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Product Group 55

THE TDS 520 DIGITIZING OSCILLOSCOPE

Component Level Diagnostic and Repair Manual

Volume 2

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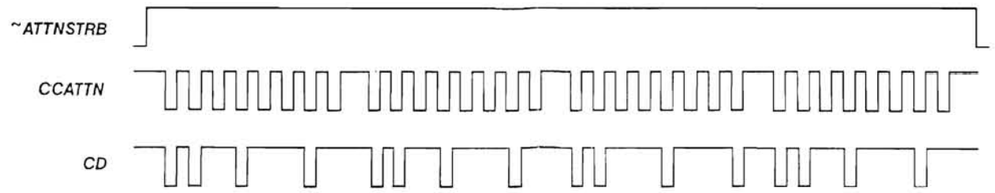
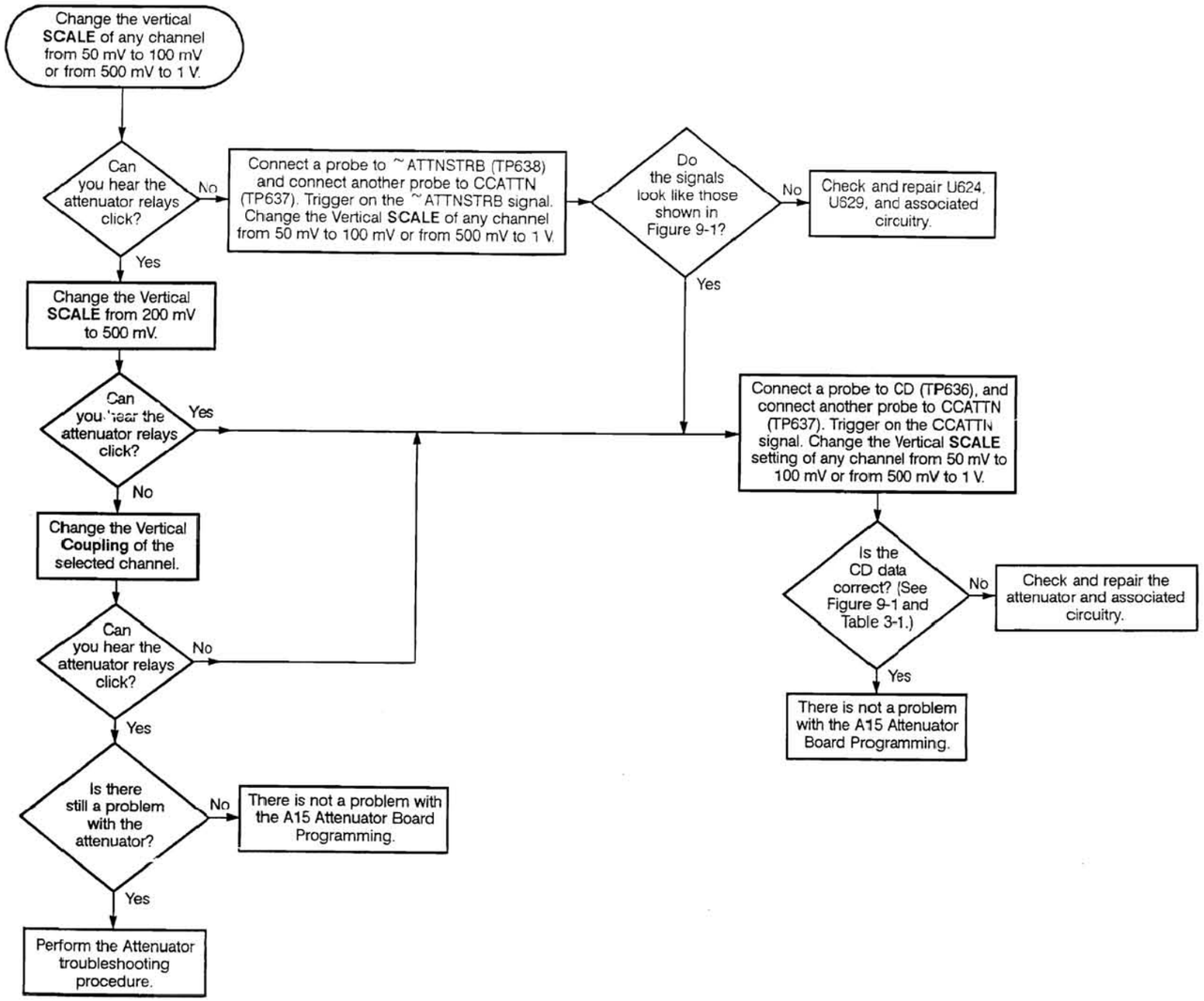


Vol. 2 Figure 9-1: Attenuator Programming



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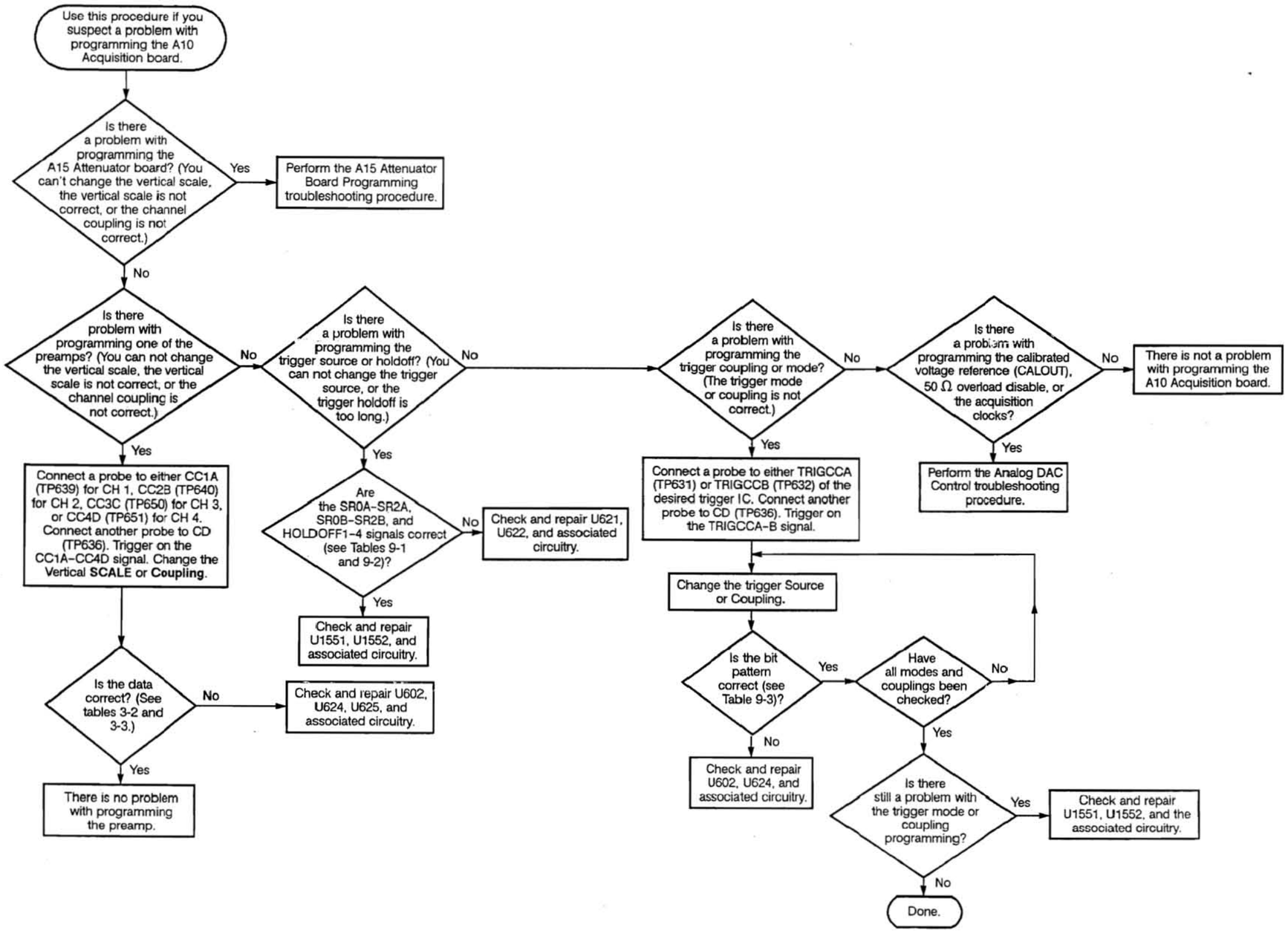

Vol. 2 Figure 9-3: Acquisition Digital Control Troubleshooting Procedure

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Vol. 2 Table 9-1: SR0A–SR2A and SR0B–SR2B Signals

Selected Input	SR2A/B	SR1A/B	SR0A/B
CH5	1	1	1
CH1	1	1	0
CH2	1	0	1
CH1 and CH2	1	0	0
CH5	0	1	1
CH3	0	1	0
CH4	0	0	1
CH1 and CH2	0	0	0

Vol. 2 Table 9-2: HOLDOFF1–4 Signals

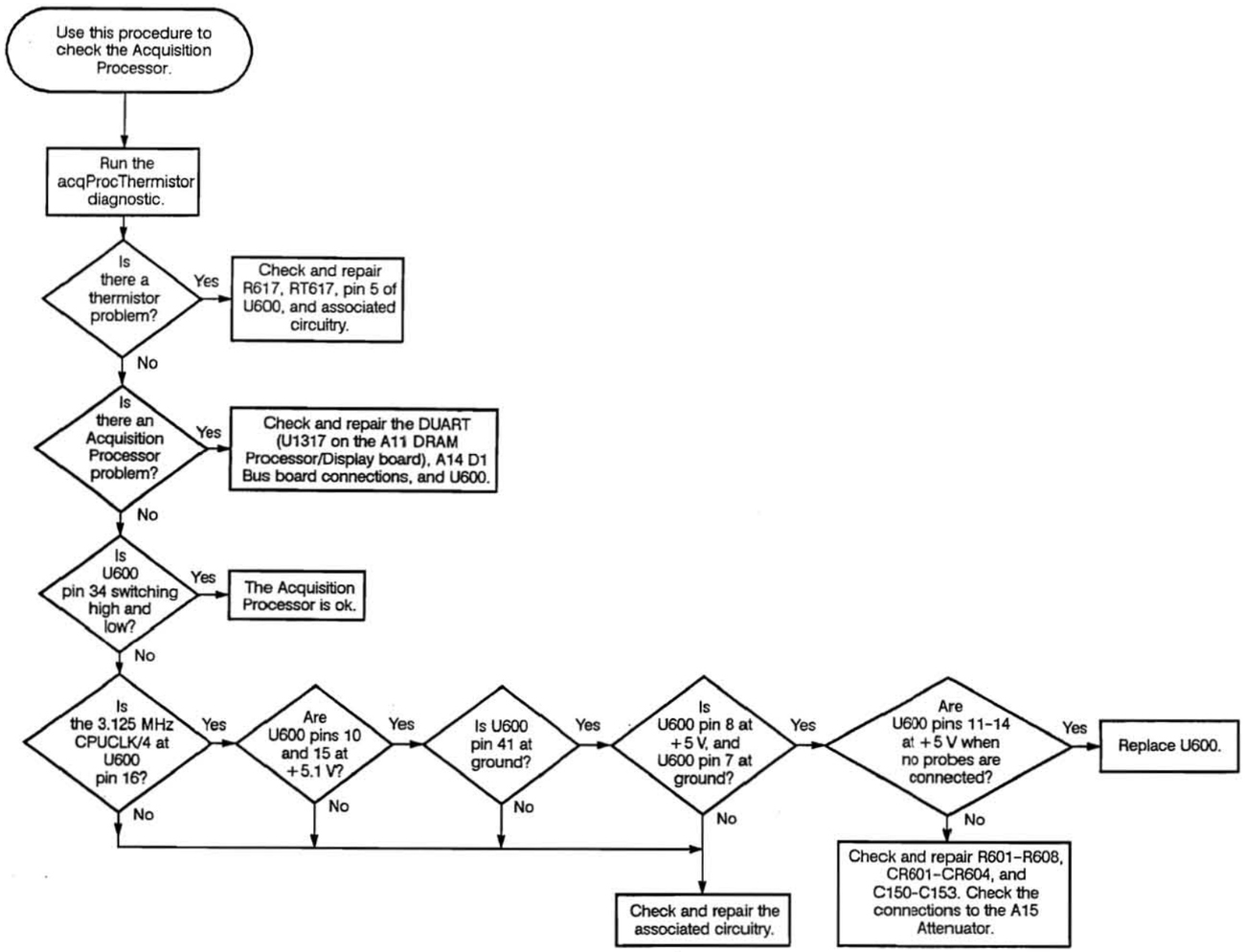
	HOLDOFF4	HOLDOFF3	HOLDOFF2	HOLDOFF1
Repair	0	0	0	0
Don't Care	All Other Combinations			

Vol. 2 Table 9-3: Trigger CD Signal

	Bit							
Trigger Mode	7	6	5	4	3	2	1	0[1]
DC	0	1	0	0	0	0	0	0
AC HF Reject	0	1	0	0	0	1	0	0
LF Reject	0	1	0	0	1	0	0	0
LF Reject	0	1	0	0	1	1	0	0
HF Reject	0	1	0	1	0	0	0	0
AC HF Reject	0	1	0	1	0	1	0	0
Direct Noise Reject	0	1	0	1	1	0	0	0
Noise Reject (20 Hz High Pass)	0	1	0	1	1	1	0	0

[1] This bit will be a 1 if negative slope is selected.

Vol. 2 Figure 9-3: Acquisition Digital Control Troubleshooting Procedure (Cont.)



Vol. 2 Figure 9-4: Acquisition Processor Troubleshooting Procedure

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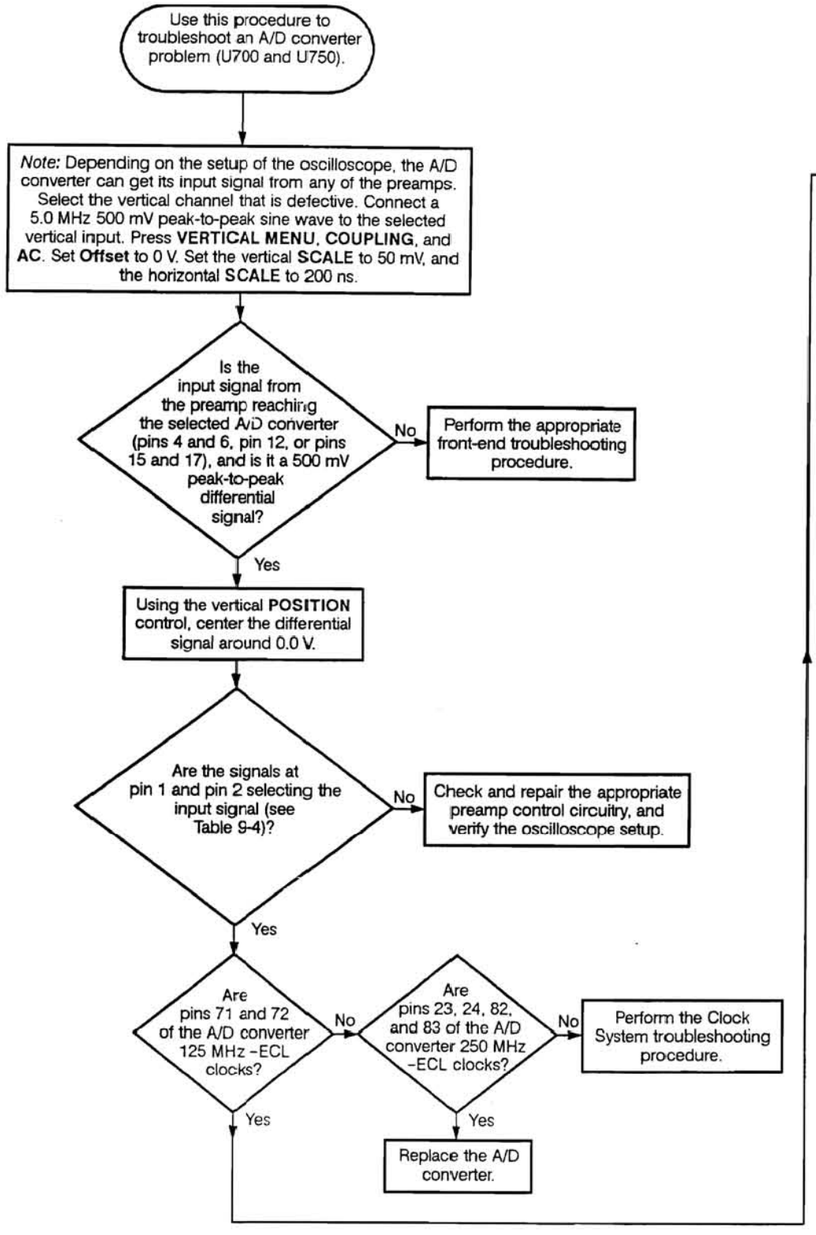
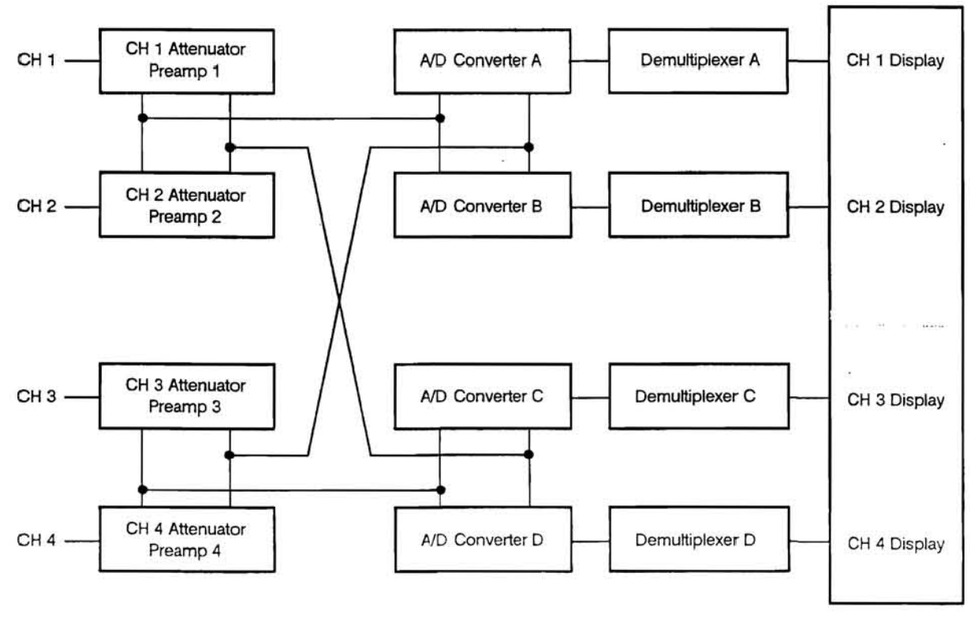


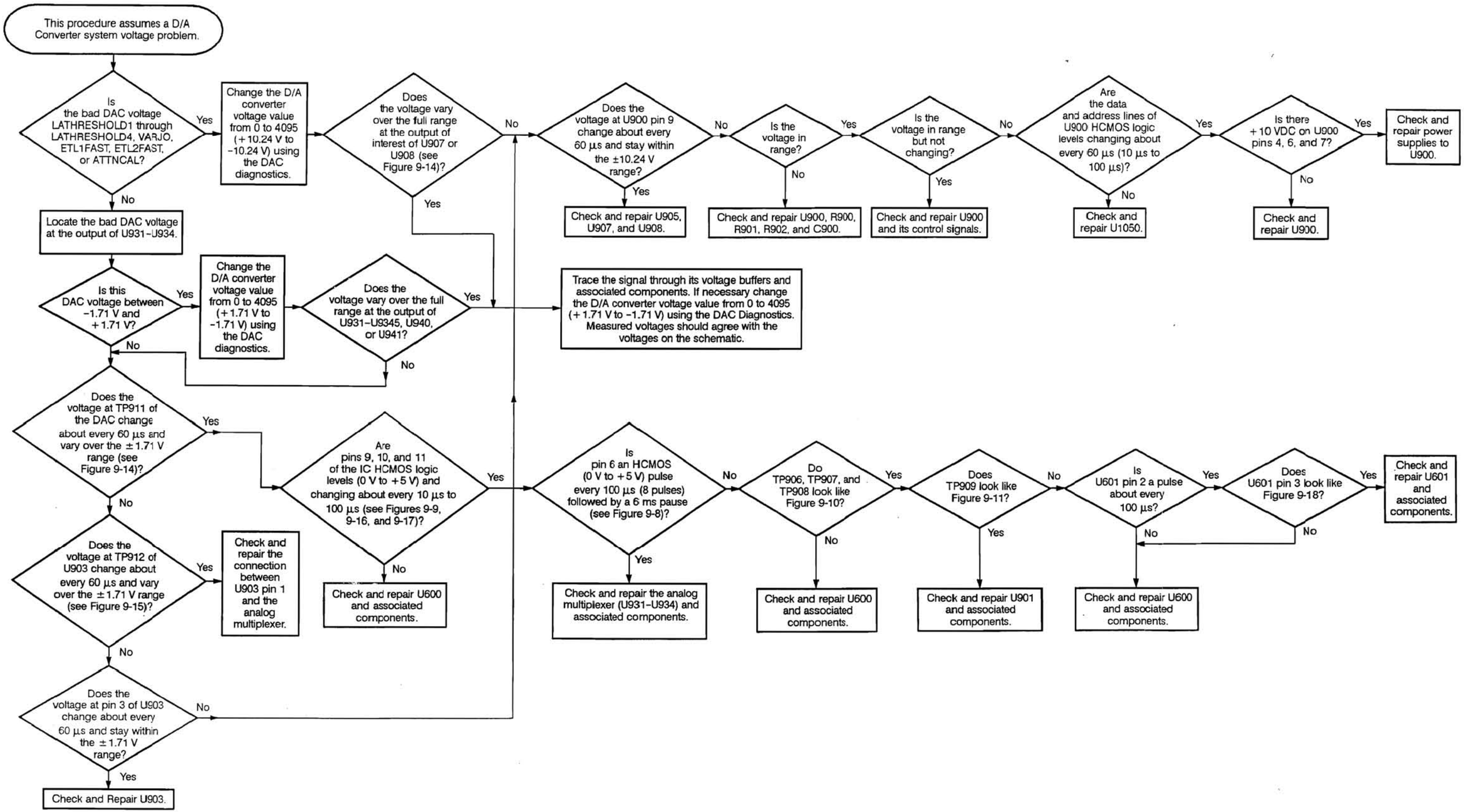
Vol. 2 Figure 9-6: A/D Converter Troubleshooting Procedure

Vol. 2 Table 9-4: A/D Converter Input Selection

Input	CALSEL (Pin 2)	CH2SEL (Pin 1)
CH1	Low	Low
CH2	Low	High
CAL	High	Don't Care
Not Allowed	High	High



Vol. 2 Figure 9-5: Normal Path of the Vertical Channels



Vol. 2 Figure 9-7: Analog DAC Control Troubleshooting Procedure

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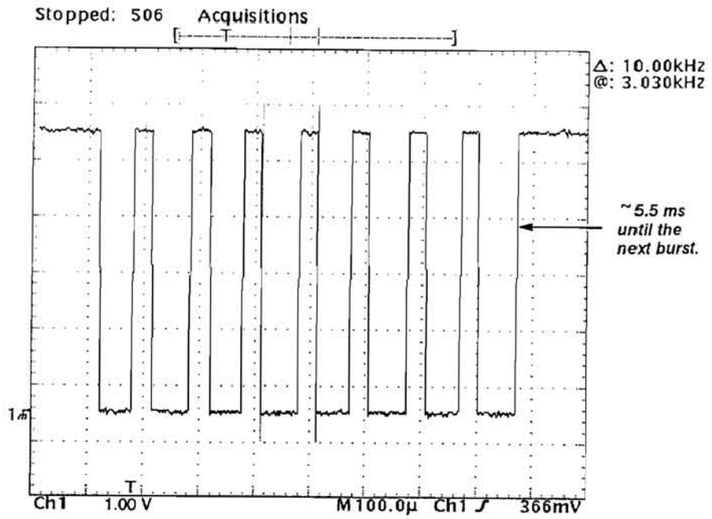
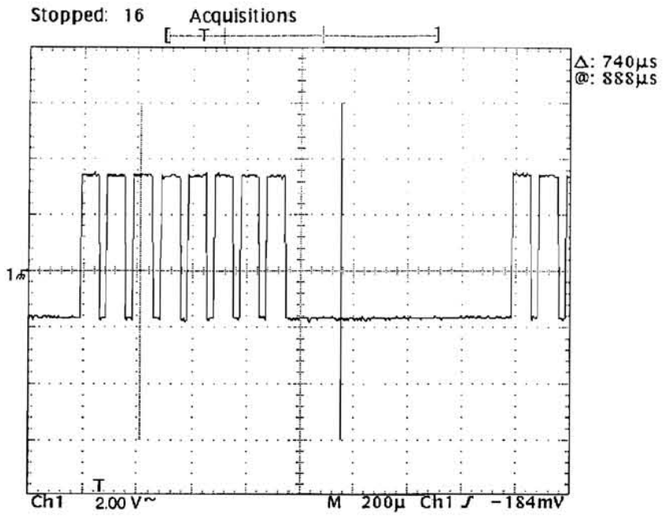
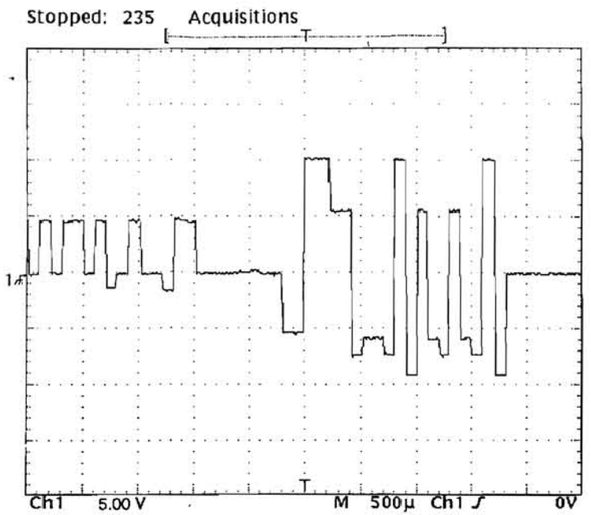


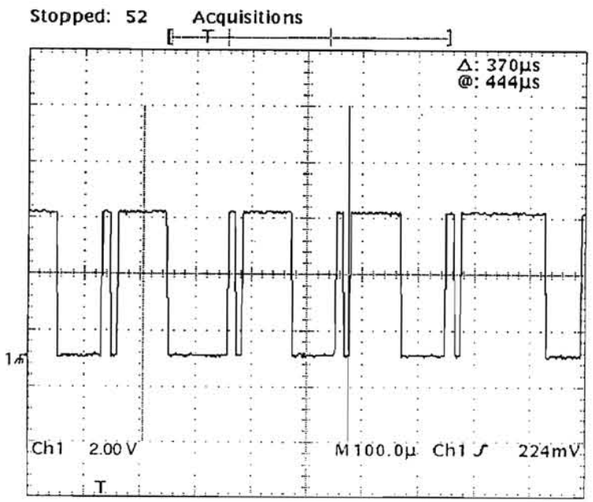
Vol. 2 Figure 9-8: Pin 6 of U931, U932, U933, and U934. This burst of eight 68 µs-strobes occurs once every 3.7 ms.



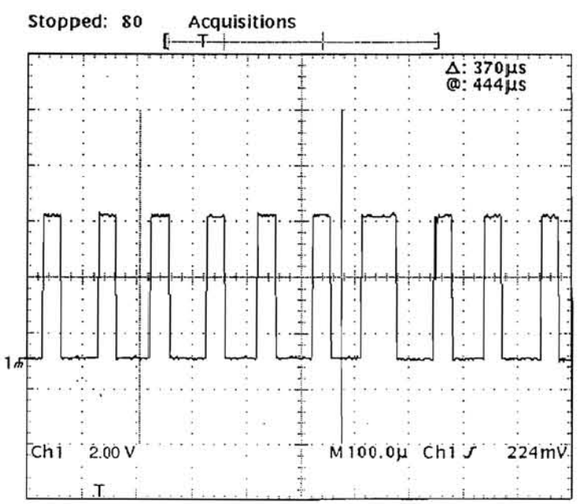
Vol. 2 Figure 9-10: TP906 (PC3). TP907 (PC4) and TP908 (PC5) are similar.



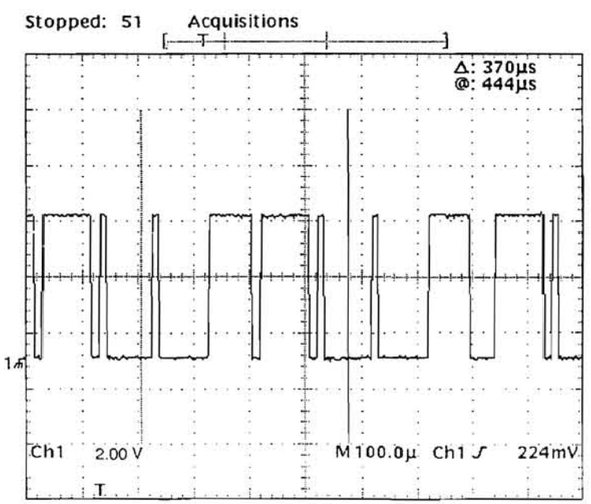
Vol. 2 Figure 9-12: TP911



Vol. 2 Figure 9-9: TP903 (PC0)

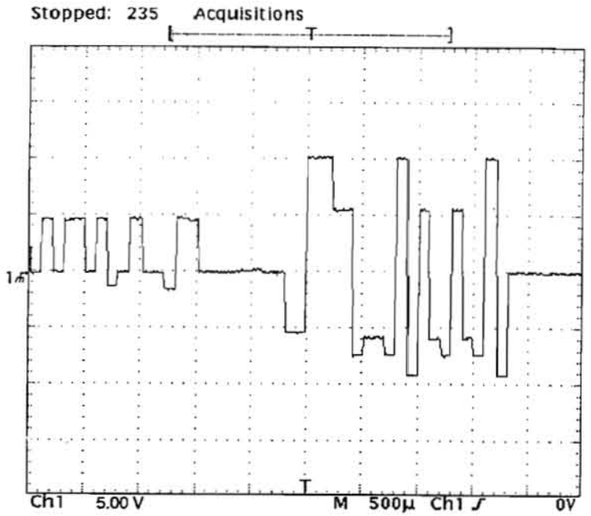


Vol. 2 Figure 9-11: TP909. Sometimes the frequency of this signal varies or there are pulses missing for several cycles.

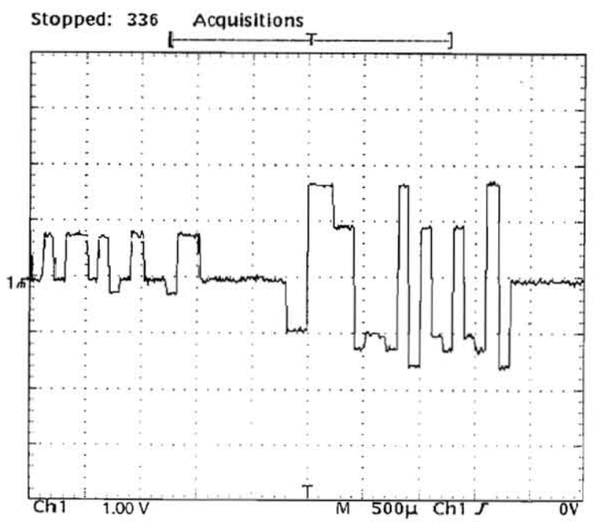


Vol. 2 Figure 9-13: TP904 (PC1)

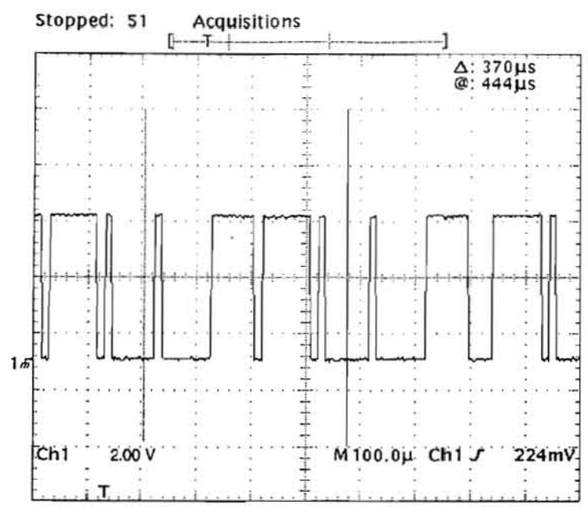
Vol. 2 Figure 9-7: Analog DAC Control Troubleshooting Procedure (Cont.)



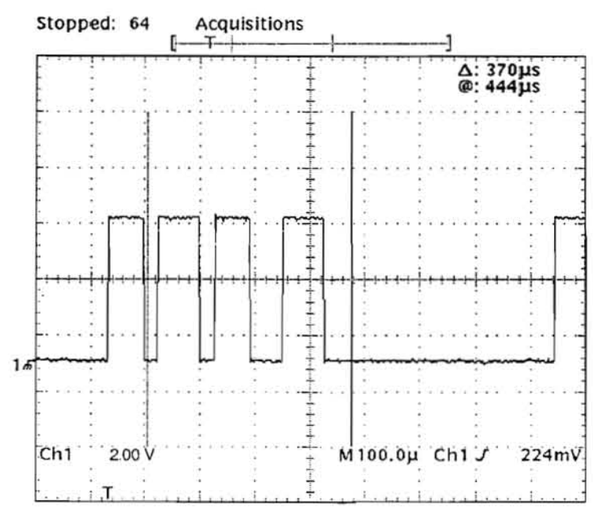
Vol. 2 Figure 9-14: TP911



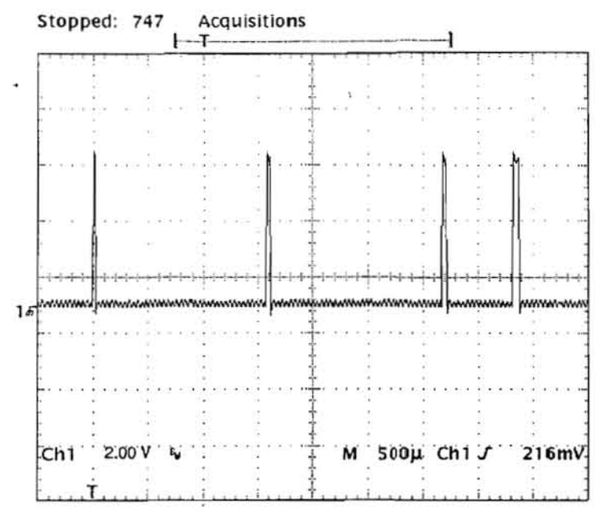
Vol. 2 Figure 9-15: TP912



Vol. 2 Figure 9-16: TP904 (PC1)



Vol. 2 Figure 9-17: TP905 (PC2)



Vol. 2 Figure 9-18: U601 pin 3 (PC7)

Vol. 2 Figure 9-7: Analog DAC Control Troubleshooting Procedure (Cont.)

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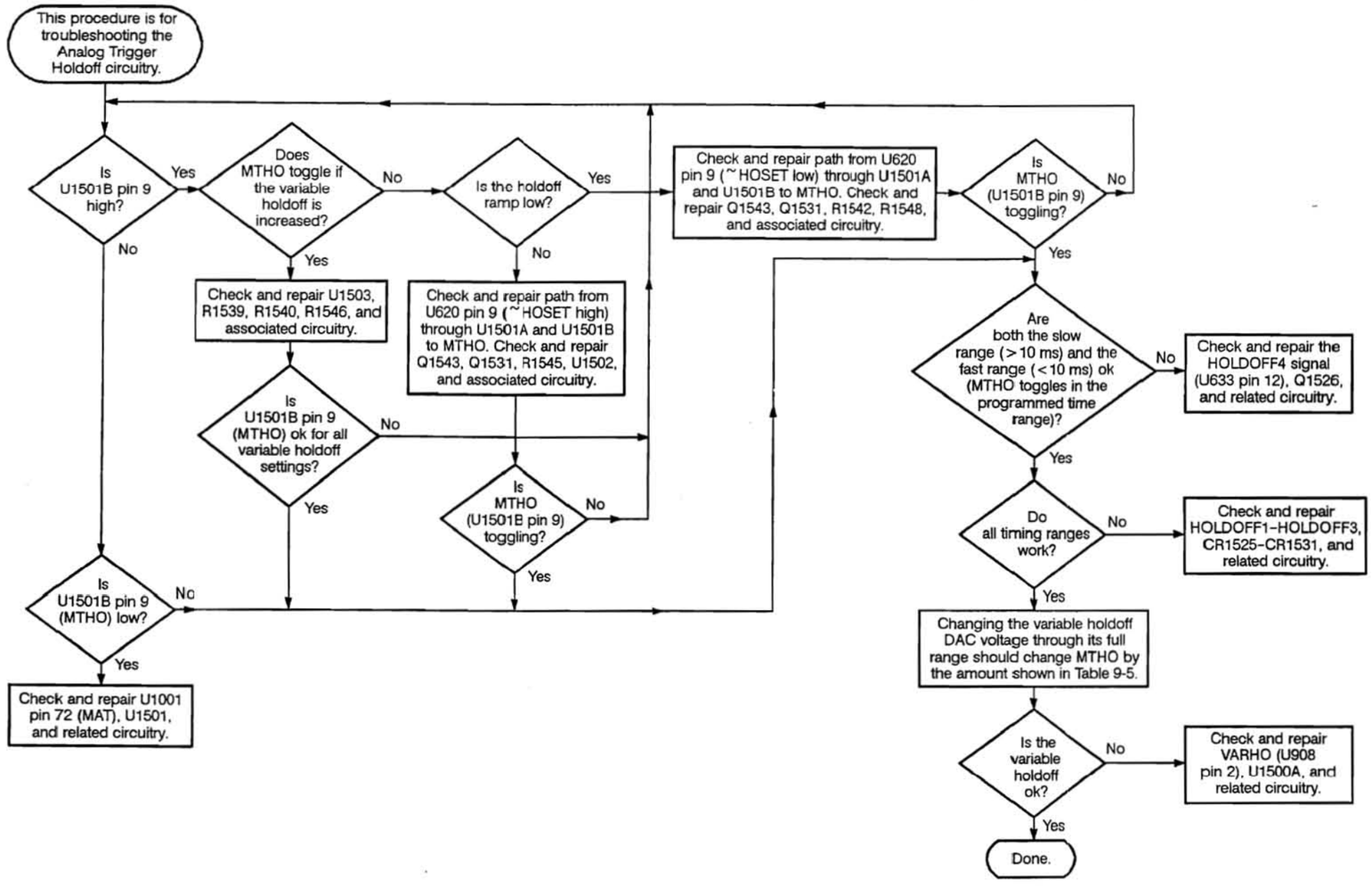


Vol. 2 Figure 9-19: Analog Holdoff Troubleshooting Procedure

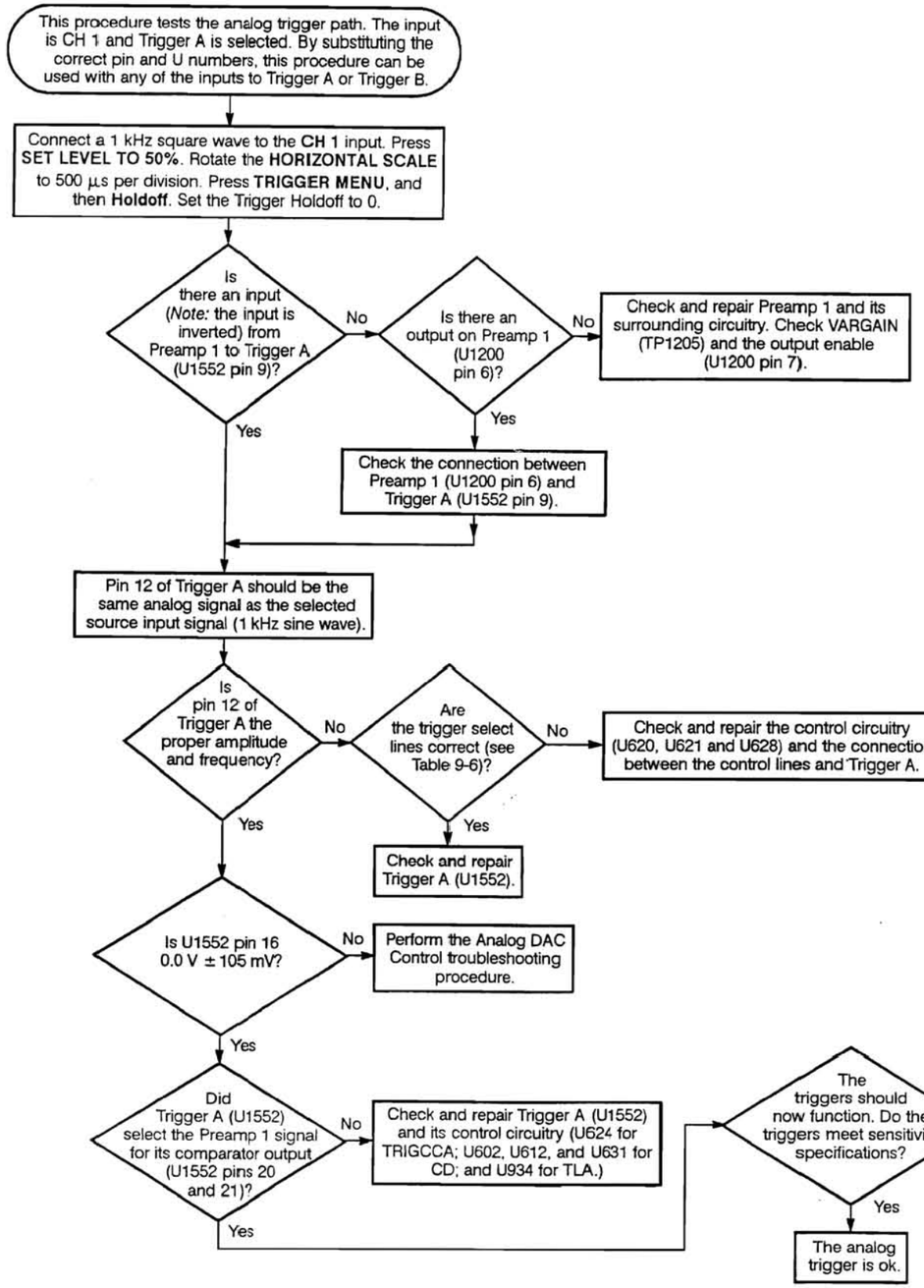
Vol. 2 Table 9-5: Holdoff Range

Horizontal Scale	Minimum Holdoff	Maximum Holdoff
>10 s	5 s	10 s
10 s	5 s	10 s
5 s	5 s	10 s
2 s	5 s	10 s
1 s	5 s	10 s
500 ms	5000 ms	10000 ms
200 ms	2000 ms	10000 ms
100 ms	1000 ms	10000 ms
50 ms	500 ms	1000 ms
20 ms	200 ms	1000 ms
10 ms	100 ms	1000 ms
5 ms	50 ms	100 ms
2 ms	20 ms	100 ms
1 ms	10 ms	100 ms
500 µs	5000 µs	10000 µs
200 µs	2000 µs	10000 µs
100 µs	1000 µs	10000 µs
50 µs	500 µs	1000 µs
20 µs	200 µs	1000 µs
10 µs	100 µs	1000 µs
5 µs	50 µs	100 µs
2 µs	20 µs	100 µs
1 µs	10 µs	100 µs
500 ns	5000 ns	10000 ns
200 ns	2000 ns	10000 ns
100 ns	1000 ns	10000 ns
50 ns	1000 ns	10000 ns
20 ns	1000 ns	10000 ns
10 ns	1000 ns	10000 ns
5 ns	1000 ns	10000 ns
2 ns	1000 ns	10000 ns
1 ns	1000 ns	10000 ns
0.5 ns	1000 ns	10000 ns

Vol. 2 Figure 9-19: Analog Holdoff Troubleshooting Procedure (Cont.)

Scans by ArtekMedia => 2011

Scans by Artekmedia => 2011

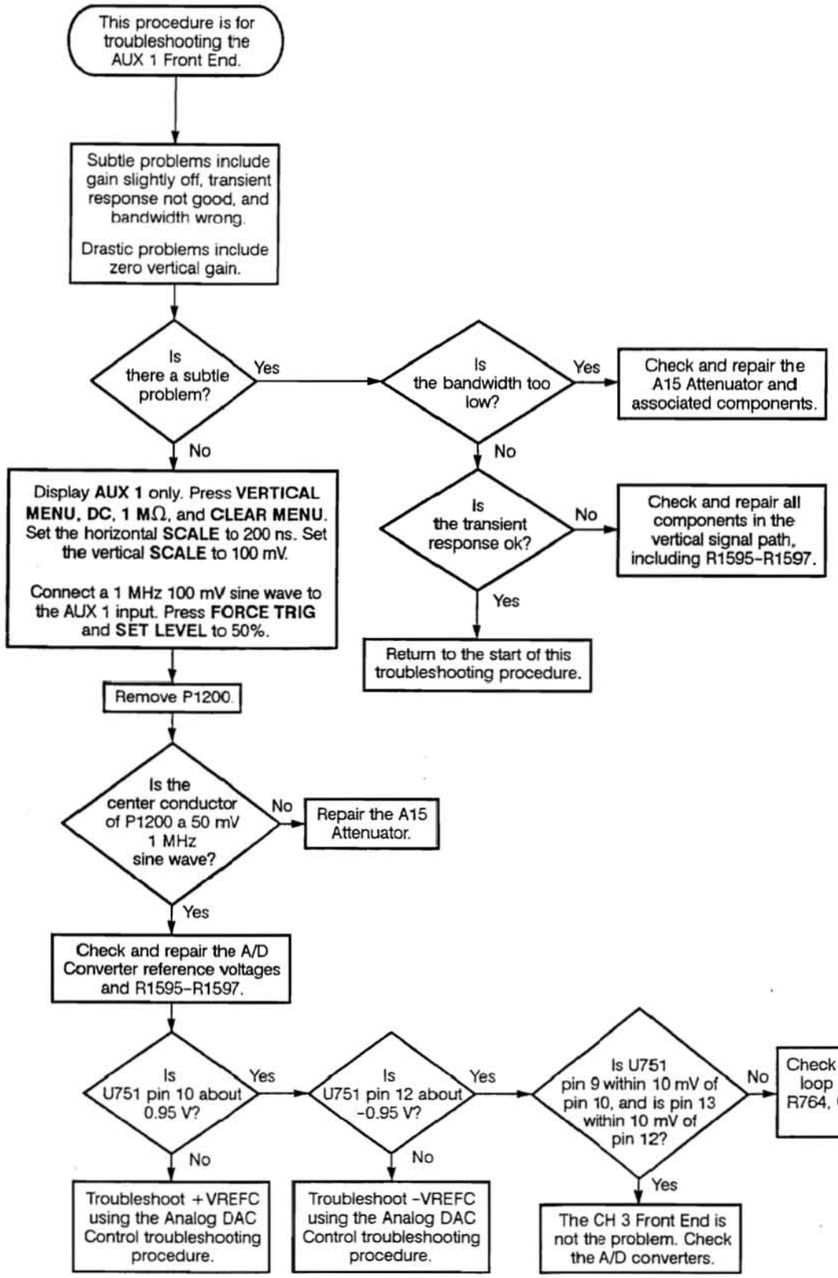


Vol. 2 Figure 9-20: Analog Trigger Troubleshooting Procedure

Vol. 2 Table 9-6: Trigger A and Trigger B Source Selection

U1551 and U1552

Pin 1	Pin 2	Pin 3	Channel Selected
0.0 V	+5 V	+5 V	CH 1
+5 V	0.0 V	+5 V	CH 2
0.0 V	+5 V	0.0 V	CH 3
+5 V	0.0 V	0.0 V	CH 4
+5 V	+5 V	X	CH 5 (LINETRIG/AUXTRIG)



Vol. 2 Figure 9-21: AUX 1 Front End Troubleshooting Procedure

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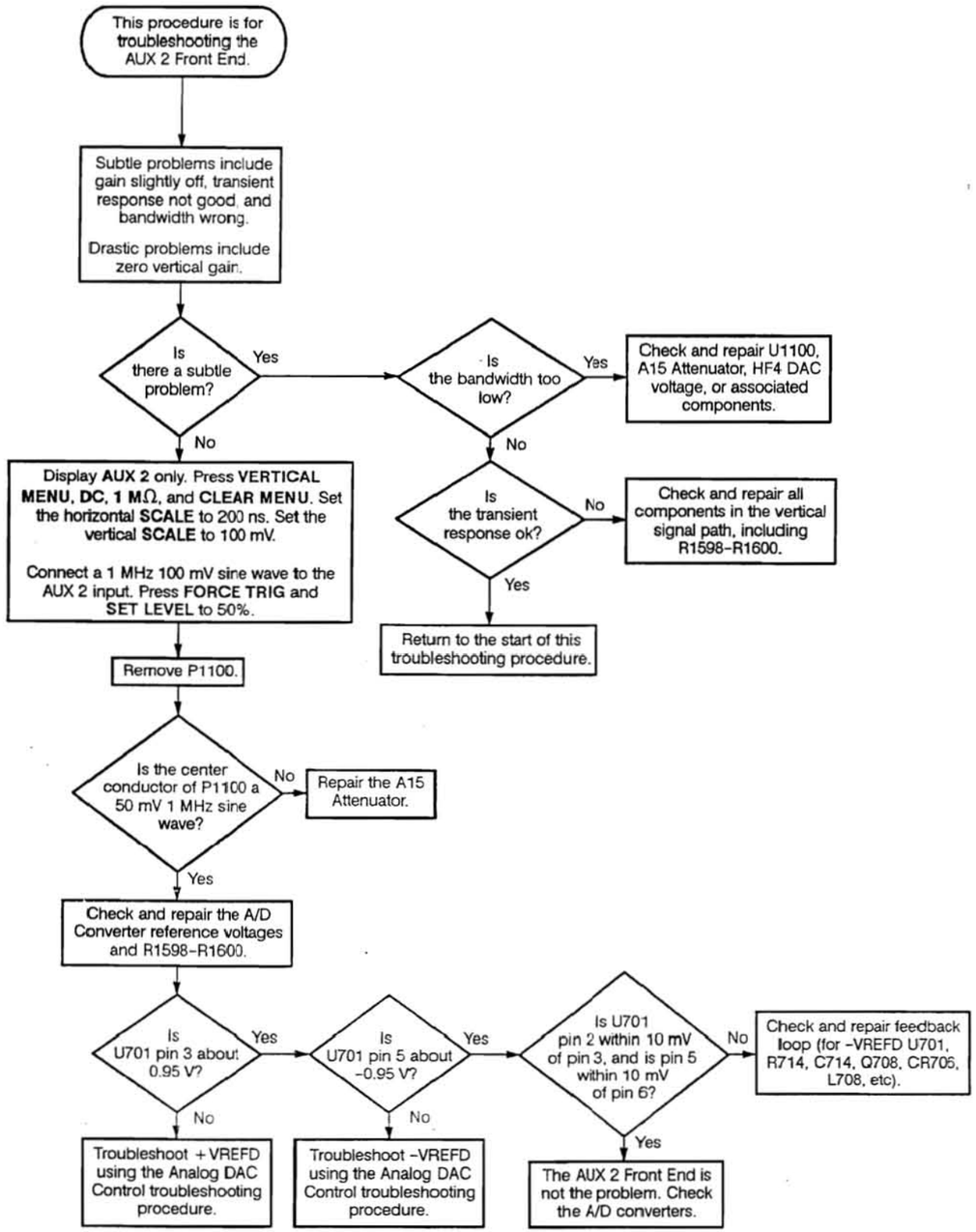
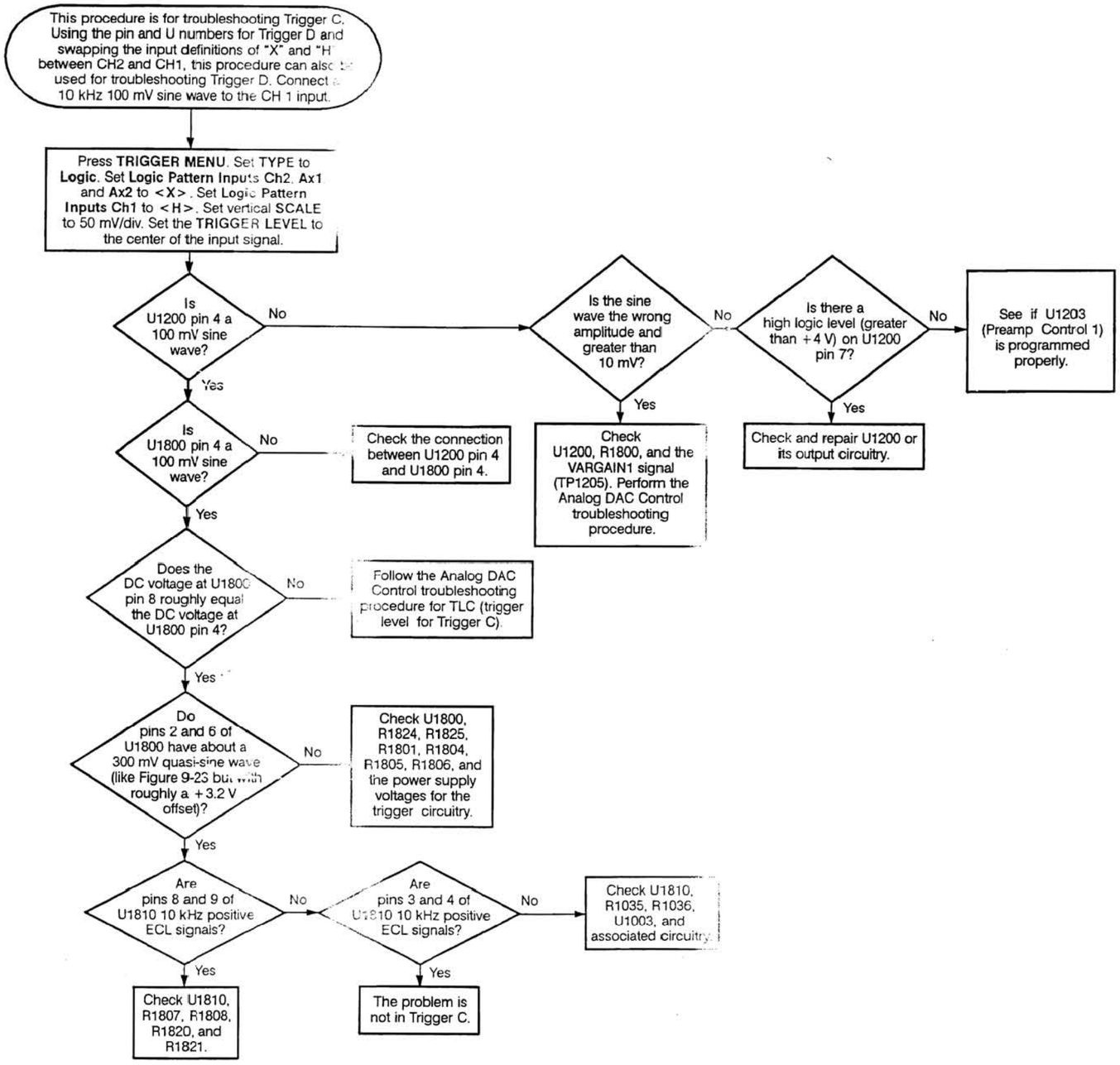
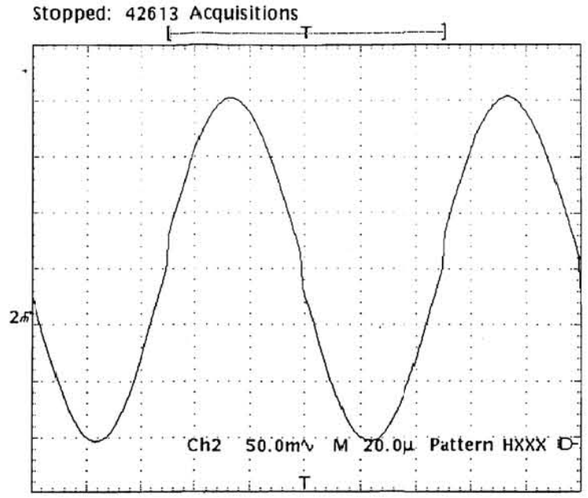
Scans by Artekmedia => 2011



Vol. 2 Figure 9-22: AUX 2 Front End Troubleshooting Procedure





Vol. 2 Figure 9-23: U1800 Pins 2, 6, 11 and 12 with 10 kHz 1 Division Input

Vol. 2 Figure 9-24: C and D Trigger Troubleshooting Procedure

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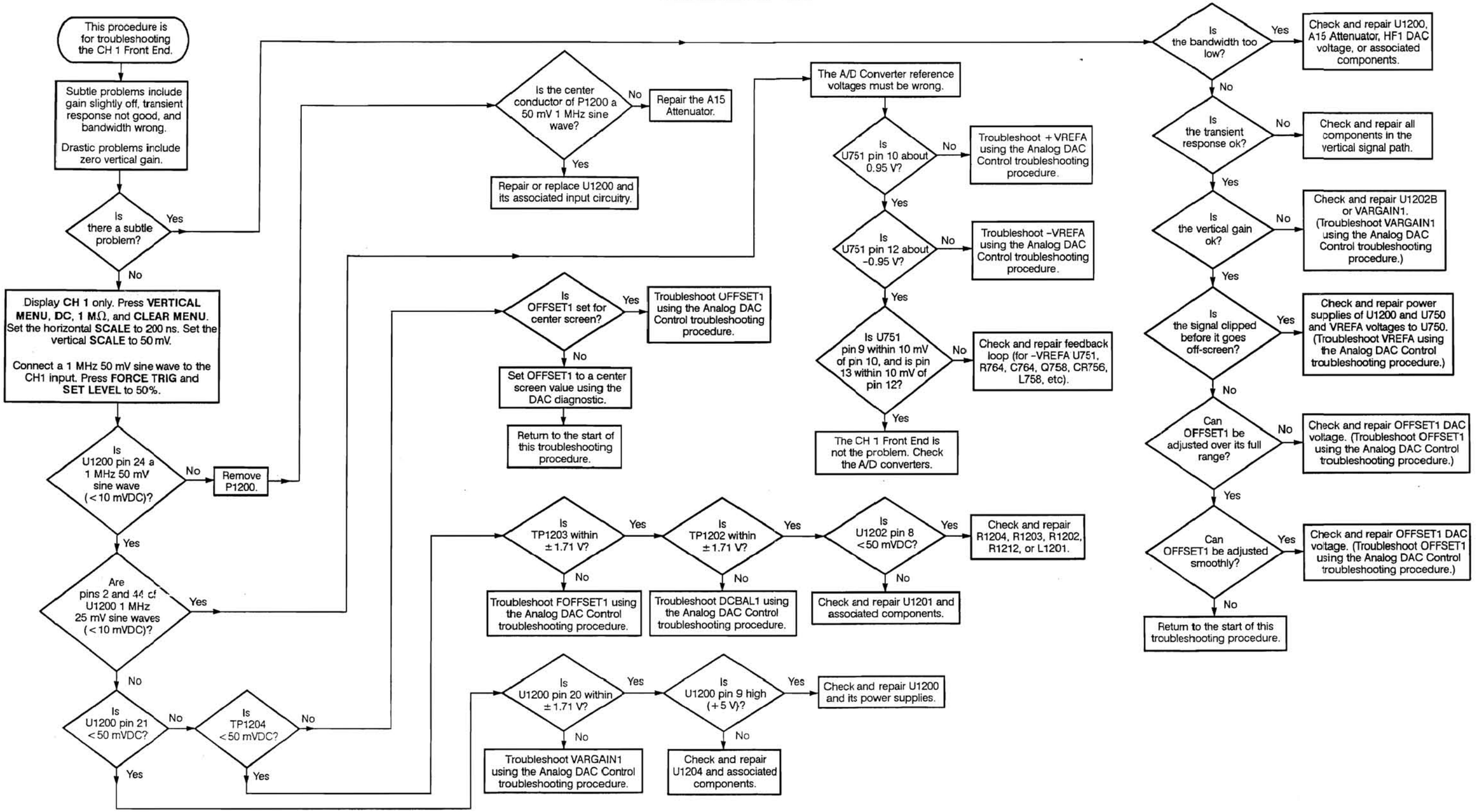
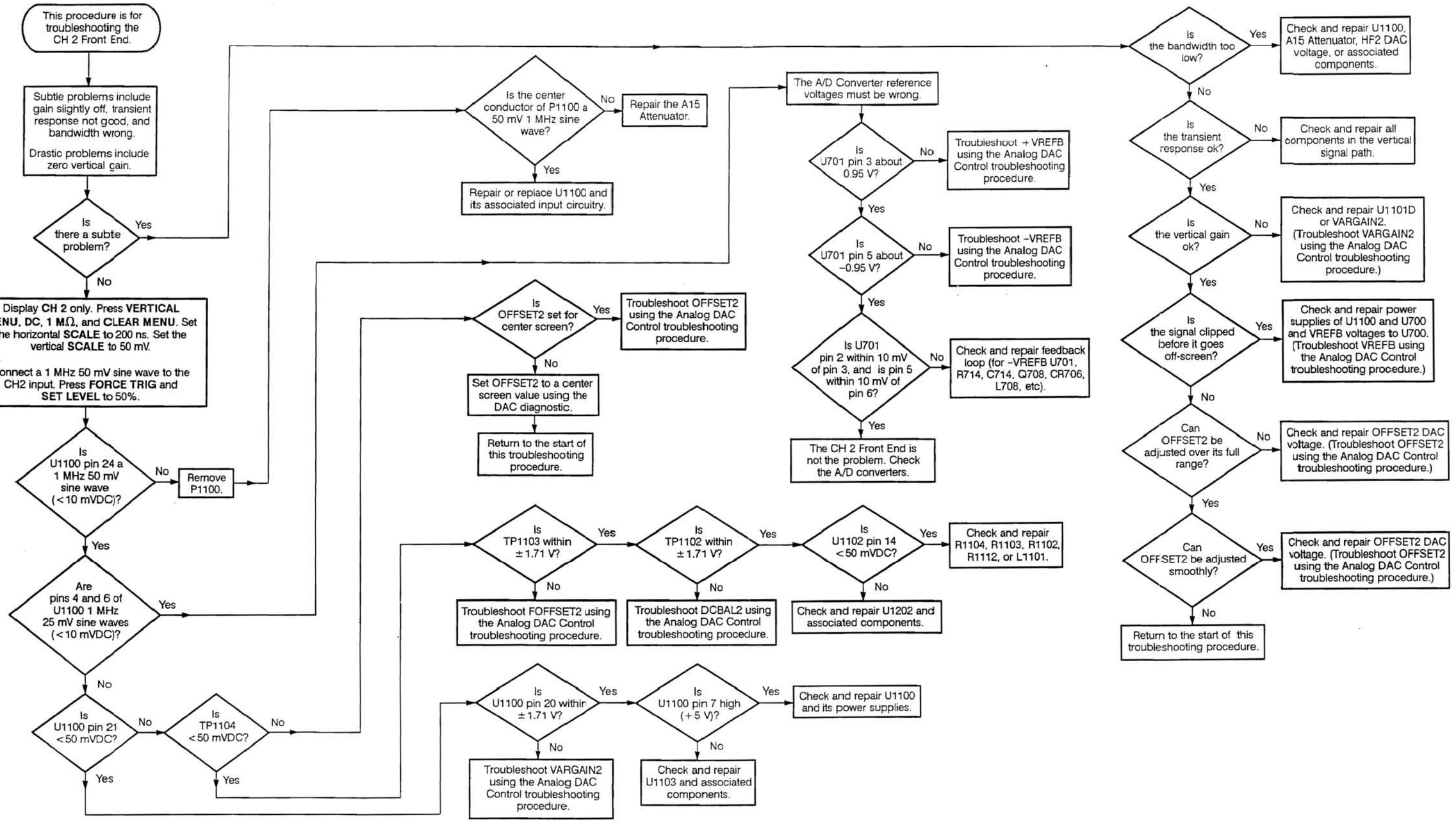


Vol. 2 Figure 9-25: CH 1 Front End Troubleshooting Procedure



Vol. 2 Figure 9-26: CH 2 Front End Troubleshooting Procedure

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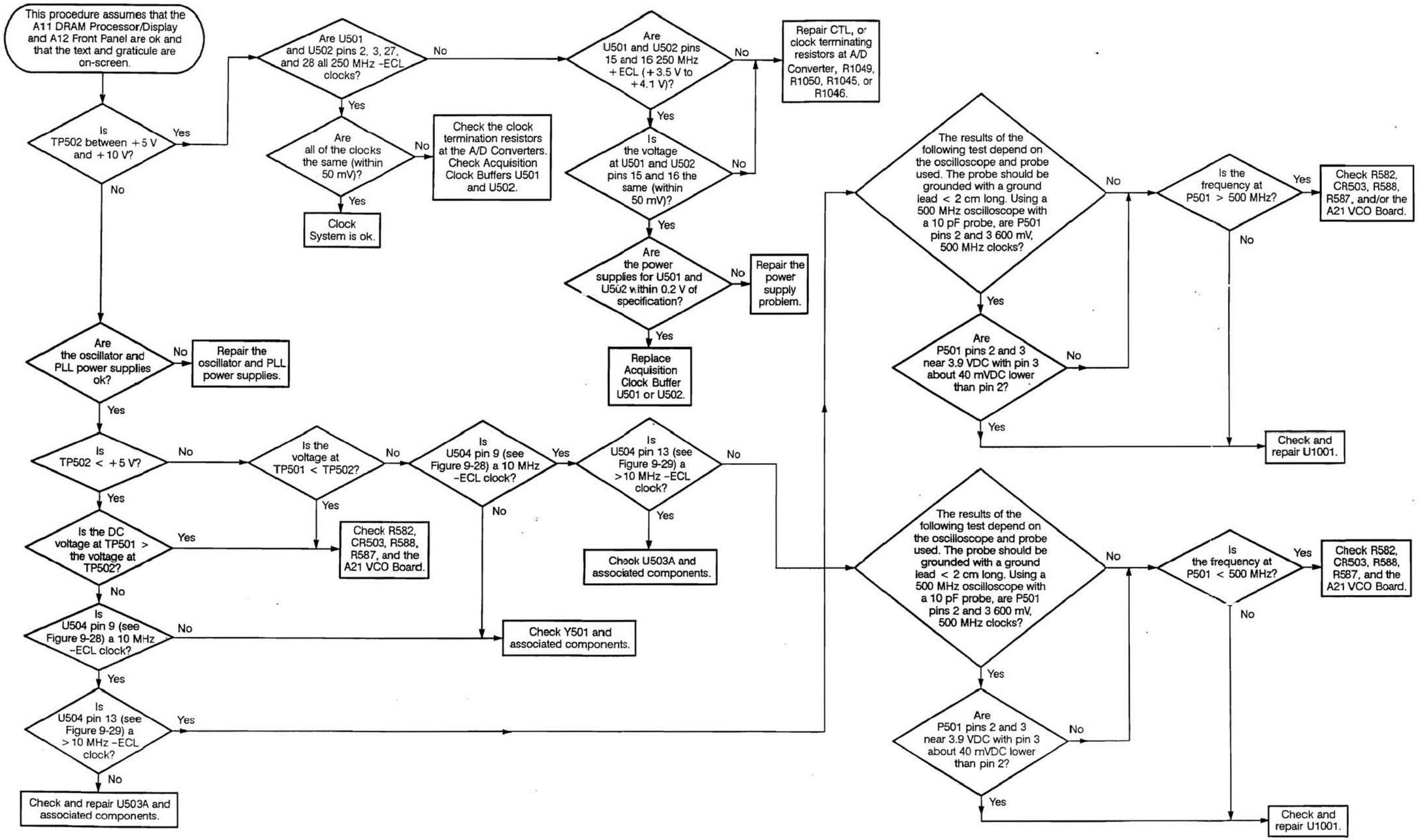
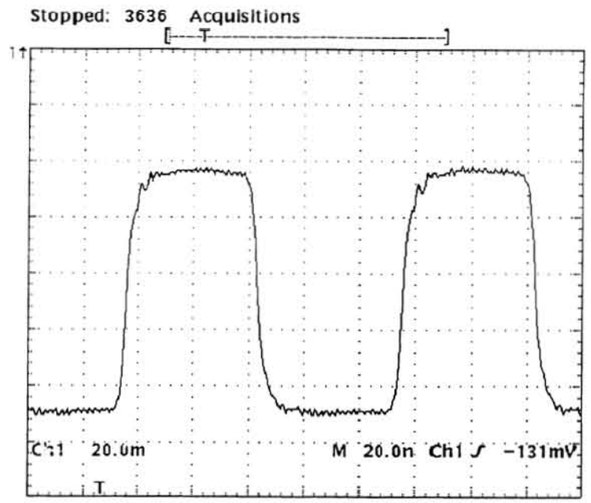
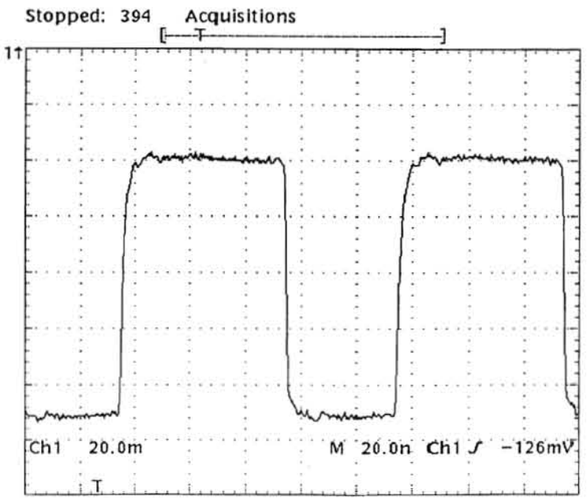
Scans by Artekmedia => 2011



Vol. 2 Figure 9-27: Clock System Troubleshooting Procedure



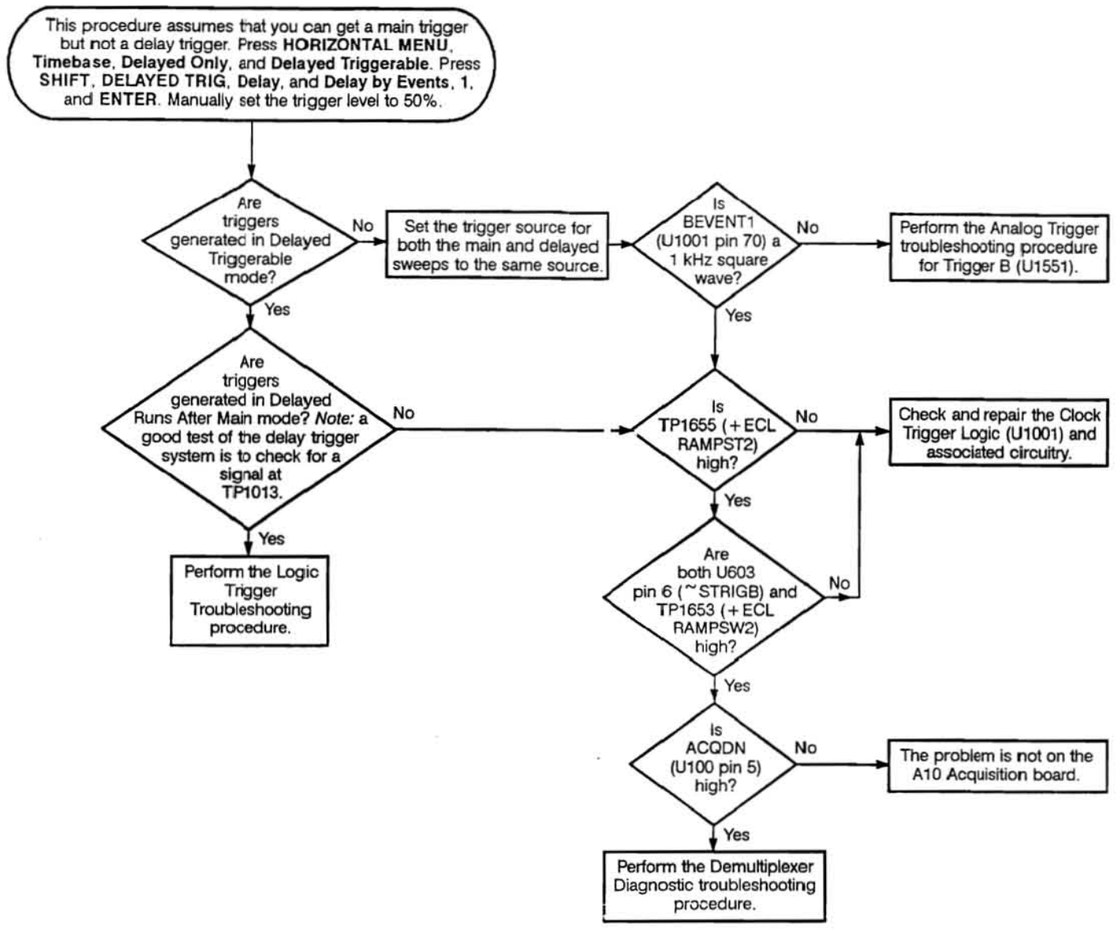
Vol. 2 Figure 9-28: Reference Oscillator (U504 pin 9)



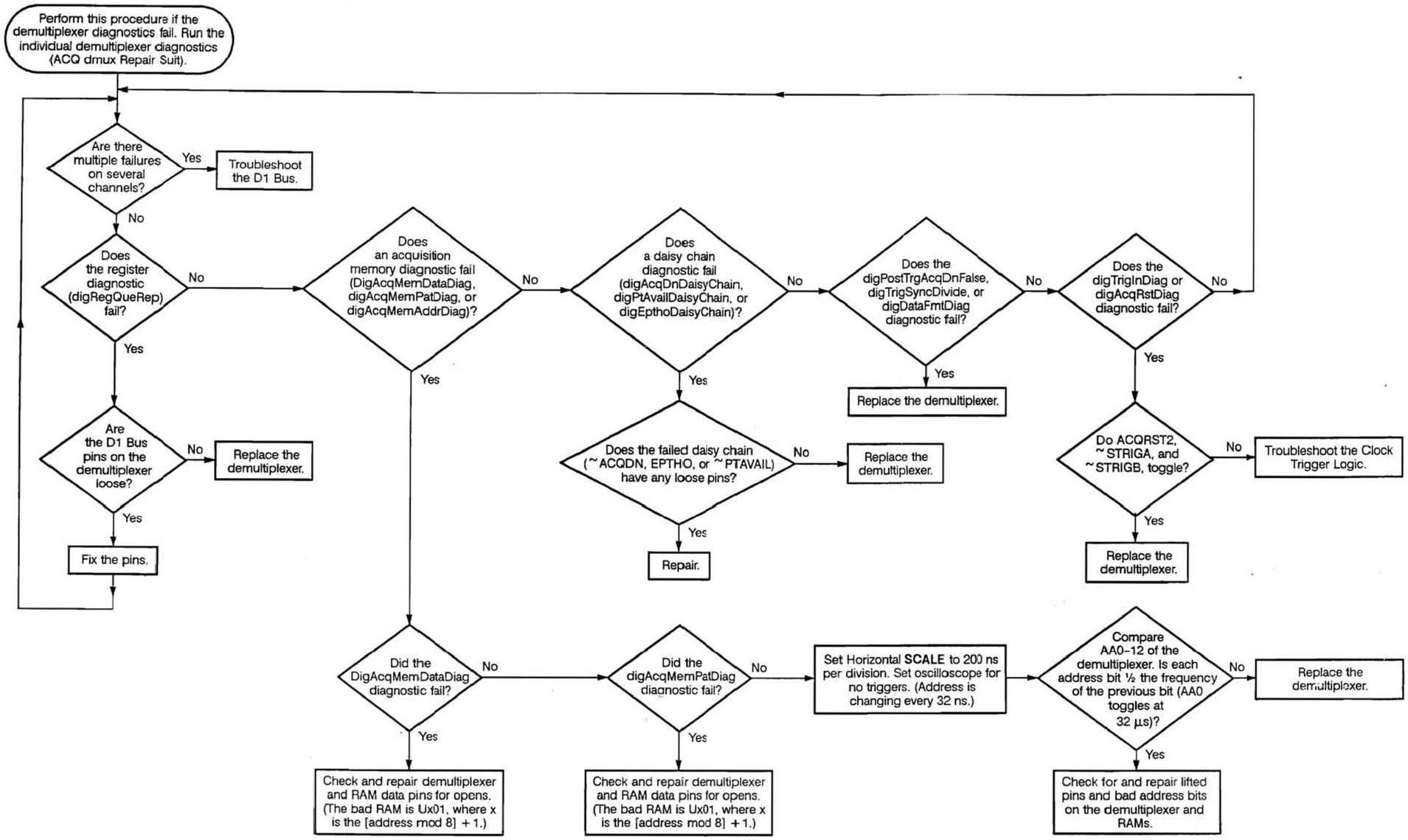
Vol. 2 Figure 9-29: 10 MHz Loopback to the VCO (U504 pin 13). TP514 is the Same Signal, but TTL Levels.

Vol. 2 Figure 9-27: Clock System Troubleshooting Procedure (Cont.)

Scans by Artekmedia => 2011



Vol. 2 Figure 9-30: Delay Trigger Troubleshooting Procedure



Vol. 2 Figure 9-31: Demultiplexer Diagnostic Troubleshooting Procedure

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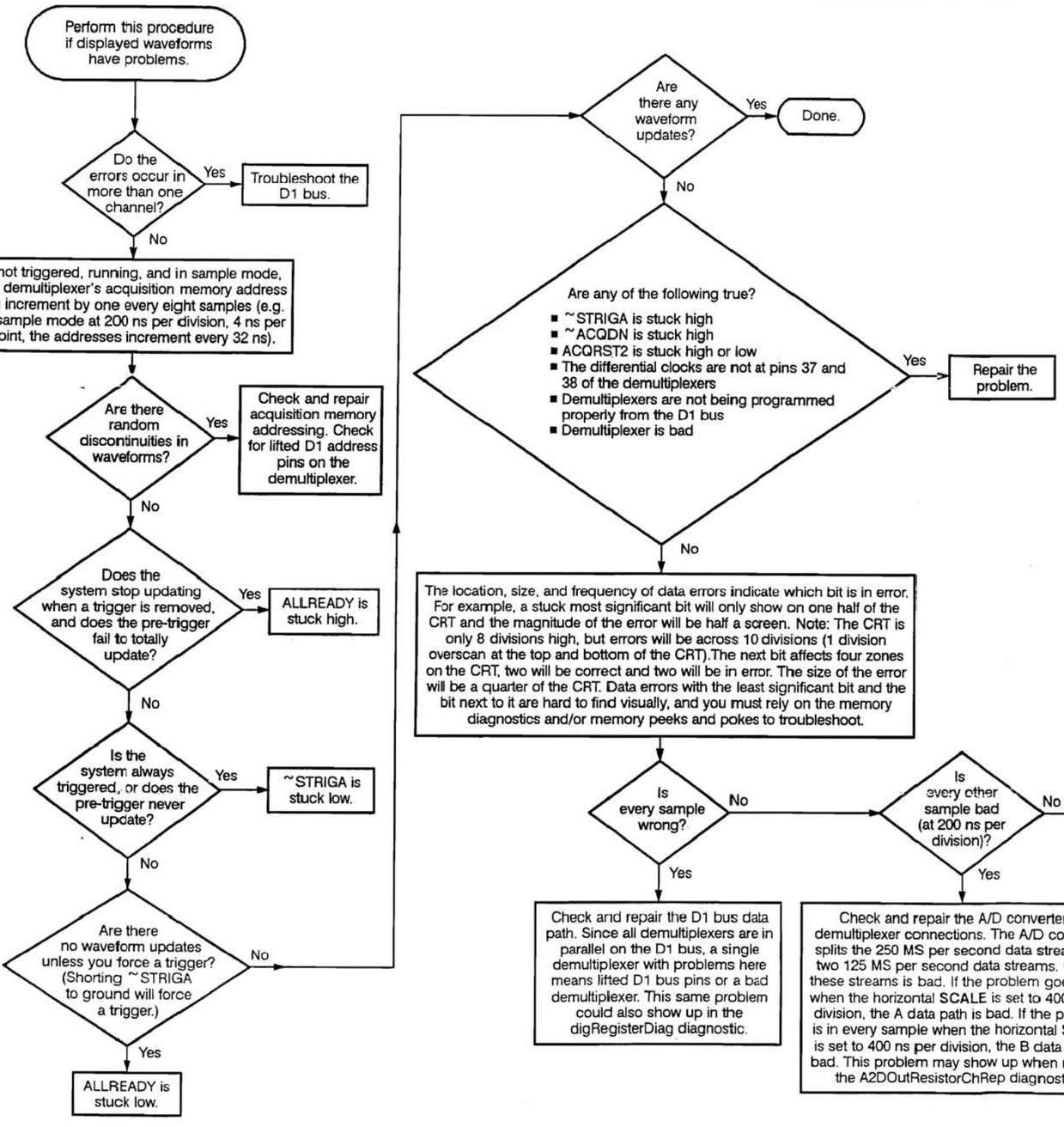


Check and repair the demultiplexer and Acquisition Memory. Set the horizontal **SCALE** to 200 ns per division. Press **SHIFT**, **RUN/STOP**, **Mode**, **Sample**, and **STOP**. In this mode, acquisition memory starting locations as seen by the 68020 are:

CH 1	Demultiplexer A	0x7300000
CH 2	Demultiplexer C	0x7340000
CH 3	Demultiplexer B	0x7380000
CH 4	Demultiplexer D	0x73C0000

There is one sample byte per address, and the data has the following format:

SDDD DDDD 0000 0000

S is the sign bit. It is inverted by the demultiplexer during reads of acquisition memory. That is, if AA00 is written into acquisition memory, 2A00 is read from acquisition memory. D is the remaining seven bits of the eight-bit sample. In this mode the low-order byte is always zero.

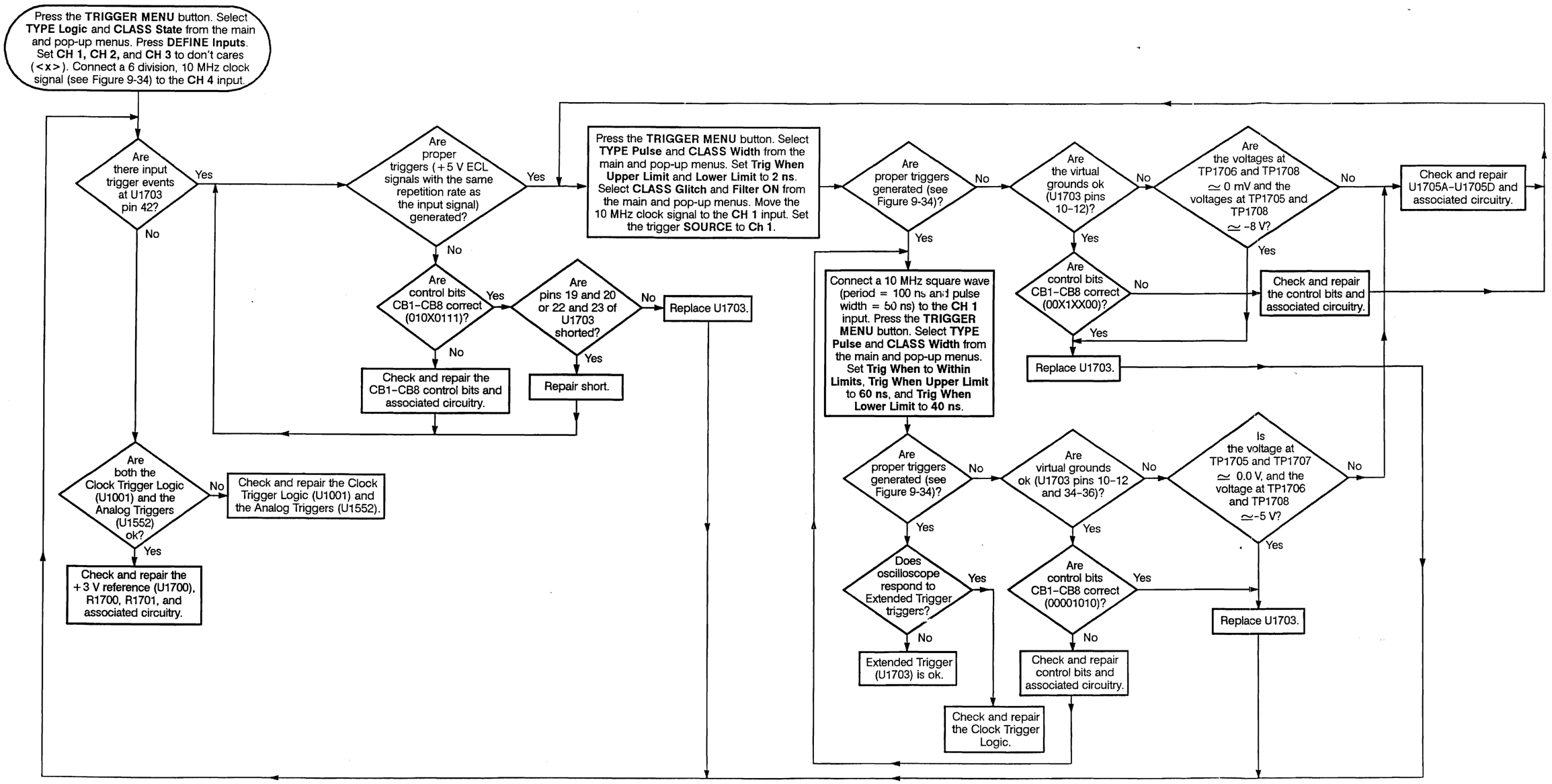
The 68020 address can be converted into the acquisition memory U number:

Hexadecimal:	7	3	X	X	X	X	X
Binary:	0111	0011	DDXX	MMRR	RRRR	RRRR	RUUU

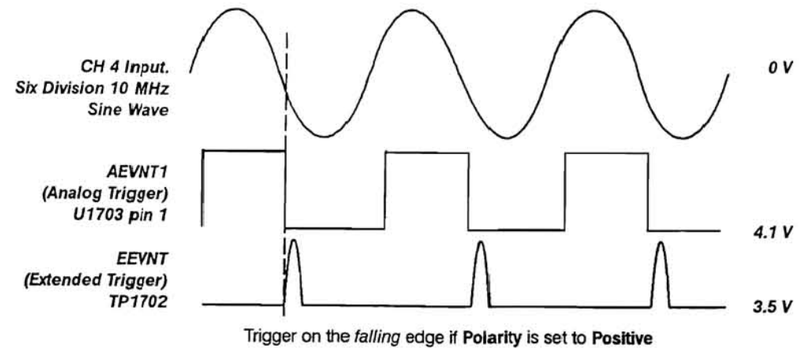
Where:

- 73 hexadecimal indicates an acquisition RAM access
- D indicates the demultiplexer connected to the acquisition RAM
- X are don't care bits
- M Row address bits for Option 1M
- R bits are acquisition memory row address bits
- U indicates which RAM is accessed (RAMs are UX01-UX08). Convert this binary number to decimal and add it to the base U number of this channel's acquisition memory + 1.

Vol. 2 Figure 9-32: Demultiplexer Screen Troubleshooting Procedure



Vol. 2 Figure 9-33: Extended Trigger Troubleshooting Procedure



Vol. 2 Figure 9-34: Glitch Triggering

Vol. 2 Figure 9-33: Extended Trigger Troubleshooting Procedure (Cont.)

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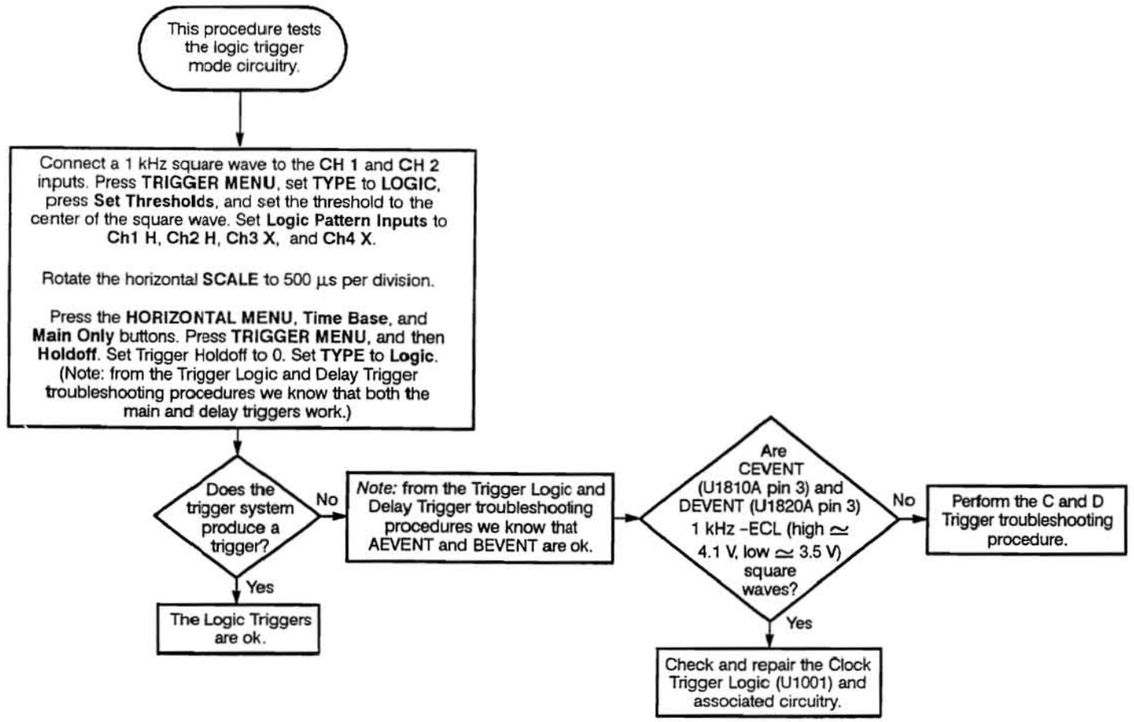
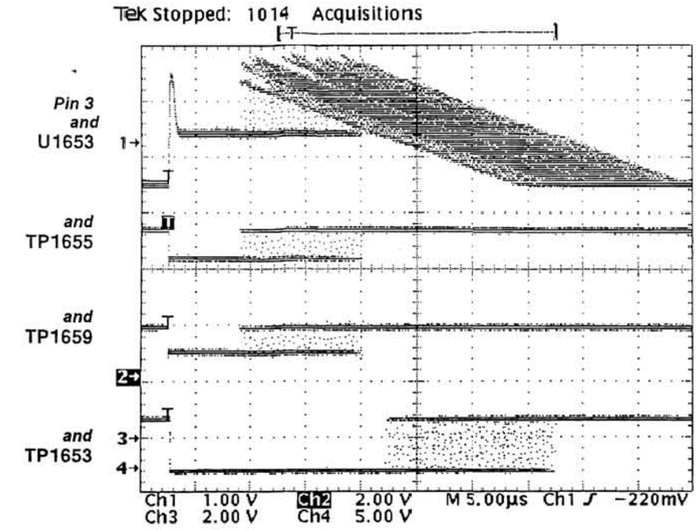
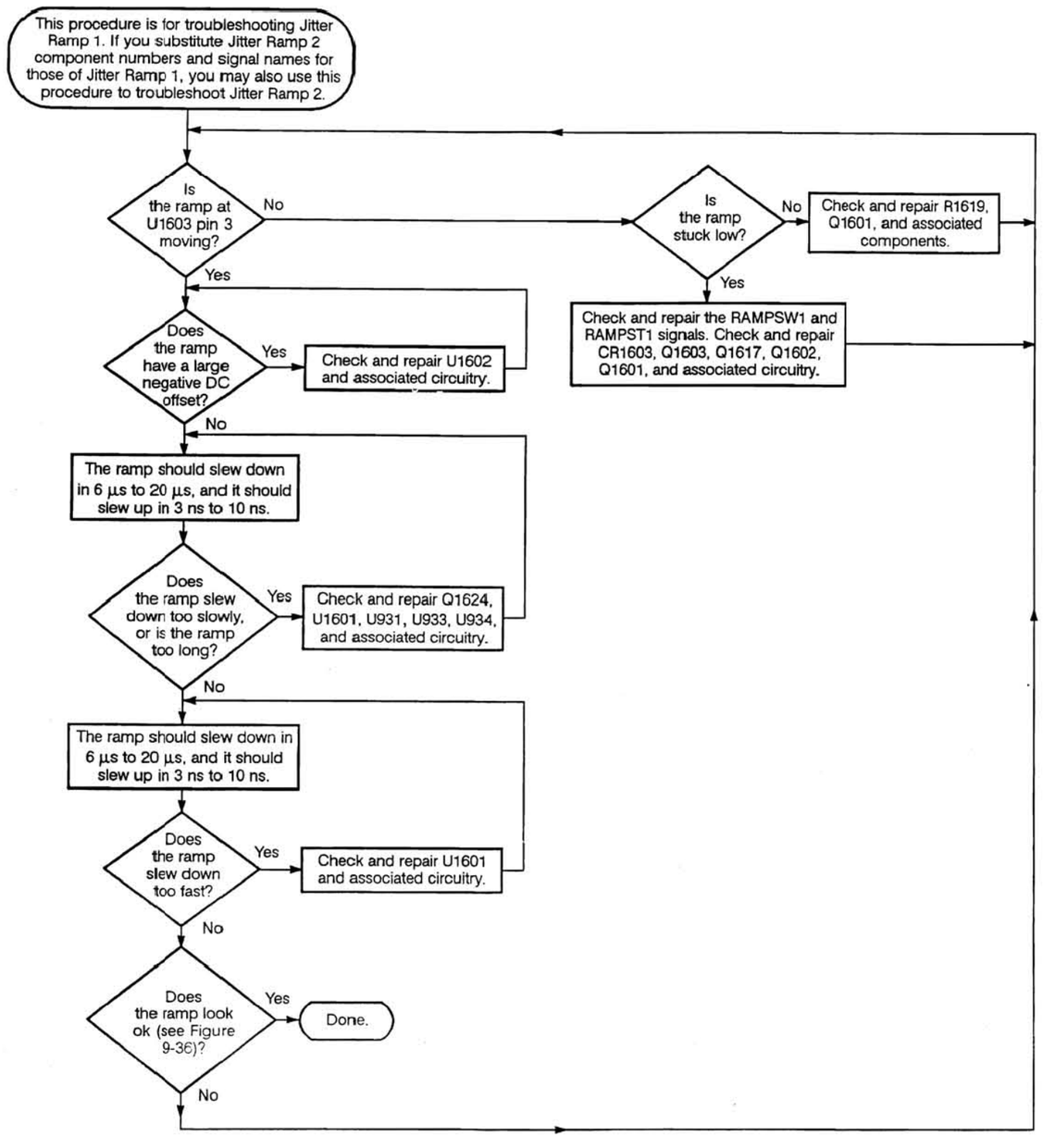
Scans by Artekmedia => 2011



Vol. 2 Figure 9-35: Logic Trigger Troubleshooting Procedure



Vol. 2 Figure 9-36: Time Interpolator Ramps



Vol. 2 Figure 9-37: Time Interpolator Troubleshooting Procedure

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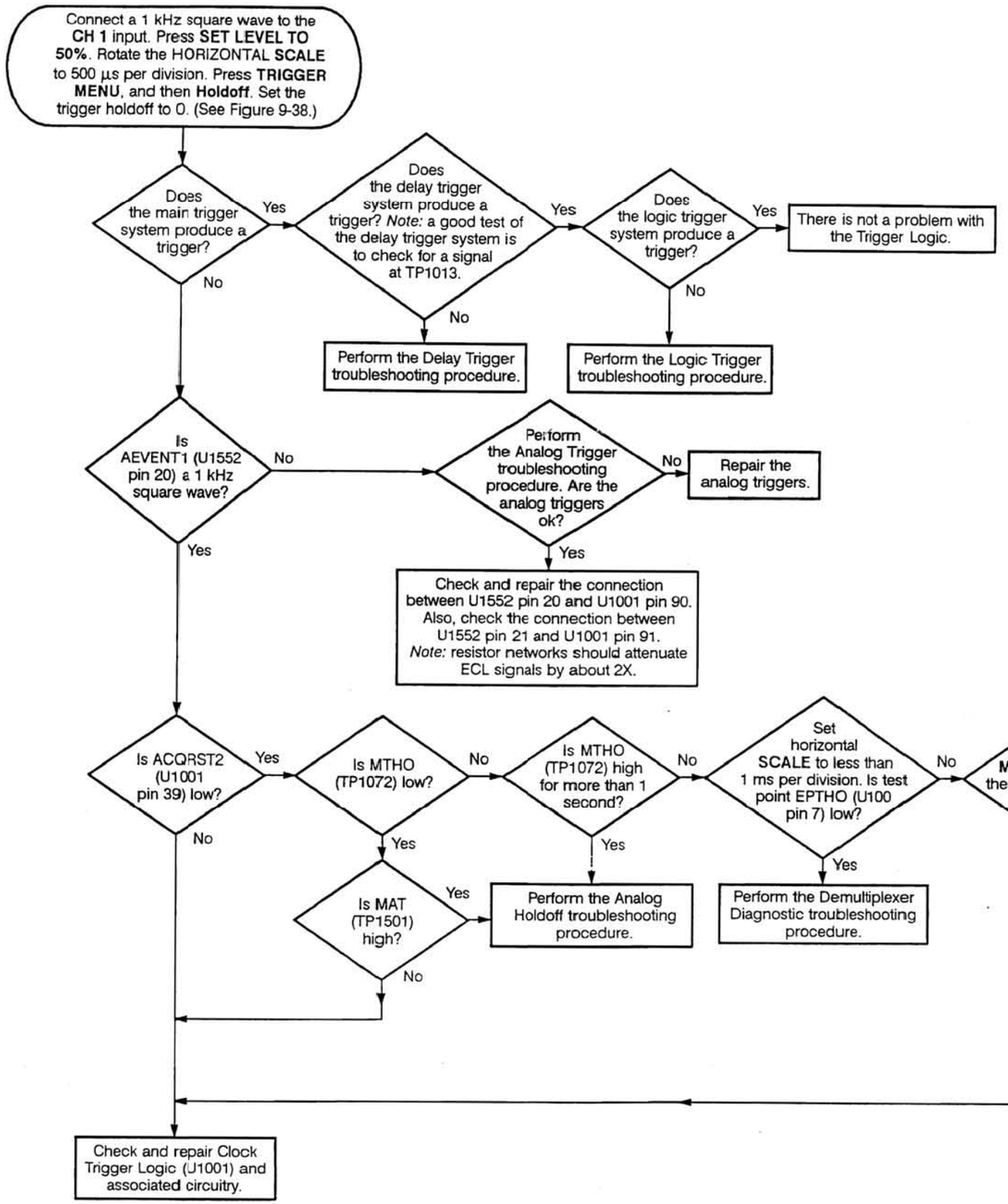
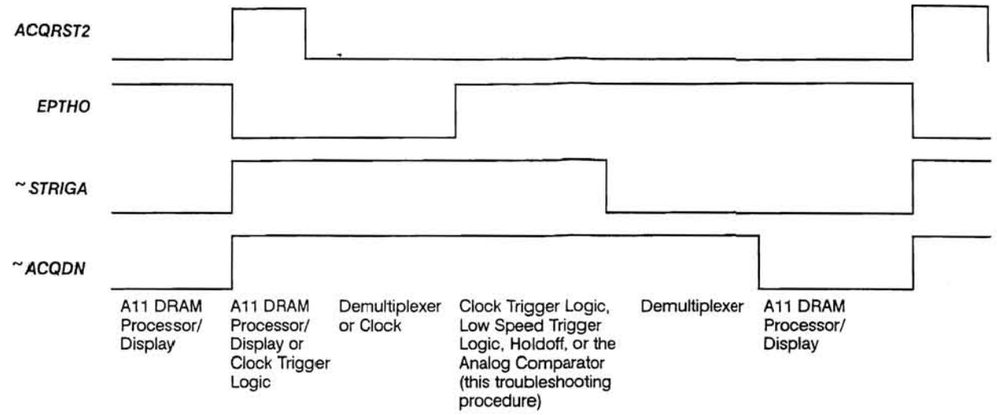
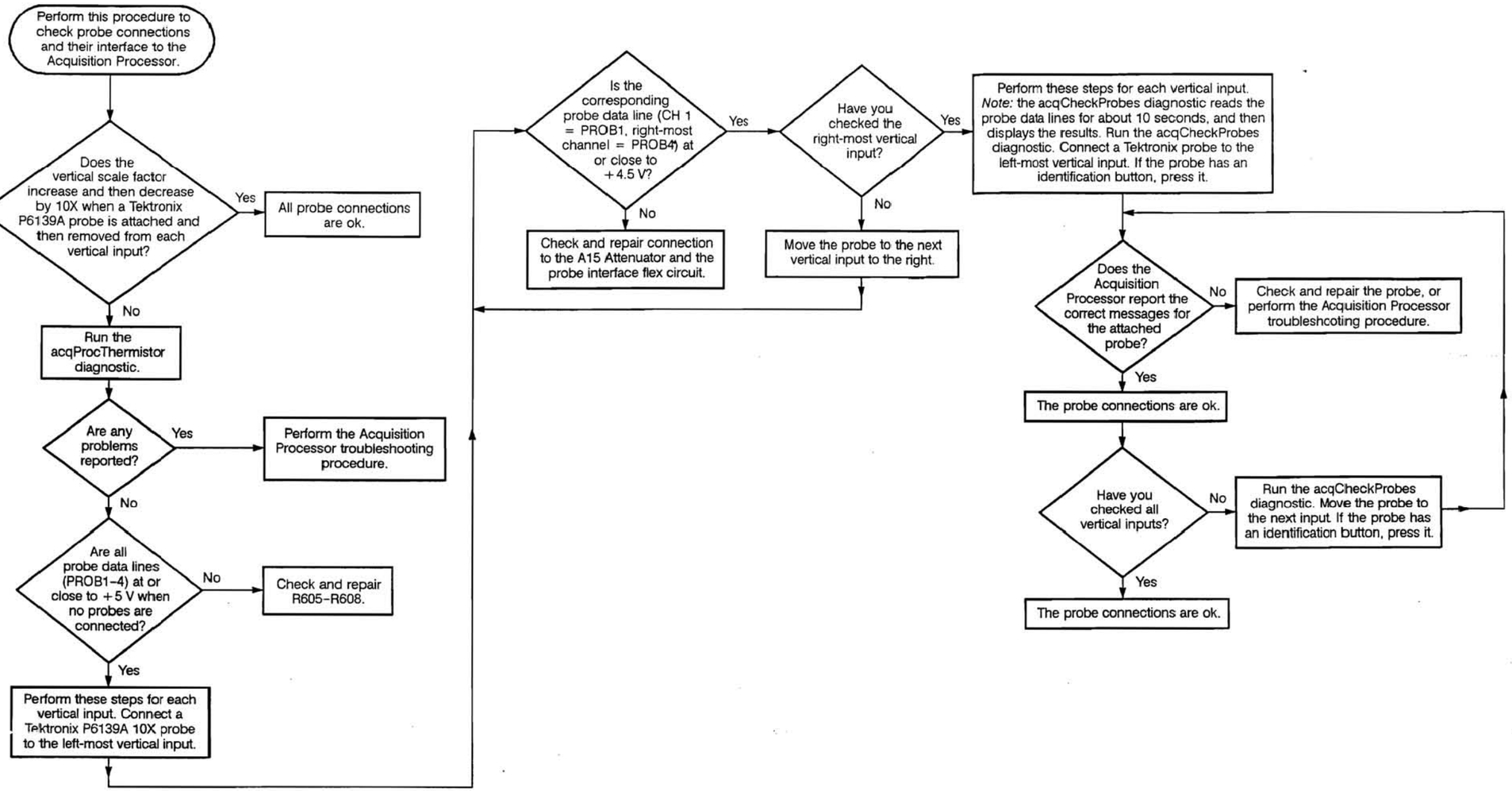
Scans by Artekmedia => 2011



Vol. 2 Figure 9-39: Trigger Logic Troubleshooting Procedure



Vol. 2 Figure 9-38: Trigger Logic Failure Areas



Vol. 2 Figure 9-40: Probe Connection Troubleshooting Procedure

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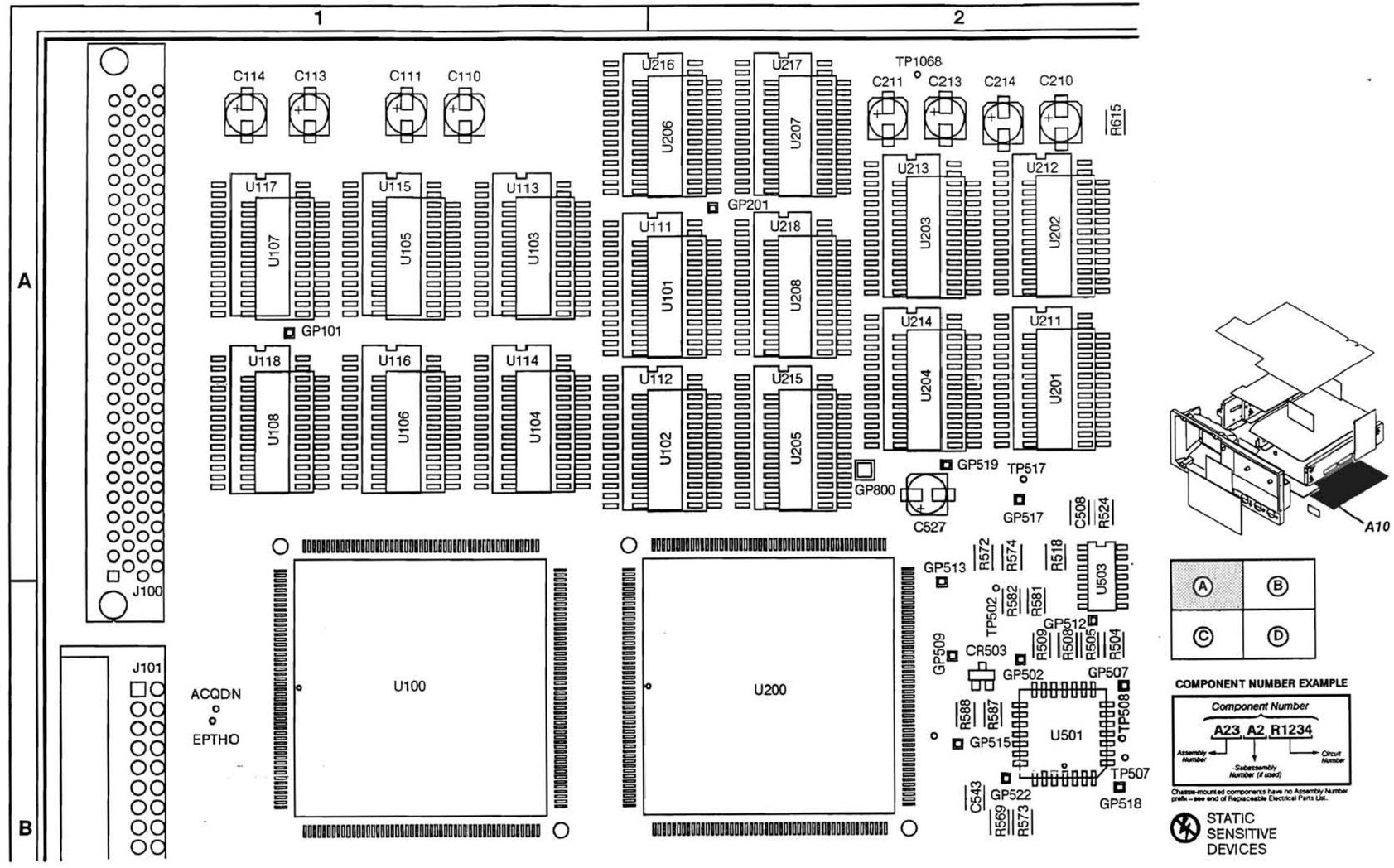
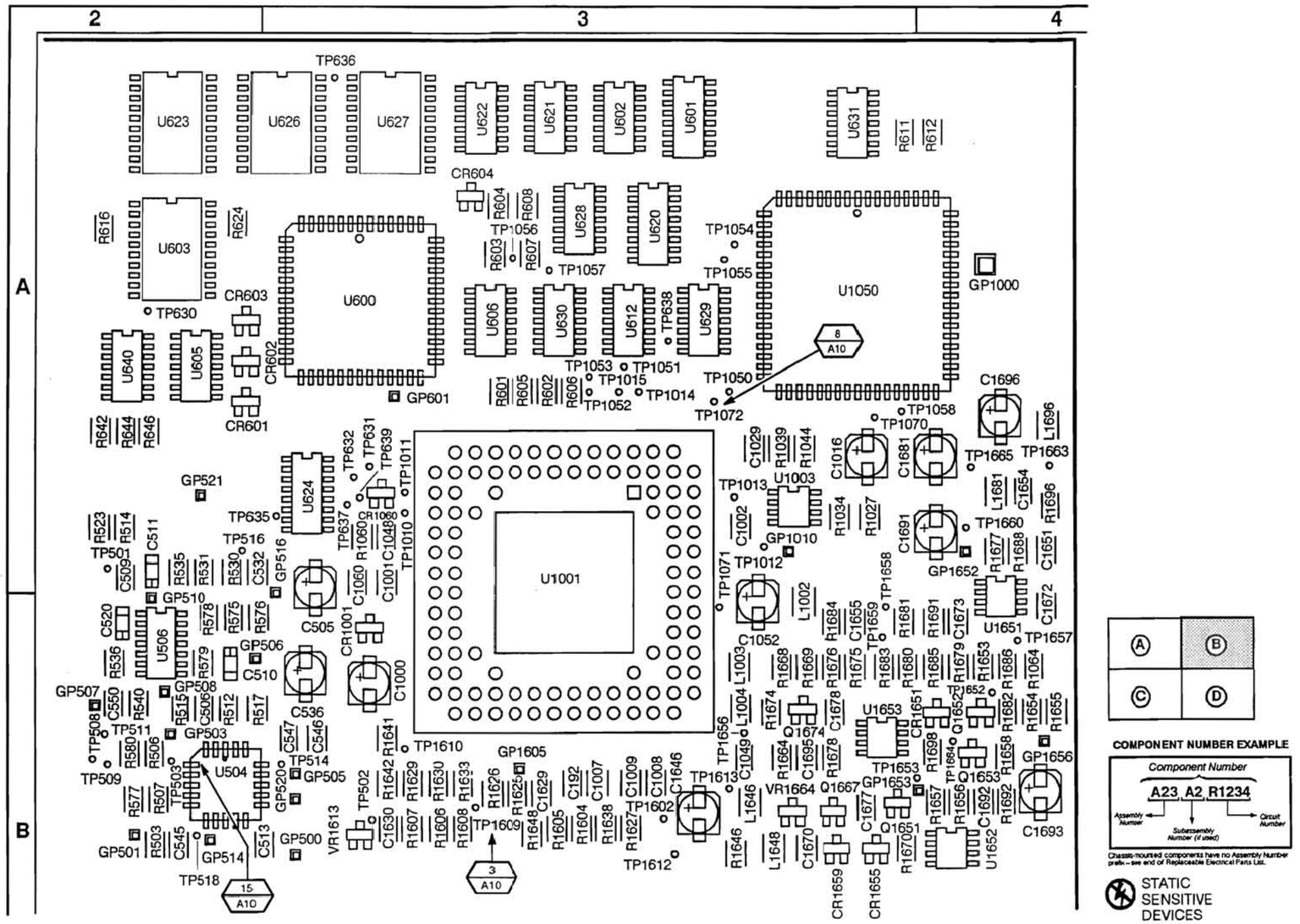
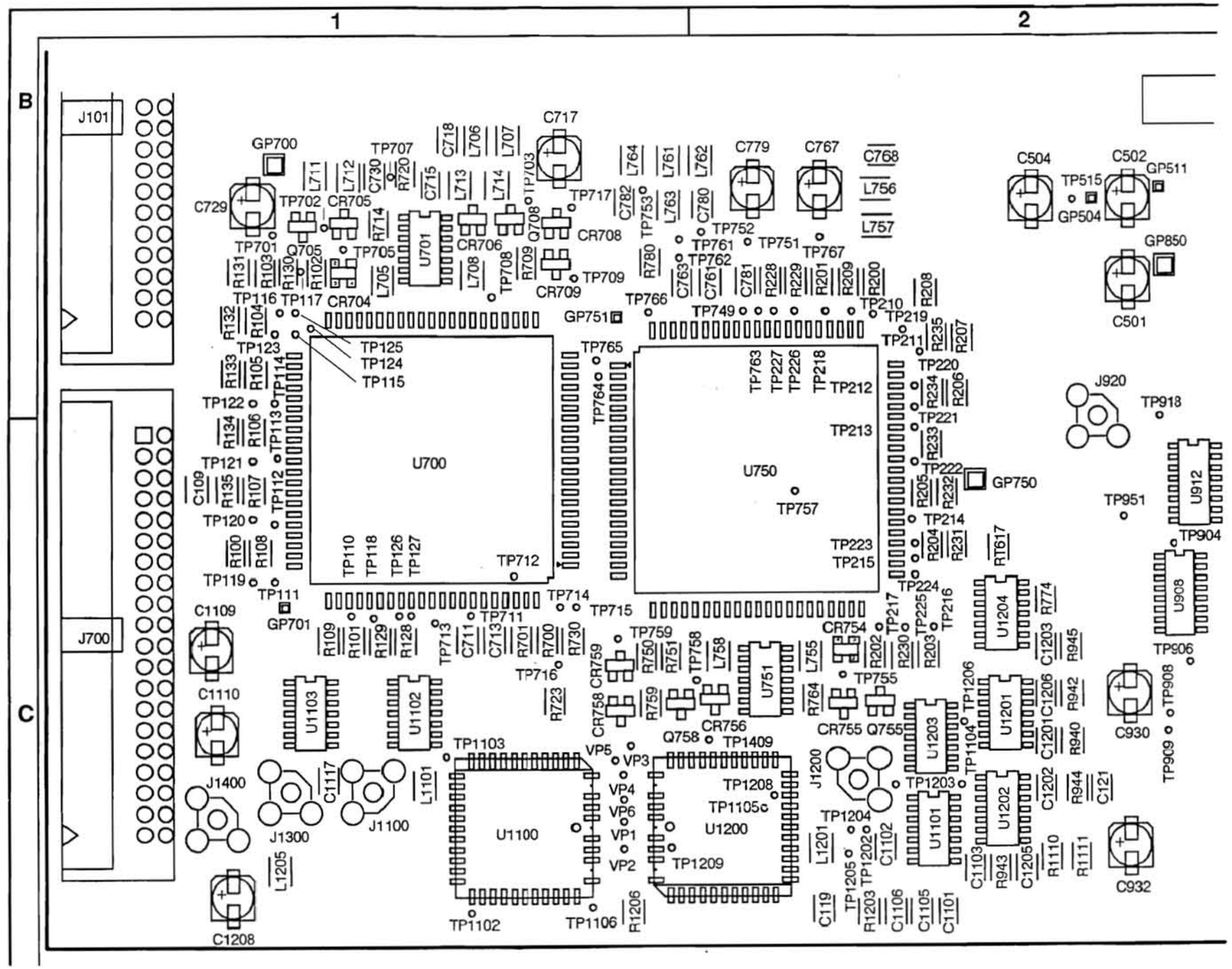


Vol. 2 Figure 9-41: A10 Acquisition Board (Section A, Front)

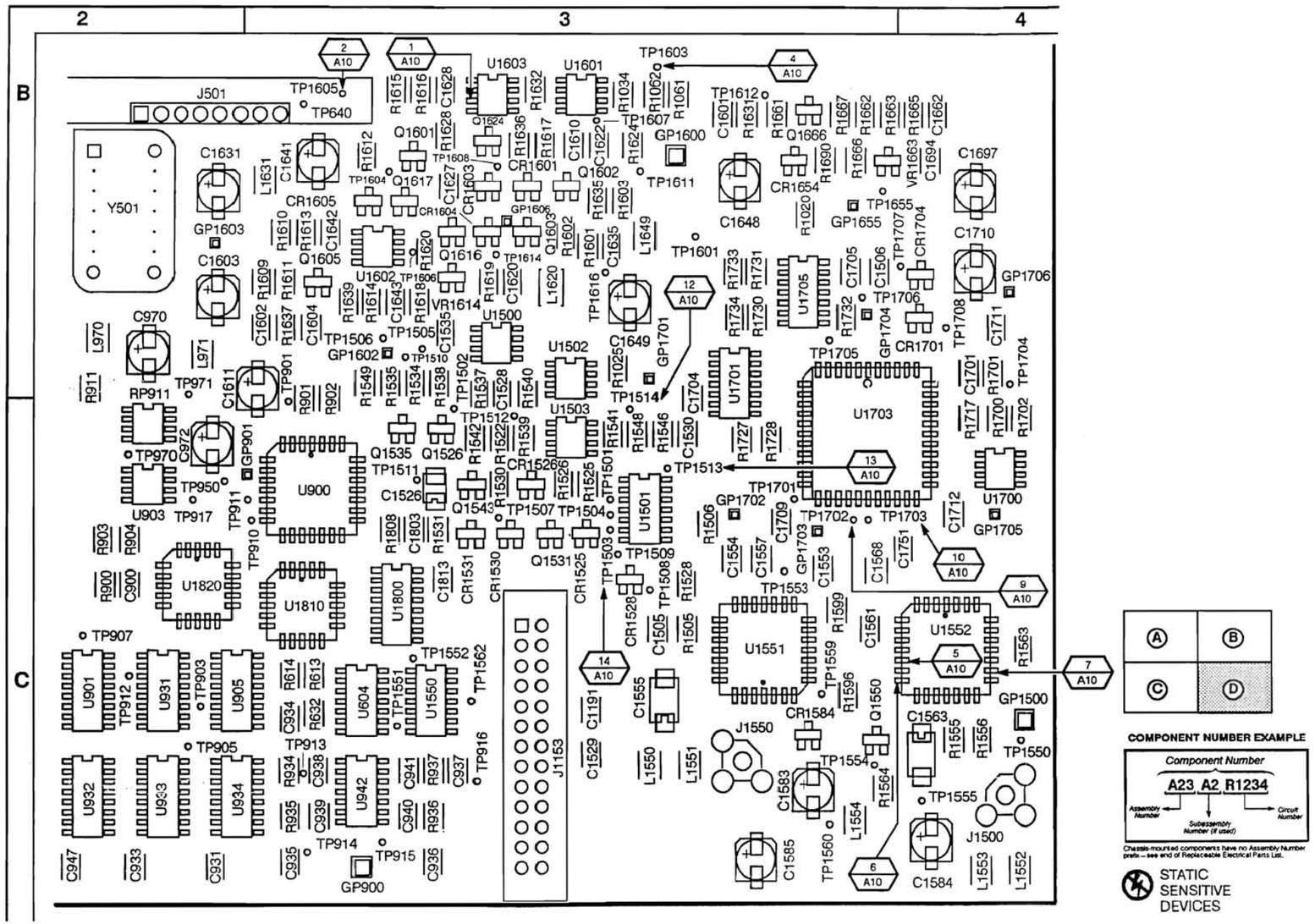


Vol. 2 Figure 9-42: A10 Acquisition Board (Section B, Front)

