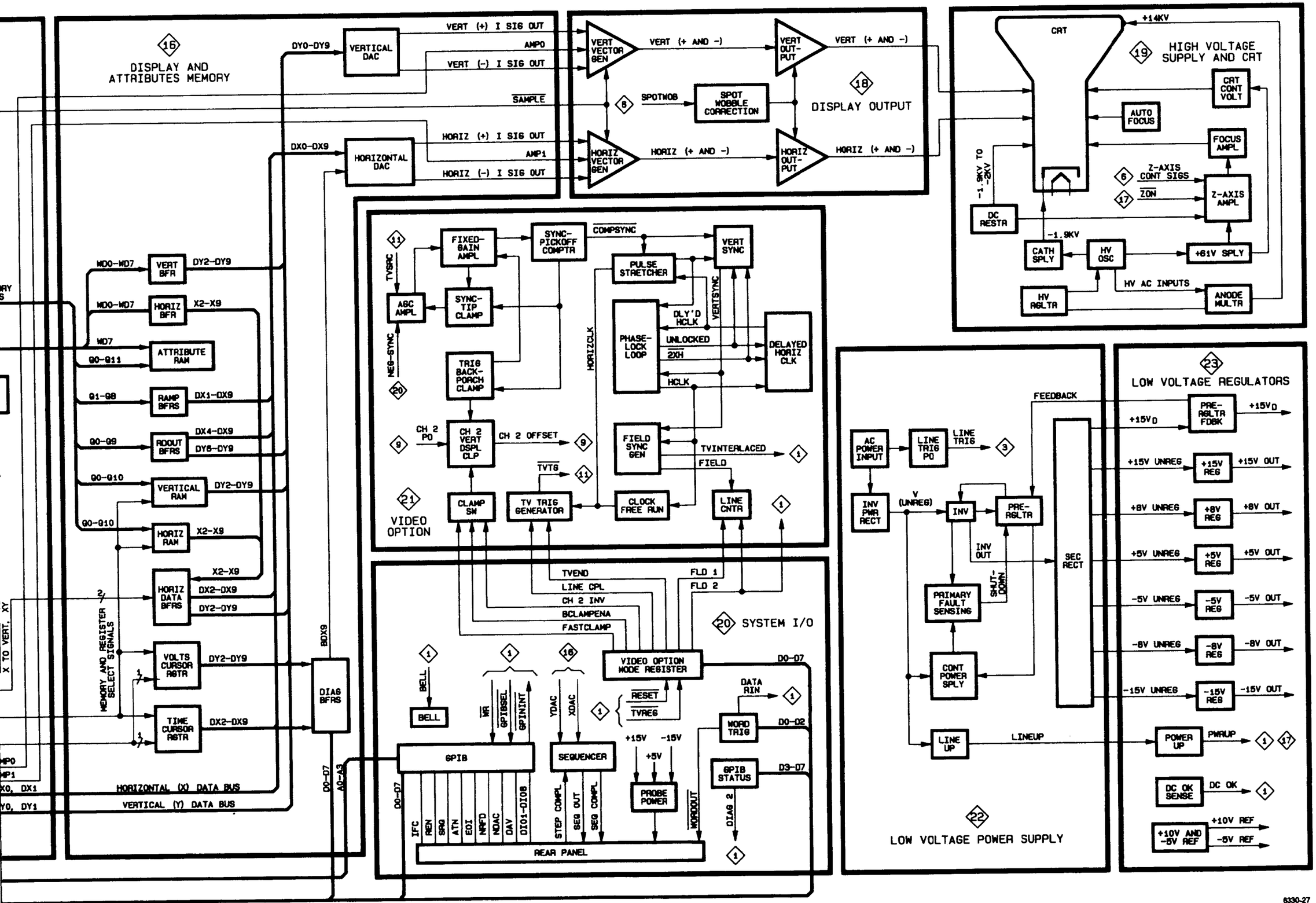


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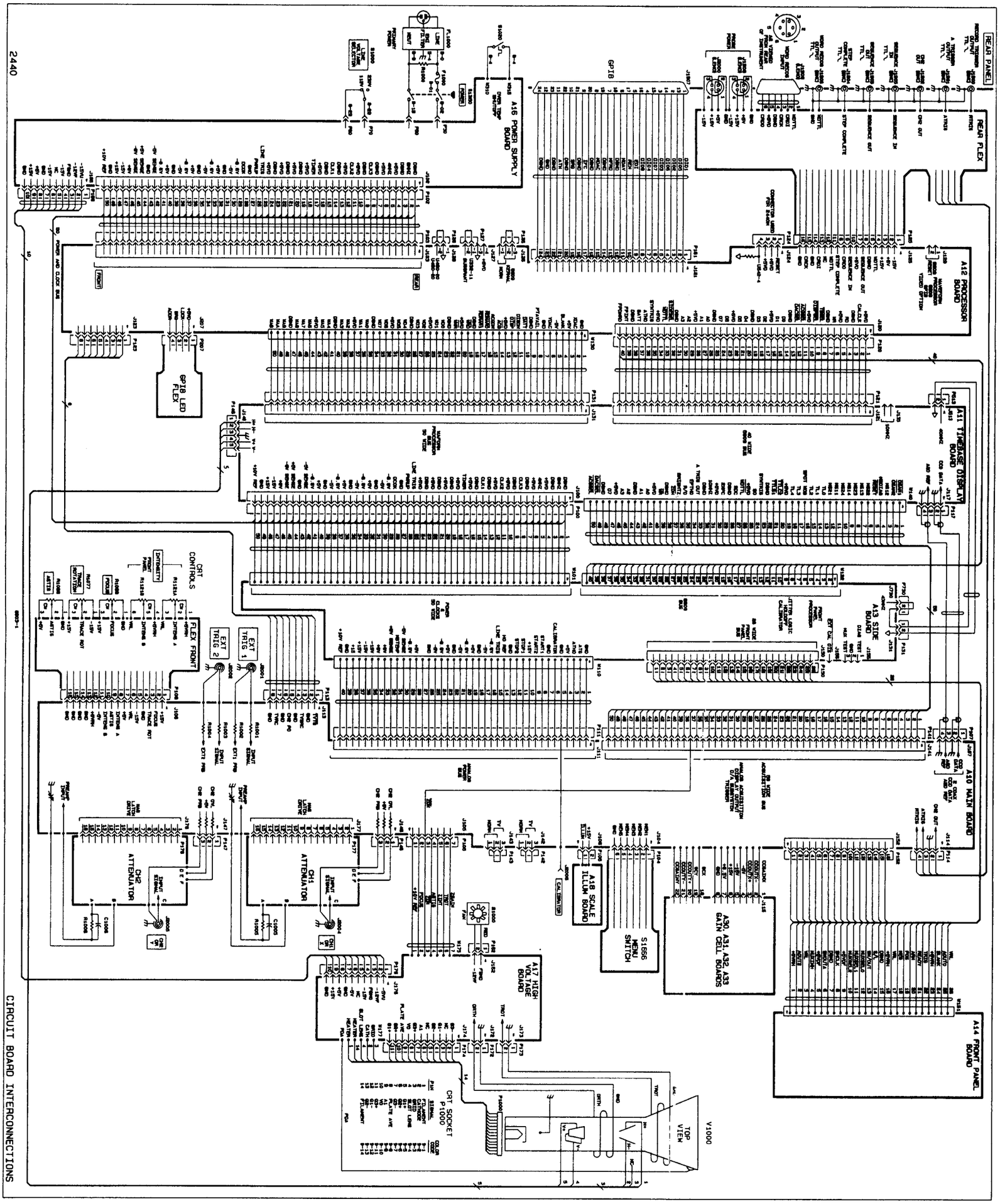
Figure 9-4b. 2440 Block diagram—part 2.

CIRCUIT BOARD INTERCONNECTIONS



TEST WAVEFORMS

Test waveforms for schematic diagrams (if applicable) precede the schematic. They are intended to aid in troubleshooting the instrument. Special conditions required of the test oscilloscope are given above the waveform; special conditions for the **2440** under test are given beneath the waveform. Unless otherwise stated, the test conditions for the first waveform listed pertain to all the waveforms for a given schematic diagram. Normal control settings for the test oscilloscope are given in the readouts shown in each waveform illustration.

RECOMMENDED TEST EQUIPMENT

Item	Specification	Example
Test oscilloscope with 10X probe and 1X probe (1X probe is optional accessory.)	Digital Storage; frequency response: dc to 40 MHz single event bandwidth to 150 MHz equivalent-time sampling.	TEKTRONIX 2440 Digital Oscilloscope with two 10X probes.
Calibration Generator	Standard-amplitude signal levels: 5 mV to 50 V. Accuracy ±3%.	TEKTRONIX PG 506 Calibration Generator.[a]
Digital Voltmeter (DMM)	Range 0 to 140 V. Dc voltage accuracy: ±0.15%. 4 1/2 digit display.	TEKTRONIX DM 501A Digital Multimeter.[a]
High Voltage Probe for DMM	Maximum voltage 20 kV.	Fluke Model 80K-40 High Voltage Probe.
Precision Coaxial Cable	Impedance: 50 ohm. Length: 36 in. Connectors: BNC.	Tektronix Part Number 012-0482-00.
Dual-Input Coupler	Connectors: BNC female-to-dual-BNC male.	Tektronix Part Number 103-0090-00.
Sync and Linearity Test Generator	Conforms to TV System requirements.	TEKTRONIX R147A NTSC Test Signal Generator. TEKTRONIX R148 Insertion Test Signal Generator.
Coaxial Cable (2 required)	Impedance: 75 ohm. Length: 42 in. Connectors: BNC.	Tektronix Part Number 012-0074-00.

[a]TM 500-Series Power-Module Mainframe required.

DC VOLTAGE MEASUREMENTS

Dc voltages indicated on the schematic diagrams are typical of a normally operating instrument. Voltages are with respect to chassis ground except in the isolated portion of the Low Voltage Power Supply, where they are with respect to the REF NODE indicated by the darker line in the Control Power Supply circuitry.

OTHER PARTS

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION
C1005	9	1G	P105	19	1C	P124	2	7M	P148	18	4M
F1000	22	2A	P105	19	8C	P125	20	1L	P148	16	6M
FL1000	22	1A	P105	6	4N	P125	20	4H	P150	3	1N
J30	22	2A	P106	6	3B	P126	1	6D	P150	3	2C
J60	22	2A	P107	14	6N	P127	2	2A	P150	3	6A
J70	22	4A	P108	19	1B	P128	2	6A	P150	3	6N
J80	22	5A	P108	6	3J	P131	16	1A	P150	3	7A
J1600	11	7K	P111	10	7E	P131	16	7A	P152	6	1J
J1601	11	6K	P111	10	6D	P131	17	1J	P152	6	2J
J1602	9	6N	P111	11	6A	P131	17	4K	P152	6	2M
J1603	20	1M	P111	11	7J	P131	18	3M	P162	19	7A
J1604	20	2M	P111	12	2M	P131	19	5A	P166	23	1M
J1605	20	2M	P111	13	7E	P131	19	8M	P166	23	2M
J1606	20	3N	P111	14	8G	P131	8	1E	P166	23	4M
J1607	20	2G	P111	6	8M	P131	8	1M	P166	23	5M
J1608	20	4G	P111	9	8F	P131	8	6M	P166	23	6M
J1609	20	4M	P113	11	7E	P131	8	7F	P172	19	2M
J2000	20	6M	P113	11	8A	P131	8	7L	P173	19	2G
J2001	9	7A	P113	9	3H	P141	10	2F	P174	19	1G
J2002	9	7A	P113	9	3N	P141	11	1A	P174	19	2G
J2004	9	1C	P114	11	6J	P141	11	5K	P174	19	2M
J2005	9	8C	P114	9	6N	P141	11	6E	P174	19	4M
L1000	19	1K	P117	15	3A	P141	11	6J	P176	19	6A
P100	17	4A	P120	1	1K	P141	11	6M	P181	19	2F
P100	18	3A	P120	1	2M	P141	11	7A	P207	20	6L
P100	7	2N	P120	1	4E	P141	14	2C	P613	7	1B
P100	7	7E	P120	1	6K	P141	14	2H	P1121	6	6F
P100	6	6F	P120	1	5A	P141	14	3B	R1000	22	2A
P102	22	1D	P120	1	6M	P141	14	4G	R1005	9	1G
P102	23	1M	P120	20	4J	P141	14	6C	R1077	19	1A
P102	23	3M	P120	20	5A	P141	14	6H	R1088	19	3A
P102	23	4E	P120	21	6H	P141	14	7B	R1089	19	2A
P102	23	4M	P121	17	1A	P141	14	8G	R1121A	6	4J
P102	23	6M	P121	18	2A	P141	19	8B	R1121B	6	3J
P103	1	4A	P121	6	1C	P141	5	1A	S1000	22	4A
P103	1	5A	P121	8	3A	P141	5	3M	S1020	22	3C
P103	1	6A	P121	6	5A	P141	6	5A	S1350	22	1A
P103	20	2A	P123	21	3A	P141	6	6G	S1666	6	2H
P103	2	1A	P123	21	6G	P146	9	1F	V1000	19	1K
P103	2	2A	P123	21	7N	P147	9	6F			
P104	6	1J	P124	2	6F	P148	18	2M			

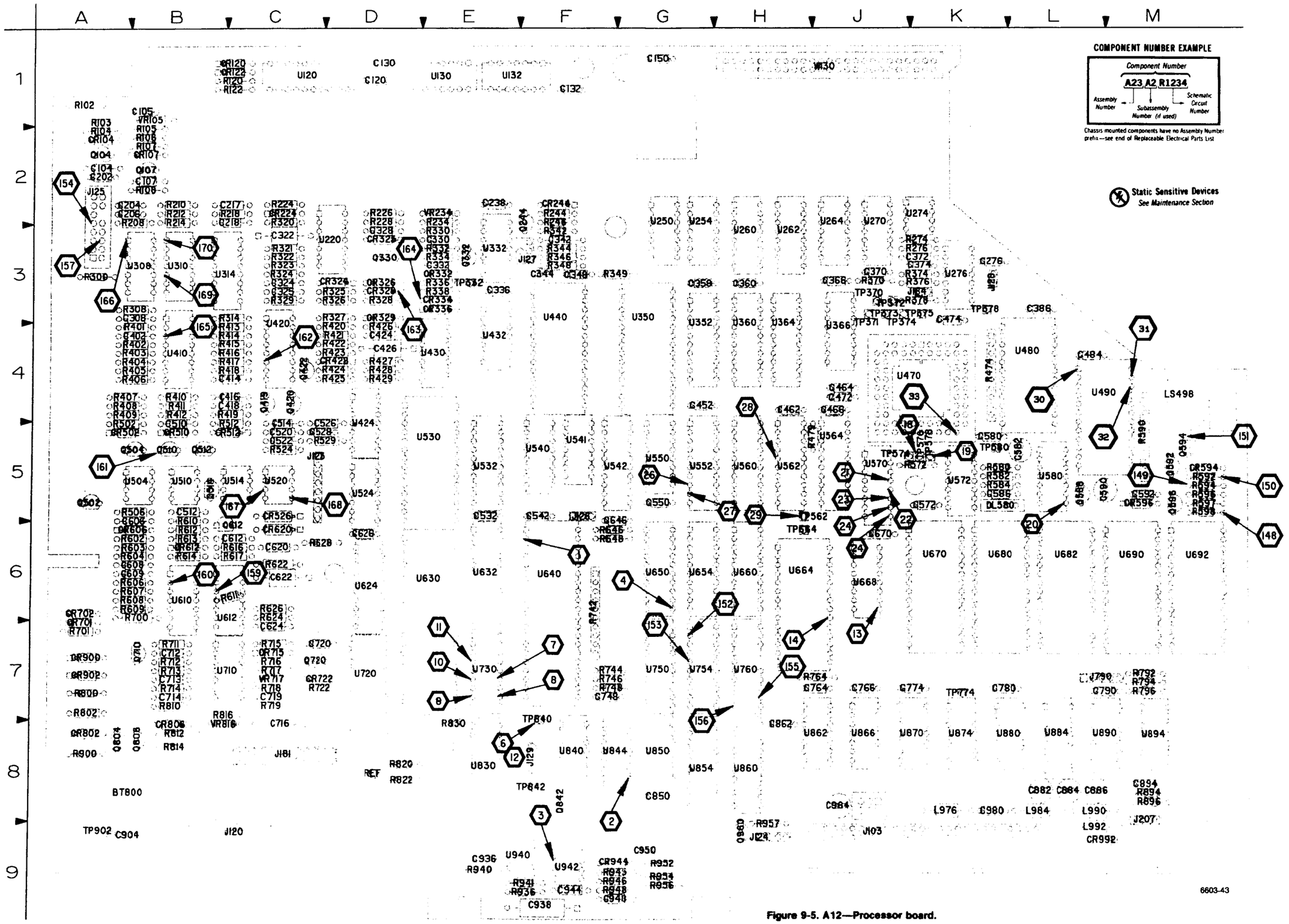


Figure 9-5. A12—Processor board.

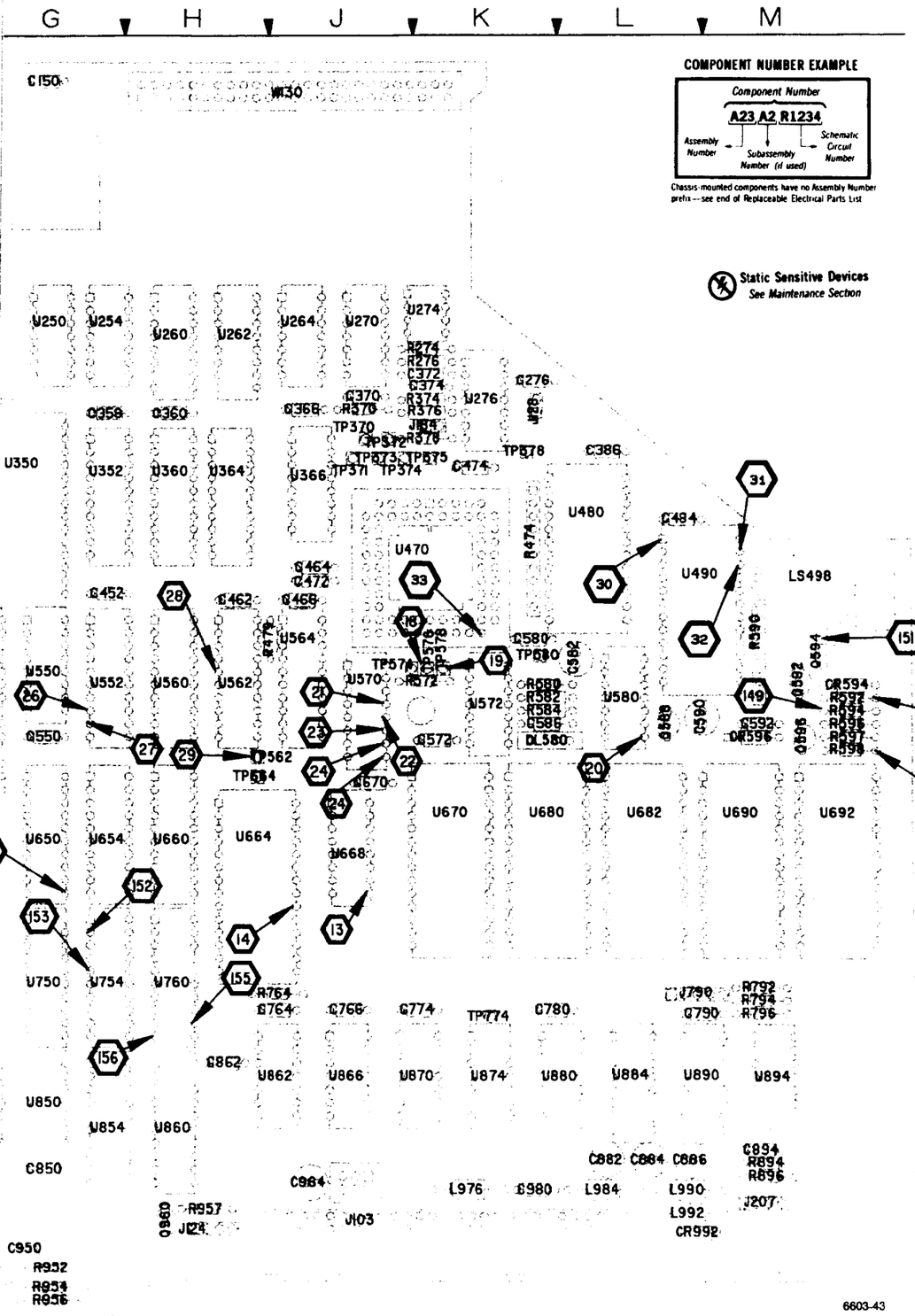
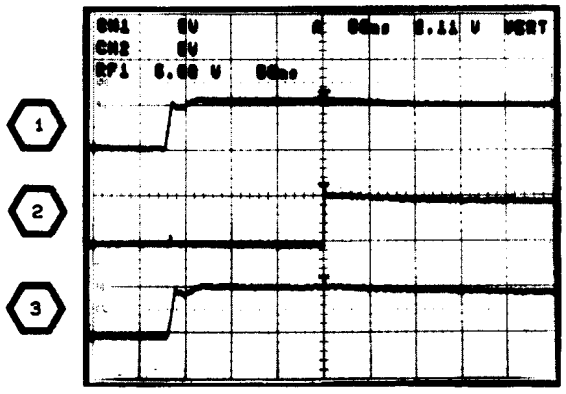


Figure 9-5. A12—Processor board.

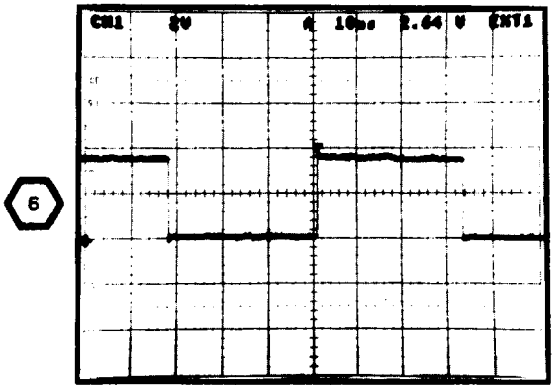
A12—PROCESSOR BOARD

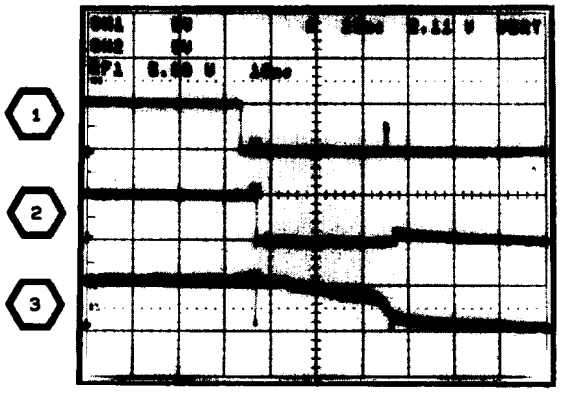
CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
BT800	1	C764	20			R404	21	R792	20	U432	2
		C766	20	LS498	20	R405	21	R794	20	U440	2
C104	20	C774	20			R406	21	R796	20	U470	2
C105	20	C780	20	Q104	20	R407	21	R800	1	U480	2
C107	20	C790	20	Q107	20	R408	21	R802	1	U490	2
C120	20	C850	20	Q244	2	R409	21	R810	21	U504	21
C130	20	C862	20	Q330	21	R410	21	R812	1	U510	21
C132	20	C882	20	Q332	2	R411	21	R814	1	U514	21
C150	20	C884	20	Q419	21	R412	21	R816	21	U520	21
C202	20	C886	20	Q420	21	R413	21	R820	1	U524	21
C204	20	C894	20	Q422	21	R414	21	R822	1	U530	21
C206	20	C904	1	Q502	21	R415	21	R830	1	U532	20
C217	21	C936	1	Q504	21	R416	21	R894	1	U540	2
C218	21	C936	20	Q510	21	R417	21	R896	1	U541	21
C238	20	C938	1	Q512	21	R418	21	R900	1	U542	2
C276	20	C944	1	Q514	21	R419	21	R936	1	U550	2
C308	21	C948	1	Q588	20	R420	21	R940	1	U552	2
C322	21	C950	1	Q592	20	R421	21	R941	1	U560	2
C324	21	C964	20	Q594	20	R422	21	R945	1	U562	2
C325	21	C980	20	Q596	20	R423	21	R946	1	U564	2
C328	21			Q612	21	R424	21	R948	1	U570	2
C330	21	CR104	20	Q710	21	R425	21	R952	1	U572	1
C332	21	CR107	20	Q720	20	R426	21	R954	1	U572	2
C336	20	CR120	20	Q804	1	R427	21	R956	1	U580	1
C342	2	CR122	20	Q806	1	R428	21	R957	2	U580	2
C344	2	CR224	21	Q842	1	R429	21			U610	21
C348	20	CR244	2	Q960	1	R474	2	TP332	20	U612	21
C358	20	CR324	21			R479	2	TP370	2	U624	20
C360	20	CR325	21	R102	21	R502	21	TP371	2	U630	20
C366	20	CR326	21	R103	20	R506	21	TP372	20	U632	1
C370	20	CR328	21	R104	20	R512	21	TP373	2	U640	1
C372	20	CR329	21	R105	20	R524	21	TP374	2	U650	1
C374	20	CR332	21	R106	20	R529	21	TP375	2	U654	1
C386	20	CR334	21	R107	20	R572	2	TP378	20	U660	1
C402	21	CR336	21	R108	20	R580	2	TP562	2	U664	1
C414	21	CR422	21	R120	20	R582	2	TP574	20	U668	1
C416	21	CR502	21	R122	20	R584	2	TP576	2	U670	1
C418	21	CR510	21	R208	21	R590	2	TP578	2	U680	1
C424	21	CR512	21	R210	21	R592	20	TP580	2	U682	1
C426	21	CR526	21	R212	21	R594	20	TP664	20	U690	1
C452	20	CR594	20	R214	21	R596	20	TP774	20	U692	1
C462	20	CR596	20	R218	21	R597	20	TP840	1	U710	21
C464	20	CR606	21	R224	21	R598	20	TP842	2	U720	20
C466	20	CR612	21	R226	21	R602	21	TP902	20	U730	1
C472	20	CR620	21	R228	21	R603	21			U750	20
C474	20	CR701	1	R234	21	R604	21	U120	20	U754	20
C484	20	CR702	1	R244	2	R606	21	U130	2	U760	1
C510	21	CR715	21	R246	2	R607	21	U132	2	U830	1
C512	21	CR722	20	R274	20	R608	21	U132	20	U840	1
C514	21	CR802	1	R276	20	R609	21	U220	21	U840	2
C520	21	CR806	1	R300	20	R610	21	U250	1	U844	1
C522	21	CR900	1	R308	21	R611	21	U250	2	U844	20
C526	21	CR902	1	R314	21	R612	21	U250	20	U850	1
C528	21	CR944	1	R320	21	R613	21	U254	1	U850	2
C532	20	CR992	20	R321	21	R614	21	U254	2	U854	1
C542	20			R322	21	R616	21	U260	2	U860	1
C550	20	DL580	2	R323	21	R617	21	U262	2	U862	1
C572	20			R324	21	R622	21	U264	2	U866	1
C580	20	J103	1	R325	21	R624	21	U264	20	U866	2
C582	2	J103	2	R326	21	R626	21	U270	2	U870	1
C586	2	J103	20	R327	21	R628	20	U270	20	U870	2
C590	20	J120	1	R328	21	R646	1	U274	20	U874	2
C592	20	J120	20	R329	21	R648	1	U276	2	U880	1
C606	21	J120	21	R330	21	R700	21	U308	21	U884	1
C608	21	J123	21	R332	20	R701	1	U310	21	U890	1
C609	21	J124	2	R334	21	R711	21	U314	21	U894	1
C612	21	J125	20	R336	21	R712	21	U332	1	U894	20
C620	21	J126	1	R338	21	R713	21	U332	2	U940	1
C622	21	J127	2	R342	2	R714	21	U332	20	U942	1
C624	21	J128	2	R344	2	R715	21	U350	2		
C626	20	J129	1	R346	2	R716	20	U352	2	VR105	20
C646	20	J181	20	R348	2	R717	20	U360	2	VR234	21
C670	20	J184	2	R349	2	R718	20	U364	2	VR717	20
C712	21	J207	20	R370	2	R719	21	U366	2	VR816	21
C713	21	J790	1	R374	2	R722	20	U410	21		
C714	21			R376	2	R742	1	U420	21	W130	2
C716	21	L976	20	R378	2	R744	1	U424	20	W130	20
C719	21	L984	20	R401	21	R746	1	U424	21		
C720	20	L990	20	R402	21	R748	1	U430	21		
C748	20	L992	20	R403	21	R764	1	U432	1		

WAVEFORMS FOR DIAGRAM 1



AT POWER ON





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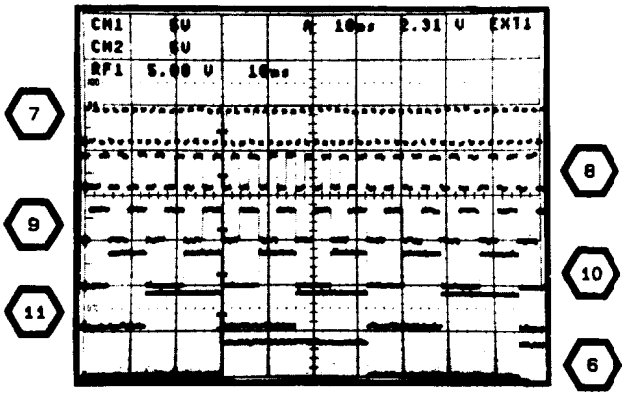
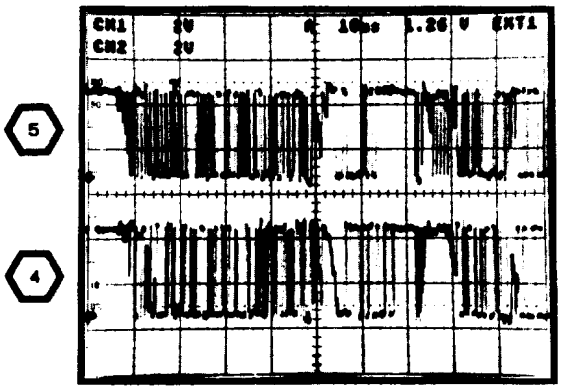
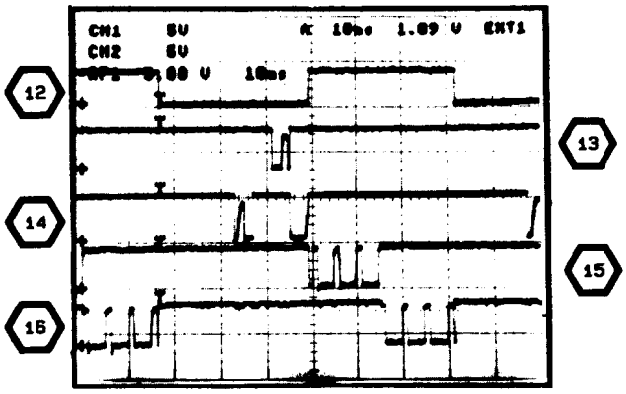
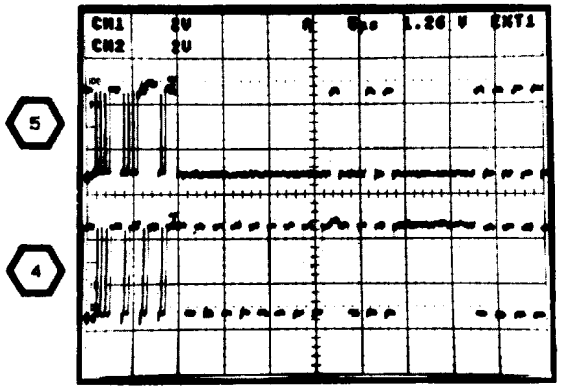


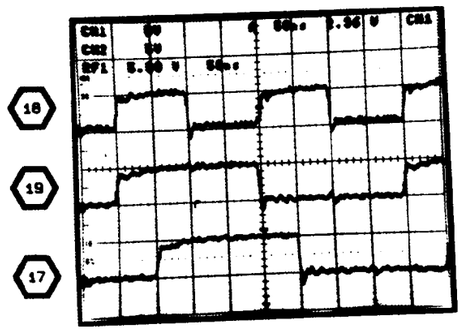


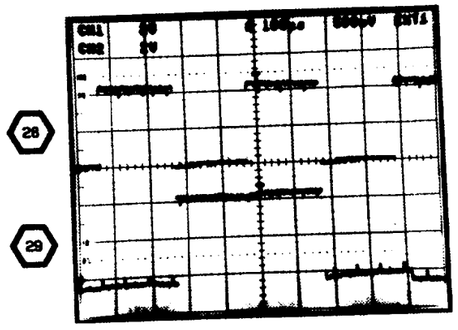


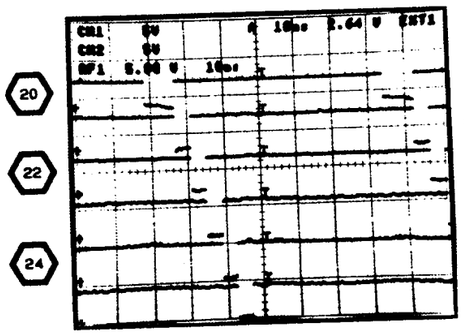


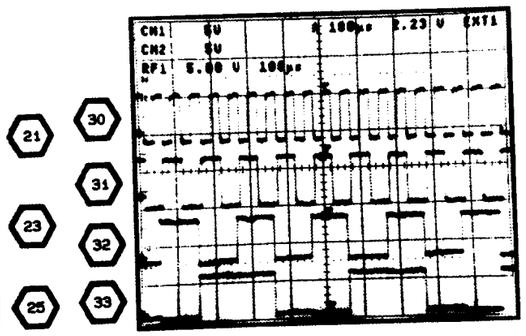
6285-32

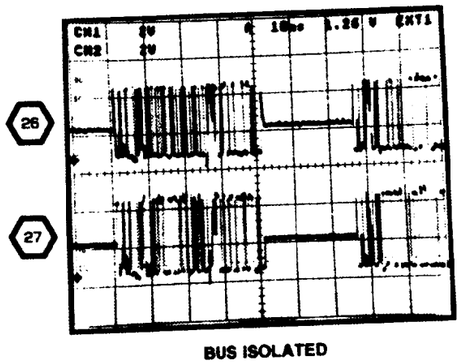
WAVEFORMS FOR DIAGRAM 2











BUS ISOLATED

WAVEFORM 34 IS NOT USED

6603-49

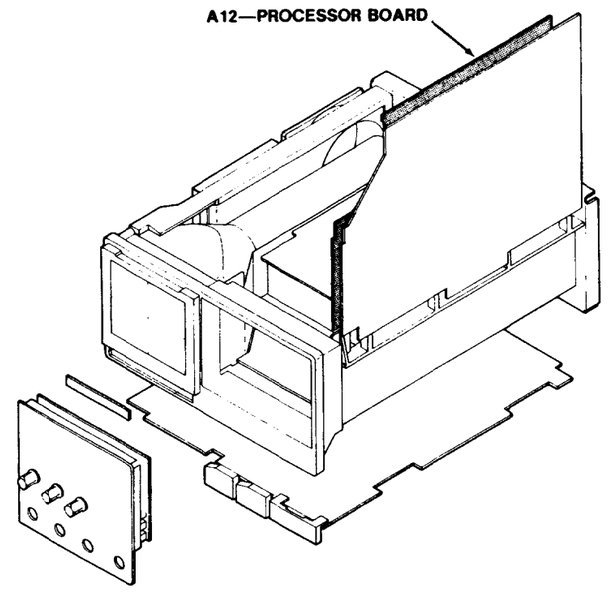
SYSTEM PROCESSOR 1

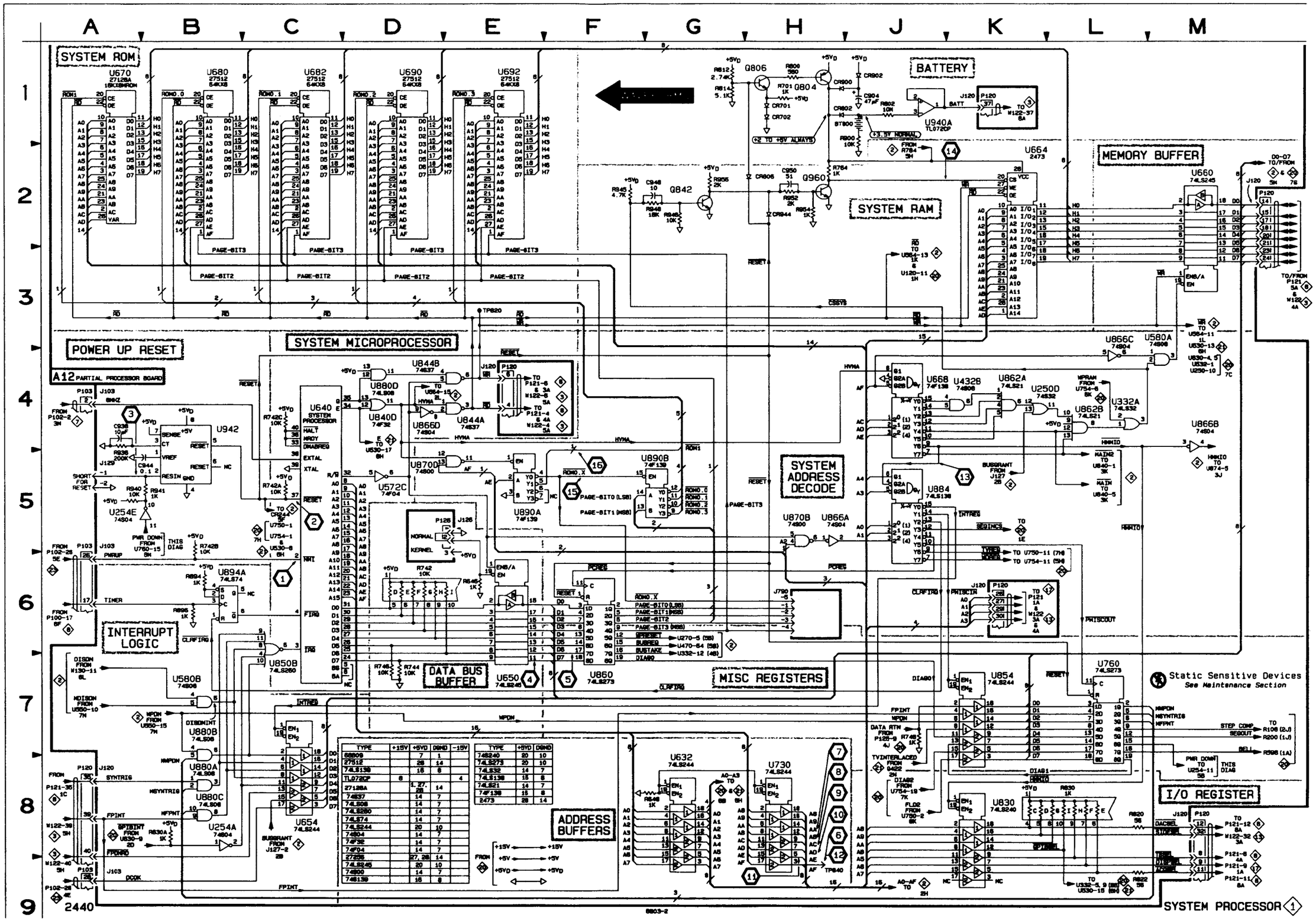
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A12											
BT800	1J	8A				R941	5A	9F	U730	8H	7E
			Q804	1H	8A	R945	2G	9F	U780	7L	7H
C904	1J	9B	Q806	1G	8B	R946	2G	9F	U830	8K	8E
C936	5A	9E	Q842	2G	8F	R948	2G	9F	U840D	4D	8F
C936	5A	9F	Q960	2H	9H	R952	2H	9G	U844A	4E	8F
C944	4B	9F				R954	2H	9G	U844B	4D	8F
C948	2G	9F	R646	6E	6G	R956	2H	9G	U844C	5A	8F
C950	2H	9G	R648	6G	6G				U850B	7C	8G
			R701	1H	7A	TP840	8H	8F	U854	7K	8G
CR701	1H	7A	R742A	5C	6F				U860	7F	8H
CR702	1H	6A	R742B	5A	6F	U250D	4K	3G	U862A	4K	8J
CR802	1H	8A	R742C	4C	6F	U254A	8B	3G	U862B	4L	8J
CR808	2H	8B	R742	6D	6F	U332A	4L	3E	U866A	5H	8J
CR900	1H	7A	R744	7D	7F	U432B	4K	4E	U866B	4M	8J
CR902	1J	7A	R746	7D	7F	U572C	5D	5K	U866C	3L	8J
CR944	2H	9G	R748	7J	7F	U580A	3M	5L	U866D	4D	8J
			R764	2H	7J	U580B	7B	5L	U870B	5H	8K
J103	4A	9J	R800	1H	7A	U632	8G	6E	U870D	5D	8K
J103	5A	9J	R802	1J	7A	U640	4C	6F	U880A	8B	8K
J103	9A	9J	R812	1G	8B	U650	7E	6G	U880B	7B	8K
J120	1K	9B	R814	1G	8B	U654	8C	6G	U880C	8B	8K
J120	2M	9B	R820	8L	8D	U660	2M	6H	U880D	4D	8K
J120	4E	9B	R822	9L	8D	U664	2K	6H	U884	5J	8L
J120	6K	9B	R830	8L	8E	U668	4J	6J	U890A	5E	8L
J120	8A	9B	R894	6B	8M	U670	1A	8J	U890B	5G	8L
J120	8M	9B	R898	6B	8M	U680	1B	6K	U894A	6B	8M
J126	5E	5F	R900	1J	8A	U682	1C	6L	U940A	1J	9F
J129	5A	8F	R936	5A	9F	U690	1D	6L	U940B	5A	9F
J790	6H	7L	R940	5A	9E	U692	1E	6M	U942	6B	9F

Partial A12 also shown on diagrams 2, 20, and 21.

OTHER PARTS

P103	4A	CHASSIS	P120	1K	CHASSIS	P120	6K	CHASSIS	P126	5D	CHASSIS
P103	5A	CHASSIS	P120	2M	CHASSIS	P120	8A	CHASSIS			
P103	9A	CHASSIS	P120	4E	CHASSIS	P120	8M	CHASSIS			



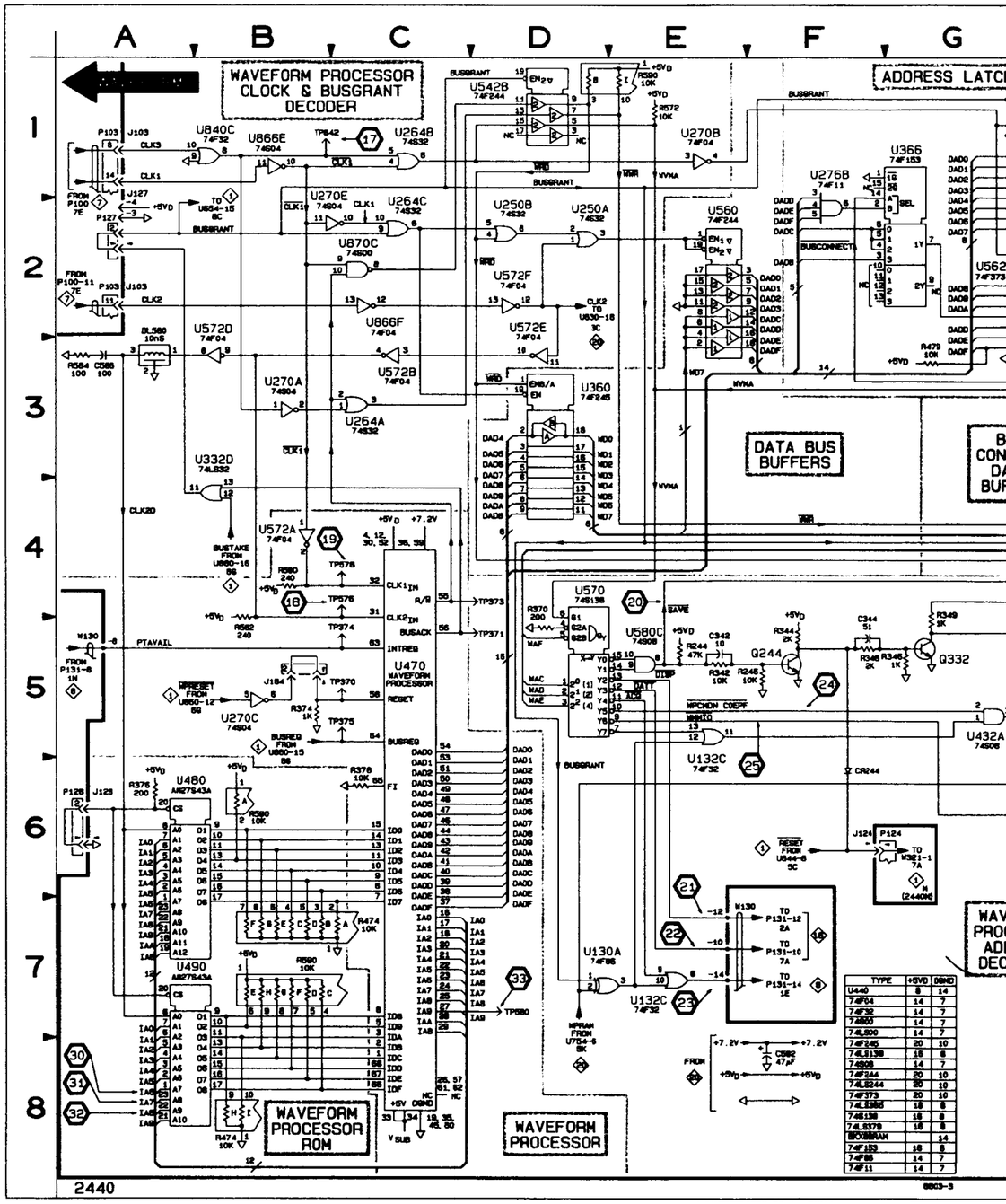

SYSTEM ROM
U670 27128A 16KX8EPROM
U680 27512 64KX8
U682 27512 64KX8
U690 27512 64KX8
U692 27512 64KX8
BATTERY
Q806
Q804
U940A TL072CP
MEMORY BUFFER
U660 74LS245
U664 2473
Q842
Q960
SYSTEM RAM
POWER UP RESET
A12 PARTIAL PROCESSOR BOARD
SYSTEM MICROPROCESSOR
U640 SYSTEM PROCESSOR
U942
U254E 74S04
U894A 74LS74
INTERRUPT LOGIC
U844B 74S37
U880D 74LS08
U840D 74F32
U866D 74S04
U844A 74S37
U870D 74S00
U572C 74F04
U890B 74F139
U890A 74F139
SYSTEM ADDRESS DECODE
U870B 74S00
U866A 74S04
U884 74LS138
U668 74F138
U4328 74S08
U862A 74LS21
U250D 74S32
U8628 74LS21
U332A 74LS32
U8668 74S04
U880B 74LS08
U880A 74LS08
U880C 74LS08
U254A 74S04
U5808 74S08
U850B 74LS260
DATA BUS BUFFER
U650 74LS245
U860 74LS273
MISC REGISTERS
U866C 74S04
U580A 74S08
U654 74LS244
U632 74LS244
U730 74LS244
ADDRESS BUFFERS
U854 74LS244
U760 74LS273
U830 74LS240
I/O REGISTER
Static Sensitive Devices
See Maintenance Section
2440
8803-2
SYSTEM PROCESSOR 1

WAVEFORM PROCESSOR (2)

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A12											
C342	5E	3F	R378	6C	3K	U254C	3K	3G	U552	3N	5G
C344	5F	3F	R474	7C	4K	U254D	3M	3G	U560	2E	5H
C582	6F	5L	R474	8B	4K	U254F	3K	3G	U562	3G	5H
C586	3A	5K	R479	3G	6B	U260	1K	3H	U564	1M	5J
			R572	1E	5K	U262	1J	3H	U570	4D	5J
CR244	6F	2F	R580	4B	5K	U264A	3C	3J	U572A	4B	5K
			R582	5B	5L	U264B	1C	3J	U572B	3C	5K
DL580	2A	5K	R584	3A	5K	U264C	2C	3J	U572D	2B	5K
			R590	1E	4M	U270A	3B	3J	U572E	2D	5K
J103	1A	9J	R590	6B	4M	U270B	1E	3J	U572F	2D	5K
J103	2A	9J	R590	7C	4M	U270C	5B	3J	U580C	5E	5L
J124	6F	9H	R957	7L	9H	U270D	6J	3J	U580D	4H	5L
J124	7M	9H				U270E	2B	3J	U840A	3K	8F
J127	1A	3F	TP370	5C	3J	U276B	1F	3K	U840B	3K	8F
J128	6A	3K	TP371	5C	3J	U332D	3B	3E	U840C	1B	8F
J184	5B	3K	TP373	4C	3J	U350	5J	3G	U850A	3L	8G
			TP374	5C	3J	U352	4K	4G	U866E	1B	8J
Q244	5F	3F	TP375	5C	3K	U360	3D	4H	U866F	2C	8J
Q332	5G	3E	TP562	2H	5H	U364	1H	4H	U870C	2C	8K
			TP576	4C	5K	U366	1G	4J	U874A	4K	8K
R244	5E	2F	TP578	4C	5K	U432A	5G	4E	U874B	3K	8K
R246	5E	3F	TP580	7D	5K	U432D	4L	4E	U874D	3J	8K
R342	5E	3F	TP642	1B	8F	U440	7J	3F			
R344	5F	3F				U470	5C	4K	W130	2N	1H
R346	5F	3F	U130A	7D	1E	U480	6A	4K	W130	5A	1H
R348	5F	3F	U132C	5E	1F	U490	7A	4L	W130	7E	1H
R349	4G	3F	U132C	7E	1F	U540	6K	5F	W130	7L	1H
R370	4D	3J	U250A	2D	3G	U542A	6L	5F			
R374	5B	3K	U250B	2D	3G	U542B	1D	5F			
R376	6A	3K	U254B	1H	3G	U550	6N	5G			

Patriot A12 also shown on diagrams 1, 20, and 21.

OTHER PARTS											
P103	1A	CHASSIS	P124	6F	CHASSIS	P127	2A	CHASSIS			
P103	2A	CHASSIS	P124	7M	CHASSIS	P128	6A	CHASSIS			



WAVEFORM PROCESSOR CLOCK & BUSGRANT DECODER

ADDRESS LATCH

BUS CONNECT ADDRESS BUFFER

DATA BUS BUFFERS

BUS CONNECT DATA BUFFER

WAVEFORM DATA BUFFER

DISPLAY STATUS BUFFER

WAVEFORM PROCESSOR ADDRESS DECODING

REGISTER ADDRESS DECODING

INTERRUPT LATCH

WAVEFORM PROCESSOR ROM

WAVEFORM PROCESSOR

WAVEFORM PROCESSOR RAM

TYPE	+5VD	DGND
U440	8	14
74F04	14	7
74F32	14	7
74S00	14	7
74LS00	14	7
74F245	20	10
74LS138	16	8
74S08	14	7
74F244	20	10
74LS244	20	10
74F373	20	10
74LS365	16	8
74S138	16	8
74LS379	16	8
8KX8SRAM		14
74F153	16	8
74F86	14	7
74F11	14	7

Static Sensitive Devices
See Maintenance Section

A12 PARTIAL PROCESSOR BOARD

2440

8803-3

WAVEFORM PROCESSOR 2

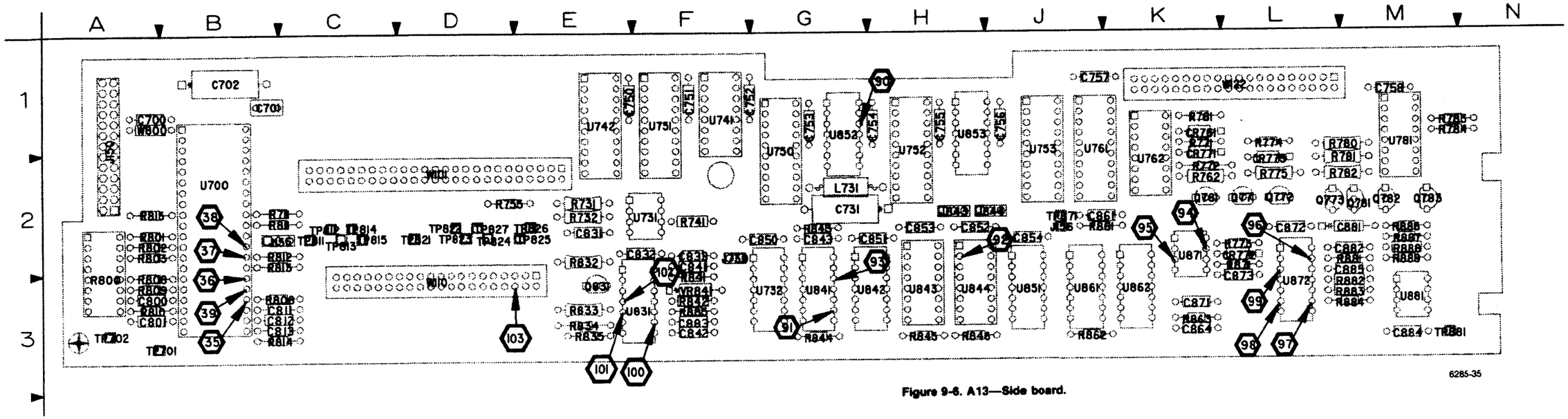
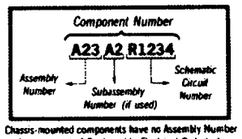


Figure 9-6. A13—Side board.

A13—SIDE BOARD

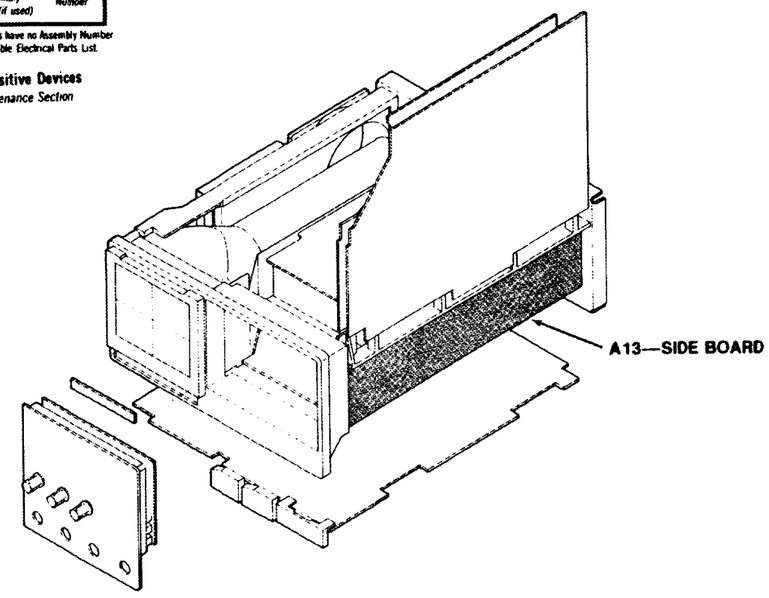
CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
C700	13	J150	3	R805	3	TP824	3
C701	3	J155	3	R806	3	TP825	3
C702	3	J156	13	R807	3	TP826	3
C731	13	J730	13	R808	3	TP826	13
C750	13	J843	13	R809	3	TP827	3
C751	13	J844	13	R810	3	TP871	13
C752	13			R811	3	TP881	3
C753	13	L731	13	R812	3		
C754	13			R813	3	U700	3
C755	13	Q761	13	R814	3	U731	13
C756	13	Q771	13	R815	3	U732	13
C757	13	Q772	13	R832	13	U741	3
C758	13	Q773	13	R833	13	U742	3
C800	3	Q781	13	R834	13	U750	13
C801	3	Q782	13	R835	13	U751	3
C811	3	Q783	13	R841	13	U752	13
C812	3	Q831	13	R842	13	U753	13
C813	3			R843	13	U761	13
C831	13	R701	3	R844	13	U762	13
C832	13	R711	3	R845	13	U781	13
C833	13	R731	13	R846	13	U831	13
C841	13	R732	13	R861	13	U841	13
C842	13	R741	13	R862	3	U842	13
C843	13	R750	13	R863	13	U843	13
C850	13	R751	13	R871	13	U844	13
C851	13	R752	13	R881	13	U851	13
C852	13	R753	13	R882	13	U852	13
C853	13	R755	13	R883	13	U853	13
C854	13	R761	13	R884	13	U861	3
C861	13	R762	13	R885	13	U862	3
C864	13	R771	13	R886	13	U871	13
C871	13	R772	13	R887	13	U872	13
C872	13	R773	13	R888	13	U881	13
C873	13	R774	13	R889	13		
C881	13	R775	13			VR841	13
C882	13	R780	13	TP701	3		
C883	13	R781	13	TP702	3	W101	3
C884	13	R782	13	TP811	3	W110	3
C885	13	R783	13	TP812	3	W110	13
		R784	13	TP813	3	W122	3
CR761	13	R800	3	TP814	3	W122	13
CR771	13	R801	3	TP815	3	W800	3
CR772	13	R802	3	TP821	3		
CR773	13	R803	3	TP822	3		
		R804	3	TP823	3		

COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List.

