

APPLE MONITOR II  
MODEL A2M2010

CMT9-1



CMT9-1

APPLE MONITOR II  
MODEL A2M2010

## SAFETY PRECAUTIONS

See page 26.

## PRELIMINARY SERVICE CHECKS

ENCLOSED

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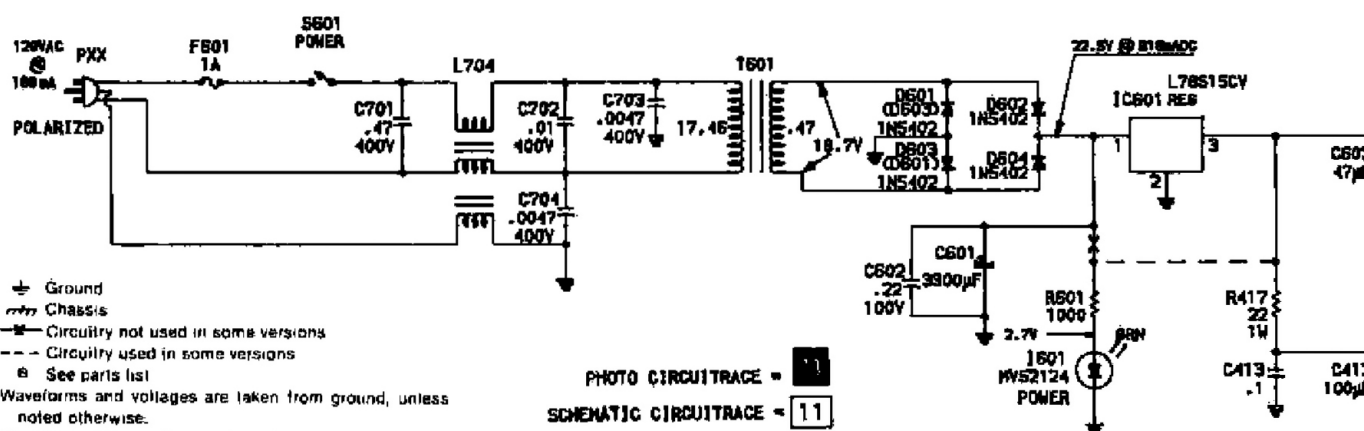
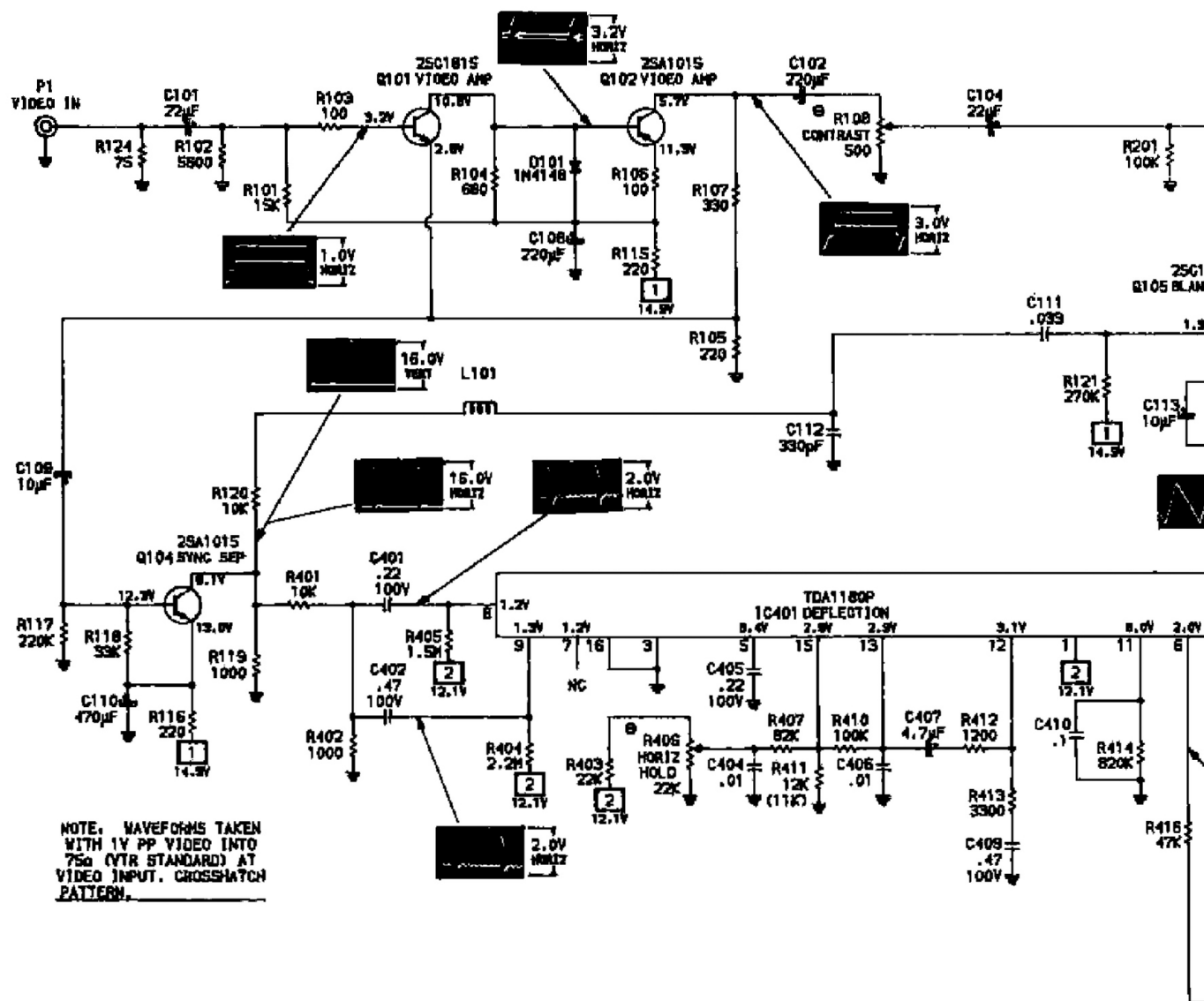
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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed.

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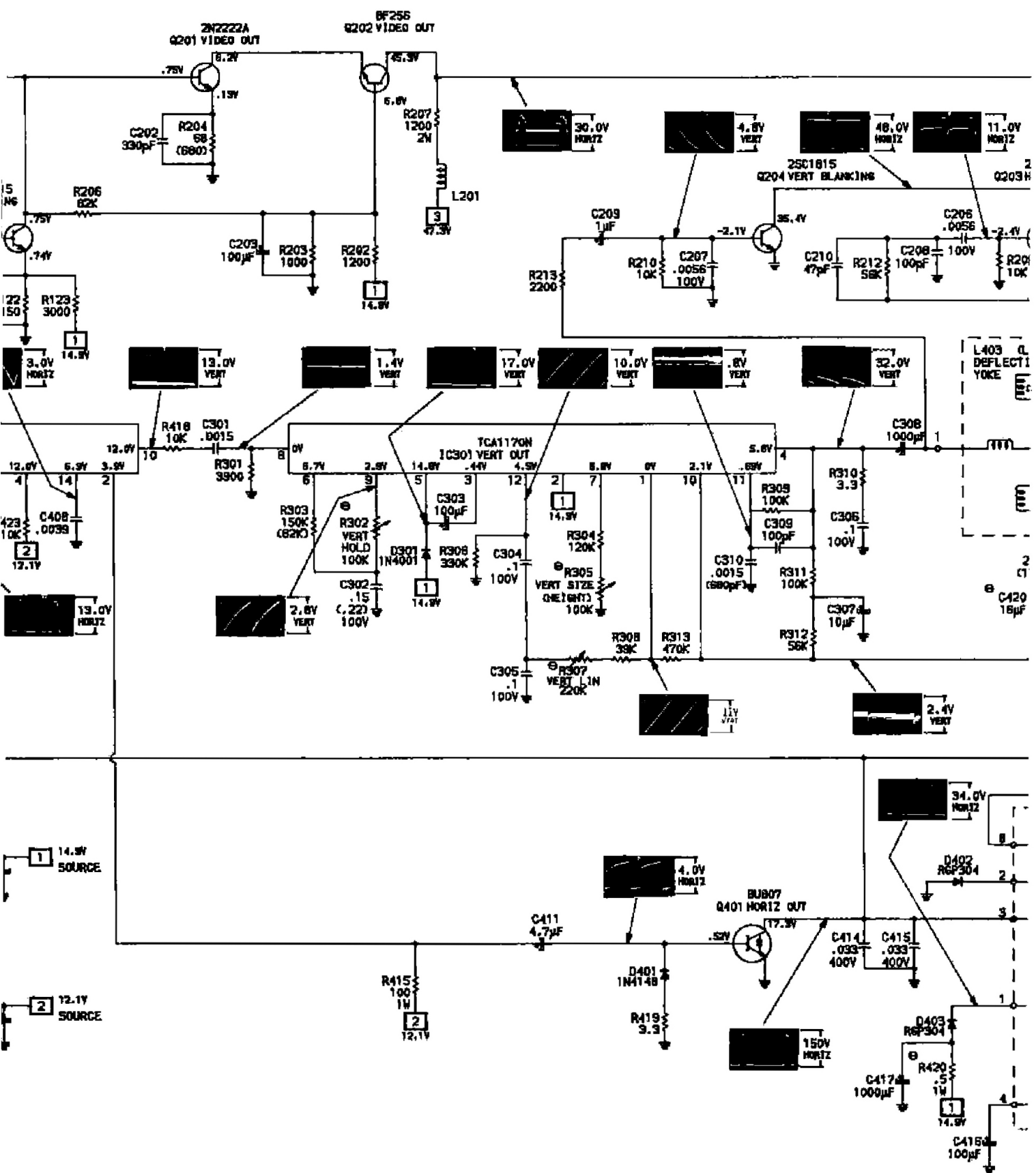


