

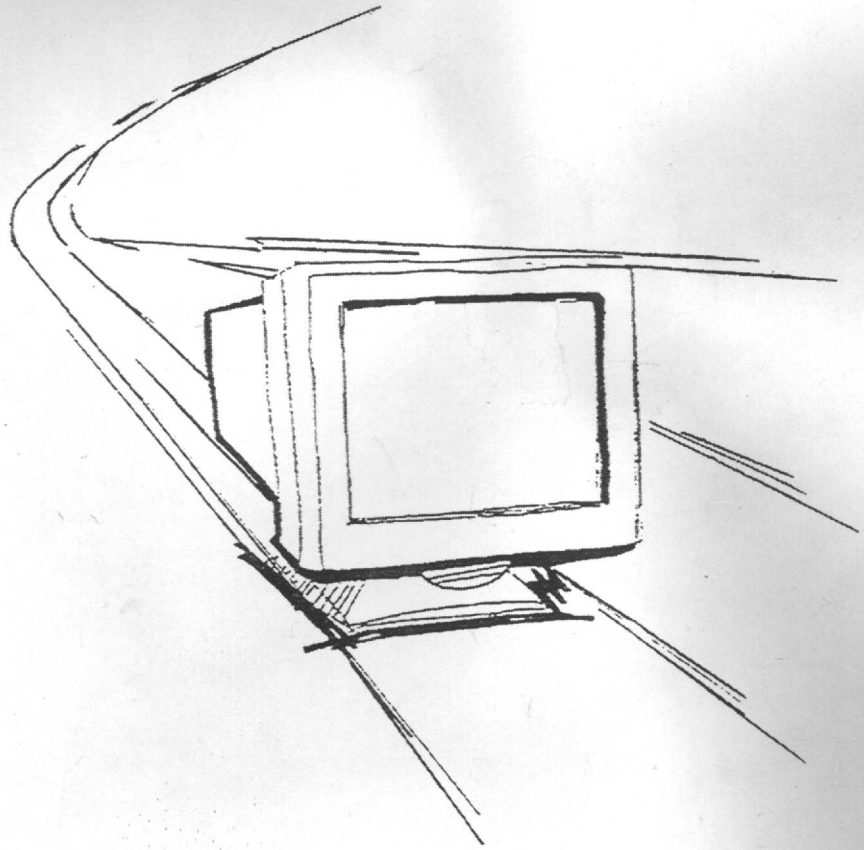


009004/95/96

1785GM/1765GM/1765J

# TROUBLESHOOTING

# GUIDE



**CTX**

The Monitor Specialists

EDITION 1  
May 1994

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## 1.0 IMPORTANT NOTICE & INTRODUCTION

### IMPORTANT NOTICE

Please read before attempting service

1. While the monitor is in operation, do not attempt to connect or disconnect any wires.
2. Make sure the power cord is disconnected before replacing any parts in the monitor.
3. When the power is on, do not attempt to short any portion of the circuit. This shorting may cause damage to the transistors in the monitor.
4. When servicing the H.V. area, be certain that the C.R.T. anode is safely discharged to ground before removing the anode cap.
5. Caution must be exercised when servicing this monitor.



## INTRODUCTION

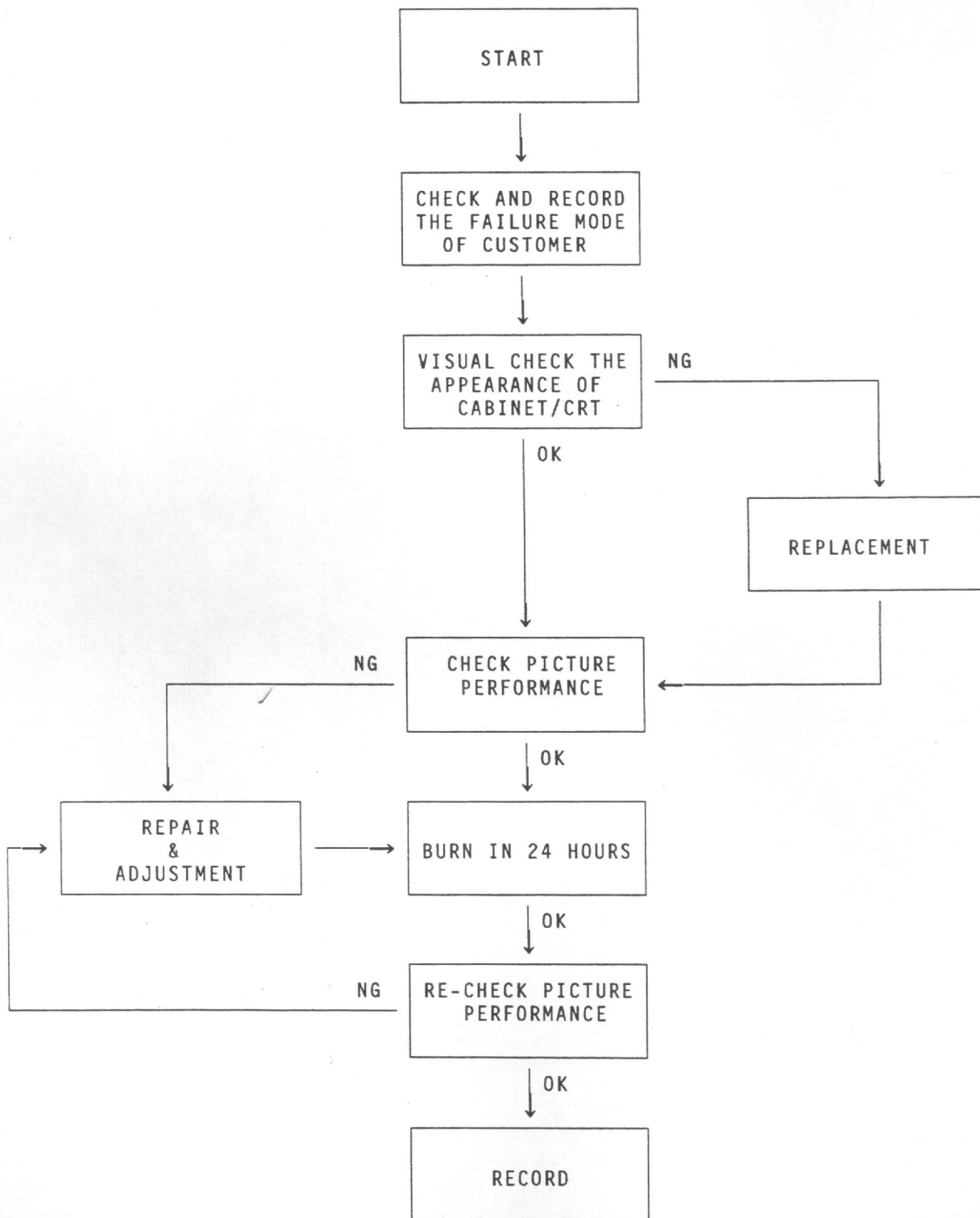
### Enhanced repair capabilities

This troubleshooting guide is edited for model 1785GM/1765GM/1765J when service occurs.

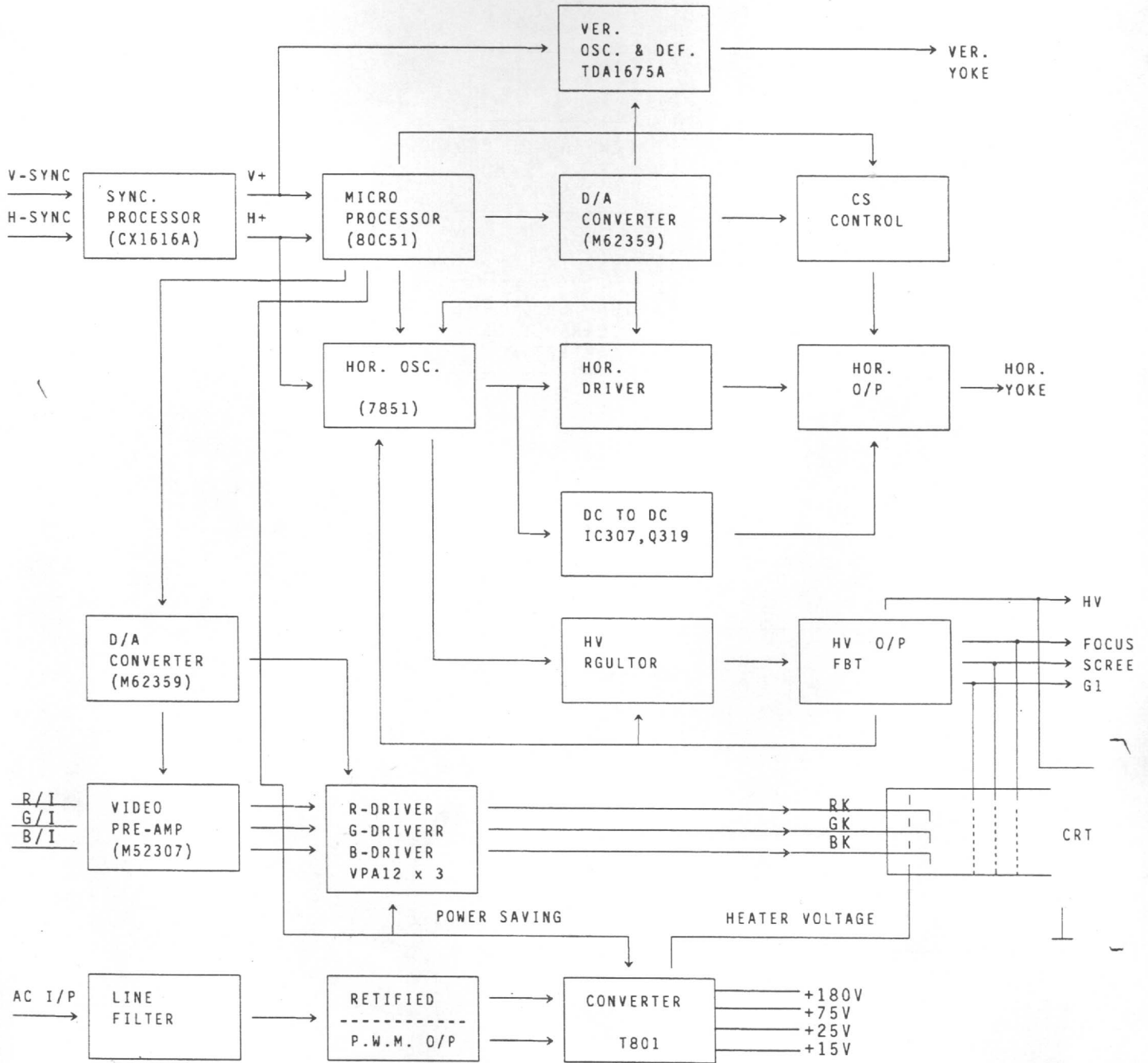
There are four primary parts included in this troubleshooting guide which offers the easiest way to locate problem point and makes the repair machine at the best condition at that moment.

- 1. Adjustment** section offers the adjustable method, steps and whole data of factory initial setting which can have machine get the best performance at that moment. By the way, before adjusting the machine must be warmed up 10 minutes at least and the CRT face East when adjusting.
- 2. Troubleshooting** section have four main parts included power supply, CRT, deflection & video circuit which can offer fast repair routine and IC, transistor voltage record against all specified signal modes.  
These voltage reading is measured with HP 34401A multimeter input impedance  $10M\Omega$  (0.1V~1000V range) and waveforms shown on circuit schematics are measured by Tektronix TDS 520 digital oscilloscope, receive VGA-350 full white square pattern.
- 3. CRT contrast list** offers repairman/technician the contrast data for different type of CRT.
- 4. Spare parts list** offers the CTX part number (P/N) which are used frequently by repairment/technician. Details please refer to service guide or service manual.  
If there is any engineering change about this model, CTX will issue the updated information by Technical Bulletin non-periodically.

## 2.0 GENERAL MAINTAINANCE PROCEDURE



3.0 FUNCTION BLOCK DIAGRAM





## 4.0 TIMING MODE

NAME	VGA-350		VGA-400		VGA-480		SVGA I	
PIXEL RATE	25.2 MHZ		25.2 MHZ		25.2 MHZ		36 MHZ	
Fh	31.5 KHZ		31.5 KHZ		31.5 KHZ		35.156 KHZ	
Fv	70 HZ		70 HZ		60 HZ		56.250 HZ	
INTERLACE MODE	NO		NO		NO		NO	
OUTPUT	ANALOG		ANALOG		ANALOG		ANALOG	
FULL SCALE Vpp	1,000		1,000		1,000		1,000	
SYNC ON R/G/B	NO		NO		NO		NO	
CONTROL BITS	0000 0000		0000 0000		0000 0000		0000 0000	
UNIT	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us
FRAME BORDER-H	0	0 us	0	0 us	0	0 us	0	0 us
FRAME BORDER-V	0	0 ms	0	0 ms	0	0 ms	0	0 ms
H TOTAL	800	31.78 us	800	31.78 us	800	31.78 us	1040	28.444us
H DISPLAY	641	25.42 us	641	25.42 us	641	25.42 us	800	2.222us
H REAR PORCH	48	1.91 us	48	1.91 us	48	1.91 us	128	3.556us
H SYNC WIDTH	96	3.81 us	96	3.81 us	96	3.81 us	72	2.0 us
H SYNC POLARITY	+		-		-		-	
V TOTAL	450	14.27 ms	450	14.27 ms	525	16.68 ms	625	17.778ms
V DISPLAY	350	11.12 ms	400	12.71 ms	480	15.25 ms	600	17.067ms
V REAR PORCH	60	1.91 ms	35	1.11 ms	33	1.05 ms	22	0.626ms
V SYNC WIDTH	2	0.06 ms	2	0.06 ms	2	0.06 ms	2	0.057ms
V SYNC POLARITY	-		+		-		-	
EQUALIZATION ?	NO		NO		NO		NO	
SERRATION ?	NO		NO		NO		NO	
COMP SYNC POLARITY	-		-		-		-	
FIT MODEL	ALL		ALL		ALL		ALL	

NAME	SVGA II		SVGA III		VESA-480		8514A	
PIXEL RATE	40 MHZ		50 MHZ		31.5 MHZ		44.9 MHZ	
Fh	37.879 KHZ		48.077 KHZ		37.860 KHZ		35.5 KHZ	
Fv	60.3165 HZ		72.187 HZ		72.809 HZ		87 HZ	
INTERLACE MODE	NO		NO		NO		VIDEO	
OUTPUT	ANALOG		ANALOG		ANALOG		ANALOG	
FULL SCALE Vpp	1,000		1,000		1,000		1,000	
SYNC ON R/G/B	NO		NO		NO		NO	
CONTROL BITS	0000 0000		0000 0000		0000 0000		0000 0000	
UNIT	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us
FRAME BORDER-H	0	0 us	0	0 us	0	0 us	0	0 us
FRAME BORDER-V	0	0 ms	0	0 ms	0	0 ms	0	0 ms
H TOTAL	1056	26.4 us	1040	20.80 us	832	26.413us	1268	28.10 us
H DISPLAY	800	20.0 us	800	16.0 us	640	20.317us	1024	22.80 us
H REAR PORCH	88	2.2 us	64	1.28 us	128	4.063us	52	1.15 us
H SYNC WIDTH	128	3.2 us	120	2.40 us	40	1.270us	176	3.91 us
H SYNC POLARITY	+		+		-		+	
V TOTAL	628	16.579ms	666	13.853ms	520	13.735ms	408	11.50 ms
V DISPLAY	600	15.840ms	600	12.480ms	480	12.678ms	384	10.80 ms
V REAR PORCH	23	0.607ms	23	0.478ms	28	0.740ms	20	0.56 ms
V SYNC WIDTH	4	0.106ms	6	0.125ms	3	0.079ms	4	0.11 ms
V SYNC POLARITY	+		+		-		+	
EQUALIZATION ?	NO		NO		NO		NO	
SERRATION ?	NO		NO		NO		NO	
COMP SYNC POLARITY	-		-		-		-	
FIT MODEL	ALL		ALL		ALL		ALL	

NAME	8514NI		VESA 56K		VESA 60K		VESA 64K	
PIXEL RATE	65 MHZ		75 MHZ		78.75 MHZ		110.0 MHZ	
Fh	48.363 KHZ		56.476 KHZ		60.023 KHZ		63.679 KHZ	
Fv	60 HZ		70.069 HZ		75.029 HZ		60.018 HZ	
INTERLACE MODE	NO		NO		NO		NO	
OUTPUT	ANALOG		ANALOG		ANALOG		ANALOG	
FULL SCALE Vpp	1,000		1,000		1,000		1,000	
SYNC ON R/G/B	NO		NO		NO		NO	
CONTROL BITS	0000 0000		0000 0000		0000 0000		0000 0000	
UNIT	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us
FRAME BORDER-H	0	0 us	0	0 us	0	0 us	0	0 us
FRAME BORDER-V	0	0 ms	0	0 ms	0	0 ms	0	0 ms
H TOTAL	1344	20.677us	1328	17.707us	1312	16.66 us	1696	15.700us
H DISPLAY	1024	15.754us	1024	13.653us	1024	13.003us	1080	11.852us
H REAR PORCH	160	2.462us	144	1.920us	176	2.235us	234	2.222us
H SYNC WIDTH	136	2.092us	136	1.813us	96	1.219us	144	1.333us
H SYNC POLARITY	-		-		+		-	
V TOTAL	806	16.667ms	806	14.272ms	800	13.328ms	1063	16.70 ms
V DISPLAY	768	15.880ms	768	13.599ms	768	12.795ms	1024	16.081ms
V REAR PORCH	29	0.600ms	29	0.513ms	28	0.466ms	34	0.534ms
V SYNC WIDTH	6	0.124ms	6	0.106ms	3	0.05 ms	3	0.047ms
V SYNC POLARITY	-		-		+		+	
EQUALIZATION ?	NO		NO		NO		NO	
SERRATION ?	NO		NO		NO		NO	
COMP SYNC POLARITY	-		-		-		-	
FIT MODEL	ALL		ALL		ALL		1785GM/1765GM	



NAME	VESA 78K		VESA 80K		MAC II 640		MAC II 832	
PIXEL RATE	135.0 MHZ		135.0 MHZ		28.05 MHZ		57.28 MHZ	
Fh	77.907 KHZ		79.976 KHZ		35.0 KHZ		49.72 KHZ	
Fv	69.888 HZ		75.025 HZ		66.667 HZ		74.55 HZ	
INTERLACE MODE	NO		NO		NO		NO	
OUTPUT	ANALOG		ANALOG		ANALOG		ANALOG	
FULL SCALE Vpp	1,000		1,000		1,000		1,000	
SYNC ON R/G/B	NO		NO		GREEN		GREEN	
CONTROL BITS	0000 0000		0000 0000		0000 0000		0000 0000	
UNIT	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us
FRAME BORDER-H	0	0 us	0	0 us	0	0 us	0	0 us
FRAME BORDER-V	0	0 ms	0	0 ms	0	0 ms	0	0 ms
H TOTAL	1709	12.661us	1688	12.504us	802	28.570us	1152	20.111us
H DISPLAY	1280	9.481us	1280	9.481us	640	22.81 us	832	14.524us
H REAR PORCH	266	1.970us	187	1.383us	89	1.150us	224	3.91 us
H SYNC WIDTH	145	1.075us	144	1.067us	59	2.120us	64	1.117us
H SYNC POLARITY	+		-		-		-	
V TOTAL	1088	13.80 ms	1066	13.329ms	526	15.000ms	667	13.414ms
V DISPLAY	1024	12.985ms	1024	12.804ms	480	13.700ms	624	12.549ms
V REAR PORCH	39	0.496ms	38	0.475ms	39	1.110ms	39	0.784ms
V SYNC WIDTH	8	0.103ms	3	0.038ms	3	0.090ms	3	0.060ms
V SYNC POLARITY	-		+		+		-	
EQUALIZATION ?	NO		NO		NO		NO	
SERRATION ?	NO		NO		NO		NO	
COMP SYNC POLARITY	-		-		-		-	
FIT MODEL	1785GM		1785GM		ALL		1785GM/1765J	

NAME	1280X1024 INT		NEC 24.8K		NEC 32.8K	
PIXEL RATE	80.0 MHZ		21.05 MHZ		47.84 MHZ	
Fh	51.02 KHZ		24.83 KHZ		32.84 KHZ	
Fv	87.588 HZ		56.40 HZ		80.0 HZ	
INTERLACE MODE	NO		NO		VIDEO	
OUTPUT	ANALOG		ANALOG		ANALOG	
FULL SCALE Vpp	1,000		1,000		1,000	
SYNC ON R/G/B	NO		NO		NO	
CONTROL BITS	0000 0000		0000 0000		0000 0000	
UNIT	PIXEL	ms/us	PIXEL	ms/us	PIXEL	ms/us
FRAME BORDER-H	0	0 us	0	0 us	0	0 us
FRAME BORDER-V	0	0 ms	0	0 ms	0	0 ms
H TOTAL	1568	19.600us	848	40.280us	1457	30.450us
H DISPLAY	1280	16.000us	640	30.400us	1120	23.410us
H REAR PORCH	48	0.600us	80	3.800us	140	2.930us
H SYNC WIDTH	216	2.700us	64	3.030us	84	1.760us
H SYNC POLARITY	—		—		—	
V TOTAL	1307	11.417ms	440	17.720ms	821	12.500ms
V DISPLAY	1024	8.945ms	400	16.110ms	750	11.420ms
V REAR PORCH	128	1.118ms	25	1.010ms	45	0.685ms
V SYNC WIDTH	12	0.104ms	8	0.320ms	10	0.150ms
V SYNC POLARITY	—		—		—	
EQUALIZATION ?	NO		NO		* NO	
SERRATION ?	NO		NO		NO	
COMP SYNC POLARITY	—		—		—	
FIT MODEL	1765GM		1765J		1765J	

## 5.0 ADJUSTMENT

### 5.1 1785GM ADJUSTMENT

#### 1. B+ voltage adjustment: VR801, VR308

- a. Use VGA-350 timing for input signal.
- b. Attach the multimeter (with a DC voltage range of 150V) between TP301 and GND, and adjust VR801 to get  $75V \pm 0.2V$  of measurement.
- c. Measure the DC voltage between TP301 and GND, and adjust VR308 to get  $16V \pm 0.05V$ .