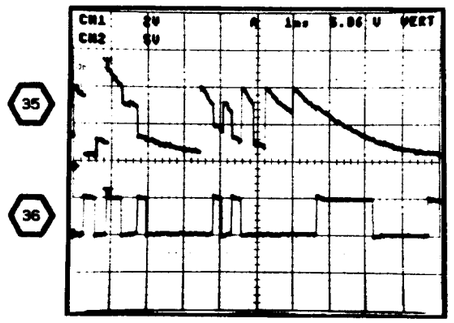
Static Sensitive Devices
See Maintenance Section

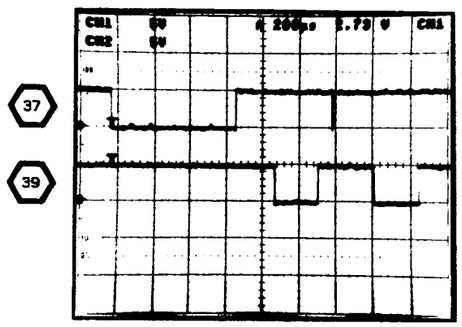


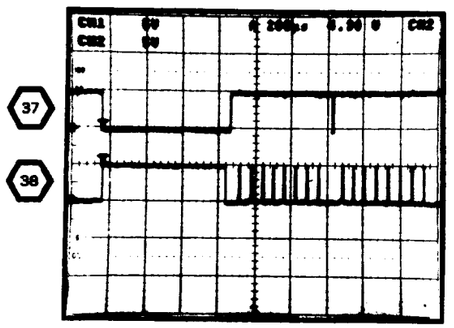
FRONT PANEL PROCESSOR ◇3

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A13											
C701	4K	1C	R800D	7M	3A	R862	4G	3J	U741	1K	1G
C702	2B	1B	R800E	7M	3A				U742	3F	2G
C800	6L	3A	R800F	6M	3A	TP701	2B	3B	U751	1H	2H
C801	8J	3A	R800G	8H	3A	TP702	2B	3A	U861A	4G	3J
C811	7J	3C	R800H	7H	3A	TP811	1B	2C	U861B	5G	3J
C812	7J	3C	R801	4K	2A	TP812	1B	2C	U862A	5F	3J
C813	8J	3C	R802	7L	2A	TP813	3B	2C	U862B	5E	3J
			R803	7L	2A	TP814	1B	2C	U862C	5E	3J
J150	1M	2A	R804	7L	2A	TP815	3B	2C	U862D	5F	3J
J150	2C	2A	R805	7L	3A	TP821	1B	2D			
J150	6A	2A	R806	6K	3C	TP821	2B	2D	W101	1A	2E
J150	6M	2A	R807	6L	3C	TP822	2B	2D	W101	6A	2E
J150	7A	2A	R808	7H	3A	TP823	3B	2D	W110	1C	3D
J155	4L	2B	R809	7H	3A	TP824	2B	2D	W110	2C	3D
			R810	4L	3B	TP825	1B	2E	W110	7A	3D
R701	5L	2A	R811	6L	2B	TP826	2B	2E	W122	4A	1L
R711	6L	2B	R812	6J	2B	TP827	6B	2D	W122	5H	1L
R800A	6H	3A	R813	4L	2B	TP881	2C	3M	W122	8A	1L
R800B	7M	3A	R814	8H	3C				W800	5L	1A
R800C	7M	3A	R815	7J	2A	U700	5K	2B			
Partial A13 also shown on diagram 13.											
OTHER PARTS											
P150	1N	CHASSIS	P150	6A	CHASSIS	P150	7A	CHASSIS			
P150	2C	CHASSIS	P150	6N	CHASSIS						

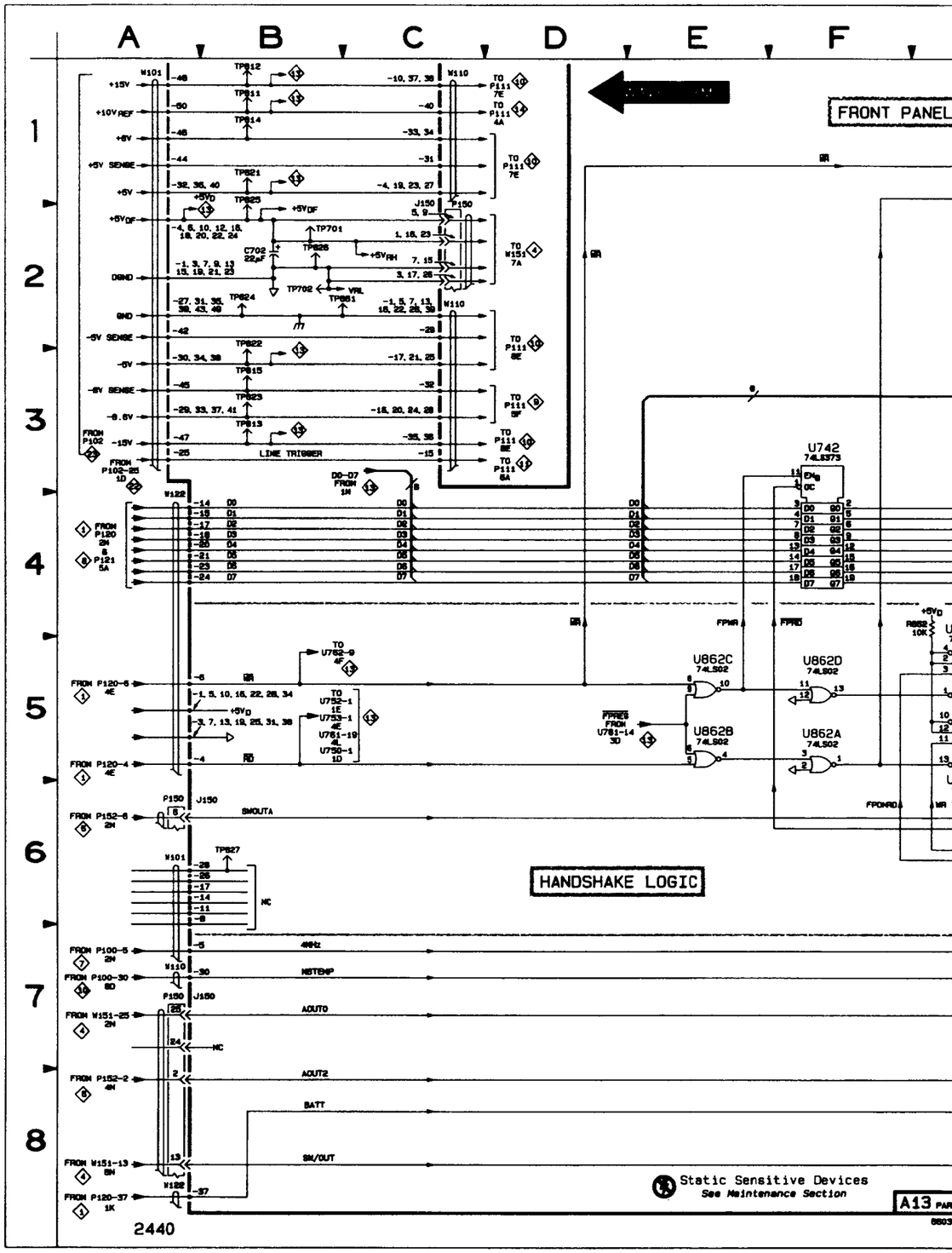
WAVEFORMS FOR DIAGRAM 3







6330-32



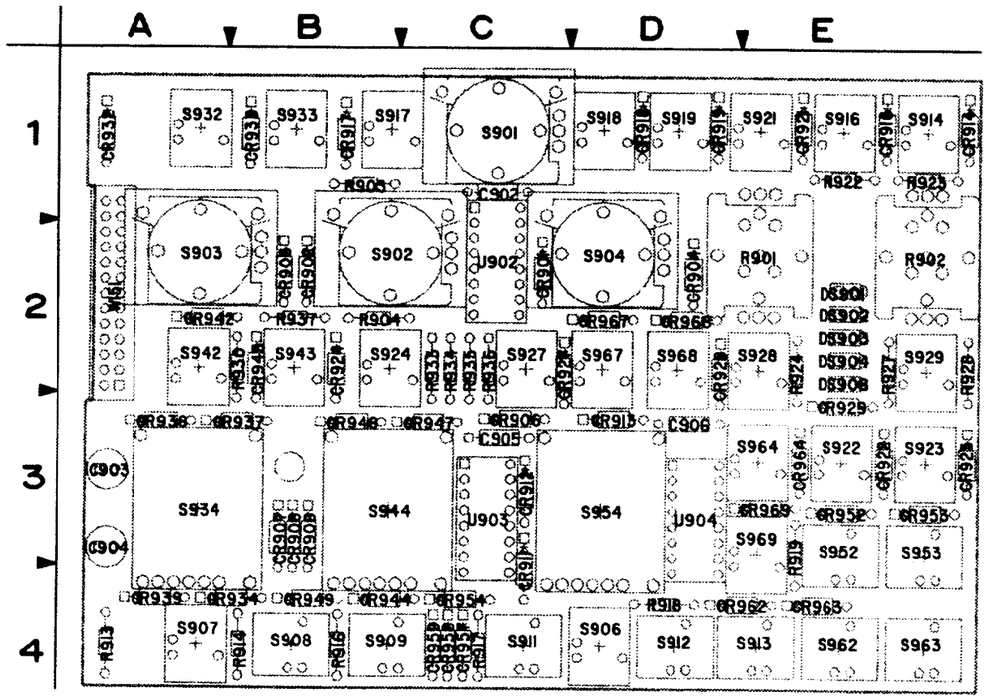


Figure 9-7. A14—Front Panel board.

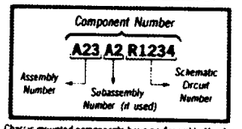
Figure 9-7. A14—Front Panel board.

FIG. 9-7
A14—FRONT PANEL BOARD

A14—FRONT PANEL BOARD

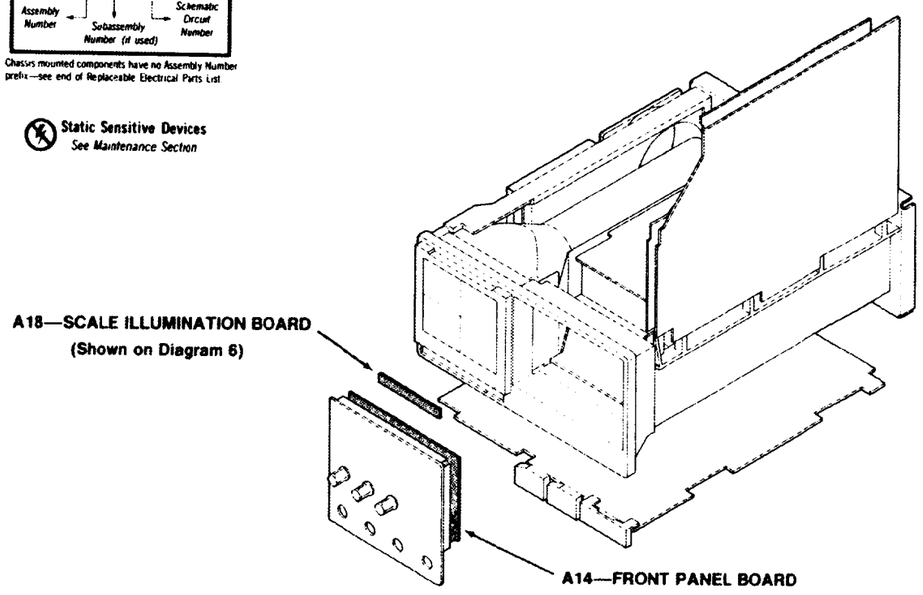
CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
C902	4	CR919	4	CR953	4	R904	4	S903	4	S932	4
C903	4	CR921	4	CR954	4	R913	4	S904	4	S933	4
C904	4	CR922	4	CR957	4	R914	4	S906	4	S934	4
C905	4	CR923	4	CR958	4	R916	4	S907	4	S942	4
C906	4	CR924	4	CR959	4	R917	4	S908	4	S943	4
		CR927	4	CR962	4	R918	4	S909	4	S944	4
CR901	4	CR928	4	CR963	4	R919	4	S911	4	S952	4
CR902	4	CR929	4	CR964	4	R922	4	S912	4	S953	4
CR903	4	CR932	4	CR967	4	R923	4	S913	4	S954	4
CR904	4	CR933	4	CR968	4	R924	4	S914	4	S962	4
CR906	4	CR934	4	CR969	4	R927	4	S916	4	S963	4
CR907	4	CR937	4			R928	4	S917	4	S964	4
CR908	4	CR938	4	DS901	4	R930	4	S918	4	S967	4
CR909	4	CR939	4	DS902	4	R933	4	S919	4	S968	4
CR911	4	CR942	4	DS903	4	R934	4	S921	4	S969	4
CR912	4	CR943	4	DS904	4	R935	4	S922	4		
CR913	4	CR944	4	DS906	4	R936	4	S923	4	U902	4
CR914	4	CR947	4			R937	4	S924	4	U903	4
CR916	4	CR948	4	R901	4			S927	4	U904	4
CR917	4	CR949	4	R902	4	S901	4	S928	4		
CR918	4	CR952	4	R903	4	S902	4	S929	4	W151	4

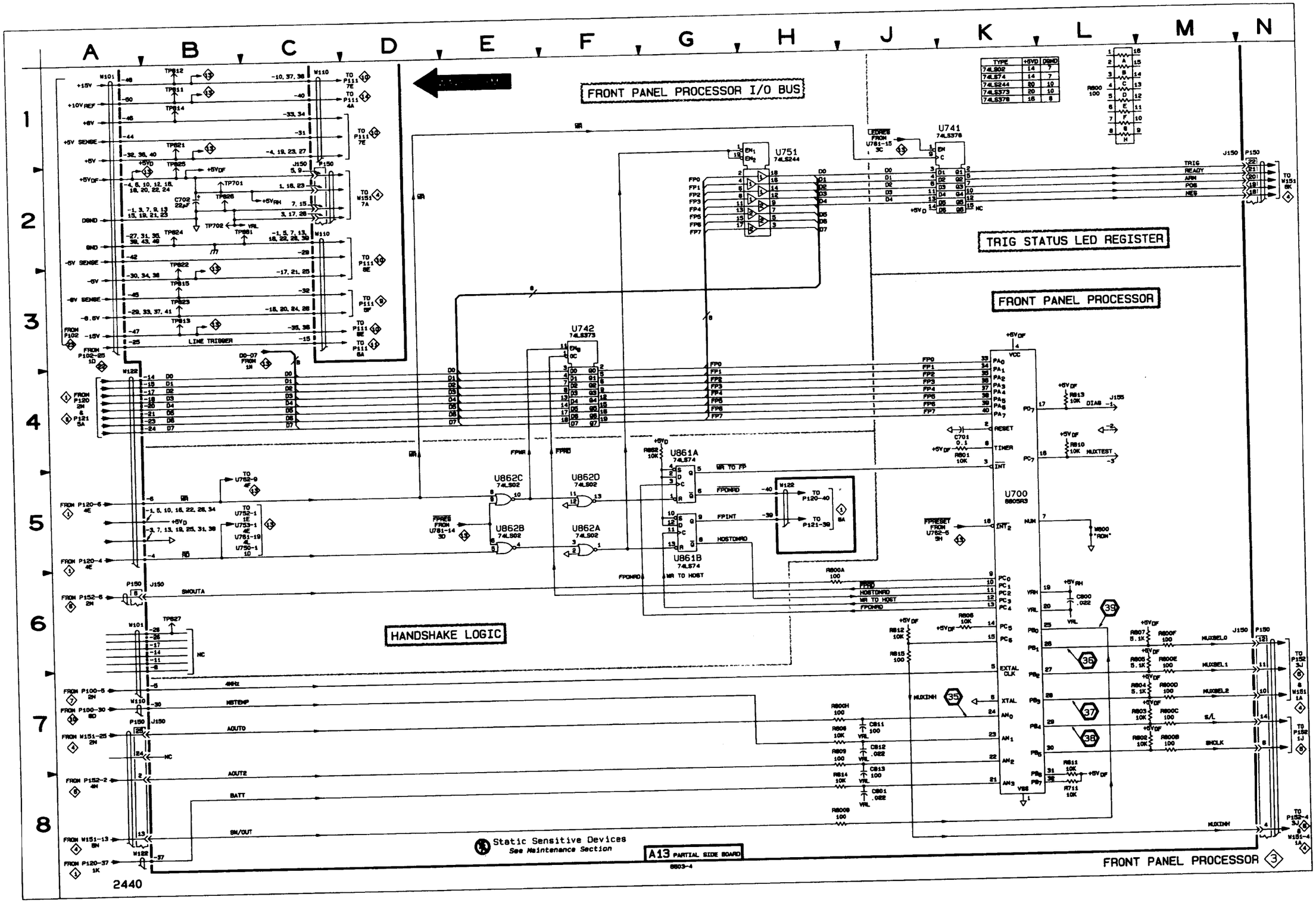
COMPONENT NUMBER EXAMPLE



Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

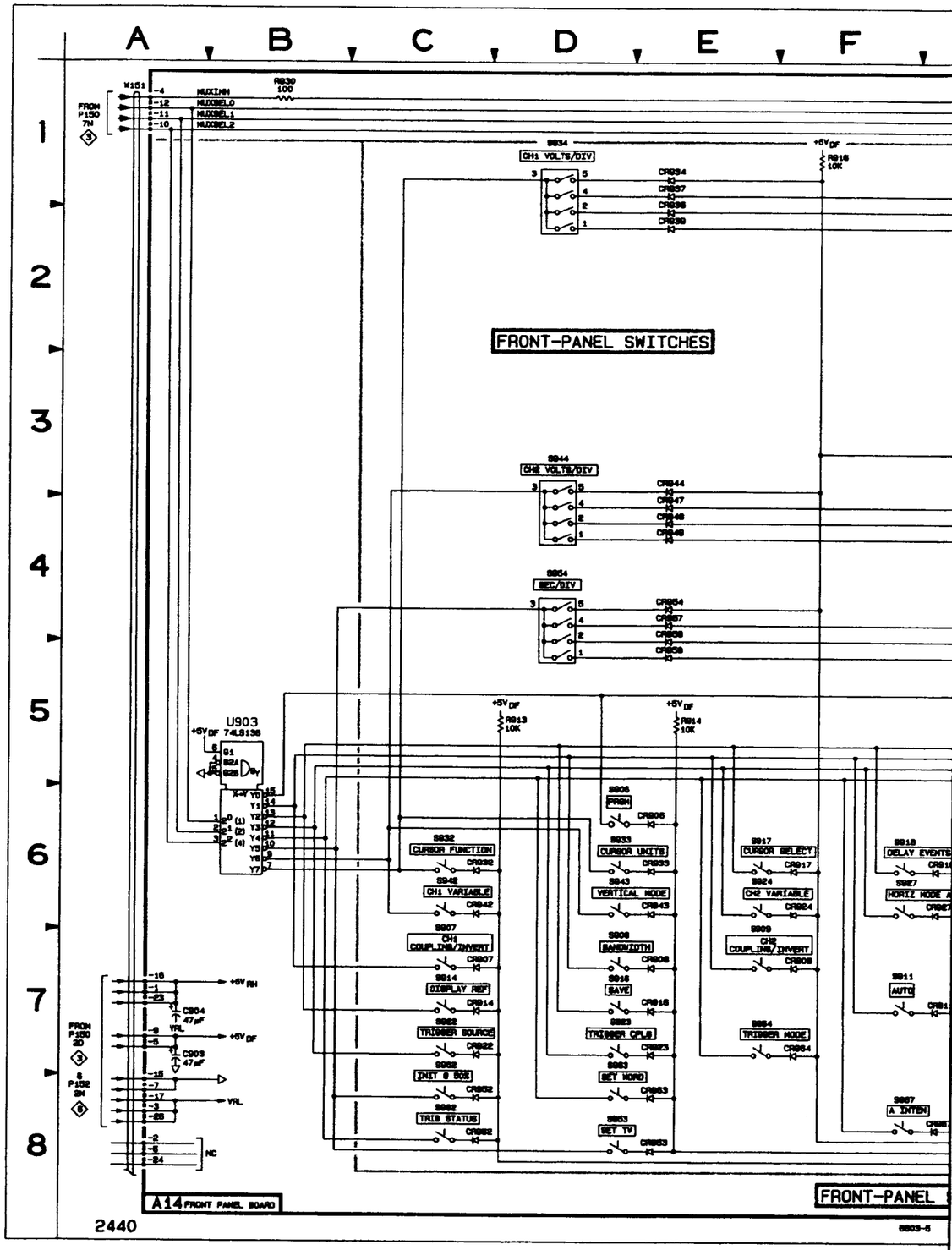
Static Sensitive Devices
See Maintenance Section

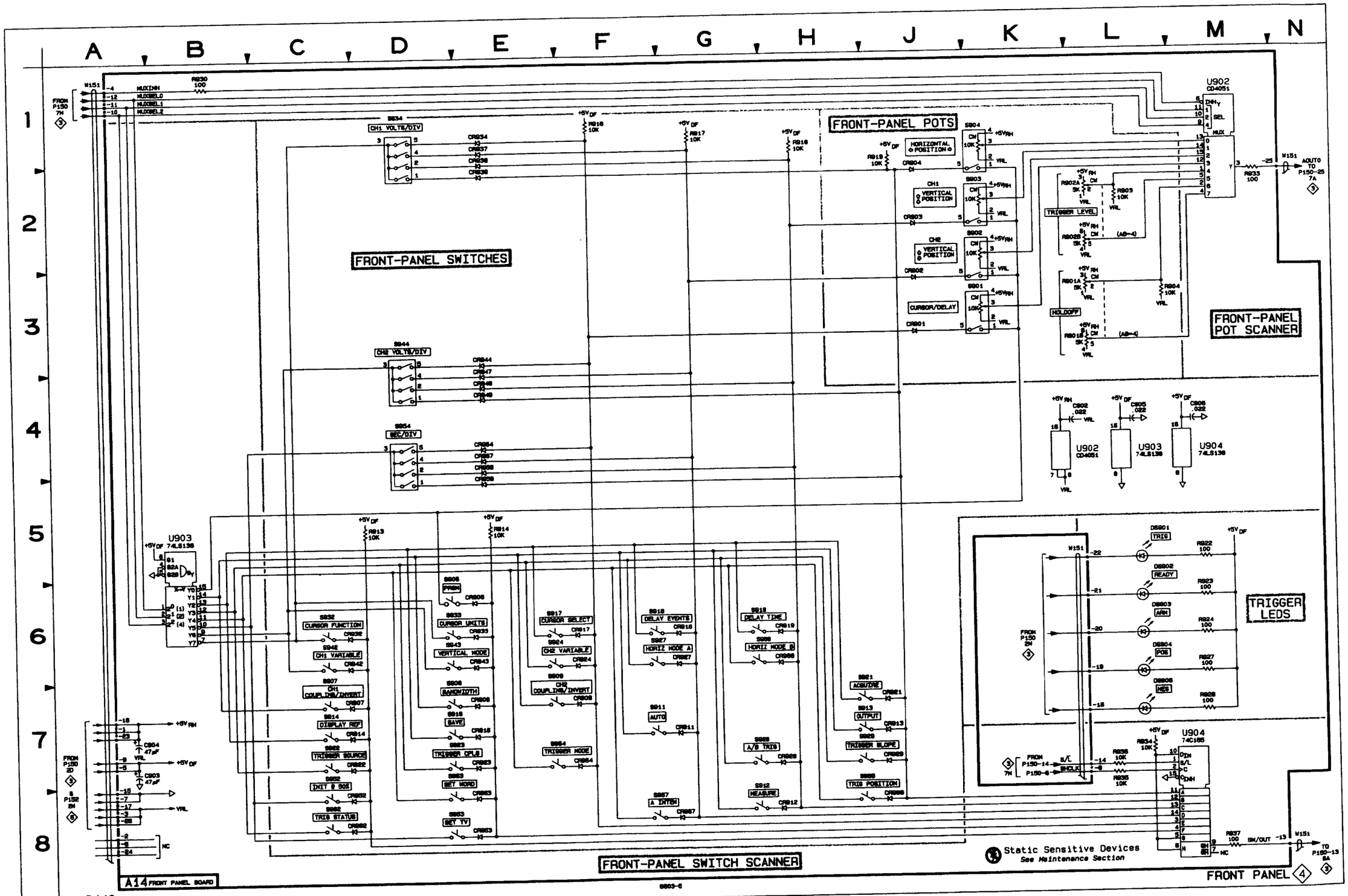


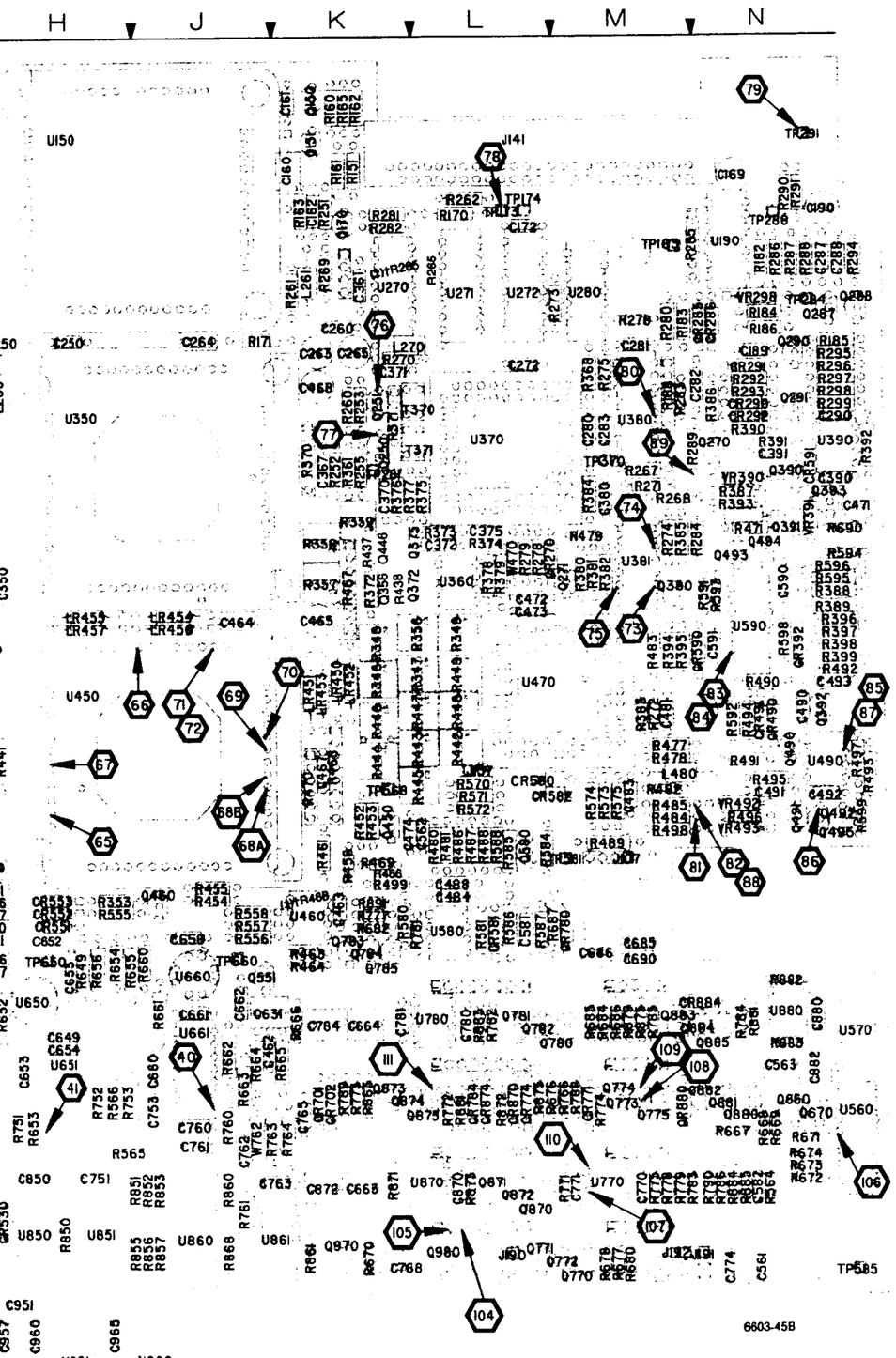

FRONT PANEL PROCESSOR I/O BUS
TRIG STATUS LED REGISTER
FRONT PANEL PROCESSOR
HANDSHAKE LOGIC
U741
74LS378
U751
74LS244
U742
74LS373
U861A
74LS74
U861B
74LS74
U862C
74LS02
U862D
74LS02
U862B
74LS02
U862A
74LS02
U700
8805R3
TRIG
READY
ARM
POS
NEG
LINE TRIGGER
SMOUTA
MSTEMP
AOUT0
AOUT2
BATT
BM/OUT
MUXSEL0
MUXSEL1
MUXSEL2
S/L
SHCLK
MUXINH
Static Sensitive Devices
See Maintenance Section
A13 PARTIAL SIDE BOARD
8803-4
FRONT PANEL PROCESSOR
2440
FRONT PANEL PROCESSOR 3

FRONT PANEL 4

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A14											
C902	4L	1C	CR938	2E	3A	R913	5D	4A	S919	6G	1D
C903	7A	3A	CR939	2E	4A	R914	5E	4B	S921	7H	1D
C904	7A	3A	CR942	6C	2A	R916	1F	4B	S922	7C	3E
C905	4L	3C	CR943	6E	2B	R917	1G	4C	S923	7D	3E
C906	4M	3D	CR944	3E	4B	R918	1H	4D	S924	6E	2B
			CR947	3E	3C	R919	2J	3E	S927	6F	2C
CR901	3J	2C	CR948	4E	3B	R922	5M	1E	S928	7G	2D
CR902	3J	2B	CR949	4E	4B	R923	6M	1F	S929	7H	2E
CR903	2J	2B	CR952	8C	3E	R924	6M	2E	S932	6C	1A
CR904	2J	2D	CR953	8E	3F	R927	6M	2E	S933	6D	1B
CR906	6E	3C	CR954	4E	4C	R928	7M	2F	S934	1D	3A
CR907	7C	3B	CR957	4E	4C	R930	1B	2B	S942	6C	2A
CR908	7E	3B	CR958	4E	4C	R933	2M	2C	S943	6D	2B
CR909	7F	3B	CR959	5E	4C	R934	7L	2C	S944	3D	3B
CR911	7G	4C	CR962	8C	4E	R935	7L	2C	S952	7C	4E
CR912	8H	3C	CR963	8E	4E	R936	7L	2C	S953	8D	4F
CR913	7J	3D	CR964	7F	3E	R937	8M	2B	S954	4D	3D
CR914	7C	1F	CR967	8G	2D				S962	8C	4E
CR916	7E	1E	CR968	6H	2D	S901	3K	1C	S963	7D	4F
CR917	8F	1B	CR969	8J	3E	S902	2K	2B	S964	7E	3D
CR918	6G	1D				S903	2K	2A	S967	8F	2D
CR919	6H	1D	DS901	5L	2E	S904	1K	2C	S968	6G	2D
CR921	7J	1E	DS902	5L	2E	S906	5D	4D	S969	7H	3D
CR922	7C	3E	DS903	6L	2E	S907	6C	4A			
CR923	7E	3F	DS904	6L	2E	S908	6D	4B	U902	1M	2C
CR924	6F	2B	DS908	7L	2E	S909	6E	4B	U903	5B	3C
CR927	6G	2D				S911	7F	4C	U904	7M	3D
CR928	7H	2D	R901A	3L	2E	S912	8G	4D			
CR929	7J	3E	R901B	3L	2E	S913	7H	4E	W151	1A	3A
CR932	6C	1A	R902A	2L	2F	S914	7C	1E	W151	2N	3A
CR933	6E	1B	R902B	2L	2F	S916	7D	1E	W151	5L	3A
CR934	1E	4B	R903	2L	1B	S917	6E	1B	W151	8N	3A
CR937	1E	3B	R904	3L	2B	S918	6F	1D			




FRONT-PANEL SWITCHES
FRONT-PANEL POTS
FRONT-PANEL POT SCANNER
FRONT-PANEL SWITCH SCANNER
TRIGGER LEDS
CH1 VOLTS/DIV
CH2 VOLTS/DIV
SEC/DIV
CURSOR FUNCTION
CH1 VARIABLE
CH1 COUPLING/INVERT
DISPLAY REF
TRIGGER SOURCE
INIT @ SOS
TRIG STATUS
PRSM
CURSOR UNITS
VERTICAL MODE
BANDWIDTH
SAVE
TRIGGER CPLG
SET WORD
SET TV
CURSOR SELECT
CH2 VARIABLE
CH2 COUPLING/INVERT
TRIGGER MODE
DELAY EVENTS
HORIZ MODE A
AUTO
A INTEN
DELAY TIME
HORIZ MODE B
A/B TRIG
MEASURE
ACQUIRE
OUTPUT
TRIGGER SLOPE
TRIG POSITION
HORIZONTAL POSITION
CH1 VERTICAL POSITION
CH2 VERTICAL POSITION
CURSOR/DELAY
TRIGGER LEVEL
HOLDOFF
U902 CD4051
U903 74LS138
U904 74LS138
U904 74C165
TRIG
READY
ARM
POS
MEB
Static Sensitive Devices
See Maintenance Section
A14 FRONT PANEL BOARD
FRONT PANEL
2440
6803-6



†Parts located on back of board.

‡Earlier Location.

8. A10—Main board.

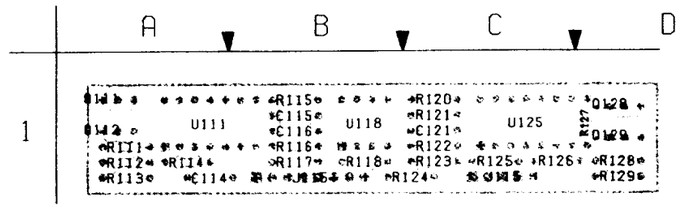
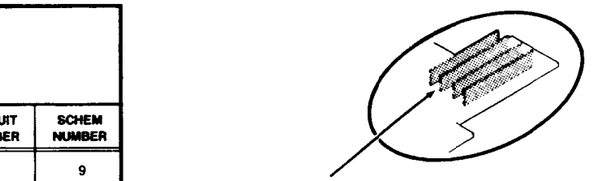


Figure 9-9. A30, A31, A32, A33—Gain Cell boards.

Components on the A30, A31, A32, A33—Gain cell boards are located on diagram 14A.

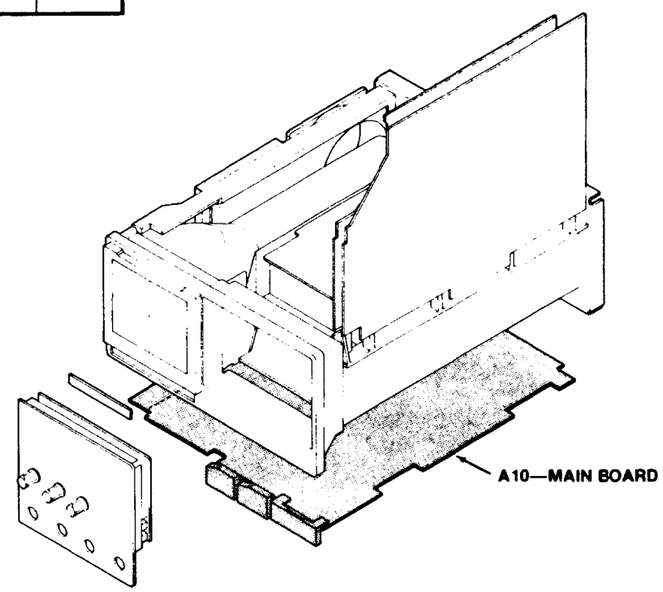
A10—MAIN BOARD

CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
AT300	9	C160	11	C216	9
AT400	9	C161	11	C220	9
		C162	11	C222	9
C101	9	C169	11	C223	9
C102	13	C172	5	C225	9
C110	10	C189	11	C230	9
C111	10	C190	10	C231	9
C112	9	C201	9	C232	9
C120	9	C202	9	C233	9
C122	9	C205	9	C240	9
C140	10	C210	9	C241	11
C141	10	C211	9	C242	10
C142	10	C212	9	C243	10
C143	9	C213	9	C250	11
C144	9	C214	9	C257	9
C150	11	C215	9	C260	11



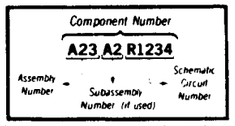
A30, A31, A32, A33—GAIN CELL BOARDS

Located near the back on the A10—Main board bottom (component) side.

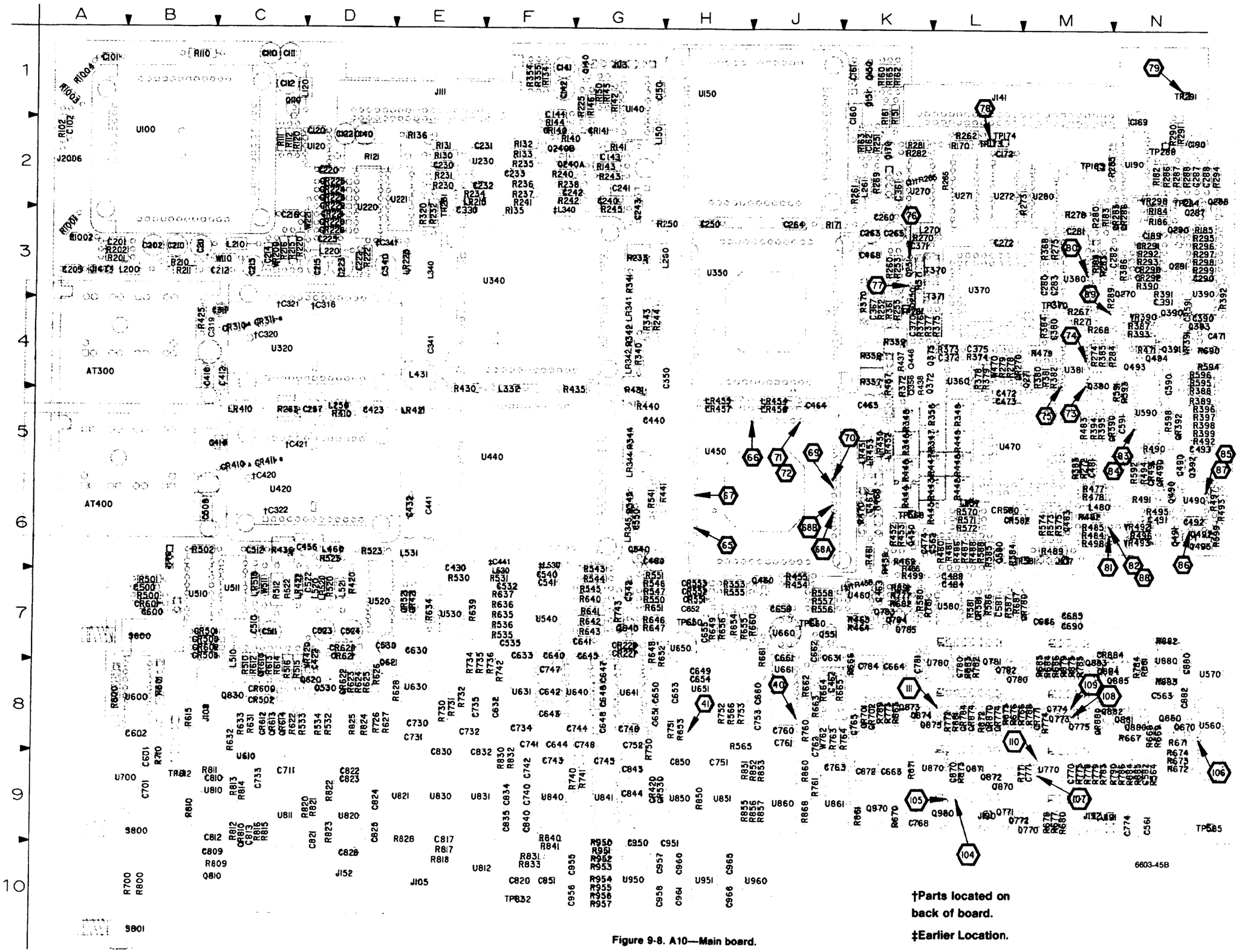


Static Sensitive Devices
See Maintenance Section

COMPONENT NUMBER EXAMPLE



Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List



†Parts located on back of board.

‡Earlier Location.

Figure 9-8. A10—Main board.

A10—MAIN BOARD (cont)

CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
C263	10	C581	10	C826	6	CR784	14	Q110	9	R135	9
C264	10	C581	14	C830	6	CR810	6	Q140	11	R136	9
C265	10	C582	14	C832	6	CR870	14	Q150	11	R140	9
C272	11	C590	12	C834	6	CR874	14	Q151	11	R141	9
C280	11	C591	12	C835	6	CR880	14	Q170	10	R142	5
C281	11	C600	9	C840	6	CR884	14	Q240	9	R143	9
C282	12	C601	6	C843	6			Q250	11	R144	9
C283	5	C602	6	C844	6	J104	6	Q251	11	R145	11
C287	11	C630	6	C850	6	J105	6	Q270	11	R146	11
C288	11	C631	6	C851	14	J105	19	Q271	11	R150	11
C290	12	C632	6	C870	14	J106	6	Q287	11	R151	11
C311	9	C633	6	C872	14	J107	14	Q288	11	R160	11
C316	9	C640	10	C880	14	J108	6	Q290	12	R161	11
C319	9	C641	10	C882	14	J108	19	Q291	12	R162	11
C320	9	C642	6	C950	5	J111	6	Q356	10	R163	11
C321	9	C643	6	C951	5	J111	9	Q372	10	R165	11
C322	9	C644	6	C955	5	J111	10	Q375	10	R170	10
C330	10	C645	6	C956	5	J111	11	Q380	12	R171	10
C340	10	C646	6	C957	5	J111	12	Q390	12	R182	5
C341	10	C647	5	C958	5	J111	13	Q391	12	R183	11
C350	10	C648	5	C960	5	J111	14	Q392	12	R184	11
C361	11	C649	5	C961	5	J113	9	Q393	12	R185	11
C367	10	C650	5	C965	5	J113	11	Q446	10	R186	11
C370	10	C651	5	C966	5	J114	9	Q450	10	R188	11
C370	11	C652	10			J114	11	Q460	10	R201	9
C371	11	C653	5	CR140	9	J141	5	Q490	12	R202	9
C372	10	C654	5	CR141	9	J141	6	Q491	12	R210	9
C375	10	C655	5	CR220	9	J141	10	Q492	12	R211	9
C380	11	C656	5	CR221	9	J141	11	Q493	12	R215	9
C390	12	C660	5	CR222	9	J141	14	Q494	12	R216	9
C391	12	C661	5	CR223	9	J141	19	Q495	12	R220	9
C410	9	C662	5	CR224	9	J146	9	Q530	10	R222	9
C412	9	C663	14	CR225	9	J147	9	Q540	10	R225	11
C414	9	C664	14	CR226	9	J152	6	Q551	10	R230	9
C420	9	C665	14	CR227	5	J157	11	Q580	10	R231	9
C421	9	C666	14	CR228	5	J190	14	Q620	9	R232	10
C422	9	C690	6	CR270	11	J191	14	Q621	9	R233	10
C423	9	C701	6	CR285	11	J192	14	Q630	10	R234	9
C430	10	C711	6	CR286	11	J2006	13	Q640	10	R235	9
C432	9	C730	6	CR290	12			Q660	14	R236	9
C440	10	C731	6	CR291	12	L120	9	Q670	14	R237	9
C441	10	C732	6	CR292	12	L150	11	Q770	14	R238	10
C456	9	C733	6	CR310	9	L200	9	Q771	14	R240	9
C462	10	C734	6	CR311	9	L210	9	Q772	14	R241	9
C463	10	C735	6	CR392	12	L220	9	Q773	14	R242	10
C464	10	C740	6	CR410	9	L250	9	Q774	14	R243	9
C465	10	C741	6	CR411	9	L260	11	Q775	14	R244	10
C467	10	C742	6	CR420	5	L261	10	Q780	14	R245	10
C468	10	C743	6	CR421	9	L270	11	Q781	14	R250	11
C471	12	C744	6	CR490	12	L332	10	Q782	14	R251	10
C472	11	C745	6	CR491	12	L340	10	Q783	14	R252	11
C473	11	C746	6	CR500	9	L431	10	Q784	14	R253	11
C474	10	C747	6	CR501	9	L460	9	Q785	14	R255	11
C480	10	C748	6	CR502	9	L480	12	Q810	6	R260	11
C481	12	C751	5	CR503	9	L510	9	Q870	14	R261	11
C483	12	C752	5	CR521	9	L520	9	Q871	14	R262	11
C484	11	C753	5	CR530	5	L521	9	Q872	14	R263	9
C488	11	C760	5	CR551	10	L530	10	Q873	14	R265	10
C490	12	C761	6	CR552	10	L531	10	Q874	14	R267	11
C491	12	C762	14	CR553	10			Q875	14	R268	11
C492	12	C763	14	CR580	11	LR215	9	Q880	14	R269	5
C493	10	C765	14	CR581	11	LR220	9	Q881	14	R270	11
C500	9	C768	14	CR582	11	LR341	10	Q882	14	R271	11
C509	9	C770	14	CR590	12	LR342	10	Q883	14	R272	11
C510	9	C771	14	CR591	12	LR344	10	Q884	14	R273	5
C511	9	C774	14	CR600	9	LR345	10	Q885	14	R274	11
C512	9	C780	14	CR601	9	LR410	9	Q970	14	R275	11
C522	9	C781	14	CR602	9	LR421	9	Q980	14	R276	11
C523	9	C784	14	CR610	9	LR422	9			R278	11
C524	9	C809	6	CR612	6	LR450	11	R102	13	R279	11
C530	9	C810	6	CR613	6	LR451	11	R110	9	R280	5
C532	10	C812	6	CR614	6	LR452	11	R111	9	R281	11
C535	10	C813	6	CR620	9	LR453	11	R112	9	R282	11
C540	10	C817	6	CR621	9	LR454	11	R120	9	R283	12
C541	10	C820	14	CR622	9	LR455	11	R121	9	R284	12
C542	10	C821	6	CR701	5	LR456	11	R130	9	R285	5
C550	10	C822	6	CR702	5	LR457	11	R131	9	R285	10
C561	14	C823	6	CR771	14	LR510	9	R132	9	R286	11
C562	10	C824	6	CR774	14	LR520	9	R133	9	R287	11
C563	14	C825	6	CR780	14			R134	11	R288	11

A10—MAIN BOARD (cont)

CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
R289	12	R444	10	R564	14	R675	14	R840	6	U340	10
R290	5	R445	10	R565	6	R676	14	R841	6	U350	10
R291	5	R446	10	R566	6	R677	14	R850	5	U360	10
R292	12	R447	10	R570	11	R678	14	R851	5	U370	11
R293	12	R448	10	R571	11	R680	14	R852	5	U380	11
R294	5	R449	10	R572	11	R681	14	R853	5	U381	11
R295	12	R452	10	R573	11	R682	14	R855	5	U390	12
R296	12	R453	10	R574	11	R683	14	R856	5	U420	9
R297	12	R454	10	R575	11	R684	14	R857	5	U440	10
R298	12	R455	10	R580	11	R685	14	R860	5	U450	10
R299	12	R456	10	R581	11	R686	14	R861	14	U460	10
R320	9	R461	10	R584	11	R687	14	R863	14	U470	11
R340	10	R463	10	R585	10	R690	12	R868	14	U490	12
R341	10	R464	9	R586	10	R700	6	R871	14	U510	9
R342	10	R464	10	R587	10	R710	6	R872	14	U511	9
R343	10	R466	10	R588	10	R726	6	R873	14	U520	6
R344	10	R467	10	R591	12	R730	6	R875	14	U520	9
R345	10	R468	10	R592	12	R731	6	R879	14	U530	5
R346	10	R469	10	R593	12	R732	6	R881	14	U540	10
R347	10	R470	10	R594	12	R734	6	R882	14	U560	14
R348	10	R471	12	R595	12	R735	6	R883	14	U570	14
R349	10	R477	12	R596	12	R736	6	R884	14	U580	10
R353	10	R478	12	R598	12	R740	6	R885	14	U580	11
R354	10	R479	11	R599	12	R741	6	R891	14	U590	12
R355	10	R480	11	R600	6	R742	10	R950	5	U600	6
R356	10	R481	11	R601	6	R743	10	R951	5	U610	6
R357	10	R482	12	R612	9	R750	5	R952	5	U630	6
R358	10	R483	12	R613	9	R751	5	R953	5	U631	6
R359	10	R484	12	R614	9	R752	5	R954	5	U640	6
R361	11	R485	12	R615	6	R753	5	R955	5	U641	5
R368	11	R486	10	R622	9	R760	5	R956	5	U650	5
R370	10	R487	10	R623	9	R761	5	R957	5	U651	5
R371	11	R488	10	R624	9	R763	14	R1001	9	U660	5
R372	10	R489	12	R625	9	R764	14	R1002	9	U661	5
R373	10	R490	12	R626	6	R766	14	R1003	9	U661	6
R374	10	R491	12	R627	6	R771	14	R1004	9	U700	6
R375	10	R492	12	R628	6	R772	14			U770	14
R376	10	R493	12	R631	10	R773	14	S600	6	U780	14
R377	10	R494	12	R632	10	R774	14	S800	6	U810	6
R378	10	R495	12	R633	10	R775	14	S801	6	U811	6
R379	10	R496	12	R634	6	R777	14			U812	6
R380	11	R497	12	R635	10	R778	14	T370	11	U820	6
R381	11	R498	12	R636	10	R779	14	T371	11	U821	6
R382	11	R499	11	R637	10	R781	14			U830	6
R383	11	R500	9	R639	6	R782	14	TP163	11	U831	6
R384	11	R501	9	R640	10	R783	14	TP173	11	U840	6
R385	11	R502	9	R641	10	R784	14	TP174	11	U841	6
R386	12	R510	9	R642	10	R785	14	TP231	11	U850	5
R387	12	R512	9	R643	10	R786	14	TP281	10	U851	5
R388	12	R515	9	R646	10	R788	14	TP284	11	U860	5
R389	12	R516	9	R647	10	R789	14	TP288	11	U861	14
R390	12	R520	9	R648	5	R790	14	TP291	11	U870	14
R391	12	R522	9	R649	5	R800	6	TP370	11	U880	14
R392	12	R523	9	R651	10	R809	6	TP568	11	U950	5
R393	12	R525	9	R652	5	R810	6	TP581	11	U951	5
R394	12	R530	9	R653	5	R811	6	TP585	11	U960	5
R395	12	R531	5	R654	5	R812	6	TP612	11		
R396	12	R532	10	R655	5	R813	6	TP650	5	VR200	9
R397	12	R533	10	R656	5	R814	6	TP660	5	VR298	11
R398	12	R534	10	R660	5	R815	6	TP832	11	VR390	12
R399	12	R535	10	R661	5	R816	6			VR391	12
R410	9	R536	10	R662	5	R817	6	U100	9	VR420	9
R420	9	R541	10	R663	5	R818	6	U120	9	VR492	12
R425	9	R543	10	R664	5	R820	6	U140	5	VR493	12
R430	10	R544	10	R665	5	R821	6	U150	11		
R431	10	R545	10	R666	5	R822	6	U190	5	W110	9
R435	10	R546	10	R667	14	R823	6	U220	9	W221	9
R436	9	R547	10	R668	14	R824	6	U221	9	W470	11
R437	10	R550	14	R669	14	R825	6	U230	9	W511	9
R438	10	R551	10	R670	14	R828	6	U270	5	W762	14
R440	10	R555	5	R671	14	R830	6	U271	5		
R441	10	R556	10	R672	14	R831	6	U272	5		
R442	10	R557	10	R673	14	R832	6	U280	5		
R443	10	R558	10	R674	14	R833	6	U320	9		

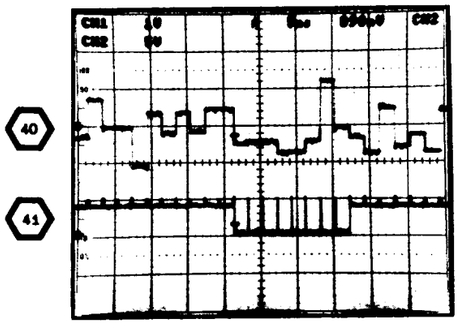
SYSTEM DAC & ACQUISITION CONTROL REGISTERS (5)

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
C172	7B	2L	CR530	6N	9H	R750	5N	8G	U272	3D	2L
C283	8B	3M	CR701	6G	8K	R751	6N	8H	U280A	2C	2M
C847	5M	8G	CR702	6G	8K	R752	7M	8H	U280B	6D	2M
C848	5M	8G				R753	4M	8H	U280C	3D	2M
C849	8B	8H	J141	1A	2K	R760	5F	8J	U280D	4C	2M
C850	6M	8G	J141	3M	2K	R761	6E	9J	U530	2H	7E
C851	6M	8G				R850	6D	9H	U841A	5N	8G
C853	6M	8H	R142	2K	1G	R851	8F	9J	U841B	4N	8G
C854	7B	8H	R182	3M	2N	R852	8F	9J	U841C	5N	8G
C855	7G	7H	R269	1G	2K	R853	8F	9J	U841D	6N	8G
C856	6G	7J	R273	4G	2M	R855	8F	9J	U850	7G	7H
C860	4M	8J	R280	4G	3M	R856	8F	9J	U851	4K	8H
C861	8B	7J	R285	3F	2N	R857	8F	9J	U860	6F	7J
C862	5F	7J	R290	4G	2N	R860	5E	9J	U861A	4N	8J
C751	6E	9H	R291	3G	2N	R950	5K	10G	U861B	7N	8J
C752	6M	8G	R294	4G	2P	R951	6L	10G	U861C	6F	8J
C753	7M	8J	R531	2G	7F	R952	8L	10G	U850	6D	9H
C760	8B	8J	R555	7G	7H	R953	8K	10G	U851	8D	9H
C950	5L	10G	R648	6N	7G	R954	7K	10G	U860	6E	9J
C951	5L	10H	R649	6M	7H	R955	7L	10G	U950A	5K	10G
C955	5K	10G	R652	6N	7H	R956	6K	10G	U950B	6L	10G
C956	6K	10G	R653	6M	8H	R957	6L	10G	U950C	7L	10G
C957	8K	10H	R654	7G	7H				U950D	8L	10G
C958	7K	10H	R655	5G	7H	TP650	7G	7H	U951A	6K	10H
C960	8K	10H	R656	6G	7H	TP660	5G	7J	U951B	7K	10H
C961	7K	10H	R660	5G	7J				U951C	7K	10H
C985	8K	10H	R681	4N	7J	U140	2L	1G	U951D	8L	10H
C986	7K	10H	R682	7M	8J	U190A	3L	2N	U980	5J	10J
			R683	6F	8J	U190B	3C	2N			
CR227	6N	7G	R684	6F	8J	U190C	3L	2N			
CR228	6N	7G	R685	7F	8K	U270	1H	2K			
CR420	6N	9G	R686	7G	7K	U271	1D	2L			

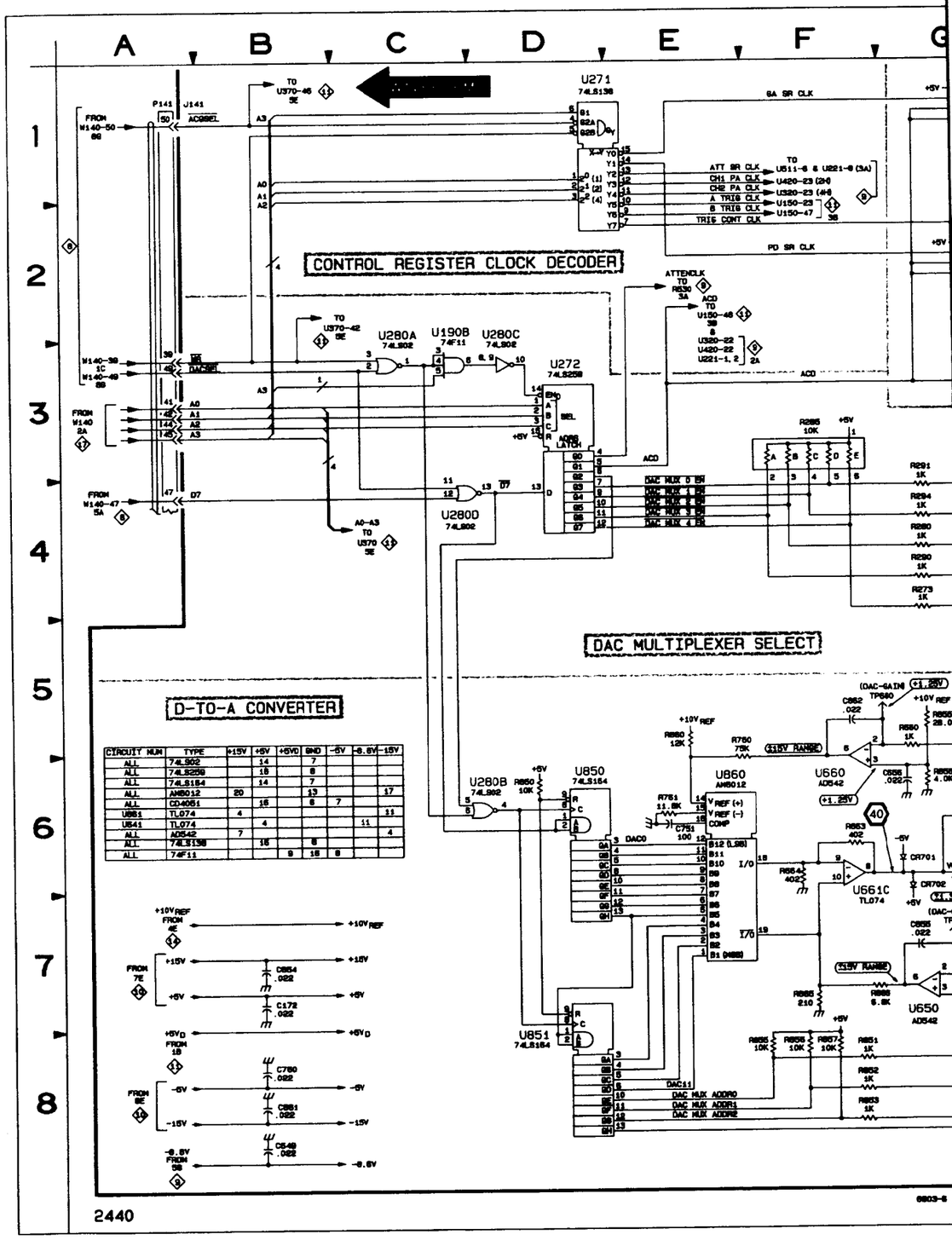
Partial A10 also shown on diagrams 6, 9, 10, 11, 12, 13, 14, and 19.