Scans by Artekmedia => 2011

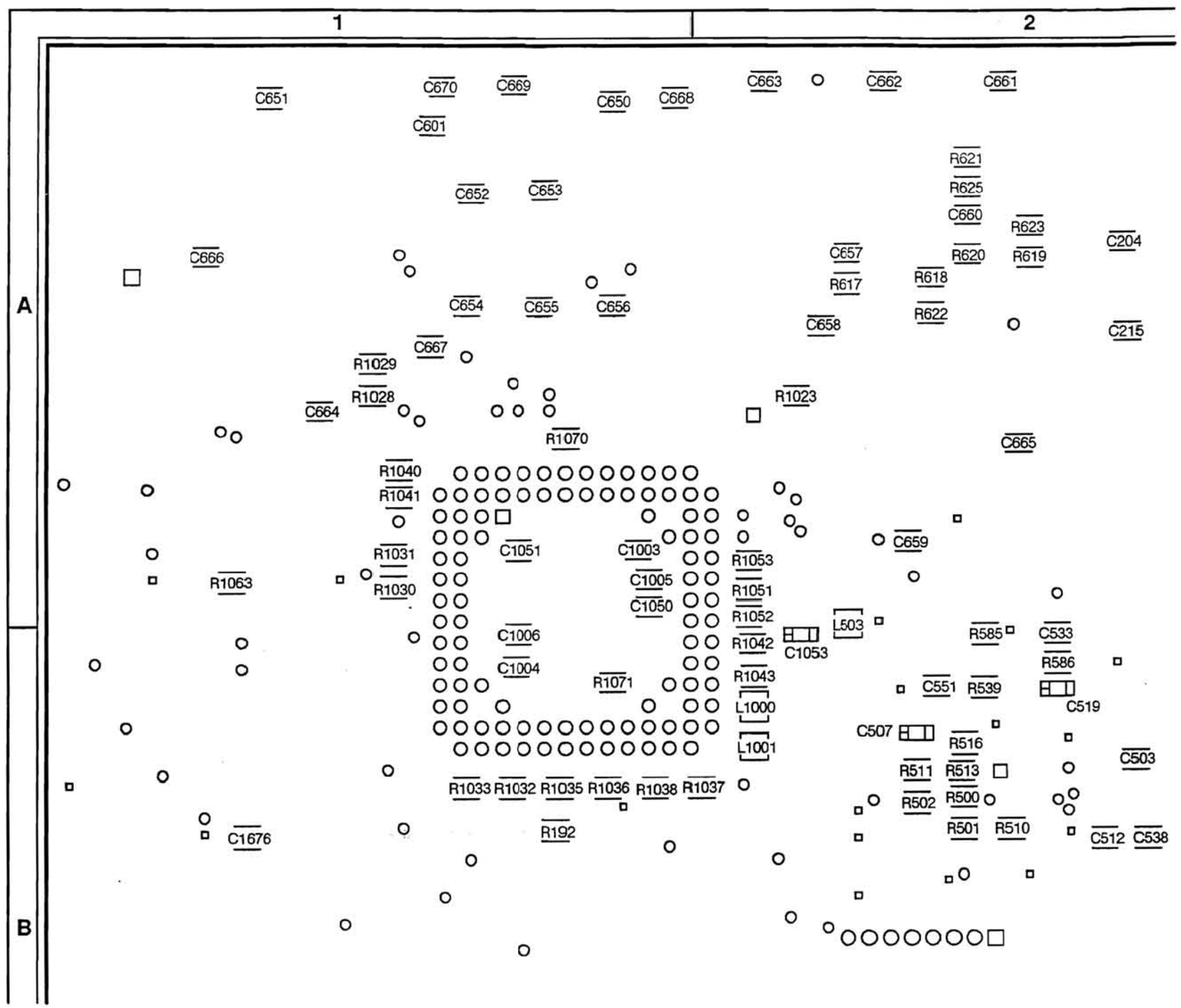


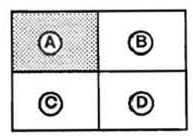
Vol. 2 Figure 9-43: A10 Acquisition Board (Section C, Front)



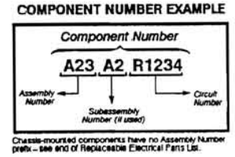
Vol. 2 Figure 9-44: A10 Acquisition Board (Section D, Front)

Scans by Artekmedia => 2011





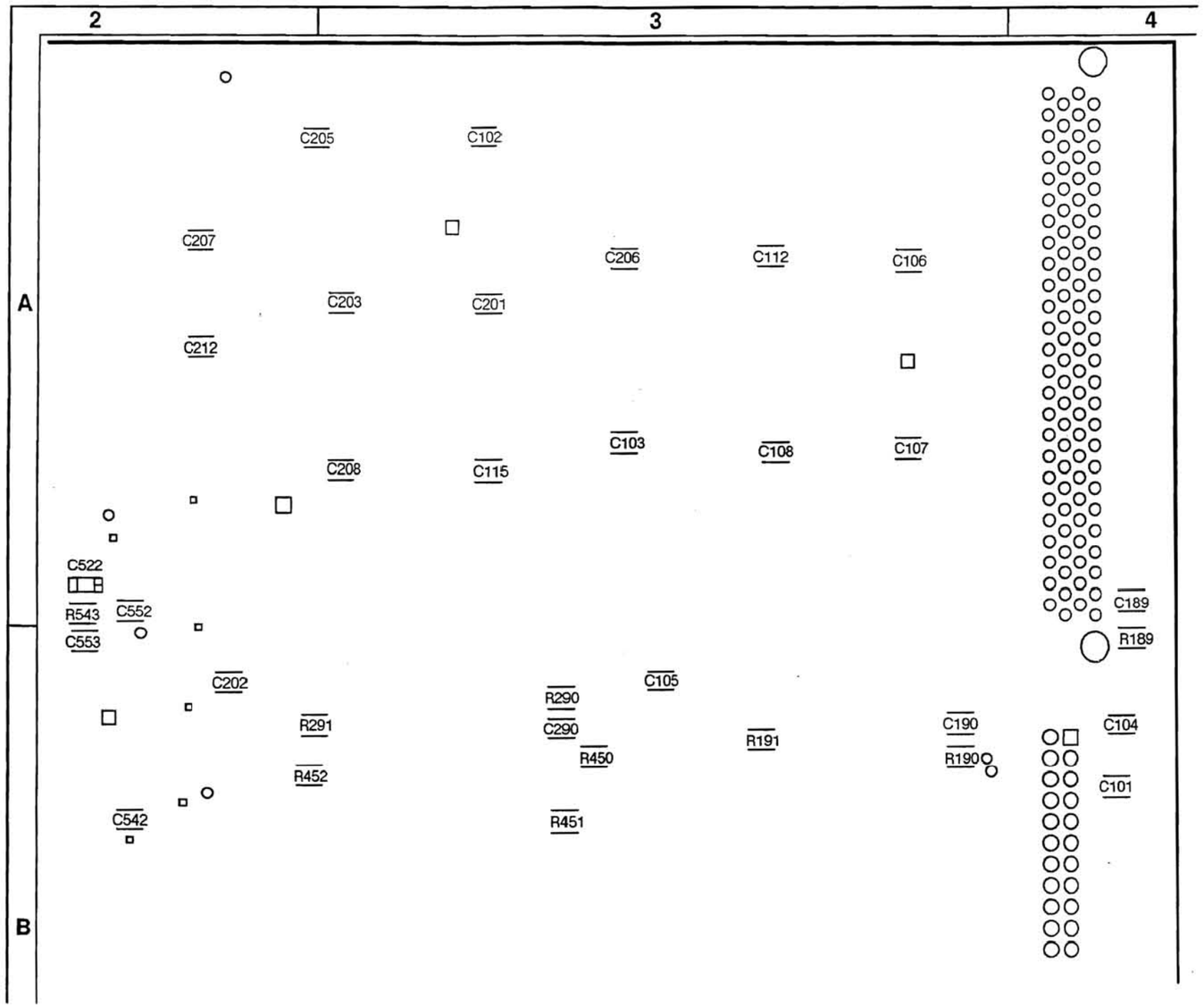
COMPONENT NUMBER EXAMPLE



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

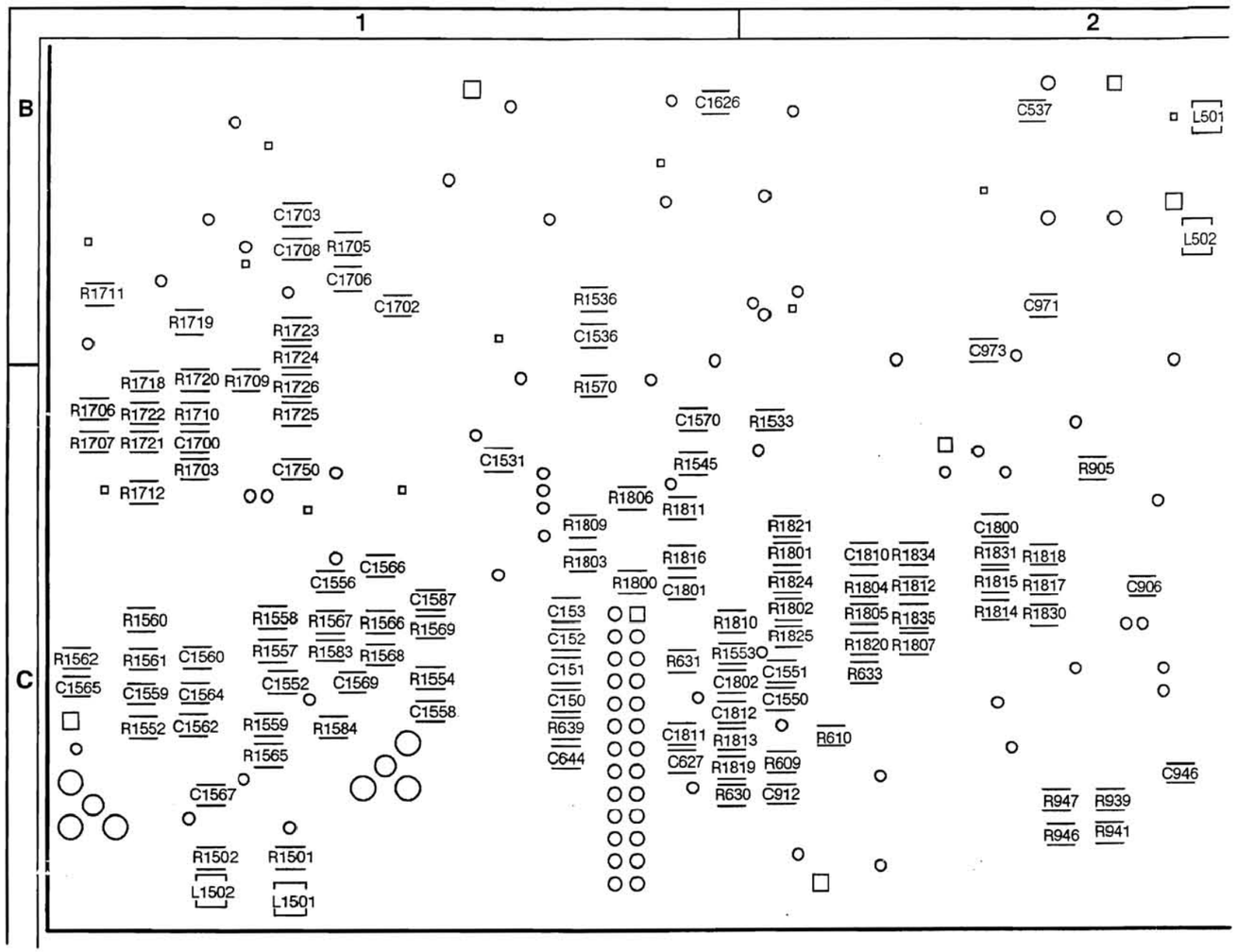
STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-45: A10 Acquisition Board (Section A, Back)

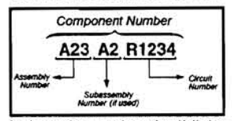


Vol. 2 Figure 9-46: A10 Acquisition Board (Section B, Back)

Scans by Artekmedia => 2011



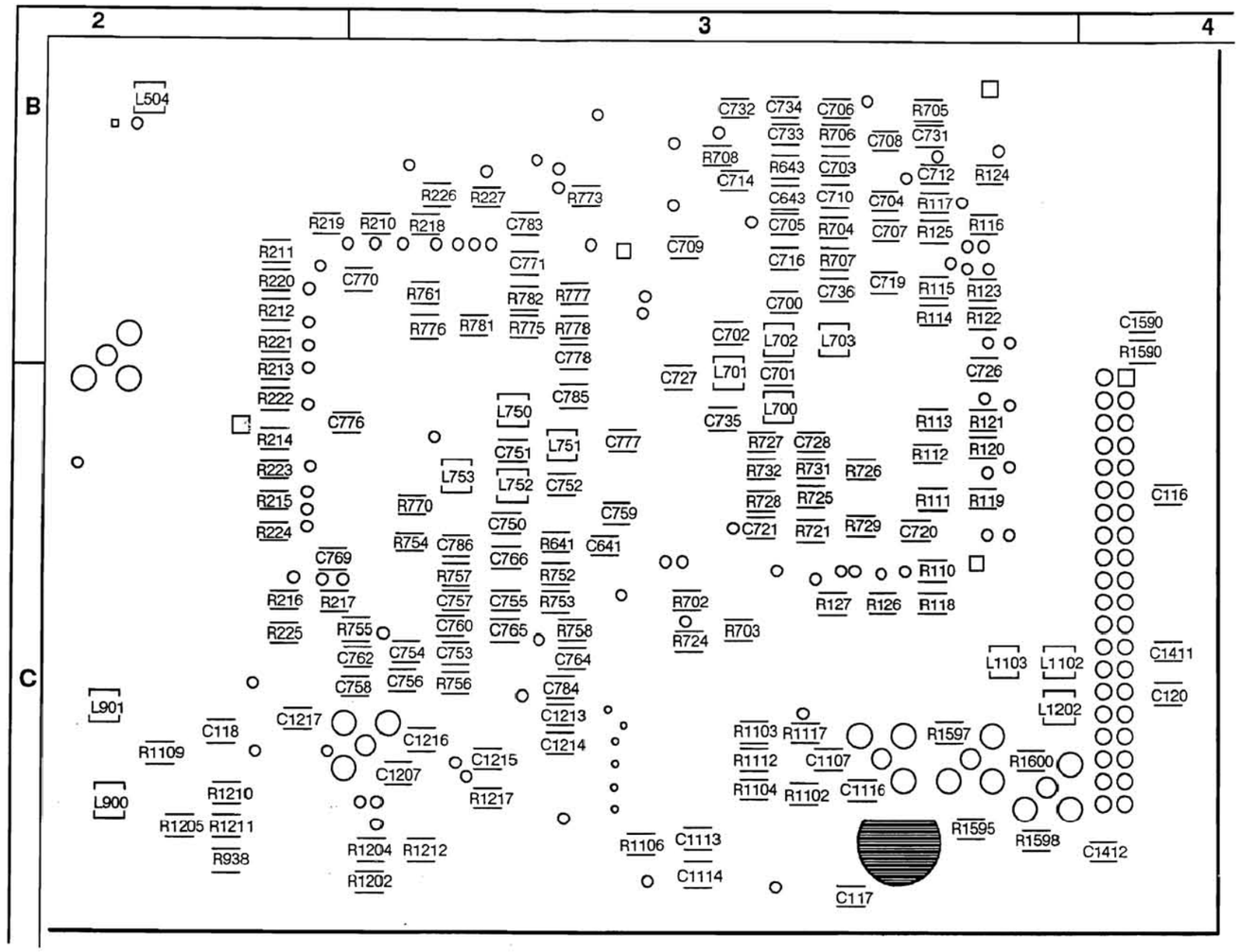
COMPONENT NUMBER EXAMPLE



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

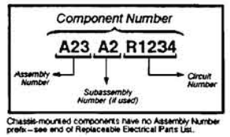
STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-47: A10 Acquisition Board (Section C, Back)



Ⓐ	Ⓑ
Ⓒ	Ⓓ

COMPONENT NUMBER EXAMPLE



STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-48: A10 Acquisition Board (Section D, Back)

Scans by Artekmedia => 2011

A10 Acquisition Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C101*	A10-2	6D	A10	4B	C547	A10-17	6D	A10	3B	C756*	A10-3	1B	A10	3C	C1105	A10-2	4B	A10	2C	C1630	A10-7	6D	A10	3B
C102*	A10-2	6D	A10	3A	C550	A10-14	3B	A10	2B	C757*	A10-3	2C	A10	3C	C1106	A10-2	4B	A10	2C	C1631	A10-7	6D	A10	2B
C103*	A10-2	6D	A10	4A	C551*	A10-14	3C	A10	3B	C758*	A10-3	1C	A10	3C	C1107*	A10-2	3A	A10	4C	C1635	A10-7	2A	A10	3B
C104*	A10-2	6D	A10	4B	C552*	A10-14	3D	A10	3B	C759*	A10-3	2C	A10	4C	C1109	A10-1	3D	A10	1C	C1641	A10-7	5B	A10	3B
C105*	A10-2	6D	A10	4B	C553*	A10-14	2D	A10	3B	C760*	A10-3	1C	A10	3C	C1110	A10-2	1D	A10	1C	C1642	A10-7	2D	A10	3B
C106*	A10-2	6D	A10	4A	C601*	A10-13	2B	A10	2A	C761	A10-3	2D	A10	2B	C1113*	A10-2	6B	A10	4C	C1643	A10-7	3D	A10	3B
C107*	A10-2	6D	A10	4A	C627*	A10-11	4C	A10	2C	C762*	A10-3	2B	A10	3C	C1114*	A10-2	6A	A10	4C	C1646	A10-7	5C	A10	3B
C108*	A10-2	6D	A10	4A	C641*	A10-3	2B	A10	4C	C763	A10-3	3D	A10	2B	C1116*	A10-2	2A	A10	4C	C1648	A10-17	5D	A10	3B
C109	A10-17	5D	A10	1C	C643*	A10-4	2B	A10	4B	C764*	A10-3	2C	A10	4C	C1117	A10-2	2A	A10	1C	C1649	A10-17	5C	A10	3B
C110	A10-2	5D	A10	1A	C644*	A10-13	2C	A10	2C	C765*	A10-3	1D	A10	3C	C1201	A10-1	2B	A10	2C	C1651	A10-8	6D	A10	4A
C111	A10-2	5D	A10	1A	C650*	A10-17	5A	A10	2A	C766*	A10-3	5D	A10	3C	C1202	A10-1	2B	A10	2C	C1654	A10-8	6D	A10	4A
C112*	A10-2	6D	A10	4A	C651*	A10-17	5A	A10	2A	C767	A10-3	5D	A10	2B	C1203	A10-1	2B	A10	2C	C1655	A10-17	6C	A10	3B
C113	A10-2	5D	A10	1A	C652*	A10-17	5A	A10	2A	C768	A10-3	5D	A10	2B	C1205	A10-1	4B	A10	2C	C1662	A10-8	5D	A10	4B
C114	A10-2	5D	A10	1A	C653*	A10-17	5A	A10	2A	C769*	A10-3	6D	A10	3C	C1206	A10-1	4B	A10	2C	C1670	A10-17	6C	A10	3B
C115*	A10-2	6D	A10	3A	C654*	A10-17	5A	A10	2A	C770*	A10-3	6D	A10	3B	C1207*	A10-1	3A	A10	3C	C1672	A10-8	3C	A10	4B
C116*	A10-17	3C	A10	4C	C655*	A10-17	6A	A10	2A	C771*	A10-3	6D	A10	4B	C1208	A10-1	1D	A10	1C	C1673	A10-17	5D	A10	4B
C117*	A10-17	3C	A10	4C	C656*	A10-17	6A	A10	2A	C776*	A10-3	5D	A10	3C	C1213*	A10-1	5B	A10	4C	C1676*	A10-8	4B	A10	2B
C118*	A10-17	4C	A10	3C	C657*	A10-17	6A	A10	2A	C777*	A10-3	6D	A10	4C	C1214*	A10-1	5A	A10	4C	C1677	A10-8	4B	A10	3B
C119	A10-17	4C	A10	2C	C658*	A10-17	5A	A10	2A	C778*	A10-3	6D	A10	4C	C1215*	A10-1	1D	A10	3C	C1678	A10-8	4B	A10	3B
C120*	A10-17	5C	A10	4C	C659*	A10-17	5A	A10	3A	C779	A10-3	5D	A10	2B	C1216*	A10-1	2A	A10	3C	C1681	A10-8	5D	A10	3A
C121	A10-17	5C	A10	2C	C660*	A10-17	5A	A10	3A	C780	A10-3	5D	A10	2B	C1217*	A10-1	2A	A10	3C	C1691	A10-8	5B	A10	3A
C150*	A10-11	4B	A10	2C	C661*	A10-17	5A	A10	3A	C781	A10-3	5D	A10	2B	C1411*	A10-1	2D	A10	4C	C1692	A10-8	6D	A10	4B
C151*	A10-11	4B	A10	2C	C662*	A10-17	5A	A10	3A	C782	A10-3	6D	A10	1B	C1412*	A10-2	1D	A10	4C	C1693	A10-8	6D	A10	4B
C152*	A10-11	4B	A10	2C	C663*	A10-17	6A	A10	2A	C783*	A10-3	5D	A10	4B	C1505	A10-12	2D	A10	3C	C1694	A10-8	2D	A10	4B
C153*	A10-11	4C	A10	2C	C664*	A10-17	6A	A10	2A	C784*	A10-3	6D	A10	4C	C1506	A10-12	2D	A10	3B	C1695	A10-8	3D	A10	3B
C189*	A10-12	3B	A10	4A	C665*	A10-17	5A	A10	3A	C785*	A10-3	2D	A10	4C	C1526	A10-12	3C	A10	3C	C1696	A10-8	5C	A10	4A
C190*	A10-6	1C	A10	4B	C666*	A10-17	5A	A10	2A	C786*	A10-3	3C	A10	3C	C1528	A10-12	3C	A10	3C	C1697	A10-8	5D	A10	4B
C191	A10-16	2B	A10	3C	C667*	A10-17	5A	A10	2A	C900	A10-12	2B	A10	2C	C1529	A10-15	3C	A10	3C	C1700*	A10-11	2A	A10	2C
C192	A10-10	6C	A10	3B	C668*	A10-17	5A	A10	2A	C906*	A10-12	3A	A10	3C	C1530	A10-17	4D	A10	3C	C1701	A10-17	4D	A10	4C
C201*	A10-1	5D	A10	3A	C669*	A10-17	5A	A10	2A	C912*	A10-12	5B	A10	2C	C1531*	A10-17	6A	A10	2C	C1702*	A10-17	4D	A10	2B
C202*	A10-1	6D	A10	3B	C670*	A10-17	6A	A10	2A	C930	A10-17	5C	A10	2C	C1535	A10-12	1D	A10	3B	C1703*	A10-11	2C	A10	2B
C203*	A10-1	6D	A10	3A	C700*	A10-4	5A	A10	4B	C931	A10-17	5C	A10	2C	C1536*	A10-12	3D	A10	2B	C1704	A10-11	1C	A10	3B
C204*	A10-1	6D	A10	3A	C701*	A10-4	4A	A10	4C	C932	A10-17	3D	A10	2C	C1550*	A10-9	1C	A10	2C	C1705	A10-11	1D	A10	3B
C205*	A10-1	6D	A10	3A	C702*	A10-4	4A	A10	4B	C933	A10-17	4D	A10	2C	C1551*	A10-9	4C	A10	2C	C1706*	A10-11	1C	A10	2B
C206*	A10-1	6D	A10	4A	C703*	A10-4	2B	A10	4B	C934	A10-13	5C	A10	3C	C1552*	A10-17	5C	A10	2C	C1708*	A10-11	1D	A10	2B
C207*	A10-1	6D	A10	3A	C704*	A10-4	2B	A10	4B	C935	A10-13	5C	A10	3C	C1553	A10-17	4D	A10	3C	C1709	A10-11	3D	A10	3C
C208*	A10-1	6D	A10	3A	C705*	A10-4	2B	A10	4B	C936	A10-13	5C	A10	3C	C1554	A10-9	5C	A10	3C	C1710	A10-11	2A	A10	4B
C210	A10-1	5D	A10	2A	C706*	A10-4	1B	A10	4B	C937	A10-13	5D	A10	3C	C1555	A10-9	5B	A10	3C	C1711	A10-9	3B	A10	4B
C211	A10-1	5D	A10	2A	C707*	A10-4	2C	A10	4B	C938	A10-13	5C	A10	3C	C1556*	A10-9	5B	A10	2C	C1712	A10-9	6B	A10	4C
C212*	A10-1	6D	A10	3A	C708*	A10-4	1C	A10	4B	C939	A10-13	5C	A10	3C	C1557	A10-9	5C	A10	3C	C1750*	A10-11	3D	A10	2C
C213	A10-1	5D	A10	2A	C709*	A10-4	2C	A10	4B	C940	A10-13	5C	A10	3C	C1558*	A10-9	6C	A10	2C	C1751	A10-11	3D	A10	4C
C214	A10-1	5D	A10	2A	C710*	A10-4	1C	A10	4B	C941	A10-13	5D	A10	3C	C1559*	A10-9	2C	A10	1C	C1800*	A10-17	4D	A10	3C
C215*	A10-1	6D	A10	3A	C711	A10-4	2D	A10	1C	C946*	A10-1	2B	A10	3C	C1560*	A10-17	4D	A10	1C	C1801*	A10-17	6C	A10	2C
C290*	A10-5	1C	A10	4B	C712*	A10-4	2B	A10	4B	C947	A10-2	2B	A10	2C	C1561	A10-17	5C	A10	3C	C1802*	A10-9	1D	A10	2C
C501	A10-17	3C	A10	2B	C713	A10-4	3D	A10	1C	C970	A10-17	5D	A10	2B	C1562*	A10-9	2B	A10	1C	C1803	A10-9	2D	A10	3C
C502	A10-17	5C	A10	2B	C714*	A10-4	2C	A10	4B	C971*	A10-17	5D	A10	3B	C1563	A10-9	2B	A10	4C	C1810*	A10-17	4D	A10	2C
C503*	A10-14	6C	A10	3B	C715	A10-4	1D	A10	1B	C972	A10-17	3C	A10	2C	C1564*	A10-9	2C	A10	1C	C1811*	A10-17	6C	A10	2C
C504	A10-17	3C	A10	2B	C716*	A10-4	5D	A10	4B	C973*	A10-17	4C	A10	3C	C1565*	A10-17	3D	A10	1C	C1812*	A10-9	4D	A10	2C
C505	A10-17	5D	A10	3B	C717	A10-4	5D	A10	1B	C1000	A10-17	5B	A10	3B	C1566*	A10-9	5B	A10	2C	C1813	A10-9	4D	A10	3C
C506	A10-14	2A	A10	2B	C718	A10-4	5D	A10	1B	C1001	A10-17	5B	A10	3B	C1567*	A10-9	2B	A10	2C					
C507*	A10-14	2B	A10	2B	C719*	A10-4	6D	A10	4B	C1002	A10-17	5B	A10	3A	C1568	A10-9	6B	A10	3C	CR503	A10-14	3B	A10	2B
C508	A10-14	3A	A10	2A	C720*	A10-4	6D	A10	4C	C1003*	A10-17	6B	A10	2A	C1569*	A10-9	3B	A10	2C	CR601	A10-11	5B	A10	2A
C509	A10-14	3B	A10	2B	C721*	A10-4	6D	A10	4C	C1004*	A10-17	6B	A10	2B	C1570*	A10-12	3C	A10	2C	CR602	A10-11	5B	A10	2A
C510	A10-14	3B	A10	2B	C726*	A10-4	5D	A10	4C	C1005*	A10-17	5B	A10	2A	C1583	A10-17	5C	A10	3C	CR603	A10-11	5B	A10	2A
C511	A10-14	3A	A10	2B	C727*	A10-4	6D	A10	4C	C1006*	A10-17	5B	A10	2B	C1584	A10-17	3D	A10	4C	CR604	A10-11	5C	A10	3A
C512*	A10-17	5D	A10	3B	C728*	A10-4	6D	A10	4C	C1007	A10-17	6B	A10	3B	C1585	A10-17	3D	A10	3C	CR704A	A10-4	2B	A10	1B
C513	A10-17	5D	A10	2B	C729	A10-4	5D	A10	1B	C1008	A10-17	6B	A10	3B	C1587*	A10-17	4D	A10	2C	CR704B	A10-4	2C	A10	1B
C519*	A10-14	2D	A10	3B	C730	A10-4	5D	A10	1B	C1009	A10-17	6B	A10	3B	C1590*	A10-9	2A	A10	4B	CR705	A10-4	2B	A10	1B
C520	A10-14	2C	A10	2B	C731*	A10-4	5D	A10	4B	C1016	A10-10	2B	A10	3A	C1601	A10-7	6D	A10	3B	CR706	A10-4	2B	A10	1B
C522*	A10-14	1C	A10	3A	C732*	A10-4	6D	A10	4B	C1029	A10-10	3B	A10	3A	C1602	A10-7	6C	A10	3B	CR708	A10-4	2C	A10	1B
C527	A10-14	3D	A10	2A	C733*	A10-4	5D	A10	4B	C1048	A10-10	2B	A10	3A	C1603	A10-7	6C	A10	2B	CR709	A10-4	2C	A10	1B
C532	A10-17	5D	A10	3A	C734*	A10-4	6D	A10	4B	C1049	A10-10	2B	A10	3B	C1604	A10-7	5D	A10	3B	CR754A	A10-3	2B	A10	2C
C533*	A10-17	4C	A10	3B	C735*	A10-4	2D	A10	4C	C1050*	A10-17	5B	A10	2A	C1610	A10-17	5D	A10	3B	CR754B	A10-3	2C	A10	2C
C536	A10-17	5C	A10	3B	C736*	A10-4	3C	A10	4B	C1051*	A10-17	6B	A10	2A	C1611	A10-7	5D	A10	2C	CR755	A10-3	2B	A10	2C
C537*	A10-17	4C	A10	3B	C750*	A10-3	5A	A10	3C	C1052	A10-17	5B	A10	3A	C1620	A10-17	6C	A10	3B	CR756	A10-3	2B	A10	2C
C538*	A10-14	6C	A10	3B	C751*	A10-3	4A	A10	3C	C1053*	A10-10	4B	A10	2B	C1622	A10-7	3C	A10	3B	CR758	A10-3	2C	A10	1C
C542*	A10-14	4B	A10	3B	C752*	A10-3	4A	A10	4C	C1060	A10-10	3C	A10	3B	C1626*	A10-7	4B	A10	2B	CR759	A10-3	2C	A10	1C
C543	A10-14	4A	A10	2B	C753*	A10-3	2B	A10	3C	C1101	A10-2	2B	A10	2C	C1627	A10-7	4B	A10	3B	CR1001	A10-10	4B	A10	3B
C545	A10-17	5D	A10	2B	C754*	A10-3	2B	A10	3C	C1102	A10-2	2B	A10	2C	C1628	A10-7	4B	A10	3B	CR1060	A10-10	3C	A10	3A
C546	A10-17	6D	A10	3B	C755*	A10-3	2B	A10	3C	C1103	A10-2	2B	A10	2C	C1629	A10-17	6C	A10	3B	CR1525	A10-12	3C	A10	3C

*Asterisks indicate components located on the back of the board.

A10 Acquisition Component Locator (cont)

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
					J100	A10–17	1A	A10	1A	L1620	A10–17	5C	A10	3B	R192*	A10–10	5C	A10	2B	R569	A10–14	6D	A10	2B
CR1526	A10–12	3C	A10	3C	J101	A10–17	4A	A10	1B	L1631	A10–7	5D	A10	3B	R200	A10–3	5B	A10	2B	R572	A10–14	2D	A10	2A
CR1528	A10–12	3C	A10	3C	J501A	A10–14	4A	A10	2B	L1646	A10–7	5C	A10	3B	R201	A10–3	5B	A10	2B	R573	A10–14	6D	A10	2B
CR1530	A10–12	4C	A10	3C	J501B	A10–14	6A	A10	2B	L1648	A10–17	5D	A10	3B	R202	A10–3	4C	A10	2C	R574	A10–14	2D	A10	2A
CR1531	A10–12	4C	A10	3C	J501C	A10–14	6A	A10	2B	L1649	A10–17	5C	A10	3B	R203	A10–3	4C	A10	2C	R575	A10–14	3C	A10	2B
CR1584	A10–9	5A	A10	3C	J501D	A10–14	4A	A10	2B	L1681	A10–8	5D	A10	4A	R204	A10–3	4C	A10	2C	R576	A10–14	3C	A10	3B
CR1601	A10–7	3A	A10	3B	J501E	A10–14	4A	A10	2B	L1696	A10–8	5C	A10	4A	R205	A10–3	4C	A10	2C	R577	A10–14	3C	A10	2B
CR1603	A10–7	3C	A10	3B	J501F	A10–14	4B	A10	2B						R206	A10–3	4C	A10	2C	R578	A10–14	3D	A10	2B
CR1604	A10–7	3C	A10	3B	J501G	A10–14	4A	A10	2B	Q705	A10–4	2B	A10	1B	R207	A10–3	5C	A10	2B	R579	A10–14	3D	A10	2B
CR1605	A10–7	2C	A10	3B	J501H	A10–14	4B	A10	2B	Q708	A10–4	2B	A10	1B	R208	A10–3	5C	A10	2B	R580	A10–14	3D	A10	2B
CR1651	A10–8	3A	A10	4B	J700	A10–17	4A	A10	1C	Q755	A10–3	2B	A10	2C	R209	A10–3	5C	A10	2B	R581	A10–14	2D	A10	2B
CR1654	A10–8	3C	A10	3B	J920	A10–12	6A	A10	2B	Q758	A10–3	2B	A10	1C	R210*	A10–3	5C	A10	3B	R582	A10–14	3A	A10	2B
CR1655	A10–8	2C	A10	3B	J1100	A10–2	1A	A10	1C	Q1526	A10–12	3C	A10	3C	R211*	A10–3	5C	A10	3B	R585*	A10–14	3C	A10	3B
CR1659	A10–8	3C	A10	3B	J1153	A10–16	1A	A10	3C	Q1531	A10–12	3C	A10	3C	R212*	A10–3	5C	A10	3B	R586*	A10–14	3C	A10	3B
CR1701	A10–11	2C	A10	3B	J1200	A10–1	1A	A10	2C	Q1535	A10–12	2C	A10	3C	R213*	A10–3	5C	A10	3C	R587	A10–14	3B	A10	2B
CR1704	A10–11	2D	A10	3B	J1300	A10–1	1D	A10	1C	Q1543	A10–12	6D	A10	3C	R214*	A10–3	5C	A10	3C	R588	A10–14	3B	A10	2B
					J1400	A10–2	1D	A10	1C	Q1550	A10–9	3A	A10	3C	R215*	A10–3	5B	A10	3C	R601	A10–11	4B	A10	3A
GP101	A10–2	5D	A10	1A	J1500	A10–9	4A	A10	4C	Q1601	A10–7	3B	A10	3B	R216*	A10–3	5B	A10	3C	R602	A10–11	4B	A10	3A
GP201	A10–1	5D	A10	2A	J1550	A10–9	4A	A10	3C	Q1602	A10–7	3B	A10	3B	R217*	A10–3	5B	A10	3C	R603	A10–11	4B	A10	3A
GP500	A10–14	1D	A10	3B						Q1603	A10–7	3A	A10	3B	R218*	A10–3	5B	A10	3B	R604	A10–11	4C	A10	3A
GP501	A10–14	1D	A10	2B	L501*	A10–17	5D	A10	3B	Q1605	A10–7	1C	A10	3B	R219*	A10–3	5B	A10	3B	R605	A10–11	4B	A10	3A
GP502	A10–14	3A	A10	2B	L502*	A10–17	3C	A10	3B	Q1616	A10–7	3D	A10	3B	R220*	A10–3	5B	A10	3B	R606	A10–11	4B	A10	3A
GP503	A10–14	1A	A10	2B	L503*	A10–17	5D	A10	2A	Q1617	A10–7	3D	A10	3B	R221*	A10–3	5B	A10	3B	R607	A10–11	4B	A10	3A
GP504	A10–14	1D	A10	2B	L504*	A10–17	3C	A10	3B	Q1624	A10–7	5C	A10	3B	R222*	A10–3	5B	A10	3C	R608	A10–11	4C	A10	3A
GP505	A10–14	1D	A10	3B	L700*	A10–4	4A	A10	4C	Q1651	A10–8	3B	A10	3B	R223*	A10–3	5B	A10	3C	R609*	A10–16	3C	A10	2C
GP506	A10–14	1D	A10	2B	L701*	A10–4	4A	A10	4C	Q1652	A10–8	3B	A10	4B	R224*	A10–3	5A	A10	3C	R610*	A10–16	3C	A10	2C
GP507	A10–14	3C	A10	2B	L702*	A10–4	4A	A10	4B	Q1653	A10–8	3A	A10	4B	R225*	A10–3	5A	A10	3C	R611	A10–16	4C	A10	3A
GP508	A10–14	4C	A10	2B	L703*	A10–4	4A	A10	4C	Q1666	A10–8	3D	A10	3B	R226*	A10–3	6C	A10	3B	R612	A10–16	4C	A10	4A
GP509	A10–14	1D	A10	2B	L705	A10–4	3B	A10	1B	Q1667	A10–8	3D	A10	3B	R227*	A10–3	6C	A10	3B	R613	A10–16	4D	A10	3C
GP510	A10–14	2D	A10	2B	L706	A10–4	5D	A10	1B	Q1674	A10–8	5C	A10	3B	R228	A10–3	5C	A10	2B	R614	A10–16	4D	A10	3C
GP511	A10–14	1D	A10	2B	L707	A10–4	5D	A10	1B						R229	A10–3	5C	A10	2B	R615	A10–11	6D	A10	2A
GP512	A10–14	1D	A10	2B	L708	A10–4	3B	A10	1B	R100	A10–4	5B	A10	1C	R230	A10–3	4B	A10	2C	R616	A10–11	5C	A10	2A
GP513	A10–14	1D	A10	2B	L711	A10–4	5D	A10	1B	R101	A10–4	5B	A10	1C	R231	A10–3	4B	A10	2C	R617*	A10–11	5C	A10	3A
GP514	A10–14	1B	A10	2B	L712	A10–4	5D	A10	1B	R102	A10–4	4C	A10	1B	R232	A10–3	4B	A10	2C	R618*	A10–11	4A	A10	3A
GP515	A10–17	4C	A10	2B	L713	A10–4	5D	A10	1B	R103	A10–4	4C	A10	1B	R233	A10–3	4B	A10	2C	R619*	A10–11	4A	A10	3A
GP516	A10–17	6D	A10	3B	L714	A10–4	5D	A10	1B	R104	A10–4	4C	A10	1B	R234	A10–3	4B	A10	2C	R620*	A10–11	5A	A10	3A
GP517	A10–17	4C	A10	2A	L750*	A10–3	4A	A10	3C	R105	A10–4	4C	A10	1B	R235	A10–3	5B	A10	2B	R621*	A10–11	5A	A10	3A
GP518	A10–17	6D	A10	2B	L751*	A10–3	4A	A10	4C	R106	A10–4	4C	A10	1C	R290*	A10–5	1C	A10	4B	R622*	A10–11	4A	A10	3A
GP519	A10–14	1D	A10	2A	L752*	A10–3	4A	A10	3C	R107	A10–4	5C	A10	1C	R291*	A10–5	2D	A10	3B	R623*	A10–11	4A	A10	3A
GP520	A10–14	1D	A10	3B	L753*	A10–3	4A	A10	3C	R108	A10–4	5C	A10	1C	R450*	A10–10	6D	A10	4B	R624	A10–11	5A	A10	2A
GP521	A10–14	1D	A10	2A	L755	A10–3	3B	A10	2C	R109	A10–4	5C	A10	1C	R451*	A10–10	6D	A10	4B	R625*	A10–11	5A	A10	3A
GP522	A10–14	2D	A10	2B	L756	A10–3	5D	A10	2B	R110*	A10–4	5C	A10	4C	R452*	A10–5	1D	A10	3B	R630*	A10–16	4C	A10	2C
GP601	A10–11	5D	A10	3A	L757	A10–3	5D	A10	2B	R111*	A10–4	5C	A10	4C	R500*	A10–14	1A	A10	3B	R631*	A10–16	4C	A10	2C
GP700	A10–17	5A	A10	1B	L758	A10–3	3B	A10	2C	R112*	A10–4	5C	A10	4C	R501*	A10–14	1A	A10	3B	R632	A10–16	4D	A10	3C
GP701	A10–4	6D	A10	1C	L761	A10–3	5D	A10	1B	R113*	A10–4	5C	A10	4C	R502*	A10–14	1B	A10	3B	R633*	A10–16	4D	A10	2C
GP750	A10–17	5A	A10	2C	L762	A10–3	5D	A10	2B	R114*	A10–4	5C	A10	4B	R503	A10–14	1B	A10	2B	R639*	A10–13	2C	A10	2C
GP751	A10–3	6D	A10	1B	L763	A10–3	5D	A10	2B	R115*	A10–4	5B	A10	4B	R504	A10–14	5C	A10	2B	R641*	A10–3	2B	A10	4C
GP800	A10–17	5A	A10	2A	L764	A10–3	5D	A10	1B	R116*	A10–4	5B	A10	4B	R505	A10–14	5C	A10	2B	R642	A10–15	6D	A10	2A
GP850	A10–17	6A	A10	2B	L900*	A10–17	3C	A10	3C	R117*	A10–4	5B	A10	4B	R506	A10–14	1A	A10	2B	R643*	A10–4	2B	A10	4B
GP900	A10–17	6A	A10	3C	L901*	A10–17	5C	A10	3C	R118*	A10–4	5B	A10	4C	R507	A10–14	1A	A10	2B	R644	A10–15	5D	A10	2A
GP901	A10–12	3B	A10	2C	L970	A10–17	5D	A10	2B	R119*	A10–4	5B	A10	4C	R508	A10–14	5C	A10	2B	R646	A10–15	5D	A10	2A
GP1000	A10–17	6A	A10	4A	L971	A10–17	3C	A10	2B	R120*	A10–4	5B	A10	4C	R509	A10–14	5C	A10	2B	R700	A10–4	2D	A10	1C
GP1010	A10–10	5D	A10	3A	L1000*	A10–17	5B	A10	2B	R121*	A10–4	5B	A10	4C	R510*	A10–14	2A	A10	3B	R701	A10–4	2D	A10	1C
GP1500	A10–17	6A	A10	4C	L1001*	A10–17	5B	A10	2B	R122*	A10–4	5B	A10	4B	R511*	A10–14	2A	A10	3B	R702*	A10–4	2D	A10	4C
GP1600	A10–17	6A	A10	3B	L1002	A10–17	5B	A10	3B	R123*	A10–4	5B	A10	4B	R512	A10–14	2B	A10	2B	R703*	A10–4	2D	A10	4C
GP1602	A10–7	2B	A10	3B	L1003	A10–17	5B	A10	3B	R124*	A10–4	5A	A10	4B	R513*	A10–14	2A	A10	3B	R704*	A10–4	3B	A10	4B
GP1603	A10–7	2B	A10	2B	L1004	A10–17	5B	A10	3B	R125*	A10–4	5A	A10	4B	R514	A10–14	3B	A10	2A	R705*	A10–4	2B	A10	4B
GP1605	A10–7	2D	A10	3B	L1101	A10–2	4A	A10	1C	R126*	A10–4	6C	A10	4C	R515	A10–14	3A	A10	2B	R706*	A10–4	2B	A10	4B
GP1606	A10–7	2C	A10	3B	L1102*	A10–1	2D	A10	4C	R127*	A10–4	6C	A10	4C	R516*	A10–14	2A	A10	3B	R707*	A10–4	3C	A10	4B
GP1652	A10–8	2B	A10	3A	L1103*	A10–2	1D	A10	4C	R128	A10–4	5C	A10	1C	R517	A10–14	2B	A10	3B	R708*	A10–4	2C	A10	4B
GP1653	A10–8	2B	A10	3B	L1201	A10–1	4A	A10	2C	R129	A10–4	5C	A10	1C	R518	A10–14	3B	A10	2A	R709	A10–4	2C	A10	1B
GP1655	A10–8	2D	A10	3B	L1202*	A10–1	2D	A10	4C	R130	A10–4	4B	A10	1B	R523	A10–14	3B	A10	2A	R714	A10–4	2C	A10	1B
GP1656	A10–8	2C	A10	4B	L1205	A10–1	1D	A10	1C	R131	A10–4	4B	A10	1B	R524	A10–14	3A	A10	2A	R720	A10–4	2D	A10	1B
GP1701	A10–11	3C	A10	3C	L1501*	A10–1	5C	A10	2C	R132	A10–4	4B	A10	1B	R530	A10–14	2C	A10	2B	R721*	A10–4	3C	A10	4C
GP1702	A10–11	3B	A10	3C	L1502*	A10–2	6B	A10	2C	R133	A10–4	4B	A10	1B	R531	A10–14	2D	A10	2B	R723	A10–4	2A	A10	1C
GP1703	A10–11	3C	A10	3C	L1550	A10–17	5C	A10	3C	R134	A10–4	4B	A10	1C	R535	A10–14	3C	A10	2B	R724*	A10–4	1A	A10	4C
GP1704	A10–11	2A	A10	3B	L1551	A10–17	5C	A10	3C	R135	A10–4	5B	A10	1C	R536	A10–14	3D	A10	2B	R725*	A10–4	2A	A10	4C
GP1705	A10–11	2C	A10	4C	L1552	A10–17	3D	A10	4C	R189*	A10–12	3B	A10	4B	R539*	A10–14	3C	A10	3B	R726*	A10–4	1A	A10	4C
GP1706	A10–11	2C	A10	4B	L1553	A10–17	3D	A10	4C	R190*	A10–6	1C	A10	4B	R540	A10–14	3C	A10	2B	R727*	A10–4	1A	A10	4C
					L1554	A10–17	3D	A10	3C	R191*	A10–6	2D	A10	4B	R543*	A10–14	1C	A10	3B	R728*	A10–4	1A	A10	4C

***Asterisks indicate components located on the back of the board.**

Scans by ArtekMedia => 2011

Scans by Artekmedia => 2011

A10 Acquisition Component Locator (cont)

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
R729*	A10-4	3C	A10	4C	R1053*	A10-10	4B	A10	2A	R1584*	A10-9	5A	A10	2C	R1680	A10-8	5B	A10	3B	RP911	A10-12	4A	A10	2C
R730	A10-4	2A	A10	1C	R1060	A10-10	3C	A10	3A	R1590*	A10-9	2A	A10	4C	R1681	A10-8	5C	A10	4B					
R731*	A10-4	2A	A10	4C	R1061	A10-10	3D	A10	3B	R1595*	A10-1	1D	A10	4C	R1682	A10-8	3B	A10	4B	RT617	A10-11	5C	A10	2C
R732*	A10-4	1A	A10	4C	R1062	A10-10	3D	A10	3B	R1596	A10-1	1D	A10	3C	R1683	A10-8	5B	A10	3B					
R750	A10-3	2D	A10	1C	R1063*	A10-10	3D	A10	2A	R1597*	A10-1	1D	A10	4C	R1684	A10-8	4C	A10	3B	TP110	A10-4	5B	A10	1C
R751	A10-3	2D	A10	1C	R1064	A10-10	3D	A10	4B	R1598*	A10-2	1D	A10	4C	R1685	A10-8	5B	A10	4B	TP111	A10-4	5B	A10	1C
R752*	A10-3	2D	A10	4C	R1070*	A10-10	5B	A10	2A	R1599	A10-2	1D	A10	3C	R1686	A10-8	3A	A10	4B	TP112	A10-4	5B	A10	1C
R753*	A10-3	2D	A10	4C	R1071*	A10-10	5C	A10	2B	R1600*	A10-2	1D	A10	4C	R1688	A10-8	4C	A10	4A	TP113	A10-4	4B	A10	1C
R754*	A10-3	3B	A10	3C	R1102*	A10-2	3B	A10	4C	R1601	A10-7	2A	A10	3B	R1690	A10-8	2C	A10	3B	TP114	A10-4	4B	A10	1B
R755*	A10-3	2B	A10	3C	R1103*	A10-2	3B	A10	4C	R1602	A10-7	2A	A10	3B	R1691	A10-8	5B	A10	4B	TP115	A10-4	4B	A10	1B
R756*	A10-3	2B	A10	3C	R1104*	A10-2	3B	A10	4C	R1603	A10-7	3A	A10	3B	R1692	A10-8	6C	A10	4B	TP116	A10-4	4B	A10	1B
R757*	A10-3	3C	A10	3C	R1106*	A10-2	6B	A10	4C	R1604	A10-7	4B	A10	3B	R1696	A10-8	6D	A10	4A	TP117	A10-4	4B	A10	1B
R758*	A10-3	2C	A10	4C	R1109*	A10-2	3A	A10	3C	R1605	A10-7	4B	A10	3B	R1698	A10-8	5B	A10	4B	TP118	A10-4	5A	A10	1C
R759	A10-3	2C	A10	1C	R1110	A10-2	3A	A10	2C	R1606	A10-7	3B	A10	3B	R1700	A10-11	1A	A10	4C	TP119	A10-4	5A	A10	1C
R761*	A10-15	5C	A10	3B	R1111	A10-2	3A	A10	2C	R1607	A10-7	3B	A10	3B	R1701	A10-11	1A	A10	4C	TP120	A10-4	5A	A10	1C
R764	A10-3	2C	A10	2C	R1112*	A10-2	3A	A10	4C	R1608	A10-7	2B	A10	3B	R1702	A10-11	2A	A10	4C	TP121	A10-4	4A	A10	1C
R770*	A10-3	2D	A10	3C	R1117*	A10-2	4A	A10	4C	R1609	A10-7	1C	A10	3B	R1703*	A10-11	2A	A10	2C	TP122	A10-4	4A	A10	1B
R773*	A10-3	2A	A10	4B	R1202*	A10-1	3B	A10	3C	R1610	A10-7	1C	A10	3B	R1705*	A10-11	2C	A10	2B	TP123	A10-4	4A	A10	1B
R774	A10-3	1A	A10	2C	R1203	A10-1	3B	A10	2C	R1611	A10-7	1B	A10	3B	R1706*	A10-11	1A	A10	1C	TP124	A10-4	4A	A10	1B
R775*	A10-3	2A	A10	3C	R1204*	A10-1	3B	A10	3C	R1612	A10-7	2C	A10	3B	R1707*	A10-11	1B	A10	1C	TP125	A10-4	4A	A10	1B
R776*	A10-3	1A	A10	3C	R1205*	A10-1	3A	A10	3C	R1613	A10-7	2D	A10	3B	R1709*	A10-11	2A	A10	2C	TP126	A10-4	5C	A10	1C
R777*	A10-3	1A	A10	4B	R1206	A10-1	5C	A10	1C	R1614	A10-7	3D	A10	3B	R1710*	A10-11	2A	A10	2C	TP127	A10-4	5C	A10	1C
R778*	A10-3	1A	A10	4B	R1210*	A10-1	3A	A10	3C	R1615	A10-7	2D	A10	3B	R1711*	A10-9	3B	A10	1B	TP210	A10-3	5B	A10	2B
R780	A10-3	2A	A10	1B	R1211*	A10-1	3A	A10	3C	R1616	A10-7	2D	A10	3B	R1712*	A10-9	6B	A10	1C	TP211	A10-3	5B	A10	2B
R781*	A10-3	2A	A10	3B	R1212*	A10-1	3A	A10	3C	R1617	A10-7	2C	A10	3B	R1717	A10-11	2D	A10	4C	TP212	A10-3	5B	A10	2B
R782*	A10-3	1A	A10	3B	R1217*	A10-1	4A	A10	3C	R1618	A10-7	3D	A10	3B	R1718*	A10-11	2D	A10	1C	TP213	A10-3	4B	A10	2C
R900	A10-12	2B	A10	2C	R1501*	A10-1	6C	A10	2C	R1619	A10-7	3D	A10	3B	R1719*	A10-11	2D	A10	1B	TP214	A10-3	4B	A10	2C
R901	A10-12	2A	A10	3C	R1502*	A10-2	6B	A10	2C	R1620	A10-7	3D	A10	3B	R1720*	A10-11	2D	A10	1C	TP215	A10-3	4B	A10	2C
R902	A10-12	2B	A10	3C	R1505	A10-12	3B	A10	3C	R1624	A10-7	4C	A10	3B	R1721*	A10-11	2D	A10	1C	TP216	A10-3	4B	A10	2C
R903	A10-12	4B	A10	2C	R1506	A10-12	4B	A10	3C	R1625	A10-7	5B	A10	3B	R1722*	A10-11	2D	A10	1C	TP217	A10-3	4B	A10	2C
R904	A10-12	4B	A10	2C	R1522	A10-12	4B	A10	3C	R1626	A10-7	5B	A10	3B	R1723*	A10-11	2C	A10	2B	TP218	A10-3	5A	A10	2B
R905*	A10-12	5B	A10	3C	R1525	A10-12	3C	A10	3C	R1627	A10-7	4C	A10	3B	R1724*	A10-11	2C	A10	2B	TP219	A10-3	5A	A10	2B
R911	A10-12	5A	A10	2C	R1526	A10-12	3C	A10	3C	R1628	A10-7	4B	A10	3B	R1725*	A10-11	2C	A10	2C	TP220	A10-3	5A	A10	2B
R934	A10-13	5B	A10	3C	R1528	A10-12	3C	A10	3C	R1629	A10-7	5B	A10	3B	R1726*	A10-11	2C	A10	2C	TP221	A10-3	4A	A10	2C
R935	A10-13	5C	A10	3C	R1530	A10-12	4C	A10	3C	R1630	A10-7	5B	A10	3B	R1727	A10-11	2C	A10	3C	TP222	A10-3	4A	A10	2C
R936	A10-13	5C	A10	3C	R1531	A10-12	4C	A10	3C	R1631	A10-7	5C	A10	3B	R1728	A10-11	2C	A10	3C	TP223	A10-3	4A	A10	2C
R937	A10-13	5D	A10	3C	R1533*	A10-12	2C	A10	2C	R1632	A10-7	3B	A10	3B	R1730	A10-11	1C	A10	3B	TP224	A10-3	4A	A10	2C
R938*	A10-2	2B	A10	3C	R1534	A10-12	2C	A10	3C	R1633	A10-7	5B	A10	3B	R1731	A10-11	2C	A10	3B	TP225	A10-3	4A	A10	2C
R939*	A10-2	2B	A10	3C	R1535	A10-12	2C	A10	3C	R1634	A10-7	4C	A10	3B	R1732	A10-11	2D	A10	3B	TP226	A10-3	5C	A10	2B
R940	A10-1	2B	A10	2C	R1536*	A10-12	2D	A10	2B	R1635	A10-7	3A	A10	3B	R1733	A10-11	2D	A10	3B	TP227	A10-3	5C	A10	2B
R941*	A10-2	4B	A10	3C	R1537	A10-12	2D	A10	3C	R1636	A10-7	2C	A10	3B	R1734	A10-11	1D	A10	3B	TP501	A10-14	3A	A10	2A
R942	A10-1	4B	A10	2C	R1538	A10-12	2D	A10	3B	R1637	A10-7	6C	A10	3B	R1800*	A10-9	2D	A10	2C	TP502	A10-14	3A	A10	2B
R943	A10-1	4B	A10	2C	R1539	A10-12	3D	A10	3C	R1638	A10-7	4C	A10	3B	R1801*	A10-9	3C	A10	2C	TP503	A10-14	1A	A10	2B
R944	A10-1	2B	A10	2C	R1540	A10-12	3D	A10	3C	R1639	A10-7	5D	A10	3B	R1802*	A10-9	2D	A10	2C	TP507	A10-14	3C	A10	2B
R945	A10-1	2B	A10	2C	R1541	A10-12	4D	A10	3C	R1641	A10-7	5B	A10	3B	R1803*	A10-9	1D	A10	2C	TP508	A10-14	4C	A10	2B
R946*	A10-2	4B	A10	3C	R1542	A10-12	6D	A10	3C	R1642	A10-7	5B	A10	3B	R1804*	A10-9	2C	A10	2C	TP509	A10-14	4D	A10	2B
R947*	A10-2	2B	A10	3C	R1545*	A10-12	5D	A10	2C	R1646	A10-7	6D	A10	3B	R1805*	A10-9	2C	A10	2C	TP511	A10-14	5D	A10	2B
R1020	A10-9	3B	A10	3B	R1546	A10-12	4D	A10	3C	R1648	A10-7	5B	A10	3B	R1806*	A10-9	3D	A10	2C	TP514	A10-14	1B	A10	3B
R1023*	A10-10	4C	A10	2A	R1548	A10-12	5D	A10	3C	R1653	A10-8	3A	A10	4B	R1807*	A10-9	3C	A10	3C	TP515	A10-17	4C	A10	2B
R1025	A10-9	6B	A10	3C	R1549	A10-12	2C	A10	3C	R1654	A10-8	4B	A10	4B	R1808	A10-9	3C	A10	3C	TP516	A10-17	6D	A10	2A
R1027	A10-10	3B	A10	3A	R1552*	A10-9	2C	A10	1C	R1655	A10-8	4B	A10	4B	R1809*	A10-9	2D	A10	2C	TP517	A10-17	4C	A10	2A
R1028*	A10-10	3B	A10	2A	R1553*	A10-9	5C	A10	2C	R1656	A10-8	3B	A10	4B	R1810*	A10-9	5D	A10	2C	TP518	A10-17	6D	A10	2B
R1029*	A10-10	3B	A10	2A	R1554*	A10-9	6C	A10	2C	R1657	A10-8	3B	A10	4B	R1811*	A10-9	5C	A10	2C	TP630	A10-15	5B	A10	2A
R1030*	A10-10	1B	A10	2A	R1555	A10-9	2C	A10	4C	R1658	A10-8	2B	A10	4B	R1812*	A10-9	5D	A10	2C	TP631	A10-15	5A	A10	3A
R1031*	A10-10	1B	A10	2A	R1556	A10-9	2C	A10	4C	R1661	A10-8	3D	A10	3B	R1813*	A10-9	4D	A10	2C	TP632	A10-15	5A	A10	3A
R1032*	A10-10	2B	A10	2B	R1557*	A10-9	5A	A10	2C	R1662	A10-8	2C	A10	3B	R1814*	A10-9	5C	A10	3C	TP635	A10-15	5A	A10	2A
R1033*	A10-10	2B	A10	2B	R1558*	A10-9	5A	A10	2C	R1663	A10-8	2D	A10	4B	R1815*	A10-9	5C	A10	3C	TP636	A10-15	3D	A10	3A
R1034	A10-10	4B	A10	3A	R1559*	A10-9	3A	A10	2C	R1664	A10-8	3D	A10	3B	R1816*	A10-9	5D	A10	2C	TP637	A10-15	5B	A10	3A
R1035*	A10-10	2B	A10	2B	R1560*	A10-9	3B	A10	1C	R1665	A10-8	2D	A10	4B	R1817*	A10-9	5C	A10	3C	TP638	A10-15	3C	A10	3A
R1036*	A10-10	2B	A10	2B	R1561*	A10-9	3B	A10	1C	R1666	A10-8	2D	A10	3B	R1818*	A10-9	5C	A10	3C	TP639	A10-15	5A	A10	3A
R1037*	A10-10	2B	A10	2B	R1562*	A10-9	3C	A10	1C	R1667	A10-8	2C	A10	3B	R1819*	A10-9	4D	A10	2C	TP640	A10-15	5A	A10	3B
R1038*	A10-10	3B	A10	2B	R1563	A10-9	3C	A10	4C	R1668	A10-8	3D	A10	3B	R1820*	A10-9	3D	A10	2C	TP701	A10-4	6D	A10	1B
R1039	A10-10	1B	A10	3A	R1564	A10-9	3A	A10	3C	R1669	A10-8	3D	A10	3B	R1821*	A10-9	3D	A10	2C	TP702	A10-4	6D	A10	1B
R1040*	A10-10	3B	A10	2A	R1565*	A10-9	3A	A10	2C	R1670	A10-8	5D	A10	4B	R1824*	A10-9	2D	A10	2C	TP703	A10-4	6D	A10	1B
R1041*	A10-10	3B	A10	2A	R1566*	A10-9	6B	A10	2C	R1674	A10-8	4C	A10	3B	R1825*	A10-9	2D	A10	2C	TP705	A10-4	3B	A10	1B
R1042*	A10-10	4B	A10	2B	R1567*	A10-9	6B	A10	2C	R1675	A10-8	5B	A10	3B	R1830*	A10-9	5D	A10	3C	TP707	A10-4	2D	A10	1B
R1043*	A10-10	4B	A10	2B	R1568*	A10-9	6C	A10	2C	R1676	A10-8	5B	A10	3B	R1831*	A10-9	5D	A10	3C	TP708	A10-4	3B	A10	1B
R1044	A10-10	1B	A10	3A	R1569*	A10-9	6C	A10	2C	R1677	A10-8	4C	A10	4A	R1834*	A10-9	5D	A10	2C	TP709	A10-4	3C	A10	1B
R1051*	A10-10	4B	A10	2A	R1570*	A10-12	3D	A10	2C	R1678	A10-8	4B	A10	3B	R1835*	A10-9	5D	A10	2C	TP711	A10-4	2D	A10	1C
R1052*	A10-10	3B	A10	2B	R1583*	A10-9	4A	A10	2C	R1679	A10-8	5B	A10	4B						TP712	A10-4	3D	A10	1C

*Asterisks indicate components located on the back of the board.

A10 Acquisition Component Locator (cont)

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
TP713	A10-4	3C	A10	1C
TP714	A10-4	2A	A10	1C
TP715	A10-4	2A	A10	1C
TP716	A10-4	3A	A10	1C
TP717	A10-4	6C	A10	1B
TP749	A10-14	6D	A10	2B
TP751	A10-3	6D	A10	2B
TP752	A10-3	6D	A10	2B
TP753	A10-3	6D	A10	1B
TP755	A10-3	3B	A10	2C
TP757	A10-3	3D	A10	2C
TP758	A10-3	3B	A10	1C
TP759	A10-3	3C	A10	1C
TP761	A10-3	2D	A10	1B
TP762	A10-3	3D	A10	1B
TP763	A10-3	3C	A10	2B
TP764	A10-3	2A	A10	1C
TP765	A10-3	2A	A10	1B
TP766	A10-3	3A	A10	1B
TP767	A10-3	6C	A10	2B
TP901	A10-12	3A	A10	3C
TP903	A10-11	6C	A10	2C
TP904	A10-11	6C	A10	2C
TP905	A10-11	6C	A10	2C
TP906	A10-11	6C	A10	2C
TP907	A10-11	6D	A10	2C
TP908	A10-11	6D	A10	2C
TP909	A10-13	2A	A10	2C
TP910	A10-12	1B	A10	2C
TP911	A10-12	3B	A10	2C
TP912	A10-12	5B	A10	2C
TP913	A10-13	6B	A10	3C
TP914	A10-13	6C	A10	3C
TP915	A10-13	6C	A10	3C
TP916	A10-13	6D	A10	3C
TP917	A10-12	4A	A10	2C
TP918	A10-12	5A	A10	2C
TP950	A10-12	4A	A10	2C
TP951	A10-12	5B	A10	2C
TP970	A10-17	6D	A10	2C
TP971	A10-17	4C	A10	2C
TP1010	A10-10	5D	A10	3A
TP1011	A10-10	5D	A10	3A
TP1012	A10-10	5A	A10	3A
TP1013	A10-10	5B	A10	3A
TP1014	A10-10	5B	A10	3A
TP1015	A10-10	5B	A10	3A
TP1050	A10-10	3C	A10	3A
TP1051	A10-10	3C	A10	3A
TP1052	A10-10	4C	A10	3A
TP1053	A10-10	4C	A10	3A
TP1054	A10-10	3C	A10	3A
TP1055	A10-10	3C	A10	3A
TP1056	A10-10	4C	A10	3A
TP1057	A10-10	4C	A10	3A
TP1058	A10-10	3D	A10	3A
TP1068	A10-10	1C	A10	2A
TP1070	A10-10	4D	A10	3A
TP1071	A10-10	4D	A10	3B
TP1072	A10-10	3B	A10	3A
TP1102	A10-2	3B	A10	1C
TP1103	A10-2	3B	A10	1C
TP1104	A10-2	3B	A10	2C
TP1105	A10-2	5B	A10	2C
TP1106	A10-2	5B	A10	1C
TP1202	A10-1	3B	A10	2C
TP1203	A10-1	3B	A10	2C
TP1204	A10-1	3B	A10	2C
TP1205	A10-1	5B	A10	2C
TP1206	A10-1	5B	A10	2C
TP1208	A10-1	2D	A10	2C
TP1209	A10-1	5C	A10	1C
TP1409	A10-1	3D	A10	1C
TP1501	A10-12	5D	A10	3C
TP1502	A10-12	3D	A10	3C
TP1503	A10-12	5D	A10	3C
TP1504	A10-12	5C	A10	3C
TP1505	A10-12	3A	A10	3B
TP1506	A10-12	2C	A10	3B
TP1507	A10-12	2B	A10	3C
TP1508	A10-12	2B	A10	3C
TP1509	A10-12	2C	A10	3C
TP1510	A10-12	3C	A10	3B
TP1511	A10-12	6C	A10	3C
TP1512	A10-12	3D	A10	3C
TP1513	A10-12	4D	A10	3C
TP1514	A10-12	4D	A10	3C
TP1550	A10-9	1C	A10	4C
TP1551	A10-9	2C	A10	3C
TP1552	A10-9	5C	A10	3C
TP1553	A10-9	6A	A10	3C
TP1554	A10-9	3A	A10	3C
TP1555	A10-9	3A	A10	4C
TP1559	A10-17	4D	A10	3C
TP1560	A10-17	4D	A10	3C
TP1562	A10-17	6C	A10	3C
TP1501	A10-7	2A	A10	3B
TP1502	A10-7	2B	A10	3B
TP1503	A10-7	2B	A10	3B
TP1504	A10-7	2B	A10	3B
TP1505	A10-7	2D	A10	3B
TP1506	A10-7	2C	A10	3B
TP1507	A10-7	3C	A10	3B
TP1508	A10-7	5C	A10	3B
TP1509	A10-7	5B	A10	3B
TP1510	A10-7	5B	A10	3B
TP1511	A10-17	6C	A10	3B
TP1512	A10-17	6D	A10	3B
TP1513	A10-7	5C	A10	3B
TP1514	A10-7	3A	A10	3B
TP1515	A10-7	5D	A10	3B
TP1516	A10-17	6C	A10	3B
TP1552	A10-8	2B	A10	4B
TP1553	A10-8	2B	A10	3B
TP1555	A10-8	2D	A10	3B
TP1556	A10-8	2C	A10	3B
TP1557	A10-8	3C	A10	4B
TP1558	A10-8	5C	A10	3B
TP1559	A10-8	5B	A10	3B
TP1560	A10-8	5B	A10	4A
TP1563	A10-8	5C	A10	4A
TP1564	A10-8	3A	A10	4B
TP1565	A10-8	5D	A10	4A
TP1701	A10-11	3D	A10	3C
TP1702	A10-11	3B	A10	3C
TP1703	A10-11	3B	A10	3C
TP1704	A10-11	1A	A10	4B
TP1705	A10-11	2C	A10	3B
TP1706	A10-11	2C	A10	3B
TP1707	A10-11	2D	A10	4B
TP1708	A10-11	2D	A10	4B
U100	A10-6	2A	A10	1B
U101	A10-6	3C	A10	2A
U102	A10-6	4C	A10	2A
U103	A10-6	5C	A10	1A
U104	A10-6	6C	A10	1A
U105	A10-6	3C	A10	1A
U106	A10-6	4C	A10	1A
U107	A10-6	5C	A10	1A
U108	A10-6	6C	A10	1A
U111	A10-6	3A	A10	1A
U112	A10-6	4A	A10	1A
U113	A10-6	5A	A10	1A
U114	A10-6	6A	A10	1A
U115	A10-6	3B	A10	1A
U116	A10-6	4B	A10	1A
U117	A10-6	5B	A10	1A
U118	A10-6	6B	A10	1A
U200	A10-5	2A	A10	2B
U201	A10-5	3C	A10	2A
U202	A10-5	4C	A10	2A
U203	A10-5	5C	A10	2A
U204	A10-5	6C	A10	2A
U205	A10-5	3C	A10	2A
U206	A10-5	4C	A10	2A
U207	A10-5	5C	A10	2A
U208	A10-5	6C	A10	2A
U211	A10-5	3A	A10	2A
U212	A10-5	4A	A10	2A
U213	A10-5	5A	A10	2A
U214	A10-5	6A	A10	2A
U215	A10-5	3B	A10	2A
U216	A10-5	4B	A10	1A
U217	A10-5	5B	A10	2A
U218	A10-5	6B	A10	2A
U501	A10-14	5C	A10	2B
U503D	A10-12	1D	A10	2B
U503A	A10-14	3A	A10	2B
U503B	A10-14	2C	A10	2B
U503C	A10-14	2D	A10	2B
U504	A10-14	2A	A10	2B
U506A	A10-14	2C	A10	2B
U506B	A10-14	2C	A10	2B
U506C	A10-14	3C	A10	2B
U506D	A10-14	3C	A10	2B
U600	A10-11	5B	A10	3A
U601A	A10-13	2A	A10	3A
U601B	A10-13	2C	A10	3A
U602D	A10-15	3D	A10	3A
U602A	A10-16	6D	A10	3A
U602B	A10-16	5C	A10	3A
U602C	A10-16	5D	A10	3A
U603	A10-11	5A	A10	2A
U604A	A10-16	3D	A10	3C
U604B	A10-16	3D	A10	3C
U604C	A10-16	3C	A10	3C
U604D	A10-16	3C	A10	3C
U605A	A10-16	5C	A10	2A
U605B	A10-16	5C	A10	2A
U605C	A10-16	5D	A10	2A
U605D	A10-16	5D	A10	2A
U606	A10-11	6B	A10	3A
U612A	A10-15	2D	A10	3A
U612C	A10-15	3D	A10	3A
U612B	A10-16	3A	A10	3A
U620	A10-15	2B	A10	3A
U621	A10-15	5C	A10	3A
U622	A10-15	5C	A10	3A
U623	A10-16	3B	A10	2A
U624	A10-15	4A	A10	3A
U626	A10-16	4B	A10	3A
U627	A10-16	5B	A10	3A
U628A	A10-15	4C	A10	3A
U628B	A10-16	3A	A10	3A
U628C	A10-16	3A	A10	3A
U628D	A10-16	3A	A10	3A
U629A	A10-15	3C	A10	3A
U629B	A10-15	5B	A10	3A
U630B	A10-15	5B	A10	3A
U630A	A10-16	3B	A10	3A
U631A	A10-15	4C	A10	3A
U631B	A10-15	2A	A10	3A
U631C	A10-15	2D	A10	3A
U631D	A10-15	2D	A10	3A
U640	A10-15	5D	A10	2A
U700	A10-4	3A	A10	1C
U701A	A10-4	1B	A10	1B
U701B	A10-4	1B	A10	1B
U701C	A10-4	1C	A10	1B
U701D	A10-4	1D	A10	1B
U750	A10-3	3A	A10	2C
U751A	A10-3	1C	A10	2C
U751B	A10-3	1D	A10	2C
U751C	A10-3	1B	A10	2C
U751D	A10-3	1B	A10	2C
U900	A10-12	2A	A10	3C
U901	A10-13	2A	A10	2C
U903A	A10-12	5B	A10	2C
U903B	A10-12	4A	A10	2C
U905	A10-12	2A	A10	2C
U908	A10-12	3A	A10	2C
U912	A10-12	5A	A10	2C
U931	A10-13	4C	A10	2C
U932	A10-13	4A	A10	2C
U933	A10-13	4D	A10	2C
U934	A10-13	4B	A10	2C
U942A	A10-13	5B	A10	3C
U942B	A10-13	5C	A10	3C
U942C	A10-13	5C	A10	3C
U942D	A10-13	5D	A10	3C
U1001	A10-10	5A	A10	3A
U1003	A10-10	1B	A10	3A
U1050	A10-10	2C	A10	3A
U1100	A10-2	5A	A10	1C
U1101A	A10-2	3B	A10	2C
U1101B	A10-2	5B	A10	2C
U1101C	A10-2	3B	A10	2C
U1101D	A10-2	5B	A10	2C
U1102	A10-2	2C	A10	1C
U1103	A10-2	2C	A10	1C
U1200	A10-1	5A	A10	2C
U1201A	A10-1	3B	A10	2C
U1201B	A10-1	3B	A10	2C
U1201C	A10-1	3B	A10	2C
U1201D	A10-1	4B	A10	2C
U1202B	A10-1	4B	A10	2C
U1202C	A10-1	3A	A10	2C
U1202A	A10-2	3B	A10	2C
U1202D	A10-2	3A	A10	2C
U1203	A10-1	2C	A10	2C
U1204	A10-1	2C	A10	2C
U1500A	A10-12	2D	A10	3B
U1500B	A10-12	1D	A10	3B
U1501A	A10-12	5D	A10	3C
U1501B	A10-12	5D	A10	3C
U1502	A10-12	3D	A10	3B
U1503	A10-12	3D	A10	3C
U1550A	A10-9	5C	A10	3C
U1550B	A10-9	2C	A10	3C
U1550C	A10-9	4D	A10	3C
U1550D	A10-9	1D	A10	3C
U1551	A10-9	5A	A10	3C
U1552	A10-9	2A	A10	4C
U1601A	A10-7	4C	A10	3B
U1601B	A10-7	4C	A10	3B
U1602A	A10-7	2C	A10	3B
U1602B	A10-7	2A	A10	3B
U1603	A10-7	5B	A10	3B
U1651A	A10-8	4C	A10	4B
U1651B	A10-8	4C	A10	4B
U1652A	A10-8	2C	A10	4B
U1652B	A10-8	2A	A10	4B
U1653	A10-8	5B	A10	3B
U1700	A10-11	1A	A10	4C
U1701	A10-11	2B	A10	3C
U1703	A10-11	3A	A10	3C
U1705A	A10-11	2C	A10	3B
U1705B	A10-11	2C	A10	3B
U1705C	A10-11	2D	A10	3B
U1705D	A10-11	2D	A10	3B
U1800A	A10-9	1D	A10	3C
U1800B	A10-9	2D	A10	3C
U1800C	A10-9	2D	A10	3C
U1800D	A10-9	5D	A10	3C
U1800E	A10-9	4D	A10	3C
U1810A	A10-9	3D	A10	3C
U1810B	A10-9	2D	A10	3C
U1810C	A10-9	3D	A10	3C
U1820A	A10-9	6D	A10	2C
U1820B	A10-9	5D	A10	2C
U1820C	A10-9	6D	A10	2C
VP1	A10-18	1E	A10	1C
VP2	A10-18	1E	A10	1C
VP3	A10-18	1E	A10	1C
VP4	A10-18	1E	A10	1C
VP5	A10-18	1E	A10	1C
VP6	A10-18	1E	A10	1C
VR1613	A10-7	2D	A10	3B
VR1614	A10-7	3D	A10	3B
VR1663	A10-8	2D	A10	4B
VR1664	A10-8	3D	A10	3B
Y501	A10-14	1A	A10	2B

*Asterisks indicate components located on the back of the board.

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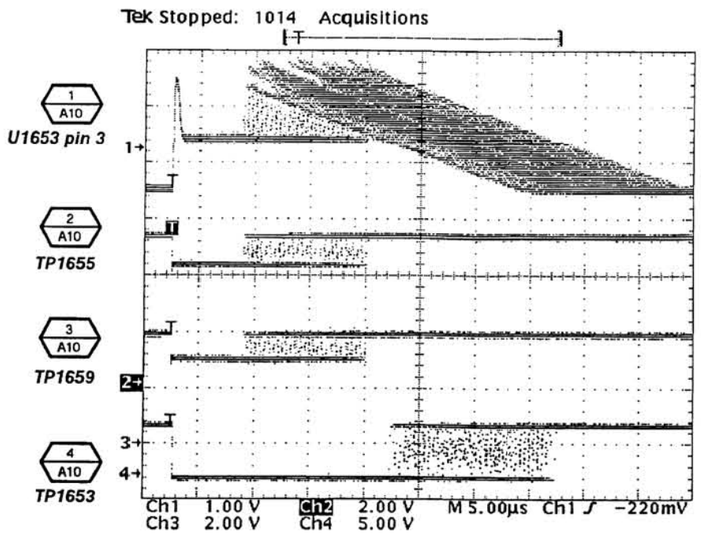
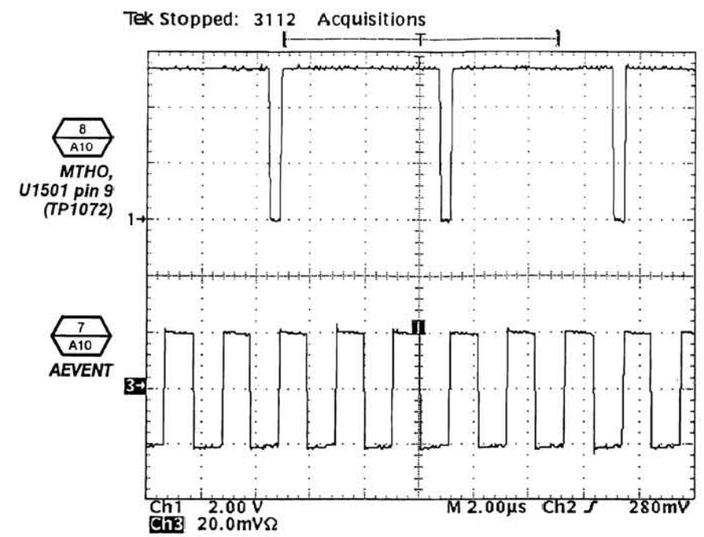
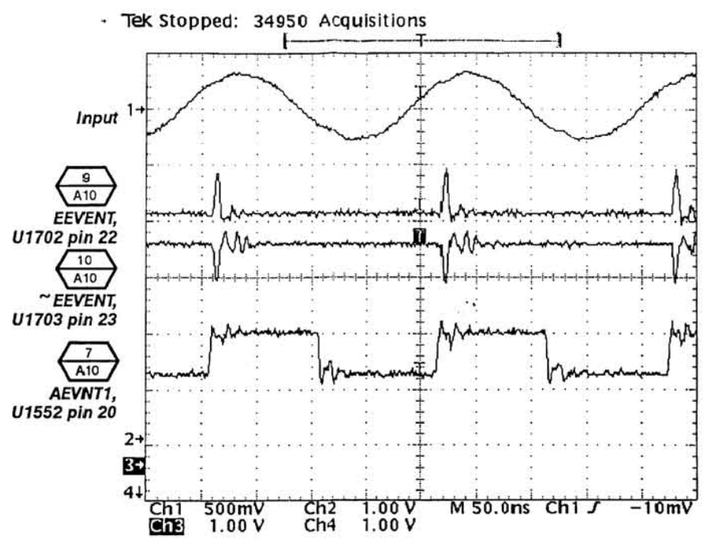
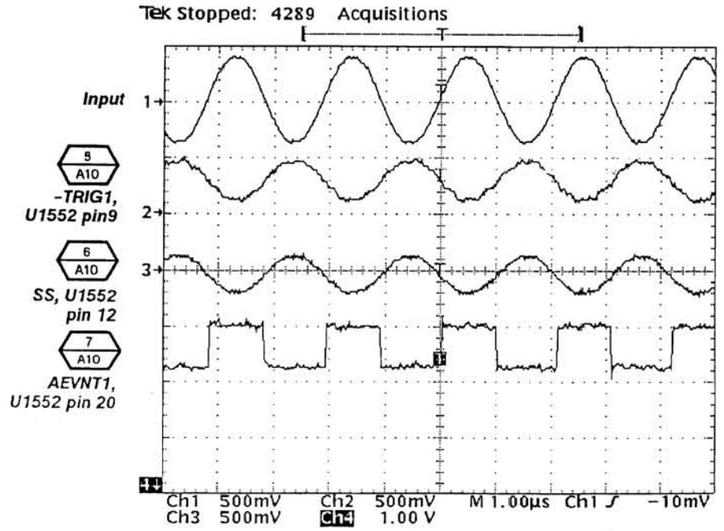
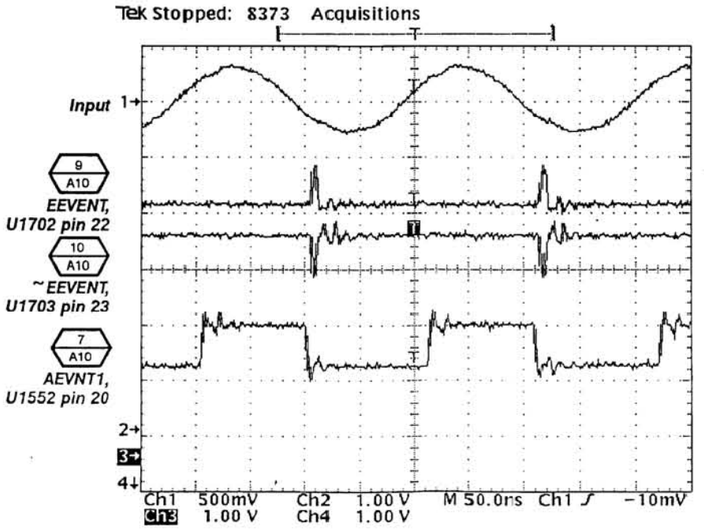


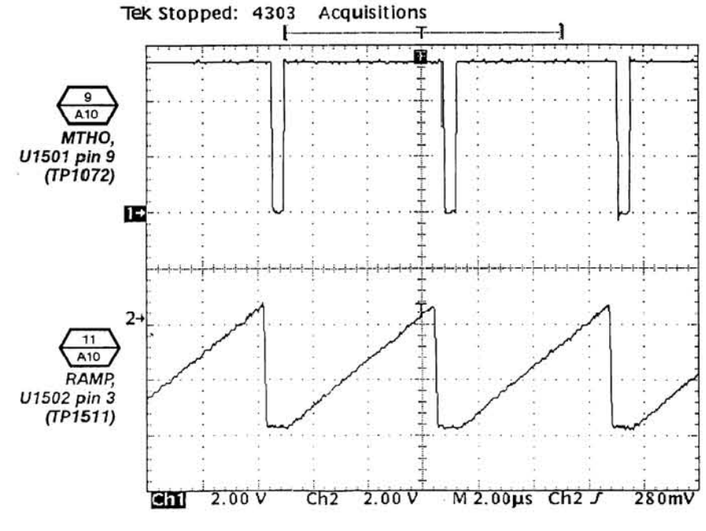




State Trigger







Glitch Trigger

Vol. 2 Figure 9-49: A10 Acquisition Waveforms

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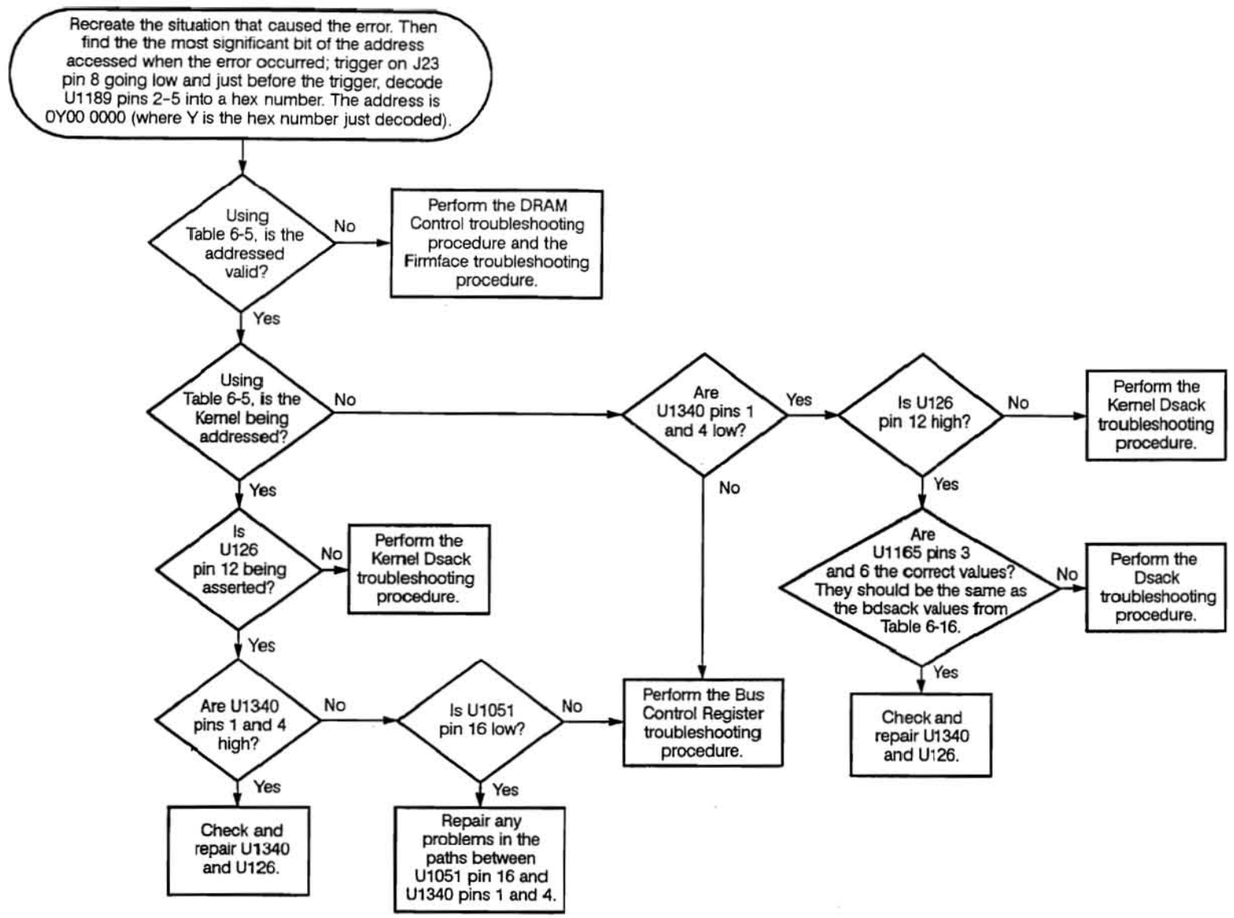
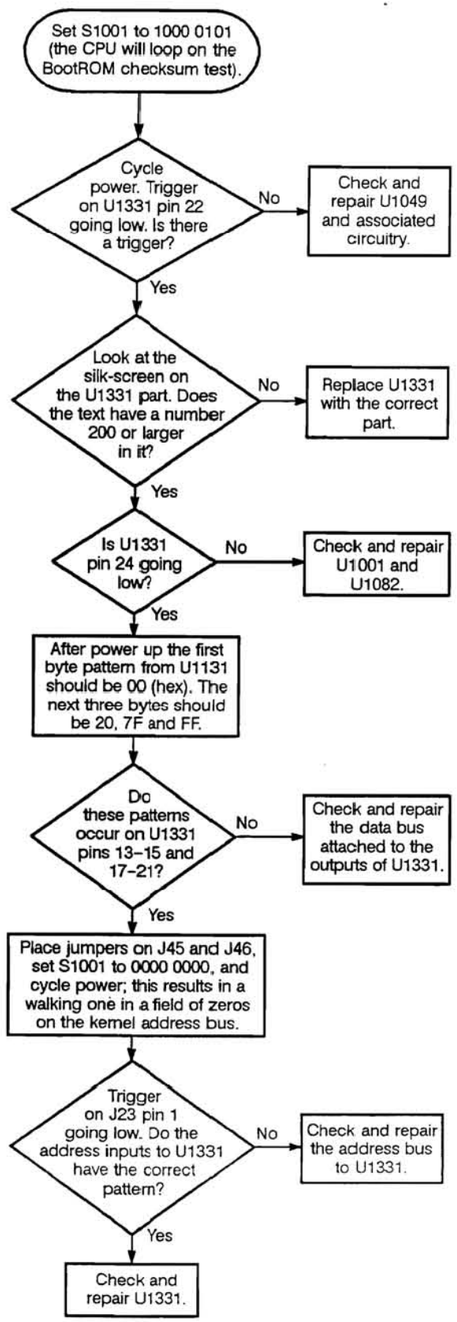


Vol. 2 Figure 9-50: Bdsack Troubleshooting Procedure



Vol. 2 Figure 9-51: BootROM Control Troubleshooting Procedure

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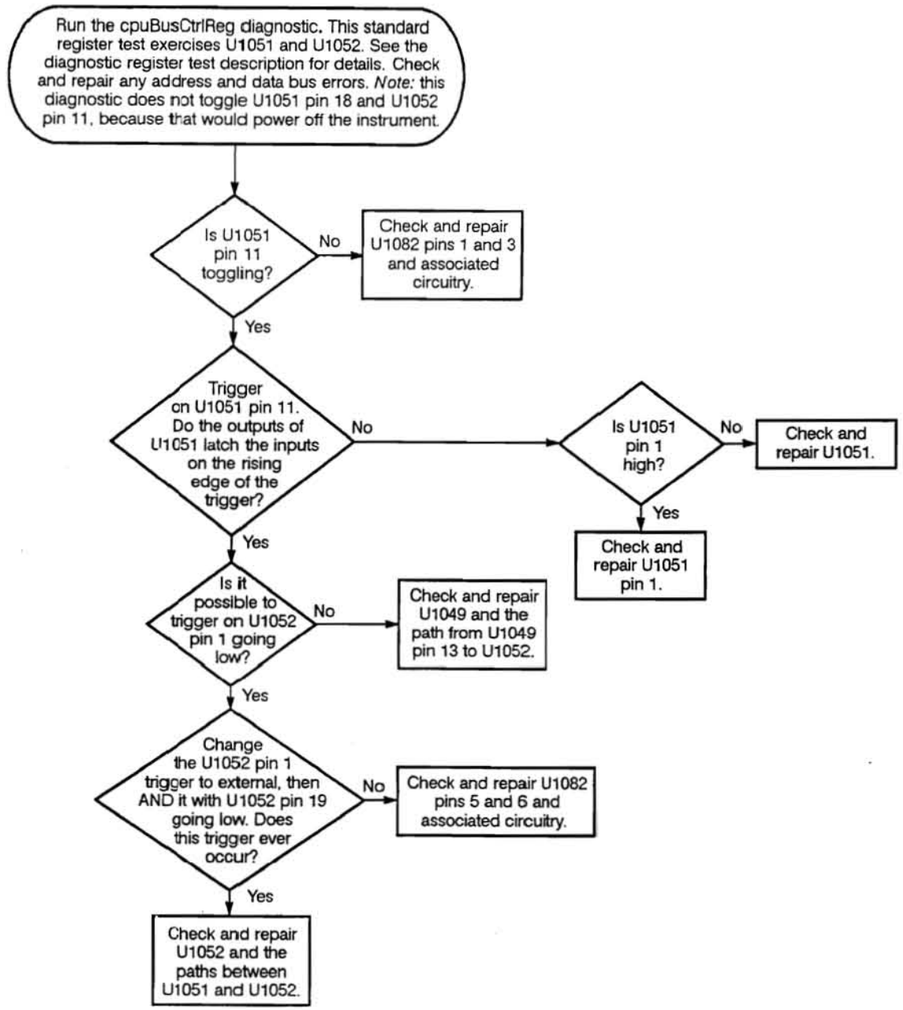
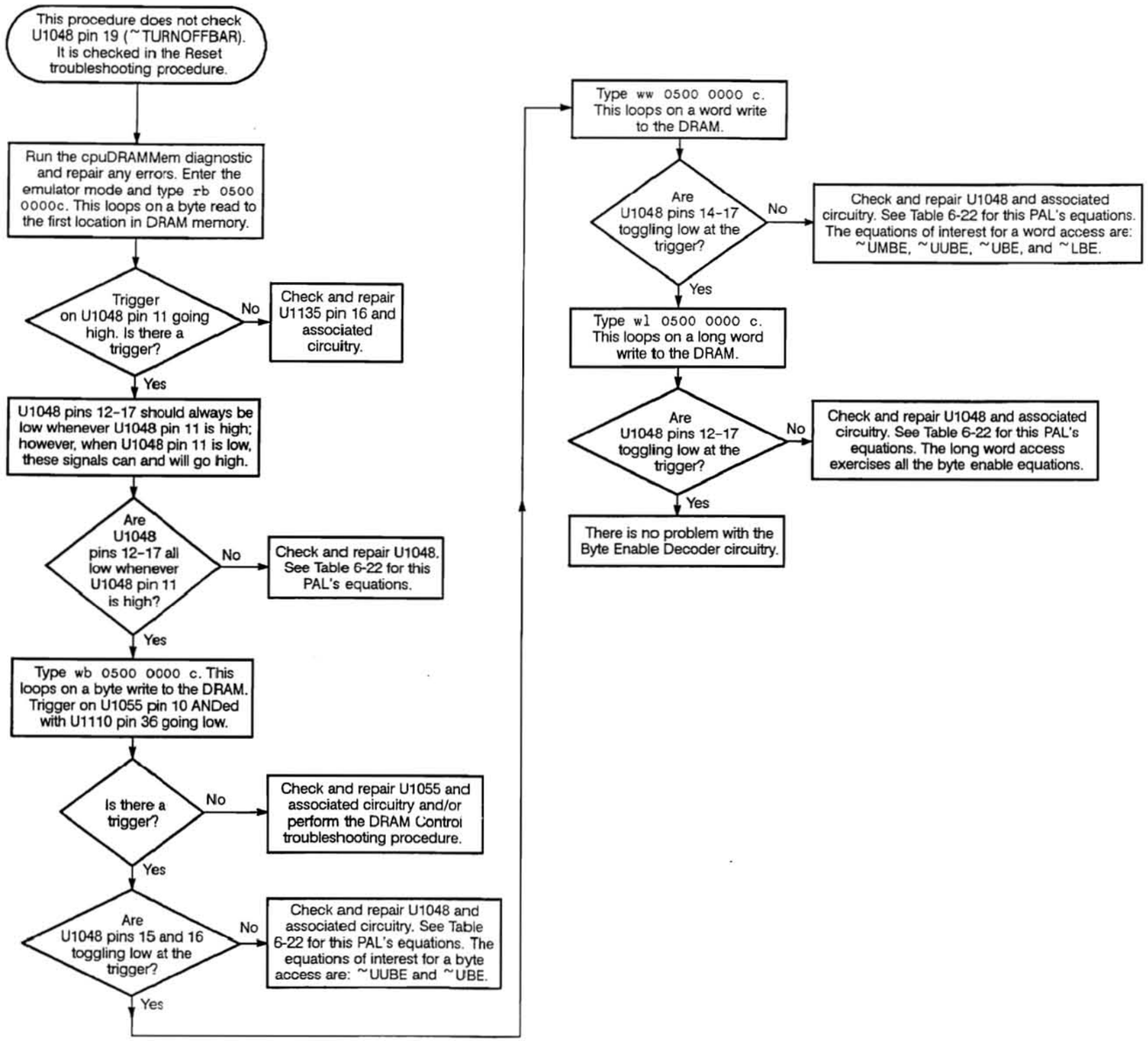


Vol. 2 Figure 9-52: Bus Control Register Troubleshooting Procedure



Vol. 2 Figure 9-53: Byte Enable Decoder Troubleshooting Procedure

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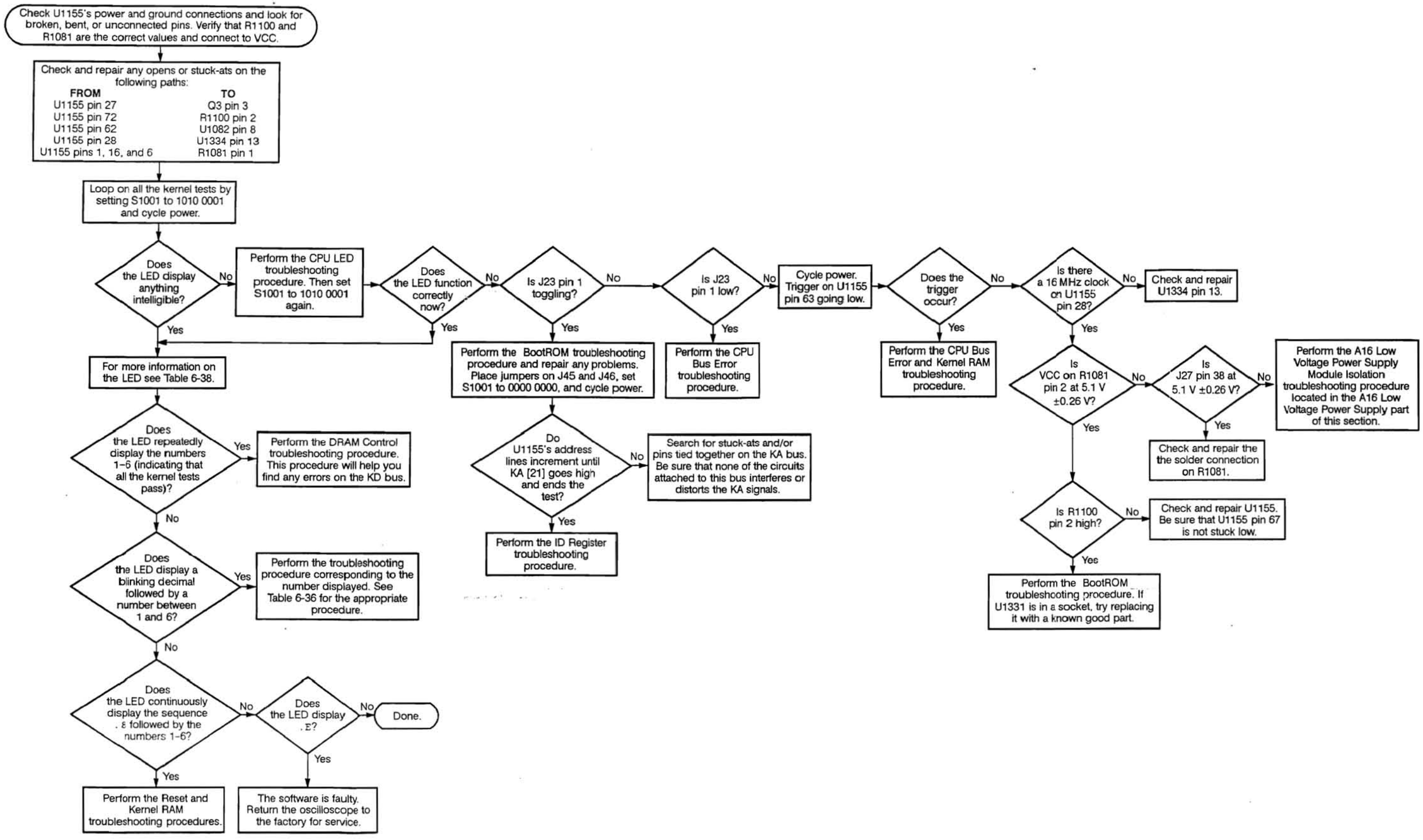
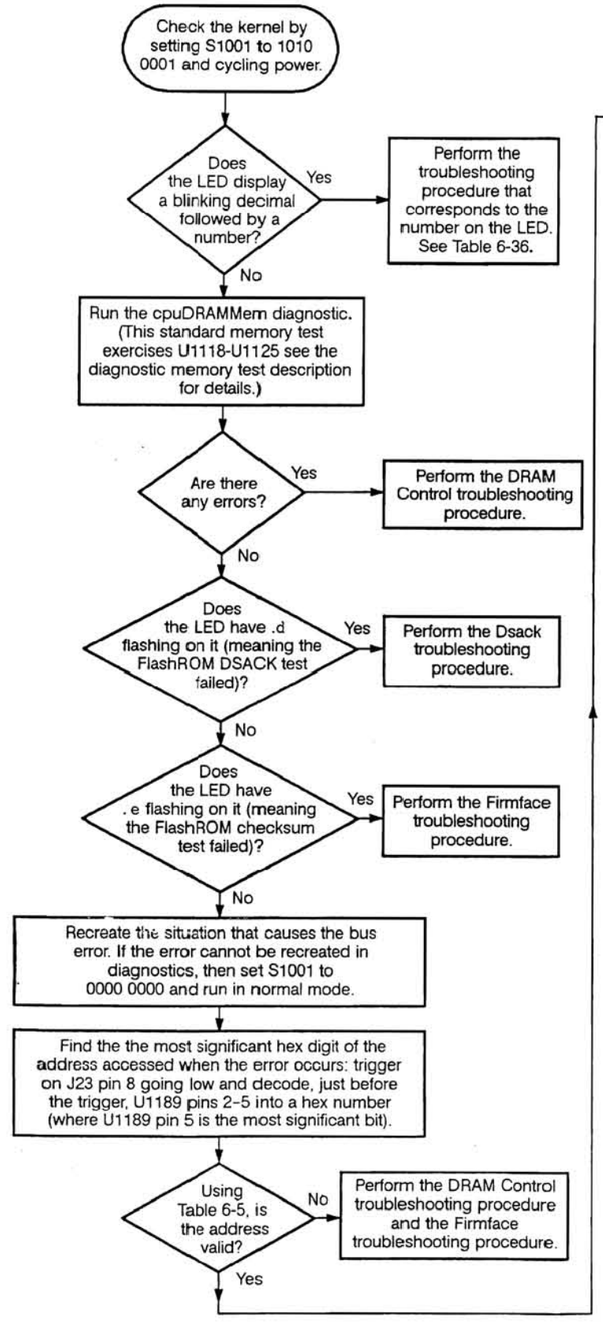
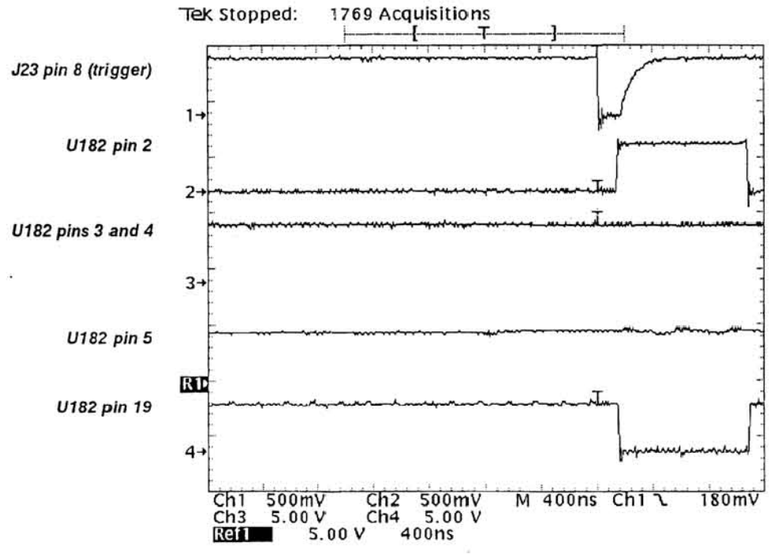


Vol. 2 Figure 9-54: CPU Troubleshooting Procedure





Vol. 2 Figure 9-55: Bus Error Circuitry Signals

Vol. 2 Figure 9-56: CPU Bus Error Troubleshooting Procedure

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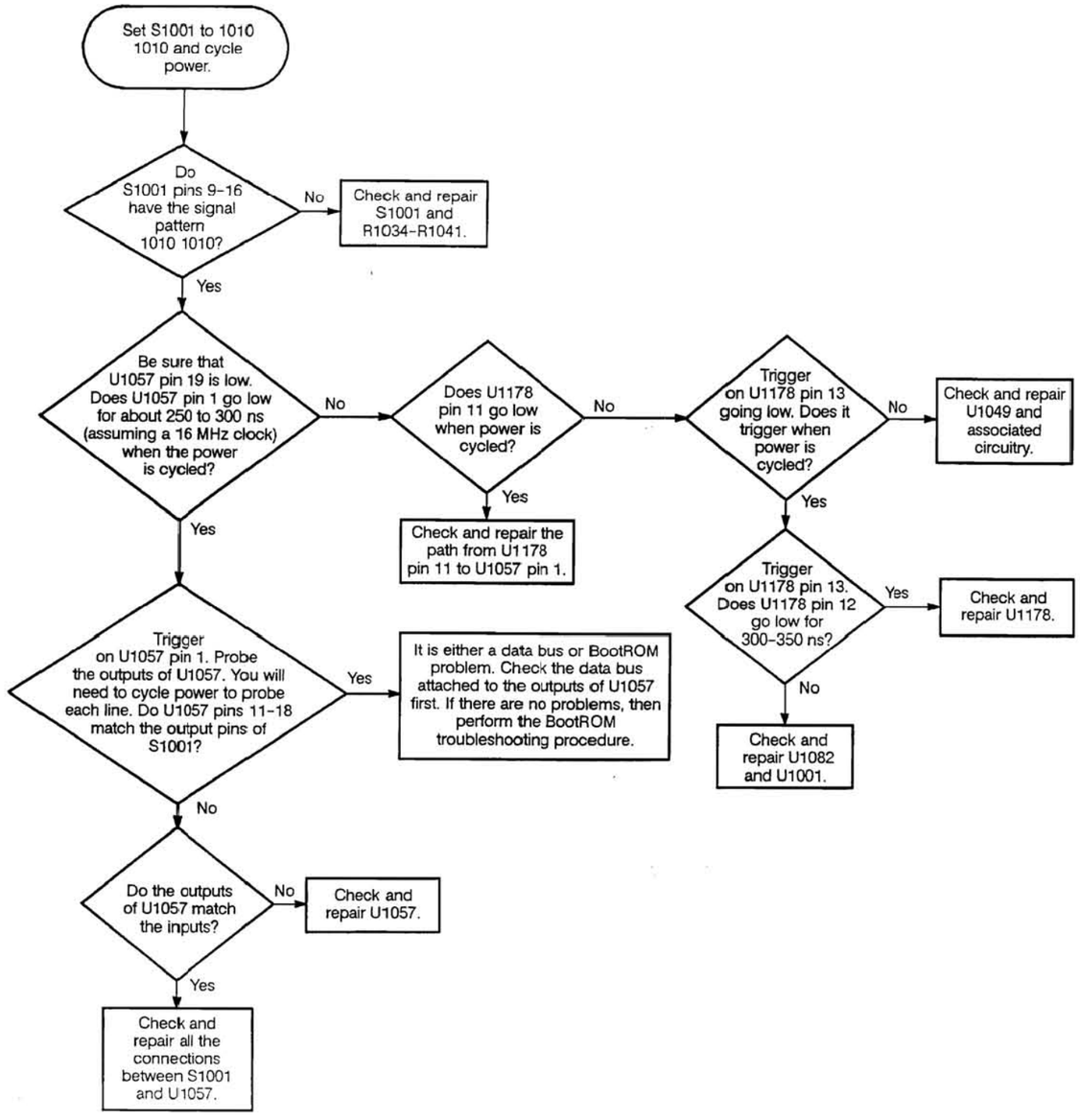
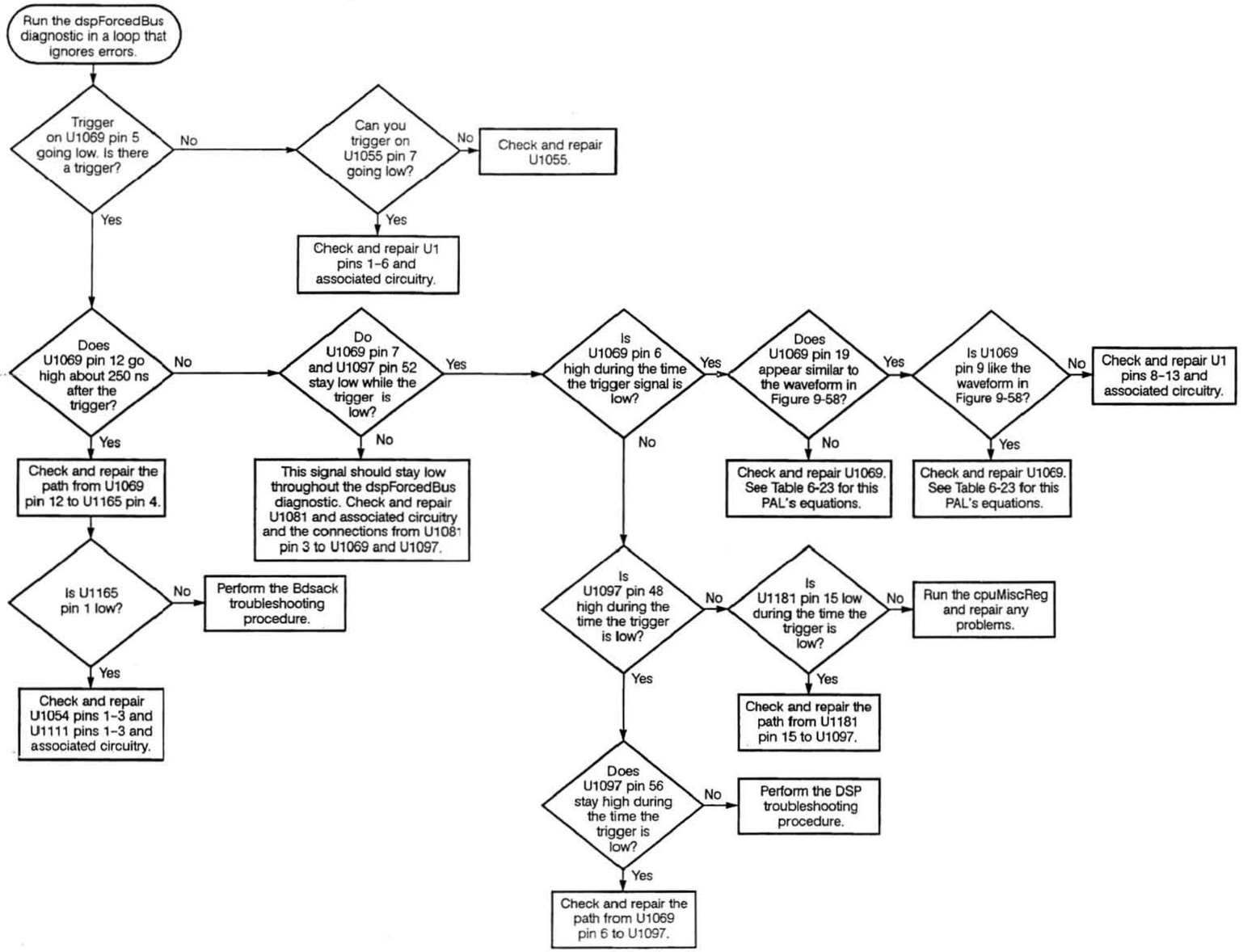
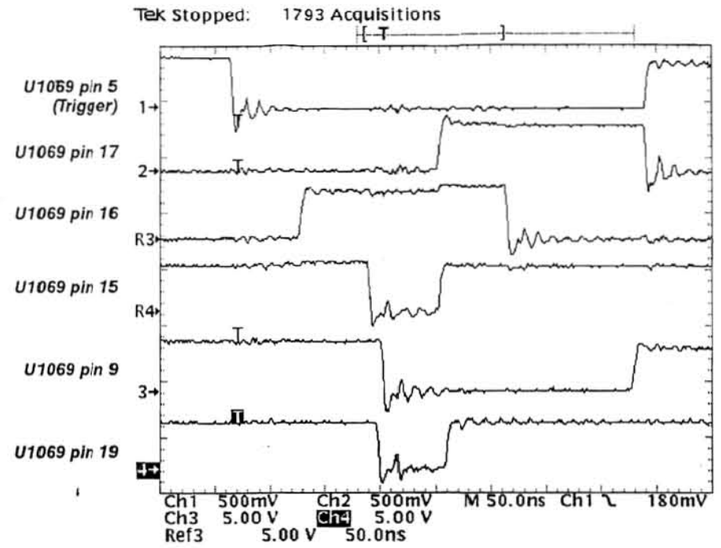
Scans by Artekmedia => 2011



Vol. 2 Figure 9-57: CPU DIP Switch Troubleshooting Procedure





Vol. 2 Figure 9-58: U1069 Signals When the CPU Forcefully Accesses the DSP (U1097) Bus

Vol. 2 Figure 9-59: CPU Forced Bus From DSP Troubleshooting Procedure

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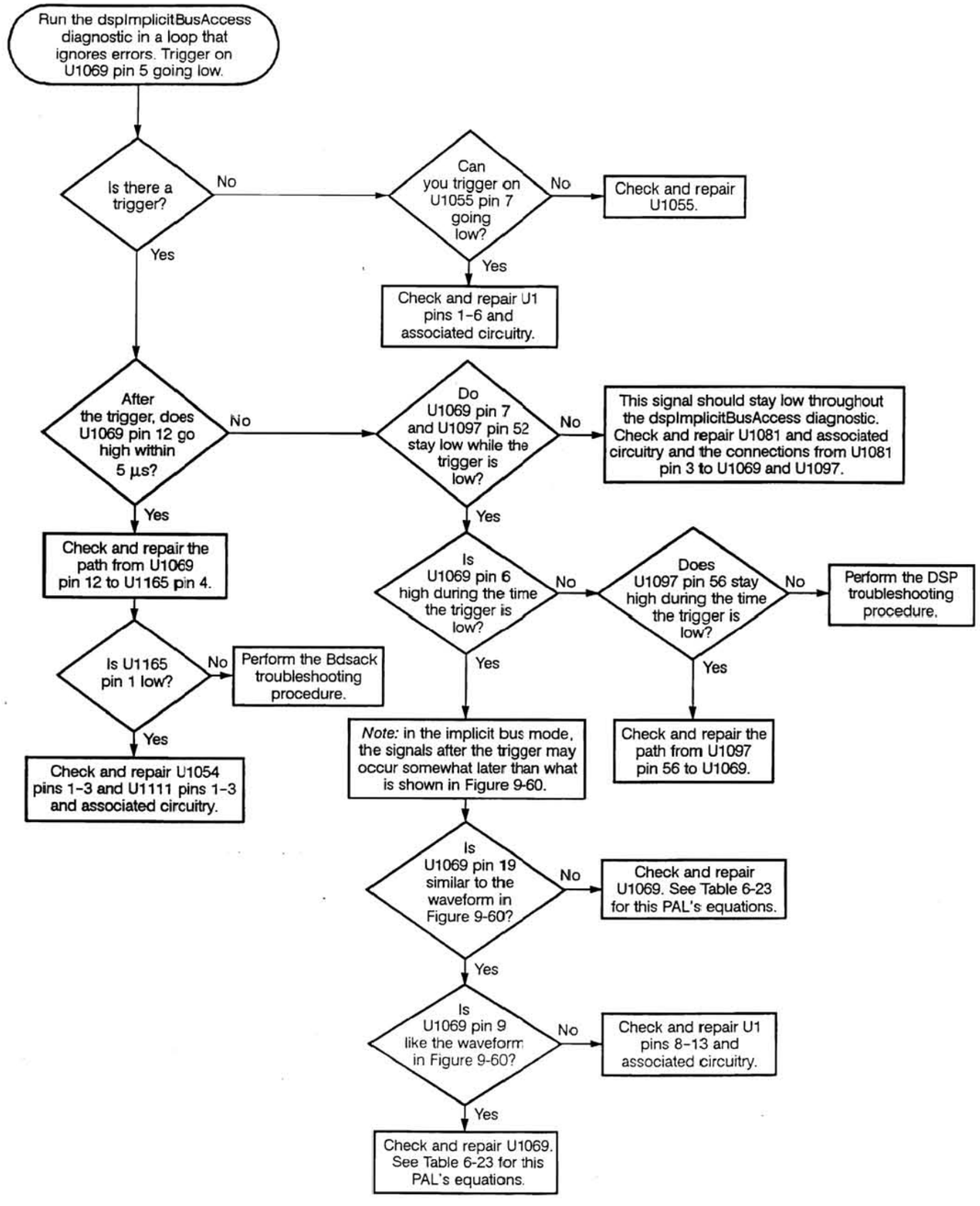
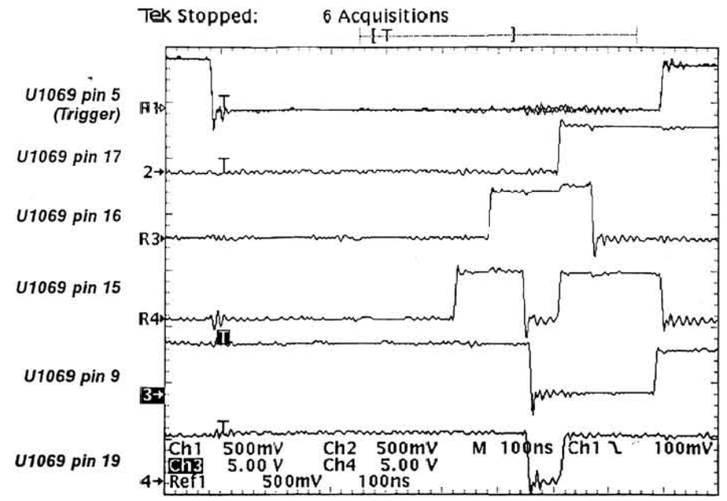
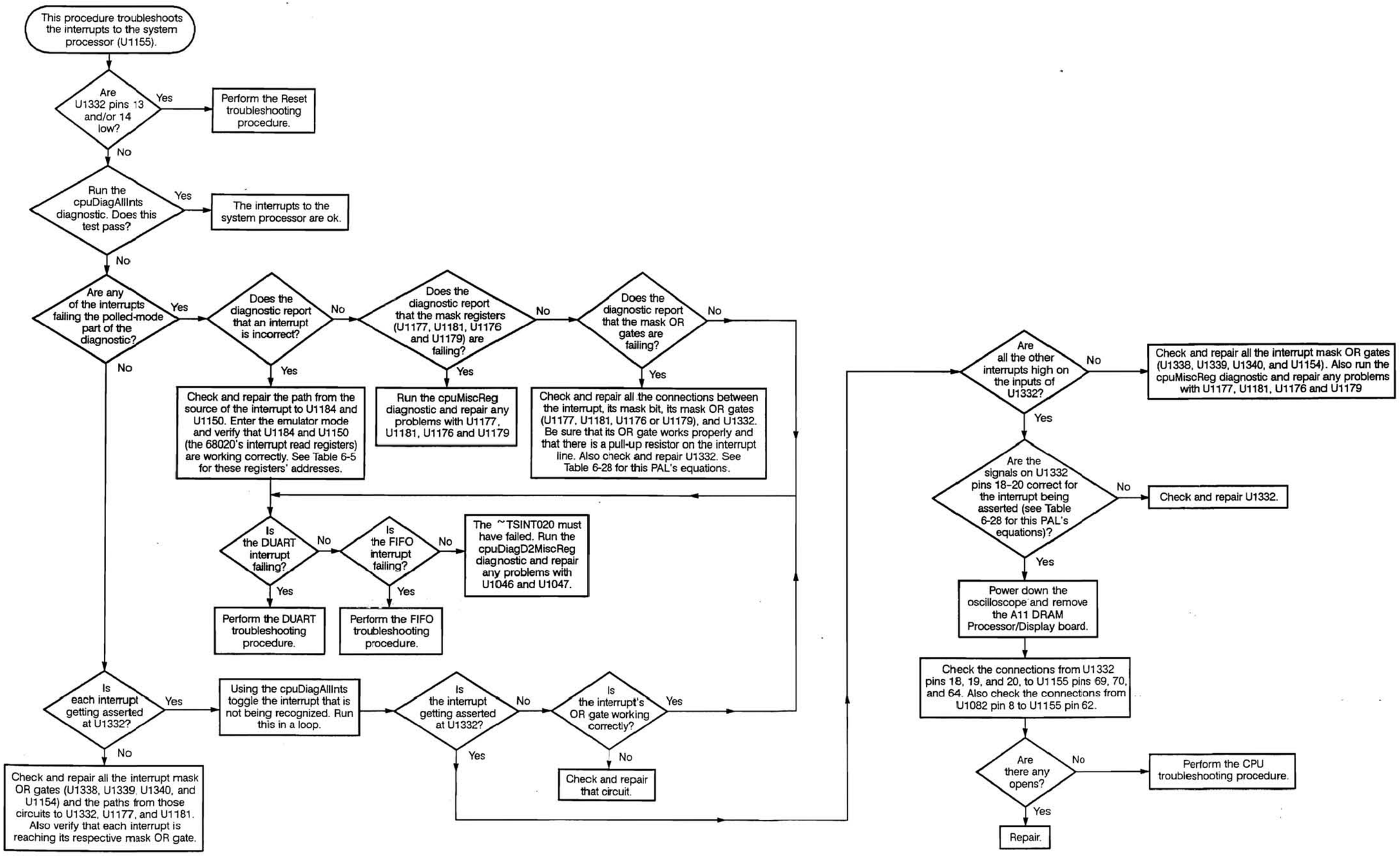
Scans by Artekmedia => 2011