#### 2. Hi-voltage adjustment: VR401

- a. Turn the power switch off before attaching multimeter with a high voltage probe by a factor 1000:1 between CRT anode GND.
- b. Adjust VR401 to make sure the measurement reading is  $26V \pm 0.1V$  (ie CRT anode voltage is  $26KV \pm 0.1KV$ ).

#### 3. Horizontal hold adjustment: VR303, VR302

- a. Connect TP302 to GND and adjust VR303 to get picture stand or blow slowly when input signal is VGA-350.
- b. Change input timing to VESA-64K and adjust VR302 to get picture stand.

#### 4. Focus adjustment: Focus VR1, VR2 on FBT

- a. Use the VESA 80K-timing for input signal. (If no, use the most high horizontal frequency that you have.)
- b. Adjust BRIGHTNESS VR & CONTRAST VR to max, and then mutually adjust FOCUS VR1 & VR2 on FBT to get the sharpest image for all zone of screen.

#### 5. V-line adjustment: VR201

- 1st, adjust V-CENTER EXTERNAL SW to have picture at the V-center of the screen, and then adjust VR201 to correct the V-linearity of cross-hatch pattern.

#### 6. V-SIZE adjustment: VR202

- a. Push EXTERNAL RECALL SW.
- b. Adjust VR202 to get a vertical full screen of picture.
- c. Adjust EXTERNAL V-SIZE SW to get picture height  $232 \pm 3mm$  and check the other modes.



7.H-CENTER adjustment: VR307

Use VESA-80K timing and adjust VR307 to shift raster into center of bezel ( $\frac{|R-L|}{2} \leq 2\text{mm}$ ).

8.H-PHASE adjustment: VR301

a. Use VESA 80K timing and push EXTERNAL RECALL SW.

b. Adjust VR301 to shift picture phase into center of bezel.

9.H-WIDTH adjustment: VR306

a. Use MAC II 832 timing and adjustment VR306 get a horizontal full screen of picture.

b. Adjust EXTERNAL H-WIDTH SW to get a picture that horizontal width is  $310 \pm 3\text{mm}$ .

10.PARALLELOGRAM adjustment: VR205

Use VESA-80K timing and adjustment VR205 to get a picture that right edge parallel with left edge.

11.PINCUSHION adjustment: VR203, VR204

Adjust VR203 and VR204 then make the picture top & bottom, right & left symmetrize.

12.White balance adjustment:

a. Pre adj. & brightness settings (Before adjusting, CRT must be degaussed.)

(1) Set VR601, 602, 603 and BRIT. VR on mechanical center.

(2) Operating on PS/2-400 mosaic pattern and adjust SCREEN VR to set the raster luminance at 1-2FL.

(3) Adjust VR601, 602, 603 (BIAS VR) to make C.I.E. coordinate  $X=0.281 \pm 0.01$ ,  $Y=0.311 \pm 0.01$ , by using color analyzer.

(4) Correct SCREEN VR which on FBT to make raster brightness disappear and the "1" row of color bar pattern (as below figure) visible obscurely.

(5) Change timing to PS/2-480 mosaic pattern and adjust VR604 to get a 40FL. (EXT CONTRAST MAX.) of mosaic which measurement by color analyzer.

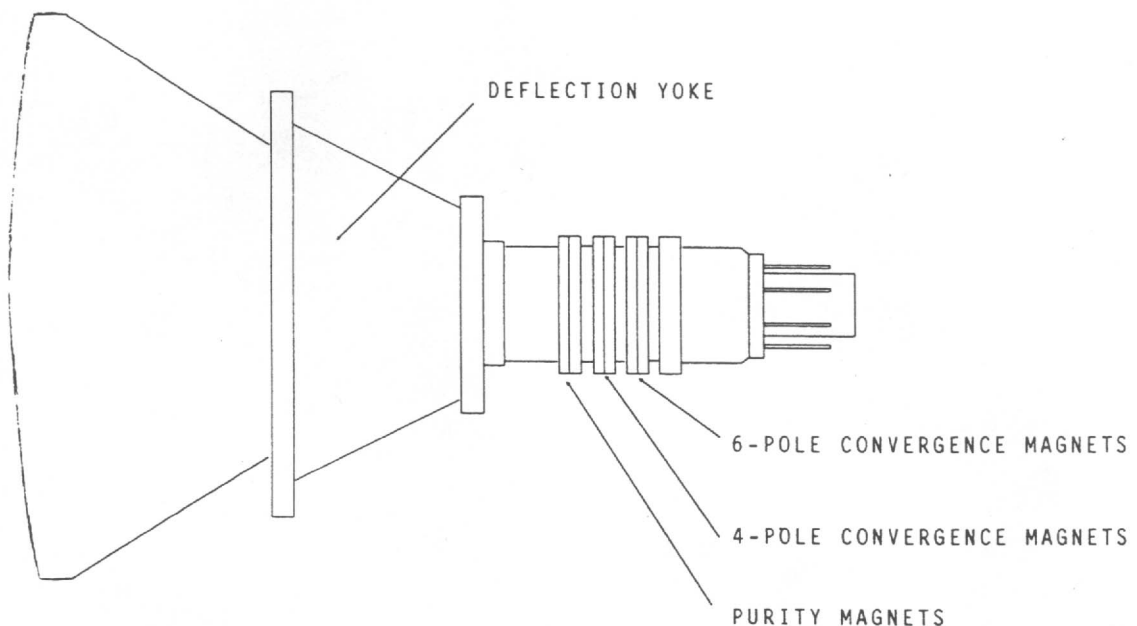
Brightness	R+B			B+G	R+G		
	BRIGHT BLUE	BRIGHT RED	BRIGHT PURPLE	GREEN	BLUE + GREEN		RED + YELLOW
15							7
14							6
13							5
12							4
11							3
10							2 → visible
9							1 → visible
8							0 obscurely

b. White balance fine regulation:

- (1) Receive PS/2-480 timing, full white square pattern.
- (2) Adjust BRIT. VR. to click, CONT. SW. to MAX.
- (3) Adjust EXT. COLOR SW. to make  $X=0.281 \pm 0.01$ ,  $y=0.311 \pm 0.01$ .
- (4) Change BRIT. VR. TO MAX and CONT. SW to 1 ~ FL, then adjust VR601,602,603 (BIAS VR) to get  $X=0.281 \pm 0.005$ ,  $Y=0.311 \pm 0.005$ .
- (5) Recheck step (2) ~ (4), if out of range then repeat step (2) ~ (4).

## 13.ADJUSTMENT FOR CONVERGENCE

- (a) Produce a magenta crosshatch on the display.
- (b) Adjust the focus for the best overall focus on the display.  
Also adjust the brightness to the desired condition.
- (c) Vertical red and blue lines are converged by varying the angle between the two tabs of the 4 pole magnets on the PCM assembly. (See diagram below)
- (d) Horizontal red and blue lines are converged by varying the two tabs together, keeping the angle between them constant.
- (e) Produce a white crosshatch pattern on the display.
- (f) Vertical green and magenta lines are covered by varying the angle between the two tabs of the 6-pole magnets.
- (g) Horizontal green and magenta lines are covered by varying the two tabs together, keeping the angle between them constant.

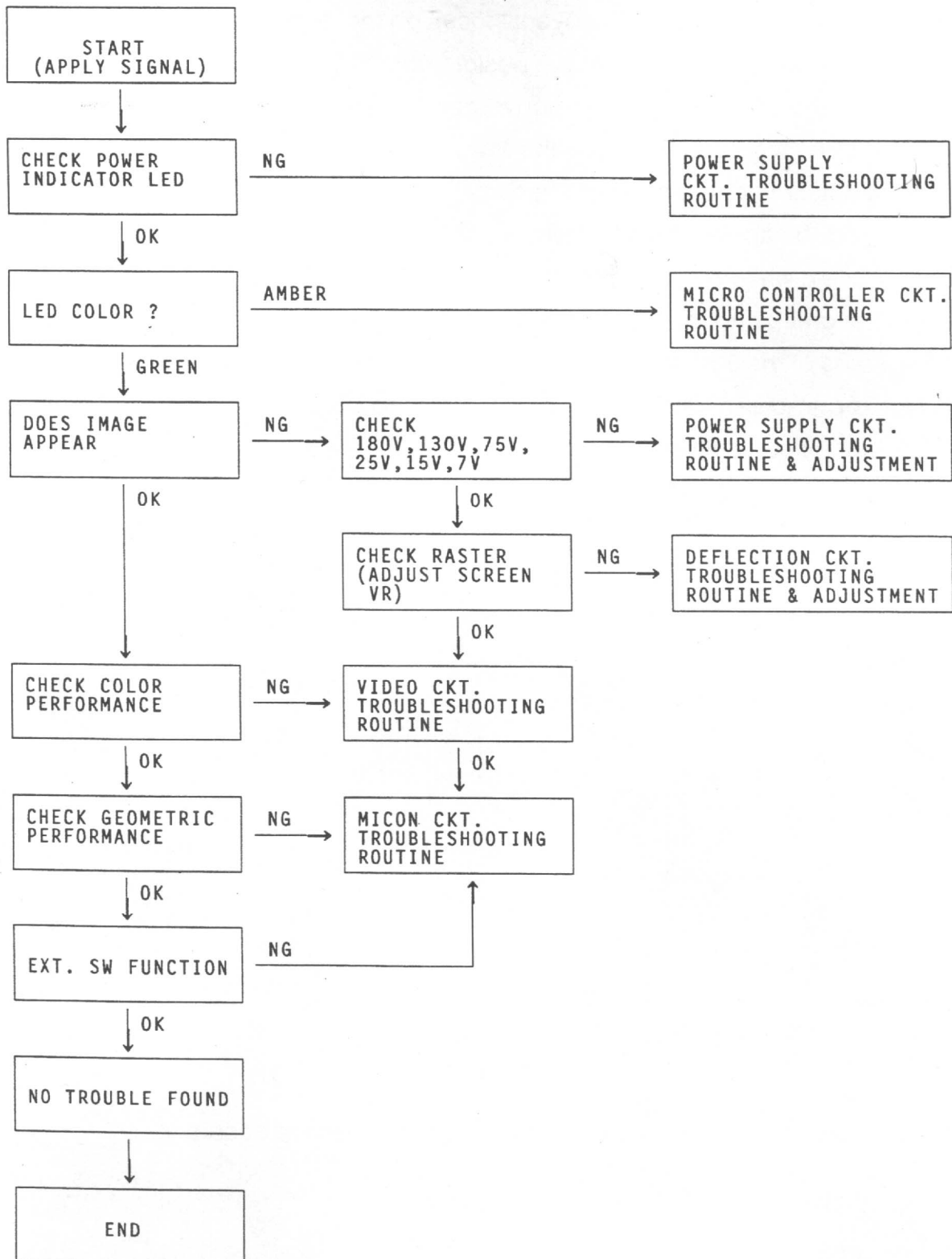


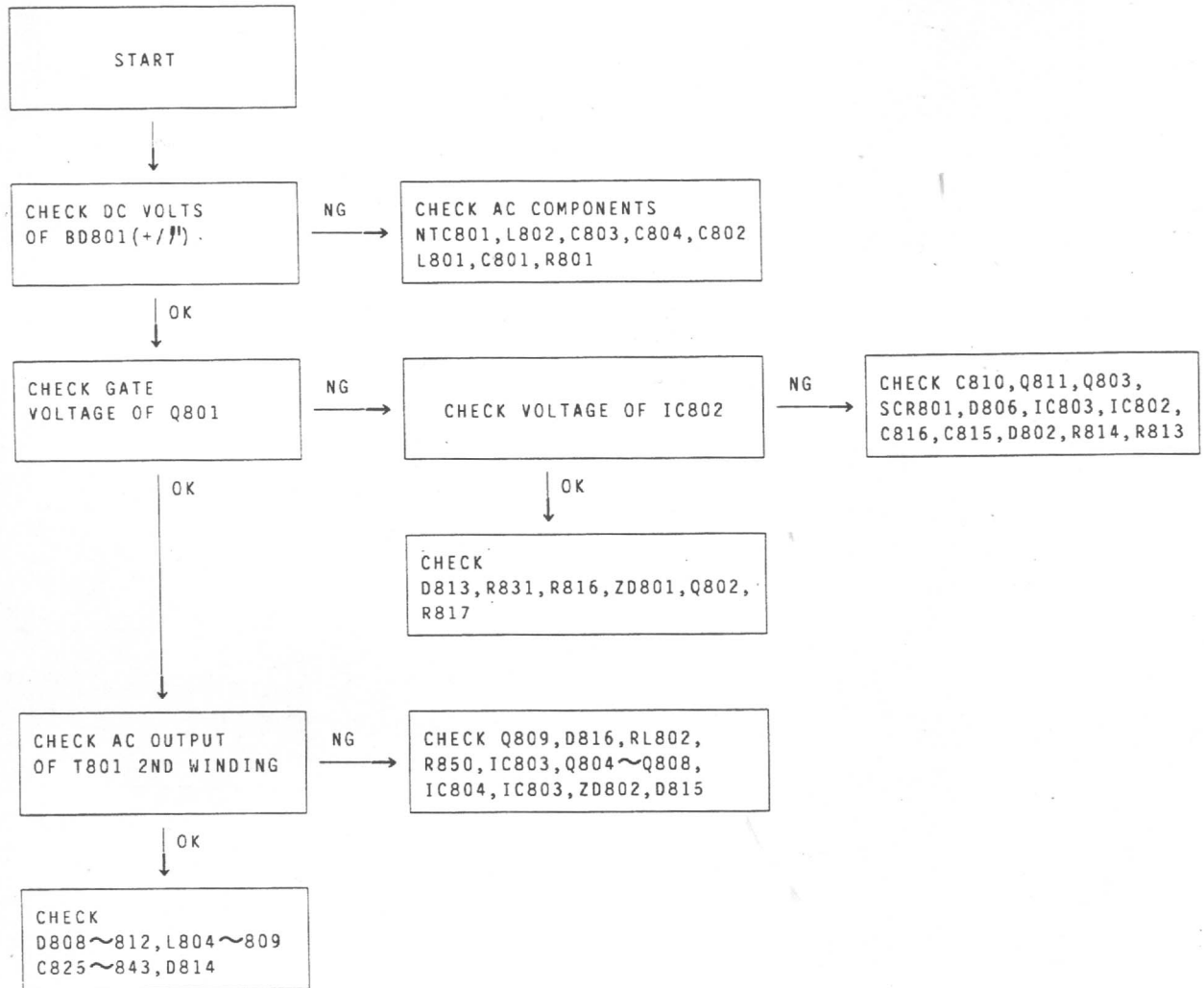
PCM: PURITY CONVERGENCE MAGNET

Note:1.Please don't adjust the purity magnets when service occurs.

