C327 → 220pF / 2kV
ZD210 → 5,1V
Q302 → 2SC5048
Sicherung 3A nicht im Schaltplan
Q304 → IRF630 neben R752
Q306 → BC637 (1945)

7276e Monitor Service Guide

July 1997

Recycled Paper

Printed in Taiwan

PART NO.:49.72402.001
DOC NO.:9707A-7276ESG

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Chapter 1

SYSTEM OVERVIEW

1.1 Introduction

This specification describes **a low-cost high performance 17" color auto-scan monitor** which will operate with highend Windows and CAD/CAM applications. This intelligent monitor is microprocessor controlled with a powerful memory base of pre-programmed screen and input configurations. It also allows users to place their own settings into memory via external controls. It's setting status is indicated on screen. It is compatible with various kind of computers and graphics adapters it synchronizes automatically with the signal from 30kHz to 72kHz horizontal frequency and from 50Hz to 120Hz Vertical scan frequency. When it works on 1024 x 768 non-interlaced/70Hz mode, the refresh rate for flicker-free high quality image will help to reduce eye strain. A power management function has been designed to save power consumption and power management is compliant with VESA and TCO. The monitor is available with two industrial designs: one for ACER and the other for OEM.

It has the following features:
-With unique design of iScreen
-Universal switching power supply
-0.28mm dot pitch CRT
-User controls: Power on/off, " P " , " ← " , " → " , " S " , are all in front bezel.
-On screen control indicators for user:
<P1>displayContrast,Brightness,H-phase,H-size,V-center,V-size,Pincushion,
Trapezoid,Tilt adjustment status.
<P2>display Manual degaussing,iColor control and adjustment status.
<P3>display mode timings status.
-Power on/off indicator
-Power on auto deguassing
-20 seconds auto save function
-Total 22 modes for factory and user settings
-Tilt and swivel base
-Detachable power cable
-VGA resolution at 31.5kHz
640 X 400
640 X 480

-6448A resolution: 640X480 at 37.5kHz
-6448B resolution: 640X480 at 43.27kHZ
-SVGA resolution:800X600 at 37kHZ to 48kHz
-UVGA resolution: 1024X768 at 48kHZ to 60kHz
-WS resolution : 1280 X 1024 (non-interlaced) at 64KHz/60kHz
-Automatic scanning all horizontal frequencies from 30kHz to72kHz
add all vertical frequencies between 50Hz and 120Hz
-Power management function
-MPRII function

1.2 Operational Specification

1.2.1 Environment

1.2.1.1 Temperature

-Operating	5 to +40 degrees Celsius
-Non-operating	-20 to +60 degrees Celsius

1.2.1.2 Humidity

-Operating	20% to 90% non-condensing
-Non-operating	10% to 95% non-condensing

1.2.1.3 Altitude

-Operating: 0 to 3,048m (10,000ft)
-Non-operating: 0 to 12,192m (40,000ft)
-Operating condition / without packing
-Non-operating condition / with packing

1.2.2 Vibration

Package, Non-Operating
-5--26.6Hz: 0.6G
-26.6--50Hz: 0.016"
-50--500H: 2G
-Total Test Time : 312min
(104min/Axis for X, Y, Z)
After test, there is no electrical and mechanical damage permitted.

1.2.3 Drop Test

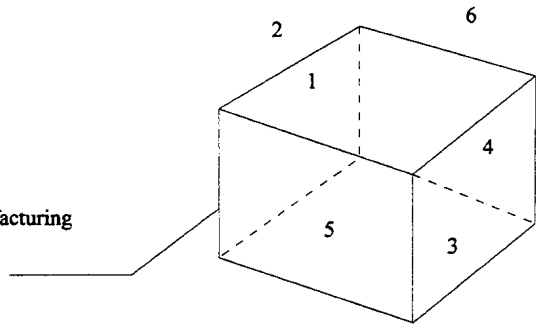
1.2.3.1 Drop Height

PKG. Gross Wt.No. of Drops Drop Height
41 - 60.991b(18.7-27.7kg) 10 24"(61cm)

1.2.3.2 Drop Sequence

Surface
1. Top
2. Front
3. Bottom
4. Rear
5. Left
6. Right

Manufacturing joint



-Corner 5-3-2 select at weakness side [the low left(or right) corner of the front panel]
-An edge drop with impact on the shortest edge radiating from corner 5-3-2
-An edge drop with impact on the next shortest edge radiating from corner 5-3-2
-An edge drop with impact on the longest edge radiating from corner 5-3-2
-A flat drop with impact on the rear
-A flat drop with impact on the front
-A flat drop with impact on the right
-A flat drop with impact on the left
-A flat drop with impact on the bottom
-A flat drop with impact on the top
After test, there is no electrical and mechanical damage permitted.

1.2.4 Electrostatic Discharge Requirements

The subject product must withstand 15kv test voltage of electrostatic discharge and meet the requirement as specified in ESD standard IEC801-2.

1.2.5 Safety Requirements

The display unit complies with the following safety standards and specifications.

1.2.5.1 110V Version

-UL compliance...standard for information-processing and business equipment, UL 1950.
-CSA compliance...standard C22.2 No. 950-M89, data processing equipment.
-DHHS...rules 21 sub-chapter J as of date of manufacture.

1.2.5.2 220V Version

-TUV compliance...EN60950 safety specification-business equipment.
-PTB...German X-ray emission standards.
-ZH1/618...German ergonomic standard.
-ISO9241-3...Ergonomic Requirements of Visual Display.
-Demko... EN60950.
-Nemko... EN60950.

-Semko... EN60950.
-Fimko.... EN60950.
-CE marking compliance....73/23/EEC (EN60950)

1.2.6 EMC Requirements

This display unit complies with the following RFI rules and regulations.

1.2.6.1 110V Version

-FCC compliance....FCC Rule, Part 15, Subpart B, Class B.
-VCCI

1.2.6.2 220V Voltage

-CE Mark Compliance... 89/336/EEC.
EN50082-1, IEC801-2, IEC801-3,IEC801-4.
EN50081-2, EN55022, CLASS B.
EN60555-2, EN60555-3.
-DNSF compliance....,EN 55022, class B
-Low Radiation.....MPRII

1.2.7 Acoustical Noise

With the display operating, the issue of sound measured is contained within 40 dB/A in the audible field.

1.2.8 Reliability

Demonstration MTBF of the display unit shall be greater than 60,000 hours excluding the picture tube.

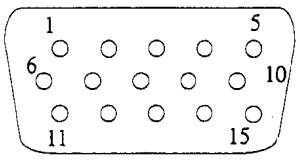
1.3 Input/Output Specifications

1.3.1 Input Signal Requirements

1.3.1.1 Signal Cable (Directly Attached to Unit)

1.3.1.1.1 Video Inputs

15pin mini D-sub connector is on the captive signal cable for IBM VGA, 8514A or compatible graphics adapters The pin assignment's of this connector are as the follows.



**15pin mini D-sub male

1. RED VIDEO
2. GREEN VIDEO
3. BLUE VIDEO
4. GROUND
5. GROUND
6. RED GROUND
7. GREEN GROUND
8. BLUE GROUND
9. +5V
10. SYNC GROUND
11. GROUND
12. SDA
13. H.SYNC (H+V)
14. V.SYNC
15. SCL

1.3.1.1.2 Cable Length

1500mm +- 20mm

1.3.1.2 Video Signal

Analog 0.7 Vpp/75 ohm positive.

1.3.1.3 SYNC Signal

-Separate SYNC : TTL level

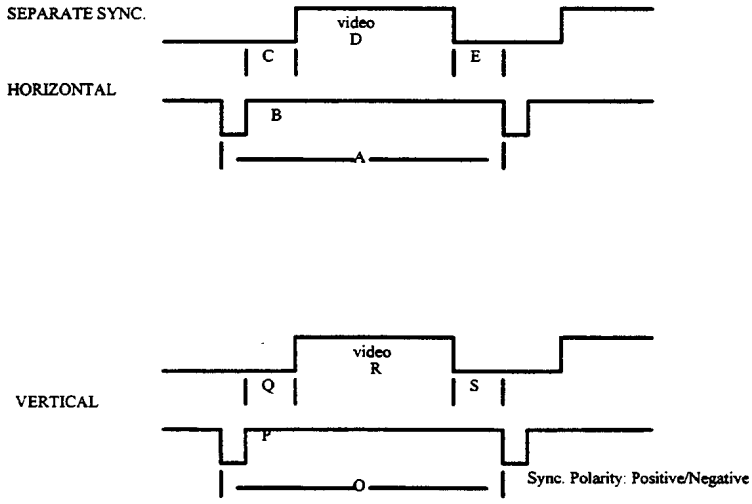
-Horizontal SYNC : positive/negative

-Vertical SYNC : positive/negative

-Composite SYNC : TTL level, positive/negative

1.3.1.4 Timing

The video signal timing is as following:



PRESET TIMING

VGA/SVGA Timing

	VGA400	VGA480	6448A	6448B
(fH)	31.47KHz	31.47KHz	37.50KHz	43.27KHz
(Aus)	31.77	31.77	26.667	23.111
(Bus)	3.81	3.81	2.032	1.333
(Cus)	1.907	1.907	4.063	3.111
(Dus)	25.42	25.42	20.317	17.778
(Eus)	0.318	0.318	0.255	0.889
(fv)	70.08Hz	59.94Hz	75.0Hz	85Hz
(Oms)	14.27	16.68	13.333	11.764
(Pms)	0.064	0.064	0.080	0.069
(Qms)	0.86	0.76	0.427	0.578
(Rms)	13.157	15.762	12.80	11.093
(Sms)	0.191	0.095	0.026	0.024
Display Resolution	640x400	640x480	640x480	640x480
Polarity H/V	-/+	-/-	-/-	-/-
Sync Type	separate	separate	separate	separate

PRESET TIMING

-VGA/SVGA Timing

	SVGA3	SVGA4	SVGA5	UVGA7
Compatible				
(fH)	48.09KHz	46.875KHz	53.67KHz	60.023KHz
(Aus)	20.794	21.333	18.631	16.660
(Bus)	2.399	1.616	1.138	1.219
(Cus)	1.279	3.232	2.702	2.235
(Dus)	15.995	16.162	14.222	13.003
(Eus)	1.119	0.323	0.569	0.203
(fv)	72.01Hz	75Hz	85Hz	75.029Hz
(Oms)	13.887	13.333	11.756	13.328
(Pms)	0.124	0.064	0.056	0.05
(Qms)	0.667	0.448	0.503	0.466
(Rms)	12.510	12.8	11.179	12.795
(Sms)	0.772	0.021	0.018	0.017
Display Resolution	800 x 600	800 x 600	800 x 600	1024 x 768
Polarity H/V	+/+	+/+	+/+	+/+
Sync Type	separate	separate	separate	separate

- 1024 X 768 Non-interlaced Timing
- 1280 X 1024 Timing

	UVGA1	UVGA2	WS2	UVGA8
(fH)	48.363kHz	6.476kHz	63.69kHz	68.677KHz
(Aus)	20.677	17.707	15.7	14.561
(Bus)	2.229	1.813	1.6	1.016
(Cus)	2.622	1.920	2.0	2.201
(Dus)	16.783	13.653	11.9	10.836
(Eus)	0.393	0.320	0.2	0.508
(fv)	60.004Hz	70.069Hz	59.86Hz	85Hz
(Oms)	16.66	14.272	16.7	11.765
(Pms)	0.124	0.106	0.047	0.044
(Qms)	0.6	0.513	0.534	0.524

(Rms) 15.88	13.599	16.07	11.183
(Sms) 0.062	0.053	0.016	0.015
Display Resolution			
1024x768	1024x768	1280x1024	1024X768
Polarity H/V			
-/-	-/-	+/+	+/+
Sync type			
separate	separate	separate	separate

1.3.1.5 Input signal Quality

(1) Rise/Fall time

Video Signal : less than 3.5ns

Horizontal SYNC : less than 50ns

Vertical SYNC : less than 100ns

(2) TTL Signal Level

The levels of Horizontal & Vertical SYNC will be TTL level, their high level will be 2.4-5.5V, and low level will be 0-0.2V.

(3) Video Signal Level

The video signal when terminated with an idea 75ohm termination will have a range of 0V to 0.7V (nominal), and its full scale output will be 0.7V and black level will be between 0V and 0.1V.

1.3.2 Power Supply Requirements

1.3.2.1 Input Power Requirements

(1) Input Voltage Range

The unit shall meet all the operating requirements with an input voltage range of 90-264 Vac

(2) Input Current

Maximum Input Current Measuring Range

(MAX) 1.5 Arms with PFC 90Vac -- 264Vac

(MAX) 2.5Arms w/o PFC

(3) Frequency Range

The unit shall operate within a frequency range of 47Hz to 63Hz.

(4) Inrush Current

Power supply inrush current shall be less than 50A for all conditions of line voltage.

(5) Regulator Efficiency

70% minimum (measuring at 115Vac and full load)

(6) Synchronization

The switching frequency of unit must be designed to synchronize to the horizontal frequency of the display unit.

(7) Power line Transient Immunity

The power supply shall function properly after being subjected to a 0.3us/1.2us, 2000 volt high peak pulse, or 5ns/10ns, 1500 volt fast peak pulse applied either differentially or single endedly to line and neutral at any phase of the power line voltage and shall not cause an unsafe or unrecoverable errors.

(8) Power consumption: maximum 100 Watts at full scan display size with full load pattern.

1.3.2.2 Output Power Requirements

The power circuit shall supply DC power outputs as followings:

Output	Norminal	Regulation	Load Current Range
1	16V	± 3%	0.4A-0.75A
2	85V	± 3%	0.02A-0.15A
3	6.5V	± 3%	0.6A-0.95A
4	50V	± 3%	0.8A-1.0A

1.3.2.3 AC Power Inlet

The display unit shall be supplied with an AC power NICOON NC-174(or equivalent), to be located at the rear of the display.

1.3.2.4 Power Cord

Each display unit shall be supplied with a power cord, with length of 1800 ㎜ king cord KC-003 or equivalent.

1.3.2.5 Power Management Function

Mode	Power Consumption	H/V Sync	LED Color & status	Heater voltage	Recovery Time
Normal	Normal	Both exist	Green Normal	Yes	----------
Stand-by	15W Max	H off/V ON	Amber	Yes	immed.
Suspend	15W Max	H ON/V off	Amber	Yes	3 sec
off	5W Max	None	Amber *Blinking	None	8 sec
**Override	Normal	None	Green Normal	Yes	----------

* LED blinking duration : 1.3± 0.2 sec. The interval of LED lights up vs off for 20% vs 80%.

** Override : The signal cable is removed from monitor side, generally used in burn-in test.

1.3.3 CRT Requirements

The color picture tube used shall be a 17 inch, 90 degrees, HI-RES tube and shall have the following features:

-Type: 17" in line electron gun, full square/flat face.

-Dot pitch: 0.28mm dot triad
-Phosphor: P22 or equivalent
-Light transmittance: 52%
-Faceplate treatment: non-glare
-Double focus

1.4 Functional Specifications

All the tests to verify specifications in this section must be performed under the following standard conditions unless otherwise noted. The standard conditions are:
-Temperature : 25 +-5 degree Celsius
-Magnetic field : No additional magnetic field in near side, CRT faces to East.
-AC line input voltage : 110Vac
-Warm-up time : 30 minutes minimum
-Checking display mode : All the presenting modes, as 3.1.4 shown.

1.4.1 Display Quality

1.4.1.1 Display Date Area (with 20 ft-l at Full White Pattern)

(1) Horizontal 300 ± 4mm
(2) Vertical 225 ± 4mm

1.4.1.2 Video AMP Performance

(1) Video bandwidth : 110MHZ
(2) Resolution : 1280 X 1024 max(center)
(3) Effective rise/fall time : 6.5ns typical
(4) Ringing : 10% max, first overshoot
4% max, second overshoot
1% max, third overshoot
(5) Sag : 5% max (at horizontal freq.)