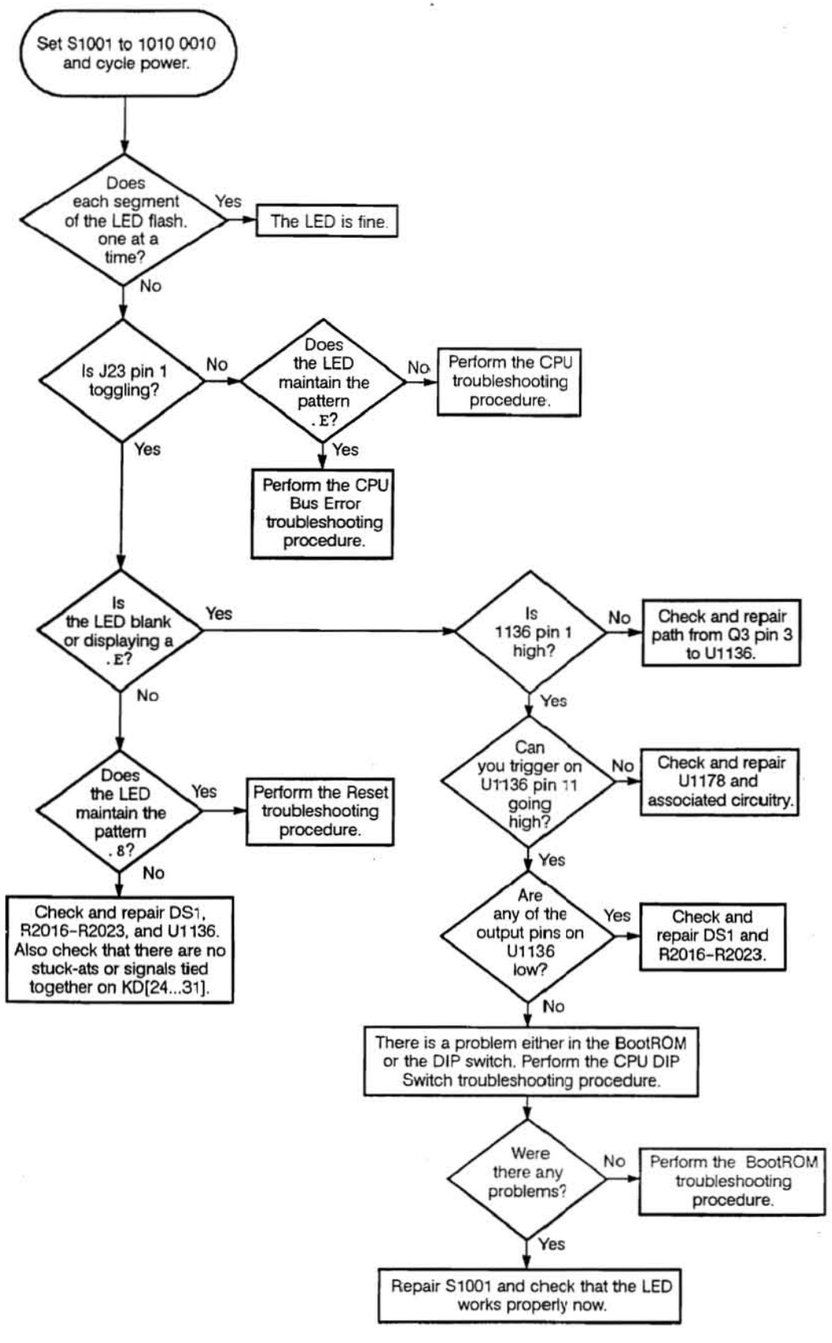
Vol. 2 Figure 9-60: U1069 Signals During an Implicit DSP (U1097) Bus Access by the CPU

Vol. 2 Figure 9-61: CPU Implicit Bus From DSP Troubleshooting Procedure

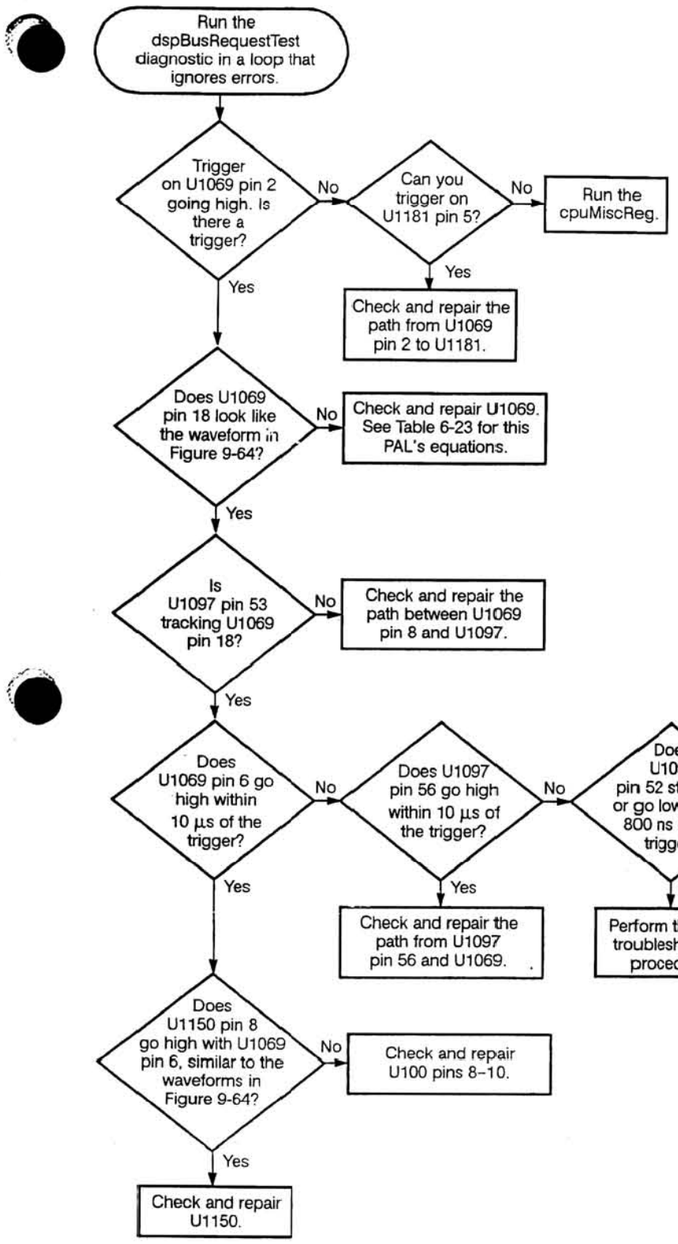


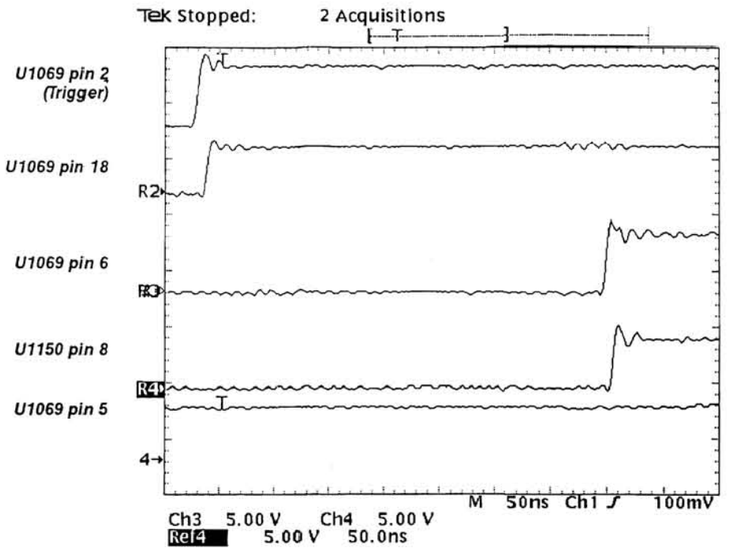
Vol. 2 Figure 9-62: CPU Interrupt Troubleshooting Procedure

Scans by Artekmedia => 2011



Vol. 2 Figure 9-63: CPU LED Troubleshooting Procedure





Vol. 2 Figure 9-64: U1069 Signals When the CPU Requests Access to the DSP (U1097) Bus

Vol. 2 Figure 9-65: CPU Request Bus From DSP Troubleshooting Procedure

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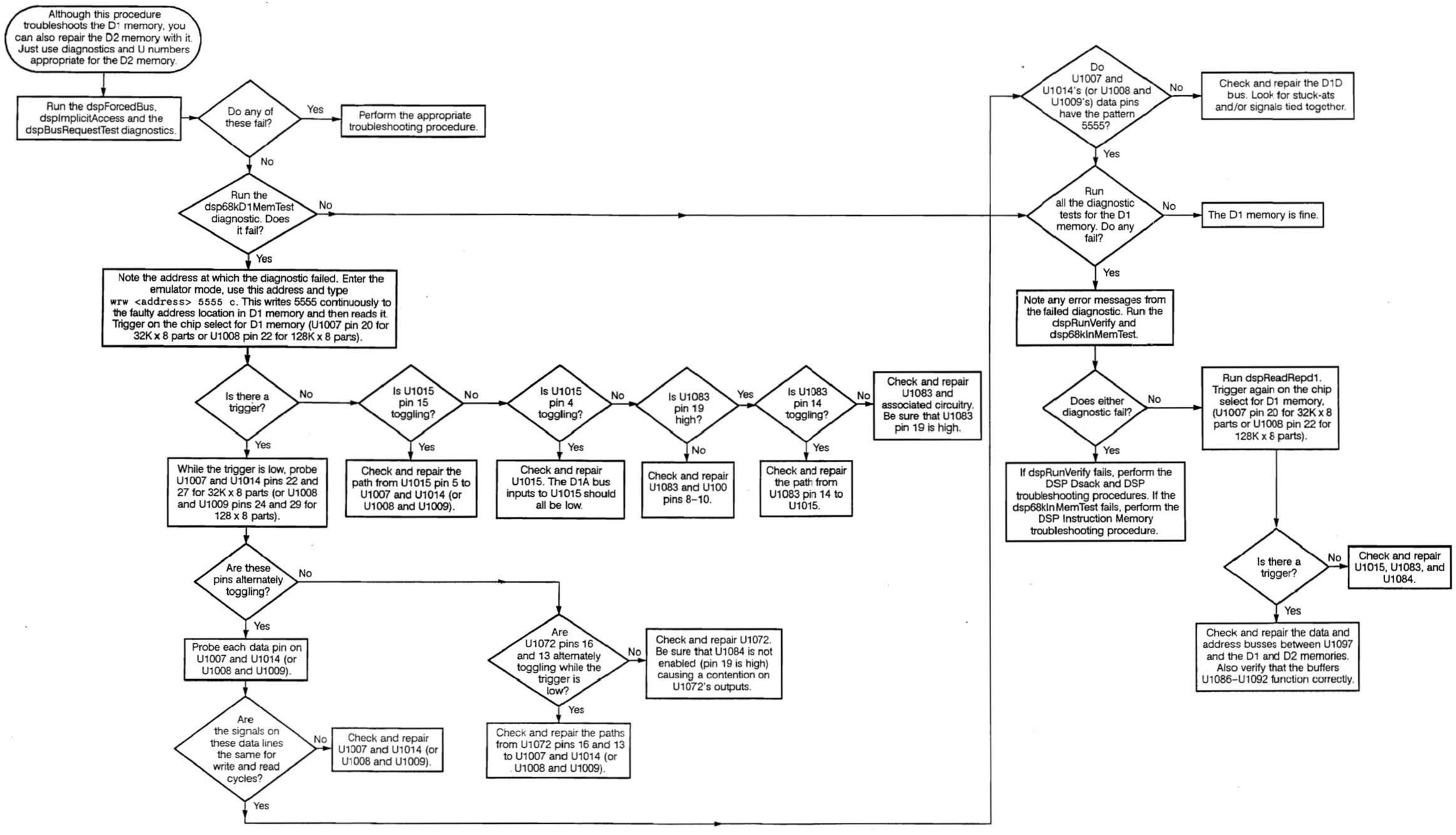
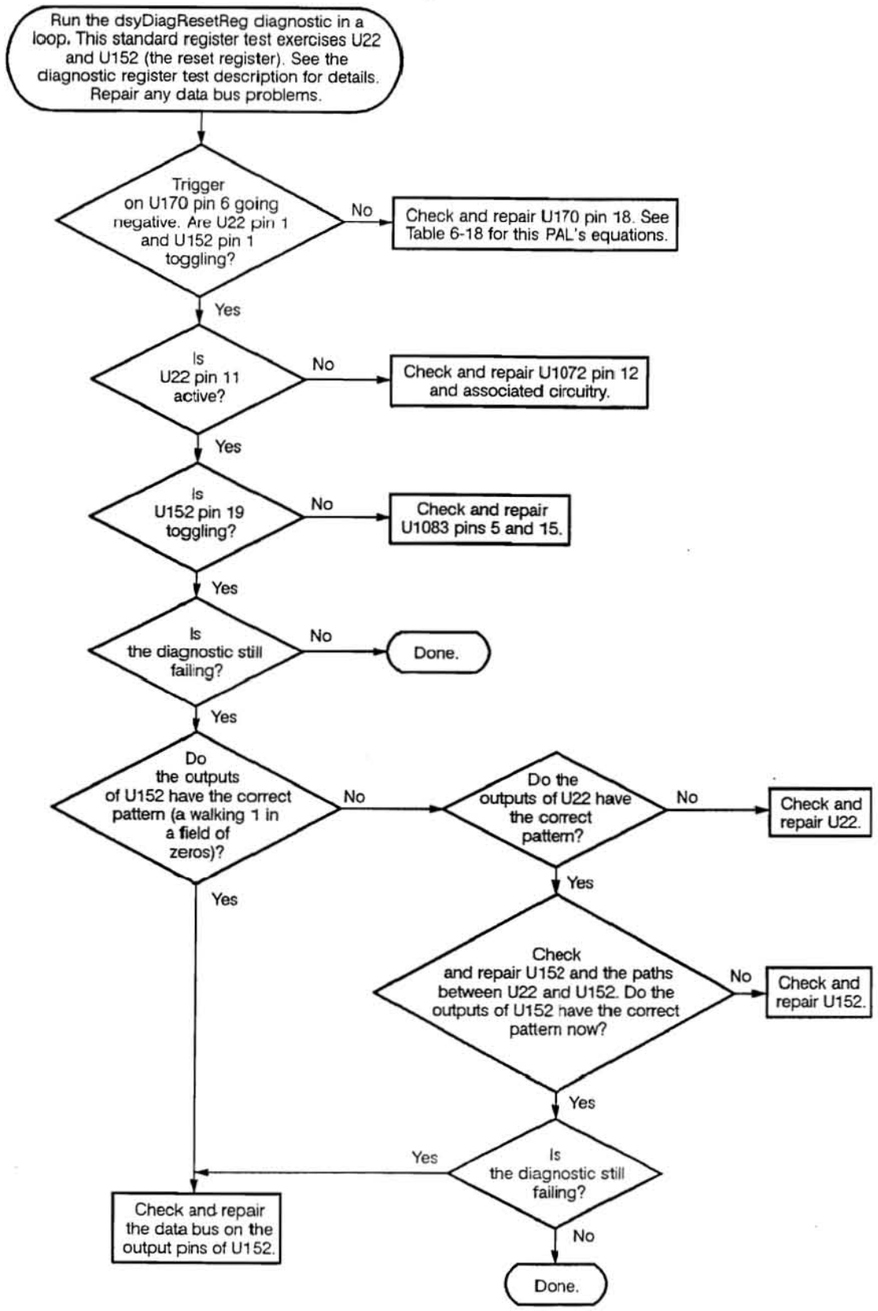


Vol. 2 Figure 9-66: D1 Memory Troubleshooting Procedure



Vol. 2 Figure 9-67: Display Reset Register Troubleshooting Procedure

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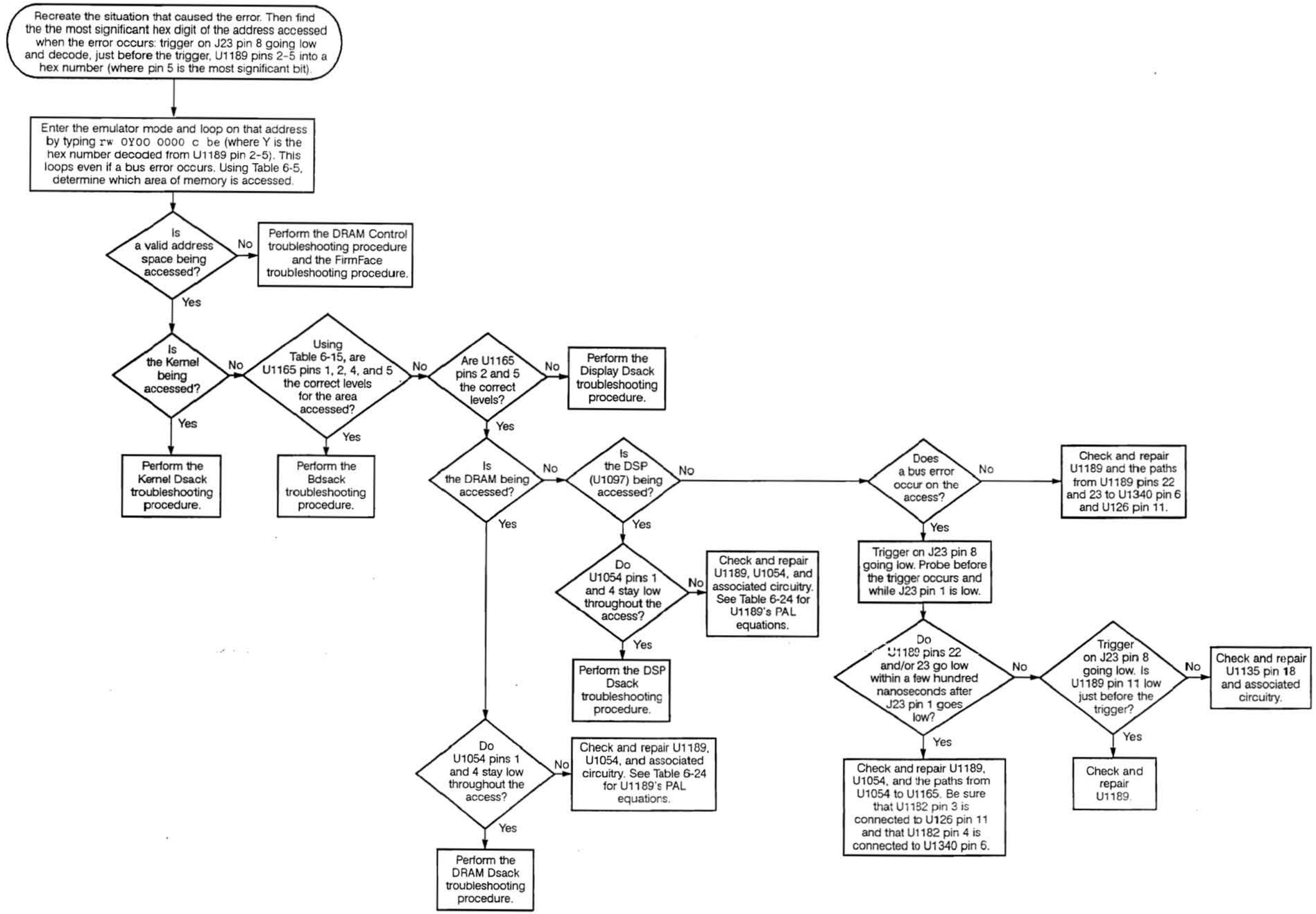
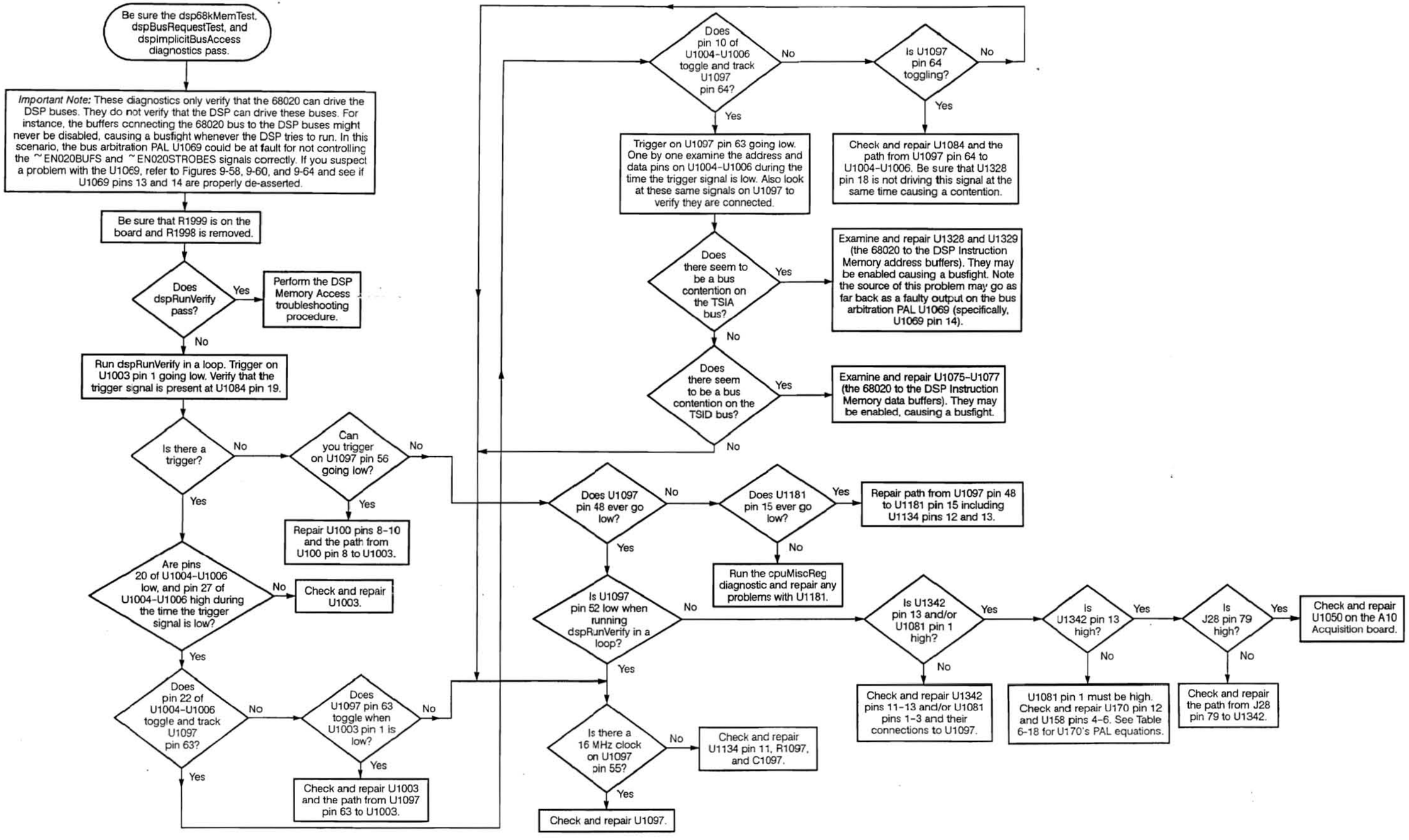


Vol. 2 Figure 9-68: Dsack Troubleshooting Procedure



Vol. 2 Figure 9-69: DSP Troubleshooting Procedure

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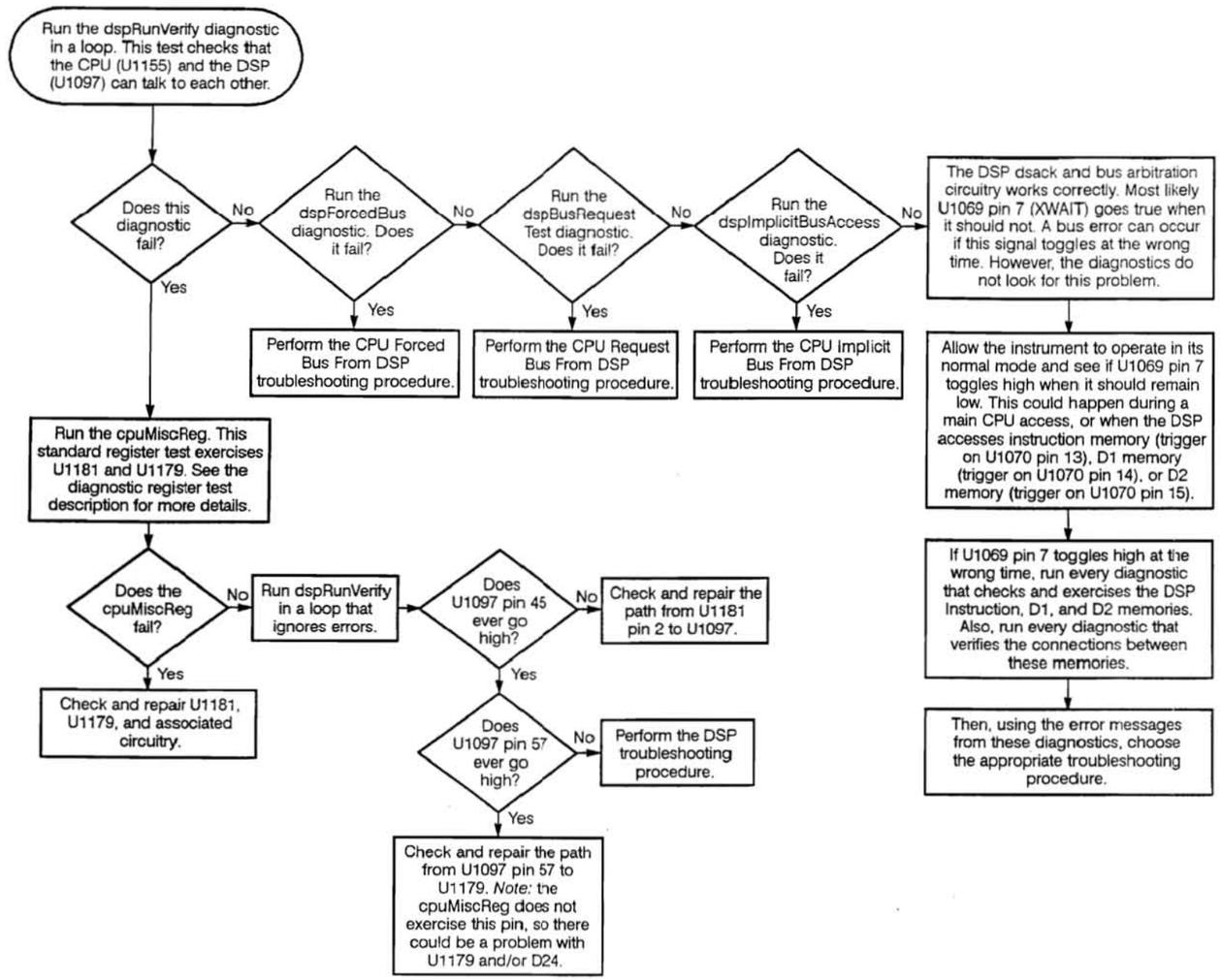
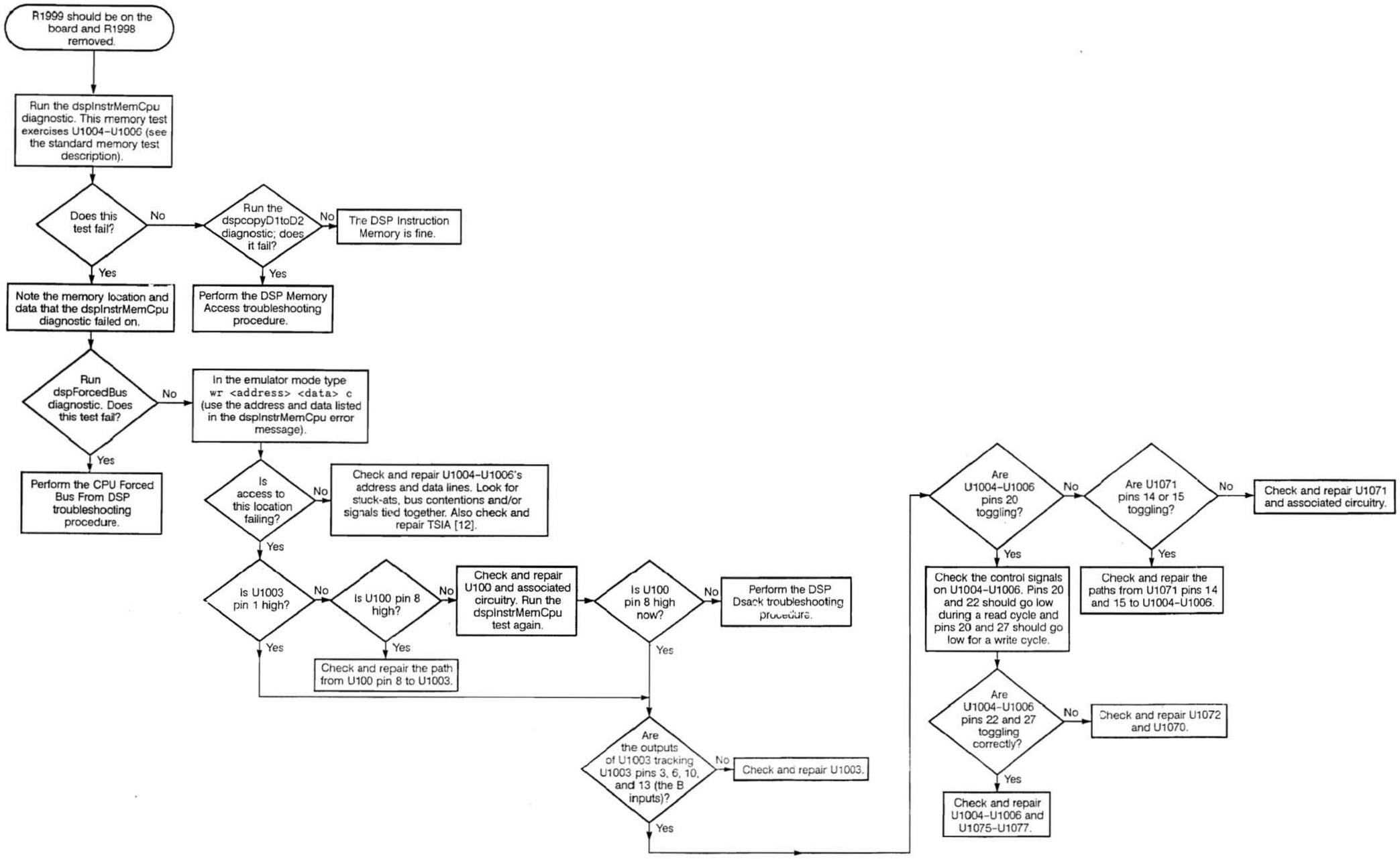


Vol. 2 Figure 9-70: DSP Dsack Troubleshooting Procedure



Vol. 2 Figure 9-71: DSP Instruction Memory Troubleshooting Procedure

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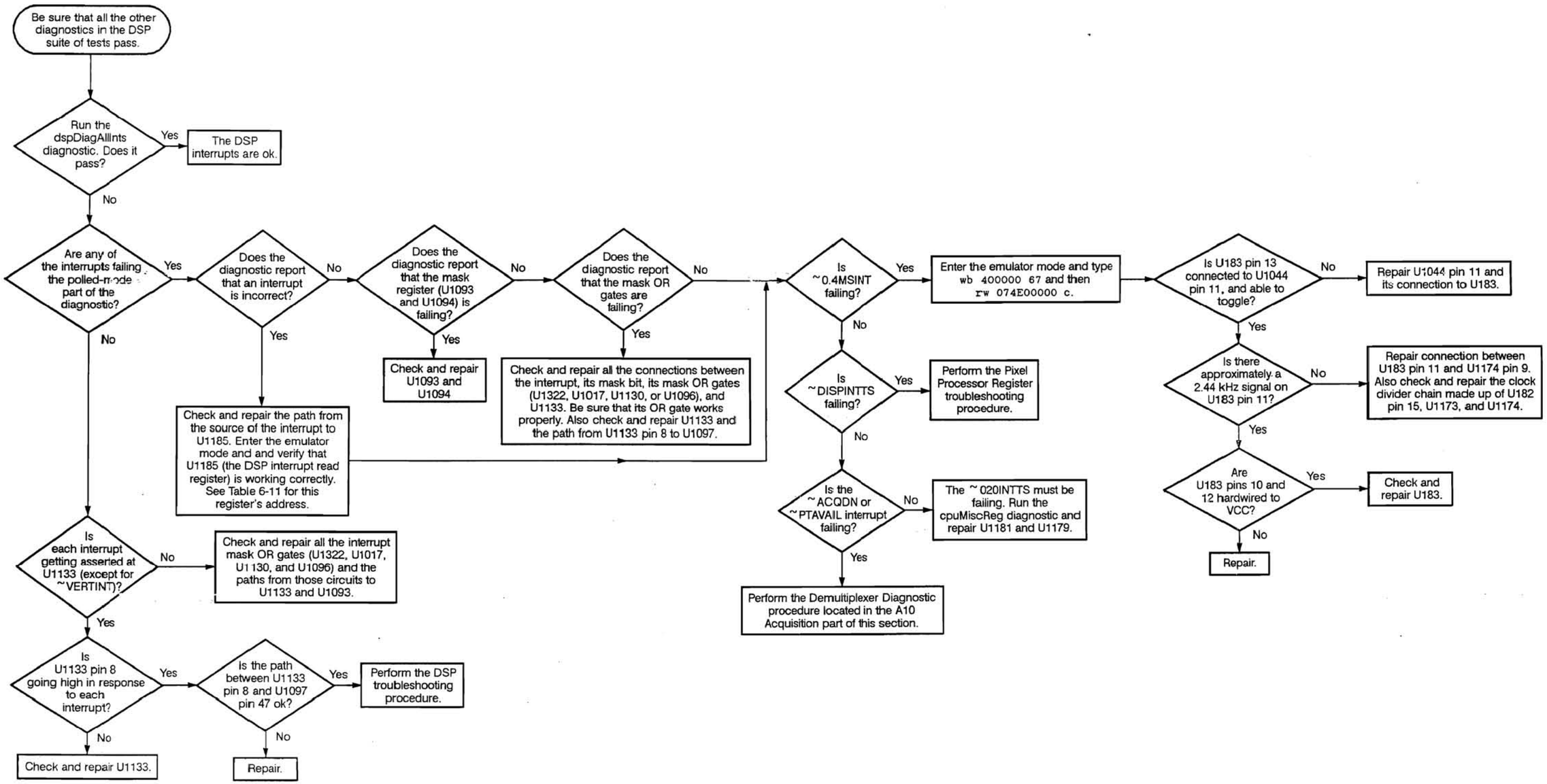
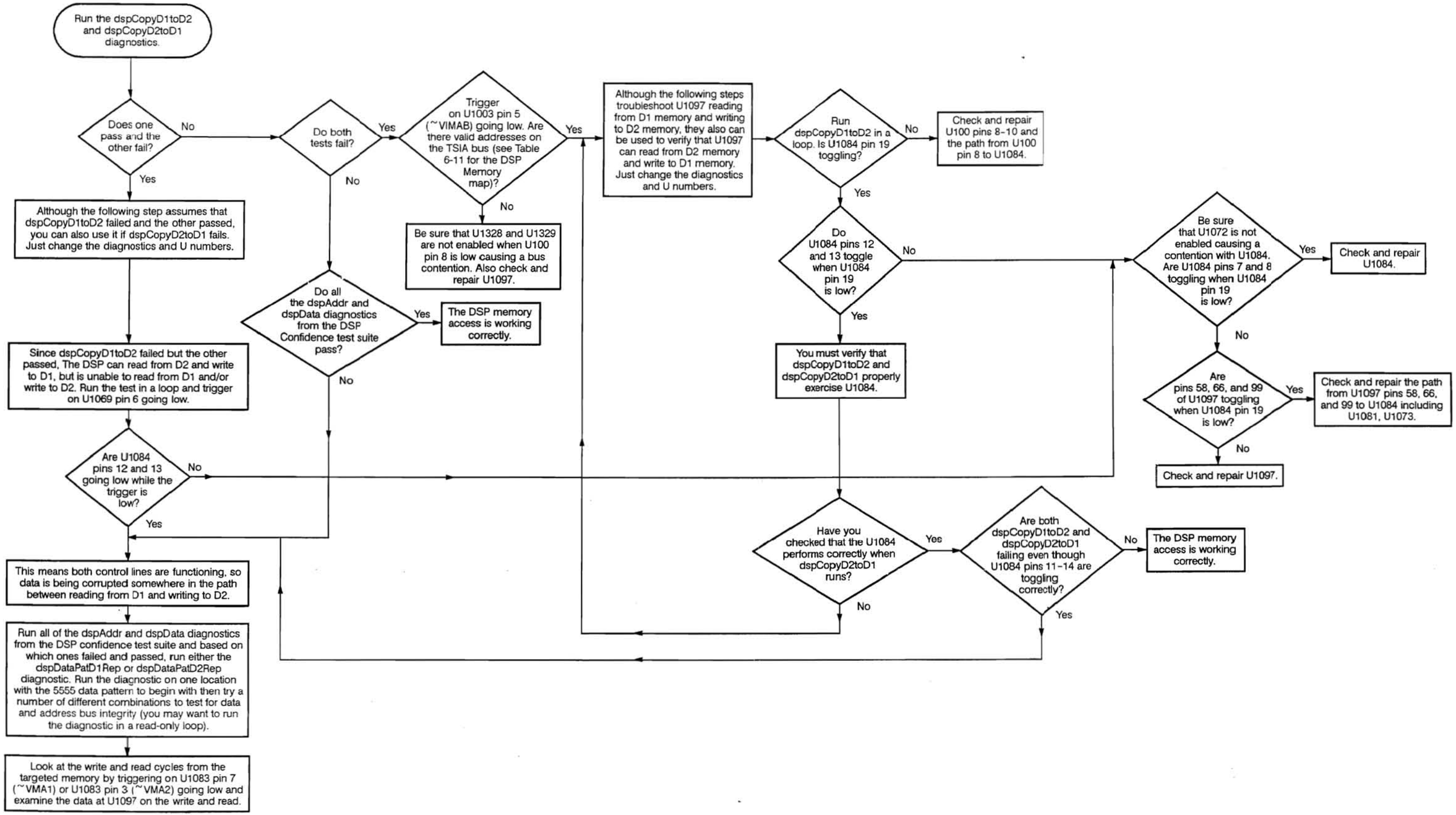


Vol. 2 Figure 9-72: DSP Interrupt Troubleshooting Procedure



Vol. 2 Figure 9-73: DSP Memory Access Troubleshooting Procedure

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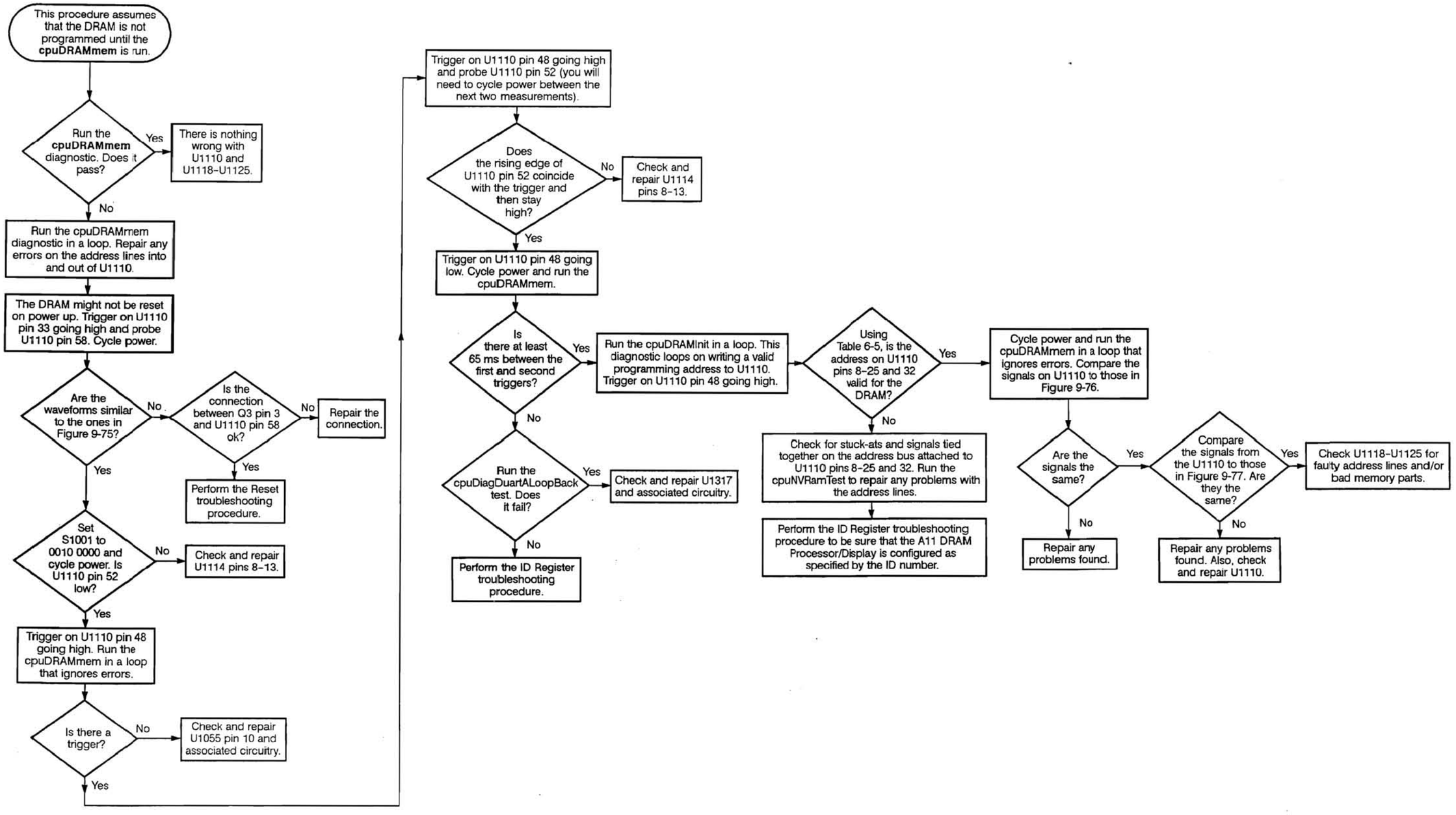
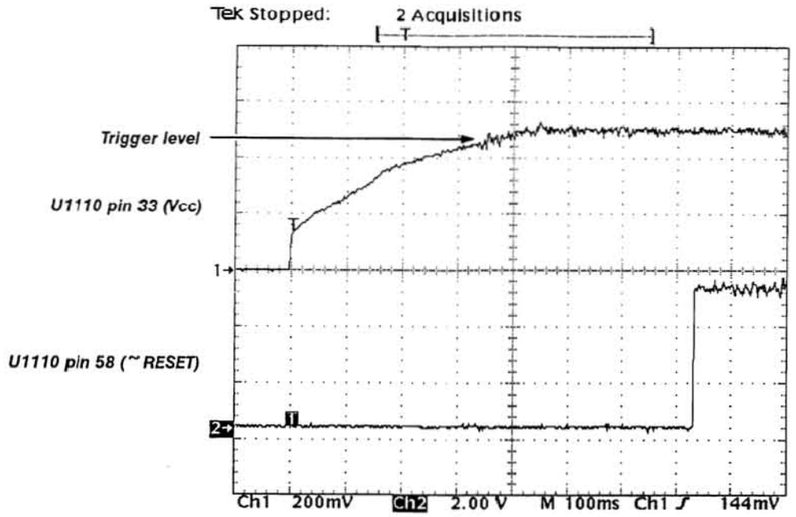
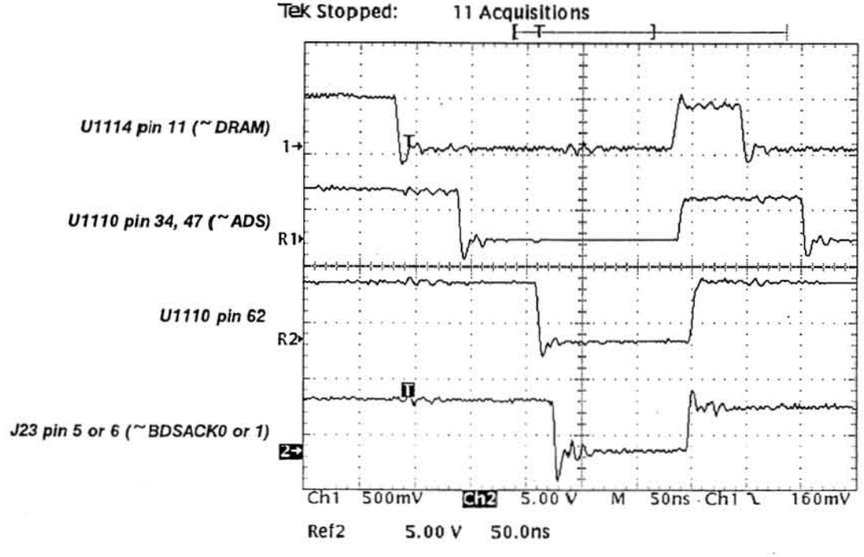


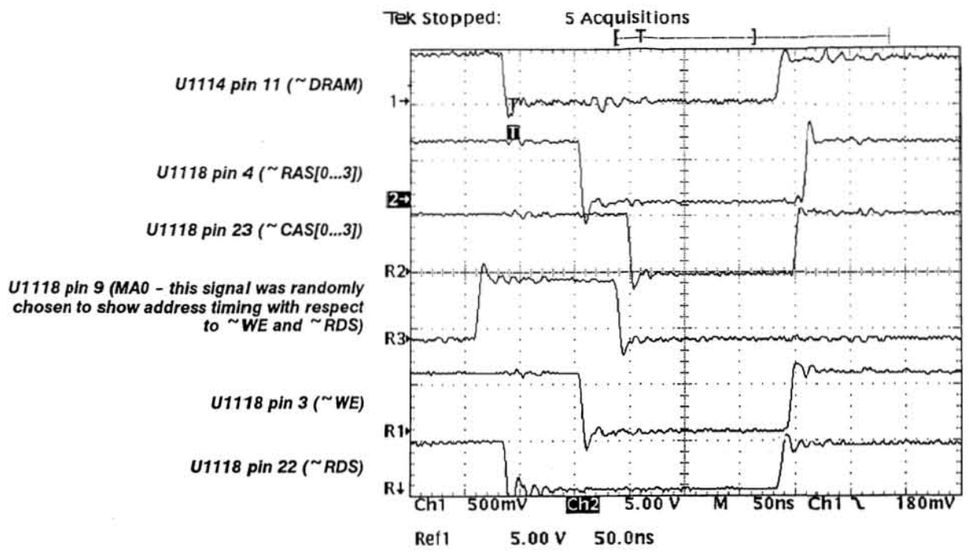
Vol. 2 Figure 9-74: DRAM Control Troubleshooting Procedure



Vol. 2 Figure 9-75: Reset on U1110 at Power Up



Vol. 2 Figure 9-76: U1110 Bus Interface Signals



Vol. 2 Figure 9-77: U1110 Output Control Signals

Vol. 2 Figure 9-74: DRAM Control Troubleshooting Procedure (Cont.)

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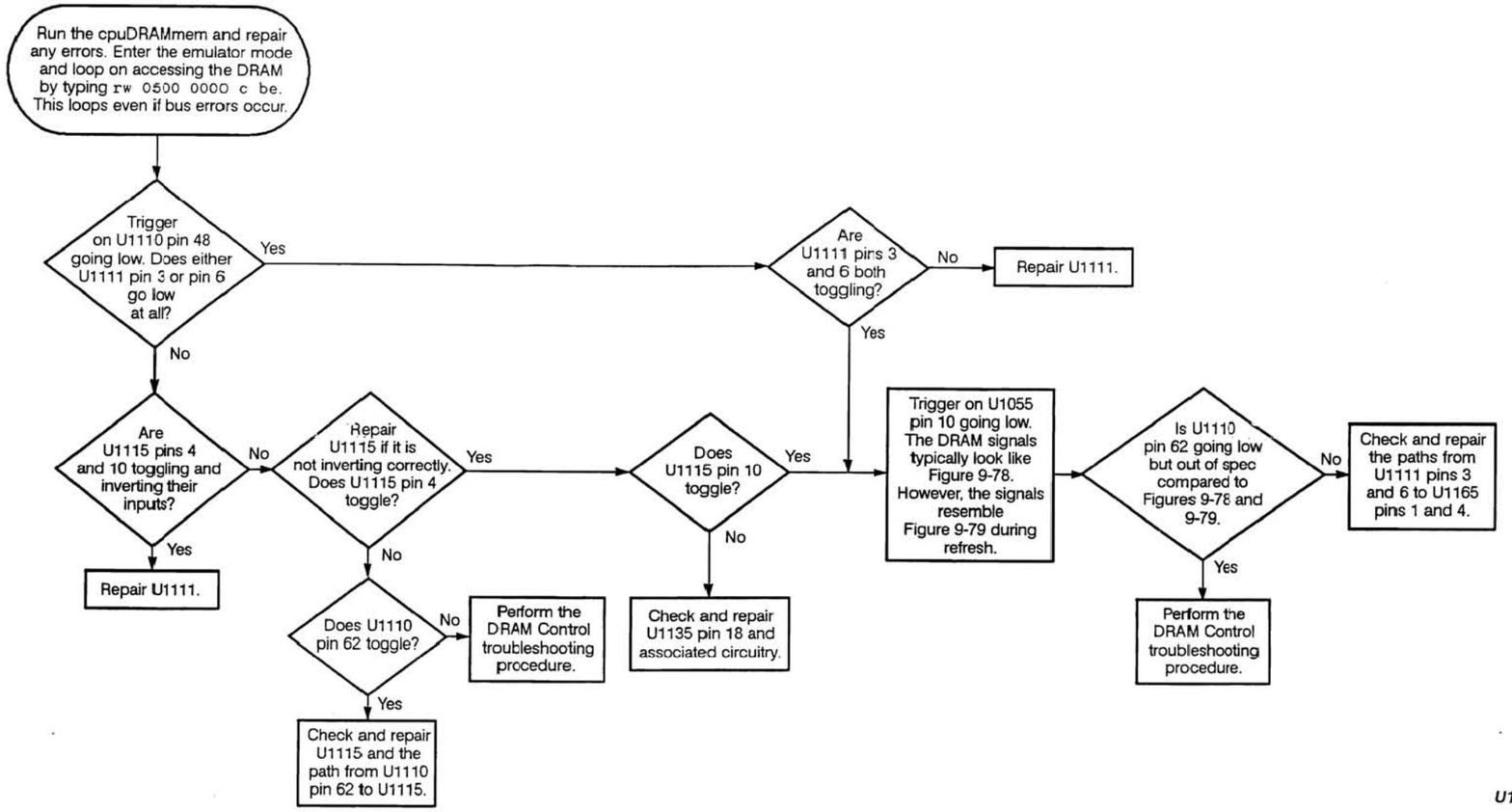
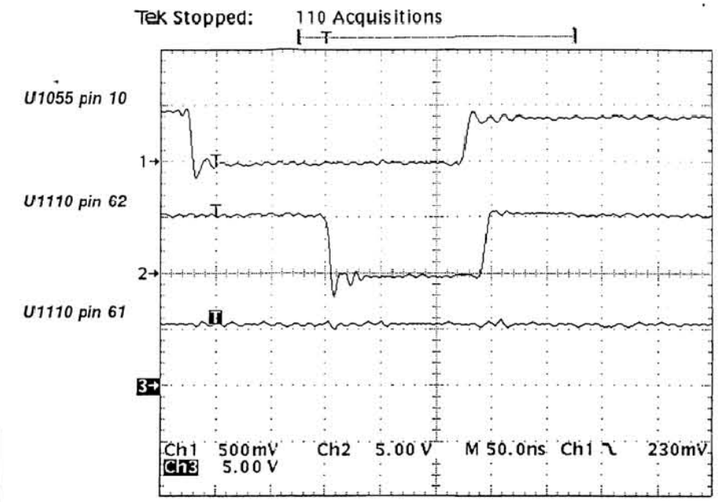
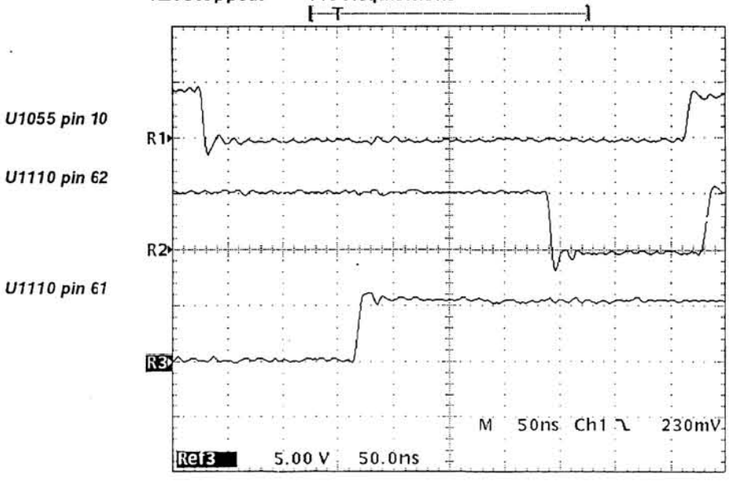




Vol. 2 Figure 9-78: Typical DRAM Dsack Signals



Vol. 2 Figure 9-79: DRAM Dsack Signals During Refresh

Vol. 2 Figure 9-80: DRAM Dsack Troubleshooting Procedure

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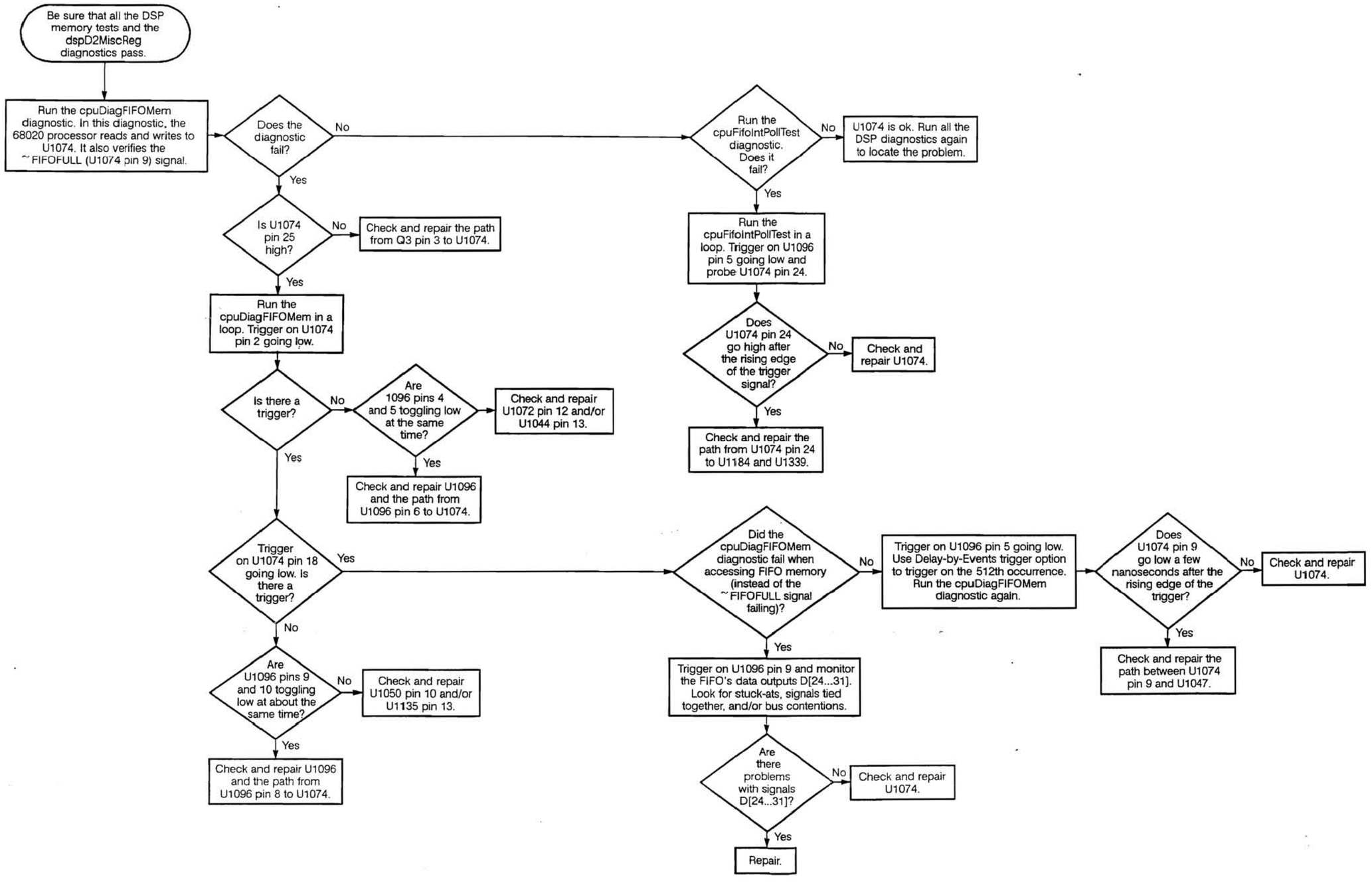

Vol. 2 Figure 9-82: FIFO Troubleshooting Procedure

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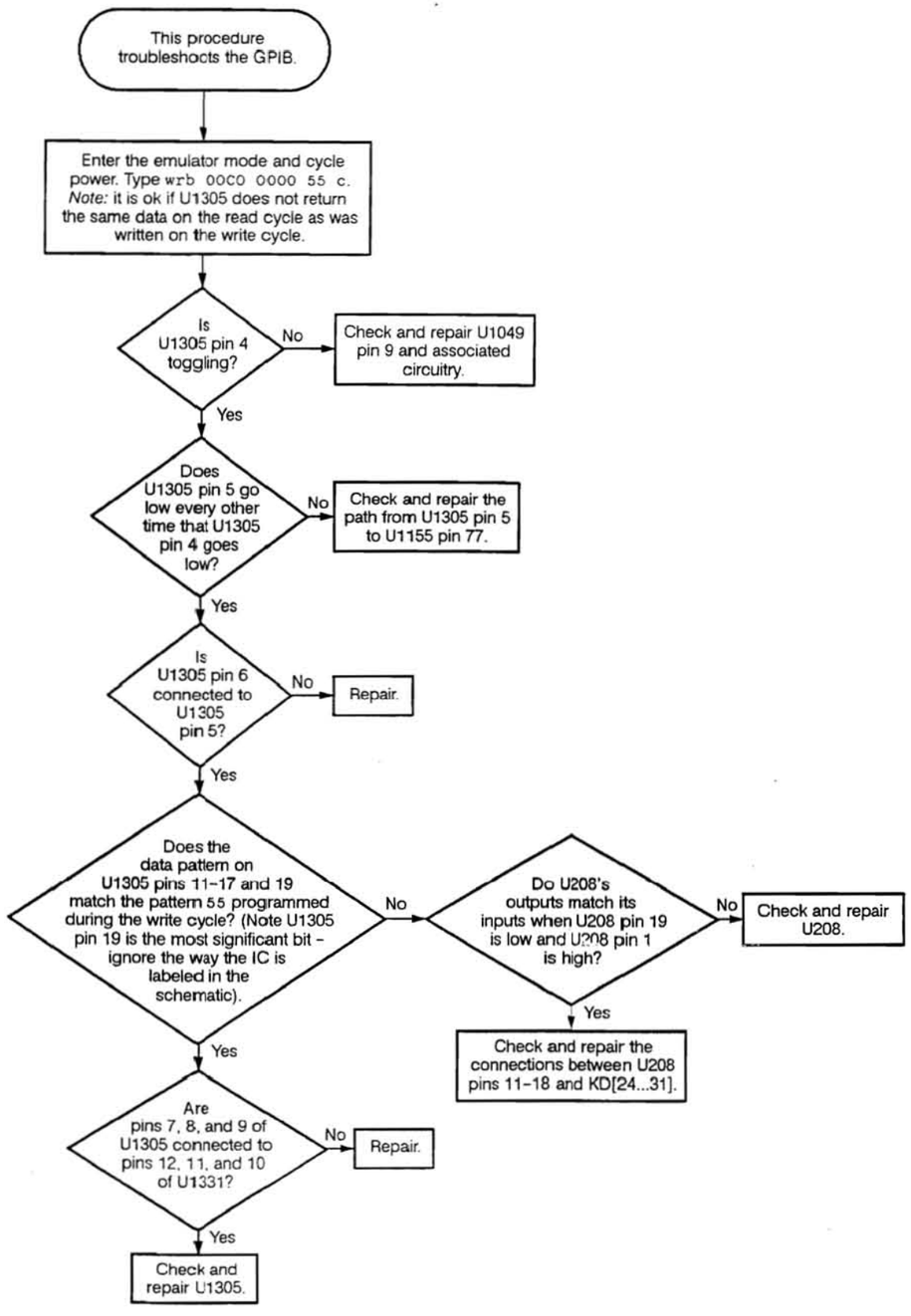
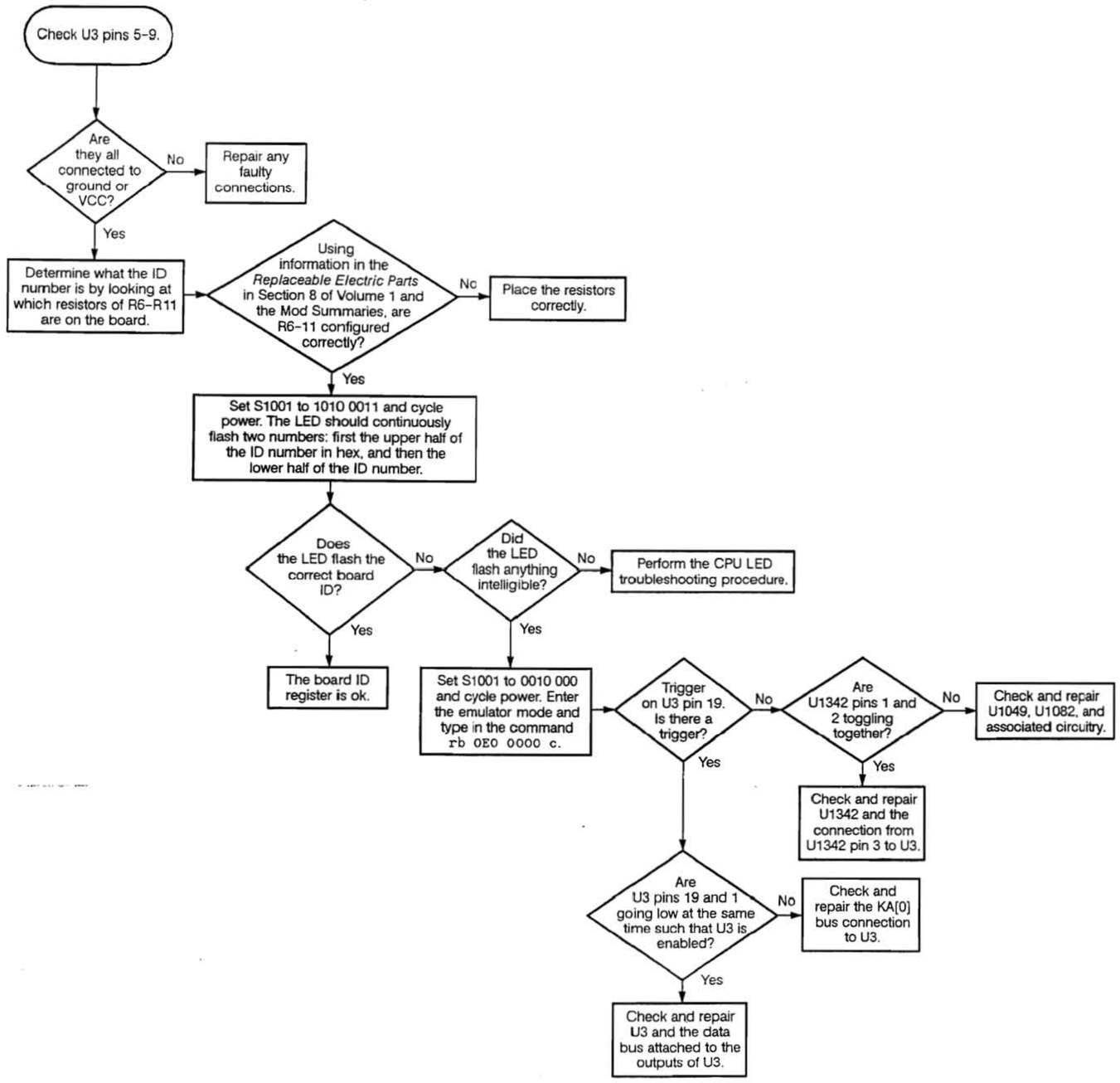
Scans by Artekmedia => 2011

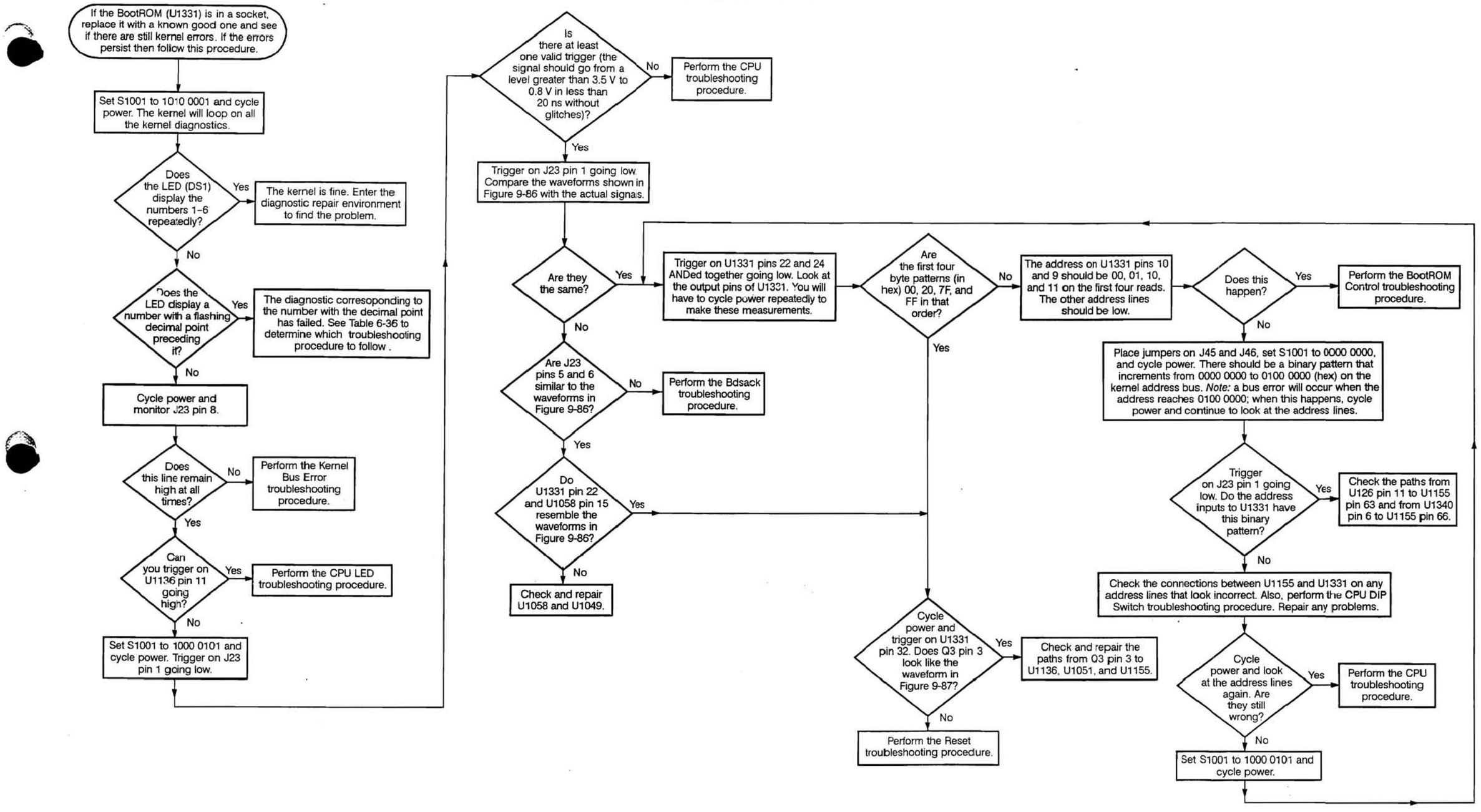


Vol. 2 Figure 9-83: GPIB Troubleshooting Procedure

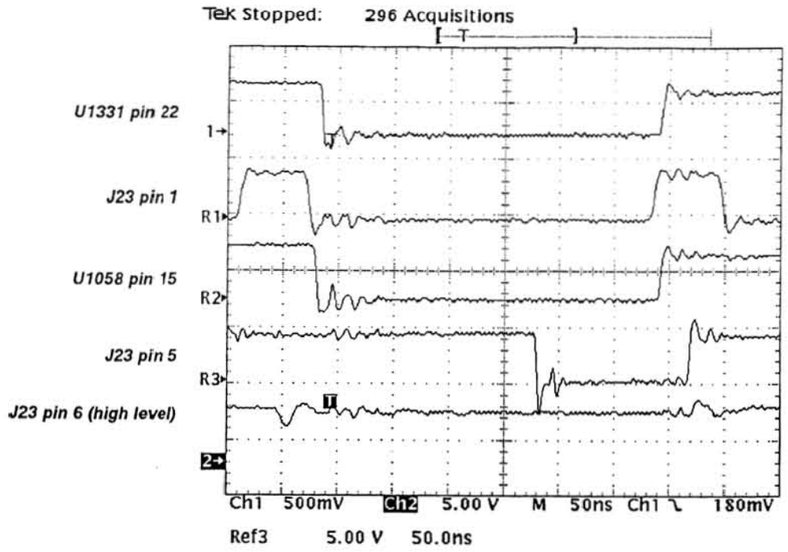


Vol. 2 Figure 9-84: ID Register Troubleshooting Procedure

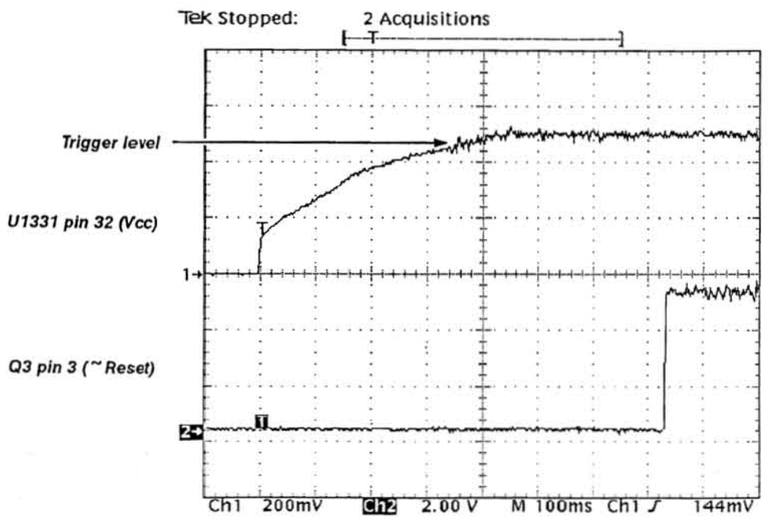
Scans by Artekmedia => 2011



Vol. 2 Figure 9-85: Kernel Troubleshooting Procedure



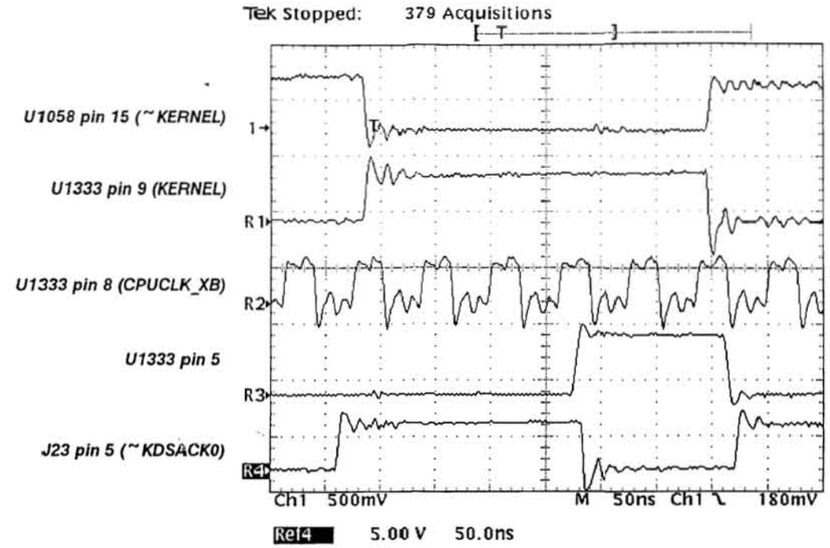
Vol. 2 Figure 9-86: Kernel Control Signals



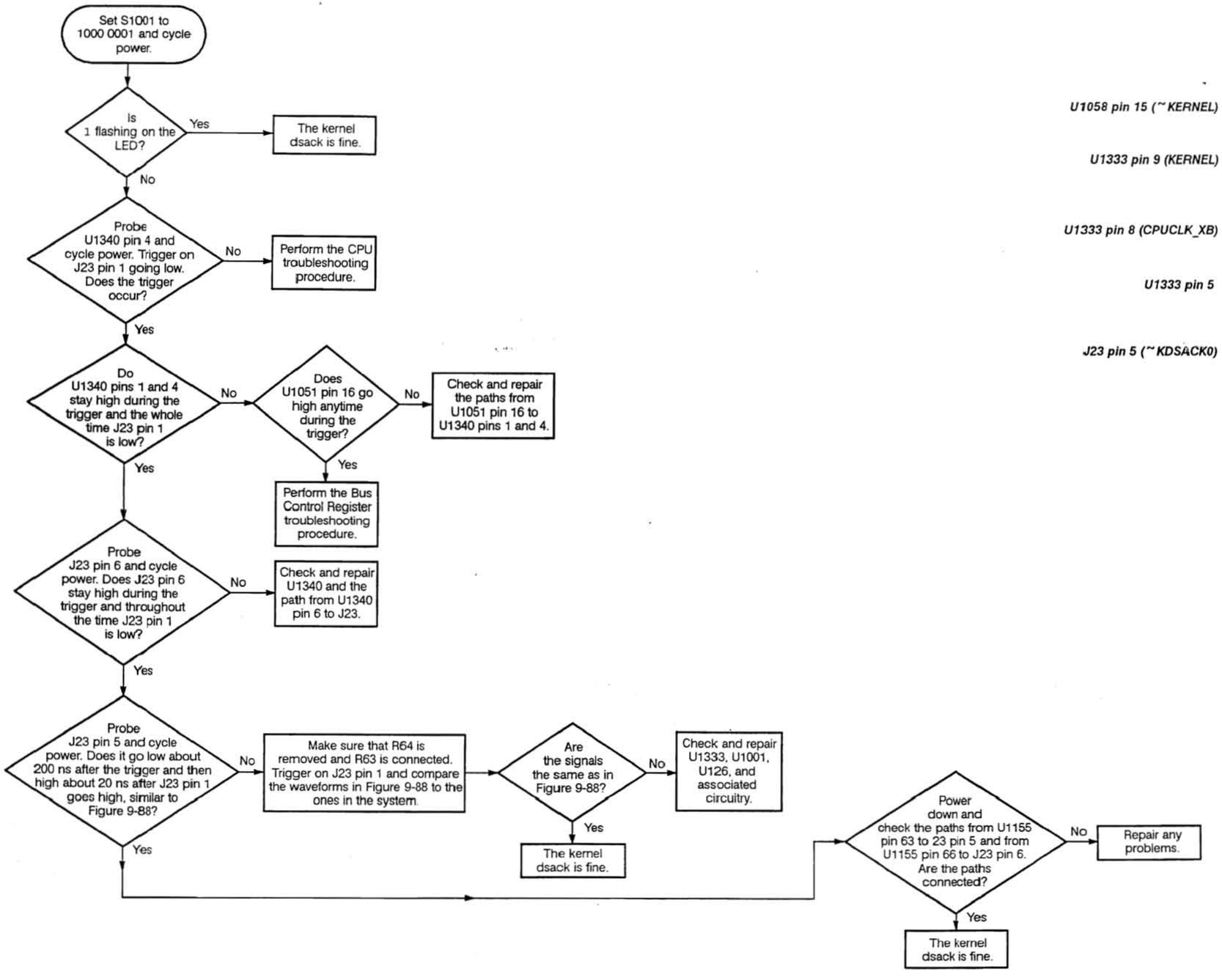
Vol. 2 Figure 9-87: Reset

Vol. 2 Figure 9-85: Kernel Troubleshooting Procedure (Cont.)

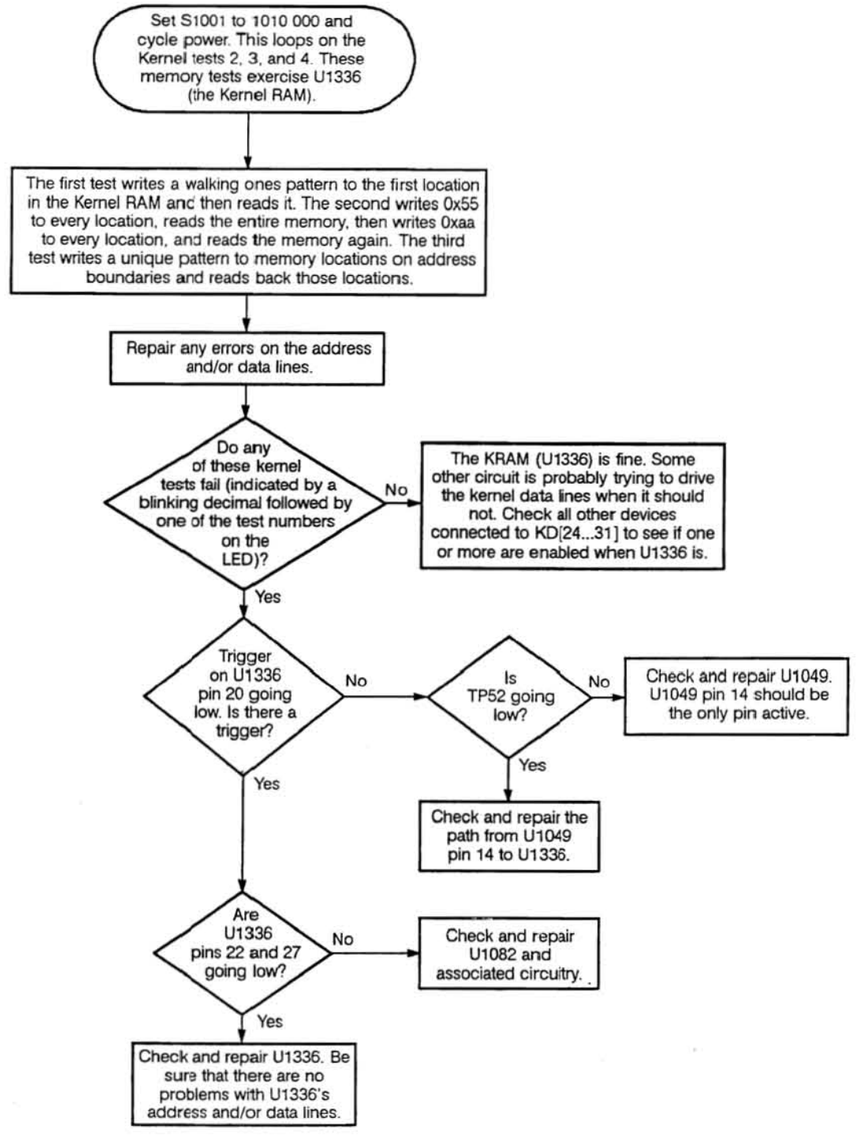
Scans by Artekmedia => 2011



Vol. 2 Figure 9-88: Kernel Dsack Signals

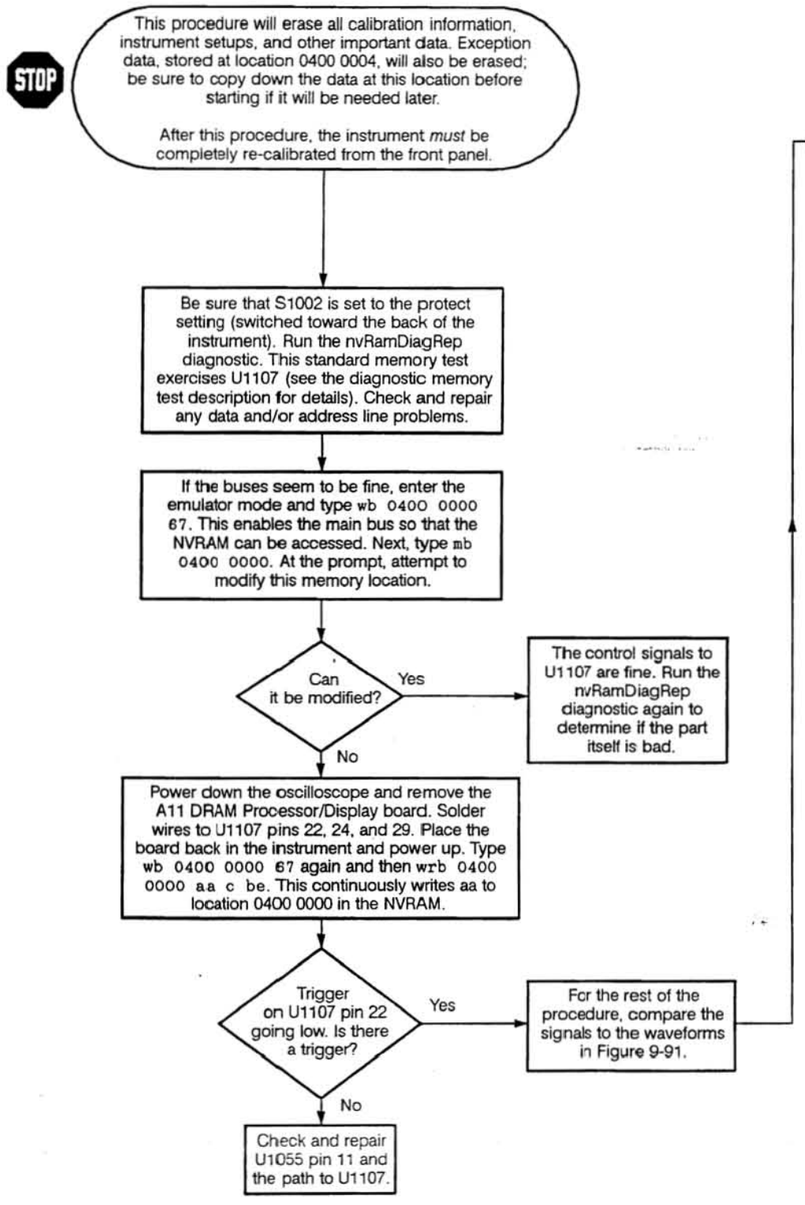


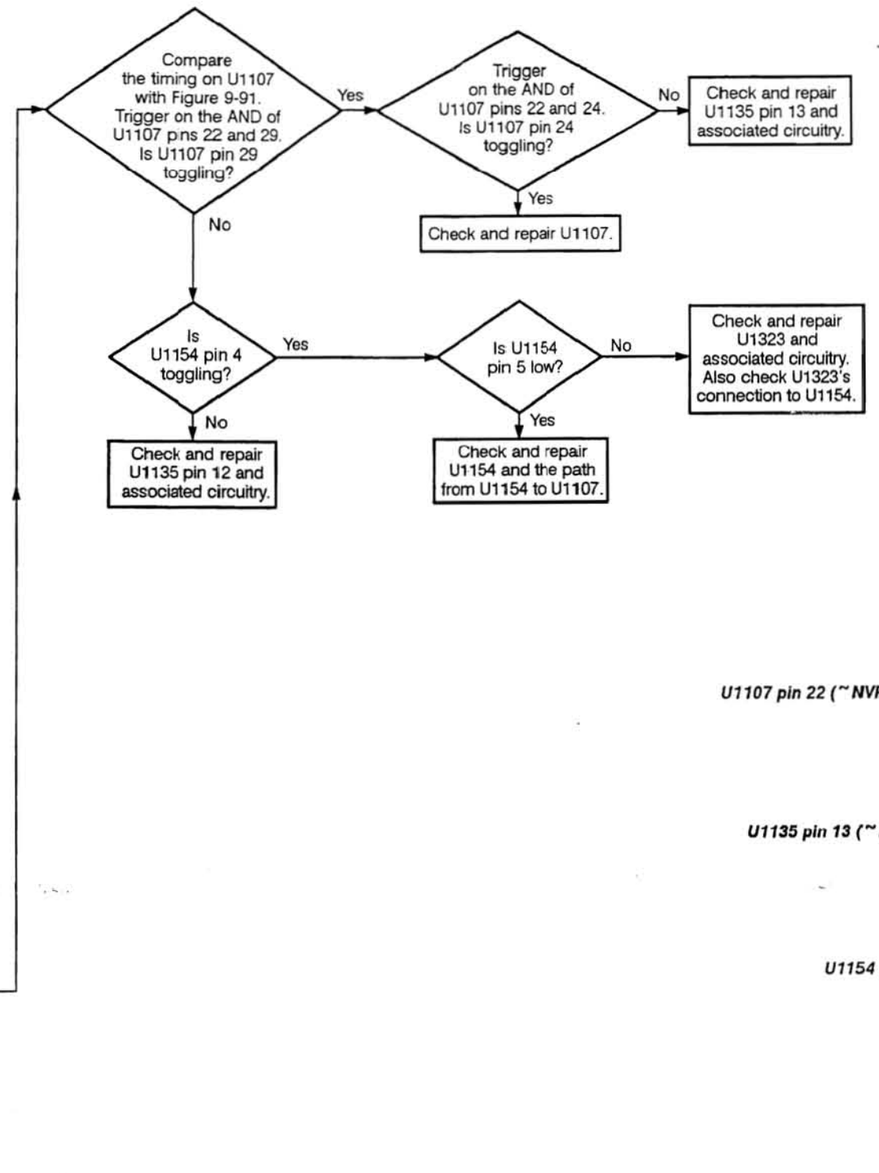
Vol. 2 Figure 9-89: Kernel Dsack Troubleshooting Procedure

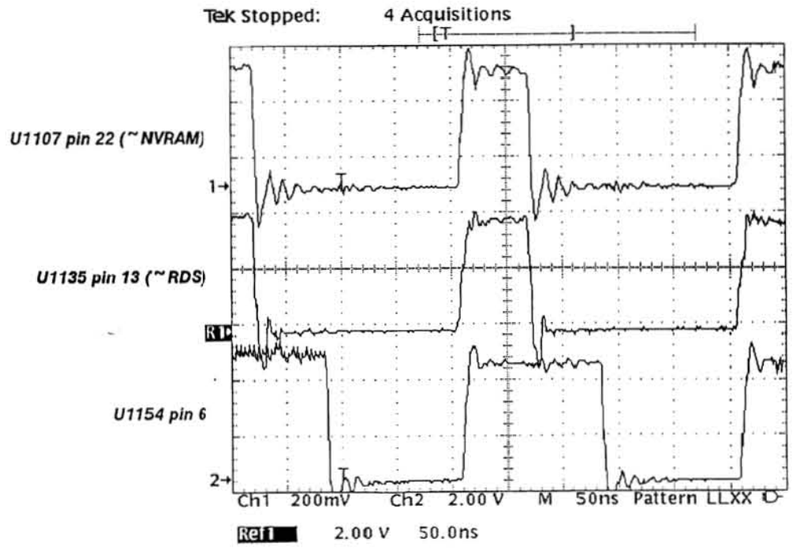


Vol. 2 Figure 9-90: Kernel RAM Troubleshooting Procedure

Scans by Artekmedia => 2011

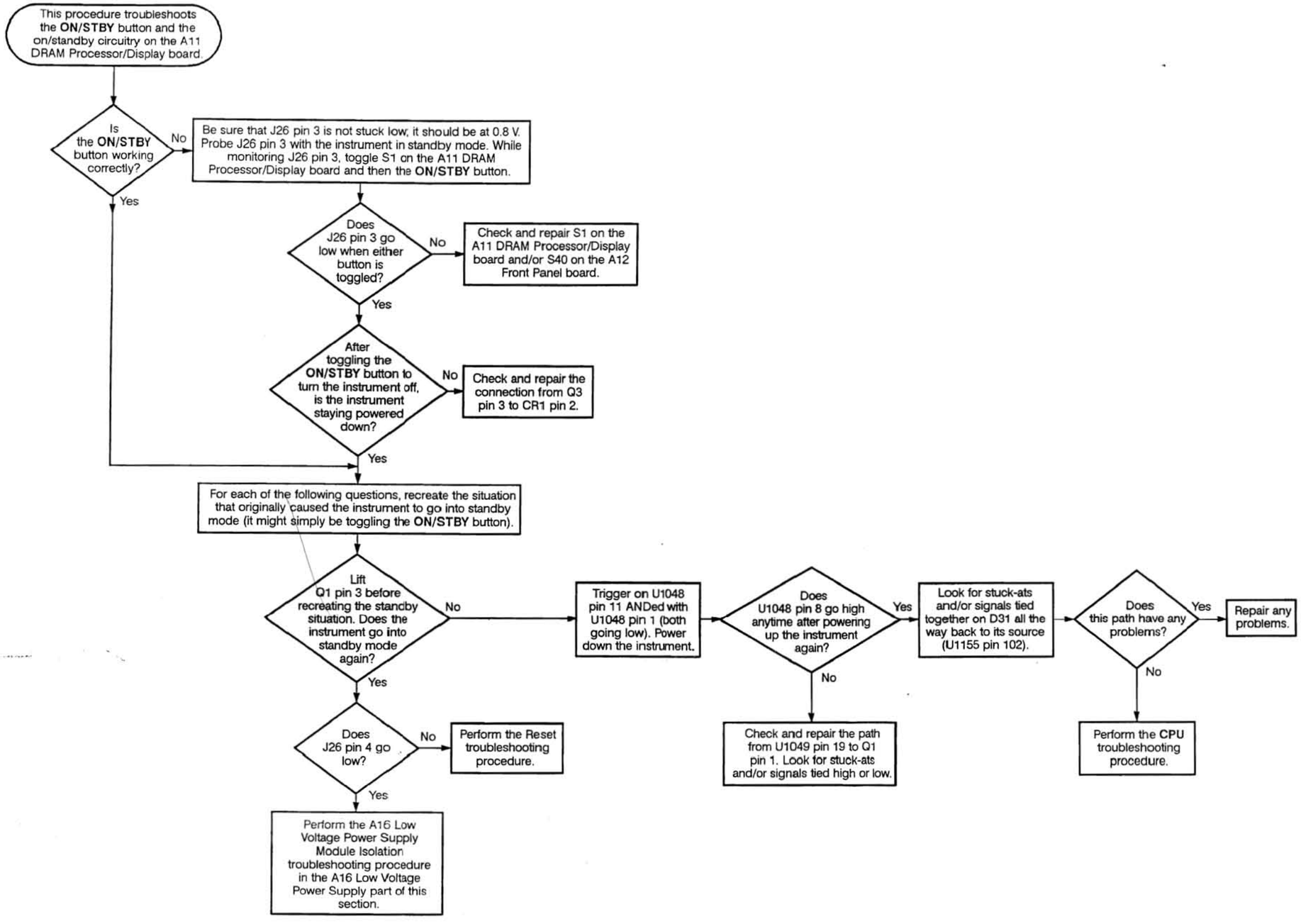






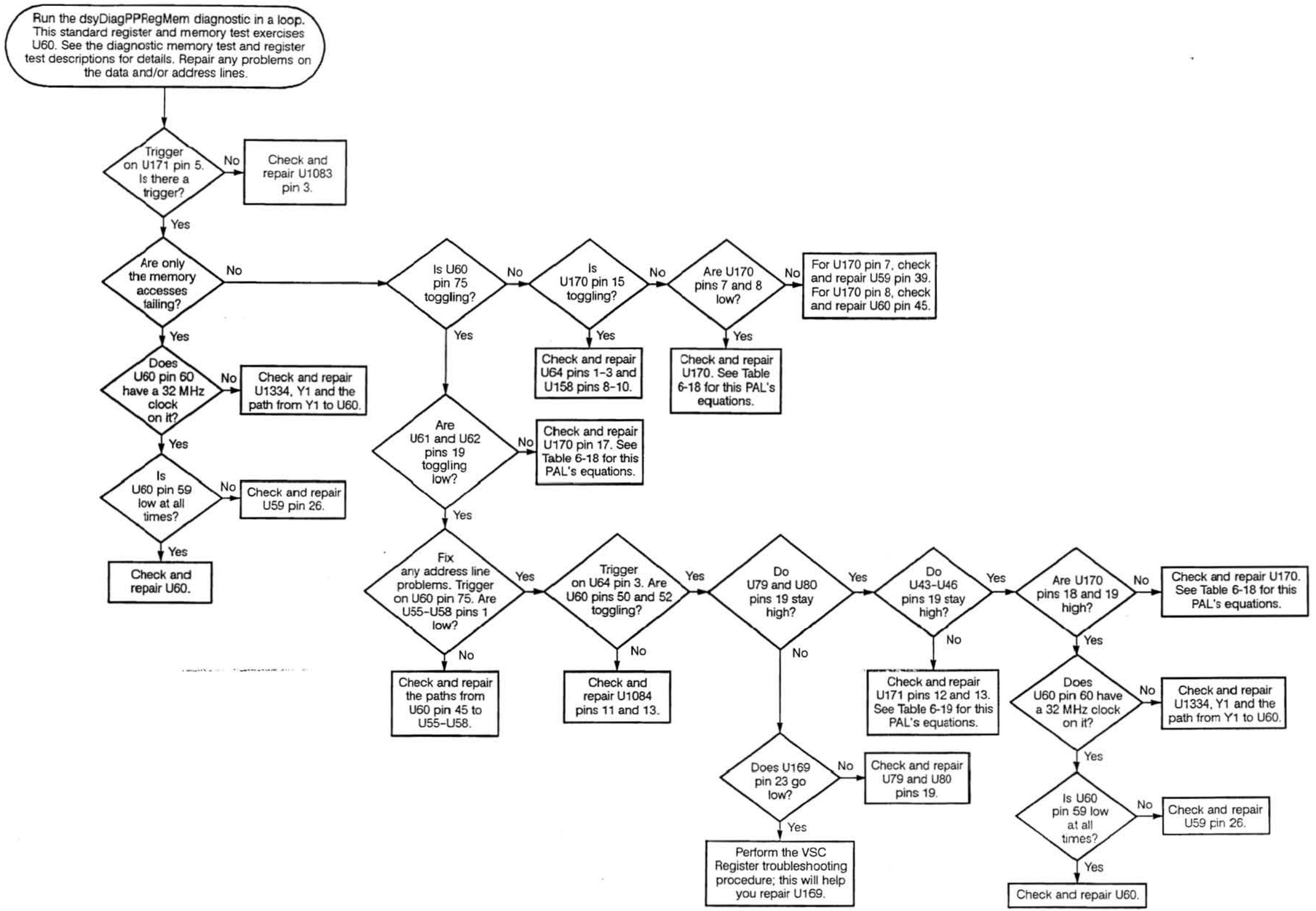
Vol. 2 Figure 9-91: U1107 (NVRAM) Control Signals

Vol. 2 Figure 9-92: NVRAM Troubleshooting Procedure

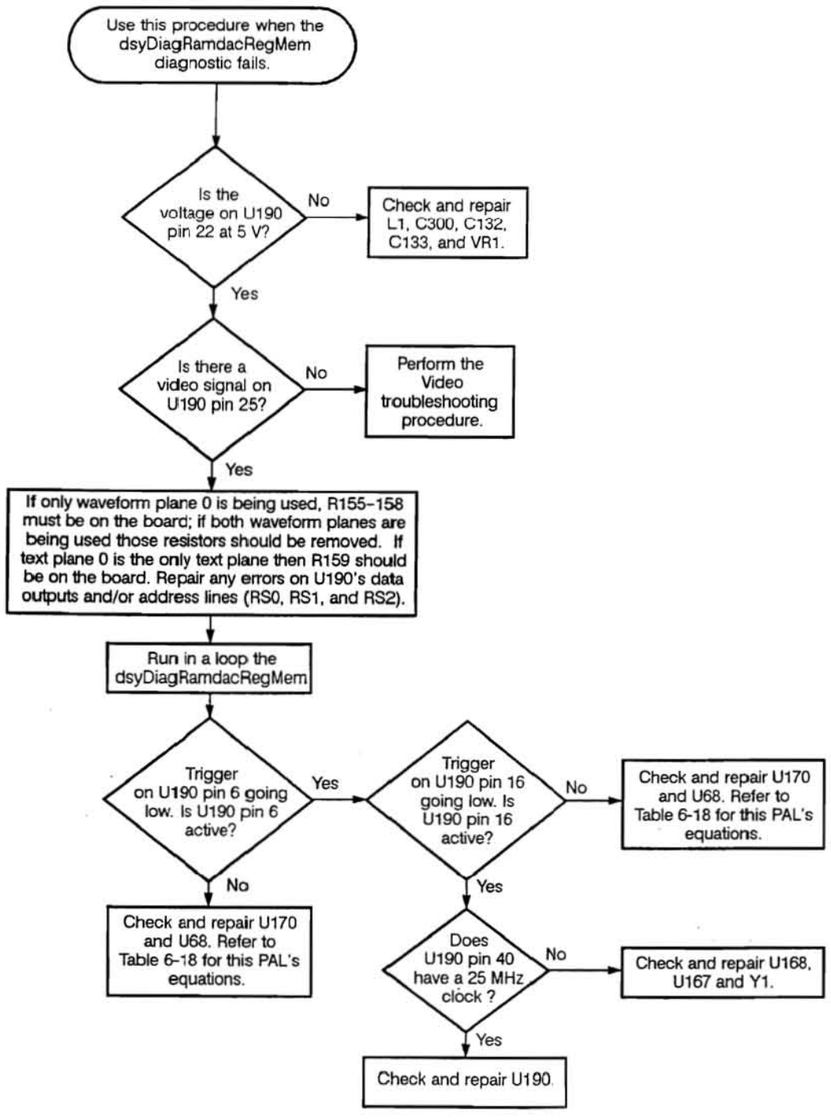


Vol. 2 Figure 9-93: On/Standby Troubleshooting Procedure

Scans by Artekmedia => 2011

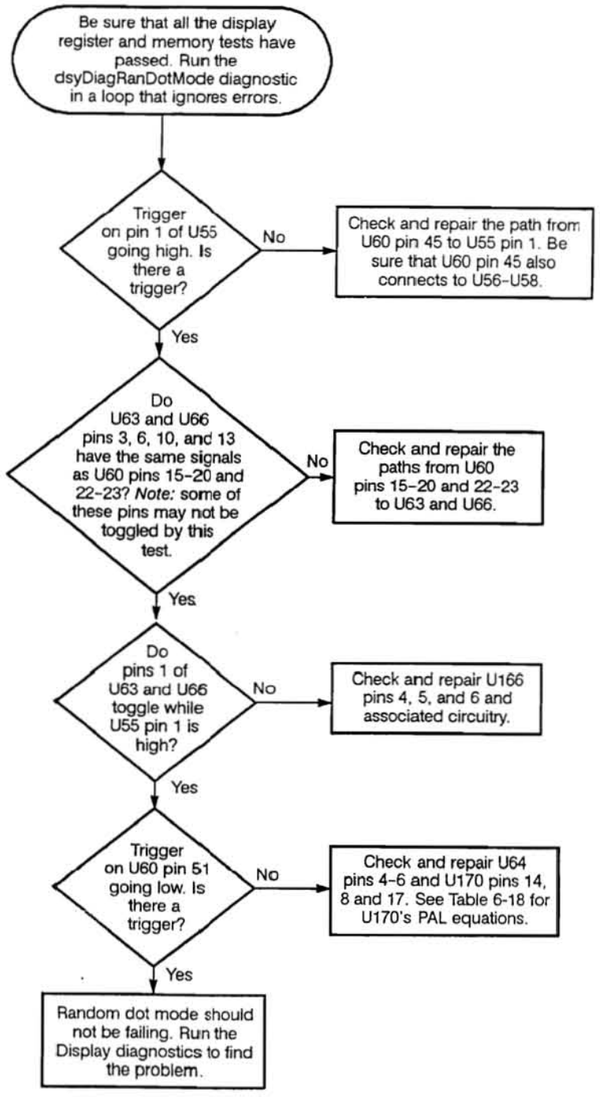


Vol. 2 Figure 9-94: Pixel Processor Register Troubleshooting Procedure

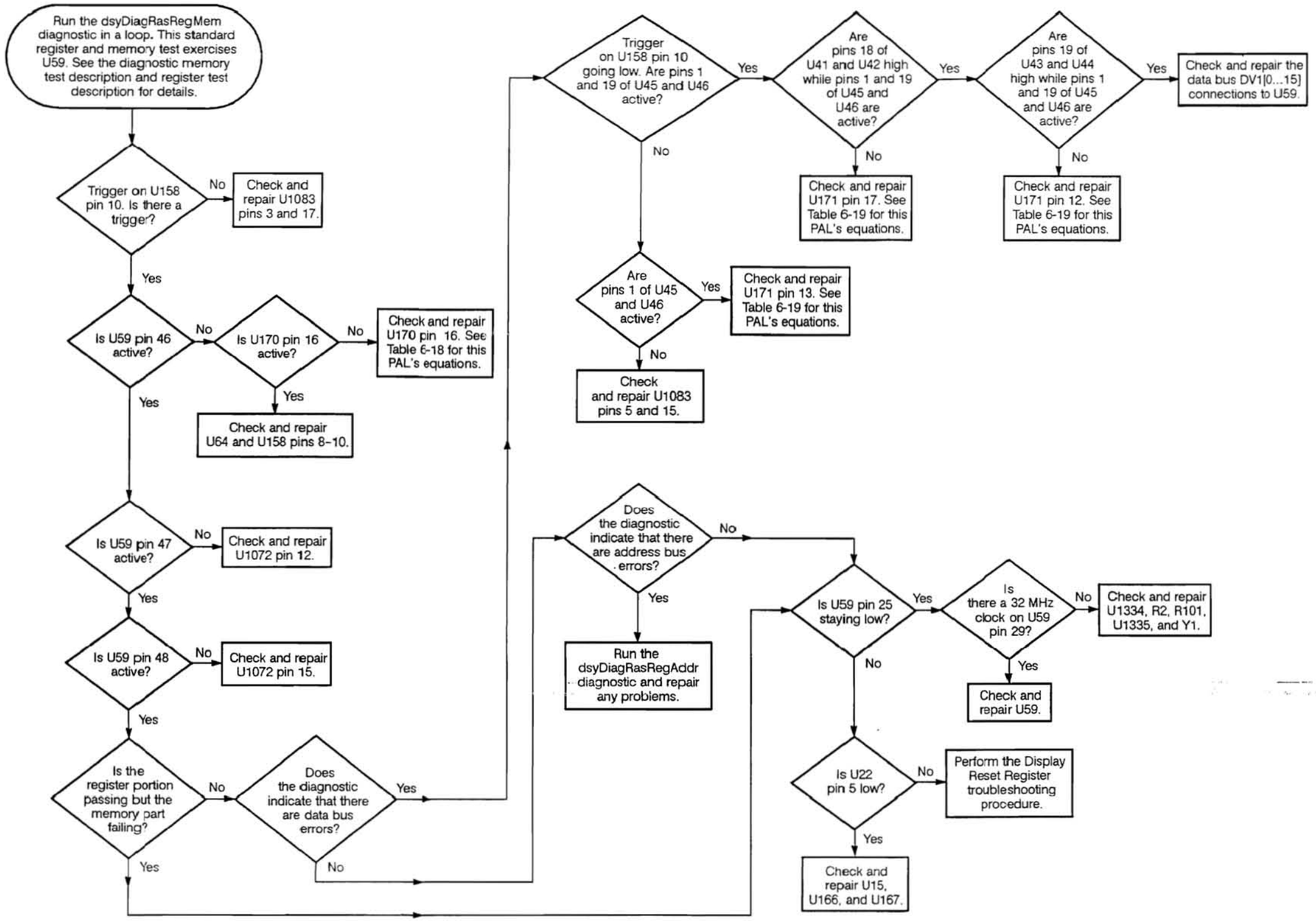


Vol. 2 Figure 9-95: RamDac Troubleshooting Procedure

Scans by Artekmedia => 2011

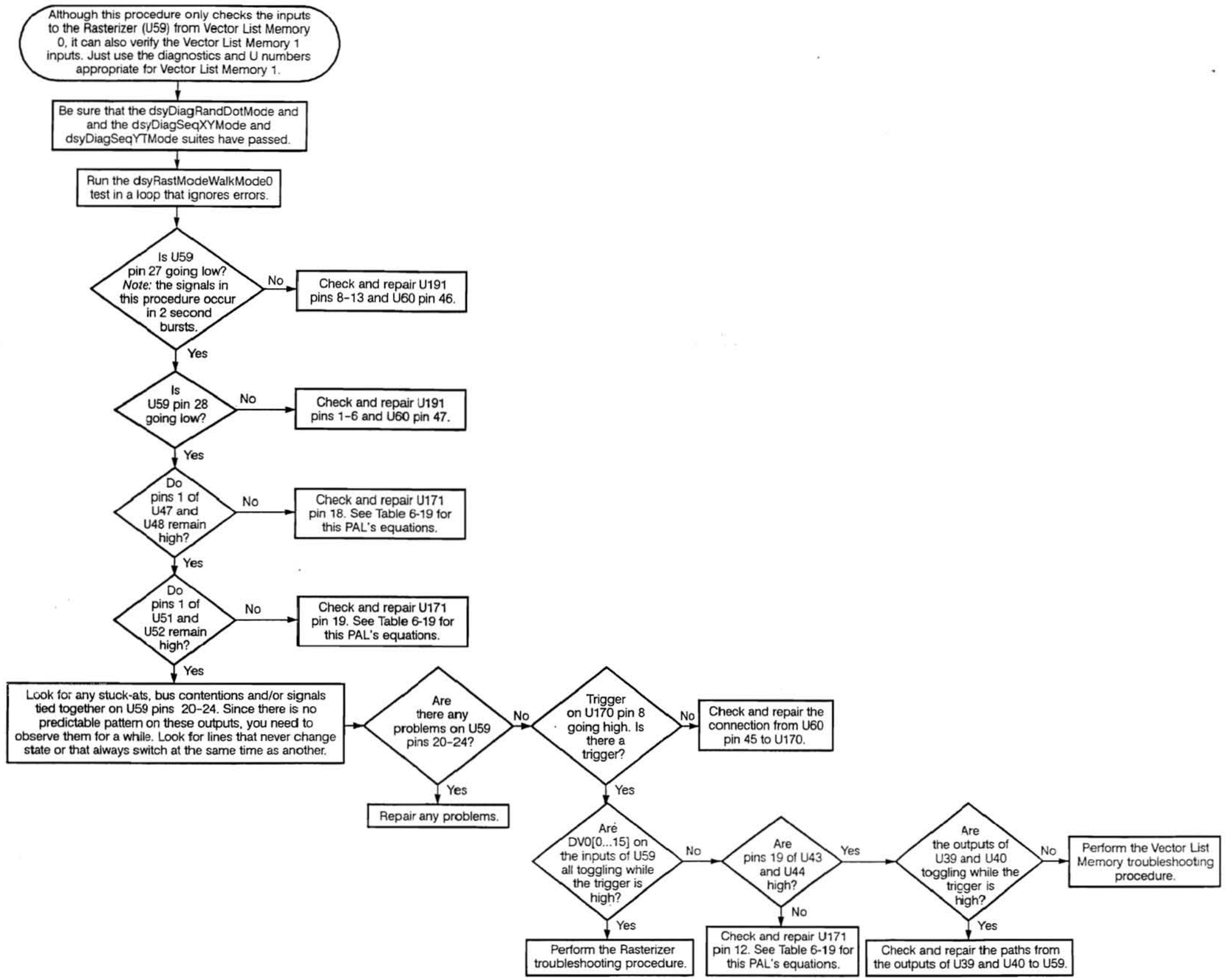


Vol. 2 Figure 9-96: Random Dot Mode Troubleshooting Procedure

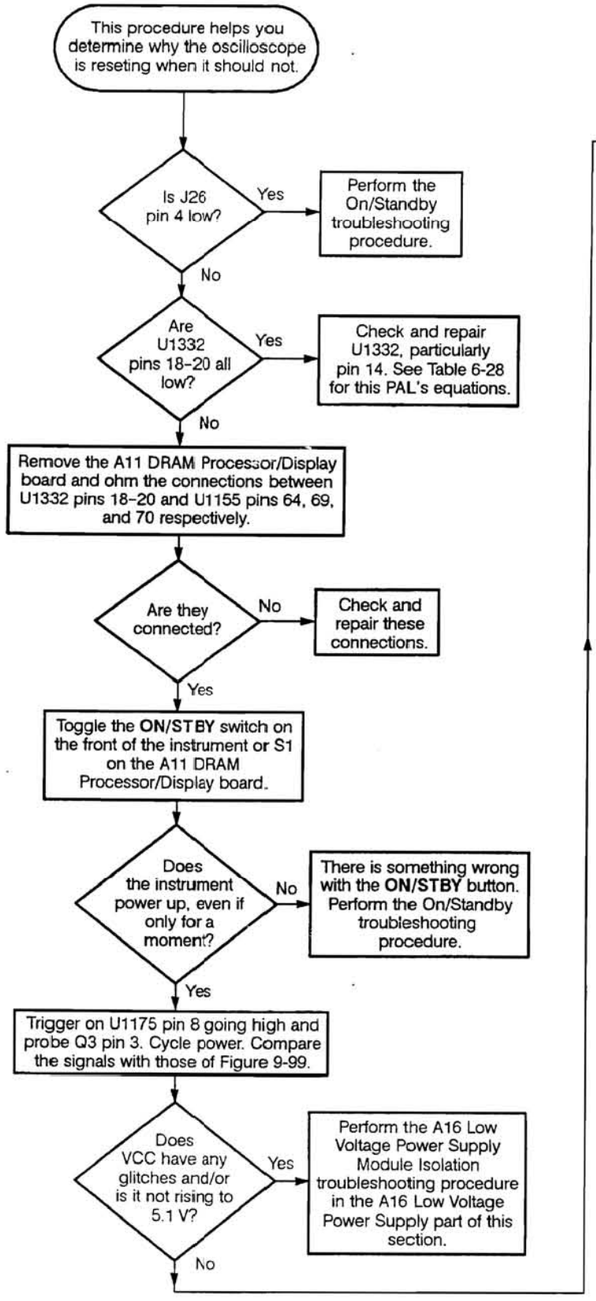


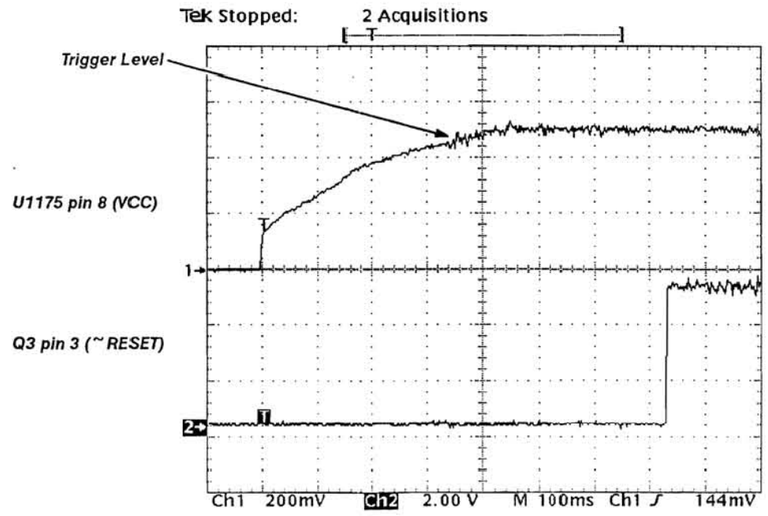
Vol. 2 Figure 9-97: Rasterizer Troubleshooting Procedure