## 6.0 TROUBLESHOOTING

### 6.1 MAIN TROUBLESHOOTING ROUTINE



6.2 POWER SUPPLY CIRCUIT TROUBLESHOOTING ROUTINE

VOLTAGE MEASURED RECORD

TEST CONDITIONS: TIMING : VGA-350

PATTERN: CROSS HATCH

STATUS : NORMAL

Unit: Volt

PART	Q801 (2SK955)			Q802 (C945)			Q803 (C945)		
AC LINE IN \ PIN	G	D	S	B	C	E	B	C	E
110V	4.1	147	0	0.23	14.9	0	0.7	0	0
220V	1.8	310	0	0.55	14.8	0	0.7	0	0

TEST CONDITIONS: AC LINE IN: 110V/60Hz, TIMING: VGA-350

PART	Q804 (A733)			Q805 (C945)			Q806 (A1018)		
STATUS \ PIN	B	C	E	B	C	E	B	C	E
NORMAL	14.8	2.5	14.8	0	14.7	0	2.1	2.5	2.8
STAND BY	14.8	2.5	14.9	0	14.7	0	2.1	2.5	2.75
SUSPAND	12.68	13.34	13.37	0.67	0	0	2.05	2.5	8.86
OFF	12.76	13.4	13.4	0.67	0	0	2.05	2.5	1.16



PART	Q807 (C1473A)			Q808 (C945)			Q809 (C945)		
PIN STATUS	B	C	E	B	C	E	B	C	E
NORMAL	0.63	0	0	0	0.63	0	0	14.8	0
STAND BY	0.61	0	0	0	0.64	0	0	14.9	0
SUSPAND	0	2.04	0	0.67	0	0	0.74	0	0
OFF	0	2.05	0	0.67	0	0	0.74	0	0

PART	Q810 (C945)			Q811 (C945)			IC804 (TL431)		
PIN STATUS	B	C	E	B	C	E	1(K)	2(R)	3(A)
NORMAL	0.69	0	0	0	0.89	0	2.5	0	11.5
STAND BY	0.68	0	0	0	0.84	0	2.49	0	11.5
SUSPAND	0.65	0	0	0	0.97	0	2.5	0	8.83
OFF	0.48	0.7	0	0.71	0	0	2.49	0	9.74

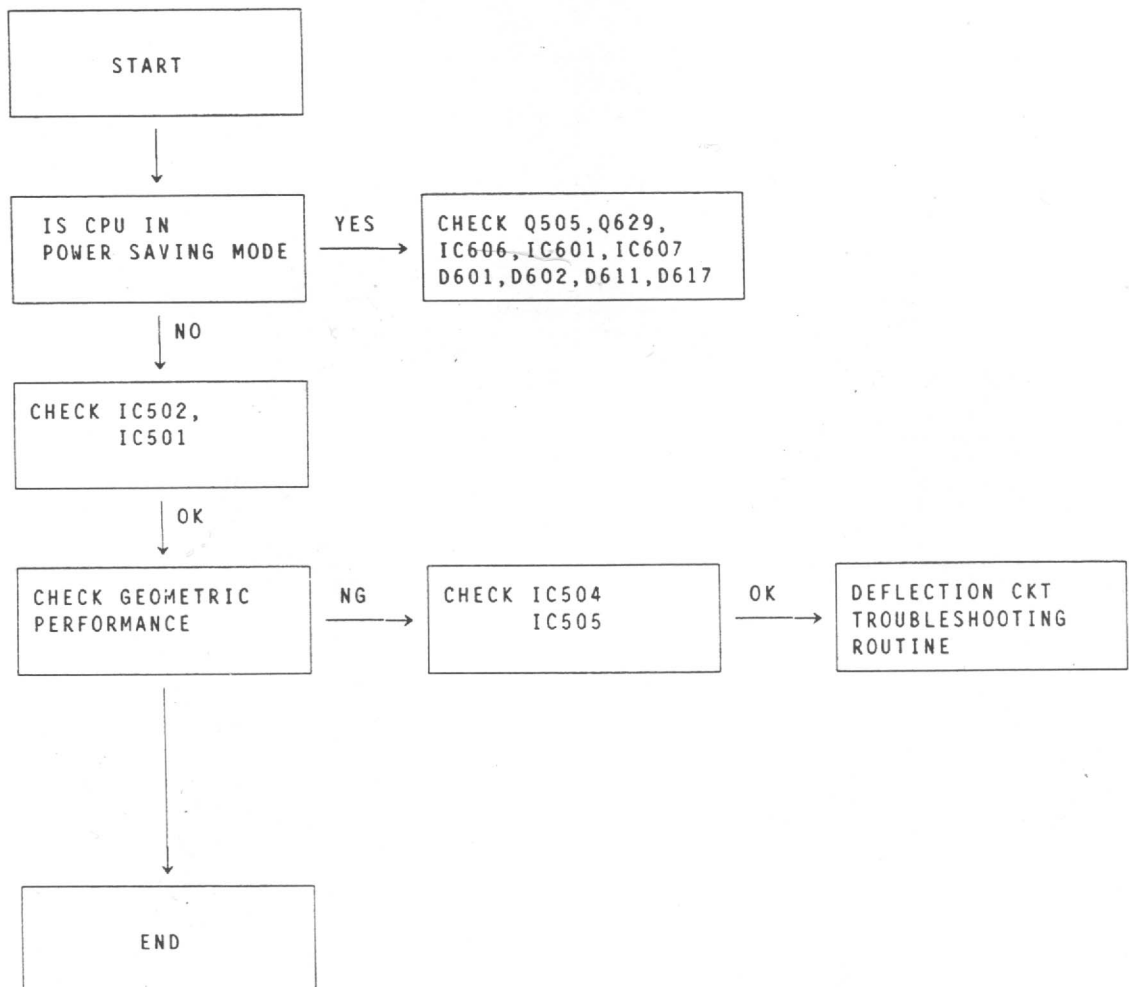
PART	IC802 (SG3842)							
AC LINE IN \ PIN	1	2	3	4	5	6	7	8
110V	3.14	2.5	0.11	2.01	0	4.3	15.4	5.0
220V	4.33	2.50	0.05	2.00	0	1.9	15.3	5.01

PART	IC803							
STATUS \ PIN	1	2	3	4	5	6		
NORMAL	12.6	11.5	0	1.79	4.97	2.76		
STAND BY	12.65	11.5	0	1.87	4.97	2.82		
SUSPAND	9.95	8.83	0	3.2	4.0	5.3		
OFF	9.7	8.6	0	3.3	5.0	4.4		

PART	P804							
PIN STATUS	1	2	3	4	5	6	7	8
NORMAL	0	24.37	0	14.95	180.60	74.76	0	7.33
STAND BY	0	24.37	0	14.95	180.60	74.76	0	7.33
SUSPAND	3.75	0.03	0	14.05	0.45	0.47	0	6.28
OFF	3.75	0.03	0	14.05	0.45	0.47	0	7.24

PART	SCR801		
PIN AC LINE IN	K	G	A
110V	2.29	0	140.9
220V	0.69	0	304.68

## 6.3

MICON CIRCUIT TROUBLESHOOTING ROUTING

## VOLTAGE MEASURED RECORD

TEST CONDITIONS: AC LINE IN : 110V / 60Hz

INPUT PLUG: D15

PATTERN : CROSS HATCH

STATUS : NORMAL

Unit: Volt

PART	Q501 (C945)			Q502 (C945)			Q503 (C945)			
	PIN TIMING	B	C	E	B	C	E	B	C	E
VGA-350		0.04	12.2	0	0.7	0.04	0	0.65	0.02	0.0
SVGAIII		0.04	12.2	0	0.7	0.04	0	0.65	0.02	0.0
8514A		0.04	12.2	0	0.7	0.04	0	0.65	0.02	0.0
VESA-56K		0.04	12.2	0	0.7	0.04	0	0.65	0.02	0.0
VESA-64K		0.04	12.2	0	0.7	0.04	0	0.65	0.02	0.0
VESA-80K		0.04	12.2	0	0.7	0.04	0	0.65	0.02	0.0
1280X1024INT		0.04	12.2	0	0.7	0.04	0	0.65	0.02	0.0
NEC-24.8K		0.04	12.2	0	0.7	0.04	0	0.65	0.02	0.0

PART	Q504 (A733)			Q505 (C945)			Q511 (C2001)			
	PIN TIMING	B	C	E	B	C	E	B	C	E
VGA-350		4.6	3.0	5.0	0.7	0.05	0	6.5	12.0	6.1
SVGAIII		4.6	3.0	5.0	0.7	0.05	0	6.5	12.0	6.1
8514A		4.6	3.0	5.0	0.7	0.05	0	6.5	12.0	6.1
VESA-56K		4.6	3.0	5.0	0.7	0.05	0	6.5	12.0	6.1
VESA-64K		4.6	3.0	5.0	0.7	0.05	0	6.5	12.0	6.1
VESA-80K		4.6	3.0	5.0	0.7	0.05	0	6.5	12.0	6.1
1280X1024INT		4.6	3.0	5.0	0.7	0.05	0	6.5	12.0	6.1
NEC-24.8K		4.6	3.0	5.0	0.7	0.05	0	6.5	12.0	6.1

PART	Q512 (C2001)			Q515 (A733)			Q516 (C945)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		5.4	12.0	5.8	3.5	0.08	2.1	2.8	2.1	2.0
SVGAIII		5.4	12.0	5.7	3.5	0.08	2.1	2.8	2.1	2.0
8514A		5.4	12.0	5.7	3.5	0.08	2.1	2.8	2.1	2.0
VESA-56K		5.4	12.0	5.7	3.5	0.08	2.1	2.8	2.1	2.0
VESA-64K		5.3	12.0	5.7	3.5	0.08	2.1	2.8	2.1	2.0
VESA-80K		5.3	12.0	5.7	3.5	0.08	2.1	2.8	2.1	2.0
1280X1024INT		5.3	12.0	5.7	3.5	0.08	2.1	2.8	2.1	2.0
NEC-24.8K		5.3	12.0	5.7	3.5	0.08	2.1	2.8	2.1	2.0

PART	Q517 (A952)			Q518 (A952)			Q620 (C1906)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		5.4	0.0	5.8	6.5	0.0	6.1	1.3	4.2	0.7
SVGAIII		5.4	0.0	5.7	6.5	0.0	6.1	1.3	4.2	0.7
8514A		5.4	0.0	5.7	6.5	0.0	6.1	1.3	4.2	0.7
VESA-56K		5.4	0.0	5.7	6.5	0.0	6.1	1.3	4.2	0.7
VESA-64K		5.3	0.0	5.7	6.5	0.0	6.1	1.3	4.2	0.7
VESA-80K		5.3	0.0	5.7	6.5	0.0	6.1	1.3	4.2	0.7
1280X1024INT		5.3	0.0	5.7	6.5	0.0	6.1	1.3	4.2	0.7
NEC-24.8K		5.3	0.0	5.7	6.5	0.0	6.1	1.3	4.2	0.7



PART	Q628 (C945)			Q699 (C1906)		
PIN TIMING	B	C	E	B	C	E
VGA-350	0.3	4.1	0.0	1.5	2.9	0.7
SVGA III	0.3	4.0	0.0	1.5	2.9	0.8
8514A	0.3	4.0	0.0	1.5	2.9	0.8
VESA-56K	0.3	4.1	0.0	1.5	2.9	0.8
VESA-64K	0.3	4.3	0.0	1.5	2.9	0.8
VESA-80K	0.3	4.1	0.0	1.5	2.9	0.8
1280X1024INT	0.3	3.9	0.0	1.5	2.9	0.8
NEC-24.8K	0.3	4.2	0.0	1.5	2.9	0.8

PART	IC501 (93C66 EEPROM)							
PIN TIMING	1	2	3	4	5	6	7	8
VGA-350	0.02	5.0	0.02	5.0	0	5.0	5.0	5.0
SVGA III	0.02	5.0	0.02	5.0	0	5.0	5.0	5.0
8514A	0.02	5.0	0.02	5.0	0	5.0	5.0	5.0
VESA-56K	0.02	5.0	0.02	5.0	0	5.0	5.0	5.0
VESA-64K	0.02	5.0	0.02	5.0	0	5.0	5.0	5.0
VESA-80K	0.02	5.0	0.02	5.0	0	5.0	5.0	5.0
1280X1024INT	0.02	5.0	0.02	5.0	0	5.0	5.0	5.0
NEC-24.8K	0.02	5.0	0.02	5.0	0	5.0	5.0	5.0

PART	IC502 (80C51)									
	PIN	1	2	3	4	5	6	7	8	9
VGA-350	5.0	2.6	3.6	4.2	2.6	5.0	5.0	5.0	0.02	5.0
8514A	5.0	2.6	3.6	4.2	2.6	5.0	5.0	5.0	0.02	5.0
VESA-80K	5.0	2.6	3.6	4.2	2.6	5.0	5.0	5.0	0.03	5.0
1280X1024INT	5.0	2.6	4.0	4.2	2.6	5.0	5.0	5.0	0.03	5.0
NEC-24.8K	5.0	2.6	3.6	4.2	2.6	5.0	5.0	5.0	0.02	5.0

PART	IC502 (80C51)									
	PIN	11	12	13	14	15	16	17	18	19
VGA-350	5.0	0.41	4.3	4.1	5.0	0.82	5.0	2.4	2.1	0
8514A	5.0	0.43	4.4	4.0	5.0	5.0	5.0	2.4	2.1	0
VESA-80K	5.0	0.4	4.6	4.1	5.0	5.0	5.0	2.4	2.1	0
1280X1024INT	5.0	0.43	4.6	3.9	5.0	0.8	0.9	2.4	2.2	0
NEC-24.8K	5.0	0.41	4.3	4.1	5.0	0.8	0.8	2.4	2.2	0

PART	IC502 (80C51)									
	PIN	21	22	23	24	25	26	27	28	29
VGA-350	2.5	4.0	1.8	1.8	2.7	5.0	5.0	5.0	5.0	1.7
8514A	2.5	4.0	1.8	1.8	2.7	5.0	5.0	5.0	5.0	1.7
VESA-80K	2.5	4.0	1.8	1.8	2.7	5.0	5.0	5.0	5.0	1.7
1280X1024INT	2.5	4.0	1.8	1.8	2.7	5.0	5.0	5.0	5.0	1.7
NEC-24.8K	2.5	4.0	1.8	1.8	2.7	5.0	5.0	5.0	5.0	1.7

PART	IC502 (80C51)									
PIN \ TIMING	3 1	3 2	3 3	3 4	3 5	3 6	3 7	3 8	3 9	4 0
VGA-350	5.0	2.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
8514A	5.0	2.2	0.02	0.02	5.0	5.0	0.02	5.0	5.0	5.0
VESA-80K	5.0	2.2	0.02	0.02	5.0	5.0	0.02	5.0	5.0	5.0
1280X1024INT	5.0	2.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
NEC-24.8K	5.0	2.2	0.02	0.02	5.0	5.0	0.02	5.0	5.0	5.0

PART	IC503 (MC14094)							
PIN \ TIMING	1	2	3	4	5	6	7	8
VGA-350	0.02	0.02	5.0	0.1	0.1	0.09	0	0
8514A	0.02	0.02	5.0	0.1	0.1	0.09	0	0
VESA-80K	0.02	0.02	5.0	0.09	0.1	0.09	0	0
1280X1024INT	0.02	0.02	5.0	0.09	5.0	0.09	0	0
NEC-24.8K	0.02	0.02	5.0	0.09	0.1	0.09	0	0

PART	IC503 (MC14094)							
PIN \ TIMING	9	1 0	1 1	1 2	1 3	1 4	1 5	1 6
VGA-350	5.0	5.0	3.5	3.6	0.1	0.1	5.0	5.0
8514A	5.0	0.0	3.5	3.6	0.1	0.1	5.0	5.0
VESA-80K	5.0	0.0	3.5	3.6	0.1	0.1	5.0	5.0
1280X1024INT	5.0	0.0	3.5	3.6	0.1	0.1	5.0	5.0
NEC-24.8K	5.0	0.0	3.5	3.6	0.1	0.1	5.0	5.0

PART	IC504 (M62359)									
	PIN	1	2	3	4	5	6	7	8	9
VGA-350		5.0	5.0	0.02	6.05	6.05	6.05	6.93	0	0
SVGAIII		5.0	5.0	0.02	6.05	6.05	6.05	5.85	0	0
8514A		5.0	5.0	0.02	6.05	6.05	6.05	5.25	0	0
VESA-56K		5.0	5.0	0.02	6.05	6.05	6.05	5.57	0	0
VESA-64K		5.0	5.0	0.02	6.05	6.05	6.05	5.76	0	0
VESA-80K		5.0	5.0	0.02	6.05	6.05	6.05	5.95	0	0
1280X1024INT		5.0	5.0	0.02	6.05	6.05	6.05	5.85	0	0
NEC-24.8K		5.0	5.0	0.02	6.05	6.05	6.05	6.1	0	0

PART	IC504 (M62359)									
	PIN	10	11	12	13	14	15	16	17	18
VGA-350		5.0	12.2	2.8	6.1	6.5	9.7	—	5.0	5.0
SVGAIII		5.0	12.3	4.8	6.1	4.2	7.0	—	5.0	5.0
8514A		5.0	12.3	2.8	7.2	6.2	6.6	—	5.0	5.0
VESA-56K		5.0	12.2	3.4	5.8	5.8	5.9	—	5.0	5.0
VESA-64K		5.0	12.3	5.5	5.2	5.7	5.3	—	5.0	5.0
VESA-80K		5.0	12.3	3.6	5.9	5.7	5.9	—	5.0	5.0
1280X1024INT		5.0	12.2	4.2	7.4	4.2	10.5	—	5.0	5.0
NEC-24.8K		5.0	12.2	2.9	5.7	6.07	7.4	—	5.0	5.0

PART	IC505 (M62359)									
	PIN	1	2	3	4	5	6	7	8	9
VGA-350		5.0	5.0	0.02	11.9	6.06	6.05	6.06	0	0
SVGAIII		5.0	5.0	0.02	11.9	6.06	6.05	6.06	0	0
8514A		5.0	5.0	0.02	11.9	6.06	6.05	6.06	0	0
VESA-56K		5.0	5.0	0.02	11.9	6.06	6.05	6.06	0	0
VESA-64K		5.0	5.0	0.02	11.9	6.06	6.05	6.06	0	0
VESA-80K		5.0	5.0	0.02	11.9	6.06	6.05	6.06	0	0
1280X1024INT		5.0	5.0	0.02	11.9	6.06	6.05	6.06	0	0
NEC-24.8K		5.0	5.0	0.02	11.9	6.06	6.05	6.06	0	0

PART	IC505 (M62359)									
	PIN	10	11	12	13	14	15	16	17	18
VGA-350		5.0	12.2	5.7	6.5	10.0	0.38	—	5.0	5.0
SVGAIII		5.0	12.3	0.09	6.5	10.0	3.7	—	5.0	5.0
8514A		5.0	12.3	5.9	6.5	10.0	1.3	—	5.0	5.0
VESA-56K		5.0	12.2	4.8	6.5	10.0	5.4	—	5.0	5.0
VESA-64K		5.0	12.3	4.4	6.5	10.1	6.9	—	5.0	5.0
VESA-80K		5.0	12.3	4.2	6.5	9.0	10.1	—	5.0	5.0
1280X1024INT		5.0	12.2	0.09	6.5	10.0	4.3	—	5.0	5.0
NEC-24.8K		5.0	12.2	5.8	6.5	10.0	0.27	—	5.0	5.0

PART	IC506 (LM358)								
	PIN	1	2	3	4	5	6	7	8
VGA-350		6.5	6.5	6.5	0	6.0	5.9	5.4	12.0
SVGAIII		6.5	6.5	6.5	0	6.0	5.9	5.4	12.0
8514A		6.5	6.5	6.5	0	6.0	5.9	5.4	12.0
VESA-56K		6.5	6.5	6.5	0	6.0	5.9	5.4	12.0
VESA-64K		6.5	6.5	6.5	0	6.0	5.9	5.3	12.0
VESA-80K		6.5	6.5	6.5	0	6.0	5.9	5.3	12.0
1280X1024INT		6.5	6.5	6.5	0	6.0	5.9	5.4	12.0
NEC-24.8K		6.5	6.5	6.5	0	6.0	5.9	5.4	12.0

PART	IC601 (74LS38)							
	PIN	1	2	3	4	5	6	7
D15		0.03	0.08	4.43	2.17	0.58	4.43	0.0
BNC		2.83	0.58	4.44	0.07	0.11	4.44	0.0

PART	IC601 (74LS38)							
	PIN	8	9	10	11	12	13	14
D15		0.31	2.17	4.68	0.31	0.03	0.08	5.0
BNC		0.31	0.07	0.11	0.31	2.83	4.68	5.0