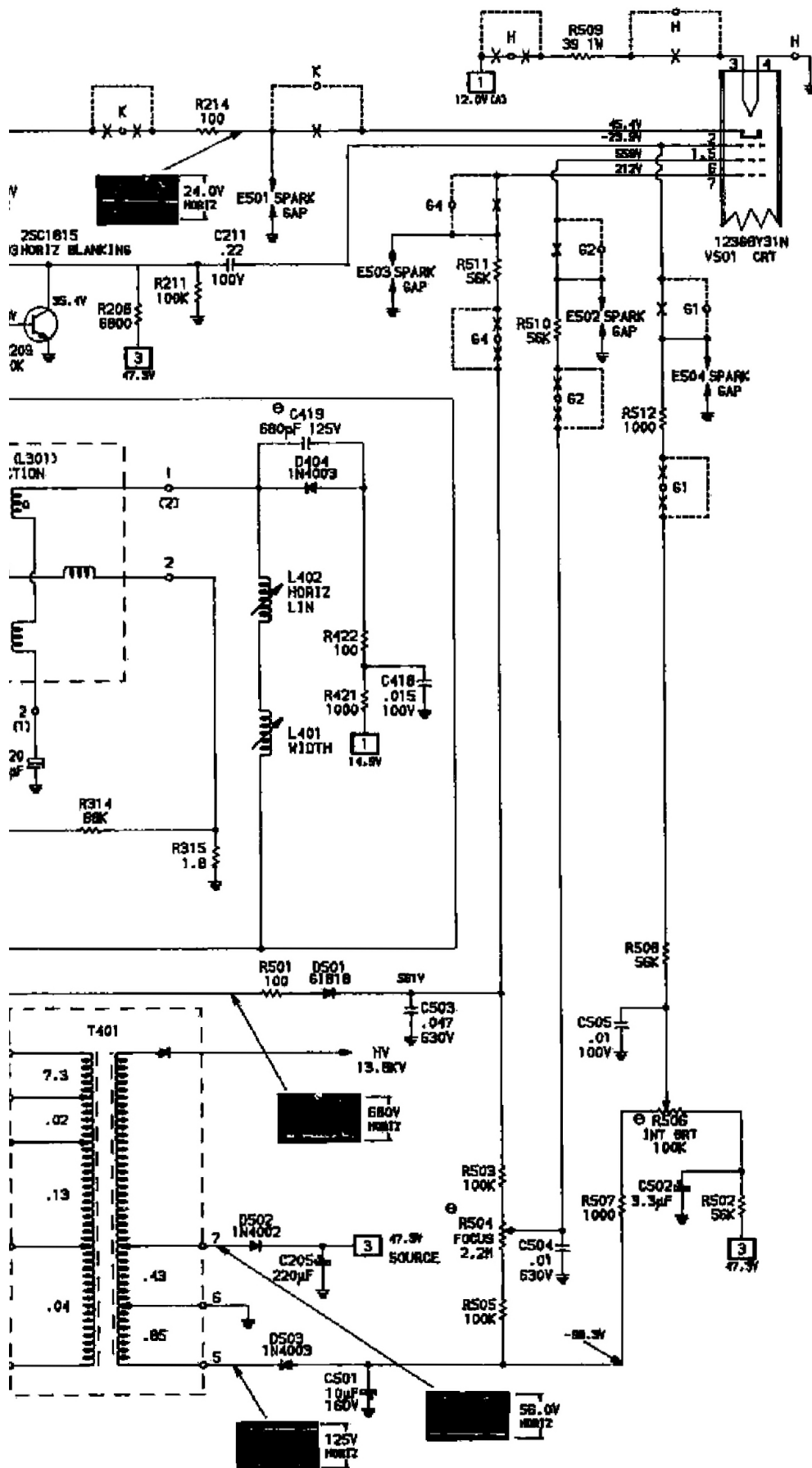
SEE PINOUTS AND TERMINAL GUIDES ON PAGE 28

A PHOTOFACIT STANDARD NOTATION SCHEMATIC WITH CIRCUITACE

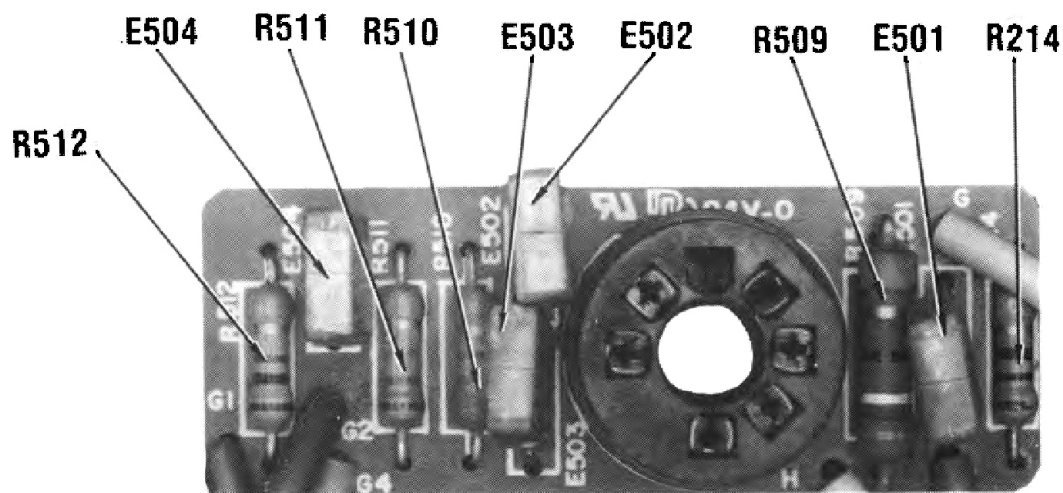
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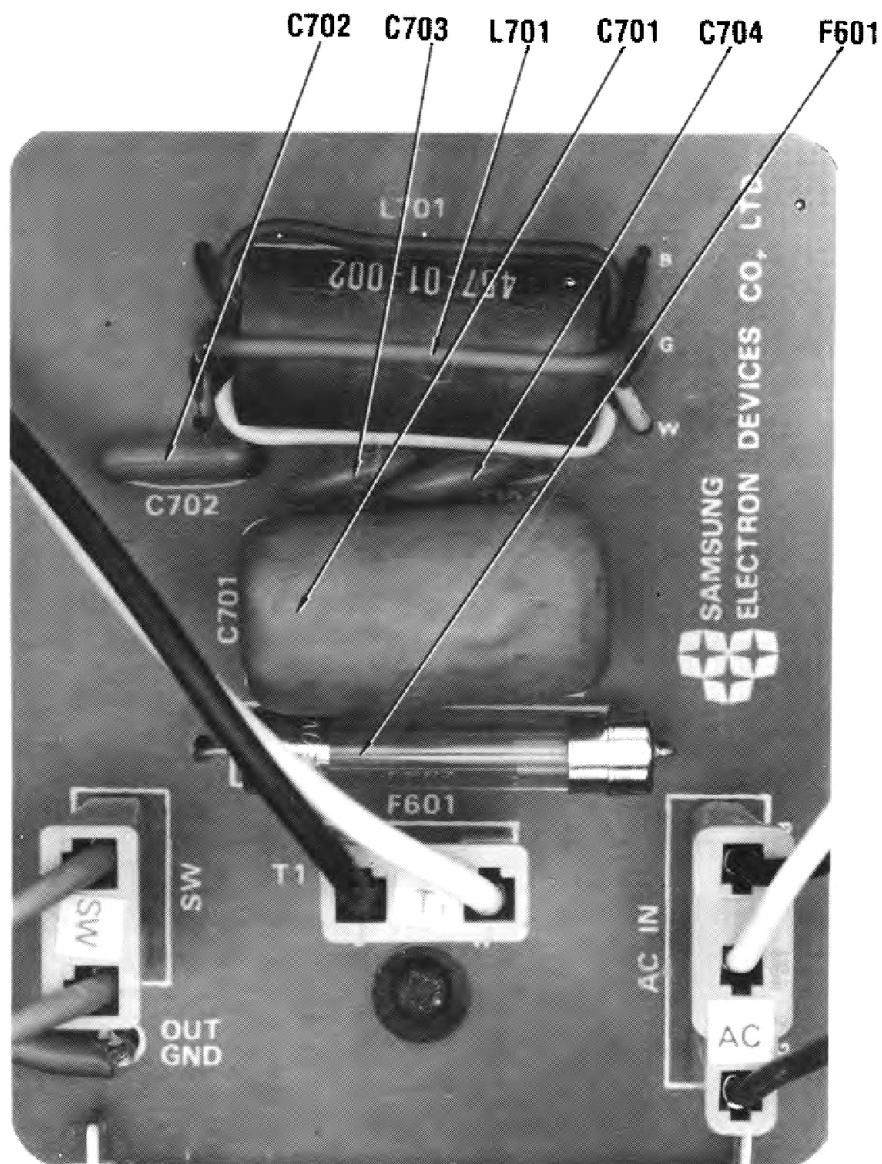




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**CRT BOARD**



**AC INPUT BOARD**

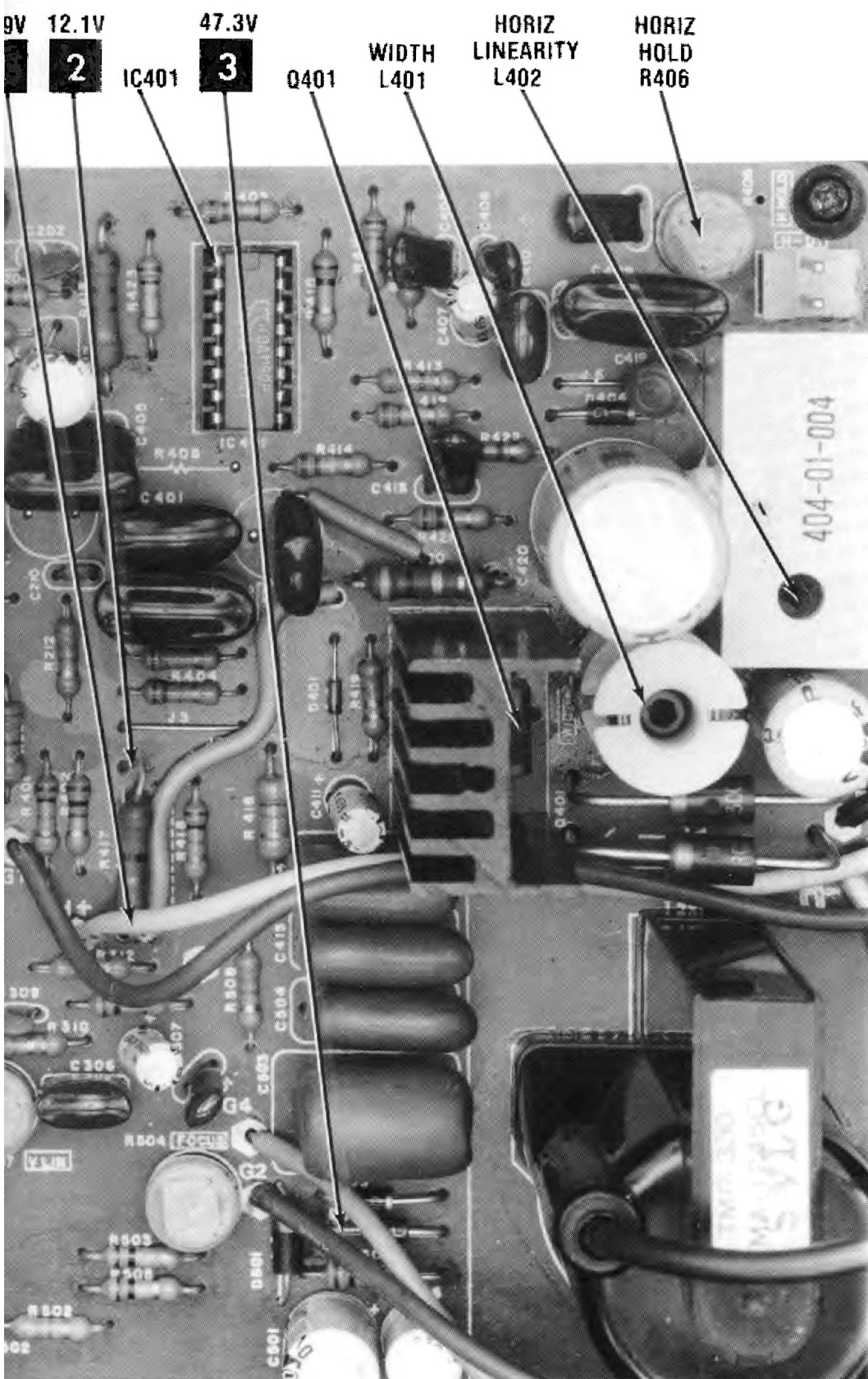
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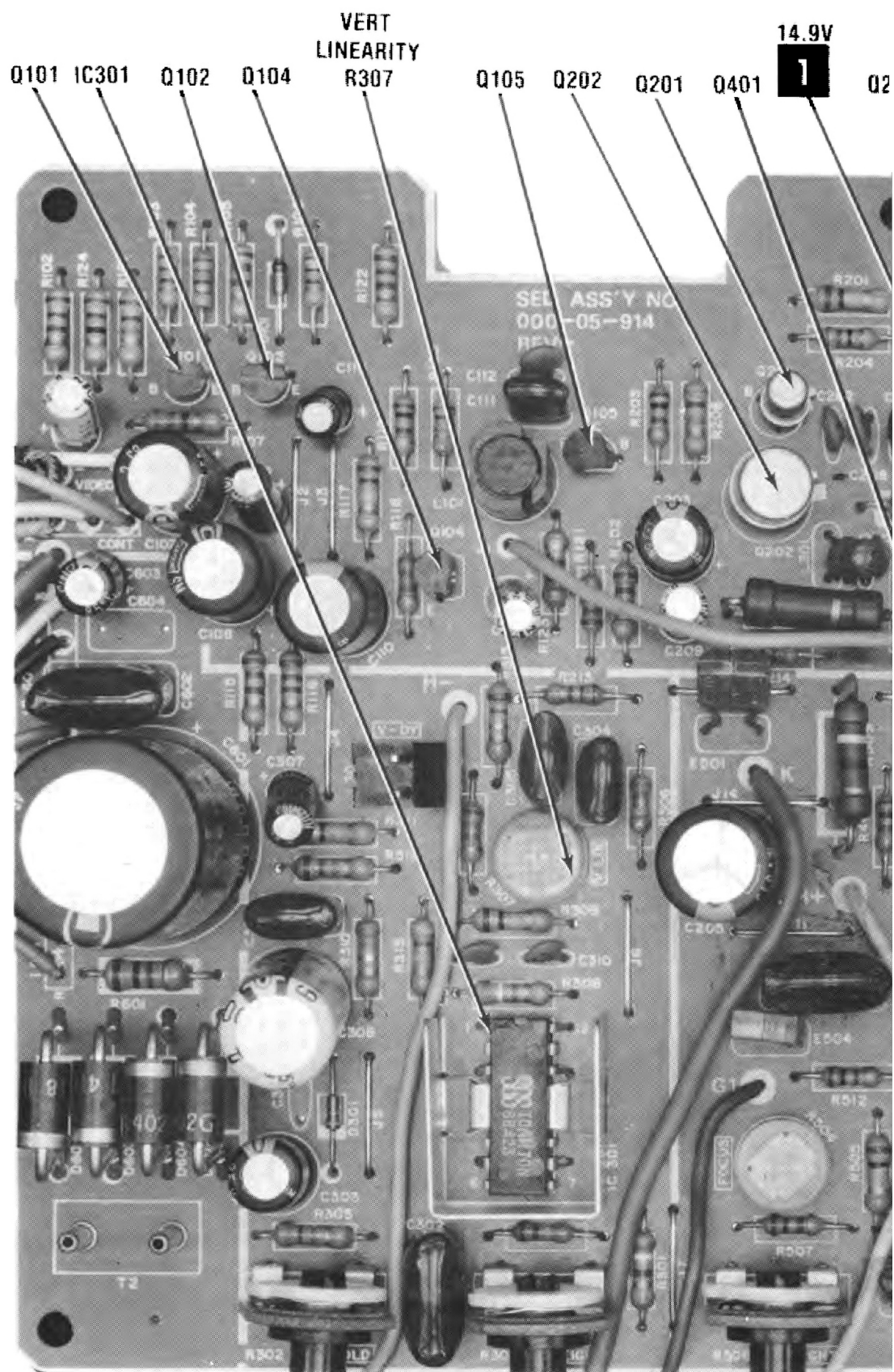