Measurement Condition:
Signal Input Source: Chroma Signal generator
Input Timing / pattern : Fh=68KHz Cross-hatch pattern measure method: Input Cross-hatch pattern signal , then set External contrast Adjustment max. and Brightness 30 and measure the output signal from each cathode of detached CRT socket at the equivalent cathode capacitance when probe is attached. From measuring the high frequency part of Input signal, we get the video AMP performance parameter defined above.

1.4.1.3 Light Output

(1) At 3" block pattern (ABL is non-working) : 45Ft-L min (C1 ~ C5).
(2) At full-white pattern (ABL is working) : 30Ft-L typical.

All the above is based on the conditions that Brightness Control, and contrast control are set to maximum.

1.4.1.4 Contrast Adjustment Range

over 15dB

1.4.1.5 Brightness Adjustment Range

At contrast control set at maximum level, adjusting Brightness control from factory setting to maximum position, the light output of 3" block pattern shall be increased more than 20Ft-L. If adjusting Brightness control from factory setting to minimum level, the 3" block pattern shall be extinguished when contrast control is set minimum also.

1.4.1.6 Linearity (Set to 20 Ft-L at Full White Pattern First) at Crosshatch Pattern

(1) Vertical Non-linearity 5% max. as Fig.1

(2) Horizontal Non-linearity 5% max. as Fig.1

1.4.1.7 Geometric Distortion (with 20Ft-L at Full White Pattern)

(1)	Top/Bottom Pincushion	2.0 mm max. as Fig.2 a1 or a2
(2)	Side Pincushion	2.0 mm max. as Fig.2 b1 or b2
(3)	Top/Bottom Barreling	2.0 mm max. as Fig.3 a1 or a2
(4)	Side Barreling	2.0 mm max. as Fig.3 b1 or b2
(5)	Vertical Trapezoid	2.0 mm max. as Fig.4 |AD-BC|
(6)	Horizontal Trapezoid	2.0 mm max. as Fig.4 |AB-CD|
(7)	Tilt	1.2 mm max. as Fig.5 b1 or b2
(8)	Orthogonal	2.0 mm max. as Fig.5 a1 or a2
(9)	Picture Centering	6.0 mm max. as Fig.5

1.4.1.8 Size Stability

Picture growth from 5 Ft-L to maximum Ft-L shall be less than 3mm with full white pattern (double side).

1.4.1.9 Swing & Jitter

Swing & Jitter are not permitted in the conditions stated as followings:(the distance of watch is **30cm** from eyes to screen)

(1) AC power input fluctuated from 90Vac to 264Vac.

(2) Brightness & contrast control changed from max, to min. or vice versa.

1.4.1.10 Focus (The Distance of Watch is 30cm from Eyes to Screen)

Under the condition of luminance of **20Ft-L** at full-white pattern (brightness control factory setting, contrast control adjusted), all # characters on the screen in the "#" pattern will be clear.

1.4.1.11 DDC1/2B Table

Address	Data	Description
00	00	Header
01	FF	
02	FF	
03	FF	
04	FF	
05	FF	
06	FF	
07	00	
08	06	ID Manufacturer Name = API
09	09	
0A	02	ID Product Code = 7276e
0B	97	(Vender Assigned code)
0C	*	ID Serial Number
0D	*	32 bits serial no.
0E	*	(use 0 if n/a)
0F	*	
10	*	Week of Manufacture (0-53),use 0 if n/a
11	*	Year of Manufacture (year - 1990)
12	01	EDID version
13	01	Revision
Address	Data	Description
14	0C	Video Input Define
15	1E	Max. H. Image Size (cm)
16	17	Max. V. Image Size (cm)
17	C8	(gamma*100) - 100
18	E8	DPMS
19	89	Red Green Bits Rx1Rx0Rxy1Ry0Gx1Gx0Gy1Gy0
1A	CE	Blue White Bits Bx1Bx0By1By0Wx1Wx0Wy1Wy0
1B	A2	Red x bit9-2
1C	55	Red y bit9-2
1D	47	Green x bit9-2
1E	98	Green y bits9-2
1F	26	Blue x bit9-2
20	10	Blue y bit9-2
21	47	White x bit9-2
22	4F	White y bit9-2
23	A4	Established Timing I
24	CE	Established Timing II
25	00	Established Timing III
26	45	Standard Timing Identification
27	59	#1 800x600 / 85Hz
28	81	#2 1280x1024 / 60Hz
29	80	
2A	31	#3 640x480 / 85Hz

2B	59	
2C 2D	61 59	#4 1024x768/85Hz
2E 2F	01 01	#5
30 31	01 01	#6
32 33	01 01	#7
34 35	01 01	#8
36 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43	00 00 00 FE 00 4D 6F 6E 69 74 6F 72 0A 20	Detailed Timing Description # 1
Address 44 45 46 47	Data 20 20 20 20	Description
48 49 4A 4B 4C 4D 4E 4F 50 51 52 53 54 55 56 57 58 59	00 00 00 FE 00 4D 6F 6E 69 74 6F 72 0A 20 20 20 20 20	Detailed Timing Description # 2
5A	00	Detailed Timing Description # 3

5B	00	
5C	00	
5D	FE	
5E	00	
5F	4D	
60	6F	
61	6E	
62	69	
63	74	
64	6F	
65	72	
66	0A	
67	20	
68	20	
69	20	
6A	20	
6B	20	
6C	00	Detailed Timing Description # 4
6D	00	
6E	00	
6F	FE	
70	00	
71	4D	
72	6F	
73	6E	
74	69	
75	74	
76	6F	
77	72	
78	0A	
79	20	
7A	20	
7B	20	
7C	20	
7D	20	
7E	00	Extension Flag
7F	*	Check sum

Note 1

Bit	Bit Description
7	Analog / Digital Signal Level
6	Signal Level Standard (6)
5	Signal Level Standard (5)
4	Setup
3	Sync Inputs Supported (3)
2	Sync Inputs Supported (2)
1	Sync Inputs Supported (1)
0	Sync Inputs Supported (0)

Bit	Description	
7	Analog / Digital Input : Defines usage of the rest if the byte as "analog input" or digital input". Analog=0, Digital=1 . If input is described as analog, the following definitions apply to bits 6-0. Digital is as yet undefined in the following but provisions have been made in anticipation of a common video output standard for Flat Panel Display (FPD) use.	
6:5	Signal Level Standard (6:5) : Refer to the following bit definitions. Identified by the level of reference white volts above blank, followed by the level of the sync tips in volts below blank. Bit 6 / Bit 5 / Operation 0 / 0 / 0.700V/0.300V (1.000V p-p) 0 / 1 / 0.714V/0.286V (1.000V p-p) 1 / 0 / 1.000V/0.400V (1.400V p-p) 1 / 1 / Reserved; TBD	
4	Setup: If set, the display is set to expect a blank-to-black setup or pedestal per the appropriate signal level standard.	
3:0	Sync Inputs (See Bit Operation below)	
	3	Separate Sync
	2	Composite Sync (on H Sync line)
	1	Sync on Green Video
	0	Serration of the V.Sync Pulse is required when composite sync or sync-on-green video is used

Note 2

Bit 7	Stand-by
Bit 6	Suspend
Bit 5	Active off
Bit 4:3	Display Type
	0,0 - Monochrome/gray scale display 0,1 - RGB color display 1,0 - Non-RGB multicolor display (example:RGY) 1,1 - Undefined.
Bit 2:0	Reserved. Set at 00h until defined.

Note 3

CRT Vender	Red (x/y)	Green (x/y)	Blue (x/y)	Gamma
Matsushita	0.635/0.333	0.280/0.595	0.152/0.063	3.0

Note 4

Byte 1	bit	Established Timings 1	Source
	7	640*400 @ 70Hz (720x400)	(VGA, IBM)
	6	720*400 @ 88Hz	(XGA2, IBM)
	5	640*480 @ 60Hz	(VGA, IBM)
	4	640*480 @ 67Hz	(Mac II, Apple)
	3	640*480 @ 72Hz	(VESA)
	2	640*480 @ 75Hz	(VESA)
	1	800*600 @ 56Hz	(VESA)
	0	800*600 @ 60Hz	(VESA)
Byte 2	bit	Established Timings II	
	7	800*600 @ 72Hz	(VESA)
	6	800*600 @ 75Hz	(VESA)
	5	832*624 @ 75Hz	(Mac II, Apple)
	4	1024*768 @ 87Hz (interlaced)	(IBM)
	3	1024*768 @ 60Hz	(VESA)
	2	1024*768 @ 70Hz	(VESA)
	1	1024*768 @ 75HZ	(VESA)
	0	1280*1024 @ 75HZ	(VESA)
Byte 3	bit	Manufacturer's Timings	Manufacturer's Specified Timing
	7	1152*870 @ 75Hz	(Mac II, Apple)
	6	640*480 @ 85HZ	
	5	800*600 @ 85HZ	
	4	1024*768 @ 85HZ	

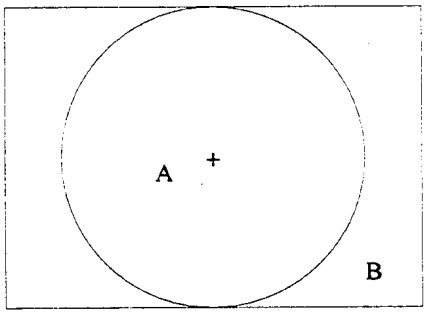
	3	1280*1024 @ 85HZ	
	2	1600*1200 @ 75HZ	
	1	1600*1200 @ 85HZ	
	0	Flag	If set = 1,then bits 6 - 1 (inclusive) should be interpreted as Manufacture Timings as EDID Ver 1 Rev 0.

1.4.2 Color Quality

1.4.2.1 Misconvergence

Use "crosshatch" white pattern, then set the brightness control at weight number is 50 & contrast control max to examine the convergence.

The misconvergence must strictly meet the requirements stated as follows:



Center <= 0.15mm

A : <= 0.30mm

B : <= 0.40mm

1.4.2.2 Moire (the Distance of Watch is 30cm from Eyes to Screen)

In the pattern of all green, all blue, all red, or all white, and the luminance is > 18Ft-L, moire is not allowed to appear. (Limit samples should be used by mutual agreement, if necessary).

1.4.2.3 Impurity

Impurity should not appear in the pattern of all green, all blue, all red, or all white, the brightness is 0 to max Ft-L and the screen display is set to east direction.

1.4.2.4 White Balance

At the condition of all white pattern, 9300K and 6500K are required to meet the specifications of x.y variety value < 5% , others white balance are required to meet the specifications of x.y variety value <10% when brightness control and contrast control changed from 5ft-l to maximum.

11500 K	x: 275	y: 275
9300 K	x: 281	y: 311
7100 K	x: 305	y: 315
6500 K	x: 313	y: 329
5500 K	x: 332	y: 348

1.4.2.5 Uniformity

When the display unit is displayed with mosaic pattern at the central brightness of 20 Ft-L, the corner (A,B,C,D) brightness must be ≧ 14 Ft-L.

A		B	75mm
	20Ft-L		75mm
C		D	75mm
100mm	100mm	100mm	

A,B,C,D ≧ 14Ft-L

Indicator of Testing Position

1.4.2.6 Degaussing

Degaussing shall occur automatically when the monitor is turned on and shall be sufficient to demagnetize the CRT to any possible change in Earth's magnetic field from movement or shipment. Degaussing shall occur by mannual when the monitor is setting at iColor adjust.

1.4.3 Controls & Presetting

1.4.3.1 User Control (on the Front Panel)

Power on/off switch--rocker switch

On screen controls:

* " P "
* " ← "
* " → "
* " S "

(1) " P " key : to be used for the page selection or feature change between function selection and adjustment which user wants to check and adjust.

(2) " S " key : to be used for save new settings and the clearance of " on the screen " display or access selected function.

(3) " ← " , " → " key : to be used for function selection, which user wants to adjust in each page or used for volume adjustment on each parameter.

(4) The 1st page: this page includes 10 function parameters: contrast, brightness , horizontal phase, horizontal size, vertical center, vertical size, pincushion, trapezoid, parallelogram and tilt control.

a. Press "P" key , then user can address this page for function adjustment. After page selection is addressed, the user can press " ← " " → " key for function selection. After function is selected, then press " S " key for control election, then press " ← " " → " for control volume adjustment.

b. Press " ← " + " → " two keys, the "Recall" function is effective, meanwhile, there is a mark " ⧖ " will be shown on the screen, then all of the parameters of current display mode that has the factorypreset data will be returned to original factory setting. The control volume of each parameter is shown by numeric number and scale.

c. Each page of the OSD is divided into two parts, one is controlled part for the display of controlled selection and adjustment, the other is indicated part for the display of operating description.

d. The background color of controlled part is "blue", the foreground is "white" , the background color of selected icon is "yellow" , the selected item is "red".

e. The background color of indicated part is "red" , the foreground is "white" , the background color of the key indicated color is "yellow", the foreground is "red".

(5) The 2nd page: this page is defined as color weight adjustment and degaussing functions. The operation procedures are as follows:

a. Press page 2 times to enter to this page for function adjustment.

b. Degaussing

Press the " ← " " → " key to first icon then press " S " key, the monitor will auto degauss.

c. For the C1 ~ C5 are color storage area, which with factory preset and also can be modified by user.

The preset information as follows:

COLOR MODE	COLOR TEMPERATURE PRESET
C1	9300K
C2	6500K
C3	5500K
C4	7100K
C5	11500K

d. Color setting

Press " ← " " → " key to choose which mode you want to modify, then press "S " to choose which color you want to modify, then press " S " again to modify the weight of the chosen color.

(6) The 3rd page: this page will be defined as "status display" field, which can show the resolution, horizontal frequency and vertical frequency status.

1.4.3.2 Presetting

The display modes which their timings are shown in section 3.1.4 are presetted by factory on the manufacture to meet all the requirements of this specification. The user can press the " ← " + " → " button to recall the factory installed preset display settings at any present operating mode to replace the existing user installed display settings.

1.4.3.3 User setting

When user changes the display settings, such as: H-size, H-phase, V-size, V-center, and Side-pincushion, Trapezoid, parallelogram, Tilt, Brightness, Contrast, iColor, all the changes will be saved automatically after about 20-second delay when finished the settings or press " S " to save the settings immediately.

1.4.3.4 Microcontroller Control

(1) Memory Partition

There are 22 memory partitions which are used to memory 22 display modes including its timing formats and display settings, which includes H-size, V-size, H-phase, V-center, Side-pin, Trapezoid, parallelogram, and divided to two area-one for factory preset and the other for user setting area

(2) Factory Preset Area

The factory settings for H-size, H-phase, V-size, V-center, Side-pin, Trapezoid, Parallelogram, Tilt and Unbalance are preset by manufacture, user is not allowed to change factory settings. All these changed data will be saved in user setting area automatically.

(3) User Setting Area

The user settings for H-size, H-phase, V-size, V-center, Side-pin, Trapezoid, Parallelogram, can be memorized different display modes, and Tilt only can be saved in one mode. The user settings are stored one by one in the user setting area. When the number of setting exceed user setting area, it will overlap from the first user setting.

There is 1 user setting for Brightness control level.

There is 1 user setting for Contrast control level.

1.4.3.5 OSD Screen Position

The OSD screen position is defined within ± 30mm for different input timing.