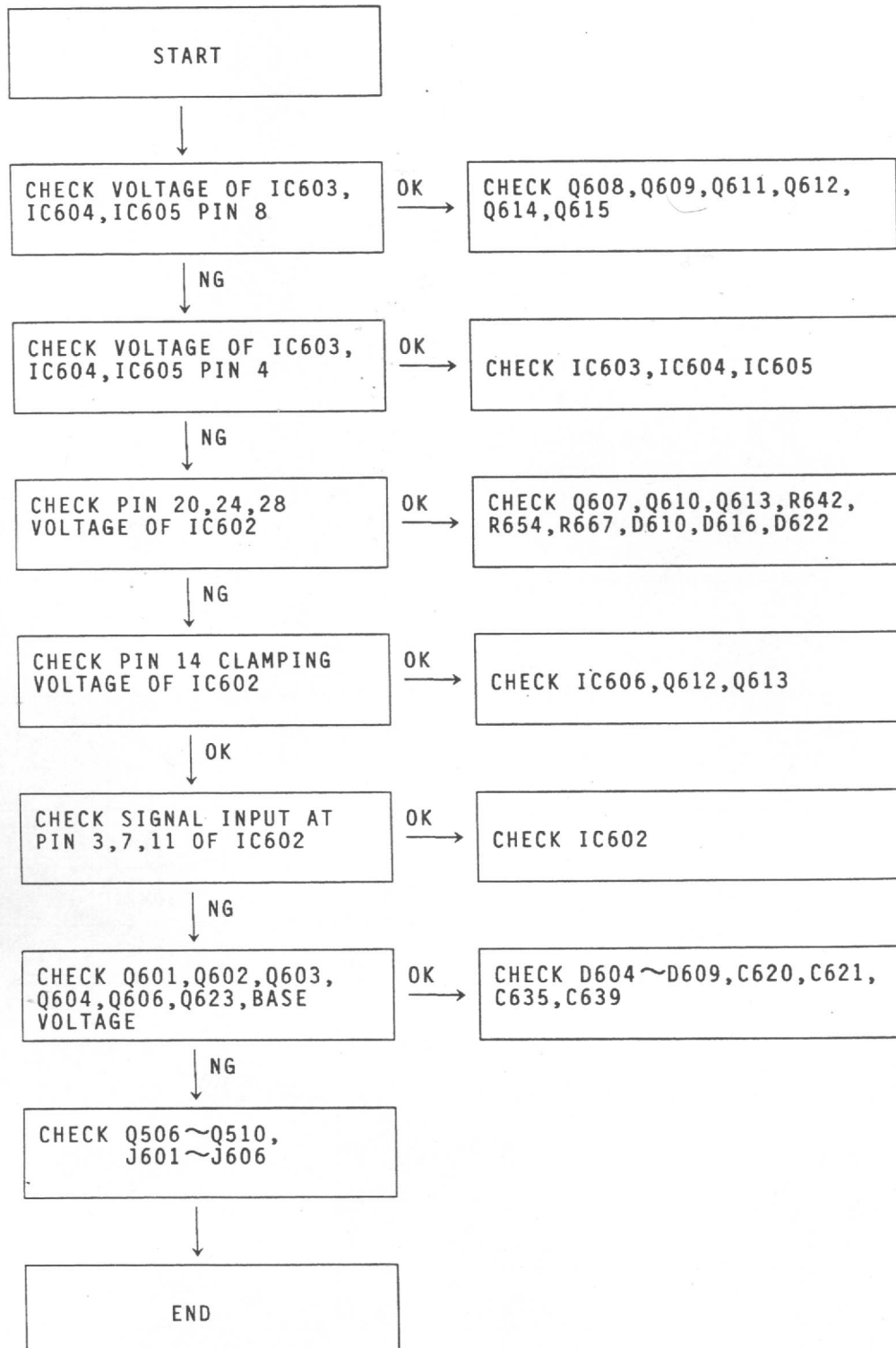


PART	IC606 (CXA1616)								
	PIN	1	2	3	4	5	6	7	8
VGA-350	TIMING	0.3	3.6	5.9	7.8	0.5	5.2	4.7	—
SVGAIII		4.8	0.05	5.9	7.7	0.5	5.25	4.7	—
8514A		4.8	0.06	6.0	8.0	0.6	5.3	4.7	—
VESA-56K		0.3	3.6	5.9	4.7	3.3	5.2	4.7	—
VESA-64K		4.8	0.04	5.8	6.4	0.3	5.2	4.7	—
VESA-80K		4.8	0.03	5.9	7.0	0.4	5.2	4.7	—
1280X1024INT		0.33	3.56	5.95	4.88	3.17	5.23	4.61	—
NEC-24.8K		0.4	3.6	5.6	4.57	3.4	5.2	4.7	—

PART	IC606 (CXA1616)								
	PIN	9	10	11	12	13	14	15	16
VGA-350	TIMING	10.7	0.18	0	4.96	—	—	—	4.97
SVGAIII		10.7	0.2	0	5.0	—	—	—	5.0
8514A		10.7	0.2	0	5.0	—	—	—	5.0
VESA-56K		10.7	0.2	0	5.0	—	—	—	0.8
VESA-64K		10.7	0.2	0	5.0	—	—	—	5.0
VESA-80K		10.7	0.2	0	5.0	—	—	—	5.0
1280X1024INT		10.64	0.21	0	4.95	—	—	—	0.83
NEC-24.8K		10.7	0.18	0	4.91				0.8

PART	IC606 (CXA1616)						
	PIN	17	18	19	20	21	22
TIMING							
VGA-350	0.8	0.9	0.01	0.01	0.39	12.22	
SVGAIII	5.0	0.9	2.7	2.7	0.4	12.3	
8514A	5.0	1.0	2.8	2.8	0.4	12.3	
VESA-56K	0.8	0.8	2.7	2.7	0.4	12.2	
VESA-64K	5.0	0.7	2.6	2.6	0.4	12.3	
VESA-80K	5.0	0.7	2.6	2.6	0.4	12.3	
1280X1024INT	0.8	0.96	2.77	2.77	0.41	12.19	
NEC-24.8K	0.8	0.7	2.5	2.5	0.4	12.3	

## 6.4

VIDEO CIRCUIT TROUBLESHOOTING ROUTINE

VOLTAGE MEASURED RECORD

TEST CONDITIONS: TIMING : VGA-350

PATTERN: CROSS HATCH

STATUS : NORMAL

Unit: Volt

PART	Q505 (C945)			Q506 (C945)			Q507 (C945)		
INPUT CONNECTOR \ PIN	B	C	E	B	C	E	B	C	E
D15	0.7	0.05	0.0	0.7	0.03	0.0	0.67	0.03	0.0
BNC	0.7	0.05	0.0	0.07	2.83	0.0	0.07	12.1	0.0

PART	Q508 (C945)			Q509 (C945)			Q510 (C945)		
INPUT CONNECTOR \ PIN	B	C	E	B	C	E	B	C	E
D15	0.03	12.2	0.0	0.03	12.1	0.0	12.1	12.2	0.0
BNC	12.1	12.2	11.5	0.7	0.02	0.0	0.03	12.2	0.0

PART	Q601,Q603,Q606 (C945)			Q602,Q604,Q623 (C945)					
INPUT CONNECTOR \ PIN	B	C	E	B	C	E			
D15	0.0	12.2	0.12	4.7	12.2	5.5			
BNC	5.4	12.2	4.6	0.0	12.2	0.2			

TEST CONDITIONS: TIMING : VGA-350  
 SIGNAL INPUT PLUG: D15  
 PATTERN : CROSS HATCH

PART	Q605 (C945)			Q618 (B562)			Q619 (C945)		
	PIN STATUS	B	C	E	B	C	E	B	C
NORMAL	0.01	10.7	0.0	6.4	7.0	7.2	0.85	0.16	0.0
STAND BY	0.72	0.04	0.0	6.3	7.0	7.2	0.85	0.16	0.0
SUSPAND	0.72	0.5	0.0	5.1	5.8	6.0	0.84	0.13	0

PART	Q625 (C945)			IC607 (LM317)					
	PIN STATUS	B	C	E	B	C	E		
NORMAL	0.75	0.01	0.0	10.7	12	14.7			
STAND BY	0.11	0.72	0.0	0.01	1.5	14.9			
SUSPAND	0.11	0.72	0.0	0.01	1.7	13.4			

TEST CONDITIONS: SIGNAL INPUT PLUG: D15  
 PATTERN : CROSS HATCH  
 STATUS : NORMAL

PART	Q607, Q610, Q613 (C1906)			Q608, Q611, Q614 (A1018)			Q609, Q612, Q615 (C1473)		
	PIN TIMING	B	C	E	B	C	E	B	C
VGA-350	2.6	12.0	1.9	89.0	0	89.0	4.3	70.2	3.7
SVGAIII	2.5	12.0	1.9	89.0	0	89.0	4.3	70.2	3.7
8514A	2.5	12.0	1.9	89.0	0	89.0	4.3	70.2	3.7
VESA-56K	2.5	12.0	1.8	89.0	0	88.4	4.3	70.2	3.7
VESA-64K	2.5	12.0	1.9	89.0	0	88.2	4.3	70.2	3.7
VESA-80K	2.5	12.0	1.8	89.0	0	87.8	4.3	70.2	3.7
1280X1024INT	2.5	12.0	1.8	89.1	0	88.6	4.3	70.2	3.7
NEC-24.8K	2.5	12.0	1.9	89.0	0	89.0	4.3	70.2	3.7

PART	Q616 (A733)			Q617 (C945)			Q621 (C945)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		0.19	0	0.1	0.19	12.0	0.10	0.02	12.0	0
SVGA III		0.21	0	0.14	0.21	12.0	0.14	0.03	11.8	0
8514A		0.20	0	0.10	0.20	12.0	0.10	0.03	11.9	0
VESA-56K		0.22	0	0.17	0.22	12.0	0.17	0.04	11.7	0
VESA-64K		0.23	0	0.19	0.23	12.0	0.19	0.04	11.7	0
VESA-80K		0.25	0	0.24	0.25	12.0	0.24	0.05	11.6	0
1280X1024INT		0.22	0	0.15	0.22	12.0	0.15	0.04	11.7	0
NEC-24.8K										0

TEST CONDITIONS: TIMING : VGA-350

STATUS : D15

PATTERN: CROSS HATCH

PART	IC507 (LM393)								
	PIN	1	2	3	4	5	6	7	8
INPUT CONNECTOR									
D15		5.0	0.0	0.05	0	0.05	0.04	4.45	5.0
BNC		4.4	0.04	0.05	0	0.05	0.35	1.4	5.0

PART	IC509							
	PIN	1	2	3	4	5	6	7
INPUT CONNECTOR								
D15		4.2	5.0	5.0	0.0	0.05	0.04	0.05
BNC		5.0	4.3	5.0	0.04	0.05	0.0	0.05



PART	IC509						
PIN INPUT CONNECTOR	8	9	10	11	12	13	14
D15	0.04	0.05	0	0.05	0	5.0	4.2
BNC	0.0	0.05	0.04	0.05	0	4.2	5.0

PART	IC602 (M52307)								
PIN TIMING	1	2	3	4	5	6	7	8	9
VGA-350	12.0	2.7	6.0	0	12.0	2.7	6.1	0	12.0
SVGA III	12.0	2.7	6.0	0	12.0	2.7	6.1	0	12.0
8514A	12.0	2.7	6.0	0	12.0	2.7	6.1	0	12.0
VESA-56K	12.0	2.7	6.0	0	12.0	2.7	6.1	0	12.0
VESA-64K	12.0	2.7	6.0	0	12.0	2.7	6.1	0	12.0
VESA-80K	12.0	2.7	6.0	0	12.0	2.7	6.1	0	12.0
1280X1024INT	12.0	2.7	6.0	0	12.0	2.7	6.1	0	12.0
NEC-24.8K	12.0	2.7	6.0	0	12.0	2.7	6.1	0	12.0

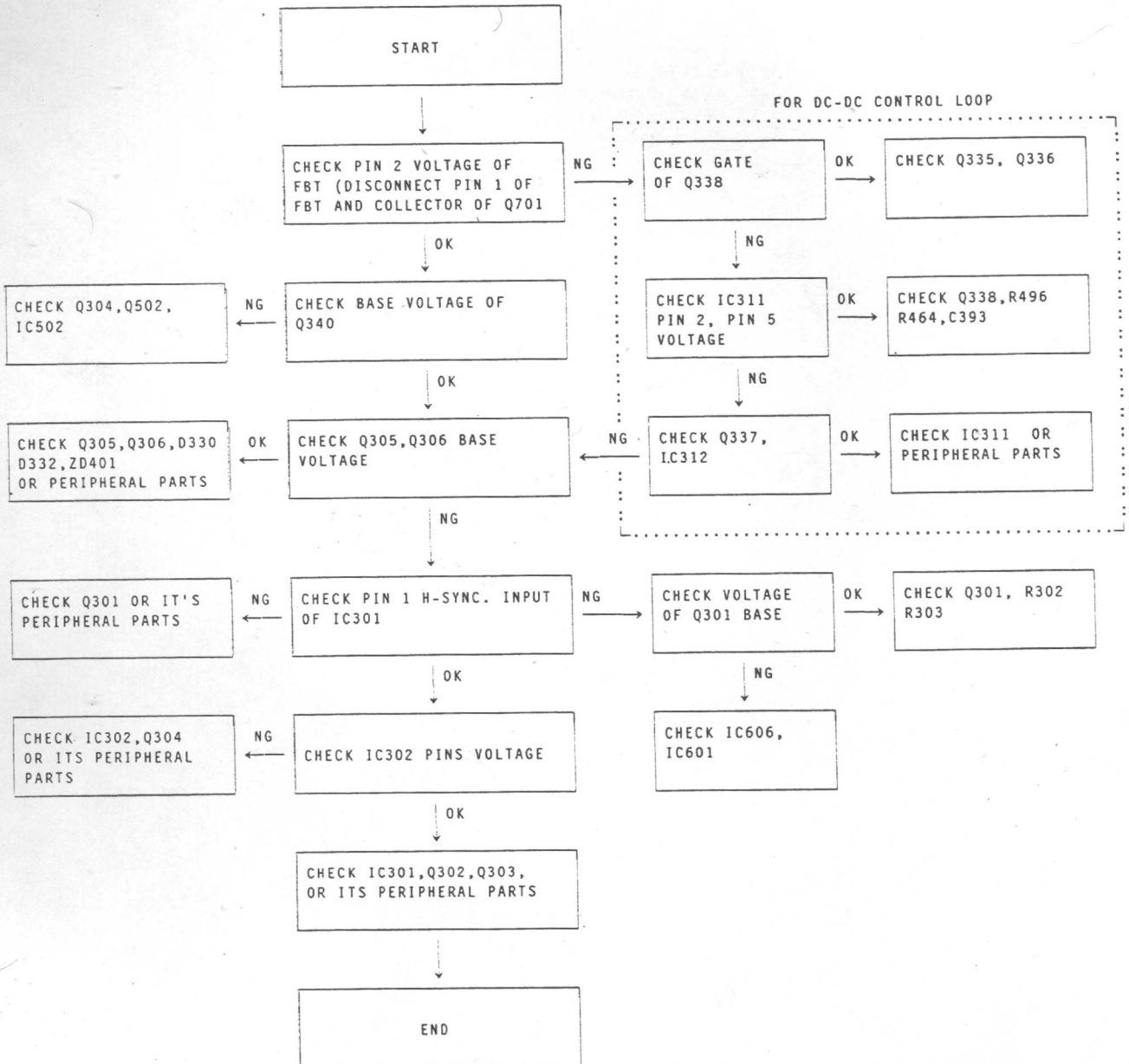
PART	IC602 (M52307)								
	PIN	1 0	1 1	1 2	1 3	1 4	1 5	1 6	1 7
VGA-350	2.7	6.0	0	7.3	0.18	4.6	12.0	0	0
SVGAIII	2.7	6.0	0	7.3	0.20	4.6	12.0	0	0
8514A	2.7	6.0	0	7.3	0.19	4.6	12.0	0	0
VESA-56K	2.7	6.0	0	7.4	0.22	4.6	12.0	0	0
VESA-64K	2.7	6.0	0	7.3	0.22	4.6	12.0	0	0
VESA-80K	2.7	6.0	0	7.3	0.24	4.6	12.0	0	0
1280X1024INT	2.7	6.0	0	7.3	0.21	4.6	12.0	0	0
NEC-24.8K	2.7	6.0	0	7.3	0.17	4.6	12.0	0	0

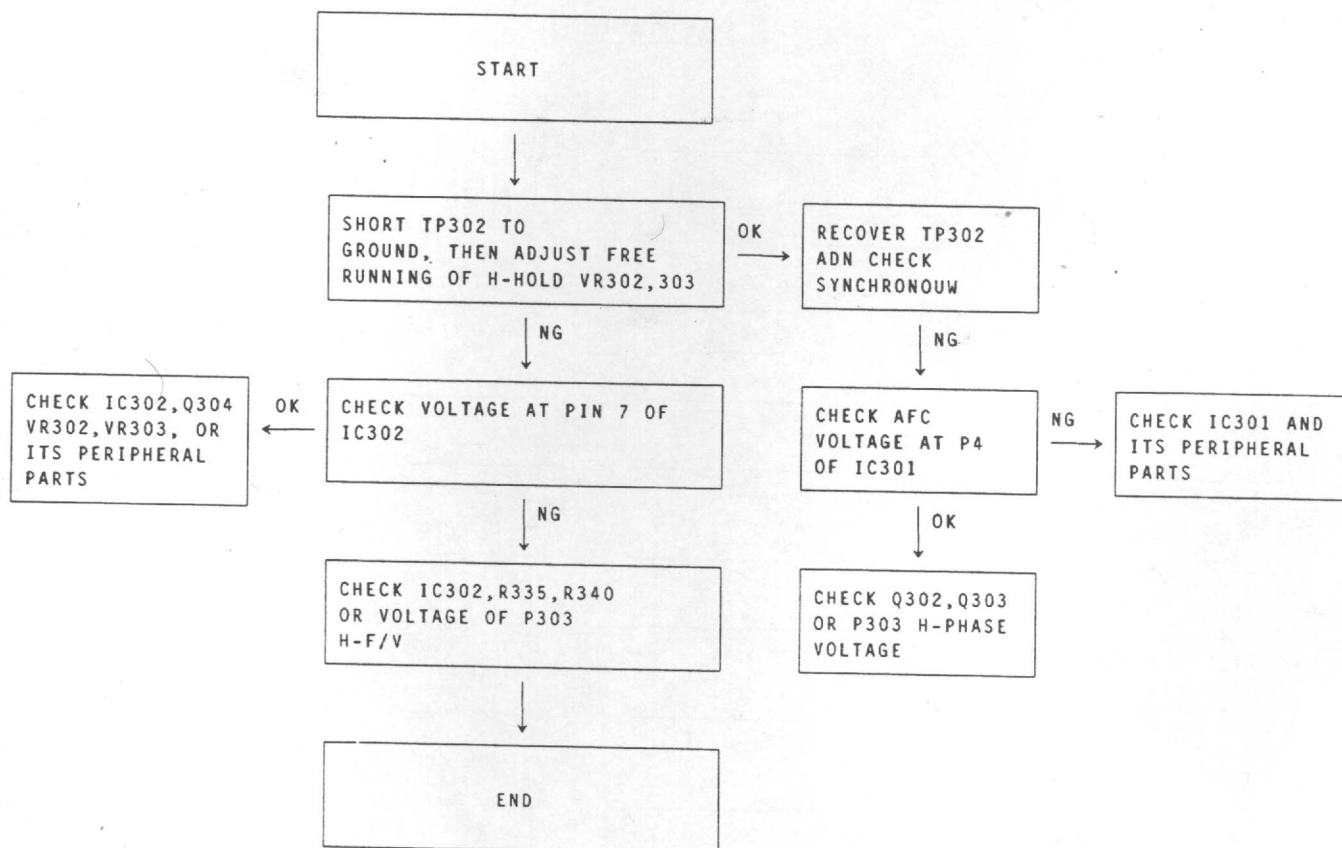
PART	IC602 (M52307)									
	PIN	1 9	2 0	2 1	2 2	2 3	2 4	2 5	2 6	2 7
VGA-350	4.3	2.6	0	0	4.3	2.6	0	0	4.3	2.6
SVGAIII	4.3	2.6	0	0	4.3	2.6	0	0	4.3	2.6
8514A	4.3	2.6	0	0	4.3	2.6	0	0	4.3	2.6
VESA-56K	4.3	2.6	0	0	4.3	2.6	0	0	4.3	2.5
VESA-64K	4.3	2.5	0	0	4.3	2.5	0	0	4.3	2.5
VESA-80K	4.3	2.5	0	0	4.3	2.5	0	0	4.3	2.5
1280X1024INT	4.3	2.5	0	0	4.3	2.5	0	0	4.3	2.5
NEC-24.8K	4.3	2.6	0	0	4.3	2.6	0	0	4.3	2.6