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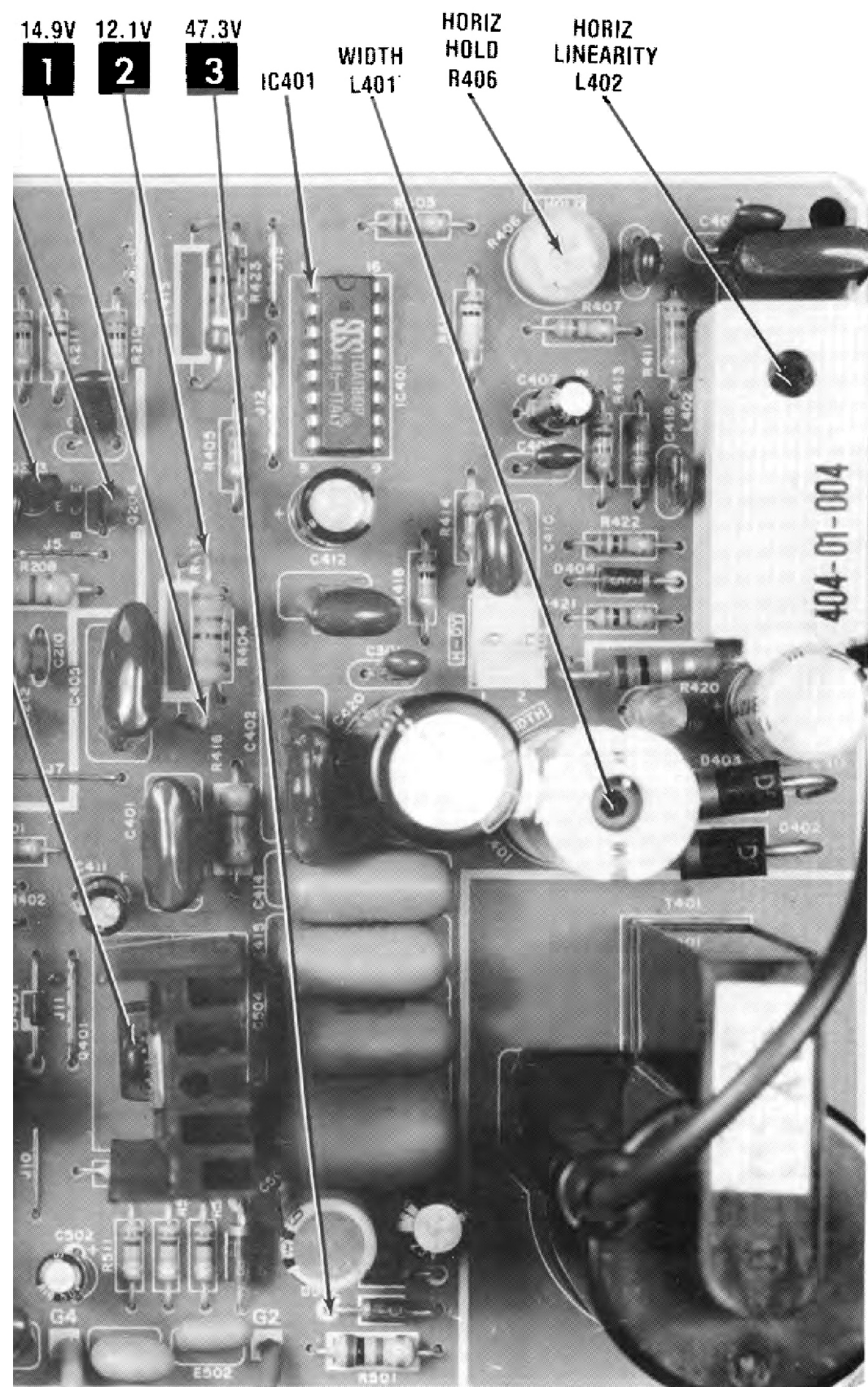




NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

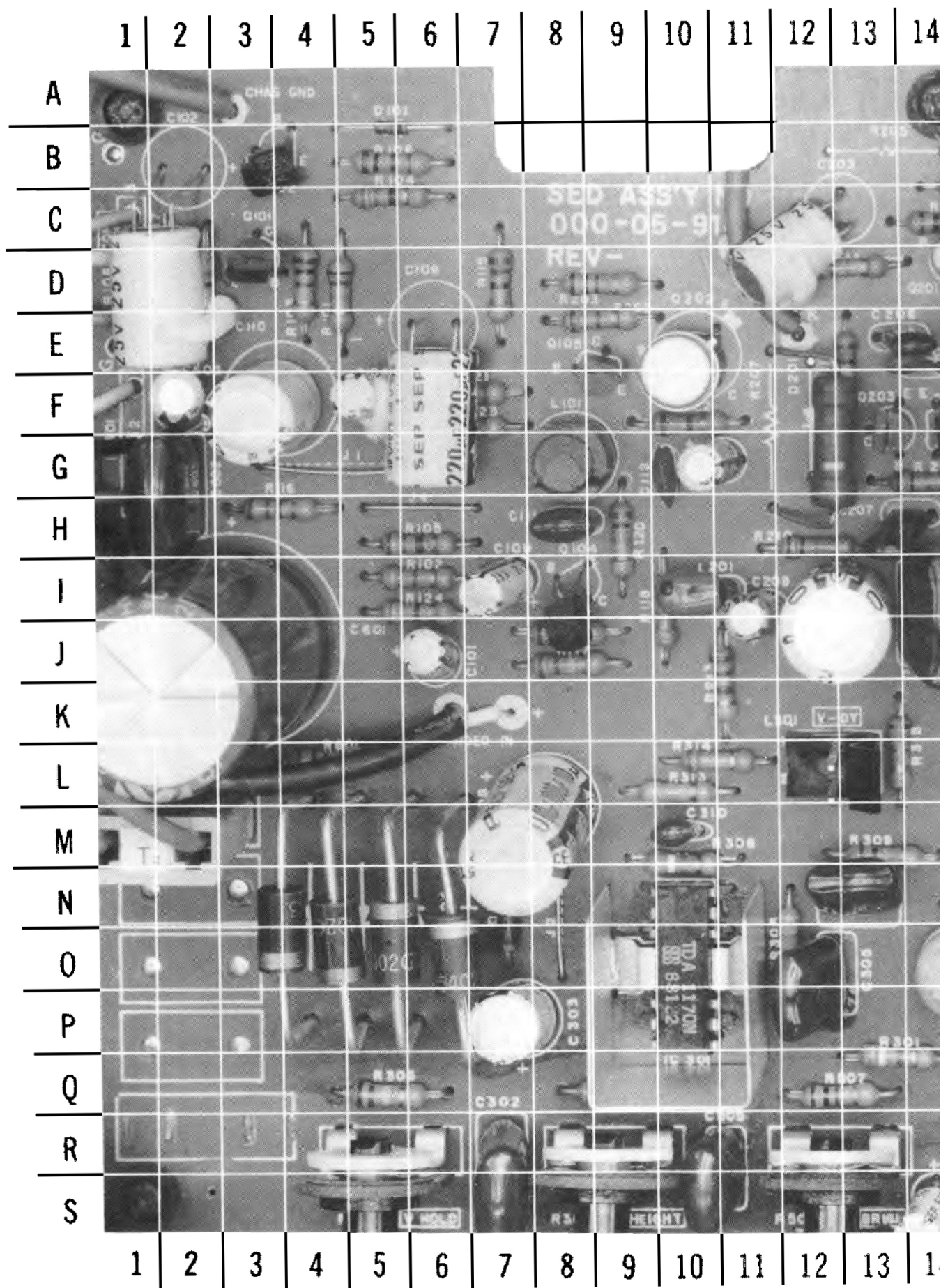
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MAIN BOARD 060-01-001 REV C