1.5 Physical Specifications

1.5.1 Physical Dimension & Appearance

1.5.1.1 Overall Dimensions

422mm (W) X 420mm (H) X 425mm (D)

1.5.1.2 Net Weight

17.4Kg

1.5.1.3 Outer Appearance

See Fig.6 & Fig.7

1.5.2 Construction and Materials on Outer Surface

-Materials: Plastic

-Color: Light Gray

1.5.3 Base & Swivel

-Tilt: -5/+15 degrees

-Swivel: -45/+45 degrees

1.5.4 Marking & Labels

1.5.4.1 Reference Label (Rear Panel)

(1) Reference numbers

(2) Manufacture data

(3) Agency Approvals

(4) Power Ratings

1.5.4.2 Controls & Connectors

(1) AC power cord input: abbreviated labels

(2) User's Controls: standard print

1.5.5 Packaging

1.5.5.1 Carton Dimension

TBD

1.5.5.2 Shipping Weight

20.5Kg

1.6. Maintainability Specifications

1.6.1 General & Requirements

1.6.1.1 Installation

From outside of unit with standard tools and documentation provided to user.

1.6.1.2 Periodic Maintenance

No periodic maintenance is required.

1.6.1.3Repair & Calibration

Require equipment and spare modulers or components as specified as followings:

(1) MAIN ASSY P/N 55.72401.001

(2) VIDEO ASSY P/N 55.72402.011

1.6.2 Mean Time to Repair

1.6.2.1 Module Level

Less than 10 minutes

1.6.2.2 Component Level

Less than 15 minutes

1.6.3 Accessibility

1.6.3.1 General

All panels, covers, and major assemblies are removable without disruption of permanent mounting or fasteners.

1.6.3.2 Outside Cabinet, Access to the Following Elements

-Operating Controls: see section 4-3

-Power Connectors: see section 3-2

1.6.3.3 Cover Removal, Access

All sub assemblies and internally adjustable components may be accessed by removing the bucket and the bezel together.

1.6.4 Equipment & Tools Required

1.6.4.1 Standard Test Equipment

(1) Voltmeter

(2) Dual trace oscilloscope

(3) High voltage probe

(4) Hand tools as required

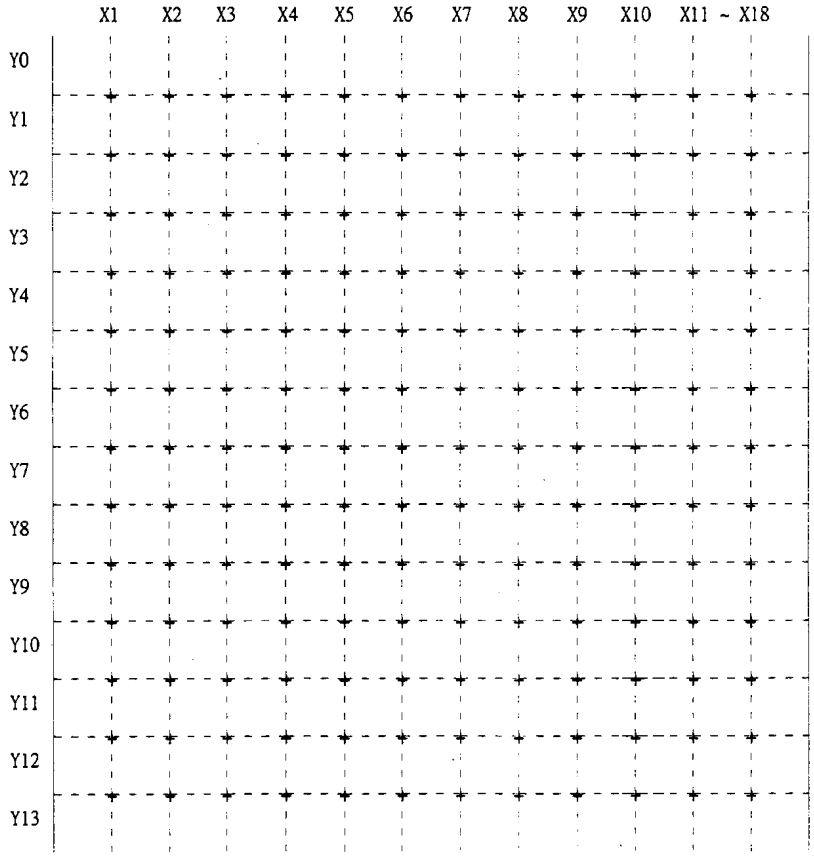
(5) Color analyzer, Minolta TV2130 or equivalent.

(6) Pattern Generator CHROMA-2000 (or equivalent).

1.6.4.2 Documentation

A service manual will be available which covers all service requirements. A users manual written in German, Italian, and English will be available to ship with the product.

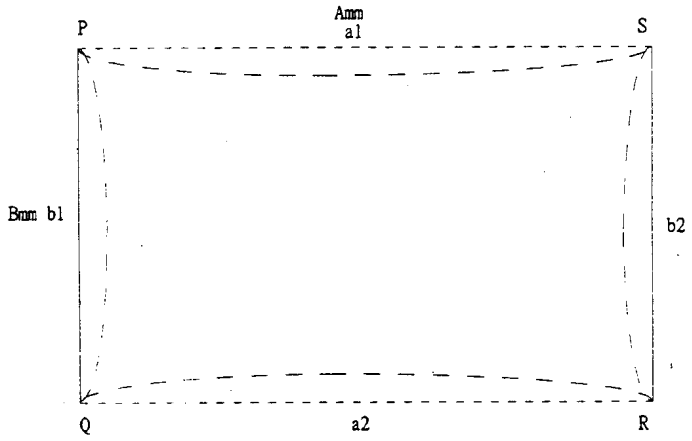
Fig.1 Linearity Measurements



$$\frac{Xmax - Xmin}{Xmax + Xmin} \times 100\%$$

$$\frac{Ymax - Ymin}{Ymax + Ymin} \times 100\%$$

Fig.2 Pincushion Measurements



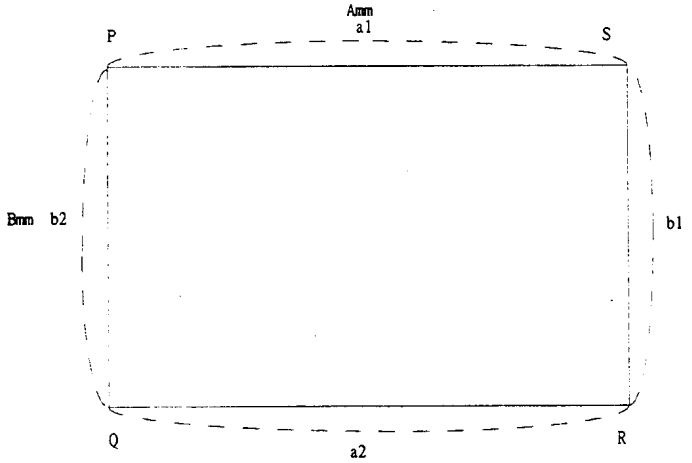
A, B represented as display area width and height

Top/Bottom Pincushion = (a1 or a2)

Side Pincushion = (b1 or b2)

substituted A by (PS + QR)/2
B by (PQ + RS)/2

Fig.3 Barreling Measurements



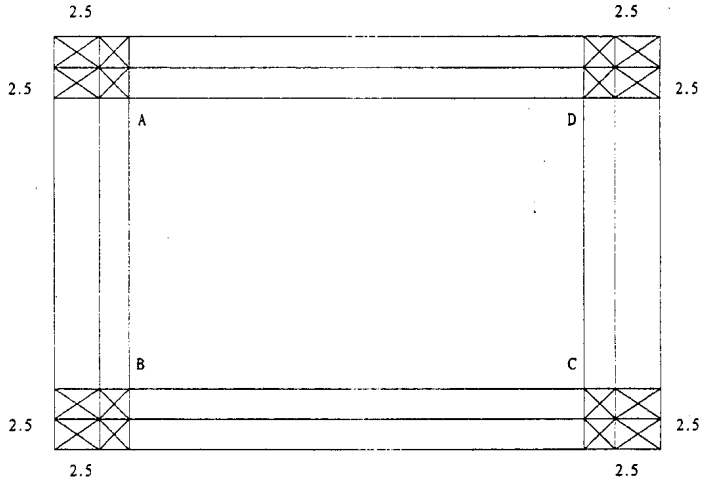
A, B represented as display area width and height

Top/Bottom Pincushion = (a1 or a2)

Side Pincushion = (b1 or b2)

substituted A by (PS + QR)/2
B by (PQ + RS)/2

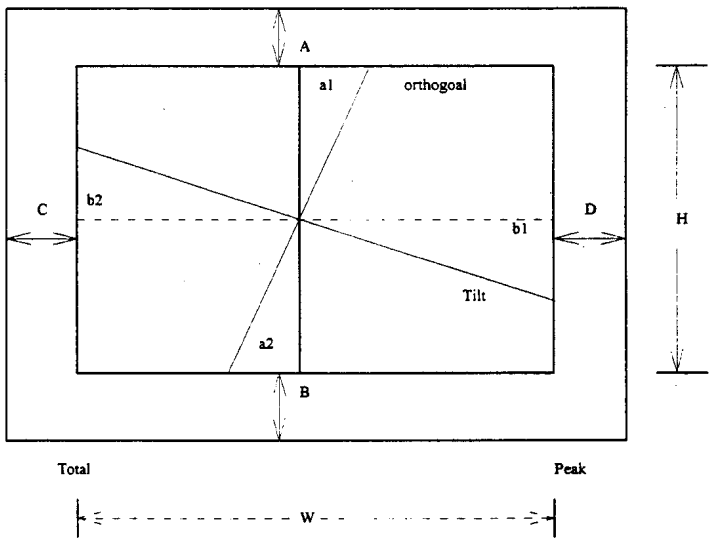
Fig.4 Trapezoid Measurements



* Each of the 4 corners of picture shall fall within the relevant area (F) illustrated up (hatched)

* ABCD is the picture outlines.

Fig. 5 Picture Distortion & Phase Measurements



V (Cent) = |A-B| < 6mm

H (Cent) = |C-D| < 6mm

Fig.6 Physical Dimension, Front View

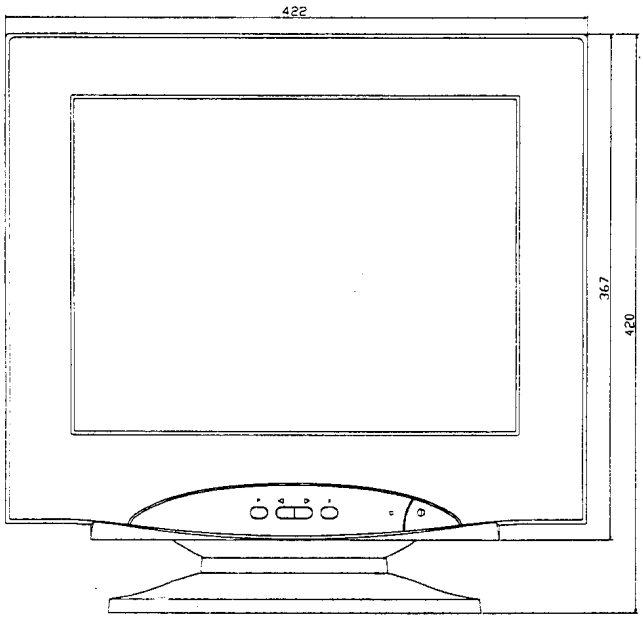
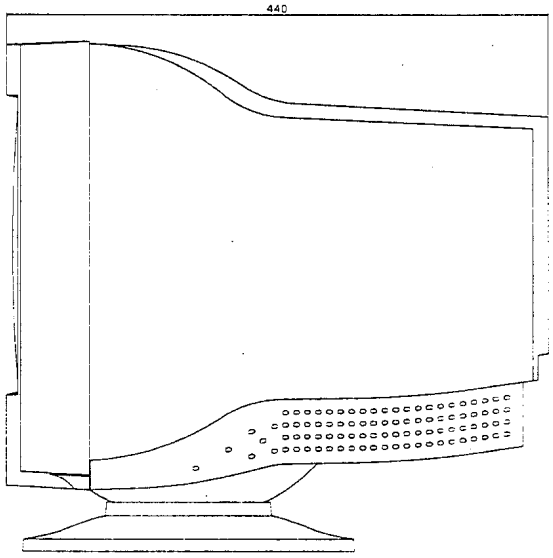


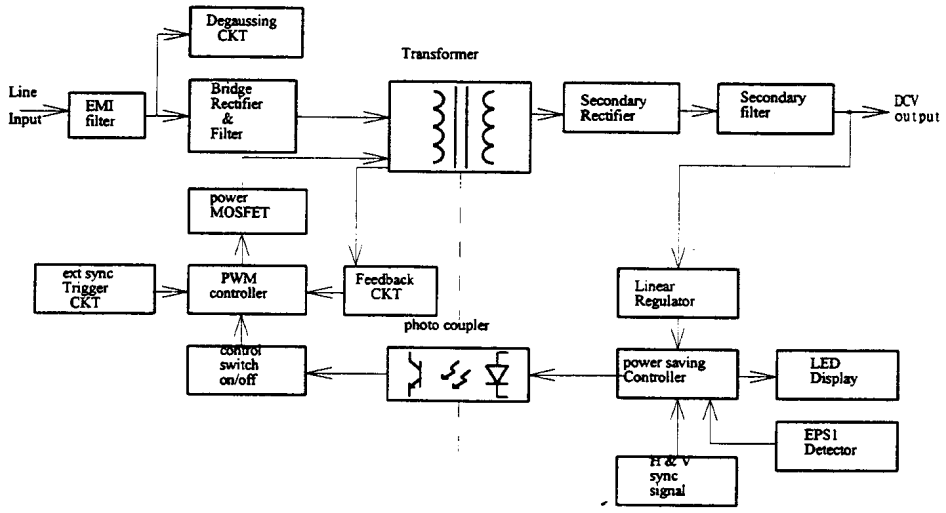
Fig.7 Physical Dimension, Side View



Chapter 2

Circuit Operation Theory

2.1 Block Diagram



2.2 General Specification

Input voltage : AC 90~264V
Input Frequency: 47~63Hz
Input current: 2.5A max
Input power: 100W max

2.3 EMI Filter

(1) EMI components have R601, common choke L602, X CAP C601, differential choke L603, L604,Y CAP C602, C603. These component main purpose is to reduce EMI interference
(2) TR601 is a NTCR to reduce inrush current when the power start up.
(3) TR602 is a PTCR to control this current of degassing coil to achieve degaussing effect when the monitor just starts up.
(4) D602, D603, D604, D605 are the bridge rectifier the C612 is filter CAP

2.4 PWM IC

The current mode PWM controller is the UC3842 which the function of each pin described as followings:

pin 1 : error amplifier output

pin 2 : error amplifier reverse input
pin 3 : current sensor
pin 4 : OSC sawtooth
pin 5 : GND
pin 6 : output
pin 7 : VCC
pin 8 : Vref = 5V
start threshold 16V (TYP)
min operating voltage after turn on 10V (TYP)
Duty cycle max:97 %
Low start up current < /MA (max)

2.5 Soft Start CKT

The D611, D612, R614, C617 are soft start components to avoid the duty too large when power starts up.

2.6 Ext. Sync CKT

The IC601 sawtooth fuquency f = $\frac{1.72}{R613.\ C615} \fallingdotseq$ 18.0 KHz T602, C650, ZD650, R612 are EXT SYNC CKT components.

2.7 Turn On CKT

The R602, R603 are start resistance of the IC601. The IC601 VCC energy supply is from winding 8-9 of T601 after the IC601 turns on.