OTHER PARTS											
P141	1A	CHASSIS	P141	3M	CHASSIS						

WAVEFORMS FOR DIAGRAM 5



6330-35



CONTROL REGISTER CLOCK DECODER

ACQUISITION CONTROL REGISTERS

DAC MUX 0 SAMPLE HOLD

DAC MULTIPLEXER SELECT

DAC MUX 4 SAMPLE HOLD

D-TO-A CONVERTER

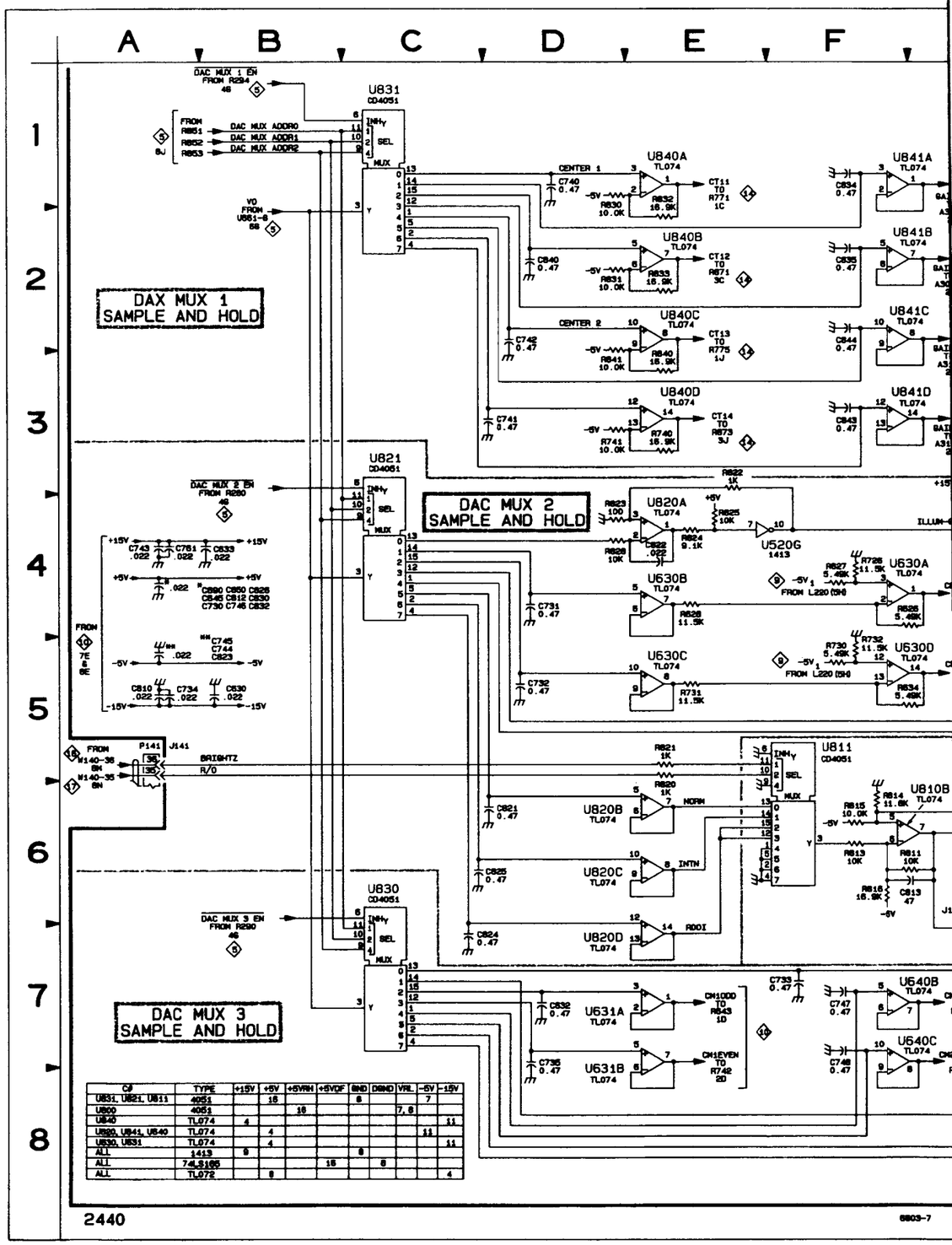
CIRCUIT NUM	TYPE	+15V	+5V	+5VD	GND	-5V	-8.6V	-15V
ALL	74LS02		14		7			
ALL	74LS259		16		8			
ALL	74LS164		14		7			
ALL	AM9012	20			13			17
ALL	CD4051		16		8	7		
U661	TL074	4						11
U641	TL074		4				11	
ALL	AD542	7						4
ALL	74LS138		16		8			
ALL	74F11			9	16	8		

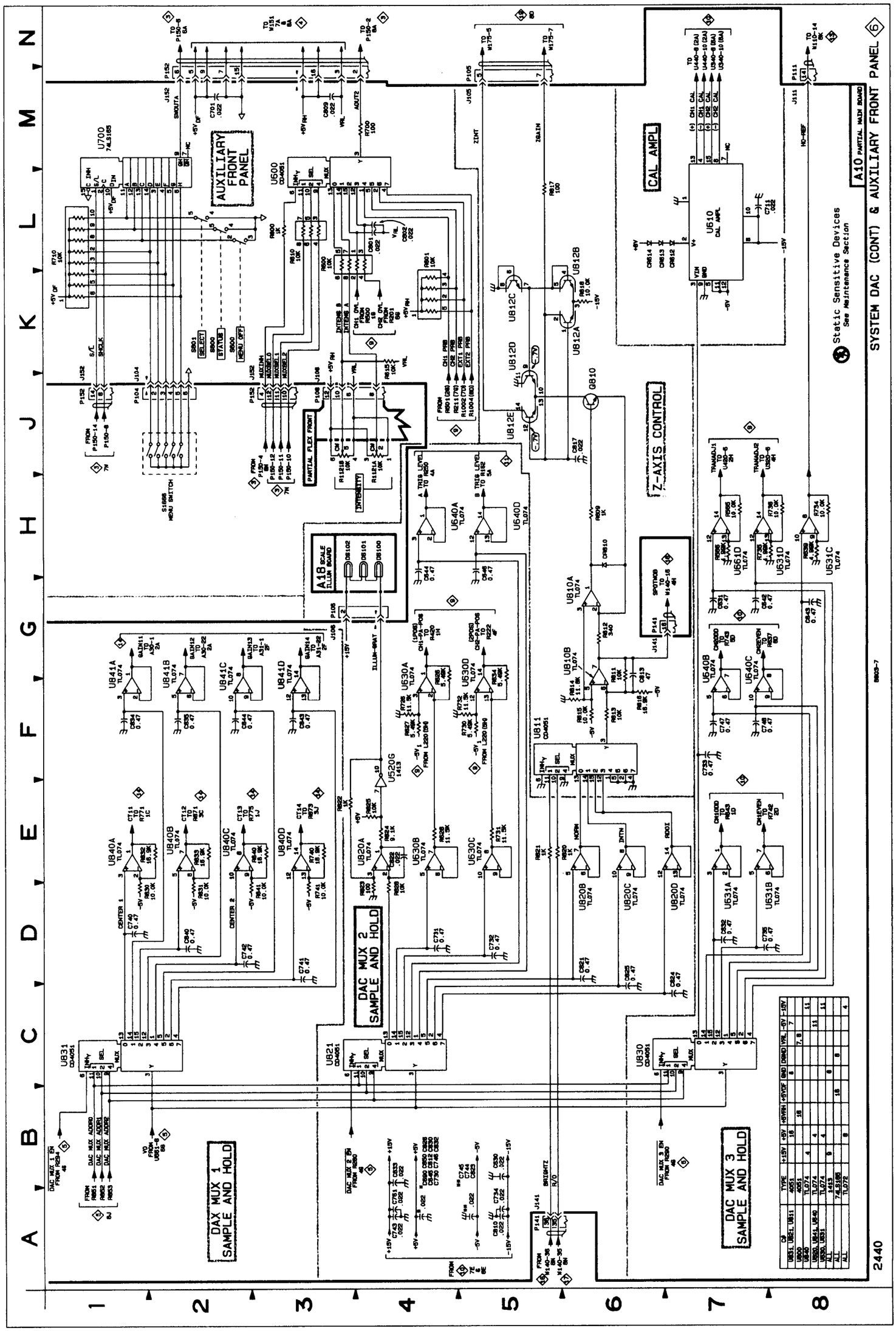
Static Sensitive Devices
See Maintenance Section

A10 PARTIAL MAIN BOARD

SYSTEM DAC (CONT) & AUXILIARY FRONT PANEL ◇6

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
C601	4L	9B	C826	4B	10D	R726	4F	8D	U610	7L	9C
C602	4L	8B	C830	4B	9E	R730	5F	8E	U630A	4G	8E
C630	5B	7E	C832	4B	9F	R731	5E	8E	U630B	4E	8E
C631	7G	7J	C834	1F	9F	R732	4F	8E	U630C	5E	8E
C632	7D	8F	C835	2F	9F	R734	8H	8E	U630D	5G	8E
C633	4B	7F	C840	2D	9F	R735	7H	8F	U631A	7E	8F
C642	7G	8F	C843	3F	9G	R736	7H	8F	U631B	7E	8F
C643	8G	8F	C844	2F	9G	R740	3E	9G	U631C	8H	8F
C644	4H	8F	C850	4B	9H	R741	3D	9G	U631D	8H	8F
C645	4B	7G				R800	3L	10B	U640A	4H	8G
C646	5H	8G	CR612	7L	8C	R809	6H	10C	U640B	7G	8G
C690	4B	7M	CR613	6L	8C	R810	3L	9B	U640C	7G	8G
C701	2M	9B	CR614	6L	8C	R811	6G	9C	U640D	5H	8G
C711	7L	9C	CR610	6H	9C	R812	6G	9C	U661D	7H	8J
C730	4B	8E				R813	6F	9C	U700	1M	9B
C731	4D	8E	J104	1J	8B	R814	6F	9C	U810A	8G	9C
C732	5D	8E	J105	4M	10E	R815	6F	9C	U810B	6G	9C
C733	7F	9C	J106	3G	7B	R816	6F	9C	U811	5F	9C
C734	5A	8F	J108	3J	8C	R817	5L	10E	U812A	6K	10F
C735	7D	8E	J111	8M	2D	R818	6K	10E	U812B	6L	10F
C740	1D	9F	J141	5A	2K	R820	5E	9D	U812C	5K	10F
C741	3D	8F	J141	8G	2K	R821	5E	9D	U812D	5K	10F
C742	2D	9F	J152	1J	10D	R822	3E	9D	U812E	5J	10F
C743	4A	9F	J152	2J	10D	R823	4E	9D	U820A	4E	9D
C744	5B	8G	J152	2M	10D	R824	4E	8D	U820B	6E	9D
C745	5B	9G				R825	4E	8D	U820C	6E	9D
C746	4B	8G	Q810	6J	10C	R826	4E	9E	U820D	7E	9D
C747	7F	8F				R830	1D	9F	U821	3C	9E
C748	7F	8G	R565	7H	8H	R831	2D	10F	U830	6C	9E
C761	4A	8J	R566	7H	8H	R832	1E	9F	U831	1C	9F
C809	3M	10C	R800	3L	8A	R833	2E	10F	U840A	1E	9F
C810	5A	9C	R801	4L	8B	R840	3E	9F	U840B	2E	9F
C812	4B	9C	R815	4K	8B	R841	3D	10F	U840C	2E	9F
C813	6G	9C	R828	4G	8D				U840D	3E	9F
C817	6J	9E	R827	4F	8D	S800	2K	7B	U841A	1F	9G
C821	6D	9D	R828	4E	8E	S800	2K	9B	U841B	2G	9G
C822	4E	9D	R834	5G	7E	S801	2K	10B	U841C	2G	9G
C823	5B	9D	R839	8H	7E				U841D	3G	9G
C824	7D	9D	R700	3M	10B	U520G	4F	7D			
C825	6D	9D	R710	1L	8B	U600	3L	8B			
Patriot A10 also shown on diagrams 5, 9, 10, 11, 12, 13, 14, and 19.											
OTHER PARTS											
P104	1J	CHASSIS	P111	8M	CHASSIS	P152	2J	CHASSIS	R1121B	3J	CHASSIS
P105	4N	CHASSIS	P141	5A	CHASSIS	P152	2M	CHASSIS	S1666	2H	CHASSIS
P108	3G	CHASSIS	P141	6G	CHASSIS	R1121A	4J	CHASSIS			
P108	3J	CHASSIS	P152	1J	CHASSIS						





CKT	TYPE	+15V	-5V	+5VRH	+5VDF	GND	DGND	VRL	-5V	-15V
U831, U821, U811	4051		16			8		7,8		7
U800	4051			16						
U840	TL074	4	4							11
U830, U841, U840	TL074	4	4							11
U530, U831	TL074	4								
ALL	74LS165	5			16		8	8		
ALL	TL072		8							4

SYSTEM DAC (CONT) & AUXILIARY FRONT PANEL 6

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
C801	4L	9B	C826	4B	10D	R726	4F	8D	U610	7L	9C
C802	4L	8B	C830	4B	9E	R730	5F	8E	U630A	4G	8E
C830	5B	7E	C832	4B	9F	R731	5E	8E	U630B	4E	8E
C831	7G	7J	C834	1F	9F	R732	4F	8E	U630C	5E	8E
C832	7D	8F	C835	2F	9F	R734	8H	8E	U630D	5G	8E
C833	4B	7F	C840	2D	9F	R735	7H	8F	U631A	7E	8F
C842	7G	8F	C843	3F	9G	R736	7H	8F	U631B	7E	8F
C843	8G	8F	C844	2F	9G	R740	3E	9G	U631C	8H	8F
C844	4H	8F	C850	4B	9H	R741	3D	9G	U631D	8H	8F
C845	4B	7G				R800	3L	10B	U640A	4H	8G
C846	5H	8G	CR612	7L	8C	R809	6H	10C	U640B	7G	8G
C890	4B	7M	CR613	6L	8C	R810	3L	9B	U640C	7G	8G
C701	2M	9B	CR614	6L	8C	R811	6G	9C	U640D	5H	8G
C711	7L	9C	CR810	6H	9C	R812	6G	9C	U661D	7H	8J
C730	4B	8E				R813	6F	9C	U700	1M	9B
C731	4D	8E	J104	1J	8B	R814	6F	9C	U810A	6G	9C
C732	5D	8E	J105	4M	10E	R815	6F	9C	U810B	6G	9C
C733	7F	9C	J106	3G	7B	R816	6F	9C	U811	5F	9C
C734	5A	8F	J108	3J	8C	R817	5L	10E	U812A	6K	10F
C735	7D	8E	J111	8M	2D	R818	6K	10E	U812B	6L	10F
C740	1D	9F	J141	5A	2K	R820	5E	9D	U812C	5K	10F
C741	3D	8F	J141	6G	2K	R821	5E	9D	U812D	5K	10F
C742	2D	9F	J152	1J	10D	R822	3E	9D	U812E	5J	10F
C743	4A	9F	J152	2J	10D	R823	4E	9D	U820A	4E	9D
C744	5B	8G	J152	2M	10D	R824	4E	8D	U820B	6E	9D
C745	5B	9G				R825	4E	8D	U820C	6E	9D
C746	4B	8G	Q810	6J	10C	R828	4E	9E	U820D	7E	9D
C747	7F	8F				R830	1D	9F	U821	3C	9E
C748	7F	8G	R565	7H	8H	R831	2D	10F	U830	6C	9E
C761	4A	8J	R566	7H	8H	R832	1E	9F	U831	1C	9F
C809	3M	10C	R800	3L	8A	R833	2E	10F	U840A	1E	9F
C810	5A	9C	R801	4L	8B	R840	3E	9F	U840B	2E	9F
C812	4B	9C	R815	4K	8B	R841	3D	10F	U840C	2E	9F
C813	6G	9C	R826	4G	8D				U840D	3E	9F
C817	6J	9E	R827	4F	8D	S800	2K	7B	U841A	1F	9G
C821	6D	9D	R828	4E	8E	S800	2K	9B	U841B	2G	9G
C822	4E	9D	R834	5G	7E	S801	2K	10B	U841C	2G	9G
C823	5B	9D	R839	8H	7E				U841D	3G	9G
C824	7D	9D	R700	3M	10B	U520G	4F	7D			
C825	6D	9D	R710	1L	8B	U800	3L	8B			

Partial A10 also shown on diagrams 5, 9, 10, 11, 12, 13, 14, and 19.

OTHER PARTS											
P104	1J	CHASSIS	P111	8M	CHASSIS	P152	2J	CHASSIS	R1121B	3J	CHASSIS
P105	4N	CHASSIS	P141	5A	CHASSIS	P152	2M	CHASSIS			
P106	3G	CHASSIS	P141	6G	CHASSIS				S1666	2H	CHASSIS
P108	3J	CHASSIS	P152	1J	CHASSIS	R1121A	4J	CHASSIS			

A11—TIME BASE/ DISPLAY BOARD FIG.9-10

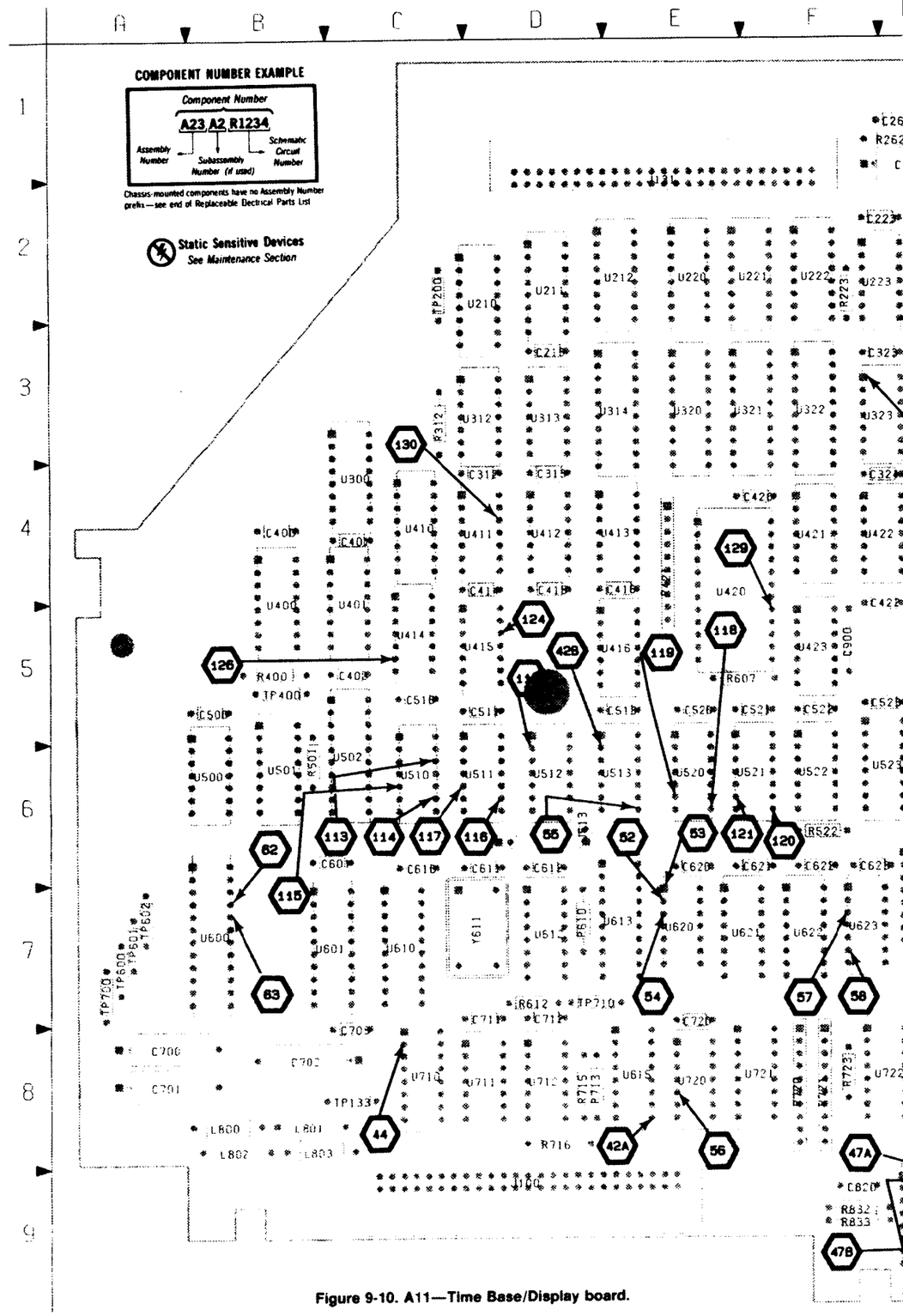
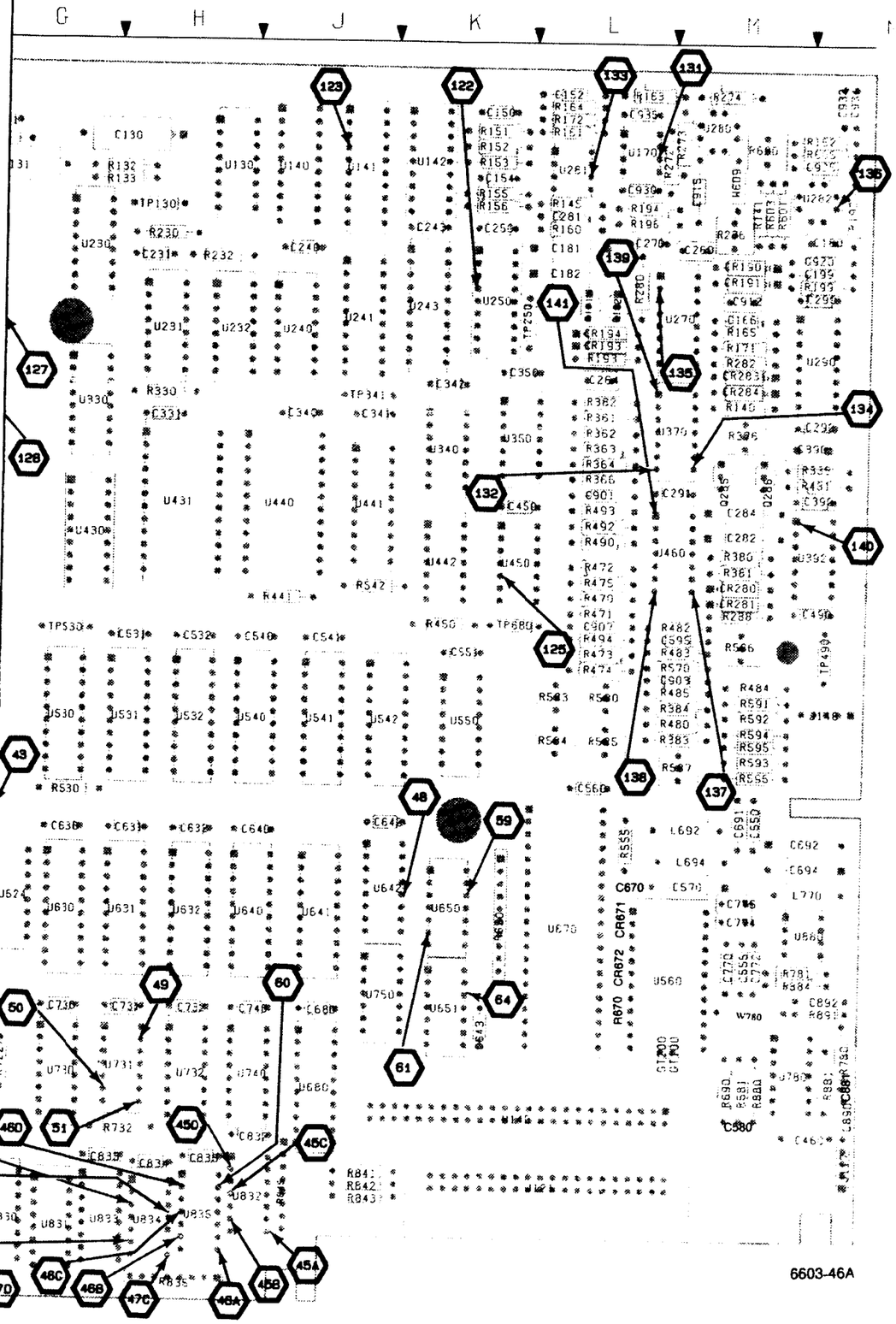


Figure 9-10. A11—Time Base/Display board.



A11—TIME BASE/DISPLAY BOARD

CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
C130	18	C623	15	L892	15	R475	18	TP601	15	U512	8
C131	18	C630	15	L894	15	R480	18	TP601	18	U512	15
C150	16	C631	15	L770	15	R481	18	TP602	18	U513	7
C152	18	C632	15	L800	18	R482	18	TP680	18	U520	15
C154	18	C640	15	L801	18	R483	18	TP700	18	U521	15
C166	18	C642	15	L802	18	R484	18	TP710	18	U522	7
C180	18	C643	15	L803	18	R485	18			U522	8
C181	18	C670	8			R490	18	U130	16	U523	7
C182	18	C680	15	Q181	18	R492	18	U140	16	U530	17
C199	18	C691	15	Q182	18	R493	18	U141	16	U531	17
C213	15	C692	15	Q285	18	R494	18	U142	16	U532	17
C223	15	C694	15	Q286	18	R501	8	U170	18	U540	17
C231	15	C700	18			R522	8	U210	17	U541	17
C240	15	C701	18	R132	17	R530	7	U211	17	U542	17
C243	15	C702	18	R133	17	R542	18	U212	17	U550	17
C250	16	C703	15	R140	18	R555	15	U220	17	U560	15
C260	18	C711	15	R141	18	R570	18	U221	17	U600	8
C261	15	C712	15	R145	18	R580	18	U222	17	U601	8
C264	18	C720	15	R151	16	R581	15	U223	17	U610	8
C270	15	C730	15	R152	16	R583	18	U230	17	U612	7
C281	18	C731	15	R153	18	R584	18	U231	17	U613	8
C282	18	C732	15	R155	16	R585	18	U232	17	U615	7
C284	18	C740	15	R156	16	R586	18	U240	18	U620	7
C290	15	C770	15	R160	18	R587	18	U241	16	U620	8
C291	15	C772	15	R161	18	R591	18	U243	15	U621	7
C292	15	C774	15	R162	18	R592	18	U250	18	U622	7
C312	15	C776	15	R163	18	R593	18	U270	18	U623	7
C313	15	C820	15	R164	18	R594	18	U280	18	U624	8
C323	15	C832	15	R165	18	R595	18	U281	18	U630	15
C324	15	C833	7	R171	18	R596	18	U282	18	U631	15
C331	15	C834	7	R172	18	R601	18	U290	18	U632	15
C340	15	C835	7	R192	18	R603	18	U300	8	U640	15
C341	15	C881	15	R193	18	R605	18	U312	17	U641	8
C342	15	C890	15	R194	18	R607	18	U313	17	U642	7
C350	15	C892	15	R196	18	R610	7	U314	16	U650	8
C390	18	C900	18	R199	18	R612	7	U320	16	U650	15
C392	15	C901	18	R223	17	R620	18	U321	16	U651	8
C400	15	C903	18	R230	17	R650	7	U322	16	U670	8
C401	15	C907	18	R232	17	R650	8	U323	16	U680	8
C402	15	C912	18	R262	18	R650	15	U323	17	U710	7
C414	15	C915	18	R272	18	R670	8	U330	17	U711	7
C415	15	C920	18	R273	18	R690	15	U340	17	U712	7
C416	15	C925	18	R274	18	R713	7	U350	16	U720	7
C420	15	C930	18	R276	18	R715	7	U350	17	U720	8
C422	15	C932	18	R280	18	R716	7	U370	18	U721	7
C450	15	C934	18	R282	18	R720	7	U392	18	U722	7
C460	15	C935	18	R288	18	R720	8	U400	8	U722	8
C490	15			R312	17	R721	7	U401	8	U730	7
C500	15	CR190	18	R330	17	R722	8	U410	17	U731	7
C510	15	CR191	18	R361	18	R723	7	U411	17	U731	8
C511	15	CR193	18	R362	18	R732	17	U412	17	U732	15
C513	15	CR194	18	R363	18	R780	15	U413	16	U740	15
C520	15	CR280	18	R364	18	R781	15	U413	17	U750	8
C521	15	CR281	18	R366	18	R832	7	U414	17	U780	15
C522	15	CR283	18	R376	18	R833	7	U415	17	U830	7
C523	15	CR284	18	R380	18	R835	7	U416	17	U831	7
C531	15	CR671	8	R381	18	R841	7	U420	17	U832	7
C532	15	CR672	8	R382	18	R842	7	U421	16	U833	7
C540	15			R383	18	R843	7	U422	16	U834	7
C541	15	J100	7	R384	18	R845	7	U423	16	U835	7
C550	15	J100	8	R385	18	R880	15	U423	17	U835	8
C551	15	J100	17	R400	8	R881	15	U430	16	U880	15
C555	15	J100	18	R421	7	R884	15	U431	16		
C560	15	J117	15	R421	8	R891	15	U440	16	W140	7
C570	15	J121	8	R421	15			U441	16	W140	8
C580	15	J121	17	R421	17	TP130	18	U442	17	W140	16
C595	18	J121	18	R421	18	TP133	7	U450	16	W140	17
C601	15	J131	8	R441	18	TP200	18	U450	17	W140	18
C610	15	J131	16	R450	16	TP250	18	U460	18	W609	18
C611	15	J131	17	R470	18	TP341	18	U500	8	W780	15
C612	15	J131	18	R471	18	TP400	15	U501	8		
C620	15	J148	18	R472	18	TP490	18	U502	8	Y611	7
C621	15	J513	7	R473	18	TP530	15	U510	15		
C622	15			R474	18	TP600	18	U511	15		

A11—TIME BASE/
DISPLAY BOARD

FIG.9-10

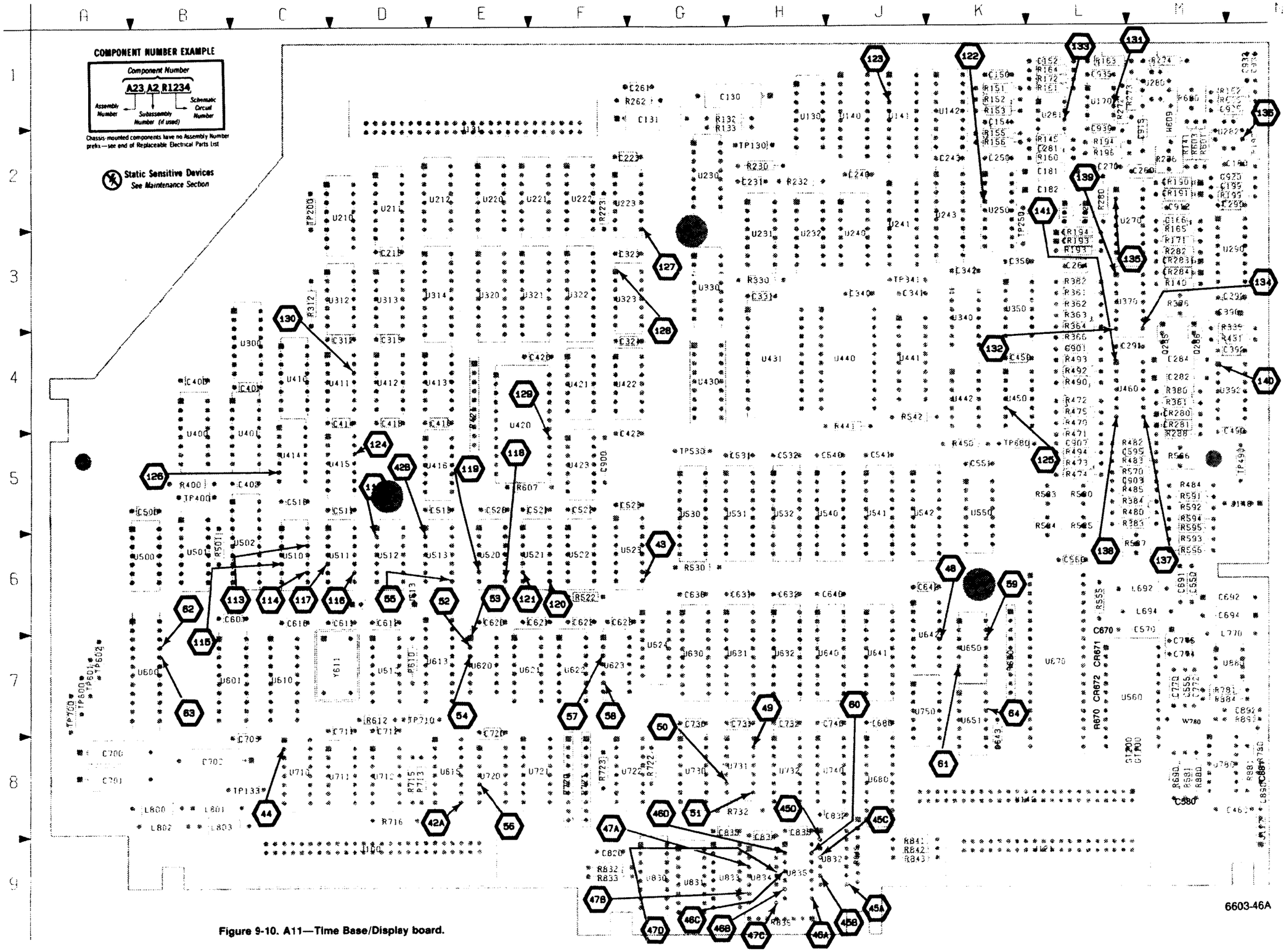
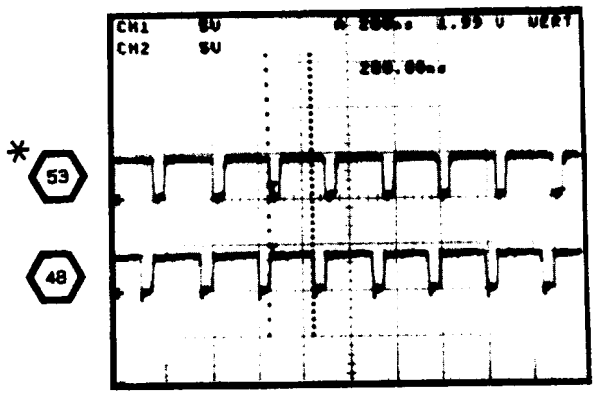
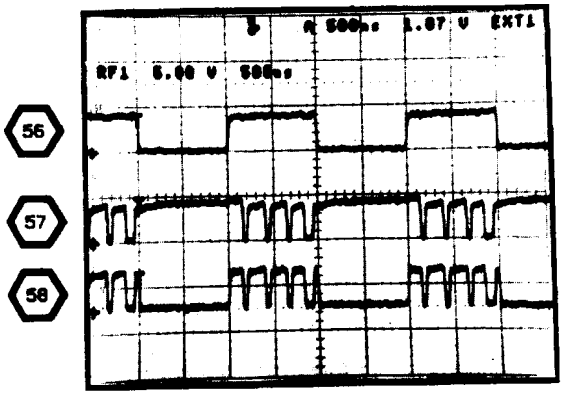


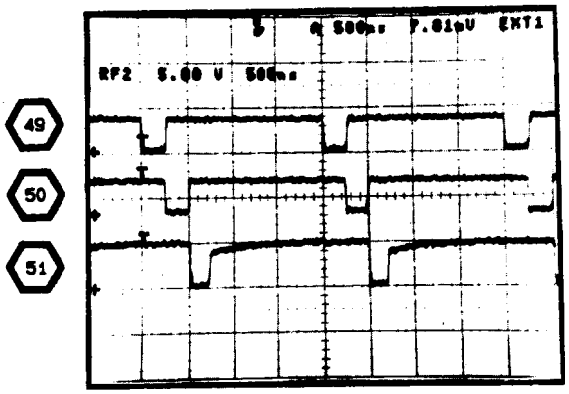
Figure 9-10. A11—Time Base/Display board.

WAVEFORMS FOR DIAGRAM 7 (con't)

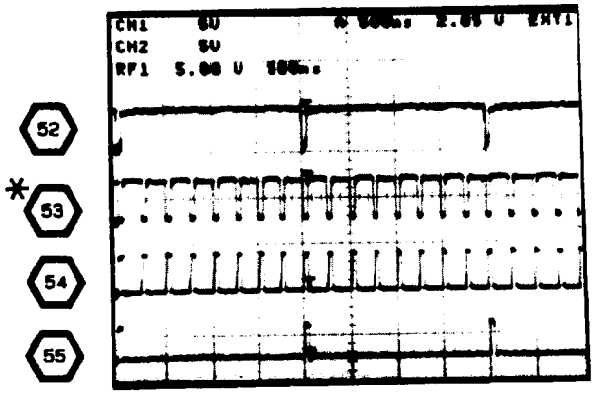


TEST SCOPE TRIGGERED
ON U623 PIN 5

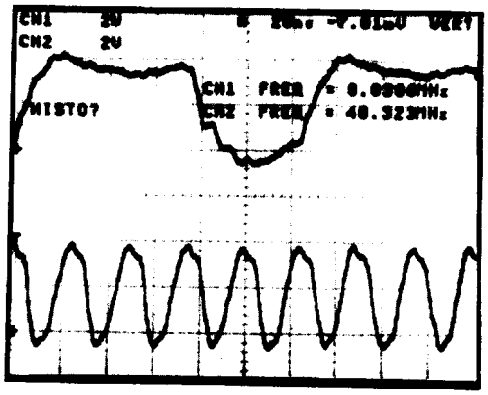




*WAVEFORM 53 IS SHOWN TWICE

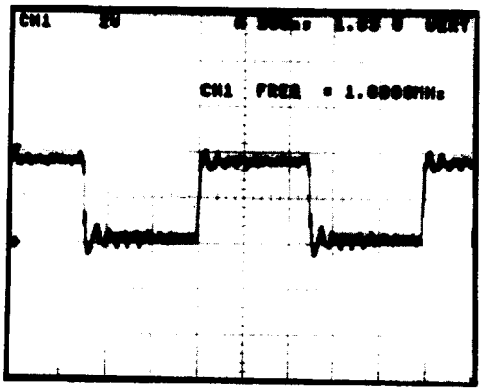


WAVEFORMS FOR DIAGRAM 7

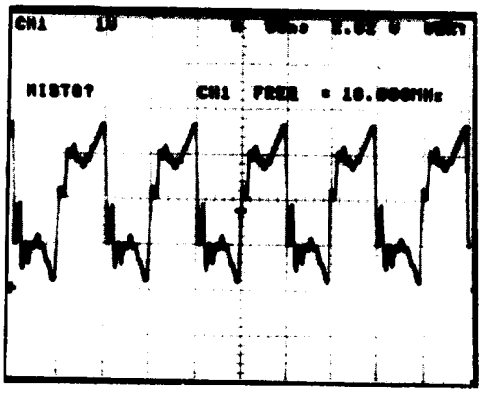


42A

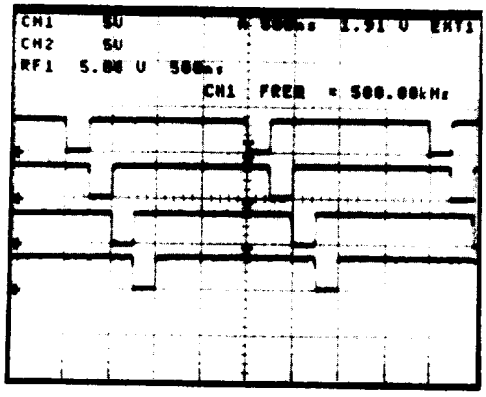
42B



43



44

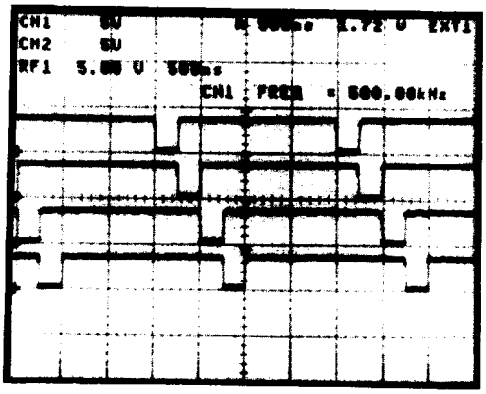


45A

45B

45C

45D

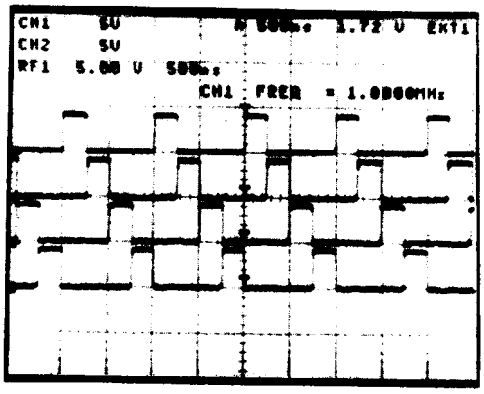


46A

46B

46C

46D



47A

47B

47C

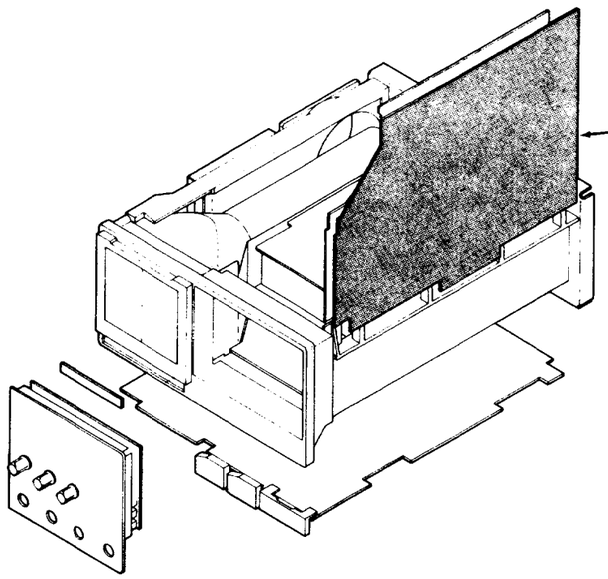
47D

TRIGGER ON FALLING EDGE OF U832 PIN 8

MORE

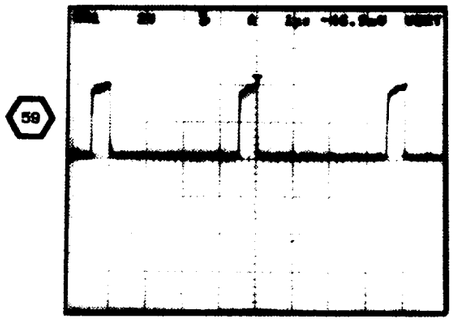
SYSTEM CLOCKS 7

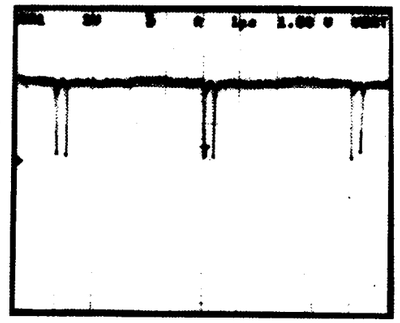
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A11											
C833	4F	8G	R721E	3G	7F	U523A	2G	6F	U731B	8L	8G
C834	4F	9H	R721F	4H	7F	U523B	1G	6F	U731C	8L	8G
C835	4F	8H	R721G	4L	7F	U612A	2B	7D	U830	8J	9G
			R721H	7L	7F	U612A	3C	7D	U831	3L	9G
J100	2N	9D	R721I	7J	7F	U612B	3B	7D	U832A	5M	9H
J100	7E	9D	R723	6D	8F	U615B	3C	8E	U832B	4M	9H
J513	1A	6D	R832	2M	9F	U620A	3K	7E	U832C	4M	9H
			R833	3M	9F	U620B	6F	7E	U832D	4M	9H
R421B	5F	4E	R835A	5N	9H	U620C	2E	7E	U832E	3L	9H
R421D	1G	4E	R835B	5N	9H	U621	5H	7E	U832F	2L	9H
R530	1M	6G	R835C	6N	9H	U622	1E	7F	U833	6L	9G
R610	2B	7D	R835D	6N	9H	U623A	4G	7F	U834A	6M	9H
R612	2C	7D	R841	7M	9J	U623B	5G	7F	U834B	7M	9H
R650E	4J	6K	R842	8M	9J	U623C	1E	7F	U834C	7M	9H
R713	8E	8D	R843	8M	9J	U642	5J	7J	U834D	7M	9H
R715	7E	8D	R845A	5N	8J	U710	8C	8C	U835A	6M	9H
R716	7E	8D	R845B	4N	8J	U711A	8B	8C	U835B	5M	9H
R720A	1D	7F	R845C	4N	8J	U711B	8B	8C	U835C	5M	9H
R720B	5G	7F	R845D	4N	8J	U711C	7B	8C	U835D	5M	9H
R720D	7D	7F				U711D	3E	8C			
R720E	8D	7F	TP133	8C	8C	U712A	7D	8D	W140	1N	8K
R720F	5E	7F				U712B	8C	8D	W140	4N	8K
R720G	7D	7F	U513A	2A	6D	U712C	7D	8D	W140	5A	8K
R720H	3E	7F	U513B	4B	6D	U712D	8D	8D	W140	6E	8K
R720I	7B	7F	U513D	4K	6D	U720A	5F	8E	W140	7N	8K
R721A	8J	7F	U513E	6H	6D	U721	3H	8E			
R721B	1G	7F	U513F	1G	6D	U722A	1K	8F	Y611	2A	7D
R721C	6E	7F	U522A	3H	6F	U730	7J	8G			
R721D	2B	7F	U522B	1F	6F	U731A	7L	8G			
Partial A11 also shown on diagrams 8, 15, 16, 17, and 18.											
OTHER PARTS											
P100	2N	CHASSIS	P100	7E	CHASSIS	P513	1B	CHASSIS			

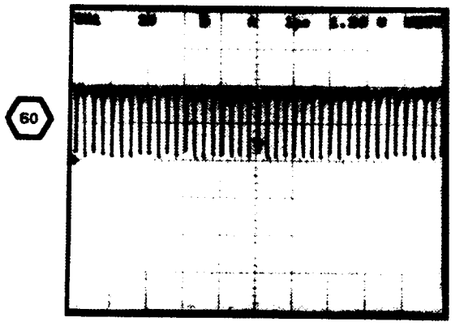


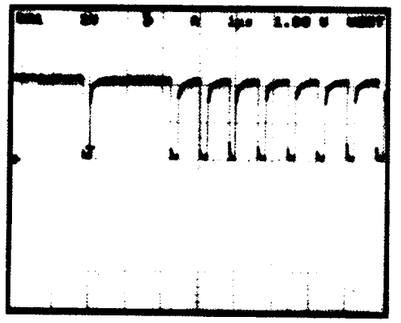
A11—TIME BASE/DISPLAY BOARD

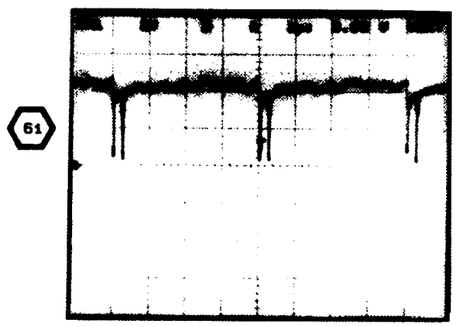
WAVEFORMS FOR DIAGRAM 8

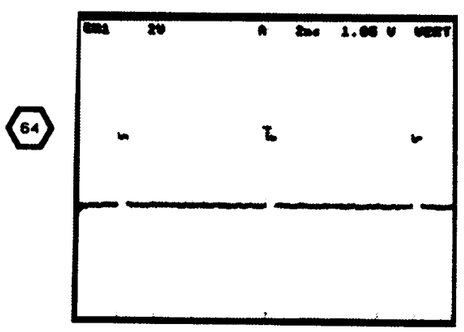




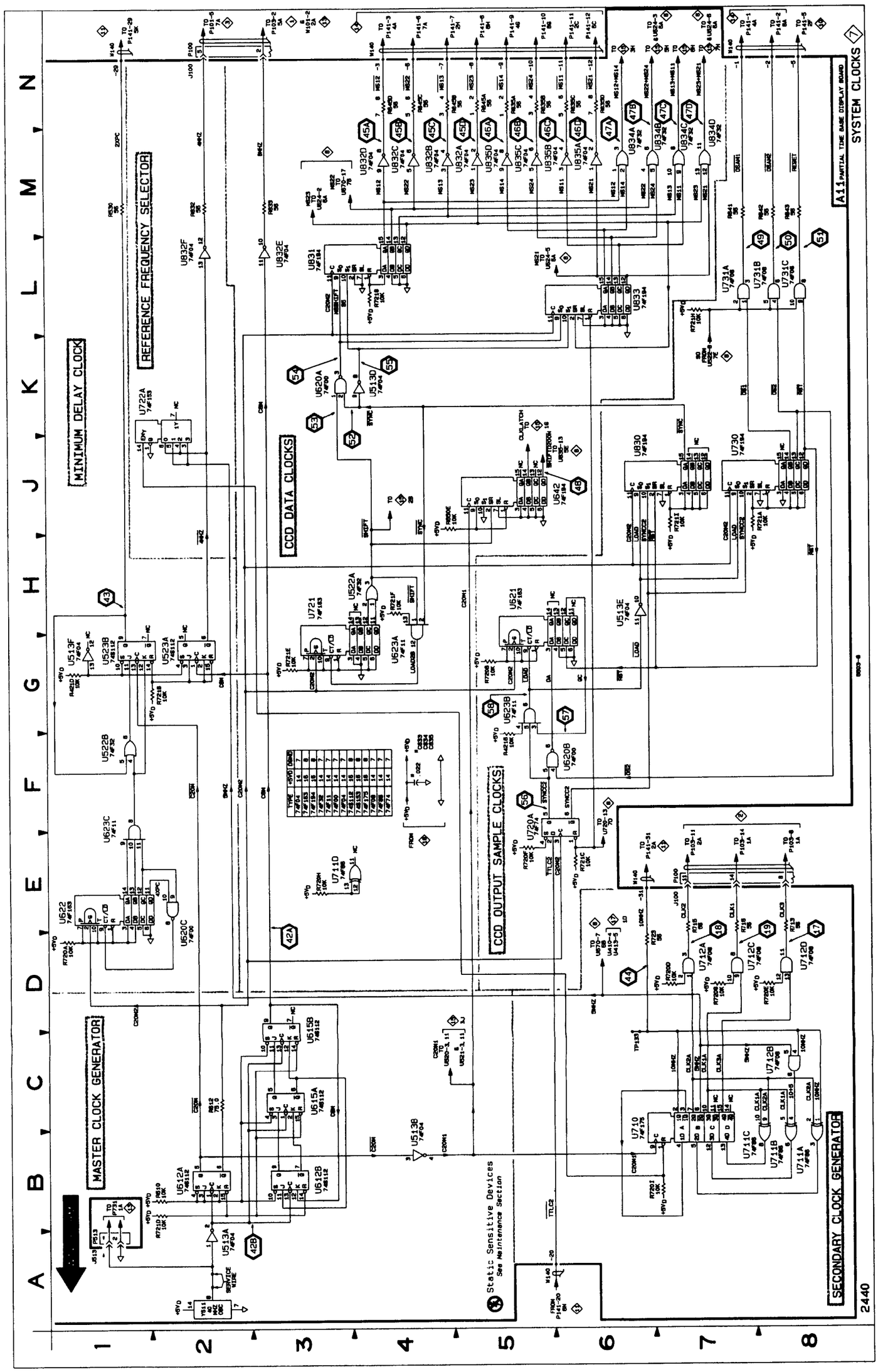








6603-27


MINIMUM DELAY CLOCK
REFERENCE FREQUENCY SELECTOR
CCD DATA CLOCKS
CCD OUTPUT SAMPLE CLOCKS
MASTER CLOCK GENERATOR
SECONDARY CLOCK GENERATOR
A11 PARTIAL TIME BASE DISPLAY BOARD
SYSTEM CLOCKS
Static Sensitive Devices
See Maintenance Section
2440

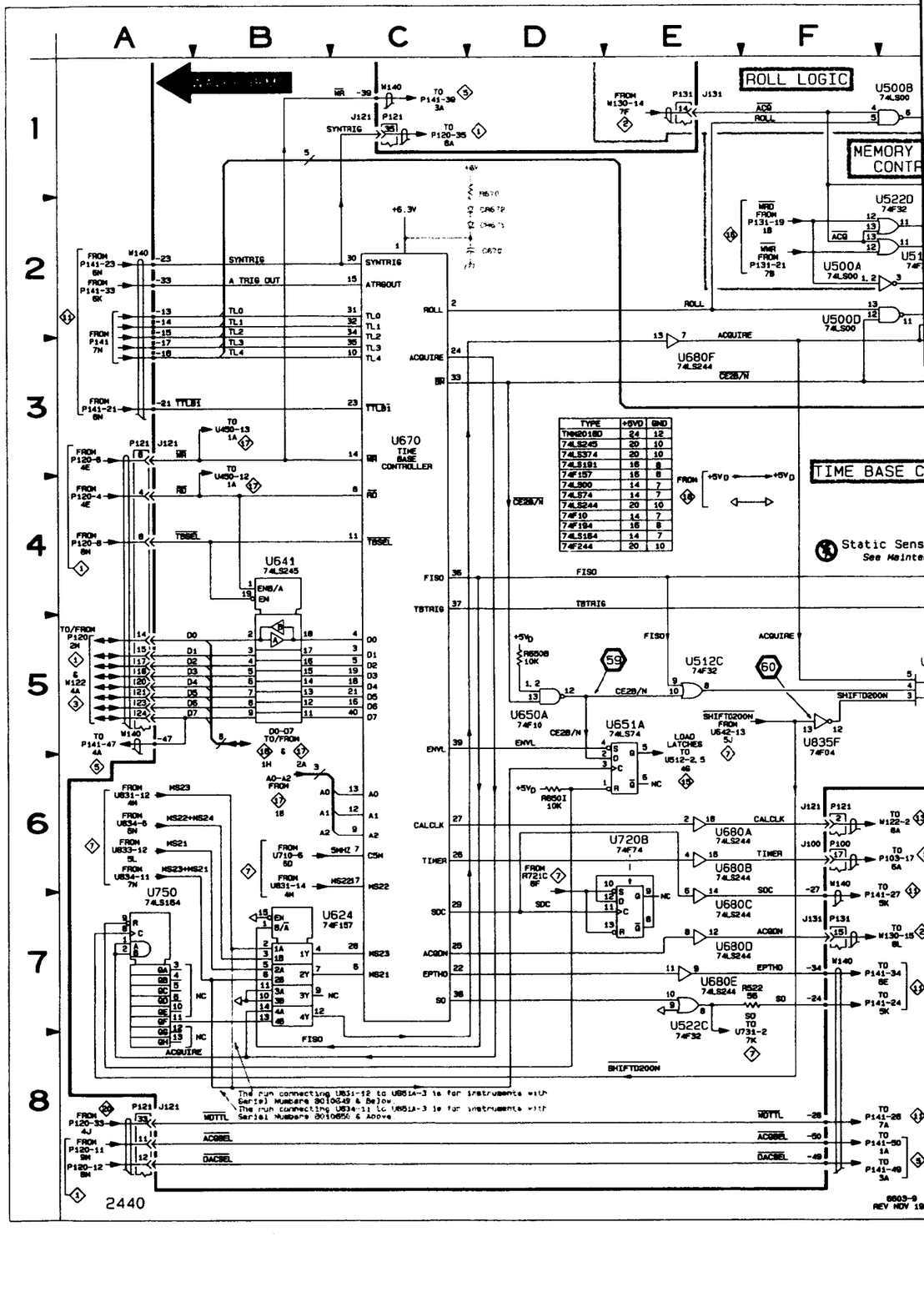
TIME BASE CONTROLLER & ACQUISITION MEMORY (8)

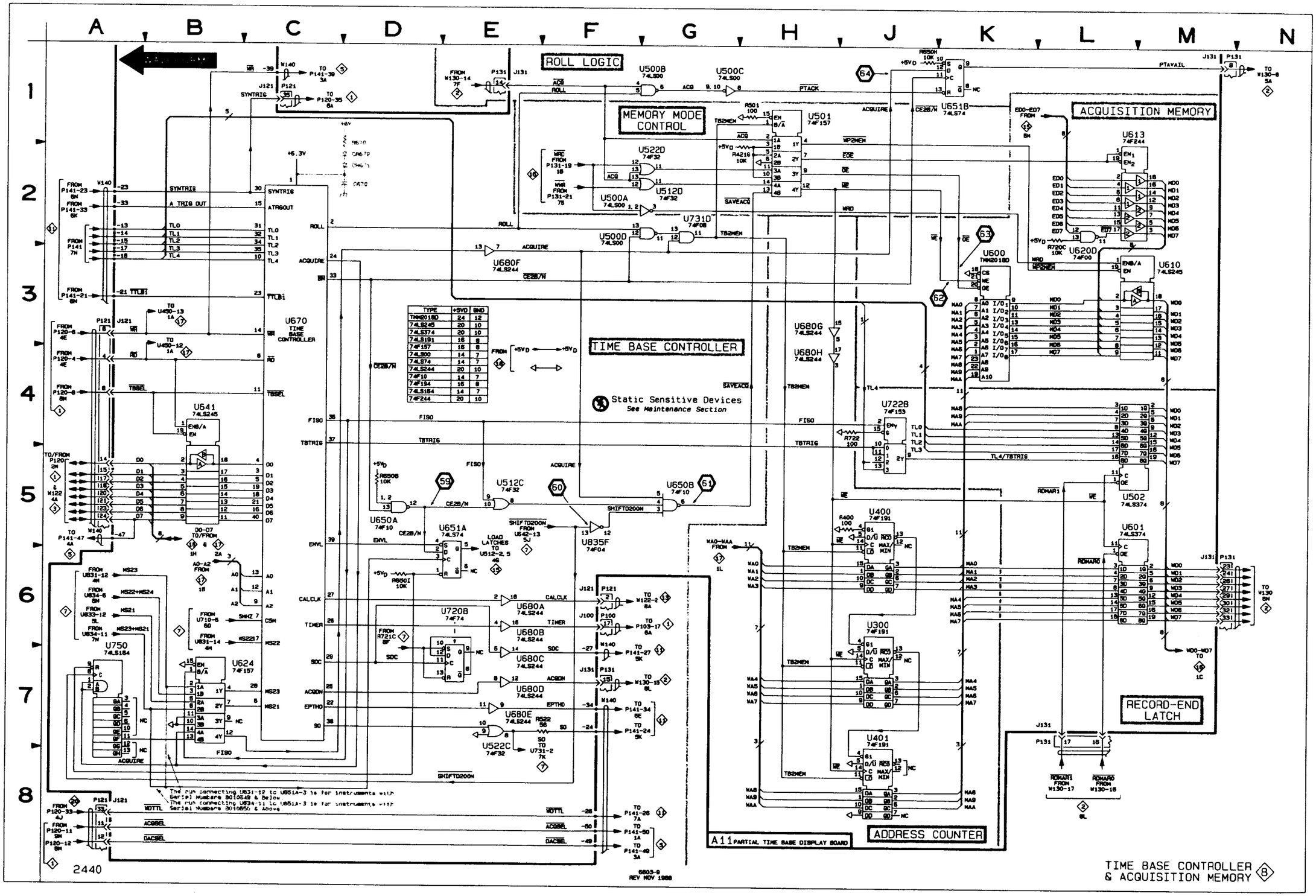
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A11											
C670*	1D	7L	R501	1H	6B	U612C	5E	6D	U680C	7E	8J
			R522	7F	6F	U612D	2G	6D	U680D	7E	8J
CR671*	2D	7L	R650B	5D	6K	U622C	7E	6F	U680E	7E	8J
CR672*	2D	7L	R650H	1J	6K	U622D	2G	6F	U680F	3E	8J
			R650I	6E	6K	U800	2K	7B	U680G	3H	8J
J100	6F	9D	R670*	1D	8L	U801	5L	7B	U680H	3H	8J
J121	1C	9L	R720C	2L	7F	U810	3M	7C	U720B	6E	8E
J121	3A	9L	R722	4J	8G	U813	1L	7D	U722B	4J	8F
J121	6F	9L				U820D	2L	7E	U731D	2G	8G
J121	8A	9L	U300	6J	4C	U824	7B	7G	U750	7A	7J
J131	1E	2E	U400	5J	5B	U841	4B	7J	U835F	5F	9H
J131	1M	2E	U401	7J	5C	U850A	5D	7K			
J131	5M	2E	U500A	2F	6B	U850B	5G	7K	W140	1C	8K
J131	7F	2E	U500B	1G	6B	U851A	5E	7K	W140	2A	8K
J131	7L	2E	U500C	1G	6B	U851B	1K	7K	W140	5A	8K
			U500D	2F	6B	U870	3C	7L	W140	6F	8K
R400	5J	5B	U501	1H	6B	U880A	6E	8J	W140	7F	8K
R421G	2H	4E	U502	5L	6C	U880B	6E	8J			

Partial A11 also shown on diagrams 7, 15, 16, 17, and 18.