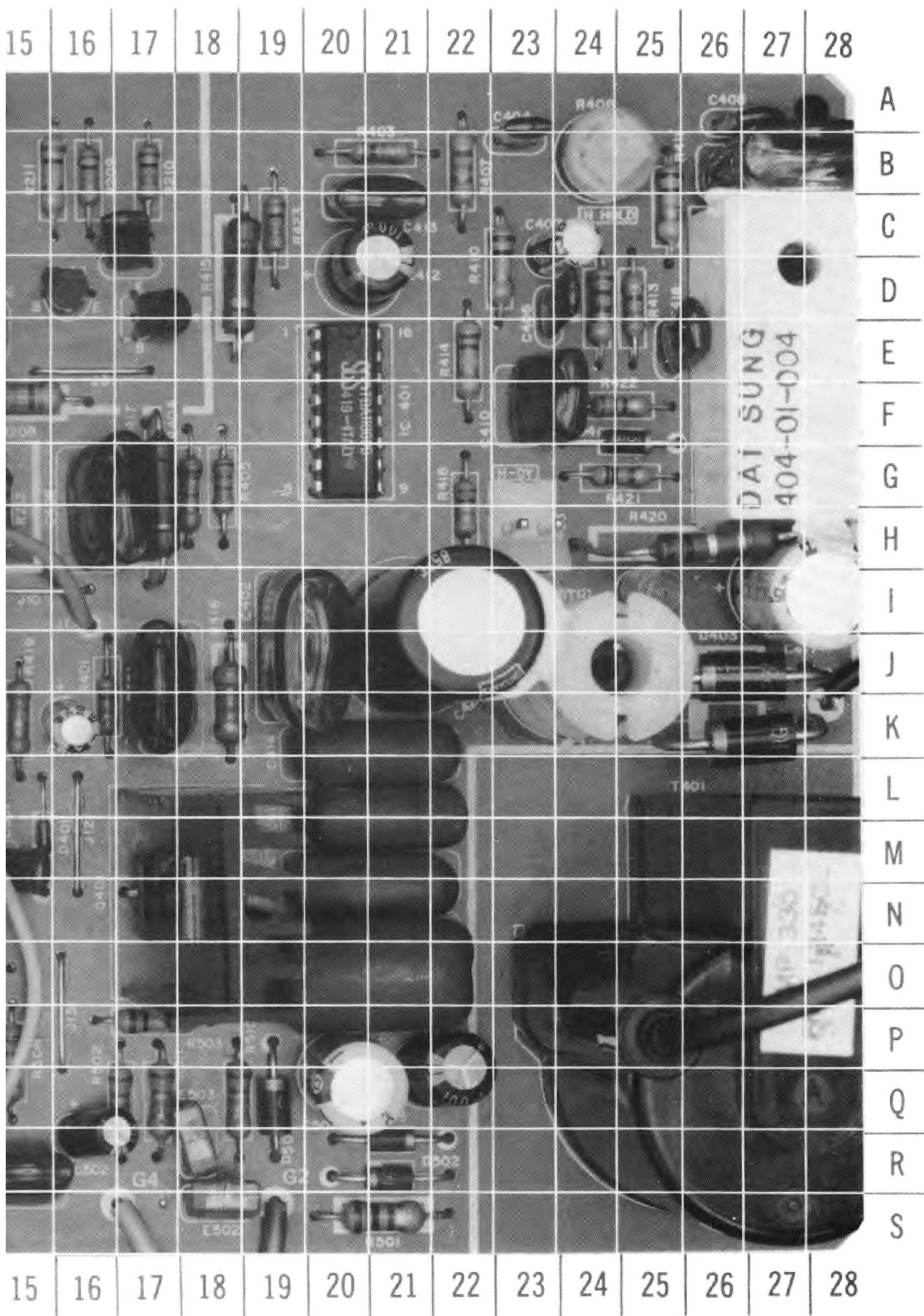
A Howard W. Sams CIRCUITRACE Photo





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MAIN BOARD 060-01-001 REV B

A Howard W. Sams GRIDTRACE™ Photo

A Howard W. Sams **GRIDTRACE™** Photo **MAIN BOARD 060-01-001 REV C**

# **BOARD 060-01-001 GridTrace LOCATION GUIDE**

C101	J-6	L401	I-25	R423	C-17
C102	D-2	L402	F-27	R501	R-20
C104	F-5	Q101	D-3	R502	S-15
C108	F-6	Q102	B-3	R503	R-17
C109	I-7	Q105	F-9	R504	Q-18
C110	F-3	Q201	D-14	R505	R-17
C111	H-8	Q202	F-10	R506	S-12
C112	G-10	Q203	G-13	R507	Q-12
C113	G-10	Q204	G-14	R508	M-18
C202	B-15	Q401	J-23	R601	L-4
C203	D-12	R101	D-5	T401	P-26
C205	J-12	R102	I-6		
C206	E-14	R103	D-4		
C207	H-13	R104	C-5		
C208	E-14	R105	H-6		
C209	J-11	R106	B-5		
C210	G-16	R107	D-2		
C211	J-14	R115	D-7		
C301	O-18	R116	H-4		
C302	S-7	R117	J-8		
C303	P-7	R118	J-10		
C304	N-13	R119	J-8		
C305	P-12	R120	H-9		
C306	O-16	R121	F-7		
C307	O-17	R122	F-10		
C308	N-17	R123	F-7		
C309	N-15	R124	I-6		
C310	M-10	R201	C-14		
C311	N-17	R202	E-9		
C401	F-17	R203	D-9		
C402	G-17	R204	C-15		
C404	A-24	R205	J-15		
C405	E-16	R206	D-13		
C406	B-22	R207	G-12		
C407	C-22	R209	G-14		
C408	B-21	R210	H-12		
C409	C-25	R211	E-13		
C410	C-23	R212	H-16		
C411	K-20	R213	K-11		
C412	D-16	R301	Q-13		
C413	G-19	R302	S-5		
C414	L-20	R303	Q-5		
C415	M-20	R304	Q-8		
C416	S-21	R305	S-9		
C417	J-27	R306	O-12		
C418	E-22	R307	O-14		
C419	D-25	R308	N-10		
C420	G-25	R309	M-13		
C501	S-20	R310	N-15		
C502	S-14	R312	M-16		
C503	P-21	R313	L-10		
C504	N-21	R314	L-10		
C505	S-10	R315	L-13		
O601	K-2	R401	K-15		
O602	G-2	R402	K-16		
O603	F-2	R403	A-18		
D101	B-5	R404	I-18		
D301	O-7	R405	H-17		
D401	I-20	R406	B-26		
D402	K-26	R407	B-21		
D403	K-26	R410	C-20		
D404	D-24	R411	B-20		
D501	R-19	R412	D-21		
D502	Q-21	R413	D-21		
D503	Q-20	R414	E-20		
D601	O-3	R415	C-16		
D602	O-5	R416	K-19		
D603	O-4	R417	K-17		
D604	O-6	R418	K-18		
IC301	O-10	R419	I-20		
IC401	C-19	R420	G-21		
L101	C-8	R421	F-22		
L201	I-10	R422	E-22		

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**APPLE MONITOR II  
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**BOARD 060-01-001 REV B GridTrace LOCATION GUIDE**

C101	D-1	L201	G-14	R421	G-25
C102	E-3	L401	J-25	R422	F-25
C104	H-9	Q101	D-3	R423	C-19
C108	G-4	Q102	D-4	R501	S-21
C109	F-4	Q104	G-7	R502	Q-17
C110	H-5	Q105	E-10	R503	P-17
C111	D-9	Q201	D-13	R504	P-13
C112	D-9	Q202	F-13	R505	P-14
C113	E-5	Q203	D-16	R507	Q-13
C202	E-14	Q204	D-17	R508	P-15
C205	L-12	Q401	N-17	R509	J-14
C206	E-15	R101	C-2	R510	Q-18
C307	C-17	R102	C-1	R511	Q-17
C308	E-14	R103	B-3	R512	Q-14
C209	G-11	R104	B-4	R601	M-3
C210	G-14	R105	B-4	T401	P-27
C211	N-13	R106	B-5		
C301	M-15	R107	E-3		
C302	S-7	R115	I-4		
C303	Q-5	R116	I-5		
C304	J-10	R117	F-6		
C305	J-9	R118	G-7		
C306	M-5	R119	E-7		
C307	K-5	R120	D-7		
C308	N-5	R121	G-10		
C309	M-8	R122	B-6		
C310	M-9	R123	G-9		
C401	J-17	R124	C-2		
C402	J-20	R201	C-14		
C404	A-23	R202	G-10		
C405	G-17	R203	D-11		
C406	D-24	R204	C-14		
C407	C-24	R206	D-11		
C408	A-27	R207	G-13		
C409	B-27	R208	F-15		
C410	F-23	R209	B-16		
C411	K-16	R210	B-17		
C412	D-21	R211	B-16		
C413	C-21	R212	G-15		
C414	L-21	R213	I-9		
C415	M-21	R214	H-13		
C416	Q-22	R301	R-11		
C417	I-28	R302	S-5		
C418	E-25	R303	R-5		
C419	I-25	R304	Q-9		
C420	I-22	R305	S-9		
C501	Q-20	R306	K-11		
C502	R-16	R307	L-9		
C503	O-21	R308	N-8		
C504	N-21	R309	M-8		
C505	R-15	R310	M-6		
C601	K-2	R311	K-6		
C602	I-2	R312	L-6		
C603	G-2	R313	M-7		
D101	B-5	R314	K-8		
D301	P-6	R315	I-8		
D401	M-15	R401	K-16		
D402	K-27	R402	K-14		
D403	J-26	R403	B-21		
D404	F-25	R404	G-18		
D501	Q-19	R405	G-18		
D502	R-21	R406	B-24		
D503	R-21	R407	B-22		
D601	P-1	R410	D-23		
D602	P-4	R411	C-25		
D603	P-2	R412	D-24		
D604	P-3	R413	D-25		
E501	I-12	R414	E-22		
E502	S-18	R415	D-19		
E503	R-18	R416	K-18		
E504	N-12	R417	G-17		
IC301	P-9	R418	G-22		
IC401	F-20	R419	K-15		
L101	E-8	R420	H-26		

# **BOARD 060-01-001 REV C GridTrace LOCATION GUIDE**

C101	E-2	L101	F-8	R419	L-14
C102	G-3	L201	H-13	R420	H-25
C104	G-8	L401	K-24	R421	H-25
C108	H-5	L402	E-27	R422	F-25
C109	F-5	Q101	D-3	R501	S-21
C110	H-6	Q102	F-3	R502	R-17
C111	F-11	Q104	F-6	R503	P-17
C112	E-11	Q105	F-10	R504	Q-13
C113	E-5	Q201	F-12	R505	Q-14
C202	F-13	Q202	G-12	R506	S-12
C203	G-11	Q203	F-15	R507	R-13
C205	N-12	Q204	F-17	R508	Q-14
C206	F-15	Q401	Q-17	R509	J-12
C207	D-17	R101	C-2	R510	R-18
C208	F-14	R102	C-1	R511	R-17
C209	I-11	R103	C-3	R512	P-13
C210	H-15	R104	C-3	R601	N-3
C211	Q-14	R105	C-4	T2	R-3
C301	H-21	R106	C-5	T401	P-27
C302	S-7	R107	F-3		
C303	Q-5	R115	J-4		
C304	L-10	R116	J-5		
C305	J-10	R117	D-7		
C306	M-5	R118	F-7		
C307	K-4	R119	D-7		
C308	N-4	R120	D-8		
C309	M-8	R121	H-9		
C310	N-8	R122	C-6		
C401	K-17	R123	H-8		
C402	K-20	R124	D-2		
C404	B-25	R201	D-12		
C405	H-17	R202	H-10		
C406	E-25	R203	D-10		
C407	D-24	R204	D-13		
C408	B-26	R206	D-10		
C409	B-27	R207	I-13		
C410	G-23	R208	G-15		
C411	L-16	R209	C-15		
C412	F-20	R210	C-17		
C413	H-20	R211	C-16		
C414	L-20	R212	I-15		
C415	M-20	R213	I-10		
C416	Q-22	R214	I-12		
C417	I-28	R301	R-10		
C418	E-25	R302	S-5		
C419	I-25	R303	R-6		
C420	J-22	R304	R-9		
C501	R-20	R305	S-9		
C502	R-16	R306	K-10		
C503	P-20	R307	M-9		
C504	N-20	R308	N-9		
C505	S-14	R309	L-8		
C601	L-1	R310	N-6		
C602	I-2	R311	L-5		
C603	H-2	R312	L-5		
D101	C-5	R313	N-7		
D301	P-6	R314	K-7		
D401	N-15	R315	J-6		
D402	K-26	R401	K-15		
D403	J-26	R402	L-14		
D404	G-25	R403	A-21		
D501	R-19	R404	H-18		
D502	S-21	R405	E-19		
D503	R-21	R406	B-24		
D601	P-1	R407	C-24		
D602	P-3	R410	C-22		
D603	P-2	R411	C-25		
D604	P-3	R412	E-24		
E501	K-12	R413	E-25		
E502	S-18	R414	F-22		
E503	S-17	R415	C-18		
E504	P-12	R416	K-19		
IC301	P-9	R417	H-18		
IC401	D-20	R418	G-21		