2.8 Switching Power MOSFET

The switching power misfit is 2SK956 of Fuji .
VDSS=800V max
VGS=30V max
ID=9A max
RDS (ON)=1.5 Ω
insulated package

2.9 Power Transformer

Core Type : EE42-15

core material : 3C80	PHILIPS	L ≒ 185UH
PC40	TDK	leakage ≒ 5UH
PL-3	SAM WHA	
B50	THOMSON	

2.10 The secondary rectifier and filter

+6.5V : D706 EGP30B, C713 2200U / 16V
+16V : D704 EGP30D, C706 1000U/25V, C710 470U / 35V
+50V : D701 FES8JT, C702 470U /100V,C704 220U/100V
+85V : D703 2NU41, C703 220U /100V,C708 220U/100V

2.11 Output power Requirements

The power circuit shall supply DC power outputs as followings:

Output	Nominal	Regulation	Load Current Range
1	50V	± 3%	0.3A~1.0A
2	85V	± 3.5%	0.05A~0.15A
3	16V	± 5%	0.5A~0.8A
4	6.5V	± 3.5%	0.5A~0.8A

2.12 Power Management

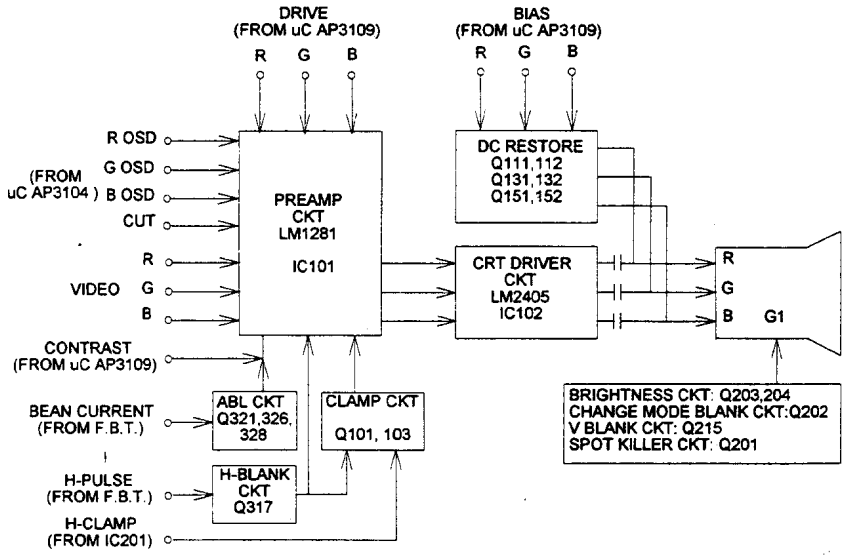
The monitor handles the power saving modes according the final VESA specification with H-sync and V-sync recognition. The power LED flashes amber only at OFF mode as follows.

Mode	H-sync	V-sync	Power	LED	Recovery Time
Stand-By	Inactive	Active	< 15W	Amber	1 sec
Suspend	Active	Inactive	< 15W	Amber	1 sec
off	Inactive	Inactive	< 5W	Amber Blinks	8 sec
Burn-In	Inactive	Inactive	< 70W	Green	--

The picture should appear within 10 seconds after the system be waked up.
The performance of unit should be in specifications within 30 minutes after the system be warmed up.

2.13 Video CKT

7276IE VIDEO C.K.T. BLOCK DIAGRAM :



2.14 OSD Preamp CKT:

(1) AS shown in the block diagram:
The R/G/B signals will generate an enough amplitude of Vpp to show up on the CRT screen after the amplification of two amplifiers. The first one, preamp CKT, process the signal and mix up the OSD, and the second one does the power amplification.

(2) OSD preamp IC101, LM1281, will output the R.G.B signals separately. The R.G.B driver will control the gain of these three guns individually to approach the white balance of CRT. Then the CONTRAST (from UC AP3109) control the gain of these three guns simultaneously.

(3) The purpose of signal CLAMP is to fix the black level of all R.G.B signals to the same level after the AC couple. This is the DC Restoration of pre-amplifier.

(4) The signal H-Blank is to let the output of LM1281 down to 0.2V while non-display duration. Then the CRT driver CKT will generate a level higher than Black Level. (ie SYNC TIP), therefore the video signal will be blanked in order to prevent the fold over to occur while adjusting H-phase. Besides, the SYNC TIP is used for the DC Restoration of cascade CKT.

(5) LM1281 is equipped with OSD mixer. when signal CUT is Low, the output of LM1281 is video signal when signal CUT goes high, the output will be OSD signal.

2.15 CRT DRIVER CKT

Output stage adopts CRT driver LM2405 to amplify the signal which has been recessed by LM1281 to a enough amplitude of Vpp, then display on the CRT. The IC contains three high input impedance, wide band amplifiers which directly drive the RGB cathodes of a CRT. The gain of each channel is internally set at -15 and can drive CRT capacity loads as well as resistive loads presented by other applications, limited only by the package's power dissipation. The rise/fall time of IC is 7nS.

2.16 DC Restore CKT

(1) The video signal amplified by the output stage is coupled to CRT by way of AC coupling. SO DC restoration CKT is needed to do the white balance adjustment.

(2) This DC restoration circuit adopts SYNC TIP CLAMP, In the duration of SYNC TIP the capacitor charges, and the capacitor discharge in the other time. The Black Level is kept to the level of DC restoration seethed by UC.

2.17 ABL CKT(Auto Brightness Limit)

ABL is a protection circuit. When the anode current goes higher than the setting value of ABL circuit . ABL will pull down the voltage of contrast to limit the anode current. This is helpful to protect CRT.

2.18 H-BLANK CKT

After the collect pulse comes from FBT being shaped and inverted, it will be sent to pre-amp CKT and used as the H-Blank.

2.19 CLAMP CKT

The two sources of clamp pulse are: First, comes from IC201 when normal status second, since there is no output of H-clamp pulse from IC201 while Free RUN, it will be switched to H-blank. The H-clamp of IC201 comprises vertical is positive pulse, it will be shaped and inverted before sent to pre-amp.

2.20 Brightness, V-blank, Change Mode Blank, Spotkiller CKT

(1) About the cut off voltage, while the voltage, cathode to G1, over the cut off

voltage, the picture will disappear. If the cut off voltage of the CRT G Gun is set at 110V and the black level of cathode is 60v, the picture wont show. the signals higher the black level once the G1 voltage is lower than -50V.

(2) As described above, we may using the voltage control G1 as the brightness control. Generally the G1 control range is about 10~15V if the Raster brightness is from 0 to 1.5ft-L.

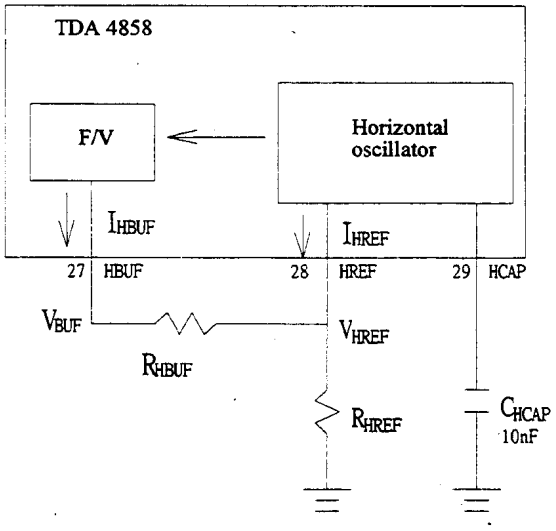
(3) Similarly, we may overlap a negative pulse of vertical duration on the G1 voltage to prevent the vertical retrace line from showing on the picture. This is to keep the voltage cathode to G1 over the cut off voltage during the period of vertical retrace.

(4) In order to avoid the picture occur transiently while change mode, pull down the G1 voltage and let the voltage cathode to G1 over CUT OFF voltage. This will make the picture blanking.

(5) While monitor turned off, the discharge speed of high voltage circuit is slow since there is no deflection scan act on the electronic beam, a spot which will destroy the phosphor of CRT. So the SPOT KILLER circuit will generate a negative voltage higher than CUT OFF to the G1 to cut the beam This is to protect the CRT.

2.21 Horizontal Deflection

(1) Horizontal oscillator



Horizontal oscillator block diagram

Horizontal oscillator frequency

$$\text{fh. osc (KHz)} = K \times \frac{I28\ (mA)}{C29(nF)} = K \times \frac{I_{HREF}\ (mA)}{C_{HCAP}(nF)}$$

with K equal to :

$$K = \frac{31.45K \times 10P}{2.55V/2.4K} = 296\ \frac{KHz \times nF}{mA}$$

with IHREF equal to :

$$I_{HREF} = \frac{V_{HREF}}{R_{HREF}} - \frac{V_{HBUF} - V_{HREF}}{R_{HBUF}} = \frac{1}{n} \times \frac{V_{HREF}}{R_{HREF}}$$

Operating frequency range : 31.5K to 68K

$$n_s = \frac{f_{s\ max}}{f_{s\ min}} = \frac{68K}{31.5K} = 2.16$$

	f_{max}	f_{min}
spread of IC	3%	3%
spread of C_{Hcap}	2%	2%
spread of R_{Href}	1%	
spread of R_{Href}. R_{Hbuf}	3.97%	<= 1 % (n_s x 2.3 - 1)
total spread	6%	8.97%

Therefore, the actual working frequency range

$$f_{min} = \frac{f_{s\ min}}{1.09} = \frac{31.5K}{1.09} = 28.85KHz$$

$$f_{max} = f_{s\ max} \times 1.06 = 68K \times 1.06 = 72.08KHz$$

then TDA 4858 RHREF and RHBUF resistance value:

$$RHREF = \frac{74KHz}{f_{max}} = \frac{74KHz}{72.08KHz} = 1.027K\Omega$$

$$RHBUF = \frac{RHREF \times 1.19 \times n}{n-1} = \frac{1.027K \times 1.19 \times 2.5}{2.5-1} = 2.04\ K\Omega$$

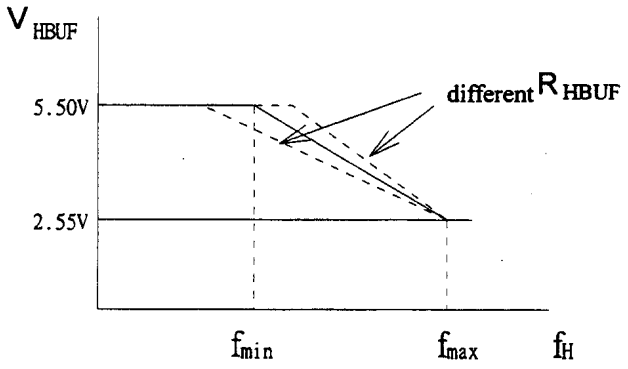
with n equal to :

$$n = \frac{f_{max}}{f_{min}} = \frac{72.08KHz}{28.85KHz} = 2.5$$

Frequency to voltage at pin HBUF:

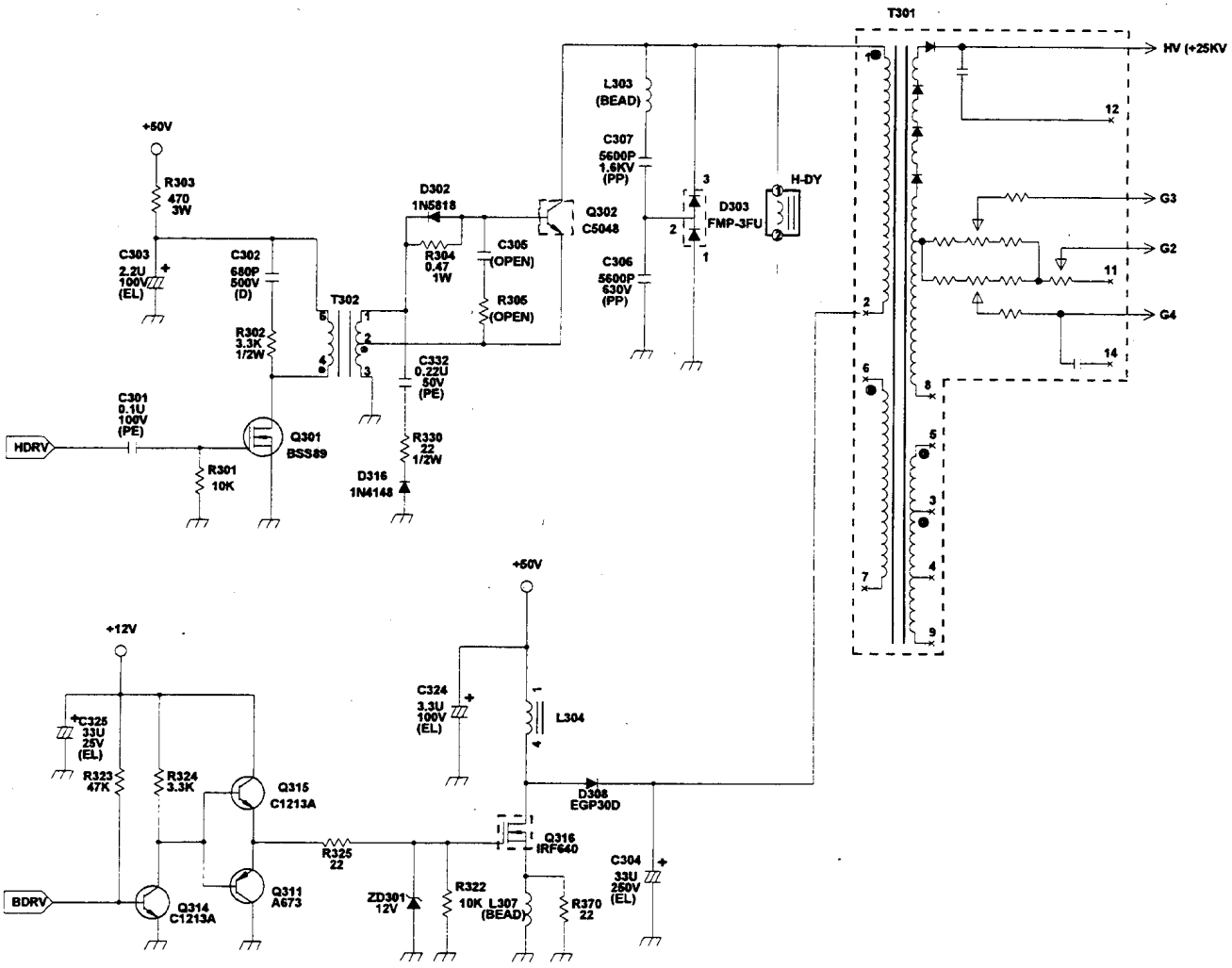
$$VHBUF = \frac{f_{max} - f_{min}}{f_{max} - f_{min}} \times 2.95 + 2.55V$$

P.S. f : operating frequency



Frequency to voltage transfer function

(2). Horizontal deflection output



Horizontal deflection output circuit

CRT spec. (Panasonic M41KXH100X02)

Horizontal deflection

LDY = 0.12 mH ± 5%

IDY = 10.78AP-P (edge - to - edge scan , typical)

RDY = 0.36 Ω ±10%

Lin = 5 μH (fh= 68K)

Vertical deflection

LDY = 6.26 mH

IDY = 1.34 AP-P

RDY = 9.5Ω ±10%

Tr

When H = 68K

$\because$ Tr < F.D. + sync pulse width + B.P.