OTHER PARTS											
P100	6F	CHASSIS	P121	8A	CHASSIS	P131	6M	CHASSIS	P1121	6F	CHASSIS
P121	1C	CHASSIS	P131	1E	CHASSIS	P131	7F	CHASSIS			
P121	3A	CHASSIS	P131	1M	CHASSIS	P131	7L	CHASSIS			

***See Parts List for serial number ranges.**





TIME BASE CONTROL & ACQ MEMORY

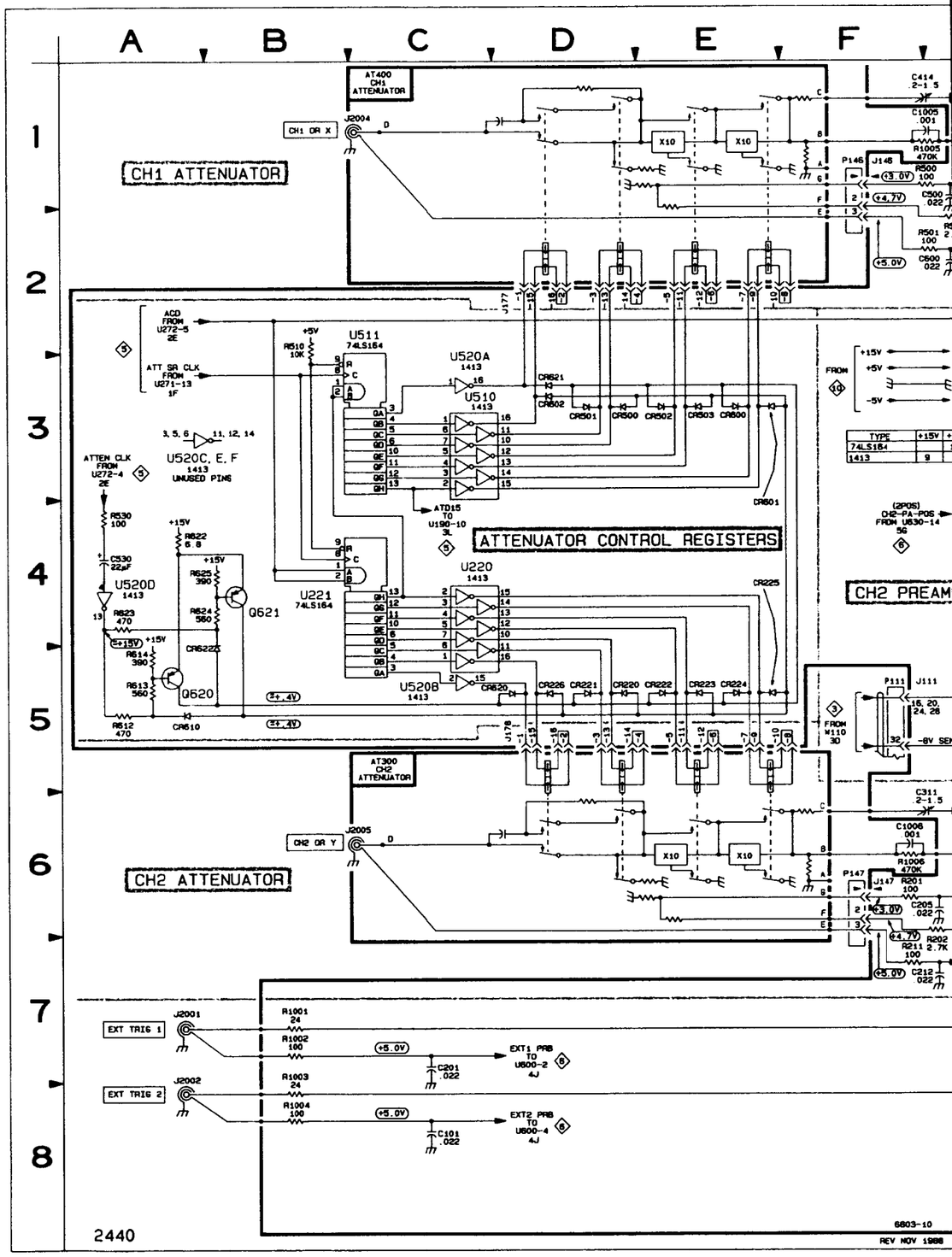
8

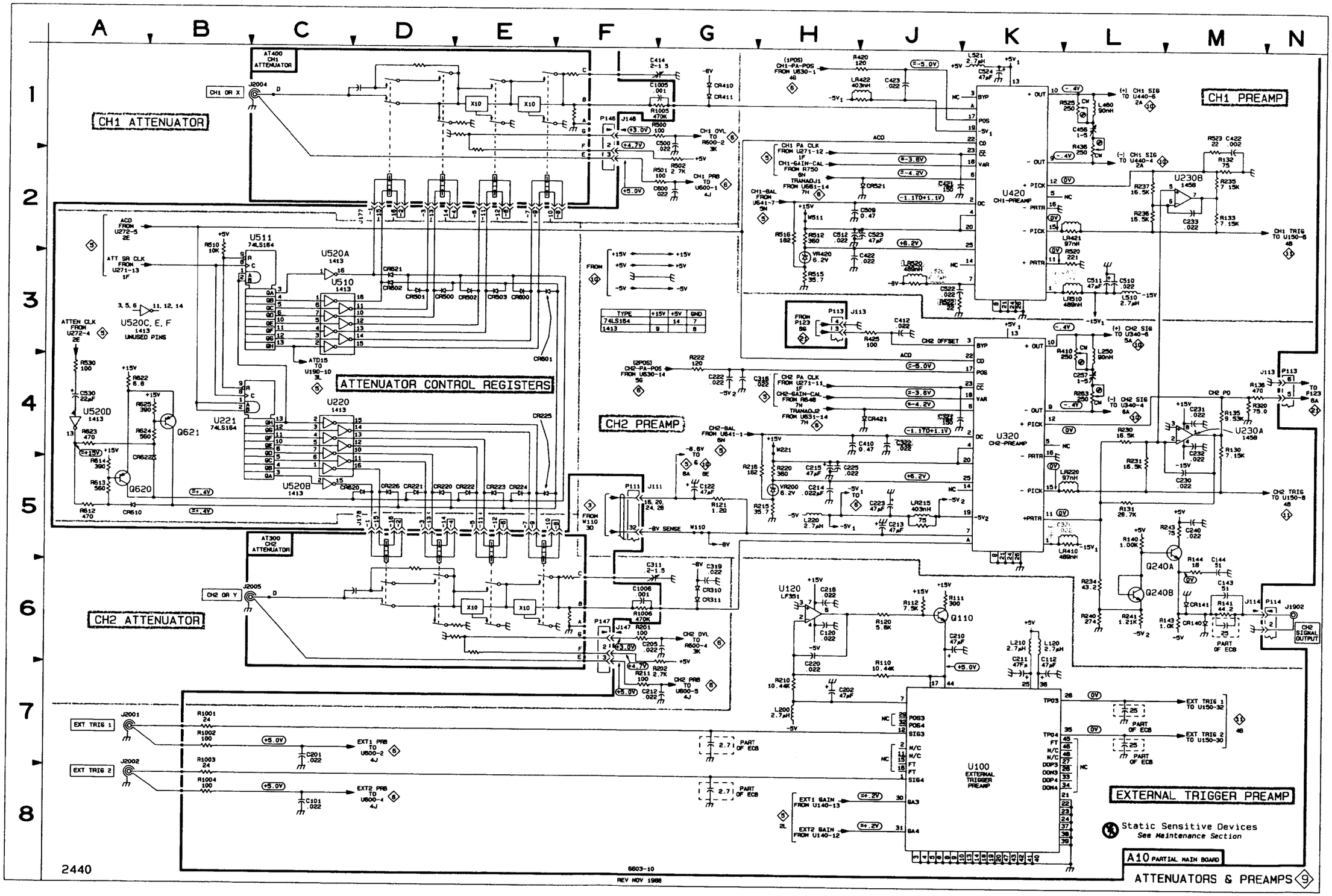
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
AT300	5C	4A	C523	2J	7D	LR220	4L	3E	R425	3J	4B
AT400	1C	6A	C524	1K	7D	LR410	5L	5C	R436	1L	6C
			C530	4A	7E	LR421	2L	5E	R464	1L	7K
C101	8C	1A	C600	2G	7B	LR422	1J	7C	R500	1G	7B
C112	6K	1C				LR510	3L	7C	R501	2G	7B
C120	6H	2D	CR140	6M	2F	LR520*	3J	7D	R502	2G	6B
C122	5G	2D	CR141	6M	2G				R510	2B	8C
C143	6M	2G	CR220	5D	3D	Q110	6K	1C	R512	2H	7C
C144	5M	1F	CR221	5D	3D	Q240A	5M	2F	R515	3H	8C
C201	7C	3A	CR222	5E	3D	Q240B	6L	2F	R516	2H	8C
C202	7H	3B	CR223	5E	2D	Q620	5A	8D	R520	2L	7D
C205	6G	3A	CR224	5E	2D	Q621	4B	8D	R522*	3K	7C
C210	6K	3B	CR225	4E	2D				R523	2M	6D
C211	6K	3B	CR226	5D	3D	R110	6J	1B	R525	1L	6D
C212	7G	3C	CR310	6G	4C	R111	6J	2C	R530	4A	7E
C213	5J	3C	CR311	6G	4C	R112	6J	2C	R612	5A	8C
C214	5H	3C	CR410	1G	5C	R120	6J	2C	R613	5A	8C
C215	4H	3D	CR411	1G	5C	R121	5G	2D	R614	5A	8C
C216	6H	3C	CR421	4J	7E	R130	4M	2E	R622	4A	8C
C220	6H	2D	CR500	3D	7C	R131	5L	2E	R623	4A	8D
C222	4G	3D	CR501	3D	7C	R132	1M	2F	R624	4B	8D
C223	5J	3D	CR502	3E	8C	R133	2M	2F	R625	4B	8D
C225	4H	3D	CR503	3E	8C	R135	4M	3F	R1001	7B	3A
C230	4M	2E	CR521	2J	7E	R136	4M	2E	R1002	7B	3A
C231	4M	2E	CR600	3E	8C	R140	5L	2F	R1003	7B	1A
C232	4M	2E	CR601	3E	7B	R141	6M	2G	R1004	8B	1A
C233	2M	2F	CR602	3D	7C	R143	6M	2G			
C240	5M	2G	CR610	5A	8C	R144	5M	2F	U100	7K	1A
C257	3L	5D	CR620	5D	7D	R201	6G	3A	U120	6H	2D
C311	6G	4C	CR621	3D	7D	R202	6G	3A	U220	4C	3D
C318	4G	4D	CR622	5B	8D	R210	7H	3B	U221	4B	2E
C319	6G	4C				R211	7G	3B	U230A	4L	2E
C320*	3L	4C	J111	5G	2D	R215	5H	3C	U230B	2M	2E
C321*	4J	4D	J113	3H	1G	R216	4H	3C	U320	4K	4C
C322*	4J	6C	J113	3N	1G	R220	4H	3C	U420	2K	6C
C410	4J	4B	J114	6M	2K	R222	3G	3D	U510	3C	7B
C412	3J	4C	J146	1F	6B	R230	4L	2E	U511	2C	7C
C414	1G	5C	J147	6F	3A	R230	4M	2E	U520A	2C	7D
C420*	6L	6C				R231	4L	2E	U520B	5C	7D
C421*	2J	5D	L120	6K	1D	R234	6L	2E	U520C	3A	7D
C422	2J	7D	L200	7H	3B	R235	2M	2F	U520D	4A	7D
C423	1J	5D	L210	6K	3C	R236	2L	2F	U520E	3A	7D
C432	2M	6E	L220	5H	3D	R237	2L	2F	U520F	3A	7D
C456	1L	6C	L250	4L	5D	R240	6L	2F			
C500	1G	7B	L460	1L	6D	R241	6L	2F	VR200	5H	3C
C509	2J	6B	L510	3L	7C	R243	5M	2G	VR420	2H	7D
C510	3L	7C	L520*	3J	7D	R263	3L	5C			
C511	3L	7C	L521	1K	7D	R320	4M	3E	W110	5G	3C
C512	2H	6C				R410	3L	5D	W221	4H	3D
C522	3J	7D	LR215	5J	2E	R420	1J	7D	W511	2H	7C

Partial A10 also shown on diagrams 5, 6, 10, 11, 12, 13, 14, and 19.

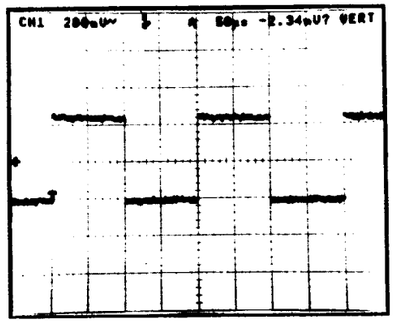
OTHER PARTS											
C1005	1G	CHASSIS	J2002	7A	CHASSIS	P111	5F	CHASSIS	P146	1F	CHASSIS
			J2004	1C	CHASSIS	P113	3H	CHASSIS	P147	6F	CHASSIS
J1902	6N	CHASSIS	J2005	6C	CHASSIS	P113	3N	CHASSIS			
J2001	7A	CHASSIS				P114	6N	CHASSIS	R1005	1G	CHASSIS

***See Parts List for serial number ranges.**



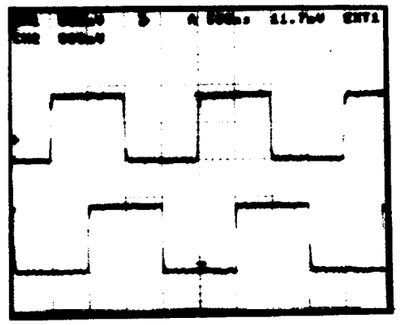

CH1 ATTENUATOR
AT400 CH1 ATTENUATOR
CH1 OR X
J2004
X10
X10
CH1 PREAMP
U420 CH1-PREAMP
U2308 1458
U230A 1458
CH1 TRIG TO U150-6 4B
ATTENUATOR CONTROL REGISTERS
U511 74LS164
U520A 1413
U510 1413
U520C, E, F 1413 UNUSED PINS
U520D 1413
U221 74LS164
U220 1413
U520B 1413
Q621
Q620
CH2 PREAMP
U320 CH2-PREAMP
CH2 TRIG TO U150-8 4B
CH2 ATTENUATOR
AT300 CH2 ATTENUATOR
J2005
CH2 OR Y
X10
X10
Q240A
Q240B
CH2 SIGNAL OUTPUT
U120 LF351
Q110
EXTERNAL TRIGGER PREAMP
U100 EXTERNAL TRIGGER PREAMP
EXT TRIG 1
EXT TRIG 2
J2001
J2002
EXT TRIG 1 TO U150-32
EXT TRIG 2 TO U150-30
Static Sensitive Devices
See Maintenance Section
A10 PARTIAL MAIN BOARD
ATTENUATORS & PREAMPS 9
2440
6803-10
REV NOV 1988

WAVEFORMS FOR DIAGRAM 10



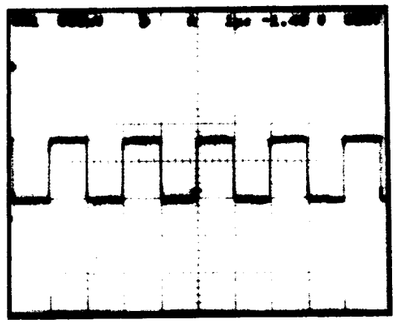
65

CAL SIGNAL ON CH1 INPUT
NORMAL ACQUISITION



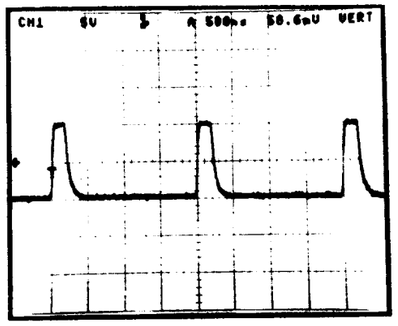
68A

68B

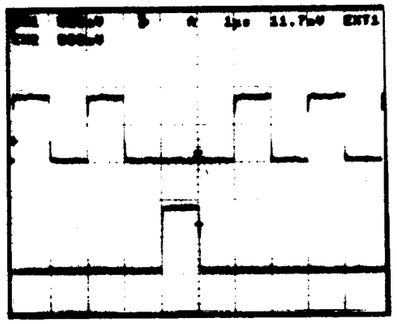


72

B2ECL IN SHORTPIPE MODE (20µs/DIV)

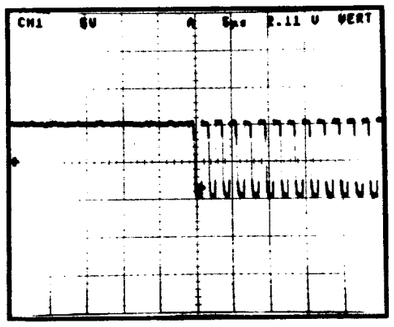


66

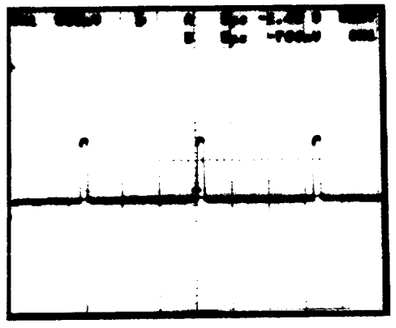


69

70



67



71

B2ECL IN FISO MODE (20µs/DIV)
TEST SCOPE A TRIGGERED ON FALLING
EDGE OF SO & B TRIGGERED ON
RISING EDGE OF B2ECL

6603-28

MORE

PEAK DETECTORS & CCD/CLOCK DRIVERS (10)

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
C110	7F	1C	L332	7B	5F	R359	8L	4K	R532	5E	8D
C111	8F	1C	L340	4B	3E	R370	4J	3K	R533	5E	8D
C140	7F	2D	L431	7B	4E	R372	5N	4K	R534	4E	8D
C141	7F	1F	L530	1B	6F	R373	6M	4L	R535	5D	7F
C142	8F	1F	L531	1B	6E	R374	3M	4L	R536	5D	7F
C190	8C	2P				R375	2N	4L	R541	1D	6G
C242	5A	2F	LR341	6C	3G	R376	3N	4K	R543	3B	7G
C243	6E	2G	LR342	5D	4G	R377	6N	4L	R544	3B	7G
C263	5M	3K	LR344	5D	5G	R378	3M	4L	R545	2D	7G
C264	5L	3J	LR345	3C	6G	R379	6M	4L	R546	2E	7G
C265	5L	3K				R430	3C	5E	R547	2E	7G
C330	6B	3E	Q170*	5F	2K	R431	4C	5G	R551	2E	7G
C340	4C	3D	Q358*	7H	5K	R435	3C	5G	R556	3G	7J
C341	4B	4E	Q372	6N	4K	R437*	1G	6J	R557	2G	7J
C350	5E	4H	Q375	3N	4K	R438*	7G	5K	R558	2G	7J
C367	5L	4K	Q446*	1H	6K	R440	3C	5G	R585	8A	6L
C370	4J	4K	Q450	4G	6K	R441	2D	6H	R586	8A	7L
C372	5N	4L	Q460	3G	7J	R442	1J	6L	R587	8B	7L
C375	3N	4L	Q530	5E	8D	R443	1J	6L	R588	8B	6L
C430	2B	7E	Q540	2E	6G	R444	1K	6K	R631	6E	8C
C440	3E	5G	Q551	2G	7J	R445	1K	6L	R632	6E	8C
C441	4B	6E	Q580	8B	6L	R446	1K	5K	R633	6E	8C
C462	4L	8J	Q630	6E	8C	R447	1L	5L	R635	6D	7F
C463	4K	7K	Q640	1E	7G	R448	1L	5L	R636	6D	7F
C464	4K	5J				R449	1L	5L	R637	6D	7F
C465	4K	5K	R170*	5F	2L	R452	4F	6K	R640	2D	7G
C467	4L	6K	R171*	5G	3J	R453	4F	6K	R641	1D	7G
C468	5L	3K	R232	7C	3E	R454	3F	7J	R642	1D	7G
C474	4J	6K	R233	7C	3G	R455	3G	7J	R643	1D	7G
C480	8F	6H	R238	5A	2F	R456	4G	6K	R646	1E	7G
C493	8F	5P	R242	5A	2F	R461	3F	6K	R647	1E	7G
C532	6E	7F	R244	6D	4G	R463	4K	7K	R651	1E	7G
C535	4E	7F	R245	7C	3G	R464	4K	7K	R742	2D	8F
C540	2E	7F	R251	5F	2K	R466*	5L	7K	R743	5D	7G
C541	4E	7F	R285*	1G	5K	R467A	8L	4K			
C542	4B	7G	R286	8A	2N	R467B	8L	4K	TP281	8C	4K
C550	1E	6G	R340	7C	4G	R467D	1L	4K			
C562	8C	6L	R341	6C	3G	R467E	8K	4K	U340	4C	3E
C581	8B	7L	R342	5D	4G	R467F	8J	4K	U350	6K	3H
C640	5E	7F	R343	5D	4G	R467G	8K	4K	U360A	6N	4L
C641	1E	7G	R344	2D	5G	R468A	8J	5K	U360B	3N	4L
C652*	4L	7H	R345	3C	6G	R468B	1L	5K	U440	1C	5E
			R346	8J	5K	R468C	1L	5K	U450	2K	5H
CR551	4L	7H	R347	8J	5L	R468D	1J	5K	U460A	4K	7K
CR552	4L	7H	R348	8K	5K	R468E	1J	5K	U460B	5L	7K
CR553	4L	7H	R349	8K	5L	R468F	1K	5K	U540A	1D	7F
			R353	5L	7H	R468G	1K	5K	U540B	2D	7F
J111	7E	2D	R354	8D	1F	R469	5K	6K	U540C	4D	7F
J111	8D	2D	R355	8D	1F	R470	4J	6K	U540D	6D	7F
J141	2F	2K	R356	8K	5L	R486	8B	6L	U580B	8B	7L
			R357	8L	4K	R487	8C	6L			
L261	4M	2K	R358	8L	4K	R488	8C	6L			

Partial A10 also shown on diagrams 5, 6, 9, 11, 12, 13, 14, and 19.

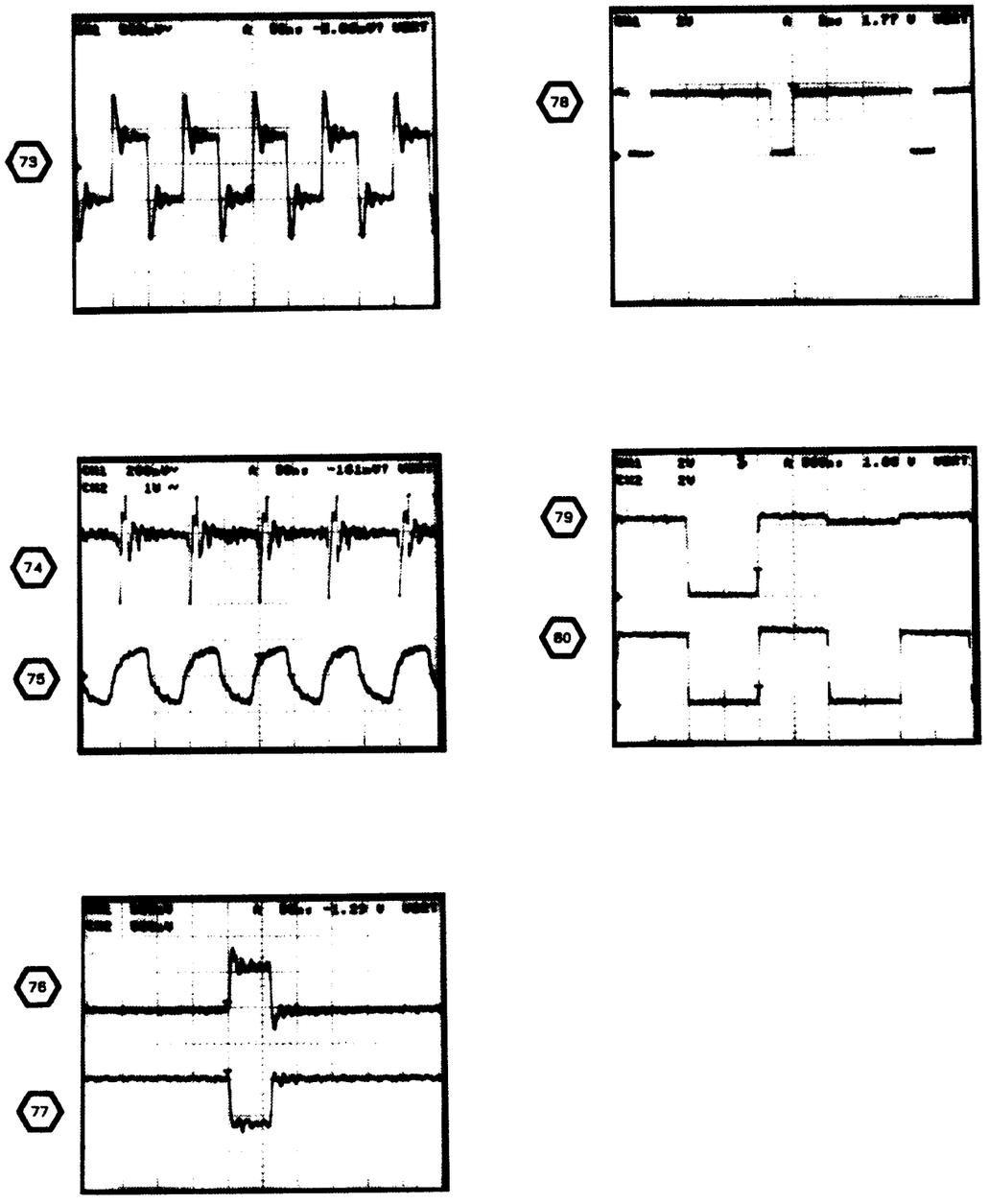
OTHER PARTS

P111	7E	CHASSIS	P111	8D	CHASSIS	P141	2F	CHASSIS			

***See Parts List for serial number ranges.**

WAVEFORMS FOR DIAGRAM 11

WAVEFORMS FOR DIAGRAM 11



CH1 PEAK DETECTOR

U440 PEAK DETECTOR

CH1 CCD/CLOCK DRIVERS

RESET DRIVER

U540A TL074

U540B TL074

U540C TL074

U540D TL074

Q640 Q540 Q551 Q460 Q450 Q530 Q630 Q446

Static Sensitive Devices
See Maintenance Section

COMMON MODE ADJUST

C CLOCK DRIVERS

U450
CCD/CLOCK DRIVER

U350
CCD/CLOCK DRIVER

U460A TL072 U460B TL072

Q375 Q372 Q356

U360B TL072 U360A TL072

CH2 PEAK DETECTOR

U340 PEAK DETECTOR

-2V SUPPLY

U580B 1458 Q580

CH2 CCD/CLOCK DRIVERS

A10 PARTIAL MAIN BOARD

PEAK DETECTORS & CCD/CLOCK DRIVERS 10

2440

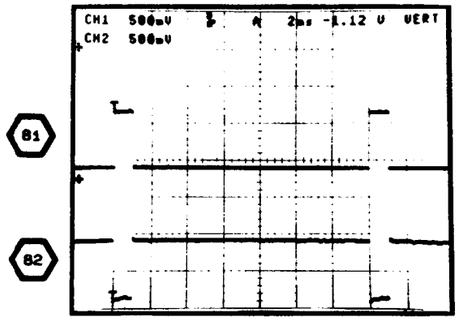
8603-11
REV NOV 1986

TRIGGERS & PHASE CLOCKS 11

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
C150	7D	1G	J157	3N	6L	R250	4B	3H	R571	3J	6L
C160	5C	1K				R252	4D	4K	R572	3H	6L
C161	5C	1K	L150	6D	2G	R253	3E	3K	R573	3K	6M
C162	6C	2K	L260	7C	3H	R255	3E	4K	R574	3J	6M
C169	1B	2N	L270	1D	3K	R260	4D	3K	R575	3J	6M
C189	7H	3N				R261	5C	2K	R580	2H	7K
C241	5C	2H	LR450	4M	5K	R262	7C	2L	R581	2H	7L
C250	4C	3H	LR451	4M	5K	R267	3H	4M	R584	2J	6L
C260	6D	3K	LR452	4M	5K	R268	3H	4M			
C272	7G	3L	LR453	4M	5K	R270	7C	3K	T370	3F	3K
C280	3G	3M	LR454	4M	5J	R271	3J	4M	T371	4F	4K
C281	1E	3M	LR455	4M	5H	R272	1H	5M			
C287	7H	2N	LR456	4M	5J	R274	2G	4M	TP163	1B	2M
C288	6H	2P	LR457	4M	5H	R275	6J	3M	TP173	5K	2L
C361	4E	2K				R276	7H	3M	TP174	2C	2L
C370	1D	4K	Q140	7D	1G	R278	4J	4L	TP231	2B	3E
C371	3E	3K	Q150	4E	1K	R279	4F	4L	TP284	2B	2N
C380	2E	4M	Q151	4E	1K	R281	6J	2K	TP288	6M	2N
C472	1L	5L	Q250	3E	3K	R282	7J	2K	TP291	6M	1N
C473	8L	5L	Q251	3E	3K	R286	6M	2N	TP370	5H	4M
C484	2H	7L	Q270	3H	3N	R286	7M	2N	TP568	2B	6K
C488	2H	7L	Q271	3J	4M	R287	6M	2N	TP581	2J	6M
			Q287	7J	2N	R287	6M	2N	TP585	2B	9P
CR270	3J	4M	Q288	6J	2P	R288	6M	2N	TP612	2B	9B
CR285	6J	3N				R361	4E	4K	TP632	2B	10F
CR286	7J	3N	R134	7B	1F	R368	7H	3M			
CR580	1J	6L	R145	7D	1G	R371A	3E	3K	U150	2C	1H
CR581	2H	7L	R146	7D	1G	R371B	3E	3K	U370	4G	4L
CR582	2J	6L	R150	7D	1G	R371D	5E	3K	U380A	7M	3M
			R151	4D	1K	R371E	5E	3K	U380B	6M	3M
J111	6B	2D	R160	4E	1K	R380	2E	4M	U380C	6M	3M
J111	6J	2D	R161	4D	1K	R381	2F	4M	U380D	6M	3M
J113	7E	1G	R162	4B	1K	R382	2G	4M	U381	2G	4M
J113	8B	1G	R163	6B	2K	R383	2F	5M	U470	2L	6M
J114	6J	2K	R165	4E	1K	R384	2D	4M	U580	2H	7L
J141	1A	2K	R183	6H	3M	R385	2G	4M			
J141	5K	2K	R184	7J	3N	R479	2G	4M	VR298	7H	2N
J141	6E	2K	R185	6H	3P	R480	2G	6L			
J141	6J	2K	R186	6J	3N	R481	2G	6L	W470	8L	4L
J141	6M	2K	R188	7M	3M	R499	2H	7K			
J141	7B	2K	R225	7C	1G	R570	3M	6L			
Patriot A10 also shown on diagrams 5, 6, 9, 10, 12, 13, 14, and 19.											
OTHER PARTS											
J1900	7K	CHASSIS	P111	7J	CHASSIS	P141	1A	CHASSIS	P141	6M	CHASSIS
J1901	6K	CHASSIS	P113	7E	CHASSIS	P141	5K	CHASSIS	P141	7A	CHASSIS
			P113	8A	CHASSIS	P141	6E	CHASSIS			
P111	6A	CHASSIS	P114	6J	CHASSIS	P141	6J	CHASSIS			

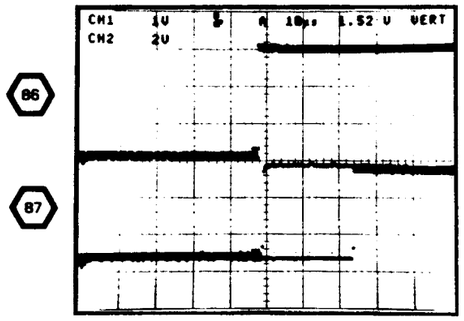
WAVEFORMS FOR DIAGRAM 12

WAVEFORMS FOR DIAGRAM 12

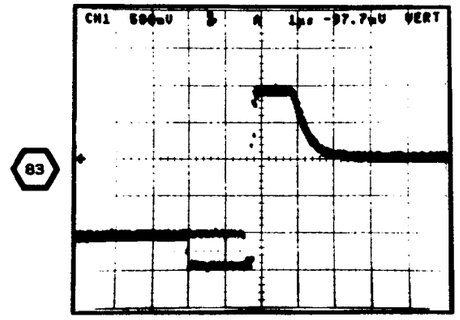


CAL SIGNAL INPUT
TRIGGERED-ACQUIRING
SEC/DIV at 100 ms

TEST SCOPE TRIGGERED ON START

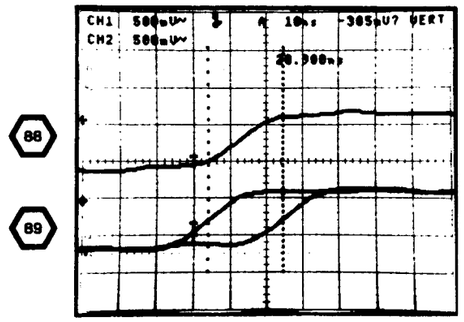


+SLOPE ENVELOPE AQUISITION MODE

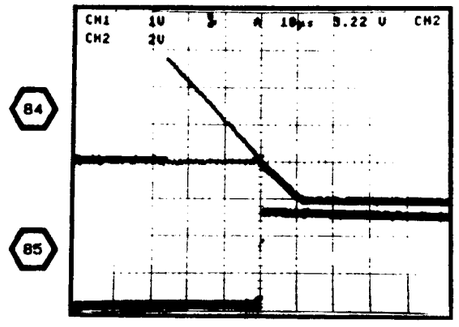


SEC/DIV at 5nS

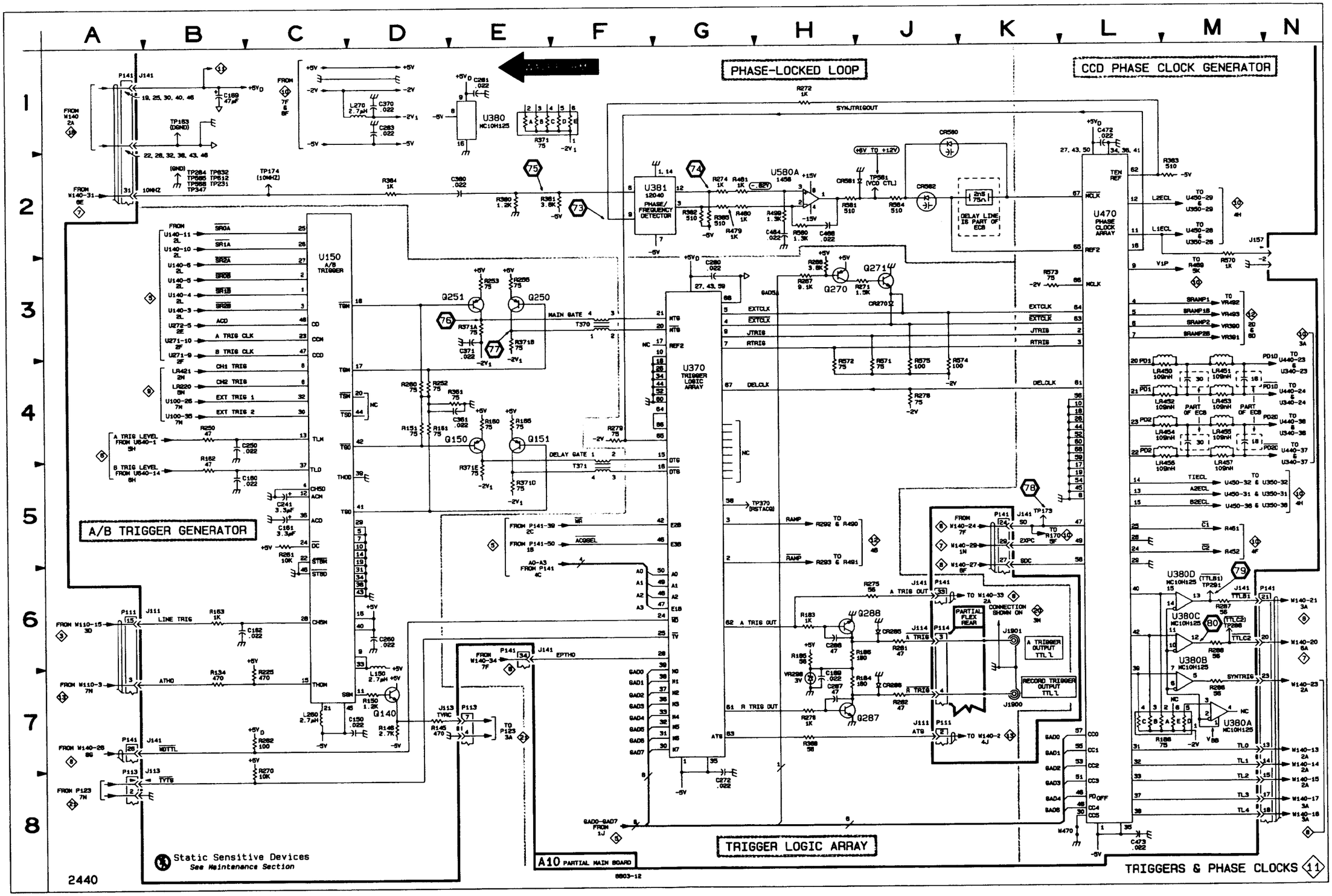
TEST SCOPE TRIGGERED
ON SRAMP1 +SLOPE



TEST SCOPE TIGGERED ON STOP
ENVELOPE ACQUISITION MODE



6285-41


PHASE-LOCKED LOOP
CCD PHASE CLOCK GENERATOR
A/B TRIGGER GENERATOR
TRIGGER LOGIC ARRAY
U150 A/B TRIGGER
U370 TRIGGER LOGIC ARRAY
U380 MC10H125
U381 12040 PHASE/ FREQUENCY DETECTOR
U580A 1458
U470 PHASE CLOCK ARRAY
Q140
Q150
Q151
Q250
Q251
Q270
Q271
Q287
Q288
DELAY GATE 1
MAIN GATE 4
DELAY LINE IS PART OF ECB
PARTIAL FLEX REAR
CONNECTION SHOWN ON 3M
A TRIGGER OUTPUT TTL
RECORD TRIGGER OUTPUT TTL
A10 PARTIAL MAIN BOARD
8803-12
Static Sensitive Devices
See Maintenance Section
2440
TRIGGERS & PHASE CLOCKS 11
TRIGGERS & PHASE CLOCKS

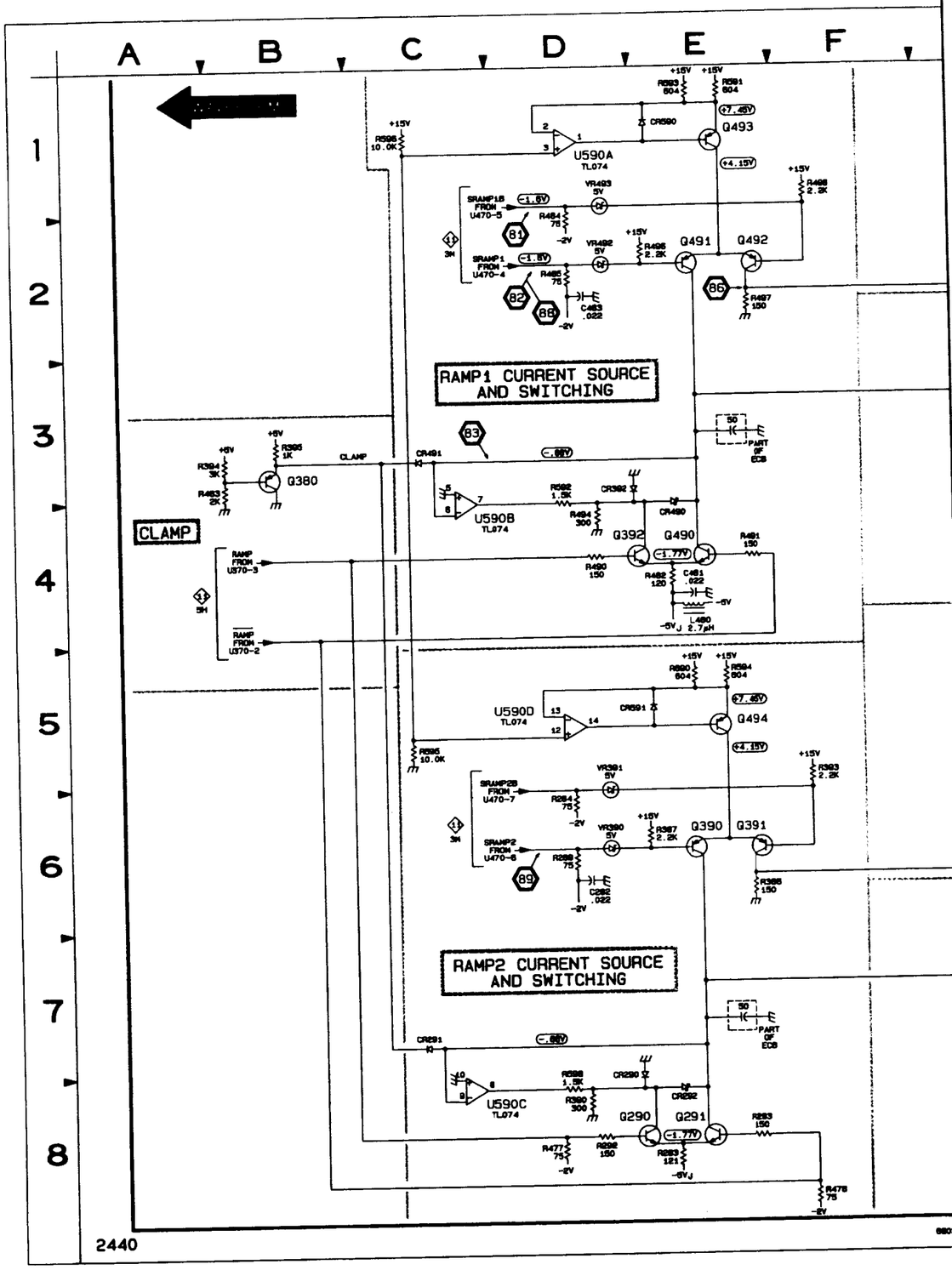
JITTER CORRECTION RAMPS (12)

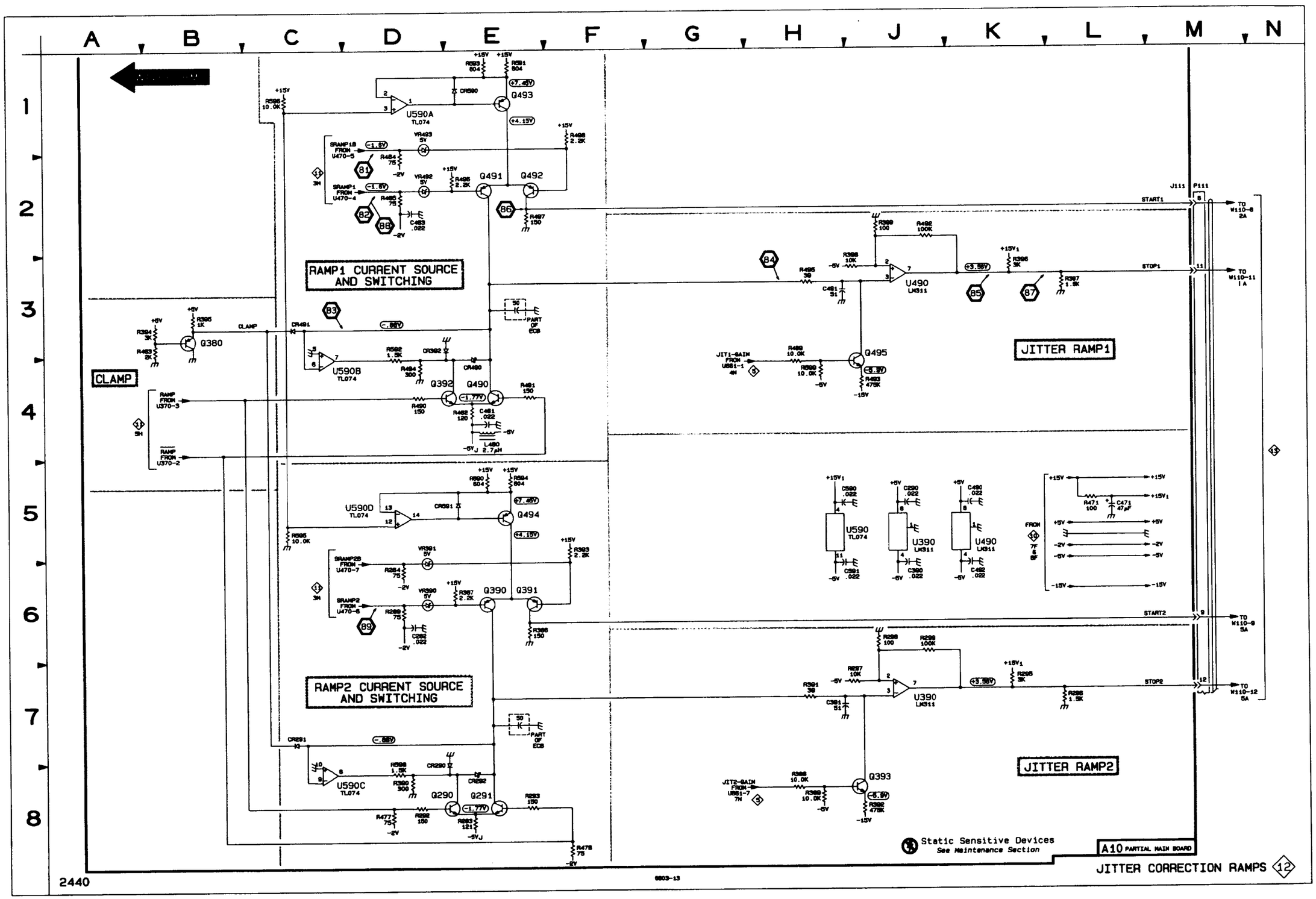
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
C282	6D	3N	Q290	8E	3N	R388	8H	4P	R496	2E	6N
C290	5J	3P	Q291	8E	3N	R389	8H	5P	R497	2E	6P
C390	6J	4P	Q380	3B	4M	R390	8D	3N	R498	1F	6M
C391	7J	4N	Q390	6E	4N	R391	7H	3N	R591	1E	4N
C471	5L	4P	Q391	6E	4N	R392	8J	3P	R592	3D	5N
C481	4E	5M	Q392	4E	5N	R393	5F	4N	R593	1E	4N
C483	2D	6M	Q393	8J	4N	R394	3B	5M	R594	5E	4P
C490	5K	5N	Q490	4E	5N	R395	3B	5M	R595	5C	4P
C491	3H	6N	Q491	2E	6N	R396	2K	5P	R596	1C	4P
C492	6K	6N	Q492	2E	6N	R397	3L	5P	R598	7D	5N
C590	5J	4N	Q493	1E	4N	R398	2J	5P	R599	4H	6P
C591	6J	5N	Q494	5E	4N	R399	2J	5P	R690	5E	4P
			Q495	3J	6P	R471	5L	4N			
CR290	7E	3N				R477	8D	6M	U390	7J	3P
CR291	7C	3N	R283	8E	3M	R478	8F	6M	U490	3J	5N
CR292	6E	3N	R284	8D	4N	R482	4E	6M	U590A	1D	5N
CR392	3D	5N	R289	8D	3N	R483	3B	5M	U590B	4D	5N
CR490	4E	5N	R292	8D	3N	R484	1D	6M	U590C	8D	5N
CR491	3C	5N	R293	8E	3N	R485	2D	6M	U590D	5D	5N
CR590	1E	5N	R295	7K	3P	R489	3H	6M			
CR591	5E	4N	R296	7L	3P	R490	4D	5N	VR390	6D	4N
			R297	7J	3P	R491	4E	6N	VR391	5D	4N
J111	2M	2D	R298	6J	3P	R492	2J	5P	VR492	2D	6N
			R299	6J	3P	R493	4J	6P	VR493	1D	6N
L480	4E	6M	R386	6E	3N	R494	4D	5N			
			R387	6E	4N	R495	3H	6N			

Patrial A10 also shown on diagrams 5, 6, 9, 10, 11, 13, 14, and 19.

OTHER PARTS

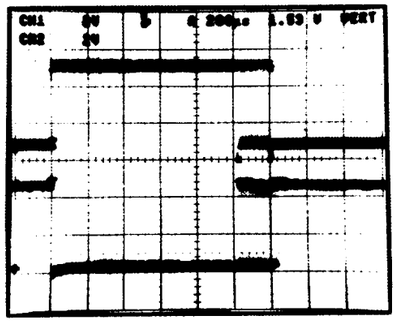
P111	2M	CHASSIS									

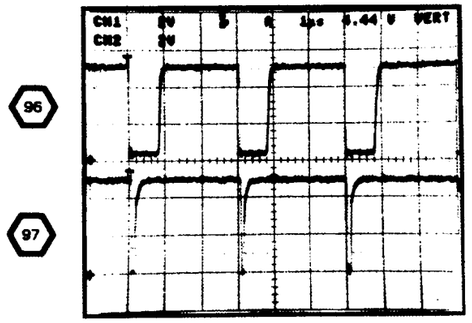


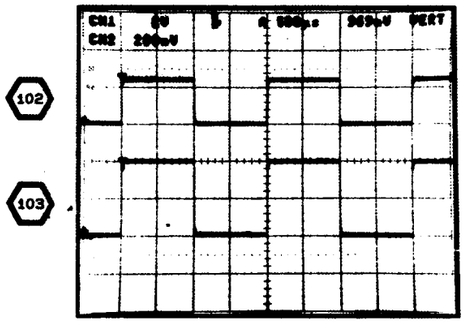

RAMP1 CURRENT SOURCE AND SWITCHING
RAMP2 CURRENT SOURCE AND SWITCHING
JITTER RAMP1
JITTER RAMP2
CLAMP
U590A TL074
U590B TL074
U590C TL074
U590D TL074
U490 LM311
U390 LM311
Q380
Q390
Q391
Q392
Q393
Q394
Q395
Q490
Q491
Q492
Q493
Q494
Q495
START1
STOP1
START2
STOP2
Static Sensitive Devices
See Maintenance Section
A10 PARTIAL MAIN BOARD
JITTER CORRECTION RAMPS 12
2440

WAVEFORMS FOR DIAGRAM 13

TEST SCOPE IN ENVELOPE

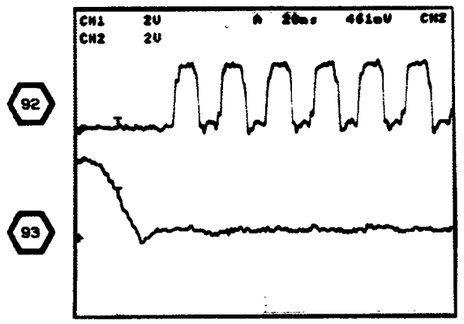


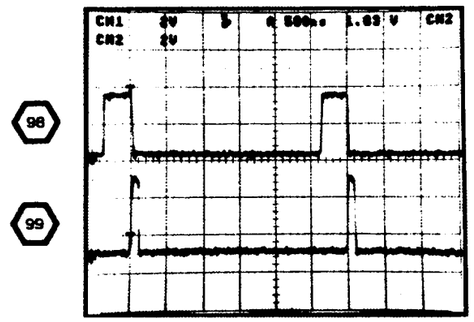


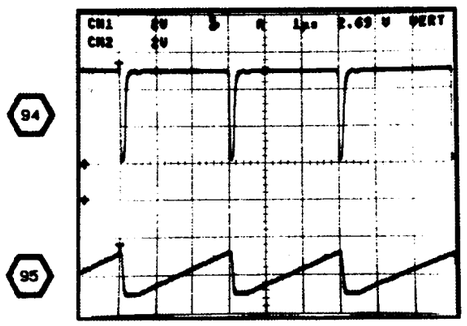


INIT FRONT PANEL

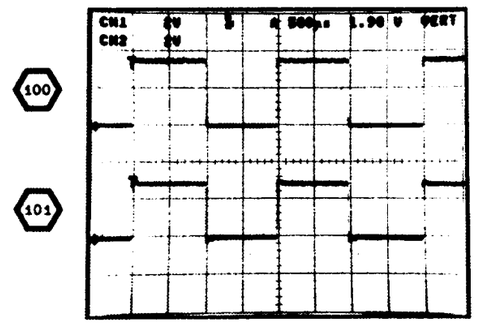
TRIG ON -SLOPE







AT 5 NS/DIV-NO HOLDOFF



INIT FRONT PANEL

6285-33

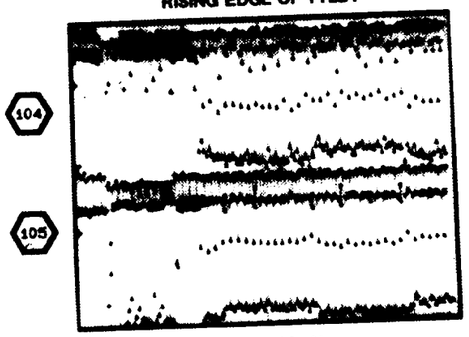
MORE

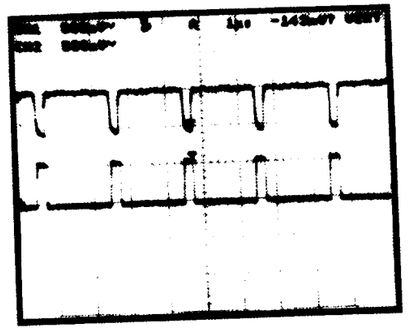
TRIGGER HOLDOFF, JITTER COUNTERS & CALIBRATOR 13

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
C102	7E	2A	J111 J2006	7E 7F	2D 2A	R102	7E	2A			
Partial A10 also shown on diagrams 5, 6, 9, 10, 11, 12, 14, and 19.											
ASSEMBLY 13											
C700	3H	1A	Q771	6H	2K	R844	1B	3G	U841B	1B	3G
C731	2G	1F	Q772	6H	2L	R844	7L	3G	U842A	5B	3G
C781	3H	1M	Q773	7J	2L	R861	5L	2J	U842B	4B	3G
C831	7B	2E	Q781	7K	2M	R863	6J	2K	U851A	4C	3H
C832	7C	2F	Q782	7H	2M	R871	7K	2L	U851B	1C	3H
C833	7D	2F	Q783	7G	2M	R881	6L	2M	U851C	4K	3H
C841	6C	3F	Q831	7D	3E	R882	7K	3M	U852A	1D	3H
C842	8C	3F				R883	7L	3M	U852B	2D	3H
C843	2H	2G	R731	7A	2E	R884	7M	3M	U853A	4D	3H
C852	2H	2H	R732	7A	2E	R885	8B	3M	U853B	6C	3H
C861	2H	2J	R741	7B	2F	R886	7G	2M	U871	7K	2K
C864	7J	2K	R761	5H	1K	R887	8J	2M	U872A	7L	3L
C871	3G	3K	R762	6J	2K	R888	8J	2M	U872B	7M	3L
C871	3H	3K	R771	5G	1L	R889	8K	2M	U881	8K	3M
C872	3G	2L	R772	6H	2K						
C873	3G	3L	R773	7G	2K	TP826	2G	2E	VR841	6C	3F
C881	7H	2M	R774	5H	1L	TP871	5L	2J			
C882	7H	2M	R775	8H	2L				W101	1A	2E
C883	8B	3M	R780	6J	2M	U731	7B	2F	W110	1A	3D
C884	2G	3M	R781	6J	2M	U752	1E	2H	W110	2A	3D
C885	7G	3M	R782	6J	2M	U753	4E	2H	W110	4A	3D
			R783	7G	1M	U761	4L	2J	W110	5J	3D
CR761	6J	2K	R784	7G	1M	U762	4G	1J	W110	6J	3D
CR771	6G	2L	R832	7D	2E	U781	3D	1M	W110	7D	3D
CR772	6G	2L	R833	7C	3E	U831A	7C	3F	W110	7N	3D
CR773	6H	2L	R834	7C	3E	U831B	7C	3F	W122	3A	1L
			R835	7D	3E	U831C	8C	3F	W122	7N	1L
J156	5L	2J	R841	6C	3F	U831D	8C	3F	W122	8A	1L
			R842	8C	3F	U831E	6B	3F			
Q761	6J	2K	R843	1B	2G	U841A	2B	3G			
Partial A13 also shown on diagram 3.											
OTHER PARTS											
P111	7E	CHASSIS									

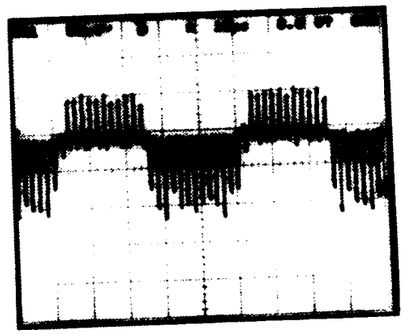
WAVEFORMS FOR DIAGRAM 14

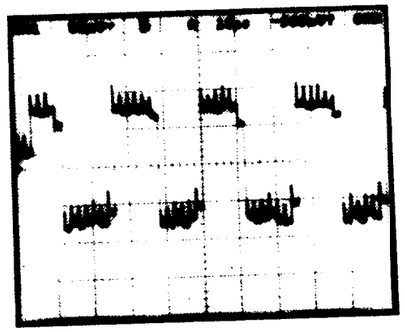
TEST SCOPE A TRIGGERED RISING EDGE OF SO & B TRIGGERED ON RISING EDGE OF TTLB1

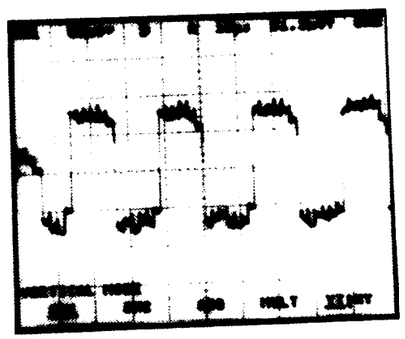


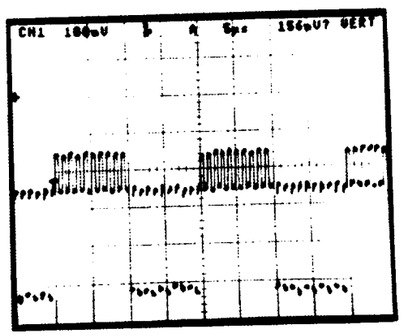


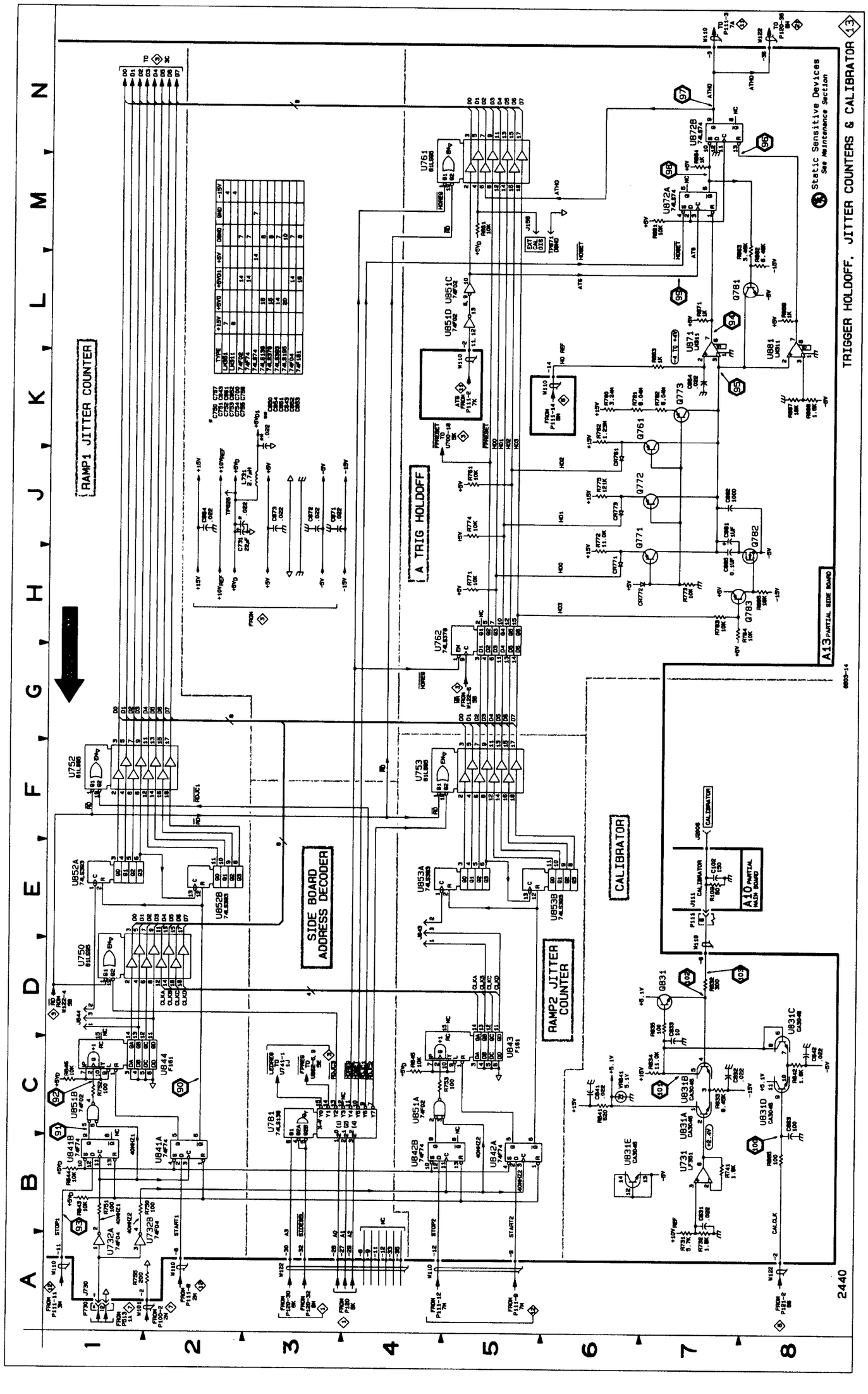
VOLTS/DIV AT 100mV
SEC/DIV AT 5µs;
CALIBRATOR SIGNAL APPLIED TO CH 1 INPUT; AC COUPLED.
VERT MODE CH 1 (CH 2 FOR CHANNEL 2 TROUBLESHOOTING)