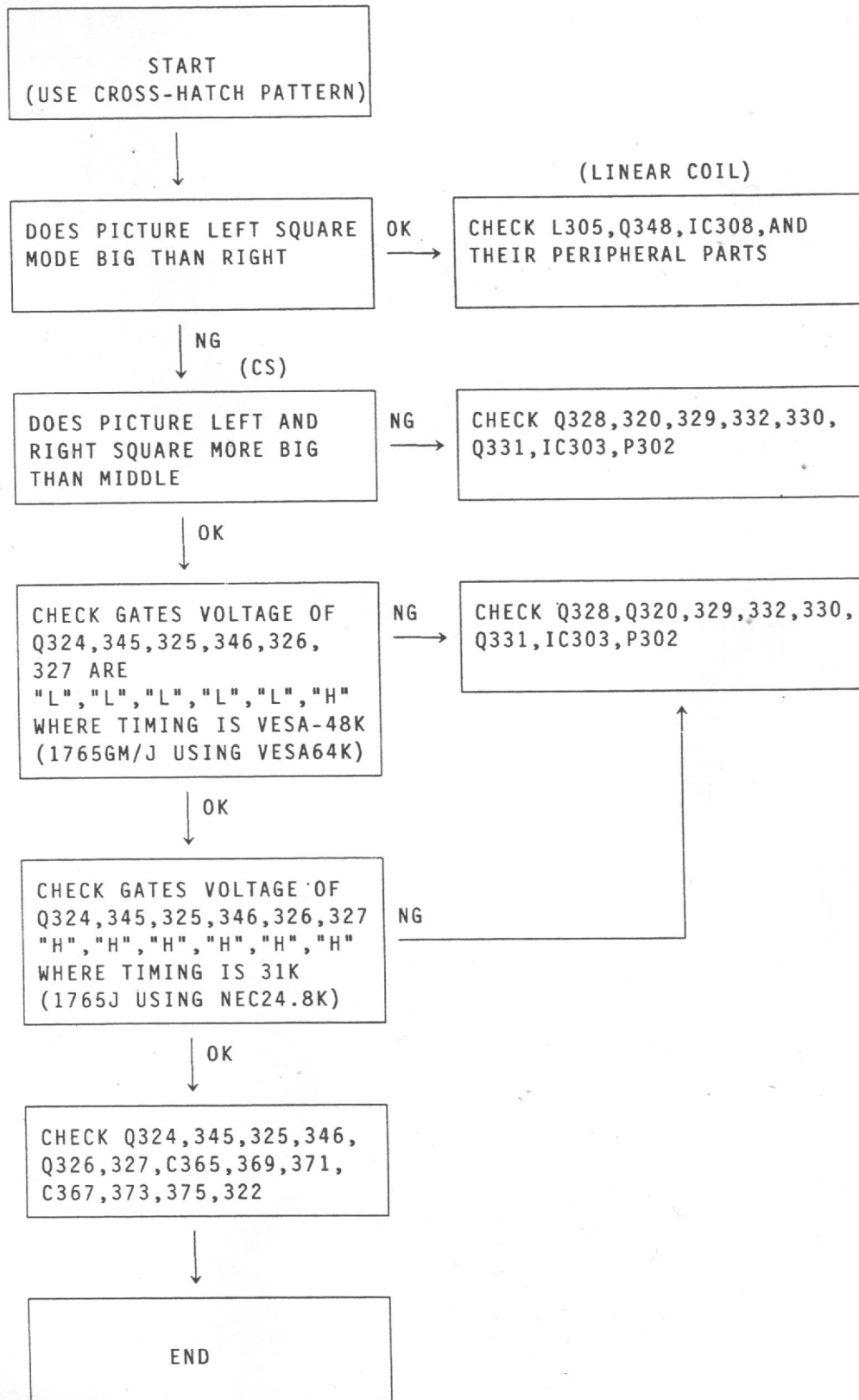
## 6.5 DEFLECTION CIRCUIT

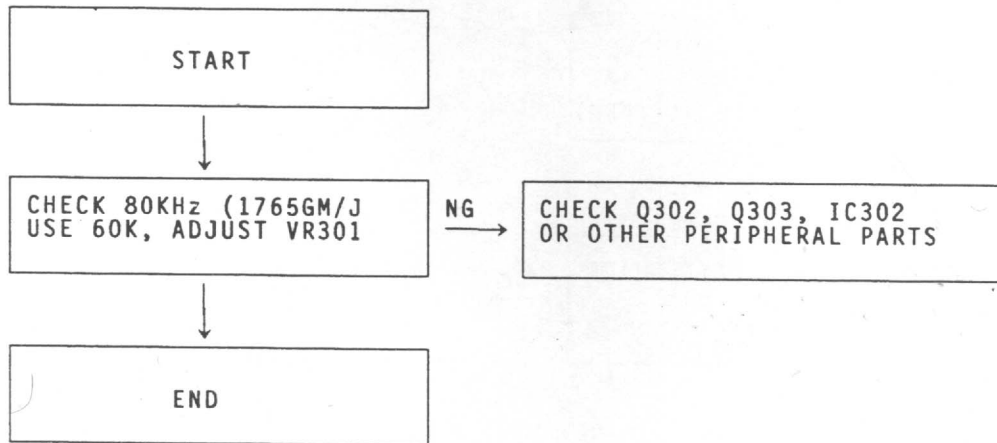
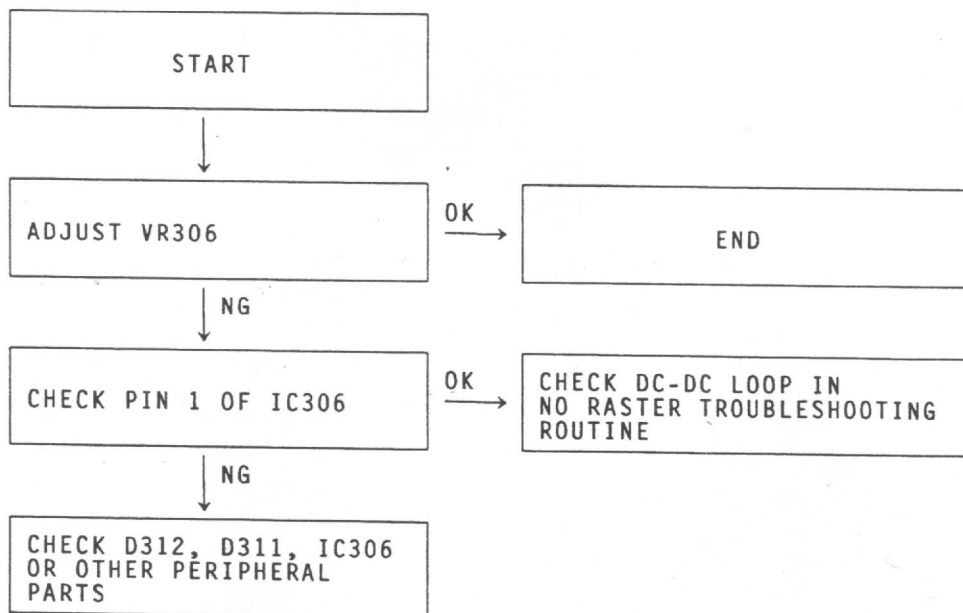
### 6.5.1 Horizontal Deflection Circuit

#### No Raster

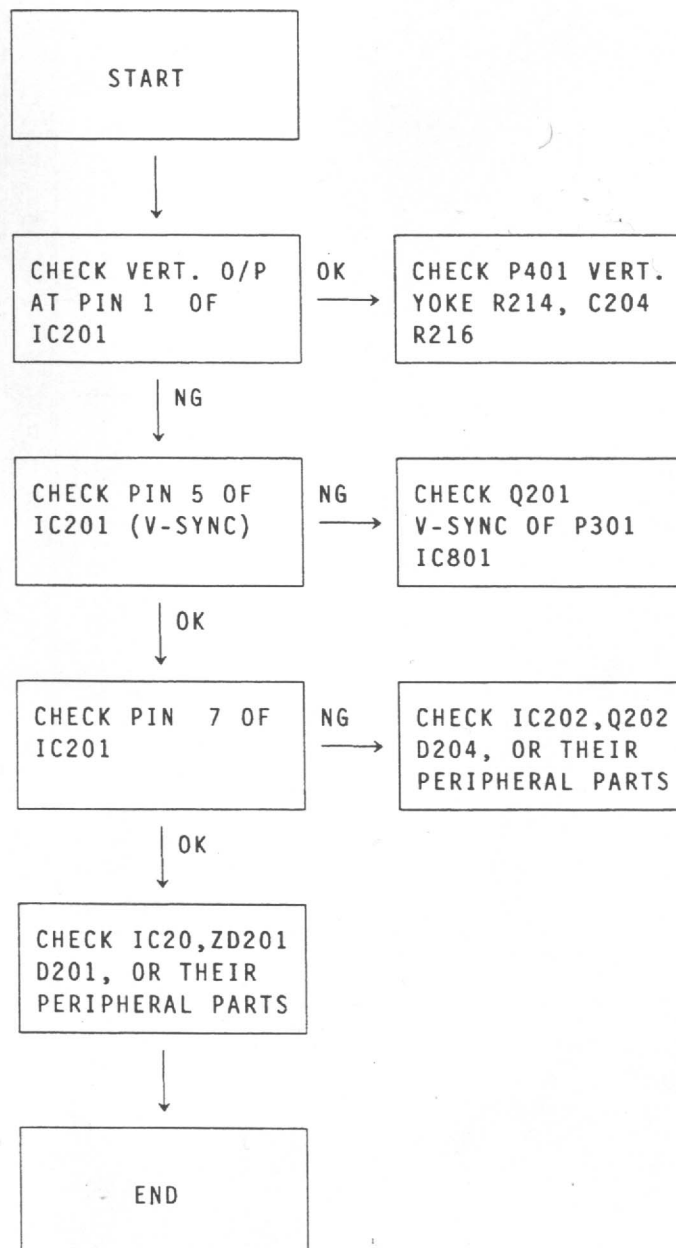


H-Asynchronous

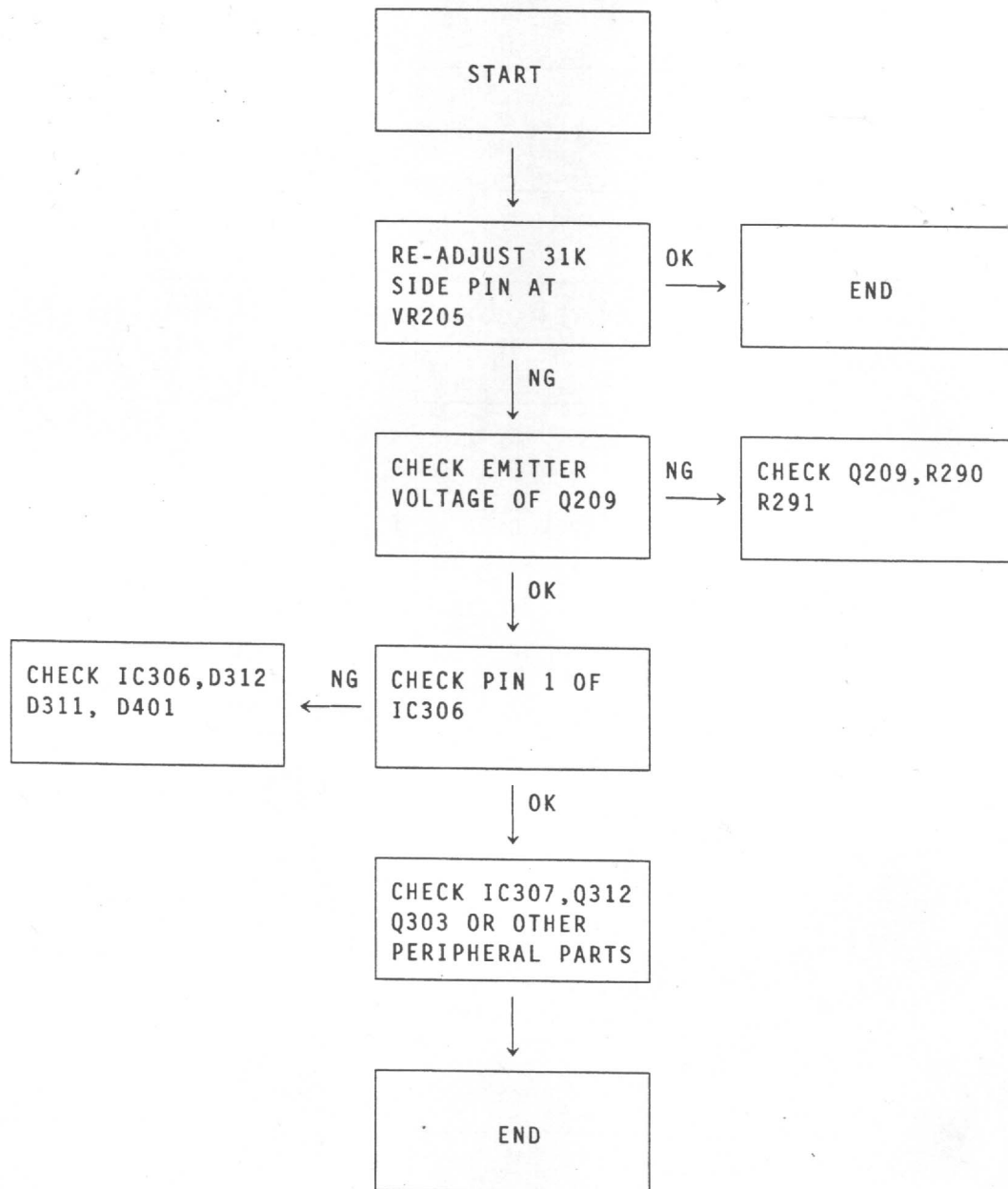
Linearity

Out of phaseWidth Abnormal

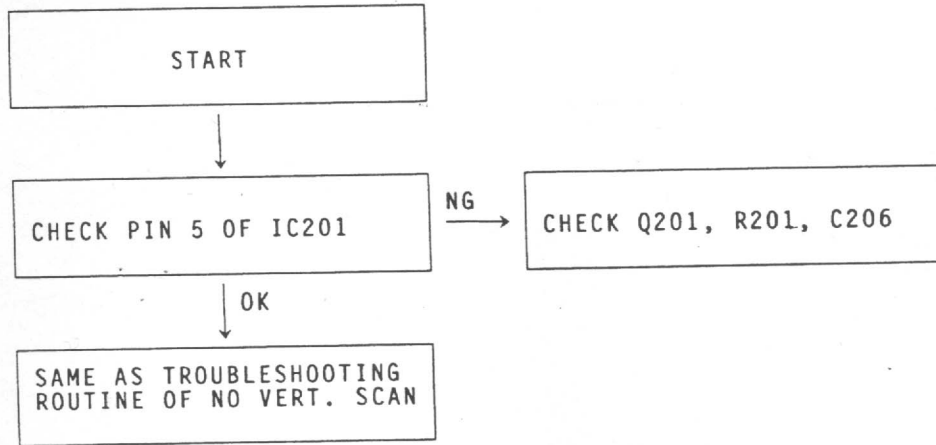
## 6.5.2 Vertical Ddflection Circuit

No vertical scan

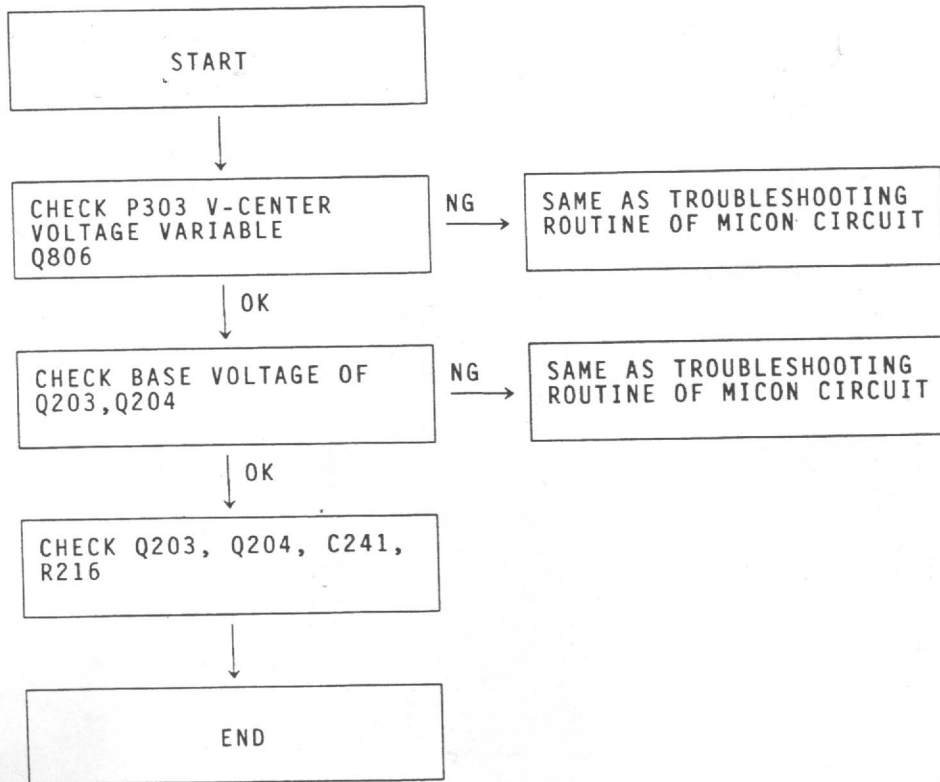


Side pin distortion

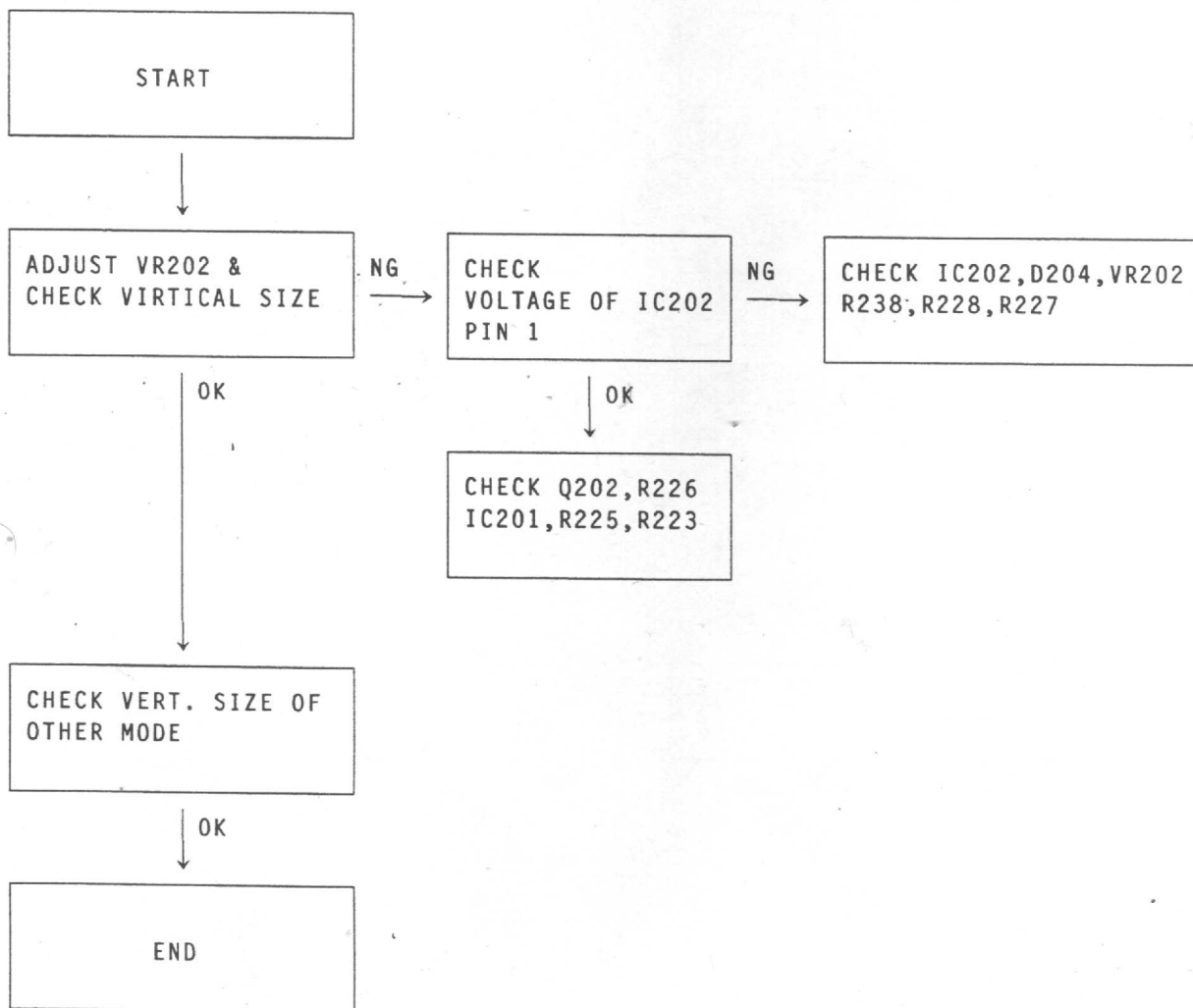
V-Asynchronous



Vertical position



Vertical Size



## VOLTAGE MEASURED RECORD

TEST CONDITIONS: PATTERN: CROSS HATCH

STATUS : NORMAL

Unit: Volt

PART	Q201 (C945)			Q202 (C945)			Q203 (D882)			
	PIN	B	C	E	B	C	E	B	C	E
TIMING										
VGA-350		0.4	24.4	0.12	3.4	6.6	2.8	8.5	24.4	8.5
SVGAIII		0.4	24.5	0.21	3.1	6.6	2.6	13.9	24.5	13.3
8514A		0.4	24.5	0.24	3.4	6.6	2.9	9.4	24.4	9.4
VESA-56K		0.4	24.5	0.18	2.9	6.6	2.4	10.2	24.5	10.1
VESA-64K		0.4	24.5	0.13	2.6	6.6	2.1	10.6	24.5	10.6
VESA-80K		0.4	24.5	0.09	3.0	6.6	2.5	10.4	24.5	10.4
1280X1024INT		0.4	24.4	0.22	4.0	6.6	3.4	13.7	24.4	13.1
NEC-24.8K		0.4	24.5	0.27	2.8	6.6	2.2	9.5	24.5	9.4