$\therefore$ Tr = 2.6 μs

C307, C306:

$Tr = \pi\sqrt{(LDY+L1N)xC307}$

$$C307 = \frac{Tr^2}{\pi^2(LDY+L1N)} = \frac{2.6\mu s^2}{3.14^2(120\mu H+5\mu H)}$$

= 5485PF ≒ 5600PF

Tm (Diode modulation)

Because of > Tm , Tm must be < 2.6 μs
Therefore:

Tm = 2.4 μs (2.6 μs-10%)
L301 = 100 μH

$$C306 = \frac{2.4\,\mu s^2}{3.14^2 \times 100\,\mu H}$$

$$= 5842PF \fallingdotseq 5600PF$$

FBT B^+

When H = 31.5 K

$Ts = Th - Tr = 31.778\,\mu s - 2.6\,\mu s = 29.178\,\mu s$

$$\frac{\text{H size}}{\text{Raster size}} = \frac{\text{Video time}}{Ts}$$

$$\text{Raster size} = \frac{323mm \times 29.178\,\mu s}{25.42\,\mu s} = 370.8mm$$

IDY' = (370.8mm / 323mm) x 10.78AP-P = 12.4 Ap-p

$$B^+ = \frac{(LDY + L1N) \times IDY'}{Ts} = \frac{(120\,\mu H + 10\,\mu H) \times 12.4Ap\text{-}p}{29.178\,\mu s} = 55.2V$$

When H = 68K

$Ts = Th - Tr = 14.56\,\mu s - 2.6\,\mu s = 11.96\,\mu s$

$$\text{Raster size} = \frac{323mm \times 11.96\,\mu s}{10.836\,\mu s} = 356.5mm$$

$$IDY' = \frac{356.5mm}{323mm} \times 10.78Ap\text{-}p = 11.9Ap\text{-}p$$

$$B^+ = \frac{(120\,\mu H + 5\,\mu H) \times 11.9Ap\text{-}p}{11.96\,\mu s} = 124.4V$$

Vcp

When H = 31.5K

$$Vcp = 55.2V \left(1 + \frac{\pi}{2} \times \frac{29.178\,\mu s}{2.6\,\mu s} \right) = 1028V$$

When H = 68K

$$Vcp = 124.4V \left(1 + \frac{\pi}{2} \times \frac{11.96\,\mu s}{2.6\,\mu s} \right) = 1023V$$

Icp

When H = 31.5K

$$Icp = \frac{29.178\,\mu s}{2} \times \frac{55.2V}{120\,\mu H + 10\,\mu H} = 6.2Ap\text{-}p$$

When H = 68K

$$Icp = \frac{11.96\,\mu s}{2} \times \frac{124.4V}{120\,\mu H + 5\,\mu H} = 5.95Ap\text{-}p$$

Damper diode

∵ Transistor ON : Damper diode ON = 55 : 45

When H = 31.5K

$31.778\,\mu s \times 45\% = 14.3\,\mu s$

$14.3\,\mu s - 2.6\,\mu s = 11.7\,\mu s$

$$Diode\ ON\% = \frac{Diode\ ON}{Ts} \times 100\%$$

$$= \frac{11.7\,\mu s}{29.178\,\mu s} \times 100\%$$

$$= 40\%$$

$ID = 12.4\ Ap\text{-}p \times 40\% = 4.96Ap\text{-}p$

When H = 68K

14.561 μs x 45% = 6.55 μs
6.55 μs - 2.6 μs = 3.95 μs

$$\text{Diode ON\%} = \frac{3.95\,\mu s}{11.961\,\mu s} \times 100\% = 33\%$$

ID = 11.9Ap-p x 33% = 3.93Ap-p

∵ Q302 2SC5048 of the hfe = 5~8 ∴ Q302 Ib = 6.2Ap-p/5 = 1.24Ap-p

2SC5048 VBE (sat) = 1.3V VR304 = 1.24Ap-p x 0.47 Ω = 0.58V

T302

Vs = 1.3V + 0.58V = 1.88V

Np : Ns = 20 : 1

∴ Np = 37.6 V

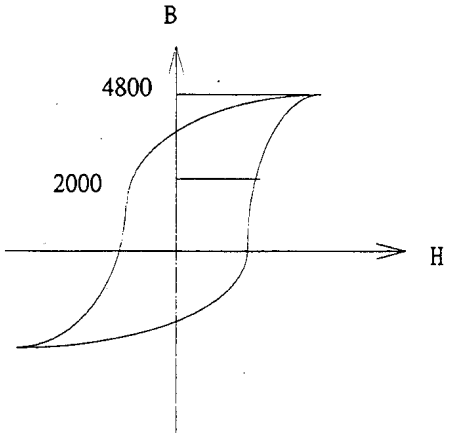
$$V = N\frac{d\varphi}{dt} = N\frac{\triangle\varphi}{\triangle t}$$

$$\triangle\varphi = \triangle B \times Ae$$

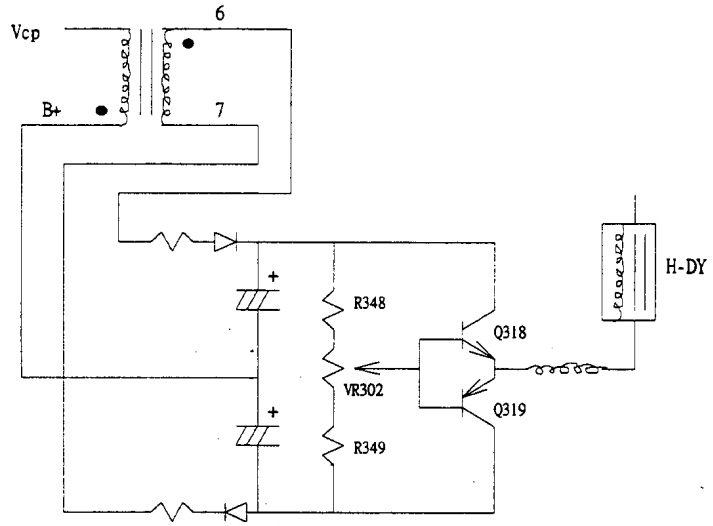
$$\triangle t = t_{ON} = \text{Duty cycle} \times T = \frac{\text{Duty cycle}}{f}$$

$$V = N\frac{\triangle B \times Ae \times f}{\text{Duty cycle}}$$

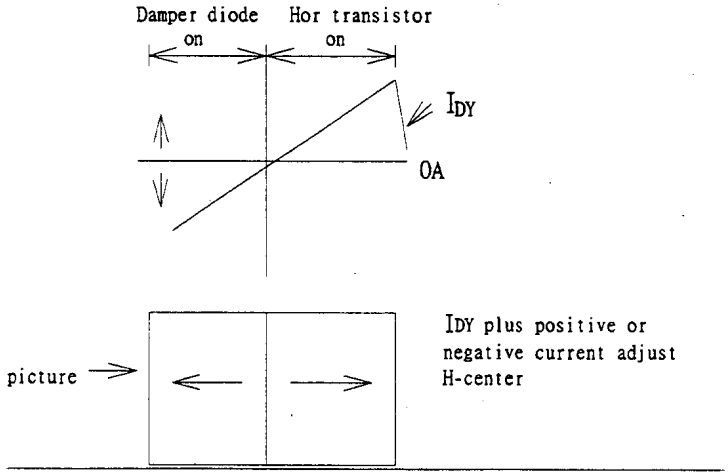
$$Np\ min > \frac{37.6V \times 45\% \times 10^8}{2000 \times 0.23 \times 31.5K} = 117$$



(3) H center adjust



H center adjust circuit



a. Positive half cycle

When VR302 turns R348, Q318/Q319 B pin voltage rise.

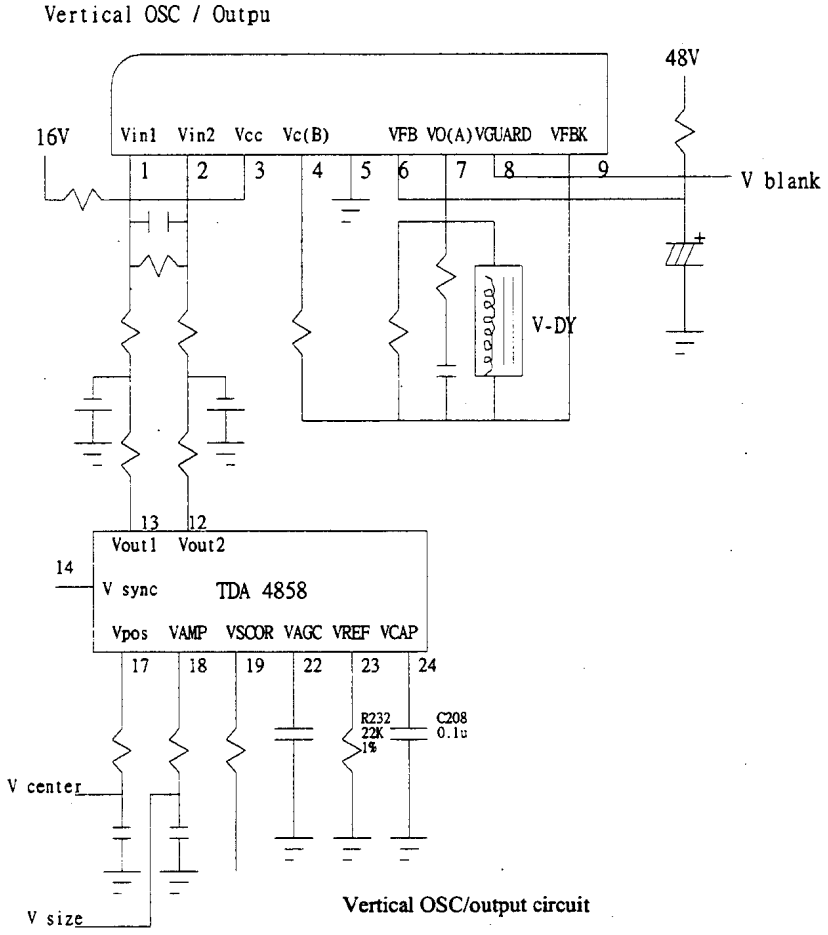
Then Q318 ON, Q319 OFF, H center shift right .

b. Negative half cycle

When VR302 turns R349, Q318/Q319 B pin voltage decrease .

then Q318 OFF, Q319 ON, H center shift left .

2.22 Vertical Deflection

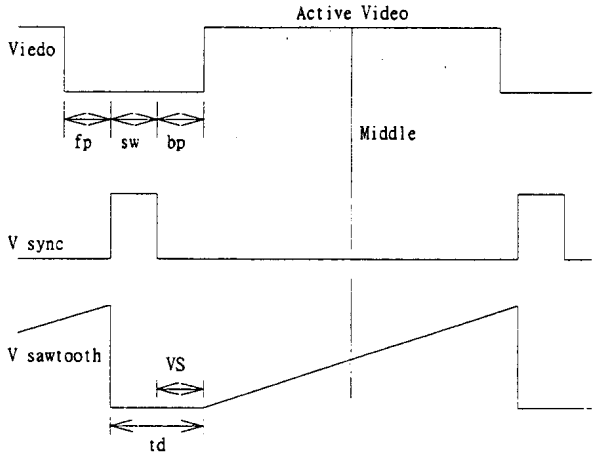


Vertical OSC/output circuit

$$f\,V.OSC = \frac{1}{10.8 \times RVREF \times CVCAP}$$

$$= \frac{1}{10.8 \times 22K \times 0.1\,\mu}$$

$$= 42\ Hz$$



Vertical shift

The distance of the middle of the video and the start of the sync equals:

$0.5 \times (Tv + bp + sw - fp)$

The distance between the middle of the scan and the start of the sync therefore equals:

$0.5 \times (Tv + Td) + Vshift$

To match the middle of the scan and the middle of the active video the shift should be:

$$shift = 0.5 \times \frac{(bp + sw - fp - td)}{TH} \times 100\%$$

Vertical DC controls

(1) The vertical amplitude control (see figure 1)

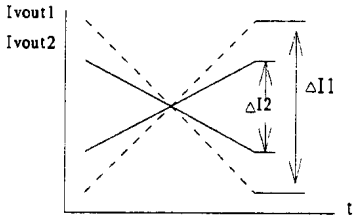
$$\triangle VAMP = \frac{\triangle I2}{\triangle I1} \times 100\%$$

(2) The vertical position control (see figure 2)

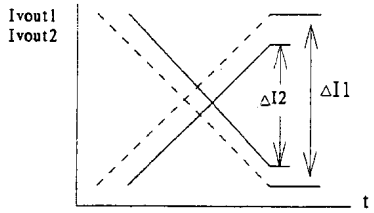
$$\triangle Vpos = \frac{\triangle I2 - \triangle I1}{2 \times \triangle I1} \times 100\%$$

(3) The vertical s-correction control (see figure 3)

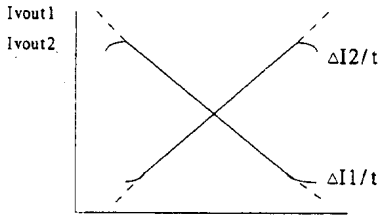
$$\triangle VSCOR = \frac{\triangle I1 - \triangle I2}{\triangle I1} \times 100\ \%$$