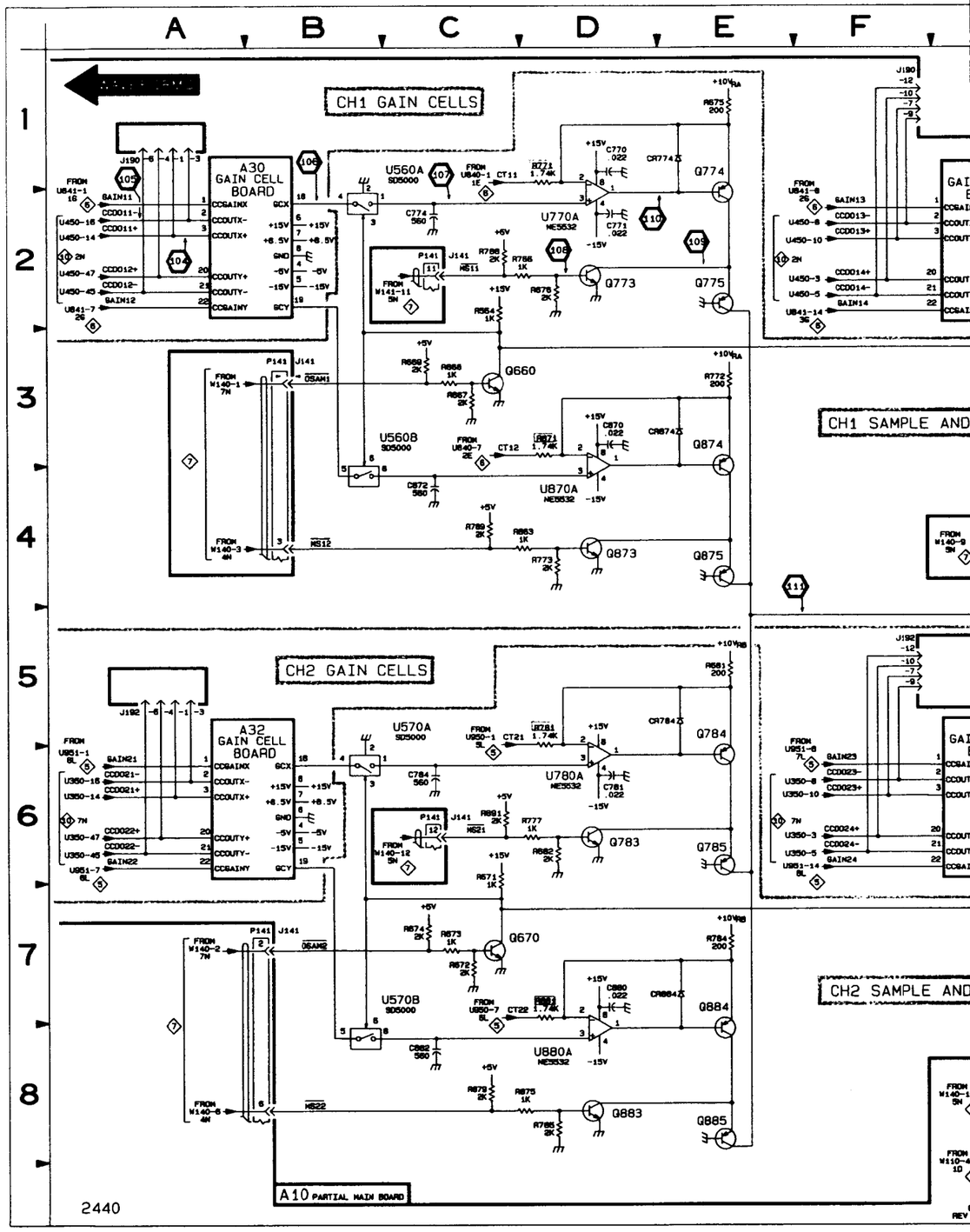


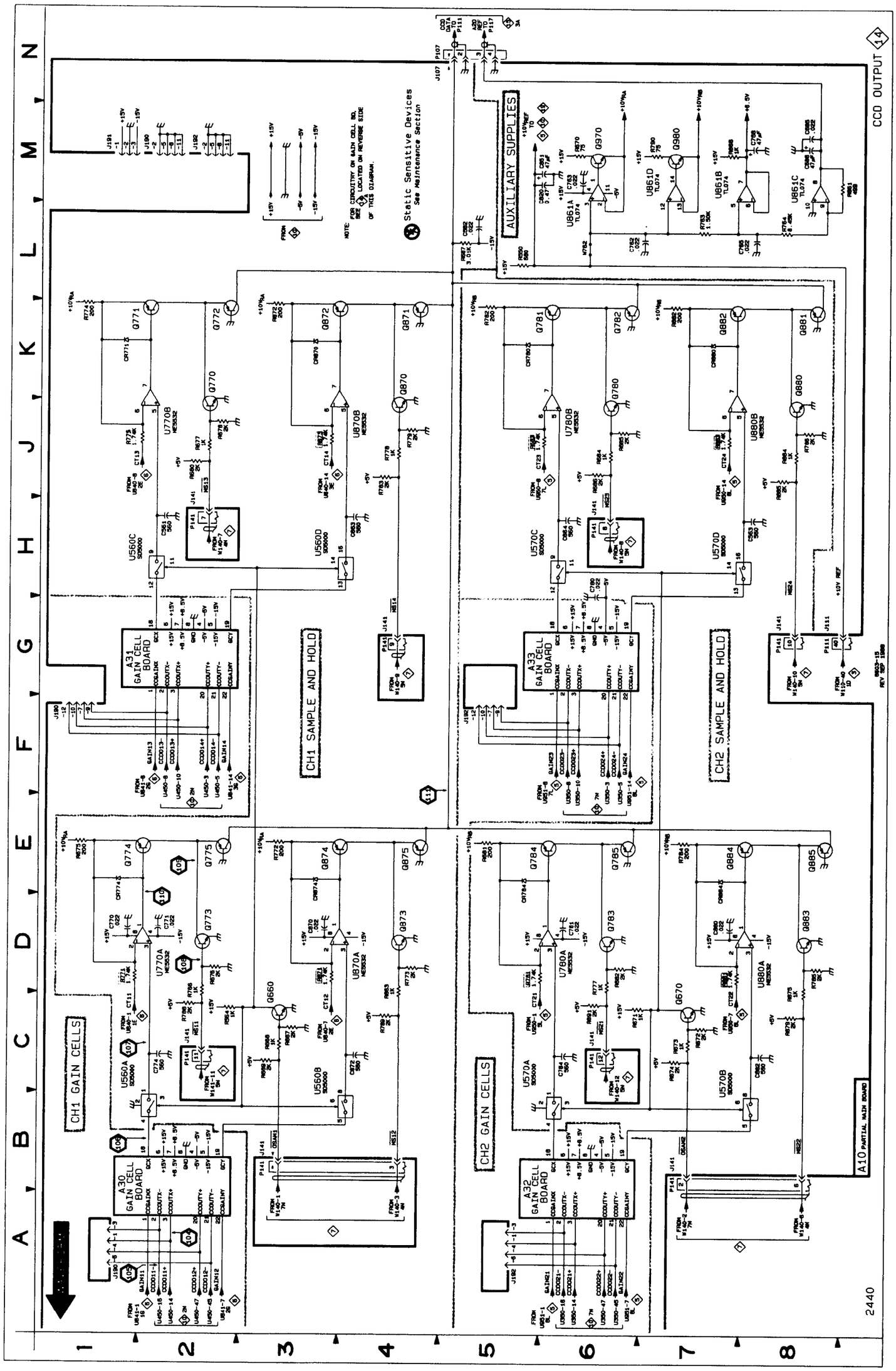

TRIGGER HOLDOFF, JITTER COUNTERS & CALIBRATOR
RAMP1 JITTER COUNTER
A TRIG HOLDOFF
SIDE BOARD ADDRESS DECODER
RAMP2 JITTER COUNTER
CALIBRATOR
A13 PARTIAL SIDE BOARD
A10 PARTIAL MAIN BOARD
Static Sensitive Devices
See Maintenance Section
2440

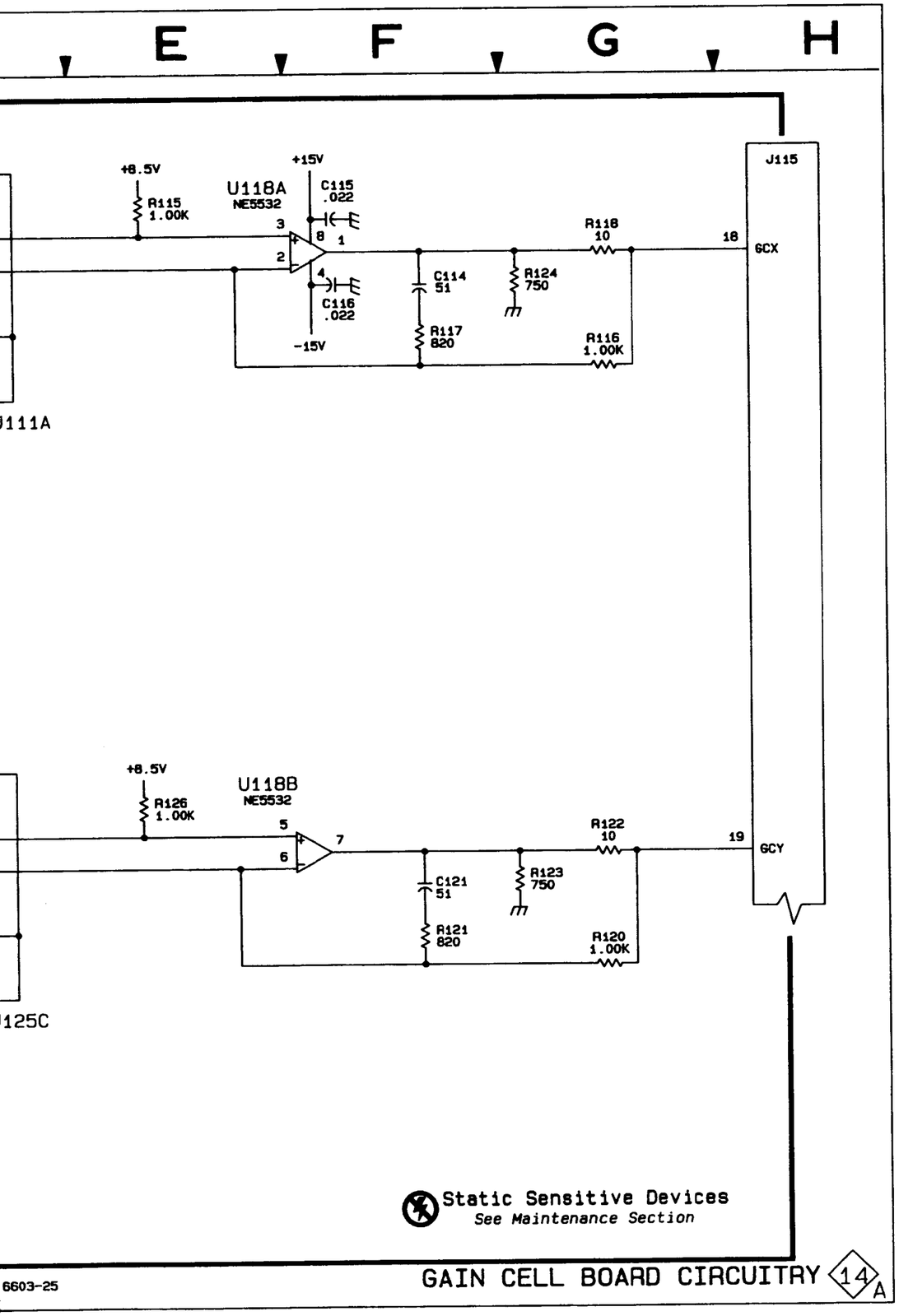
CCD OUTPUT 14

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A10											
C561	2H	9N	J141	6C	2K	R550	5L	7G	R789	4C	8K
C563	8H	8N	J141	6H	2K	R564	2C	9N	R790	7M	9N
C581	5M	7L	J141	7A	2K	R667	3C	8N	R861	8M	9K
C582	5L	9N	J141	8G	2K	R668	3C	8N	R863	4D	8K
C663	4H	9K	J190	1A	9L	R669	3C	8N	R868	7M	9J
C664	6H	8K	J190	1F	9L	R670	6M	9K	R871*	3D	9K
C685	8M	7M	J190	2M	9L	R671	6C	8N	R872	3K	8L
C686	8M	7M	J191	1M	9N	R672	7C	9N	R873*	3J	9L
C762	6L	8J	J192	2M	9M	R673	7C	9N	R875	8D	7M
C763	6M	9J	J192	5F	9M	R674	7C	8N	R879	8C	7M
C765	7L	8K				R675	1E	8L	R881*	7D	7N
C768	8M	9K	Q660	3C	8N	R676	2D	8L	R882	7K	7N
C770	1D	9M	Q670	7D	8N	R677	2J	9M	R883*	7J	8N
C771	2D	9M	Q770	2K	9M	R678	2J	9M	R884	8J	9N
C774	2C	9N	Q771	1K	9L	R680	2J	9M	R885	8J	9N
C780	6H	8L	Q772	2K	9M	R681	5E	8L	R891	6C	7K
C781	6D	7K	Q773	2D	8M	R682	6D	7K			
C784	6C	8K	Q774	1E	8M	R683*	5J	8L	U560A	1C	8P
C820	5M	10F	Q775	2E	8M	R684	6J	7M	U560B	3C	8P
C851	6M	10F	Q780	6K	7M	R685	6J	7M	U560C	1H	8P
C870	3D	9L	Q781	5K	7L	R686	6J	7M	U560D	3H	8P
C872	4C	9K	Q782	6K	7L	R687	5L	7M	U570A	5C	8P
C880	7D	7N	Q783	6D	7K	R763	7L	8J	U570B	7C	8P
C882	8C	8N	Q784	5E	7K	R764	8L	8K	U570C	5H	8P
			Q785	6E	7K	R766	2C	8M	U570D	7H	8P
CR771	1K	8M	Q870	4K	9L	R771*	1D	9M	U770A	2D	9M
CR774	1E	8L	Q871	4K	9L	R772	3E	8L	U770B	2J	9M
CR780	5K	7M	Q872	3K	9L	R773	4D	8K	U780A	6D	7L
CR784	5E	8L	Q873	4D	8K	R774	1K	8M	U780B	6J	7L
CR870	3K	8L	Q874	3E	8K	R775*	1J	9M	U861A	6L	9J
CR874	3E	8L	Q875	4E	8L	R777	6D	7K	U861B	7M	9J
CR880	7K	8M	Q880	8K	8N	R778	4J	9M	U861C	8M	9J
CR884	7E	7N	Q881	8K	8N	R779	4J	9M	U861D	7M	9J
			Q882	7K	8N	R781*	5D	7L	U870A	4D	9L
J107	4N	6M	Q883	8D	7M	R782	5K	8L	U870B	4J	9L
J111	8G	2D	Q884	7E	7N	R783	4J	9M	U880A	8D	7N
J141	2C	2K	Q885	8E	7N	R784	7E	7N	U880B	8J	7N
J141	2H	2K	Q970	6M	9K	R785	8D	7M			
J141	3B	2K	Q980	7M	9L	R786	8J	9N	W782	6L	8J
J141	4G	2K				R788	2C	8M			
Partial A10 also shown on diagrams 5, 6, 9, 10, 11, 12, 13, and 19.											
OTHER PARTS											
P107	5N	CHASSIS	P141	2H	CHASSIS	P141	6C	CHASSIS	P141	8G	CHASSIS
P111	8G	CHASSIS	P141	3B	CHASSIS	P141	6H	CHASSIS			
P141	2C	CHASSIS	P141	4G	CHASSIS	P141	7B	CHASSIS			

***See Parts List for serial number ranges.**

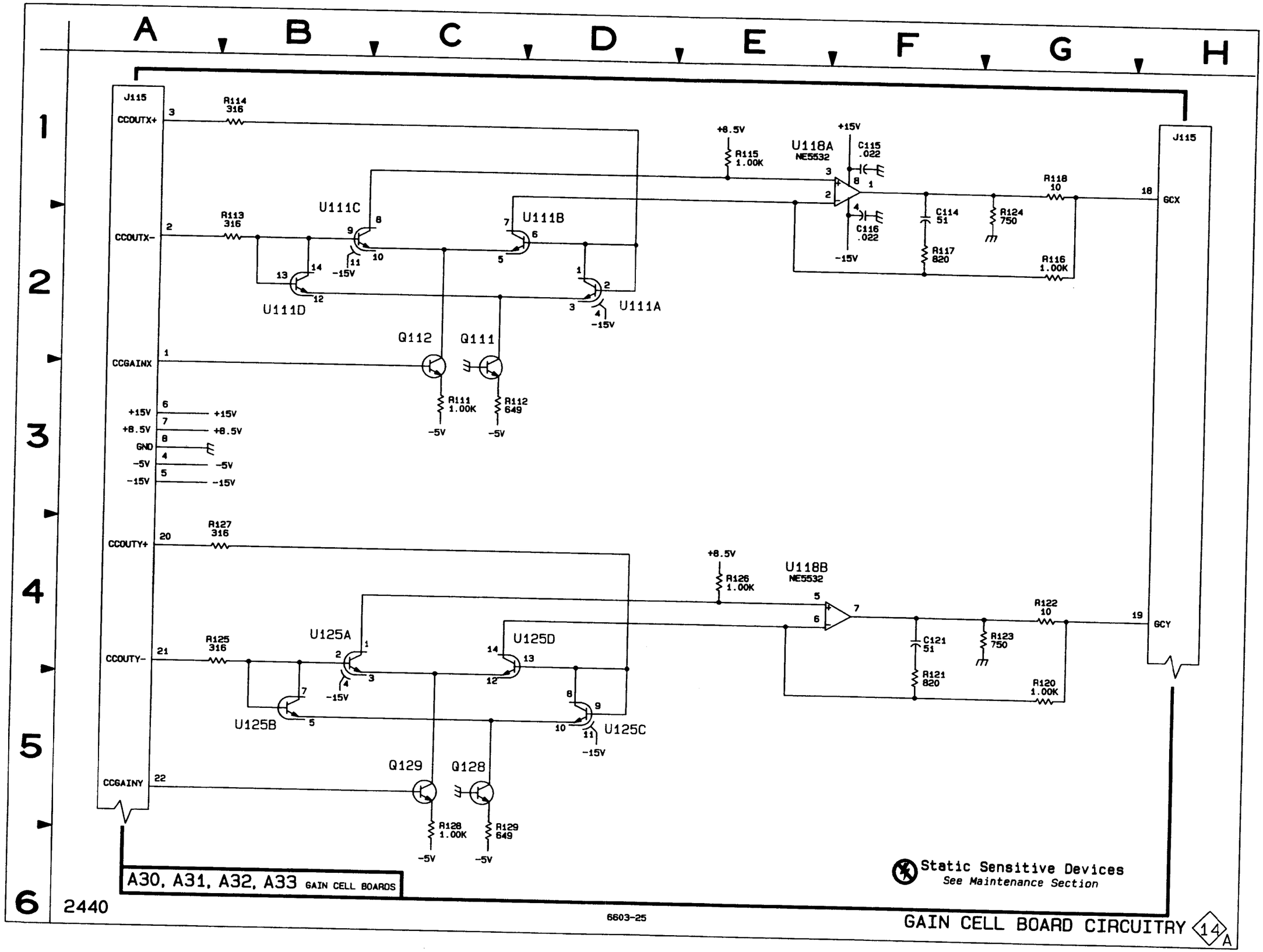



CCD OUTPUT 14
AUXILIARY SUPPLIES
Static Sensitive Devices
See Maintenance Section
CH1 SAMPLE AND HOLD
CH2 SAMPLE AND HOLD
CH1 GAIN CELLS
CH2 GAIN CELLS
A30 GAIN CELL BOARD
A31 GAIN CELL BOARD
A32 GAIN CELL BOARD
A33 GAIN CELL BOARD
A10 PARTIAL MAIN BOARD
2440



GAIN CELL BOARD CIRCUITRY 14A

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLIES A30, A31, A32, A33											
C114	1F	1A	Q128	5C	1D	R120	4G	1C	U111A	2D	1A
C115	1F	1B	Q129	5C	1D	R121	4F	1C	U111B	2D	1A
C116	2F	1B				R122	4G	1C	U111C	2B	1A
C121	4F	1C	R111	3C	1A	R123	4G	1C	U111D	2B	1A
			R112	3C	1A	R124	1G	1B	U118A	1E	1B
J115	1A	1B	R113	2B	1A	R125	4B	1C	U118B	4E	1B
J115	1A	1C	R114	1B	1A	R126	4E	1C	U125A	4B	1C
J115	1H	1B	R115	1E	1B	R127	4B	1D	U125B	5B	1C
			R116	2G	1B	R128	5C	1D	U125C	5D	1C
Q111	2C	1A	R117	2F	1B	R129	5C	1D	U125D	4D	1C
Q112	2C	1A	R118	1G	1B						


A
B
C
D
E
F
G
H
1
2
3
4
5
6
J115
CCOUTX+
CCOUTX-
CCGAINX
+15V
+8.5V
GND
-5V
-15V
R114 316
R113 316
U111C
U111B
U111D
U111A
Q112
Q111
R111 1.00K
R112 649
-5V
-15V
+8.5V
+15V
U118A NE5532
C115 .022
C116 .022
C114 51
R124 750
R117 820
R118 10
R116 1.00K
18
GCX
CCOUTY+
CCOUTY-
CCGAINY
R127 316
R125 316
U125A
U125D
U125B
U125C
Q129
Q128
R128 1.00K
R129 649
U118B NE5532
R126 1.00K
C121 51
R123 750
R121 820
R122 10
R120 1.00K
19
GCY
A30, A31, A32, A33 GAIN CELL BOARDS
2440
6603-25
Static Sensitive Devices
See Maintenance Section
GAIN CELL BOARD CIRCUITRY 14A

A/D CONVERTER & ACQUISITION LATCHES (15)

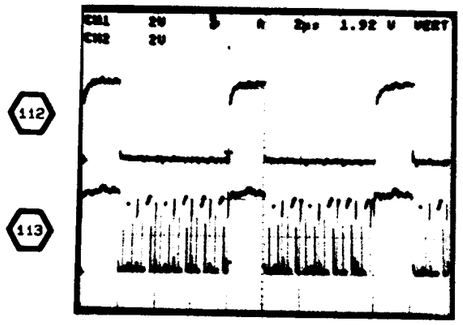
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A11											
C213	6C	3D	C510	6C	5C	C692	7B	8M	R780	4B	8N
C223	6C	2F	C511	6C	5D	C694	7B	8M	R781	2B	7M
C231	6C	2H	C513	6C	5E	C703	6C	8C	R880	3B	8M
C240	6C	2J	C520	6C	5E	C711	6C	7D	R881	3B	8N
C243	6C	2K	C521	6C	5E	C712	6C	7D	R884	3B	7M
C261	5C	1G	C522	6C	5F	C720	6C	8E	R891	4B	7N
C270	5C	2L	C523	6C	5F	C730	6C	7G			
C290	5B	2M	C531	6C	5H	C731	6C	7H	TP400	7B	5B
C291	7B	4L	C532	6C	5H	C732	6C	7H	TP530	7C	5G
C292	7B	3M	C540	6C	5H	C740	6C	7H	TP601	7C	7A
C312	6C	4D	C541	6C	5J	C770	4C	7M			
C313	6C	4D	C550	5C	6M	C772	4C	7M	U510A	4J	6C
C323	6C	3F	C551	6C	5K	C774	3C	7M	U510B	3J	6C
C324	6C	4F	C555	1C	7M	C776	2C	7M	U511A	7J	6C
C331	6C	3H	C560	6C	6L	C820	6C	9F	U511B	5J	6C
C340	6C	3J	C570	2C	7M	C832	6C	8H	U512A	3G	6D
C341	6C	3J	C580*	3B	8M	C881*	3B	8N	U512B	4G	6D
C342	6C	3K	C601	6C	6B	C890	3B	8N	U520A	4K	6E
C350	6C	3K	C810	6C	6C	C892	4B	7N	U520B	3K	6E
C392	8B	4M	C811	6C	6D				U521A	7K	6E
C400	6C	4B	C812	6C	6D	J117	3A	9N	U521B	6K	6E
C401	6C	4C	C820	6C	6E				U560	2D	7L
C402	6C	5C	C821	6C	6E	L692	5B	8M	U630	7M	7G
C414	6C	4D	C822	6C	6F	L694	8B	6M	U631	5M	7G
C415	6C	4D	C823	6C	6F	L770	2B	7M	U632	4M	7H
C416	6C	4E	C830	6C	6G				U640	3M	7H
C420	6C	4F	C831	6C	6H	R421H	3H	4E	U650C	2H	7K
C422	6C	5F	C832	6C	6H	R421I	3K	4E	U732	2F	8H
C450	6C	4K	C840	6C	6H	R555	2C	6L	U740	2D	8H
C460	4B	8M	C842	6C	6J	R581	3B	8M	U780	3B	8M
C480	7C	8M	C843	6C	8K	R650D	2H	6K	U880	2B	7M
C490	5C	5M	C880	6C	7J	R650G	2D	6K			
C500	6C	5B	C891	7C	8M	R690	3B	8M	W780	3B	7M

Partial A11 also shown on diagrams 7, 8, 16, 17, and 18.

OTHER PARTS											
P117	3A	CHASSIS									

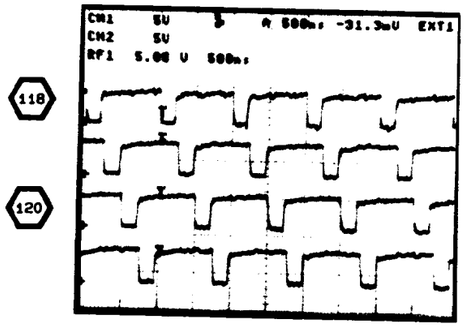
***See Parts List for serial number ranges.**

WAVEFORMS FOR DIAGRAM 15

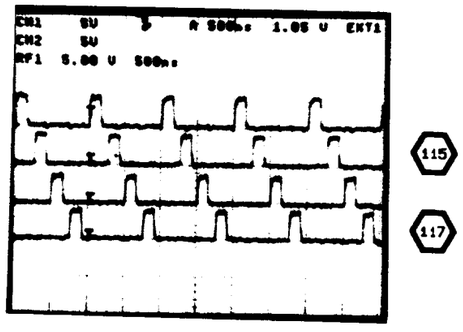


(112) (113)

ENVELOPE MODE 100 µS/DIV

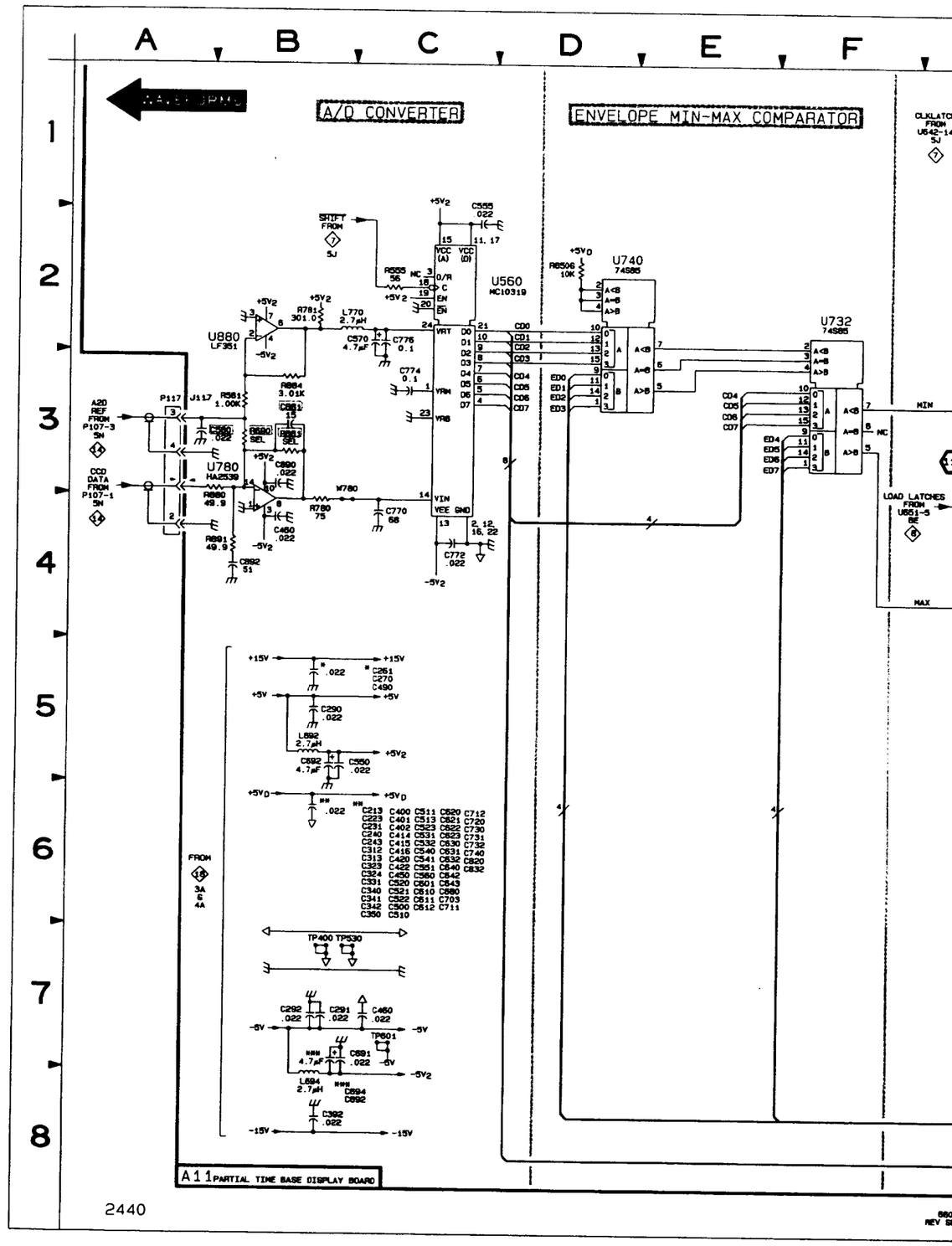


(118) (119) (120) (121)



(114) (115) (116) (117)

6603-31



A/D CONVERTER AND ACQUISITION LATCHES 15

ACQUISITION LATCHES

ACQUISITION LATCH SWITCHES

ENVELOPE MIN-MAX COMPARATOR

A/D CONVERTER

Static Sensitive Devices
See Maintenance Section

A11 PARTIAL TIME BASE DISPLAY BOARD

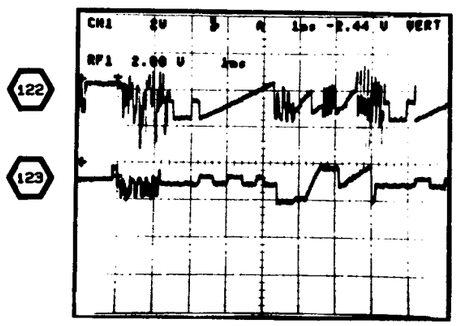
8003-15
REV SEP 1988

2440

DISPLAY & ATTRIBUTES MEMORY 16

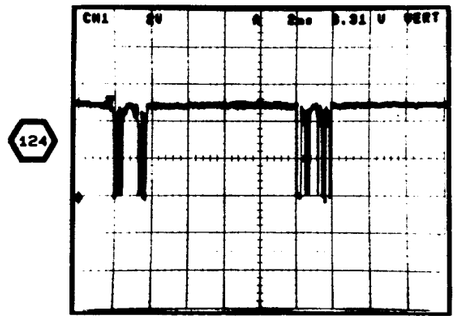
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A11											
C150	1L	1K	U130	7G	1H	U323B	2B	3F	U422B	7C	4F
C250	5L	2K	U140	7J	1J	U323C	5B	3F	U422C	7C	4F
			U141	2M	1J	U323D	4B	3F	U422D	6C	4F
J131	1A	2E	U142	1M	1K	U350A	2L	3K	U423A	8D	5F
J131	7A	2E	U240	7K	3J	U350D	6L	3K	U430	7E	4G
			U241	2J	2J	U413B	4B	4D	U431	2E	4H
R151	1M	1K	U243	4M	2K	U421A	2C	4F	U440	5E	4J
R152	1M	1K	U250	5M	2K	U421B	2C	4F	U441	4J	4J
R155	5M	2K	U314	4E	3D	U421C	5C	4F	U450C	8H	4K
R156	5M	2K	U320	3G	3E	U421D	4C	4F			
R450	8K	5K	U321	5G	3E	U421D	5C	4F	W140	8M	8K
			U322	2E	3F	U422A	7B	4F			
Patriot A11 also shown on diagrams 7, 8, 15, 17, and 18.											
OTHER PARTS											
P131	1A	CHASSIS	P131	7A	CHASSIS						

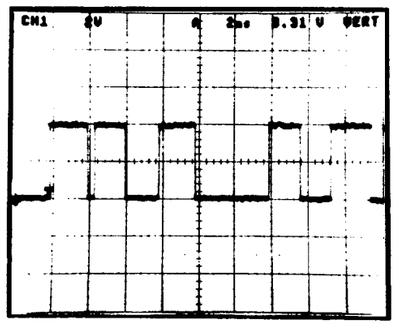
WAVEFORMS FOR DIAGRAM 16

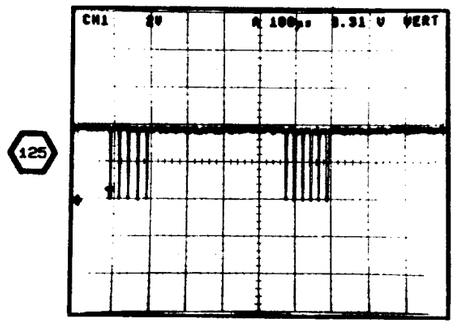


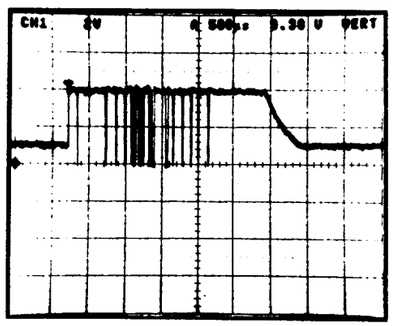
6330-45

WAVEFORMS FOR DIAGRAM 17

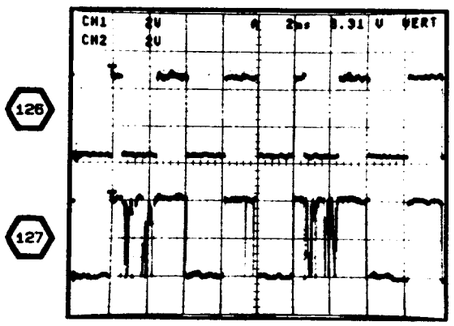


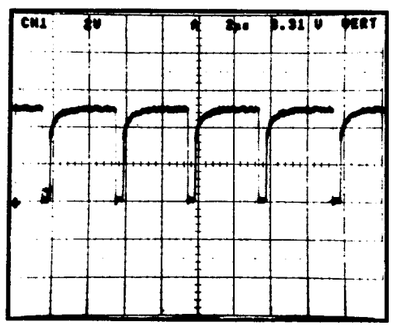






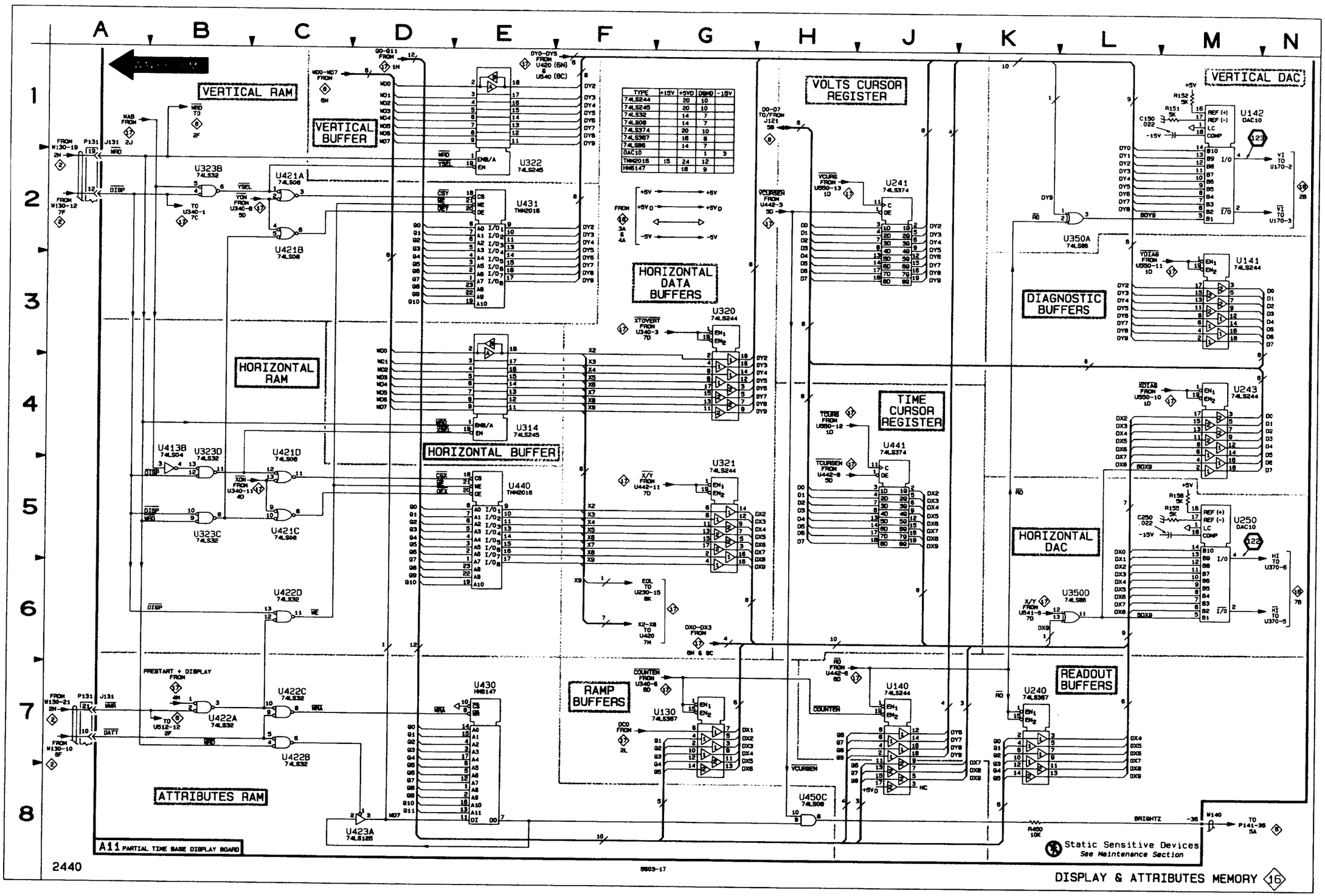
TEST SCOPE TRIGGERED ON 126





6330-46

WAVEFORMS FOR DIAGRAM 17

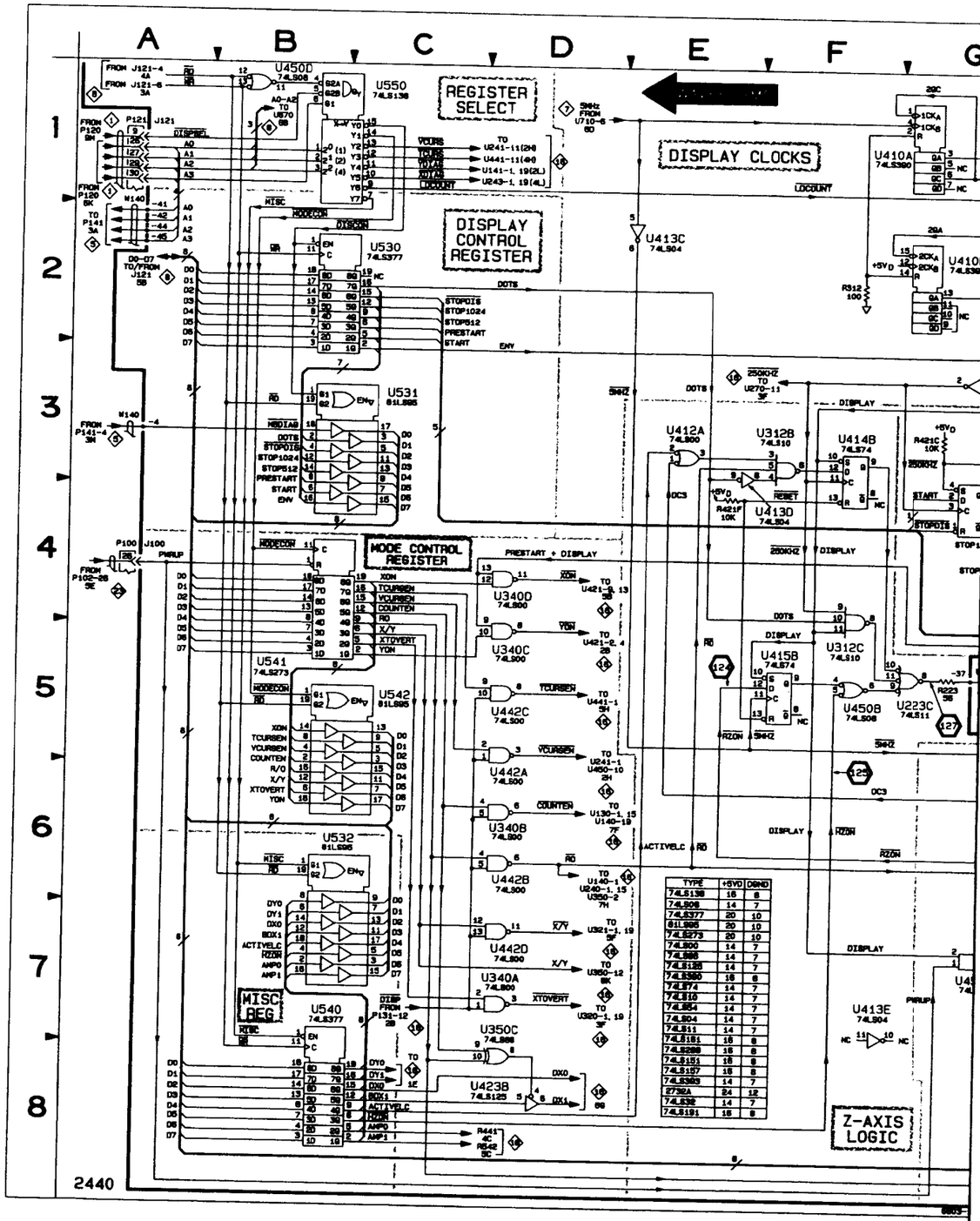

VERTICAL RAM
VERTICAL BUFFER
HORIZONTAL RAM
HORIZONTAL BUFFER
ATTRIBUTES RAM
VOLTS CURSOR REGISTER
TIME CURSOR REGISTER
HORIZONTAL DATA BUFFERS
RAMP BUFFERS
VERTICAL DAC
HORIZONTAL DAC
DIAGNOSTIC BUFFERS
READOUT BUFFERS
U322 74LS245
U314 74LS245
U440 TMM2016
U431 TMM2016
U430 HM6147
U320 74LS244
U321 74LS244
U130 74LS367
U140 74LS244
U240 74LS367
U241 74LS374
U441 74LS374
U142 DAC10
U250 DAC10
U141 74LS244
U243 74LS244
U350A 74LS86
U3500 74LS86
U450C 74LS08
U421A 74LS08
U421B 74LS08
U421C 74LS08
U421D 74LS08
U422A 74LS32
U422B 74LS32
U422C 74LS32
U422D 74LS32
U323B 74LS32
U323C 74LS32
U323D 74LS32
U413B 74LS04
U423A 74LS125
A11 PARTIAL TIME BASE DISPLAY BOARD
Static Sensitive Devices
See Maintenance Section
2440
8603-17
DISPLAY & ATTRIBUTES MEMORY 16

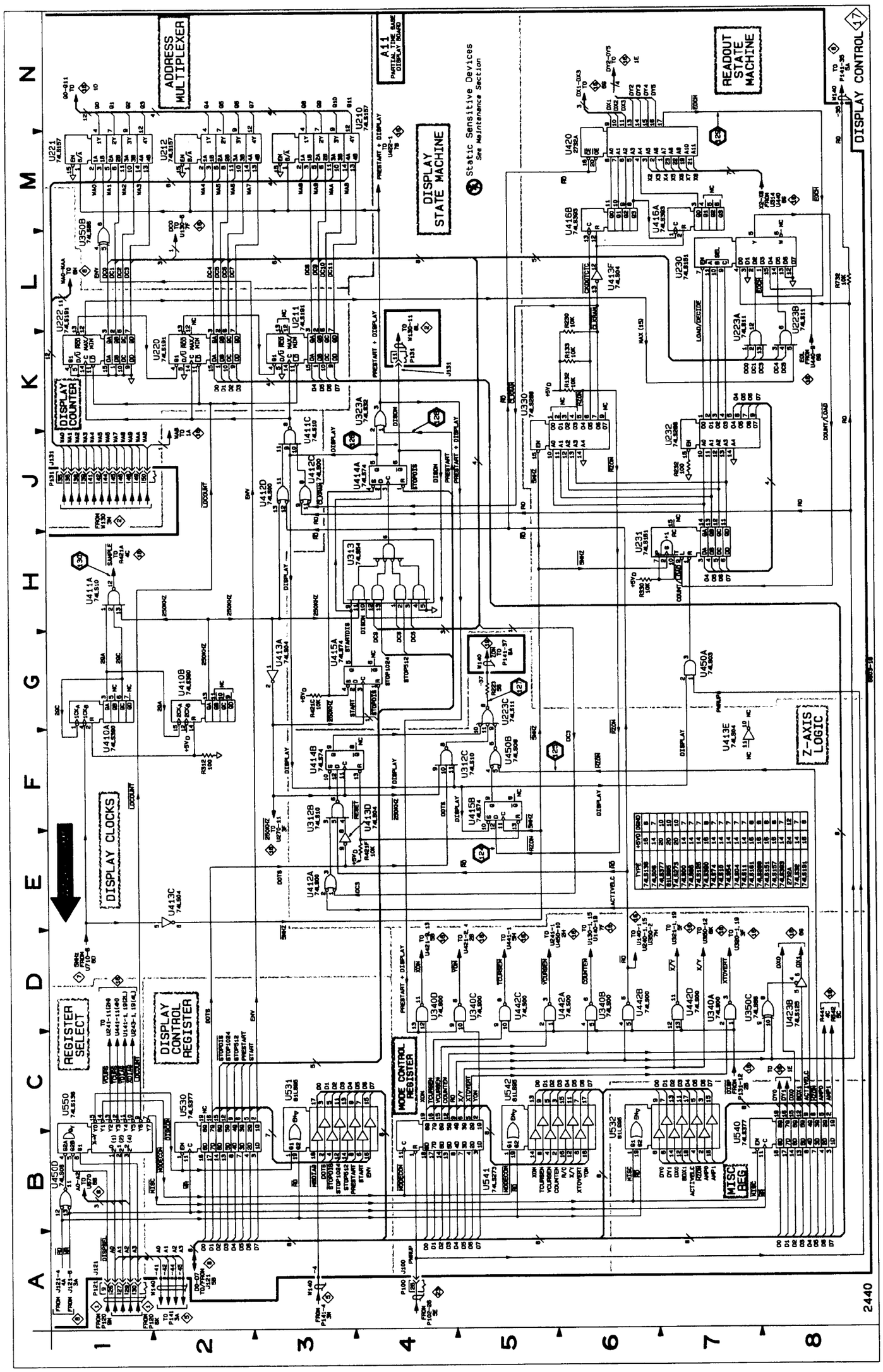
DISPLAY CONTROL 17

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A11											
J100	4A	9D	U221	1M	2E	U410B	2G	4C	U442B	6D	4K
J121	1A	9L	U222	1L	2F	U411A	1H	4C	U442C	5D	4K
J131	1J	2E	U223A	7L	2F	U411C	3J	4C	U442D	7D	4K
J131	4K	2E	U223B	8L	2F	U412A	3E	4D	U450A	7G	4K
			U223C	5G	2F	U412C	3J	4D	U450B	5F	4K
R132	6K	1G	U230	7L	2G	U412D	3J	4D	U450D	1B	4K
R133	6K	2G	U231	6H	3H	U413A	3G	4D	U530	2A	5G
R223	5G	2F	U232	7J	3H	U413C	2E	4D	U531	3C	5G
R230	6L	2H	U312B	3F	3C	U413D	4F	4D	U532	6C	5H
R232	7J	2H	U312C	5F	3C	U413E	7F	4D	U540	7C	5H
R312	2F	3C	U313	4H	3D	U413F	6L	4D	U541	5B	5J
R330	6H	3H	U323A	4K	3F	U414A	4J	5C	U542	5C	5J
R421C	3G	4E	U330	5K	3G	U414B	3F	5C	U550	1C	5K
R421F	4E	4E	U340A	7D	3K	U415A	3G	5C			
R732	8L	8G	U340B	6D	3K	U415B	5F	5C	W140	2A	8K
			U340C	5D	3K	U416A	7M	5D	W140	3A	8K
U210	4N	2D	U340D	4D	3K	U416B	6M	5D	W140	5G	8K
U211	3L	2D	U350B	1L	3K	U420	6M	4E	W140	8N	8K
U212	2M	2E	U350C	7D	3K	U4238	8D	5F			
U220	2K	2E	U410A	1F	4C	U442A	6D	4K			

Partial A11 also shown on diagrams 7, 8, 15, 16, and 18.

OTHER PARTS											
P100	4A	CHASSIS	P121	1A	CHASSIS	P131	1J	CHASSIS	P131	4K	CHASSIS

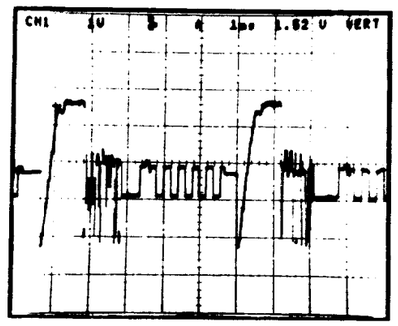



DISPLAY CONTROL 17
ADDRESS MULTIPLEXER
DISPLAY STATE MACHINE
READOUT STATE MACHINE
DISPLAY CLOCKS
REGISTER SELECT
DISPLAY CONTROL REGISTER
MODE CONTROL REGISTER
MISC REG.
Z-AXIS LOGIC
DISPLAY COUNTER
Static Sensitive Devices
See Maintenance Section
A11
PARTIAL TIME BASE DISPLAY BOARD
2440

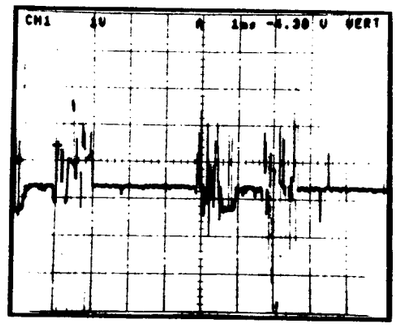
WAVEFORMS FOR DIAGRAM 18

TEST SCOPE HF REJ COUPLING

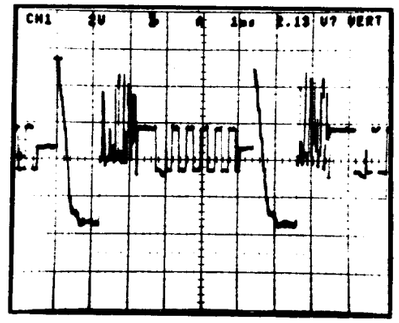
131



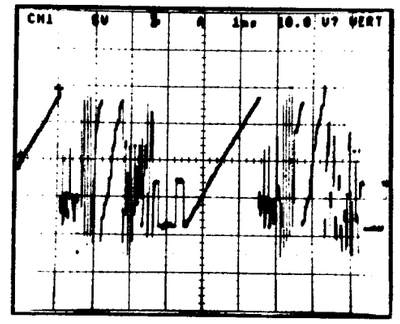
134



137

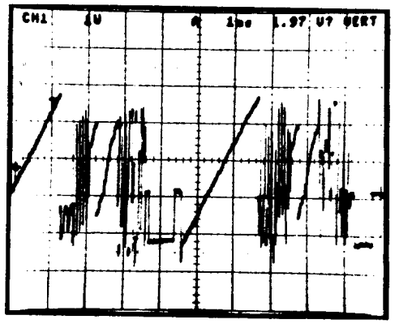


140

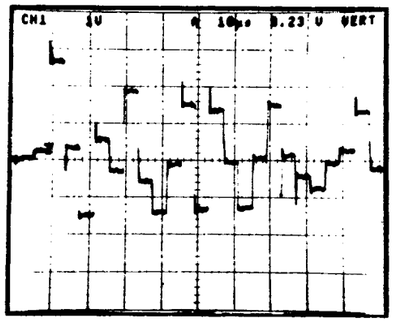


TRIGGERED ON
AND DISPLAYING CAL SIGNAL
1 mS/DIV, 200 mV/DIV
TRIG POS 1/2, SAVE MODE

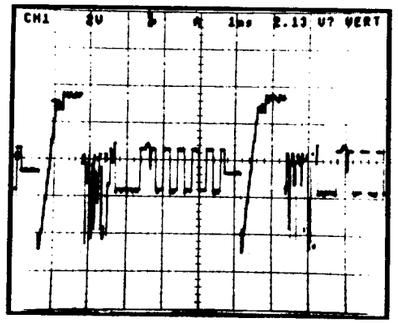
132



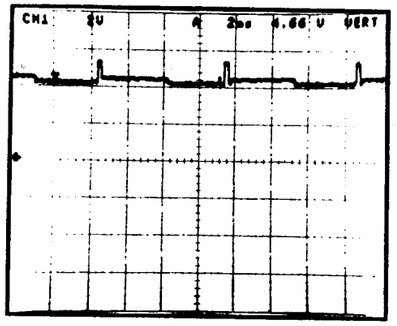
135



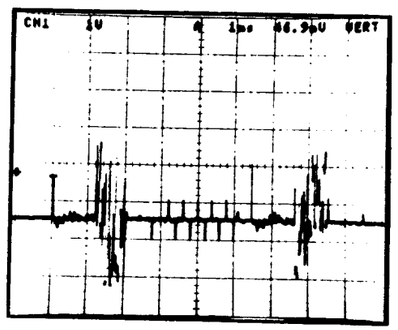
138



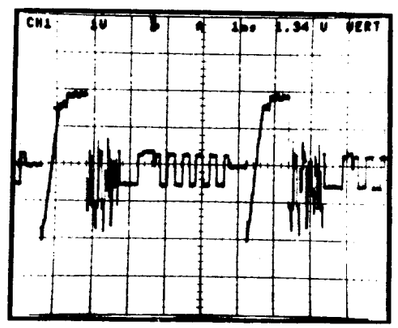
141



133

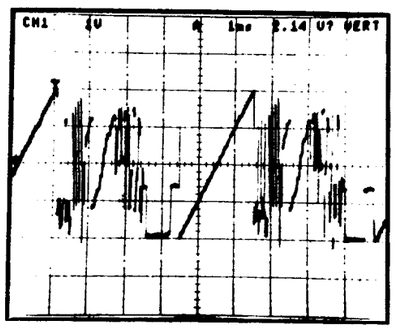


136



HF REJ COUPLING

139



6285-44

MORE

DISPLAY OUTPUT 18

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A11											
C130	4B	1G	J131	3M	2E	R362	7C	3L	R601	2H	2M
C131	3B	1G	J131	5A	2E	R363	7C	3L	R603	2H	2M
C152	2C	1L	J131	6M	2E	R364	7D	4L	R605	2G	1M
C154	3M	1K	J148	2M	5N	R368	7C	4L	R607	2G	5E
C166	2J	2M	J148	4M	5N	R376	6G	3M	R620	2G	1M
C180	2H	2N	J148	6M	5N	R380	7D	4M			
C181	2D	2L				R381	7D	4M	TP130	5B	2H
C182	2D	2L	L800	4B	8B	R382	7G	3L	TP200	5B	2C
C199	6H	2M	L801	4B	8B	R383	6D	5L	TP250	5B	3K
C280	2F	2M	L802	3B	8B	R384	7C	5L	TP341	5B	3J
C254	7F	3L	L803	3B	8B	R385	8J	4M	TP490	5B	5N
C281	3D	2L				R421A	4D	4E	TP600	4B	7A
C282	7D	4M	Q181	2D	2L	R441	4D	4J	TP601	4B	7A
C284	6D	4M	Q182	2D	2L	R470	2K	4L	TP602	3B	7A
C300	7H	3M	Q285	7D	4M	R471	2K	5L	TP680	5B	5K
C595	7K	5L	Q286	6D	4M	R472	2L	4L	TP700	4B	7A
C700	4B	8A				R473	3L	5L	TP710	5B	7D
C701	4B	8A	R140	6G	3M	R474	2L	5L			
C702	4B	8B	R141	1G	2M	R475	2M	4L	U170	2C	1L
C800	3G	5F	R145	2D	2L	R480	7K	5L	U270A	2G	2L
C901	5K	4L	R153	3M	1K	R481	7J	4M	U270B	2E	2L
C903	5K	5L	R160	1D	2L	R482	7K	5L	U270C	6E	2L
C907	3L	5L	R161	2C	1L	R483	7K	5L	U280	2G	1M
C912	3J	2M	R162	2G	1M	R484	7K	5M	U281	2D	1L
C915	2F	2M	R163	2B	1L	R485	7L	5L	U282	2H	2M
C920	2H	2M	R164	2C	1L	R490	2K	4L	U290A	2J	3M
C925	2G	1M	R165	2J	3M	R492	4J	4L	U290B	6J	3M
C930	5M	2L	R171	2J	3M	R493	4K	4L	U370A	6G	3L
C932	5M	1N	R172	2C	1L	R494	3L	5L	U370B	7C	3L
C934	4M	1N	R192	2G	2N	R542	5D	4J	U370C	7D	3L
C935	4M	1L	R193	2D	3L	R570	5K	5L	U370D	6H	3L
			R194	2D	2L	R580	2K	5L	U392A	6K	4M
CR190	2H	2M	R196	2D	2L	R583	4K	5L	U392B	7J	4M
CR191	2H	2M	R199	7H	2M	R584	4K	5L	U392C	6L	4M
CR193	2D	3L	R262	6M	1F	R585	2K	5L	U392D	6L	4M
CR194	2D	3L	R272	2F	1L	R586	7K	5M	U460A	4K	4L
CR280	7D	4M	R273	2F	1M	R587	7K	6L	U460B	2L	4L
CR281	7D	4M	R274	2G	1M	R591	7L	5M	U460C	2L	4L
CR283	7H	3M	R276	1G	2M	R592	7L	5M	U460D	2K	4L
CR284	6H	3M	R280	3D	2L	R593	2M	6M			
			R282	2J	3M	R594	7M	5M	W140	2A	6K
J100	3A	9D	R288	6D	5M	R595	6M	6M	W140	4J	6K
J121	2A	9L	R361	6G	3L	R596	2M	6M	W609	2F	2M
Partial A11 also shown on diagrams 7, 8, 15, 16, and 17.											
OTHER PARTS											
P100	3A	CHASSIS	P131	3M	CHASSIS	P131	8M	CHASSIS	P148	4M	CHASSIS
P121	2A	CHASSIS	P131	5A	CHASSIS	P148	2M	CHASSIS	P148	6M	CHASSIS

A17—HIGH VOLTAGE BOARD FIG.9-11

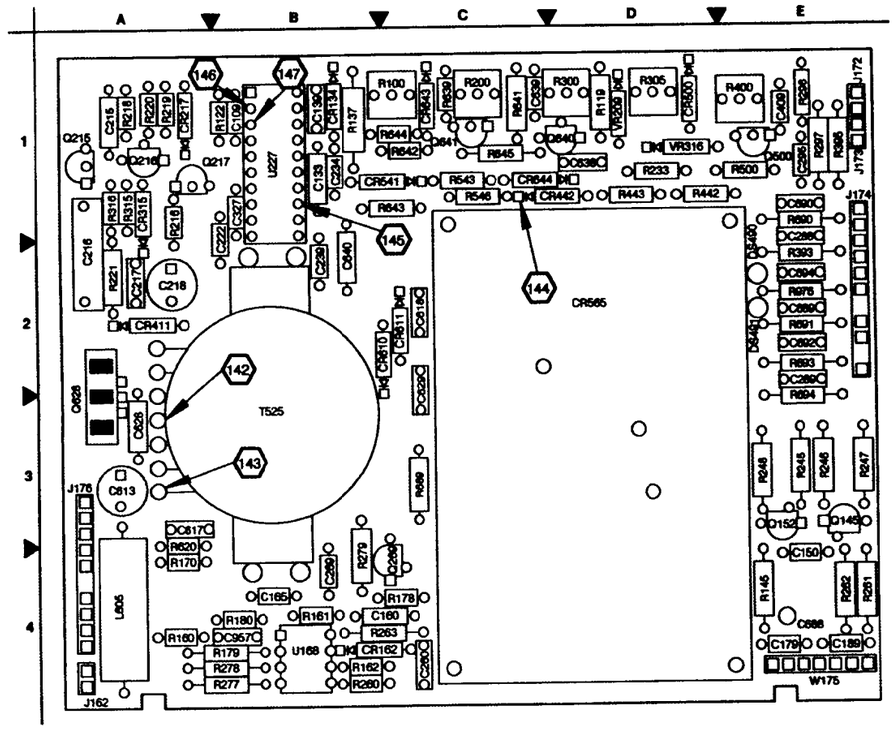
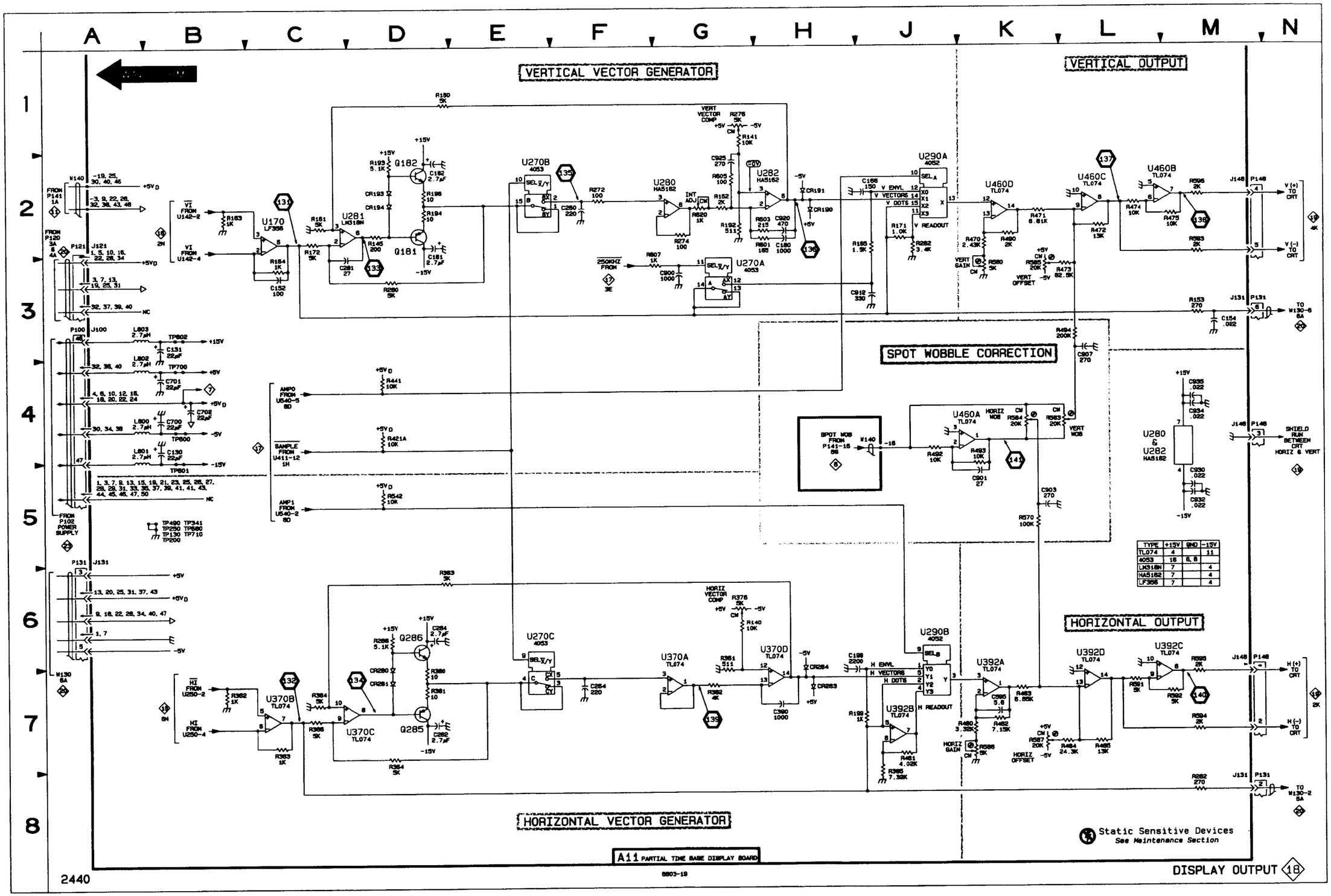


Figure 9-11. A17—High Voltage board.