Scans by Artekmedia => 2011



Vol. 2 Figure 9-98: Rasterizer Mode Troubleshooting Procedure

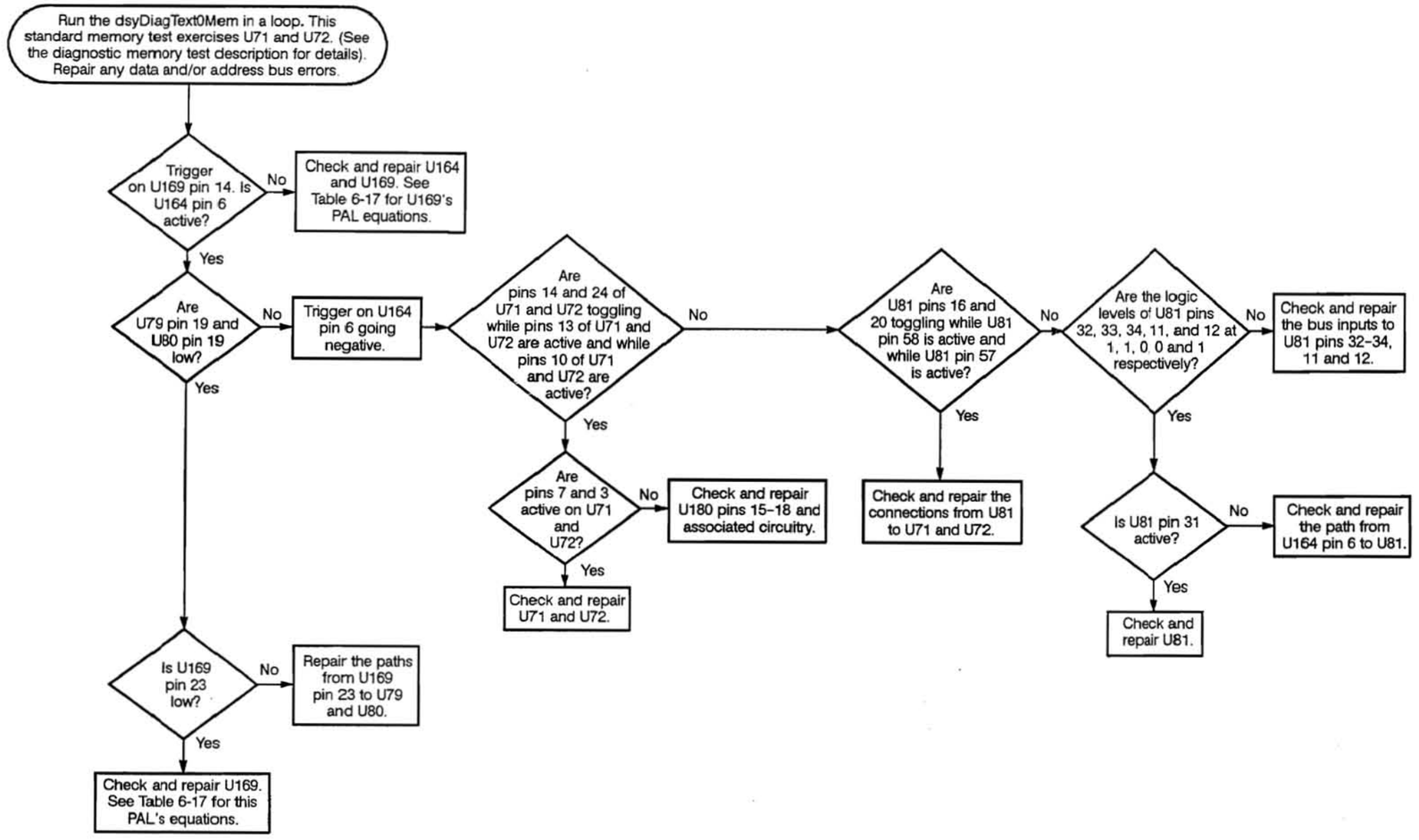




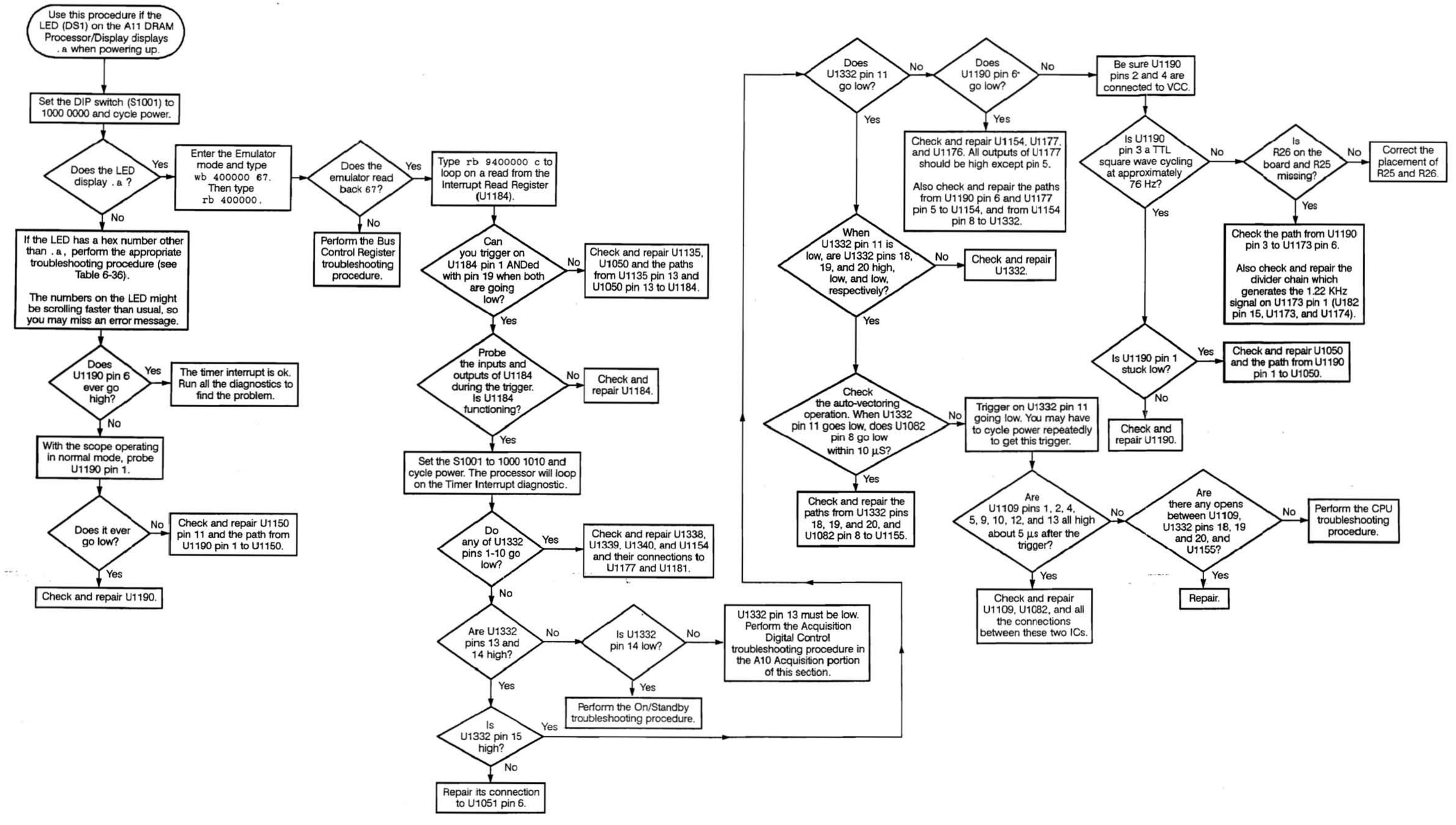
Vol. 2 Figure 9-99: ~Reset and VCC

Vol. 2 Figure 9-100: Reset Troubleshooting Procedure

Scans by Artekmedia => 2011

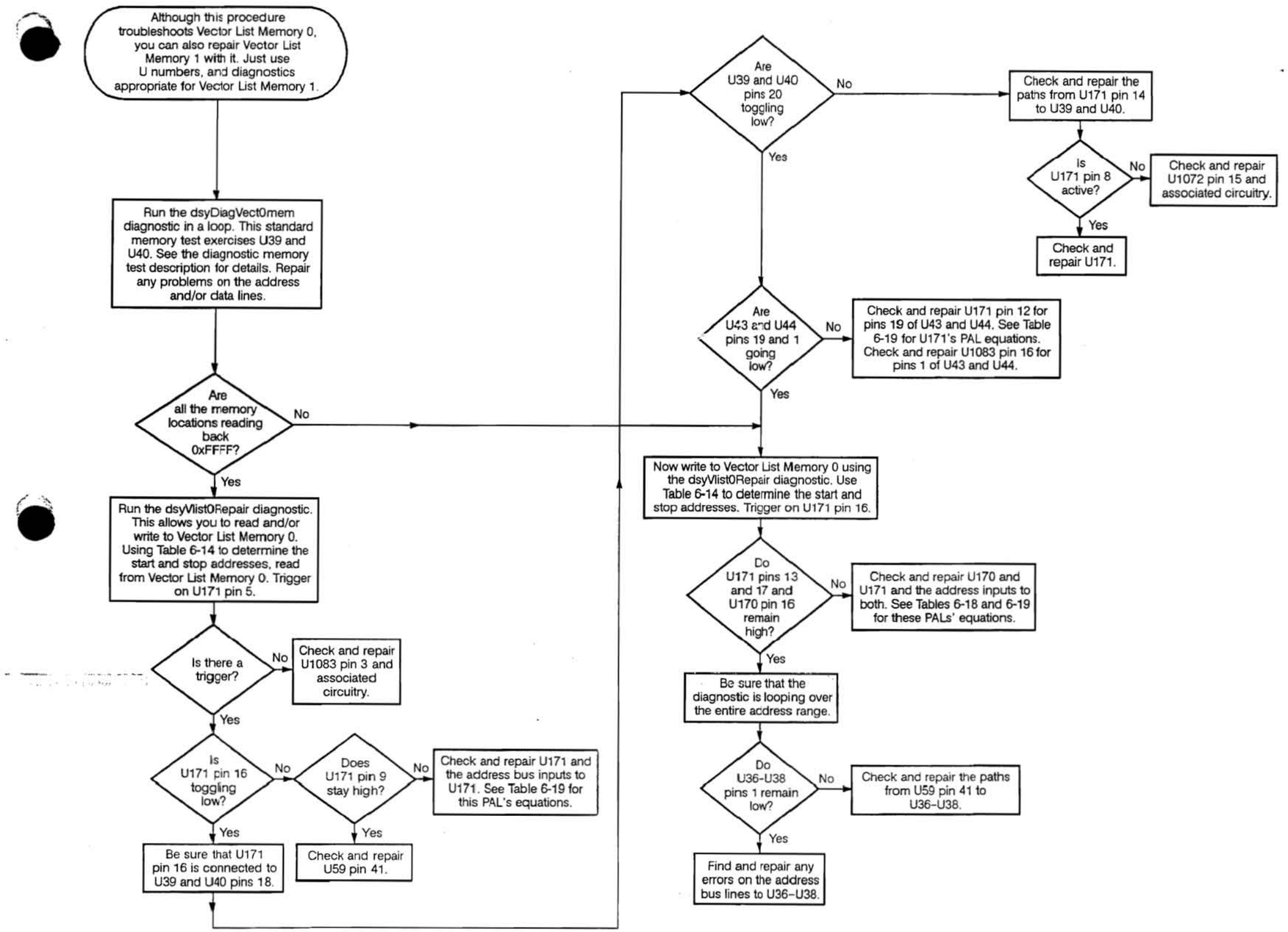


Vol. 2 Figure 9-101: Text Memory Troubleshooting Procedure

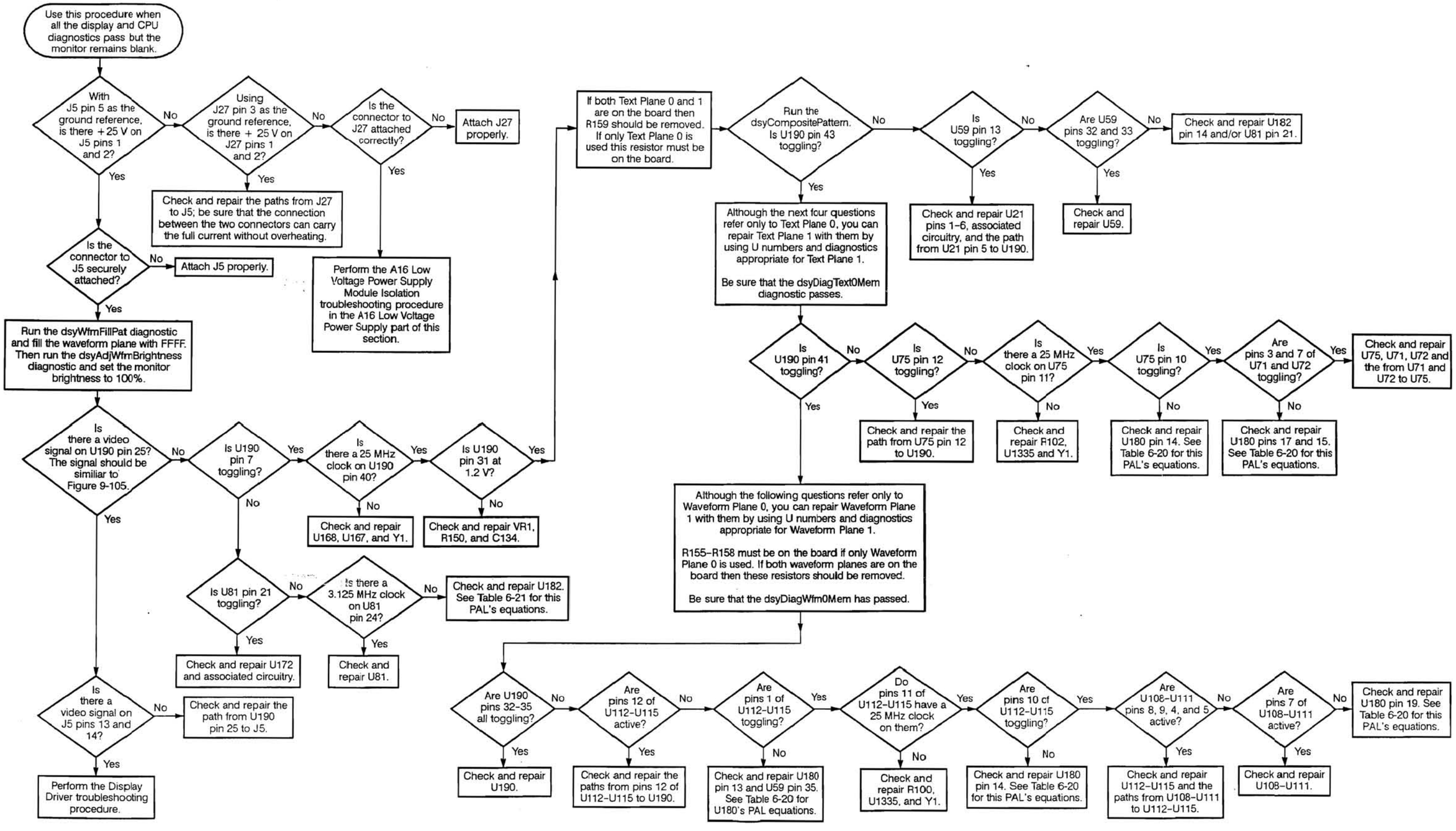


Vol. 2 Figure 9-102: Timer Interrupt Troubleshooting Procedure

Scans by Artekmedia => 2011

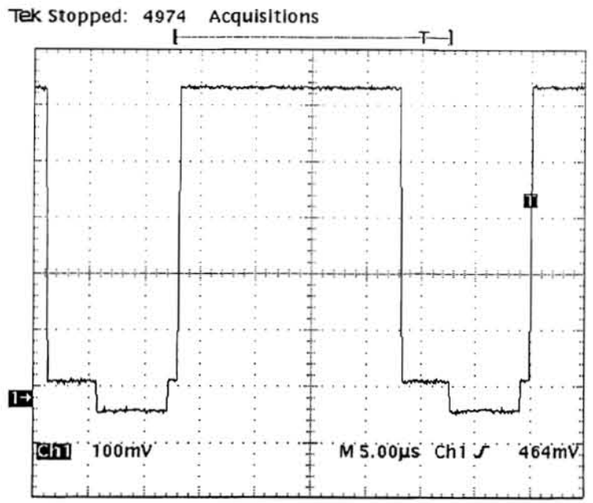


Vol. 2 Figure 9-103: Vector List Memory Troubleshooting Procedure



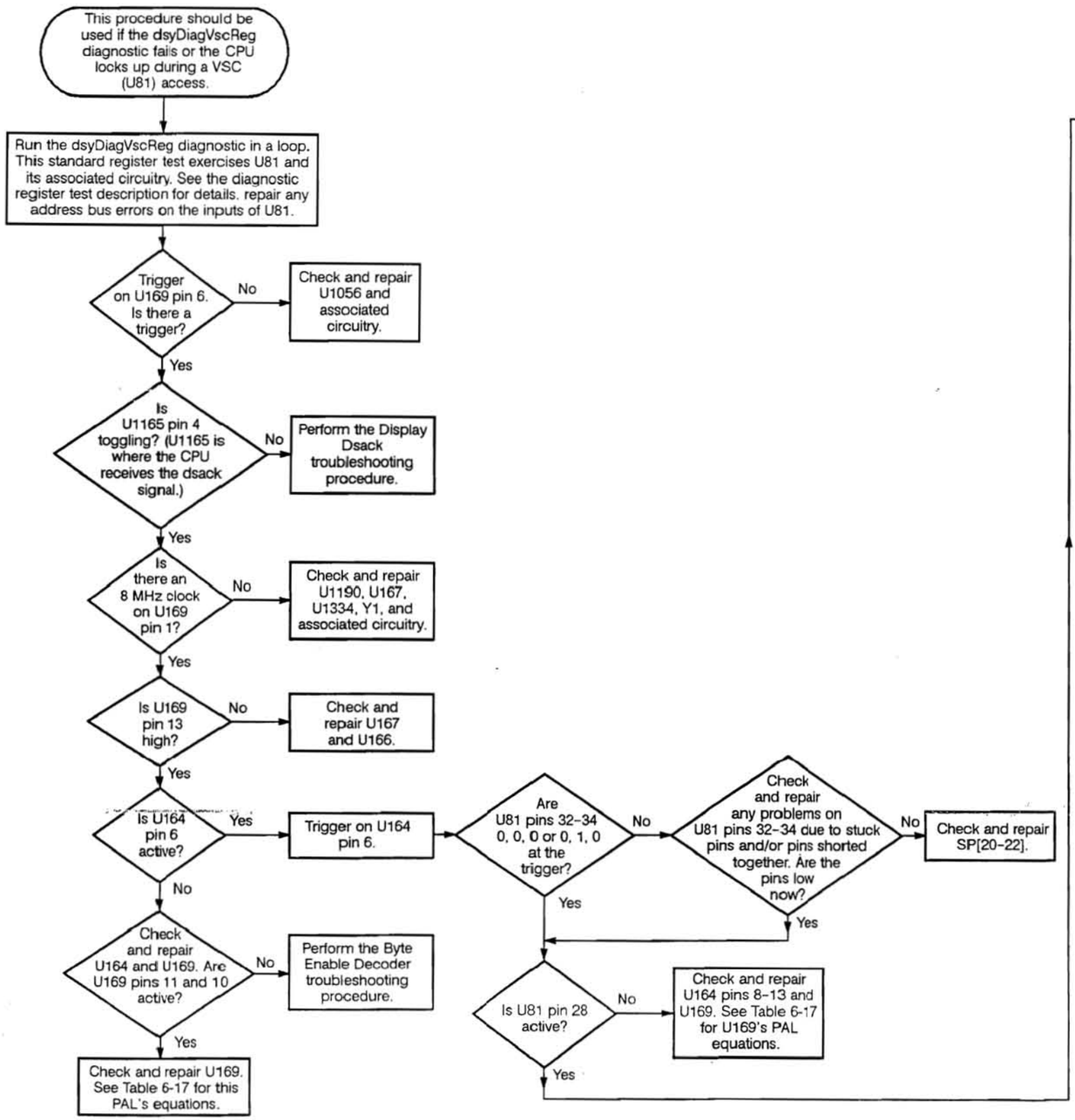
Vol. 2 Figure 9-104: Video Troubleshooting Procedure

Scans by Artekmedia => 2011



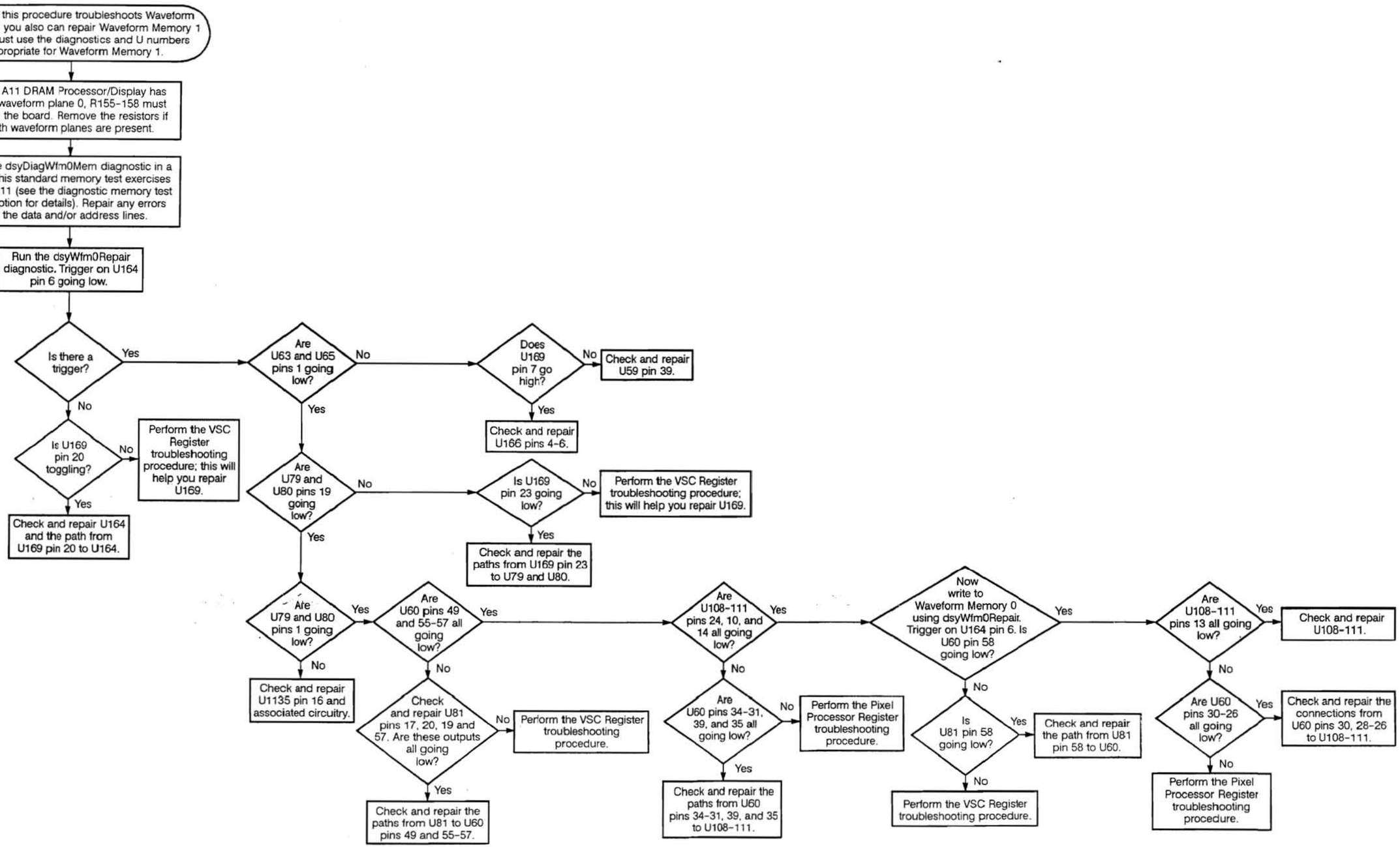
Vol. 2 Figure 9-105: Video Out Signal

Vol. 2 Figure 9-104: Video Troubleshooting Procedure (Cont.)

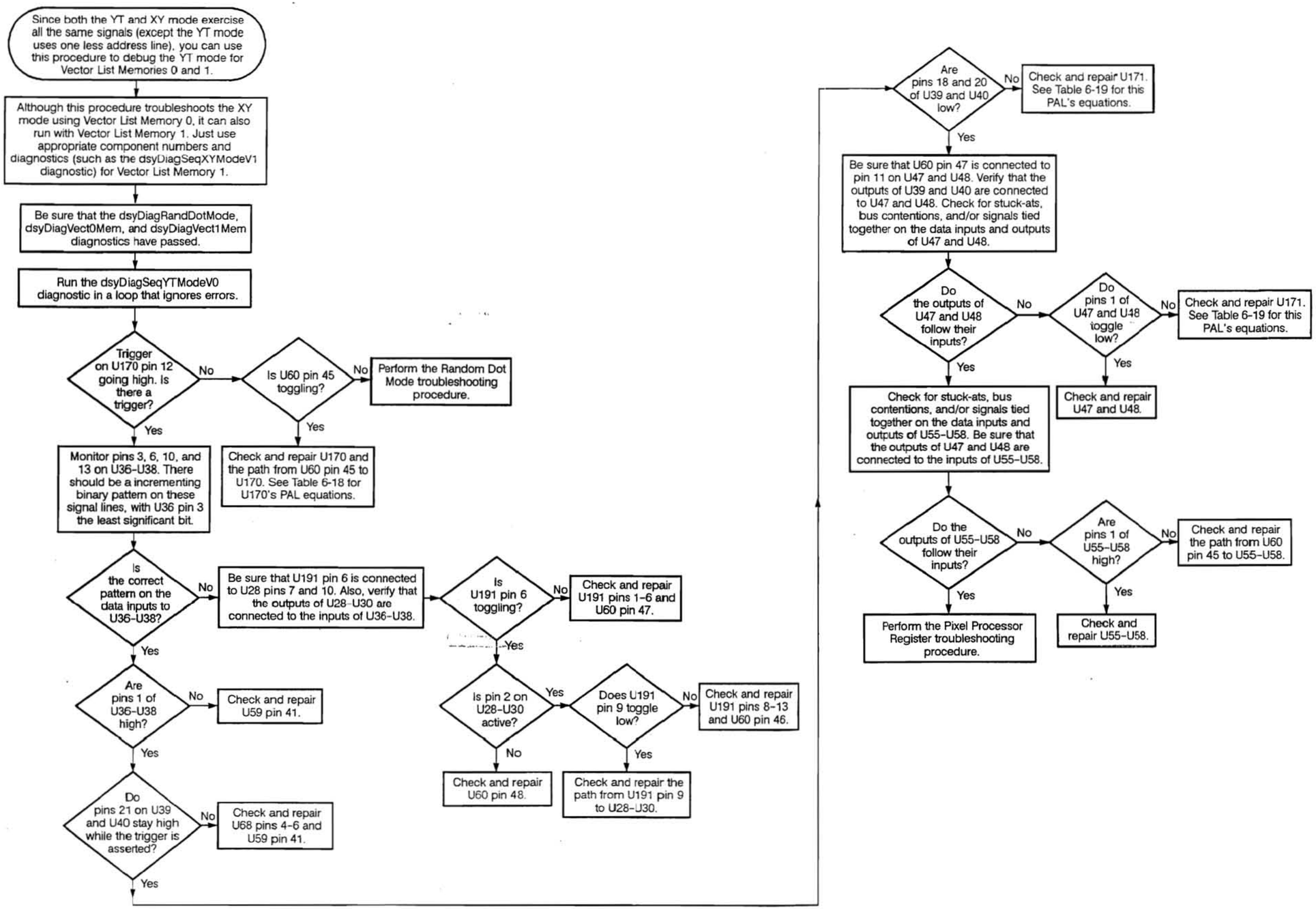


Vol. 2 Figure 9-106: VSC Register Troubleshooting Procedure

Scans by Artekmedia => 2011

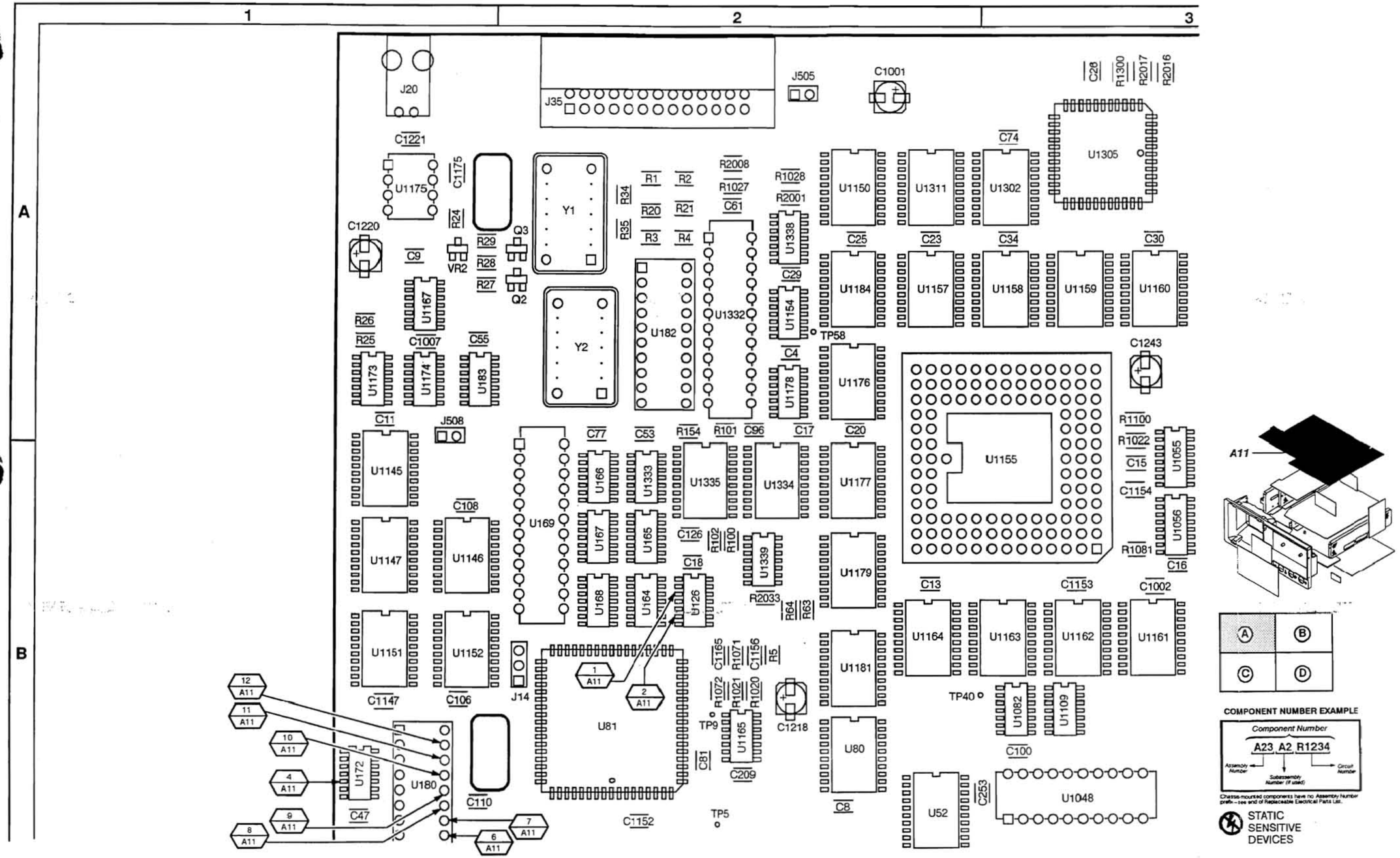


Vol. 2 Figure 9-107: Waveform Memory Troubleshooting Procedure

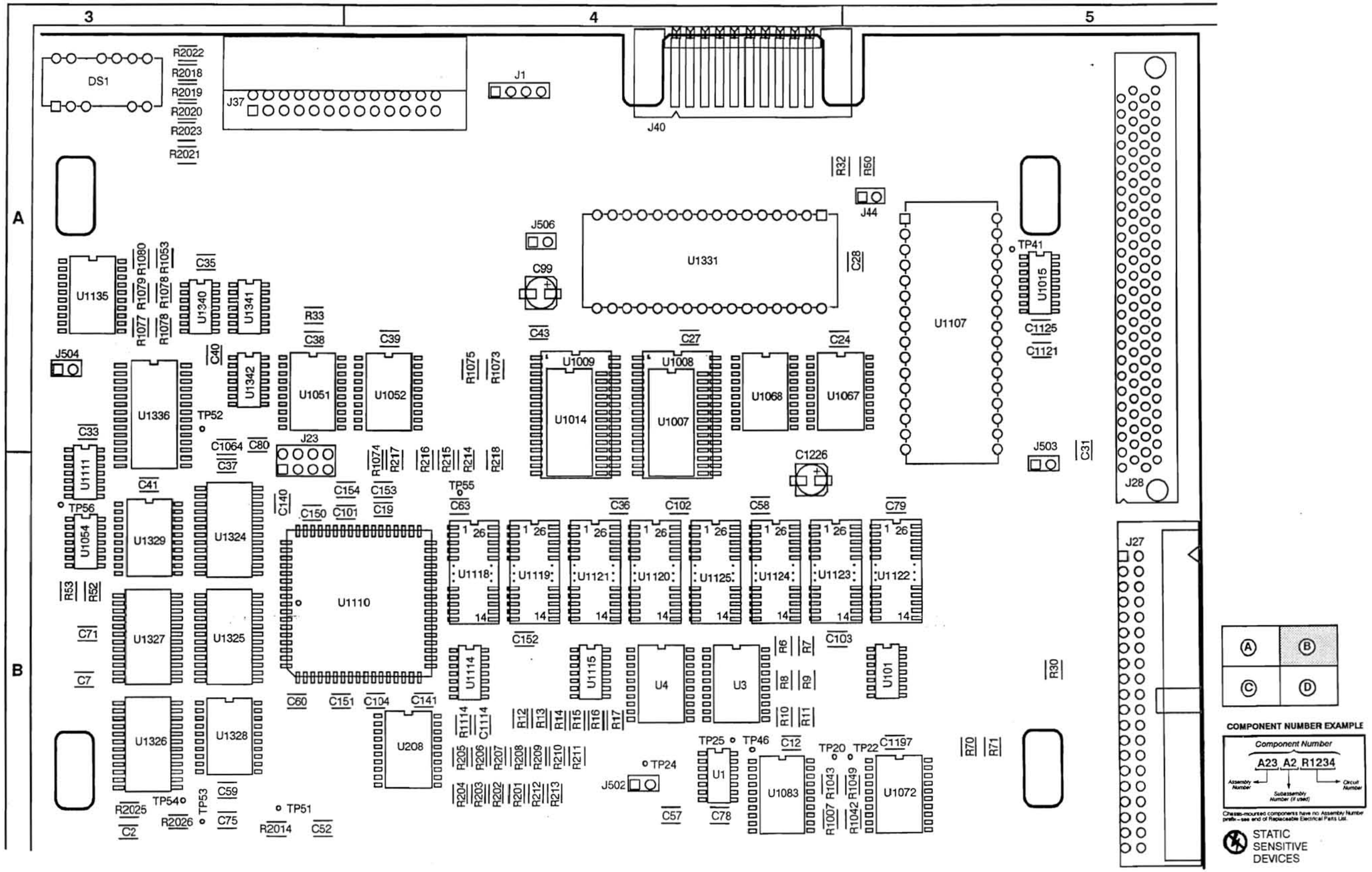


Vol. 2 Figure 9-108: XY Mode Troubleshooting Procedure

Scans by Artekmedia => 2011

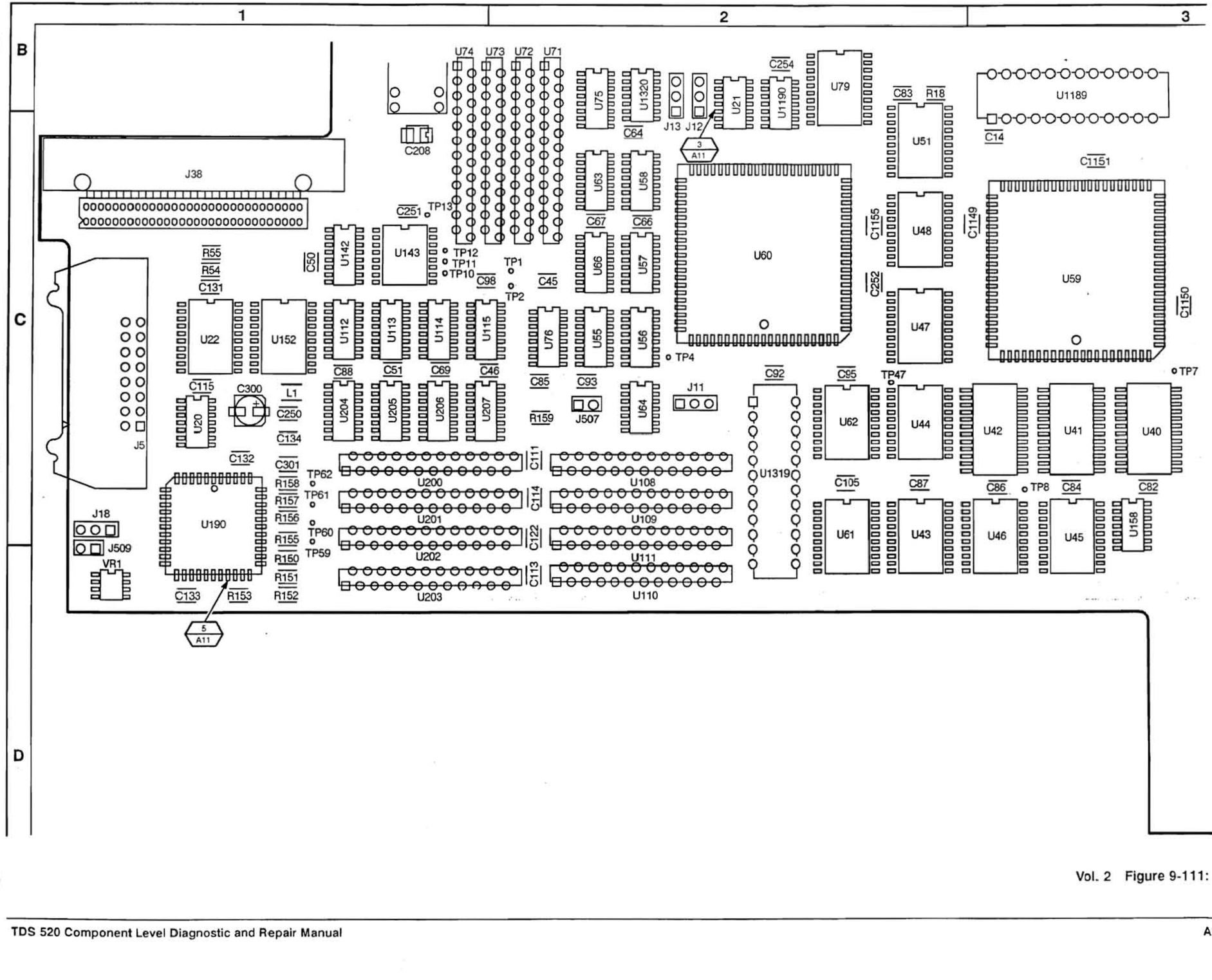


Vol. 2 Figure 9-109: A11 DRAM Processor/Display Board (Section A)

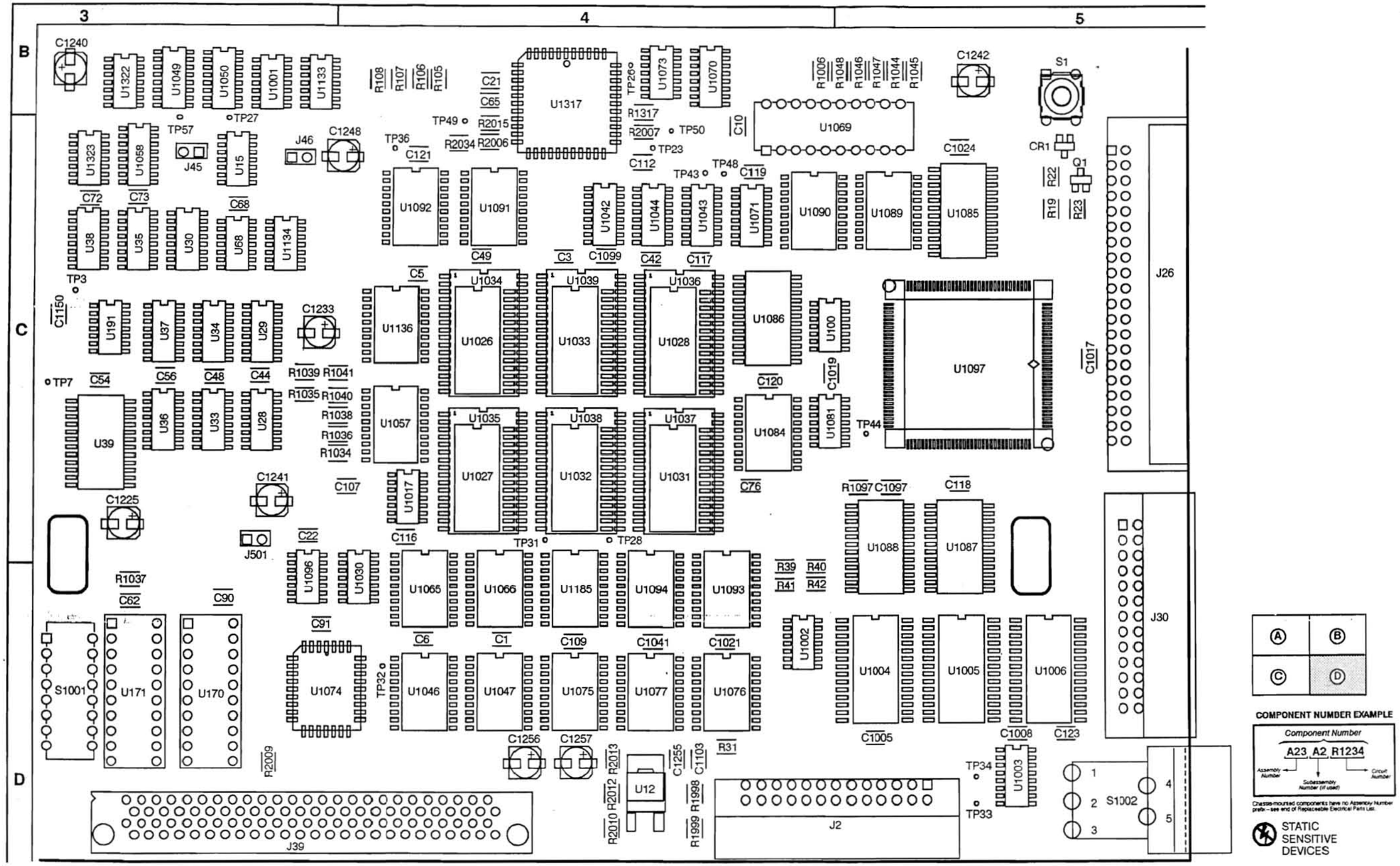


Vol. 2 Figure 9-110: A11 DRAM Processor/Display Board (Section B)

Scans by Artekmedia => 2011



Vol. 2 Figure 9-111: A11 DRAM Processor/Display Board (Section C)



Vol. 2 Figure 9-112: A11 DRAM Processor/Display Board (Section D)

Scans by ArtekMedia => 2011

Scans by Artekmedia => 2011

A11 DRAM Processor/Display Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C1	A11-27	3A	A11	4D	C73	A11-27	4B	A11	3C	C1002	A11-27	4D	A11	3B	J503	A11-2	1D	A11	5B	R151	A11-26	4A	A11	1D
C2	A11-27	3A	A11	3B	C74	A11-27	4B	A11	3A	C1005	A11-27	4D	A11	5D	J504	A11-2	1D	A11	3A	R152	A11-26	4A	A11	1D
C3	A11-27	3A	A11	4C	C75	A11-27	4B	A11	3B	C1007	A11-27	4D	A11	1A	J505	A11-2	1D	A11	2A	R153	A11-26	5B	A11	1D
C4	A11-27	3A	A11	2A	C76	A11-27	4B	A11	4C	C1008	A11-27	4D	A11	5D	J506	A11-2	1D	A11	4A	R154	A11-3	2B	A11	2B
C5	A11-27	4A	A11	4C	C77	A11-27	4B	A11	2B	C1017	A11-27	4D	A11	5C	J507	A11-2	2D	A11	2C	R155	A11-23	5B	A11	1D
C6	A11-27	4A	A11	4D	C78	A11-27	4B	A11	4B	C1019	A11-27	4D	A11	4C	J508	A11-2	2D	A11	1B	R156	A11-23	5C	A11	1D
C7	A11-27	4A	A11	3B	C79	A11-27	4B	A11	5B	C1021	A11-27	4D	A11	4D	J509	A11-2	2D	A11	1D	R157	A11-23	5C	A11	1C
C8	A11-27	4A	A11	2B	C80	A11-27	5B	A11	3B	C1024	A11-27	4D	A11	5C						R158	A11-23	5D	A11	1C
C9	A11-27	4A	A11	1A	C81	A11-27	5B	A11	2B	C1041	A11-27	4D	A11	4D	L1	A11-26	2B	A11	1C	R159	A11-25	6B	A11	2C
C10	A11-27	4A	A11	4C	C82	A11-27	5B	A11	3C	C1064	A11-27	4D	A11	3B						R201	A11-8	3B	A11	4B
C11	A11-27	4A	A11	1B	C83	A11-27	5B	A11	2C	C1097	A11-14	1D	A11	5C	Q1	A11-7	4D	A11	5C	R202	A11-8	3B	A11	4B
C12	A11-27	4A	A11	4B	C84	A11-27	5B	A11	3C	C1099	A11-27	4D	A11	4C	Q2	A11-5	2D	A11	2A	R203	A11-8	3B	A11	4B
C13	A11-27	4A	A11	2B	C85	A11-27	3C	A11	2C	C1103	A11-27	5D	A11	4D	Q3	A11-5	2D	A11	2A	R204	A11-8	3B	A11	4B
C14	A11-27	4A	A11	3C	C86	A11-27	3C	A11	2C	C1114	A11-8	1D	A11	4B						R205	A11-8	3B	A11	4B
C15	A11-27	4A	A11	3B	C87	A11-27	3C	A11	2C	C1121	A11-27	5D	A11	5A	R1	A11-3	2D	A11	2A	R206	A11-8	3B	A11	4B
C16	A11-27	5A	A11	3B	C88	A11-27	3C	A11	1C	C1125	A11-27	5D	A11	5A	R2	A11-3	2C	A11	2A	R207	A11-8	3B	A11	4B
C17	A11-27	5A	A11	2B	C90	A11-27	4C	A11	3D	C1147	A11-27	5D	A11	1B	R3	A11-3	2D	A11	2A	R208	A11-8	3B	A11	4B
C18	A11-27	5A	A11	2B	C91	A11-27	4C	A11	3D	C1149	A11-27	5D	A11	2C	R4	A11-3	3C	A11	2A	R209	A11-8	3B	A11	4B
C19	A11-8	2D	A11	4B	C92	A11-27	4C	A11	2C	C1150	A11-27	5D	A11	3C	R5	A11-24	5C	A11	2B	R210	A11-8	3C	A11	4B
C20	A11-27	5A	A11	2B	C93	A11-27	4C	A11	2C	C1151	A11-27	5D	A11	3C	R6	A11-6	2A	A11	4B	R211	A11-8	3C	A11	4B
C21	A11-27	5A	A11	4B	C95	A11-27	4C	A11	2C	C1152	A11-27	5D	A11	2B	R7	A11-6	2A	A11	4B	R212	A11-8	3C	A11	4B
C22	A11-27	3A	A11	3D	C96	A11-27	4C	A11	2B	C1153	A11-27	5D	A11	3B	R8	A11-6	2A	A11	4B	R213	A11-8	3C	A11	4B
C23	A11-27	3A	A11	2A	C98	A11-27	4C	A11	1C	C1154	A11-27	5D	A11	3B	R9	A11-6	2B	A11	4B	R214	A11-8	3C	A11	4B
C24	A11-27	3A	A11	4A	C99	A11-27	1A	A11	4A	C1155	A11-27	5D	A11	2C	R10	A11-6	2B	A11	4B	R215	A11-8	3C	A11	4B
C25	A11-27	3A	A11	2A	C100	A11-27	4C	A11	3B	C1156	A11-27	6D	A11	2B	R11	A11-6	2B	A11	4B	R216	A11-8	3C	A11	4B
C26	A11-27	4A	A11	3A	C101	A11-27	4C	A11	3B	C1165	A11-27	6D	A11	2B	R12	A11-6	2B	A11	4B	R217	A11-8	3C	A11	4B
C27	A11-27	4A	A11	4A	C102	A11-27	4C	A11	4B	C1175	A11-27	6D	A11	1A	R13	A11-6	2B	A11	4B	R218	A11-8	3C	A11	4B
C28	A11-27	4A	A11	5A	C103	A11-27	4C	A11	4B	C1197	A11-27	6D	A11	5B	R14	A11-6	2B	A11	4B	R1006	A11-10	4A	A11	4C
C29	A11-27	4A	A11	2A	C104	A11-27	5C	A11	4B	C1218	A11-27	2A	A11	2B	R15	A11-6	2B	A11	4B	R1007	A11-10	5A	A11	4B
C30	A11-27	4A	A11	3A	C105	A11-27	5C	A11	2C	C1220	A11-5	1D	A11	1A	R16	A11-6	2B	A11	4B	R1020	A11-5	1C	A11	2B
C31	A11-2	5C	A11	5B	C106	A11-27	5C	A11	1B	C1221	A11-5	1D	A11	1A	R17	A11-6	2B	A11	4B	R1021	A11-5	1C	A11	2B
C33	A11-27	4A	A11	3B	C107	A11-27	5C	A11	3C	C1225	A11-27	2A	A11	3C	R18	A11-4	1A	A11	2C	R1022	A11-5	2C	A11	3B
C34	A11-27	4A	A11	2A	C108	A11-27	5C	A11	1B	C1226	A11-27	2A	A11	4B	R19	A11-7	3D	A11	5C	R1027	A11-4	2C	A11	2A
C35	A11-27	4A	A11	3A	C109	A11-27	3C	A11	4D	C1233	A11-27	2A	A11	3C	R20	A11-3	2D	A11	2A	R1028	A11-4	2D	A11	2A
C36	A11-27	4A	A11	4B	C110	A11-27	3C	A11	1B	C1240	A11-27	2A	A11	3B	R21	A11-3	3C	A11	2A	R1034	A11-6	2D	A11	3C
C37	A11-27	4A	A11	3B	C111	A11-27	3C	A11	2C	C1241	A11-27	2A	A11	3C	R22	A11-7	3D	A11	5C	R1035	A11-6	2D	A11	3C
C38	A11-27	4A	A11	3A	C112	A11-27	3C	A11	4C	C1242	A11-27	2A	A11	5B	R23	A11-7	3D	A11	5C	R1036	A11-6	1D	A11	3C
C39	A11-27	5A	A11	4A	C113	A11-27	4C	A11	2D	C1243	A11-27	2A	A11	3A	R24	A11-5	2D	A11	1A	R1037	A11-6	1D	A11	3D
C40	A11-27	5A	A11	3A	C114	A11-27	4C	A11	2C	C1248	A11-27	2A	A11	3C	R25	A11-4	1D	A11	1A	R1038	A11-6	1D	A11	3C
C41	A11-27	5A	A11	3B	C115	A11-27	4C	A11	1C	C1255	A11-2	2C	A11	4D	R26	A11-4	1D	A11	1A	R1039	A11-6	1D	A11	3C
C42	A11-27	5A	A11	4C	C116	A11-27	4C	A11	4D	C1256	A11-2	2C	A11	4D	R27	A11-5	2D	A11	1A	R1040	A11-6	1D	A11	3C
C43	A11-27	5A	A11	4A	C117	A11-27	4C	A11	4C	C1257	A11-2	2C	A11	4D	R28	A11-5	2D	A11	1A	R1041	A11-6	1D	A11	3C
C44	A11-27	3B	A11	3C	C118	A11-27	4C	A11	5C						R29	A11-5	2D	A11	1A	R1042	A11-10	5A	A11	4B
C45	A11-27	3B	A11	2C	C119	A11-27	4C	A11	4C	CR1	A11-7	3D	A11	5C	R30	A11-3	5C	A11	5B	R1043	A11-10	5A	A11	4B
C46	A11-27	3B	A11	2C	C120	A11-27	4C	A11	4C						R31	A11-3	5C	A11	4D	R1044	A11-10	4B	A11	5C
C47	A11-27	3B	A11	1B	C121	A11-27	4C	A11	4C	DS1	A11-6	5A	A11	3A	R32	A11-14	1C	A11	4A	R1045	A11-10	4B	A11	5C
C48	A11-27	4B	A11	3C	C122	A11-27	4C	A11	2D						R33	A11-14	1C	A11	3A	R1046	A11-10	4B	A11	5C
C49	A11-27	4B	A11	4C	C123	A11-27	4C	A11	5D	J2	A11-2	6C	A11	4D	R34	A11-3	2C	A11	2A	R1047	A11-10	4B	A11	5C
C50	A11-27	4B	A11	1C	C125	A11-27	5C	A11	2B	J5	A11-2	2D	A11	1C	R35	A11-3	2C	A11	2A	R1048	A11-10	4B	A11	4C
C51	A11-27	4B	A11	1C	C131	A11-27	5C	A11	1C	J11	A11-17	4A	A11	2C	R39	A11-14	3C	A11	4D	R1049	A11-10	4B	A11	4B
C52	A11-27	4B	A11	3B	C132	A11-26	2B	A11	1C	J12	A11-18	1A	A11	2C	R40	A11-14	3C	A11	4D	R1053	A11-4	2D	A11	3A
C53	A11-27	4B	A11	2B	C133	A11-26	2B	A11	1D	J13	A11-24	4A	A11	2C	R41	A11-14	3C	A11	4D	R1071	A11-5	1C	A11	2B
C54	A11-27	4B	A11	3C	C134	A11-26	4A	A11	1C	J14	A11-24	4D	A11	2B	R42	A11-14	3C	A11	4D	R1072	A11-5	1C	A11	2B
C55	A11-27	4B	A11	1A	C140	A11-27	5C	A11	3B	J18	A11-24	6D	A11	1D	R50	A11-10	2C	A11	5A	R1073	A11-5	4B	A11	4A
C56	A11-27	4B	A11	3C	C141	A11-27	5C	A11	4B	J20	A11-2	2D	A11	1A	R52	A11-7	4C	A11	3B	R1074	A11-5	4B	A11	4B
C57	A11-27	4B	A11	4B	C150	A11-27	5C	A11	3B	J23	A11-5	6A	A11	3B	R53	A11-7	4C	A11	3B	R1075	A11-5	4B	A11	4A
C58	A11-27	4B	A11	4B	C151	A11-27	5C	A11	3B	J26	A11-2	1B	A11	5C	R54	A11-7	4C	A11	1C	R1076	A11-5	5B	A11	3A
C59	A11-27	5B	A11	3B	C152	A11-27	5C	A11	4B	J27	A11-2	1C	A11	5B	R55	A11-7	4C	A11	1C	R1077	A11-5	5B	A11	3A
C60	A11-27	5B	A11	3B	C153	A11-27	5C	A11	4B	J28	A11-2	5A	A11	5B	R63	A11-5	5A	A11	2B	R1078	A11-5	5B	A11	3A
C61	A11-27	5B	A11	2A	C154	A11-27	5C	A11	3B	J30	A11-14	5D	A11	5D	R64	A11-5	5A	A11	2B	R1079	A11-5	5B	A11	3A
C62	A11-27	5B	A11	3D	C208	A11-27	1A	A11	1C	J35	A11-2	4C	A11	2A	R70	A11-10	4B	A11	5B	R1080	A11-5	5B	A11	3A
C63	A11-27	5B	A11	4B	C209	A11-27	5C	A11	2B	J37	A11-2	4D	A11	3A	R71	A11-10	4B	A11	5B	R1081	A11-5	2B	A11	3B
C64	A11-27	3B	A11	2C	C250	A11-27	3D	A11	1C	J38	A11-2	1A	A11	1C	R100	A11-3	2B	A11	2B	R1097	A11-14	1D	A11	5C
C65	A11-27	3B	A11	4C	C251	A11-27	3D	A11	1C	J39	A11-2	3A	A11	3D	R101	A11-3	2B	A11	2B	R1100	A11-5	3C	A11	3A
C66	A11-27	3B	A11	2C	C252	A11-27	3D	A11	2C	J40	A11-2	6D	A11	4A	R102	A11-3	2B	A11	2B	R1114	A11-8	1D	A11	4B
C67	A11-27	3B	A11	2C	C253	A11-27	3D	A11	2B	J44	A11-14	1C	A11	5A	R105	A11-11	4D	A11	4B	R1300	A11-4	3C	A11	3A
C68	A11-27	4B	A11	3C	C254	A11-27	3D	A11	2B	J45	A11-5	4A	A11	3C	R106	A11-11	4D	A11	4B	R1317	A11-9	3C	A11	4C
C69	A11-27	4B	A11	1C	C300	A11-26	2B	A11	1C	J46	A11-6	1C	A11	3C	R107	A11-11	4D	A11	4B	R1998	A11-14	5A	A11	4D
C71	A11-27	4B	A11	3B	C301	A11-26	5A	A11	1C	J501	A11-2	1D	A11	3D	R108	A11-11	4D	A11	4B	R1999	A11-14	5A	A11	4D
C72	A11-27	4B	A11	3C	C1001	A11-27	2A	A11	2A	J502	A11-2	1D	A11	4B	R150	A11-26	4A	A11	1D	R2001	A11-4	1B	A11	2A

***Asterisks indicate components located on the back of the board.**

A11 DRAM Processor/Display Component Locator (cont)

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
R2006	A11-9	4C	A11	4C
R2007	A11-9	5C	A11	4C
R2008	A11-4	2D	A11	2A
R2009	A11-2	3C	A11	3D
R2010	A11-2	2C	A11	4D
R2012	A11-2	2C	A11	4D
R2013	A11-2	2C	A11	4D
R2014	A11-2	3C	A11	3B
R2015	A11-9	4C	A11	4C
R2016	A11-6	4A	A11	3A
R2017	A11-6	4A	A11	3A
R2018	A11-6	4A	A11	3A
R2019	A11-6	4A	A11	3A
R2020	A11-6	4A	A11	3A
R2021	A11-6	4A	A11	3A
R2022	A11-6	4A	A11	3A
R2023	A11-6	4A	A11	3A
R2025	A11-5	4A	A11	3B
R2026	A11-6	1C	A11	3B
R2033	A11-4	2C	A11	2B
R2034	A11-4	3C	A11	4C
S1A	A11-7	4D	A11	5B
S1B	A11-7	4D	A11	5B
S1001	A11-6	1D	A11	3D
S1002	A11-2	3C	A11	5D
TP1	A11-21	1B	A11	2C
TP2	A11-21	1C	A11	2C
TP3	A11-21	1C	A11	3C
TP4	A11-21	1C	A11	2C
TP5	A11-26	3C	A11	2B
TP7	A11-18	4A	A11	3C
TP8	A11-19	3A	A11	3C
TP9	A11-24	5B	A11	2B
TP10	A11-22	6B	A11	1C
TP11	A11-22	6C	A11	1C
TP12	A11-22	6C	A11	1C
TP13	A11-22	6D	A11	1C
TP20	A11-10	4B	A11	4B
TP22	A11-10	4B	A11	5B
TP23	A11-15	2B	A11	4C
TP24	A11-11	2C	A11	4B
TP25	A11-11	5C	A11	4B
TP26	A11-11	4C	A11	4B
TP27	A11-15	2C	A11	3C
TP28	A11-10	3C	A11	4D
TP31	A11-10	3C	A11	4D
TP32	A11-15	3B	A11	4D
TP33	A11-11	2A	A11	5D
TP34	A11-11	2A	A11	5D
TP36	A11-14	1A	A11	4C
TP40	A11-5	6B	A11	2B
TP41	A11-13	5A	A11	5A
TP43	A11-14	3D	A11	4C
TP44	A11-14	3D	A11	5C
TP46	A11-14	3C	A11	4B
TP47	A11-14	3D	A11	2C
TP48	A11-13	2A	A11	4C
TP49	A11-9	4C	A11	4C
TP50	A11-9	4C	A11	4C
TP51	A11-5	4A	A11	3B
TP52	A11-5	5B	A11	3A
TP53	A11-5	5B	A11	3B
TP54	A11-5	5B	A11	3B
TP55	A11-7	3B	A11	4B
TP56	A11-7	3B	A11	3B
TP57	A11-2	5D	A11	3C
TP58	A11-4	1C	A11	2A
TP59	A11-23	5B	A11	1D
TP60	A11-23	5C	A11	1D
TP61	A11-23	5C	A11	1D
TP62	A11-23	5D	A11	1C
U1A	A11-10	3A	A11	4B
U1B	A11-10	3A	A11	4B
U3	A11-6	3A	A11	4B
U4	A11-6	3B	A11	4B
U12	A11-2	2C	A11	4D
U15A	A11-17	2D	A11	3C
U15B	A11-17	6D	A11	3C
U15C	A11-17	1C	A11	3C
U15D	A11-17	1A	A11	3C
U15F	A11-17	1D	A11	3C
U15E	A11-7	3D	A11	3C
U20B	A11-22	5A	A11	1C
U20A	A11-5	2D	A11	1C
U21B	A11-17	3D	A11	2C
U21A	A11-26	3C	A11	2C
U22	A11-17	5C	A11	1C
U28	A11-18	2B	A11	3C
U29	A11-18	2B	A11	3C
U30	A11-18	2C	A11	3C
U33	A11-19	2A	A11	3C
U34	A11-19	2B	A11	3C
U35	A11-19	2C	A11	3C
U36	A11-18	3A	A11	3C
U37	A11-18	3B	A11	3C
U38	A11-18	3C	A11	3C
U39	A11-18	4A	A11	3C
U40	A11-18	4B	A11	3C
U41	A11-19	4A	A11	3C
U42	A11-19	4B	A11	3C
U43	A11-18	5C	A11	2D
U44	A11-18	5D	A11	2C
U45	A11-19	4C	A11	3D
U46	A11-19	4D	A11	3D
U47	A11-18	5A	A11	2C
U48	A11-18	5B	A11	2C
U51	A11-19	5A	A11	2C
U52	A11-19	5B	A11	2B
U55	A11-21	2B	A11	2C
U56	A11-21	2C	A11	2C
U57	A11-21	2C	A11	2C
U58	A11-21	2D	A11	2C
U59	A11-20	5A	A11	3C
U60	A11-21	3B	A11	2C
U61	A11-21	5A	A11	2D
U62	A11-21	5B	A11	2C
U63	A11-22	2C	A11	2C
U64A	A11-17	3A	A11	2C
U64B	A11-17	3A	A11	2C
U64C	A11-17	3B	A11	2C
U64D	A11-25	4B	A11	2C
U66	A11-22	2C	A11	2C
U68C	A11-17	3B	A11	3C
U68D	A11-17	3B	A11	3C
U68B	A11-18	4A	A11	3C
U68A	A11-19	3A	A11	3C
U71	A11-25	2B	A11	2B
U72	A11-25	2C	A11	2B
U73	A11-25	5B	A11	1B
U74	A11-25	5C	A11	1B
U75	A11-25	3B	A11	2C
U76	A11-25	6B	A11	2C
U79	A11-21	6C	A11	2C
U80	A11-21	6C	A11	2B
U81	A11-24	4A	A11	2B
U100D	A11-10	2B	A11	4C
U100A	A11-13	1A	A11	4C
U100B	A11-14	1A	A11	4C
U100C	A11-14	3D	A11	4C
U101A	A11-14	1B	A11	5B
U101B	A11-14	1C	A11	5B
U101C	A11-14	1C	A11	5B
U101D	A11-14	1C	A11	5B
U108	A11-22	3A	A11	2C
U109	A11-22	3B	A11	2D
U110	A11-22	3C	A11	2D
U111	A11-22	3D	A11	2D
U112	A11-22	5B	A11	1C
U113	A11-22	5C	A11	1C
U114	A11-22	5C	A11	1C
U115	A11-22	5D	A11	1C
U126C	A11-20	3C	A11	2B
U126A	A11-24	5C	A11	2B
U126B	A11-24	5D	A11	2B
U126D	A11-5	2C	A11	2B
U142	A11-20	2C	A11	1C
U143	A11-20	2C	A11	1C
U152	A11-17	6B	A11	1C
U158A	A11-17	2A	A11	3D
U158B	A11-17	3A	A11	3D
U158C	A11-17	1A	A11	3D
U158D	A11-17	2D	A11	3D
U164A	A11-24	3B	A11	2B
U164B	A11-24	3B	A11	2B
U165A	A11-24	3B	A11	2B
U165B	A11-24	3C	A11	2B
U166C	A11-17	5D	A11	2B
U166D	A11-17	5D	A11	2B
U166A	A11-24	2C	A11	2B
U166B	A11-24	3C	A11	2B
U167F	A11-17	5D	A11	2B
U167A	A11-24	2A	A11	2B
U167B	A11-24	2C	A11	2B
U167C	A11-24	2C	A11	2B
U167E	A11-26	2D	A11	2B
U167D	A11-3	1A	A11	2B
U168A	A11-24	2C	A11	2B
U168D	A11-25	1B	A11	2B
U168B	A11-26	2D	A11	2B
U168C	A11-3	2A	A11	2B
U169	A11-24	2B	A11	2B
U170	A11-17	2B	A11	3D
U171	A11-17	2C	A11	3D
U172A	A11-26	3C	A11	1B
U172B	A11-26	2C	A11	1B
U180	A11-26	5C	A11	1B
U182	A11-3	3A	A11	2A
U183B	A11-10	1C	A11	1A
U183A	A11-3	2D	A11	1A
U190	A11-26	4A	A11	1D
U191A	A11-18	1B	A11	3C
U191B	A11-18	1C	A11	3C
U200	A11-23	2A	A11	1C
U201	A11-23	2B	A11	1D
U202	A11-23	2C	A11	1D
U203	A11-23	2D	A11	1D
U204	A11-23	4B	A11	1C
U205	A11-23	4B	A11	1C
U206	A11-23	4C	A11	1C
U207	A11-23	4D	A11	1C
U208	A11-6	4B	A11	4B
U1001A	A11-5	5A	A11	3C
U1001B	A11-5	5D	A11	3C
U1001C	A11-5	3C	A11	3C
U1001D	A11-5	1D	A11	3C
U1001E	A11-5	6D	A11	3C
U1001F	A11-5	4A	A11	3C
U1002A*	A11-13	2C	A11	4D
U1002B	A11-13	2C	A11	4D
U1002C	A11-13	1C	A11	4D
U1002D	A11-13	2C	A11	4D
U1003	A11-14	5A	A11	5D
U1004	A11-14	6C	A11	5D
U1005	A11-14	6B	A11	5D
U1006	A11-14	6B	A11	5D
U1007	A11-13	6A	A11	4B
U1008	A11-13	6B	A11	4A
U1009	A11-13	6C	A11	4A
U1014	A11-13	6C	A11	4B
U1015	A11-13	4A	A11	5A
U1017A	A11-10	6A	A11	4C
U1017C	A11-10	5D	A11	4C
U1017B	A11-14	2D	A11	4C
U1017D	A11-14	2D	A11	4C
U1026	A11-14	4A	A11	4C
U1027	A11-14	5A	A11	4C
U1028	A11-14	6A	A11	4C
U1031	A11-14	6C	A11	4C
U1032	A11-14	5C	A11	4C
U1033	A11-14	4C	A11	4C
U1034	A11-14	4B	A11	4C
U1035	A11-14	5B	A11	4C
U1036	A11-14	6B	A11	4C
U1037	A11-14	6C	A11	4C
U1038	A11-14	5C	A11	4C
U1039	A11-14	4C	A11	4C
U1042	A11-14	2C	A11	4C
U1043	A11-14	2D	A11	4C
U1044	A11-15	2A	A11	4C
U1046	A11-15	3B	A11	4D
U1047	A11-15	5B	A11	4D
U1048	A11-7	2D	A11	3B
U1049	A11-5	4B	A11	3C
U1050	A11-7	2C	A11	3C
U1051	A11-5	4D	A11	3A
U1052	A11-5	6C	A11	4A
U1054D	A11-24	2C	A11	3B
U1054C	A11-5	1C	A11	3B
U1054A	A11-7	6A	A11	3B
U1054B	A11-7	6A	A11	3B
U1055	A11-7	2A	A11	3B
U1056	A11-7	2B	A11	3B
U1057	A11-6	2D	A11	4C
U1058	A11-5	4A	A11	3C
U1065	A11-11	4A	A11	4D
U1066	A11-11	4B	A11	4D
U1067	A11-11	5B	A11	4A
U1068	A11-11	5A	A11	4A
U1069	A11-10	1A	A11	4C
U1070	A11-11	1B	A11	4C
U1071	A11-11	1A	A11	4C
U1072	A11-10	3B	A11	5B
U1073A	A11-10	4A	A11	4C
U1073B	A11-10	4A	A11	4C
U1073E	A11-11	1A	A11	4C
U1073C	A11-14	3C	A11	4C
U1073D	A11-14	3C	A11	4C
U1073F	A11-6	2B	A11	4C
U1074	A11-15	3C	A11	3D
U1075	A11-11	2A	A11	4D
U1076	A11-11	2A	A11	4D
U1077	A11-11	2B	A11	4D
U1081A	A11-14	1C	A11	4C
U1081B	A11-14	3D	A11	4C
U1081C	A11-14	4C	A11	4C
U1081D	A11-14	4C	A11	4C
U1082A	A11-5	4D	A11	3B
U1082B	A11-5	4C	A11	3B
U1082C	A11-5	2B	A11	3B
U1082D	A11-5	4C	A11	3B
U1083A	A11-10	4A	A11	4B
U1083B	A11-14	3C	A11	4B
U1084	A11-14	4C	A11	4C
U1085	A11-13	3C	A11	5C
U1086	A11-13	3D	A11	4C
U1087	A11-14	2B	A11	5D
U1088	A11-14	2B	A11	5D
U1089	A11-13	2A	A11	5C
U1090	A11-13	2B	A11	4C
U1091	A11-14	1A	A11	4C
U1092	A11-14	1B	A11	4C
U1093	A11-10	4C	A11	4D
U1094	A11-10	5C	A11	4D
U1096A	A11-10	5D	A11	3D
U1096B	A11-15	3C	A11	3D
U1096C	A11-15	2C	A11	3D
U1096D	A11-15	5C	A11	3D
U1097	A11-14	2A	A11	5C
U1107	A11-8	6A	A11	5A
U1109A	A11-5	1A	A11	3B
U1109B	A11-5	1B	A11	3B
U1110	A11-8	2B	A11	4B
U1111D	A11-10	2B	A11	3B
U1111C	A11-14	1C	A11	3B
U1111A	A11-8	2D	A11	3B
U1111B	A11-8	2D	A11	3B
U1114A	A11-8	1D	A11	4B
U1114B	A11-8	1C	A11	4B
U1115C	A11-3	4D	A11	4B
U1115D	A11-3	5C	A11	4B
U1115F	A11-3	5D	A11	4B
U1115A	A11-8	1D	A11	4B
U1115B	A11-8	2D	A11	4B
U1115E	A11-8	2D	A11	4B
U1118	A11-8	3B	A11	4B
U1119	A11-8	3B	A11	4B
U1120	A11-8	3C	A11	4B
U1121	A11-8	3C	A11	4B
U1122	A11-8	4C	A11	5B
U1123	A11-8	4C	A11	4B
U1124	A11-8	4B	A11	4B
U1125	A11-8	4B	A11	4B
U1130A	A11-10	5D	A11	4D
U1130B	A11-10	5D	A11	4D
U1130C	A11-10	5D	A11	4D
U1130D	A11-10	5D	A11	4D
U1133	A11-10	5C	A11	3C
U1134A	A11-10	1D	A11	3C
U1134B	A11-10	5A	A11	3C
U1134F	A11-14	1D	A11	3C
U1134D	A11-15	4C	A11	3C
U1134C	A11-3	4C	A11	3C
U1134E	A11-9	3C	A11	3C
U1135	A11-5	4B	A11	3A
U1136	A11-6	4A	A11	4C
U1145	A11-9	1A	A11	1B
U1146	A11-9	1B	A11	1B
U1147	A11-9	1B	A11	1B
U1150	A11-4	2A	A11	2A
U1151	A11-9	5A	A11	1B
U1152	A11-9	5A	A11	1B
U1154C	A11-4	4D	A11	2A
U1154D	A11-4	4D	A11	2A
U1154A	A11-6	4C	A11	2A
U1154B	A11-8	6A	A11	2A
U1155	A11-5	2A	A11	3B
U1157	A11-6	6A	A11	2A

*Asterisks indicate components located on the back of the board.

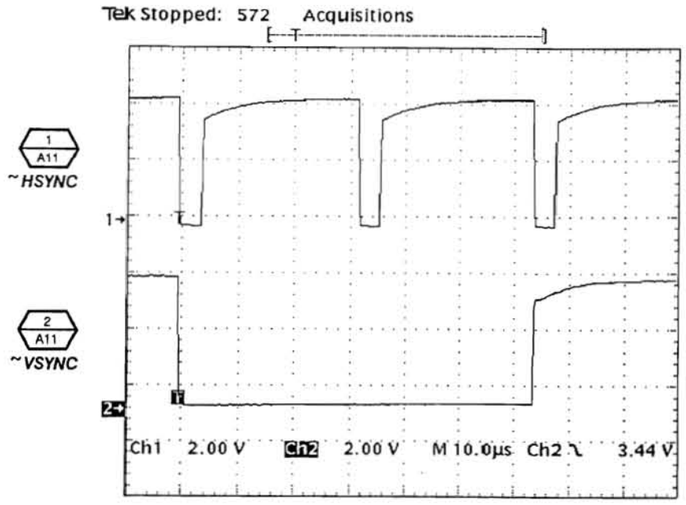
Scans by ArtekMedia => 2011

Scans by Artekmedia => 2011

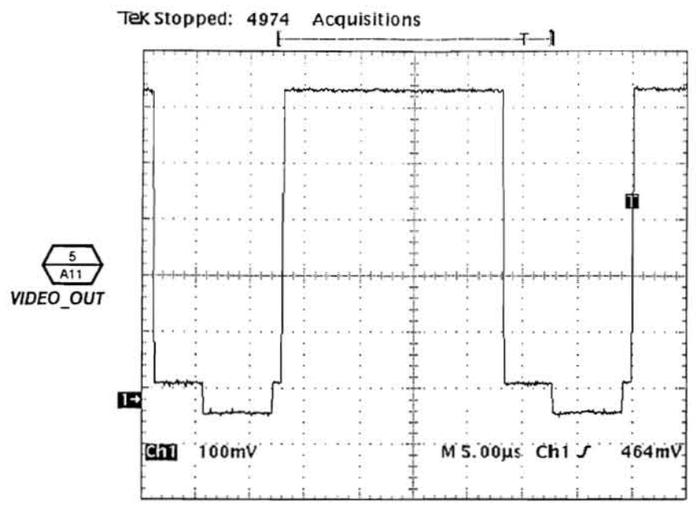
A11 DRAM Processor/Display Component Locator (cont)

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
U1158	A11-6	6B	A11	3A	U1176	A11-4	5B	A11	2A	U1319	A11-22	6A	A11	2C	U1331	A11-6	1B	A11	4A	U1340A	A11-5	1C	A11	3A
U1159	A11-6	6B	A11	3A	U1177	A11-4	3B	A11	2B	U1320B	A11-17	3D	A11	2C	U1332	A11-4	6C	A11	2A	U1340B	A11-5	2C	A11	3A
U1160	A11-6	6C	A11	3A	U1178A	A11-6	5A	A11	2A	U1320A	A11-20	3C	A11	2C	U1333	A11-5	5A	A11	2B	U1341A	A11-8	5A	A11	3A
U1161	A11-6	5C	A11	3B	U1178B	A11-6	5A	A11	2A	U1322C	A11-10	5C	A11	3C	U1334	A11-3	3C	A11	2B	U1341C	A11-8	5A	A11	3A
U1162	A11-6	5C	A11	3B	U1178C	A11-6	4A	A11	2A	U1322D	A11-10	5C	A11	3C	U1335	A11-3	1A	A11	2B	U1341E	A11-9	5A	A11	3A
U1163	A11-6	5B	A11	3B	U1178D	A11-6	1C	A11	2A	U1322A	A11-7	4C	A11	3C	U1336	A11-6	1A	A11	3B	U1341C	A11-9	4A	A11	3A
U1164	A11-6	5B	A11	2B	U1179	A11-4	5A	A11	2B	U1322B	A11-7	4C	A11	3C	U1338A	A11-4	4C	A11	2A	U1342C	A11-14	1C	A11	3A
U1165A	A11-5	1C	A11	2B	U1181	A11-4	3A	A11	2B	U1323A	A11-8	6A	A11	3C	U1338B	A11-4	4D	A11	2A	U1342A	A11-6	2A	A11	3A
U1165B	A11-5	1D	A11	2B	U1184	A11-4	2B	A11	2A	U1323B	A11-8	6C	A11	3C	U1338C	A11-4	4D	A11	2A	U1342B	A11-9	5A	A11	3A
U1165C	A11-9	2D	A11	2B	U1185	A11-10	3C	A11	4D	U1323C	A11-8	5A	A11	3C	U1338D	A11-4	4C	A11	2A	U1342C	A11-9	3B	A11	3A
U1165D	A11-9	2D	A11	2B	U1189	A11-7	5A	A11	3C	U1323D	A11-8	6C	A11	3C	U1339A	A11-4	3A	A11	2B					
U1167	A11-5	1B	A11	1A	U1190B	A11-24	3A	A11	2C	U1324	A11-11	5C	A11	3B	U1339B	A11-4	4C	A11	2B	VR1	A11-26	4A	A11	1D
U1173A	A11-3	4B	A11	1A	U1190A	A11-4	1D	A11	2C	U1325	A11-11	5D	A11	3B	U1339C	A11-4	4C	A11	2B	VR2	A11-5	2D	A11	1A
U1173B	A11-3	3B	A11	1A	U1302	A11-6	4D	A11	3A	U1326	A11-11	4C	A11	3B	U1339D	A11-4	4C	A11	2B					
U1174A	A11-3	4B	A11	1A	U1305	A11-6	3C	A11	3A	U1327	A11-11	4D	A11	3B	U1340C	A11-4	4C	A11	3A	Y1	A11-3	1A	A11	2A
U1174B	A11-3	4B	A11	1A	U1311	A11-6	4C	A11	2A	U1328	A11-11	2C	A11	3B	U1340D	A11-4	4D	A11	3A	Y2	A11-3	2D	A11	2A
U1175	A11-5	1D	A11	1A	U1317	A11-9	4B	A11	4C	U1329	A11-11	2D	A11	3B										

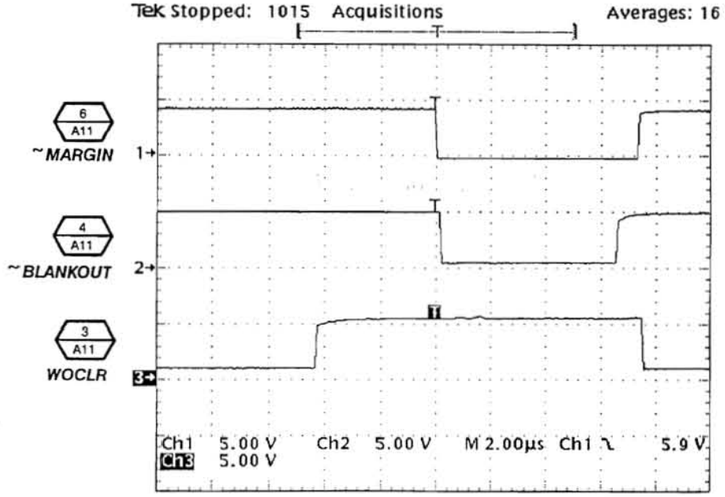
*Asterisks indicate components located on the back of the board.



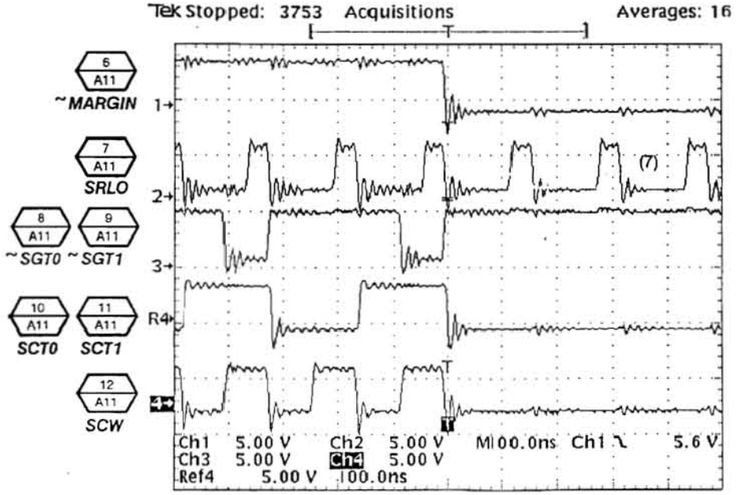
Horizontal and Vertical Sync Signals (outputs from the A11 DRAM Processor/Display to the Monitor)



Typical video signal to the monitor.
Blanking period occurs every 36 ms.



Video Timing Control Signals



Video Timing Control Signals

Vol. 2 Figure 9-113: A11 DRAM Processor/Display Waveforms

Scans by ArtekMedia => 2011

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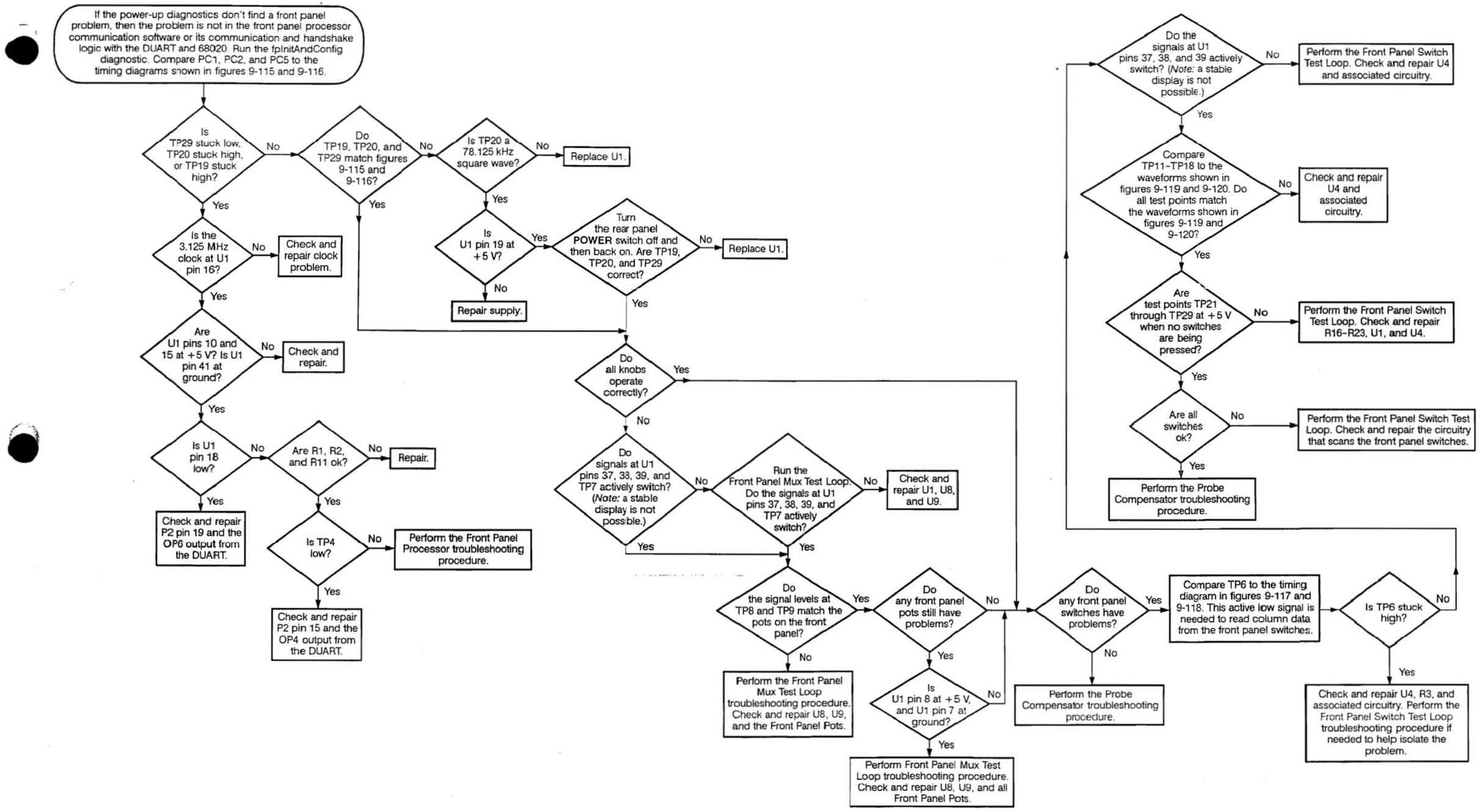
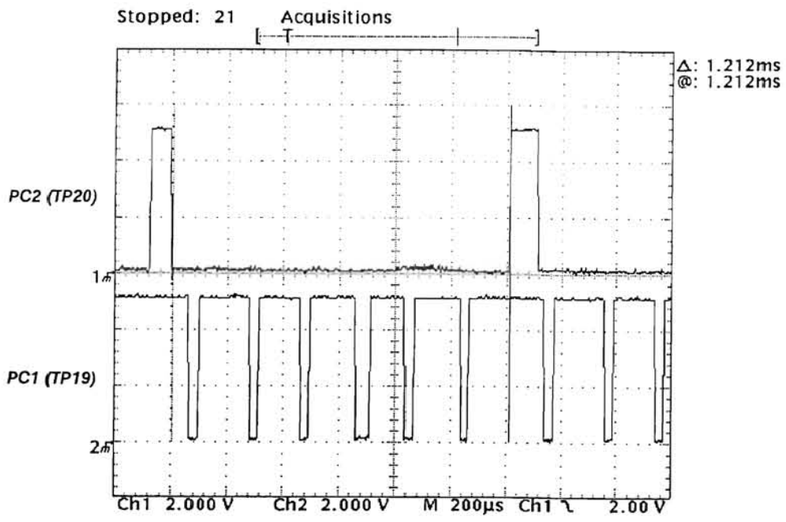


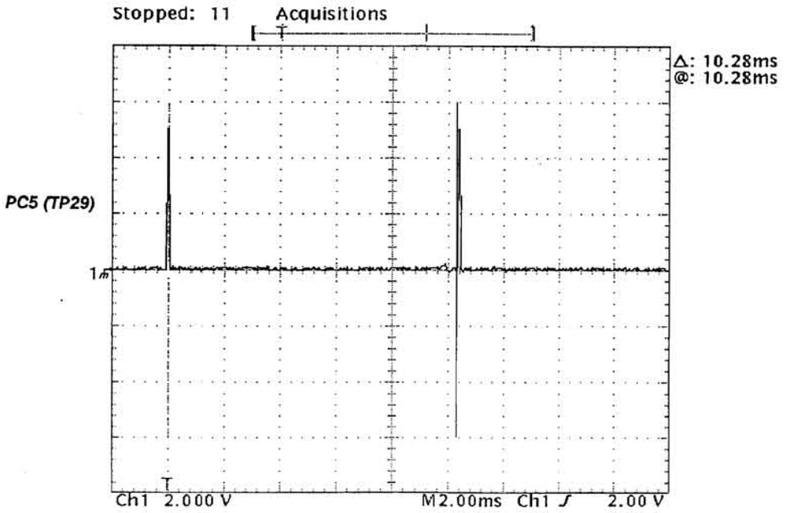
Vol. 2 Figure 9-114: A12 Front Panel System Troubleshooting Procedure

Scans by ArtekMedia => 2011

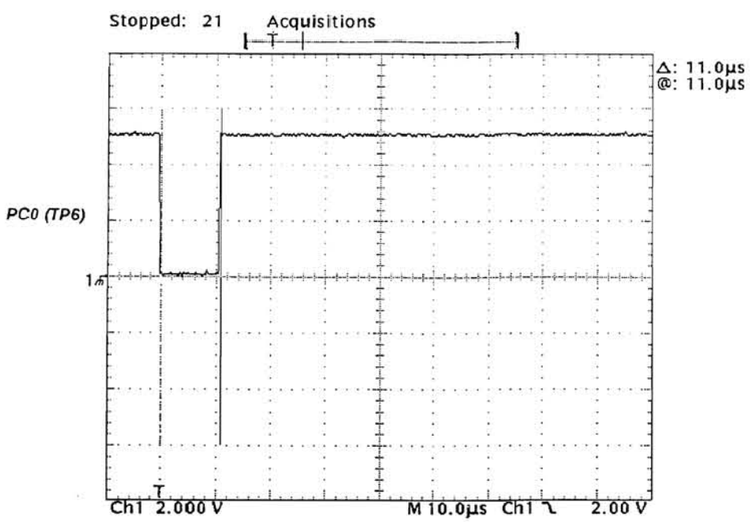
Scans by Artekmedia => 2011



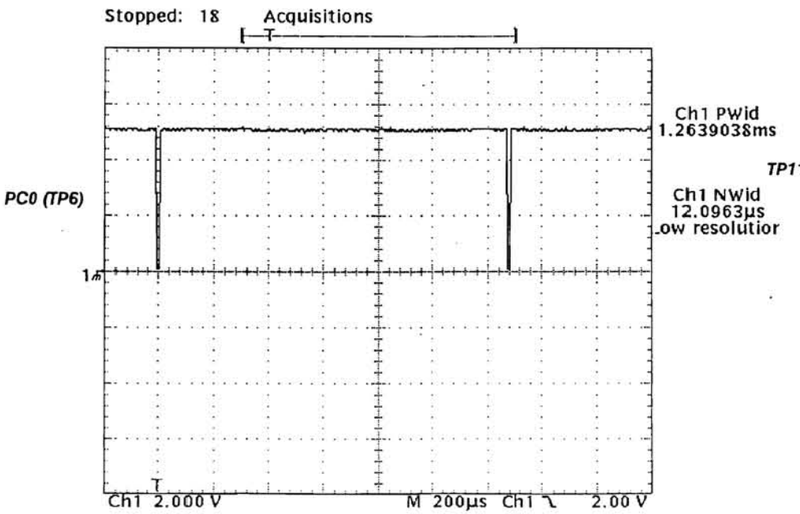
Vol. 2 Figure 9-115: PC1 and PC2 Timing
(Trigger Position = 10%)



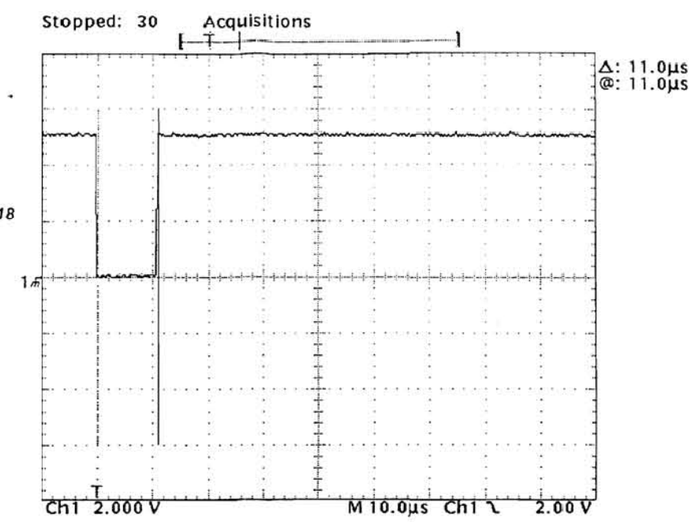
Vol. 2 Figure 9-116: PC5 Timing
(Trigger Position = 10%)



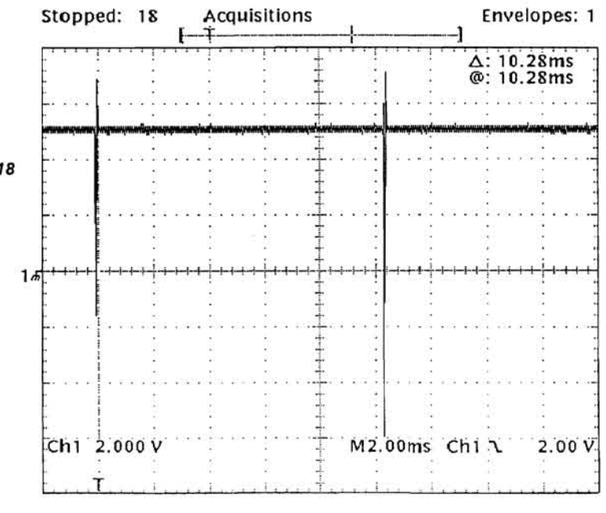
Vol. 2 Figure 9-117: PC0 Timing
(Trigger Position = 10%)



Vol. 2 Figure 9-118: PC0 Timing
(Trigger Position = 10%)

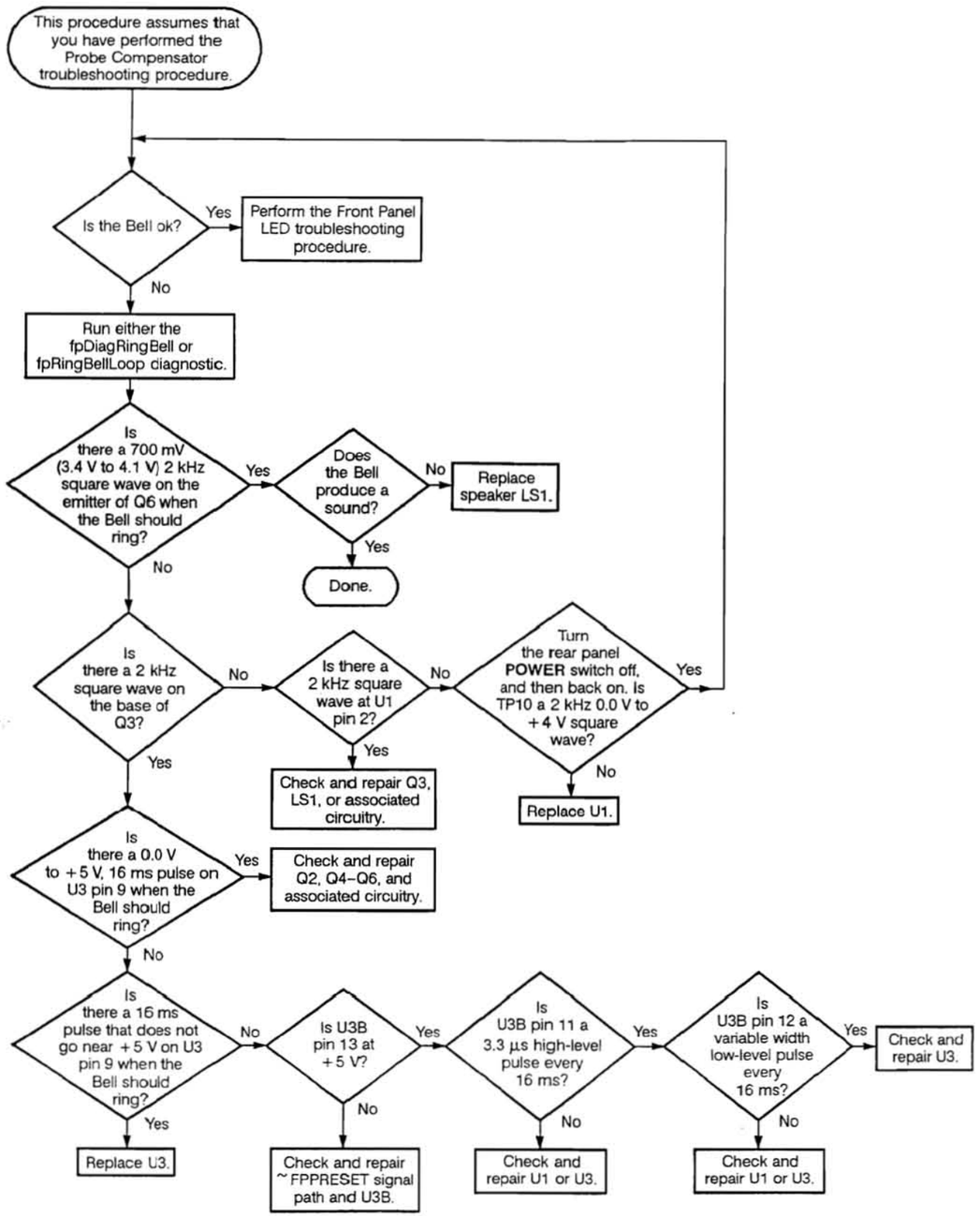


Vol. 2 Figure 9-119: Row 1-8 Timing
(Trigger Position = 10%)



Vol. 2 Figure 9-120: Row 1-8 Timing
(Trigger Position = 10%, Acquisition Mode = Envelope)

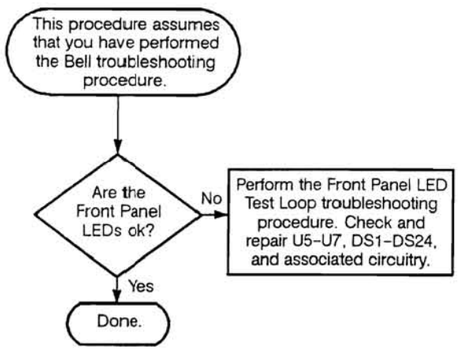
Vol. 2 Figure 9-114: A12 Front Panel System Troubleshooting Procedure (Cont.)



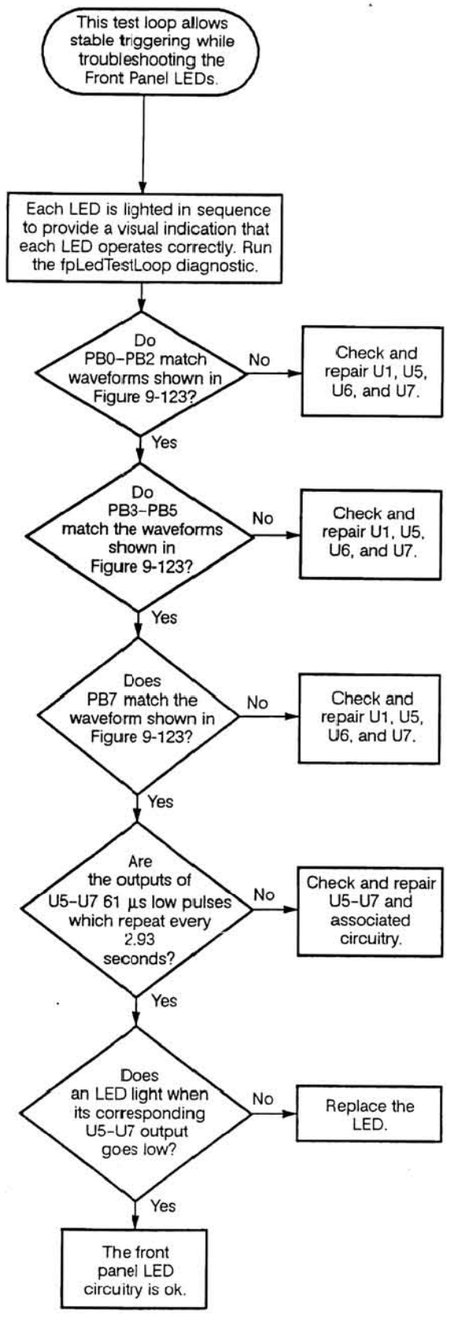
Vol. 2 Figure 9-121: Bell Troubleshooting Procedure

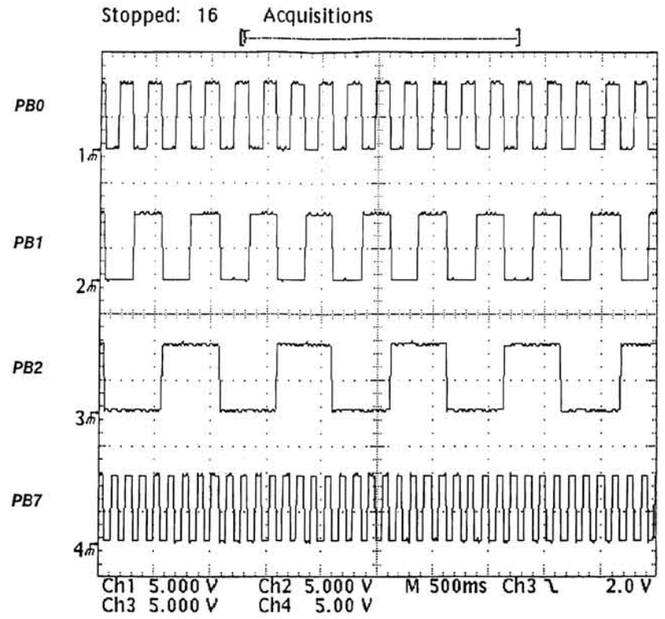
Scans by ArtekMedia => 2011

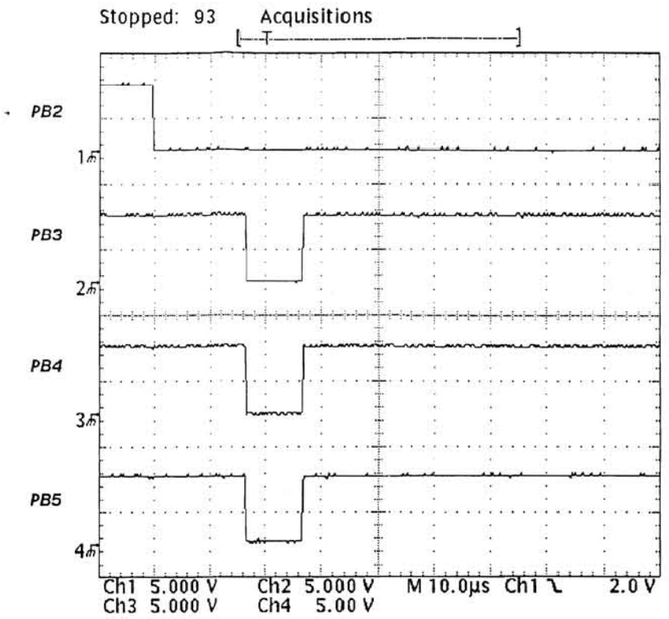
Scans by Artekmedia => 2011

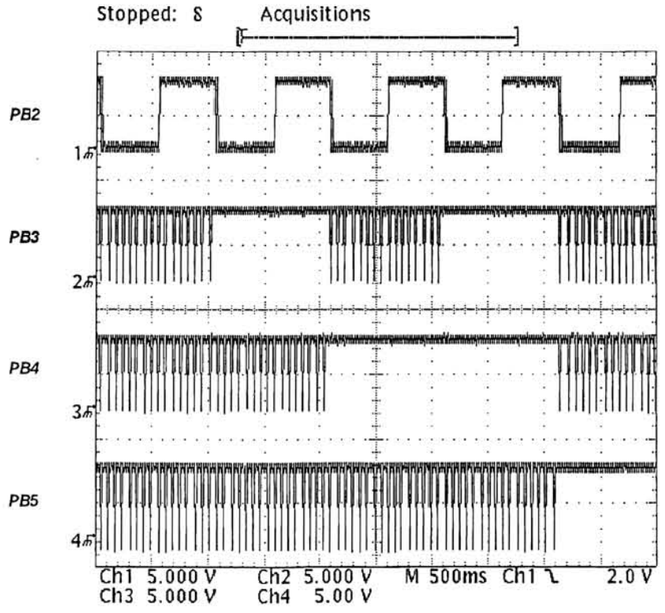


Vol. 2 Figure 9-122: Front Panel LED Troubleshooting Procedure







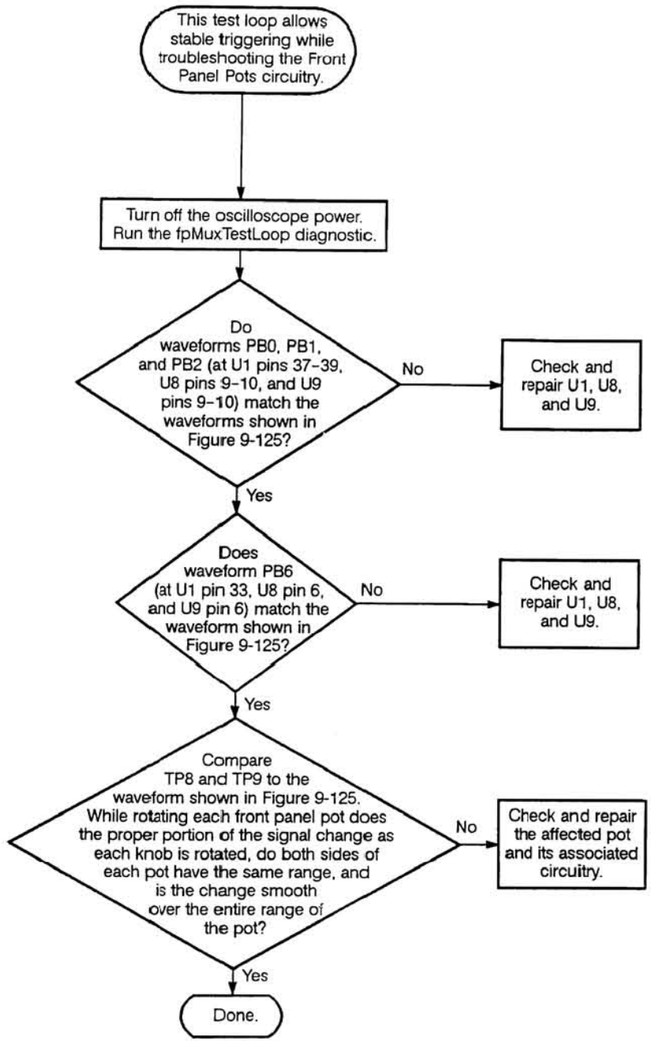


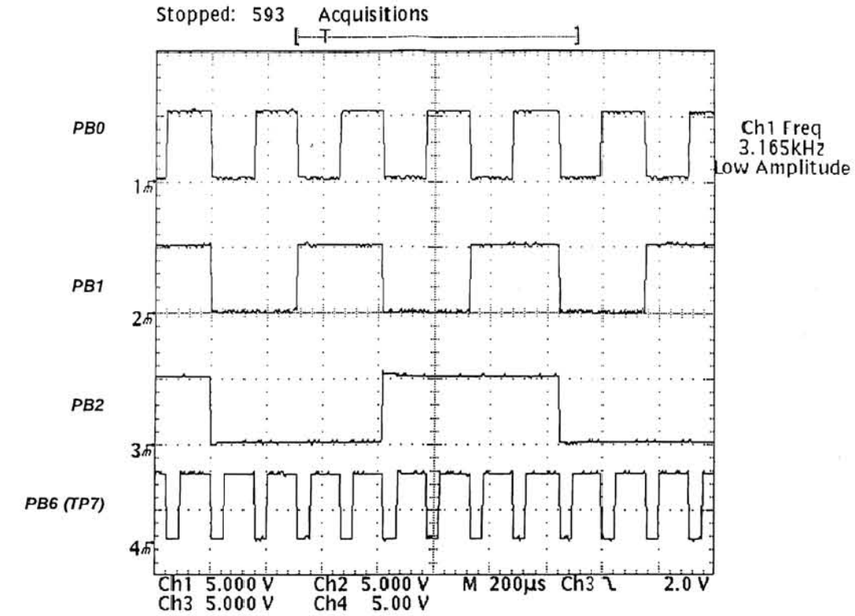
Vol. 2 Figure 9-123: Front Panel LED Test Loop Waveforms

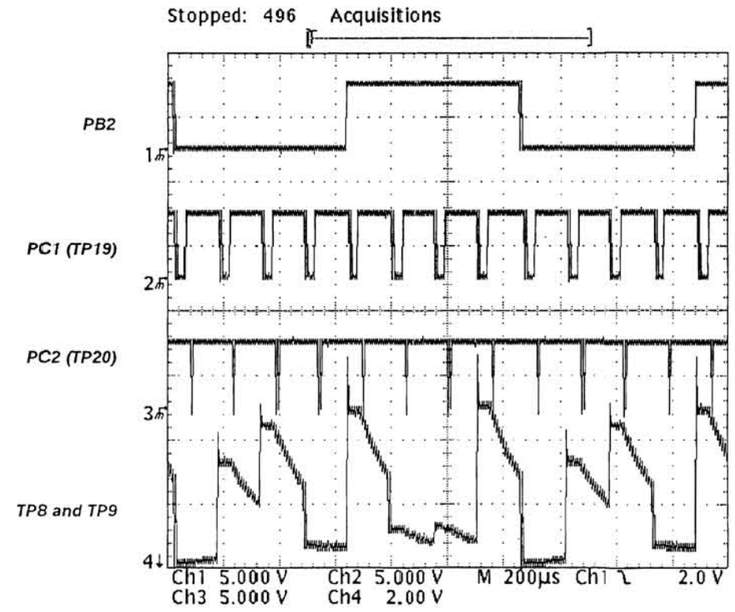
Vol. 2 Figure 9-124: Front Panel LED Test Loop Troubleshooting Procedure

Scans by ArtekMedia => 2011

Scans by Artekmedia => 2011

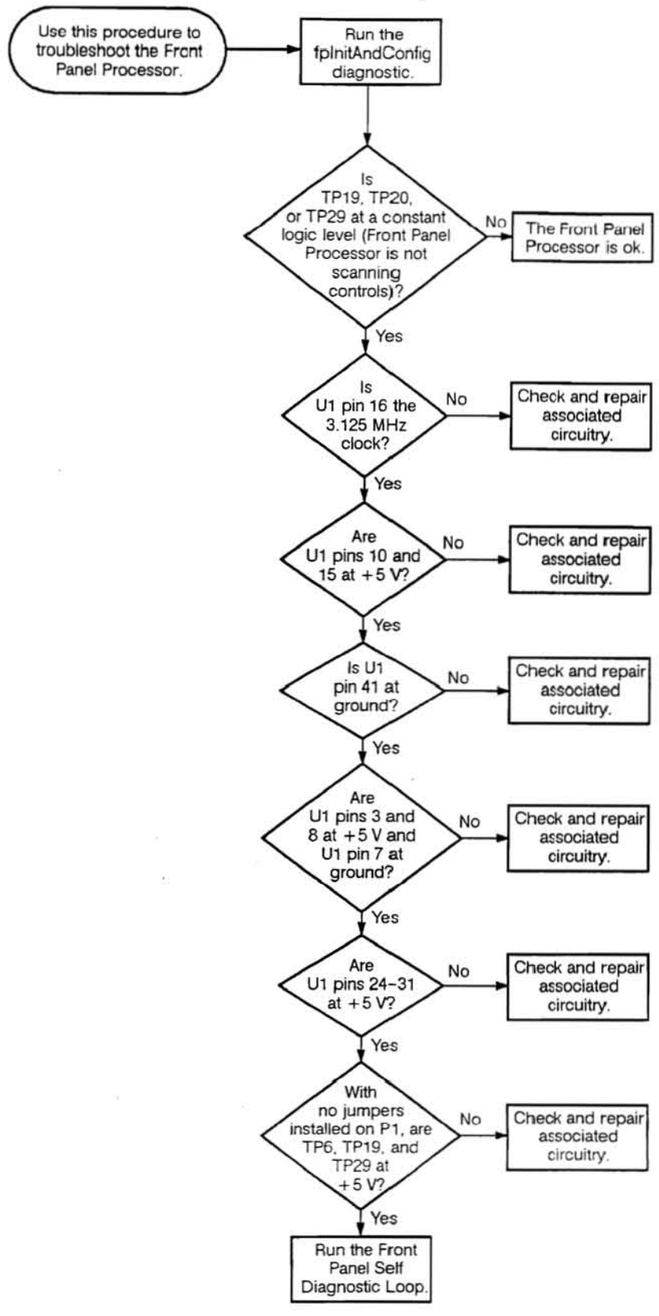






Vol. 2 Figure 9-125: Front Panel Mux Test Loop Waveforms

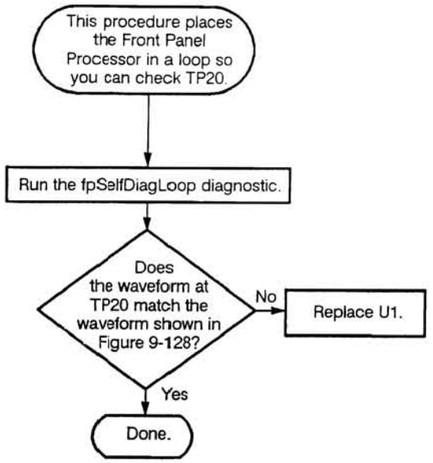
Vol. 2 Figure 9-126: Front Panel Mux Test Loop Troubleshooting Procedure

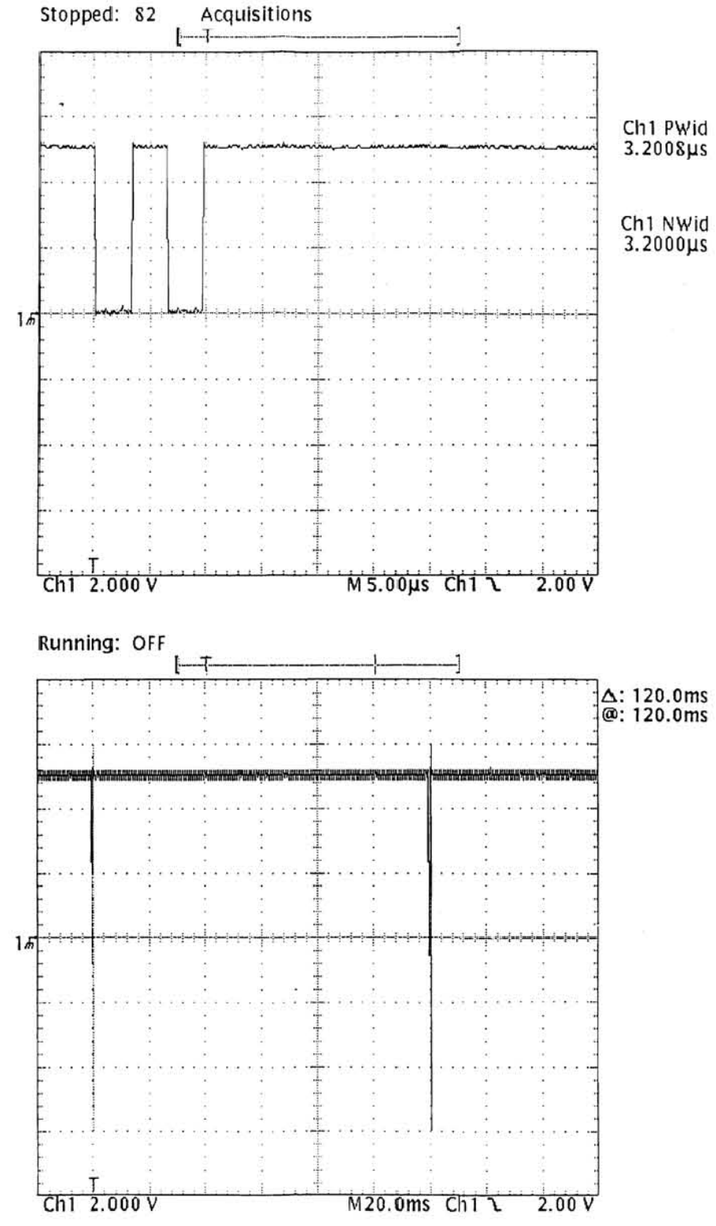


Vol. 2 Figure 9-127: Front Panel Processor Troubleshooting Procedure

Scans by ArtekMedia => 2011

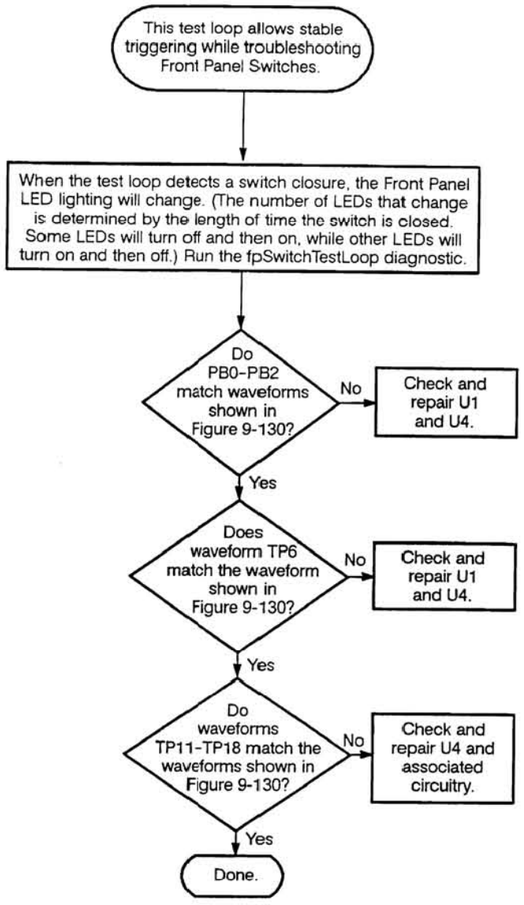
Scans by Artekmedia => 2011

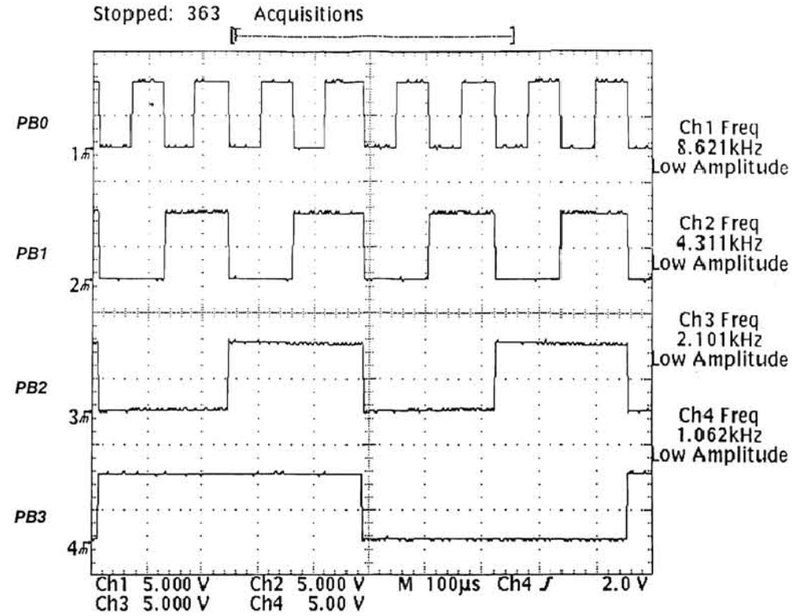




Vol. 2 Figure 9-128: PC2 (TP20) Timing Signal During the Front Panel Self Diagnostic Loop

Vol. 2 Figure 9-129: Front Panel Self Diagnostic Loop Troubleshooting Procedure

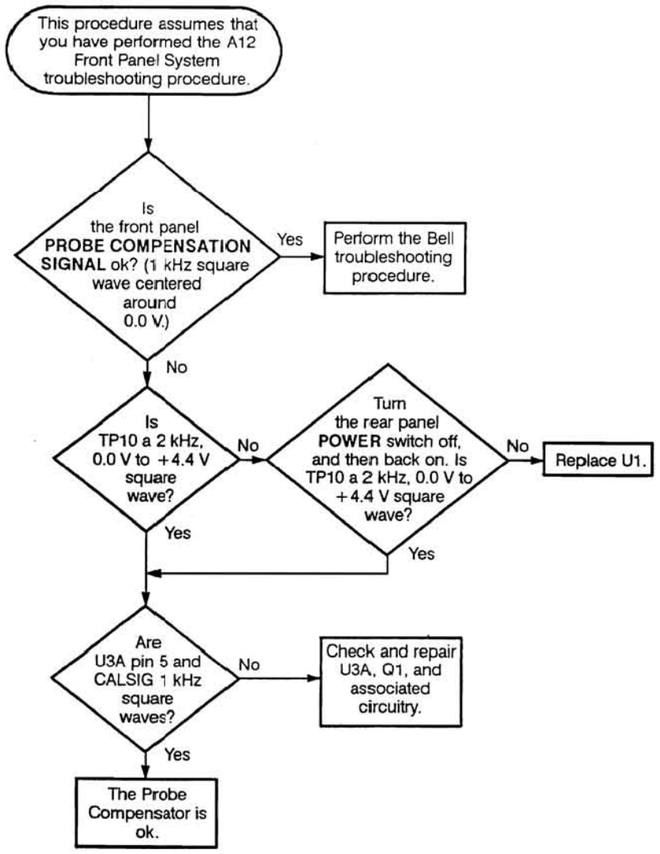




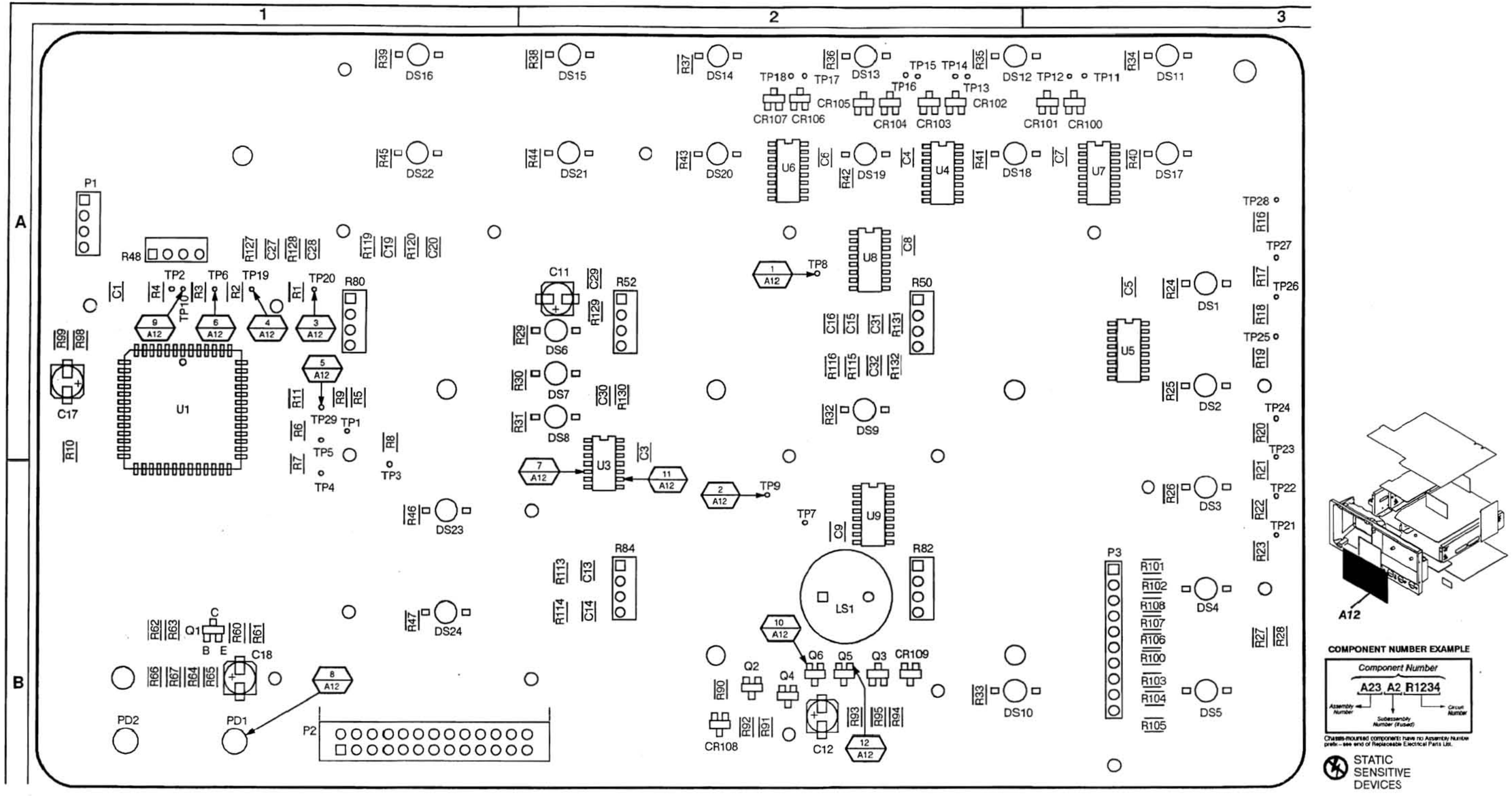
Vol. 2 Figure 9-130: Front Panel Switch Test Loop Waveforms

Vol. 2 Figure 9-131: Front Panel Switch Test Loop Troubleshooting Procedure

Scans by Artekmedia => 2011

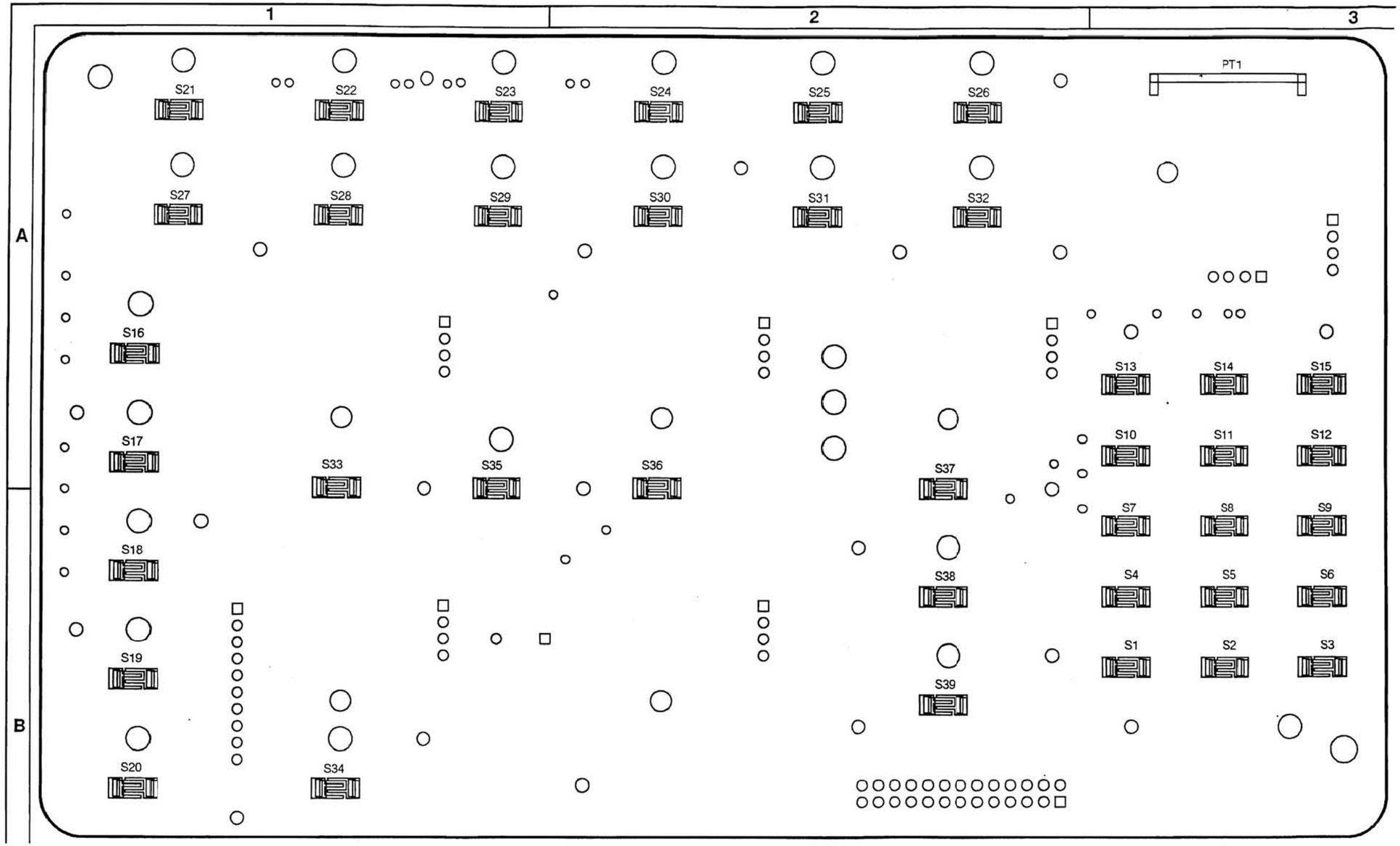


Vol. 2 Figure 9-132: Probe Compensator Troubleshooting Procedure



Vol. 2 Figure 9-133: A12 Front Panel Board (Front)

Scans by Artekmedia => 2011



Vol. 2 Figure 9-134: A12 Front Panel Board (Back)

A12 Front Panel Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C1	A12-3	2B	A12	1A
C3	A12-3	2B	A12	2A
C4	A12-3	1B	A12	2A
C5	A12-3	2B	A12	3A
C6	A12-3	2B	A12	2A
C7	A12-3	1C	A12	3A
C8	A12-3	2C	A12	2A
C9	A12-3	2C	A12	2B
C11	A12-3	1B	A12	2A
C12	A12-3	4D	A12	2B
C13	A12-1	2B	A12	2B
C14	A12-1	2B	A12	2B
C15	A12-1	2B	A12	2A
C16	A12-1	2B	A12	2A
C17	A12-3	1B	A12	1A
C18	A12-3	1C	A12	1B
C19	A12-1	2C	A12	1A
C20	A12-1	2C	A12	1A
C27	A12-1	2A	A12	1A
C28	A12-1	2A	A12	1A
C29	A12-1	2D	A12	2A
C30	A12-1	2D	A12	2A
C31	A12-1	2D	A12	2A
C32	A12-1	2D	A12	2A
CR100A	A12-2	2A	A12	3A
CR101A	A12-2	2A	A12	2A
CR102A	A12-2	2A	A12	2A
CR103A	A12-2	2B	A12	2A
CR104A	A12-2	2B	A12	2A
CR105A	A12-2	2B	A12	2A
CR106A	A12-2	2B	A12	2A
CR107A	A12-2	2B	A12	2A
CR108A	A12-3	4D	A12	2B
CR109A	A12-3	5D	A12	2B
DS1	A12-3	3A	A12	3A
DS2	A12-3	4A	A12	3A
DS3	A12-3	4A	A12	3B
DS4	A12-3	4A	A12	3B
DS5	A12-3	5A	A12	3B
DS6	A12-3	5A	A12	2A
DS7	A12-3	5A	A12	2A
DS8	A12-3	6A	A12	2A
DS9	A12-3	3B	A12	2A
DS10	A12-3	4B	A12	2B
DS11	A12-3	4B	A12	3A
DS12	A12-3	4B	A12	2A
DS13	A12-3	5B	A12	2A
DS14	A12-3	5B	A12	2A
DS15	A12-3	5B	A12	2A
DS16	A12-3	6B	A12	1A
DS17	A12-3	3C	A12	3A
DS18	A12-3	4C	A12	2A
DS19	A12-3	4C	A12	2A
DS20	A12-3	4C	A12	2A
DS21	A12-3	5C	A12	2A
DS22	A12-3	5C	A12	1A
DS23	A12-3	5C	A12	1B
DS24	A12-3	6C	A12	1B
LS1	A12-3	5D	A12	2B
P3	A12-2	2C	A12	3B
PD1	A12-1	6D	A12	1B
PD2	A12-1	6D	A12	1B
PT*	A12-4	5B	A12	3A
Q1	A12-1	5D	A12	1B
Q2	A12-3	4D	A12	2B
Q3	A12-3	5D	A12	2B
Q4	A12-3	4D	A12	2B
Q5	A12-3	4D	A12	2B
Q6	A12-3	5D	A12	2B
R1	A12-1	4B	A12	1A
R2	A12-1	4B	A12	1A
R3	A12-1	4A	A12	1A
R4	A12-1	4C	A12	1A
R5	A12-1	5C	A12	1A
R6	A12-1	5C	A12	1A
R7	A12-1	5C	A12	1A
R8	A12-1	3D	A12	1A
R9	A12-1	5C	A12	1A
R10	A12-1	3D	A12	1A
R11	A12-1	4B	A12	1A
R16	A12-2	5C	A12	3A
R17	A12-2	5C	A12	3A
R18	A12-2	4C	A12	3A
R19	A12-2	3C	A12	3A
R20	A12-2	5A	A12	3A
R21	A12-2	5A	A12	3B
R22	A12-2	4A	A12	3B
R23	A12-2	3A	A12	3B
R24	A12-3	3A	A12	3A
R25	A12-3	4A	A12	3A
R26	A12-3	4A	A12	3B
R27	A12-3	4A	A12	3B
R28	A12-3	5A	A12	3B
R29	A12-3	5A	A12	1A
R30	A12-3	5A	A12	1A
R31	A12-3	6A	A12	1A
R32	A12-3	3B	A12	2A
R33	A12-3	4B	A12	2B
R34	A12-3	4B	A12	3A
R35	A12-3	4B	A12	2A
R36	A12-3	5B	A12	2A
R37	A12-3	5B	A12	2A
R38	A12-3	5B	A12	2A
R39	A12-3	6B	A12	1A
R40	A12-3	3C	A12	3A
R41	A12-3	4C	A12	2A
R42	A12-3	4C	A12	2A
R43	A12-3	4C	A12	2A
R44	A12-3	5C	A12	2A
R45	A12-3	5C	A12	1A
R46	A12-3	5C	A12	1B
R47	A12-3	6C	A12	1B
R48	A12-1	1A	A12	1A
R50	A12-1	1C	A12	2A
R52	A12-1	1D	A12	2A
R60	A12-1	5D	A12	1B
R61	A12-1	5D	A12	1B
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R64	A12-1	5D	A12	1B
R65	A12-1	5D	A12	1B
R66	A12-1	5D	A12	1B
R67	A12-1	6D	A12	1B
R80	A12-1	1C	A12	1A
R82	A12-1	1B	A12	2B
R84	A12-1	1B	A12	2B
R90	A12-3	3D	A12	2B
R91	A12-3	4D	A12	2B
R92	A12-3	4D	A12	2B
R93	A12-3	4D	A12	2B
R94	A12-3	4D	A12	2B
R95	A12-3	4D	A12	2B
R98	A12-1	3C	A12	1A
R99	A12-1	3C	A12	1A
R100	A12-2	2D	A12	3B
R101	A12-2	2C	A12	3B
R102	A12-2	2C	A12	3B
R103	A12-2	2D	A12	3B
R104	A12-2	2D	A12	3B
R105	A12-2	2D	A12	3B
R106	A12-2	2D	A12	3B
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R108	A12-2	2C	A12	3B
R113	A12-1	2B	A12	2B
R114	A12-1	2B	A12	2B
R115	A12-1	2B	A12	2A
R116	A12-1	2B	A12	2A
R119	A12-1	2C	A12	1A
R120	A12-1	2C	A12	1A
R127	A12-1	2A	A12	1A
R128	A12-1	2A	A12	1A
R129	A12-1	2D	A12	2A
R130	A12-1	2D	A12	2A
R131	A12-1	2D	A12	2A
R132	A12-1	2D	A12	2A
S1	A12-2	3A	A12	3B
S2	A12-2	4A	A12	3B
S3	A12-2	5A	A12	3B
S4	A12-2	5A	A12	3B
S5	A12-2	3C	A12	3B
S6	A12-2	4C	A12	3B
S7	A12-2	5C	A12	3B
S8	A12-2	5C	A12	3B
S9	A12-2	3A	A12	3B
S10	A12-2	4A	A12	3A
S11	A12-2	5A	A12	3A
S12	A12-2	5A	A12	3A
S13	A12-2	3C	A12	3A
S14	A12-2	4C	A12	3A
S15	A12-2	5C	A12	3A
S16	A12-2	5C	A12	1A
S17	A12-2	3B	A12	1A
S18	A12-2	4B	A12	1B
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S20	A12-2	5B	A12	1B
S21	A12-2	3D	A12	1A
S22	A12-2	4D	A12	2A
S23	A12-2	5D	A12	2A
S24	A12-2	5D	A12	2A
S25	A12-2	3B	A12	2A
S26	A12-2	4B	A12	3A
S27	A12-2	5B	A12	1A
S28	A12-2	5B	A12	2A
S29	A12-2	3D	A12	2A
S30	A12-2	4D	A12	2A
S31	A12-2	5D	A12	2A
S32	A12-2	5D	A12	3A
S33	A12-2	3B	A12	2A
S34	A12-2	4B	A12	2B
S35	A12-2	5B	A12	2A
S36	A12-2	5B	A12	2A
S37	A12-2	3D	A12	3A
S38	A12-2	4D	A12	3B
S39	A12-2	5D	A12	3B
TP1	A12-1	5C	A12	1A
TP2	A12-1	4C	A12	1A
TP3	A12-1	3D	A12	1B
TP4	A12-1	5C	A12	1B
TP5	A12-1	5C	A12	1A
TP6	A12-1	4A	A12	1A
TP7	A12-1	4A	A12	2B
TP8	A12-1	3B	A12	2A
TP9	A12-1	3B	A12	2B
TP10	A12-1	4C	A12	1A
TP11	A12-2	2A	A12	3A
TP12	A12-2	2A	A12	3A
TP13	A12-2	2A	A12	2A
TP14	A12-2	2B	A12	2A
TP15	A12-2	2B	A12	2A
TP16	A12-2	2B	A12	2A
TP17	A12-2	2B	A12	2A
TP18	A12-2	2B	A12	2A
TP19	A12-1	4B	A12	1A
TP20	A12-1	4B	A12	1A
TP21	A12-2	4A	A12	3B
TP22	A12-2	4A	A12	3B
TP23	A12-2	5A	A12	3A
TP24	A12-2	6A	A12	3A
TP25	A12-2	4D	A12	3A
TP26	A12-2	4D	A12	3A
TP27	A12-2	5D	A12	3A
TP28	A12-2	6D	A12	3A
TP29	A12-1	4B	A12	1A
U1	A12-1	4A	A12	1A
U3A	A12-1	4D	A12	2B
U3B	A12-3	3D	A12	2B
U4	A12-2	2A	A12	2A
U5	A12-3	3A	A12	3A
U6	A12-3	3B	A12	2A
U7	A12-3	3C	A12	3A
U8	A12-1	3A	A12	2A

*Asterisks indicate components located on the back of the board.