vertical amplitude control

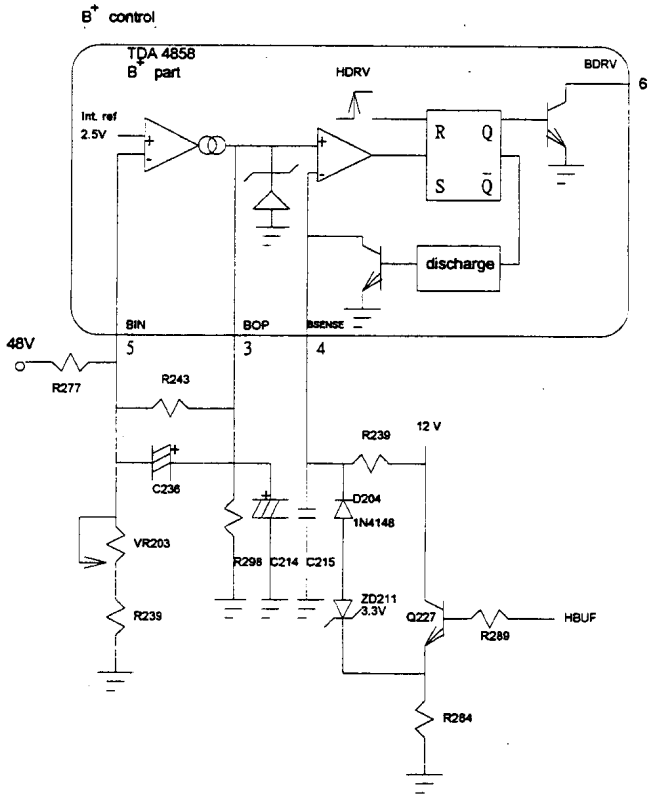


vertical amplitude control



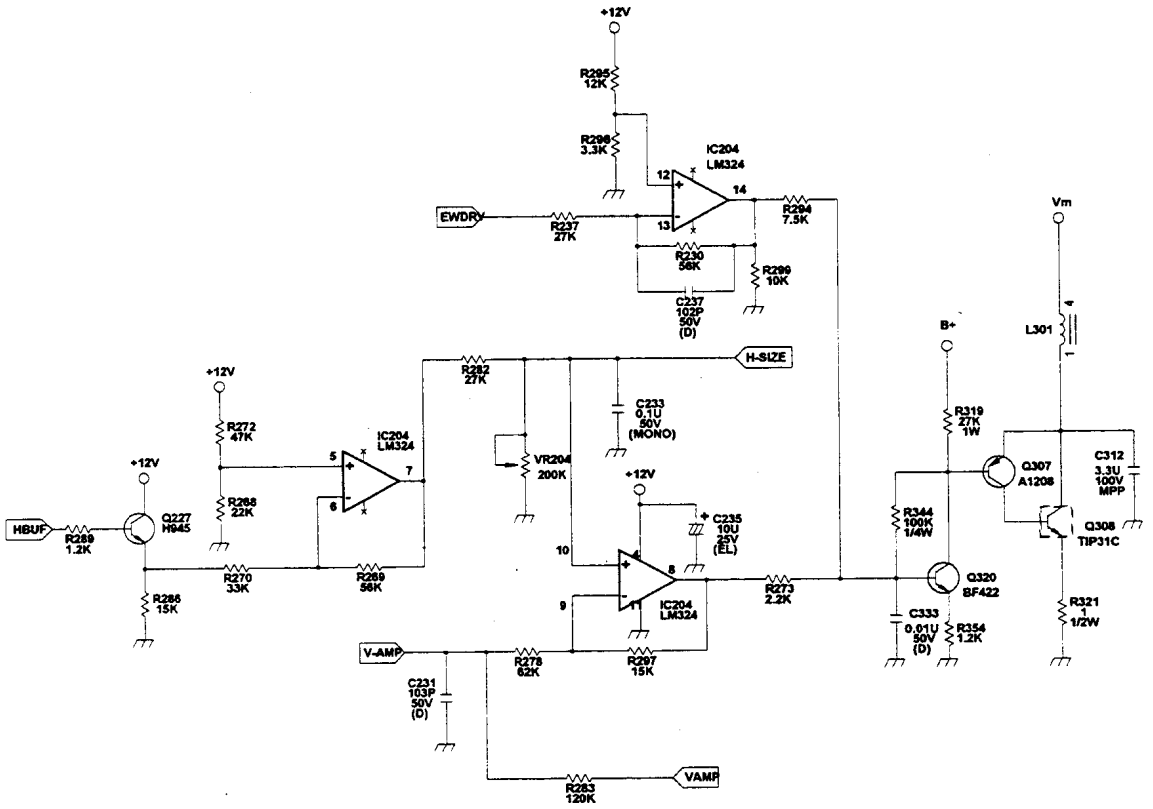
vertical s-correction

2.23 BDRV Control



B+ control section

7276e is a multi-sync product, which frequency is from 30K~72K. Base on the B^+ = LDY x IDY/Ts There should be different supplication of B+ when different frequency is operating. Thus, 7276e can be supplied by a 50V basic power and there is another DC - DC circuit for B^+ of FBT. The DC-DC control circuit is controlled by TDA4858 IC. The control pins are pin 3, 4, 5, 6. It control theory is like 3842 SMPS controller IC . The circuit drawing of TDA4858 IC B^+ control section and it control circuit is drawn on previous page. The decision of pin 6 output duty is made by comparison with pin 5 and it internal reference voltage 2.5V. Then , comparison with pin 3 output level and pin 4. After inverting by transistor, the output will be sent by pin 6. As to pin 3, it internal center diode is 5.3V. So this center diode will clamp the voltage of pin 3 under 5.3V for escaping from increasing abnormally. Further more, the function of inside RS flip-flop is for synchronization.



H size , Side-pin , Trapezoid adjust circuit

2.24 H size , Side-pin , Trapezoid Adjust

The control of H-size , side-pin Trape 20 id and function is mode by adjusting it's Vim voltage and wave form. From UC. it sends out 0~5V wardroom. After integrate the signal send to IC204 LM358 pin10. Then mixed with the parabola nave sent by TDA4858 pin 11, amplified by Q320

and adjust the voltage of Vm to achieve the grant of adjusting the side-pin and trapezoid Beside, send another voltage from TDA4858 PIN 27 (Horizontal F/V) to compensate the different H-size of high and low frequency.

2.25 Brightness Control

(1) Because Uc Bright output range is 0~3.8v , the voltage range of Q203 B pin should be 0~3.1V.

(a) When the voltage of Q203 B pin is oV:

Based on (1):

24V - 36KIE - 0.7V = 0

(b) When the voltage of Q203 B pin is 3.1 V:

Based on (1) :

24V - 36KIE - 0.7V = 0

So, the adjustable voltage range of G1 (DC part):

S -39.7V ~ -58.6V

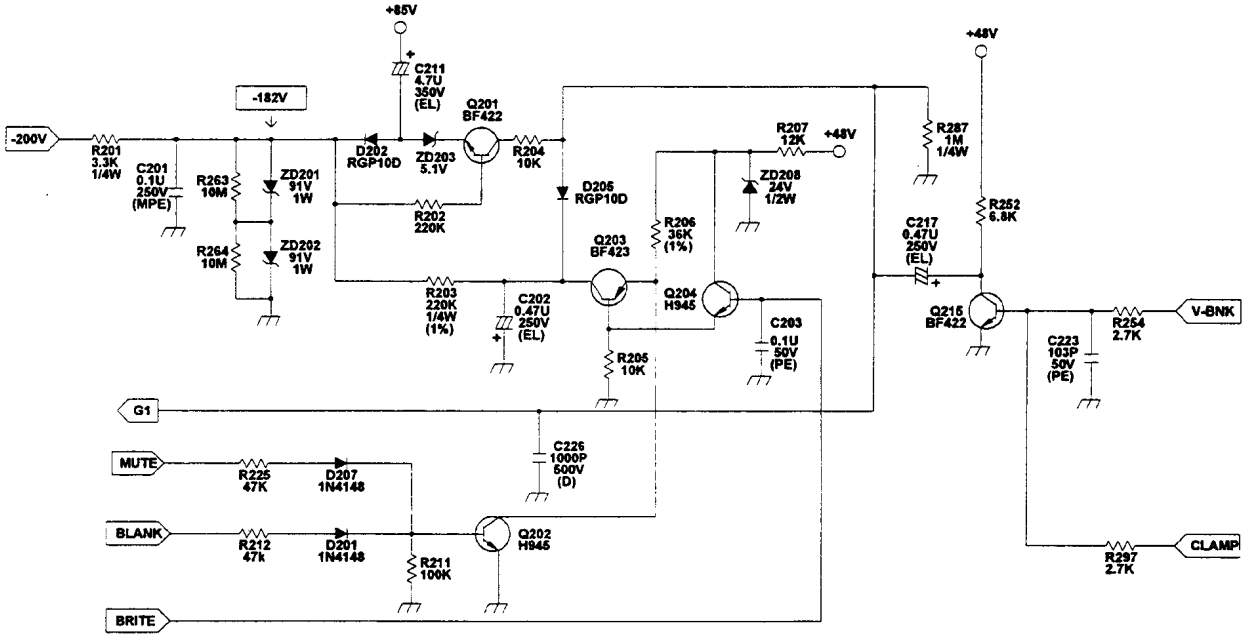
(2) Vertical blanking

Sending a signal from TDA8351 pin8 magnified and inverting by Q215 and coupled by C217 to G1 for blanking the vertical rephrase time.

(3) Spot killer

When the circuit tares on, D322, C323 will be charged with - 182V the D202 is on. There is 85V at the positive siek. At this moment, there is not enough bias voltage for Q201 to conduct. When the circuit turns off, C211 is -182V -85V = -267 V. At this moment, it is because that Q201 is a forwork bias voltage, so C211 supply a more negative voltage (below cut-off point) to G1 and the spot disappears. The function of ZD203 is to prevent D202 acting error and R204 supply bias voltage.

2.25 Brightness Control



Brightness control. V.blank . Spot killer . Mute circuit

(1) Brightness control range (DC part)

24V - R206 IE - VBE - R205 IB = 0 .....(1)

24V - R206 IE - VCE - R203 IC = -182V .....(2) IC ≒ IE

UC Brite output range is 0 ~ 3.8V, the voltage of Q203 B pin should be 0 ~ 3.1V.

(a) When the voltage of Q203 B pin is oV:

Based on (1):

24V - 36KIE - 0.7 V = 0

IE = 0.647mA

VR203 = IR = 0.647mA x 220K = 142.3V

∴ G1 max ≒ -182V + 142.3 V = -39.7V

(b) When the voltage of Q203 B pin is 3.1 V:

Based on (1) :

24V - 36KIE - 0.7V - 3.1V = 0

IE = 0.561 mA

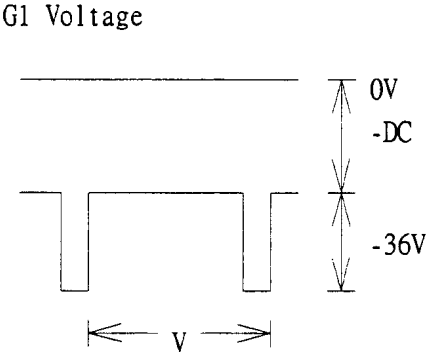
VR203 = IR = 0.561 mA x 220K = 123.4V

∴ G1 min ≒ -182V + 123.4V = -58.6V

So, the adjustable voltage range of G1 (PC part) is -39.7v ~ 58.6V

(2) Vertical blanking

Sending a signal from TDA8351 pin 8 magnified and inverting by Q215 and coupled by C217 to G1 for blanking the vertical retrace time.

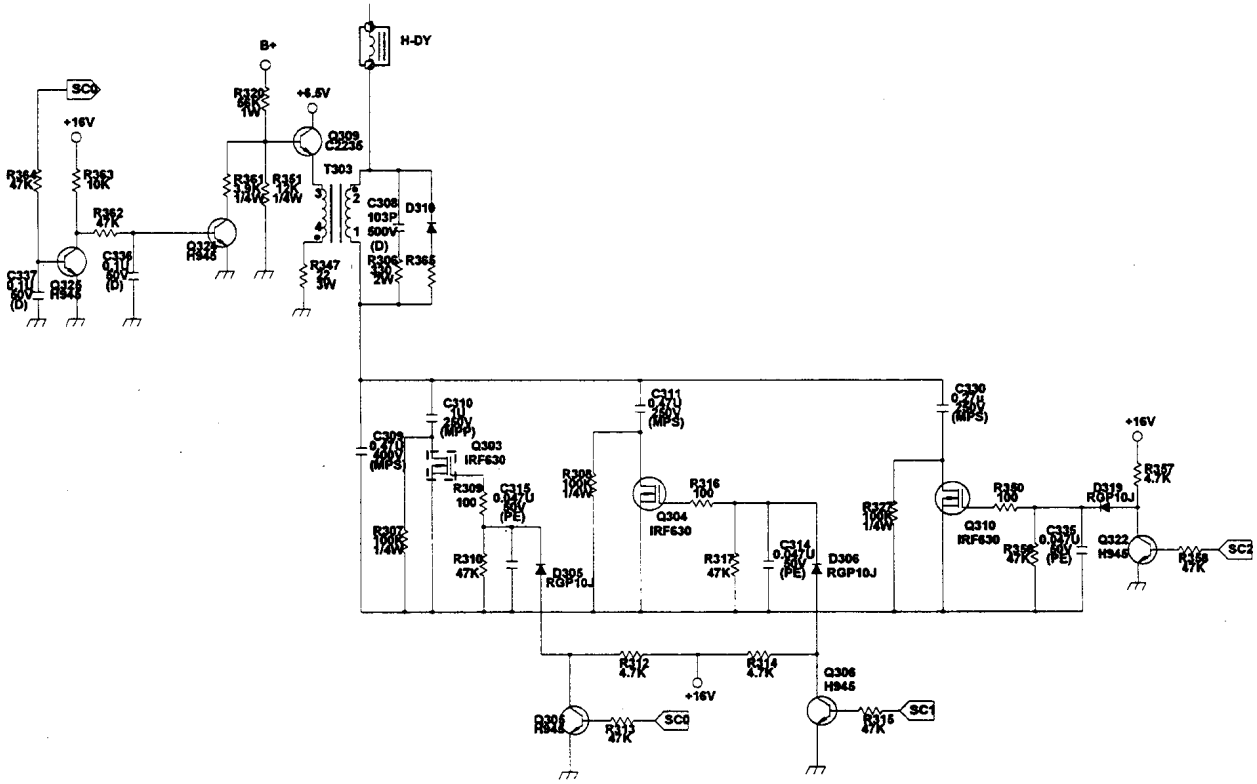


(3) Spot killer

When the circuit turns on, D322, C323 will be charged with -182V and the d202 sun. There is 85V at the positive siek. At this moment there is not enough bias voltage for Q201 to conduct. When the circuit turns off , C211 is -182V-85V=-267V. At this moment, it is because that Q201 is a forward bias voltage, so C211 can be conducted. Based on this conduction , C211 supplies a the spot disappears. The function of ZD203 is to prevent D202 acting error and R204 supplies bias voltage.

(4) Mute When changing mode, the H/V sync pull-in seeming and all micro-control sending timing need a fixed time. constant for circuit integral. And there are changing or abnormal status on the screen. In rider to avoid then condition , blanking this screen in the unstable period, The after the status is sable showing the screen again. The theory of this circuit is when mute acts it sends out a high signal and turns Q202 on but Q203 off. In this may. Let G1 voltage more negative and there can achieve the function of blanking.

2.26 Cs Control

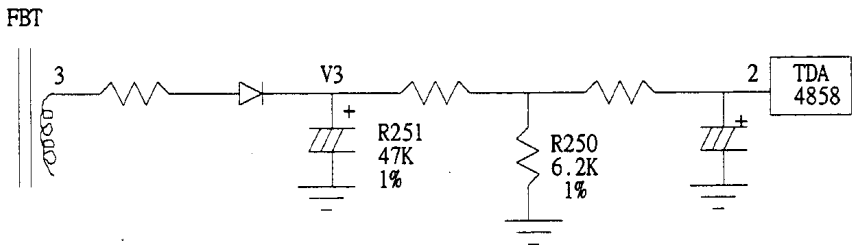


Horizontal Linearity

7276e Cs control truth table

Frequency range	SC2	SC1	SC0	Cs Capacitor
30K<Fh<36K	0	0	0	C309+C310+C311+C330
36K<Fh<45K	0	1	0	C309+C310+C330
45K<Fh<55K	1	0	1	C309+C311
55K<Fh<62K	0	1	1	C309+C330
62K<Fh<70K	1	1	1	C309

2.27 X-Ray Protection



X-Ray protect circuit

HV (KV)	FBT #3 (V)	TDA4858 #2 (V)
23	44.7	5.24
24	46.5	5.45
25	48.3	5.64
26	50.1	5.85
27	51.9	6.05
28	53.7	6.26
29	55.5	6.45

$$\text{TDA4858 V2} = \frac{R250}{R250+R251} \times V3$$

When TDA4858 V2 > 6.38V . then X-Ray acts

7276e shut down voltage is 28.4KV ~ 28.6KV

When TDA4858 pin 2 voltage is over 6.38V (typical) ,

Action as follow:

(1) Pin HDRV (Horizontal output stage) is floating.