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**APPLE MONITOR II  
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## 4 PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

### SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA					
			NOTES	NTE PART No.	ECG PART No.	RCA PART No.	WORKMAN PART No.	ZENITH PART No.
D101 D301 D401 D402,3	1N4148 1S2473 1N4001 1N4148 RGP306	(1) (2) (3)		NTE519 NTE519 NTE116 NTE519 NTE580	ECG519 ECG519 ECG116 ECG519 ECG580	SK3100/519 SK3100/519 SK3311 SK3100/519 SK5036/580	WEP925/519 WEP925/519 WEP154 WEP925/519	103-131 103-131 212-76-02 103-131 103-316-04
D404 D501	1N4003 G1818 MR818 PLR818			NTE116 NTE506 NTE506 NTE506	ECG116 ECG506 ECG506 ECG506	SK3311 SK3998/506 SK3998/506 SK3998/506	WEP156 WEP172/506 WEP172/506 WEP172/506	212-76-02 103-287 103-287 103-287
D502	1N4002			NTE116	ECG116	SK3311	WEP155	212-76-02
D503 D601 thru D604 IC301 IC401	1N4003 1N5402 TDA1170N TDA1180P TDA1180PD	(1)(3) (2)		NTE116 NTE5802 NTE1289	ECG116 ECG5802 ECG1289	SK3311 SK9005/5802 SK9182/1289	WEP156 WEP4002/5802	212-76-02 212-Z9000
IC601  Q101  Q102	L78S15CV 7815 2SC945CY 2SC1815BL 2SC1815GR 2SA1015GR	  (1) (2) (3)		NTE968 NTE968 NTE85 NTE85 NTE85 NTE290A	ECG968 ECG968 ECG85 ECG85 ECG85 ECG290A	SK3593/968 SK3593/968 SK3124A/289A SK3124A/289A SK3124A/289A SK9132	WEP736/123A* WEP66/199 WEP66/199 WEP911/290A	HE-442-63 HE-442-63 121-972 121-Z9065 121-Z9065 121-Z9003*
Q104 Q105  Q201 Q202	2SA1015GR 2SC945CY 2SC1815BL 2SC1815GR 2N2222A 8F258	(1) (2) (3)		NTE290A NTE85 NTE85 NTE85 NTE123A NTE396	ECG290A ECG85 ECG85 ECG85 ECG123A ECG396	SK9132 SK3124A/289A SK3124A/289A SK3124A/289A SK3444/123A* SK3103A/396	WEP911/290A WEP736/123A* WEP66/199 WEP66/199 WEP736/123A	121-Z9003* 121-972 121-Z9065 121-Z9065 121-Z9000A
Q203,4  Q401	2SC945CY 2SC1815BL 2SC1815GR BU807	(1) (2) (3)		NTE85 NTE85 NTE85	ECG85 ECG85 ECG85 ECG2315	SK3124A/289A SK3124A/289A SK3124A/289A	WEP736/123A* WEP66/199 WEP66/199	121-972 121-Z9065 121-Z9065

(1) Board 060-01-001 Revision C.

(2) Board 060-01-001 Revision B.

(3) Board 060-01-001.

\* Lead configuration may vary from original.

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### ELECTROLYTIC CAPACITORS Items Not Listed Are Normally Available At Local Distributors.

ITEM No.	RATING	MFGR. PART No.
C420	16 25V NP	

### CAPACITORS

ITEM No.	RATING	MFGR. PART No.
C419	680 120V AC	

### RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
R420	.5 5% 1W Metal Oxide			

(1) Used as fuse.

### COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.
L101	RF Choke (15mH)	
L201	RF Choke (15uH)	

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### COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
L401	Width		403-01-004 (1)	
L402	Horiz Linearity		404-01-004 (1)	
L403	Yoke Horiz 99.7uH		DMB-1294BL (1)	
T401	90° Vert 14.2mH			
T601	Horiz Output		FMA-1245CL/ TMP-330 (1)	
T601	Power		APT001U (1)	
L704	AC Line Filter			

(1) Number on unit.

### CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
R108	Contrast	500		
R302	Vert Hold	100K		
R305	Vert (Height) Size	100K		
R307	Vert Linearity	200K		
R406	Horiz Hold	22K		
R504	Focus	2-2M		
R506	INT BRT	100K		



## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

### FUSE DEVICES

ITEM NO.	DESCRIPTION	MFR. PART NO.		NOTES
		DEVICE	HOLDER	
F601	1A @ 250V Fast Acting Pigtall 500mA @ 110V Fast Acting 500mA @ 230V Slow Blow 200mA @ 230V			

### MISCELLANEOUS

ITEM No.	PART NAME	MFR. PART No.	NOTES
E501 Thru E504 I601 P1 S601  Y501	Spark Gap  LED Jack Switch  CRT Foot Magnet Magnet Magnet Magnet Magnet Power Cord PC Board		Power, Green Video Input Power, 115V Power, 230V  Square, White Square, Red Square, Green Square, Blue Square, Yellow  Main

### CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

### WIRING DATA

High Voltage Lead .....	Use BELDEN No. 8869 (17 KV)
Shielded Hook-up Wire .....	Use BELDEN No. 8401 or 8421 (Single-Conductor) 8208 (Two-Conductor)
General-use Unshielded Hook-up Wire .....	Use BELDEN No. 8529 (Solid) Available in 13 Colors 8522 (Stranded) Available in 13 Colors
Power Cord .....	Use BELDEN No. 8895 (Polarized Interlocking Type)



## TEST EQUIPMENT

Test Equipment listed by Manufacturer illustrates typical or equivalent equipment used by SAMS Engineers to obtain measurements and is compatible with most types used by field service technicians.

### TEST EQUIPMENT (COMPUTERFACTS)

Equipment Name	B & K Precision Equipment No.	Sencore Equipment No.	Simpson Equipment No.
OSCILLOSCOPE	1570A,1590A,1596	SC81	454
LOGIC PROBE	DP51		
LOGIC PULSER	DP101		
DIGITAL VOM	2830	DVM37,DVM56,SC81	463,467,470,474,467E
ANALOG VOM	277		260-7,160,165, 260-6XL,260-7P, 260-6XLP
ISOLATION TRANSFORMER	TR110,1604,1653,1655	PR57	
FREQUENCY COUNTER	1803,1805	FC71,SC61	710
COLOR BAR GENERATOR	1211A,1248,1251,1260	CG25,VA62	431
RGB GENERATOR	1260		
FUNCTION GENERATOR	3020		420A,420D
HI-VOLTAGE PROBE VOM/DMM Accessory probes	HV-44	HP200	248 00168,00411,00749
TEMPERATURE PROBE	TP-28		IR-10,00760,00758; 383,389,388
CRT ANALYZER	467,470	CR70	

## TROUBLESHOOTING

### POWER SUPPLY

Check AC Fuse F601, if open, check Capacitors C701 thru C704, Transformer T601, Bridge Rectifier Diodes D601 thru D604 and Regulator IC (IC601). If Fuse F601 is good apply 120V AC and check for 22.5V at the cathode of Diode D604. If this voltage is absent, check the Power Switch S601 and the AC Line Filter. If 22.5V is present at the cathode of Diode D604, check for 14.9V at pin 3 of IC601. If this voltage is absent, check the voltages and components associated with IC601 and check the Horizontal Output Transistor (Q401). If 14.9V is present at pin 3 of IC601, refer to the "Horizontal" section of this Troubleshooting guide.

### HORIZONTAL

Check for 14.9V at the collector of the Horizontal Output Transistor (Q401). If this voltage is absent, check Resistor R420, Diode D403, and refer to the "Power Supply" section of this Troubleshooting guide. If 14.9V is present at the collector of Q401, inject a horizontal signal at the base of Transistor Q401. If horizontal deflection is now present, check the voltages, waveforms and components associated with pins 1, 2, 4, 5, 8, 11, 12, 13 14 and 15 of Deflection IC (IC401). If there is still no horizontal sweep, check the voltages, waveforms and components associated with the Horizontal Output Transformer (T401). The High Voltage Rectifier is part of Transformer T401 and if defective will affect the operation of the horizontal circuits. If the horizontal oscillator is off frequency, check the voltages, waveforms and components associated with pins 13, 14 and 15 of IC401. Horizontal linearity or foldover problems may be caused by defective Capacitors C414, C415, C420 or Coils L401 and L402.

### VIDEO

Inject a video signal at the Video Input Jack (P1) and check for video on the CRT. If there is no video, check the voltages, waveforms and components associated with Video Amp Transistors Q101, Q102, Q201, Q202, and check the CRT and CRT voltages. Check blanking Transistors Q203, Q204 and associated components. If there is inadequate Brightness or Contrast, check the voltages and components associated with Contrast and Brightness Controls (R108 and R506) and check the voltage on pins 1 and 5 of the CRT.

### VERTICAL

Check the voltages on Vertical Output IC (IC301). If these voltages are absent, check IC301 and refer to the "Power Supply" section of this Troubleshooting guide. If the proper voltages are present on IC301, check for a Vertical waveform at pin 4 of IC301. If this waveform is absent, check the components associated with IC301. If a vertical waveform is present at pin 4, check Electrolytic C308 and the Deflection Yoke (L430). Check Electrolytics C209, C303, C307 for defects.

### SYNC

If there is no Vertical or Horizontal Sync, check for a video waveform at the collector of Sync Separator Transistor (Q104). If this waveform is absent, check Transistor Q104 and associated components. If there is no Vertical Sync, check the voltages, waveforms and components associated with pins 8, 9 and 10 of Deflection IC (IC401). If there is no Horizontal Sync, check the voltages, waveforms and components associated with pins 8, 9, 13 and 15 of IC401.

## MISCELLANEOUS ADJUSTMENTS

### HORIZONTAL WIDTH ADJUSTMENT

Connect a pattern generator (1VPP into 75 $\Omega$  VTR Standard) to the video input and tune in a crosshatch pattern. Adjust L401 to obtain a pattern that is equal on each side and not squeezed together.

### HORIZONTAL LINEARITY

Connect a pattern generator (1VPP into 75 $\Omega$  VTR Standard) to the video input and tune in a crosshatch pattern. If L402 is not factory sealed, adjust to obtain proper linearity.

Note: Alternate Width and Linearity adjustments until pattern is correct.

### HORIZONTAL HOLD

Connect a pattern generator (1VPP into 75 $\Omega$  VTR Standard) to the video input and select a crosshatch pattern. Adjust Horizontal Hold Control (R406) until pattern locks in position. This adjustment will also eliminate tearing.

### VERTICAL LINEARITY

Connect a pattern generator (1VPP into 75 $\Omega$  VTR Standard) to the video input and select a crosshatch pattern. Adjust Vertical Linearity Control (R307) to make pattern even at top and bottom.

Note: Vertical Height Control can affect linearity.