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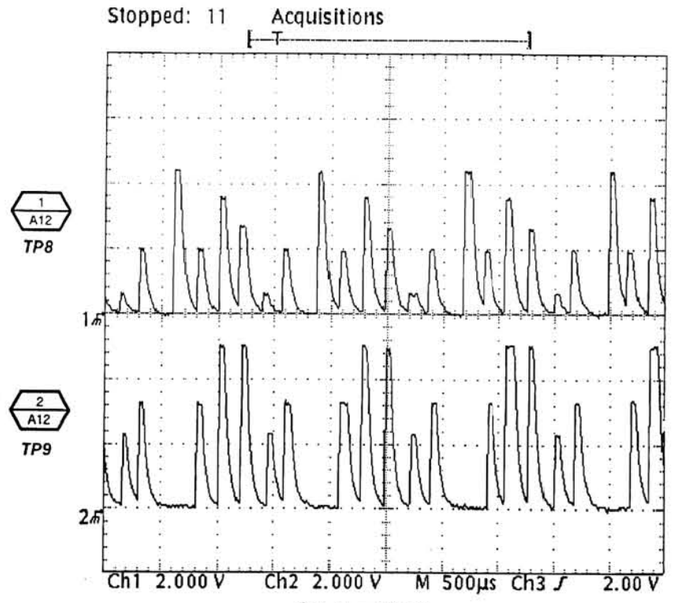
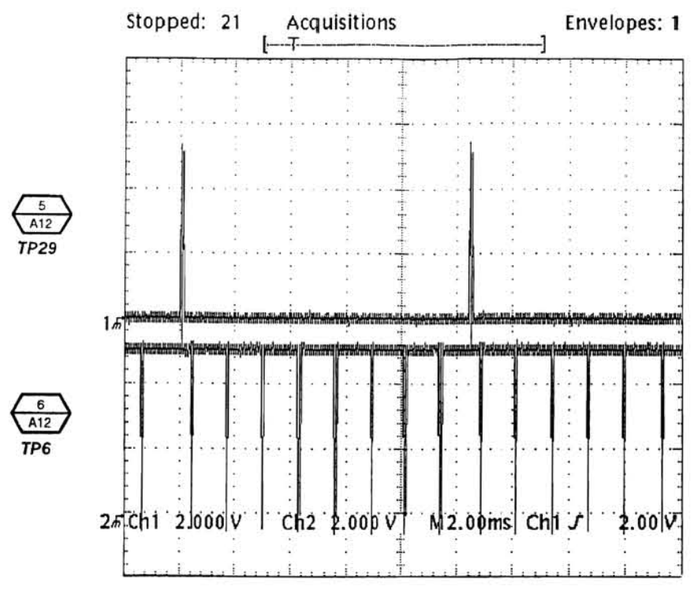
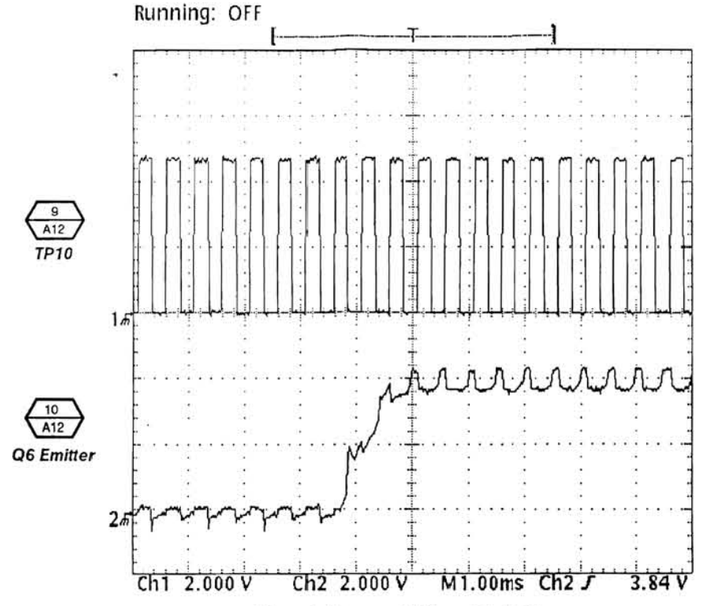
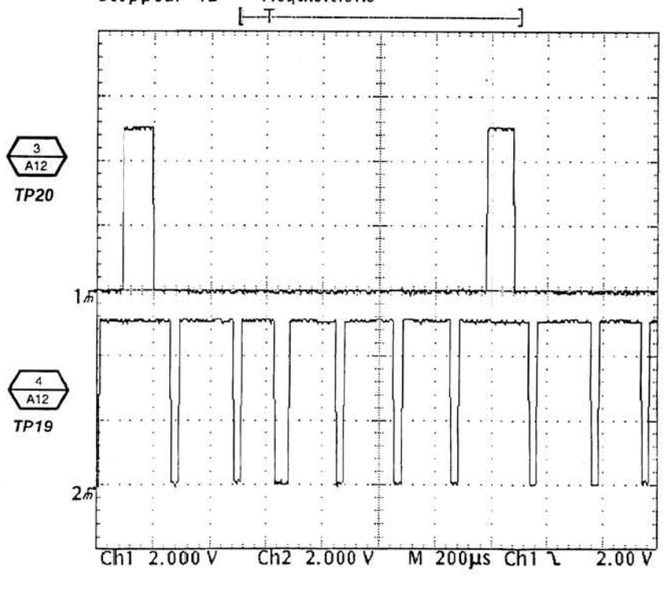


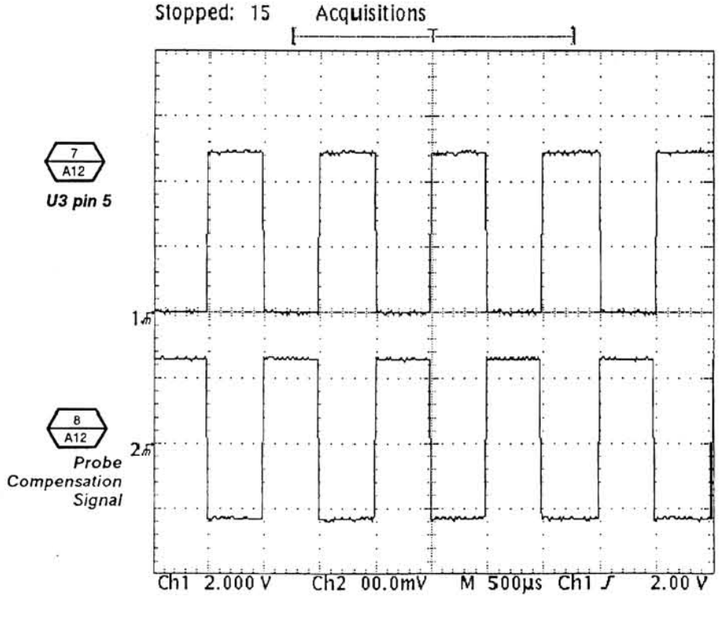
CH 3 = TP20

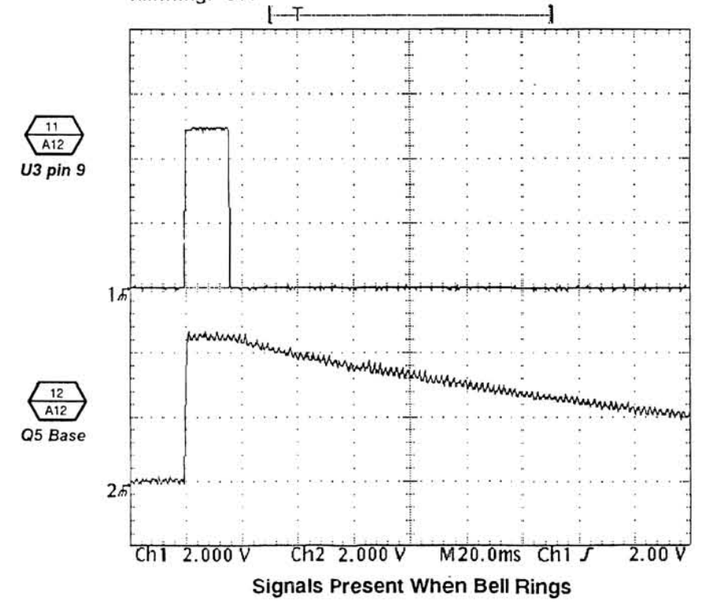




Signals Present When Bell Rings







Signals Present When Bell Rings

Vol. 2 Figure 9-135: A12 Front Panel Waveforms

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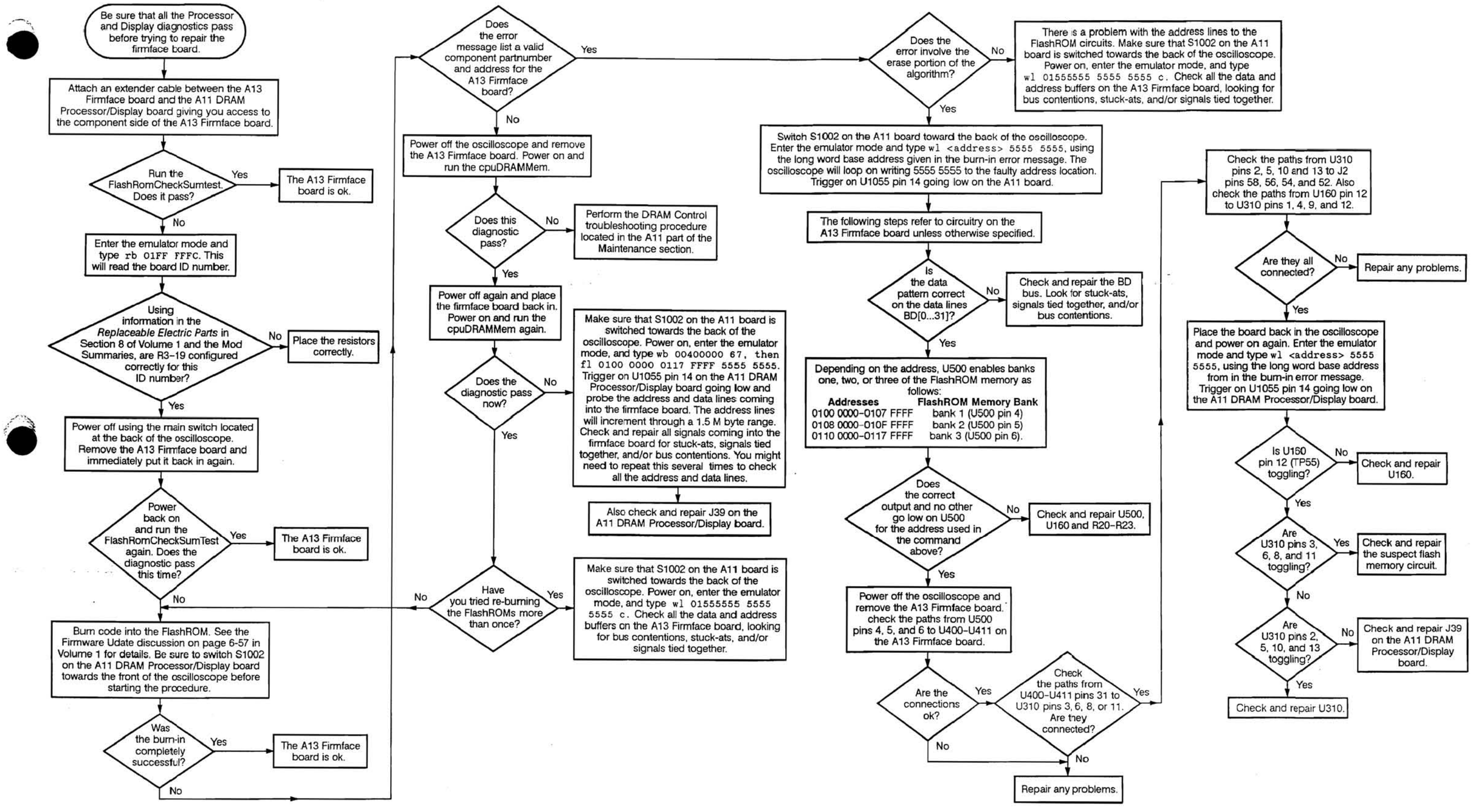
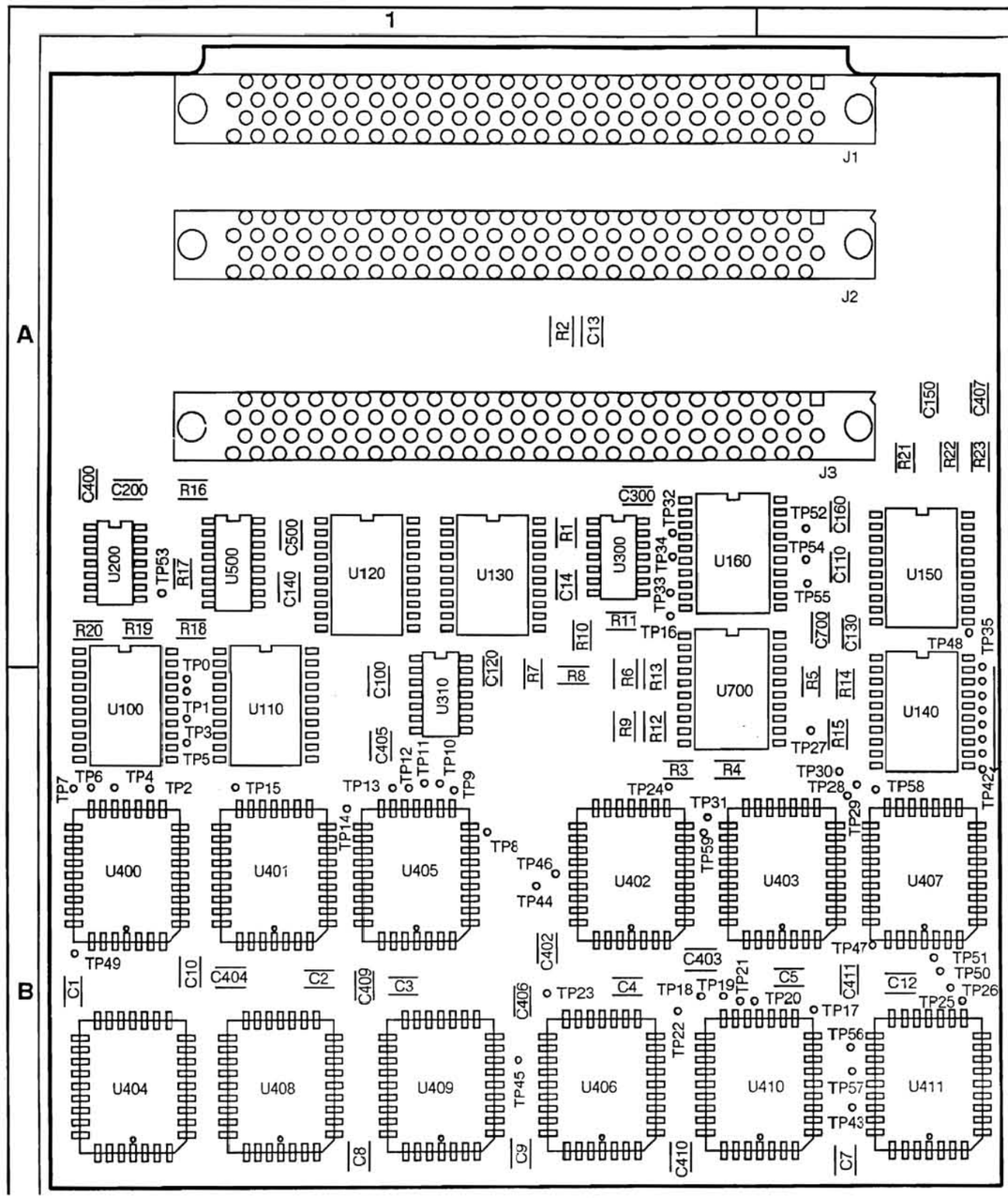
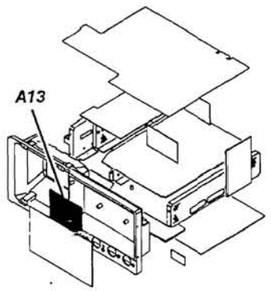
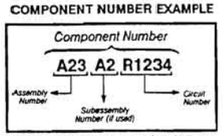


Vol. 2 Figure 9-136: Firmface Troubleshooting Procedure





COMPONENT NUMBER EXAMPLE



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

STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-137: A13 Firmface Boar

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A13 Firmface Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C1	A13-3	5C	A13	1B
C2	A13-3	5C	A13	1B
C3	A13-3	5C	A13	1B
C4	A13-3	5C	A13	1B
C5	A13-3	6C	A13	1B
C7	A13-3	5C	A13	2B
C8	A13-3	5C	A13	1B
C9	A13-3	5C	A13	1B
C10	A13-3	5C	A13	1B
C12	A13-3	6C	A13	2B
C13	A13-3	5B	A13	1A
C14	A13-1	1D	A13	1A
C100	A13-3	5B	A13	1B
C110	A13-3	5B	A13	2A
C120	A13-3	5B	A13	1B
C130	A13-3	5B	A13	2A
C140	A13-3	6B	A13	1A
C150	A13-3	5B	A13	2A
C160	A13-3	5B	A13	2A
C200	A13-3	5B	A13	1A
C300	A13-3	5B	A13	1A
C400	A13-3	5C	A13	1A
C402	A13-3	5C	A13	1B
C403	A13-3	5C	A13	1B
C404	A13-3	5C	A13	1B
C405	A13-3	6C	A13	1B
C406	A13-3	5D	A13	1B
C407	A13-3	5D	A13	2A
C409	A13-3	5D	A13	1B
C410	A13-3	5D	A13	1B
C411	A13-3	6D	A13	2B
C500	A13-3	6B	A13	1A
C700	A13-3	6B	A13	2A

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
J1A	A13-3	3A	A13	2A
J1B	A13-3	3A	A13	2A
J1C	A13-3	3B	A13	2A
J1D	A13-3	3C	A13	2A
J1E	A13-3	3D	A13	2A
J2A	A13-3	1A	A13	2A
J2B	A13-3	1B	A13	2A
J2C	A13-3	1B	A13	2A
J2D	A13-3	1C	A13	2A
J2E	A13-3	1D	A13	2A
J3A	A13-3	4A	A13	2A
J3B	A13-3	4A	A13	2A
J3C	A13-3	4B	A13	2A
J3D	A13-3	4C	A13	2A
J3E	A13-3	4D	A13	2A
R1	A13-1	1D	A13	1A
R2	A13-3	5B	A13	1A
R3	A13-1	5D	A13	1B
R4	A13-1	5D	A13	1B
R5	A13-1	5D	A13	2B
R6	A13-1	4B	A13	1B
R7	A13-1	4B	A13	1B
R8	A13-1	4B	A13	1B
R9	A13-1	4B	A13	1B
R10	A13-1	4C	A13	1A
R11	A13-1	4C	A13	1A
R12	A13-1	4C	A13	1B
R13	A13-1	4C	A13	1B
R14	A13-1	4C	A13	2B
R15	A13-1	4C	A13	2B
R16	A13-1	4C	A13	1A
R17	A13-1	4C	A13	1A
R18	A13-1	4D	A13	1A

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
R19	A13-1	4D	A13	1A
R20	A13-1	5A	A13	1A
R21	A13-1	5A	A13	2A
R22	A13-1	5A	A13	2A
R23	A13-1	5A	A13	2A
TP0	A13-1	3A	A13	1B
TP1	A13-1	3A	A13	1B
TP2	A13-1	3A	A13	1B
TP3	A13-1	3A	A13	1B
TP4	A13-1	3B	A13	1B
TP5	A13-1	3B	A13	1B
TP6	A13-1	3B	A13	1B
TP7	A13-1	3B	A13	1B
TP8	A13-1	3B	A13	1B
TP9	A13-1	3B	A13	1B
TP10	A13-1	3B	A13	1B
TP11	A13-1	3B	A13	1B
TP12	A13-1	3B	A13	1B
TP13	A13-1	3B	A13	1B
TP14	A13-1	3B	A13	1B
TP15	A13-1	3B	A13	1B
TP16	A13-1	3C	A13	1A
TP17	A13-1	3C	A13	2B
TP18	A13-1	3C	A13	1B
TP19	A13-1	3C	A13	1B
TP20	A13-1	3C	A13	1B
TP21	A13-1	3C	A13	1B
TP22	A13-1	3C	A13	1B
TP23	A13-1	3C	A13	1B
TP24	A13-1	3C	A13	1B
TP25	A13-1	3C	A13	2B
TP26	A13-1	3C	A13	2B
TP27	A13-1	3D	A13	2B

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
TP28	A13-1	3D	A13	2B
TP29	A13-1	3D	A13	2B
TP30	A13-1	3D	A13	2B
TP31	A13-1	3D	A13	1B
TP32	A13-1	1D	A13	1A
TP33	A13-1	2A	A13	1A
TP34	A13-1	5C	A13	1A
TP35	A13-1	4A	A13	2B
TP36	A13-1	4A	A13	2A
TP37	A13-1	4A	A13	2A
TP38	A13-1	4A	A13	2A
TP39	A13-1	4A	A13	2A
TP40	A13-1	4B	A13	2B
TP41	A13-1	4B	A13	2B
TP42	A13-1	4B	A13	2B
TP43	A13-1	4B	A13	2B
TP44	A13-1	4B	A13	1B
TP45	A13-1	4B	A13	1B
TP46	A13-1	4B	A13	1B
TP47	A13-1	4B	A13	2B
TP48	A13-1	4B	A13	2A
TP49	A13-1	4B	A13	1B
TP50	A13-1	4B	A13	2B
TP51	A13-1	4C	A13	2B
TP52	A13-1	4C	A13	2A
TP53	A13-1	4C	A13	1A
TP54	A13-1	4C	A13	1A
TP55	A13-1	4C	A13	1A
TP56	A13-1	4C	A13	2B
TP57	A13-1	5A	A13	2B
TP58	A13-1	5A	A13	2B
TP59	A13-1	5A	A13	1B
U100	A13-1	2A	A13	1B

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
U110	A13-1	2B	A13	1B
U120	A13-1	2C	A13	1A
U130	A13-1	2C	A13	1A
U140	A13-1	3A	A13	2B
U150	A13-1	3B	A13	2A
U160	A13-1	3C	A13	1A
U200A	A13-1	1D	A13	1A
U200B	A13-1	6C	A13	1A
U200C	A13-1	6C	A13	1A
U200D	A13-1	6C	A13	1A
U200E	A13-1	6C	A13	1A
U200F	A13-1	6C	A13	1A
U300A	A13-1	2D	A13	1A
U300B	A13-1	2D	A13	1A
U300C	A13-1	1A	A13	1A
U300D	A13-1	5C	A13	1A
U310A	A13-2	1A	A13	1B
U310B	A13-2	3A	A13	1B
U310C	A13-2	4A	A13	1B
U310D	A13-2	5A	A13	1B
U400	A13-2	2A	A13	1B
U401	A13-2	3A	A13	1B
U402	A13-2	5A	A13	1B
U403	A13-2	6A	A13	1B
U404	A13-2	2B	A13	1B
U405	A13-2	3B	A13	1B
U406	A13-2	5B	A13	1B
U407	A13-2	6B	A13	2B
U408	A13-2	2C	A13	1B
U409	A13-2	3C	A13	1B
U410	A13-2	5C	A13	1B
U411	A13-2	6C	A13	2B
U500	A13-1	5A	A13	1A
U700	A13-1	5C	A13	1B

*Asterisks indicate components located on the back of the board.

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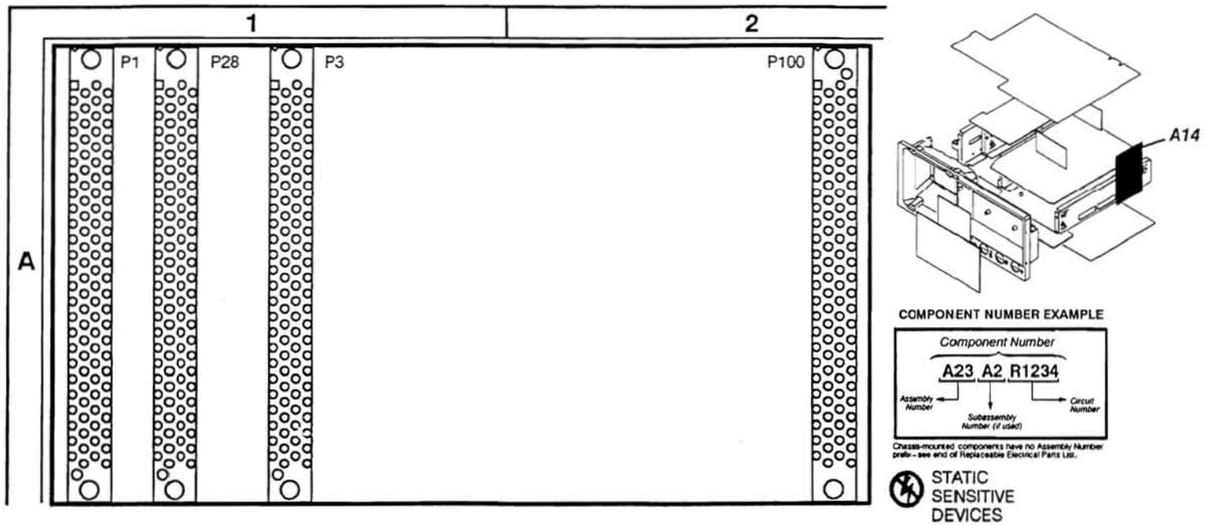

COMPONENT NUMBER EXAMPLE

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

STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-138: A14 D1 Bus Board

A14 D1 Bus Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
P3A	A14-1	4A	A14	1A	P3D	A14-1	4C	A14	1A	P28B	A14-1	6B	A14	1A	P28E	A14-1	6D	A14	1A	P100C	A14-1	1B	A14	2A
P3B	A14-1	4A	A14	1A	P3E	A14-1	4D	A14	1A	P28C	A14-1	6B	A14	1A	P100A	A14-1	1A	A14	2A	P100D	A14-1	1C	A14	2A
P3C	A14-1	4B	A14	1A	P28A	A14-1	6A	A14	1A	P28D	A14-1	6C	A14	1A	P100B	A14-1	1B	A14	2A	P100E	A14-1	1D	A14	2A

*Asterisks indicate components located on the back of the board.

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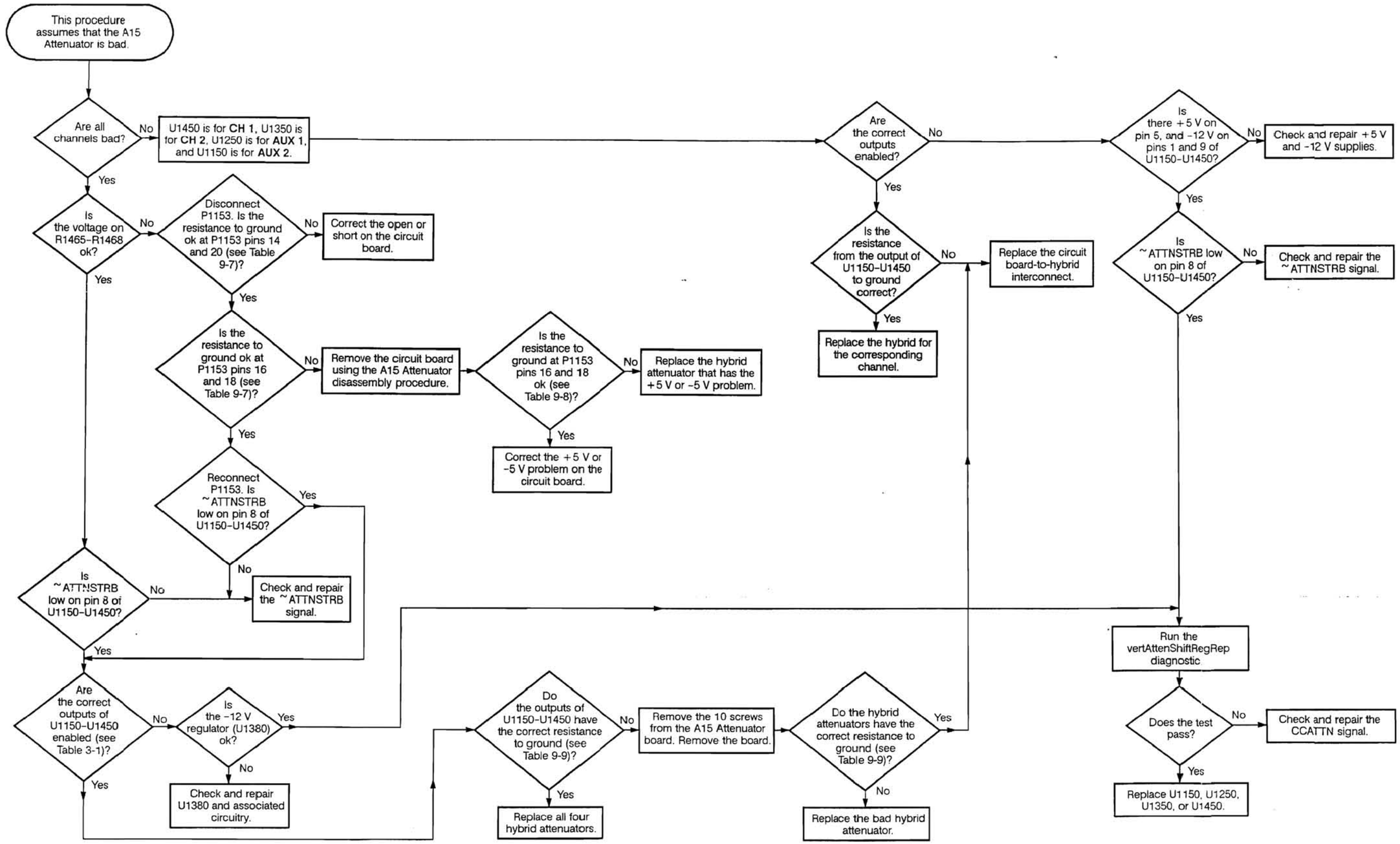

Vol. 2 Figure 9-139: Attenuator Troubleshooting Procedure

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Vol. 2 Table 9-7: Resistance with P1153 Disconnected

P1153 Pin	Resistance to Ground
14	Open
16	300 Ω
18	300 Ω
20	16 kΩ

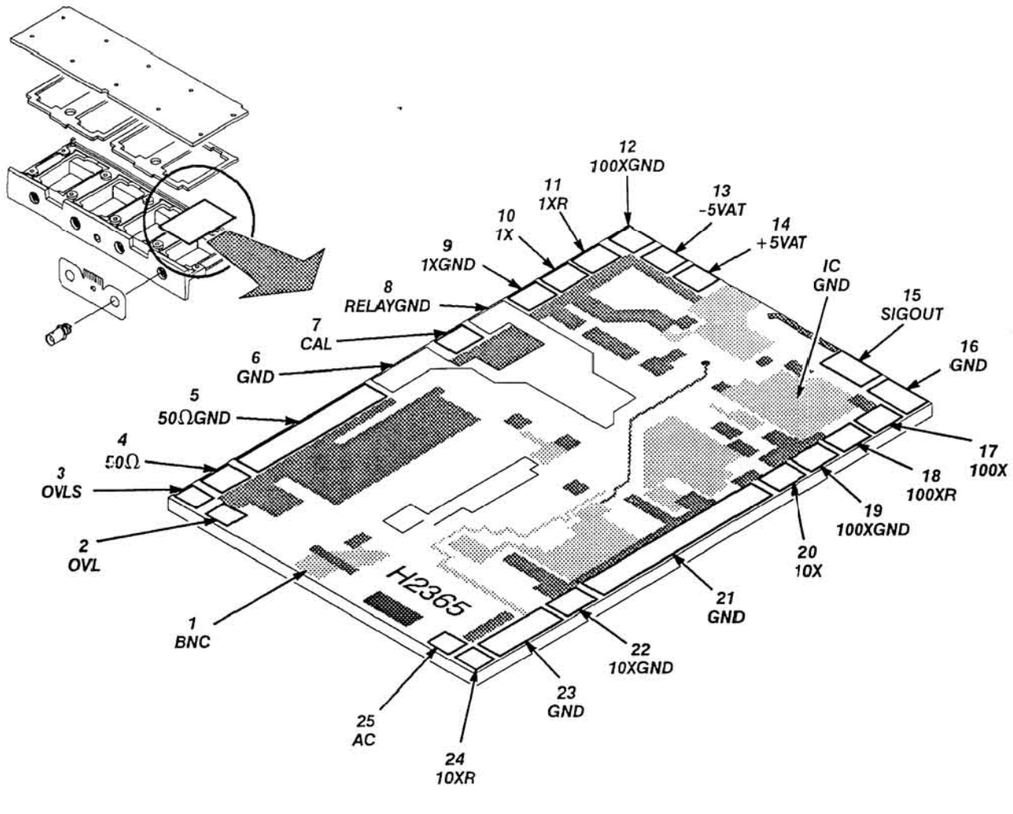
Vol. 2 Table 9-8: Resistance at P1153 with Circuit Board Removed

P1153 Pin	Resistance to Ground
16	Open
18	Open
Hybrid +5 V	1.2 kΩ
Hybrid –5 V	1.3 kΩ

Vol. 2 Table 9-9: Resistance with Circuit Board Removed

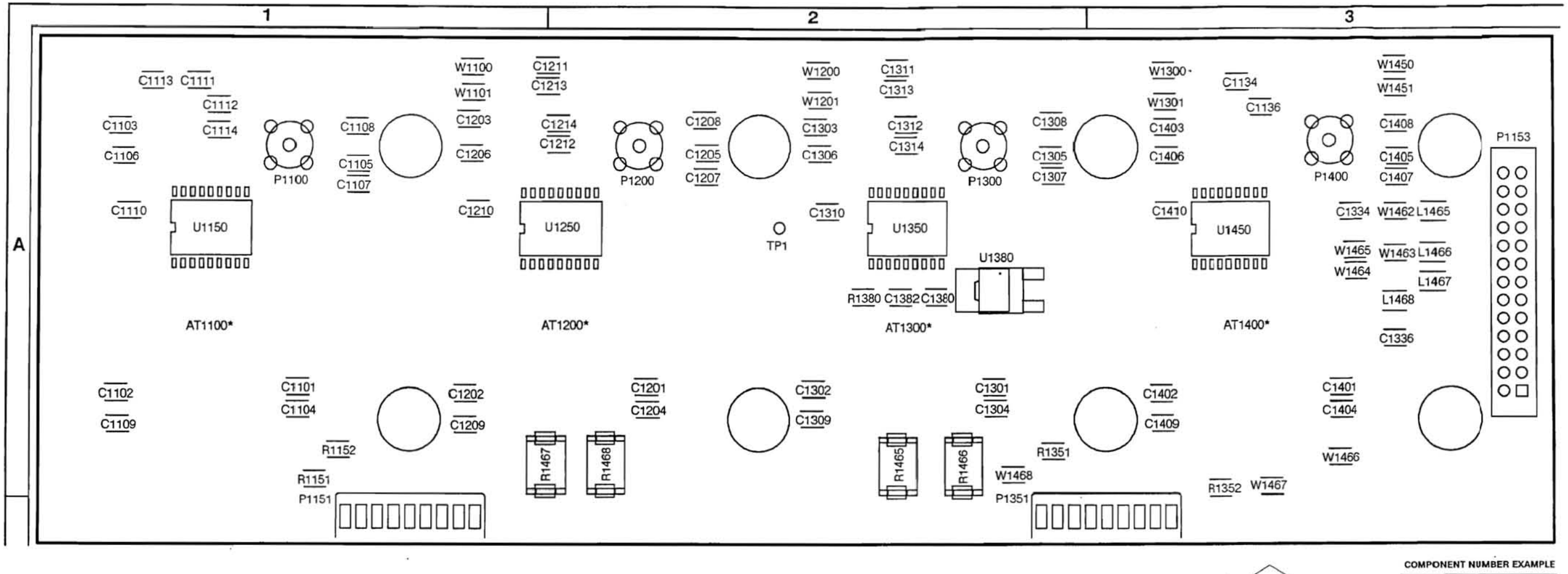
U1150–U1450 Pin	Hybrid Pin	Resistance to Ground	Hybrid Ground
11	17	17 kΩ[1]	IC GND
12	20	17 kΩ[1]	IC GND
13	10	17 kΩ[1]	IC GND
14	18	370 Ω	RELAYGND Pin 8
15	24	370 Ω	RELAYGND Pin 8
16	11	370 Ω	RELAYGND Pin 8
17	4	370 Ω	RELAYGND Pin 8
18	25	1.1 kΩ	RELAYGND Pin 8

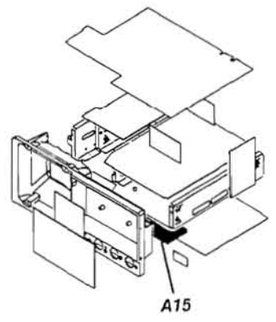
[1]DMM input current may affect reading.



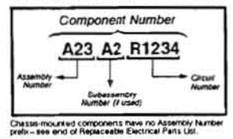
Vol. 2 Figure 9-140: Attenuator Hybrid

Vol. 2 Figure 9-139: Attenuator Troubleshooting Procedure (Cont.)





COMPONENT NUMBER EXAMPLE



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

STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-141: A15 Attenuator Board

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A15 Attenuator Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
A1100	A15-0	5A	A15	1A	C1202	A15-0	4B	A15	1A	C1310	A15-0	5C	A15	2A	L1457	A15-0	1D	A15	3A	U1150	A15-0	3A	A15	1A
A1200	A15-0	5B	A15	2A	C1203	A15-0	4B	A15	1A	C1311	A15-0	2D	A15	2A	L1468	A15-0	2A	A15	3A	U1250	A15-0	3B	A15	1A
A1300	A15-0	5C	A15	2A	C1204	A15-0	4B	A15	2A	C1312	A15-0	2D	A15	2A						U1350	A15-0	3C	A15	2A
A1400	A15-0	5C	A15	3A	C1205	A15-0	4B	A15	2A	C1313	A15-0	3D	A15	2A	P1100	A15-0	6A	A15	1A	U1380	A15-0	2D	A15	2A
					C1206	A15-0	5B	A15	1A	C1314	A15-0	3D	A15	2A	P1151	A15-0	1B	A15	1A	U1450	A15-0	3D	A15	3A
C1101	A15-0	4A	A15	1A	C1207	A15-0	5B	A15	2A	C1334	A15-0	2D	A15	3A	P1153	A15-0	1A	A15	3A					
C1102	A15-0	4A	A15	1A	C1208	A15-0	5B	A15	2A	C1336	A15-0	2A	A15	3A	P1200	A15-0	6B	A15	2A	W1100	A15-0	4D	A15	1A
C1103	A15-0	4A	A15	1A	C1209	A15-0	6B	A15	1A	C1380	A15-0	2D	A15	2A	P1300	A15-0	6C	A15	2A	W1101	A15-0	5D	A15	1A
C1104	A15-0	4A	A15	1A	C1210	A15-0	5B	A15	1A	C1382	A15-0	3D	A15	2A	P1351	A15-0	1C	A15	2A	W1200	A15-0	5D	A15	2A
C1105	A15-0	4A	A15	1A	C1211	A15-0	2D	A15	1A	C1401	A15-0	4D	A15	3A	P1400	A15-0	6C	A15	3A	W1201	A15-0	5D	A15	2A
C1106	A15-0	5A	A15	1A	C1212	A15-0	2D	A15	1A	C1402	A15-0	4D	A15	2A						W1300	A15-0	5D	A15	2A
C1107	A15-0	5A	A15	1A	C1213	A15-0	2D	A15	1A	C1403	A15-0	4D	A15	2A	R1151	A15-0	2B	A15	1A	W1301	A15-0	5D	A15	2A
C1108	A15-0	5A	A15	1A	C1214	A15-0	2D	A15	1A	C1404	A15-0	4D	A15	3A	R1152	A15-0	2B	A15	1A	W1450	A15-0	6D	A15	3A
C1109	A15-0	6A	A15	1A	C1301	A15-0	4C	A15	2A	C1405	A15-0	4D	A15	3A	R1351	A15-0	2C	A15	2A	W1451	A15-0	6D	A15	3A
C1110	A15-0	5A	A15	1A	C1302	A15-0	4C	A15	2A	C1406	A15-0	5D	A15	2A	R1352	A15-0	2C	A15	3A	W1462	A15-0	2D	A15	3A
C1111	A15-0	1D	A15	1A	C1303	A15-0	4C	A15	2A	C1407	A15-0	5D	A15	3A	R1380	A15-0	3D	A15	2A	W1463	A15-0	2D	A15	3A
C1112	A15-0	1D	A15	1A	C1304	A15-0	4C	A15	2A	C1408	A15-0	5D	A15	3A	R1465	A15-0	2D	A15	2A	W1464	A15-0	5D	A15	3A
C1113	A15-0	2D	A15	1A	C1305	A15-0	4C	A15	2A	C1409	A15-0	6D	A15	2A	R1466	A15-0	2D	A15	2A	W1465	A15-0	2A	A15	3A
C1114	A15-0	2D	A15	1A	C1306	A15-0	5C	A15	2A	C1410	A15-0	5D	A15	2A	R1467	A15-0	2D	A15	1A	W1466	A15-0	6D	A15	3A
C1134	A15-0	2D	A15	3A	C1307	A15-0	5C	A15	2A						R1468	A15-0	2A	A15	1A	W1467	A15-0	2B	A15	3A
C1136	A15-0	2D	A15	3A	C1308	A15-0	5C	A15	2A	L1465	A15-0	1D	A15	3A						W1468	A15-0	2C	A15	2A
C1201	A15-0	4B	A15	2A	C1309	A15-0	6C	A15	2A	L1466	A15-0	1D	A15	3A	TP1	A15-0	2A	A15	2A					

*Asterisks indicate components located on the back of the board.

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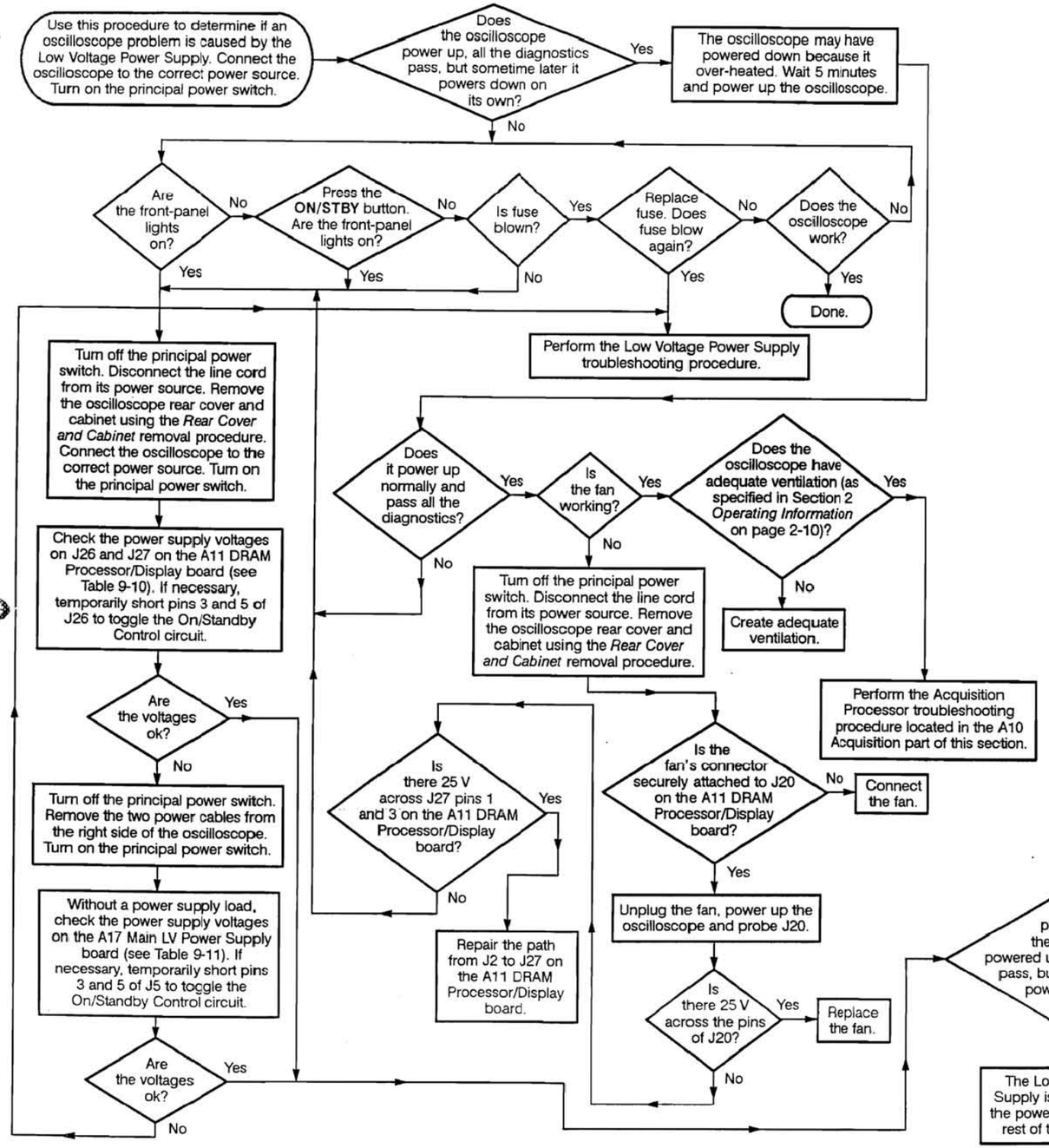

Vol. 2 Table 9-10: Normal Supply Voltages (Measured on J26 and J27 on the A11 DRAM Processor/Display board)

Supply	Lower Limit	Upper Limit
Ground (J26 or J27 pin 15)		
+5.1 VA (J27 pin 5)	+5.0 V	+5.2 V
+5.1 VB (J27 pin 17)	+5.0 V	+5.2 V
+25 V (J27 pin 1)	+23.5 V	+27.5 V
+5 V (J26 pin 39)	+4.9 V	+5.1 V
-5.1 V (J26 pin 17)	-4.9 V	-5.2 V
+15 V (J26 pin 11)	+14.7 V	+15.3 V
-15 V (J26 pin 7)	-14.7 V	-15.3 V

Vol. 2 Table 9-11: No-Load Supply Voltages (Measured on J5 and J6 on the A17 Main LV Power Supply board)

Supply	Lower Limit	Upper Limit
Ground (J5 or J6 pin 15)		
+5.1 VA (J6 pin 5)	+4.95 V	+5.25 V
+5.1 VB (J6 pin 17)	+4.95 V	+5.25 V
+25 V (J6 pin 1)	+23.5 V	+27.5 V
+5 V (J5 pin 39)	+0.59 V	+0.81 V
-5.1 V (J5 pin 17)	-0.39 V	-0.61 V
+15 V (J5 pin 11)	+1.05 V	+1.75 V
-15 V (J5 pin 7)	-1.05 V	-1.75 V

Vol. 2 Figure 9-142: A16 Low Voltage Power Supply Module Isolation Troubleshooting Procedure

This procedure assumes that you have performed the Standby Supply troubleshooting procedure.

WARNING

Line voltage and voltages up to 800 VDC are accessible during this procedure. Refer to the Safety Summary at the front of this manual for safety information. Turn the power switch off and unplug the power cord before starting this troubleshooting procedure.

Note: the 60 V supply and the jumper to disable the Input Under Voltage Lockout are both still installed.

Are Q5 and Q6 (A17) receiving gate drive (about 40 µs on and 30 µs off)? (See Figure 9-144.)

Yes → Turn off and disconnect the 60 V supply. → Perform the Main Converter Control troubleshooting procedure.

No

Is the FET DRIVE signal at W2 pin 11? (See Figure 9-145.)

No → Is U2 (A19) pin 6 low?

Yes → Check and repair the FET DRIVE circuitry.

No → Check and repair U2, Q4–Q6, and associated circuitry.

Yes → There are six circuits that can hold U2 pin 6 low. Is Error Amplifier U1A pin 3 at +2.5 V? Is Error Amplifier U1A pin 1 high? Is Error Amplifier U1A pin 2 low?

Yes → Is Current Limit comparator U3B pin 5 at 2.5 V? Is U3B pin 6 low? Is U3B pin 7 being allowed to go high by U3B?

Yes → Is Input Under Voltage Lockout comparator U1B pin 5 at 2.5 V? Is Input Under Voltage Lockout comparator U1B pin 6 the +15 V Bias? Is U1B pin 7 low? Does U1B pin 7 go high if the jumper at R1 is temporarily removed?

Yes → Is U3 pin 2 low (A19 Power Factor Control board)? Is U3 pin 3 at 2.5 V? Is U3 pin 1 high?

Yes → Is the collector-to-emitter voltage of Q2 at 2.5 V (A19 Power Factor Control board)? Is the base-to-emitter voltage of Q1 at 0.0 V?

Yes → Check and repair the Reset Detect circuit.

No → Repair the faulty circuit.

Vol. 2 Figure 9-143: Boost Control Troubleshooting Procedure

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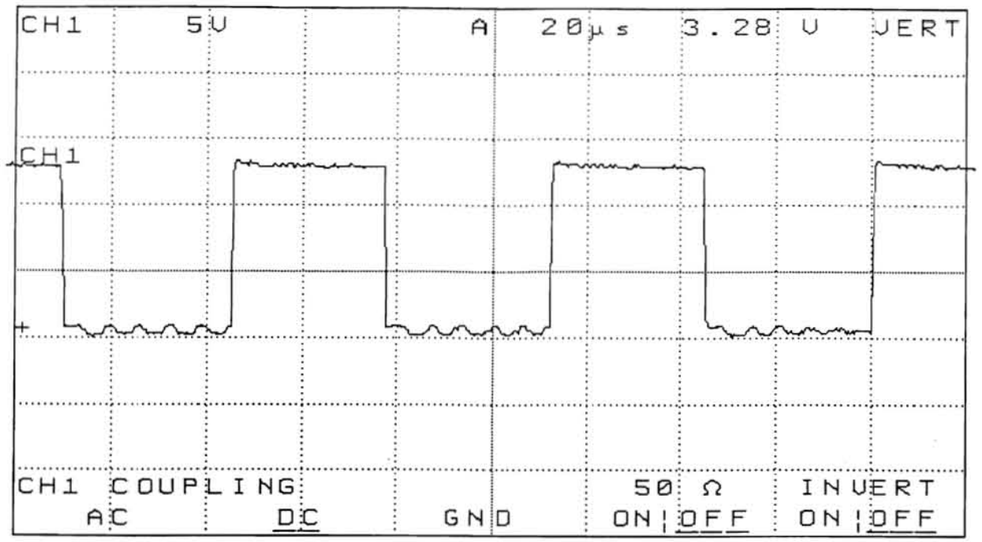
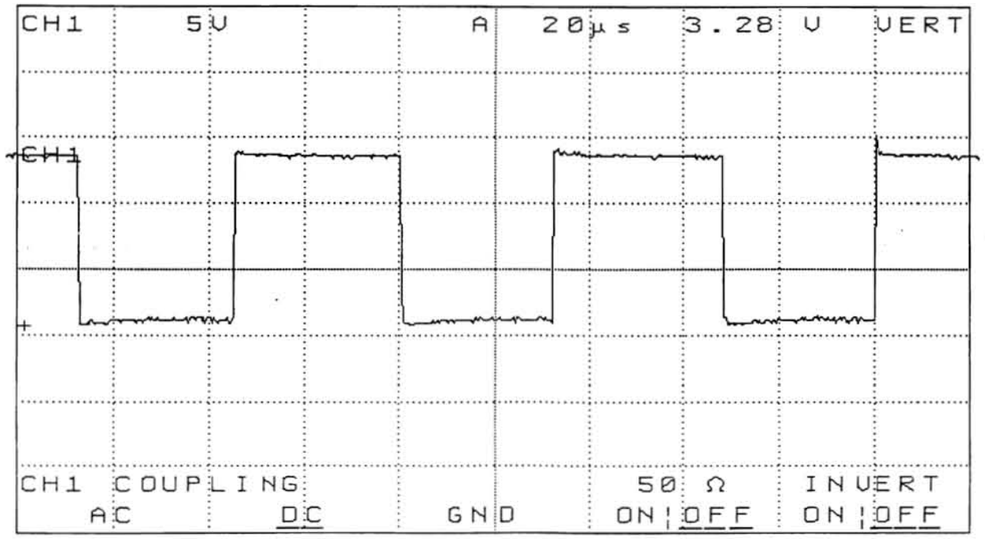
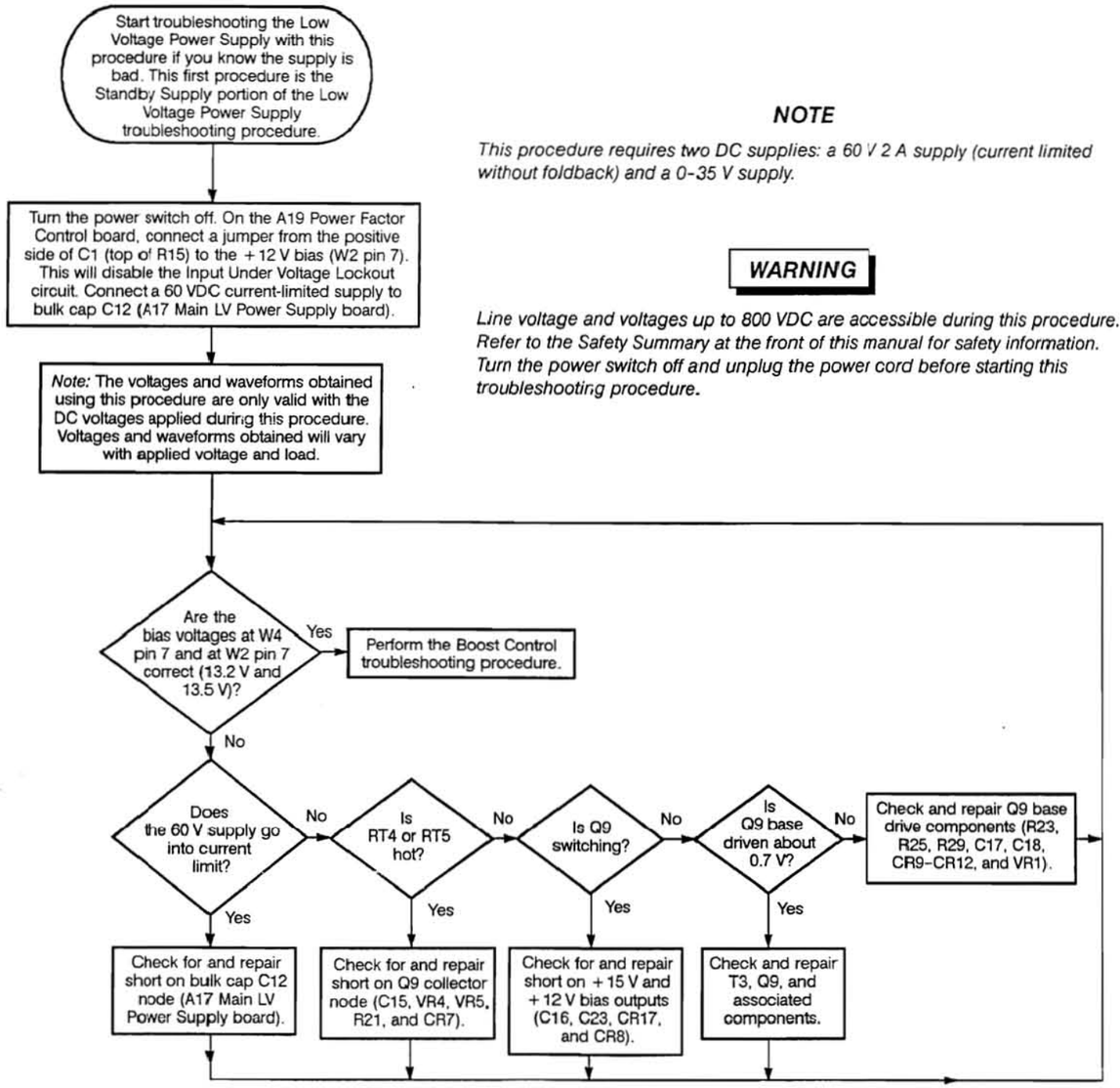


Vol. 2 Figure 9-144: Q5 and Q6 Gate Drive Waveforms (With 60 VDC Input, and Bulk – As the Ground Reference)



Vol. 2 Figure 9-145: FET DRIVE Waveform (With 60 VDC Input, and Bulk – As the Ground Reference)

Vol. 2 Figure 9-143: Boost Control Troubleshooting Procedure (Cont.)



NOTE

This procedure requires two DC supplies: a 60 V 2 A supply (current limited without foldback) and a 0-35 V supply.

WARNING

Line voltage and voltages up to 800 VDC are accessible during this procedure. Refer to the Safety Summary at the front of this manual for safety information. Turn the power switch off and unplug the power cord before starting this troubleshooting procedure.

Vol. 2 Figure 9-146: Low Voltage Power Supply Troubleshooting Procedure

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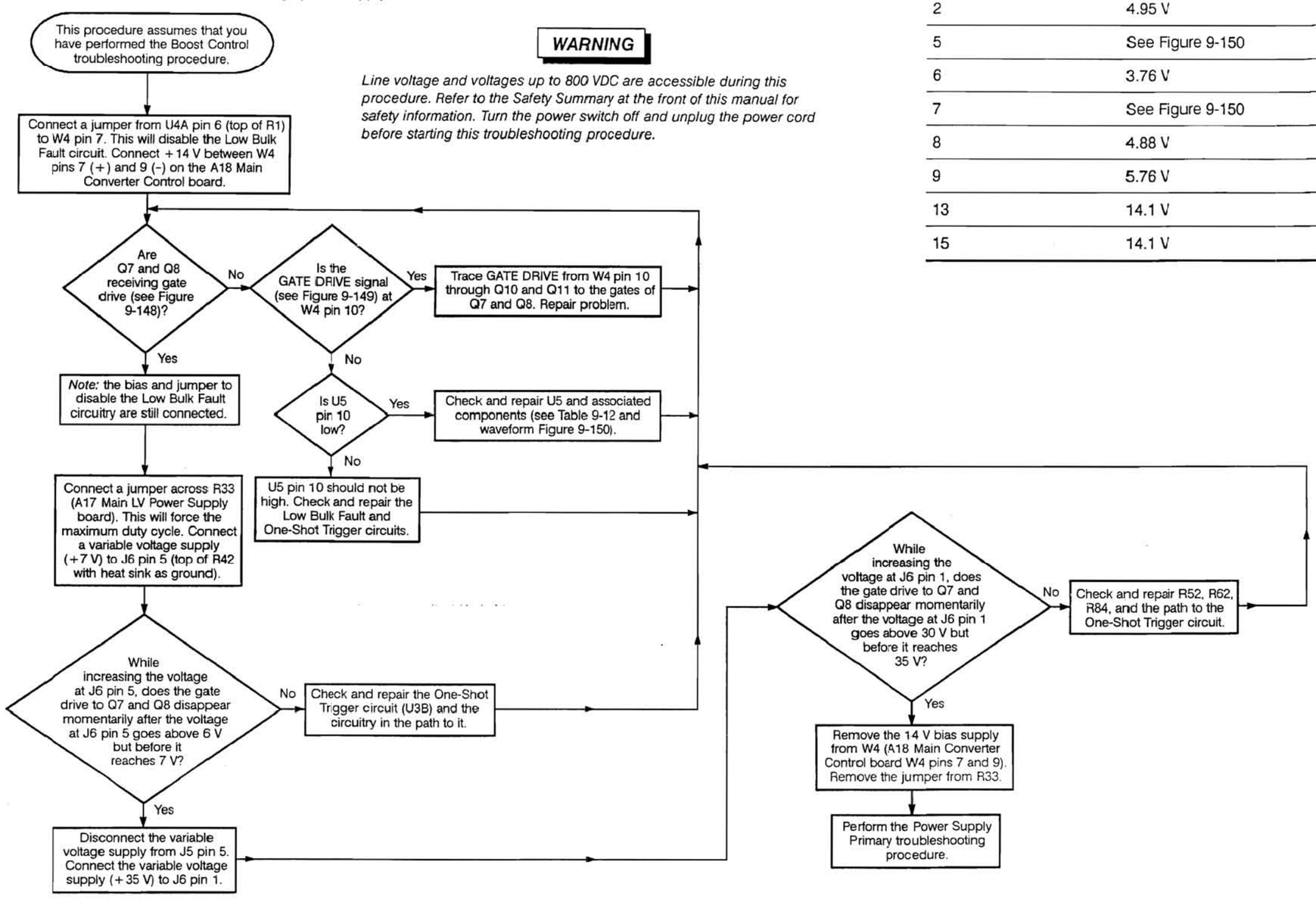
CAUTION

Do not connect more than +15 V between W4 pins 7 and 9. Double-check connections before turning the power on. Turn off all of the power before changing or making connections to the low voltage power supply.

WARNING

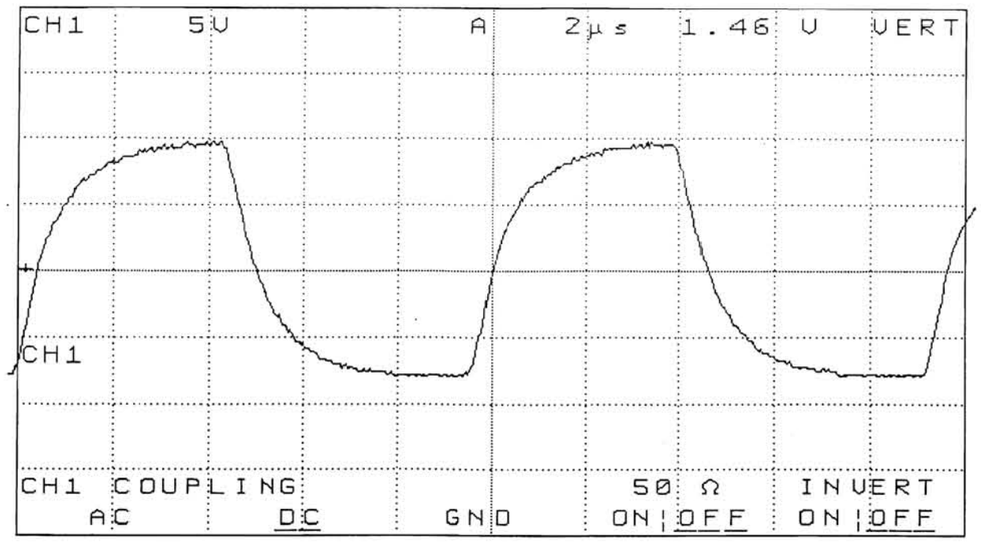
Line voltage and voltages up to 800 VDC are accessible during this procedure. Refer to the Safety Summary at the front of this manual for safety information. Turn the power switch off and unplug the power cord before starting this troubleshooting procedure.



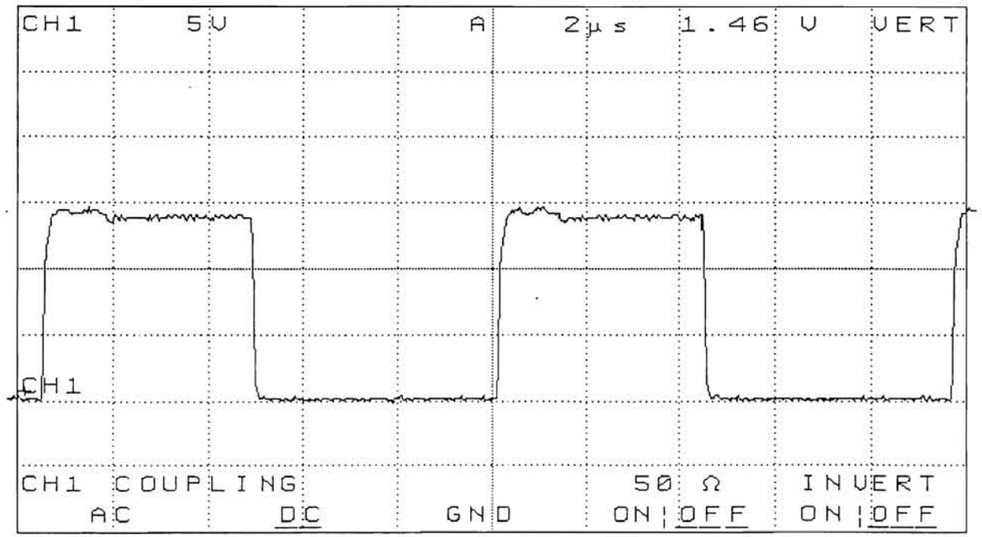
Vol. 2 Figure 9-147: Main Converter Control Troubleshooting Procedure

Vol. 2 Table 9-12: Voltages on U5

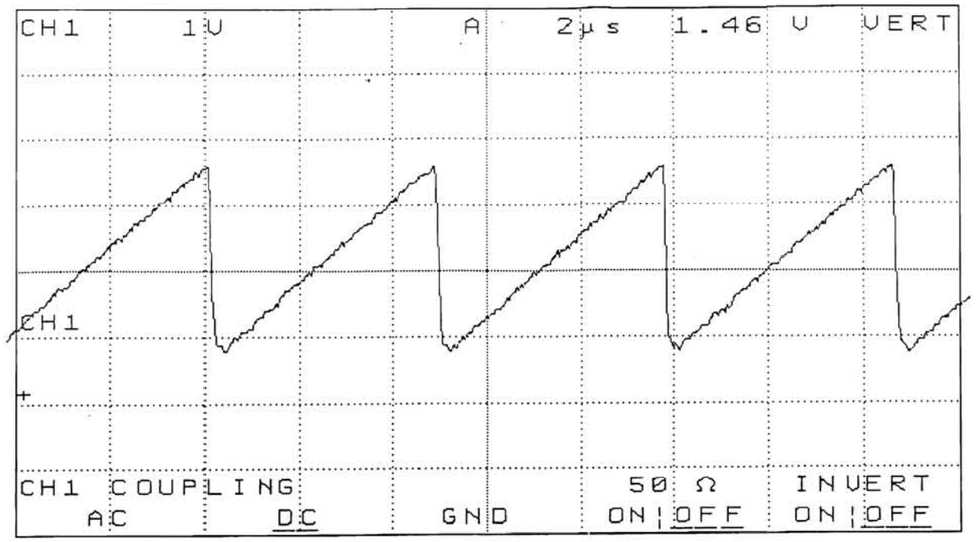
U5 Pin	Voltage with 60 V DC Input
1	1.0 V
2	4.95 V
5	See Figure 9-150
6	3.76 V
7	See Figure 9-150
8	4.88 V
9	5.76 V
13	14.1 V
15	14.1 V



Vol. 2 Figure 9-148: Q7 and Q8 GATE DRIVE
(With 60 VDC Input, and Bulk – As the Ground Reference)



Vol. 2 Figure 9-149: GATE DRIVE
(With 60 VDC Input, and W4 pin 9 – As the Ground Reference)



Vol. 2 Figure 9-150: U5 Pin 7
(With 60 VDC Input, and W4 pin 9 – As the Ground Reference)

Vol. 2 Figure 9-147: Main Converter Control Troubleshooting Procedure (Cont.)

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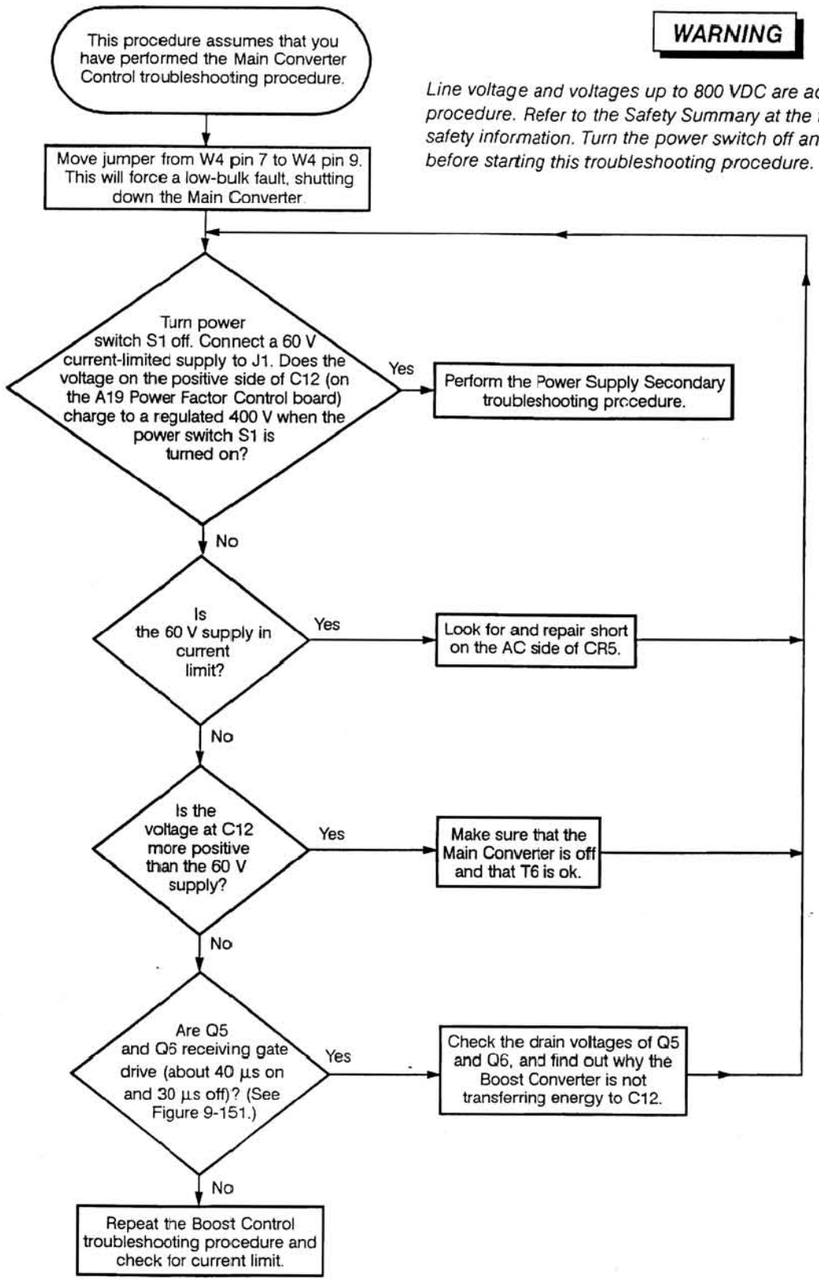
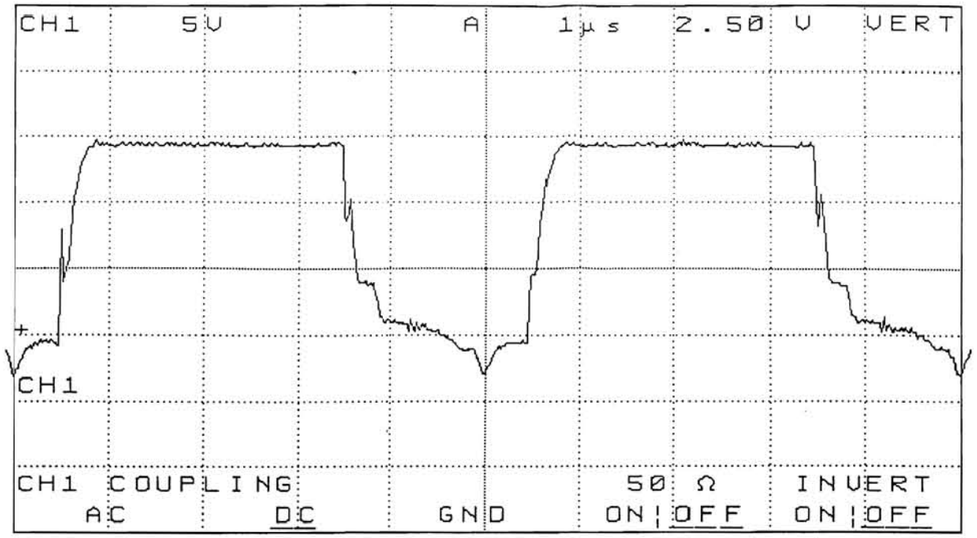


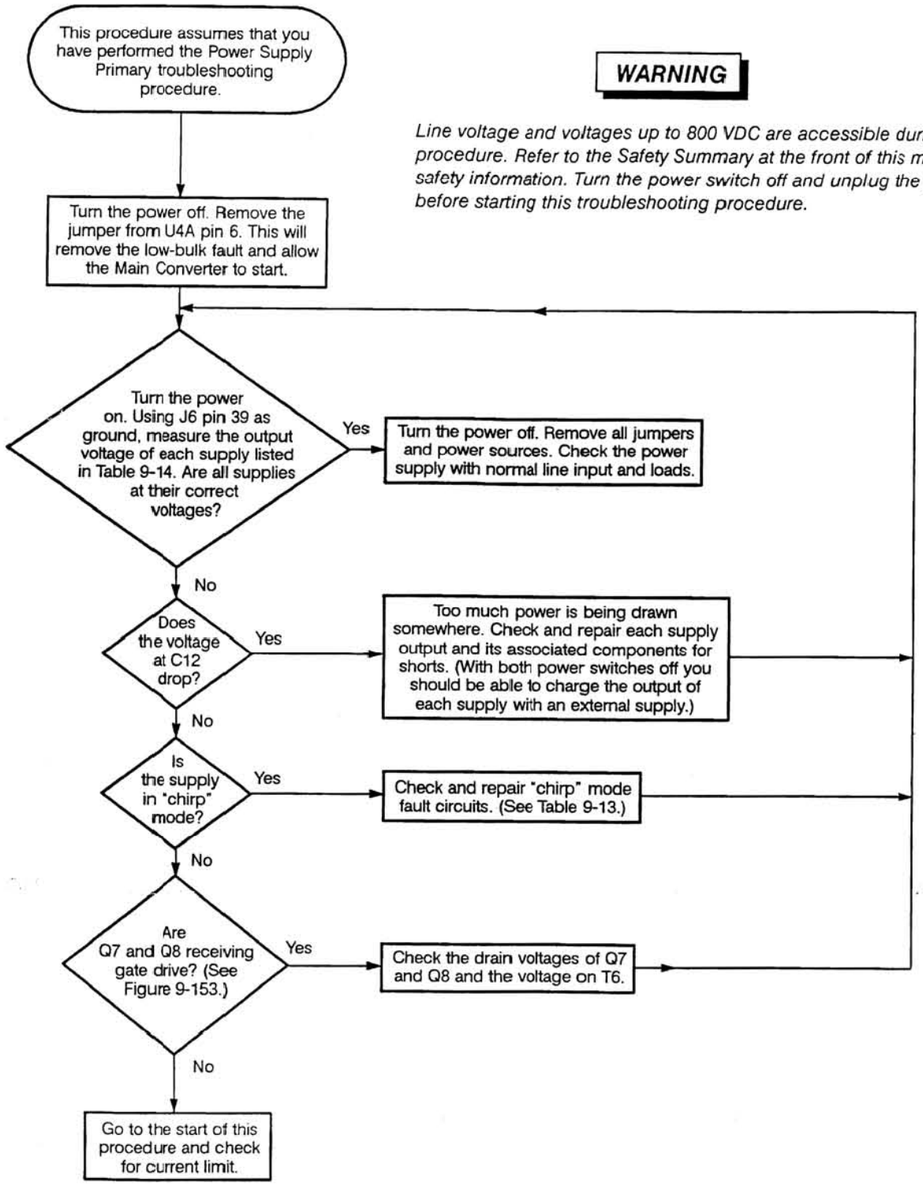
WARNING

Line voltage and voltages up to 800 VDC are accessible during this procedure. Refer to the Safety Summary at the front of this manual for safety information. Turn the power switch off and unplug the power cord before starting this troubleshooting procedure.



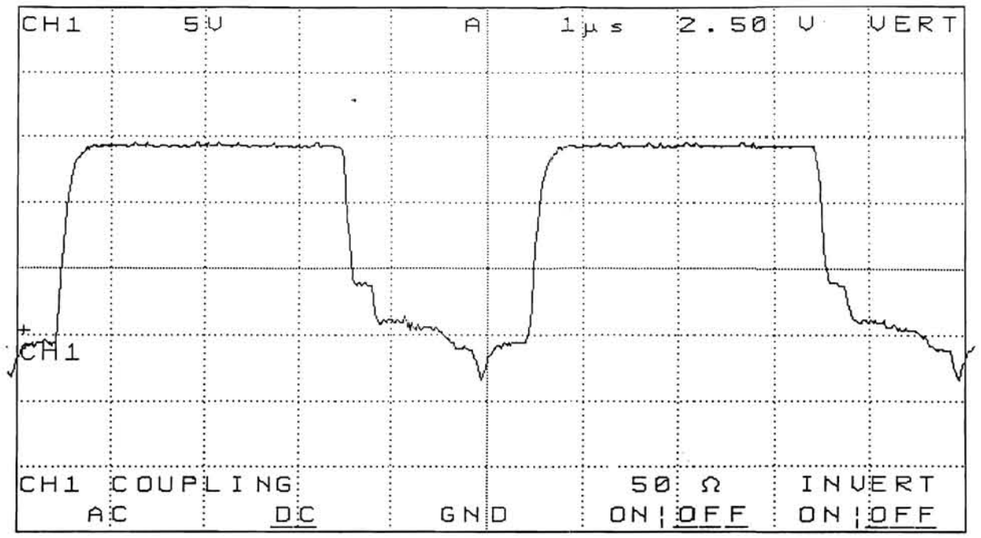
Vol. 2 Figure 9-151: Q5 and Q6 Gate Drive (With 60 VDC Input, and Bulk — As the Ground Reference)

Vol. 2 Figure 9-152: Power Supply Primary Troubleshooting Procedure



WARNING

Line voltage and voltages up to 800 VDC are accessible during this procedure. Refer to the Safety Summary at the front of this manual for safety information. Turn the power switch off and unplug the power cord before starting this troubleshooting procedure.



Vol. 2 Figure 9-153: Q7 and Q8 Gate Drive (With 60 VDC Input, and Bulk – As the Ground Reference)

Vol. 2 Table 9-13: Chirp Mode Fault Circuits

Supply	Fault	Circuit
+5.1 VA	Over Current	U1A and U3A
+5.1 VB	Over Current	U1B and U3B
+5.1 V	Over Voltage	CR23, R49, and R50
+25 V	Over Voltage	CR25, R52, R62, and R84
+25 V	Over Current	U2A
±5 V and ±15 V	Voltage Sum	U5 and Q12

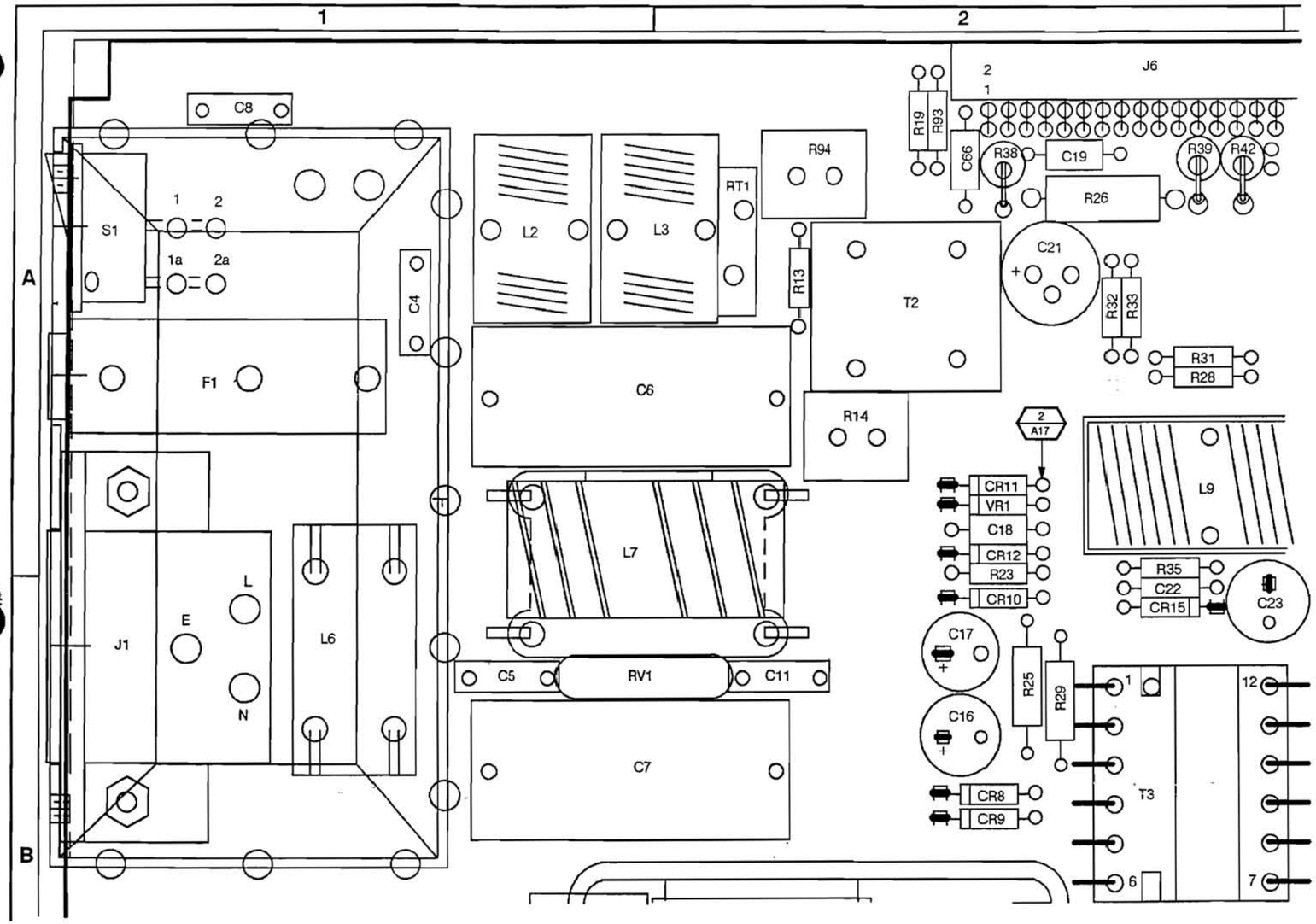
Vol. 2 Table 9-14: No-Load Supply Voltages

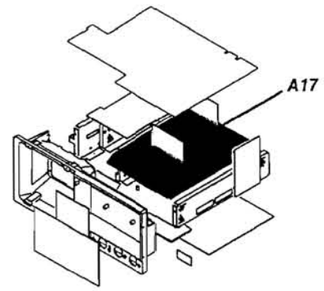
Supply	Voltage	Lower Limit	Upper Limit
+5.1 VA	+5.1 V	+5.0 V	+5.25 V
+5.1 VB	+5.1 V	+5.0 V	+5.25 V
+25 V	+25 V	+23.5 V	+27.5 V
+5 V	+0.6 V	+0.5 V	+0.8 V
-5.1 V	-0.5 V	-0.45 V	-0.55 V
+15 V	+1.4 V	+1.2 V	+1.6V
-15 V	-1.4 V	-1.2 V	-1.6V

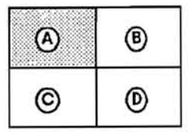
Vol. 2 Figure 9-154: Power Supply Secondary Troubleshooting Procedure

Scans by ArtekMedia => 2011

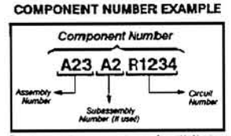
Scans by Artekmedia => 2011







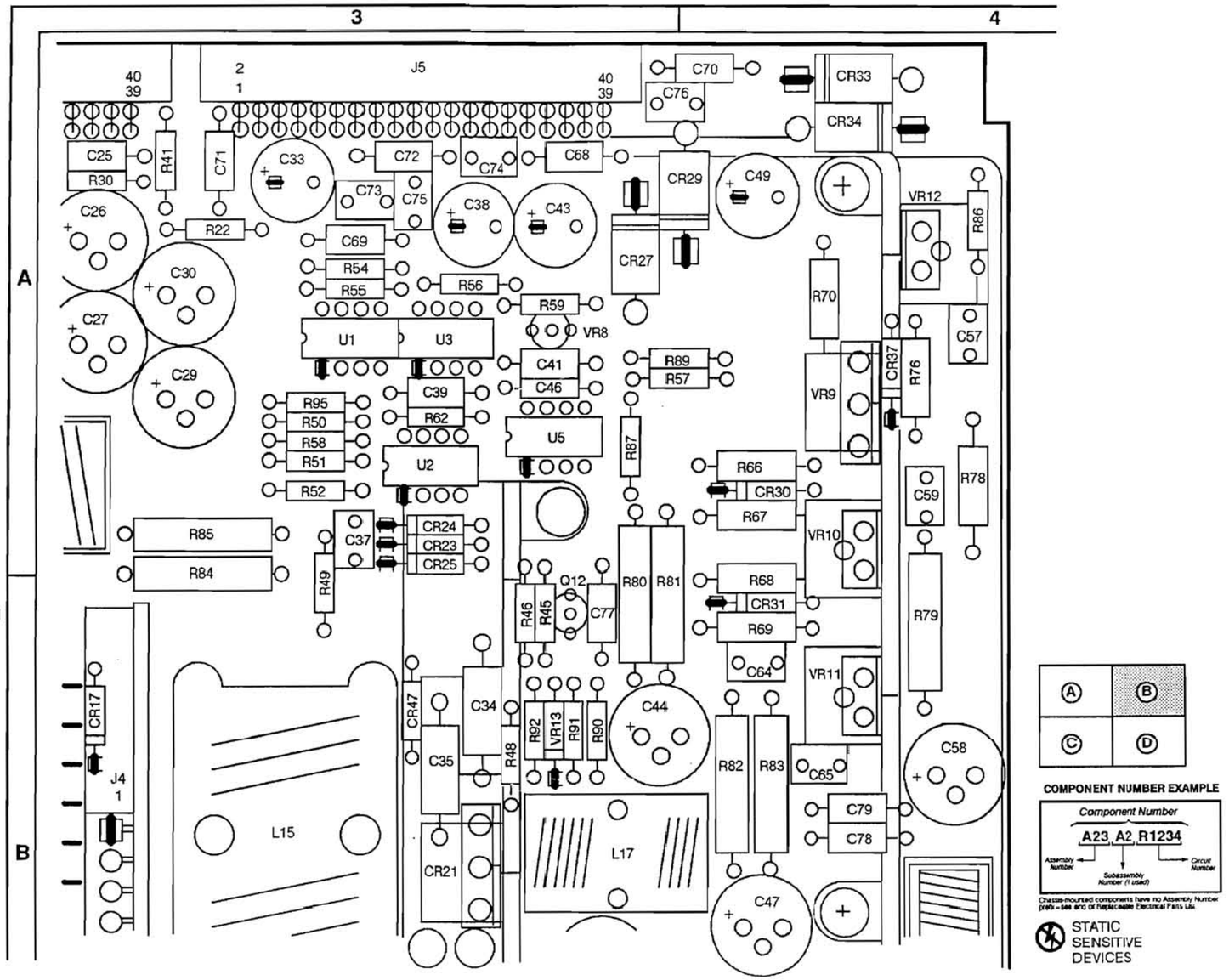
COMPONENT NUMBER EXAMPLE



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

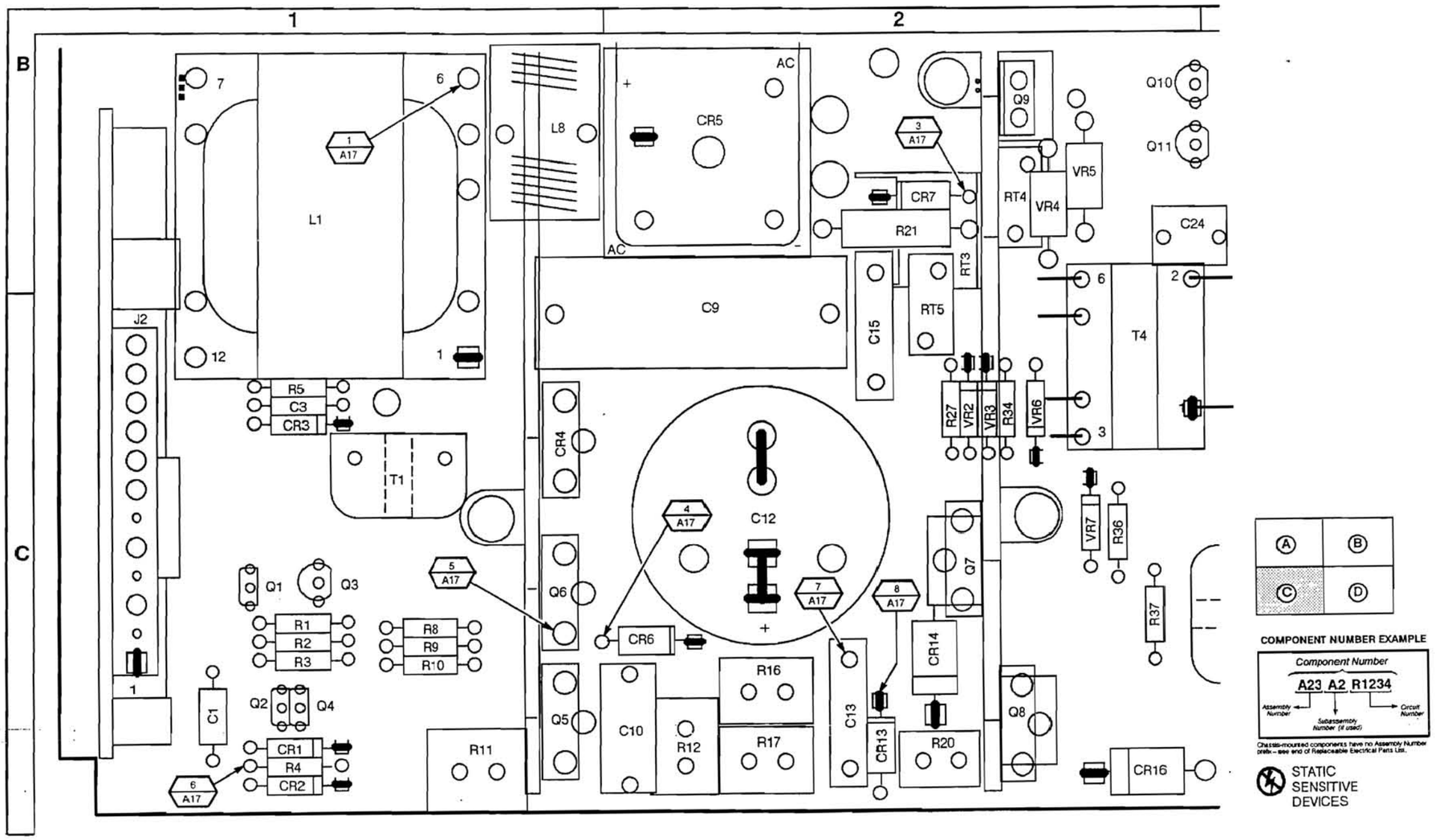
STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-155: A17 Main LV Power Supply Board (Section A)

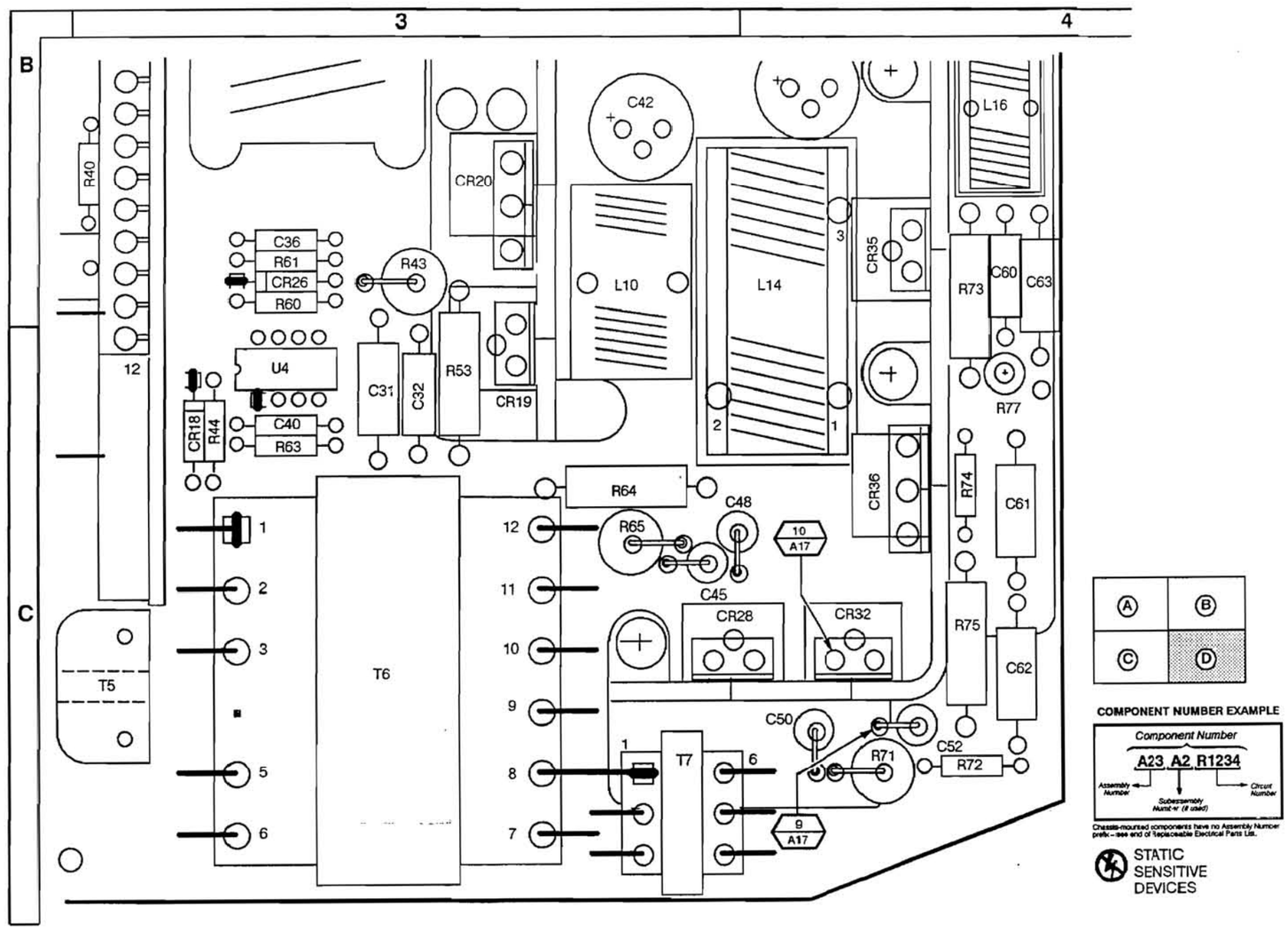


Vol. 2 Figure 9-156: A17 Main LV Power Supply Board (Section B)

Scans by Artekmedia => 2011



Vol. 2 Figure 9-157: A17 Main LV Power Supply Board (Section C)



COMPONENT NUMBER EXAMPLE

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

STATIC SENSITIVE DEVICES

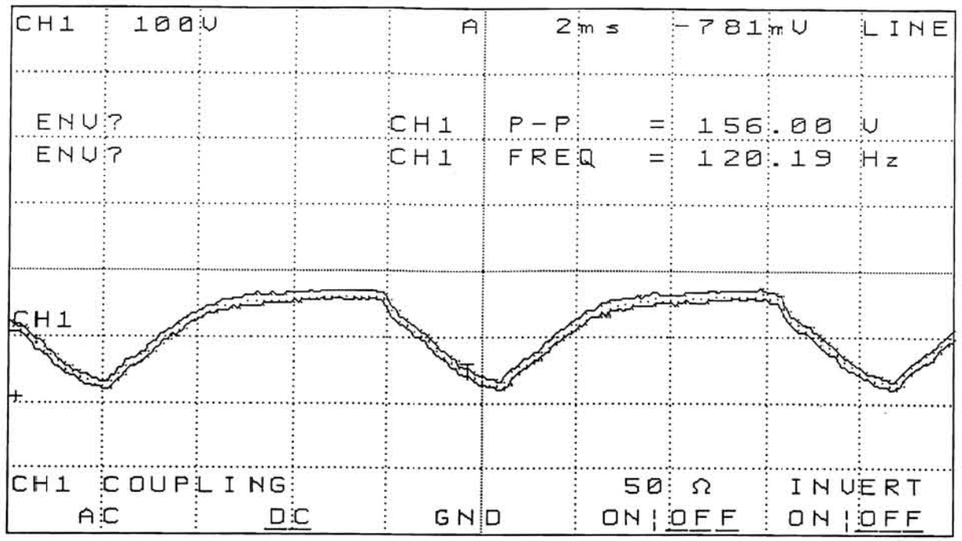
Vol. 2 Figure 9-158: A17 Main LV Power Supply Board (Section D)

Scans by Artekmedia => 2011

A17 Main LV Power Supply Component Locator

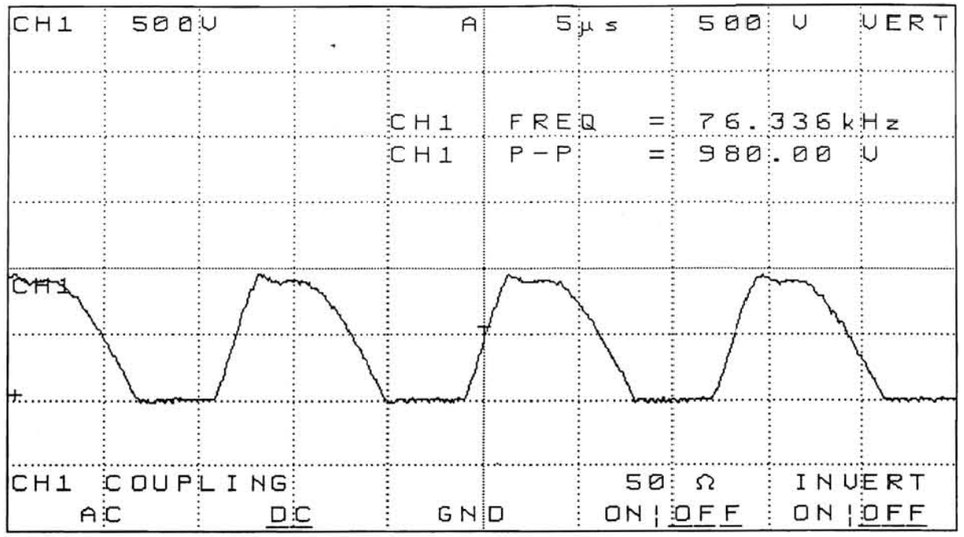
CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C1	A17-1	6C	A17	1C	C68	A17-2	4C	A17	3A	E10	A17-2	1D	A17	3B	R25	A17-1	5B	A17	2B	R82	A17-2	2A	A17	4B
C3	A17-1	5D	A17	1C	C69	A17-2	4C	A17	3A	E11	A17-2	1D	A17	3B	R26	A17-2	5B	A17	2A	R83	A17-2	2A	A17	4B
C4	A17-1	2A	A17	1A	C70	A17-2	4B	A17	4A	E12	A17-2	1B	A17	4C	R27	A17-1	2C	A17	2C	R84	A17-2	3C	A17	3B
C5	A17-1	2A	A17	1B	C71	A17-1	5A	A17	3A	E13	A17-2	1C	A17	4C	R28	A17-2	2D	A17	2A	R85	A17-2	2D	A17	3A
C6	A17-1	2A	A17	2A	C72	A17-2	4A	A17	3A						R29	A17-1	5B	A17	2B	R86	A17-2	3B	A17	4A
C7	A17-1	3A	A17	2B	C73	A17-2	3C	A17	3A	F1	A17-1	1A	A17	1A	R30	A17-2	5B	A17	3A	R87	A17-2	5C	A17	3A
C8	A17-1	2A	A17	1A	C74	A17-2	4C	A17	3A						R31	A17-2	5D	A17	2A	R89	A17-2	5C	A17	4A
C9	A17-1	3B	A17	2C	C75	A17-2	4A	A17	3A	J5	A17-1	6A	A17	3A	R32	A17-2	5D	A17	2A	R90	A17-2	5C	A17	3B
C10	A17-1	4D	A17	2C	C76	A17-2	4B	A17	4A	J5	A17-2	4A	A17	3A	R33	A17-2	5D	A17	2A	R91	A17-2	6C	A17	3B
C11	A17-1	2A	A17	2B	C77	A17-2	5C	A17	3B	J6	A17-2	4C	A17	2A	R34	A17-1	2C	A17	2C	R92	A17-2	6C	A17	3B
C12	A17-1	4B	A17	2C	C78	A17-2	4C	A17	4B						R35	A17-1	6B	A17	2B	R93	A17-1	5A	A17	2A
C13	A17-1	3C	A17	2C	C79	A17-2	4C	A17	4B	L1	A17-1	4A	A17	1B	R36	A17-1	2B	A17	2C	R94	A17-1	4A	A17	2A
C15	A17-1	5C	A17	2C						L2	A17-1	2A	A17	1A	R37	A17-1	2B	A17	3C	R95	A17-2	4A	A17	3A
C16	A17-1	6C	A17	2B	CR1	A17-1	2C	A17	1C	L3	A17-1	2A	A17	2A	R38	A17-2	2D	A17	2A					
C17	A17-1	4C	A17	2B	CR2	A17-1	2D	A17	1C	L6A	A17-1	1A	A17	1B	R39	A17-2	5B	A17	2A	RT1	A17-1	2A	A17	2A
C18	A17-1	5C	A17	2A	CR3	A17-1	4D	A17	1C	L6B	A17-1	1A	A17	1B	R40	A17-1	1B	A17	3B	RT3	A17-1	3A	A17	2B
C19	A17-2	6B	A17	2A	CR4	A17-1	4A	A17	2C	L7	A17-1	2A	A17	2A	R41	A17-2	6C	A17	3A	RT4	A17-1	4B	A17	2B
C21	A17-2	2C	A17	2A	CR5	A17-1	3A	A17	2B	L8	A17-1	3A	A17	1B	R42	A17-2	5B	A17	2A	RT5	A17-1	4B	A17	2C
C22	A17-1	6B	A17	2B	CR6	A17-1	4D	A17	2C	L9	A17-2	2D	A17	2A	R43	A17-2	2C	A17	3B					
C23	A17-1	6B	A17	3B	CR7	A17-1	5B	A17	2B	L10	A17-2	2A	A17	3B	R44	A17-2	2A	A17	3C	RV1	A17-1	3A	A17	2B
C24	A17-1	2B	A17	3B	CR8	A17-1	5C	A17	2B	L14	A17-2	2C	A17	4B	R45	A17-2	5C	A17	3B					
C25	A17-2	6B	A17	3A	CR9	A17-1	4B	A17	2B	L15	A17-2	2D	A17	3B	R46	A17-2	5C	A17	3B	S1A	A17-1	2A	A17	1A
C26	A17-2	2D	A17	3A	CR10	A17-1	4C	A17	2B	L16	A17-2	2B	A17	4B	R47	A17-2	2D	A17	3B	S1B	A17-1	2A	A17	1A
C27	A17-2	3D	A17	3A	CR11	A17-1	4C	A17	2A	L17	A17-2	2C	A17	3B	R48	A17-2	2D	A17	3B					
C29	A17-2	3D	A17	3A	CR12	A17-1	5C	A17	2A						R49	A17-2	4D	A17	3B	T1	A17-1	4D	A17	1C
C30	A17-2	3D	A17	3A	CR13	A17-1	3B	A17	2C	Q1	A17-1	2D	A17	1C	R50	A17-2	4D	A17	3A	T2	A17-1	5A	A17	2A
C31	A17-2	2D	A17	3C	CR14	A17-1	3B	A17	2C	Q2	A17-1	2C	A17	1C	R51	A17-2	3D	A17	3A	T3	A17-1	5B	A17	2B
C32	A17-2	2C	A17	3C	CR15	A17-1	6B	A17	2B	Q3	A17-1	2D	A17	1C	R52	A17-2	3C	A17	3A	T4	A17-1	2B	A17	2C
C33	A17-2	3C	A17	3A	CR16	A17-1	3C	A17	2C	Q4	A17-1	2D	A17	1C	R53	A17-2	2C	A17	3C	T5	A17-2	1A	A17	3C
C34	A17-2	2D	A17	3B	CR17	A17-1	6B	A17	3B	Q5	A17-1	3D	A17	2C	R54	A17-2	5B	A17	3A	T6	A17-2	1A	A17	3C
C35	A17-2	1D	A17	3B	CR18	A17-2	3A	A17	3C	Q6	A17-1	3D	A17	2C	R55	A17-2	5A	A17	3A	T7A	A17-2	1B	A17	3C
C36	A17-2	4D	A17	3B	CR19	A17-2	2C	A17	3C	Q7	A17-1	3C	A17	2C	R56	A17-2	5C	A17	3A	T7B	A17-2	1B	A17	3C
C37	A17-2	3C	A17	3A	CR20	A17-2	2D	A17	3B	Q8	A17-1	3B	A17	2C	R57	A17-2	5C	A17	4A	T7C	A17-2	1B	A17	3C
C38	A17-2	3A	A17	3A	CR21	A17-2	2D	A17	3B	Q9	A17-1	5B	A17	2B	R58	A17-2	3D	A17	3A					
C39	A17-1	6B	A17	3A	CR23	A17-2	4D	A17	3A	Q10	A17-1	1B	A17	3B	R59	A17-2	5A	A17	3A	U1A	A17-2	5A	A17	3A
C40	A17-2	5D	A17	3C	CR24	A17-2	4D	A17	3A	Q11	A17-1	1B	A17	3B	R60	A17-2	5D	A17	3C	U1B	A17-2	5B	A17	3A
C41	A17-2	5A	A17	3A	CR25	A17-2	4C	A17	3B	Q12	A17-2	6C	A17	3B	R61	A17-2	4D	A17	3B	U2A	A17-2	3D	A17	3A
C42	A17-2	2A	A17	3B	CR26	A17-2	6D	A17	3B						R62	A17-2	3D	A17	3A	U3A	A17-2	5A	A17	3A
C43	A17-2	3C	A17	3A	CR27	A17-2	4C	A17	3A	R1	A17-1	2D	A17	1C	R63	A17-2	6A	A17	3C	U3B	A17-2	5B	A17	3A
C44	A17-2	2C	A17	3B	CR28	A17-2	2C	A17	4C	R2	A17-1	2D	A17	1C	R64	A17-2	2C	A17	3C	U4A	A17-2	5D	A17	3C
C45	A17-2	2C	A17	3C	CR29	A17-2	4A	A17	4A	R3	A17-1	3D	A17	1C	R65	A17-2	2C	A17	3C	U4B	A17-2	5D	A17	3C
C46	A17-2	5A	A17	3A	CR30	A17-2	3A	A17	4A	R4	A17-1	1D	A17	1C	R66	A17-2	3A	A17	4A	U5A	A17-2	5C	A17	3A
C47	A17-2	2B	A17	4B	CR31	A17-2	3C	A17	4B	R5	A17-1	5D	A17	1C	R67	A17-2	3A	A17	4A	U5B	A17-2	5C	A17	3A
C48	A17-2	2C	A17	4C	CR32	A17-2	2A	A17	4C	R8	A17-1	3D	A17	1C	R68	A17-2	3C	A17	4B					
C49	A17-2	3B	A17	4A	CR33	A17-2	3B	A17	4A	R9	A17-1	2D	A17	1C	R69	A17-2	3C	A17	4B	VR1	A17-1	4C	A17	2A
C50	A17-2	2A	A17	4C	CR34	A17-2	3B	A17	4A	R10	A17-1	2D	A17	1C	R70	A17-2	3B	A17	4A	VR2	A17-1	2C	A17	2C
C52	A17-2	2A	A17	4C	CR35	A17-2	2B	A17	4B	R11	A17-1	4D	A17	1C	R71	A17-2	2A	A17	4C	VR3	A17-1	2C	A17	2C
C57	A17-2	3B	A17	4A	CR36	A17-2	2B	A17	4C	R12	A17-1	4D	A17	2C	R72	A17-2	2B	A17	4C	VR4	A17-1	5B	A17	2B
C58	A17-2	2B	A17	4B	CR37	A17-2	3B	A17	4A	R13	A17-1	5A	A17	2A	R73	A17-2	2B	A17	4C	VR5	A17-1	5B	A17	2B
C59	A17-2	3B	A17	4A						R14	A17-1	4A	A17	2A	R74	A17-2	2B	A17	4C	VR6	A17-1	2B	A17	2C
C60	A17-2	2B	A17	4B	E1	A17-1	2A	A17	1A	R16	A17-1	3C	A17	2C	R75	A17-2	2A	A17	4C	VR7	A17-1	2B	A17	2C
C61	A17-2	2B	A17	4C	E2	A17-1	2A	A17	1A	R17	A17-1	3B	A17	2C	R76	A17-2	3B	A17	4A	VR8	A17-2	5A	A17	3A
C62	A17-2	2B	A17	4C	E3	A17-1	4D	A17	1C	R19	A17-1	5A	A17	2A	R77	A17-2	2B	A17	4C	VR9	A17-2	3B	A17	4A
C63	A17-2	2B	A17	4B	E4	A17-1	4D	A17	1C	R20	A17-1	3C	A17	2C	R78	A17-2	2B	A17	4A	VR10	A17-2	3A	A17	4B
C64	A17-2	3C	A17	4B	E5	A17-1	3A	A17	2B	R21	A17-1	5B	A17	2B	R79	A17-2	2B	A17	4B	VR11	A17-2	3C	A17	4B
C65	A17-2	3A	A17	4B	E6	A17-1	3A	A17	2B	R22	A17-2	5B	A17	3A	R80	A17-2	2C	A17	3B	VR12	A17-2	3B	A17	4A
C66	A17-2	2C	A17	2A	E7	A17-2	1A	A17	2C	R23	A17-1	5C	A17	2B	R81	A17-2	2C	A17	4B	VR13	A17-2	6C	A17	3B

*Asterisks indicate components located on the back of the board.