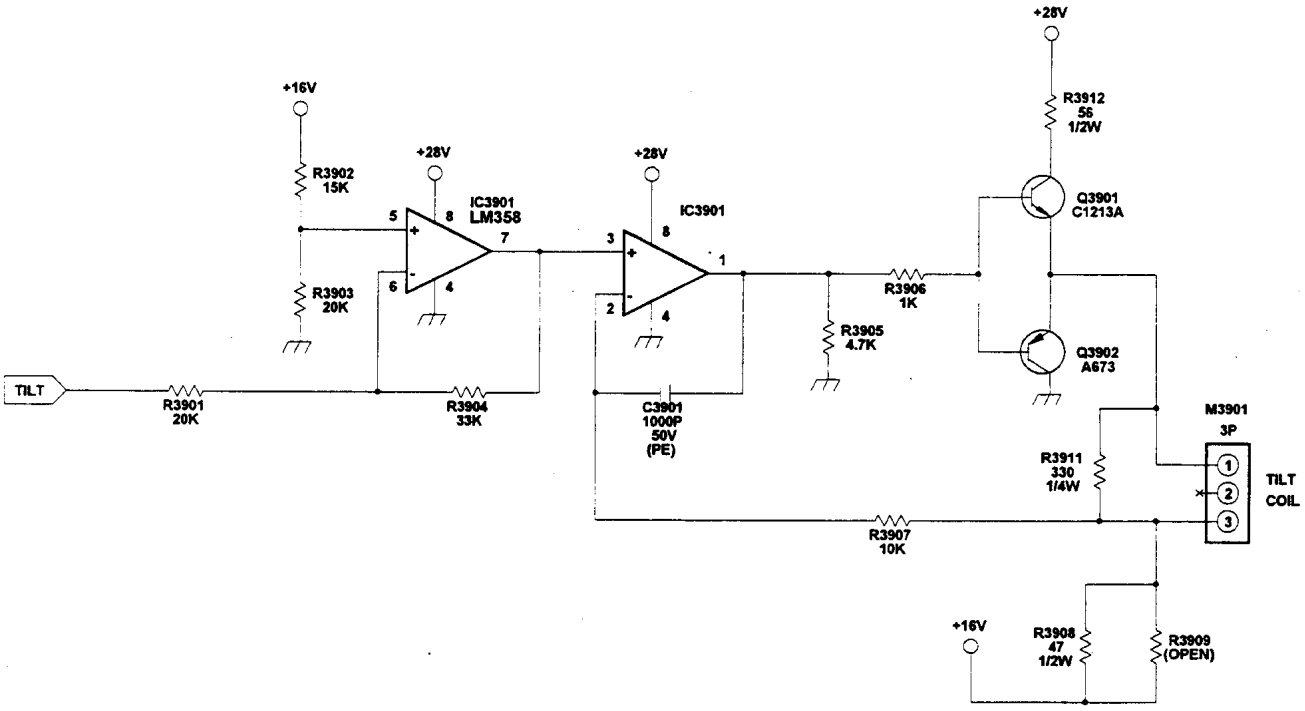
(2) Pin BDRV (B^+ control driver stage) is floating.

(3) Pins Vout1 and Vout2 (Vertical output stage) are floating.

(4) Pin CLBL provides a continuous blanking signal.

(5) The capacitor at pin HPCC2 is discharged.

2.28 Tilt Adjust



CRT spec.

Rotate

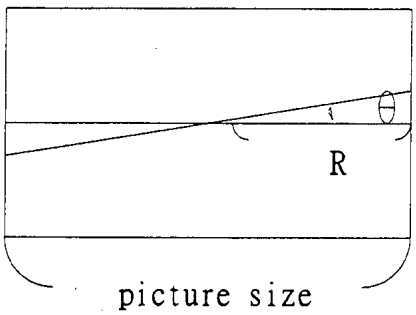
1.5 ° => 100mA

1.5 ° => ? mm

$$\Rightarrow 2\ \pi\ R \times \frac{\theta^\circ}{360^\circ}$$

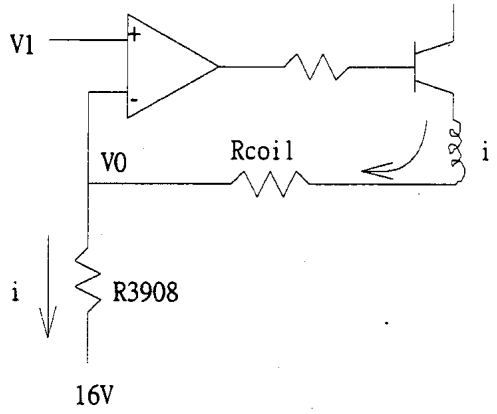
∵ Picture size = 300mm x 225mm

$$\therefore 2 \times 3.14 \times 150 \times \frac{1.5^\circ}{360^\circ} = 3.925\text{mm}$$



Owing to CRT spec, make rotate shift to reach largest angle 1.5 °

(which is 3.925mm) , the current of rotate coil flow should be 100mA.



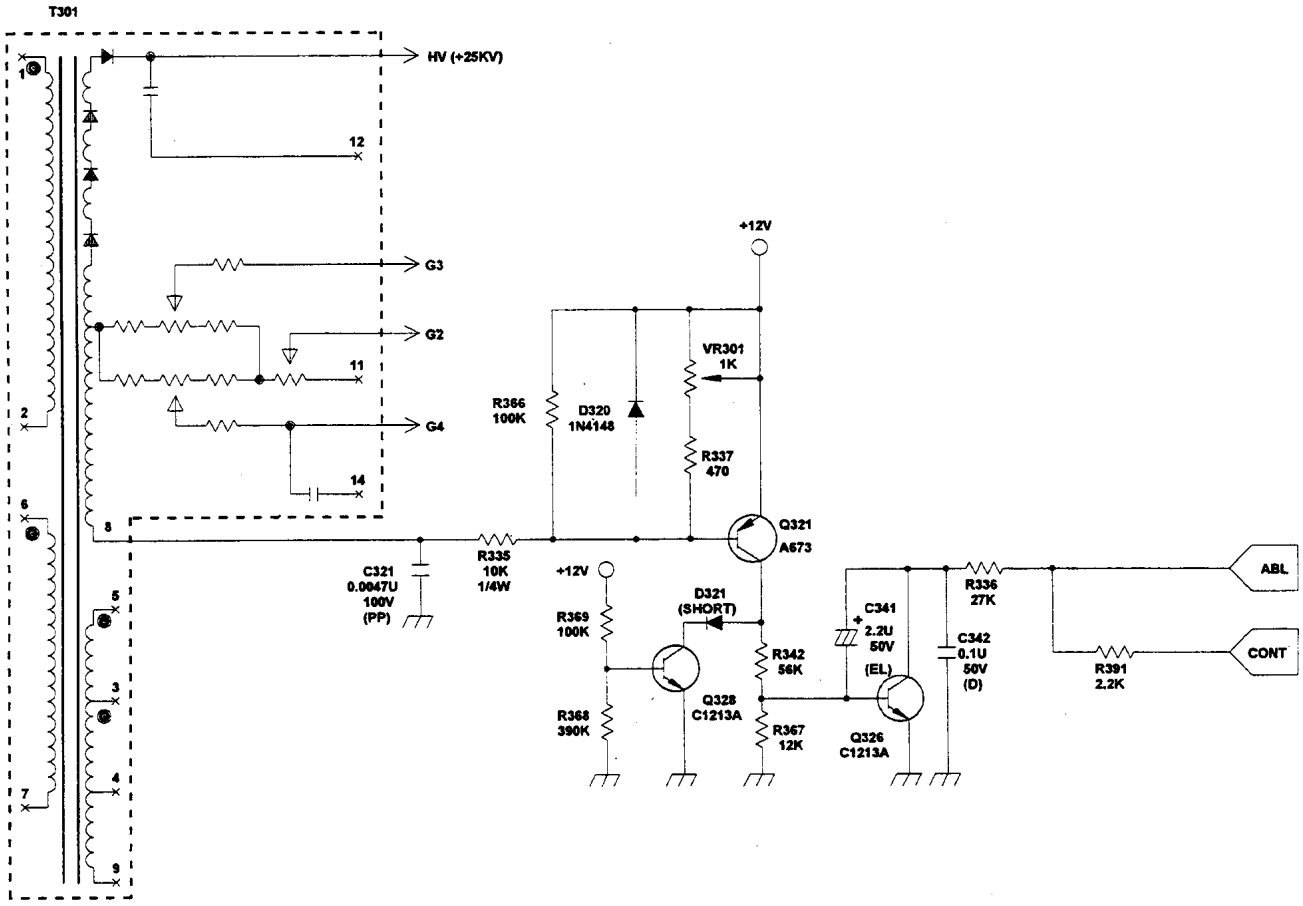
$$\pm i = \frac{V0 - 16V}{R3908}$$

$$V0 = 16V \pm R3908i$$

Because of V0 voltage was decided by V1 ,

$$V1 = \frac{VR - VT}{R3901} \times R3904 + VR$$

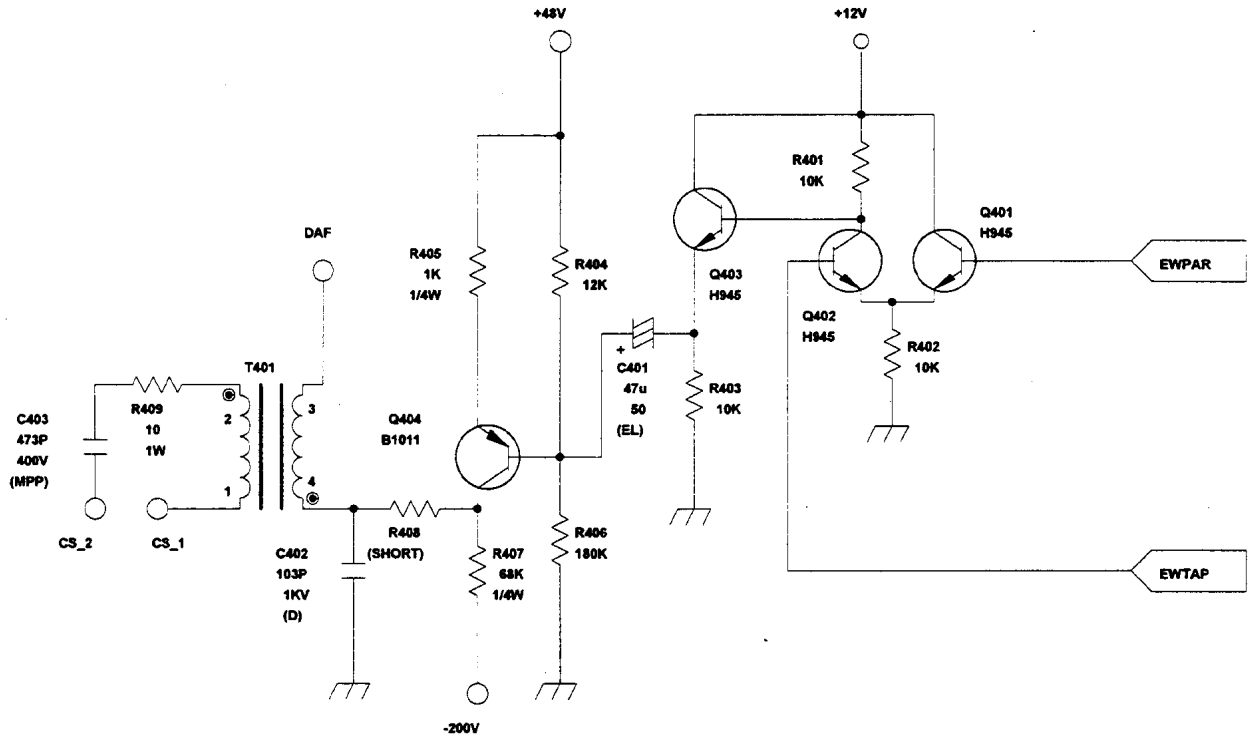
2.29 ABL



Avoiding over beam current to decrease CRT life, add the circuit to control beam current flow The size of beam current, by means of adjusting VR301 resistance value, can control R335 current.

$$\text{then beam current} \fallingdotseq IR335 = \frac{VR335}{R335}$$

2.30 Dynamic Focus



To improve CRT edge of the four corner focus, TDA4858 Pin20 (EWTAR) and Vm pulls a wave to fold focus voltage in order to improve focus.

Chapter 3

ALIGNMENT PROCEDURE

3.1 Preparation for Alignment

(1) Setup unit and keep it warm up at least 30 minutes

(2) Signal mode

Mode	Frequency (H/V)	Display
1	31.47k/70Hz (- /+)	640 * 400 (VGA400)
2	31.47k/60Hz (- / -)	640 * 480 (VGA480)
3	37.5 k / 75Hz (- /-)	640 * 480 (VESA640)
4	43.27 k / 85Hz (- / -)	640 * 480 (6448B)
5	48.0 k/ 72Hz (+ /+)	800 * 600 (SVGA3)
6	46.8 k / 75Hz (+ /+)	800 * 600(VESA800)
7	53.6 k / 85Hz (+ /+)	800 * 600 (SVGA5)
8	60.0 k / 75Hz (+ / +)	1024 * 768 (VESA1024)
9	48.3 k / 60Hz (- /-)	1024 * 768 (UVGA1)
10	56.48 k / 70Hz (- / -)	1024 * 768 (UVGA2)
11	64.3 k / 60Hz (+ / +)	1280 * 1024 (WS2)
12	68.6 k/ 85Hz (+/+)	1024 * 768 (UVGA8)

3.2 B+ Adjustment

(1) Input mode 48k [UVGA1] with crosshatch Pattern.

(2) Set brightness and contrast in OSD to maximal value

(3) Adjust main board VR601 , let output Voltage :16.8 ± 0.1V at R707

3.3 HV Adjustment

(1) Input mode 48k (UVGA1) with crosshatch pattern.

(2) Adjust VR203 to let anode voltage be 25 ± 0.1KV for Matsushita CRT.
For Samsung CRT anode voltage is 26 ± 0.1KV

3.4 H-center Adjustment

(1) Input mode 68k (UVGA8) with crosshatch pattern

(2) Adjust VR302 to make raster in CRT center

3.5 H-size Preset

(1) For Matsushita CRT : Input mode 48k (UVGA1) with crosshatch pattern.

For Samsung CRT : Input mode 37.5k (VESA 640) with crosshatch pattern

(2) Use OSD to adjust H-size maximum
Adjust VR204 to make H-size just over screen

3.6 Factory Setting Mode Adjustment

(1) H-phase: Set picture to the center of screen
(2) H-Size: Set picture to 300 ± 2 mm
(3) V-center: Set picture to the center of screen
(4) V-size: Set picture to 225 ± 2 ㎜
(5) Parallelogram: Set picture to rectangular or balance
(6) Trapezoid: Set picture to rectangular or balance of top and bottom
(7) Pincushion: Set picture to a real rectangular
(8) Tilt: Let tilt ± 0.5mm between edge to edge

3.7 Focus Adjustment

(1) Input mode 48k (UVGA1) with green crosshatch pattern
(2) Adjust V(F2) Focus VR of FBT to make vertical line between center and corner area of CRT clear
(3) Adjust H(F1) to make horizontal line between center and corner area of CRT clear
(4) Repeat step b and c to get the best focus

3.8 Convergence Adjustment

(1) Input mode 31.5k (VGA480) with crosshatch patterns
(2) Adjust VRs of Yoke and 4-pole , 6-pole to meet specification

3.9 Color Temperature Auto Alignment

3.9.1 PREPARING ITEMS

(1) PC
(2) RS232 BOX
(3) RS232 CABLE (9P) TO PC
(4) RS232 BOX TO MONITOR CABLE (3P)
(5) COLOR ANALYZER (CA100)
(6) CA100 CABLE TO PC
(7) ADJUST PROGRAM (Release NEW Version)

3.9.2 Alignment Procedure

(1) Press "SPACE BAR " to get raster pattern and set contrast and

brightness to maximum position,adjust the G2 VR such that the max. color of R.G.B color bar on the monitor is in the mark region

(2) Press "SPACE BAR" to do auto color temperature adjustment and color tracking

C1: 9300K X= 281 ± 5 Y=311 ± 5

C2: 6500K X= 313 ± 5 Y=329 ± 5

C3: 5500K X= 332 ± 5 Y=348 ± 5

C4: 7100K X= 305 ± 5 Y=315 ± 5

C5: 11500K X= 275 ± 5 Y=275 ± 5

(3) Press "SPACE BAR" to get full white pattern and set contrast and brightness to maximum position , adjust VR301 ABL adjustment to let Y = 30 ft-l ± 1 ft-l.

(4) Press "SPACE BAR" to get 3" block and measure the bright of Y meet engineering spec.