### PINCUSHION ADJUSTMENT

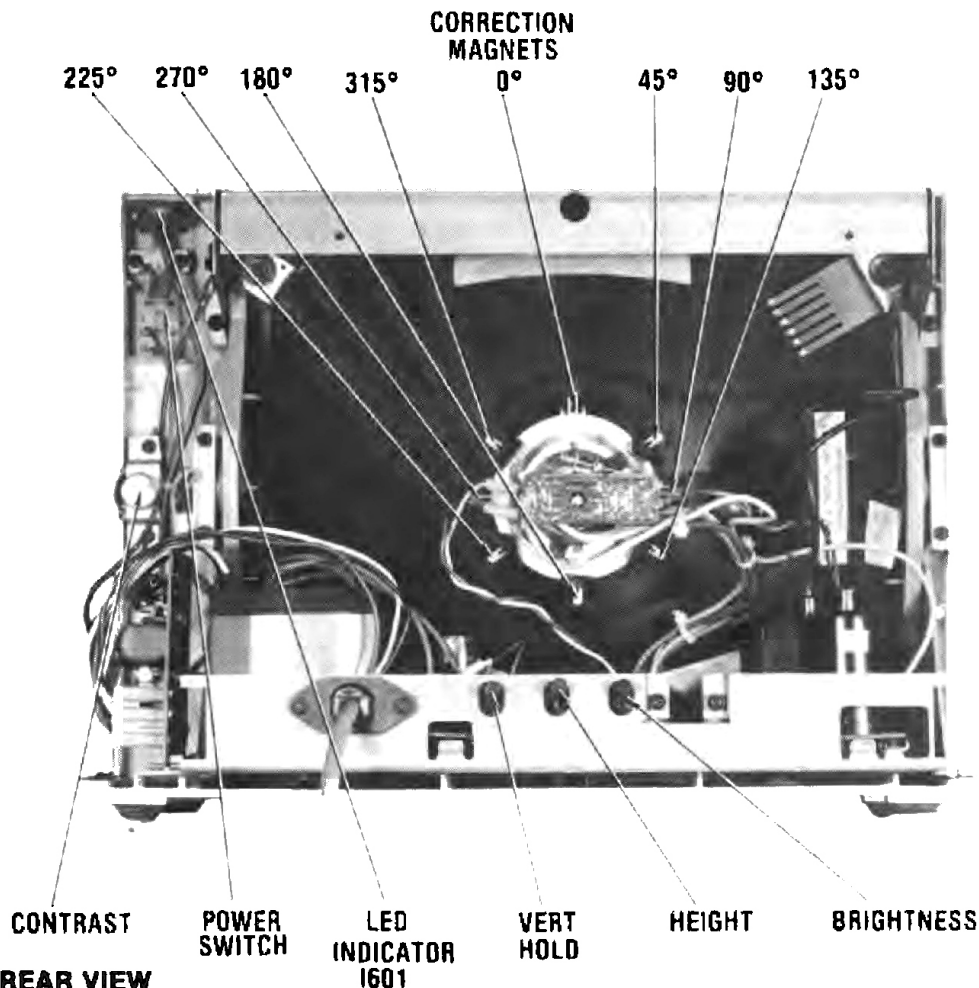
To correct Pincushion effect on the C.R.T. raster place a magnet on the yoke mounting pin that corresponds with the affected area. Top Bow is corrected with a magnet at 0° (top center) pin. Left side Bow is corrected with a magnet at 90° clockwise pin. Bottom Low is corrected with a magnet at 180° clockwise pin. Right side Bow is corrected with a magnet at 270° clockwise pin. Rotate magnets on pin to obtain desired raster.

Note: If a second magnet is needed on any one pin the poles of the magnets must be aligned and both magnets rotated simultaneously.

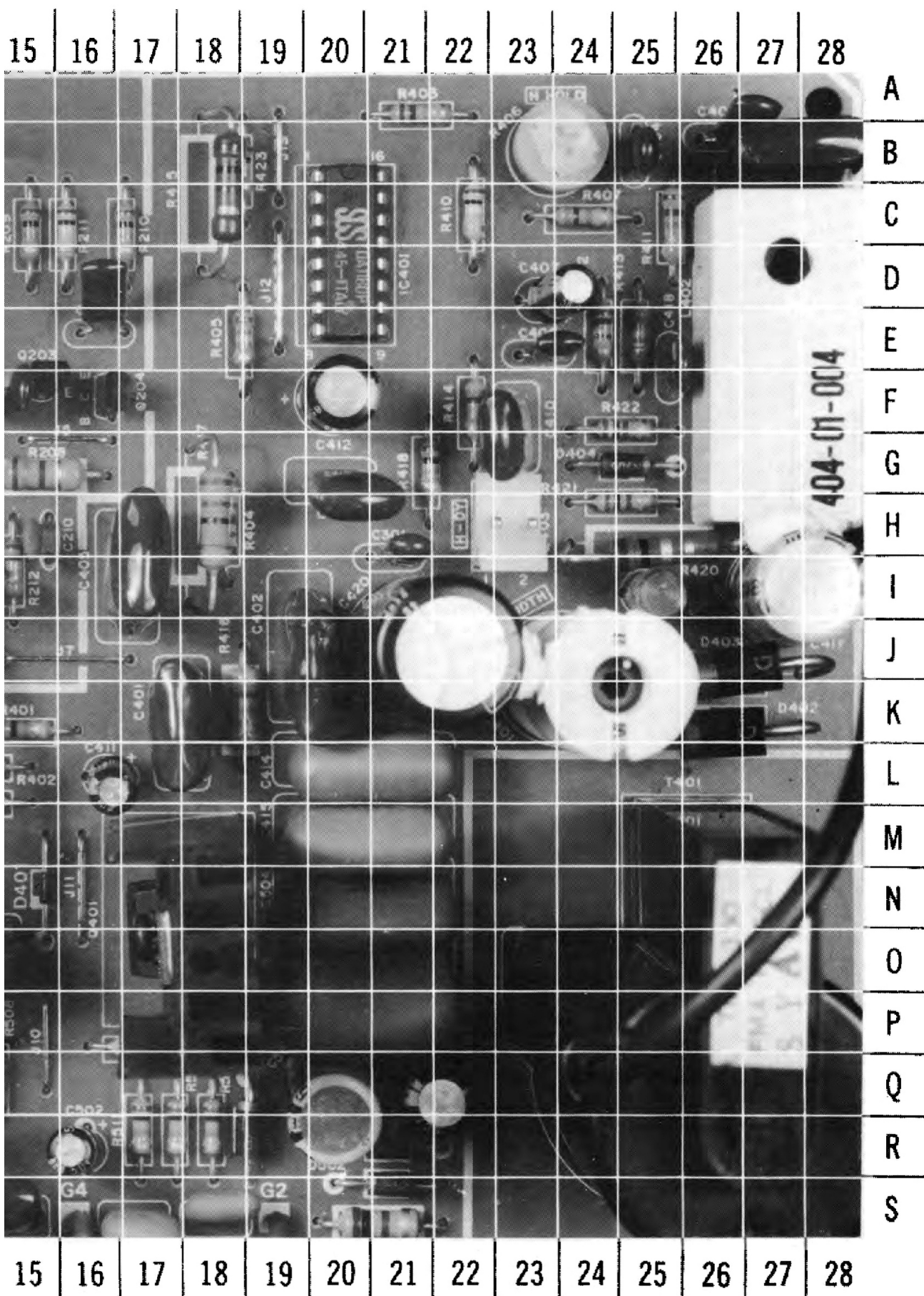
### TRAPEZOIDAL ADJUSTMENT

To correct a trapezoidal effect on the C.R.T. raster place a magnet on the yoke mounting pin that corresponds to the affected area. Place a magnet on the pin 45° clockwise from top center to correct top left corner. Place a magnet on the pin 135° clockwise from top center to correct bottom left corner. Place a magnet on the pin 225° clockwise from top center to correct bottom right corner. Place a magnet on the pin 315° clockwise from top center to correct top right corner. Rotate magnets to obtain desired raster.

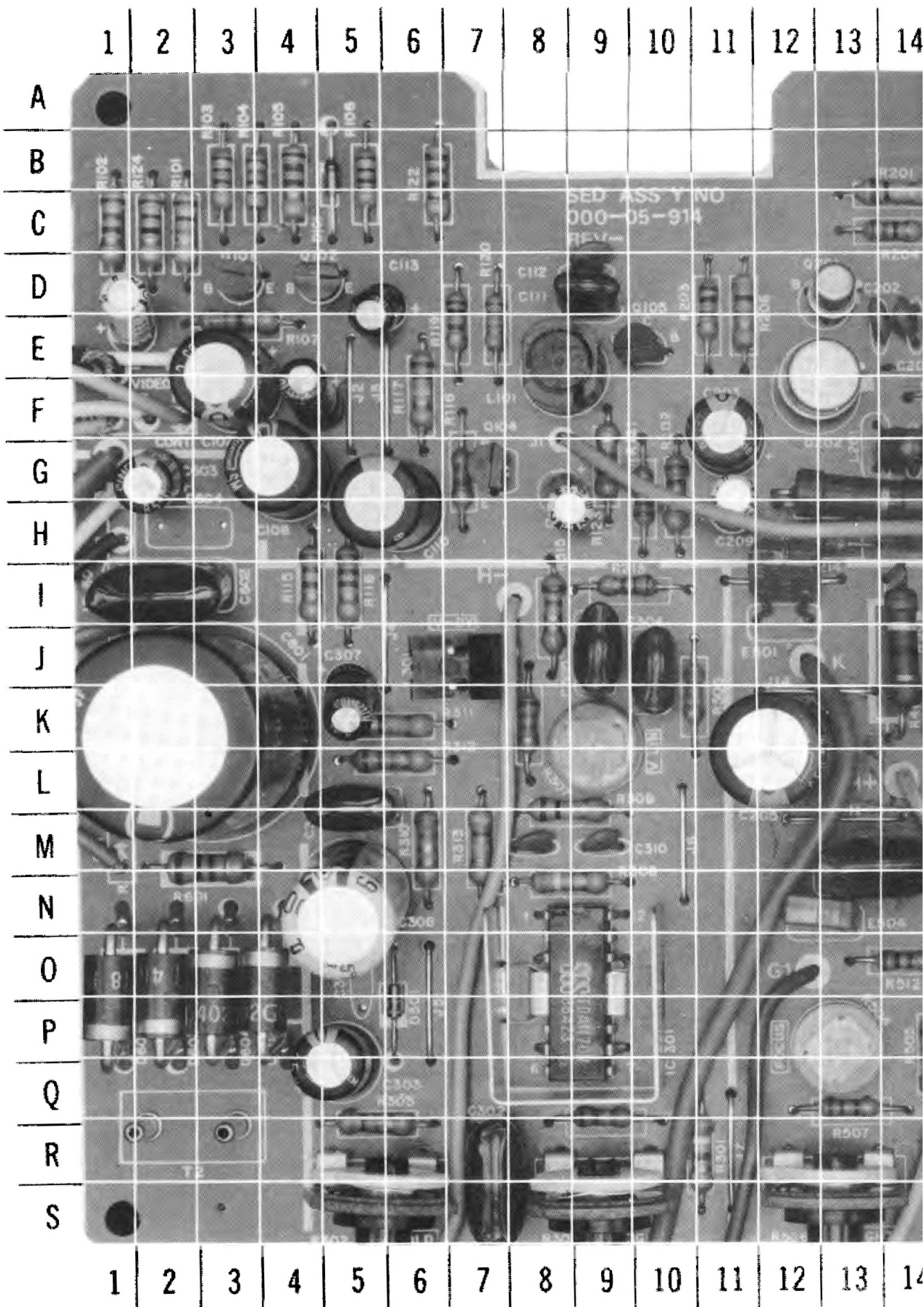
Note: If a second magnet is needed on any one pin the poles of the magnet must be aligned and both magnets rotated simultaneously.