PART	Q204 (B772)			Q205 (C945)			Q206 (C945)			
	PIN	B	C	E	B	C	E	B	C	E
TIMING										
VGA-350		7.9	0	8.5	2.3	7.9	1.7	0.4	11.9	0.03
SVGAIII		13.3	0	13.3	1.6	13.3	1.0	0.4	11.9	0.06
8514A		8.8	0	9.4	2.2	8.8	1.6	0.4	11.9	0.06
VESA-56K		9.5	0	10.1	2.1	9.5	1.5	0.4	11.9	0.05
VESA-64K		10.0	0	10.6	2.1	10.0	1.4	0.4	11.9	0.03
VESA-80K		9.8	0	10.4	2.1	9.8	1.5	0.4	11.9	0.02
1280X1024INT		13.1	0	13.1	2.1	13.1	1.0	0.4	11.9	0.06
NEC-24.8K		8.8	0	9.4	2.2	8.9	1.6	0.4	11.9	0.11

PART	Q208 (C945)			Q209 (C945)			Q210 (C3675)		
	PIN	B	C	E	B	C	E	B	C
VGA-350	0.06	20.9	0.0	6.3	11.9	5.7	11.9	468	11.3
SVGAIII	0.06	20.1	0.0	6.3	11.9	5.7	11.9	491	11.3
8514A	0.06	20.6	0.0	6.3	11.9	5.6	11.9	475	11.3
VESA-56K	0.06	19.7	0.0	6.3	11.9	5.7	11.9	498	11.3
VESA-64K	0.06	19.4	0.0	6.3	11.9	5.7	11.9	501	11.3
VESA-80K	0.06	18.4	0.0	6.4	11.9	5.8	11.9	511	11.3
1280X1024INT	0.06	19.7	0.0	6.4	11.9	5.7	11.9	492	11.3
NEC-24.8K	0.06	20.4	0.0	6.3	11.9	5.6	11.9	455	11.3

PART	Q211 (A733)			Q212 (C945)			Q301 (C945)		
	PIN	B	C	E	B	C	E	B	C
VGA-350	9.7	0.0	10.3	0.0	5.0	0.0	0.0	12.0	0.6
SVGAIII	9.7	0.0	10.3	0.0	5.0	0.0	0.0	12.0	0.6
8514A	9.7	0.0	10.3	0.0	5.0	0.0	0.0	12.0	0.6
VESA-56K	9.7	0.0	10.3	0.0	5.0	0.0	0.0	12.0	0.6
VESA-64K	9.7	0.0	10.3	0.0	5.0	0.0	0.0	12.0	0.6
VESA-80K	9.7	0.0	10.3	0.0	5.0	0.0	0.0	12.0	0.6
1280X1024INT	9.7	0.0	10.3	0.0	5.0	0.0	0.0	12.0	0.6
NEC-24.8K	9.7	0.0	10.3	0.0	5.0	0.0	0.0	12.0	0.6

PART	Q302 (C945)			Q303 (C945)			Q304 (A773)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		1.7	7.8	1.0	0.8	7.8	0.2	9.9	6.0	10.5
SVGA III		2.2	7.3	1.5	1.5	7.3	0.8	9.1	5.9	9.7
8514A		1.7	7.7	1.0	1.0	7.7	0.4	9.7	5.9	10.3
VESA-56K		1.8	7.8	1.2	1.8	7.8	1.1	8.7	5.9	9.3
VESA-64K		2.3	6.8	1.7	2.1	6.8	1.4	8.3	5.8	8.9
VESA-80K		1.9	6.7	1.2	2.7	6.7	2.0	7.5	5.8	8.1
1280X1024INT		2.0	7.3	1.3	1.6	7.3	0.9	8.9	5.9	9.5
NEC-24.8K		1.5	7.9	0.8	0.8	7.9	0.2	10.1	5.9	10.7

PART	Q305 (C945)			Q306 (A733)			Q307 (D669)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		5.2	24.4	5.0	5.2	0	5.0	47.0	75.3	47.1
SVGA III		5.6	24.4	5.6	5.6	0	5.6	48.4	75.3	48.7
8514A		5.3	24.4	5.3	5.3	0	5.3	48.3	75.3	48.3
VESA-56K		5.8	24.4	5.8	5.8	0	5.8	48.3	75.3	48.6
VESA-64K		6.0	24.4	6.1	6.0	0	6.1	48.0	75.3	48.3
VESA-80K		6.3	24.4	6.4	6.3	0	6.4	48.5	75.3	48.8
1280X1024INT		5.7	24.4	5.7	5.7	0	5.7	49.1	75.3	49.3
NEC-24.8K		5.0	24.4	4.8	5.0	0	4.8	17.0	75.3	47.1



PART	Q308 (B649)			Q309 (D669)			Q310 (A733)			
	PIN TIMING	B	C	E	B	C	E	B	C	E
VGA-350		46.4	0	47.1	11.9	46.4	11.3	7.9	0.06	8.5
SVGAIII		47.7	0	48.7	11.9	47.7	11.3	8.1	0.06	8.7
8514A		47.5	0	48.3	11.9	47.5	11.3	8.0	0.06	8.7
VESA-56K		47.6	0	48.6	11.9	47.6	11.3	8.1	0.06	8.7
VESA-64K		47.3	0	48.3	11.9	47.3	11.3	8.1	0.06	8.7
VESA-80K		47.7	0	48.8	11.9	47.7	11.3	8.1	0.06	8.7
1280X1024INT		48.4	0	49.3	11.9	48.4	11.3	8.1	0.06	8.8
NEC-24.8K		46.4	0	17.1	11.9	46.4	11.3	7.8	0.06	8.4

PART	Q311 (A733)			Q312 (A733)			Q313 (C945)			
	PIN TIMING	B	C	E	B	C	E	B	C	E
VGA-350		7.9	0.0	8.5	12.0	1.1	12.6	0.5	6.8	0.0
SVGAIII		7.9	0.0	8.5	12.0	1.7	12.6	0.6	5.4	0.0
8514A		7.9	0.0	8.5	12.0	1.3	12.6	0.5	6.4	0.0
VESA-56K		7.9	0.0	8.5	12.0	2.0	12.6	0.6	4.8	0.0
VESA-64K		7.9	0.0	8.5	12.0	2.4	12.6	0.7	4.0	0.0
VESA-80K		7.9	0.0	8.5	12.0	3.0	12.6	0.7	2.9	0.0
1280X1024INT		7.9	0.0	8.5	12.0	1.7	12.6	0.6	5.2	0.0
NEC-24.8K		7.9	0.0	8.5	12.0	0.8	12.6	0.5	7.2	0.0



PART	Q314 (C3996)			Q318 (K357)			Q319 (K553)		
	PIN TIMING	B	C	E	G	D	S	G	D
VGA-350	0.65	50.1	0	5.1	18.4	0.0	56.0	180.0	53.4
SVGAIII	0.68	77.6	0	5.6	16.7	0.0	84.5	180.0	80.4
8514A	0.66	57.1	0	5.3	18.0	0.0	62.6	180.0	60.0
VESA-56K	0.69	92.4	0	5.9	16.0	0.0	100.2	180.0	96.9
VESA-64K	0.69	106.1	0	6.1	15.4	0.0	114.8	180.0	111.2
VESA-80K	0.70	134.3	0	6.4	14.2	0.0	144.0	180.0	139.8
1280X1024INT	0.70	81.0	0	5.7	16.4	0.0	87.6	180.0	84.4
NEC-24.8K	0.65	48.2	0	4.8	18.7	0.0	48.5	180.0	48.2

PART	Q320 (C945)			Q321 (D669)			Q322 (C945)		
	PIN TIMING	B	C	E	B	C	E	B	C
VGA-350	0.07	16.6	0.0	52.7	64.2	52.6	0.24	16.4	0.0
SVGAIII	0.7	0.0	0.0	80.8	92.1	80.7	0.24	16.4	0.0
8514A	0.7	16.6	0.0	59.3	70.6	59.2	0.24	16.4	0.0
VESA-56K	0.07	0.0	0.0	96.3	107.6	96.1	0.24	16.4	0.0
VESA-64K	0.7	0.0	0.0	110.7	122.0	110.5	0.65	0.0	0.0
VESA-80K	0.7	0.0	0.0	139.3	150.0	139.1	0.65	0.0	0.0
1280X1024INT	0.7	0.0	0.0	83.8	94.9	83.7	0.24	16.4	0.0
NEC-24.8K	0.07	16.6	0.0	50.7	58.1	50.2	0.24	16.4	0.0

PART	Q323 (B649)			Q324 (IRF630)			Q325 (IRF630)			
	PIN	B	C	E	G	D	S	G	D	S
VGA-350		52.7	42.0	52.6	16.6	0.0	0.0	16.3	0.0	0.0
SVGAIII		80.8	70.3	80.7	0.0	33.8	0.0	16.3	0.0	0.0
8514A		59.3	48.8	59.2	0.0	21.6	0.0	16.3	0.0	0.0
VESA-56K		96.3	85.7	96.1	0.0	33.3	0.0	0.0	33.0	0.0
VESA-64K		110.7	100.0	110.5	0.0	36.2	0.0	0.0	35.9	0.0
VESA-80K		139.3	129.0	139.1	0.0	42.5	0.0	0.0	42.2	0.0
1280X1024INT		83.8	73.6	83.7	0.0	31.1	0.0	16.3	0.0	0.0
NEC-24.8K		50.7	35.1	50.2	16.6	0.0	0.0	16.3	0.0	0

PART	Q326 (IRF630)			Q327 (IRF630)			Q328 (C945)			
	PIN	G	D	S	G	D	S	B	C	E
VGA-350		16.3	0.0	0	16.3	0.0	0	0.06	16.5	0.0
SVGAIII		16.3	0.0	0	16.3	0.0	0	0.7	0.0	0.0
8514A		16.3	0.0	0	16.3	0.0	0	0.7	0.0	0.0
VESA-56K		16.3	0.0	0	16.3	0.0	0	0.7	0.0	0.0
VESA-64K		16.3	0.0	0	16.3	0.0	0	0.7	0.0	0.0
VESA-80K		0.0	42.2	0	0.0	41.7	0	0.7	0.0	0.0
1280X1024INT		—	—	—	—	—	—	0.7	0.0	0.0
NEC-24.8K		16.3	0.0	0	16.3	0.0	0	0.06	16.5	0

PART	Q329 (C945)			Q330 (C945)			Q331 (C945)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		0.07	16.3	0	0.06	16.3	0	0.1	16.3	0
SVGAIII		0.07	16.3	0	0.06	16.3	0	0.1	16.3	0
8514A		0.07	16.3	0	0.06	16.3	0	0.1	16.3	0
VESA-56K		0.07	16.3	0	0.06	16.3	0	0.1	16.3	0
VESA-64K		0.7	0.0	0	0.06	16.3	0	0.1	16.3	0
VESA-80K		0.7	0.0	0	0.7	0.0	0	0.7	0.0	0
1280X1024INT		0.07	16.3	0	—	—	—	—	—	—
NEC-24.8K		0.07	16.3	0	0.06	16.3	0	0.1	16.3	0

PART	Q332 (C945)			Q333 (C945)			Q334 (C945)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		0.7	0.03	0.0	0.03	15.0	0.0	0.04	20.9	0.0
SVGAIII		0.7	0.03	0.0	0.03	15.0	0.0	0.03	20.1	0.0
8514A		0.7	0.03	0.0	0.03	15.0	0.0	0.03	20.6	0.0
VESA-56K		0.7	0.03	0.0	0.03	15.0	0.0	0.03	19.7	0.0
VESA-64K		0.7	0.03	0.0	0.03	15.0	0.0	0.03	19.4	0.0
VESA-80K		0.7	0.03	0.0	0.03	15.0	0.0	0.03	18.4	0.0
1280X1024INT		0.7	0.03	0.0	0.03	15.0	0.0	0.03	19.7	0.0
NEC-24.8K		0.7	0.03	0	0.03	15.0	0	0.02	21.0	0

PART	Q335 (C4769)			Q336 (D669)			Q337 (C945)		
	PIN	B	C	E	B	C	E	B	C
VGA-350	132	179	132	-1.1	11.5	0.0	0.5	6.8	0.0
SVGAIII	103	179	103	-1.1	9.2	0.0	0.6	5.4	0.0
8514A	124	179	124	-1.1	10.8	0.0	0.5	6.4	0.0
VESA-56K	87	179	87	-1.1	8.4	0.0	0.7	4.8	0.0
VESA-64K	73	179	73	-1.1	7.8	0.0	0.7	3.9	0.0
VESA-80K	36	179	36	-1.1	6.4	0.0	0.7	2.8	0.0
1280X1024INT	97	179	97	-1.1	8.9	0.0	0.6	5.1	0.0
NEC-24.8K	142	179	143	-1.1	12.4	0.0	0.4	7.2	0.0

PART	Q338 (K553)			Q339 (A733)			Q340 (C945)		
	PIN	G	D	S	B	C	E	B	C
VGA-350	3.9	131.8	0.0	0.03	20.9	0	0.04	22.3	0.0
SVGAIII	6.2	102.8	0.0	0.03	20.1	0	0.04	22.1	0.0
8514A	4.5	124.4	0.0	0.03	20.6	0	0.04	22.3	0.0
VESA-56K	7.4	86.9	0.0	0.01	19.7	0	0.04	22.0	0.0
VESA-64K	8.6	72.5	0.0	0.03	19.4	0	0.04	21.8	0.0
VESA-80K	11.5	35.6	0.0	0.03	18.4	0	0.04	21.7	0.0
1280X1024INT	6.6	97.6	0.0	0.03	19.7	0	0.04	22.0	0.0
NEC-24.8K	3.0	142.5	0.0	0.03	21.0	0	0.04	22.3	0.0

PART	Q341 (C945)			Q342 (A733)			Q343 (C1473A)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		20.9	24.5	20.8	20.9	0	20.8	123.6	180.4	124.5
SVGAIII		20.1	24.5	20.1	20.1	0	20.1	123.6	180.4	124.5
8514A		20.6	24.5	20.5	20.6	0	20.5	123.6	180.4	124.5
VESA-56K		19.7	24.5	19.7	19.7	0	19.7	123.6	180.4	124.5
VESA-64K		19.4	24.5	19.4	19.4	0	19.4	123.6	180.4	124.5
VESA-80K		18.4	24.5	18.4	18.4	0	18.4	123.6	180.4	124.5
1280X1024INT		19.7	24.5	19.7	19.7	0	19.7	123.6	180.4	124.5
NEC-24.8K		21.2	24.5	21.1	21.2	0	21.1	123.6	180.4	124.5

PART	Q344 (A733)			Q345 (IRF630)			Q346 (IRF630)			
	PIN	B	C	E	G	D	S	G	D	S
VGA-350		11.7	0.0	11.9	16.6	0.0	0.0	16.4	0.0	0.0
SVGAIII		11.7	0.0	11.9	0.02	33.7	0.0	16.4	0.0	0.0
8514A		11.7	0.0	11.9	16.6	0.0	0.0	16.4	0.0	0.0
VESA-56K		11.7	0.0	11.9	0.02	33.3	0.0	16.4	0.0	0.0
VESA-64K		11.7	0.0	11.9	0.02	36.3	0.0	0.03	35.9	0.0
VESA-80K		11.7	0.0	11.9	0.02	42.6	0.0	0.02	42.2	0.0
1280X1024INT		11.7	0.0	11.9	0.02	31.0	0.0	16.4	0.0	0.0
NEC-24.8K		11.7	0.0	11.9	16.6	0.0	0.0	16.4	0.0	0.0



PART	Q348 (C2001)			Q350 (C945)			Q401 (C1473A)			
	PIN	B	C	E	B	C	E	B	C	E
VGA-350		-1.0	7.2	0	0.0	7.3	0	-161.0	-35.6	-152.6
SVGAIII		-1.6	6.9	0	0.0	7.3	0	-159.1	-35.6	-150.7
8514A		-1.2	7.1	0	0.0	7.3	0	-160.3	-35.5	-152.0
VESA-56K		-1.8	6.7	0	0.0	7.4	0	-158.3	-35.6	-150.0
VESA-64K		-2.0	6.5	0	0.0	6.6	0	-156.9	-35.5	-148.4
VESA-80K		-2.3	6.0	0	0.0	7.3	0	-156.7	-36.2	-148.5
1280X1024INT		-1.63	6.8	0	0.0	7.3	0	-158.2	-35.6	-149.9
NEC-24.8K		-0.84	7.3	0	0.0	7.3	0	-156.1	-25.5	-147.9

PART	Q402 (C945)			
	PIN	B	C	E
VGA-350		3.8	8.5	2.9
SVGAIII		3.9	8.7	2.9
8514A		3.8	8.7	2.9
VESA-56K		3.9	8.7	3.0
VESA-64K		3.9	8.7	3.0
VESA-80K		4.1	8.7	3.2
1280X1024INT		3.9	8.9	3.0
NEC-24.8K		3.8	8.5	2.9

PART	IC201 (TDA1675A)								
	PIN	1	2	3	4	5	6	7	8
VGA-350	TIMING	12.0	23.8	4.2	0.5	0.0	0.13	6.6	0.0
SVGA III		12.1	23.9	4.2	0.5	0.0	0.13	6.6	0.0
8514A		12.5	23.9	4.1	0.5	0.0	0.13	6.6	0.0
VESA-56K		12.6	23.9	4.2	0.5	0.0	0.13	6.6	0.0
VESA-64K		12.6	23.8	4.3	0.5	0.0	0.13	6.6	0.0
VESA-80K		12.5	23.9	4.2	0.5	0.0	0.12	6.6	0.0
1280X1024INT		11.7	23.9	4.1	0.5	0.0	0.13	6.6	0.0
NEC-24.8K		12.0	23.8	4.2	0.5	0.0	0.13	6.6	0.0