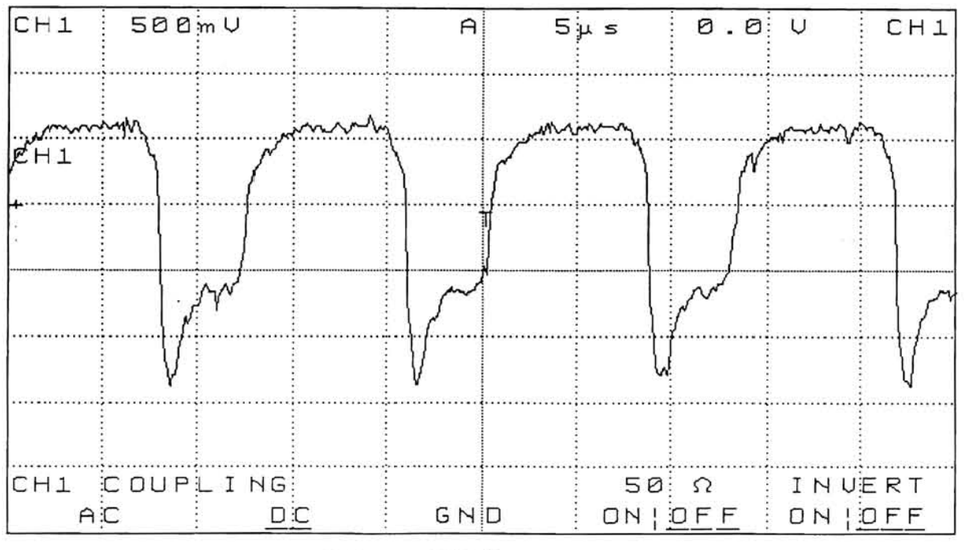
1 A17

L1 pin 5 (ground Bulk –)



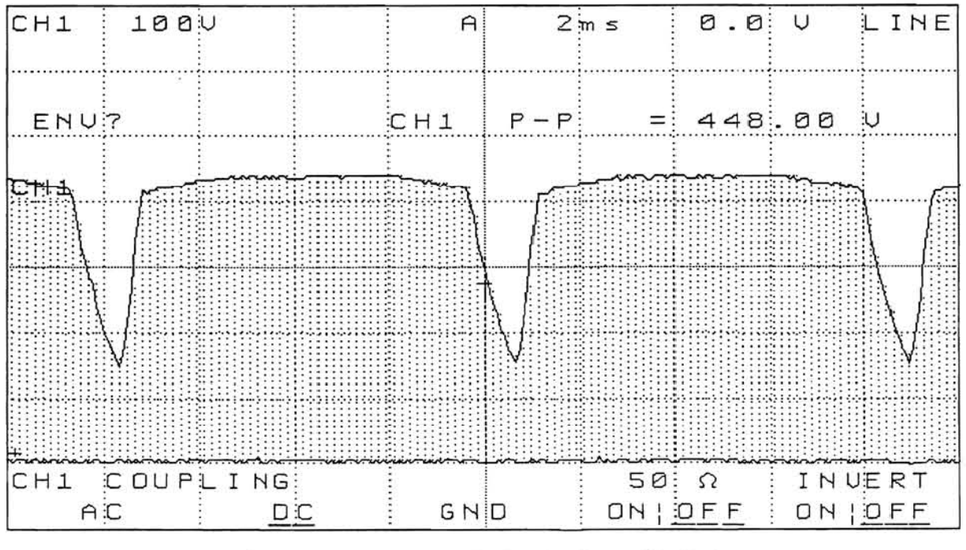
3 A17

Collector of Q9 (Ground Bulk –)



2 A17

Collector of Q9 (Ground Bulk –)

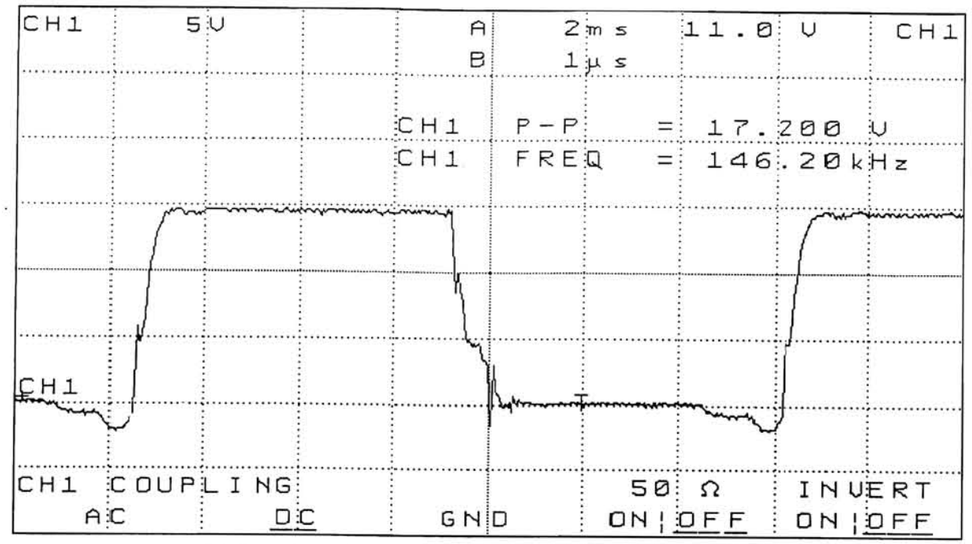


4 A17

CR6 Anode (Envelope Mode with Ground Bulk –)

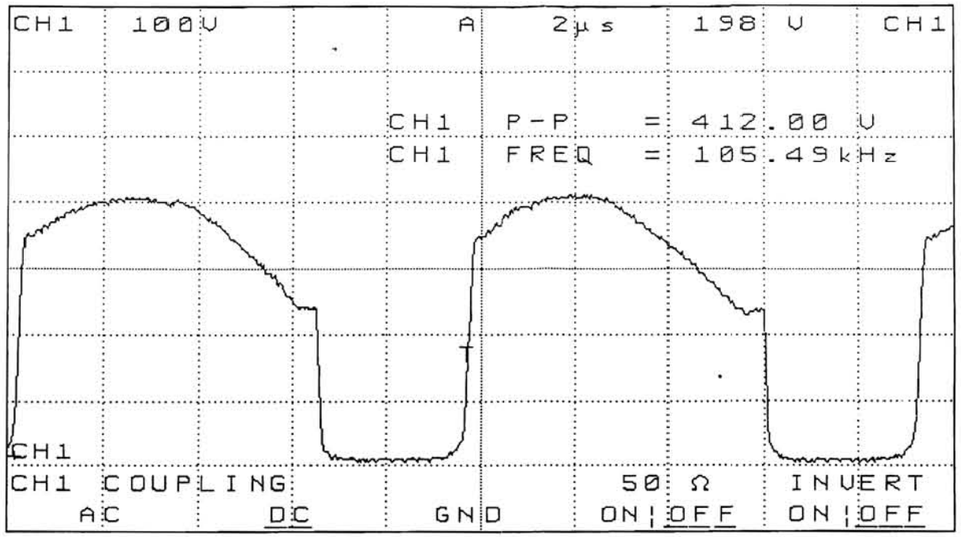
Vol. 2 Figure 9-159: A17 Main LV Power Supply Waveforms

Scans by Artekmedia => 2011



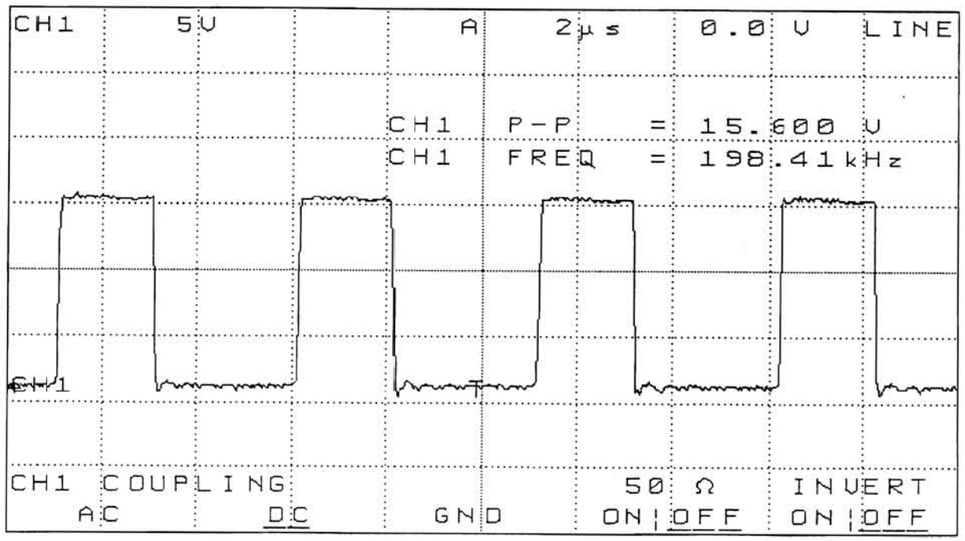
5 A17

Q6 Gate (This Signal's Pulse Width Varies. Ground Bulk –)



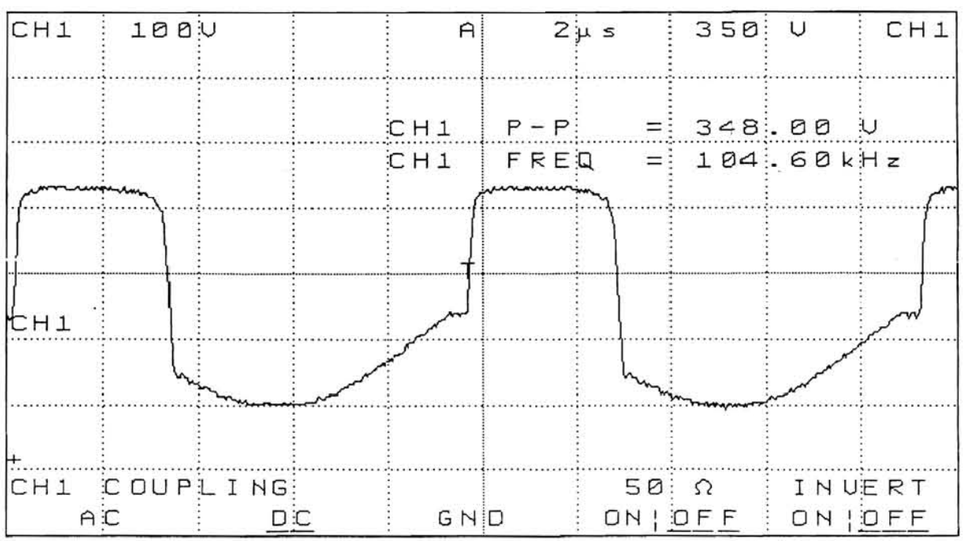
7 A17

T6 pin 6 (Ground Bulk –)



6 A17

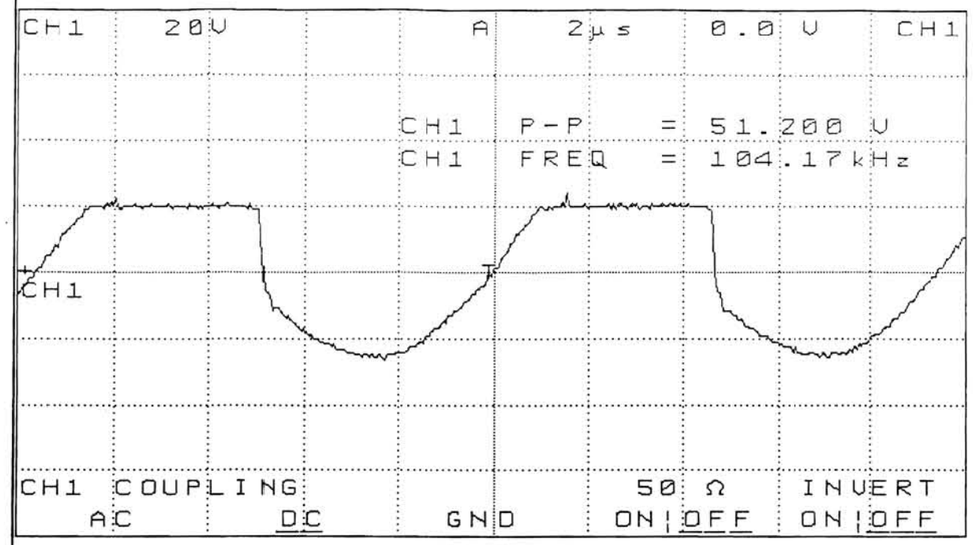
W2 pin 11 (Ground W4 pin 9)



8 A17

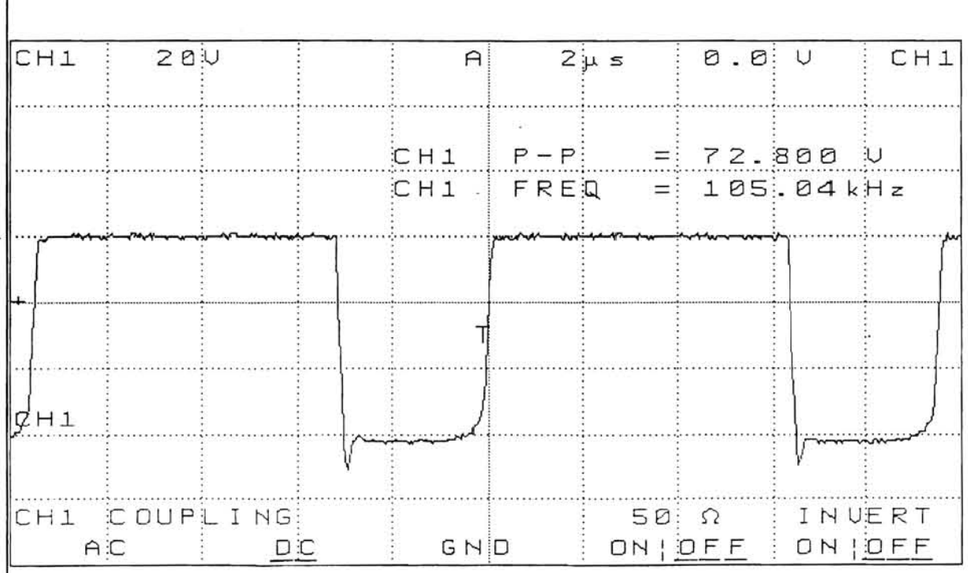
T5 pin E7 (Ground Bulk –)

Vol. 2 Figure 9-159: A17 Main LV Power Supply Waveforms (Cont.)



9 A17

T6 pin 10 (Ground W4 pin 9)



10 A17

T6 pin 9 (Ground W4 pin 9)

Vol. 2 Figure 9-159: A17 Main LV Power Supply Waveforms (Cont.)

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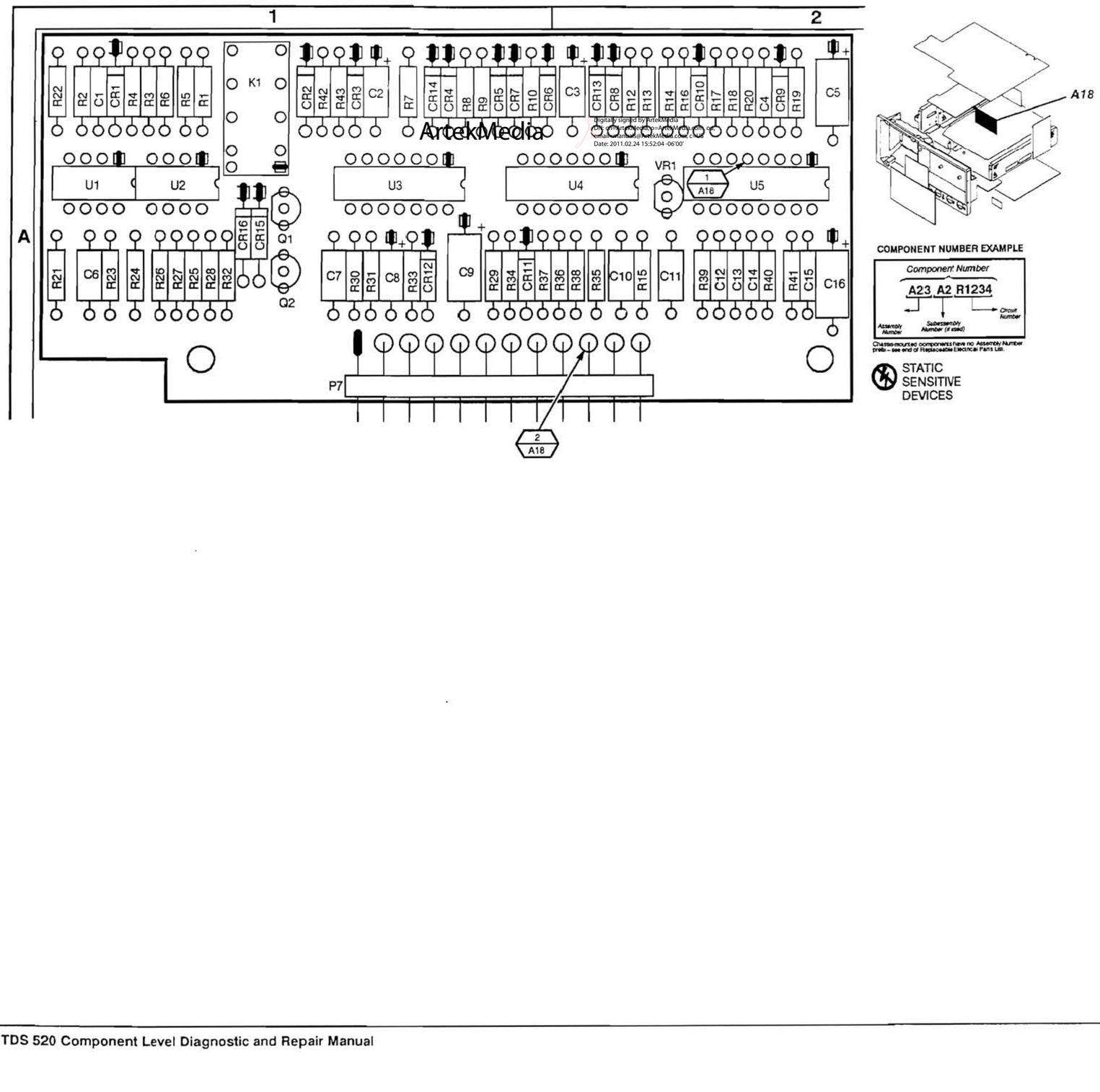


COMPONENT NUMBER EXAMPLE

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

STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-160: A18 Main Converter Control Board

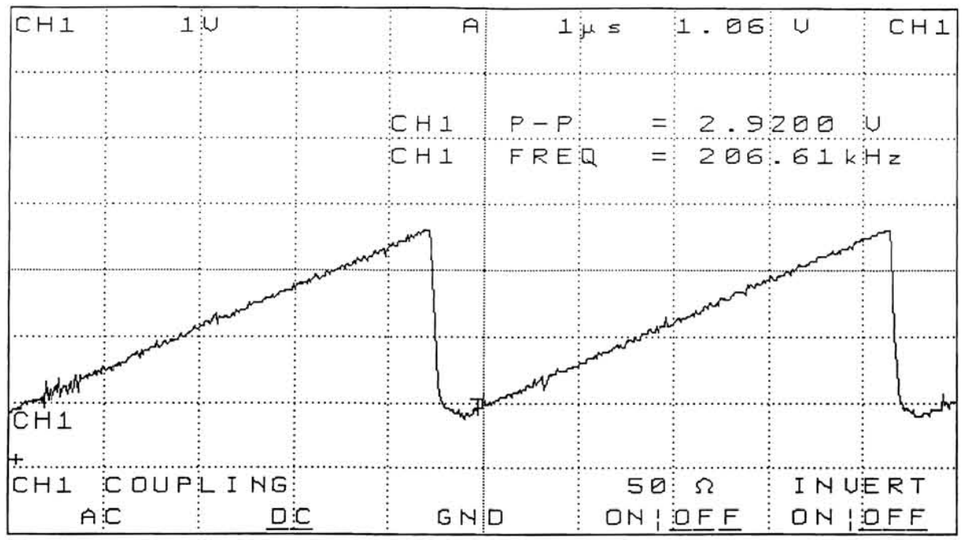
A18 Main Converter Control Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C1	A18-1	2D	A18	1A	CR3	A18-1	3B	A18	1A	Q2	A18-1	1C	A18	1A	R20	A18-1	5B	A18	2A	R39	A18-1	4A	A18	2A
C2	A18-1	2C	A18	1A	CR4	A18-1	4C	A18	1A	R1	A18-1	3D	A18	1A	R21	A18-1	5D	A18	1A	R40	A18-1	4A	A18	2A
C3	A18-1	2C	A18	2A	CR5	A18-1	4D	A18	1A	R2	A18-1	2D	A18	1A	R22	A18-1	5D	A18	1A	R41	A18-1	4A	A18	2A
C4	A18-1	5B	A18	2A	CR6	A18-1	4B	A18	2A	R3	A18-1	2D	A18	1A	R23	A18-1	2B	A18	1A	R42	A18-1	1B	A18	1A
C5	A18-1	5B	A18	2A	CR7	A18-1	2C	A18	1A	R4	A18-1	5D	A18	1A	R24	A18-1	2B	A18	1A	R43	A18-1	1C	A18	1A
C6	A18-1	2B	A18	1A	CR8	A18-1	4B	A18	2A	R5	A18-1	3D	A18	1A	R25	A18-1	2B	A18	1A					
C7	A18-1	5B	A18	1A	CR9	A18-1	4D	A18	2A	R6	A18-1	3D	A18	1A	R26	A18-1	2B	A18	1A	U1A	A18-1	5D	A18	1A
C8	A18-1	3B	A18	1A	CR10	A18-1	3D	A18	2A	R7	A18-1	3C	A18	1A	R27	A18-1	2B	A18	1A	U1B	A18-1	2B	A18	1A
C9	A18-1	3C	A18	1A	CR11	A18-1	4C	A18	1A	R8	A18-1	4C	A18	1A	R28	A18-1	2B	A18	1A	U2A	A18-1	2D	A18	1A
C10	A18-1	3B	A18	2A	CR12	A18-1	3D	A18	1A	R9	A18-1	4D	A18	1A	R29	A18-1	3D	A18	1A	U2B	A18-1	5D	A18	1A
C11	A18-1	1A	A18	2A	CR13	A18-1	4D	A18	2A	R10	A18-1	2C	A18	1A	R30	A18-1	3B	A18	1A	U3A	A18-1	3C	A18	1A
C12	A18-1	4A	A18	2A	CR14	A18-1	4D	A18	1A	R12	A18-1	3B	A18	2A	R31	A18-1	3B	A18	1A	U3B	A18-1	3D	A18	1A
C13	A18-1	4A	A18	2A	CR15	A18-1	1C	A18	1A	R13	A18-1	4B	A18	2A	R32	A18-1	2D	A18	1A	U4A	A18-1	3D	A18	1A
C14	A18-1	4A	A18	2A	CR16	A18-1	1C	A18	1A	R14	A18-1	4D	A18	2A	R33	A18-1	3D	A18	1A	U4B	A18-1	3D	A18	1A
C15	A18-1	5A	A18	2A						R15	A18-1	4D	A18	2A	R34	A18-1	3C	A18	1A	U4C	A18-1	3B	A18	1A
C16	A18-1	5B	A18	2A	K1A	A18-1	2C	A18	1A	R16	A18-1	4D	A18	2A	R35	A18-1	4B	A18	2A	U4D	A18-1	4B	A18	1A
					K1B	A18-1	2C	A18	1A	R17	A18-1	3D	A18	2A	R36	A18-1	3A	A18	2A	U5	A18-1	5A	A18	2A
CR1	A18-1	2D	A18	1A						R18	A18-1	3D	A18	2A	R37	A18-1	3B	A18	1A					
CR2	A18-1	4D	A18	1A	Q1	A18-1	1B	A18	1A	R19	A18-1	4B	A18	2A	R38	A18-1	3B	A18	2A	VR1	A18-1	4A	A18	2A

*Asterisks indicate components located on the back of the board.

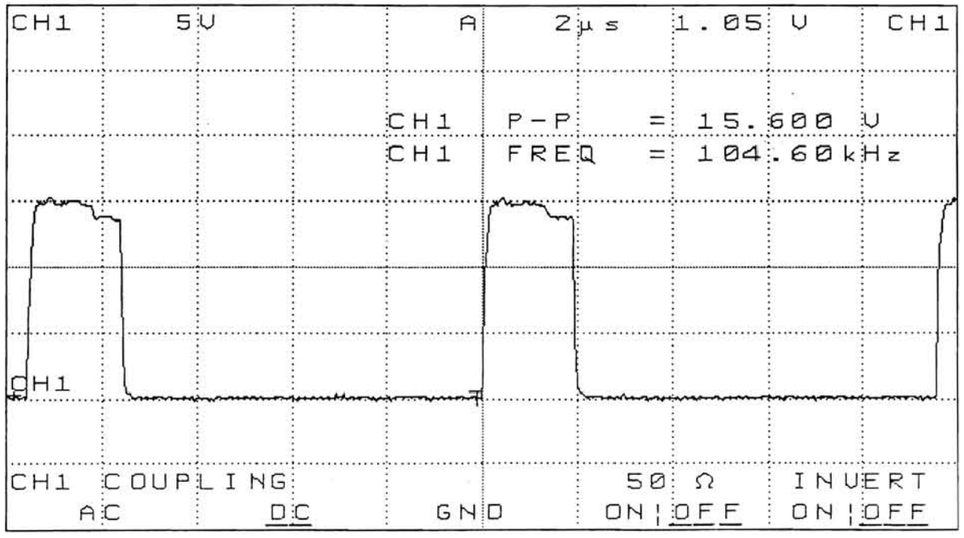
Scans by ArtekMedia => 2011

Scans by Artekmedia => 2011



1 A18

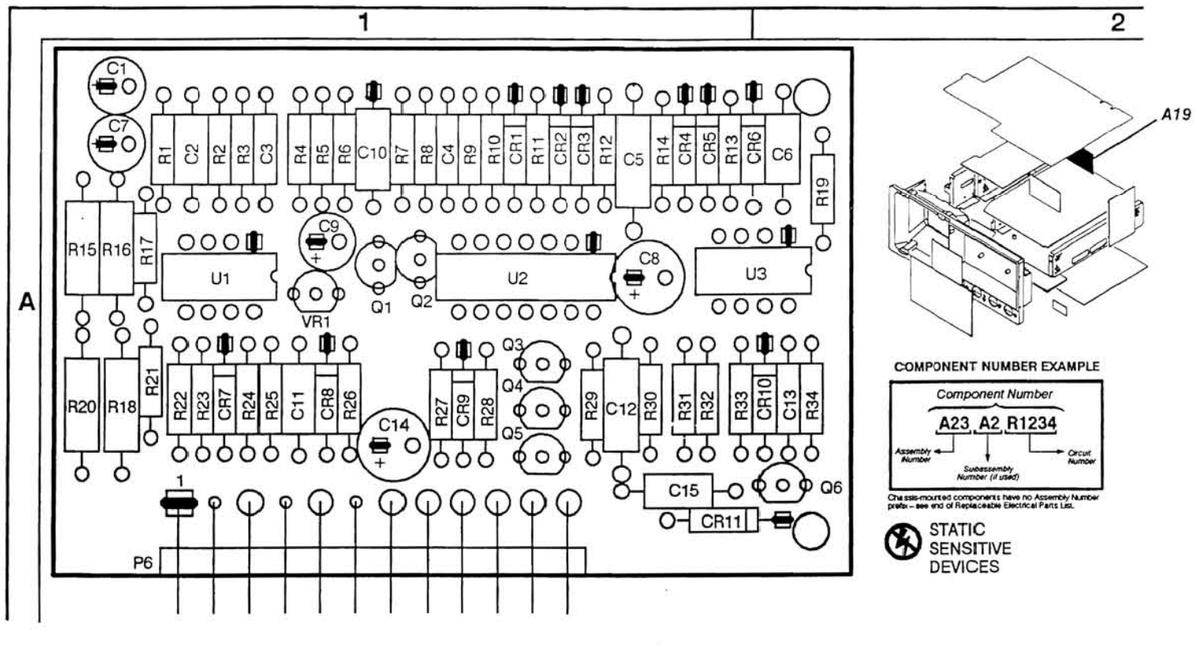
U5 pin 7 (Ground W4 pin 9)



2 A18

W4 pin 10 (Ground W4 pin 9)

Vol. 2 Figure 9-161: A18 Main Converter Control Waveforms



COMPONENT NUMBER EXAMPLE

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

STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-162: A19 Power Factor Control Board

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A19 Power Factor Control Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C1	A19-1	2D	A19	1A	CR1	A19-1	4C	A19	1A	Q5	A19-1	5C	A19	1A	R15	A19-1	2D	A19	1A	R31	A19-1	5C	A19	1A
C2	A19-1	2B	A19	1A	CR2	A19-1	4C	A19	1A	Q6	A19-1	6C	A19	2A	R16	A19-1	2B	A19	1A	R32	A19-1	3A	A19	1A
C3	A19-1	3C	A19	1A	CR3	A19-1	4C	A19	1A						R17	A19-1	3B	A19	1A	R33	A19-1	2A	A19	1A
C4	A19-1	3D	A19	1A	CR4	A19-1	5C	A19	1A	R1	A19-1	2D	A19	1A	R18	A19-1	2B	A19	1A	R34	A19-1	3A	A19	2A
C5	A19-1	4C	A19	1A	CR5	A19-1	4B	A19	1A	R2	A19-1	3C	A19	1A	R19	A19-1	3B	A19	2A	R111	A19-1	4C	A19	1A
C6	A19-1	3B	A19	2A	CR6	A19-1	3B	A19	2A	R3	A19-1	3C	A19	1A	R20	A19-1	1D	A19	1A					
C7	A19-1	2D	A19	1A	CR7	A19-1	2D	A19	1A	R4	A19-1	3C	A19	1A	R21	A19-1	3B	A19	1A	U1A	A19-1	3C	A19	1A
C8	A19-1	1A	A19	1A	CR8	A19-1	3D	A19	1A	R5	A19-1	4C	A19	1A	R22	A19-1	2D	A19	1A	U1B	A19-1	2D	A19	1A
C9	A19-1	4C	A19	1A	CR9	A19-1	4D	A19	1A	R6	A19-1	3C	A19	1A	R23	A19-1	2C	A19	1A	U2A	A19-1	5C	A19	1A
C10	A19-1	3C	A19	1A	CR10	A19-1	5C	A19	2A	R7	A19-1	3C	A19	1A	R24	A19-1	2D	A19	1A	U2B	A19-1	4C	A19	1A
C11	A19-1	2C	A19	1A	CR11	A19-1	5C	A19	1A	R8	A19-1	3D	A19	1A	R25	A19-1	3D	A19	1A	U2C	A19-1	4C	A19	1A
C12	A19-1	5C	A19	1A						R9	A19-1	3D	A19	1A	R26	A19-1	3C	A19	1A	U2D	A19-1	5C	A19	1A
C13	A19-1	2A	A19	2A	Q1	A19-1	3D	A19	1A	R10	A19-1	3C	A19	1A	R27	A19-1	2C	A19	1A	U3A	A19-1	3B	A19	1A
C14	A19-1	2A	A19	1A	Q2	A19-1	3C	A19	1A	R12	A19-1	3B	A19	1A	R28	A19-1	3D	A19	1A	U3B	A19-1	3A	A19	1A
C15	A19-1	2A	A19	1A	Q3	A19-1	4D	A19	1A	R13	A19-1	3B	A19	1A	R29	A19-1	3D	A19	1A					
					Q4	A19-1	5C	A19	1A	R14	A19-1	4A	A19	1A	R30	A19-1	6C	A19	1A	VR1	A19-1	2C	A19	1A

*Asterisks indicate components located on the back of the board.

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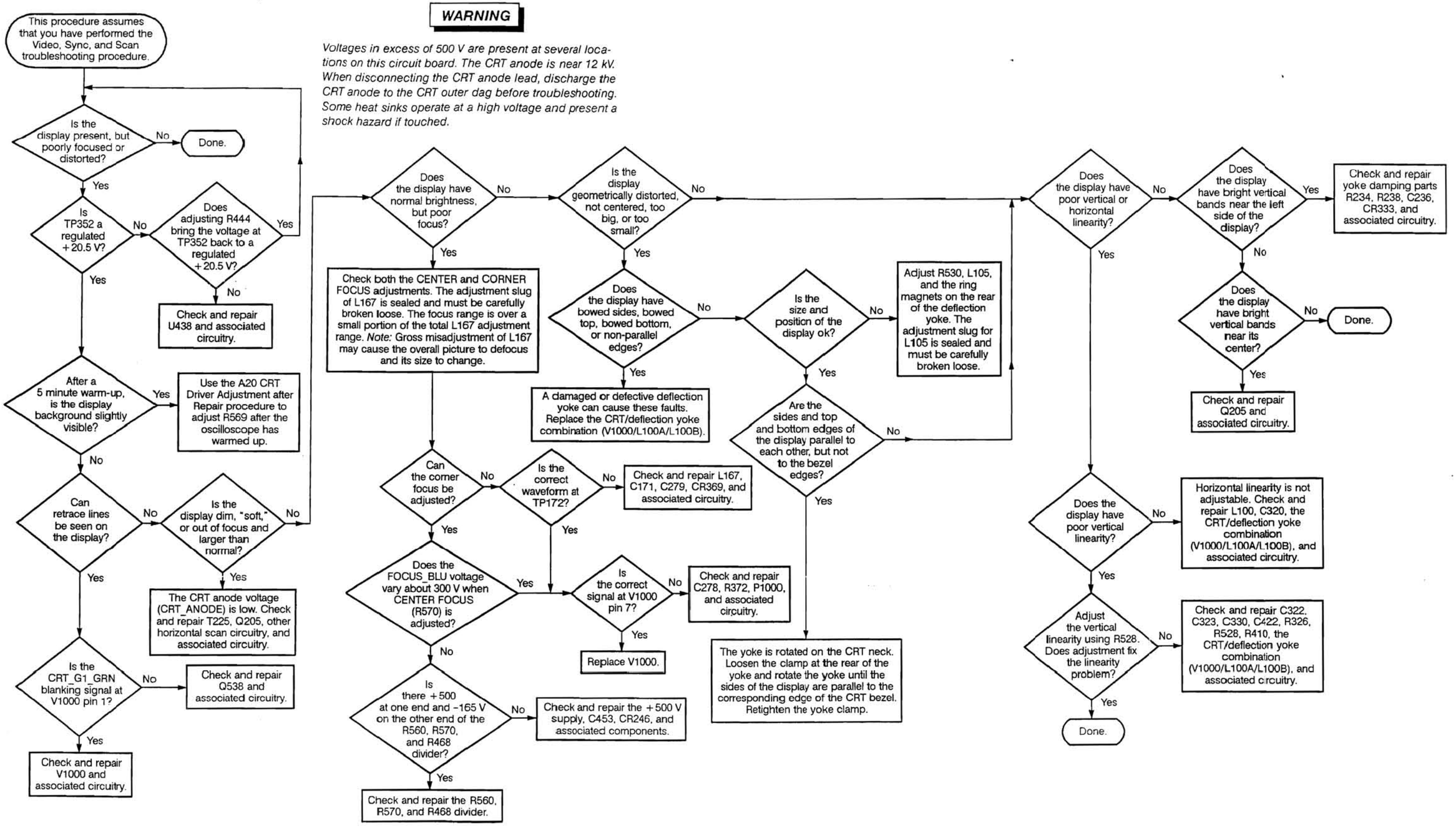
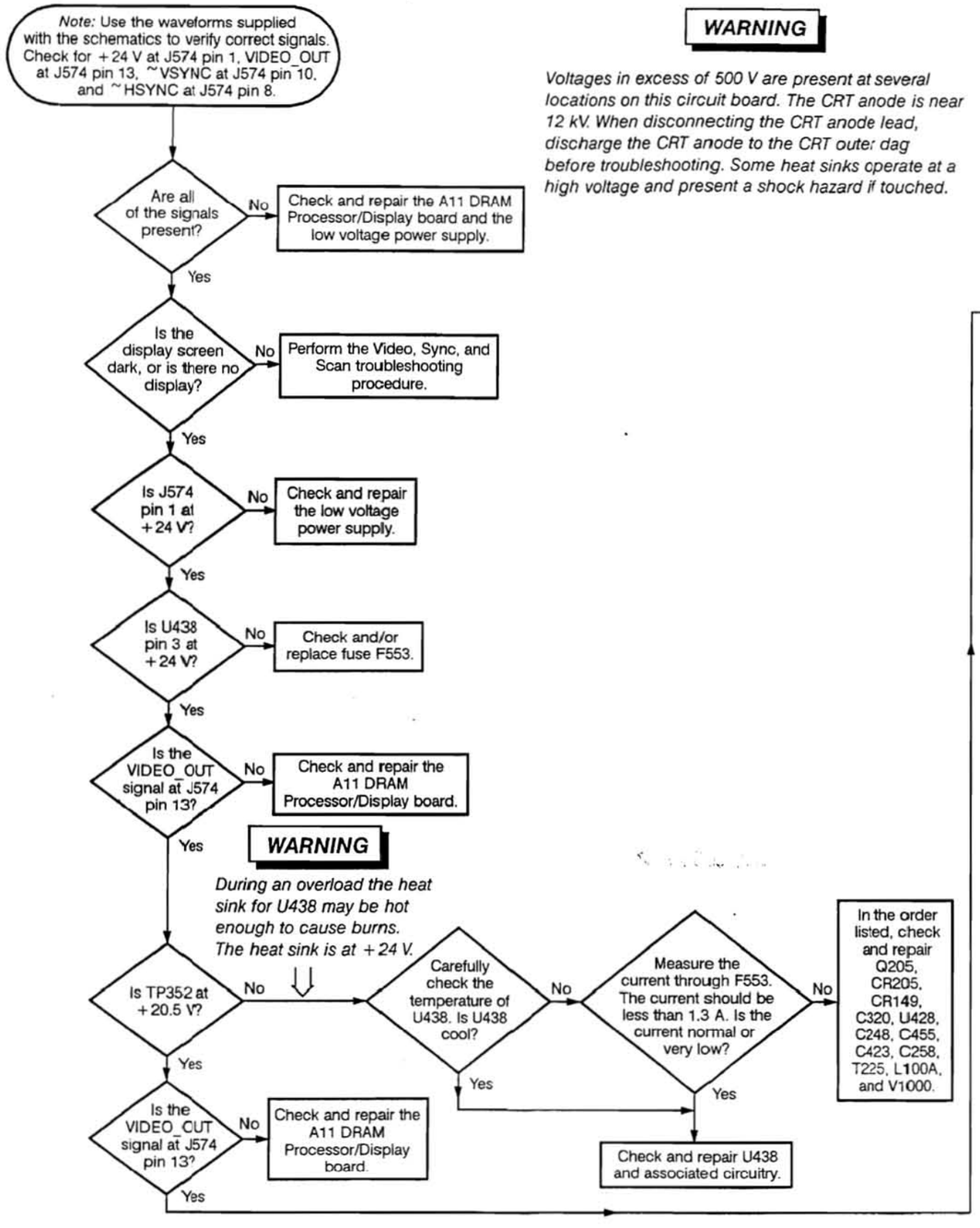
WARNING

Voltages in excess of 500 V are present at several locations on this circuit board. The CRT anode is near 12 kV. When disconnecting the CRT anode lead, discharge the CRT anode to the CRT outer dag before troubleshooting. Some heat sinks operate at a high voltage and present a shock hazard if touched.



Vol. 2 Figure 9-163: Display Distortion Troubleshooting Procedure



Vol. 2 Figure 9-164: Display Driver Troubleshooting Procedure

Scans by ArtekMedia => 2011

Scans by Artekmedia => 2011

This procedure assumes that you have performed the Display Driver troubleshooting procedure.

WARNING

Voltages in excess of 500 V are present at several locations on this circuit board. The CRT anode is near 12 kV. When disconnecting the CRT anode lead, discharge the CRT anode to the CRT outer dag before troubleshooting. Some heat sinks operate at a high voltage and present a shock hazard if touched.

Is the display screen bright with no video?
- No → Is the only display on-screen a bright horizontal line with no vertical scan?
- Yes → Is the VIDEO_OUT signal at J574 pin 13, and is the black level of the VIDEO_OUT signal near 0.0 V?

Is the VIDEO_OUT signal at J574 pin 13, and is the black level of the VIDEO_OUT signal near 0.0 V?
- No → Check and repair the A11 DRAM Processor/Display board.
- Yes → Is the VIDEO_OUT signal at the base of Q464, and is the black level of the signal near 0.0 V?

Is the VIDEO_OUT signal at the base of Q464, and is the black level of the signal near 0.0 V?
- No → Check and repair Q464, R572, and associated circuitry.
- Yes → Is there 50 VDC at R353?

Is there 50 VDC at R353?
- No → Check and repair the path from R353 to T225.
- Yes → Is the video signal at the collector of Q456 absent, compressed, or at less than a 45 VDC level?

Is the video signal at the collector of Q456 absent, compressed, or at less than a 45 VDC level?
- No → While adjusting R569 does the voltage at V1000 pin 1 vary from −20 V to +30 V, and does the bright field on the display screen vary?
- Yes → Check and repair Q456, Q462, Q464, and associated circuitry.

While adjusting R569 does the voltage at V1000 pin 1 vary from −20 V to +30 V, and does the bright field on the display screen vary?
- No → Turn off the oscilloscope power. Disconnect P1000. Turn on the oscilloscope power.
- Yes → Replace V1000.

Turn off the oscilloscope power. Disconnect P1000. Turn on the oscilloscope power.
→ While adjusting R569 does the voltage at V1000 pin 1 vary from −20 V to +30 V?

While adjusting R569 does the voltage at V1000 pin 1 vary from −20 V to +30 V?
- No → Is the anode voltage of CR246 at −165 VDC?
- Yes → Replace V1000.

Is the anode voltage of CR246 at −165 VDC?
- No → Check and repair T225, CR246, C453, and associated circuitry.
- Yes → Is the voltage at V1000 pin 1 greater than +30 V?

Is the voltage at V1000 pin 1 greater than +30 V?
- No → Check and repair R552, R554, R569, and associated circuitry.
- Yes → Check and repair C447 and associated circuitry.

CAUTION

Loss of vertical or horizontal deflection may cause CRT phosphor damage. After the deflection failure is repaired, check for CRT phosphor damage.

Is the only display on-screen a bright horizontal line with no vertical scan?
- No → Is the only display on-screen a bright vertical line?
- Yes → Is there a signal at U428 pin 4?

Is there a signal at U428 pin 4?
- No → Check and repar U428 and associated circuitry.
- Yes → Is there a ramp signal at R335?

Is there a ramp signal at R335?
- No → Check and repair J340, P340, L100B, and associated circuitry.
- Yes → Check and repair R335 and associated circuitry.

Is the only display on-screen a bright vertical line?
- No → Is the display unsynchronized?
- Yes → Is the CRT anode voltage (CRT_ANODE) low?

Is the CRT anode voltage (CRT_ANODE) low?
- No → Is the display unsynchronized?
- Yes → Check and repair L100A, C320, L100, L105, and associated circuitry.

Is the display unsynchronized?
- No → Perform the Display Distortion troubleshooting procedure.
- Yes → Is the vertical sync defective (horizontal bars and a vertically rolling display)?

Is the vertical sync defective (horizontal bars and a vertically rolling display)?
- No → Is the horizontal sync defective (diagonal bars)?
- Yes → Are there vertical sync pulses at J574 pin 10?

Are there vertical sync pulses at J574 pin 10?
- No → Trace the signal to its source on the A11 DRAM Processor/Display board.
- Yes → Is the signal (much smaller and differentiated (spikes)) at U428 pin 8?

Is the signal (much smaller and differentiated (spikes)) at U428 pin 8?
- No → Check and repair R47, R558, C535, C545, and associated circuitry.
- Yes → Check and repair R529, C526, U428, and associated circuitry.

Is the horizontal sync defective (diagonal bars)?
- No → Perform the Display Distortion troubleshooting procedure.
- Yes → Are there horizontal sync pulses at J574 pin 8?

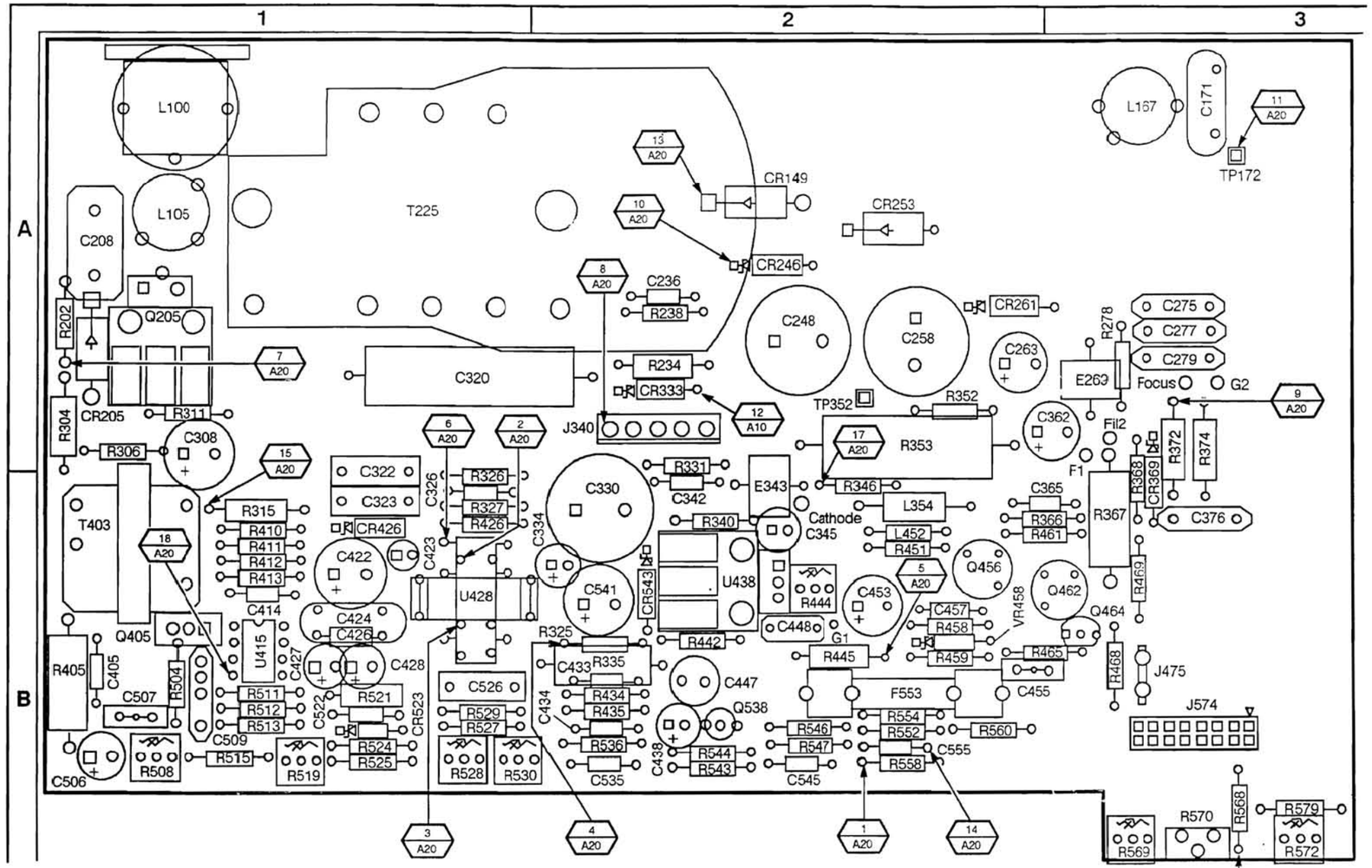
Are there horizontal sync pulses at J574 pin 8?
- No → Trace the signal to its source on the A11 DRAM Processor/Display board.
- Yes → Can the sync problem be corrected by the adjustment of R508?

Can the sync problem be corrected by the adjustment of R508?
- No → Is a differentiated version of the sync pulse at U415 pin 3?
- Yes → Done.

Is a differentiated version of the sync pulse at U415 pin 3?
- No → Check and repair C522, C555, CR523, R511, R524, and associated circuitry.
- Yes → Is the horizontal ramp at U415 pin 4?

Is the horizontal ramp at U415 pin 4?
- No → Check and repair R311, R411, R519, C208, C426, and C509.
- Yes → Replace U415.

Vol. 2 Figure 9-165: Video, Sync, and Scan Troubleshooting Procedure



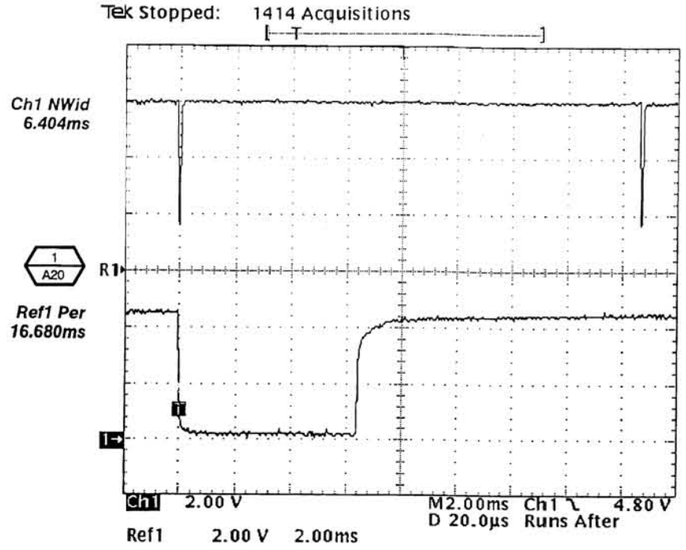
Vol. 2 Figure 9-166: A20 CRT Driver Board

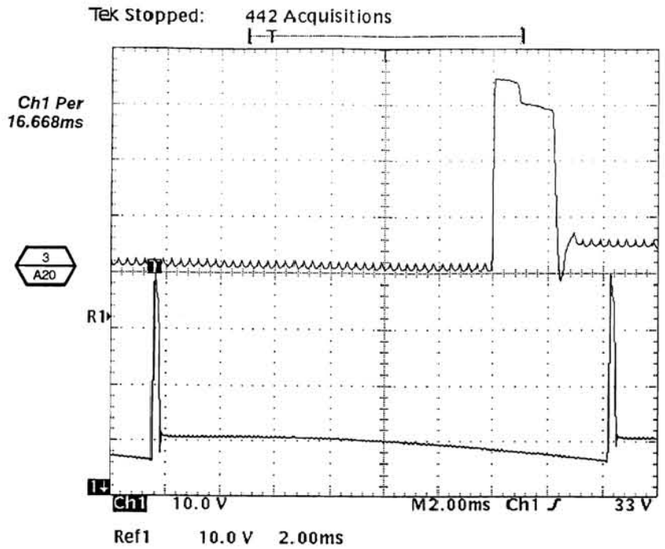
Scans by Artekmedia => 2011

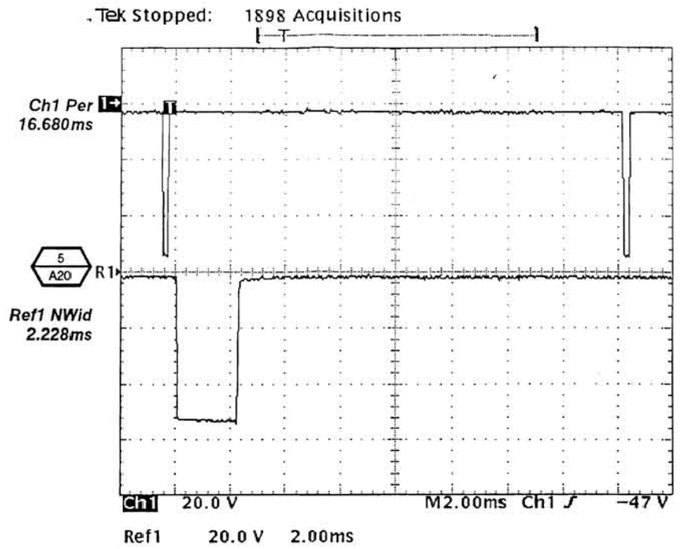
A20 CRT Driver Component Locator

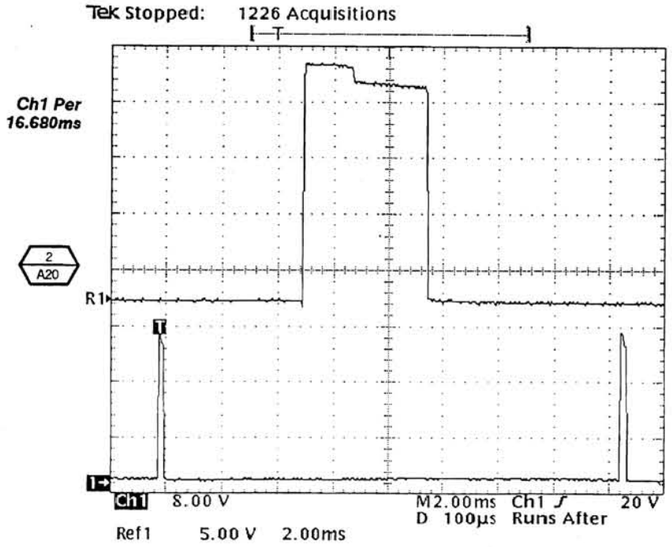
CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C171	A20-1	4C	A20	3A	C448	A20-1	5B	A20	2B	L100	A20-1	3D	A20	1A	R366	A20-2	3D	A20	3B	R524	A20-2	2B	A20	1B
C208	A20-2	2C	A20	1A	C453	A20-1	4C	A20	2B	L100A	A20-1	6D	A20	1A	R367	A20-2	4C	A20	3B	R527	A20-1	2A	A20	1B
C236	A20-1	3C	A20	2A	C455	A20-2	3A	A20	2B	L100B	A20-1	6A	A20	1A	R368	A20-1	5C	A20	3B	R528	A20-1	3B	A20	1B
C248	A20-2	2A	A20	2A	C457	A20-2	2D	A20	2B	L105	A20-1	3D	A20	1A	R372	A20-1	5C	A20	3A	R529	A20-1	2B	A20	1B
C258	A20-1	2C	A20	2A	C506	A20-1	2C	A20	1B	L167	A20-1	4C	A20	3A	R374	A20-2	4D	A20	3A	R530	A20-1	2A	A20	1B
C263	A20-1	3C	A20	2A	C507	A20-1	1D	A20	1B	L354	A20-2	3C	A20	2B	R405	A20-1	2C	A20	1B	R536	A20-1	3A	A20	2B
C275	A20-1	3C	A20	3A	C509	A20-2	3C	A20	1B	L452	A20-2	3C	A20	2B	R410	A20-1	3B	A20	1B	R543	A20-1	4B	A20	2B
C277	A20-1	3C	A20	3A	C522	A20-2	3B	A20	1B						R411	A20-2	2C	A20	1B	R544	A20-1	4B	A20	2B
C279	A20-1	4C	A20	3A	C526	A20-1	2B	A20	1B	Q205	A20-1	2C	A20	1A	R412	A20-2	4B	A20	1B	R546	A20-1	4A	A20	2B
C308	A20-1	2C	A20	1A	C535	A20-1	2B	A20	2B	Q405	A20-1	2D	A20	1B	R413	A20-2	4B	A20	1B	R547	A20-1	2B	A20	2B
C320	A20-1	3D	A20	1A	C541	A20-2	2A	A20	2B	Q456	A20-2	3D	A20	2B	R426	A20-1	4A	A20	1B	R552	A20-1	4C	A20	2B
C322	A20-1	3B	A20	1B	C545	A20-1	1B	A20	2B	Q462	A20-2	3D	A20	3B	R434	A20-1	4A	A20	2B	R554	A20-1	4B	A20	2B
C323	A20-1	3B	A20	1B	C555	A20-2	2B	A20	2B	Q464	A20-2	2D	A20	3B	R435	A20-1	4A	A20	2B	R558	A20-1	1B	A20	2B
C326	A20-1	4A	A20	1B						Q538	A20-1	4B	A20	2B	R442	A20-2	2A	A20	2B	R560	A20-1	4C	A20	2B
C330	A20-1	5A	A20	2B	CR149	A20-1	2C	A20	2A						R444	A20-2	2A	A20	2B	R568	A20-2	2D	A20	3B
C334	A20-1	4A	A20	2B	CR205	A20-1	2D	A20	1A	R202	A20-1	2D	A20	1A	R445	A20-1	5A	A20	2B	R569	A20-1	4C	A20	3B
C345	A20-2	2A	A20	2B	CR246	A20-1	4C	A20	2A	R234	A20-1	3D	A20	2A	R451	A20-2	3C	A20	2B	R570	A20-1	4C	A20	3B
C362	A20-1	3C	A20	3A	CR253	A20-1	3C	A20	2A	R238	A20-1	3C	A20	2A	R458	A20-2	2D	A20	2B	R572	A20-2	2D	A20	3B
C365	A20-2	3D	A20	3B	CR261	A20-1	3C	A20	2A	R278	A20-1	3C	A20	3A	R459	A20-2	2C	A20	2B	R579	A20-2	2D	A20	3B
C376	A20-1	5C	A20	3B	CR333	A20-1	3D	A20	2A	R304	A20-1	2C	A20	1A	R461	A20-2	3D	A20	3B					
C405	A20-1	2C	A20	1B	CR369	A20-1	4C	A20	3B	R306	A20-1	2D	A20	1A	R465	A20-2	2D	A20	2B	T225	A20-1	2B	A20	1A
C414	A20-2	4B	A20	1B	CR426	A20-1	2A	A20	1B	R311	A20-2	2C	A20	1A	R468	A20-1	4B	A20	3B	T403	A20-1	2D	A20	1B
C422	A20-1	2A	A20	1B	CR523	A20-2	2B	A20	1B	R315	A20-1	1D	A20	1B	R469	A20-1	4C	A20	3B					
C423	A20-2	2A	A20	1B	CR543	A20-2	2A	A20	2B	R325	A20-1	5A	A20	2B	R504	A20-1	2D	A20	1B	TP172	A20-1	4C	A20	3A
C424	A20-2	4B	A20	1B						R326	A20-1	3B	A20	1B	R508	A20-2	4B	A20	1B	TP352	A20-2	2A	A20	2A
C426	A20-2	3B	A20	1B	E343	A20-2	3C	A20	2B	R327	A20-1	4A	A20	1B	R511	A20-2	3B	A20	1B					
C427	A20-2	4B	A20	1B						R335	A20-1	5A	A20	2B	R512	A20-2	3B	A20	1B	U415	A20-2	3B	A20	1B
C428	A20-2	3B	A20	1B	F553	A20-2	1A	A20	2B	R340	A20-2	2A	A20	2B	R513	A20-2	3B	A20	1B	U428	A20-1	2A	A20	1B
C433	A20-1	3A	A20	2B						R346	A20-2	3C	A20	2B	R515	A20-2	4B	A20	1B	U438	A20-2	2A	A20	2B
C434	A20-1	4A	A20	2B	J340	A20-1	6A	A20	2A	R352	A20-1	3C	A20	2A	R519	A20-2	3B	A20	1B					
C438	A20-1	4A	A20	2B	J574	A20-2	1A	A20	3B	R353	A20-2	3C	A20	2A	R521	A20-2	3B	A20	1B	VR458	A20-2	2D	A20	2B
C447	A20-1	4A	A20	2B																				

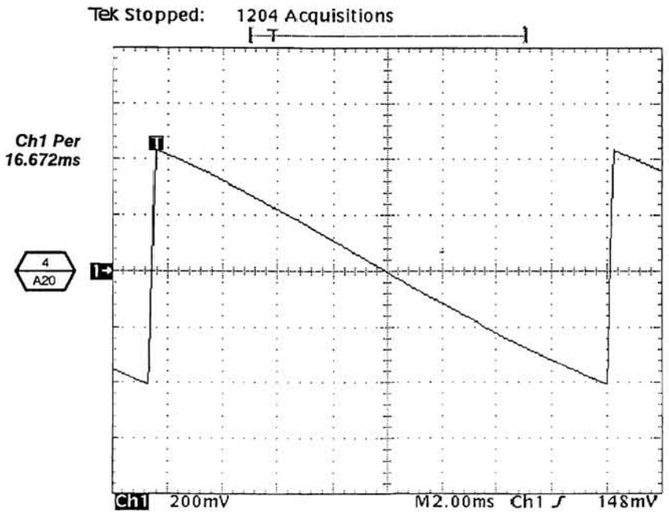
*Asterisks indicate components located on the back of the board.

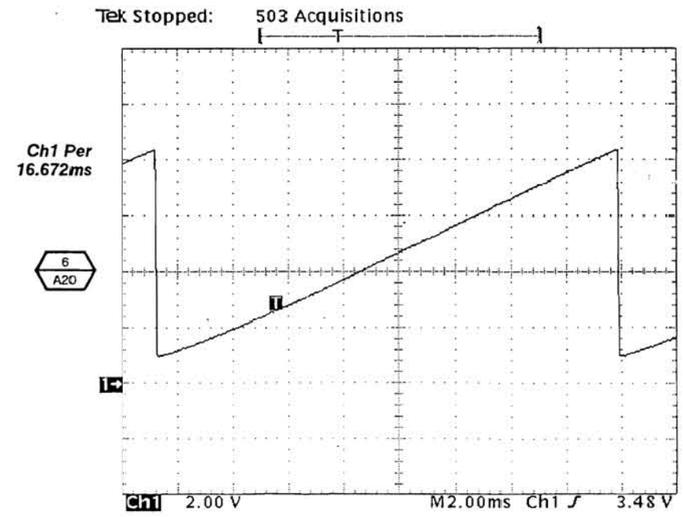






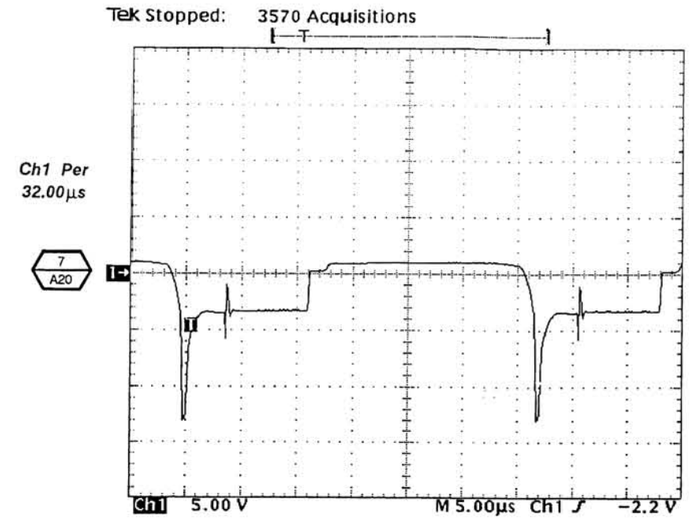


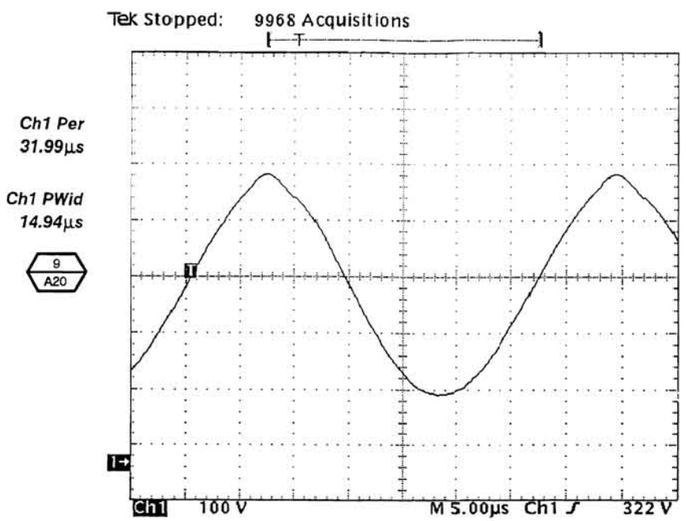


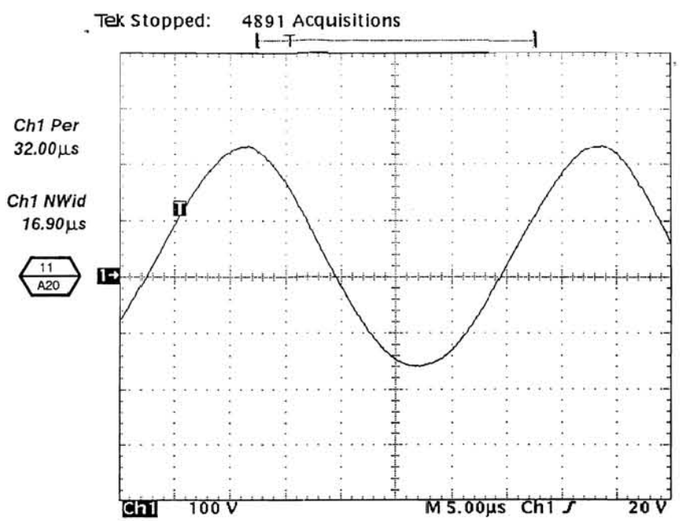


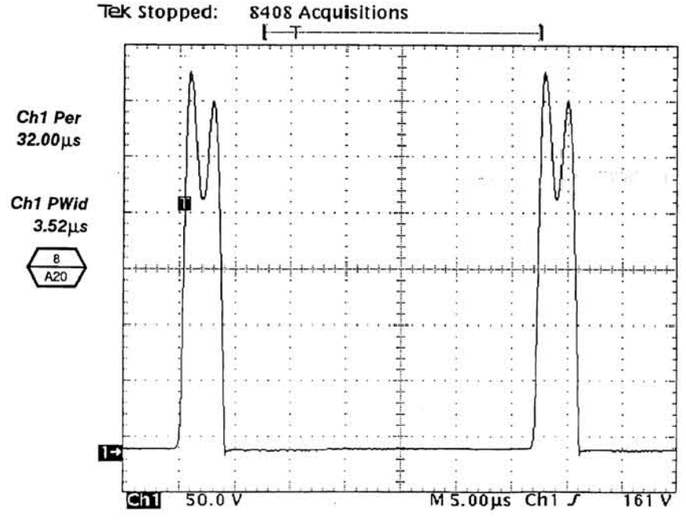
Vol. 2 Figure 9-167: A20 CRT Driver Waveforms

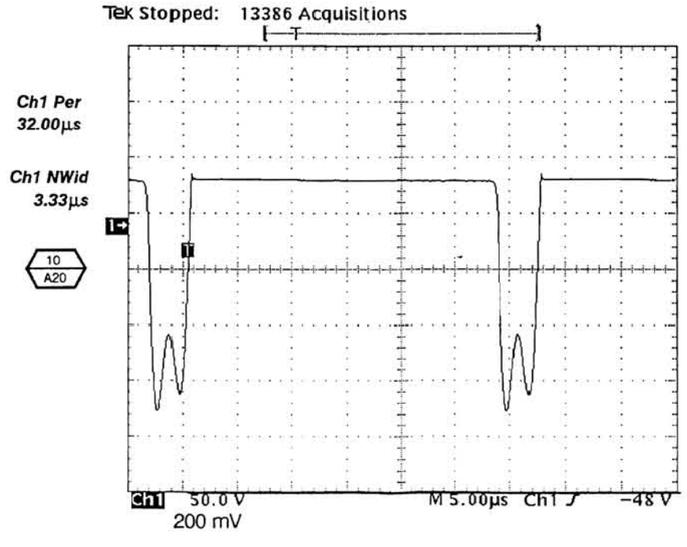
Scans by Artekmedia => 2011

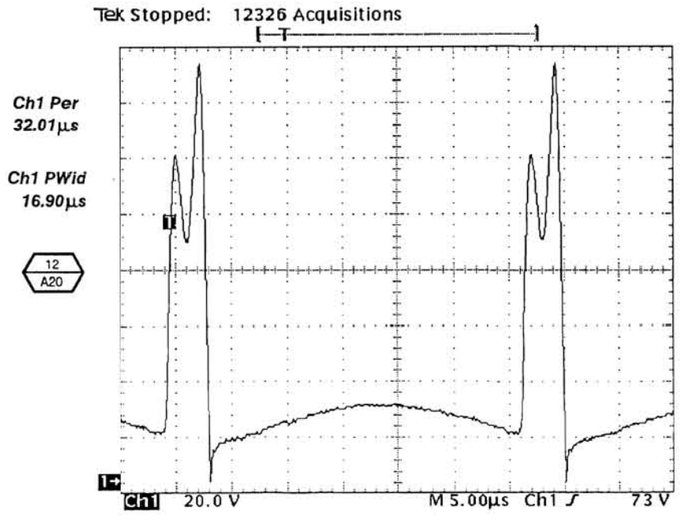




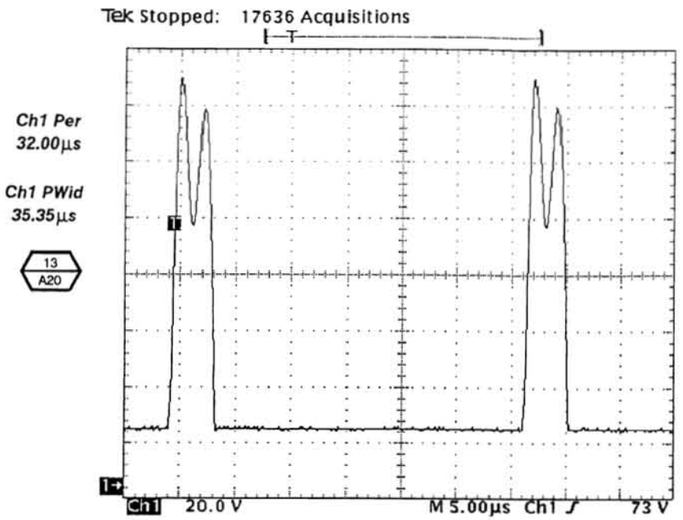


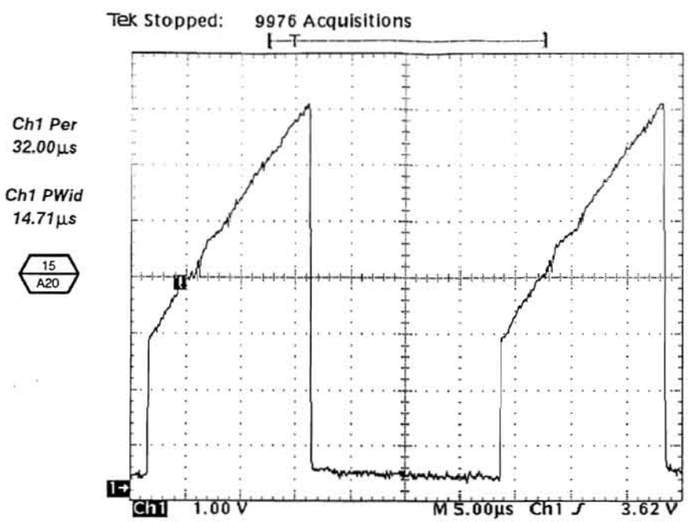


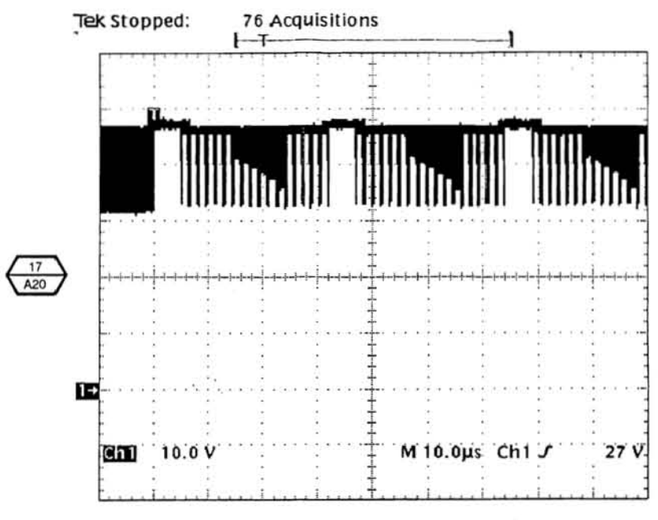


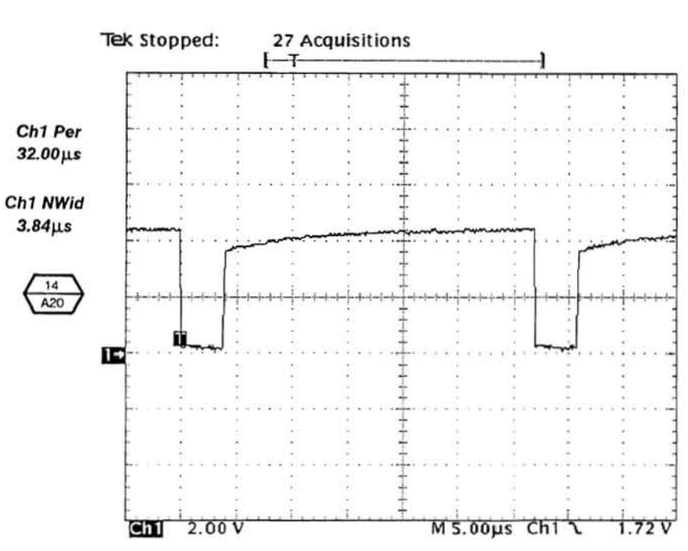


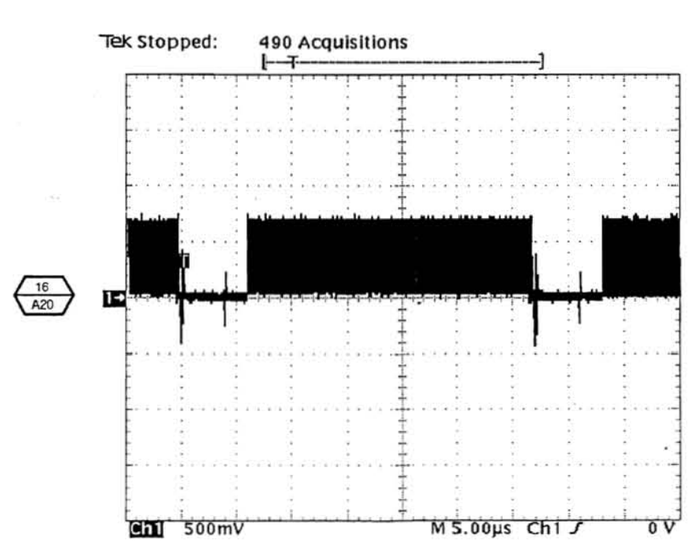
Vol. 2 Figure 9-167: A20 CRT Driver Waveforms (Cont.)

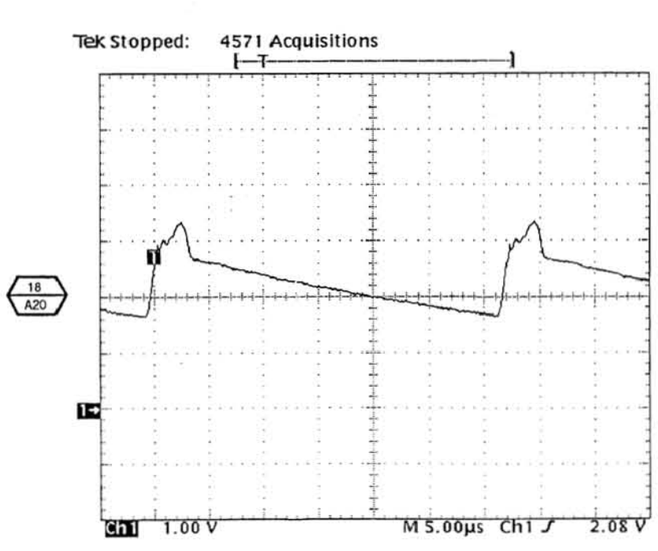








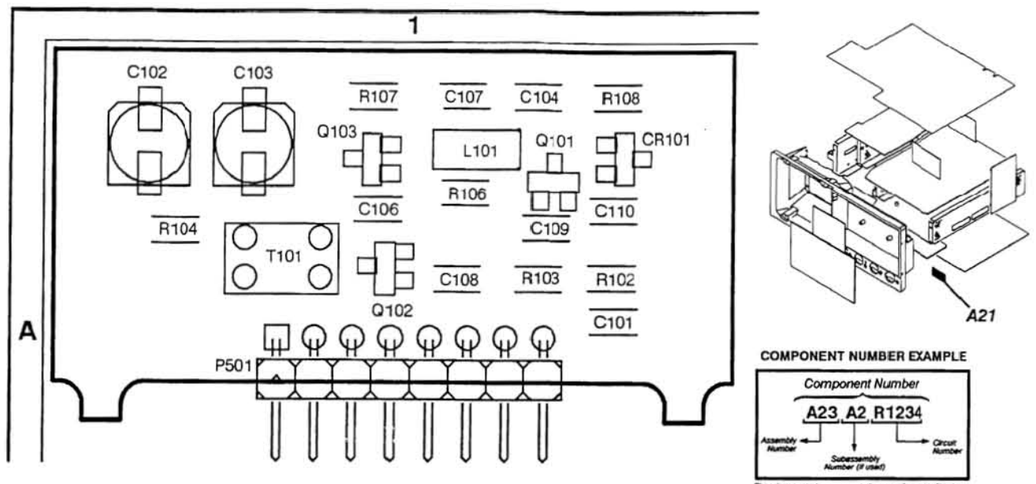




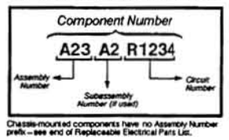
Vol. 2 Figure 9-167: A20 CRT Driver Waveforms (Cont.)

Scans by ArtekMedia => 2011

Scans by Artekmedia => 2011



COMPONENT NUMBER EXAMPLE



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

STATIC SENSITIVE DEVICES

Vol. 2 Figure 9-168: A21 VCO Board

Scans by ArtekMedia => 2011

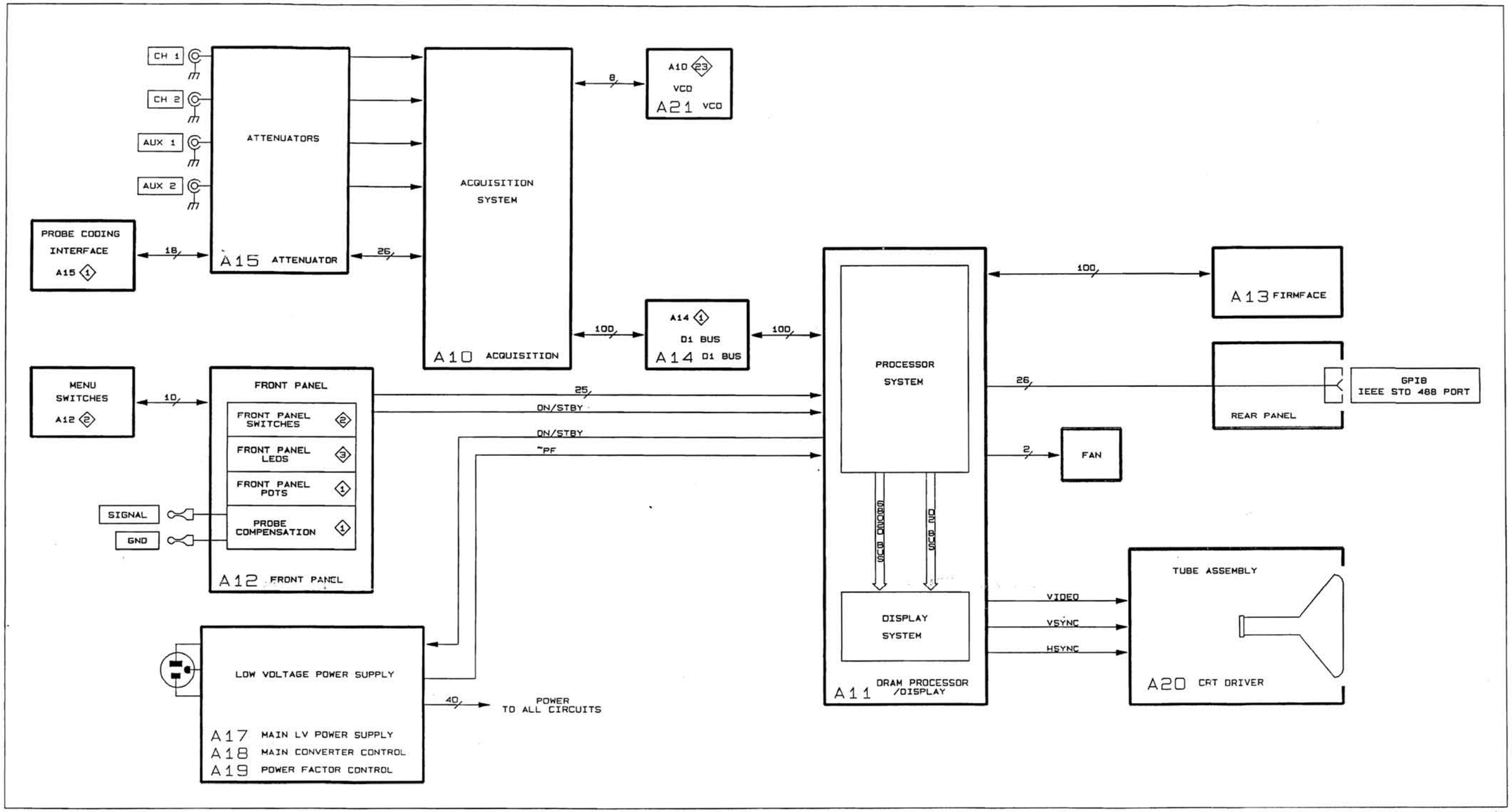
Scans by Artekmedia => 2011

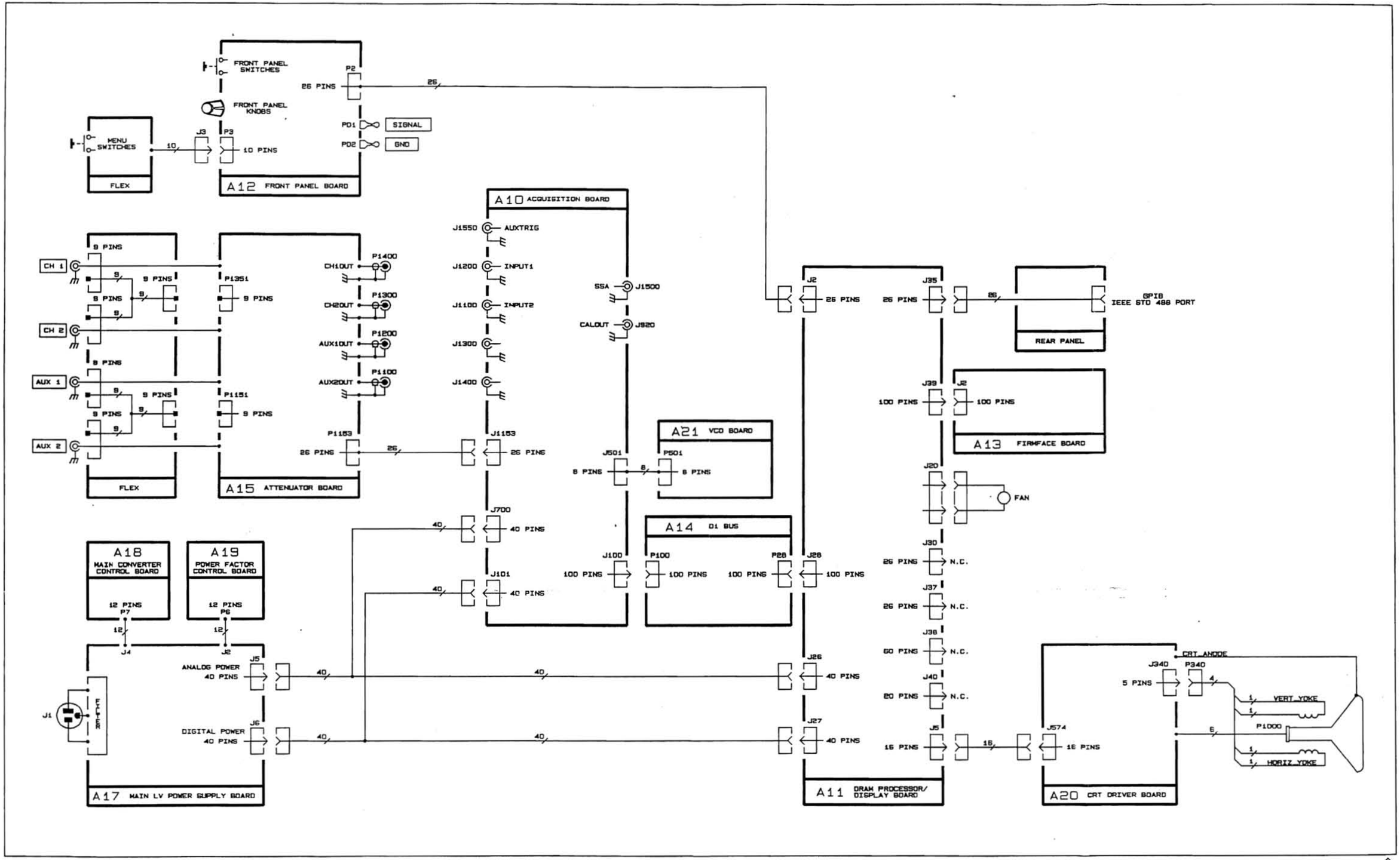
A21 VCO Board Component Locator

CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION	CIRCUIT NUMBER	SCHEM NUMBER	SCHEM LOCATION	BOARD NUMBER	BOARD LOCATION
C101	A21-1	4A	A21	1A	C109	A21-1	5A	A21	1A	P501B	A21-1	6A	A21	1A	Q101	A21-1	5A	A21	1A	R104	A21-1	5A	A21	1A
C102	A21-1	4A	A21	1A	C110	A21-1	5A	A21	1A	P501C	A21-1	6A	A21	1A	Q102	A21-1	5A	A21	1A	R106	A21-1	5B	A21	1A
C103	A21-1	5A	A21	1A						P501D	A21-1	4A	A21	1A	Q103	A21-1	6A	A21	1A	R107	A21-1	6B	A21	1A
C104	A21-1	5A	A21	1A	CR101	A21-1	5A	A21	1A	P501E	A21-1	4A	A21	1A						R108	A21-1	5A	A21	1A
C106	A21-1	5B	A21	1A						P501F	A21-1	4A	A21	1A	R102	A21-1	4A	A21	1A					
C107	A21-1	4B	A21	1A						P501G	A21-1	4A	A21	1A	R103	A21-1	5B	A21	1A	T101	A21-1	6A	A21	1A
C108	A21-1	4B	A21	1A	P501A	A21-1	4A	A21	1A	P501H	A21-1	4B	A21	1A										

*Asterisks indicate components located on the back of the board.

Schematics


CH 1
CH 2
AUX 1
AUX 2
ATTENUATORS
A15 ATTENUATOR
PROBE CODING INTERFACE
A15 1
18
26
ACQUISITION SYSTEM
A10 ACQUISITION
8
A10 23
VCO
A21 VCO
100
A14 1
D1 BUS
A14 D1 BUS
100
MENU SWITCHES
A12 2
10
FRONT PANEL
FRONT PANEL SWITCHES 2
FRONT PANEL LEDS 3
FRONT PANEL POTS 1
PROBE COMPENSATION 1
SIGNAL
GND
A12 FRONT PANEL
25
ON/STBY
ON/STBY
~PF
PROCESSOR SYSTEM
9600 BPS
DVD BPS
DISPLAY SYSTEM
A11 DRAM PROCESSOR /DISPLAY
100
A13 FIRMFACE
26
REAR PANEL
GPIB
IEEE STD 488 PORT
2
FAN
VIDEO
VSYNC
HSYNC
TUBE ASSEMBLY
A20 CRT DRIVER
LOW VOLTAGE POWER SUPPLY
40
POWER
TO ALL CIRCUITS
A17 MAIN LV POWER SUPPLY
A18 MAIN CONVERTER CONTROL
A19 POWER FACTOR CONTROL


FRONT PANEL SWITCHES
FRONT PANEL KNOBS
MENU SWITCHES
FLEX
A12 FRONT PANEL BOARD
26 PINS
10 PINS
SIGNAL
GND
A10 ACQUISITION BOARD
AUXTRIG
INPUT1
INPUT2
SSA
CALOUT
CH 1
CH 2
AUX 1
AUX 2
9 PINS
A15 ATTENUATOR BOARD
CH1OUT
CH2OUT
AUX1OUT
AUX2OUT
A21 VCO BOARD
A14 D1 BUS
A18 MAIN CONVERTER CONTROL BOARD
A19 POWER FACTOR CONTROL BOARD
12 PINS
ANALOG POWER
DIGITAL POWER
40 PINS
A17 MAIN LV POWER SUPPLY BOARD
A11 DRAM PROCESSOR/ DISPLAY BOARD
REAR PANEL
GPIB IEEE STD 488 PORT
A13 FIRMFACE BOARD
FAN
N.C.
A20 CRT DRIVER BOARD
CRT ANODE
VERT YOKE
HORIZ YOKE
P1000

A15 ATTENUATOR
CH 1
ATTENUATOR
CH 2
ATTENUATOR
AUX 1
ATTENUATOR
AUX 2
ATTENUATOR
PREAMP 1 ①
PREAMP 2 ②
+SIG34AB
+SIG12AB
+TRIG1
2X ATTEN ①
2X ATTEN ②
+CH3
+CH4
LOW VOLTAGE POWER SUPPLY A17 ①
LINETRIG
TRIGGER A ⑨
TRIGGER B ⑨
TRIGGER C ⑨
TRIGGER D ⑨
+TRIG2
SSA
AEVNT
BEVNT
CEVNT
DEVNT
EXTENDED TRIGGER ⑪
EEVNT
TGH
ATHO
A/D CONVERTER A ③
A/D CONVERTER B ④
CH2 CH1 CAL
A/D
DIV
CLKA
CLKB
-SIG34AB
+SIG34AB
-SIG12AB
+SIG12AB
CH1A
CH1B
DCLKA
CH2A
CH2B
DCLKB
VCO AND ACQUISITION CLOCKS ⑭
10MHz
ACQRST1
ACQCLK1
ACQCLK1
DSC500
FROM A14 D1 BUS
~TVTRIG
CLOCK TRIGGER LOGIC ⑩
ACQRST2
~SYSRESET
DEMULTIPLEXER A ⑤
DEMULTIPLEXER B ⑥
EPTHO
ACQON
PTAVAIL
AD[0..63]
AA[0..12]
BD[0..63]
BA[0..12]
ACQUISITION MEMORY A ⑤
ACQUISITION MEMORY B ⑥
D1 BUS
TO TRISTAR
LOW SPEED TRIGGER LOGIC ⑩
TTL
STRIGA, STRIGB
TIME INTERPOLATOR & JITTER RAMP 1 ⑦
TIME INTERPOLATOR & JITTER RAMP 2 ⑧
EDRAMP1
EDRAMP2
MAT
ACQUISITION CONTROL ⑪ ⑫ ⑬ ⑭ ⑮ ⑯
~HOSET
HOLDOFF[1..4]
ANALOG TRIGGER HOLDOFF ⑫
MTHO
TO A14 D1 BUS

PREAMP 1 CONTROL BUFFERS

J1200 1 INPUT1
2, 3, 4

J1200SHLD
J1200SHLD TO [4B] 12

C1216 1.0uF
C1217 0.1
C1207 1.0uF

U1202C TL074CD
R1210 1.00kM
R1211 22.1kM
R1212 1.00kM
R1205 18.2kM

L1201 FB52
R1217 100M

FROM [5B] 13 DCBAL1 ±1.71V
R940 39.2
C1201 0.1
U1201C TL074CD
TP1202
R1202 1.00kM

FROM [4A] 13 VARGAIN1 ±1.71V
R943 39.2
C1205 0.1
U1202B TL074CD
TP1205

FROM [5C] 13 FOFFSET1 ±1.71V
R944 39.2
C1202 0.1
U1201B TL074CD
TP1203
R1203 1.82k

FROM [5C] 13 OFFSET1 ±1.71V
R945 5.62k
C946 .001M
C1203 0.1
U1201A TL074CD
VCC5P
VEE5P
TP1204
R1204 49.9M

FROM [4A] 13 HF1 ±1.71V
R942 39.2
C1206 0.1
U1201D TL074CD
TP1206

U1203 74HCT164
FROM [3C] 15 CC1A
FROM [6D] 15 CD
+5V
CLK

U1204 74HCT164
CALSELA TO [1A] 3
SIG34SELA TO [1A] 3
FLTSELA TO [1A] 3
DIAG1A TO [28] 16

PREAMP CONTROL 1

J1300 1
R1597 33.2M
R1595 182M
R1596 82.5
+CALA TO [3D] 3
+CH3 TO [1A] 9

L1205 FB52
+15V
C1208 10uF
C1215 0.1M
TP1208
+15V2

C1411 0.1M
L1102 FB52M
L1202 FB52M
C1109 33uF
TP1409
-5.1V
VEE5P

U1200 155-0378
+VIN 24
-VIN 21
VAR 20
HF1 39
HF2 43
HF3 3
+POS 38
-POS 36
NC 23
NC 25
STB 28
G0 29
G1 30
G2 31
B0 32
B1 33
OUT3EN 7
OUT3INV 8
OUT2EN 9
OUT2INV 10
OUT1EN 13
OUT1INV 14
VCC15 26 +15V2
VCC5 11,35 VCC5P C1214 0.1M
GND 12,20,37
VEE5 15,34 C1213 0.1M VEE5P
+OUT1 40 +SIG34AB TO [1A] 3 4
-OUT1 42 -SIG34AB TO [1A] 3 4
+OUT2 44 +SIG12AB TO [1A] 3 4
-OUT2 2 -SIG12AB TO [1A] 3 4
+OUT3 4 TP1209 +TRIG1 TO [1D] 9
-OUT3 6 L1501 180nHM R1501 33.2M R1206 100 -TRIG1 TO [1A] 9

PREAMP 1

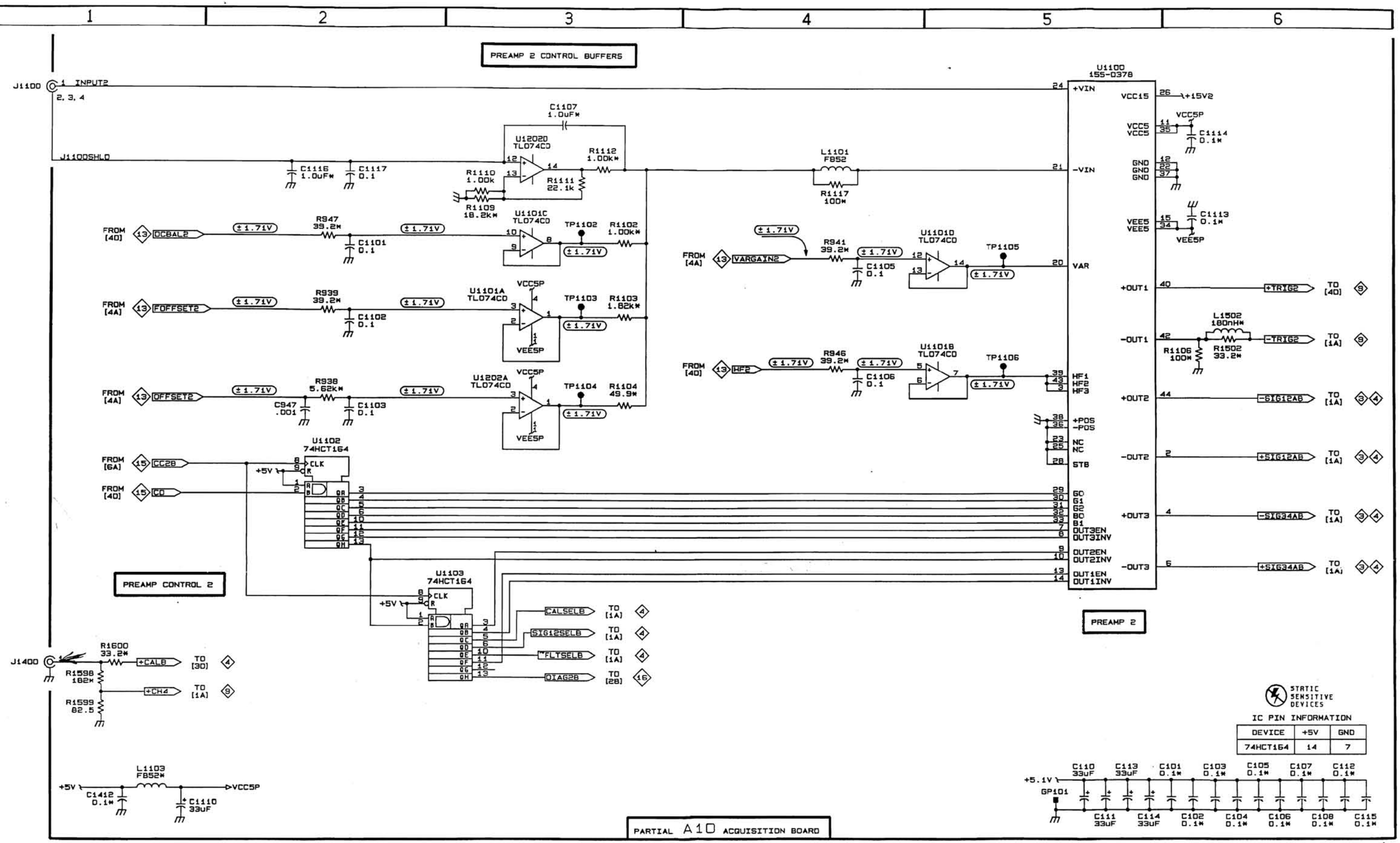
STATIC SENSITIVE DEVICES

IC PIN INFORMATION

DEVICE	+5V	GND
74HCT164	14	7

+5.1V GP201
C210 33uF
C213 33uF
C201 0.1M
C203 0.1M
C205 0.1M
C207 0.1M
C212 0.1M
C211 33uF
C214 33uF
C202 0.1M
C204 0.1M
C206 0.1M
C208 0.1M
C215 0.1M

PARTIAL A10 ACQUISITION BOARD


PREAMP 2 CONTROL BUFFERS
PREAMP CONTROL 2
PREAMP 2
PARTIAL A10 ACQUISITION BOARD
J1100
INPUT2
J1100SHLD
U1100
155-0378
U1102
74HCT164
U1103
74HCT164
U1101A
TL074CD
U1101B
TL074CD
U1101C
TL074CD
U1101D
TL074CD
U1202A
TL074CD
U1202D
TL074CD
FROM [4D]
FROM [4A]
FROM [6A]
FROM [4D]
DCBAL2
FOFFSET2
OFFSET2
CC2B
CD
VARGAIN2
HF2
CALSELB
SIG12SELB
FLTSELB
DIAG2B
J1400
+CALB
+CH4
+15V2
+TRIG2
-TRIG2
-SIG12AB
+SIG12AB
-SIG34AB
+SIG34AB
+5.1V
GP101
STATIC SENSITIVE DEVICES
IC PIN INFORMATION
DEVICE | +5V | GND
74HCT164 | 14 | 7

A/D CONVERTER A

STATIC SENSITIVE DEVICES

U750 A/D_CNVTR

FROM [6B] 1 / [6C] 2 +SIG12AB
FROM [6C] 1 / [6B] 2 -SIG12AB
FROM [6B] 1 / [6C] 2 +SIG34AB
FROM [6C] 1 / [6B] 2 -SIG34AB
FROM [3C] 1 CALSELA
SIG34SELA
FROM [3D] 1 -FLTSELA
FROM [6D] 14 DIV
FROM [4B] 13 +VREFA
FROM [6D] 15 DITHER
FROM [4C] 13 -VREFA
FROM [4C] 13 HFADJA
FROM [4D] 13 OFFSET3
FROM [6C] 14 CLKA / -CLKA
FROM [6C] 15 A-B
FROM [1D] 1 +CALA

+CH1 17
-CH1 15
+CH2 4
-CH2 6
CALSEL 2
CH2SEL 1
-FLTSEL 84
DIV 74
VARTS 34
VART 35
VARB 30
VARBS 31
NC 10, 13, 22, 32, 33
HFADJ 21
A-B 69
MOD 73
-CAL 9
+CAL 12
+CLK 23
-CLK 24
+CLK 83
-CLK 82
CVRTADJ 79
LINADJ 80
SMPLADJ 76
SUB 56
+FLTIN 26
+FLTOUTA
+FLTO 19
-FLTOUTA
-FLTO 20
-FLTIN 27

R778 3.92kΩ, R782 3.92kΩ, R781 3.92kΩ, R780 3.92k, TP764
R776 3.92kΩ
R774 3.92k
R777 3.32kΩ, R775 3.32kΩ, R773 3.32kΩ
VEEA
TP765, TP766
R754 3.92kΩ
C753 0.1μ, +5DCPLA, R755 100Ω
U751C TL074CD
R756 3.92kΩ, C762 100Ω, CR754A, TP755, L755 FB52
C754 .01μ, Q755
C756 0.1μ, R641 1.00kΩ
-3.5V TO +4V
-0.24V TO +1.3V
-3.5V TO +2V
C641 .001μ
CR755, CR756
TP758, L758 FB52
C755 .01μ, Q758
C758 0.1μ
U751D TL074CD
R764 3.92k, C764 100Ω, CR754B
-1.3V TO +0.24V
R758 100Ω
-5DCPLA
C757 0.1μ
R757 3.92kΩ
U751A TL074CD
C786 .001μ
CR758, CR759
TP759
R759 100Ω, C759 0.1μ
±1.3V
TP763
C760 0.1μ
U751B TL074CD
C765 0.1μ
R770 221Ω
TP757
-CALA
R752 82.5Ω, R753 82.5Ω, R751 121Ω, R750 121Ω
TP761, C761 0.1
TP762, C763 0.1
±1.71V
±1.3V

TP225 TP224 TP223 TP222 TP221 TP220 TP219 TP218
A0 40, A1 43, A2 46, A3 49, A4 59, A5 62, A6 65, A7 68
R225 82.5Ω CH1A0
R224 82.5Ω CH1A1
R223 82.5Ω CH1A2
R222 82.5Ω CH1A3
R221 82.5Ω CH1A4
R220 82.5Ω CH1A5
R219 82.5Ω CH1A6
R218 82.5Ω CH1A7
R230 475, R231 475, R232 475, R233 475, R234 475, R235 475, R200 475, R201 475
VEEA
8 CH1A [0..7] TO [1A] 5
CH1A [0..7]

TP217 TP216 TP215 TP214 TP213 TP212 TP211 TP210
B0 38, B1 41, B2 44, B3 47, B4 57, B5 60, B6 63, B7 66
R217 82.5Ω CH1B0
R216 82.5Ω CH1B1
R215 82.5Ω CH1B2
R214 82.5Ω CH1B3
R213 82.5Ω CH1B4
R212 82.5Ω CH1B5
R211 82.5Ω CH1B6
R210 82.5Ω CH1B7
R202 475, R203 475, R204 475, R205 475, R206 475, R207 475, R208 475, R209 475
VEEA
8 CH1B [0..7] TO [1A] 5
CH1B [0..7]

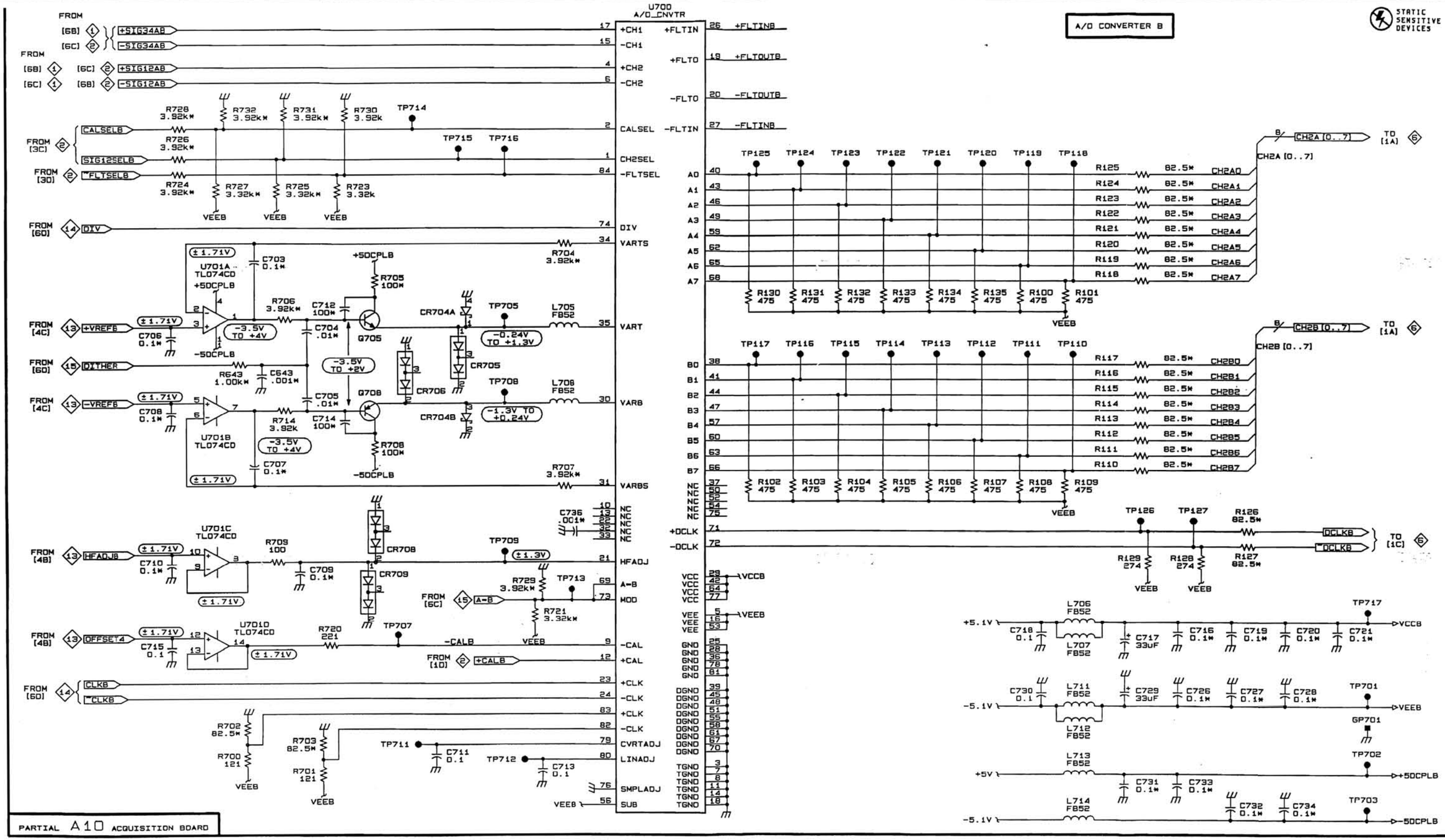
NC 37, 50, 52, 54, 75

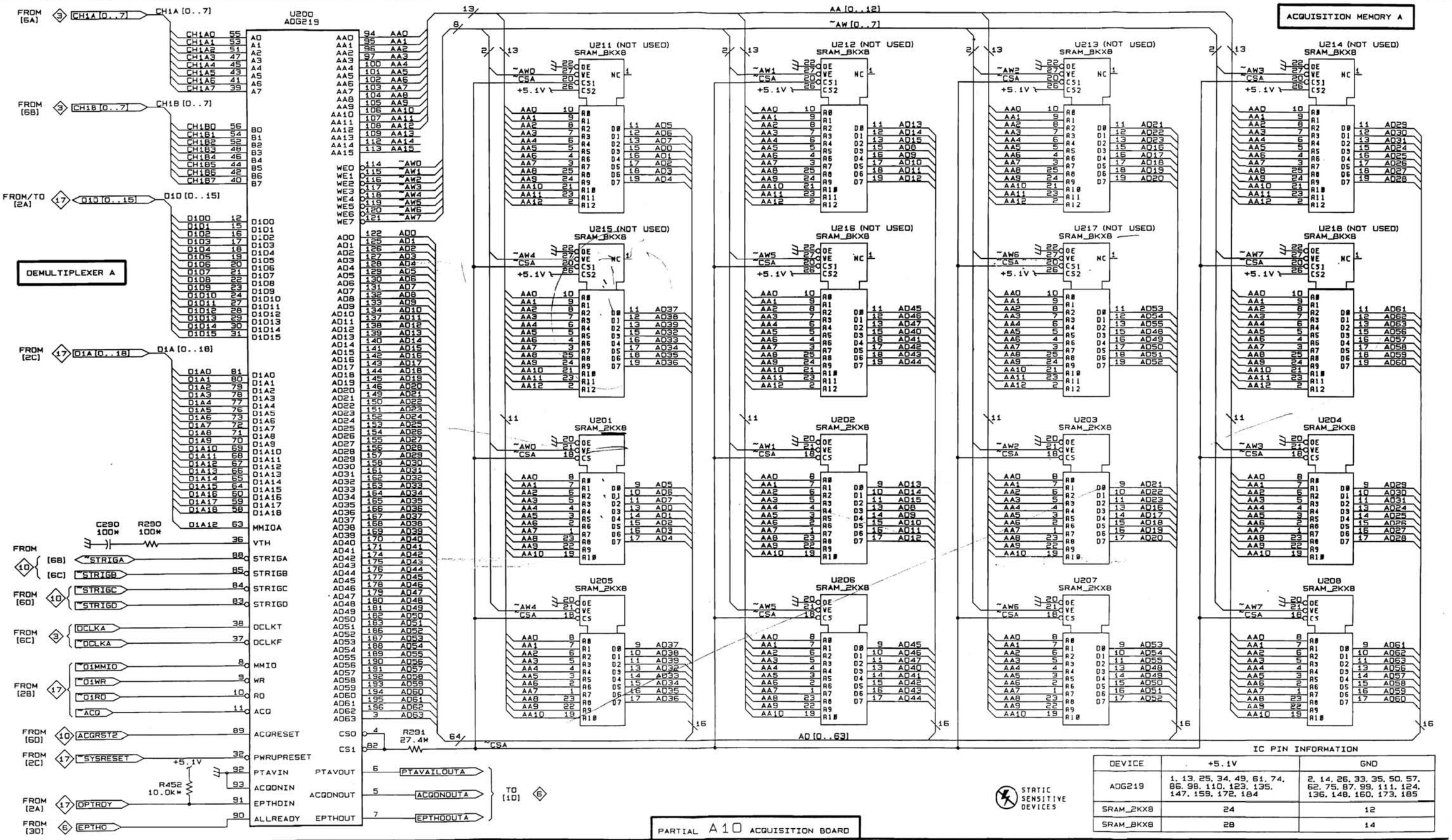
+DCLK 71
-DCLK 72
TP226, TP227
R226 82.5Ω, R227 82.5Ω
R229 274, R228 274
VEEA
DCLKA, -DCLKA TO [1C] 5

VCC 29, 42, 64, 77 → VCCA
VEE 5, 16, 53 → VEEA
GND 25, 28, 36, 76, 81
DGND 39, 45, 48, 51, 55, 58, 61, 67, 70
TGND 3, 7, 8, 11, 14, 18