CABINET-REAR VIEW

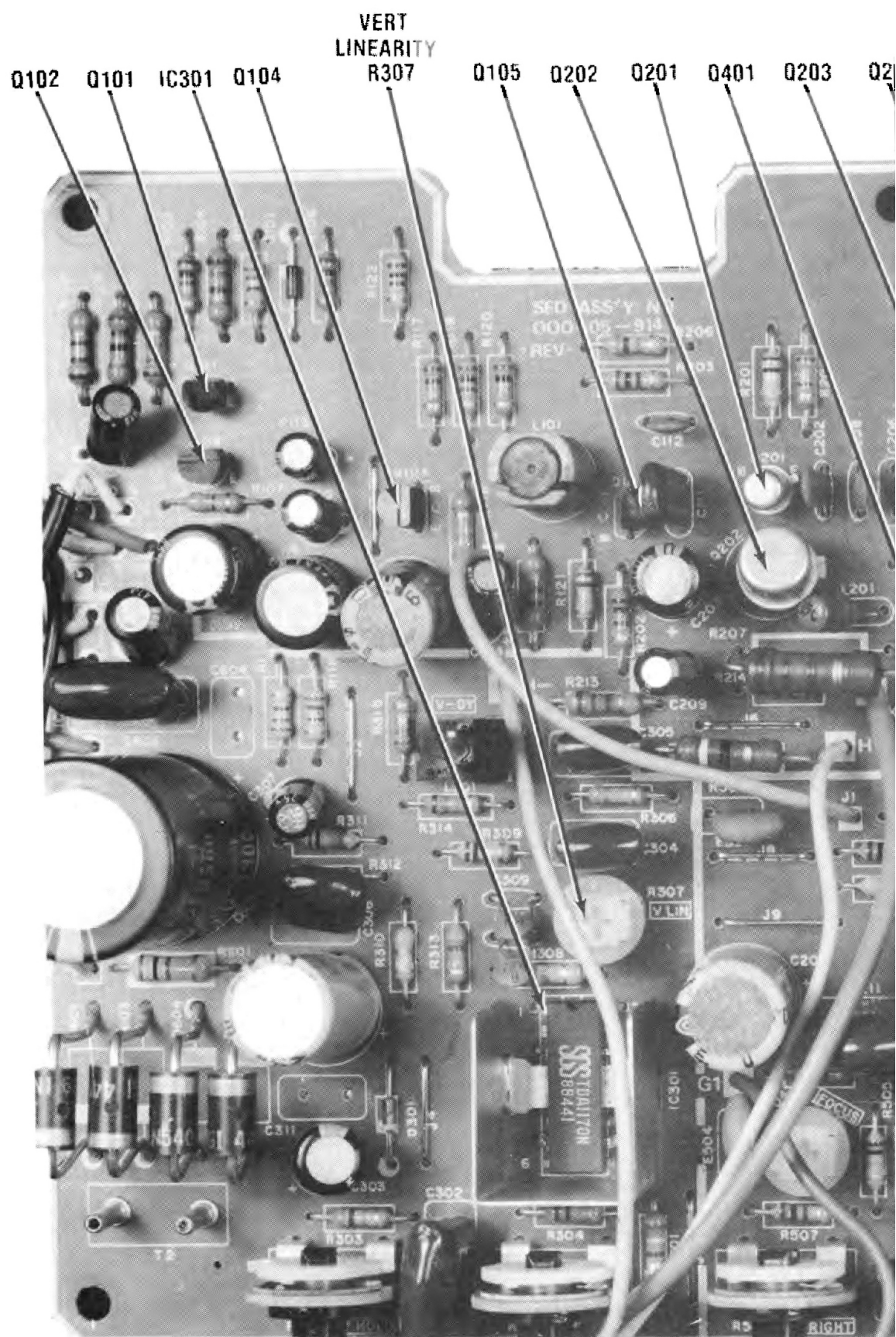


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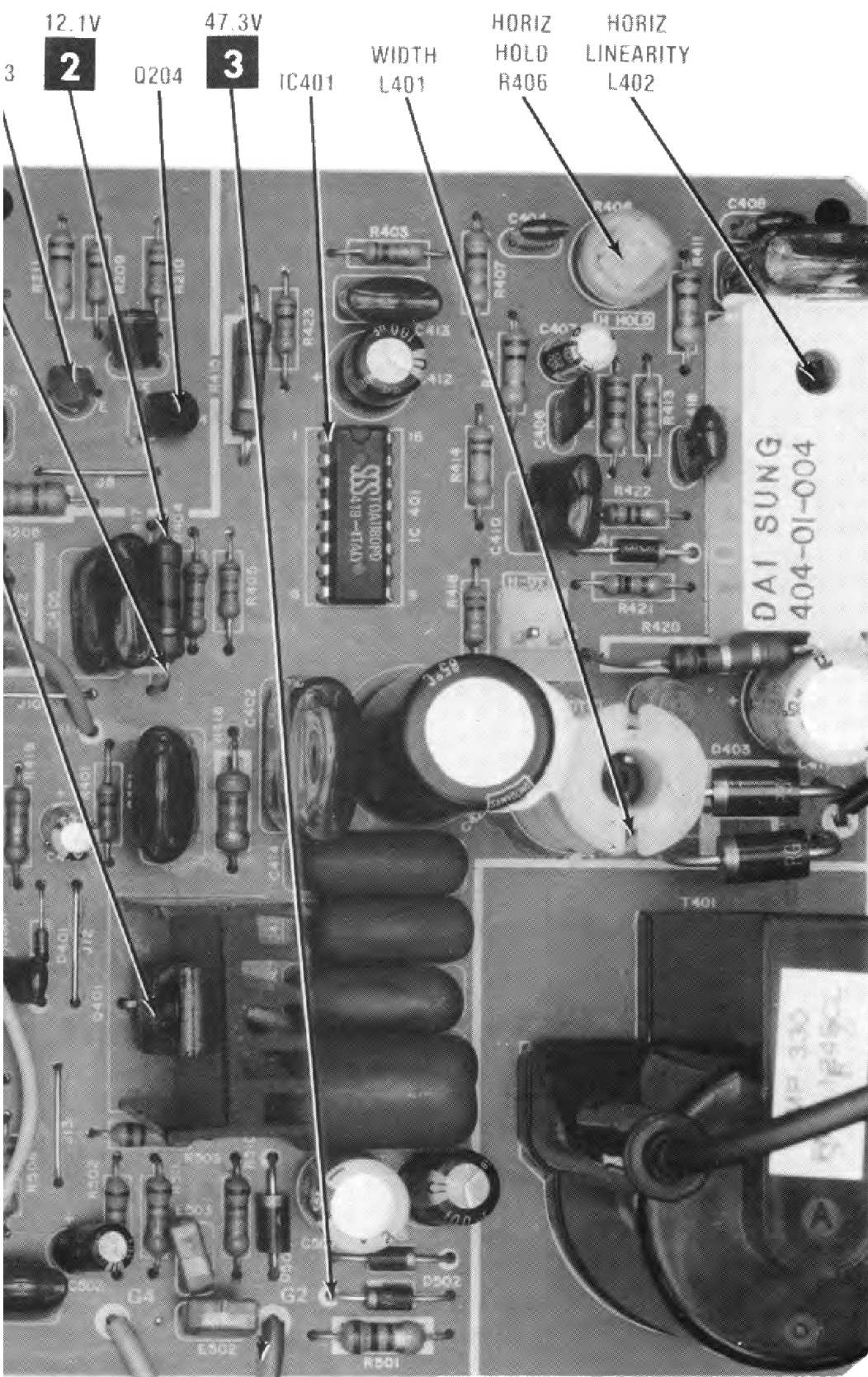




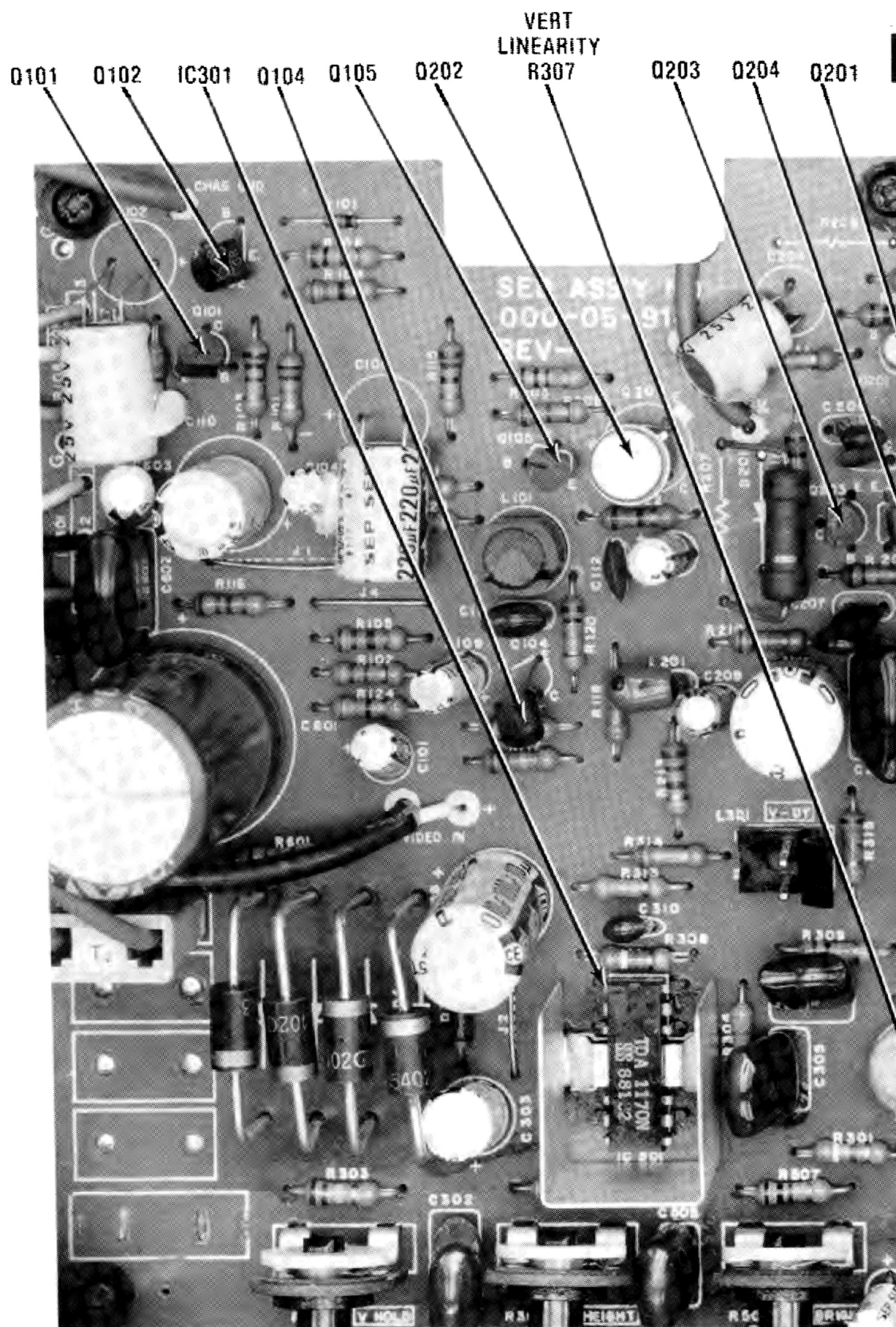
NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED

MAIN BOARD 060-01-001 REV C

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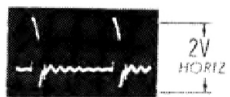






NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED





IC401 PIN 8  
HORIZ



IC401 PIN 10  
VERT

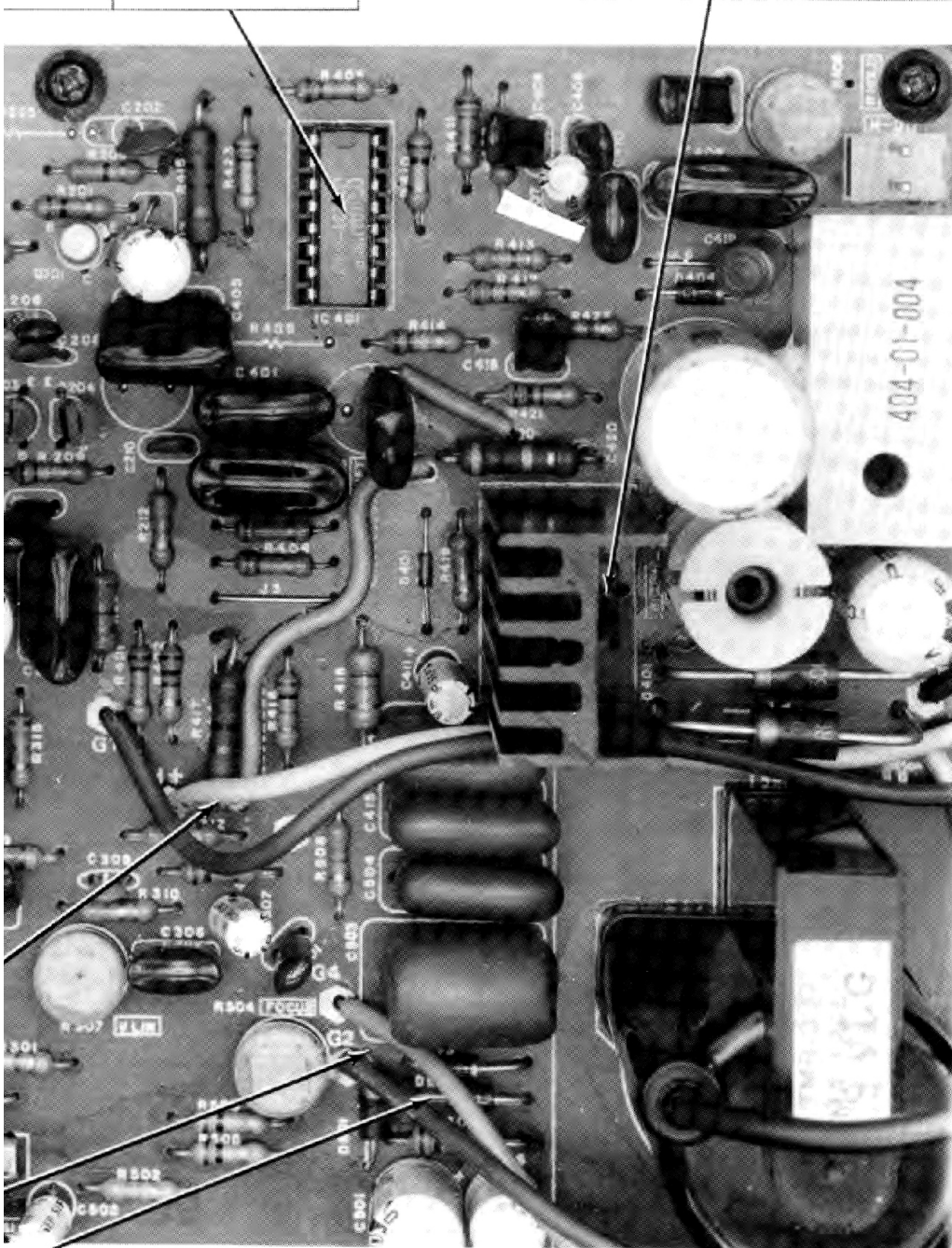


Q401(B)  
HORIZ



Q401(C)  
HORIZ

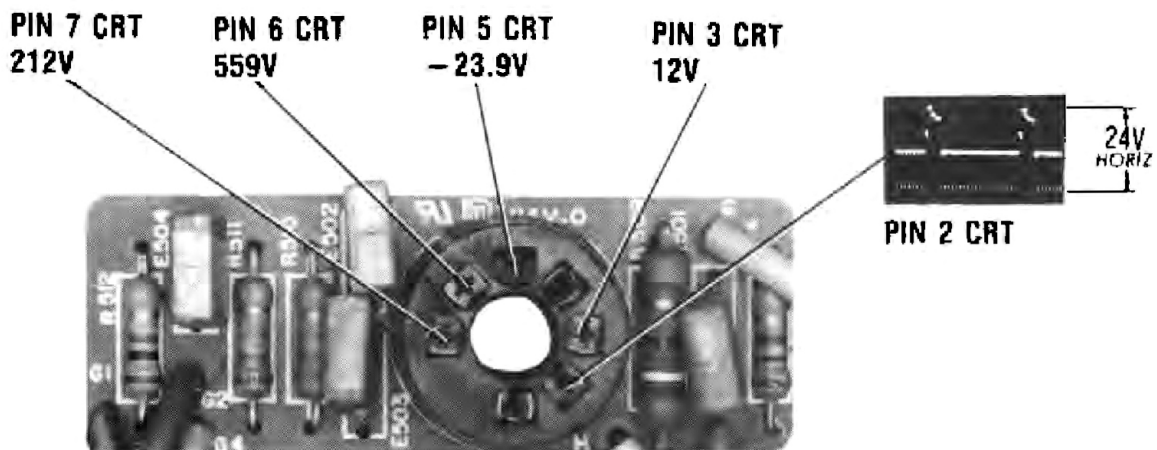
Q401(C)  
17.3V  
HORIZ



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## SAFETY PRECAUTIONS

1. Use an isolation transformer for servicing.
2. Maintain AC line voltage at rated input.
3. Remove AC power from the monitor before servicing or installing electrostatically sensitive devices. Examples of typical ES devices are integrated circuits and semiconductor "chip" components.
4. Use extreme caution when handling the printed circuit boards. Some semiconductor devices can be damaged easily by static electricity. Drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available discharging wrist strap device. This should be removed prior to applying power to the unit under test.
5. Use a grounded-tip, low voltage soldering iron.
6. Use an isolation (times 10) probe on scope.
7. Do not remove or install boards with monitor AC power On.
8. Do not use freon-propelled sprays. These can generate electrical charges sufficient to damage semiconductor devices.
9. This monitor is equipped with a grounded three-pronged AC plug. This plug must fit into a grounded AC power outlet. Do not defeat the AC plug safety feature.
10. Periodically examine the AC power cord for damaged or cracked insulation.
11. The monitor cabinet is equipped with vents to prevent heat build-up. Never block, cover, or obstruct these vents.
12. Instructions should be given, especially to children, that objects should not be dropped or pushed into the vents of the cabinet. This could cause shock or equipment damage.
13. Never expose the monitor to water. If exposed to water turn the unit off. Do not place the monitor near possible water sources.
14. Never leave the monitor unattended or plugged into the AC outlet for long periods of time. Remove AC plug from AC outlet during lightning storms.
15. Do not allow anything to rest on AC power cord.
16. Unplug AC power cord from outlet before cleaning monitor.
17. Never use liquids or aerosols directly on the monitor. Spray on cloth and then apply to the monitor cabinet. Make sure the monitor is disconnected from the AC power line.



# **DISASSEMBLY INSTRUCTIONS**

## **CHASSIS REMOVAL**

Remove six screws holding cabinet back and remove back. Disconnect CRT socket, HV anode and ground leads. Remove six screws holding Power Indicator, Power Switch and Contrast Control to cabinet front. Disconnect yoke connector and slide chassis out of cabinet.

## **CRT REMOVAL**

Follow "chassis removal" procedure and lay set face down on a soft protective surface. Remove four screws holding CRT to cabinet front and lift CRT out of cabinet. **Do not lift CRT by the neck.**

# **SERVICING IN THE FIELD**

## **CRT IMPLOSION PROTECTION AND CLEANING**

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

## **FUSE DEVICES**

A 1-amp fuse is used for low-voltage power-supply protection.

## **POWER INDICATOR**

Indicator is accessible after removing cabinet back.

## **HORIZONTAL OSCILLATOR**

Adjustment of the horizontal hold is accomplished by the proper setting of the Horiz Hold Control.

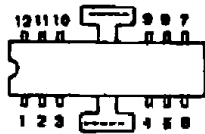
## **WIDTH**

The width may be varied by adjusting the width coil.

## **CENTERING**

Centering is accomplished by proper adjustment of two magnetic rings located on the yoke rear cover.

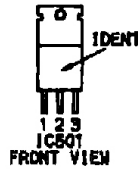
## IC PINOUTS & TERMINAL GUIDES



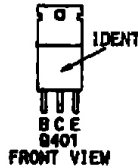
IC301  
TOP VIEW



IC401  
TOP VIEW



FRONT VIEW



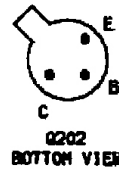
FRONT VIEW



Q101, Q102  
Q104, Q105  
Q203, Q204  
BOTTOM VIEW



Q201  
BOTTOM VIEW

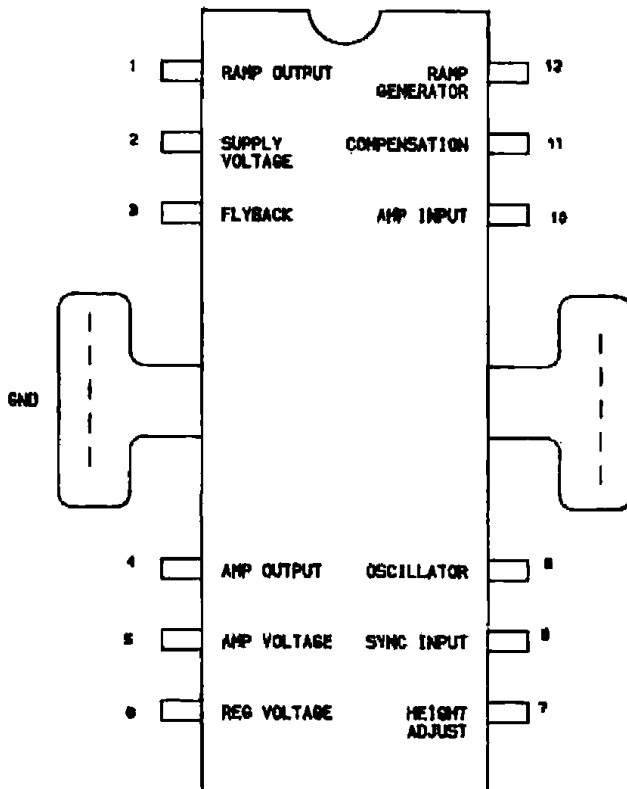


Q202  
BOTTOM VIEW

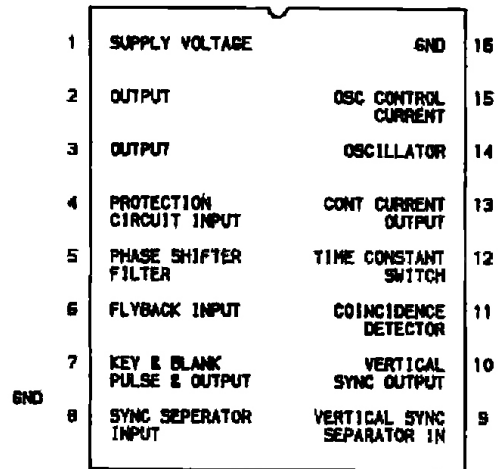


T401  
BOTTOM VIEW

IC301  
TDA1170N



IC401  
TDA1180P



# PRELIMINARY SERVICE CHECKS (Continued)

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