PART	IC202 (TDA1675A)								
	PIN	9	10	11	12	13	14	15	
VGA-350	TIMING	5.2	6.1	4.4	4.1	0.06	24.1	0.9	
SVGA III		4.7	5.6	4.4	4.2	0.06	24.2	0.7	
8514A		4.6	5.5	4.4	4.2	0.06	24.2	0.9	
VESA-56K		4.5	5.3	4.4	4.2	0.06	24.2	0.7	
VESA-64K		4.5	5.3	4.4	4.2	0.06	24.2	0.6	
VESA-80K		4.5	5.4	4.4	4.2	0.06	24.2	0.7	
1280X1024INT		5.3	6.3	4.4	4.1	0.06	24.1	1.0	
NEC-24.8K		5.2	6.1	4.4	4.1	0.06	24.1	0.9	



PART	P302							
	PIN TIMING	1 (NC)	2 (S5)	3 (S4)	4 (S3)	5 (GND)	6 (S2)	7 (S1)
VGA-350	—	0.1	0.1	0.0	0.0	0.1	0.1	0.1
SVGAIII	—	0.1	0.1	0.0	0.0	0.1	5.0	0.1
8514A	—	0.1	0.1	0.0	0.0	0.1	0.1	5.0
VESA-56K	—	0.1	0.1	0.0	0.0	5.0	0.1	0.1
VESA-64K	—	0.1	0.1	4.2	0.0	0.1	0.1	0.1
VESA-80K	—	4.8	0.1	0.1	0.0	0.1	0.1	0.1
1280X1024INT	—	0.1	0.1	0.0	0.0	0.1	5.0	0.1
NEC-24.8K	—	0.1	0.1	0.1	0.0	0.1	0.1	0.1

PART	IC202 (LM358)							
	PIN TIMING	1	2	3	4	5	6	7
VGA-350	6.8	8.6	8.6	0.0	5.6	5.6	5.6	24.1
SVGAIII	6.3	7.7	7.7	0.0	5.1	5.1	5.1	24.2
8514A	6.9	7.6	7.6	0.0	5.0	5.0	5.0	24.2
VESA-56K	5.9	7.3	7.3	0.0	5.0	4.9	4.9	24.2
VESA-64K	5.3	7.1	7.1	0.0	4.9	4.9	4.9	24.2
VESA-80K	6.1	7.3	7.3	0.0	4.9	4.9	4.9	24.2
1280X1024INT	8.0	8.9	8.9	0.0	5.6	5.7	5.7	24.1
NEC-24.8K	5.5	7.6	7.6	0.0	5.1	5.5	5.1	24.2

PART	IC203 (7812)							
	PIN	I	G	O				
TIMING								
VGA-350	18.9	0	11.9					
SVGAIII	18.7	0	11.9					
8514A	18.8	0	11.9					
VESA-56K	18.8	0	11.9					
VESA-64K	18.8	0	11.9					
VESA-80K	18.7	0	11.9					
1280X1024INT	18.7	0	11.9					
NEC-24.8K	18.9	0	11.9					

PART	IC204 (AN5766)								
	PIN	1	2	3	4	5	6	7	8
TIMING									
VGA-350	0	4.9	—	6.0	6.8	6.8	6.5	11.9	
SVGAIII	0	4.9	—	6.0	6.8	6.8	6.5	11.9	
8514A	0	4.9	—	6.0	7.4	6.8	6.5	11.9	
VESA-56K	0	4.9	—	6.0	6.8	6.8	6.5	11.9	
VESA-64K	0	4.9	—	6.0	6.4	6.4	6.5	11.9	
VESA-80K	0	4.9	—	6.0	6.9	6.9	6.5	11.9	
1280X1024INT	0	4.9	—	6.0	7.4	7.4	6.5	11.9	
NEC-24.8K	0	4.9	—	6.0	6.2	6.2	6.5	11.9	

PART	IC204 (AN5766)							
	PIN	9	10	11	12	13	14	15
VGA-350	6.0	2.6	—	—	5.7	6.1	5.7	6.3
SVGAIII	6.0	2.6	—	—	5.7	6.1	5.7	6.3
8514A	6.0	2.6	—	—	5.7	6.1	5.7	6.3
VESA-56K	6.0	2.6	—	—	5.7	6.1	5.7	6.3
VESA-64K	6.0	2.6	—	—	5.7	6.1	5.7	6.3
VESA-80K	6.0	2.6	—	—	5.7	6.1	5.7	6.3
1280X1024INT	6.0	2.6	—	—	5.7	6.1	5.7	6.3
NEC-24.8K	6.0	2.6	—	—	5.7	6.1	5.7	6.3

PART	IC204 (AN5766)						
	PIN	17	18	19	20	21	22
VGA-350	2.6	3.3	2.1	2.1	2.7	2.2	
SVGAIII	2.6	3.2	7.7	2.1	1.2	1.9	
8514A	2.6	3.1	7.6	2.1	2.8	2.3	
VESA-56K	2.6	3.2	7.3	2.1	2.5	2.2	
VESA-64K	2.5	3.3	7.1	2.1	2.4	2.2	
VESA-80K	2.6	3.4	7.3	2.1	2.3	2.2	
1280X1024INT	2.5	3.3	8.9	2.1	1.2	1.9	
NEC-24.8K	2.6	2.9	2.5	2.1	2.8	2.2	

PART	IC301 (LA7851)								
	PIN	1	2	3	4	5	6	7	8
VGA-350	TIMING	7.8	7.8	8.6	-0.3	4.4	3.7	5.8	6.0
SVGA III		7.7	7.3	8.4	-0.3	3.9	3.2	5.8	5.9
8514A		7.8	7.7	8.5	-0.3	4.2	3.5	5.7	5.9
VESA-56K		7.7	7.8	8.4	-0.3	3.7	5.8	5.8	5.9
VESA-64K		7.7	6.8	8.3	-0.3	3.6	5.7	5.7	5.8
VESA-80K		7.7	6.7	8.2	-0.3	3.5	6.0	6.0	5.8
1280X1024INT		7.7	7.3	8.4	-0.3	3.8	5.8	5.8	5.9
NEC-24.8K		7.7	7.9	8.5	-0.3	4.7	4.0	5.5	5.9

PART	IC301 (LA7851)								
	PIN	9	10	11	12	13	14	15	16
VGA-350	TIMING	5.8	11.9	5.8	5.2	0.0	0	—	—
SVGA III		5.6	11.9	5.9	5.7	0.0	0	—	—
8514A		5.7	11.9	5.8	5.3	0.0	0	—	—
VESA-56K		5.6	11.9	6.0	5.9	0.0	0	—	—
VESA-64K		5.5	11.9	6.0	6.0	0.0	0	—	—
VESA-80K		5.5	11.9	6.1	6.3	0.0	0	—	—
1280X1024INT		5.6	11.9	5.9	5.7	0.0	0	—	—
NEC-24.8K		5.7	11.9	5.7	5.0	0.0	0	—	—

PART	IC301 (LA7851)								
	PIN	17	18	19	20				
TIMING									
VGA-350	—	—	—	—					
SVGAIII	—	—	—	—					
8514A	—	—	—	—					
VESA-56K	—	—	—	—					
VESA-64K	—	—	—	—					
VESA-80K	—	—	—	—					
1280X1024INT	—	—	—	—					
NEC-24.8K	—	—	—	—					

PART	IC302 (LM324)								
	PIN	1	2	3	4	5	6	7	8
TIMING									
VGA-350	2.1	2.1	2.1	14.9	2.1	2.1	2.1	2.1	9.9
SVGAIII	5.0	5.0	5.0	14.9	5.0	5.0	5.0	5.0	9.1
8514A	2.9	2.9	2.9	14.9	2.9	2.9	2.9	2.9	9.7
VESA-56K	6.5	6.5	6.5	14.9	6.5	6.5	6.5	6.5	8.7
VESA-64K	7.8	7.8	7.8	14.9	7.8	7.8	7.8	7.8	8.3
VESA-80K	10.6	10.6	10.6	14.9	10.6	10.6	10.6	10.6	7.5
1280X1024INT	5.5	5.5	5.5	14.9	5.5	5.5	5.5	5.5	8.9
NEC-24.8K	1.9	1.9	1.9	14.9	1.9	1.9	1.9	1.9	10.1



PART	IC302 (LM324)						
	PIN	9	10	11	12	13	14
VGA-350	10.5	10.5	0.0	6.3	6.3	10.5	
SVGA III	9.7	9.7	0.0	6.3	6.3	7.6	
8514A	10.3	10.3	0.0	6.3	6.3	9.7	
VESA-56K	9.3	9.3	0.0	6.3	6.3	6.2	
VESA-64K	8.9	8.9	0.0	6.3	6.3	4.8	
VESA-80K	8.1	8.1	0.0	6.3	6.3	2.0	
1280X1024INT	9.5	9.5	0.0	6.3	6.3	7.1	
NEC-24.8K	10.7	10.7	0.0	6.3	6.3	10.7	

PART	IC303 (74LS32)							
	PIN	1	2	3	4	5	6	7
VGA-350	0.3	0.3	0.03	0.02	0.4	0.07	0.0	0.06
SVGA III	0.3	0.3	0.03	0.02	5.0	4.0	0.0	4.0
8514A	0.3	0.3	0.03	0.02	0.4	0.08	0.0	4.0
VESA-56K	0.3	0.3	0.03	4.0	0.4	4.0	0.0	4.0
VESA-64K	0.3	0.3	0.03	4.0	0.4	4.0	0.0	4.0
VESA-80K	0.3	4.8	3.8	4.0	0.4	4.0	0.0	4.0
1280X1024INT	0.3	0.3	0.03	0.02	5.0	4.0	0.0	4.0
NEC-24.8K	0.3	0.3	0.03	0.02	0.4	0.06	0.0	0.06

PART	IC303 (74LS32)						
	PIN	9	10	11	12	13	14
VGA-350	0.07	0.3	0.02	0.2	0.3	5.3	
SVGAIII	4.0	0.3	0.02	0.2	0.3	5.3	
8514A	0.07	0.0	0.02	0.2	0.3	5.3	
VESA-56K	4.0	0.3	4.0	0.2	5.0	5.3	
VESA-64K	4.0	0.3	4.0	1.7	0.3	5.3	
VESA-80K	4.0	0.3	4.0	3.1	0.3	5.3	
1280X1024INT	4.0	0.3	0.02	0.2	0.3	5.3	
NEC-24.8K	0.06	0.3	0.06	0.2	0.3	5.3	

PART	IC304 (AN5262)							
	PIN	1	2	3	4	5	6	7
VGA-350	5.4	0.0	10.2	0.0	1.7	11.9	5.2	
SVGAIII	5.4	0.0	8.5	0.0	1.7	11.9	5.2	
8514A	5.4	0.0	9.4	0.0	1.7	11.9	5.2	
VESA-56K	5.4	0.0	8.5	0.0	1.7	11.9	5.2	
VESA-64K	5.4	0.0	8.4	0.0	1.7	11.9	5.2	
VESA-80K	5.4	0.0	8.0	0.0	1.7	11.9	5.2	
1280X1024INT	5.4	0.0	8.5	0.0	1.7	11.9	5.2	
NEC-24.8K	5.4	0.0	9.4	0.0	1.8	11.9	5.1	



PART	IC305 (TL431)			IC310 (LM317)			
	PIN TIMING	1 (K)	A	R	A	O	I
VGA-350		10.2	0.0	2.5	13.7	15.0	24.5
SVGAIII		8.5	0.0	2.5	13.7	15.0	24.5
8514A		9.4	0.0	2.5	13.7	15.0	24.5
VESA-56K		8.5	0.0	2.5	13.7	15.0	24.5
VESA-64K		8.4	0.0	2.5	13.7	15.0	24.5
VESA-80K		8.0	0.0	2.5	13.7	15.0	24.5
1280X1024INT		8.5	0.0	2.5	13.7	15.0	24.5
NEC-24.8K		9.4	0.0	2.5	13.7	15.0	24.5

PART	IC306 (C4557)								
	PIN TIMING	1	2	3	4	5	6	7	8
VGA-350		7.3	8.51	8.48	0	9.6	9.6	9.6	15.0
SVGAIII		7.2	8.51	8.48	0	9.3	9.3	9.3	15.0
8514A		6.9	8.51	8.48	0	9.3	9.3	9.3	15.0
VESA-56K		7.4	8.51	8.48	0	9.2	9.2	9.2	15.0
VESA-64K		7.9	8.51	8.48	0	9.2	9.2	9.2	15.0
VESA-80K		7.8	8.51	8.48	0	8.8	8.8	8.8	15.0
1280X1024INT		6.6	8.51	8.48	0	9.1	9.1	9.1	15.0
NEC-24.8K		9.9	8.50	8.48	0	9.5	9.5	9.5	15.0

PART	IC307 (NE555)								
	PIN	1	2	3	4	5	6	7	8
TIMING									
VGA-350	0	7.5	4.1	15.0	8.8	1.1	1.1	15.0	
SVGAIII	0	7.5	6.2	15.0	8.8	1.7	1.7	15.0	
8514A	0	7.5	4.6	15.0	8.7	1.3	1.3	15.0	
VESA-56K	0	7.5	7.4	15.0	8.9	2.0	2.0	15.0	
VESA-64K	0	7.5	8.5	15.0	9.1	2.4	2.4	15.0	
VESA-80K	0	7.5	10.6	15.0	9.1	3.0	3.0	15.0	
1280X1024INT	0	7.5	6.5	15.0	8.6	1.7	1.7	15.0	
NEC-24.8K	0	7.6	3.8	15.0	10.0	1.3	1.3	15.0	

PART	IC308 (NE555)								
	PIN	1	2	3	4	5	6	7	8
TIMING									
VGA-350	0.0	7.5	1.52	0.04	5.2	0.02	0.02	15.0	
SVGAIII	0.0	7.5	2.34	15.0	5.2	0.02	0.02	15.0	
8514A	0.0	7.5	1.73	0.04	5.2	0.02	0.02	15.0	
VESA-56K	0.0	7.5	2.75	15.0	5.2	0.8	0.8	15.0	
VESA-64K	0.0	7.5	3.1	15.0	5.2	0.9	0.9	15.0	
VESA-80K	0.0	7.5	3.9	15.0	5.2	1.1	1.1	15.0	
1280X1024INT	0.0	7.5	2.4	15.0	5.2	0.7	0.7	15.0	
NEC-24.8K	0.0	7.6	1.2	15.0	6.0	0.25	0.25	15.0	

PART	IC309 (74LS123)							
	PIN	1	2	3	4	5	6	7
VGA-350	0.0	5.0	4.6	—	4.6	0.0	0.84	0.0
SVGAIII	0.0	5.0	4.6	—	4.6	0.0	0.74	0.0
8514A	0.0	5.0	4.6	—	4.6	0.0	0.80	0.0
VESA-56K	0.0	5.0	4.6	—	4.6	0.0	0.71	0.0
VESA-64K	0.0	5.1	4.6	—	4.6	0.0	0.69	0.0
VESA-80K	0.0	5.1	4.6	—	4.6	0.0	0.68	0.0
1280X1024INT	0.0	5.0	4.6	—	4.6	0.0	0.73	0.0
NEC-24.8K	0.0	5.0	4.6	—	4.6	0.0	0.87	0.0

PART	IC309 (74LS123)							
	PIN	9	10	11	12	13	14	15
VGA-350	0.0	1.0	5.1	—	3.7	0.0	1.1	5.1
SVGAIII	0.0	0.96	5.1	—	3.7	0.0	1.1	5.1
8514A	0.0	0.98	5.1	—	3.7	0.0	1.0	5.1
VESA-56K	0.0	0.95	5.1	—	3.7	0.0	1.1	5.1
VESA-64K	0.0	0.95	5.1	—	3.7	0.0	1.1	5.1
VESA-80K	0.0	0.93	5.1	—	3.7	0.0	1.1	5.1
1280X1024INT	0.0	0.96	5.1	—	3.7	0.0	1.0	5.1
NEC-24.8K	0.0	0.93	5.1	—	3.7	0.0	1.1	5.1

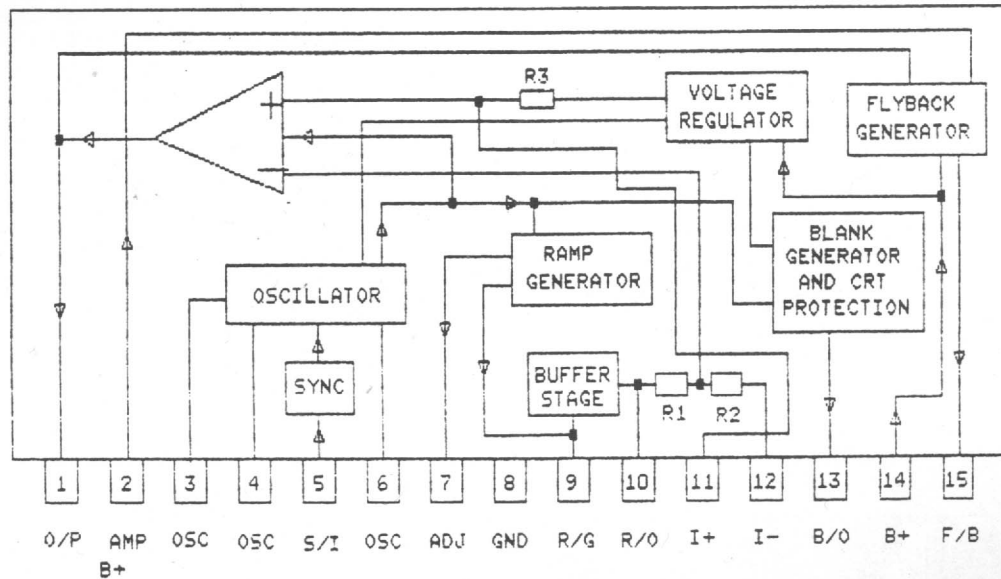
PART	IC311 (NE555)								
	PIN	1	2	3	4	5	6	7	8
TIMING									
VGA-350	0	9.0	3.8	15.0	5.6	0.7	0.7	15.0	
SVGAIII	0	9.0	6.2	15.0	5.8	1.2	1.2	15.0	
8514A	0	9.0	4.5	15.0	5.6	0.8	0.8	15.0	
VESA-56K	0	9.0	7.4	15.0	6.0	1.4	1.4	15.0	
VESA-64K	0	9.0	8.6	15.0	6.1	1.7	1.7	15.0	
VESA-80K	0	9.0	11.5	15.0	6.5	2.4	2.4	15.0	
1280X1024INT	0	9.0	6.6	15.0	5.8	1.2	1.2	15.0	
NEC-24.8K	0	9.0	3.0	15.0	5.5	0.6	0.6	15.0	

PART	IC312 (LM358)								
	PIN	1	2	3	4	5	6	7	8
TIMING									
VGA-350	7.6	7.6	7.6	0.0	7.5	7.5	5.0	15.0	
SVGAIII	7.6	7.6	7.6	0.0	7.5	7.5	5.2	15.0	
8514A	7.6	7.6	7.6	0.0	7.5	7.5	5.0	15.0	
VESA-56K	7.6	7.6	7.6	0.0	7.5	7.5	5.4	15.0	
VESA-64K	7.6	7.6	7.6	0.0	7.5	7.5	5.5	15.0	
VESA-80K	7.6	7.6	7.6	0.0	7.5	7.5	5.9	15.0	
1280X1024INT	7.6	7.6	7.6	0.0	7.5	7.5	5.2	15.0	
NEC-24.8K	7.6	7.6	7.6	0.0	7.5	7.5	4.9	15.0	

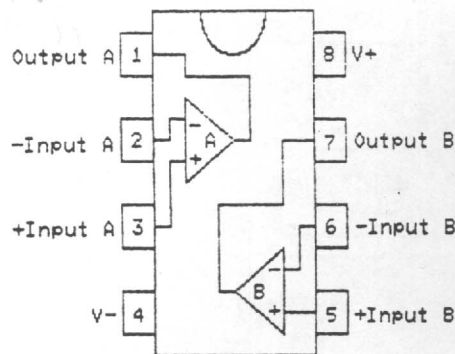
## 7.0 TRANSISTOR OUTLINE AND IC CONFIGURATION

Transistor outline please reference pins arrangement field of SPARE PARTS LIST.