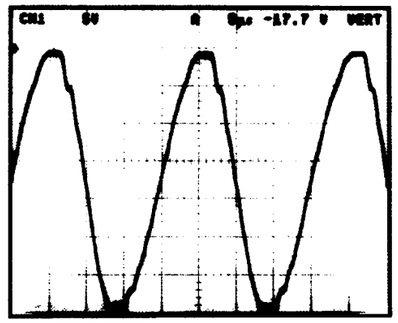
A17 – HIGH VOLTAGE BOARD

CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
C109	19	C818	19	CR643	19	Q641	19	R247	19	R620	19
C133	19	C828	19	CR644	19			R248	19	R639	19
C139	19	C829	19			R100	19	R260	19	R641	19
C150	19	C838	19	DS490	19	R119	19	R261	19	R642	19
C160	19	C839	19	DS491	19	R122	19	R262	19	R643	19
C165	19	C840	19			R137	19	R263	19	R644	19
C179	19	C888	19	J162	19	R145	19	R277	19	R645	19
C189	19	C889	19	J172	19	R160	19	R278	19	R689	19
C215	19	C890	19	J173	19	R161	19	R279	19	R690	19
C216	19	C892	19	J174	19	R162	19	R297	19	R691	19
C217	19	C894	19	J176	19	R170	19	R298	19	R693	19
C218	19	C957	19			R178	19	R300	19	R694	19
C222	19			L805	19	R179	19	R305	19	R976	19
C234	19	CR134	19			R180	19	R315	19		
C239	19	CR162	19	Q145	19	R200	19	R316	19	T525	19
C260	19	CR217	19	Q152	19	R216	19	R393	19		
C269	19	CR315	19	Q215	19	R218	19	R395	19	U168	19
C288	19	CR411	19	Q216	19	R219	19	R400	19	U227	19
C289	19	CR442	19	Q217	19	R220	19	R442	19		
C295	19	CR500	19	Q269	19	R221	19	R443	19	VR209	19
C327	19	CR541	19	Q500	19	R233	19	R500	19	VR316	19
C409	19	CR565	19	Q628	19	R245	19	R543	19		
C613	19	CR610	19	Q640	19	R246	19	R546	19	W175	19
C617	19	CR611	19								


VERTICAL VECTOR GENERATOR
VERTICAL OUTPUT
SPOT WOBBLE CORRECTION
HORIZONTAL OUTPUT
HORIZONTAL VECTOR GENERATOR
U170 UF356
U281 LM318N
Q181
Q182
U270B 4053
U280 HA5162
U282 HA5162
U270A 4053
U290A 4052
U460D TL074
U460C TL074
U460B TL074
U460A TL074
U270C 4053
U370A TL074
U370D TL074
U290B 4052
U370B TL074
U370C TL074
Q285
Q286
U392A TL074
U392D TL074
U392C TL074
U392B TL074
U280 & U282 HA5162
TYPE +15V GND -15V
TL074 4 11
4053 16 8, 8
LM318N 7 4
HA5162 7 4
LF356 7 4
Static Sensitive Devices
See Maintenance Section
A11 PARTIAL TIME BASE DISPLAY BOARD
8803-19
2440
DISPLAY OUTPUT 18

WAVEFORMS FOR DIAGRAM 19

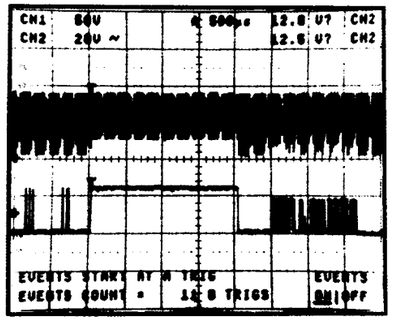
142



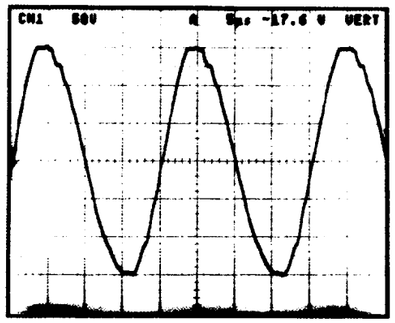
TEST SCOPE A DELAY BY EVENTS

144

145

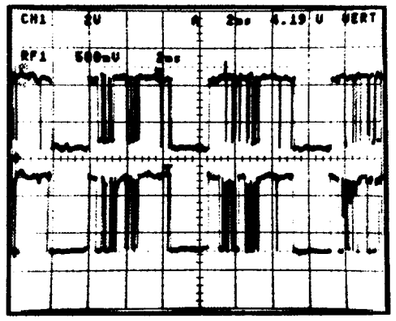


143



146

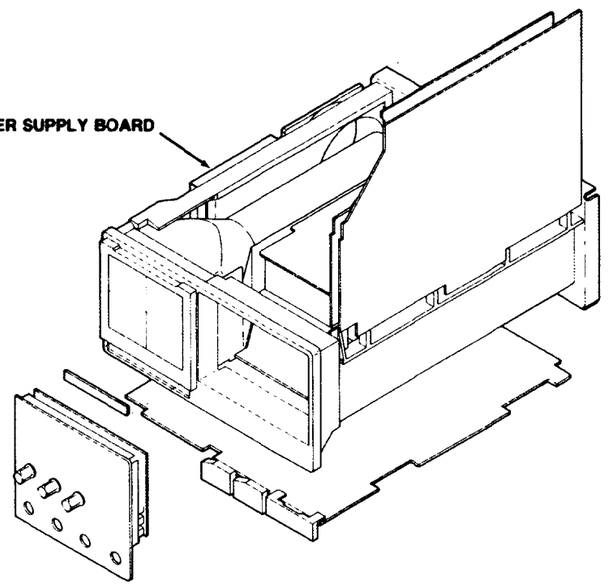
147



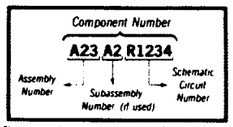
REF 1

6330-49

A17—HIGH VOLTAGE POWER SUPPLY BOARD



COMPONENT NUMBER EXAMPLE



Chassis-mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

Static Sensitive Devices
See Maintenance Section

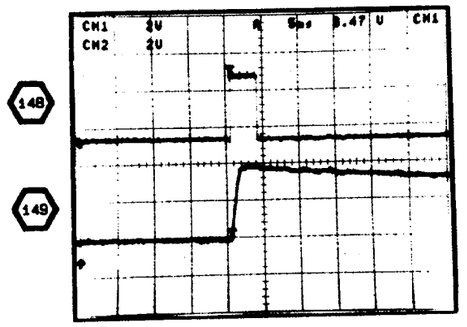
HIGH VOLTAGE SUPPLY & CRT DIAGRAM 19

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
A10 MAIN BOARD											
J105	1C	10E	J105	8C	10E	J108	1B	8C	J141	8B	2K
Partial A10 also shown on diagrams 5, 6, 9, 10, 11, 12, 13, and 14.											
A17 HIGH VOLTAGE BOARD											
C109	7F	1B	CR134	8E	1B	Q641	6F	1C	R315	5D	1A
C133	7E	1B	CR162	4D	4B				R316	5D	1A
C139	7E	1B	CR217	6D	1A	R100	6D	1C	R393	1G	2E
C150	4D	4E	CR315	5D	1A	R119	3M	1D	R395	4N	1E
C160	4B	4B	CR411	5C	2A	R122	8E	1B	R400	7H	1E
C165	4C	4B	CR442	5F	1D	R137	7E	1B	R442	5F	1D
C179	3D	4E	CR500	7H	1D	R145	3E	4E	R443	5F	1D
C189	2D	4E	CR541	5F	1C	R160	4B	4A	R500	8G	1E
C215	5D	1A	CR565	4H	2D	R161	4C	4B	R543	5F	1C
C216	5C	2A	CR610	5E	2C	R162	4D	4B	R546	5F	1C
C217	5D	2A	CR611	4E	2C	R170	4B	4A	R620	4B	3A
C218	5D	2A	CR643	6D	1C	R178	1E	4C	R639	6D	1C
C222	6E	1B	CR644	5F	1C	R179	1C	4B	R641	6F	1C
C234	7E	1B				R180	2E	4B	R642	6D	1C
C239	7F	2B	DS490	5J	2E	R200	2N	1C	R643	5F	1C
C260	4D	4C	DS491	6J	2E	R216	6D	1A	R644	6F	1C
C269	4C	4B				R218	6D	1A	R645	6F	1C
C288	1F	2E	J162	7B	4A	R219	6D	1A	R689	2E	3C
C289	1F	2E	J172	2M	1E	R220	6D	1A	R690	5M	1E
C295	4M	1E	J173	2G	1E	R221	5C	2A	R690	5M	1E
C327	8E	1B	J174	1G	1E	R233	8E	1D	R691	2G	2E
C409	7H	1E	J174	2G	1E	R245	3F	3E	R693	3G	2E
C813	6B	3A	J174	2M	1E	R246	2F	3E	R694	1F	3E
C817	4B	3A	J174	4M	1E	R247	2F	3E	R976	2M	2E
C818	5E	2C	J176	6B	1E	R248	3F	3E			
C828	4B	3A				R260	4D	4B	T525	4C	3B
C829	4E	2C	L805	6B	4A	R261	2D	4E			
C838	6F	1D				R262	3E	4E	U168A	4C	4B
C839	6D	1C	Q145	2F	3E	R263	4D	4C	U168B	1C	4B
C840	5E	2B	Q152	3F	3E	R277	1C	4B	U227	7E	1B
C888	6K	4E	Q215	5D	1A	R278	1C	4B			
C889	2F	2E	Q216	6C	1A	R279	2E	4B	VR209	1D	1D
C890	5M	1E	Q217	6D	1A	R297	4N	1E	VR316	7G	1D
C892	3F	2E	Q269	1E	4C	R298	2K	1E			
C894	2M	2E	Q500	7H	1E	R300	1C	1D	W175	1C	4E
C957	2E	4B	Q628	4B	2A	R305	2N	1D	W175	7D	4E
			Q640	6F	1D						
CHASSIS PARTS (NOT MOUNTED ON ANY CIRCUIT BOARD)											
L1000	1K	CHASSIS	P141	8B	CHASSIS	P174	2G	CHASSIS	R1077	1A	CHASSIS
			P162	7A	CHASSIS	P174	2M	CHASSIS	R1088	3A	CHASSIS
P105	1C	CHASSIS	P172	2M	CHASSIS	P174	4M	CHASSIS	R1099	2A	CHASSIS
P105	8C	CHASSIS	P173	2G	CHASSIS	P178	6A	CHASSIS			
P108	1B	CHASSIS	P174	1G	CHASSIS				V1000	1K	CHASSIS

WAVEFORMS FOR DIAGRAM 20

WAVEFORMS FOR DIAGRAM 20

TEST SCOPE IN NORM TRIGGER

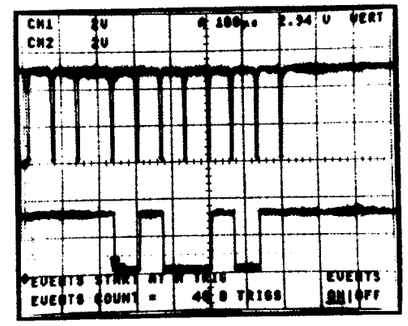


148

149

PRESS GPIB TRANSMIT TO RING BELL

EVENTS SOURCE CH 1

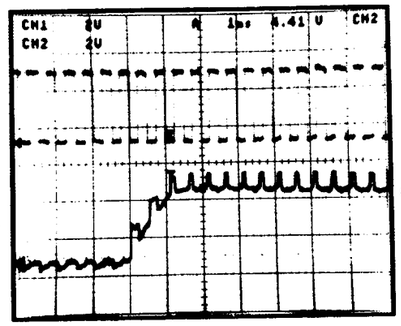


152

CH 1 SIGNAL

154

154 IS LAST BYTE OUT



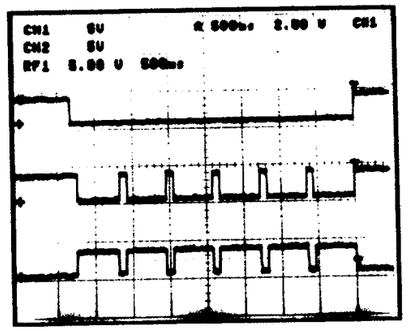
150

151

PRESS GPIB TRANSMIT TO RING BELL

NORM TRIGGER ON 151 +SLOPE LEVEL 4.4

TEST SCOPE IN ROLL MODE

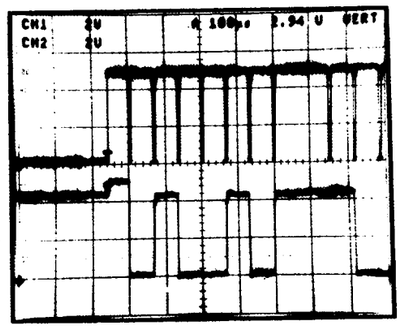


155

156

157

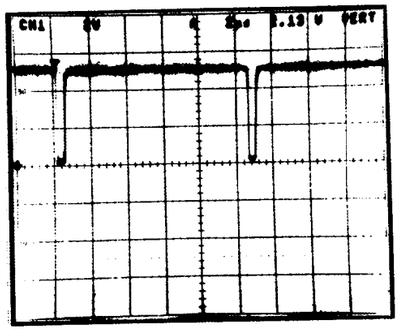
CAL SIGNAL INPUT 1ms/DIV
200mV/DIV FOR 155 and 156



152

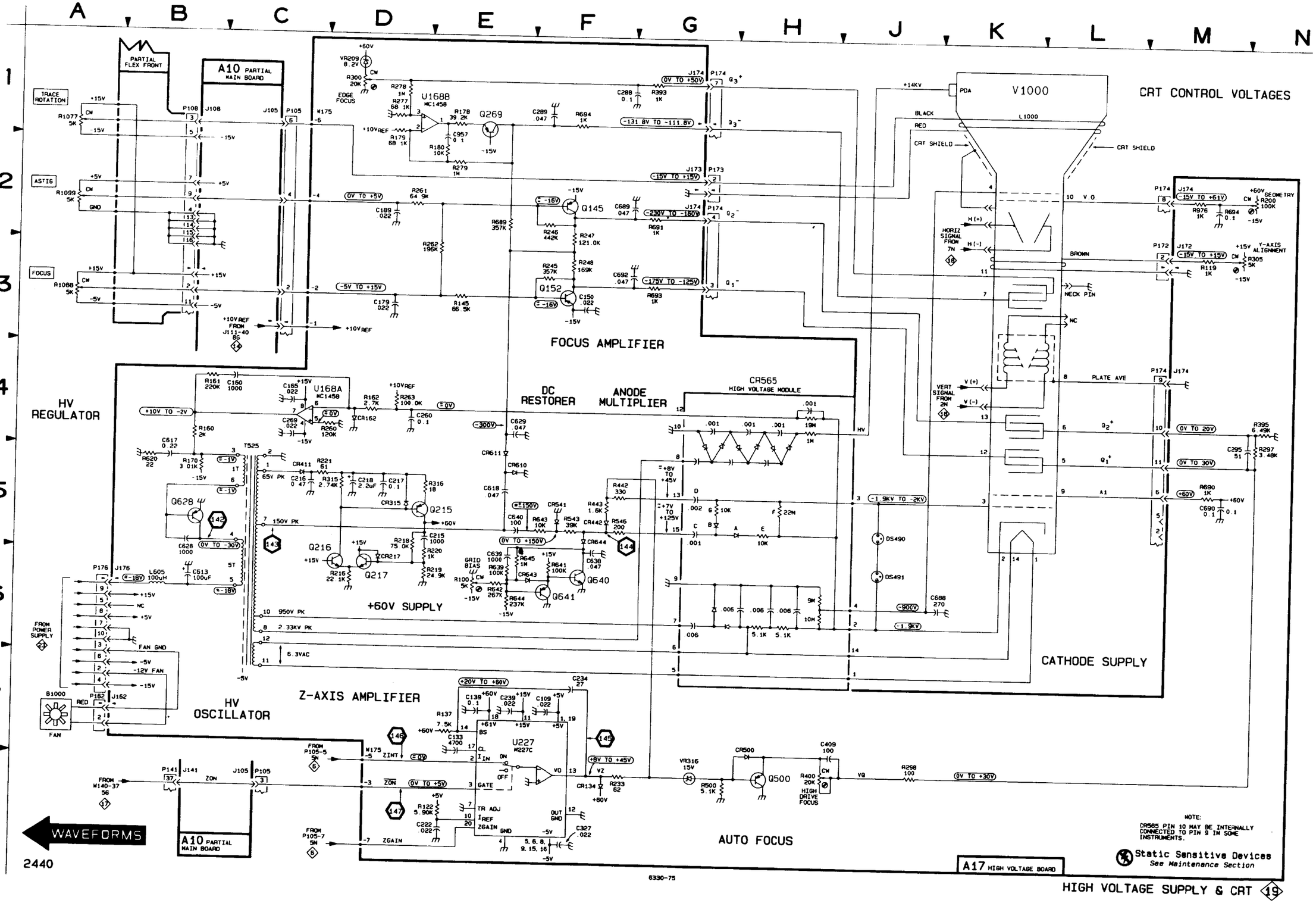
153

153 IS FIRST BYTE IN



158

6285-45

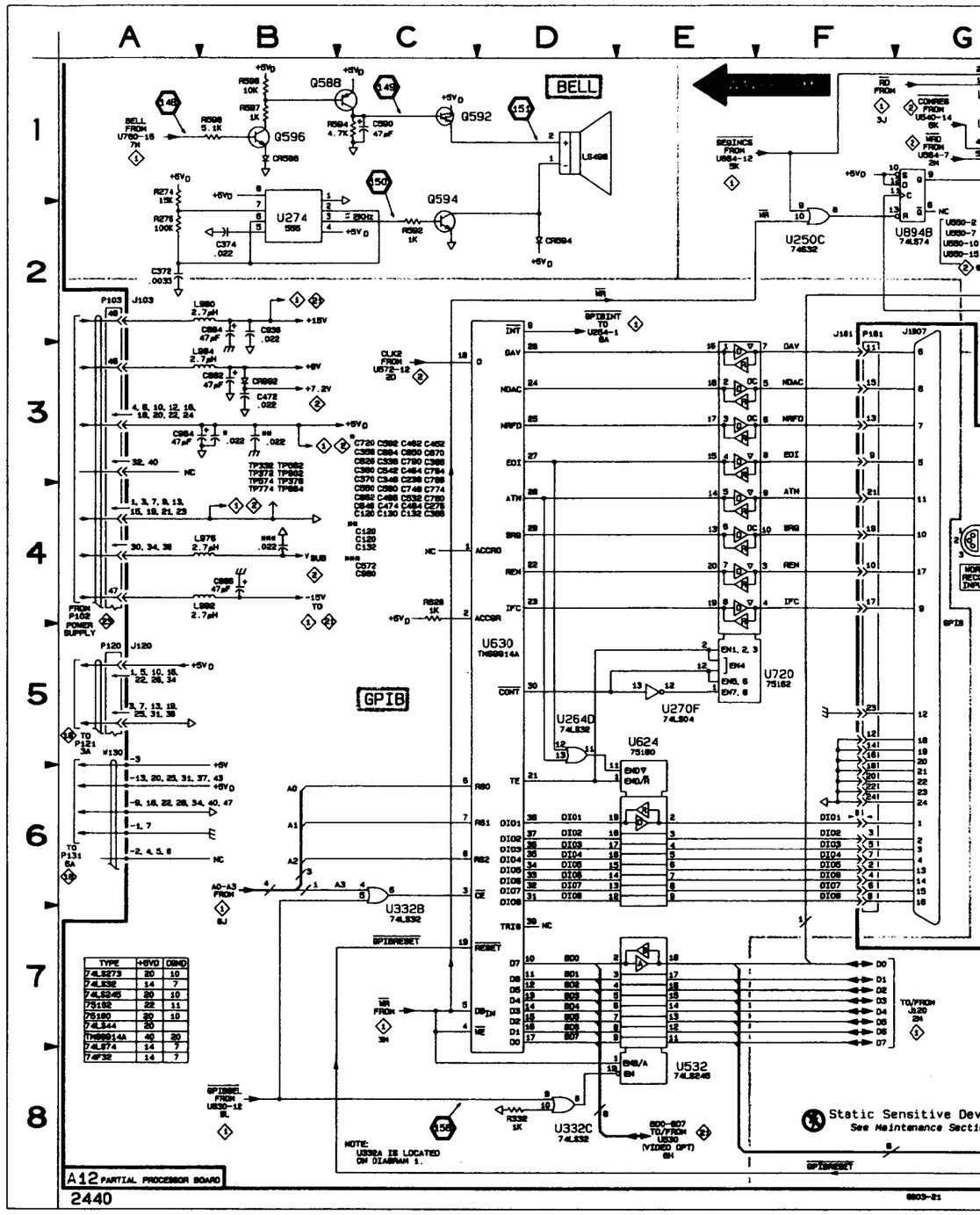

A10 PARTIAL MAIN BOARD
PARTIAL FLEX FRONT
TRACE ROTATION
ASTIG
FOCUS
EDGE FOCUS
U1688 MC1458
Q269
Q145
Q152
FOCUS AMPLIFIER
CRT CONTROL VOLTAGES
V1000
CRT SHIELD
BLACK
RED
BROWN
NECK PIN
NC
PLATE AVE
HORIZ SIGNAL FROM 7N
VERT SIGNAL FROM 2N
Y-AXIS ALIGNMENT
GEOMETRY
HV REGULATOR
U168A MC1458
DC RESTORER
ANODE MULTIPLIER
CR565 HIGH VOLTAGE MODULE
+60V SUPPLY
CATHODE SUPPLY
DS490
DS491
HV OSCILLATOR
Z-AXIS AMPLIFIER
U227 M227C
AUTO FOCUS
Q500
HIGH DRIVE FOCUS
FROM POWER SUPPLY 23
FAN
FAN GND
-12V FAN
WAVEFORMS
A10 PARTIAL MAIN BOARD
A17 HIGH VOLTAGE BOARD
NOTE:
CR565 PIN 10 MAY BE INTERNALLY CONNECTED TO PIN 9 IN SOME INSTRUMENTS.
Static Sensitive Devices
See Maintenance Section
2440
6330-75
HIGH VOLTAGE SUPPLY & CRT 19
HV SUPPLY & CRT 19

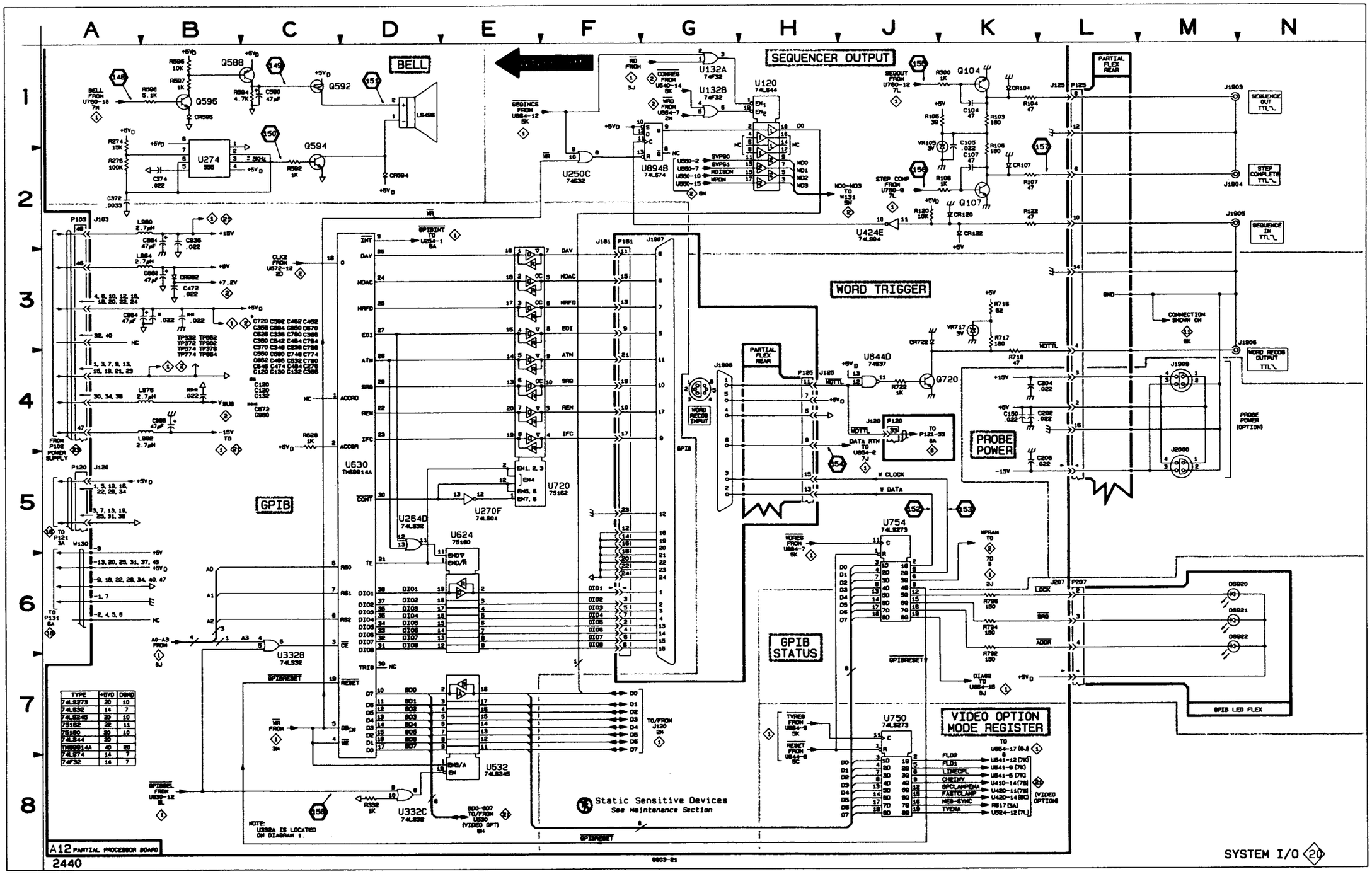
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A12											
C104	1J	2A	C592	3C	5M				R722	4J	7C
C105	1J	1B	C626	3C	6D	L976	4B	8K	R792	6K	7M
C107	2K	2B	C646	4C	6F	L984	3B	8L	R794	6K	7M
C120	4C	1D	C670	3C	6J	L990	2B	8L	R796	6K	7M
C120	4C	1D	C720	3C	7C	L992	4B	9L			
C130	4C	1D	C748	4C	7F				TP332	4B	3E
C132	4C	1F	C764	3C	7J	LS496	1D	4M	TP372	4B	3J
C132	4C	1F	C766	3C	7J				TP378	4B	3K
C150	4K	1G	C774	4C	7K	Q104	1J	2A	TP574	4B	5K
C202	4K	2A	C780	4C	7K	Q107	2K	2B	TP664	4B	6H
C204	4K	2A	C790	3C	7L	Q588	1B	5L	TP774	4B	7K
C208	5K	2A	C850	3C	8G	Q592	1C	5M	TP902	4B	9A
C236	3C	2E	C862	4C	8H	Q594	1C	5M			
C276	2A	3K	C882	3B	8L	Q596	1B	5M	U120	1H	1D
C276	4C	3K	C884	2B	8L	Q720	4J	7D	U132A	1G	1F
C336	3C	3E	C886	4B	8L				U132B	1G	1F
C348	3C	3F	C894	3C	8M	R103	1J	1A	U250C	2F	3G
C358	3C	3G	C936	2B	9E	R104	1J	2A	U264D	5D	3J
C360	3C	3H	C964	3A	8J	R105	1J	2B	U270F	5E	3J
C366	4C	3J	C980	4C	8K	R106	1J	2B	U274	2B	2K
C370	3C	3J				R107	2K	2B	U332B	6C	3E
C372	2A	3K	CR104	1J	2A	R108	2K	2B	U332C	8D	3E
C374	2B	3K	CR107	2K	2B	R120	2J	1C	U424E	2J	5D
C386	3C	3L	CR120	2K	1C	R122	2K	1C	U532	8E	5E
C452	3C	4G	CR122	2K	1C	R274	1A	3K	U624	5E	6D
C462	3C	4H	CR594	2D	5M	R276	2A	3K	U630	5D	6D
C464	3C	4J	CR596	1B	5M	R300	1J	3A	U720	5F	7D
C466	4C	4J	CR722	3J	7C	R332	8D	3E	U750	7J	7G
C472	3B	4J	CR992	3B	9M	R592	2C	5M	U754	5J	7G
C474	4C	3K				R594	1C	5M	U844D	4J	8F
C484	4C	4L	J103	2A	9J	R596	1B	5M	U894B	2G	8M
C532	4C	5E	J120	4J	9B	R597	1B	5M			
C542	3C	5F	J120	5A	9B	R598	1B	5N	VR105	1J	1B
C550	4C	5G	J125	1L	3A	R628	4C	6D	VR717	3K	7C
C572	4C	5K	J125	4H	3A	R716	3K	7C			
C580	4C	5K	J181	2F	8C	R717	3K	7C	W130	5A	1H
C590	1C	5L	J207	6L	9M	R718	4K	7C	W130	6A	1H

Patriot A12 also shown on diagrams 1, 2, and 21.

OTHER PARTS

J1903	1M	CHASSIS	J1907	2G	CHASSIS				P125	1L	CHASSIS
J1904	2M	CHASSIS	J1908	4G	CHASSIS	P103	2A	CHASSIS	P126	4H	CHASSIS
J1905	2M	CHASSIS	J1909	4M	CHASSIS	P120	4J	CHASSIS	P181	2F	CHASSIS
J1906	3N	CHASSIS	J2000	5M	CHASSIS	P120	5A	CHASSIS	P207	6L	CHASSIS

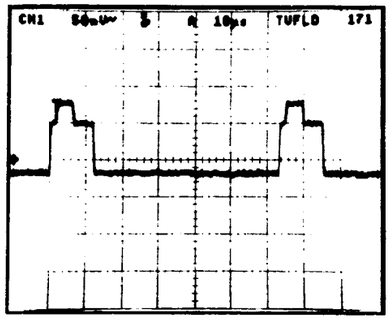



BELL
SEQUENCER OUTPUT
WORD TRIGGER
GPIB
GPIB STATUS
PROBE POWER
VIDEO OPTION MODE REGISTER
PARTIAL FLEX REAR
SEQUENCE OUT TTL
STEP COMPLETE TTL
SEQUENCE IN TTL
WORD RECOG OUTPUT TTL
CONNECTION SHOWN ON
PROBE POWER (OPTION)
GPIB LED FLEX
Static Sensitive Devices
See Maintenance Section
NOTE: U332A IS LOCATED ON DIAGRAM 1.
A12 PARTIAL PROCESSOR BOARD
2440
8803-21
SYSTEM I/O 20

WAVEFORMS FOR DIAGRAM 21

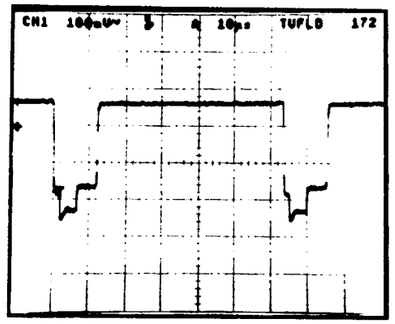
BW LIMIT;
20 MHz ON TEST SCOPE

159

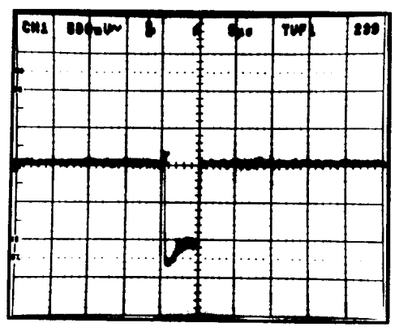


COMPOSITE FLAT-FIELD NEG-SYNC VIDEO SIGNAL APPLIED TO CH 2 INPUT. TRIG SOURCE, CH 2; TRIG CPLG, TV; A TV COUPLING, ALT.

160



161



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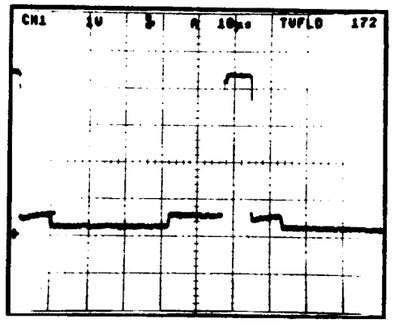

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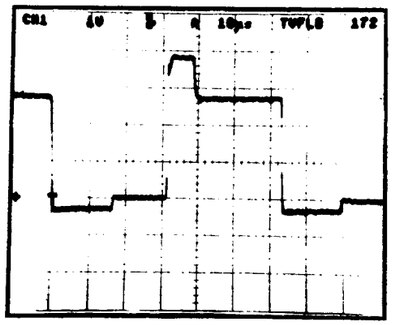
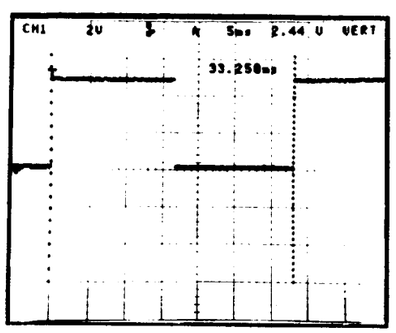
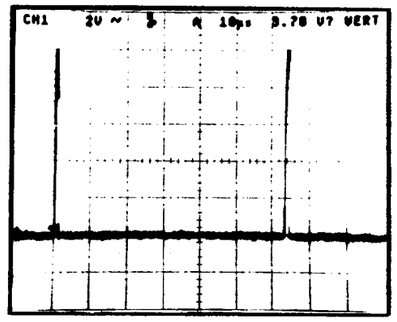


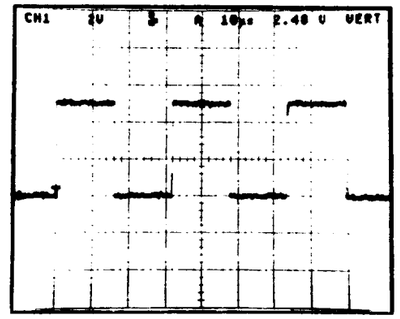
164



165



166



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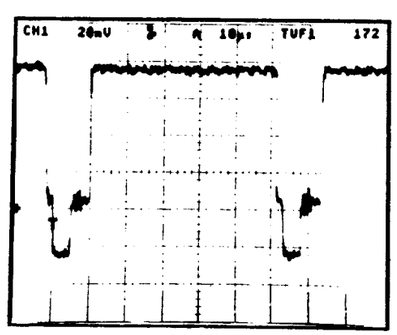
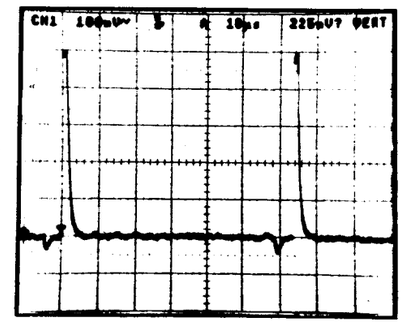
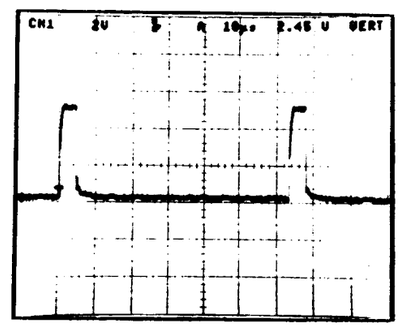


168



TV CLAMP ON; CH 2 INVERT ON

169



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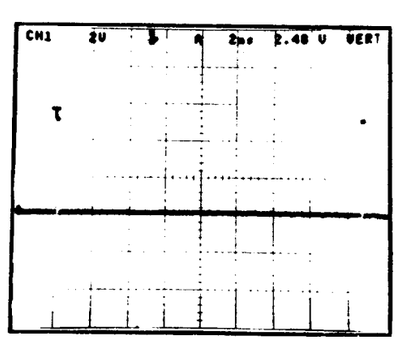


6285-46

MORE

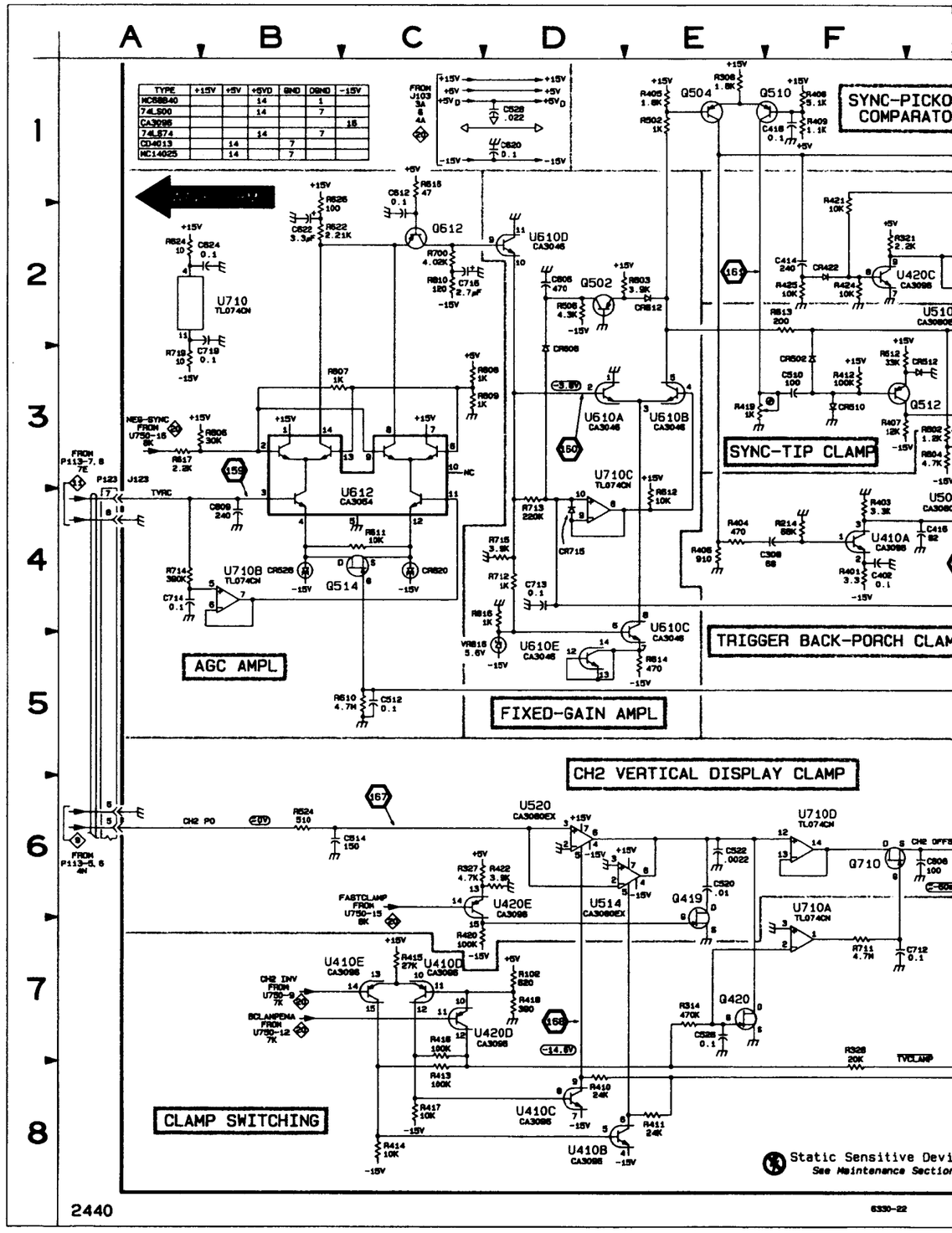
VIDEO OPTION 21

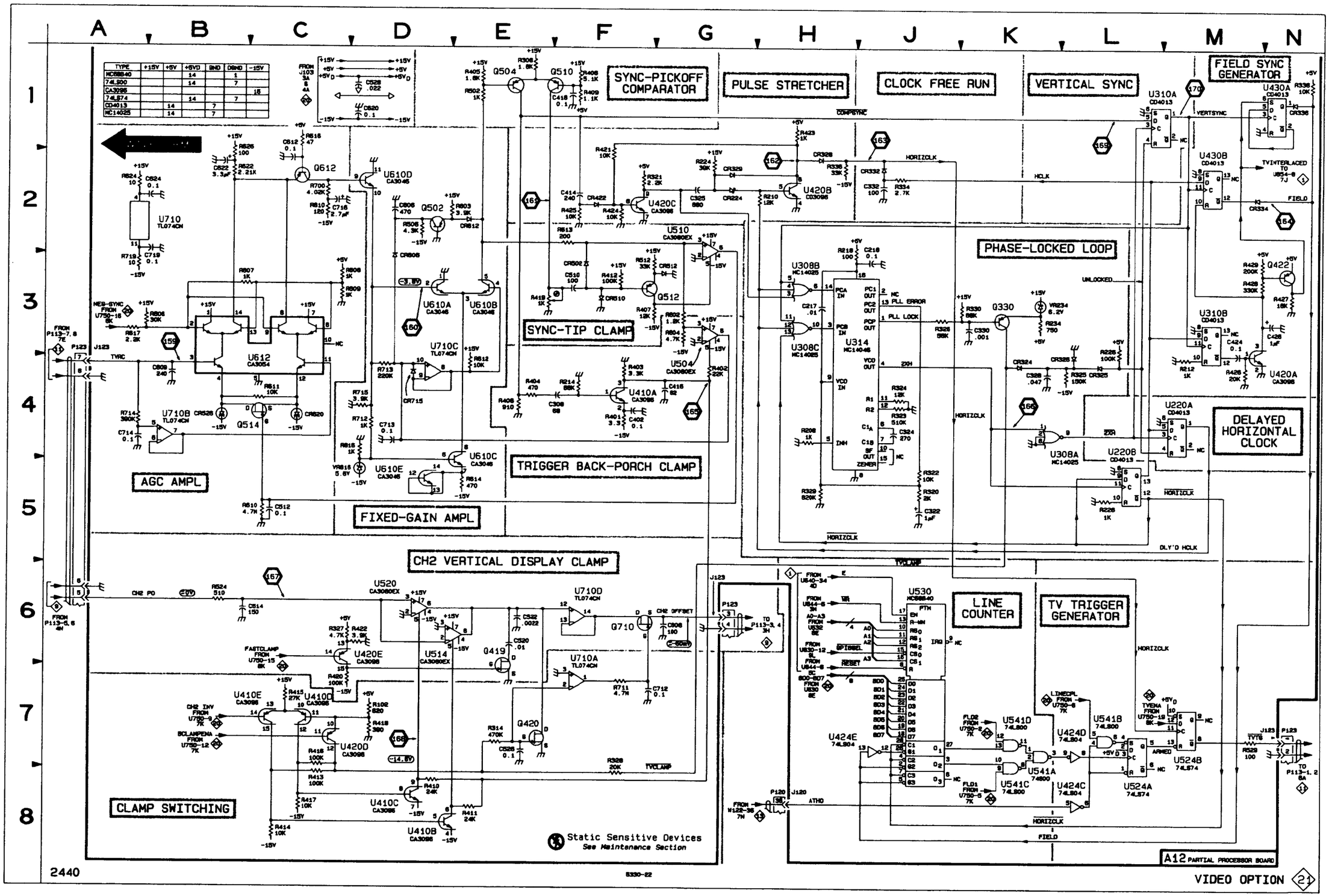
CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A12											
C217	3H	2C	CR715	4D	7C	R408	1F	4A	R816	4D	7C
C218	2J	3C				R409	1F	4A			
C308	4F	3B	J120	8H	9B	R410	8D	4B	U220A	4M	3D
C322	5J	3C	J123	3A	5C	R411	8E	4B	U220B	4L	3D
C324	4J	3C	J123	6G	5C	R412	3F	4B	U308A	4K	3B
C325	2G	3C	J123	7N	5C	R413	8C	4C	U308B	3H	3B
C328	4K	3D				R414	8C	4C	U308C	3H	3B
C330	3K	3E	Q330	3K	3D	R415	7C	4C	U310A	1L	3B
C332	2J	3E	Q419	6E	4C	R416	7C	4C	U310B	3M	3B
C402	4F	4B	Q420	7E	4C	R417	8C	4C	U314	3H	3B
C414	2F	4C	Q422	3N	4C	R418	7D	4C	U410A	4F	4B
C416	4G	4C	Q502	2D	5A	R419	3E	4C	U410B	8D	4B
C418	1F	4C	Q504	1E	5B	R420	7C	4D	U410C	8D	4B
C424	3M	4D	Q510	1F	5B	R421	1F	4D	U410D	7C	4B
C426	3N	4E	Q512	3G	5B	R422	6D	4D	U410E	7C	4B
C510	3F	5B	Q514	4B	5B	R423	1H	4D	U420A	3N	4C
C512	5C	5B	Q612	2C	6C	R424	2F	4D	U420B	2H	4C
C514	6C	5C	Q710	6F	7B	R425	2F	4D	U420C	2F	4C
C520	2E	5C				R426	3M	4D	U420D	7D	4C
C522	6E	5C	R102	7D	1A	R427	3N	4D	U420E	6D	4C
C526	7E	5D	R208	4H	3B	R428	3M	4D	U424C	7L	5D
C528	1D	5C	R210	2H	2B	R429	3M	4D	U424D	7L	5D
C606	2D	6B	R212	3M	2B	R502	1E	5B	U424E	7J	5D
C608	6G	6B	R214	4F	3B	R506	2D	5B	U430A	1N	4E
C609	4B	6B	R218	2H	2C	R512	3F	5C	U430B	1M	4E
C612	1C	6C	R224	2G	2C	R524	6B	5C	U504	3G	5B
C620	1D	6C	R226	3L	2D	R529	7M	5D	U510	2G	5B
C622	1B	6D	R228	5L	3D	R602	3G	6B	U514	6D	5C
C624	2A	7C	R234	3K	3E	R603	2E	6B	U520	6D	5C
C712	7F	7B	R308	1E	3B	R604	3G	6B	U524A	7L	5D
C713	4D	7B	R314	7E	3C	R606	3B	6B	U524B	7M	5D
C714	4A	7B	R320	5J	3C	R607	3B	6B	U530	6J	4D
C716	2C	8D	R321	2F	3C	R608	3C	6B	U541A	7K	5F
C719	2A	7C	R322	4J	3C	R609	3C	6B	U541B	7L	5F
			R323	4J	3C	R610	5C	6B	U541C	7K	5F
CR224	2G	2C	R324	4J	3C	R611	4B	4B	U541D	7K	5F
CR324	3K	3D	R325	4L	3D	R612	3E	6B	U610A	3D	6B
CR325	4L	3D	R326	3J	3D	R613	2F	6B	U610B	3E	6B
CR326	3L	3D	R327	6C	3D	R614	5E	6B	U610C	4E	6B
CR328	1H	3D	R328	7F	3D	R616	1C	6C	U610D	2D	6B
CR329	2G	3D	R329	5H	3C	R617	3A	6C	U610E	5D	6B
CR332	2J	3E	R330	3K	3E	R622	1B	6C	U612	3C	6C
CR334	2M	3E	R334	2J	3E	R624	2A	7C	U710A	6F	7C
CR336	1N	3E	R336	2H	3E	R626	1B	6C	U710B	4B	7C
CR422	2F	4D	R338	1N	3E	R700	2C	7B	U710C	3D	7C
CR502	3F	5A	R401	4F	4B	R711	7F	7B	U710D	6F	7C
CR510	3F	5B	R402	4G	4B	R712	4D	7B			
CR512	3G	5C	R403	4F	4B	R713	4D	7B	VR234	3K	2E
CR526	4B	5C	R404	4E	4B	R714	4A	7B	VR616	5D	6C
CR606	2D	6B	R405	1E	4B	R715	4D	7C			
CR612	2E	6B	R406	4E	4B	R719	2A	7C			
CR620	4C	6C	R407	3F	4A	R810	2C	7B			

Patrial A12 also shown on diagrams 1, 2, and 20.

OTHER PARTS

P120	8H	CHASSIS	P123	3A	CHASSIS	P123	6G	CHASSIS	P123	7N	CHASSIS




SYNC-PICKOFF COMPARATOR
PULSE STRETCHER
CLOCK FREE RUN
VERTICAL SYNC
FIELD SYNC GENERATOR
PHASE-LOCKED LOOP
DELAYED HORIZONTAL CLOCK
SYNC-TIP CLAMP
TRIGGER BACK-PORCH CLAMP
AGC AMPL
FIXED-GAIN AMPL
CH2 VERTICAL DISPLAY CLAMP
CLAMP SWITCHING
LINE COUNTER
TV TRIGGER GENERATOR
Static Sensitive Devices
See Maintenance Section
A12 PARTIAL PROCESSOR BOARD
2440
8330-22
VIDEO OPTION 21

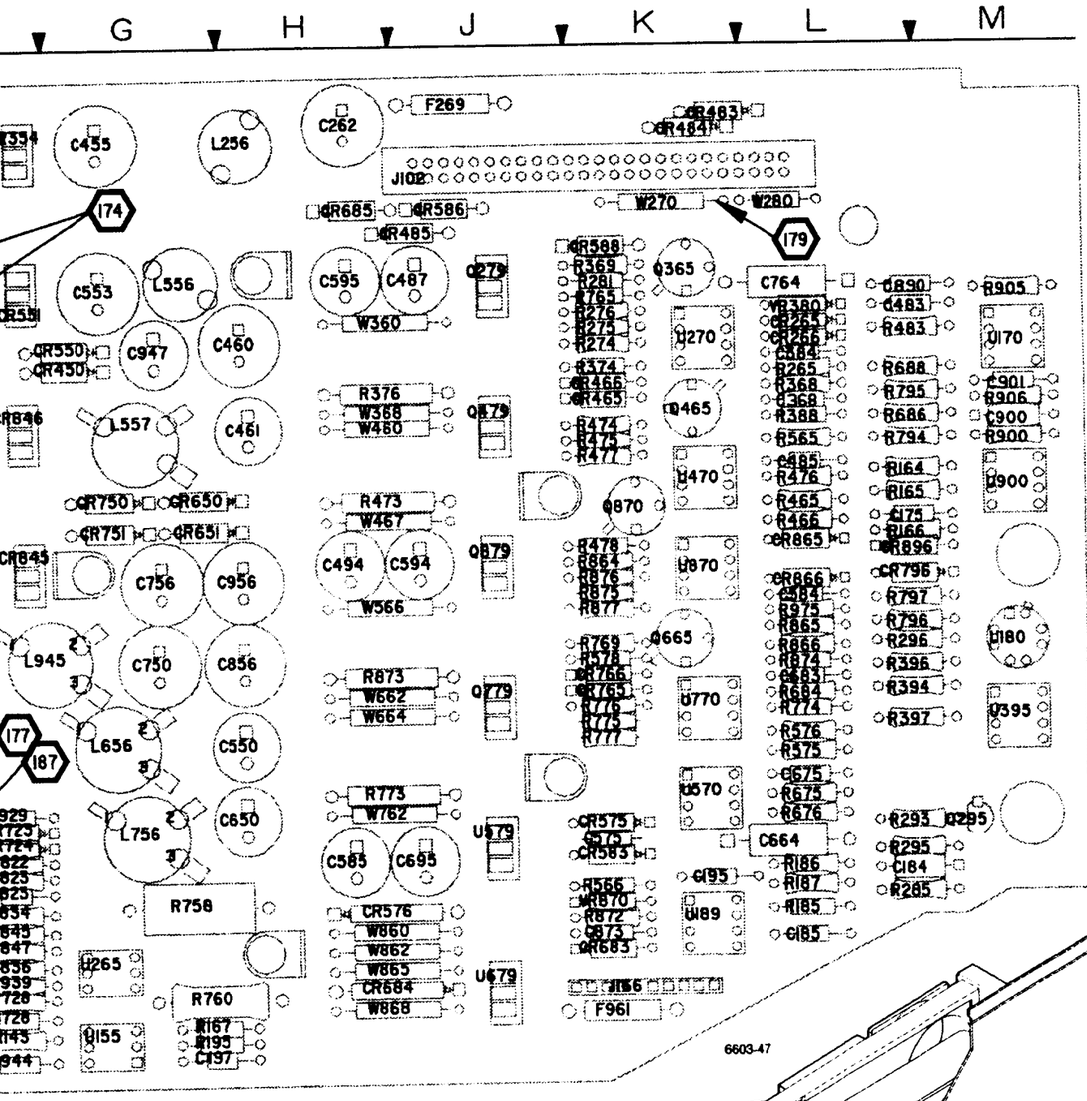
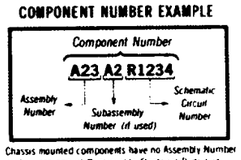


Figure 9-12. A16—Power Supply board.

COMPONENT NUMBER EXAMPLE



Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

Static Sensitive Devices
See Maintenance Section

A16—LOW VOLTAGE POWER SUPPLY BOARD

A16—LOW VOLTAGE POWER SUPPLY BOARD

CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER	CIRCUIT NUMBER	SCHEM NUMBER
C105	22	C873	23			R217	22	R640	22	RT717	22
C128	22	C890	23	F269	22	R223	22	R675	23	RT805	22
C137	22	C900	23	F961	23	R226	22	R676	23		
C138	22	C901	23			R227	22	R684	23	T117	22
C144	22	C929	22	J102	22	R228	22	R686	23	T335	22
C145	22	C944	22	J102	23	R238	22	R688	23	T415	22
C175	23	C947	22	J166	23	R240	22	R713	22	T620	22
C184	23	C956	22			R244	22	R723	22	T639	22
C185	23			L256	22	R265	23	R724	22		
C195	23	CR239	22	L556	22	R274	23	R727	22	U155	22
C197	23	CR245	22	L557	22	R275	23	R728	22	U170	22
C219	22	CR265	23	L656	22	R276	23	R758	23	U170	23
C223	22	CR266	23	L709	22	R281	23	R760	23	U180	23
C225	22	CR354	22	L715	22	R285	23	R765	23	U189	23
C227	22	CR426	22	L756	22	R293	23	R769	23	U233	22
C238	22	CR450	22	L945	22	R295	23	R773	23	U265	22
C244	22	CR465	23	L950	22	R296	23	R774	23	U270	23
C262	22	CR466	23			R323	22	R775	23	U395	23
C305	22	CR483	23	P30	22	R324	22	R776	23	U470	23
C328	22	CR484	23	P60	22	R325	22	R777	23	U570	23
C368	23	CR485	23	P70	22	R368	23	R794	23	U579	23
C384	23	CR510	22	P80	22	R369	23	R795	23	U679	23
C405	22	CR550	22			R374	23	R796	23	U770	23
C455	22	CR551	22	Q148	22	R376	23	R797	23	U829	22
C460	22	CR575	23	Q240	22	R388	23	R808	22	U834	22
C461	22	CR576	23	Q279	23	R394	23	R809	22	U840	22
C483	22	CR583	23	Q295	23	R396	23	R815	22	U870	23
C485	23	CR586	23	Q365	23	R397	23	R822	22	U900	23
C487	23	CR588	23	Q421	22	R401	22	R823	22		
C494	23	CR630	22	Q423	22	R405	22	R824	22	VR144	22
C525	22	CR631	22	Q465	23	R410	22	R834	22	VR380	23
C528	22	CR650	22	Q479	23	R428	22	R835	22	VR870	23
C550	22	CR651	22	Q521	22	R429	22	R836	22	VR929	22
C553	22	CR683	23	Q665	23	R434	22	R845	22		
C575	23	CR684	23	Q721	22	R435	22	R847	22	W270	22
C584	23	CR685	23	Q779	23	R436	22	R864	23	W280	22
C585	23	CR723	22	Q836	22	R465	23	R865	23	W310	22
C594	23	CR724	22	Q870	23	R466	23	R866	23	W315	22
C595	23	CR730	22	Q879	23	R473	23	R872	23	W360	22
C625	22	CR750	22			R474	23	R873	23	W368	23
C650	22	CR751	22	R117	22	R475	23	R874	23	W460	22
C664	23	CR765	23	R128	22	R476	23	R875	23	W462	22
C675	23	CR766	23	R129	22	R477	23	R876	23	W467	23
C683	23	CR796	23	R136	22	R478	23	R877	23	W566	22
C695	23	CR823	22	R143	22	R483	22	R900	23	W627	22
C706	22	CR824	22	R144	22	R505	22	R905	23	W662	23
C728	22	CR845	22	R146	22	R516	22	R906	23	W664	22
C750	22	CR846	22	R164	23	R518	22	R925	22	W762	23
C756	22	CR865	23	R165	23	R565	23	R926	22	W860	23
C764	23	CR866	23	R166	23	R566	23	R931	22	W862	23
C816	22	CR896	23	R167	22	R575	23	R932	22	W865	23
C823	22	CR930	22	R185	23	R576	23	R938	22	W868	23
C829	22			R186	23	R578	23	R939	22		
C835	22	E609	22	R187	23	R624	22	R975	23		
C856	22	E616	22	R195	23	R627	22				

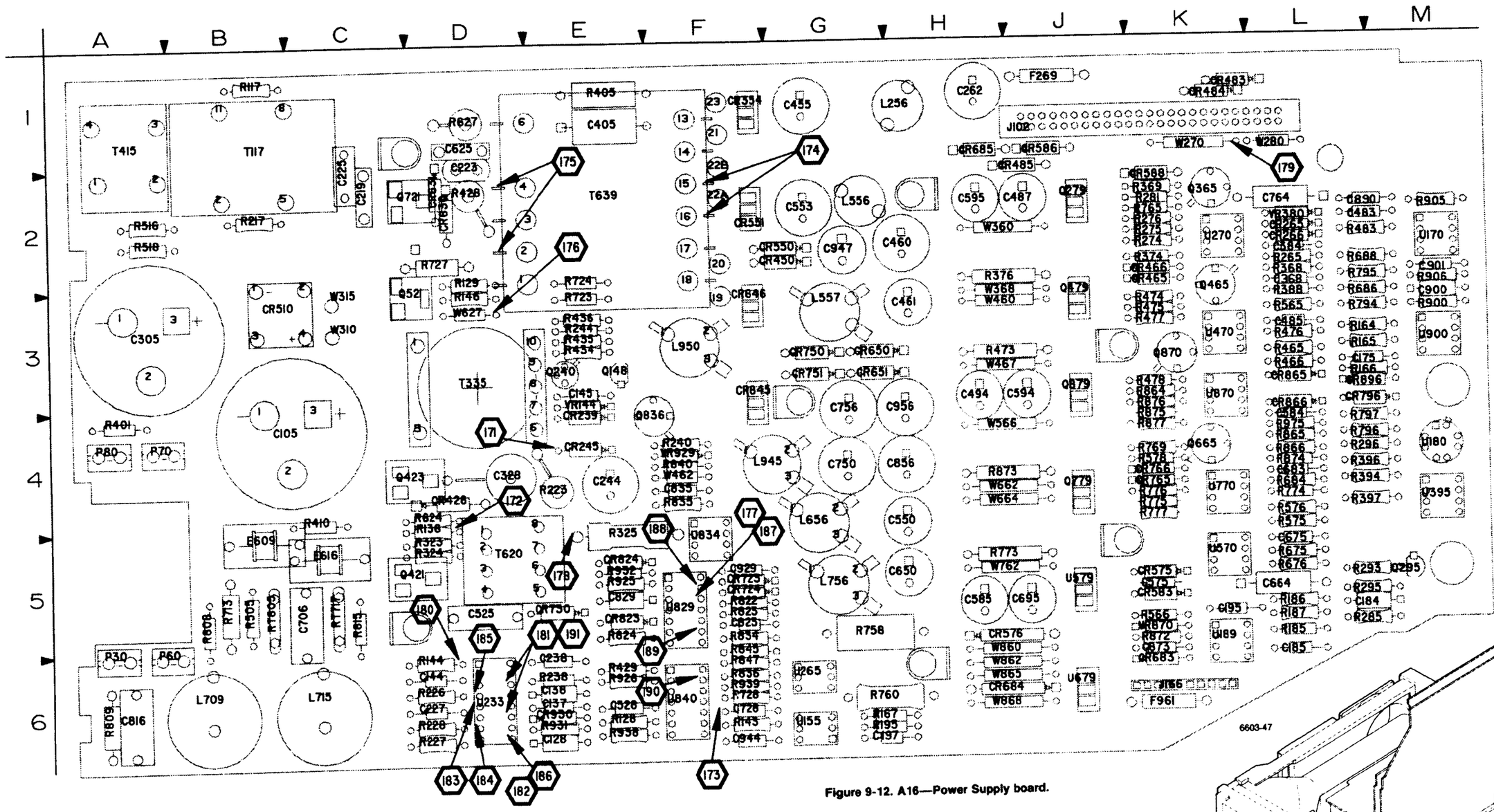


Figure 9-12. A16—Power Supply board.