+5.1V: L756 FB852, C738 0.1, L757 FB852, C767 33μF, C766 0.1μ, C769 0.1μ, C770 0.1μ, C771 0.1μ, TP767, VCCA
-5.1V: C730 0.1, L761 FB852, L762 FB852, C779 33μF, C776 0.1μ, C777 0.1μ, C778 0.1μ, TP751, VEEA, GP751
+5V: L763 FB852, C781 0.1, C783 0.1μ, TP752, +5DCPLA
-5.1V: L764 FB852, C782 0.1, C784 0.1μ, TP753, -5DCPLA

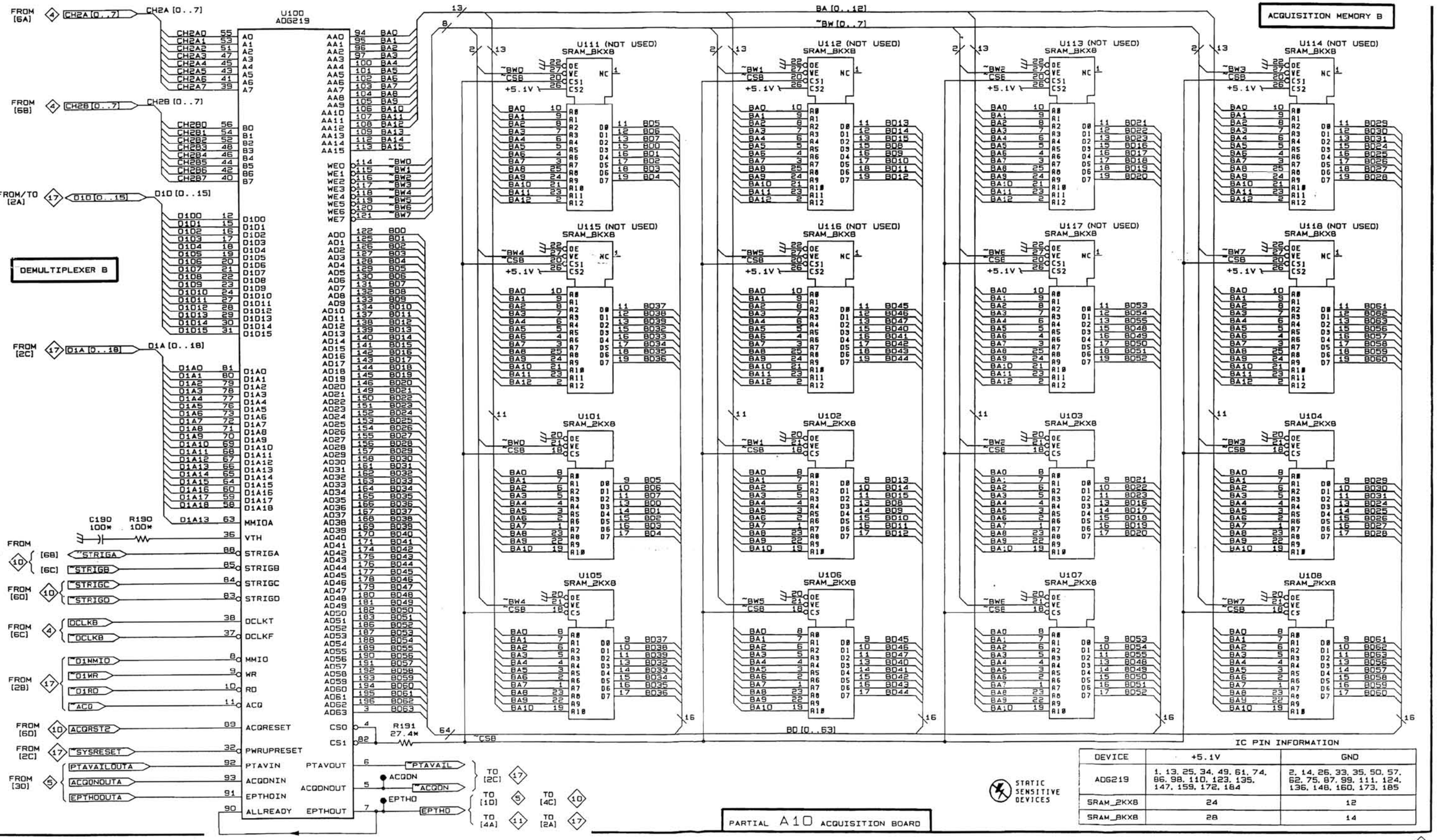
PARTIAL A10 ACQUISITION BOARD


A/D CONVERTER B
STATIC SENSITIVE DEVICES
U700 A/D_CNVTR
FROM [6B] 1 +SIG34AB
FROM [6C] 2 -SIG34AB
FROM [6B] 1 [6C] 2 +SIG12AB
FROM [6C] 1 [6B] 2 -SIG12AB
R728 3.92kM
R732 3.92kM
R731 3.92kM
R730 3.92k
TP714
CALSELB
R726 3.92kM
TP715
TP716
FROM [3C] 2
SIG12SELB
FROM [3D] 2 *FLTSELB
R724 3.92kM
R727 3.32kM
R725 3.32kM
R723 3.32k
VEEB
FROM [6D] 14 DIV
R704 3.92kM
±1.71V
U701A TL074CD
C703 0.1M
+5DCPLB
R705 100M
R706 3.92kM
C712 100M
CR704A
TP705
L705 FB52
FROM [4C] 13 +VREFB
C706 0.1M
-3.5V TO +4V
Q705
-0.24V TO +1.3V
-5DCPLB
FROM [6D] 15 DITHER
R643 1.00kM
C643 .001M
-3.5V TO +2V
C704 .01M
CR705
FROM [4C] 13 -VREFB
C708 0.1M
C705 .01M
Q708
CR706
TP708
L708 FB52
R714 3.92k
C714 100M
CR704B
-1.3V TO +0.24V
U701B TL074CD
-3.5V TO +4V
R708 100M
C707 0.1M
R707 3.92kM
VARTS
VART
VARB
VARBS
C736 .001M
NC
U701C TL074CD
FROM [4B] 13 HFADJB
R709 100
TP709
±1.3V
CR708
C710 0.1M
C709 0.1M
CR709
HFADJ
R729 3.92kM
TP713
A-B
FROM [6C] 15 A-B
MOD
R721 3.32kM
U701D TL074CD
FROM [4B] 13 OFFSET4
R720 221
TP707
-CALB
C715 0.1
-CAL
FROM [1D] 2 +CALB
+CAL
FROM [6D] 14 CLKB
*CLKB
+CLK
-CLK
R702 82.5M
R703 82.5M
R700 121
R701 121
TP711
TP712
C711 0.1
C713 0.1
CVRTADJ
LINADJ
SMPLADJ
SUB
VEEB
+FLTIN
-FLTIN
+FLTO
-FLTO
+FLTINB
+FLTOUTB
-FLTINB
-FLTOUTB
CALSEL
CH2SEL
-FLTSEL
DIV
VARTS
+CH1
-CH1
+CH2
-CH2
TP125 TP124 TP123 TP122 TP121 TP120 TP119 TP118
A0 A1 A2 A3 A4 A5 A6 A7
R125 R124 R123 R122 R121 R120 R119 R118
82.5M
CH2A0 CH2A1 CH2A2 CH2A3 CH2A4 CH2A5 CH2A6 CH2A7
R130 R131 R132 R133 R134 R135 R100 R101
475
CH2A [0..7]
TO [1A] 6
TP117 TP116 TP115 TP114 TP113 TP112 TP111 TP110
B0 B1 B2 B3 B4 B5 B6 B7
R117 R116 R115 R114 R113 R112 R111 R110
CH2B0 CH2B1 CH2B2 CH2B3 CH2B4 CH2B5 CH2B6 CH2B7
R102 R103 R104 R105 R106 R107 R108 R109
CH2B [0..7]
TP126 TP127
R126 82.5M
R129 274
R128 274
R127 82.5M
DCLKB
*DCLKB
TO [1C] 6
+DCLK
-DCLK
VCC
VCCB
VEE
GND
DGND
TGND
L706 FB52
L707 FB52
TP717
+5.1V
C718 0.1
C717 33uF
C716 0.1M
C719 0.1M
C720 0.1M
C721 0.1M
L711 FB52
L712 FB52
TP701
-5.1V
C730 0.1
C729 33uF
C726 0.1M
C727 0.1M
C728 0.1M
GP701
L713 FB52
TP702
+5V
C731 0.1M
C733 0.1M
L714 FB52
TP703
C732 0.1M
C734 0.1M
PARTIAL A10 ACQUISITION BOARD



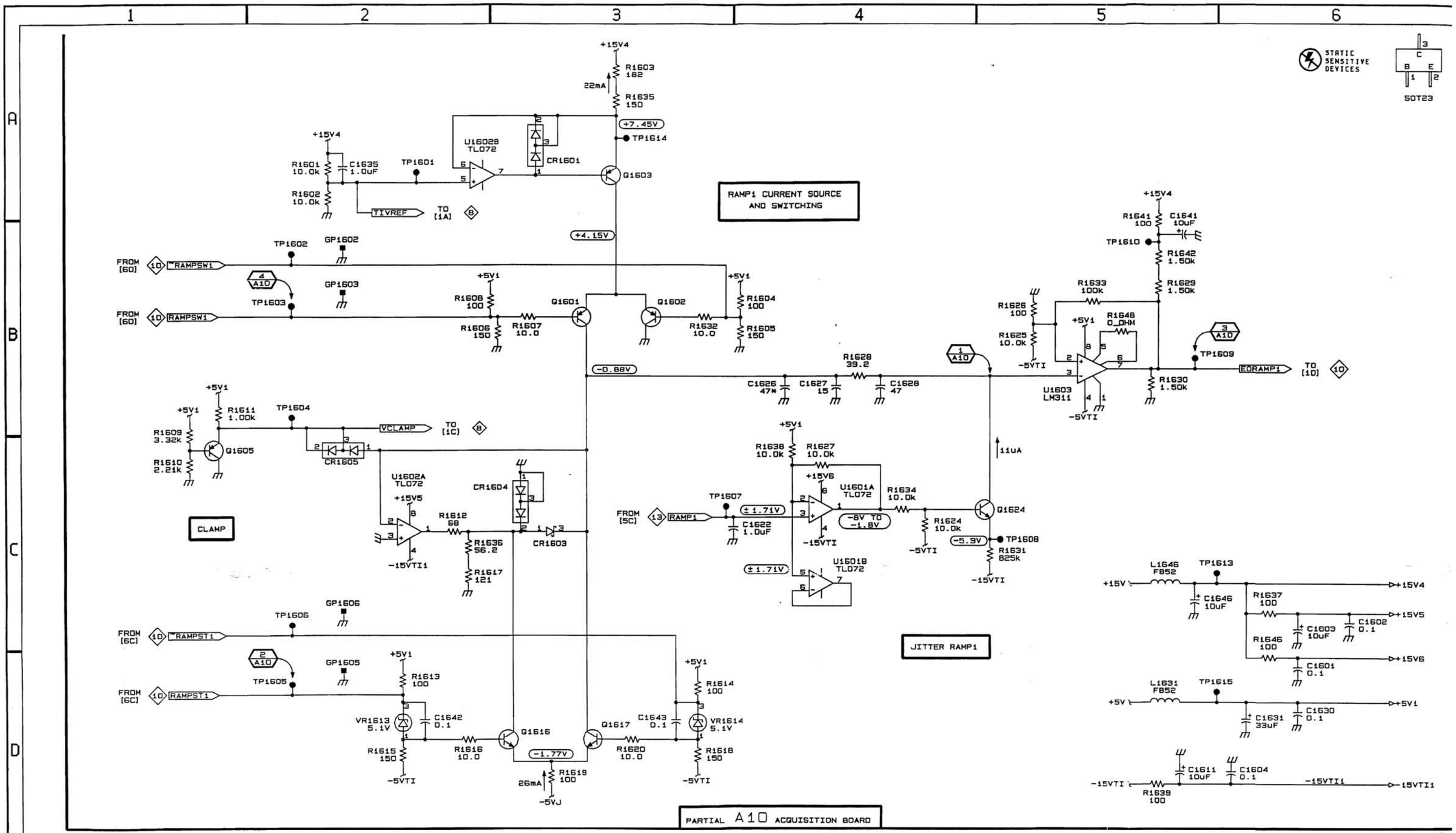
IC PIN INFORMATION

DEVICE	+5.1V	GND
ADG219	1, 13, 25, 34, 49, 61, 74, 86, 98, 110, 123, 135, 147, 159, 172, 184	2, 14, 26, 33, 35, 50, 57, 62, 75, 87, 99, 111, 124, 136, 148, 160, 173, 185
SRAM_2KX8	24	12
SRAM_8KX8	28	14



IC PIN INFORMATION

DEVICE	+5.1V	GND
ADG219	1, 13, 25, 34, 49, 61, 74, 86, 98, 110, 123, 135, 147, 159, 172, 184	2, 14, 26, 33, 35, 50, 57, 62, 75, 87, 99, 111, 124, 136, 148, 160, 173, 185
SRAM_2KX8	24	12
SRAM_8KX8	28	14



STATIC SENSITIVE DEVICES
SOT23
RAMP1 CURRENT SOURCE AND SWITCHING
CLAMP
JITTER RAMP1
PARTIAL A10 ACQUISITION BOARD
+15V4
R1603 182
22mA
R1635 150
+7.45V
TP1614
U1602B TL072
CR1601
Q1603
R1601 10.0k
C1635 1.0uF
TP1601
R1602 10.0k
TIVREF
TO [1A]
+4.15V
TP1602
GP1602
FROM [6D]
RAMPSW1
TP1603
GP1603
+5V1
R1608 100
R1606 150
R1607 10.0
Q1601
Q1602
R1632 10.0
R1604 100
R1605 150
-0.88V
R1628 39.2
C1626 47*
C1627 15
C1628 47
R1641 100
C1641 10uF
TP1610
R1642 1.50k
R1629 1.50k
R1633 100k
R1626 100
R1625 10.0k
R1648 0_OHM
-5VTI
U1603 LM311
TP1609
EDRAMP1
TO [1D]
R1630 1.50k
R1611 1.00k
TP1604
R1609 3.32k
Q1605
R1610 2.21k
VCLAMP
TO [1C]
CR1605
U1602A TL072
+15V5
CR1604
R1612 68
R1636 56.2
R1617 121
CR1603
-15VTI1
R1638 10.0k
R1627 10.0k
+15V6
U1601A TL072
R1634 10.0k
TP1607
FROM [5C]
RAMP1
±1.71V
C1622 1.0uF
-8V TO -1.8V
R1624 10.0k
Q1624
11uA
-5.9V
TP1608
R1631 825k
-15VTI
U1601B TL072
TP1606
GP1606
FROM [6C]
RAMPST1
TP1605
GP1605
R1613 100
VR1613 5.1V
C1642 0.1
R1615 150
R1616 10.0
Q1616
Q1617
-1.77V
R1619 100
26mA
-5VJ
R1620 10.0
C1643 0.1
R1614 100
VR1614 5.1V
R1618 150
L1646 F852
TP1613
+15V
C1646 10uF
R1637 100
C1603 10uF
C1602 0.1
R1646 100
C1601 0.1
+15V4
+15V5
+15V6
L1631 F852
TP1615
+5V
C1631 33uF
C1630 0.1
+5V1
C1611 10uF
C1604 0.1
-15VTI
R1639 100
-15VTI1

STATIC SENSITIVE DEVICES

SOT23

RAMP2 CURRENT SOURCE AND SWITCHING

JITTER RAMP2

PARTIAL A10 ACQUISITION BOARD

IC PIN INFORMATION

DEVICE	+5VA	GND	-5VA
CA3127			5
MC10H116S	2, 20	10	
TL074CD	4		11

STATIC SENSITIVE DEVICES

TRIGGER A

TRIGGER B

TRIGGER C

TRIGGER D

PARTIAL A10 ACQUISITION BOARD

CLOCK TRIGGER LOGIC

LOW SPEED TRIGGER LOGIC

U1001 CTL

U1050 ADG225C

U1003 TL431

CR1001

CR1060

TP1072

FROM [38] AEVNT1 / ~AEVNT1
FROM [68] BEVNT1 / ~BEVNT1
FROM [3D] CEVNT1 / ~CEVNT1
FROM [68] DEVNT1 / ~DEVNT1
FROM [38] EEVNT / ~EEVNT
FROM [6A] OSC500 / ~OSC500
FROM [2A] +OPTRIGECL / -OPTRIGECL
FROM [60] MTHO
FROM/TO [28] D1D [8..15]
FROM [2C] D1A [0..10]
FROM [20] ~WAITCLK
FROM [28] ~D1MMIO
FROM [28] ~D1RD / ~D1WR
FROM [20] CPUCLK/4
FROM [2C] ~SYSRESET
FROM [68] EORAMP1
FROM [68] EORAMP2
FROM [3C] ET1GO/RST / ET2GO/RST

+ECL 50 OHM

R1030 75.0Ω
R1031 75.0Ω
R1032 75.0Ω
R1033 75.0Ω
R1035 75.0Ω
R1036 75.0Ω
R1037 75.0Ω
R1038 75.0Ω
R1040 75.0Ω
R1041 75.0Ω
R1052 75.0Ω
R1051 75.0Ω
R1053 2.21kΩ
R1042 49.9Ω
R1043 49.9Ω
R1039 10.0
R1044 49.9
R1028 75.0Ω
R1029 75.0Ω
R1027 1.00k
R1034 100
R1023 10.0kΩ
R1060 10.0k
R1061 182
R1062 182
R1063 182Ω
R1064 182
R1070 274Ω
R1071 2.21kΩ
R192 100Ω
R450 2.21kΩ
R451 2.21kΩ
C1016 33uF
C1048 0.1
C1049 0.1
C1029 0.1
C1053 0.1μ
C1060 10
C192 47
+3V
+5V
+5.1V

TP1050 TP1051 TP1052 TP1053
TP1054 TP1055 TP1056 TP1057
TP1058 TP1070 TP1071
TP1068
TP1012 TP1013 TP1014 TP1015
TP1010 TP1011
GP1010

U1001 CTL pins:
90 METT, 91 METF, 70 DETT, 71 DETF, 60 FC1T, 59 FC1F, 54 FC2T, 53 FC2F, 4 EETT, 3 EETF, 40 M500T, 41 M500F, 35 DENVT2T, 34 DENVT2F, 44 DEVNT1, 17 MH0, 31 M50T, 30 M50F, 98 EPTH0, 16 WRITE, 23 TVEVNT, 66 AD00, 65 AD01, 64 AD02, 61 AD03, 48 DAT0, 47 DAT1, 46 DAT2, 45 DAT3, 82 TC0BE, 80 TC0BT, 92 TCT0T, 97 FEDGEIN, 36 READ, 67 DELG2, 81 DBEG2, 93 DBTG3, 73 TOTG2
NC 12, NC 13, NC 55
ASIG 89 TP1012
BSIG 94 TP1013
OSIG1 9 OPTSIG1 TO [2A] 17
OSIG2 10 OPTSIG2
ACQRST1 22 ACQRST1 TO [4C] 14
ACQCLKT 20 ACQCLK1 TO [4C] 14
ACQCLKF 21 ~ACQCLK1 TO [4C] 14
FEDGET 29, FEDGEF 28
MSTCLKT 62, MSTCLKF 63
SMUT 11 ~STRIGA TO [1C] 5 6 TO [4A] 11
SOUT 56 ~STRIGB TO [1C] 5 6 TO [4A] 11
MAT 72 MAT TO [4D] 12
ESIGT 6 TGH TO [1A] 11
ESIGF 5 ~TGH
MH02 14 ATH0 TO [1C] 9
RSTMT 95 RAMPST1 [1D] 7
RSTMF 96 ~RAMPST1 [1C]
RSTDT 86 RAMPST2 [1D] 8
RSTDF 85 ~RAMPST2 [1C]
TSTOT 33 TP1010
TSTOF 32 TP1011
RSWMT 79 ~STRIGC TO [1C] 5 6
RSWMF 78 ~STRIGD
RSWDT 84 RAMPSW1 TO [1B] 7
RSWDF 83 ~RAMPSW1
ACQRST2 39 RAMPSW2 TO [1B] 8
~RAMPSW2
ACQRST2 TO [1D] 5 6

U1050 ADG225C pins:
28 USRCLK, 26 +50MHZ, 25 -50MHZ
D1D8 32, D1D9 33, D1D10 34, D1D11 35, D1D12 36, D1D13 37, D1D14 38, D1D15 39
43 D1WAIT TO [2C] 17
59 TLBUSWR
10 BIAS, 27 10MHZ TO [1A] 14
68 ET1TC TO [28] 11
2 ET2TC
D1A0 52, D1A1 51, D1A2 50, D1A3 49, D1A4 48, D1A5 47, D1A6 46, D1A7 45, D1A10 53
4 TLA0, 5 TLA1, 6 TLA2, 7 TLA3
61 CLKMODE TO [40] 14
16 TLD0, 15 TLD1, 14 TLD2, 13 TLD3
18 CALFREQ
63 DBETC, 62 DBTTC, 41 TOTTC
29 FEDGEIN
60 TLBUSRD
66 TIDELCLK, 65 DBECLK, 64 DBTCLK, 40 TOTCLK
19 +RSWM, 20 -RSWM, 22 +RSWD, 23 -RSWD
3 ACQRESET2
TLSEL, WAITCLK, D1MMIO, D1RD, D1WR, CPUCLK/4, SYSRESET, EORM, EORD, ET1GO/RST, ET2GO/RST

FROM [6] EPTH0
FROM [20] 17 ~TVTRIG
FROM [3D] 6 EPTH0

LSTL+

CTL PIN INFORMATION

VCTL	VTTL	VECL	GND
7, 19, 37, 57, 69, 88	26, 50, 76, 100	1, 25, 51, 75	2, 8, 18, 24, 27, 38, 49, 52, 58, 68, 74, 77, 87, 99

STATIC SENSITIVE DEVICES

ADG225C PIN INFORMATION

VCC	GND
8, 11, 30, 57	9, 12, 31, 58

PARTIAL A10 ACQUISITION BOARD

EXTENDED TRIGGER

U1703 EXTENDED_TRIGGER

ACQUISITION PROCESSOR

U600 MC68HC0584FN

U603 74HCT244

U1701 74HCT164

U606 74LS05

U1700 TL431

U1705A TL074CD

U1705B TL074CD

U1705C TL074CD

U1705D TL074CD

EXTENDED TRIGGER

STATIC SENSITIVE DEVICES

IC PIN INFORMATION

DEVICE	+5.1V	VCCXT	GND
74LS05	14		7
74HCT164		14	7
74HCT244	20	10	

PARTIAL A10 ACQUISITION BOARD

DAC

ANALOG MULTIPLEXER 1

STATIC SENSITIVE DEVICES

IC PIN INFORMATION

DEVICE	+15V	+5.1V	+5V	VDD	GND	-15V
74HCT74			14		7	
74HCT138		16			8	
AD667	8				16	10
DG444 (U908)	13			12	5	4
DG444 (U912)	13		12		5	4

SEE DIAGRAM 17 FOR POWER DISTRIBUTION

ANALOG TRIGGER HOLDOFF

PARTIAL A10 ACQUISITION BOARD

TDS 520

CALIBRATED V REF & ANALOG TRIGGER HOLDOFF A10 12

ANALOG MULTIPLEXER 2

FROM [6C] 11 PC[0..7] 8 PC[0..7] 3

FROM [6C] 11 ~DACEN

U601A 74HCT139 — EN, SEL, Y0 Y1 Y2 Y3

PC6 2, PC7 3

TP909

VDD 6 → G1, G2A, G2B (EN)

C601 .001M

U901 74HCT138 — SEL (A B C), EN

PC3 1, PC4 2, PC5 3

Y0 15 ~DACMUXEN0
Y1 14 ~DACMUXEN1
Y2 13 ~DACMUXEN2
Y3 12 ~DACMUXEN3
Y4 11 ~DACMUXEN4
Y5 10 ~DACMUXEN5
Y6 9 ~DACMUXEN6
Y7 7 ~DACMUXEN7

~DACWR → TO [1B] 12

~DACMUXEN0 → TO [1A] 12

U601B 74HCT139 — EN, SEL, Y0 Y1 Y2 Y3

PC4 14, PC5 13

R639 100Ω

C644 .001µ

~ENPA → TO [4A] 11

PRBCLK → TO [1B] 16

~ACQPSTAT → TO [2B] 15

U932 CD4051 — S0 S1 S2 INH, DMUX

PC0 11, PC1 10, PC2 9, ~DACMUXEN1 6

+/-1.71V 3

X0 13 OFFSET2
X1 14 FOFFSET2
X2 15 DCBAL1 [1B]
X3 12 VARGAIN2 [4B]
X4 1 HF1
X5 5 VARGAIN1
X6 2 FOFFSET1
X7 4 OFFSET1

OFFSET2 → TO [1B] 2
FOFFSET2 → TO [1B] 1
DCBAL1 → [1B] 1
VARGAIN2 → [4B] 2
HF1 → TO [4B] 1
VARGAIN1 → TO [4B] 1
FOFFSET1 → TO [1B] 1
OFFSET1 → TO [1B] 1

U934 CD4051 — S0 S1 S2 INH, DMUX

PC0 11, PC1 10, PC2 9, ~DACMUXEN3 6

+/-1.71V 3

X0 13 TLO
X1 14 TLA
X2 15 TLB
X3 12 TLC
X4 1 RAMP2
X5 5 OFFSET4
X6 2 HFADJB
X7 4 +VREFA

TLO → TO [4C] 9
TLA → TO [1C]
TLB → [4C]
TLC → TO [1D]
RAMP2 → [3C] 8
OFFSET4 → TO [1C] 4
HFADJB → TO [1C]
+VREFA → [1B] 3

U931 CD4051 — S0 S1 S2 INH, DMUX

PC0 11, PC1 10, PC2 9, ~DACMUXEN4 6

+/-1.71V 3

X0 13 HFADJA
X1 14 -VREFB
X2 15 +VREFB
X3 12 -VREFA
X4 1 BDLY
X5 5 ADLY
X6 2 ETL1SLOW
X7 4 ETL2SLOW

HFADJA → TO [1C] 3
-VREFB → TO [1B] 4
+VREFB → [1B] 3
-VREFA → TO [1C]
BDLY → TO [1C] 14
ADLY → [1B]
ETL1SLOW → TO [1C] 11
ETL2SLOW → [1C]

U933 CD4051 — S0 S1 S2 INH, DMUX

PC0 11, PC1 10, PC2 9, ~DACMUXEN2 6

+/-1.71V 3

X0 13 POFFSET3
X1 14 POFFSET4
X2 15 POFFSET1
X3 12 POFFSET2
X4 1 RAMP1
X5 5 HF2
X6 2 OFFSET3
X7 4 DCBAL2

RAMP1 → TO [3C] 7
HF2 → [4B] 2
OFFSET3 → [1C] 3
DCBAL2 → [1B] 2

FROM [6B] 12 +/-1.71V

IC PIN INFORMATION

DEVICE	+5.1V	VDD	GND	VEE
74HCT139	16		8	
HC4051		16	8	7

STATIC SENSITIVE DEVICES

PROBE CONTROL BUFFERS

±1.71V → R934 15.0k → POFFSET1 → C934 0.1, C938 .01

U942A TLO74CD — VDD 4, VEE 11, TP913

POFFSET1 → ±1.71V → PROBEOFFSET1 → TO [1A] 16

±1.71V → R935 15.0k → POFFSET2 → C935 0.1, C939 .01

U942B TLO74CD — TP914

POFFSET2 → ±1.71V → PROBEOFFSET2 → TO [1A] 16

±1.71V → R936 15.0k → POFFSET3 → C936 0.1, C940 .01

U942C TLO74CD — TP915

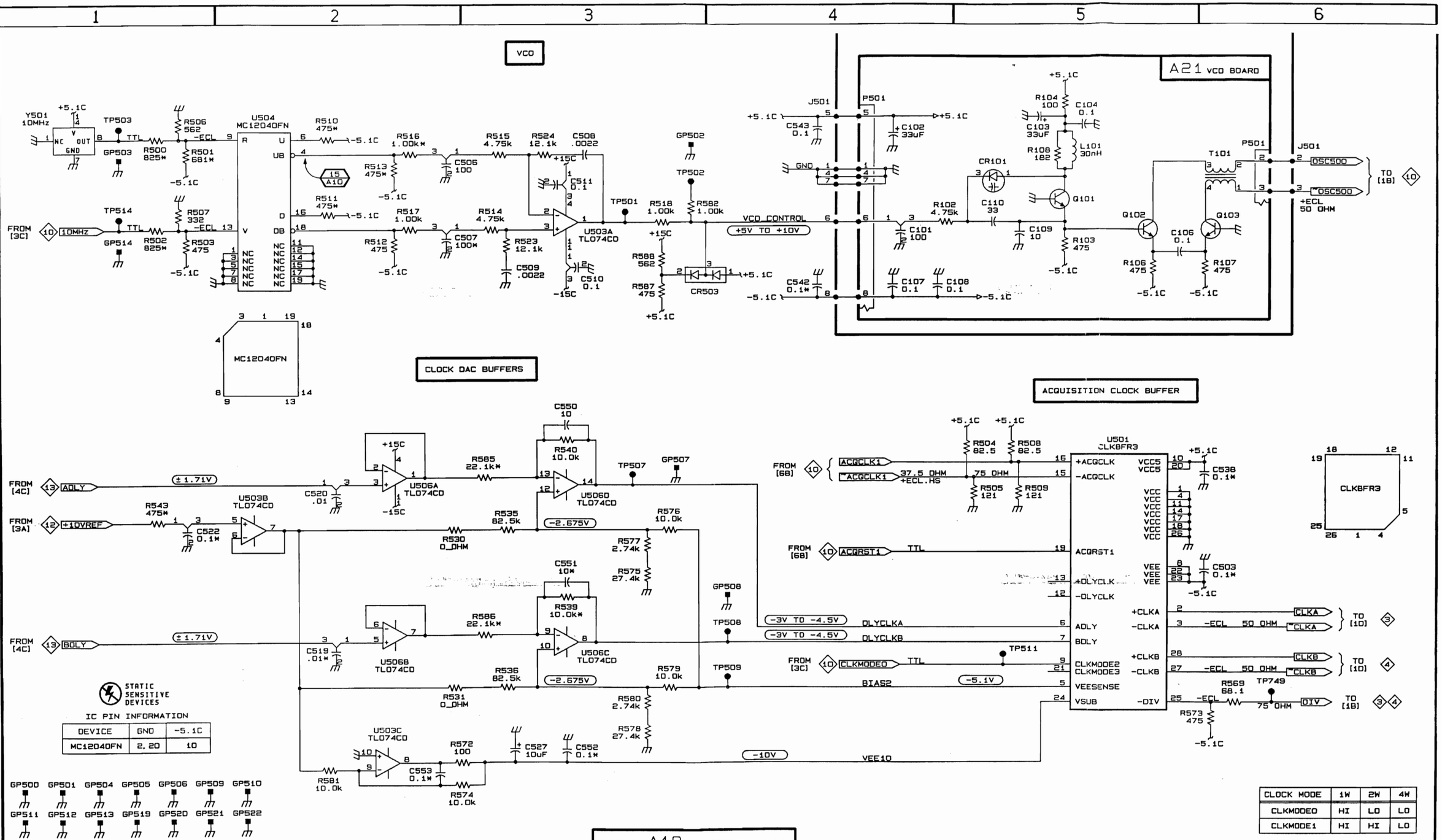
POFFSET3 → ±1.71V → PROBEOFFSET3 → TO [1A] 16

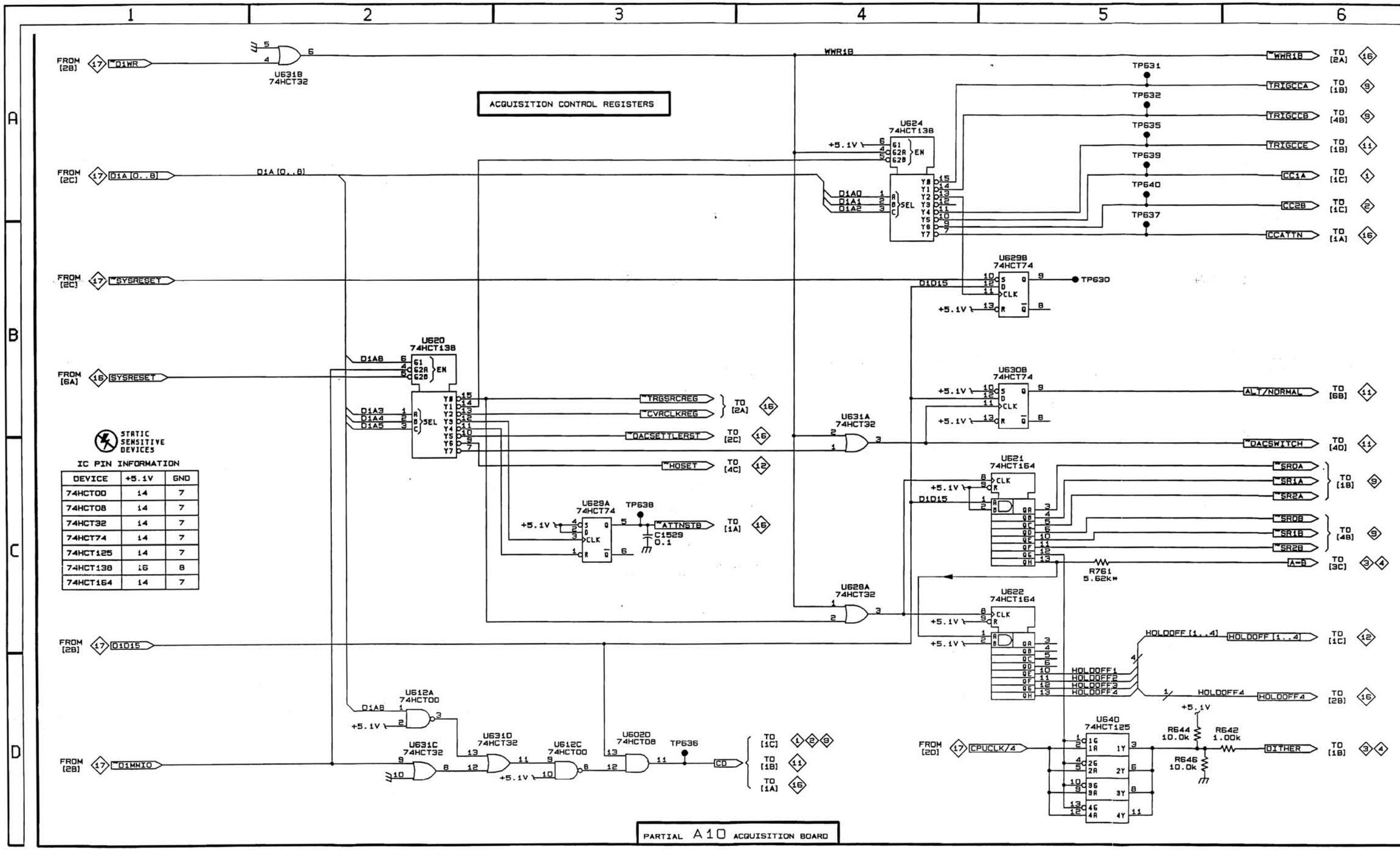
±1.71V → R937 15.0k → POFFSET4 → C937 0.1, C941 .01

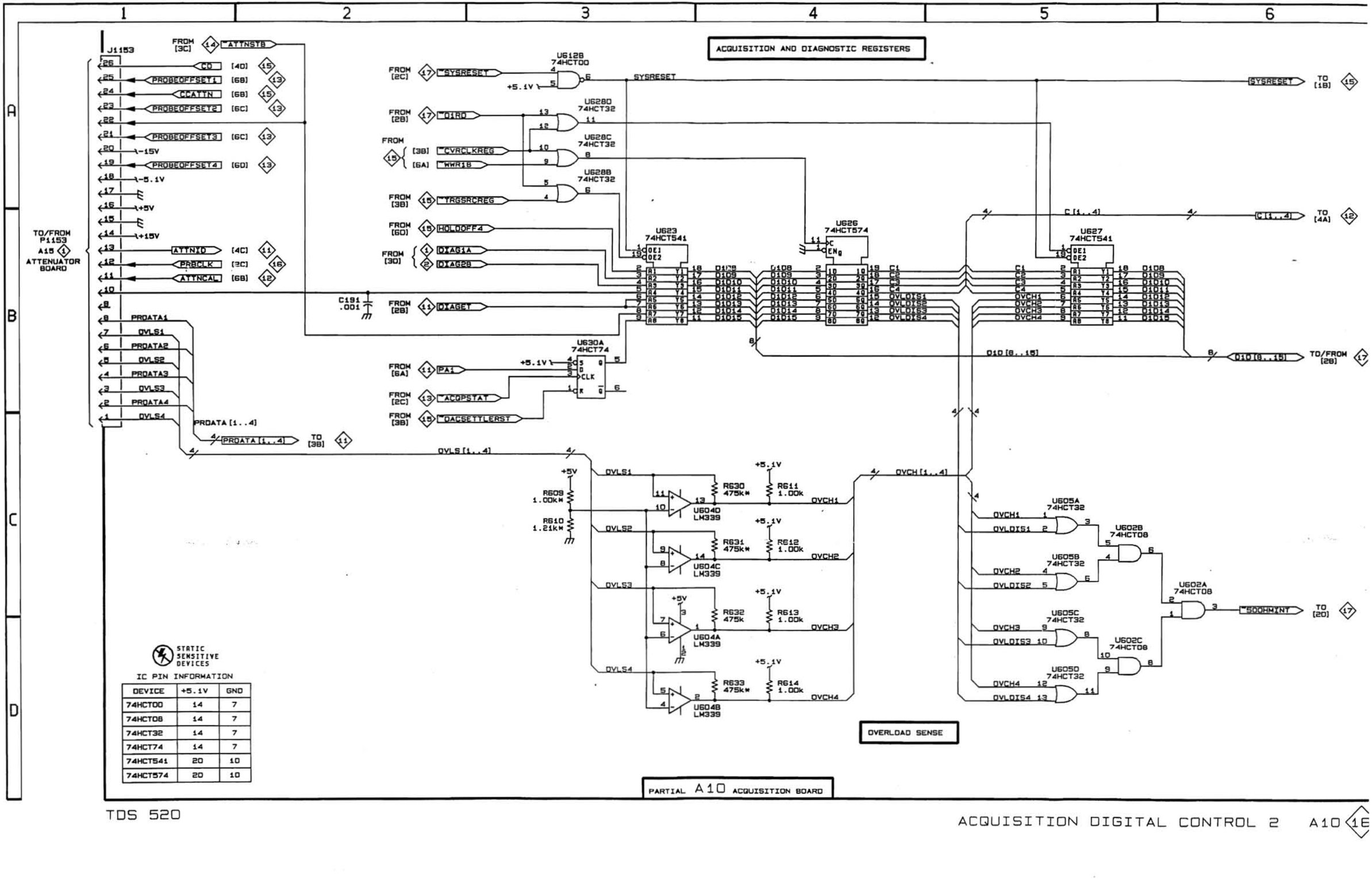
U942D TLO74CD — TP916

POFFSET4 → ±1.71V → PROBEOFFSET4 → TO [1A] 16

PARTIAL A10 ACQUISITION BOARD

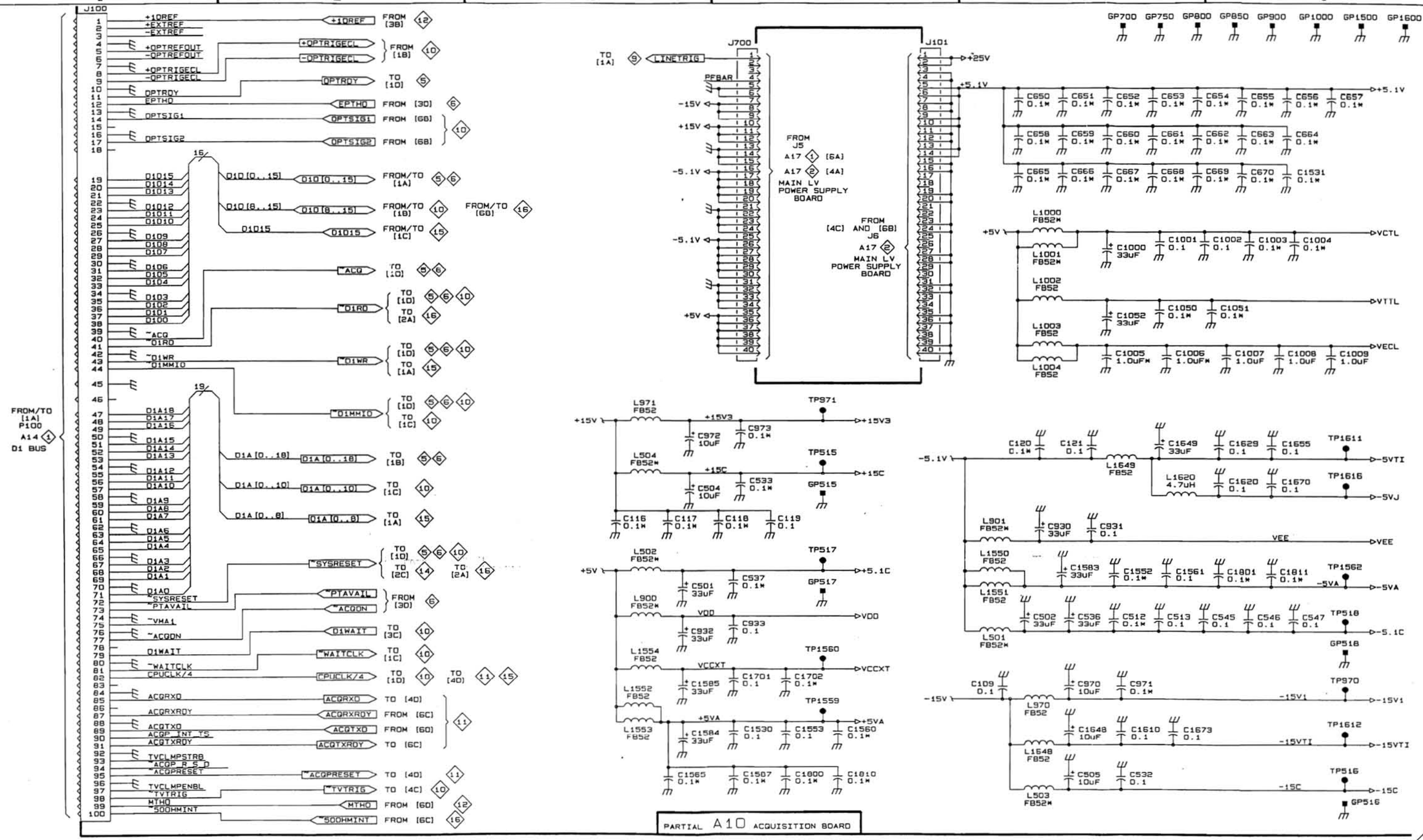

VCO
A21 VCO BOARD
CLOCK DAC BUFFERS
ACQUISITION CLOCK BUFFER
PARTIAL A10 ACQUISITION BOARD
STATIC SENSITIVE DEVICES
IC PIN INFORMATION
DEVICE | GND | -5.1C
MC12040FN | 2, 20 | 10
CLOCK MODE | 1W | 2W | 4W
CLKMODE0 | HI | LO | LO
CLKMODE1 | HI | HI | LO

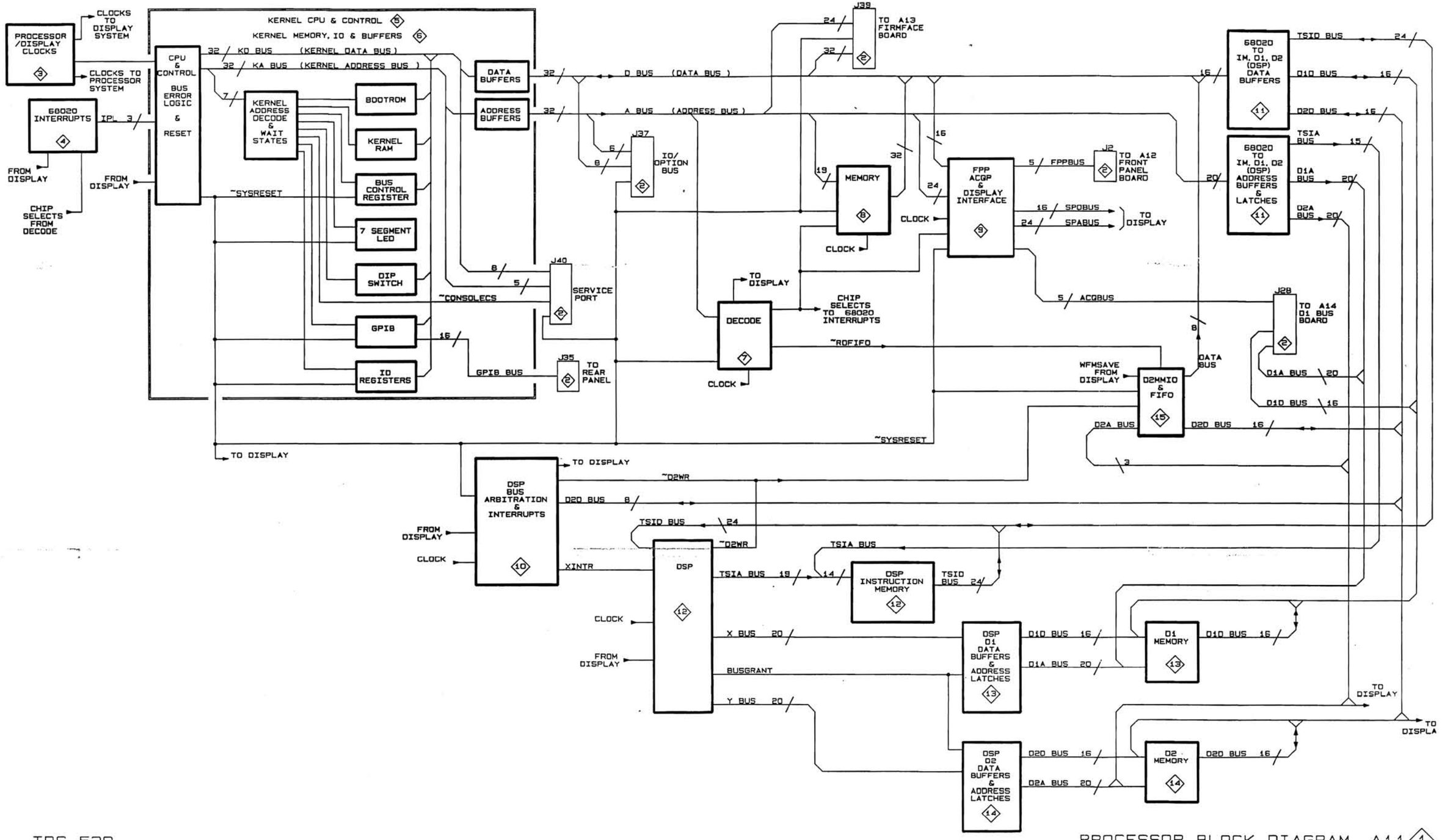

ACQUISITION CONTROL REGISTERS
FROM [2B] D1WR
U631B 74HCT32
WWR1B
TO [2A] WWR1B
U624 74HCT138
+5.1V
D1A0
D1A1
D1A2
TP631
TP632
TP635
TP639
TP640
TP637
TRIGCCA TO [1B]
TRIGCCB TO [4B]
TRIGCCE TO [1B]
CC1A TO [1C]
CC2B TO [1C]
CCATTN TO [1A]
FROM [2C] D1A[0..8]
D1A[0..8]
FROM [2C] SYSRESET
U629B 74HCT74
D1D15
TP630
U620 74HCT138
FROM [6A] SYSRESET
D1A3
D1A4
D1A5
D1A8
TRGSRCREG
CVRCLKREG
TO [2A]
DACSETTLERST TO [2C]
HOSET TO [4C]
U631A 74HCT32
U629A 74HCT74
TP638
ATTNSTB TO [1A]
C1529 0.1
U630B 74HCT74
ALT/NORMAL TO [6B]
DACSWITCH TO [4D]
U621 74HCT164
SR0A
SR1A
SR2A
TO [1B]
SR0B
SR1B
SR2B
TO [4B]
A=B TO [3C]
R761 5.62k*
U628A 74HCT32
U622 74HCT164
HOLDOFF[1..4]
HOLDOFF1
HOLDOFF2
HOLDOFF3
HOLDOFF4
TO [1C]
TO [2B]
FROM [2B] D1D15
U612A 74HCT00
U631C 74HCT32
U631D 74HCT32
U612C 74HCT00
U602D 74HCT08
TP636
CD
TO [1C]
TO [1B]
TO [1A]
FROM [2B] D1MWIO
U640 74HCT125
FROM [20] CPUCLK/4
R644 10.0k
R642 1.00k
R646 10.0k
DITHER TO [1B]
STATIC SENSITIVE DEVICES
IC PIN INFORMATION
DEVICE | +5.1V | GND
74HCT00 | 14 | 7
74HCT08 | 14 | 7
74HCT32 | 14 | 7
74HCT74 | 14 | 7
74HCT125 | 14 | 7
74HCT138 | 16 | 8
74HCT164 | 14 | 7
PARTIAL A10 ACQUISITION BOARD



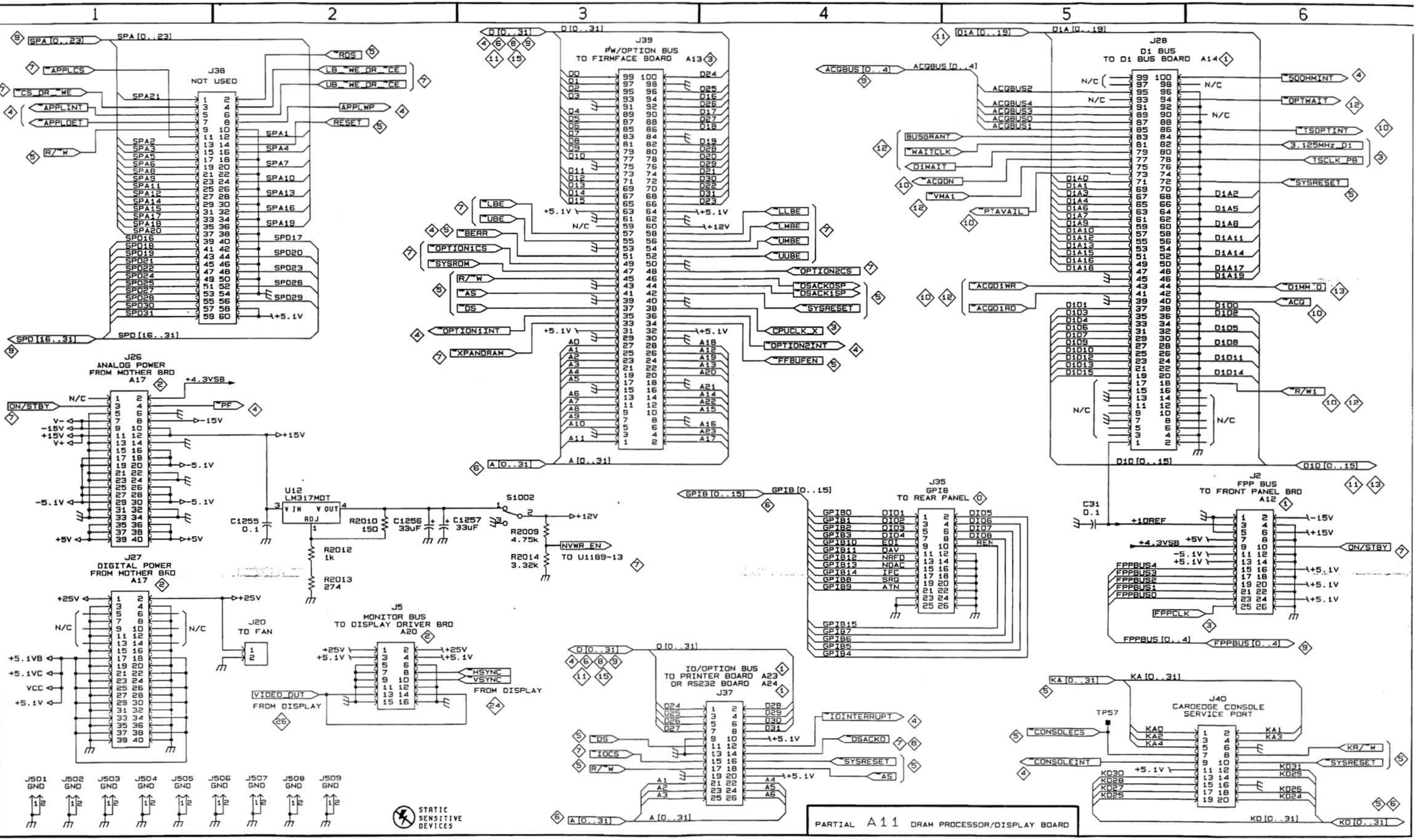
IC PIN INFORMATION

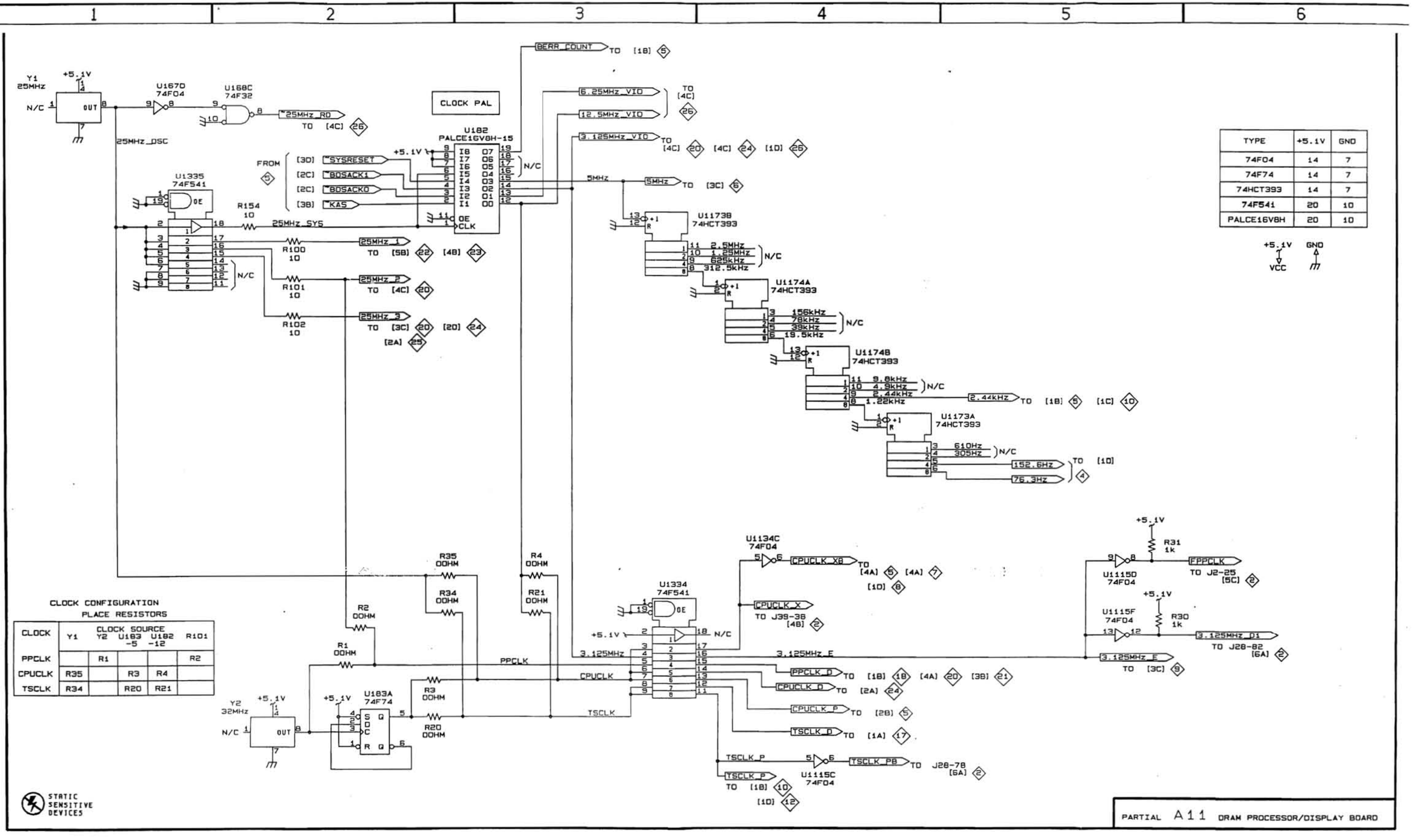
DEVICE	+5.1V	GND
74HCT00	14	7
74HCT08	14	7
74HCT32	14	7
74HCT74	14	7
74HCT541	20	10
74HCT574	20	10

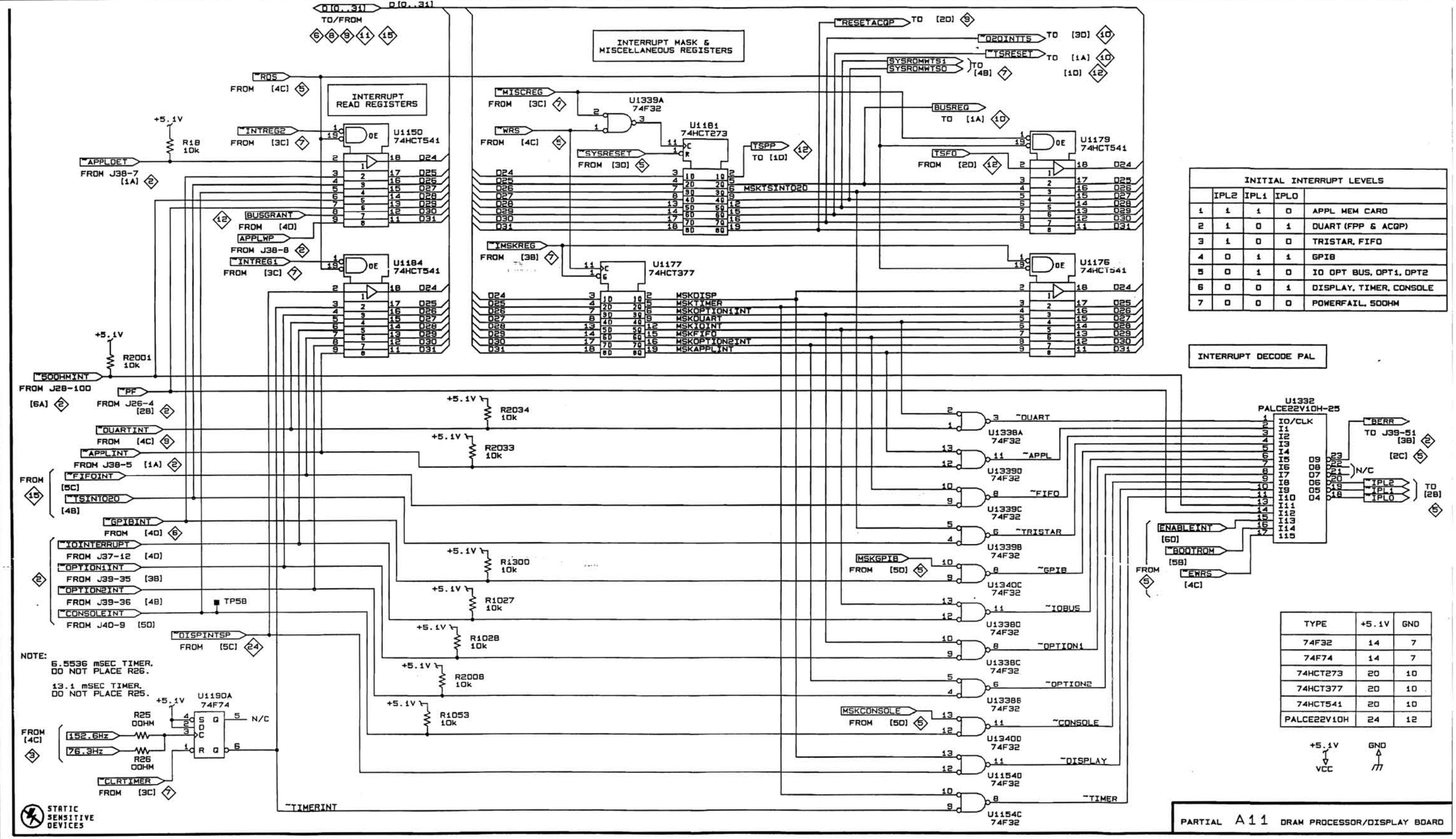

J100
+10REF
+EXTREF
-EXTREF
+OPTREFOUT
-OPTREFOUT
+OPTRIGECL
-OPTRIGECL
OPTRDY
EPTHO
OPTSIG1
OPTSIG2
D1D15
D1D14
D1D13
D1D12
D1D11
D1D10
D1D9
D1D8
D1D7
D1D6
D1D5
D1D4
D1D3
D1D2
D1D1
D1D0
~ACQ
~D1RD
~D1WR
~D1MMIO
D1A18
D1A17
D1A16
D1A15
D1A14
D1A13
D1A12
D1A11
D1A10
D1A9
D1A8
D1A7
D1A6
D1A5
D1A4
D1A3
D1A2
D1A1
D1A0
~SYSRESET
~PTAVAIL
~VMA1
~ACQON
D1WAIT
~WAITCLK
CPUCLK/4
ACQRXD
ACQRXRDY
ACQTXD
ACQP_INT_TS
ACQTXRDY
TVCLMPSTRB
~ACQP_R_S_D
~ACQPRESET
TVCLMPENBL
~TVTRIG
MTHO
~500HMINT
FROM/TO [1A] P100 A14 1 D1 BUS
D1D[0..15]
D1D[8..15]
D1A[0..18]
D1A[0..10]
D1A[0..8]
FROM/TO [1A]
FROM/TO [1B]
FROM/TO [1C]
TO [1D]
TO [2A]
TO [2C]
FROM [3B]
FROM [3C]
FROM [3D]
TO [4C]
FROM [6C]
TO [4D]
FROM [6D]
TO [6C]
FROM [6B]
TO [4B]
J700
J101
TO [1A] LINETRIG
PFBAR
-15V
+15V
-5.1V
+5V
FROM J5 A17 1 [6A] A17 2 [4A] MAIN LV POWER SUPPLY BOARD
FROM [4C] AND [6B] J6 A17 2 MAIN LV POWER SUPPLY BOARD
+25V
+5.1V
GP700 GP750 GP800 GP850 GP900 GP1000 GP1500 GP1600
C650 0.1M
C651 0.1M
C652 0.1M
C653 0.1M
C654 0.1M
C655 0.1M
C656 0.1M
C657 0.1M
C658 0.1M
C659 0.1M
C660 0.1M
C661 0.1M
C662 0.1M
C663 0.1M
C664 0.1M
C665 0.1M
C666 0.1M
C667 0.1M
C668 0.1M
C669 0.1M
C670 0.1M
C1531 0.1M
L1000 FB52M
L1001 FB52M
L1002 FB52
L1003 FB52
L1004 FB52
C1000 33uF
C1001 0.1
C1002 0.1
C1003 0.1M
C1004 0.1M
C1050 0.1M
C1051 0.1M
C1052 33uF
C1005 1.0uFM
C1006 1.0uFM
C1007 1.0uF
C1008 1.0uF
C1009 1.0uF
VCTL
VTTL
VECL
L971 FB52
TP971
+15V3
C972 10uF
C973 0.1M
L504 FB52M
TP515
+15C
C504 10uF
C533 0.1M
GP515
C116 0.1M
C117 0.1M
C118 0.1M
C119 0.1
L502 FB52M
TP517
+5.1C
C501 33uF
C537 0.1M
GP517
L900 FB52M
VDD
C932 33uF
C933 0.1
L1554 FB52
TP1560
VCCXT
C1585 33uF
C1701 0.1
C1702 0.1M
L1552 FB52
TP1559
+5VA
L1553 FB52
C1584 33uF
C1530 0.1
C1553 0.1
C1560 0.1M
C1565 0.1M
C1507 0.1M
C1000 0.1M
C1010 0.1M
PARTIAL A10 ACQUISITION BOARD
C120 0.1M
C121 0.1
L1649 FB52
C1649 33uF
C1629 0.1
C1655 0.1
TP1611
-5VTI
L1620 4.7uH
C1620 0.1
C1670 0.1
TP1615
-5VJ
L901 FB52M
C930 33uF
C931 0.1
VEE
L1550 FB52
L1551 FB52
C1583 33uF
C1552 0.1M
C1561 0.1
C1801 0.1M
C1811 0.1M
TP1562
-5VA
C502 33uF
C536 33uF
C512 0.1M
C513 0.1
C545 0.1
C546 0.1
C547 0.1
TP518
-5.1C
L501 FB52M
GP518
C109 0.1
L970 FB52
C970 10uF
C971 0.1M
TP970
-15V1
L1648 FB52
C1648 10uF
C1610 0.1
C1673 0.1
TP1612
-15VTI
L503 FB52M
C505 10uF
C532 0.1
TP516
-15C
GP516



PROCESSOR BLOCK DIAGRAM A11 1

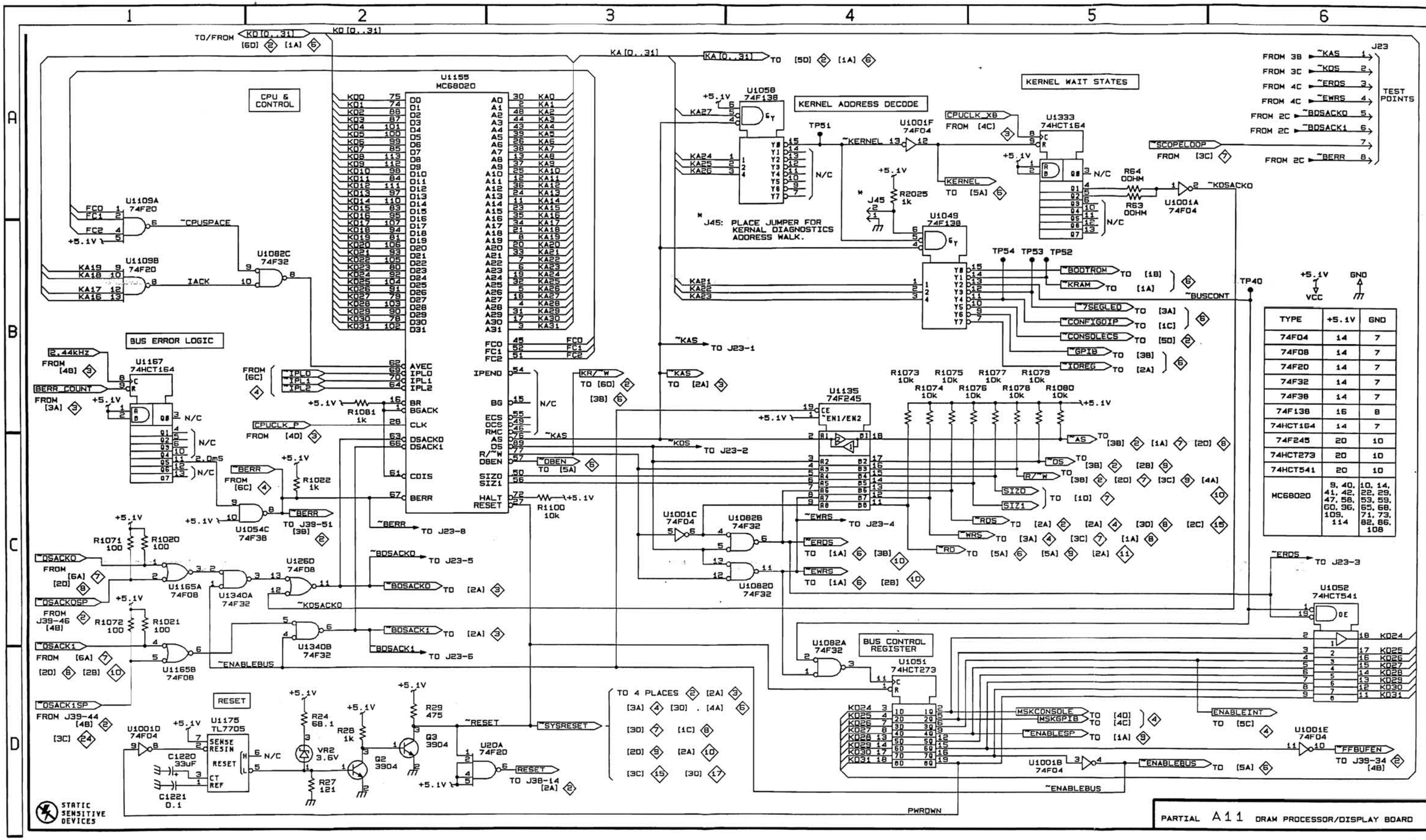

J38
NOT USED
J39
PW/OPTION BUS
TO FIRMFACE BOARD A13
J28
D1 BUS
TO D1 BUS BOARD A14
J26
ANALOG POWER
FROM MOTHER BRD
A17
J27
DIGITAL POWER
FROM MOTHER BRD
A17
J20
TO FAN
J5
MONITOR BUS
TO DISPLAY DRIVER BRD
A20
J35
GPIB
TO REAR PANEL
J2
FPP BUS
TO FRONT PANEL BRD
A12
J37
IO/OPTION BUS
TO PRINTER BOARD A23
OR RS232 BOARD A24
J40
CARDEDGE CONSOLE
SERVICE PORT
U12
LM317MDT
S1002
NVWR_EN
TO U1189-13
FROM DISPLAY
J501 GND
J502 GND
J503 GND
J504 GND
J505 GND
J506 GND
J507 GND
J508 GND
J509 GND
STATIC
SENSITIVE
DEVICES
PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD


CLOCK PAL
U182
PALCE16V8H-15
Y1
25MHz
+5.1V
U1670
74F04
U1680
74F32
25MHz_OSC
25MHz_RD
U1335
74F541
R154
10
25MHz_SYS
R100
10
R101
10
R102
10
25MHz_1
25MHz_2
25MHz_3
FROM
[30] SYSRESET
[2C] BDSACK1
[2C] BDSACK0
[3B] KAS
BERR_COUNT
6.25MHz_VIO
12.5MHz_VIO
3.125MHz_VIO
5MHz
U11738
74HCT393
2.5MHz
1.25MHz
625kHz
312.5kHz
U1174A
74HCT393
156kHz
78kHz
39kHz
19.5kHz
U1174B
74HCT393
9.8kHz
4.9kHz
2.44kHz
1.22kHz
U1173A
74HCT393
610Hz
305Hz
152.6Hz
76.3Hz
N/C
TO [18] 5
TO [4C] 26
TO [3C] 6
TO [1B] 5 [1C] 10
TO [10] 4
R35
00HM
R34
00HM
R4
00HM
R21
00HM
R2
00HM
R1
00HM
R3
00HM
R20
00HM
PPCLK
CPUCLK
TSCLK
3.125MHz
U1334
74F541
Y2
32MHz
U183A
74F74
U1134C
74F04
CPUCLK_XB
CPUCLK_X
TO J39-38 [4B] 2
PPCLK_D
CPUCLK_D
CPUCLK_P
TSCLK_D
TSCLK_P
TSCLK_PB
U1115C
74F04
TO J28-78 [6A] 2
U1115D
74F04
FPPCLK
TO J2-25 [5C] 2
U1115F
74F04
3.125MHz_D1
TO J28-82 [6A] 2
3.125MHz_E
TO [3C] 9
R31
1k
R30
1k
CLOCK CONFIGURATION
PLACE RESISTORS
CLOCK | CLOCK SOURCE Y1 | Y2 | U183 -5 | U182 -12 | R101
PPCLK | | R1 | | | R2
CPUCLK | R35 | | R3 | R4 |
TSCLK | R34 | | R20 | R21 |
TYPE | +5.1V | GND
74F04 | 14 | 7
74F74 | 14 | 7
74HCT393 | 14 | 7
74F541 | 20 | 10
PALCE16V8H | 20 | 10
STATIC SENSITIVE DEVICES
PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

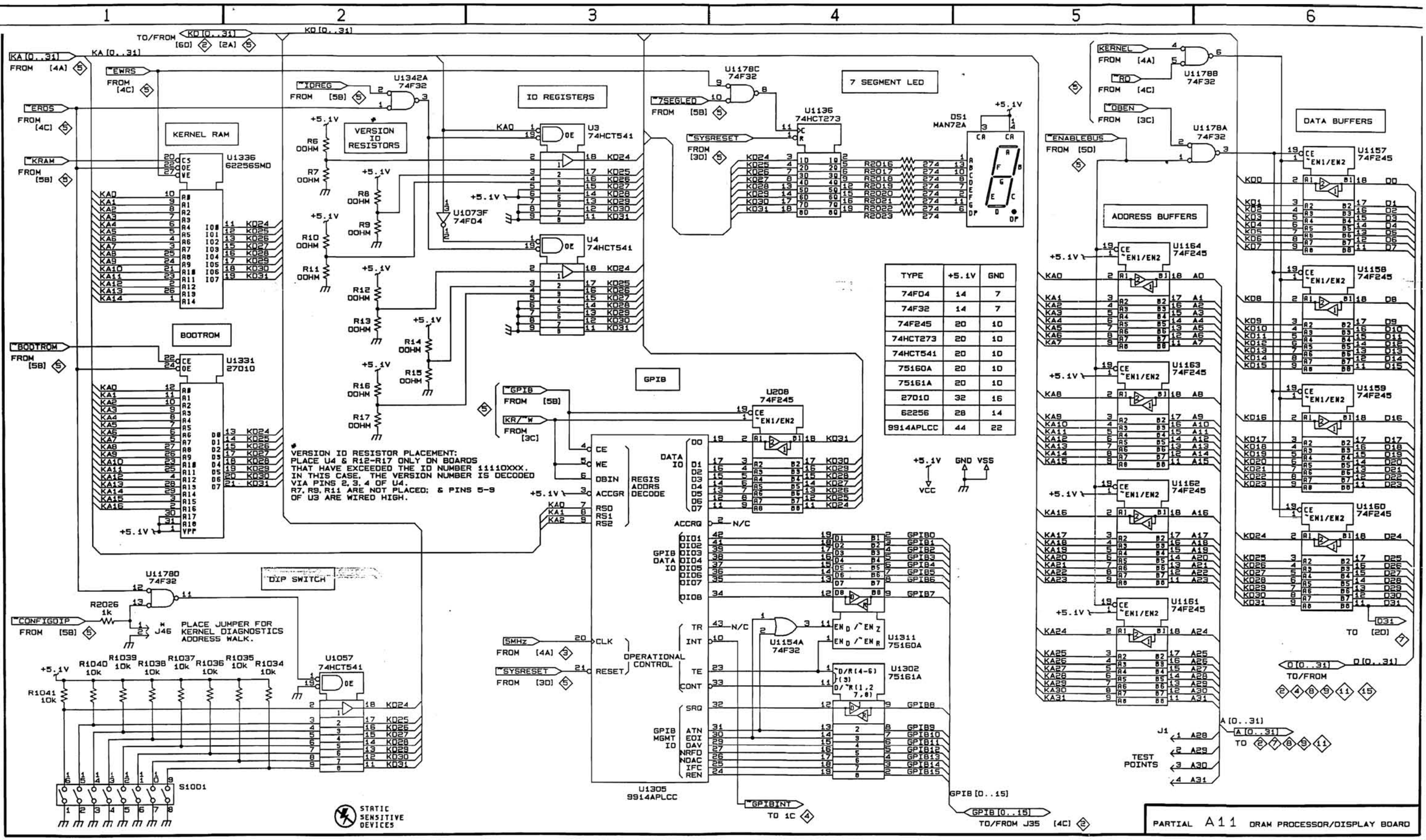


INITIAL INTERRUPT LEVELS				
	IPL2	IPL1	IPL0	
1	1	1	0	APPL MEM CARD
2	1	0	1	DUART (FPP & ACQP)
3	1	0	0	TRISTAR, FIFO
4	0	1	1	GPIB
5	0	1	0	IO OPT BUS, OPT1, OPT2
6	0	0	1	DISPLAY, TIMER, CONSOLE
7	0	0	0	POWERFAIL, 500HM

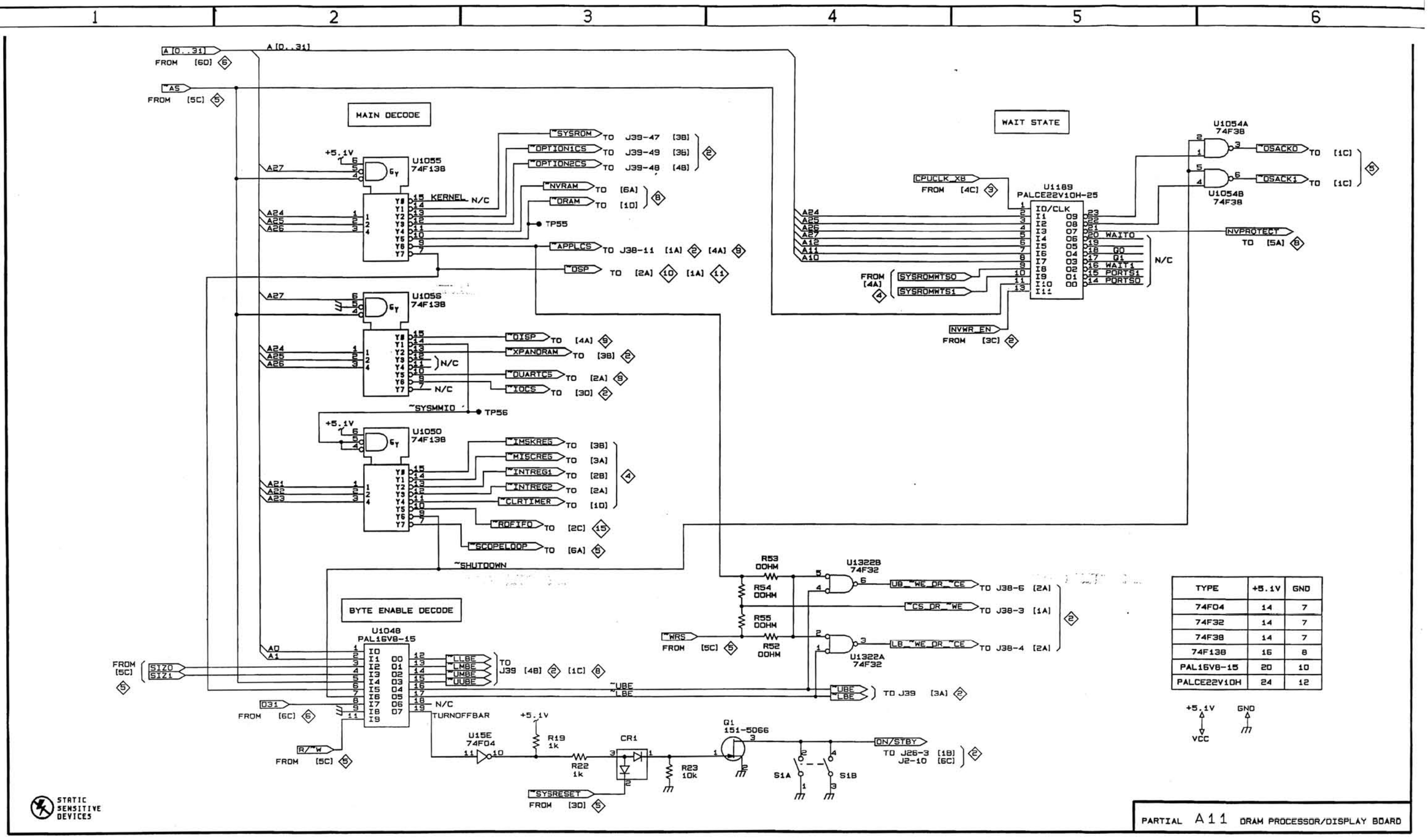
TYPE	+5.1V	GND
74F32	14	7
74F74	14	7
74HCT273	20	10
74HCT377	20	10
74HCT541	20	10
PALCE22V10H	24	12

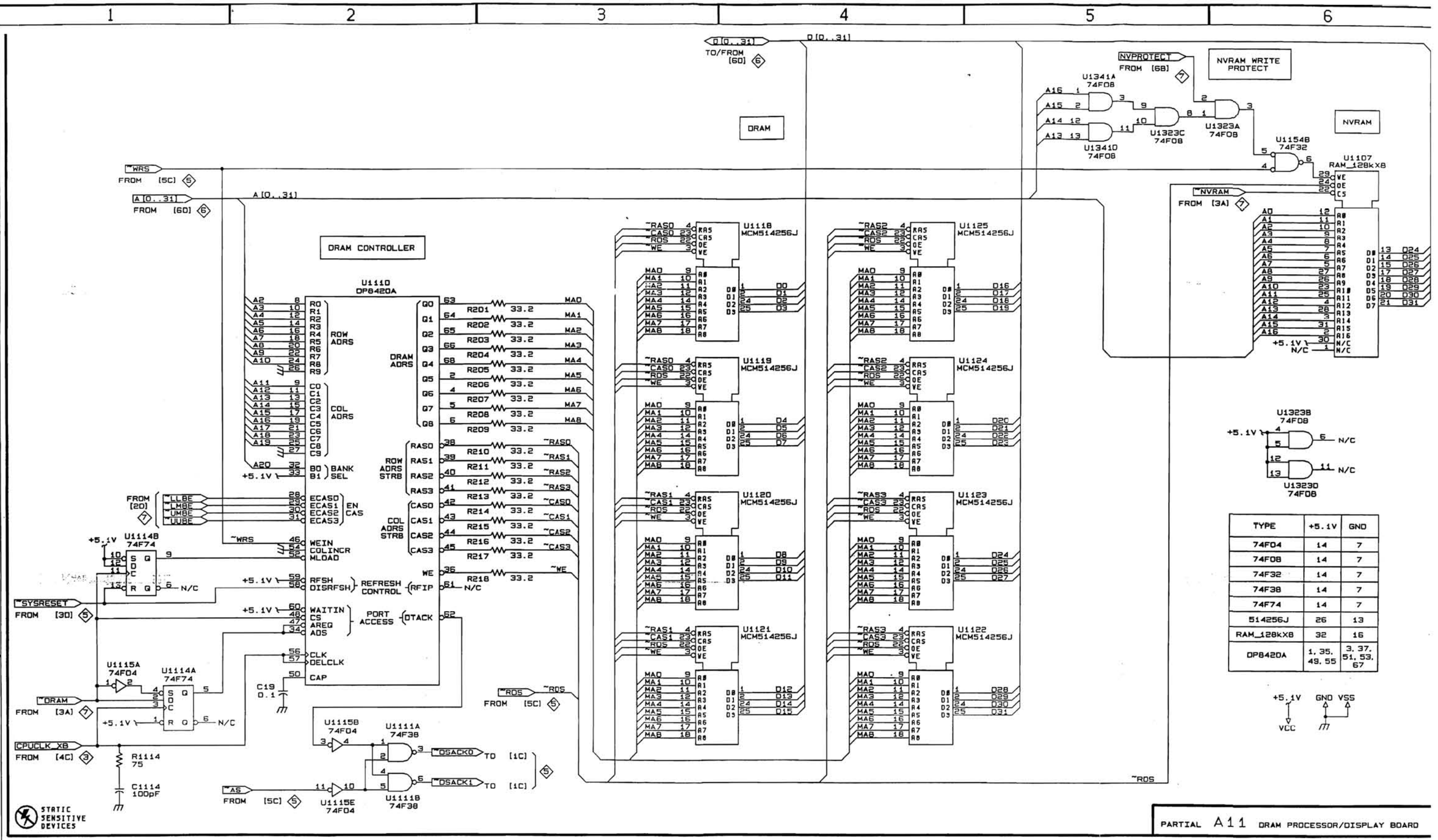


TYPE	+5.1V	GND
74F04	14	7
74F08	14	7
74F20	14	7
74F32	14	7
74F38	14	7
74F138	16	8
74HCT164	14	7
74F245	20	10
74HCT273	20	10
74HCT541	20	10
MC68020	9, 40, 41, 42, 47, 58, 60, 96, 109, 114	10, 14, 22, 29, 53, 59, 65, 68, 71, 73, 82, 86, 108



TYPE	+5.1V	GND
74F04	14	7
74F32	14	7
74F245	20	10
74HCT273	20	10
74HCT541	20	10
75160A	20	10
75161A	20	10
27010	32	16
62256	28	14
9914APLCC	44	22

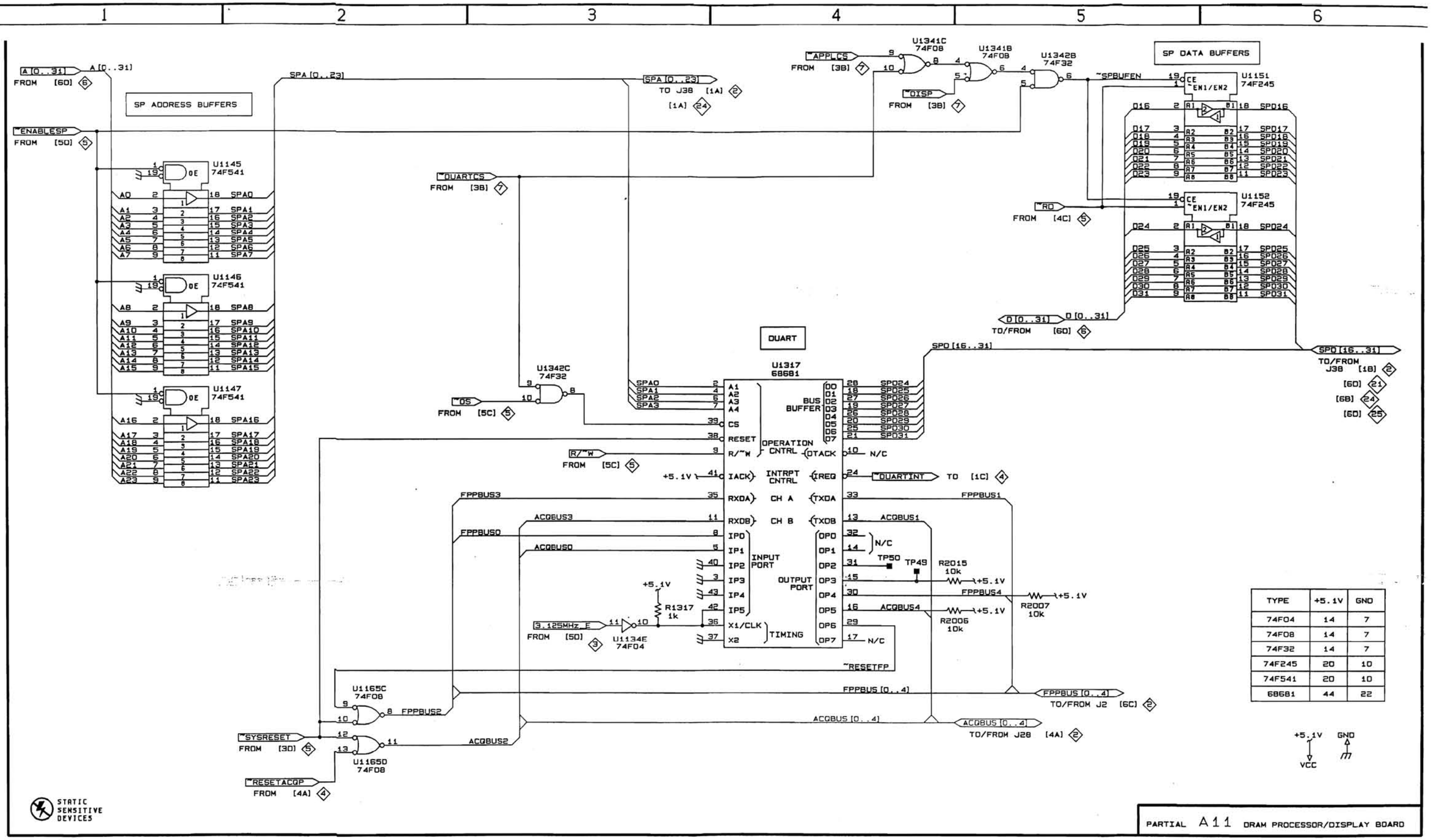

A[0..31]
FROM [6D] 6
~AS
FROM [5C] 5
MAIN DECODE
+5.1V
U1055
74F138
A27
A24
A25
A26
~SYSROM TO J39-47 [3B]
~OPTION1CS TO J39-49 [3B]
~OPTION2CS TO J39-48 [4B]
~NVRAM TO [6A]
~ORAM TO [10]
8
KERNEL
N/C
TP55
~APPLCS TO J38-11 [1A] 2 [4A] 9
~DSP TO [2A] 10 [1A] 11
U1056
74F138
~DISP TO [4A] 9
~XPANDRAM TO [3B] 2
N/C
~DUARTCS TO [2A] 9
~IOCS TO [3D] 2
~SYSMMID
TP56
U1050
74F138
A21
A22
A23
~IMSKREG TO [3B]
~MISCREG TO [3A]
~INTREG1 TO [2B]
~INTREG2 TO [2A]
~CLRTIMER TO [1D]
4
~ROFIFO TO [2C] 15
~SCOPELOOP TO [6A] 5
~SHUTDOWN
WAIT STATE
CPUCLK_X8
FROM [4C] 3
U1189
PALCE22V10H-25
A24
A25
A26
A27
A12
A11
A10
I0/CLK
I1
I2
I3
I4
I5
I6
I7
I8
I9
I10
I11
O9
O8
O7
O6
O5
O4
O3
O2
O1
O0
WAIT0
WAIT1
PORTS1
PORTS0
N/C
FROM [4A] 4
~SYSROMWTS0
~SYSROMWTS1
~NVWR_EN
FROM [3C] 2
U1054A
74F38
~OSACK0 TO [1C]
~OSACK1 TO [1C]
5
U1054B
74F38
NVPROTECT
TO [5A] 8
BYTE ENABLE DECODE
U1048
PAL16V8-15
A0
A1
FROM [5C] 5
SIZ0
SIZ1
~LLBE
~LMBE
~UMBE
~UUBE
TO J39 [4B] 2 [1C] 8
~UBE
~LBE
D31
FROM [6C] 6
N/C
TURNOFFBAR
R/~W
FROM [5C] 5
U15E
74F04
+5.1V
R19
1k
R22
1k
CR1
Q1
151-5066
R23
10k
~SYSRESET
FROM [3D] 5
S1A
S1B
ON/~STBY
TO J26-3 [1B]
J2-10 [6C] 2
R53
OOHM
R54
OOHM
R55
OOHM
R52
OOHM
~WRS
FROM [5C] 5
U1322B
74F32
UB_~WE_OR_~CE TO J38-6 [2A]
~CS_OR_~WE TO J38-3 [1A]
2
U1322A
74F32
LB_~WE_OR_~CE TO J38-4 [2A]
~UBE
~LBE
TO J39 [3A] 2
TYPE | +5.1V | GND
74F04 | 14 | 7
74F32 | 14 | 7
74F38 | 14 | 7
74F138 | 16 | 8
PAL16V8-15 | 20 | 10
PALCE22V10H | 24 | 12
+5.1V
VCC
GND
STATIC SENSITIVE DEVICES
PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD



TYPE	+5.1V	GND
74F04	14	7
74F08	14	7
74F32	14	7
74F38	14	7
74F74	14	7
514256J	26	13
RAM_128kX8	32	16
DP8420A	1, 35, 49, 55	3, 37, 51, 53, 67

+5.1V GND VSS
VCC

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD



TYPE	+5.1V	GND
74F04	14	7
74F08	14	7
74F32	14	7
74F245	20	10
74F541	20	10
68681	44	22

+5.1V VCC GND

BUS ARBITRATION

DSP INTERRUPTS

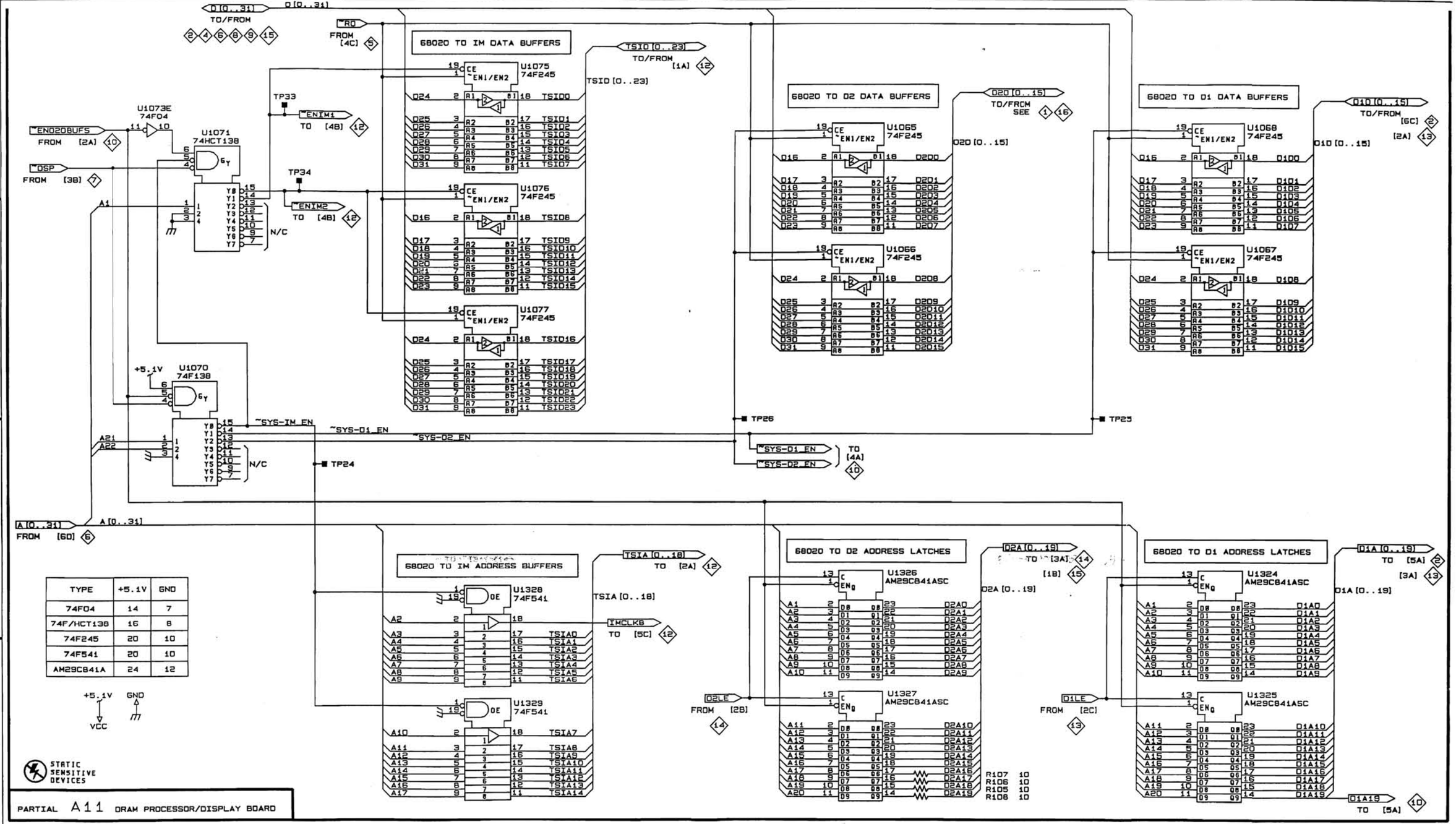
TYPE	+5.1V	GND
74F04	14	7
74HCT30	14	7
74F32	14	7
74F38	14	7
74F74	14	7
74F240	20	10
74F245	20	10
74HCT377	20	10
74HCT541	20	10
16V8-15	20	10

+5.1V VCC

GND

STATIC SENSITIVE DEVICES

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

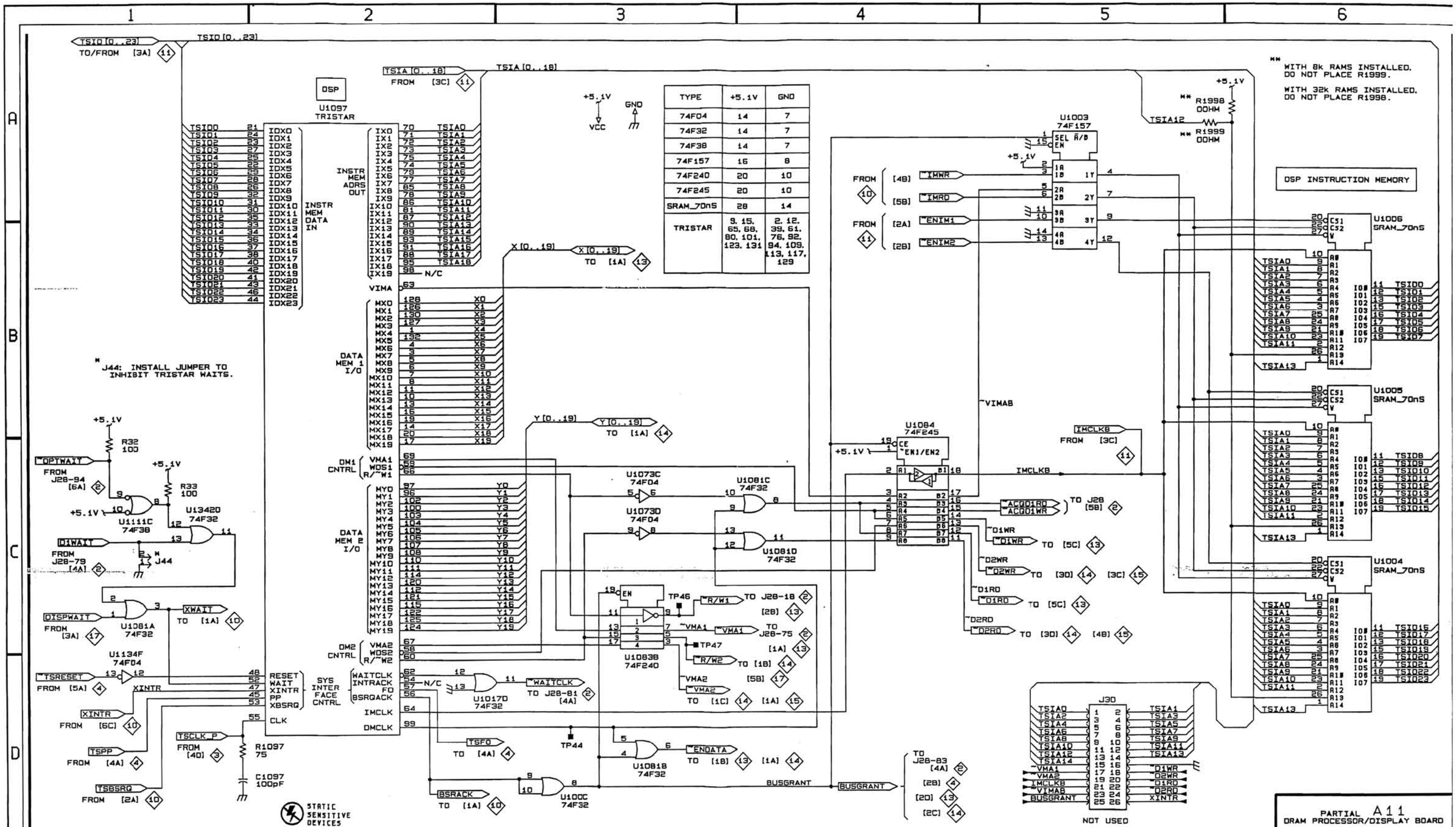


TYPE	+5.1V	GND
74F04	14	7
74F/HCT138	16	8
74F245	20	10
74F541	20	10
AM29C841A	24	12

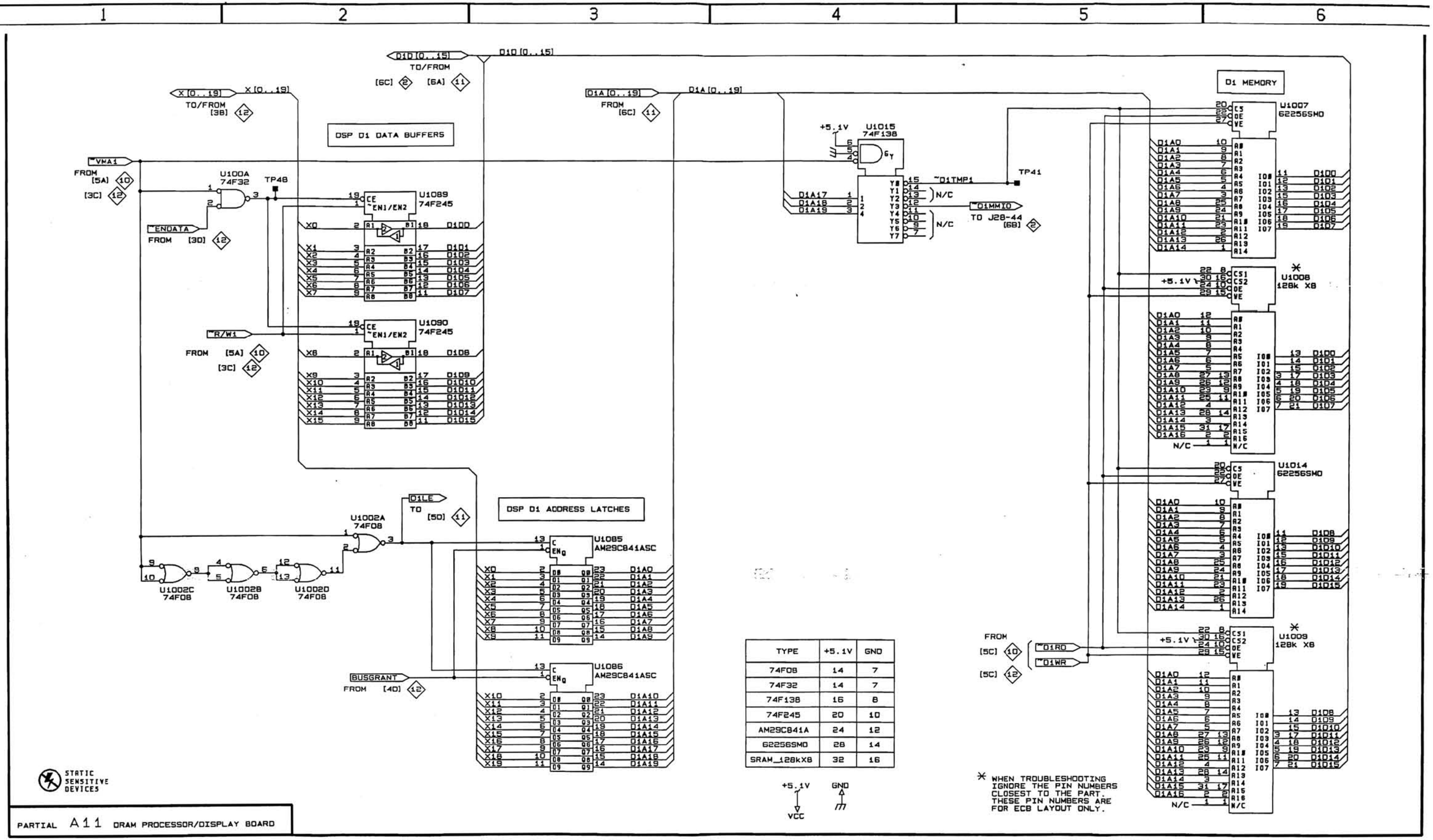
+5.1V GND VCC

STATIC SENSITIVE DEVICES

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

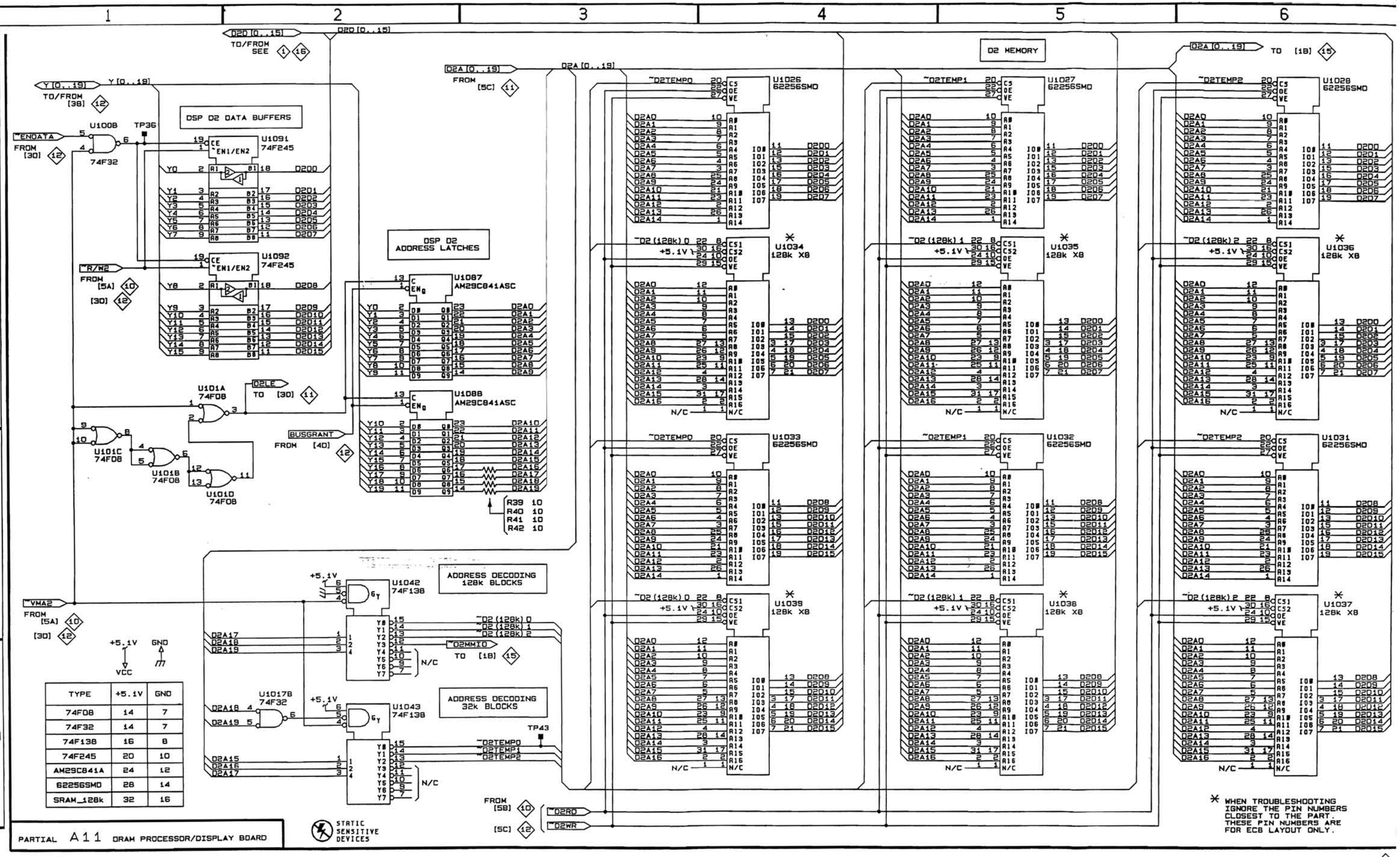


TYPE	+5.1V	GND
74F04	14	7
74F32	14	7
74F38	14	7
74F157	16	8
74F240	20	10
74F245	20	10
SRAM_70nS	28	14
TRISTAR	9, 15, 65, 68, 80, 101, 123, 131	2, 12, 39, 61, 76, 92, 94, 109, 113, 117, 129



TYPE	+5.1V	GND
74F08	14	7
74F32	14	7
74F138	16	8
74F245	20	10
AM29C841A	24	12
62256SMD	28	14
SRAM_128kX8	32	16

+5.1V VCC GND



TYPE	+5.1V	GND
74F08	14	7
74F32	14	7
74F138	16	8
74F245	20	10
AM29C841A	24	12
62256SMD	28	14
SRAM_128k	32	16

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

D2MMIO DECODING

D2MMIO MISC REGISTER

U1044 74F138

+5.1V

FROM [5A] 10 ~VMA2
[30] 12

~D2MMIO FROM [20] 14

D2A14 D2A15 D2A16

D2A [0..19] FROM [5C] 11 [6A] 14

~TSMSKREG TO [3C]
~TSINTREG TO [3C] 10
~CLRTSPERINT TO [10]

N/C

TP23 ~WRFIFO

TP32 ~D2MISCREG

~D2WR FROM [4B] 10 [5C] 12

U1046 74HCT377

WFMSAVE FROM [6A] 22

FROM [5B] 10 [5C] 12 ~D2RD

U1047 74HCT541

D208 D209 D2010 D2011 D2012 D2013 D2014 D2015

N/C N/C

TSMSKFIFOINT020

~TSINT020 TO [1C] 4

FIFO

U1096B 74F32

~FIFOFULL

TP27

~RDFIFO FROM [3C] 7

~RDS FROM [5C] 5

U1096C 74F32

~SYSRESET FROM [30] 5

U1074 7201PLCC

+5.1V

N/C FIFO HAS DATA

U1134D 74F04

U1096D 74F32

~FIFOINT TO [1C] 4

D200 D201 D202 D203 D204 D205 D206 D207

D208 D209 D210 D211 D212 D213 D214 D215

N/C

D20 [0..15] TO/FROM SEE 1 16

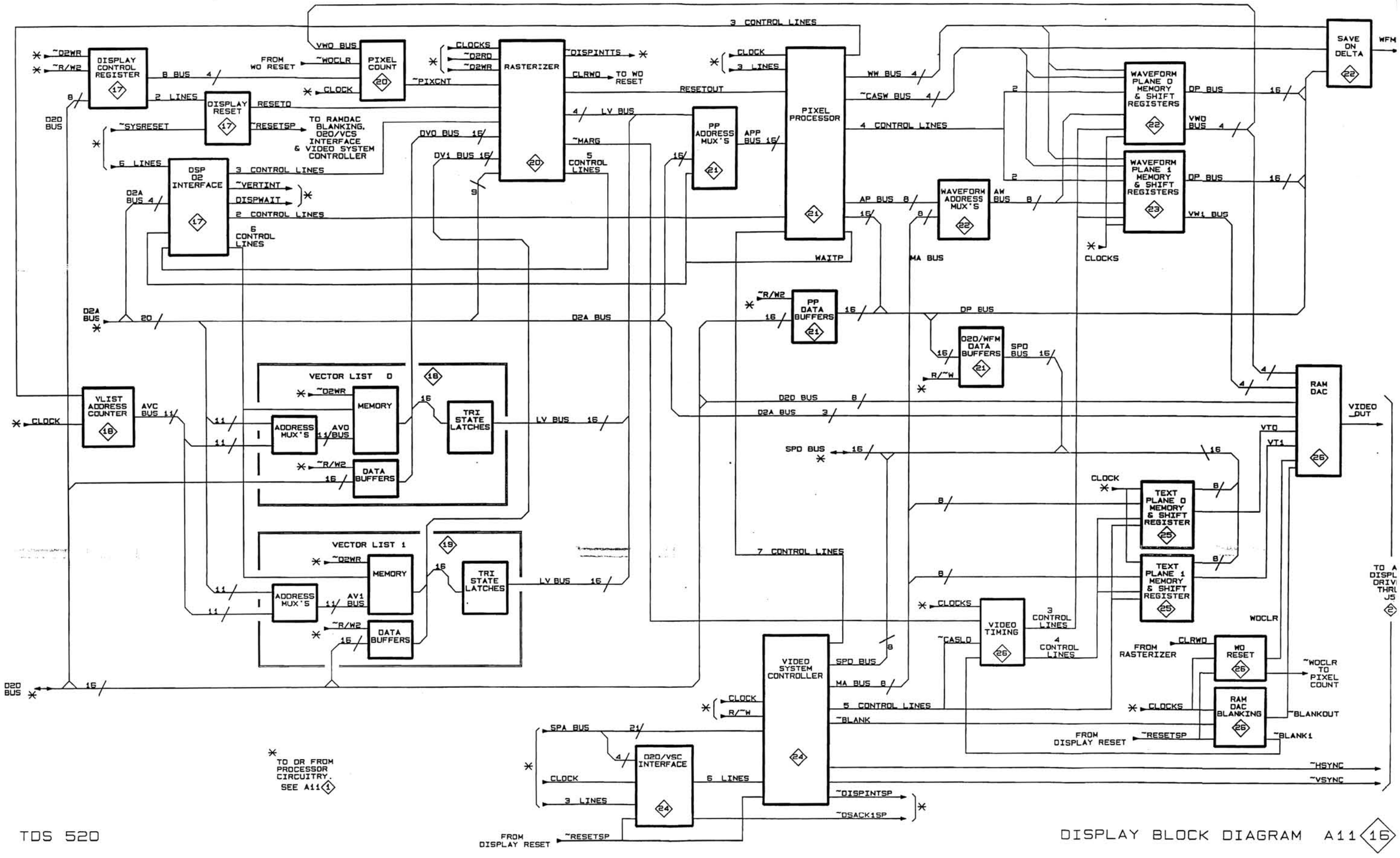
D [0..31] TO 2 4 5 8 9 11

TYPE	+5.1V	GND
74F138	16	8
74HCT377	20	10
74HCT541	20	10
7201	32	16

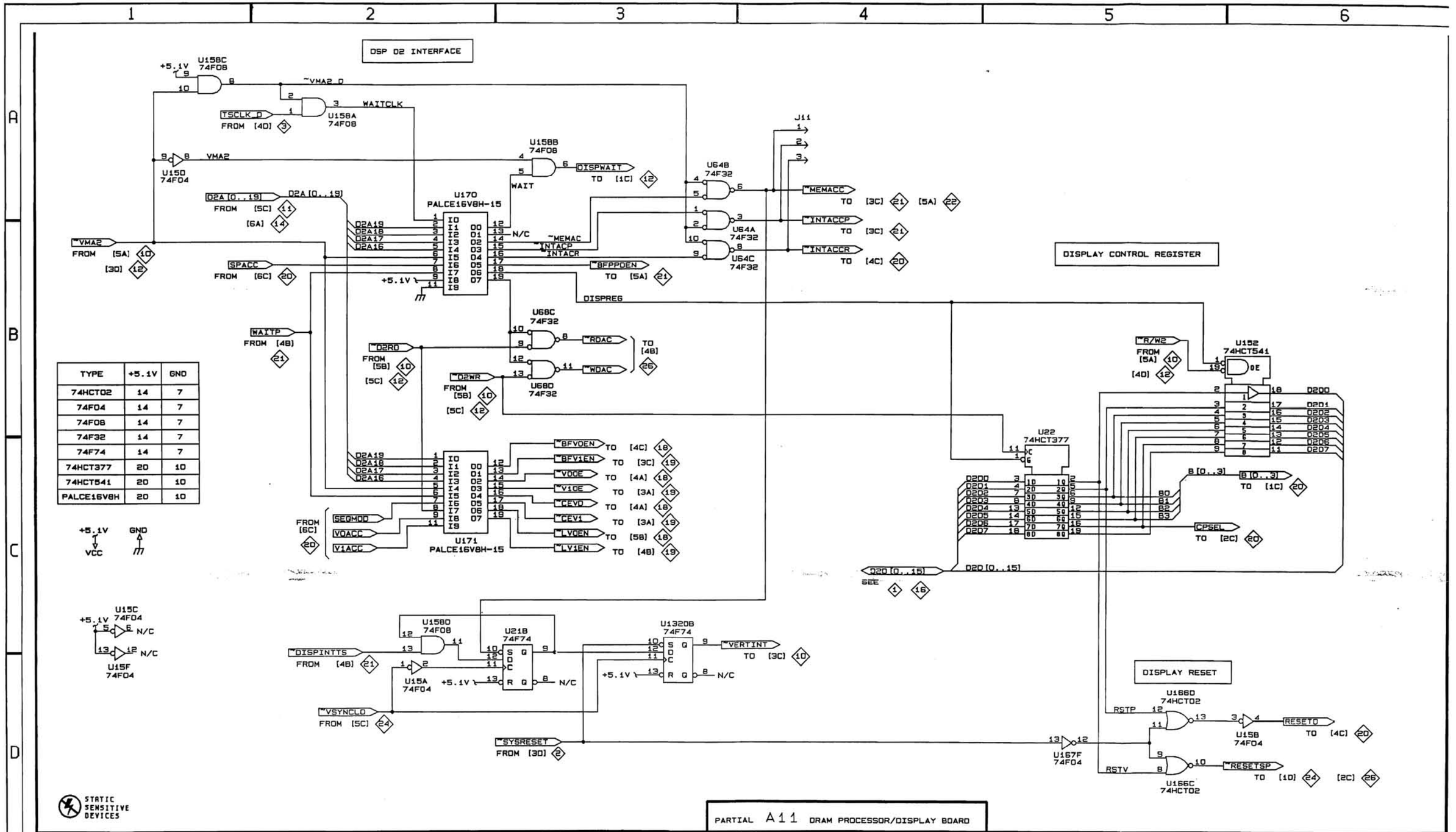
+5.1V VCC GND

STATIC SENSITIVE DEVICES

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

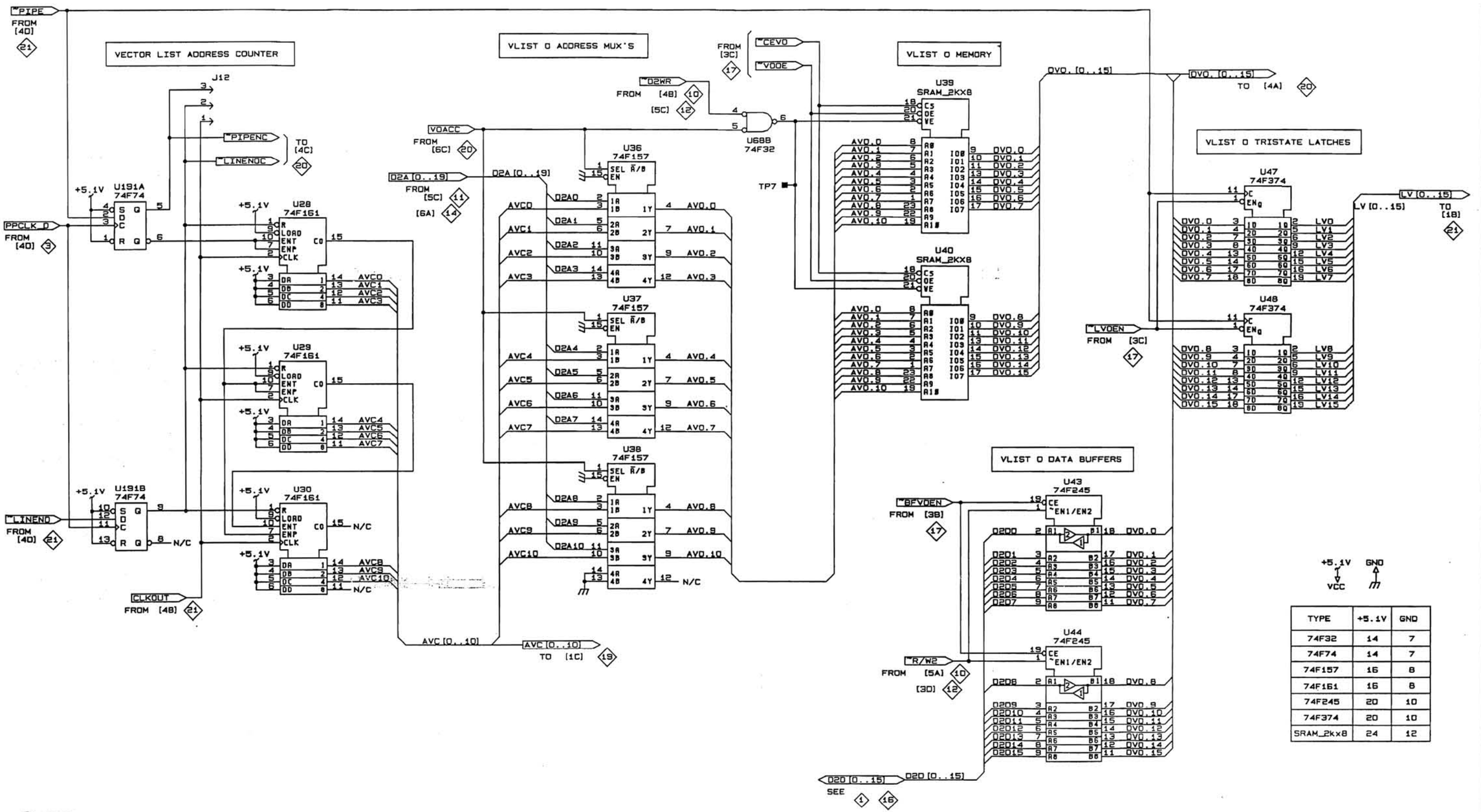


DISPLAY BLOCK DIAGRAM A11 16

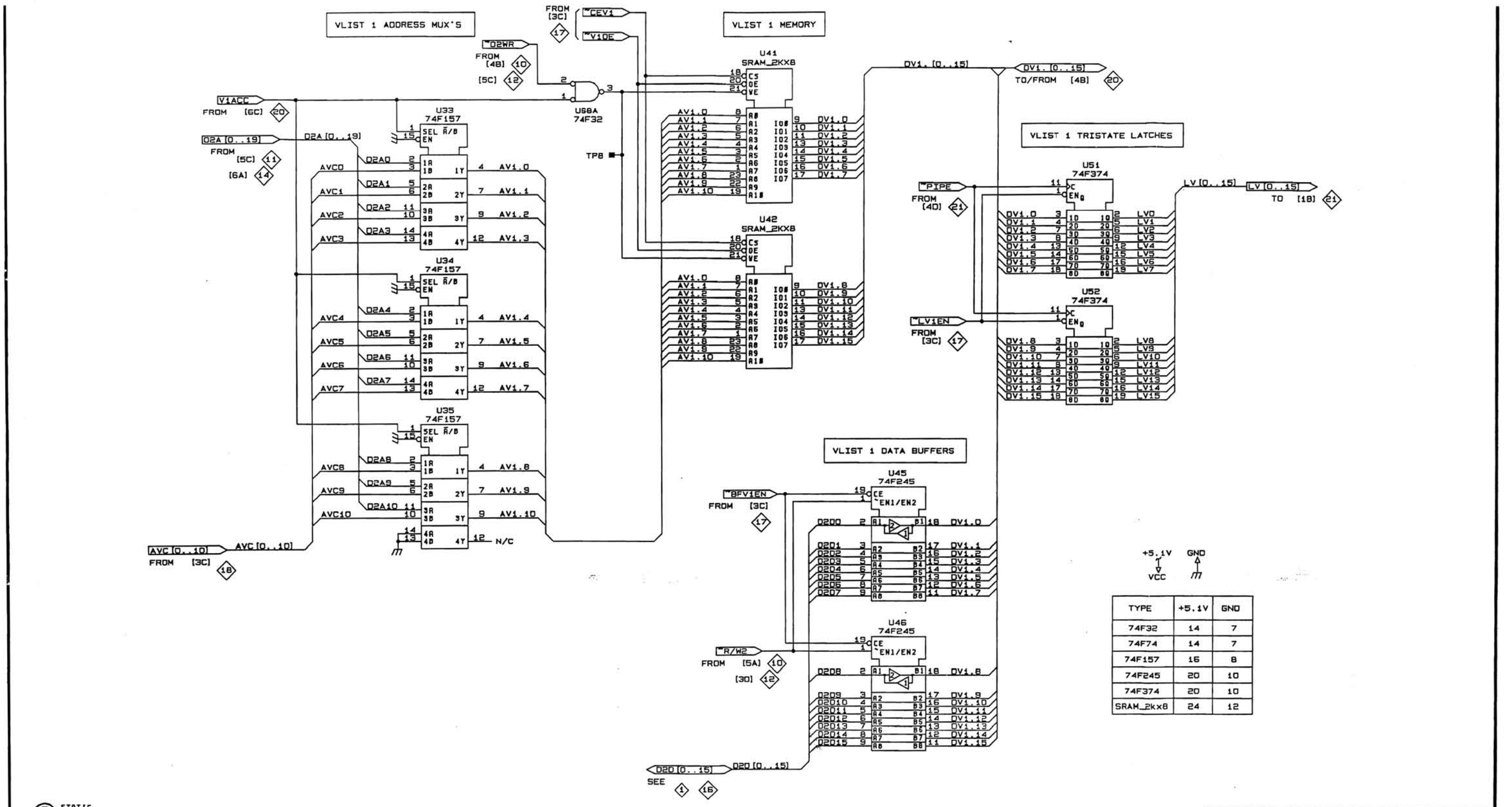


TYPE	+5.1V	GND
74HCT02	14	7
74F04	14	7
74F08	14	7
74F32	14	7
74F74	14	7
74HCT377	20	10
74HCT541	20	10
PALCE16V8H	20	10

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD



TYPE	+5.1V	GND
74F32	14	7
74F74	14	7
74F157	16	8
74F161	16	8
74F245	20	10
74F374	20	10
SRAM_2kx8	24	12



TYPE	+5.1V	GND
74F32	14	7
74F74	14	7
74F157	16	8
74F245	20	10
74F374	20	10
SRAM_2kx8	24	12

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

+5.1V VCC VDD GND

TYPE	+5.1V	GND
74F08	14	7
74F32	14	7
74F74	14	7
74F85	16	8
74F157	16	8
ADG222	18, 37 44, 67 84	1, 14 22, 38 43, 68

PIXEL COUNT

U143 74F85
U142 74F157
U126C 74F08
U1320A 74F74

VWO.[0..3] FROM [6D] 22
B[0..3] FROM [6C] 17
CPSEL FROM [5C] 17
~WOCLR FROM [3C] 26
25MHz_3 FROM [2B] 3
A.EQ.B
A.GT.B
N/C