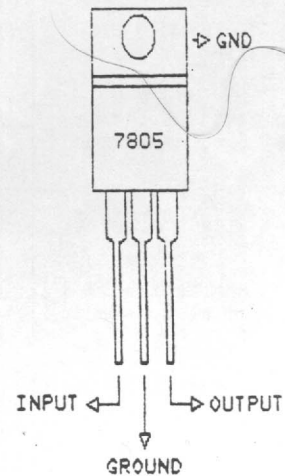
(1) IC201 (TDA1675A)



(2) IC202, IC212, IC306  
(C4557, LM358)

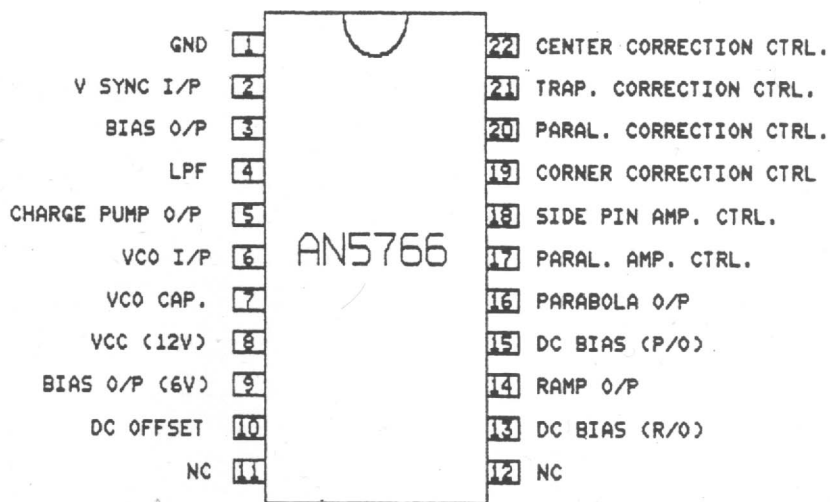


(3) IC203 (7805)

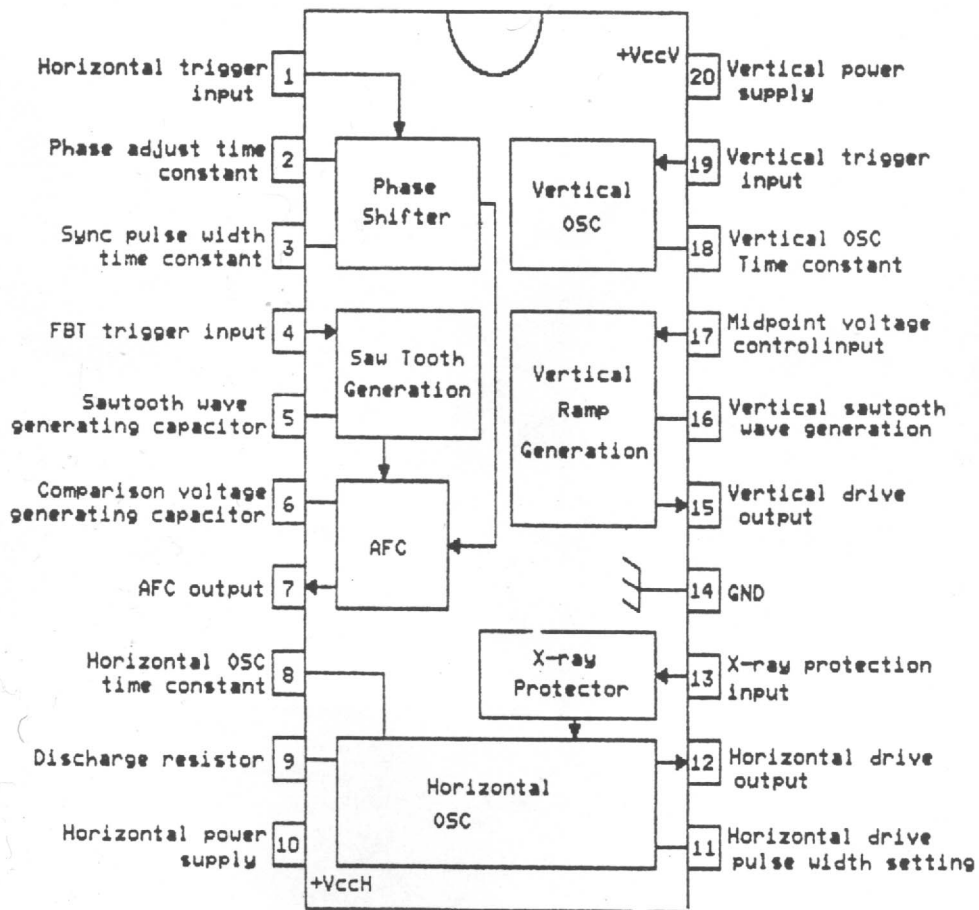




(4) IC204 (AN5766K)

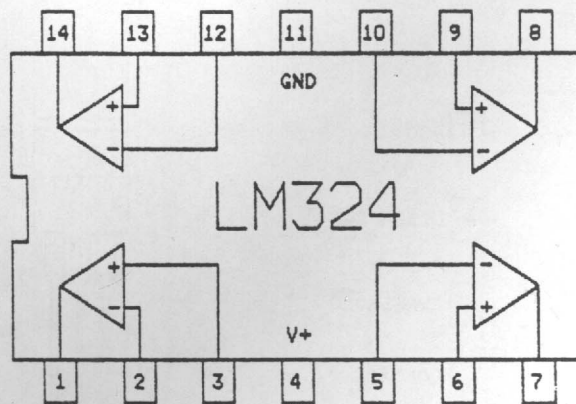


(5) IC301 (7851)

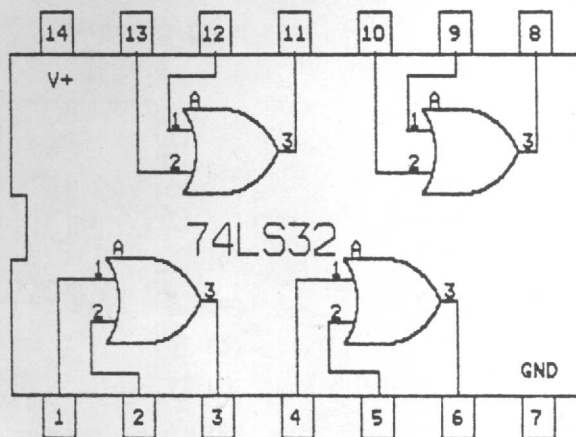




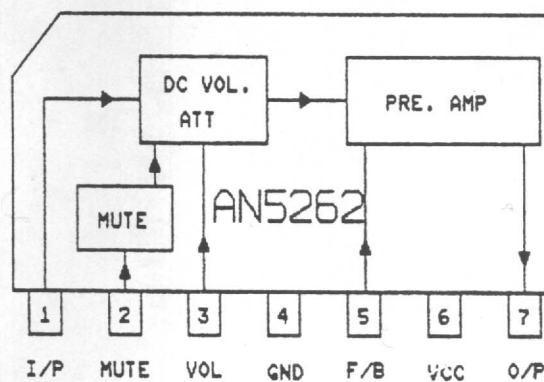
(6) IC302 (LM324)



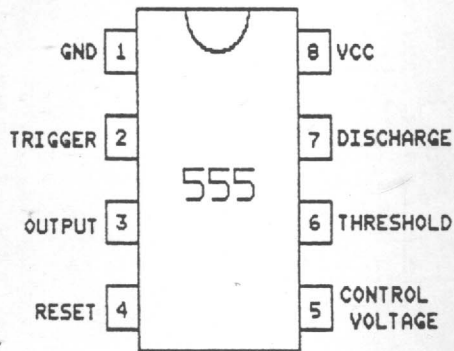
(7) IC303 (74LS32)



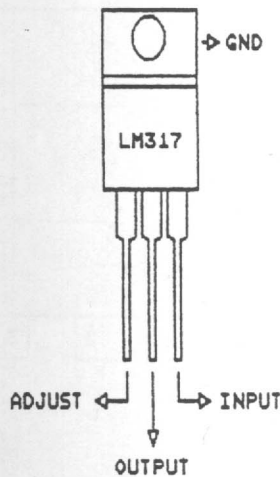
(8) IC304 (AN5262)



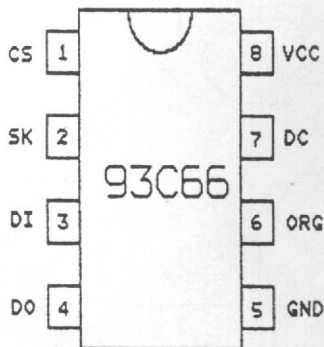
(9) IC307, IC311 (NE555)



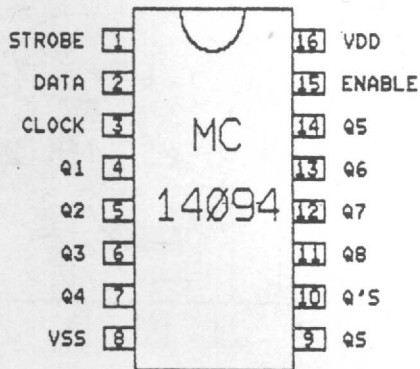
(10) IC310 (LM317)



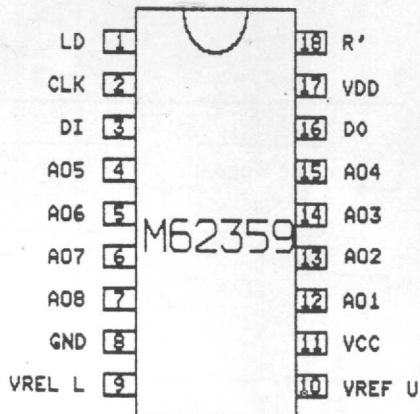
(11) IC501 (93C66)



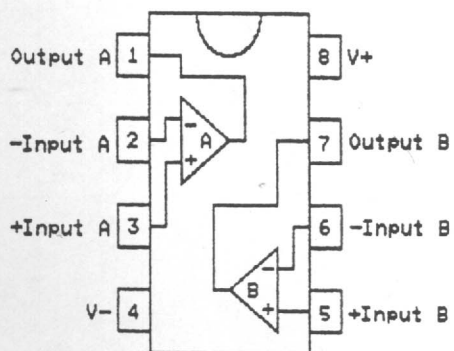
(12) IC503 (MC14094)



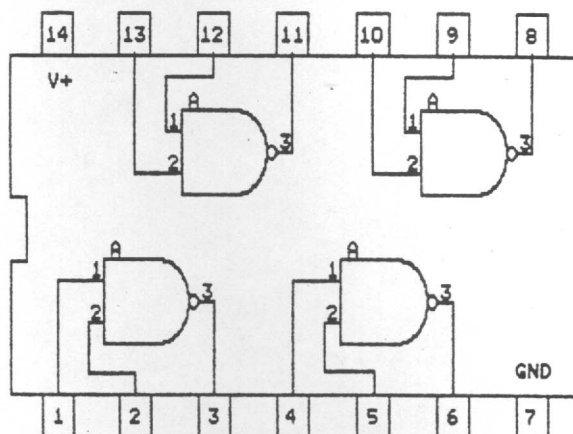
(13) IC504, IC505 (M62359)



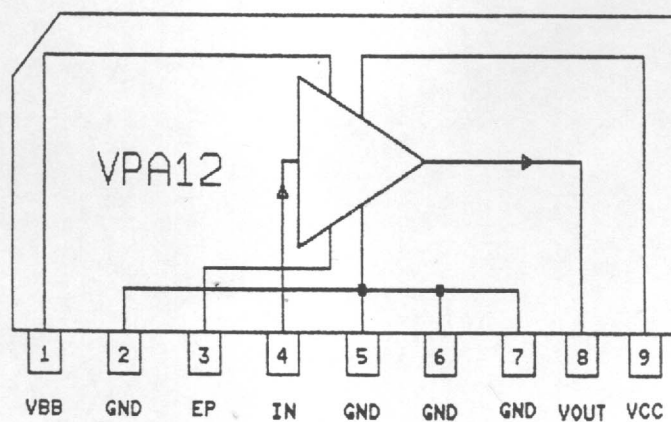
(14) IC507 (HA17393)



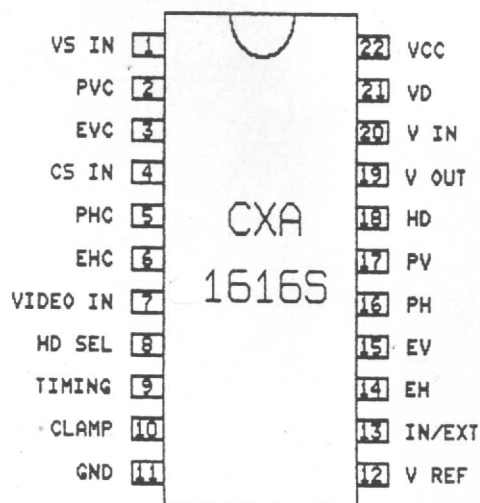
(15) IC601 (74LS38)



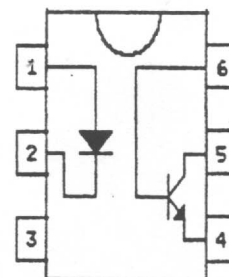
(16) IC603,604,605 (VPA12)



(17) IC606 (CXA1616)



(18) IC803 (4N35)



## 8.0 LAYOUT FOR MAIN COMPONENTS AND ADJUST VR.

## 9.0 CIRCUIT DIAGRAM

## 10.0 CRT CONTRAST LIST

The 1765GM & 1765J have two kinds of CRT "Panasonic M41KXH800X03" and "HITACHI M41KKL680X74(PU)".

The different parts between them have been shown in follow.

CRT MODEL			R001
Panasonic	M41KXH800X03	0.28mm	2R2/2W
Hitachi	M41KKL680X74 (PU)	0.26mm	1R0/2W



## 11.0 SPARE PARTS LIST &amp; TRANSISTOR PINS ARRANGEMENT

MAIN BOARD				REV. B	
ITEM	PART NO.	DESCRIPTION	LOCATION	PINS ARRANGEMENT	REMARK
1.	17A06-180H	TDA1675A	IC201		
2.	17A11-040H	LM358	IC202,212		
3.	17A07-010H	7812	IC203		
4.	17A06-220H	AN5766	IC204		
5.	17A06-140H	LA7851	IC301		
6.	17A11-050H	LM324	IC302		
7.	16T14-021R	74LS32	IC303		
8.	17A12-060H	AN5262	IC304		
9.	17A07-030H	TL431	IC305		
10.	17A11-020H	C4557	IC306		
11.	17A08-030T	NE555N	IC307,308 IC311		
12.	16T16-003R	74LS123	IC309		
13.	17A07-100H	LM317	IC310		
14.	14C92-111B	2SC945	Q201,Q202 Q301	ECB	
15.	14D26-010B	2SD882P/Q	Q203	ECB	
16.	14B26-030B	2SB772	Q204	ECB	
17.	14C92-220C	2SC3675	Q210	BCE	
18.	14A92-021B	2SA733P/Q	Q211,Q304	ECB	
19.	14C92-101B	2SC2001K	Q348	ECB	
20.	14C92-201D	2SC1473AQ	Q343,Q401	ECB	
21.	14B17-010P	2SB649	Q232	ECB	
22.	14D17-010P	2SD669A	Q309,Q321, Q336	ECB	
23.	14K22-080P	2SK357	Q318	GDS	
24.	14K22-110W	IRF630	Q324,Q325	GDS	
25.	14C3P-160C	2SC3996	Q314	BCE	

Note: The definition of transistor Pins arrangement is face to front of part and from left side to right side.

MAIN BOARD				REV. B	
ITEM	PART NO.	DESCRIPTION	LOCATION	PINS ARRANGEMENT	REMARK
26.	14K22-003P	2SK553	Q338,Q319	GDS	
27.	14C3P-080C	2SC4769	Q335	BCE	
28.	15S3C-702F	DD54RC	D319		
29.	15B40T2011	1N5819	D317,D326		
30.	15S11M001F	1N4148	D203		
31.	15S65M201F	1N4004	D340		
32.	15S33T201F	RGP10D	D312,D401		
33.	15S3LM100F	RGP02-16E	D325		
34.	15S47T201F	BYV26C	D327		
35.	15S47TK00F	BYM26C	D320		
36.	49FRA-001M	FUSE 1 $\Omega$ 1/4W	R380		
37.	47D10-0150	TRANSFORMER	T302		
38.	46L00-0490	LINNEAR COIL	L305		
39.					
40.					
41.					
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VIDEO BOARD				REV. B	
ITEM	PART NO.	DESCRIPTION	LOCATION	PINS ARRANGEMENT	REMARK
1.	16M08-003R	93C66	IC501		
2.	16P40-002W	80C51	IC502		
3.	16R16-001Z	MC14094	IC503		
4.	17A23-002H	M62359P	IC504,505		
5.	17A11-030H	HA17393	IC507		
6.	17A11-010H	LM339	IC509		
7.	16T14-022R	74LS38	IC601		
8.	17A04-060H	M52307SP	IC602		
9.	17A01-010C	CXA1616	IC606		
10.	17A07-140H	7805	IC608		
11.	14A92-061D	2SA1018Q/R	Q608,611, Q614	ECB	
12.	14A92-071B	2SA952	Q517,Q518	ECB	
13.	14B92-011P	2SB562	Q618	ECB	
14.	14C92-101B	2SC2001K	Q511,Q512	ECB	
15.	14C92-201D	2SC1473AQ	Q609,Q612 Q615	ECB	
16.	14C92-281P	2SC1906	Q601,Q602 Q603	ECB	
17.	15S34M001F	ISS83	D612,D613		
18.	15Z33M3390	ZERNER 3.3V	ZD501		
19.					
20.					
21.					
22.					
23.					
24.					
25.					

POWER BOARD				REV. B	
ITEM	PART NO.	DESCRIPTION	LOCATION	PINS ARRANGEMENT	REMARK
1.	17A06-150H	UC3842	IC802		
2.	17B21-040H	4N35	IC803		
3.	15Z33M1300	ZENER DIODE 13V	ZD804		
4.	15Z33M1800	ZENER DIODE 18V	ZD801,802		
5.	15S49T200F	BYV26E	D804,D805		
6.	15B4J-G010	RK46	D812		
7.	15S47TK00F	BYM26C	D809,D810 D811		
8.	15S49TK00F	BYM26E	D808,D814		
9.	14K3P-040S	2SK955	Q801	GDS	
10.	14T92-010E	BT169D	SCR801	KGA	
11.	28A57-330R	1UF 35V	C823		
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## Relation of New 17" Series

MODEL PCB	1765GM	1785GM	1765J	1766J	1766GM
Main/B	11S31-035A	11S31-035A	11S31-035A	11S31-035A	11S31-035A
Display/B	11D3D-001A	11D3D-001A	11D3D-001A	11D3D-002A	11D3D-002A
Video/B	11D30-003A	11D30-002A	11D30-002A	11D30-004A	11D30-006A
Front CAB. First Set Second Set	FIRST	FIRST	FIRST	SECOND	SECOND
Power/B	11S32-014A	11S32-014A	11S32-014A	11S32-014A	11S32-014A
CRT	20H17-116B	20H17-23AA	20H17-23AA	20H17-23AA	20H17-116B
H-FREQUENCY RANGE	31KHz ~ 65KHz	31KHz ~ 85KHz	24KHz ~ 65KHz	24KHz ~ 65KHz	31KHz ~ 65KHz