COMPONENT NUMBER EXAMPLE

Component Number

A23 A2 R1234

Assembly Number

Subassembly Number (if used)

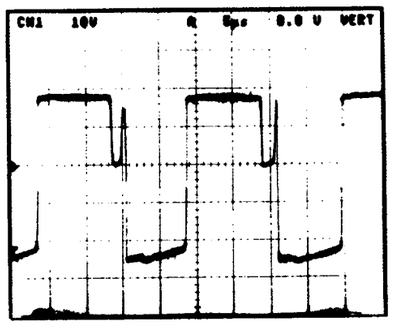
Schematic Circuit Number

Chassis mounted components have no Assembly Number prefix—see end of Replaceable Electrical Parts List

Static Sensitive Devices
See Maintenance Section

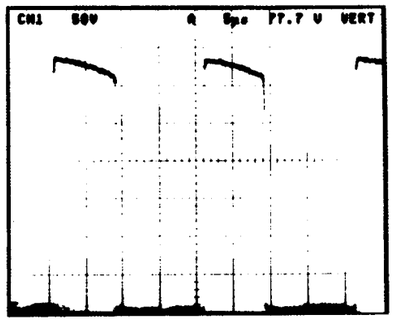
WAVEFORMS FOR DIAGRAM 22

171



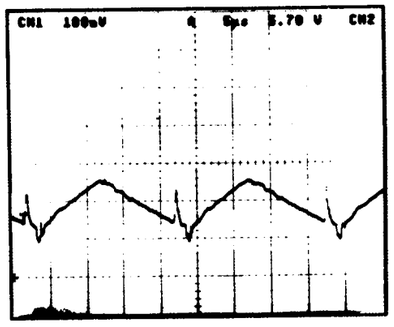
NORMAL AC LINE OPERATION

172



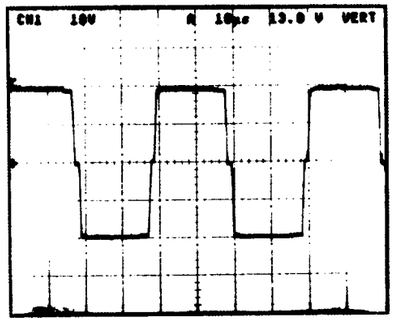
NORMAL AC LINE OPERATION

173



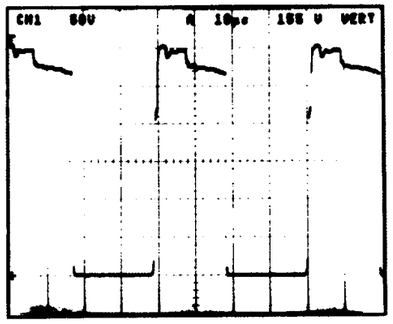
NORMAL AC LINE OPERATION

174



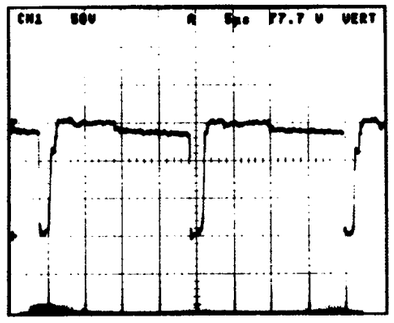
NORMAL AC LINE OPERATION

175



NORMAL AC LINE OPERATION

176



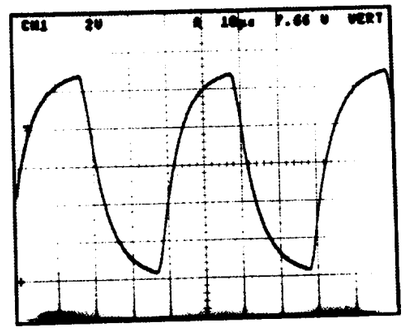
NORMAL AC LINE OPERATION

MORE

WAVEFORMS FOR DIAGRAM 22 (cont.)

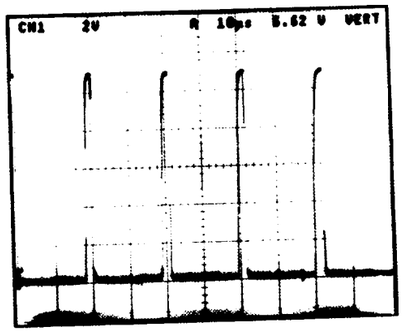
WAVEFORMS FOR DIAGRAM 22 (cont)

189



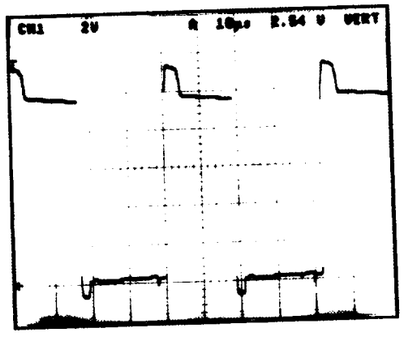
EITHER AC LINE OR
CONTROL CIRCUIT POWER

190



EITHER AC POWER OR
CONTROL CIRCUIT POWER

191

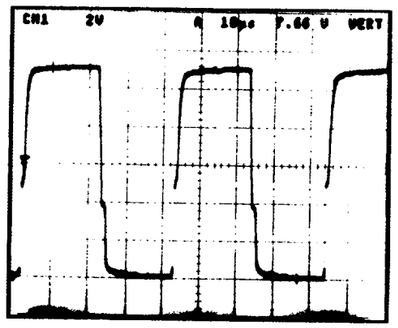


CONTROL CIRCUIT POWER ONLY

WARNING

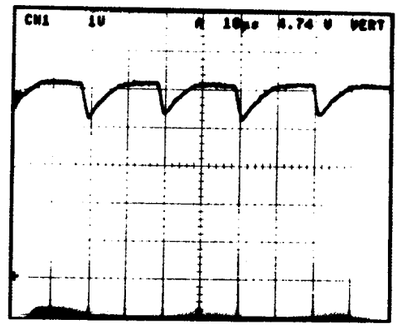
**PORTIONS OF THE POWER SUPPLY ARE AT THE AC LINE POTENTIAL-
USE AN ISOLATION TRANSFORMER.**

177



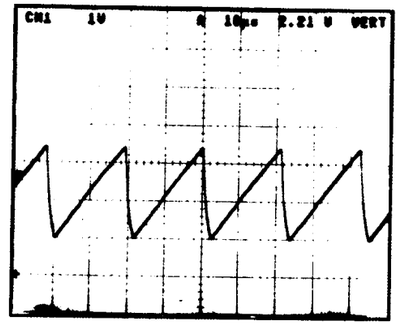
NORMAL AC LINE OPERATION

180



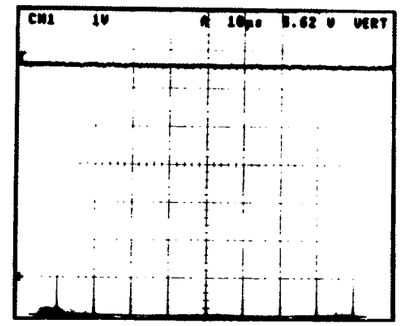
NORMAL AC LINE OPERATION

183



EITHER AC POWER OR
CONTROL CIRCUIT POWER

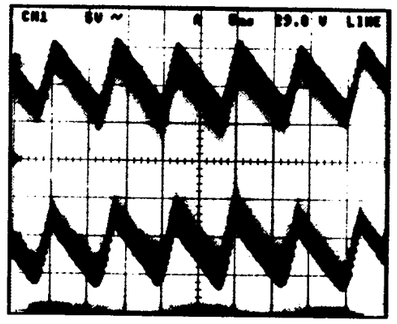
186



CONTROL CIRCUIT POWER ONLY

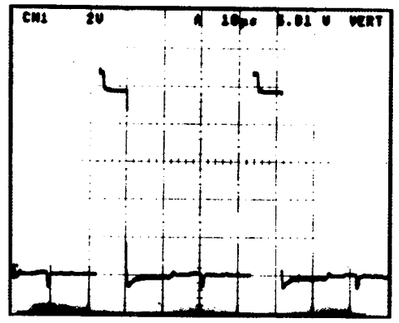
TEST SCOPE IN ENVELOPE

178



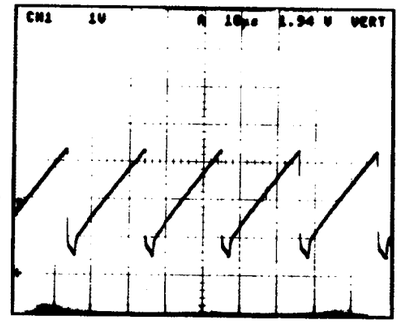
NORMAL AC LINE OPERATION

181



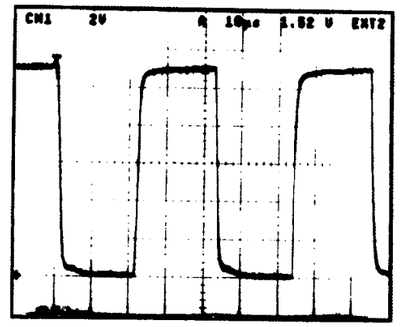
NORMAL AC LINE OPERATION

184



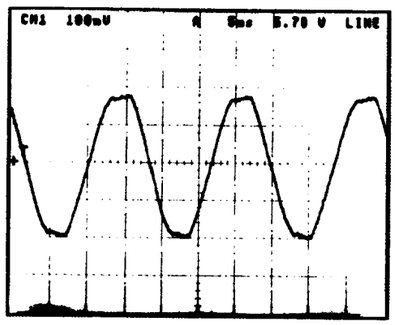
EITHER AC POWER OR
CONTROL CIRCUIT POWER

187



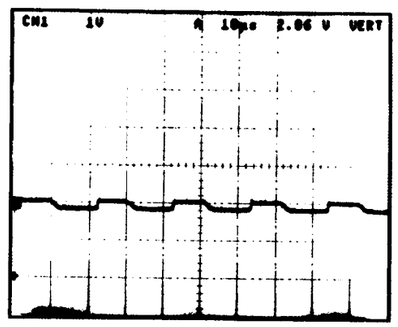
CONTROL CIRCUIT POWER ONLY

179



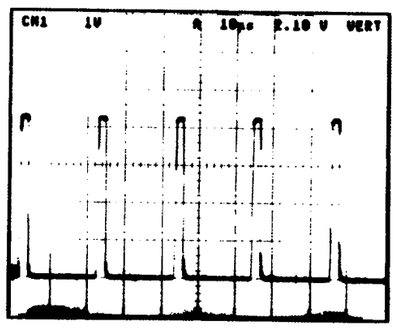
NORMAL AC LINE OPERATION

182



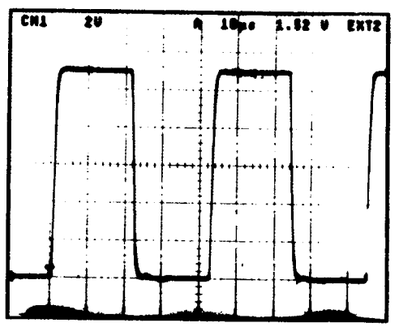
NORMAL AC LINE OPERATION

185



EITHER AC POWER OR
CONTROL CIRCUIT POWER

188



CONTROL CIRCUIT POWER ONLY

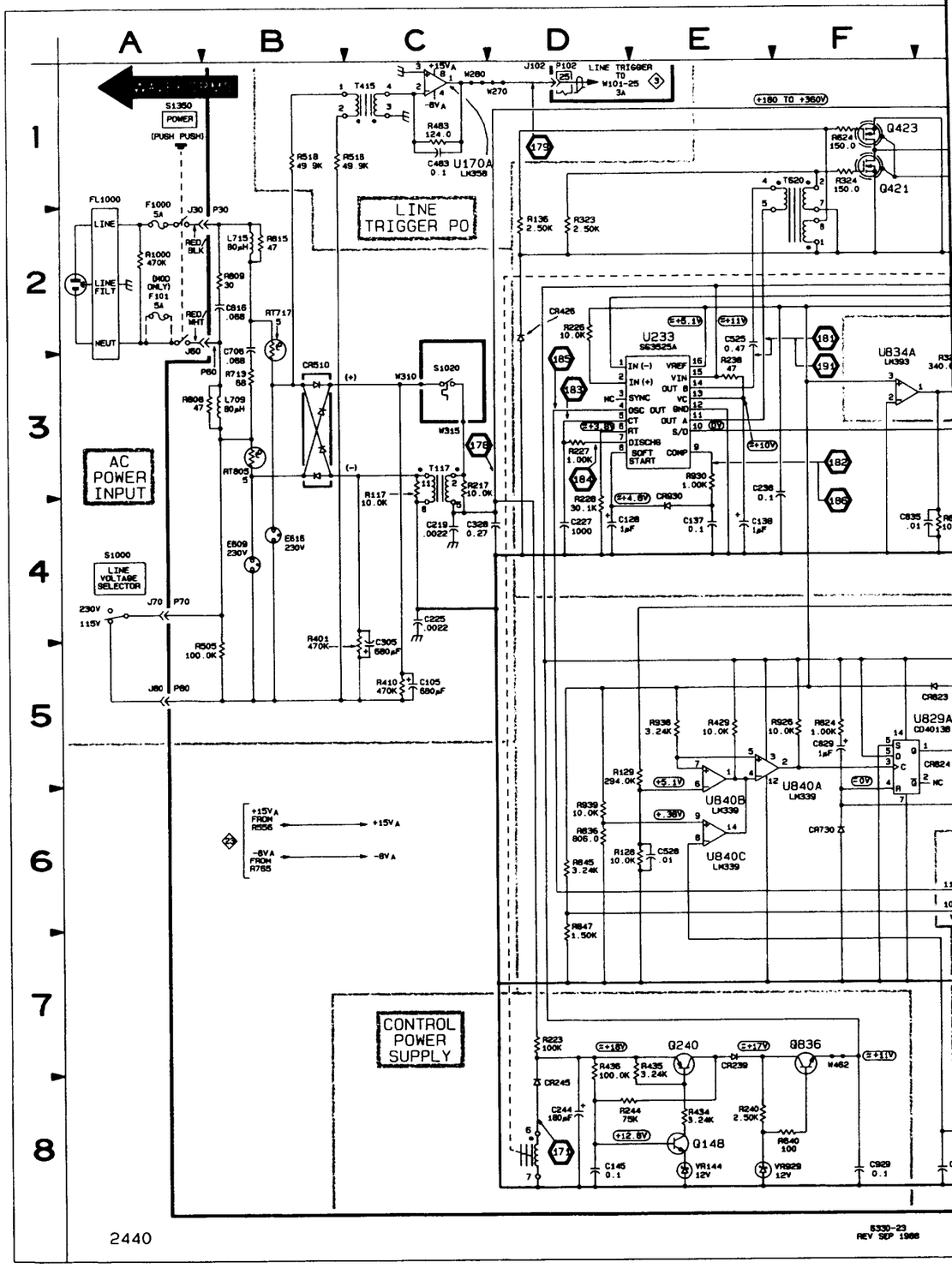
6285-47

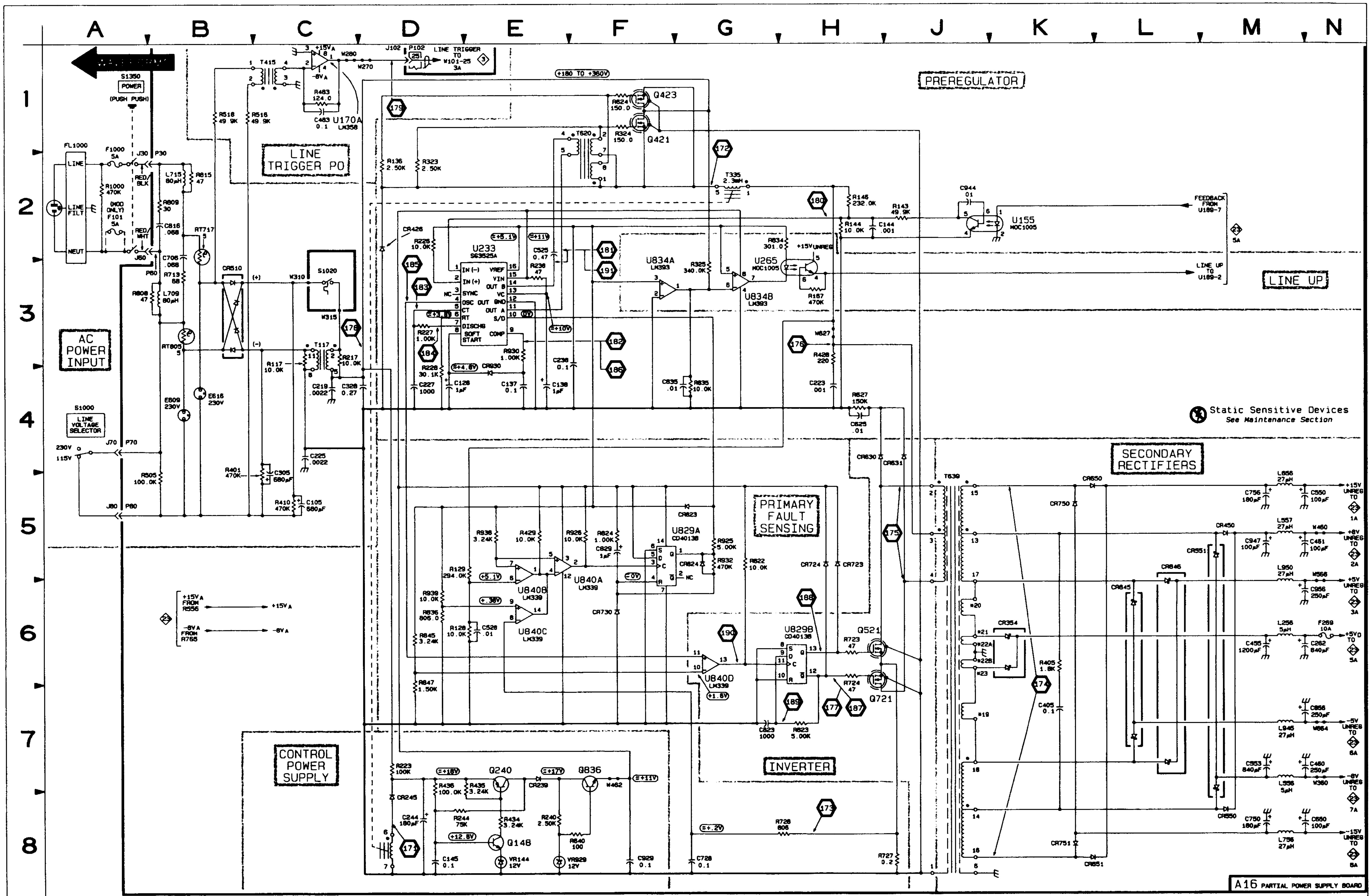
LOW VOLTAGE POWER SUPPLY (22)

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A16											
C105	5C	4B	CR551	5M	2F	R128	6D	6E	R845	6D	6F
C126	4D	6E	CR630	4H	2D	R129	5E	2D	R847	6D	6F
C137	4E	6E	CR631	4J	2D	R136	2D	5D	R925	5G	5E
C138	4E	6E	CR650	5K	3H	R143	2J	6F	R926	5F	6E
C144	2H	6D	CR651	8K	3H	R144	2H	6D	R931	3E	6E
C145	8D	3E	CR723	5H	5G	R146	2H	3D	R932	5G	5E
C219	4C	2C	CR724	5H	5G	R167	3H	6G	R938	5E	6E
C223	4H	2D	CR730	6F	5E	R217	3C	2B	R939	6D	6F
C225	4C	2C	CR750	5K	3G	R223	7D	4E			
C227	4D	6D	CR751	8K	3G	R226	2D	6D	RT717	2B	5C
C238	3E	6E	CR823	5G	5F	R227	3D	6D	RT805	3B	5C
C244	8D	4E	CR824	5G	5F	R228	3D	6D			
C262	8N	1H	CR845	6L	3F	R238	3E	6E	T117	3C	2B
C305	4C	3A	CR846	5L	3F	R240	6E	4F	T335	2G	3D
C328	4C	4D	CR930	3E	6E	R244	6D	3E	T415	1C	2A
C405	7K	1E				R323	2D	5D	T620	1F	5D
C455	6M	1G	E609	4B	5B	R324	1F	5D	T839	5J	1D
C460	7N	2H	E616	4B	5C	R325	3G	5E			
C461	5N	3H				R401	4B	4A	U155	2K	6G
C483	1C	2L	F269	6N	1J	R405	6K	1E	U170A	1C	2M
C525	2E	5D				R410	5C	4C	U233	2E	6D
C528	6E	6E	J102	1D	1J	R428	3H	2D	U265	3G	6G
C550	5N	4H				R429	5E	6E	U829A	5G	5F
C553	7M	2G	L256	6M	1H	R434	8E	3E	U829B	6H	5F
C825	4H	1D	L556	7M	2G	R435	7E	3E	U834A	2F	4F
C850	8N	5H	L557	5M	3G	R436	7D	3E	U834B	3G	4F
C708	2B	5C	L656	5M	4G	R483	1C	2L	U840A	5F	6F
C728	8G	6F	L709	3B	5B	R505	4B	5B	U840B	6E	6F
C750	8M	4G	L715	2B	5C	R518	1B	2A	U840C	6E	6F
C756	5M	3G	L756	8M	5G	R519	1B	2A	U840D	6G	6F
C816	2B	6A	L945	7M	4F	R624	1F	4D			
C823	7G	5F	L950	5M	3F	R627	4H	1D	VR144	8E	4E
C829	5F	5F				R640	8F	4F	VR929	8E	4F
C835	4G	4F	P30	2B	6A	R713	3B	5B			
C856	7N	4H	P60	3B	6A	R723	6H	3E	W270	1D	1K
C929	8F	5F	P70	4A	4A	R724	6H	2E	W280	1C	1L
C944	2J	6F	P80	5A	4A	R727	8J	2D	W310	3C	3C
C947	5M	2G				R728	8H	6F	W315	3C	3C
C956	6N	3H	Q148	8E	3E	R808	3B	5B	W360	7N	2H
			Q240	7E	3E	R809	2B	6A	W460	5N	3H
CR239	7E	4E	Q421	1F	5C	R815	2B	5C	W462	7F	4F
CR245	8D	4E	Q423	1F	4C	R822	5G	5F	W586	5N	4H
CR354	6K	1F	Q521	6H	2C	R823	7H	5F	W627	3H	3D
CR426	2D	4D	Q721	7H	2C	R824	5F	5E	W664	7N	4H
CR450	5M	2G	Q836	7F	3F	R834	2H	5F			
CR510	3B	2B				R835	4G	4F			
CR550	8M	2G	R117	3C	1B	R836	6D	6F			

Partial A16 also shown on diagram 23.

OTHER PARTS											
F1000	2A	CHASSIS	J30	2A	CHASSIS	P102	1D	CHASSIS	S1000	4A	CHASSIS
			J60	2A	CHASSIS				S1020	3C	CHASSIS
FL1000	1A	CHASSIS	J70	4A	CHASSIS	R1000	2A	CHASSIS	S1350	1A	CHASSIS
			J80	5A	CHASSIS						





PREREGULATOR
LINE TRIGGER PO
AC POWER INPUT
LINE UP
SECONDARY RECTIFIERS
PRIMARY FAULT SENSING
INVERTER
CONTROL POWER SUPPLY
Static Sensitive Devices
See Maintenance Section
A16 PARTIAL POWER SUPPLY BOARD

CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION	CIRCUIT NUMBER	SCHEM LOCATION	BOARD LOCATION
ASSEMBLY A16											
C175	2J	3L	CR865	4H	3L	R368	6F	2L	R873	4J	4H
C184	5B	5M	CR866	4H	4L	R369	7D	2K	R874	4J	4L
C185	5B	6L	CR898	4C	3L	R374	2F	2K	R875	4J	4K
C195	6C	5K				R376	7F	3H	R878	4J	4K
C197	5B	6G	F981	8K	6K	R388	6G	3L	R877	4H	4K
C368	6F	3L				R394	3D	4L	R900	2J	3M
C384	6E	2L	J102	1M	1J	R396	4C	4L	R905	2K	2M
C485	3E	3L	J102	3M	1J	R397	3D	4L	R906	2K	3M
C487	7G	2J	J102	4E	1J	R465	3F	3L	R975	4J	4L
C494	4K	3H	J102	4M	1J	R466	3E	3L			
C575	2C	5K	J102	5M	1J	R473	3F	3H	U170B	2K	2M
C584	5H	4L	J166	1M	6J	R474	2F	3K	U180	1H	4M
C585	7D	5H	J166	2M	6J	R475	2E	3K	U189A	5C	5K
C594	5J	3J	J166	4M	6J	R476	3F	3L	U189B	4B	5K
C595	3F	2H	J166	5M	6J	R477	2E	3K	U270A	6E	2K
C664	1A	5L	J166	8M	6J	R478	3J	3K	U270B	6E	2K
C675	8C	5L				R565	2D	3L	U395A	4D	4M
C683	5H	4L	Q279	7F	2J	R566	1A	5K	U395B	4D	4M
C695	1D	5J	Q295	5D	5M	R575	1C	5L	U470A	2E	3K
C784	7B	2L	Q365	7E	2K	R576	1C	4L	U470B	3E	3K
C873	8B	6K	Q465	2E	3K	R578	6J	4K	U570A	1C	5K
C890	2L	2L	Q479	2F	3J	R675	7C	5L	U570B	7B	5K
C900	2J	3M	Q665	6H	4K	R676	7C	5L	U579	1B	5J
C901	2K	2M	Q779	6J	4J	R684	5J	4L	U679	8B	6J
			Q870	3H	3K	R686	4B	3L	U770A	5H	4K
CR265	7E	2L	Q879	3J	3J	R688	4B	2L	U770B	5G	4K
CR268	6E	2L				R758	8K	5G	U870A	4H	3K
CR465	2E	3K	R164	2K	3L	R760	8K	6G	U870B	4H	3K
CR466	3E	2K	R165	2K	3L	R765	7B	2K	U900	1K	3M
CR483	2L	1L	R166	2K	3L	R769	6G	4K			
CR484	3L	1L	R185	5B	5L	R773	5J	5H	VR380	7D	2L
CR485	4K	2J	R186	4C	5L	R774	5K	4L	VR870	7B	5K
CR575	1B	5K	R187	4C	5L	R775	5J	4K			
CR578	1B	5H	R195	5C	6G	R776	5J	4K	W368	7F	3H
CR583	1B	5K	R265	6F	2L	R777	5H	4K	W467	2H	3H
CR586	6L	1J	R274	7E	2K	R794	4B	3L	W662	4K	4H
CR588	7L	2K	R275	7F	2K	R795	4B	3L	W762	5K	5H
CR683	8B	6K	R276	7F	2K	R796	4C	4L	W860	1A	6H
CR684	8C	6J	R281	7F	2K	R797	4C	4L	W862	1C	6H
CR685	5K	1H	R285	5C	5L	R864	3G	3K	W865	8B	6H
CR765	5G	4K	R293	5C	5L	R865	4J	4L	W868	8C	6H
CR766	5G	4K	R295	5D	5L	R866	4H	4L			
CR798	4C	4M	R296	4D	4L	R872	8B	6K			

Patriot A16 also shown on diagram 22.

OTHER PARTS

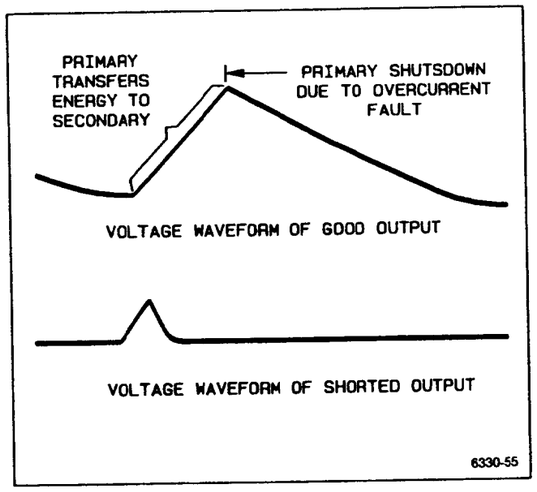
P102	1M	CHASSIS	P102	4M	CHASSIS	P166	2M	CHASSIS	P166	8M	CHASSIS
P102	3M	CHASSIS	P102	5M	CHASSIS	P166	4M	CHASSIS			
P102	4E	CHASSIS	P166	1M	CHASSIS	P166	5M	CHASSIS			

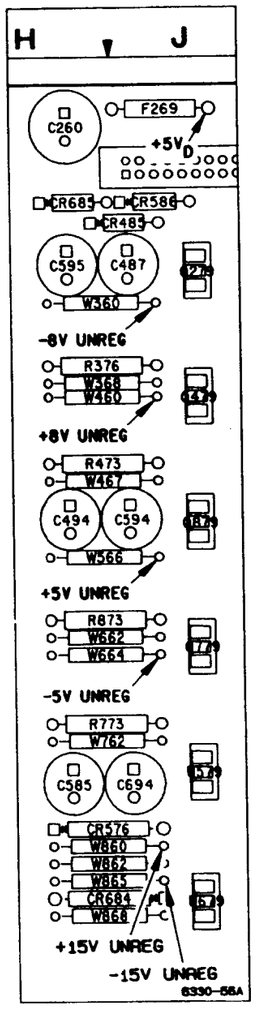
POWER SUPPLY OVERCURRENT FAULT

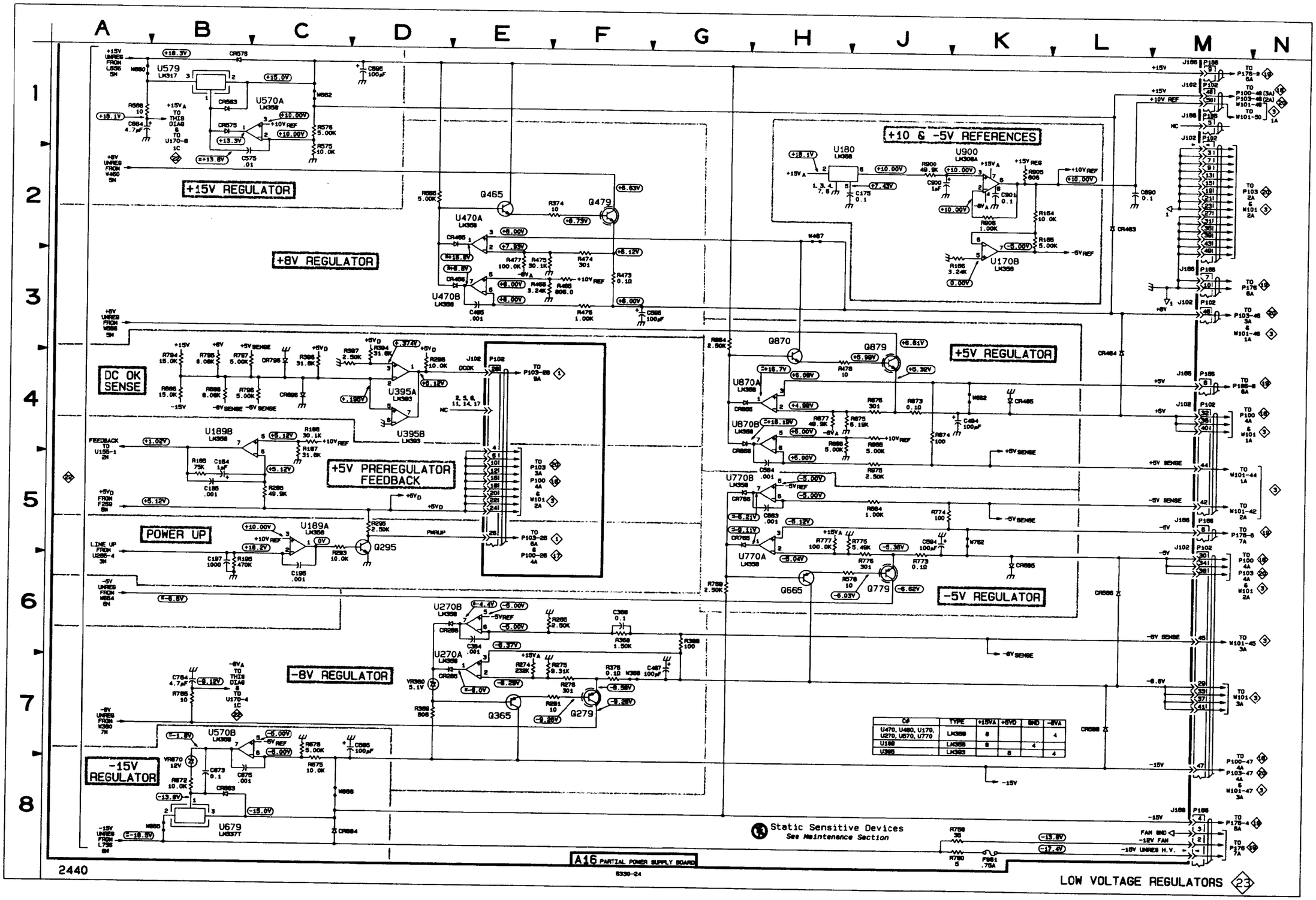
IN THE EVENT OF A SHORTED LOAD ON AN UNREGULATED VOLTAGE SUPPLY, THE POWER SUPPLY WILL GO INTO THE "CHIRP" MODE. IT CONTINUALLY STARTS UP AND SHUTS DOWN IN A REPEATED MANNER AS THE OVER-CURRENT SENSE CIRCUIT DETECTS THE EXCESSIVE SECONDARY LOADING. THE VOLTAGE WAVEFORM PRESENT ON THE UNREGULATED VOLTAGE LINES GIVES AN INDICATION OF WHETHER THE SECONDARY IS EXCESSIVELY LOADED. CHECK THE WAVEFORMS AT THE ZERO OHM RESISTORS INDICATED IN THE ACCOMPANYING COMPONENT LOCATION FIGURE FOR AN INDICATION OF EXCESSIVE LOADING. A SHORTED SECONDARY CIRCUIT IS IDENTIFIED BY A MUCH SMALLER VOLTAGE WAVEFORM THAN SEEN ON A GOOD SECONDARY (SEE ACCOMPANYING WAVEFORM ILLUSTRATION).

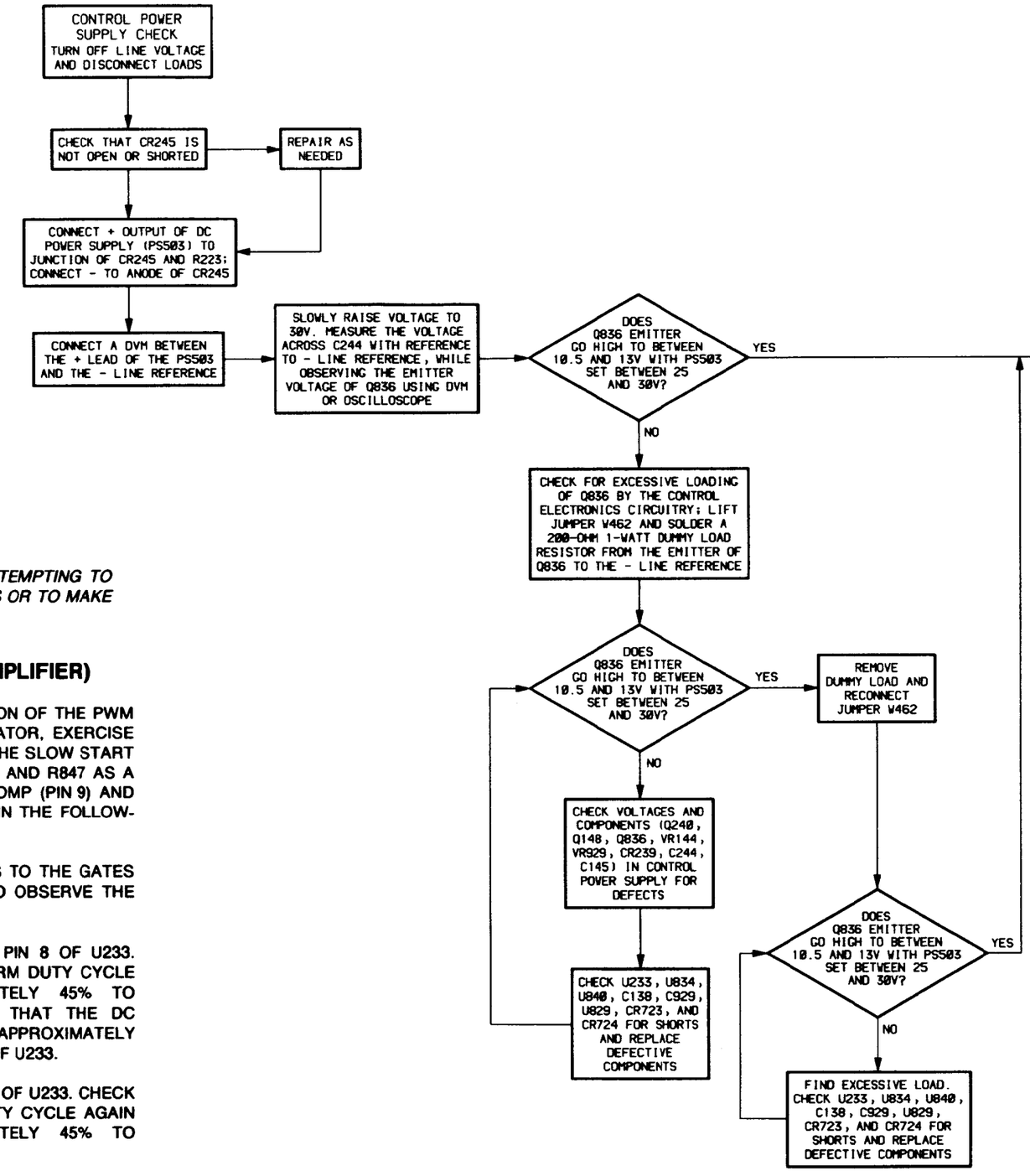
NOTE

A SHORT ON THE +5 VD SUPPLY WILL BLOW FUSE F269.






+15V REGULATOR
+8V REGULATOR
DC OK SENSE
+5V PREREGULATOR FEEDBACK
POWER UP
-15V REGULATOR
-8V REGULATOR
+10 & -5V REFERENCES
+5V REGULATOR
-5V REGULATOR
Static Sensitive Devices
See Maintenance Section
A16 PARTIAL POWER SUPPLY BOARD
6330-24
LOW VOLTAGE REGULATORS
LV REGULATORS
2440



WARNING

TURN OFF ALL POWER BEFORE ATTEMPTING TO SOLDER OR REPLACE COMPONENTS OR TO MAKE RESISTANCE MEASUREMENTS.

EXERCISE E/A (ERROR AMPLIFIER)

TO VERIFY THE FUNCTIONAL OPERATION OF THE PWM (PULSE-WIDTH MODULATOR) COMPARATOR, EXERCISE THE ERROR AMPLIFIER OUTPUT AND THE SLOW START INPUT. USE THE NODE BETWEEN R845 AND R847 AS A SOURCE OF +1.6 V TO DRIVE THE COMP (PIN 9) AND SOFT START (PIN 8) INPUTS OF U233 IN THE FOLLOWING MANNER:

1. MONITOR THE DRIVE WAVEFORMS TO THE GATES OF PWM FETS Q424 AND Q421 TO OBSERVE THE CHANGES THAT OCCUR.

2. CONNECT THE +1.6 V LEVEL TO PIN 8 OF U233. CHECK THAT THE DRIVE WAVEFORM DUTY CYCLE DECREASES FROM APPROXIMATELY 45% TO APPROXIMATELY 15%. MEASURE THAT THE DC VOLTAGE ON PIN 9 OF U233 IS APPROXIMATELY 0.7 V MORE POSITIVE THAN PIN 8 OF U233.

3. MOVE THE +1.6 V LEVEL TO PIN 9 OF U233. CHECK THAT THE DRIVE WAVEFORM DUTY CYCLE AGAIN DECREASES FROM APPROXIMATELY 45% TO APPROXIMATELY 15%.

VOLTAGE TO
THE VOLTAGE
TH REFERENCE
RENCE, WHILE
HE EMITTER
36 USING DVM
LOSCOPE

DOES Q836 EMITTER GO HIGH TO BETWEEN 10.5 AND 13V WITH PS503 SET BETWEEN 25 AND 30V?

YES

NO

CHECK FOR EXCESSIVE LOADING OF Q836 BY THE CONTROL ELECTRONICS CIRCUITRY; LIFT JUMPER W462 AND SOLDER A 200-OHM 1-WATT DUMMY LOAD RESISTOR FROM THE EMITTER OF Q836 TO THE - LINE REFERENCE

DOES Q836 EMITTER GO HIGH TO BETWEEN 10.5 AND 13V WITH PS503 SET BETWEEN 25 AND 30V?

YES

REMOVE DUMMY LOAD AND RECONNECT JUMPER W462

NO

CHECK VOLTAGES AND COMPONENTS (Q240, Q148, Q836, VR144, VR929, CR239, C244, C145) IN CONTROL POWER SUPPLY FOR DEFECTS

CHECK U233, U834, U840, C138, C929, U829, CR723, AND CR724 FOR SHORTS AND REPLACE DEFECTIVE COMPONENTS

DOES Q836 EMITTER GO HIGH TO BETWEEN 10.5 AND 13V WITH PS503 SET BETWEEN 25 AND 30V?

YES

NO

FIND EXCESSIVE LOAD. CHECK U233, U834, U840, C138, C929, U829, CR723, AND CR724 FOR SHORTS AND REPLACE DEFECTIVE COMPONENTS

DOES Q836 EMITTER GO LOW AS CR245 CATHODE VOLTAGE IS LOWERED BELOW 13 TO 16V?

YES

NO

CHECK VOLTAGES AND COMPONENTS (Q240, Q148, Q836, VR144, VR929, CR239, C244, C245) IN CONTROL POWER SUPPLY FOR DEFECTS. REPLACE DEFECTIVE COMPONENTS

CHECK GATE DRIVE WAVEFORMS AT PULSE WIDTH MODULATOR FET GATES BY ATTACHING SCOPE GND TO CATHODE OF CR426 AND PROBING GATES DIRECTLY.
DRIVE >= 7V.
≈ 45% DUTY CYCLE.
PERIOD ≈ 40µs.

WAVEFORMS CORRECT?

NO

YES

CHECK LOGIC LEVEL ON S/D PIN U233-10

IS LOGIC LEVEL STUCK HI?

NO

YES

TROUBLESHOOT MONOSTABLE FLIP-FLOP U829A

CHECK T620 (FOR CRACKED/BROKEN CORE), Q421 AND Q423. CHECK U233 PWM IC OPERATION

CHECK U233 - PWM (PULSE WIDTH MODULATOR) IC OPERATION
PIN 15 - SAME VOLTAGE AS Q836 EMITTER.
PIN 12 - 0 VOLTS AND PIN 16 - +5.1V.
IF NOT, CHECK FOR EXCESSIVE LOADING (S.C. CURRENT = 100mA MAX) (NOMINAL LOAD <20mA);
CHECK C238 FOR SHORTS;
CHECK U233.
PIN 4 - ≈10% DUTY CYCLE PULSE AT ≈20µs PERIOD.
IF NOT, CHECK OSCILLATOR COMPONENTS (R227, C227, R228).
PIN 10 - TTL LOW LEVEL.
IF NOT, CHECK CHIRP TIMER.
PIN 8 - DC LEVEL HIGHER THAN PEAK RAMP VOLTAGE AT U233-7.
IF NOT, CHECK C128, CR930 AND U233.
PIN 13 - NOT LESS THAN 2V BELOW PIN 15.
IF NOT, CHECK R238 AND C138;
CHECK FOR SHORTED C525;
CHECK T620 FOR CRACKED OR BROKEN CORE;
CHECK R323 AND R137.
PINS 11 AND 14 - ≈45% DUTY CYCLE PULSES AT ≈40µs PERIOD.

EXERCISE S/D (SHUTDOWN): ENSURE CLOCK KEEPS RUNNING.
CONNECT U233-10 TO 5.1V REFERENCE (U233-16).
OBSERVE THAT U233-4 PULSES ARE STILL OCCURRING.
OBSERVE THAT U233-11, 14 WAVEFORMS STOP AND A LOW VOLTAGE IS PRESENT ON THESE PINS.

EXERCISE E/A (ERROR AMPLIFIER): TO VERIFY FUNCTIONALITY.
OBSERVE U233-11, 14 OUTPUT DRIVER WAVEFORMS.
CONNECT U233-1 TO U233-15.
OBSERVE THAT WAVEFORM BECOMES A STEADY LOW VOLTAGE.

CHECK GATE DRIVE WAVEFORMS AT CHOPPER FET GATES.
DRIVE >= 10V.
50% DUTY CYCLE.
(SEE NOTE FOR CORRECT WAVEFORMS)

WAVEFORMS CORRECT?

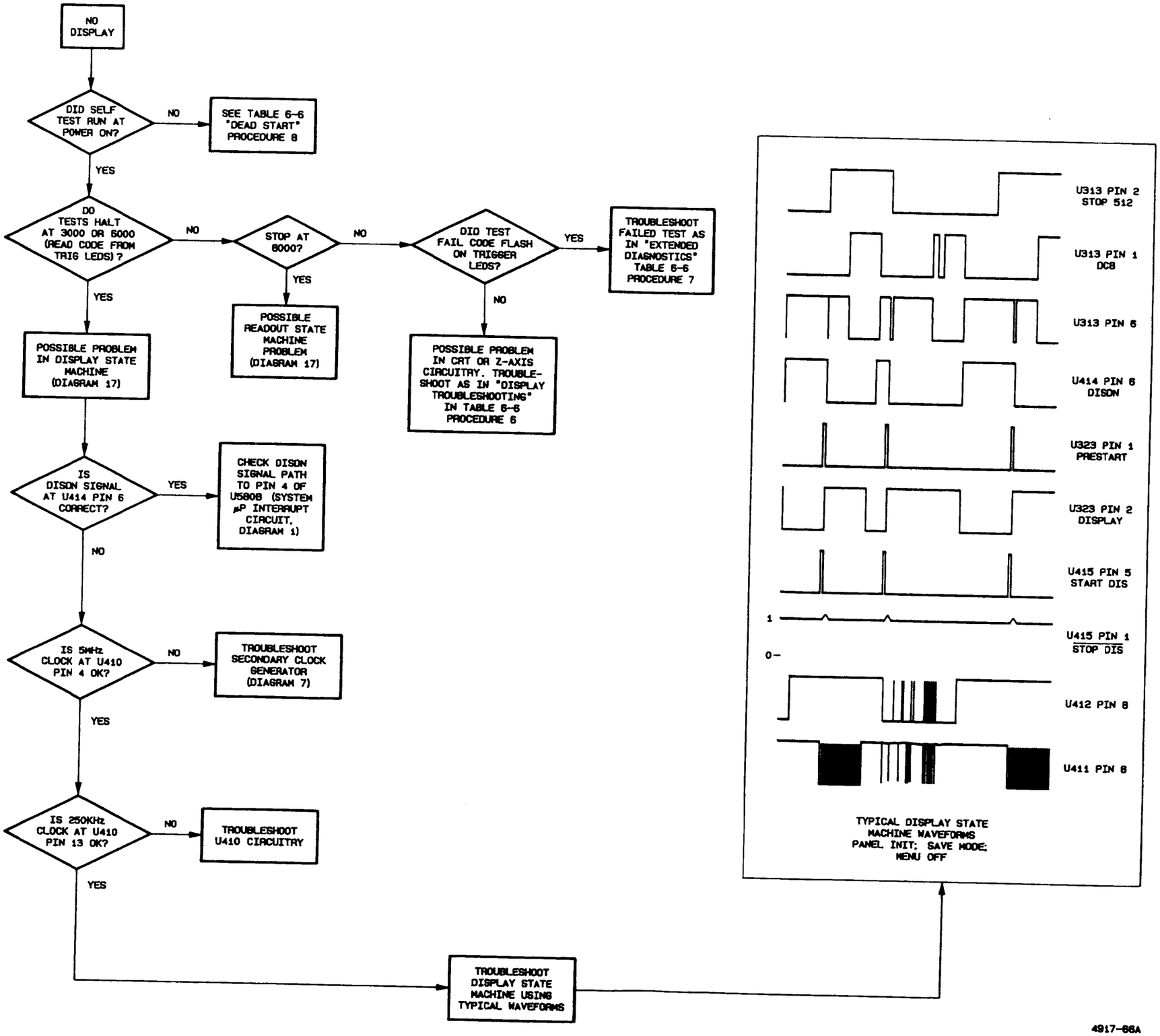
NO

YES

CHECK OSCILLATOR OUT (U233-11) SIGNAL PATH THROUGH U840-10, 11, 13 TO U829-11.
CHECK LEVEL AT U840-10.
CHECK U829 FOR DEFECTIVE FLIP-FLOP.
CHECK FETS.

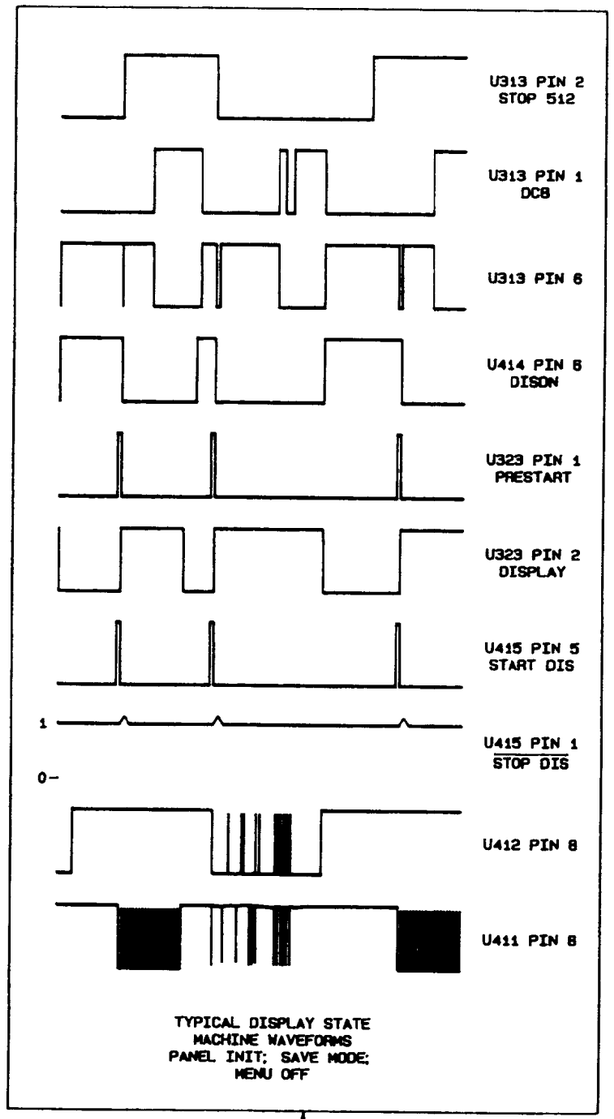
CHECK THE CURRENT-LIMIT COMPARATOR, OVER-VOLTAGE COMPARATOR, CLOCK BUFFER, AND MONOSTABLE ONESHOT. (U840, U829A)
1. CHECK LEVEL AT U840-9 FOR 0.38V.
2. CONNECT "- LINE REFERENCED" SCOPE PROBE TO U233-10. MOMENTARILY CONNECT U840-8 TO CONTROL ELECTRONICS SUPPLY VOLTAGE, AND OBSERVE THAT U233-10 GOES HIGH AND REMAINS HIGH FOR 200 TO 300ms AFTER CONNECTION IS REMOVED.
3. VOLTAGE ON PIN 7 IS V (SUB)REF.
4. MOMENTARILY CONNECT U840-6 TO CONTROL ELECTRONICS SUPPLY VOLTAGE AND OBSERVE THAT U233-10 GOES HIGH AND REMAINS HIGH FOR 200 TO 300ms AFTER THE CONNECTION IS REMOVED.

CONTROL ELECTRONICS TROUBLESHOOTING
(VOLTAGES WITH RESPECT TO - LINE REFERENCE)


NO DISPLAY
DID SELF TEST RUN AT POWER ON?
NO
SEE TABLE 6-6 "DEAD START" PROCEDURE 8
YES
DO TESTS HALT AT 3000 OR 6000 (READ CODE FROM TRIG LEDS)?
NO
STOP AT 8000?
NO
DID TEST FAIL CODE FLASH ON TRIGGER LEDS?
YES
TROUBLESHOOT FAILED TEST AS IN "EXTENDED DIAGNOSTICS" TABLE 6-6 PROCEDURE 7
YES
POSSIBLE READOUT STATE MACHINE PROBLEM (DIAGRAM 17)
NO
POSSIBLE PROBLEM IN CRT OR Z-AXIS CIRCUITRY. TROUBLE-SHOOT AS IN "DISPLAY TROUBLESHOOTING" IN TABLE 6-6 PROCEDURE 6
YES
POSSIBLE PROBLEM IN DISPLAY STATE MACHINE (DIAGRAM 17)
IS DISON SIGNAL AT U414 PIN 6 CORRECT?
YES
CHECK DISON SIGNAL PATH TO PIN 4 OF U5808 (SYSTEM μP INTERRUPT CIRCUIT, DIAGRAM 1)
NO
IS 5MHz CLOCK AT U410 PIN 4 OK?
NO
TROUBLESHOOT SECONDARY CLOCK GENERATOR (DIAGRAM 7)
YES
IS 250KHz CLOCK AT U410 PIN 13 OK?
NO
TROUBLESHOOT U410 CIRCUITRY
YES
TROUBLESHOOT DISPLAY STATE MACHINE USING TYPICAL WAVEFORMS
U313 PIN 2 STOP 512
U313 PIN 1 DC8
U313 PIN 6
U414 PIN 6 DISON
U323 PIN 1 PRESTART
U323 PIN 2 DISPLAY
U415 PIN 5 START DIS
1
0
U415 PIN 1 STOP DIS
U412 PIN 8
U411 PIN 8
TYPICAL DISPLAY STATE MACHINE WAVEFORMS PANEL INIT; SAVE MODE; MENU OFF

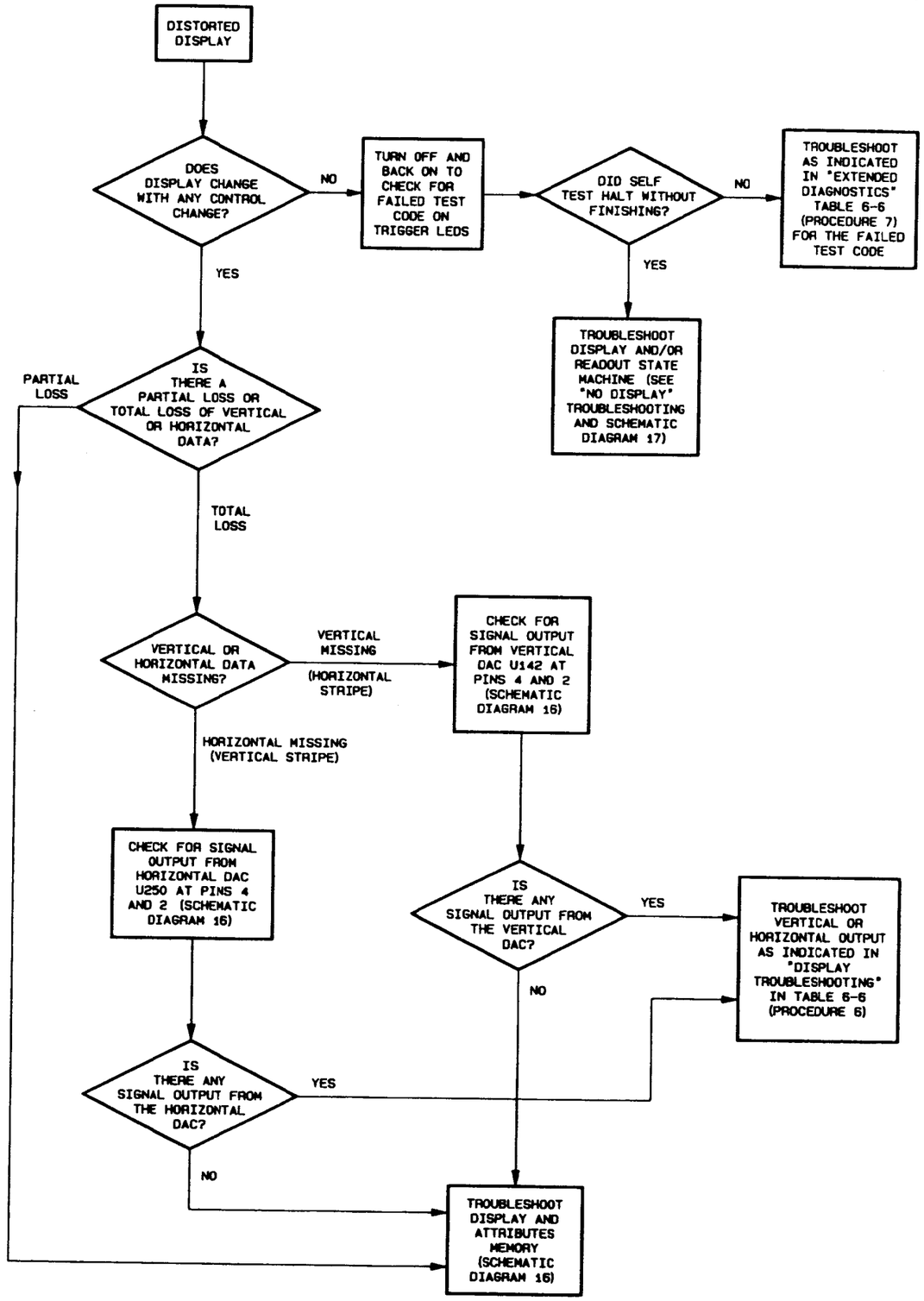
4917-66A

TROUBLESHOOT AILED TEST AS IN "EXTENDED DIAGNOSTICS" TABLE 6-6 PROCEDURE 7

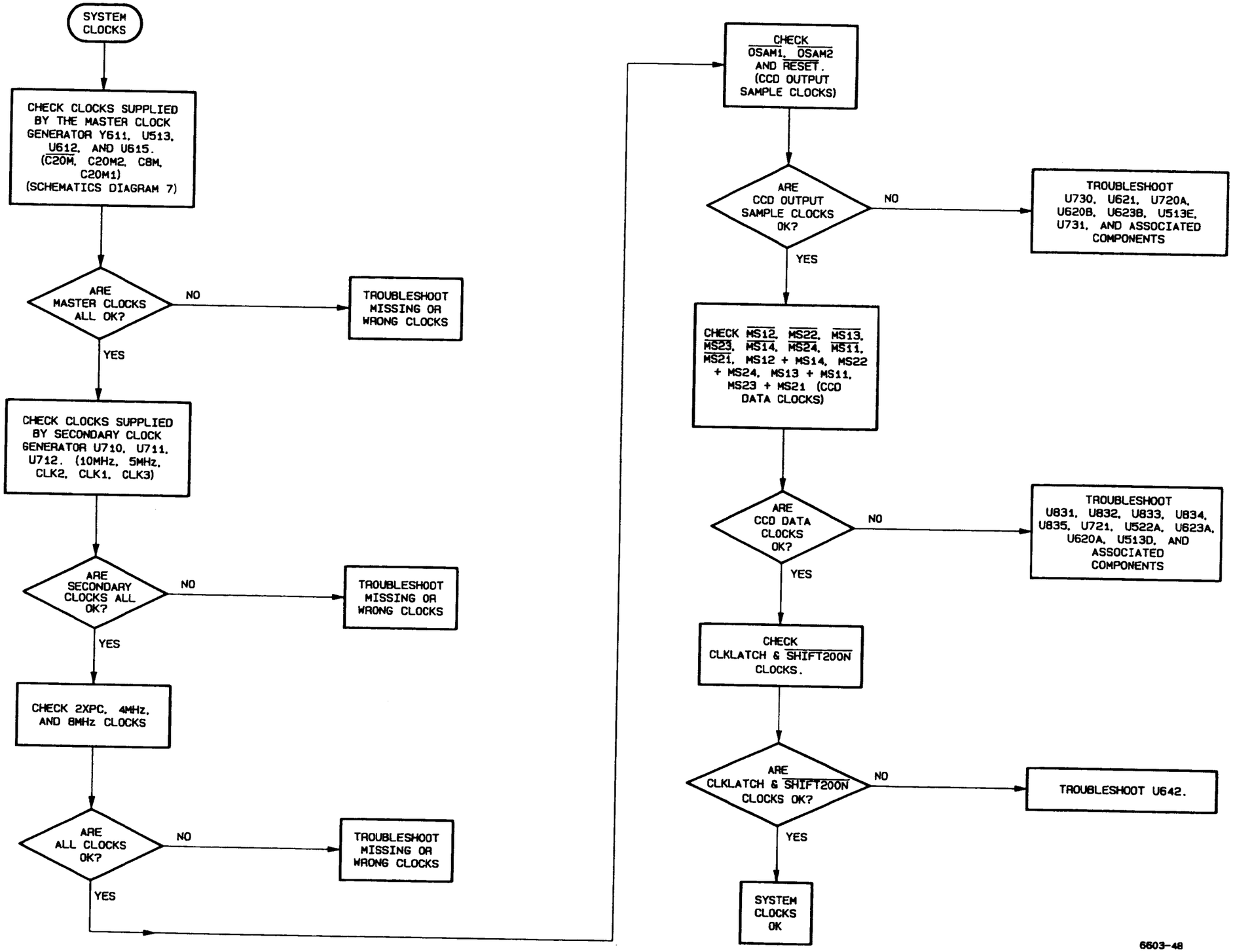


TYPICAL DISPLAY STATE MACHINE WAVEFORMS PANEL INIT; SAVE MODE; MENU OFF

4917-66A



6330-59


SYSTEM CLOCKS
CHECK CLOCKS SUPPLIED BY THE MASTER CLOCK GENERATOR Y611, U513, U612, AND U615. (C20M, C20M2, C8M, C20M1) (SCHEMATICS DIAGRAM 7)
ARE MASTER CLOCKS ALL OK?
NO
TROUBLESHOOT MISSING OR WRONG CLOCKS
YES
CHECK CLOCKS SUPPLIED BY SECONDARY CLOCK GENERATOR U710, U711, U712. (10MHz, 5MHz, CLK2, CLK1, CLK3)
ARE SECONDARY CLOCKS ALL OK?
NO
TROUBLESHOOT MISSING OR WRONG CLOCKS
YES
CHECK 2XPC, 4MHz, AND 8MHz CLOCKS
ARE ALL CLOCKS OK?
NO
TROUBLESHOOT MISSING OR WRONG CLOCKS
YES
CHECK OSAM1, OSAM2 AND RESET. (CCD OUTPUT SAMPLE CLOCKS)
ARE CCD OUTPUT SAMPLE CLOCKS OK?
NO
TROUBLESHOOT U730, U621, U720A, U620B, U623B, U513E, U731, AND ASSOCIATED COMPONENTS
YES
CHECK MS12, MS22, MS13, MS23, MS14, MS24, MS11, MS21, MS12 + MS14, MS22 + MS24, MS13 + MS11, MS23 + MS21 (CCD DATA CLOCKS)
ARE CCD DATA CLOCKS OK?
NO
TROUBLESHOOT U831, U832, U833, U834, U835, U721, U522A, U623A, U620A, U513D, AND ASSOCIATED COMPONENTS
YES
CHECK CLKLATCH & SHIFT200N CLOCKS.
ARE CLKLATCH & SHIFT200N CLOCKS OK?
NO
TROUBLESHOOT U642.
YES
SYSTEM CLOCKS OK

6603-48

REPLACEABLE MECHANICAL PARTS

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

When ordering parts, 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.