RASTERIZER

U59 ADG222

PPCLK_D FROM [4D] 3
DVO.[0..15] FROM [5A] 18
DV1.[0..15] FROM/TO [5A] 19
D2A[0..19] FROM [5C] 11 [6A] 14
~INTACCR FROM [4B] 17
FROM [5B] 10 [5C] 12 ~D2RD ~D2WR
RESETO FROM [6D] 17
FROM [2A] 18 ~LINENDC ~PIPENC
FROM [2B] 3 25MHz_2 3.125MHz_VIO [3A]
FROM [5C] 24 ~HSYNCLO ~VSYNCLO ~BLANK

CLKIN
DVO.0 DVO.1 DVO.2 DVO.3 DVO.4 DVO.5 DVO.6 DVO.7 DVO.8 DVO.9 DVO.10 DVO.11 DVO.12 DVO.13 DVO.14 DVO.15
CH 0 IN
DV1.0 DV1.1 DV1.2 DV1.3 DV1.4 DV1.5 DV1.6 DV1.7 DV1.8 DV1.9 DV1.10 DV1.11 DV1.12 DV1.13 DV1.14 DV1.15
CH 1 IN OUT
D2A0 D2A1 D2A2 D2A3 D2A4 D2A5 D2A6 D2A7 D2A8
AD0 AD1 AD2 AD3 AD4 AD5 AD6 AD7 AD8
D2 BUS INTERFACE
INTACCR RD WR RESETIN
LINEND PIPEN
PP INTERFACE
SPIXEL SCLK VIOCLK HSYNC VSYNC BLANK
VIDEO FUNCTIONS
MODE CONTROL OUTPUTS
INTERLACE

INTENSITY OUTPUTS: INTA0 20 LV3, INTA1 21 LV4, INTA2 23 LV5, INTA3 24 LV6
LV[0..15] TO [1B] 21
INTB0 15, INTB1 16, INTB2 17, INTB3 18 N/C
RESETOUT 26 TO [3D] 21
VOACC 41 TO [2C] 17 [2A] 18
V1ACC 39 TO [2C] 17 [2A] 19
SPACC 40 TO [1B] 17 [1C] 24
SEQMOD 36 TO [1C] 17
RASTMD 35 N/C
WOCLR 13 N/C
W1CLR 12
MARGIN 35 N/C
LCOMP 49 N/C
CLRWO TO [2C] 26
~MARG TO [4D] 26

STATIC SENSITIVE DEVICES

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

TYPE	+5.1V	GND
74F157	16	8
74F/HCT245	20	10
ADG221	4, 21 24, 40 64	1, 14 25, 28 42, 65

+5.1V VCC VDD

GND VSS

PP ADDRESS MUX'S

U55 74F157

U56 74F157

U57 74F157

U58 74F157

D2A [0..19] FROM [5C] 11 [6A] 14

LV [0..15] FROM [6A] 18 [6A] 19 [6A] 20

TP1 TP2 TP3 TP4

PPCLK_D FROM [4D] 3

PIXEL PROCESSOR

U60 ADG221

CLKIN CLKOUT FRMINT WAITP VLIST INTERFACE D2 BUS INTERFACE VIDEO SYSTEM INTERFACE PP INTERFACE WAVE FORM PLANE INTERFACE

FROM [5B] 10 [5C] 12 ~D2RD ~D2WR

FROM [4A] 17 ~INTACCP ~MEMACC

FROM [6B] 24 ~CASHI ~CASLO ~RASO ~WVSC ~TRV ~HOLD ~HLDAV

FROM [3C] 24

RESETOUT FROM [6C] 20

CLKOUT TO [1C] 18

~DISPINTTS TO [30] 10 [20] 17

WAITP TO [2B] 17

AP [0..7] TO [10] 22

~WW [0..3] TO [2A] 22

~CASW [0..3] TO [2A] 22

~RASW0 TO [3A] 22

~RASW1 TO [2A] 23

~TRW TO [3A] 22

~TRW1 TO [2A] 23

~HLDAP TO [1B] 24

~LINEND TO [1C] 18

~PIPE TO [1A] 18 [4A] 19

~BFPPDEN FROM [3B] 17

~R/W2 FROM [5A] 10 [4D] 12

D20 [0..15] SEE 1 16

PP DATA BUFFERS

U61 74HCT245

U62 74HCT245

DP [0..15] TO/FROM [4A] 22 [3D] 23

D20/WFM DATA BUFFERS

~WBFEN FROM [2B] 24

R/~W FROM [5C] 9

U79 74F245

U80 74F245

SPD [16..31] FROM/TO [6B] 9 [6B] 24 [6D] 25

STATIC SENSITIVE DEVICES

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

TYPE	+5.1V	GND
74F20	14	7
74F157	16	8
74F194	16	8
UPD41264	18	6
CE22V10H-25	24	12

+5.1V GND VCC

WFM ADDRESS MULTIPLEXERS

FROM [5C] ~WW[0..3] ~CASW[0..3]

FROM [50] SCW

FROM [40] ~TRW ~RASWO

WAVEFORM 0 MEMORY

U108 UPD41264V-12
U109 UPD41264V-12
U110 UPD41264V-12
U111 UPD41264V-12

~WW0 ~CASW0 ~WW1 ~CASW1 ~WW2 ~CASW2 ~WW3 ~CASW3

DP[0..15] TO/FROM [68] [21] [30] [23]

SAVE ON DELTA

U20B 74F20 ~WW0 ~WW1 ~WW2 ~WW3 WFMW

FROM [4A] ~MEMACC

U1319 CE22V10H-25 IO/CLK I1 I2 I3 I4 I5 I6 I7 I8 I9 I10 I11 I12 I13 I14 I15 I16 I17

DP1 DP2 DP3 DP5 DP6 DP7 DP9 DP10 DP11 DP13 DP14 DP15 ~CASW3 ~CASW2 ~CASW1 ~CASW0

O5 O4 O3 O2 N/C N/C N/C WFMSAVE TO [4A]

FROM [50] SRLO

FROM [28] 25MHz

FROM [5C] ~MARGIN

WFM 0 SHIFT REGISTERS

U112 74F194 U113 74F194 U114 74F194 U115 74F194

SWO.0 SWO.4 SWO.8 SWO.12 SWO.1 SWO.5 SWO.9 SWO.13 SWO.2 SWO.6 SWO.10 SWO.14 SWO.3 SWO.7 SWO.11 SWO.15

N/C

VWO.0 VWO.1 VWO.2 VWO.3 TP10 TP11 TP12 TP13

VWO.[0..3] TO [1C] [20] [38] [26]

U63 74F157 U66 74F157

~VADEN FROM [3C]

MA0 MA1 MA2 MA3 MA4 MA5 MA6 MA7

AP0 AP1 AP2 AP3 AP4 AP5 AP6 AP7

AW0 AW1 AW2 AW3 AW4 AW5 AW6 AW7

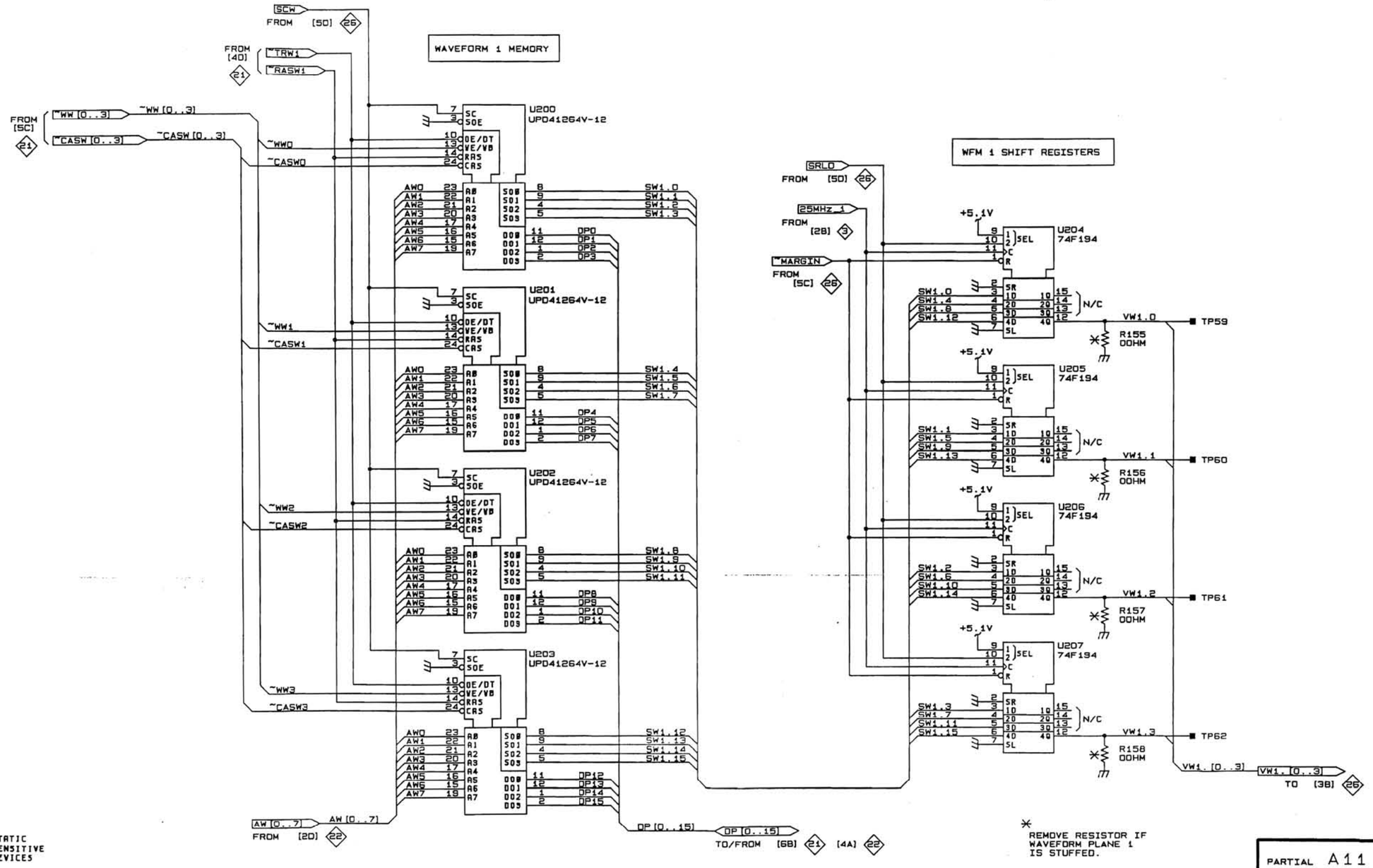
MA[0..7] FROM [6A]

AP[0..7] FROM [4C]

AW[0..7] TO [20]

STATIC SENSITIVE DEVICES

PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD


WAVEFORM 1 MEMORY
WFM 1 SHIFT REGISTERS
SCW FROM [50] 26
FROM [40] 21
~TRW1
~RASW1
FROM [5C] 21
~WW [0..3]
~CASW [0..3]
~WW0
~CASW0
~WW1
~CASW1
~WW2
~CASW2
~WW3
~CASW3
U200 UPD41264V-12
U201 UPD41264V-12
U202 UPD41264V-12
U203 UPD41264V-12
SC
SOE
DE/DT
VE/VB
RAS
CAS
AW0
AW1
AW2
AW3
AW4
AW5
AW6
AW7
SW1.0
SW1.1
SW1.2
SW1.3
SW1.4
SW1.5
SW1.6
SW1.7
SW1.8
SW1.9
SW1.10
SW1.11
SW1.12
SW1.13
SW1.14
SW1.15
DP0
DP1
DP2
DP3
DP4
DP5
DP6
DP7
DP8
DP9
DP10
DP11
DP12
DP13
DP14
DP15
AW [0..7]
FROM [2D] 22
DP [0..15]
TO/FROM [6B] 21 [4A] 22
SRLD FROM [50] 26
25MHz_1 FROM [2B] 3
~MARGIN FROM [5C] 26
+5.1V
U204 74F194
U205 74F194
U206 74F194
U207 74F194
SEL
N/C
VW1.0
VW1.1
VW1.2
VW1.3
R155 00HM
R156 00HM
R157 00HM
R158 00HM
TP59
TP60
TP61
TP62
VW1. [0..3]
TO [3B] 26
TYPE | +5.1V | GND
74F194 | 16 | 8
UPD41264 | 18 | 6
+5.1V VCC
GND
STATIC SENSITIVE DEVICES
* REMOVE RESISTOR IF WAVEFORM PLANE 1 IS STUFFED.
PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

VIDEO SYSTEM CONTROLLER & 020/VSC INTERFACE

020/VSC INTERFACE

SPA[0..23] FROM [3A] 9

U169 PALCE22V10H-25
I0/CLK, I1, I2, I3, I4, I5, I6, I7, I8, I9, I10, I11
O9, O8, O7, O6, O5, O4, O3, O2, O1, O0
SPA22, SPA21, SPA20, SPA19
N/C, N/C, N/C
~WBFEN TO [5C] 21
G2
~G0
~DISP FROM [3B] 7
~HLOAP FROM [4D] 21
FROM [4D] 7: ~LBE, ~UBE
CELPAL
CEHPAL

U167A 74F04
CPUCLK_D FROM [4D] 3
U11908 74F74
+5.1V
CPUCLK/2

U164A 74F74 — N/C, ~ALEV
U164B 74F74 — N/C, ~CEL
U165A 74F74 — N/C, ~CEH
U166A 74HCT02
U165B 74F74 — N/C, ~HLDAV
U167C 74F04
U168A 74F32
U167B 74F04
U168B 74HCT02
~VADEN TO [1C] 22
~HLDAV TO [3D] 21
~CS
SPACC FROM [6C] 20

DSACKEN
U1054D 74F38
~DSACK1SP TO [1D] 5

~RESETSP FROM [6D] 17

J13: ~CS 3, ~ALEV 2, CPUCLK/2 1

J14: ~CEL 3, ~HLDAV 2, ~HOLD 1

STATIC SENSITIVE DEVICES

VIDEO SYSTEM CONTROLLER

U81 TMS34061

SPA1–SPA8 → CA0–CA8 (COLUMN & ROW ADDRESS LATCHES)
SPA9–SPA16 → RA0–RA8
ALE
SPA17–SPA22 → RS0, RS1, FS0, FS1, FS2
SYSCLK, CEL, CEH, CS, R/~W, RESET
R/~W FROM [5C] 5
HOLDACK, VIDCLK
READY LOGIC → RDY/~HOLD
CRT CONTROL LOGIC → BLANK, INT, HSYNC, VSYNC
3.125MHz_VID FROM [3A] 3

ADDRESS MUX OUTPUTS: MA0–MA8 → MA[0..7] TO [5D] 21 [1D] 22
020 DATA INTERFACE: D0–D7 ↔ SPD[16..31] TO/FROM [6B] 9 [5D] 21 [6D] 25
MEMORY CYCLE GENERATOR: RAS0, RAS1, RAS2, RAS3, CASHI, CASLO, W, TR/QE
~RAS0 TO [3C] 21
~RAS1 TO [1A] 25
~CASHI TO [3C] 21 [4B] 25
~CASLO TO [3C] 21 [1B] 25 [4D] 26
TP9
~WVSC TO [3D] 21 [1D] 25
~TRV TO [3D] 21 [1A] 25
~HOLD TO [3D] 21
~BLANK TO [4C] 20 [1C] 26
~DISPINTSP TO [1C] 4
~HSYNCLD TO [4C] 20
~VSYNCLD TO [2D] 17 [4C] 20

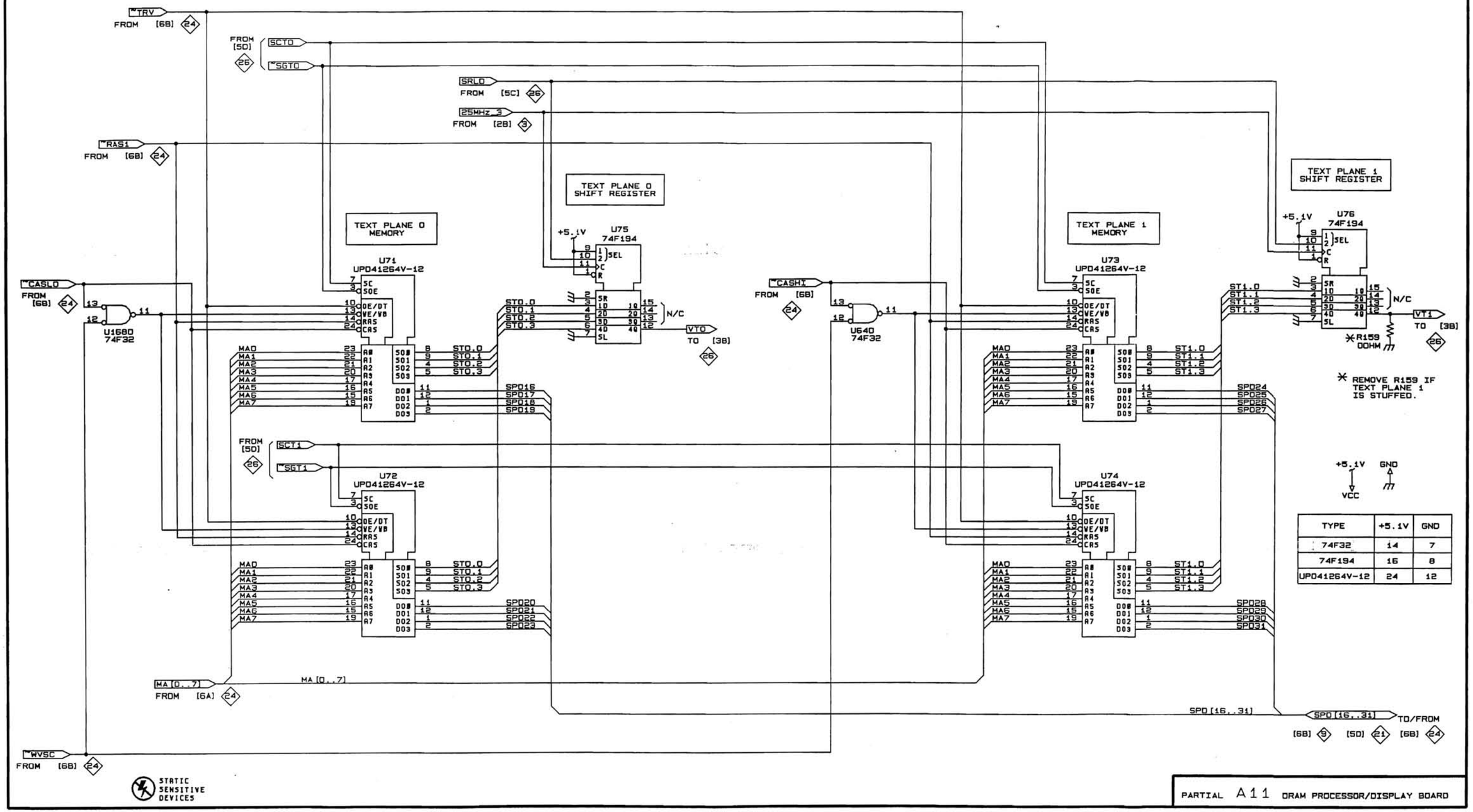
R5 2.74k

U126A 74F08 — 1/A11 ~HSYNC, 2/A11 ~VSYNC → TO J5 [3D] 2
U126B 74F08
J18: 1, 2, 3 VIDEO_OUT FROM [5B] 26

TYPE	+5.1V	GND
74HCT02	14	7
74F04	14	7
74F08	14	7
74F38	14	7
74F74	14	7
PALCE22V10H-25	24	12
TMS34061	10, 44	1, 18, 35, 52

+5.1V, GND, VSS → VCC

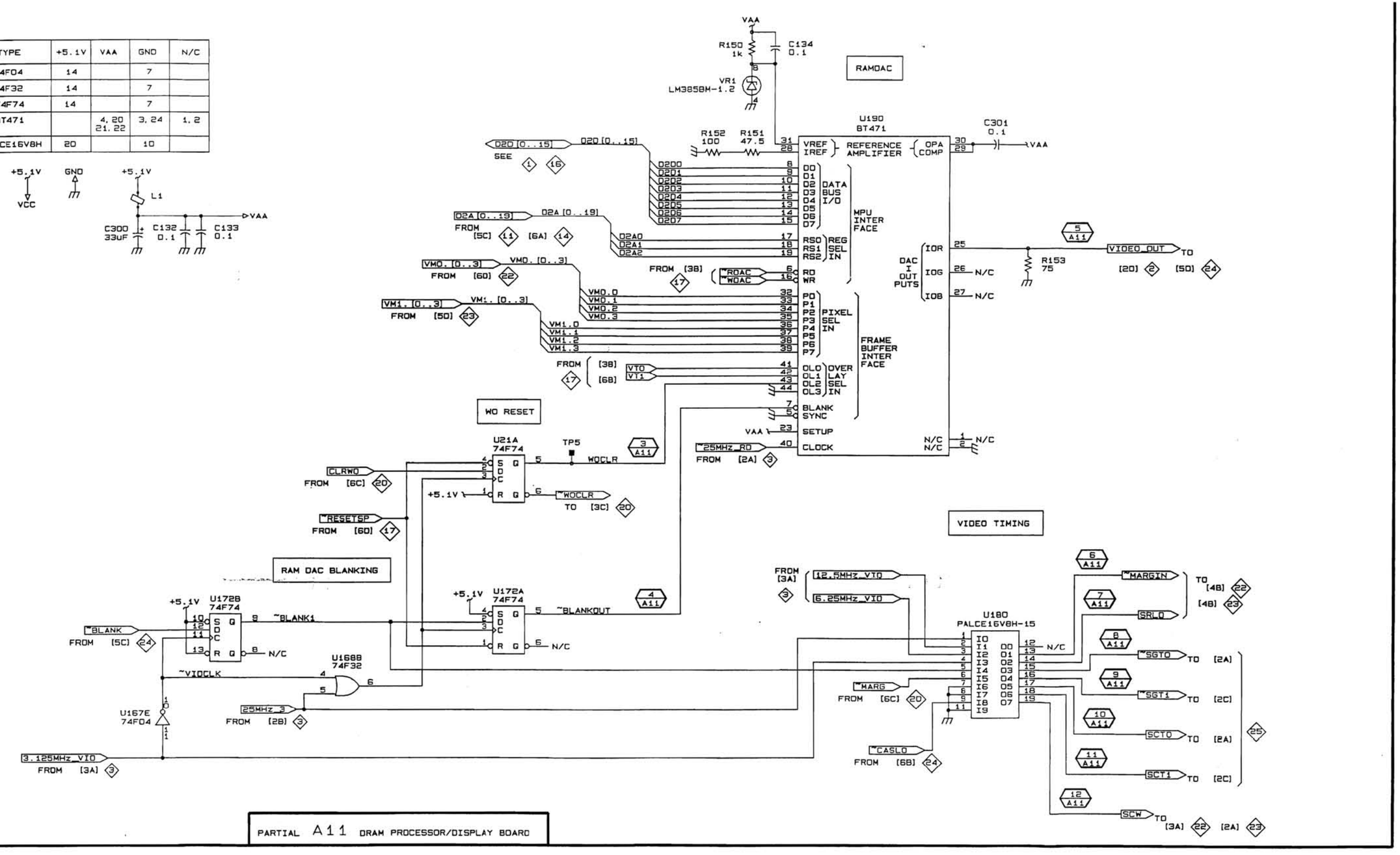
PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD



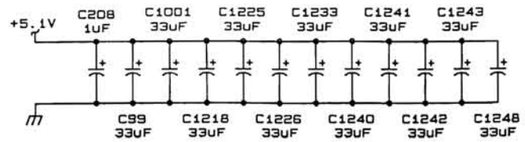
TYPE	+5.1V	GND
74F32	14	7
74F194	16	8
UPD41264V-12	24	12

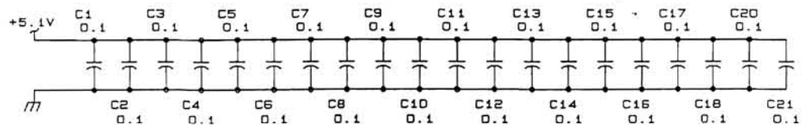
PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

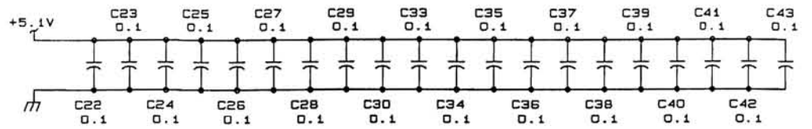
TYPE	+5.1V	VAA	GND	N/C
74F04	14		7	
74F32	14		7	
74F74	14		7	
BT471		4, 20 21, 22	3, 24	1, 2
PALCE16V8H	20		10	

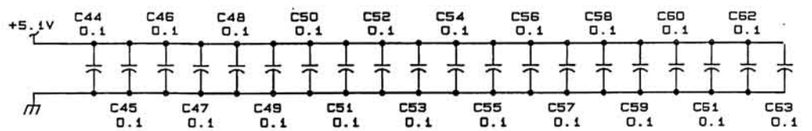


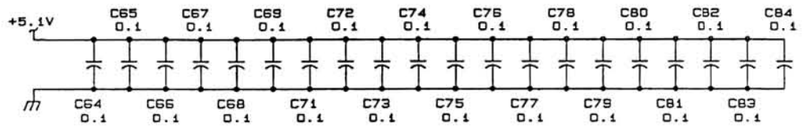
PARTIAL A11 DRAM PROCESSOR/DISPLAY BOARD

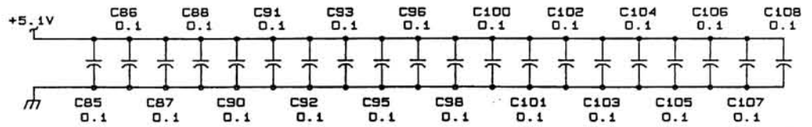


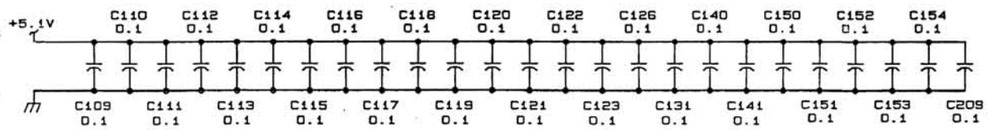


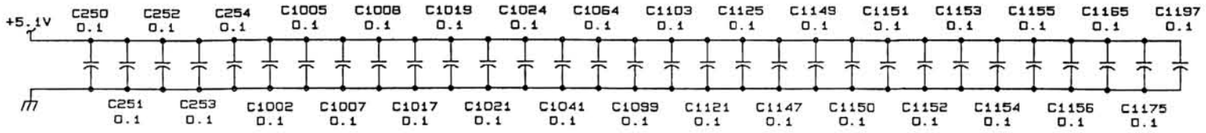




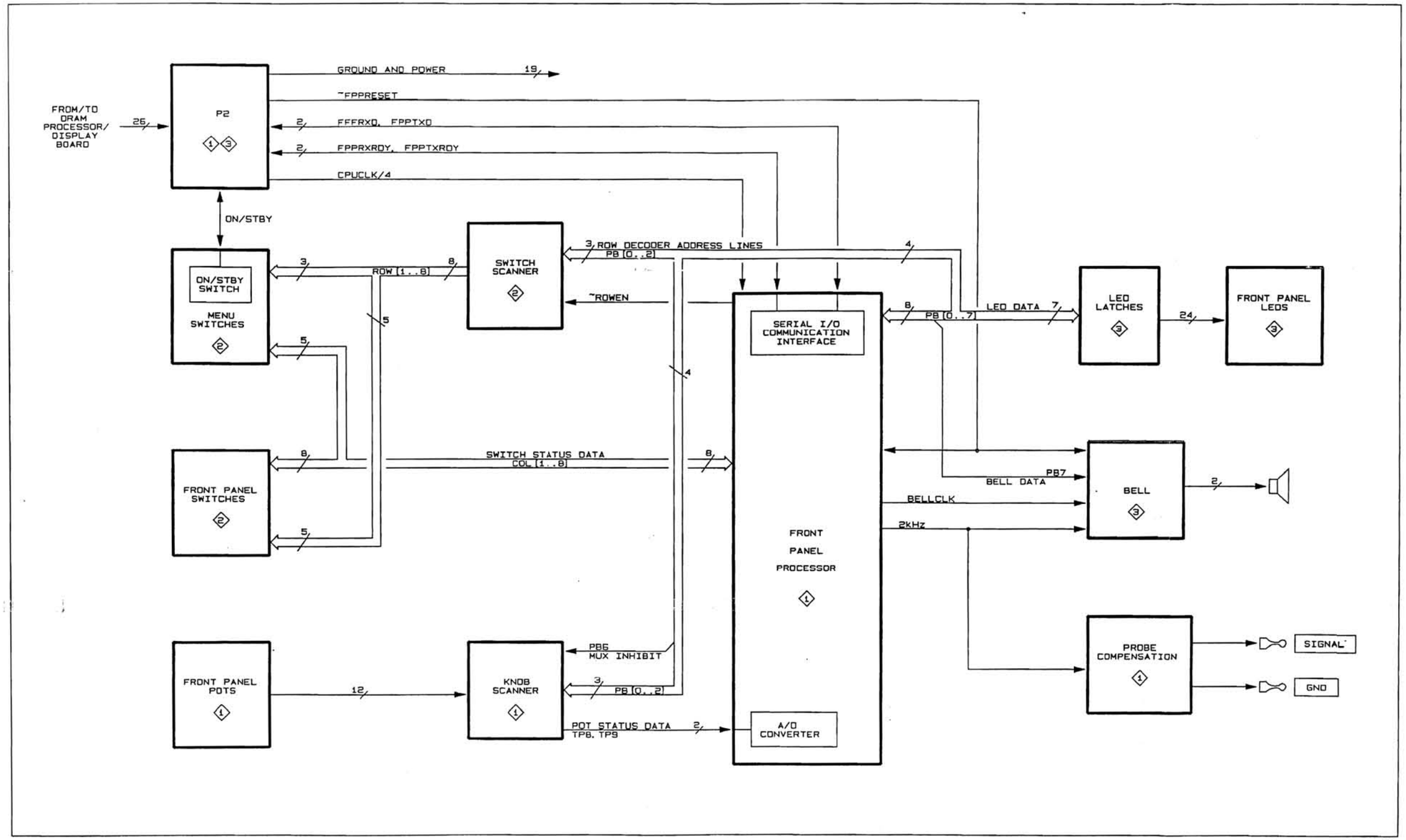


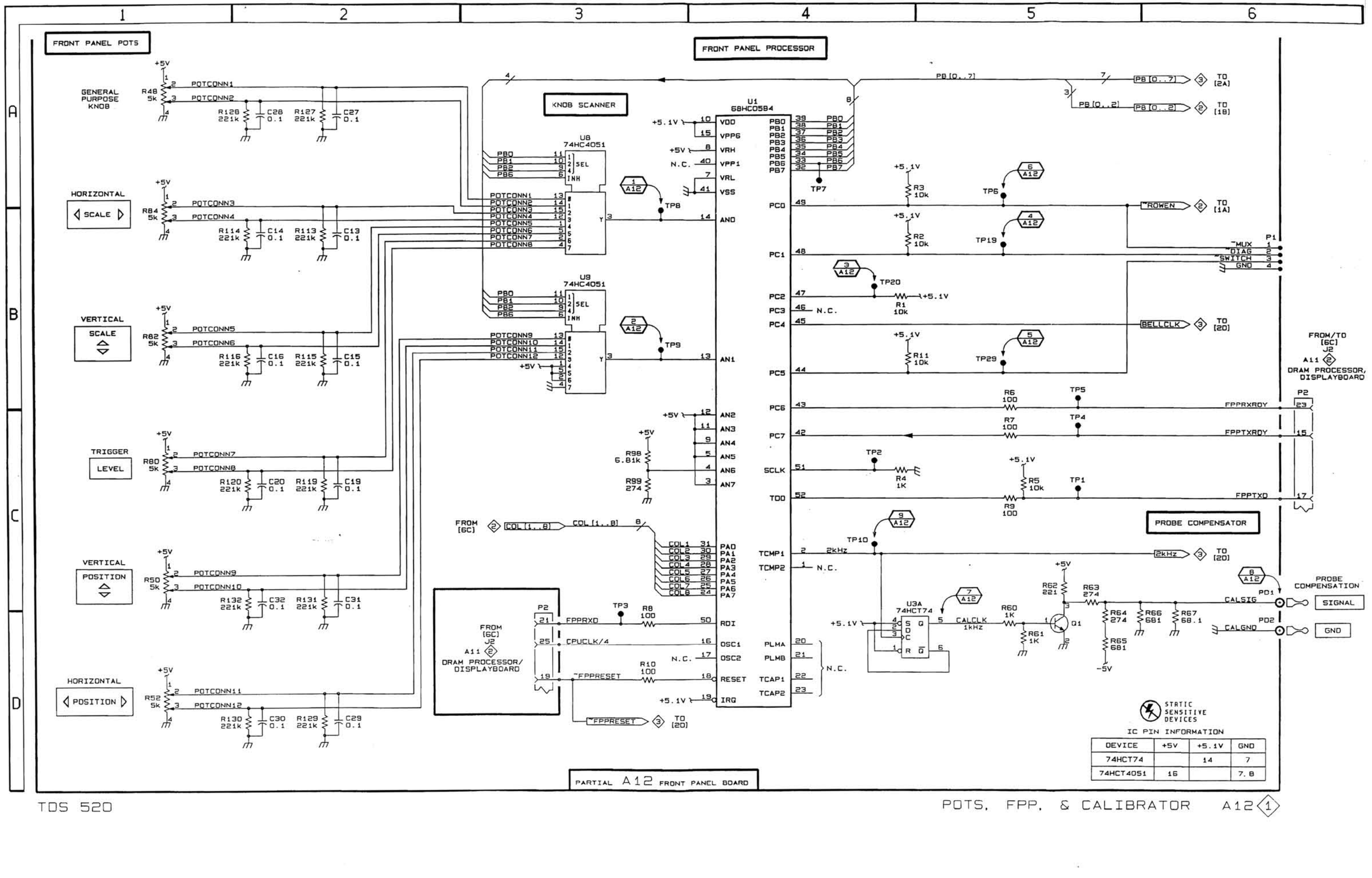






PARTIAL A11 DRAW PROCESSOR/DISPLAY BOARD


FROM/TO
ORAM
PROCESSOR/
DISPLAY
BOARD
26
P2
1
3
GROUND AND POWER
19
~FPPRESET
2
FFFRXD, FPPTXD
2
FPPRXRDY, FPPTXRDY
CPUCLK/4
ON/STBY
ON/STBY
SWITCH
MENU
SWITCHES
2
3
ROW [1..8]
8
SWITCH
SCANNER
2
3 ROW DECODER ADDRESS LINES
PB [0..2]
4
~ROWEN
5
5
4
SERIAL I/O
COMMUNICATION
INTERFACE
8
PB [0..7]
LED DATA
7
LED
LATCHES
3
24
FRONT PANEL
LEDS
3
8
SWITCH STATUS DATA
COL [1..8]
8
FRONT PANEL
SWITCHES
2
5
PB7
BELL DATA
BELL
3
2
BELLCLK
2kHz
FRONT
PANEL
PROCESSOR
1
PROBE
COMPENSATION
1
SIGNAL
GND
FRONT PANEL
POTS
1
12
KNOB
SCANNER
1
PB6
MUX INHIBIT
3
PB [0..2]
POT STATUS DATA
TP8, TP9
2
A/D
CONVERTER


FRONT PANEL POTS
FRONT PANEL PROCESSOR
KNOB SCANNER
GENERAL PURPOSE KNOB
HORIZONTAL SCALE
VERTICAL SCALE
TRIGGER LEVEL
VERTICAL POSITION
HORIZONTAL POSITION
U1 68HC05B4
U8 74HC4051
U9 74HC4051
U3A 74HCT74
PROBE COMPENSATOR
PROBE COMPENSATION
SIGNAL
GND
FROM/TO [6C] J2 A11 DRAM PROCESSOR/ DISPLAYBOARD
FROM [6C] J2 A11 DRAM PROCESSOR/ DISPLAYBOARD
STATIC SENSITIVE DEVICES
IC PIN INFORMATION
DEVICE | +5V | +5.1V | GND
74HCT74 | | 14 | 7
74HCT4051 | 16 | | 7, 8
PARTIAL A12 FRONT PANEL BOARD

SWITCH SCANNER

FRONT PANEL SWITCHES

FLEX

MENU SWITCHES

U4
74HCT138

FROM [1] [6B] ~ROWEN, [6A] PB[0..2]

+5.1V

PB0, PB1, PB2

STATIC SENSITIVE DEVICES

IC PIN INFORMATION

DEVICE	+5.1V	GND
74HCT138	16	8

TP11 CR100A ROW1
TP12 CR101A ROW2
TP13 CR102A ROW3
TP14 CR103A ROW4
TP15 CR104A ROW5
TP16 CR105A ROW6
TP17 CR106A ROW7
TP18 CR107A ROW8

ROW[1..8]

CLR S1 R23 10k ROW1 COL1 TP21
F 3 S9 ROW2 COL1
VERTICAL CH 2 S17 ROW3 COL1
ACQUIRE MENU RUN/STOP S25 ROW4 COL1
VERTICAL MENU S33 ROW5 COL1

X S2 R22 10k ROW1 COL2 TP22
U 4 S10 ROW2 COL2
VERTICAL CH 3 S18 ROW3 COL2
TOGGLE S26 ROW4 COL2
WAVEFORM OFF S34 ROW5 COL2

ENTER S3 R21 10k ROW1 COL3 TP23
n 5 S11 ROW2 COL3
VERTICAL CH 4 S19 ROW3 COL3
STATUS HELP S27 ROW4 COL3
ZOOM S35 ROW5 COL3

A 0 S4 R20 10k ROW1 COL4 TP24
p 6 S12 ROW2 COL4
VERTICAL MORE S20 ROW3 COL4
SAVE/RECALL SETUP S28 ROW4 COL4
HORIZONTAL MENU S36 ROW5 COL4

B . S5 R19 10k ROW1 COL5
M 7 S13 ROW2 COL5
MENU AUTOSET S21 ROW3 COL5
CURSOR S29 ROW4 COL5
TRIGGER MENU S37 ROW5 COL5 TP25

C - S6 R18 10k ROW1 COL6
k 8 S14 ROW2 COL6
SAVE/RECALL WAVEFORM S22 ROW3 COL6
UTILITY DISPLAY S30 ROW4 COL6
SET LEVEL TO 50% S38 ROW5 COL6 TP26

D 1 S7 R17 10k ROW1 COL7
m 9 S15 ROW2 COL7
APPLICATION MEASURE S23 ROW3 COL7
SHIFT S31 ROW4 COL7
FORCE TRIGGER S39 ROW5 COL7 TP27

E 2 S8 R16 10k ROW1 COL8
VERTICAL CH 1 S16 ROW2 COL8
MENU HARDCOPY S24 ROW3 COL8
S32 ROW4 COL8 TP28

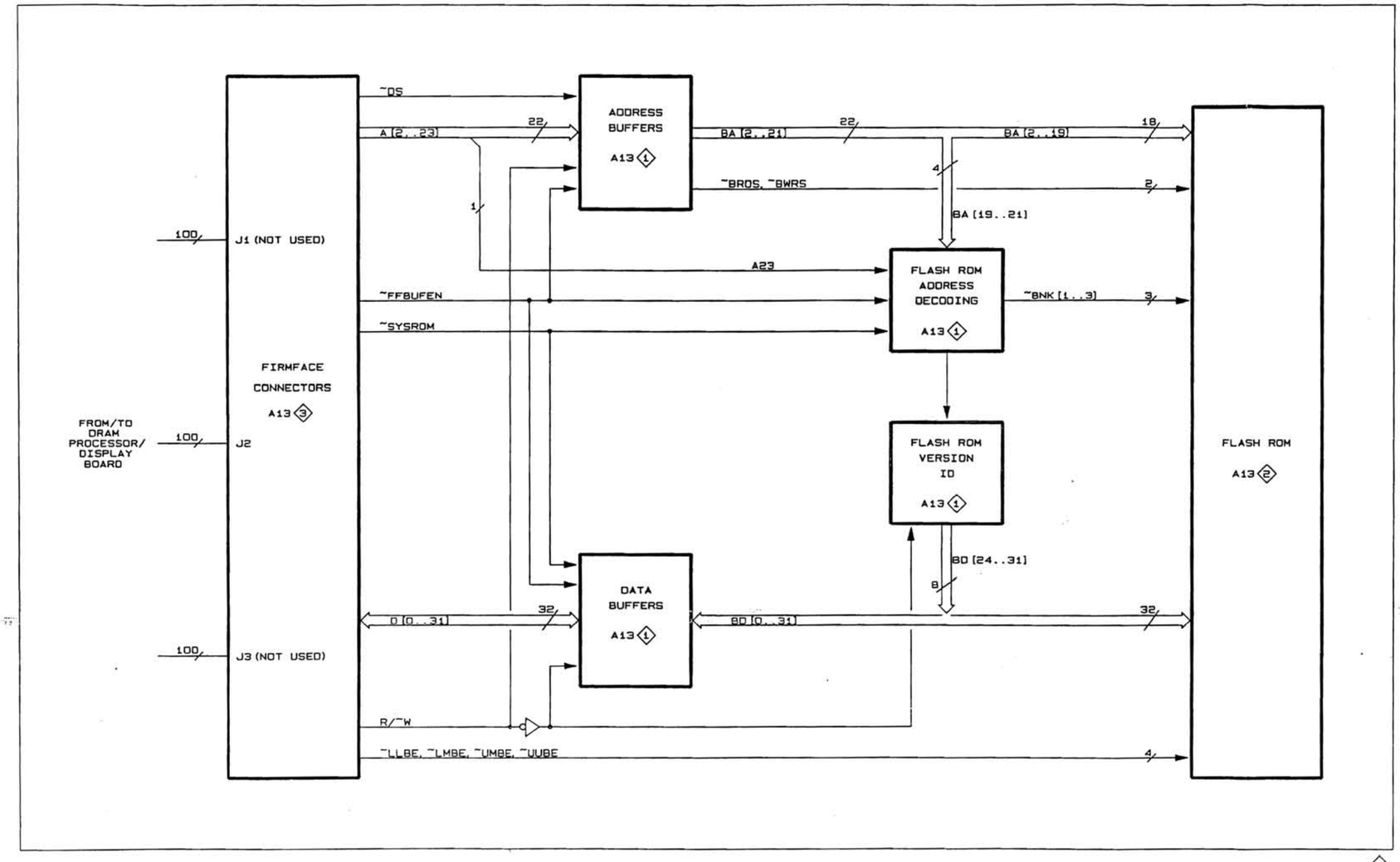
COL[1..8] → [1] TO [3C]

S40 ON/STBY — ON/OFF
S61 (LEFT) — PROW3 COLM5
S53 — PROW7 COLM5
S60 — PROW8 COLM4
S52 — PROW7 COLM4
S44 — PROW6 COLM4
S43 — PROW6 COLM3
S51 (RIGHT) — PROW7 COLM3
S45 CLEAR MENU — PROW6 COLM5
S50 (BOTTOM) — PROW7 COLM2
S58 — PROW8 COLM2
S57 — PROW8 COLM1
S49 — PROW7 COLM1
S41 (TOP) — PROW6 COLM1

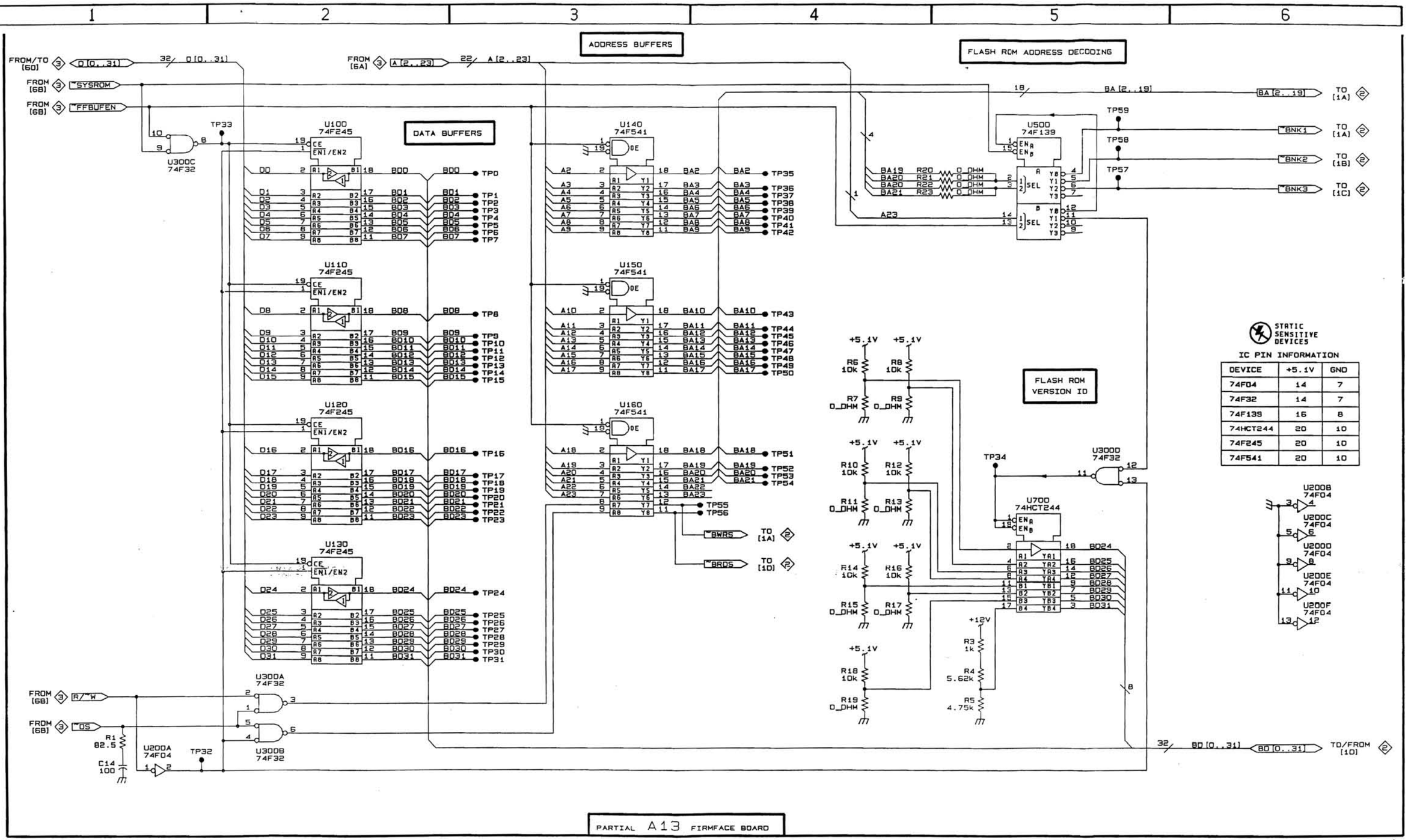
J3 P3
COLM1 1 — 1 R101 1k COL1
COLM2 2 — 2 R102 1k COL2
PROW8 3 — 3 R108 100 ROW8
PROW7 4 — 4 R107 100 ROW7
PROW6 5 — 5 R106 100 ROW5
6 — 6
ON/OFF 7 — 7 R100 100 ON/STBY → TO [2C] [3]
COLM3 8 — 8 R103 1k COL3
COLM4 9 — 9 R104 1k COL4
COLM5 10 — 10 R105 1k COL5

COL[1..5]

PARTIAL A12
FRONT PANEL BOARD



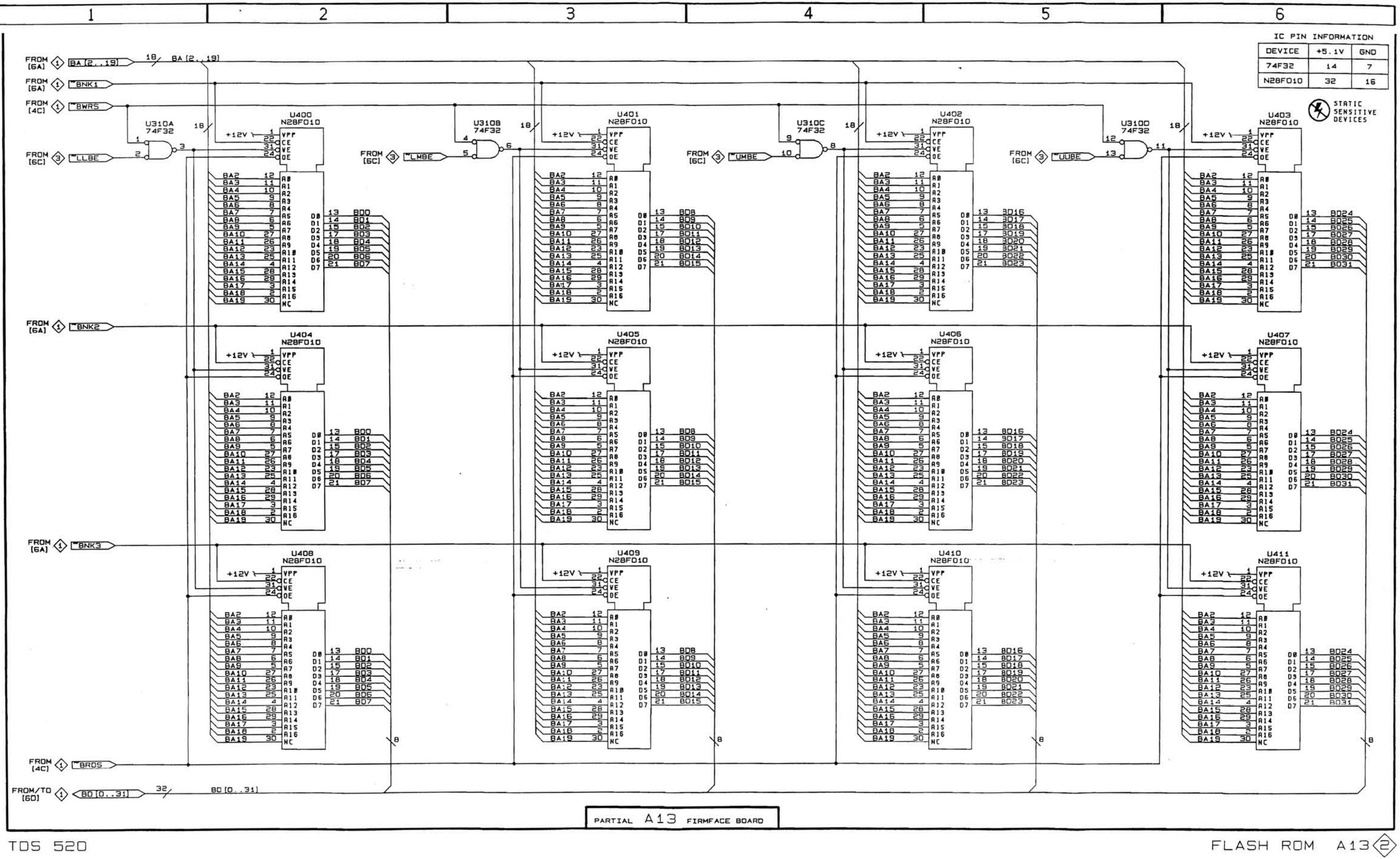
A13 FIRMFACE BOARD BLOCK DIAGRAM A13 0



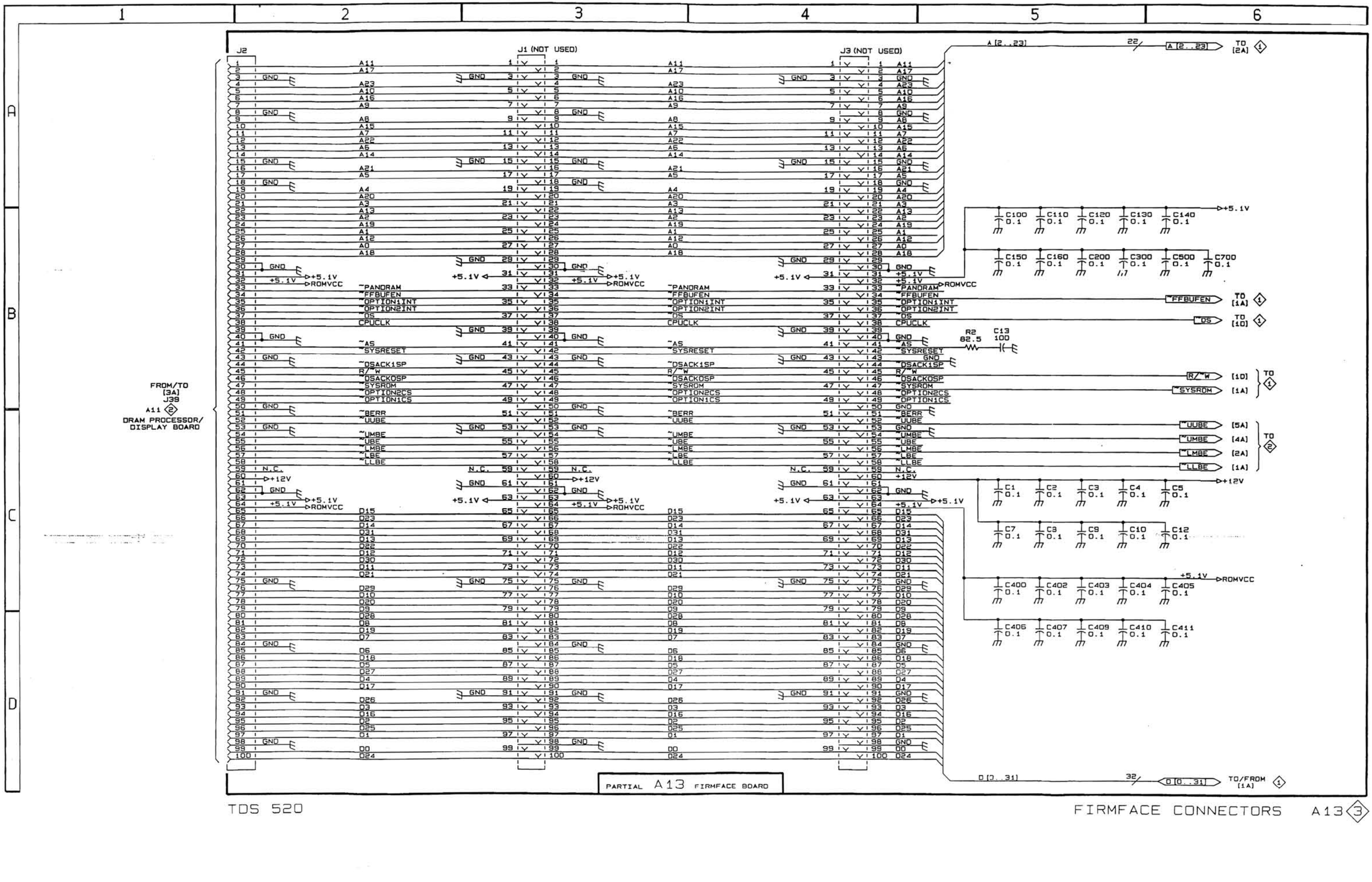
IC PIN INFORMATION

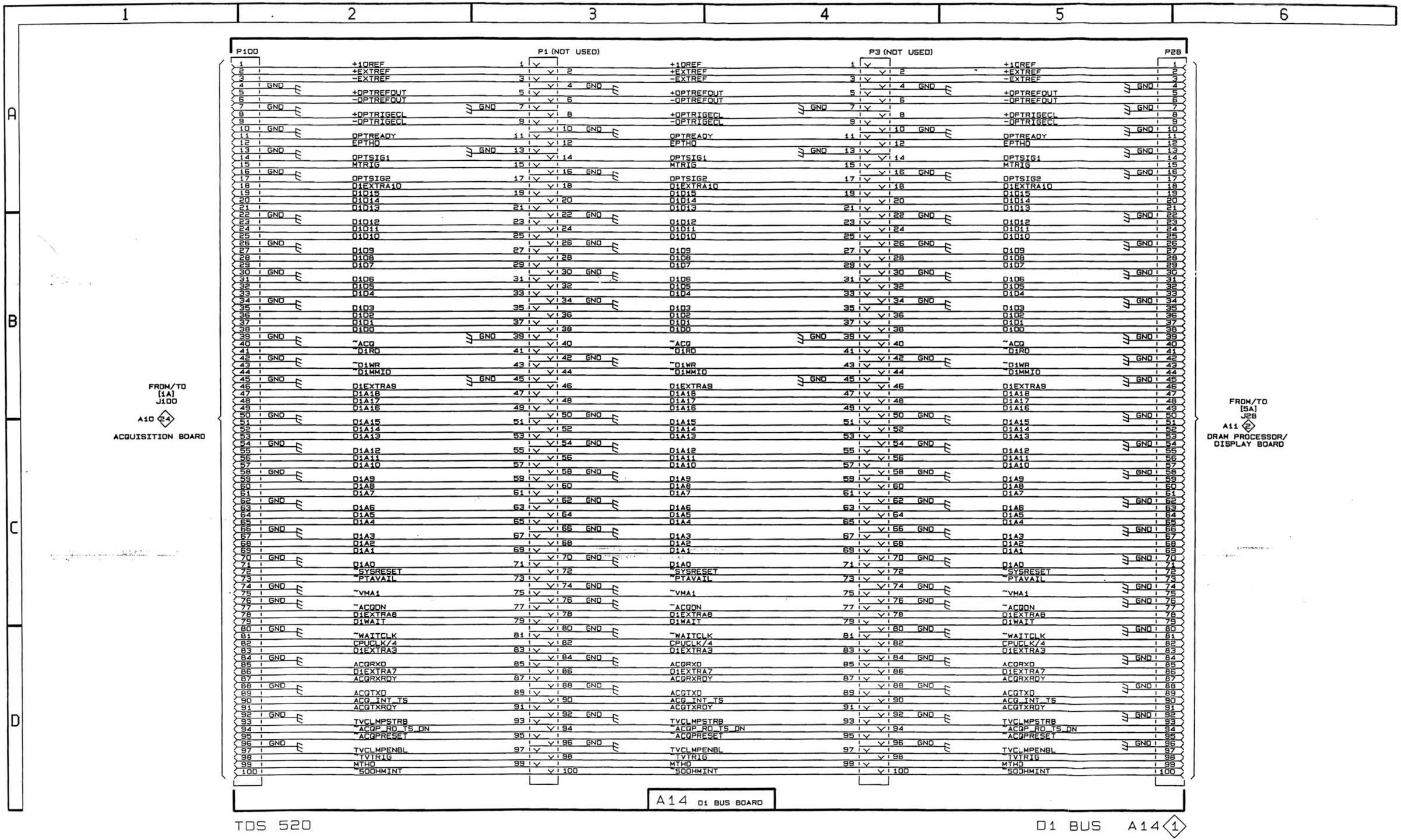
DEVICE	+5.1V	GND
74F04	14	7
74F32	14	7
74F139	16	8
74HCT244	20	10
74F245	20	10
74F541	20	10

PARTIAL A13 FIRMFACE BOARD

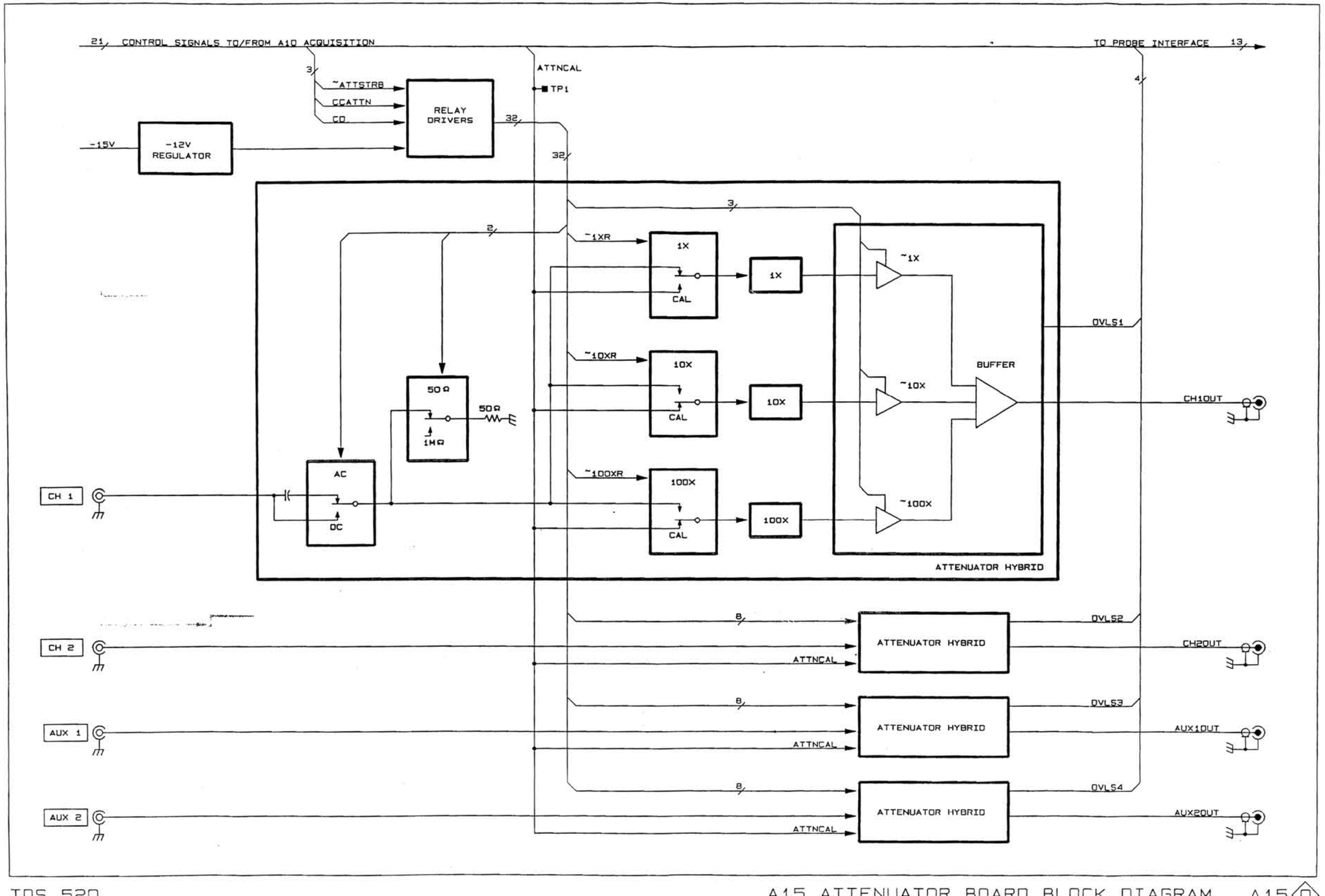


PARTIAL A13 FIRMFACE BOARD

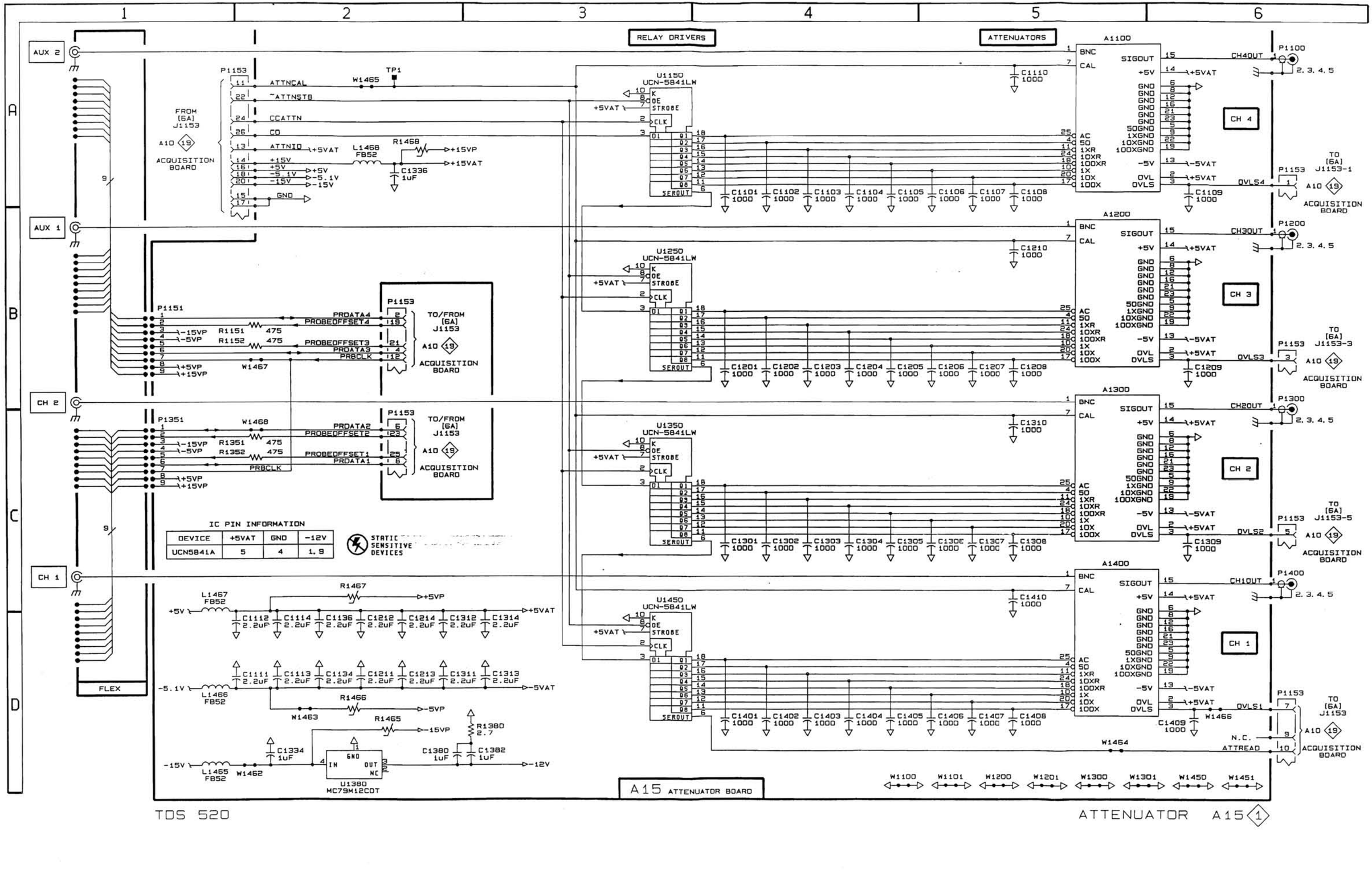

J2
J1 (NOT USED)
J3 (NOT USED)
FROM/TO [3A] J39 A11
DRAM PROCESSOR/ DISPLAY BOARD
A [2..23]
TO [2A]
+5.1V
ROMVCC
~PANDRAM
~FFBUFEN
~OPTION1INT
~OPTION2INT
~DS
CPUCLK
~AS
~SYSRESET
~OSACK1SP
R/~W
~OSACKOSP
~SYSROM
~OPTION2CS
~OPTION1CS
~BERR
~UUBE
~UMBE
~UBE
~LMBE
~LBE
~LLBE
N.C.
+12V
GND
C100 0.1
C110 0.1
C120 0.1
C130 0.1
C140 0.1
C150 0.1
C160 0.1
C200 0.1
C300 0.1
C500 0.1
C700 0.1
R2 82.5
C13 100
C1 0.1
C2 0.1
C3 0.1
C4 0.1
C5 0.1
C7 0.1
C9 0.1
C10 0.1
C12 0.1
C400 0.1
C402 0.1
C403 0.1
C404 0.1
C405 0.1
C406 0.1
C407 0.1
C409 0.1
C410 0.1
C411 0.1
TO [1A]
TO [1D]
TO [1]
TO [5A]
TO [4A]
TO [2A]
TO [1A]
TO [2]
D [0..31]
TO/FROM [1A]
PARTIAL A13 FIRMFACE BOARD

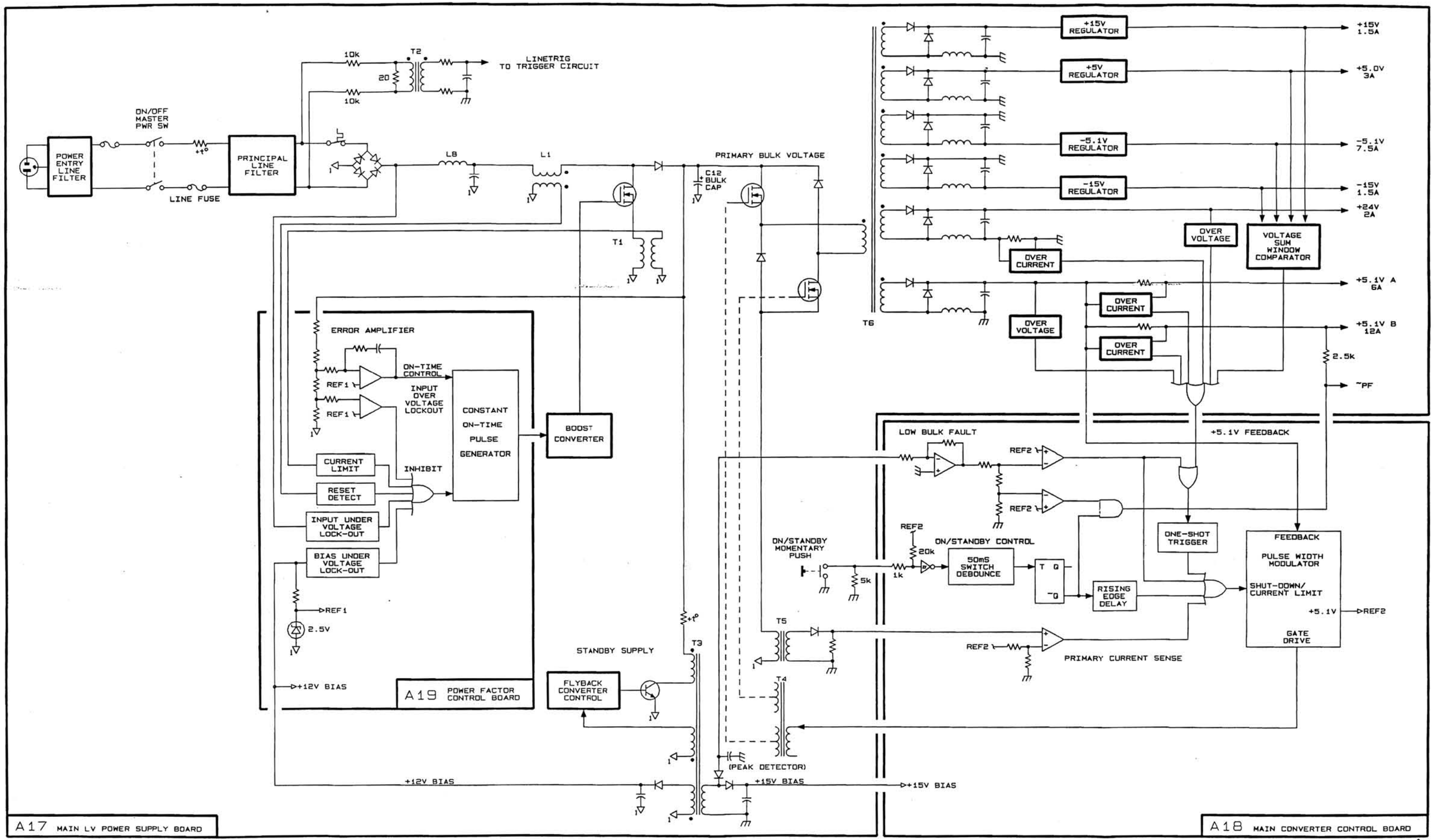


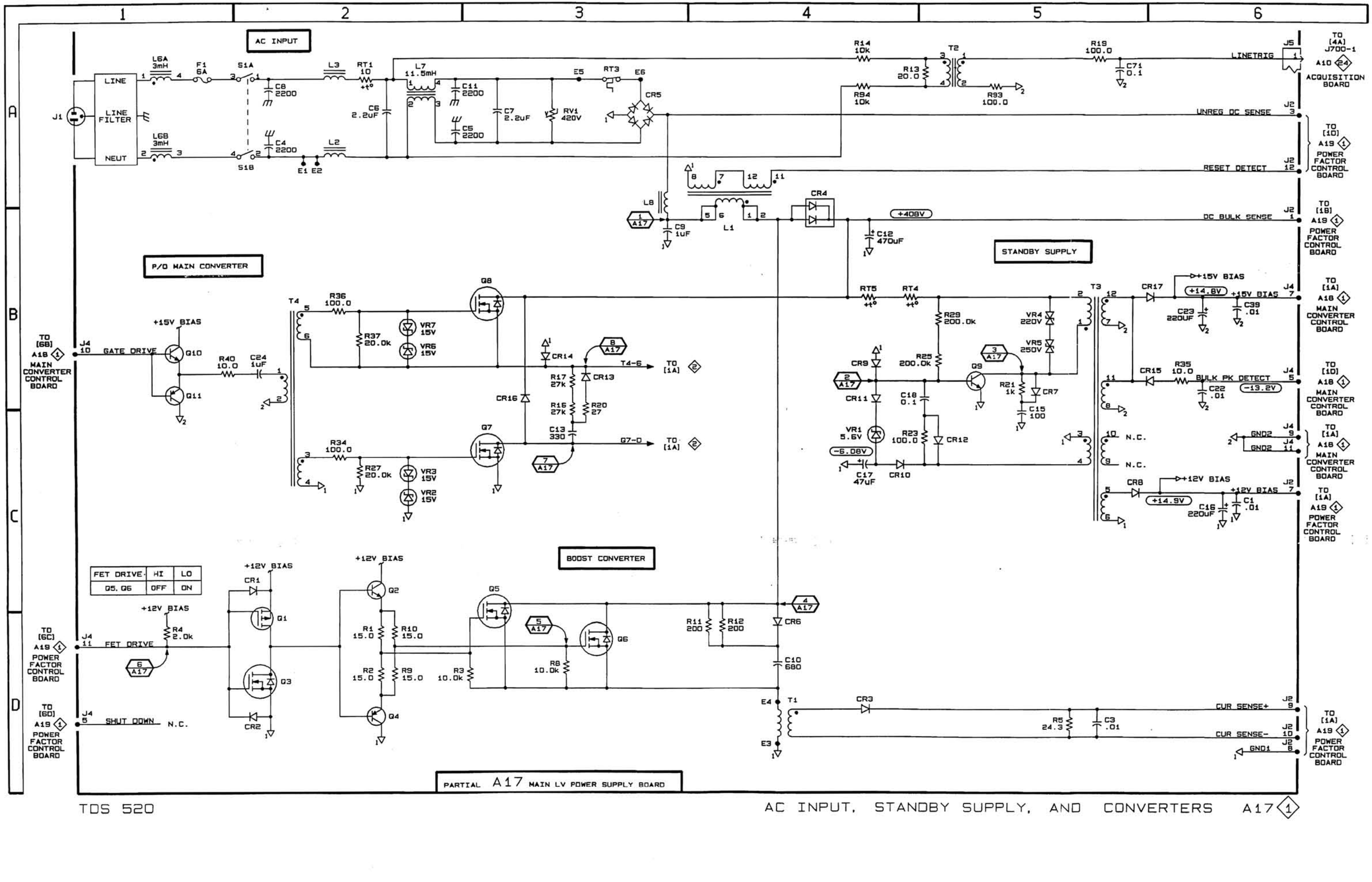
P100
P1 (NOT USED)
P3 (NOT USED)
P28
+1OREF
+EXTREF
-EXTREF
+OPTREFOUT
-OPTREFOUT
+OPTRIGECL
-OPTRIGECL
OPTREADY
EPTHO
OPTSIG1
MTRIG
OPTSIG2
D1EXTRA10
D1D15
D1D14
D1D13
D1D12
D1D11
D1D10
D1D9
D1D8
D1D7
D1D6
D1D5
D1D4
D1D3
D1D2
D1D1
D1D0
~ACQ
~D1RD
~D1WR
~D1MMIO
D1EXTRA9
D1A18
D1A17
D1A16
D1A15
D1A14
D1A13
D1A12
D1A11
D1A10
D1A9
D1A8
D1A7
D1A6
D1A5
D1A4
D1A3
D1A2
D1A1
D1A0
~SYSRESET
~PTAVAIL
~VMA1
~ACQDN
D1EXTRA8
D1WAIT
~WAITCLK
CPUCLK/4
D1EXTRA3
ACQRXD
D1EXTRA7
ACQRXRDY
ACQTXD
ACQ_INT_TS
ACQTXRDY
TVCLMPSTRB
~ACQP_RD_TS_DN
~ACQPRESET
TVCLMPENBL
~TVTRIG
MTHO
~50OHMINT
GND
FROM/TO [1A] J100
A10 24
ACQUISITION BOARD
FROM/TO [5A] J28
A11 2
DRAM PROCESSOR/ DISPLAY BOARD
A14 D1 BUS BOARD

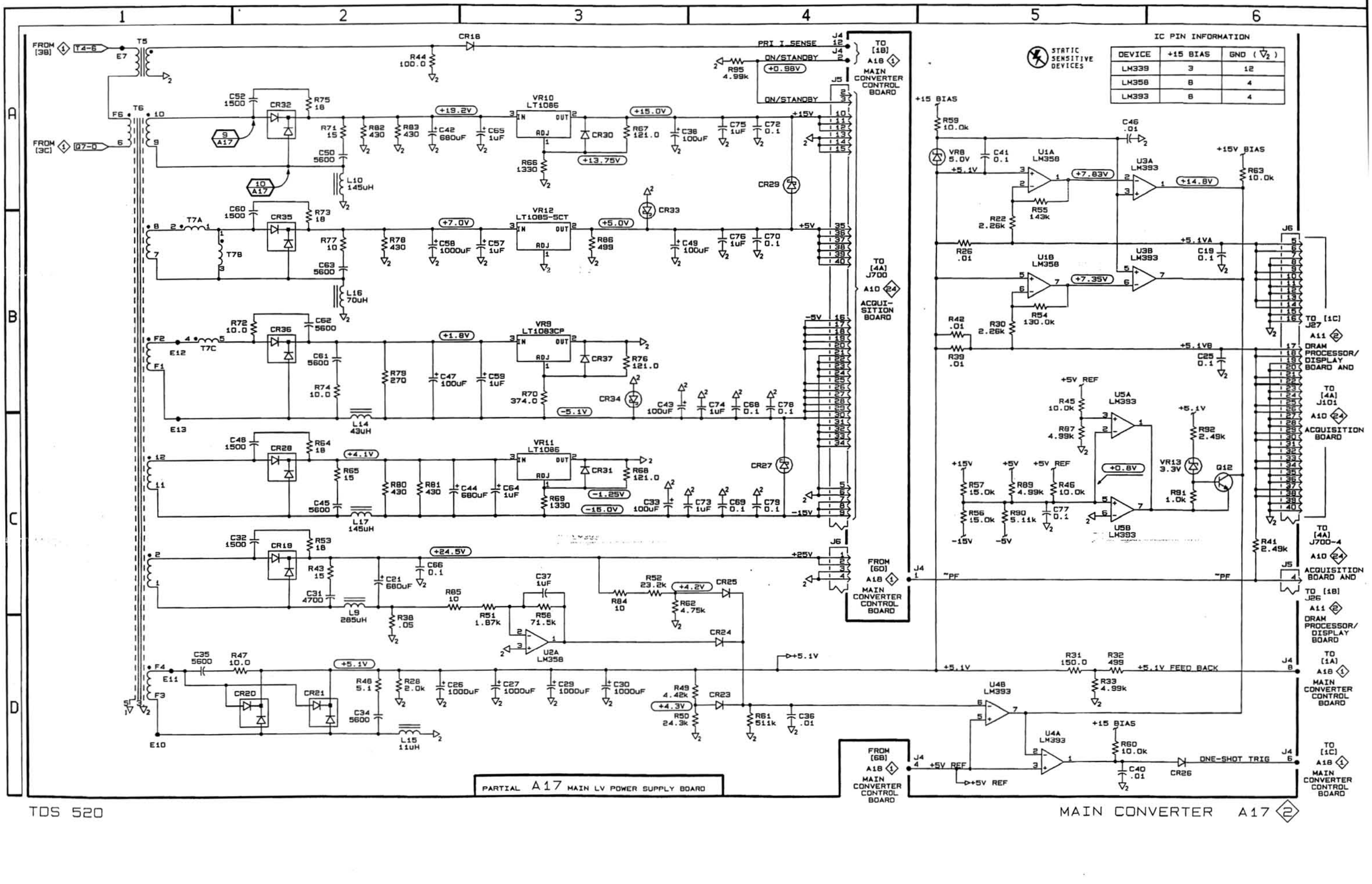


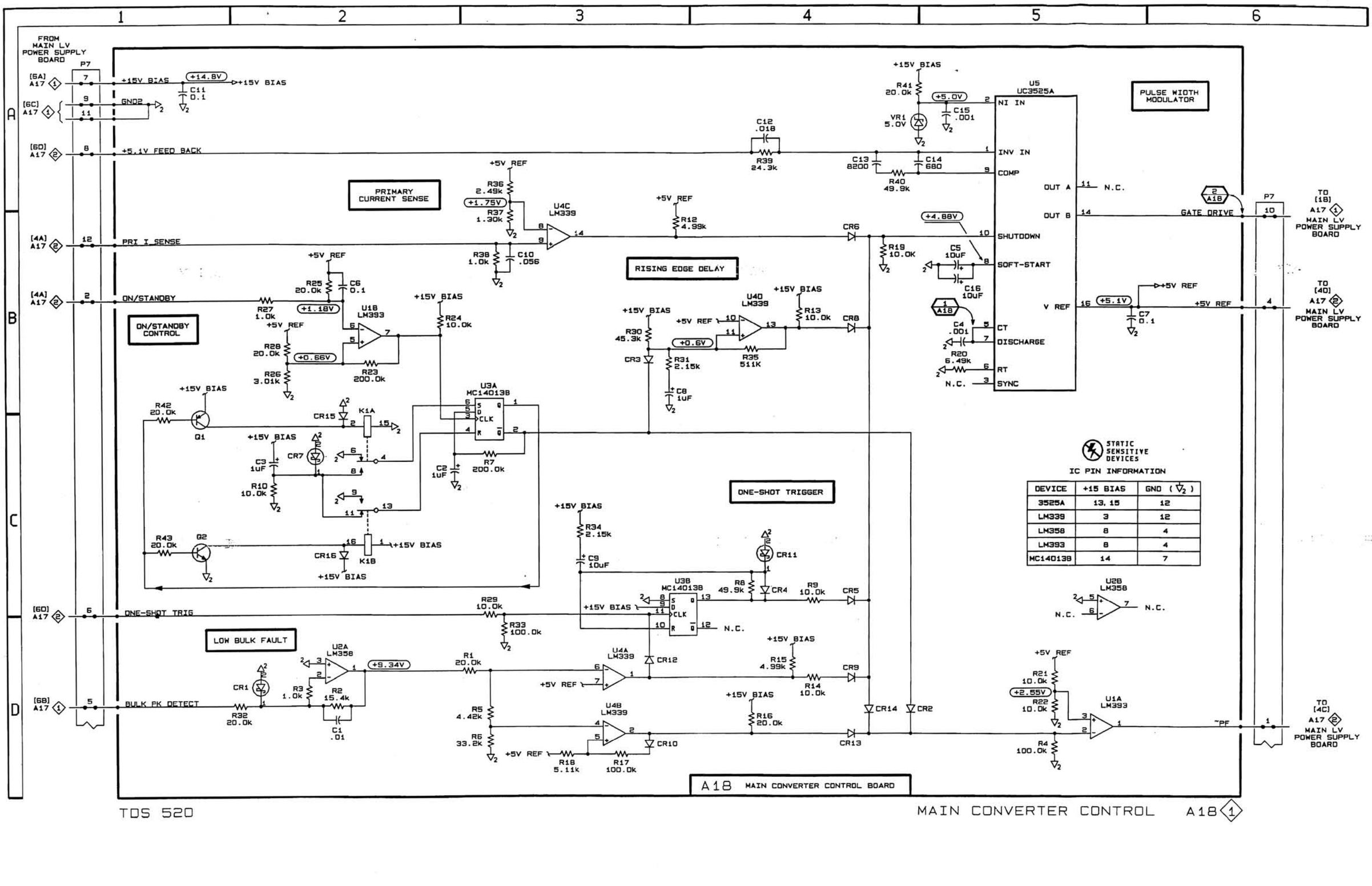
A15 ATTENUATOR BOARD BLOCK DIAGRAM A15


RELAY DRIVERS
ATTENUATORS
AUX 2
AUX 1
CH 2
CH 1
FROM [6A] J1153
A10 19
ACQUISITION BOARD
P1153
ATTNCAL
~ATTNSTB
CCATTN
CO
ATTNID
+15V
+5V
-5.1V
-15V
GND
+5VAT
W1465
TP1
L1468 FB52
R1468
C1336 1uF
+15VP
+15VAT
+5V
-5.1V
-15V
U1150 UCN-5841LW
U1250 UCN-5841LW
U1350 UCN-5841LW
U1450 UCN-5841LW
K
OE
STROBE
CLK
SEROUT
C1101 1000
C1102 1000
C1103 1000
C1104 1000
C1105 1000
C1106 1000
C1107 1000
C1108 1000
C1201 1000
C1202 1000
C1203 1000
C1204 1000
C1205 1000
C1206 1000
C1207 1000
C1208 1000
C1301 1000
C1302 1000
C1303 1000
C1304 1000
C1305 1000
C1306 1000
C1307 1000
C1308 1000
C1401 1000
C1402 1000
C1403 1000
C1404 1000
C1405 1000
C1406 1000
C1407 1000
C1408 1000
P1151
P1351
PRDATA4
PROBEOFFSET4
PROBEOFFSET3
PRDATA3
PRBCLK
PRDATA2
PROBEOFFSET2
PROBEOFFSET1
PRDATA1
R1151 475
R1152 475
R1351 475
R1352 475
-15VP
-5VP
+5VP
+15VP
W1467
W1468
TO/FROM [6A] J1153
A1100
A1200
A1300
A1400
BNC
CAL
SIGOUT
+5V
GND
50GND
1XGND
10XGND
100XGND
AC
50
1XR
10XR
100XR
1X
10X
100X
-5V
OVL
OVLS
C1110 1000
C1210 1000
C1310 1000
C1410 1000
C1109 1000
C1209 1000
C1309 1000
C1409 1000
CH40UT
CH30UT
CH20UT
CH10UT
P1100
P1200
P1300
P1400
2, 3, 4, 5
CH 4
CH 3
CH 2
CH 1
OVLS4
OVLS3
OVLS2
OVLS1
TO [6A] J1153-1
TO [6A] J1153-3
TO [6A] J1153-5
TO [6A] J1153
W1466
W1464
N.C.
ATTREAD
W1100
W1101
W1200
W1201
W1300
W1301
W1450
W1451
IC PIN INFORMATION
DEVICE | +5VAT | GND | -12V
UCN5841A | 5 | 4 | 1, 9
STATIC SENSITIVE DEVICES
R1467
L1467 FB52
C1112 2.2uF
C1114 2.2uF
C1136 2.2uF
C1212 2.2uF
C1214 2.2uF
C1312 2.2uF
C1314 2.2uF
C1111 2.2uF
C1113 2.2uF
C1134 2.2uF
C1211 2.2uF
C1213 2.2uF
C1311 2.2uF
C1313 2.2uF
L1466 FB52
R1466
R1465
R1380 2.7
C1334 1uF
C1380 1uF
C1382 1uF
L1465 FB52
W1462
W1463
U1380 MC79M12CDT
FLEX
A15 ATTENUATOR BOARD


10k
T2
20
10k
LINETRIG
TO TRIGGER CIRCUIT
ON/OFF
MASTER
PWR SW
POWER
ENTRY
LINE
FILTER
LINE FUSE
PRINCIPAL
LINE
FILTER
L8
L1
PRIMARY BULK VOLTAGE
C12
BULK
CAP
T1
T6
+15V
REGULATOR
+5V
REGULATOR
-5.1V
REGULATOR
-15V
REGULATOR
+15V
1.5A
+5.0V
3A
-5.1V
7.5A
-15V
1.5A
+24V
2A
OVER
VOLTAGE
VOLTAGE
SUM
WINDOW
COMPARATOR
OVER
CURRENT
OVER
VOLTAGE
+5.1V A
6A
OVER
CURRENT
+5.1V B
12A
OVER
CURRENT
2.5k
~PF
ERROR AMPLIFIER
REF1
REF1
ON-TIME
CONTROL
INPUT
OVER
VOLTAGE
LOCKOUT
CONSTANT
ON-TIME
PULSE
GENERATOR
BOOST
CONVERTER
CURRENT
LIMIT
INHIBIT
RESET
DETECT
INPUT UNDER
VOLTAGE
LOCK-OUT
BIAS UNDER
VOLTAGE
LOCK-OUT
REF1
2.5V
+12V BIAS
A19 POWER FACTOR
CONTROL BOARD
LOW BULK FAULT
REF2
REF2
+5.1V FEEDBACK
REF2
ON/STANDBY
MOMENTARY
PUSH
20k
ON/STANDBY CONTROL
1k
5k
50mS
SWITCH
DEBOUNCE
T Q
-Q
RISING
EDGE
DELAY
ONE-SHOT
TRIGGER
FEEDBACK
PULSE WIDTH
MODULATOR
SHUT-DOWN/
CURRENT LIMIT
+5.1V
REF2
GATE
DRIVE
T5
REF2
PRIMARY CURRENT SENSE
STANDBY SUPPLY
T3
T4
FLYBACK
CONVERTER
CONTROL
(PEAK DETECTOR)
+12V BIAS
+15V BIAS
+15V BIAS
A17 MAIN LV POWER SUPPLY BOARD
A18 MAIN CONVERTER CONTROL BOARD


AC INPUT
LINE
LINE FILTER
NEUT
J1
L6A 3mH
L6B 3mH
F1 6A
S1A
S1B
C8 2200
C4 2200
L3
L2
RT1 10
C6 2.2uF
L7 11.5mH
C11 2200
C5 2200
C7 2.2uF
RV1 420V
E5
RT3
E6
CR5
E1 E2
R14 10k
R94 10k
T2
R13 20.0
R93 100.0
R19 100.0
C71 0.1
J5
TO [4A] J700-1 A10 4 ACQUISITION BOARD
LINETRIG
J2 3
UNREG DC SENSE
J2 12
RESET DETECT
TO [1D] A19 1 POWER FACTOR CONTROL BOARD
L8
C9 1uF
L1
CR4
+408V
C12 470uF
J2 1
DC BULK SENSE
TO [1B] A19 1 POWER FACTOR CONTROL BOARD
STANDBY SUPPLY
P/O MAIN CONVERTER
TO [6B] A18 4 MAIN CONVERTER CONTROL BOARD
J4 10
GATE DRIVE
+15V BIAS
Q10
Q11
R40 10.0
C24 1uF
T4
R36 100.0
R37 20.0k
VR7 15V
VR6 15V
Q8
CR14
CR13
R17 27k
R16 27k
R20 27
C13 330
CR16
T4-6
TO [1A] 2
Q7
R34 100.0
R27 20.0k
VR3 15V
VR2 15V
Q7-D
RT5
RT4
T3
R29 200.0k
R25 200.0k
VR4 220V
VR5 250V
Q9
R21 1k
CR7
C15 100
CR9
CR11
C18 0.1
VR1 5.6V
-6.08V
C17 47uF
R23 100.0
CR12
CR10
CR17
+15V BIAS
+14.8V
C23 220uF
C39 .01
J4 7
TO [1A] A18 1 MAIN CONVERTER CONTROL BOARD
CR15
R35 10.0
BULK PK DETECT
-13.2V
C22 .01
J4 5
TO [1D] A18 1 MAIN CONVERTER CONTROL BOARD
N.C.
N.C.
J4 9
J4 11
GND2
GND2
TO [1A] A18 4 MAIN CONVERTER CONTROL BOARD
CR8
+12V BIAS
+14.9V
C16 220uF
C1 .01
J2 7
TO [1A] A19 1 POWER FACTOR CONTROL BOARD
BOOST CONVERTER
FET DRIVE HI LO
Q5, Q6 OFF ON
+12V BIAS
CR1
Q1
Q3
CR2
Q2
Q4
R1 15.0
R10 15.0
R2 15.0
R9 15.0
R4 2.0k
TO [6C] A19 1 POWER FACTOR CONTROL BOARD
J4 11
FET DRIVE
TO [6D] A19 1 POWER FACTOR CONTROL BOARD
J4 5
SHUT DOWN
N.C.
Q5
Q6
R3 10.0k
R8 10.0k
R11 200
R12 200
CR6
C10 680
T1
CR3
E4
E3
R5 24.3
C3 .01
J2 9
CUR SENSE+
J2 10
CUR SENSE-
J2 8
GND1
TO [1A] A19 1 POWER FACTOR CONTROL BOARD
PARTIAL A17 MAIN LV POWER SUPPLY BOARD


1
2
3
4
5
6
A
B
C
D
FROM [3B] T4-6
FROM [3C] Q7-0
T5
T6
T7A
T7B
T7C
CR16
R44 100.0
PRI I SENSE
ON/STANDBY
+0.98V
R95 4.99k
TO [1B] A18 MAIN CONVERTER CONTROL BOARD
J4
J5
J6
CR32
CR35
CR36
CR28
CR19
C52 1500
C60 1500
C48 1500
C32 1500
R75 18
R73 18
R64 18
R53 18
VR10 LT1086
VR12 LT1085-5CT
VR9 LT1083CP
VR11 LT1086
+19.2V
+7.0V
+1.8V
+4.1V
+24.5V
+15.0V
+5.0V
-5.1V
-1.25V
-15.0V
+13.75V
R71 15
R82 430
R83 430
C42 680uF
C65 1uF
C50 5600
L10 145uH
R67 121.0
C38 100uF
C75 1uF
C72 0.1
R66 1330
CR30
CR29
CR33
R77 10
R78 430
C58 1000uF
C57 1uF
C63 5600
L16 70uH
R86 499
C49 100uF
C76 1uF
C70 0.1
R72 10.0
C62 5600
C61 5600
R74 10.0
R79 270
C47 100uF
C59 1uF
L14 43uH
R76 121.0
CR37
CR34
R70 374.0
C43 100uF
C74 1uF
C68 0.1
C78 0.1
CR27
R64 18
R65 15
C45 5600
L17 145uH
R80 430
R81 430
C44 680uF
C64 1uF
R68 121.0
CR31
R69 1330
C33 100uF
C73 1uF
C69 0.1
C79 0.1
C32 1500
R53 18
R43 15
C31 4700
L9 285uH
C21 680uF
C66 0.1
R38 .05
R85 10
R51 1.87k
C37 1uF
R56 71.5k
U2A LM358
R52 23.2k
R84 10
+4.2V
R62 4.75k
CR25
CR24
C35 5600
R47 10.0
CR20
CR21
R48 5.1
C34 5600
L15 11uH
R28 2.0k
C26 1000uF
C27 1000uF
C29 1000uF
C30 1000uF
R49 4.42k
+4.3V
R50 24.3k
CR23
R61 511k
C36 .01
+5.1V
TO [4A] J700 A10 24 ACQUISITION BOARD
FROM (6D) A18 1 MAIN CONVERTER CONTROL BOARD
FROM (6O) A18 1 MAIN CONVERTER CONTROL BOARD
~PF
~PF
+5.1V FEED BACK
R31 150.0
R32 499
R33 4.99k
U4B LM393
U4A LM393
+15 BIAS
R60 10.0k
C40 .01
CR26
ONE-SHOT TRIG
+5V REF
+5V REF
TO [4A] J700-4 A10 24 ACQUISITION BOARD AND
TO [1B] J26 A11 2 DRAM PROCESSOR/ DISPLAY BOARD
TO [1A] A18 1 MAIN CONVERTER CONTROL BOARD
TO [1C] A18 1 MAIN CONVERTER CONTROL BOARD
R41 2.49k
IC PIN INFORMATION
STATIC SENSITIVE DEVICES
DEVICE | +15 BIAS | GND (▽2)
LM339 | 3 | 12
LM358 | 8 | 4
LM393 | 8 | 4
+15 BIAS
R59 10.0k
VR8 5.0V
+5.1V
C41 0.1
U1A LM358
+7.83V
C46 .01
U3A LM393
+14.8V
R63 10.0k
R55 143k
R22 2.26k
R26 .01
+5.1VA
U1B LM358
U3B LM393
C19 0.1
+7.35V
R54 130.0k
R30 2.26k
R42 .01
R39 .01
+5.1VB
C25 0.1
R45 10.0k
R87 4.99k
U5A LM393
+5.1V
R92 2.49k
VR13 3.3V
Q12
R91 1.0k
+0.8V
U5B LM393
R57 15.0k
R89 4.99k
R46 10.0k
R56 15.0k
R90 5.11k
C77 0.1
+15V
+5V
+5V REF
-15V
-5V
J6
TO [1C] J27 A11 2 DRAM PROCESSOR/ DISPLAY BOARD AND
TO [4A] J101 A10 24 ACQUISITION BOARD
PARTIAL A17 MAIN LV POWER SUPPLY BOARD


FROM MAIN LV POWER SUPPLY BOARD
P7
[6A] A17 ◇1
7
+15V BIAS
+14.8V
C11 0.1
+15V BIAS
9
GND2
[6C] A17 ◇1
11
[6D] A17 ◇2
8
+5.1V FEED BACK
PRIMARY CURRENT SENSE
+5V REF
R36 2.49k
+1.75V
R37 1.30k
U4C LM339
[4A] A17 ◇2
12
PRI I SENSE
R38 1.0k
C10 .056
C12 .018
R39 24.3k
+15V BIAS
R41 20.0k
+5.0V
C15 .001
VR1 5.0V
U5 UC3525A
NI IN
INV IN
COMP
C13 8200
C14 680
R40 49.9k
PULSE WIDTH MODULATOR
OUT A
N.C.
OUT B
GATE DRIVE
2 A18
P7
10
TO [1B] A17 ◇1 MAIN LV POWER SUPPLY BOARD
+4.88V
SHUTDOWN
CR6
R19 10.0K
C5 10uF
SOFT-START
C16 10uF
1 A18
V REF
16
+5.1V
+5V REF
C7 0.1
4
TO [4D] A17 ◇2 MAIN LV POWER SUPPLY BOARD
C4 .001
CT
DISCHARGE
R20 6.49k
RT
N.C.
SYNC
RISING EDGE DELAY
+15V BIAS
R30 45.3k
CR3
+5V REF
+0.6V
U4D LM339
R31 2.15k
C8 1uF
R35 511K
R13 10.0K
CR8
[4A] A17 ◇2
2
ON/STANDBY
ON/STANDBY CONTROL
R27 1.0k
+1.18V
R25 20.0k
C6 0.1
U1B LM393
+5V REF
R28 20.0k
+0.66V
R26 3.01k
R23 200.0k
+15V BIAS
R24 10.0k
+15V BIAS
R42 20.0k
Q1
CR15
K1A
+15V BIAS
CR7
C3 1uF
R10 10.0k
U3A MC14013B
CLK
C2 1uF
R7 200.0k
R43 20.0k
Q2
CR16
K1B
+15V BIAS
ONE-SHOT TRIGGER
+15V BIAS
R34 2.15k
C9 10uF
CR11
U3B MC14013B
R8 49.9k
CR4
R9 10.0k
CR5
[6D] A17 ◇2
6
ONE-SHOT TRIG
R29 10.0k
R33 100.0k
+15V BIAS
N.C.
U2B LM358
N.C.
N.C.
LOW BULK FAULT
U2A LM358
+9.34V
CR1
R3 1.0k
R2 15.4k
C1 .01
[6B] A17 ◇1
5
BULK PK DETECT
R32 20.0k
R1 20.0k
U4A LM339
+5V REF
CR12
+15V BIAS
R15 4.99k
CR9
R14 10.0k
R5 4.42k
R6 33.2k
U4B LM339
+15V BIAS
R16 20.0k
CR14
CR2
CR13
CR10
+5V REF
R18 5.11k
R17 100.0k
+5V REF
R21 10.0k
+2.55V
R22 10.0k
R4 100.0k
U1A LM393
~PF
1
TO [4C] A17 ◇2 MAIN LV POWER SUPPLY BOARD
STATIC SENSITIVE DEVICES
IC PIN INFORMATION
DEVICE | +15 BIAS | GND (⏚2)
3525A | 13, 15 | 12
LM339 | 3 | 12
LM358 | 8 | 4
LM393 | 8 | 4
MC14013B | 14 | 7
A18 MAIN CONVERTER CONTROL BOARD

FROM MAIN LV POWER SUPPLY BOARD A17 ◇1

P6 7 [6C] +12V BIAS
8 [6C] GND1
9 [6D] CUR SENSE+
10 [6D] CUR SENSE-
1 [6B] DC BULK SENSE
3 [6A] UNREG DC SENSE
12 [6A] RESET DETECT

+14.9V
C8 47uF
C14 47uF
C15 0.1
+12V BIAS

CURRENT LIMIT
R33 1.0k
C13 100
U3B LM393
R14 10.0k
R32 20.0k
R34 221k

OUTPUT OVER VOLTAGE LOCKOUT
R18 191k
R16 191k
C2 0.1
R17 110.0
R19 4.53k
R21 2.26k
U3A LM393
C6 0.1
CR5
R13 100.0k
R12 4.53k
CR6

ERROR AMPLIFIER
R3 20.0k
R4 147k
C3 .068
R27 7.50k
+2.5V
R2 10.0k
C11 0.1
R23 20.0k
VR1
C10 3.3uF
U1A LM358
+5.6V
R5 2.26k
C9 15uF

BIAS UNDER VOLTAGE LOCKOUT
R10 39.2k
R6 221k
R26 10.0k
+3.43V
Q2
R7 10.0k
CR2

INPUT UNDER VOLTAGE LOCKOUT
CR7
R24 150.0k
R9 4.53k
R20 191k
R15 191k
+4.76V
R22 4.53k
R1 17.4k
C1 22uF
C7 22uF
U1B LM358
R25 4.53k
CR8
R8 4.53k
C4 .01
Q1

CONSTANT ON-TIME PULSE GENERATOR
U2C MC14093
U2B MC14093
CR3
R111 150.0k
C5 220
U2A MC14093
CR11
U2D MC14093
R31 221k
C12 270
CR10
R30 20.0k
Q6
ON-TIME CLOCK
OFF-TIME CLOCK

Q4
Q5
CR1
CR4
FET DRIVE
SHUT DOWN
P6 11 → TO [1D] A17 ◇1 MAIN LV POWER SUPPLY BOARD
P6 5 → TO [1D] A17 ◇1 MAIN LV POWER SUPPLY BOARD

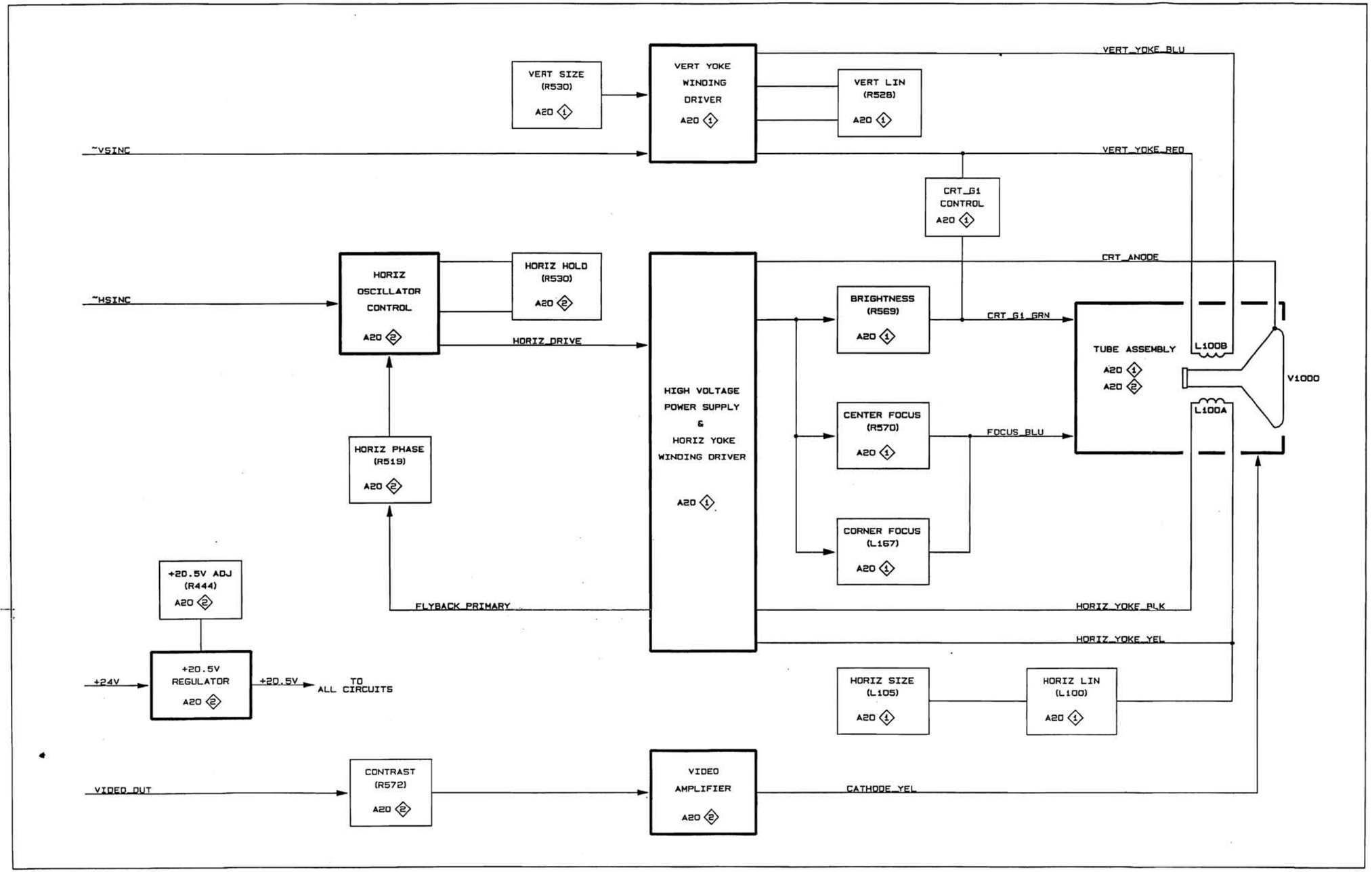
RESET DETECT
R29 2.26k
R28 20.0k
Q3
CR9

IC PIN INFORMATION

DEVICE	+12V BIAS	GND (⏚)
LM358	8	4
LM393	8	4
MC14093	14	7

STATIC SENSITIVE DEVICES

A19 POWER FACTOR CONTROL BOARD



TDS 520

CRT DRIVER BOARD BLOCK DIAGRAM A20 0

IC PIN INFORMATION

DEVICE	+20.5V	GND
TDA1170S	2	TABS

STATIC SENSITIVE DEVICES

VERT YOKE WINDING DRIVER

U428 TDA1170S

AMP_IN, AMP_V, FLYBACK, HGT_ADJ, SYNC_IN, RGLTD_V, OSC, AMPOUT, COMP, RAMPOUT, RAMPGEN

+20.5V, CR426, C422 100uF, VERT SIZE, R530 100k, R527 165k, FROM [28] VSINC, R558 470, C545 1000, R547 18k, C535 1000, R529 243k, C526 0.1, R536 47k, R528 50k VERT LIN, C323 0.1, R326 47k, C322 .082, R410 330k

R426 15k, C334 10uF, R327 15k, C433 33, R434 220k, C326 1000, R435 3.3, C434 0.1, R325 5.6k, R335 1.1, C330 1000uF, VERT_YOKE_BLU, VERT_YOKE_RED, J340 P340, L100B VERTICAL DEFLECTION YOKE

C438 10uF, R543 10k, R544 470, +50V, R546 2.2k, Q538, C447 2.2uF, C448 .001, R445 470, CRT_G1_GRN, TO [40]

HIGH VOLTAGE POWER SUPPLY & HORIZ YOKE WINDING DRIVER

T225, CRT_ANODE, TO [5C], C258 2200uF, +31V, +20.5V, CR149, CR261, R352 10, +50V, C263 33uF, C362 10uF, +21V, CR253, R278 10k, +520V, C275 .01, C277 .01, +500V

+50V, R554 47k, R569 100k BRIGHTNESS, R552 270k, -165V, CR246, +500V, R468 820k, CENTER FOCUS, R570 2M, R560 1.2M, C453 1uF, CORNER FOCUS, L167 10uH-20uH, C171 2500, TP172, C279 .01, R469 470k, CR369, C376 2200uF, R368 10M, R372 47k, FOCUS_BLU, TO [40]

+20.5V, R405 33, C506 22uF, +18.3V, C405 680, T403, R306 680, C308 100uF, R304 3.3, R202 47, Q205, CR205, R238 4.7k, C236 1000, FLYBACK_PRIMARY, TO [28], R234 820, CR333, C320 1.33uF, L100 HORIZ LIN, L105 10uH-50uH HORIZ SIZE

FROM [48] HORIZ_DRIVE, R315 1.2k, C507 .047, R504 330, Q405

J340 P340, HORIZ_YOKE_BLK, N.C., HORIZ_YOKE_YEL, L100A HORIZONTAL DEFLECTION YOKE

PARTIAL A20 CRT DRIVER BOARD

STATIC SENSITIVE DEVICES

FROM [2C] J5 A11 2 DRAM PROCESSOR/ DISPLAY BOARD

J574
1 +24V
2
3 N.C.
4 N.C.
5 GND
6 GND
7 GND

F553 2A

CR543

U438 LM317 (V IN, V OUT, ADJ)

C541 100uF

R444 500 (+20.5V ADJ)

R340 3.48k

R442 237.0

C345 10uF

C248 2200uF

C423 4.7uF

C455 0.1

TP352

+20.5V

+20.5V REGULATOR

C428 47uF

+8.8V

R521 620

R512 2.7k

R513 2.4k

U415 MC1391P
6 VCC
8 MK_SP
7 OSC
5 PH_DET
3 SYNC_IN
4 SAW_IN
1 OUT
2 GND

HORIZ HOLD R508 5k

R515 19.6k

C424 1800

R413 20k

C414 2200

R412 1.6k

C427 1uF

HORIZ OSCILLATOR CONTROL

8 ~HSYNC
9 GND
10 ~VSYNC
11 GND
12 GND

14 A20

C555 1000

R524 10k

C522 1000

R511 2.2k

CR523

~VSYNC TO [1B] 1

18 A20

15 A20

C426 .047

HORIZ PHASE R519 250

R311 39k

R411 39k

C208 .0068

C509 .01

FROM [3C] 1 FLYBACK_PRIMARY

HORIZ_DRIVE FROM [1D] 1

+50V

R353 750

L354 4.5uH

R346 300

17 A20

E343

CATHODE_YEL

R451 2.2k

L452 1.8uH

R459 1.6k

R458 47 (+6.4V)

C457 0.1

VR458 6.2V

Q456

VIDEO AMPLIFIER

16 A20

13 VIDEO_OUT
14
15 GND
16 GND

R465 1.8k

Q462

R568 150

R572 100 CONTRAST

Q464

R579 49.9

R461 16.5

C365 330

R366 10

FROM [3B] 1 CRT_ANODE

R367 120 +20.5V

FIL_BRN (+11.7V)

FIL_BLK

P1000
3
4
2
5
1
6
7

V1000

FROM [5A] 1 CRT_G1_GRN

CRT_G1_GRN

R374 3.9k +500V

CRT_G2_RED (+520V)

FROM [5C] 1 FOCUS_BLU

FOCUS_BLU

PARTIAL A20 CRT DRIVER BOARD