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.

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 indentations system used in the description column.

1 2 3 4 5 Name & Description

Assembly and/or component
Attaching parts for assembly and/or component

END ATTACHING PARTS

Detail part of assembly and/or component
Attaching parts for detail part

END ATTACHING PARTS

Parts of detail part
Attaching parts for parts or detail part

END ATTACHING PARTS

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.

Attaching parts must be purchased separately, unless otherwise specified.

ABBREVIATIONS

Abbreviations conform to American National Standard Y1.1.

CROSS INDEX – MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
S3109	FELLER	72 VERONICA AVE UNIT 4	SUMMERSET NJ 08873
S3629	SCHURTER AG H C/O PANEL COMPONENTS CORP	2015 SECOND STREET	BERKELEY CA 94170
TK0011	OREGON FOUR-SLIDE PROD	RT 1 BOX 83G	YONCOLLA OR 97499
TK0032	POWELL ELECTRONICS	411 FAIRCHILD DR	MT VIEW CA 94040
TK0433	PORTLAND SCREW CO		
TK0435	LEWIS SCREW CO	4300 S RACINE AVE	CHICAGO IL 60609-3320
TK0588	UNIVERSAL PRECISION PRODUCTS	1775 NW 216TH	HILLSBORO OR 97123
TK0657	CALORIC COLOR CO	176 SADDLE RIVER AVE	GARFIELD NJ 07026-1914
TK0860	LABEL GRAPHICS	6700 SW BRADBURY CT	PORTLAND OR 97224
TK1159	IMPROVED PRODUCTS	3400 OLYMPIC STREET	SPRINGFIELD OR 97477
TK1163	POLYCAST INC	9698 SW TIGARD ST	TIGARD OR 97223
TK1165	STEN MFG INC	9702 85TH AVENUE N	MINNEAPOLIS MN 55369
TK1167	COLUMBINE PLASTICS CORP	3195 BLUFF	BOULDER CO 80301-2103
TK1169	DIEMAKERS INC	801 2ND ST PO BOX 278	MONROE CITY MO 63456-1441
TK1287	ENOCH MFG CO	14242 SE 82ND DR PO BOX 98	CLACKAMAS OR 97015
TK1302	MOUNTAIN MOLDING	606 SECOND STREET	BERTHOUD CO 80513
TK1312	LEMO USA INC	335 TESCONI CIR PO BOX 11006	SANTA ROSA CA 95406
TK1359	BLAIR HIRSCH CO	9645 SW BEAVERTON HWY	BEAVERTON OR 97005
TK1386	PYRAMID ELECTRONICS SUPPLY INC	9757 JUANITA DRIVE NE	KIRKLAND WA 98034
TK1465	BEAVERTON PARTS MFG CO	1800 NW 216TH AVE	HILLSBORO OR 97124-6629
TK1499	AMLAN INC	97 THORNWOOD RD	STAMFORD CT 06903-2617
TK1585	POFCO INC	12805 SE CAPPS RD PO BOX 307	CLACKAMAS OR 97015-8903
TK1591	EASTMAN PLASTICS INC	4605 SW 180TH	ALOHA OR 97007
TK1614	STUCKEL R J CO	1385 HOWARD ST	ELK GROVE VILLAGE IL 60007-2213
TK1622	TRIPLE L PRECISION	P O BOX 85	TIMBER OR 97144
TK1623	STARKOR MFG	3454 NE HWY 101	LINCOLN CITY OR 97367
TK1725	GREENPAR CONNECTORS LTD	PO BOX 15 HARLOW	ESSEX CM20 2ER ENGLAND
TK1905	PUGET CORP OF OREGON	7440 S W BONITA	TIGARD OR 97223
TK2394	HARTZELL MANUFACTURING INC	2516 WABASH AVENUE	ST PAUL MN 55114
0B445	ELECTRI-CORD MFG CO INC	312 EAST MAIN ST	WESTFIELD PA 16950
0JRZ2	BADGLEY MFG CO	1620 NE ARGYLE	PORTLAND OR 97211
0JR05	TRIQUEST CORP	3000 LEWIS AND CLARK HWY	VANCOUVER WA 98661-2999
0J260	COMTEK MANUFACTURING OF OREGON (METALS)	PO BOX 4200	BEAVERTON OR 97076-4200
0J7N9	MCX INC	30608 SAN ANTONIO ST	HAYWARD CA 94544
0J9P9	GEROME MFG CO INC	PO BOX 737	NEWBERG OR 97132

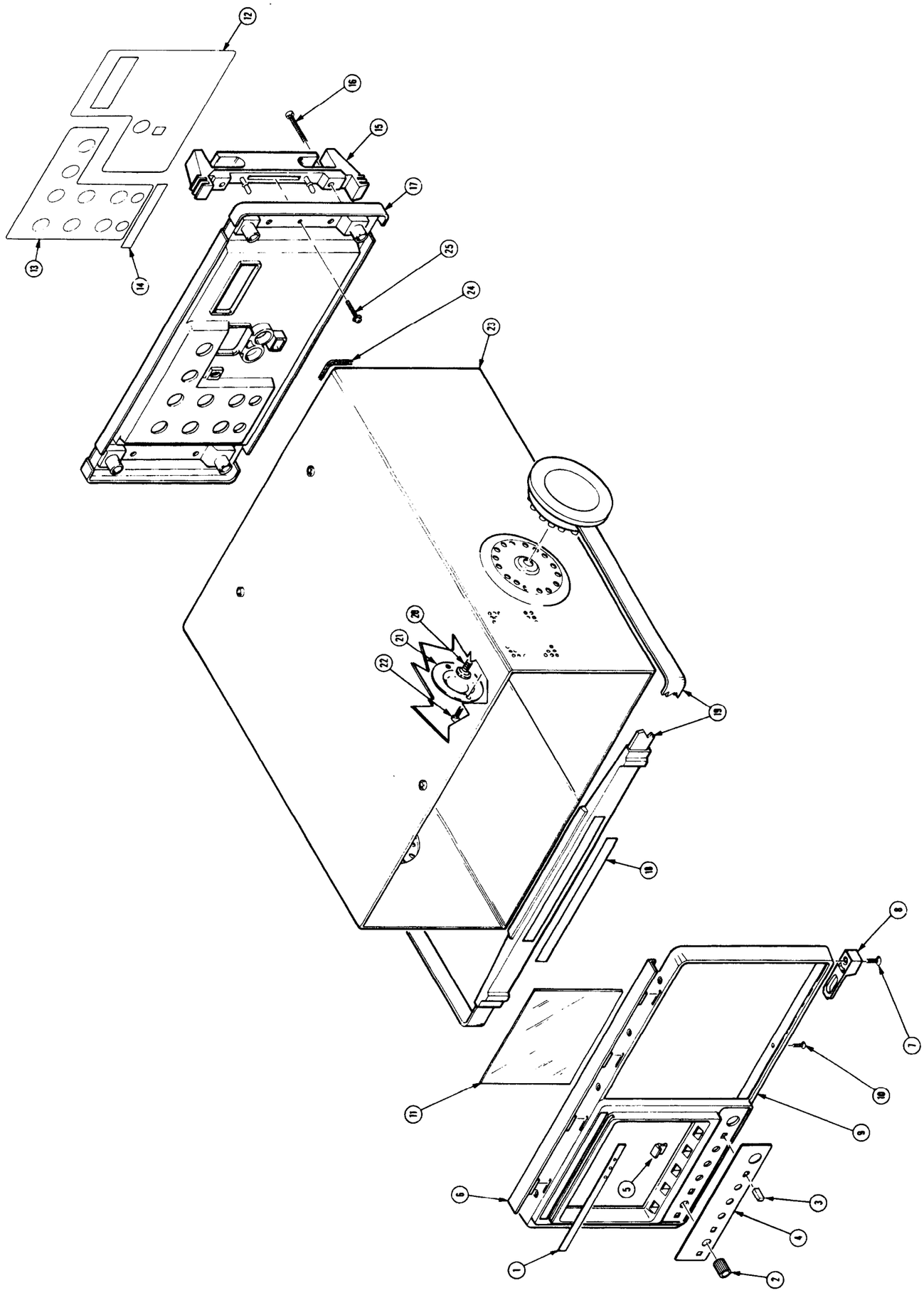
Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Serial No. Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
1-1	334-7093-00			1	MARKER,IDENT:MARKED 2440	22670	ORDER BY DESC
	378-0896-01			3	LENS,LIGHT:CLEAR LED	TK1591	ORDER BY DESC
-2	366-1833-01			1	KNOB:DOVE GRAY,0.25 ID X 0.392 OD X 0.466 H	0JR05	ORDER BY DESC
	377-0512-01	B010100	B011143	1	INSERT,KNOB:0.172 ID X 0.28 OD X 0.64,NYL	0JR05	ORDER BY DESC
	377-0512-03	B011144		1	INSERT,KNOB:0.128 ID X 0.37 OD X 0.67 L,XL	TK1163	ORDER BY DESC
-3	366-2036-00			3	PUSH BUTTON:GY,0.206 SQ,1.445 H	0JR05	ORDER BY DESC
-4	334-6726-00			1	MARKER,IDENT:MKD CRT CONTROLS	76814	ORDER BY DESC
-5	105-0608-00			5	ACTUATOR,SWITCH:MENU,ABS,SMOKE TAN	TK1163	ORDER BY DESC
-6	200-2779-00			1	COVER,TOP:TRIM	0JR05	ORDER BY DESC
-7	348-0740-00			2	FOOT,CABINET:BOTTOM FRONT,PLASTIC ATTACHING PARTS	0JR05	ORDER BY DESC
-8	211-0718-00			2	SCREW,MACHINE:6-32 X 0.312,FLH,STL END ATTACHING PARTS	0KB01	ORDER BY DESC
-9	101-0096-00			1	TRIM,DECORATIVE:FRONT ATTACHING PARTS	TK1163	ORDER BY DESC
-10	211-0718-00			6	SCREW,MACHINE:6-32 X 0.312,FLH,STL END ATTACHING PARTS	0KB01	ORDER BY DESC
	214-3374-01			1	SPRING,FILTER:1.32 L,CU-BE	TK0011	ORDER BY DESC
-11	337-2926-03			1	SHLD,IMPLOSION:4.44 X 3.67 X 0.06,CLEAR	TK1159	ORDER BY DESC
-12	334-5581-03			1	MARKER,IDENT:MKD ,	76814	ORDER BY DESC
-13	334-6758-00			1	MARKER,IDENT:MKD STD CONNECTOR	76814	ORDER BY DESC
	334-6759-00			1	MARKER,IDENT:MKD PROBE POWER (OPTION 11 ONLY)	76814	ORDER BY DESC
-14	334-5696-02			1	MARKER,IDENT:MKD OPTION	07416	ORDER BY DESC
-15	348-0729-01			2	FOOT,CABINET:W/CORD WRAP,REAR ATTACHING PARTS	0JR05	ORDER BY DESC
-16	212-0154-00			4	SCREW,MACHINE:8-32 X 1.125,PNH,STL END ATTACHING PARTS	0KB01	ORDER BY DESC
-17	200-2961-00			1	COVER,REAR:POLYCARBONATE,SMOKE TAN	TK1163	ORDER BY DESC
-18	334-8202-00			1	MARKER,IDENT:MKD HANDLE	80009	334820200
-19	367-0303-04			1	HANDLE,CARRYING:12.86 L,GRIP & INDEX ATTACHING PARTS	0JR05	ORDER BY DESC
-20	212-0144-00			2	SCREW,TPG,TF:8-16 X 0.562 L,PLASTITE END ATTACHING PARTS	0KB01	ORDER BY DESC
-21	337-2395-00			2	SHIELD,ELEC:HANDLE ATTACHING PARTS	TK1614	ORDER BY DESC
-22	213-0138-00			4	SCREW,TPG,TF:4-24 X 0.188,TYPE B,PNH,STL END ATTACHING PARTS	TK0435	TAPPING SCREW
-23	437-0139-00			1	CABINET,SCOPE:	0J9P9	ORDER BY DESC
-24	348-0792-01			1	GASKET:ELECTRICAL SHIELD,34.0 L	18565	ORDER BY DESC
-25	211-0730-00			2	SCR,ASSEM WSHR:6-32 X 0.375,PNH,STL,T15	0KB01	ORDER BY DESC

CROSS INDEX – MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip Code
0KB00	SCHRAMM PLASTIC FABRICATIORS	7885 SW HUNZIKER	TIGARD OR 97223
0KB01	STAUFFER SUPPLY	810 SE SHERMAN	PORTLAND OR 97214
04811	PRECISION COIL SPRING CO	10107 ROSE ST PO BOX 5450	EL MONTE CA 91734
05006	20TH CENTURY PLASTICS INC	3628 CRENSHAW BLVD PO BOX 30231	LOS ANGELES CA 90030
06090	RAYCHEM CORP	300 CONSTITUTION DRIVE	MENLO PARK CA 94025-1111
07416	NELSON NAME PLATE CO	3191 CASITAS	LOS ANGELES CA 90039-2410
18565	CHOMERICS INC	77 DRAGON COURT	WOBURN MA 01801-1039
2K262	BOYD CORP	6136 NE 87th AVE PO BOX 20038	PORTLAND OR 97220
22526	DU PONT E I DE NEMOURS AND CO INC DU PONT ELECTRONICS DEPT	515 FISHING CREEK RD	NEW CUMBERLAND PA 17070-3007
22670	G M NAMEPLATE INC	2040 15TH AVE WEST	SEATTLE WA 98119-2728
31918	ITT SCHADOW INC	8081 WALLACE RD	EDEN PRAIRIE MN 55344-2224
5Y400	TRIAX METAL PRODUCTS INC DIV OF BEAVERTON PARTS MFG CO	1800 216TH AVE NW	HILLSBORO OR 97124-6629
58050	TEKA PRODUCTS INC	45 SALEM ST	PROVIDENCE RI 02907
61857	SAN-0 INDUSTRIAL CORP	85 ORVILLE DR PO BOX 511	BOHEMIA LONG ISLAND NY 11716-2501
7X318	KASO PLASTICS INC	11015 A NE 39th	VANCOUVER WA 98662
70903	COOPER BELDEN ELECTRONICS WIRE AND CABLE SUB OF COOPER INDUSTRIES INC		
73743	FISCHER SPECIAL MFG CO	111 INDUSTRIAL RD	COLD SPRING KY 41076-9749
76814	NORTHERN ENGRAVING CORP	803 S BLACK RIVER ST	SPARTA WI 54656-2221
78189	ILLINOIS TOOL WORKS INC SHAKEPROOF DIV	ST CHARLES ROAD	ELGIN IL 60120
78488	STACKPOLE CORP THE	201 STACKPOLE ST	ST MARYS PA 15857-1401
80009	TEKTRONIX INC	14150 SW KARL BRAUN DR PO BOX 500	BEAVERTON OR 97077-0001
83014	HARTWELL CORP LOCKWELL DIVISION	950 S RICHFIELD RD	PLACENTIA CA 92670-6732
85480	BRADY W H CO CORP H Q INDUSTRIAL PRODUCTS DIV	2221 W CAMDEN RD PO BOX 2131	MILWAUKEE WI 53209
92101	SCHULZE MFG	50 INGOLD RD	BURLINGAME CA 94010-2206

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345	Name & Description	Mfr. Code	Mfr. Part No.

FIG. 1 CABINET



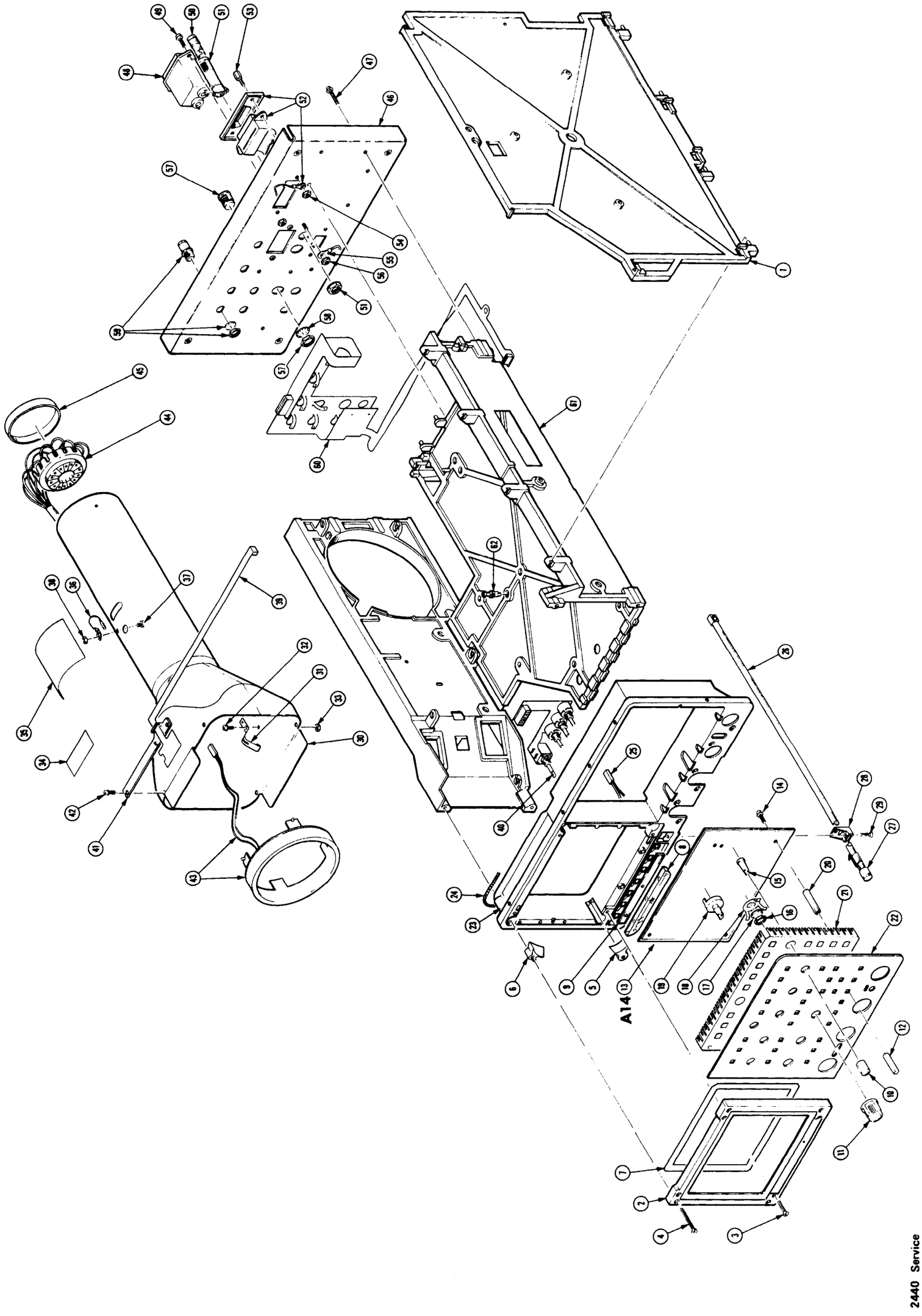


FIG. 2 CHASSIS

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-1	441-1563-01			1	CHASSIS,SCOPE:TOP	TK1163	ORDER BY DESC
-2	426-1864-01			1	FRAME,CRT: ATTACHING PARTS	TK1169	ORDER BY DESC
-3	213-0914-00			4	SCREW,TPG,TR:6-32 X 0.75,FLH,STL	0KB01	ORDER BY DESC
-4	211-0713-00			4	SCREW,MACHINE:6-32 X 1.25,FLH,STL END ATTACHING PARTS	0KB01	ORDER BY DESC
-5	343-0992-00			2	RETAINER,CRT:CLEAR,PLASTIC	TK1163	ORDER BY DESC
-6	343-0993-00			2	RETAINER,CRT:BLACK,PLASTIC	TK1163	ORDER BY DESC
-7	348-0731-01			1	GASKET:CRT,POLYETHYLENE	TK1159	ORDER BY DESC
-8	378-0204-00			1	REFLECTOR,LIGHT:INT SCALE ILLUMINATION	7X318	ORDER BY DESC
-9	--------			1	CKT BD ASSY:SCALE ILLUM (SEE A18 REPL)		
-10	366-1833-01			6	KNOB:DOVE GRAY,0.25 ID X 0.392 OD X 0.466 H	0JR05	ORDER BY DESC
-11	366-0555-00			3	KNOB:	TK1163	ORDER BY DESC
-12	366-2017-00			31	PUSH BUTTON:0.18 SQ X 0.644 H,IVORY GY	0JR05	ORDER BY DESC
-13	--------			1	CKT BD ASSY:FRONT PANEL (SEE A14 REPL) ATTACHING PARTS		
-14	211-0304-00	B010100	B013221	4	SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,T9	0KB01	ORDER BY DESC
	211-0337-00	B013222		4	SCREW,MACHINE:4-40 X 0.25,PNH,SST (STANDARD ONLY)	TK0435	ORDER BY DESC
	211-0304-00	B010100	B010116	4	SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,T9	0KB01	ORDER BY DESC
	211-0337-00	B010117		4	SCREW,MACHINE:4-40 X 0.25,PNH,SST (2440M ONLY)	TK0435	ORDER BY DESC
					END ATTACHING PARTS		
	352-0641-00			1	HOLDER,LED:FIVE,POLYURETHANE,BLACK	TK1905	ORDER BY DESC
-15	377-0550-01			2	INSERT,KNOB:0.178 ID X 0.37 OD X 0.64	TK1167	ORDER BY DESC
-16	210-0590-00			3	NUT,PLAIN,HEX:0.375-32 X 0.438 BRS	73743	28269-402
-17	210-0012-00			3	WASHER,LOCK:0.384 ID,INTL,0.022 THK,STL	78189	1220-02-00-0541
-18	214-3373-00			3	SPRING,GROUND:PHOSPHOR-BRONZE	92101	ORDER BY DESC
-19	377-0383-00			4	INSERT,KNOB:0.178 ID 0.78 OD X 1.0,PLSTC	TK1163	ORDER BY DESC
-20	129-0938-00			4	SPACER,POST:1.102 L,4-40 EA END,AL	TK1622	ORDER BY DESC
-21	354-0465-01			1	RING,MOUNTING:6.065 X 4.16,BRASS	0J260	ORDER BY DESC
-22	333-3378-00			1	PANEL,FRONT:STANDARD (STANDARD ONLY)	07416	ORDER BY DESC
	333-3379-00			1	PANEL,FRONT:TV TRIGGER (OPTION 05 ONLY)	07416	ORDER BY DESC
-23	386-4728-01			1	SUBPANEL,FRONT: ATTACHING PARTS	TK2394	ORDER BY DESC
	210-0046-00			4	WASHER,LOCK:0.261 ID,INTL,0.018 THK,STL	78189	1214-05-00-0541
	210-0583-00			4	NUT,PLAIN,HEX:0.25-32 X 0.312,BRS	73743	2X-20319-402
					END ATTACHING PARTS		
	131-3772-00			2	CONN,BOX:PCB,:FEMALE,STR,1 X 4,0.1 CTR	22526	76308-004
-24	348-0792-01			1	GASKET:ELECTRICAL SHIELD,34.0 L	18565	ORDER BY DESC
-25	175-4593-01			1	CA ASSY,SP,ELEC:2,22 AWG,3.5 L,RIBBON	0J7N9	ORDER BY DESC
-26	384-0837-00			1	EXTENSION SHAFT:13.470 L X 0.250 X 0.300	TK1163	ORDER BY DESC
-27	366-1767-00			1	PUSH BUTTON:BLACK,YELLOW INDICATOR	31918	160597
-28	407-2904-02			1	BRACKET,EXT SFT:POWER,POLYCARBONATE ATTACHING PARTS	TK1163	407-2904-02

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Serial No. Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-29	211-0718-00			1	SCREW,MACHINE:6-32 X 0.312,FLH,STL END ATTACHING PARTS	0KB01	ORDER BY DESC
	626-0009-00			1	SHIELD,CRT ASSY:	0J9P9	ORDER BY DESC
-30	337-2931-01			1	.SHIELD,CRT:	0J9P9	337-2931-01
-31	214-0291-00			2	.CONTACT,ELEC:CRT CONNECTOR,CU BE ATTACHING PARTS	04811	ORDER BY DESC
-32	211-0324-00			2	.SCR,ASSEM WSHR:4-40 X 0.188,PNH,T9	0KB01	ORDER BY DESC
-33	210-0586-00			2	.NUT,PL,ASSEM WA:4-40 X 0.25,STL END ATTACHING PARTS	TK0435	ORDER BY DESC
-34	334-1379-00			1	.MARKER,IDENT:MKD HI VACUUM	07416	ORDER BY DESC
-35	334-1951-00			1	.MARKER,IDENT:MKD WARNING,CRT VOLTAGES	TK0860	ORDER BY DESC
-36	195-6851-01			1	.LEAD,ELECTRICAL:BRAIDED,1.65 L	TK1386	ORDER BY DESC
	195-8410-00			1	.LEAD,ELECTRICAL:22 AWG,1.65 L ATTACHING PARTS	TK1386	ORDER BY DESC
-37	211-0324-00			1	.SCR,ASSEM WSHR:4-40 X 0.188,PNH,T9	0KB01	ORDER BY DESC
-38	210-0586-00			1	.NUT,PL,ASSEM WA:4-40 X 0.25,STL END ATTACHING PARTS	TK0435	ORDER BY DESC
-39	--------			1	FLEX CKT ASSY:GPIB,POLYMIDE (SEE A15 REPL)		
-40	175-9359-01			1	FLEX CKT ASSY:CRT CONTROLS,POLYMIDE	80009	175935901
-41	386-0867-00			1	PLATE,MOUNTING:LED ATTACHING PARTS	TK1302	ORDER BY DESC
-42	211-0304-00			4	SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,T9 END ATTACHING PARTS	0KB01	ORDER BY DESC
-43	--------			1	COIL,TUBE DEFL: (SEE L1000 REPL)		
	348-0762-00			1	GROMMET,PLASTIC:NATURAL,ROUND,0.54 ID	0JR05	ORDER BY DESC
-44	175-9271-00			1	CA ASSY,HV:DESCRETE,;SDI,14,24 AWG,9.5 L	0J7N9	ORDER BY DESC
-45	200-0917-01			1	COVER,CRT SKT:2.052 OD X 0.291 H,PLASTIC	0JR05	ORDER BY DESC
-46	441-1562-00			1	CHASSIS,SCOPE:REAR ATTACHING PARTS	0J9P9	ORDER BY DESC
-47	213-0942-00			4	SCREW,TPG,TR:6-32 X 0.75,TYPE TT,PNH,STL END ATTACHING PARTS	0KB01	ORDER BY DESC
-48	--------			1	FILTER,RFI: (SEE FL1000 REPL) ATTACHING PARTS		
-49	211-0304-00			2	SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,T9 END ATTACHING PARTS	0KB01	ORDER BY DESC
-50	200-2264-00			1	CAP,FUSEHOLDER:3AG FUSES,	S3629	FEK 031 1666
-51	204-0832-00			1	BODY,FUSEHOLDER:3AG & 5 X 20MM FUSES	S3629	031 1673 (FEU M
	195-5569-00			1	LEAD,ELECTRICAL:18 AWG,3.0 L,8-0	0J7N9	ORDER BY DESC
	196-2828-01			1	LEAD,ELECTRICAL:DESCRETE,;CUT,1,18 AWG	0J7N9	ORDER BY DESC
	196-2830-00			1	LEAD,ELECTRICAL:18 AWG,4.5 L,8-01	0J7N9	ORDER BY DESC
	196-2831-00			1	LEAD,ELECTRICAL:18 AWG,4.75 L,8-02	0J7N9	ORDER BY DESC
	196-2832-00			1	LEAD,ELECTRICAL:18 AWG,5.25 L,8-19	0J7N9	ORDER BY DESC
	196-2833-00			1	CA ASSY,SP:DESCRETE,;PSC,1,18 AWG,4.75 L	0J7N9	ORDER BY DESC
	276-0573-00			2	CORE,EM:TOROID,FERRITE (ADDED TO 195-5569-00 & 196-2828-01)	78488	57-0972
-52	--------			1	CA ASSY,SP:RIBBON,GPIB;24,28 AWG,7.0 L (SEE J1907 REPL) ATTACHING PARTS		
-53	129-1107-00			2	SPACER,POST:0.98 L,6-32 EXT & M3.5 INT THD	TK1287	129-1107-00

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Serial No. Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
3-1	--------			1	CKT BD ASSY:TIME BASE DSPLY (SEE A11 REPL)		
					ATTACHING PARTS		
-2	213-0927-00			3	SCREW,TPG,TR:6-32 X 0.875,TYPE TT,PNH,STL	0KB01	ORDER BY DESC
					END ATTACHING PARTS		
-3	--------			1	CKT BD ASSY:PROCESSOR (SEE A12 REPL)		
-4	175-9353-01			1	CA ASSY,SP:COAXIAL,;RFP,2,50 OHM COAX,15.0L	0J7N9	ORDER BY DESC
					(OPTION 05 ONLY)		
-5	343-0150-00			1	CLAMP,TIEDOWN:PLASTIC	85480	TYPE A-30
					(OPTION 05 ONLY)		
-6	343-0549-00			2	STRAP,TIEDOWN,E:0.098 W X 4.0 L,ZYTEL	TK1499	HW-047
					(OPTION 05 ONLY)		
-7	--------			1	SKT,PL-IN ELEK: (SEE A12XU470 REPL)		
-8	--------			1	MICROCKT,DGTL: (SEE A12U470 REPL)		
-9	214-3637-01			1	HT SK,MICROCKT:ALUMINUM,BLACK ANODIZE	TK1359	MCHS-68-1.2
-10	--------			1	CKT BD ASSY:SIDE (SEE A13 REPL)		
					ATTACHING PARTS		
-11	213-0927-00			1	SCREW,TPG,TR:6-32 X 0.875,TYPE TT,PNH,STL	0KB01	ORDER BY DESC
					END ATTACHING PARTS		
-12	--------			1	CKT BD ASSY:MAIN (SEE A10 REPL)		
					ATTACHING PARTS		
-13	211-0730-00			1	SCR,ASSEM WSHR:6-32 X 0.375,PNH,STL,T15	0KB01	ORDER BY DESC
-14	210-0586-00			2	NUT,PL,ASSEM WA:4-40 X 0.25,STL	TK0435	ORDER BY DESC
					END ATTACHING PARTS		
					MAIN BOARD INCLUDES:		
-15	--------			2	SKT,PL-IN ELEK: (SEE A10XU370,XU470 REPL)		
-16	--------			2	INTEGRATED CKT: (SEE A10U370,U470 REPL)		
-17	214-3637-01			2	.HT SK,MICROCKT:ALUMINUM,BLACK ANODIZE	TK1359	MCHS-68-1.2
-18	--------			2	SKT,PL-IN ELEK: (SEE A10XU340,XU440 REPL)		
-19	--------			2	MICROCKT,HYBRID: (SEE A10U340,440 REPL)		
					ATTACHING PARTS		
-20	210-0586-00			6	.NUT,PL,ASSEM WA:4-40 X 0.25,STL	TK0435	ORDER BY DESC
	211-0324-00			2	.SCR,ASSEM WSHR:4-40 X 0.188,PNH,T9	0KB01	ORDER BY DESC
	129-0985-00			2	.SPACER,POST:0.350 L,4-40 THRU,STL,0.25HEX	TK1287	ORDER BY DESC
	214-2270-00			2	.CONTACT,ELEC:CRT TO SHLD,CU-BE	5Y400	ORDER BY DESC
					END ATTACHING PARTS		
-21	--------			2	SKT,PL-IN ELEK: (SEE A10XU350,XU450 REPL)		
-22	--------			2	MICROCKT,HYBRID: (SEE A10U350,U450 REPL)		
					ATTACHING PARTS		
-23	210-0586-00			8	.NUT,PL,ASSEM WA:4-40 X 0.25,STL	TK0435	ORDER BY DESC
					END ATTACHING PARTS		
-24	--------			2	SKT,PL-IN ELEK: (SEE A10XU100,XU150 REPL)		
-25	--------			2	MICROCKT,LINEAR: (SEE A10U100,U150 REPL)		
					ATTACHING PARTS		
-26	210-0586-00			8	.NUT,PL,ASSEM WA:4-40 X 0.25,STL	TK0435	ORDER BY DESC
					END ATTACHING PARTS		
-27	337-3031-00			2	.SHIELD,ELEC:PRE-AMP	TK1585	ORDER BY DESC
					ATTACHING PARTS		
-28	211-0324-00			4	.SCR,ASSEM WSHR:4-40 X 0.188,PNH,T9	0KB01	ORDER BY DESC
					END ATTACHING PARTS		

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Serial No. Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
2-54	210-0457-00			4	NUT,PL,ASSEM WA:6-32 X 0.312,STL END ATTACHING PARTS	TK0435	ORDER BY DESC
-55	195-3990-00			1	LEAD,ELECTRICAL:18 AWG,4.5 L,5-4 ATTACHING PARTS	TK0032	ORDER BY DESC
-56	210-0457-00			1	NUT,PL,ASSEM WA:6-32 X 0.312,STL END ATTACHING PARTS	TK0435	ORDER BY DESC
-57	--------			1	CONN,CIRC:SLDR CUP;;3 MALE,3 FEMALE (SEE J1908 REPL)		
-58	210-0021-00			1	WASHER,LOCK:0.476 ID,INTL,0.018 THK,STL	0KB01	ORDER BY DESC
-59	--------			7	CONN,RF JACK:BNC,;50 OHM,FEMALE,STR (SEE J1900,1901,1902,1903,1904,1905,1906)		
-60	175-9357-01			1	FLEX CKT ASSY:REAR PANEL,POLYMIDE	80009	175935701
	131-3388-01			2	CONN,RCPT,ELEC:CKT BD,2 X 8,0.1 SPACING	58050	TKO-10254-501
-61	441-1574-00			1	CHASSIS,SCOPE:MAIN	0J9P9	ORDER BY DESC
-62	361-1276-00			18	SPACER,CKT BD:0.25 STANDOFF,POLYSULFONE	83014	HNST4-250-1

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345	Name & Description	Mfr. Code	Mfr. Part No.

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
3-29	129-0985-00			4	.SPACER,POST:0.350 L,4-40 THRU,STL,0.25HEX	TK1287	ORDER BY DESC
-30	--------			1	SKT,PL-IN ELEK: (SEE A10XU420 REPL)		
-31	--------			2	MICROCKT,HYBRID: (SEE A10U320,U420 REPL)		
	386-4699-00			1	.BAR,SUPPORT:ATTENUATOR,AL	TK1169	ORDER BY DESC
					ATTACHING PARTS		
-32	136-0252-07			32	.SOCKET,PIN TERM:SINGLE,PCB,T/G,0.030 H	22526	75060-012
	210-0586-00			4	.NUT,PL,ASSEM WA:4-40 X 0.25,STL	TK0435	ORDER BY DESC
					END ATTACHING PARTS		
-33	--------			2	ATTENUATOR,VAR: (SEE A10AT300,AT400 REPL)		
					ATTACHING PARTS		
-34	211-0304-00			4	.SCR,ASSEM WSHR:4-40 X 0.312,PNH,STL,T9	0KB01	ORDER BY DESC
					END ATTACHING PARTS		
-35	351-0677-01			2	.GUIDE,MAG CATCH:BLACK,PLOYCARBONATE	TK1905	351-0677-01
-37	361-0382-00			6	.SPACER,PB SW:0.275 L,BROWN POLYCARB	0JR05	ORDER BY DESC
-38	214-0973-00	B010100	B012567	1	.HEAT SINK,XSTR:TO-92,CU BE	80009	214097300
	162-0533-00	B012568		1	.INSUL SLVG,ELEC:HT SHRINK,0.25 ID	06090	VERSAFIT
-39	386-4735-01			1	.PLATE,CMPNT MTG:ALUMINUM	TK1169	ORDER BY DESC
					ATTACHING PARTS		
-40	213-0006-00			2	.SETSCREW:8-32 X 0.188,STL	TK0433	ORDER BY DESC
					END ATTACHING PARTS		
-41	--------			2	.CONN,RF JACK::BNC,:50 OHM,FEMALE,STR		
					(SEE A10J2001, A10J2002 REPL)		
-42	--------			1	.TERMINAL,CAL:		
					(SEE A10J2006 REPL)		
-43	--------			1	CKT BD ASSY:GAIN CELL (SEE A30,A31,A32,A33)		

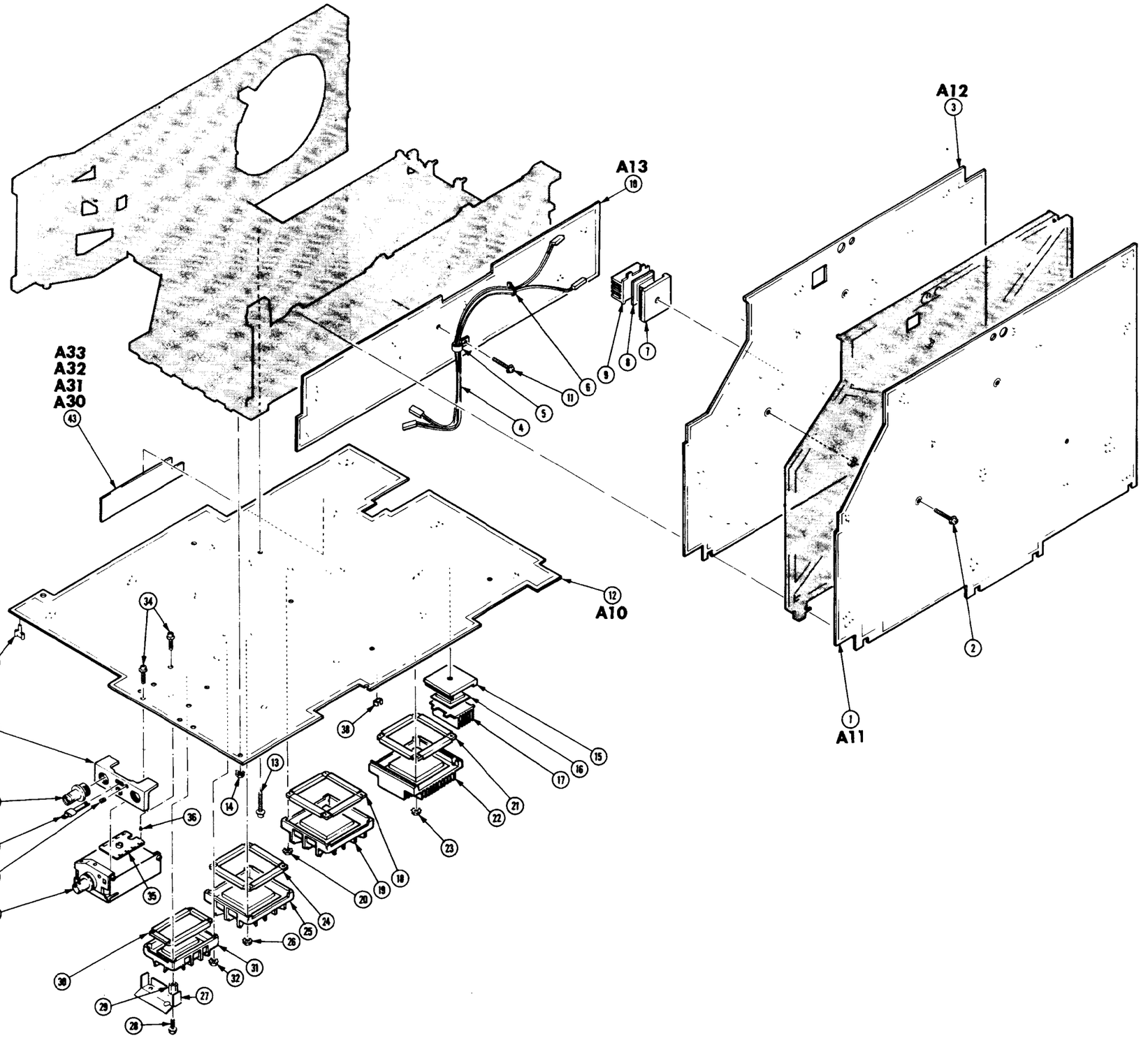


FIG. 3 CIRCUIT BOARDS

FIG. 4 LV, HV PWR SUPPLY

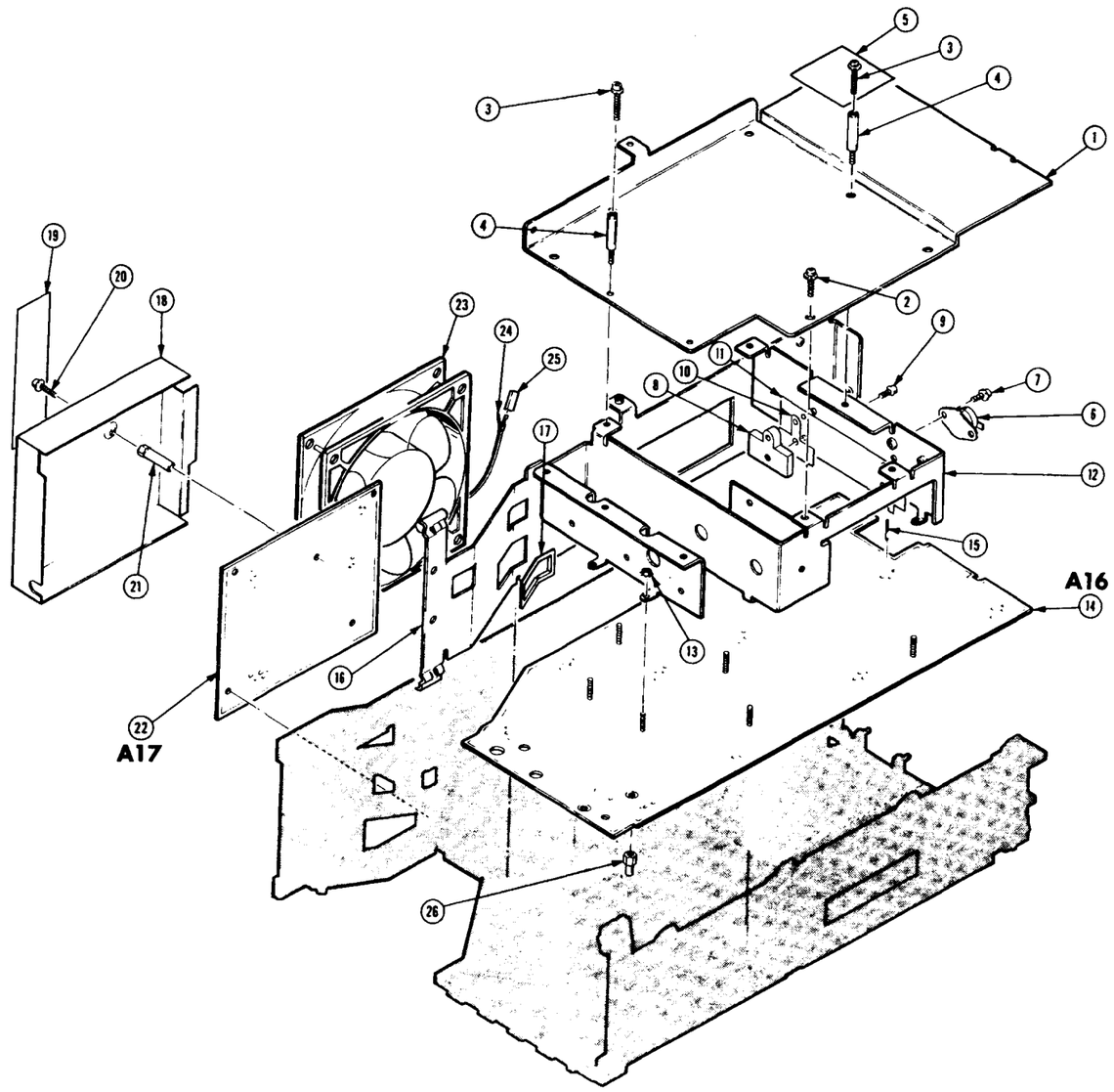


Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
4-1	337-3163-01			1	SHIELD,ELEC:LV,UPPER	0J9P9	OORDER BY DESCT
					ATTACHING PARTS		
-2	211-0730-00			7	SCR,ASSEM WSHR:6-32 X 0.375,PNH,STL,T15	0KB01	ORDER BY DESC
-3	211-0730-00			2	SCR,ASSEM WSHR:6-32 X 0.375,PNH,STL,T15	0KB01	ORDER BY DESC
-4	129-0474-00			2	SPACER,POST:0.92 L,0.24 DIA STEEL,0.250HEX	TK0588	ORDER BY DESC
					END ATTACHING PARTS		
-5	334-4759-00			1	MARKER,IDENT:MKD SHIELDS INVERTER	07416	ORDER BY DESC
-6	--------			1	SWITCH,THRMSTC: (SEE A16S1020 REPL)		
					ATTACHING PARTS		
-7	211-0730-00			2	SCR,ASSEM WSHR:6-32 X 0.375,PNH,STL,T15	0KB01	ORDER BY DESC
					END ATTACHING PARTS		
-8	343-0527-00			7	RETAINER,XSTR:POLYCARBONATE	TK1163	ORDER BY DESC
					ATTACHING PARTS		
-9	211-0730-00			7	SCR,ASSEM WSHR:6-32 X 0.375,PNH,STL,T15	0KB01	ORDER BY DESC
					END ATTACHING PARTS		
-10	342-0676-00			7	INSULATOR,XSTR:SILICON RUBBER,0.006 THK	2K262	ORDER BY DESC
-11	337-3196-00			1	SHIELD,ELEC:FARADAY,POLYMIDE	80009	337319600
-12	407-2843-01			1	BRACKET,XSTR:ALUMINUM	0J9P9	ORDER BY DESC
					ATTACHING PARTS		
-13	210-0586-00			7	NUT,PL,ASSEM WA:4-40 X 0.25,STL	TK0435	ORDER BY DESC
					END ATTACHING PARTS		
-14	--------			1	CKT BD ASSY:LVPS (SEE A16 REPL)		
-15	131-0608-00			1	.TERMINAL,PIN:PRESSFIT/PCB,:MALE,STR	22526	48283-018
	166-0165-00			2	.SPACER,SLEEVE:0.35 L X 0.055 ID,CERAMIC	80009	166016500
	175-9230-01			1	.CA ASSY,SP:RIBBON,:CPR,10,26 AWG,0.1 CTR	0J7N9	ORDER BY DESC
					(LVPS TO HV BOARDS)		
-16	441-1573-01			1	CHASSIS,SCOPE:CENTER	0J9P9	ORDER BY DESC
-17	348-0897-00			1	GROMMET,PLASTIC:1.534 ID,BLACK,RECT	TK1163	ORDER BY DESC
-18	337-1925-00	B010100	B012402	1	SHIELD,ELEC:CIRCUIT BOARD	0J9P9	ORDER BY DESC
	337-3682-00	B012403		1	SHIELD,ELEC:HIGH VOLTAGE POWER SUPPLY	0J9P9	ORDER BY DESC
					(STANDARD ONLY)		
	337-1925-00	B010100	B010107	1	SHIELD,ELEC:CIRCUIT BOARD	0J9P9	ORDER BY DESC
	337-3682-00	B010108		1	SHIELD,ELEC:HIGH VOLTAGE POWER SUPPLY	0J9P9	ORDER BY DESC
					(2440M ONLY)		
-19	334-5583-00	B010100	B012402	1	.MARKER,IDENT:MKD CAUTION HIGH VOLTAGE	07416	ORDER BY DESC
					(STANDARD ONLY)		
	334-5583-00	B010100	B010107	1	.MARKER,IDENT:MKD CAUTION HIGH VOLTAGE	07416	ORDER BY DESC
					(2440M ONLY)		
					ATTACHING PARTS FOR SHIELD		
-20	211-0730-00			1	SCR,ASSEM WSHR:6-32 X 0.375,PNH,STL,T15	0KB01	ORDER BY DESC
					END ATTACHING PARTS		
-21	129-0474-00			1	SPACER,POST:0.92 L,0.24 DIA STEEL,0.250HEX	TK0588	ORDER BY DESC
-22	--------			1	CKT BD ASSY:HIGH VOLTAGE (SEE A17 REPL)		
-23	--------			1	FAN,TUBEAXIAL: (SEE B1000 REPL)		
-24	131-0707-00			2	CONTACT,ELEC:22-26 AWG,BRS & CU BE	22526	47439-000
-25	204-0805-00			1	CONN BODY,PLUG:HOLDE:,MINI PV	22526	65039-035
-26	129-1044-00			1	SPACER,POST:0.575 L,6-32 INT THRU,STL	TK0588	ORDER BY DESC

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
	020-1702-00	B010100	B012859	1	UPGRADE KIT:SPANISH	80009	020170200
	020-1702-02	B012860		1	COMPONENT KIT:SPANISH HELP TEXT (OPTION 4S ONLY)	80009	020170202
	020-1703-00	B010100	B012859	1	UPGRADE KIT:DANISH	80009	020170300
	020-1703-02	B012860		1	COMPONENT KIT:DANISH HELP TEXT (OPTION 4D ONLY)	80009	020170302
	020-1704-00	B010100	B012859	1	UPGRADE KIT:ENGLISH	80009	020170400
	020-1704-02	B012860		1	COMPONENT KIT:ENGLISH HELP TEXT (2440 – ENGLISH)	80009	020170402

Fig. & Index No.	Tektronix Part No.	Serial No. Effective	Dscont	Qty	12345 Name & Description	Mfr. Code	Mfr. Part No.
					STANDARD ACCESSORIES		
5-1	016-0692-00			1	POUCH,ACCESSORY:2465/2445	0JRZ2	ORDER BY DESC
-2	386-4849-00			1	PLATE,MOUNTING:ACCESSORY POUCH,AL	TK1165	ORDER BY DESC
-3	378-0199-03			1	FILTER,LT,CRT:BLUE,3.415 X 4.105 X 0.030THK (STANDARD)	0KB00	378019903
	378-0199-05			1	FILTER,LT,CRT:BLUE,4.105 X 3.415 X 0.03 THK (OPTION 05)	0KB00	378-01999-05
	378-0208-00			1	FILTER,LT,CRT:CLEAR,4.105 X 3.415,POLYCARB (STANDARD)	TK0657	101-7 LEXAN
-4	159-0014-00			1	FUSE,CARTRIDGE:3AG,5A,250V,0.8SEC	61857	SS2-5A
-5	200-3199-01			1	COVER,FRONT:ABS	0JR05	ORDER BY DESC
-6	161-0104-00			1	CABLE ASSY,PWR,:3,18 AWG,98 L,SVT,GREY/BLK	0B445	MC6 -3 CG86
-7	343-1213-00			1	CLAMP,PWR CORD:POLYMIDE	TK1163	ORDER BY DESC
-8	161-0104-06			1	CABLE ASSY,PWR,:3 X 0.75MM SQ,220V,98.0 L (OPTION A1 - EUROPEAN)	S3109	VIIGSOPO-HO5VVF
-9	161-0104-08			1	CABLE ASSY,PWR,:3,18 AWG,98 L (OPTION A4 - NORTH AMERICAN)	70903	ORDER BY DESC
-10	161-0104-07			1	CABLE ASSY,PWR,:3,1.0MM SQ,240 VOLT,2.5M (OPTION A2 - UNITED KINGDOM)	S3109	ORDER BY DESC
-11	161-0104-05			1	CABLE ASSY,PWR,:3,18 AWG,240V,98.0 L (OPTION A3 - AUSTRALIAN)	S3109	SAA/3-OD3CCFC3X
-12	161-0167-00			1	CABLE ASSY,PWR,:3.0 X 0.75,6A,240V,2.5M (OPTION A5 - SWISS)	S3109	ORDER BY DESC
	--------			1	ACCESSORY KIT:TWO PROBES,COMPACT TIP		
	016-0537-00			1	POUCH,ACCESSORY:6 IN X 9 IN W/ZIPPER	05006	ZIP-6X9ID
	070-6599-00			1	MANUAL,TECH:OPERATORS,2440	80009	070659900
	070-6600-00			1	MANUAL,TECH:USERS,2440	80009	070660000
	070-6601-00			1	MANUAL,TECH:PROGRAMMERS,2440	80009	070660100
	070-6602-00			1	MANUAL,TECH:POCKET PROGRAMMERS,2440P2G	80009	070660200
	134-0016-01			1	ADAPTER,CONN:BANANA W/BINDING POST	0J260	ORDER BY DESC
					OPTIONAL ACCESSORIES		
	016-0096-00			1	HDW KIT,ELEK EQ:RACKMOUNTING	TK1465	ORDER BY DESC
	016-0825-01			1	RACK MOUNT KIT:2430/2445A/2465A/2467	80009	016082501
	061-3516-06			1	DATA SHEET:INSTL,2430/30A/32/32A/40/24L/31L	80009	061351606
	070-6603-00			1	MANUAL,TECH:SERVICE,2440	80009	070660300
	202-0302-00			1	CASE,CARRYING:23.75 X 15.75 X 7,TEK BLUE	80009	202030200
	346-0199-00			1	STRAP,CARRYING:MKD TEKTRONIX	TK1623	ORDER BY DESC
	020-1699-00	B010100	B012859	1	UPGRADE KIT:FRENCH	80009	020169900
	020-1699-02	B012860		1	COMPONENT KIT:FRENCH HELP TEXT (OPTION 4F ONLY)	80009	020169902
	020-1700-00	B010100	B012859	1	UPGRADE KIT:GERMAN	80009	020170000
	020-1700-02	B012860		1	COMPONENT KIT:GERMAN HELP TEXT (OPTION 4G ONLY)	80009	020170002
	020-1701-00	B010100	B012859	1	UPGRADE KIT:ITALIAN	80009	020170100
	020-1701-02	B012860		1	COMPONENT KIT:ITALIAN HELP TEXT (OPTION 4H ONLY)	80009	020170102

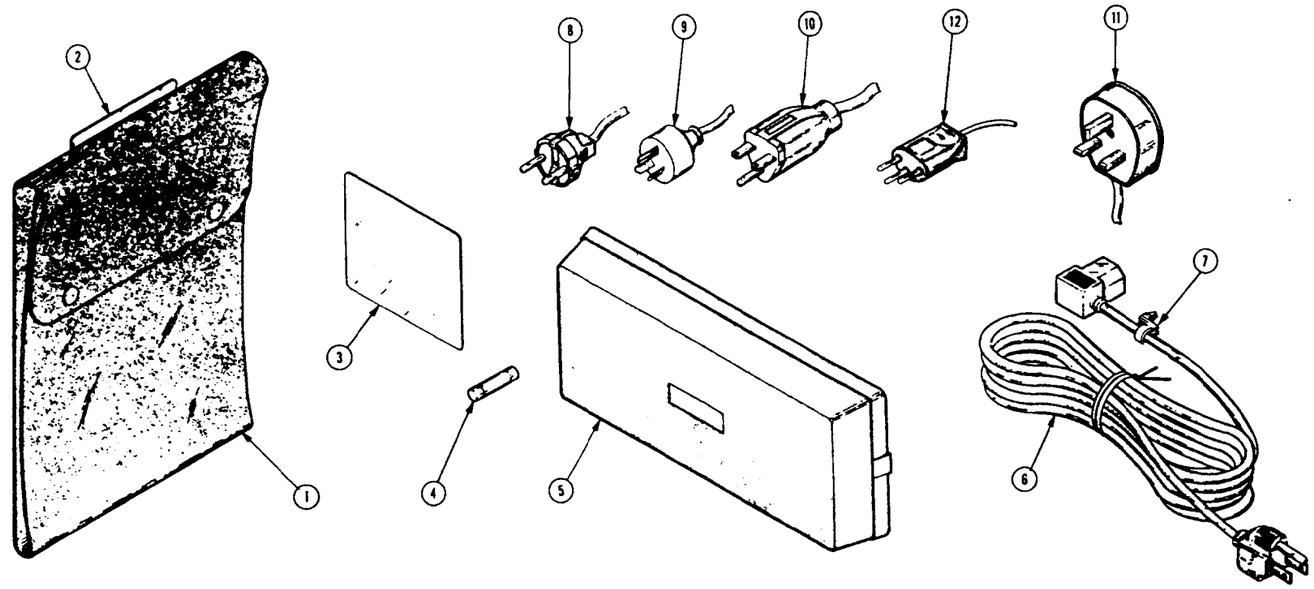

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FIG. 5 ACCESSORIES