3.10 Clear All of User Mode Data

After finishing all factory setting , Press "←" and "→" keys at this time all of user mode data have been cleared

3.11 Geometry Specification

ITEM	DESCRIPTION	SPECIFICATION
1	HORI SIZE	300 ± 2 mm
2	VERT SIZE	225 ± 2 mm
3	SIDE PIN	≦2.0 mm
4	TOP/BOTTOM PIN	≦2.0 mm
5	SIDE BARREL	≦1.5 mm
6	TOP/BOTTOM BARREL	≦1.5 mm
7	TRAPEZOID	≦2.0 mm
8	VIDEO OFFSET	≦4.0 mm
9	PARALLELOGRAM	≦3.5 mm

3.12 Power Saving Function Check

(1) Input mode 31.5KHz (VGA1 640 X 400) with full white pattern.

(2) Press both contrast and brightness keys to maximum position.

(3) Remove the horizontal sync signal from input, the unit will go into "Standby" mode. The picture will disappear, and the LED indicator is amber. The power consumption should be less than 15W.

(4) Remove vertical sync signal from the input, the unit will go into "Suspend" mode.

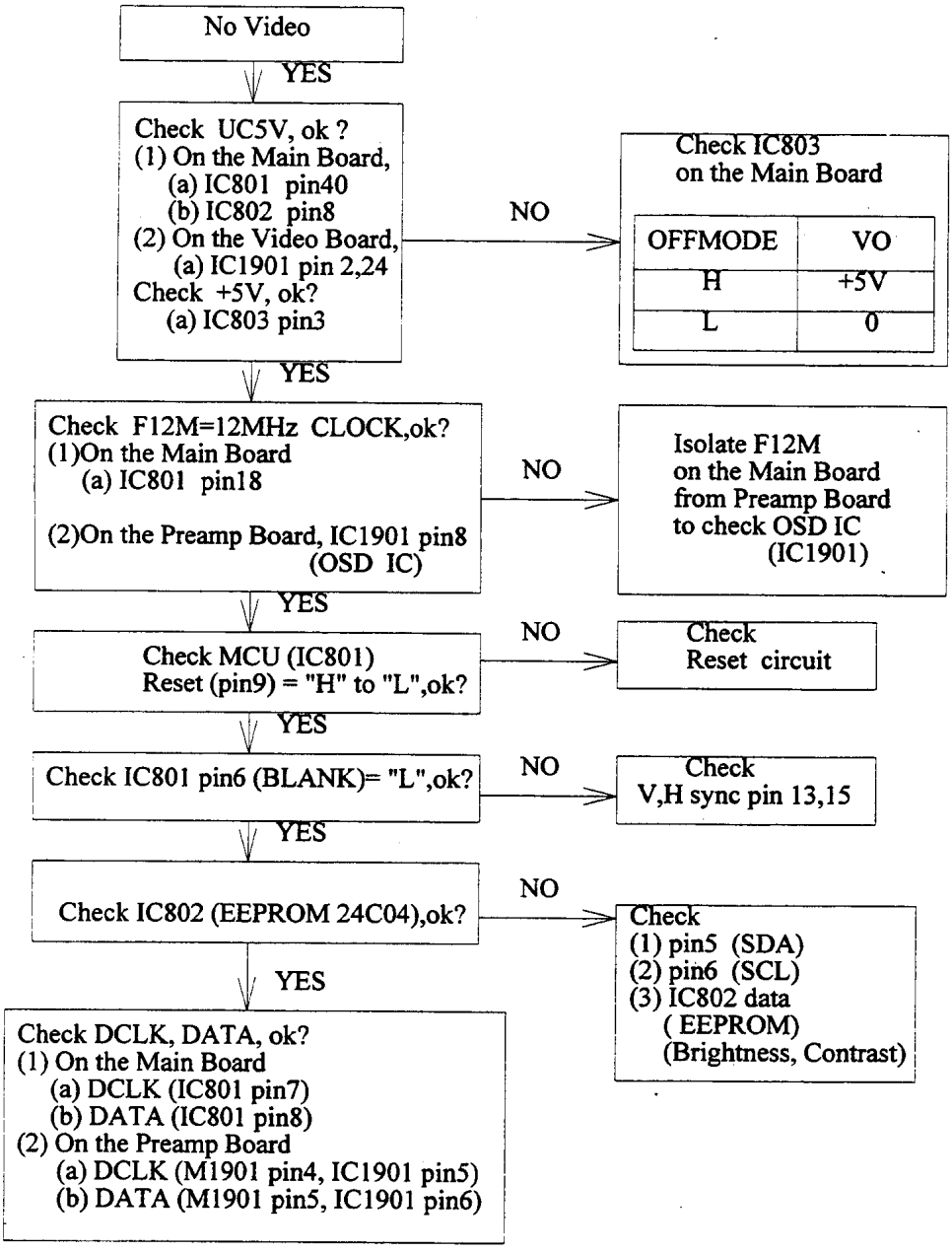
(5) The picture will disappear, and the LED indicator is amber. The power consumption should be less than 15W.
(6) Remove both syncs from input, the unit will go into "Off" mode. The picture will disappear, and the LED indicator should flash every 1.25 second OFF and second ON. The power consumption should be less than 5W in this case.
(7) Input H-sync and V-sync signals in case c, d and e, the unit will recover to normal state, and the LED indicator is green
(8) Disconnect the signal cable from input, the unit will go into "Override" mode.
(9) The raster should be extinguished, and the LED indicator is green. The power consumption is normal.
(10) Re-connect the signal cable in case g, the unit will recover to normal state, and the LED indicator is green.

Chapter 4

TROUBLESHOOTING

4.1 Microcontroller & Its Peripheral Circuit:

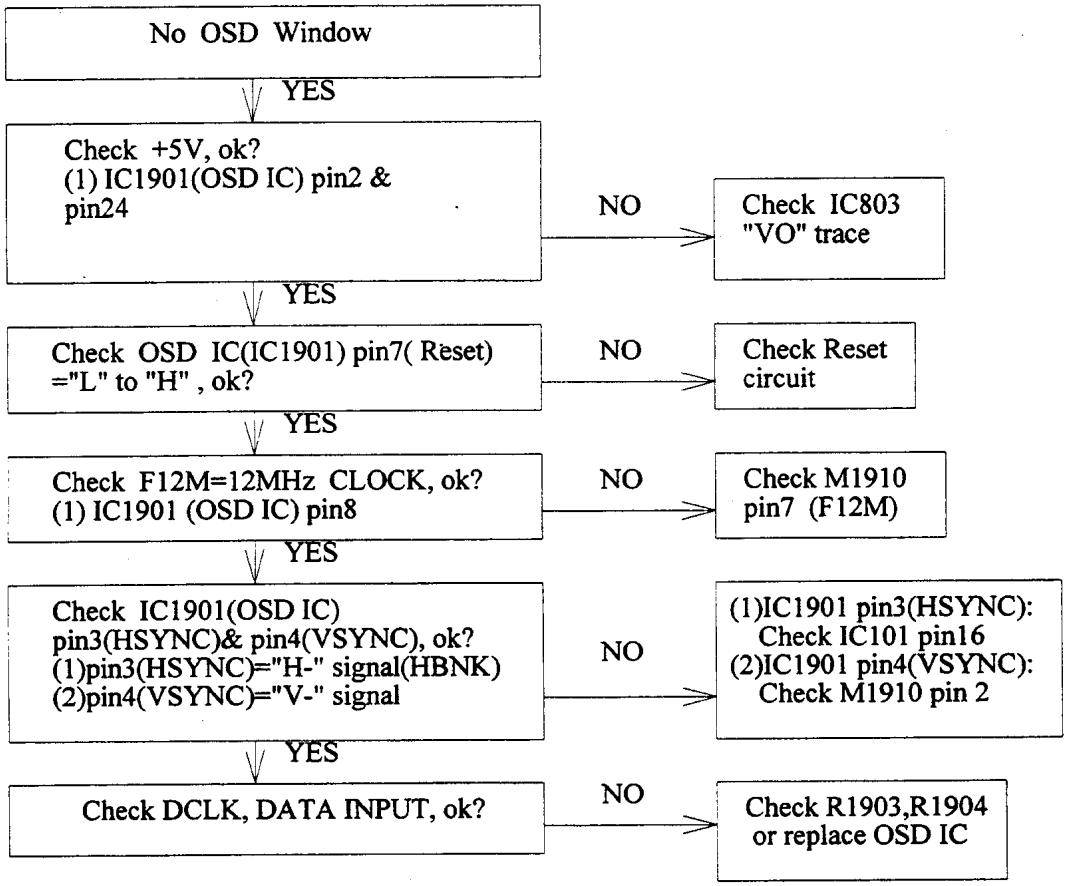
(A) No Video:



(B) Can't save data to EEPROM

Check IC801 pin 10 (RXD) :pin 10 should keep "high"

(C) No OSD window



(NOTE: IC1901,M1910,R1904,R9103 are on the Preamp Board)

4.2 Video Board

Caution: Before power on, you must check whether all connectors and components of the set are correct, otherwise it maybe to destroy the set. There assume that following cases depend on above setup OK. Please follow as below and check it step by step.

Case 1:No video display on screen

(1) Check IC101 pin 13 (Video Contrast). If it is 0 volt, check IC1901 or maybe IC101 pin 13 short.

(2) Check IC101 pin 16 (Blank Gate). If it is 0 volt, check IC101 and H-clamp pulse switch circuit.

(3) Check IC101 pin 4 (OSD Cut). If it is high level, check IC1901 and IC101.
(4) Check IC101 pin 18,20,23. If they are 0 volts, replace a new IC to IC101.
(5) Check RGB cathode. If anyone pin is 0 volt, replace a new IC to IC102.
(6) Check IC102 output path. It must be right and without short circuit.
(7) Check G1 voltage. If it is lower equal than -182 volts, check spot killer circuit and check IC801 pin36(Blank).
(8) Check CRT heater. If it is dark, check +6.3v supply voltage of heater.
(9) Replace CRT if it burns out.

Case 2: one or more of R, G, B channel does no display
(1) Check IC101 pin 18,20,23. If anyone is 0 volt, replace a new IC to IC101.
(2) Check RGB cathode. If anyone pin is 0 volt, replace a new IC to IC102.
(3) Check IC102 output path. It must be right and without short circuit.
(4) Replace CRT if it burns out.

Case 3: OSD does not display on screen
Check IC101 pin 1,2,3,4. If they are 0 volt, check IC101 and IC1901.

Case 4: No video display on screen, but OSD can display on screen
Check IC101 pin 13 (Video Contrast). If it is 0 volt, check IC1901 or maybe IC101 pin 13 short.

Case 5: OSD control cannot adjust Bias
(1) Check IC1901.
(2) Check DC restore circuit.

Case6: OSD control cannot adjust Drive
Check IC101 and IC1901.

Case 7: OSD control cannot adjust Contrast
Check IC 101 and IC1901.

Case 8: OSD control cannot adjust Brightness
(1) Check D103. Replace it if it is short.
(2) Check brightness control circuit (G1) and IC801 BRITE output.

Case 9: ABL VR cannot adjust ABL.
Check ABL circuit.

Case 10: Spot killer function failure

(1) Check SG101 (1KV spark gap). Replace it if it is inserted error.
(2) Check D103. replace it if it is short.
(3) check spot killer circuit.

Case 11: Picture quality is not so good

(1) Check M100 (CRT socket). Fix it if it is loose.
(2) Check C181 and another filtering capacitors on video board. Replace it if they are open or inserted error.
(3) Check IC101 pin 15 (clamp gate). If it has no clamping pulse, check H-clamp pulse switch circuit.
(4) Check R173, R174. Replace it if they are no correct.
(5) Replace IC102.

Case 12: Moire appears when Y is greater than 18 Ft-l

(1) Run auto-alignment procedure to acquire optimum G2 voltage.
(2) If necessary, decrease G2 voltage.

Case 13: H-blank function failure

(1) Check M102 connector. Fix it if it loose.
(2) Check H-blank circuit of H-clamp pulse switch circuit.
(3) Check M102 connector. Fix it if it loose.
(4) Check H-blank circuit of H-clamp pulse switch circuit.

Case 14: H-blank phase error

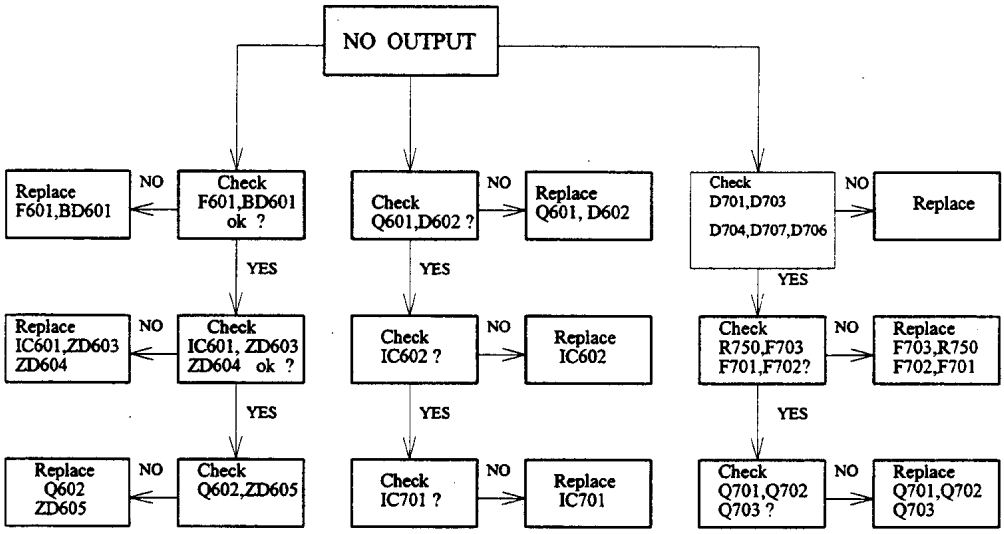
(1) Check H-blank circuit. Replace it if it is inserted error.
(2) Check flyback RC circuit . Replace it if inserted error.

Case 15:OSD quality is not so good in free run mode

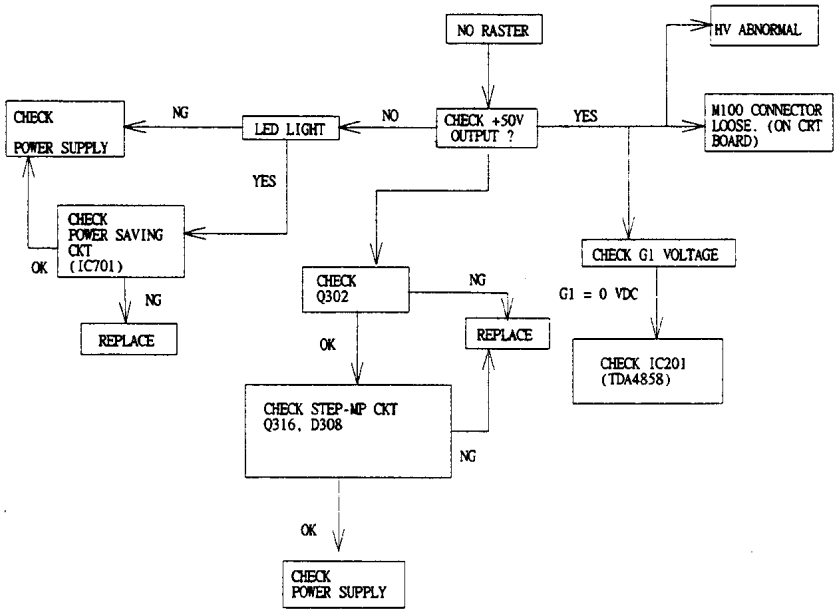
Check clamp pulse switch circuit.

4.3 Power Supply

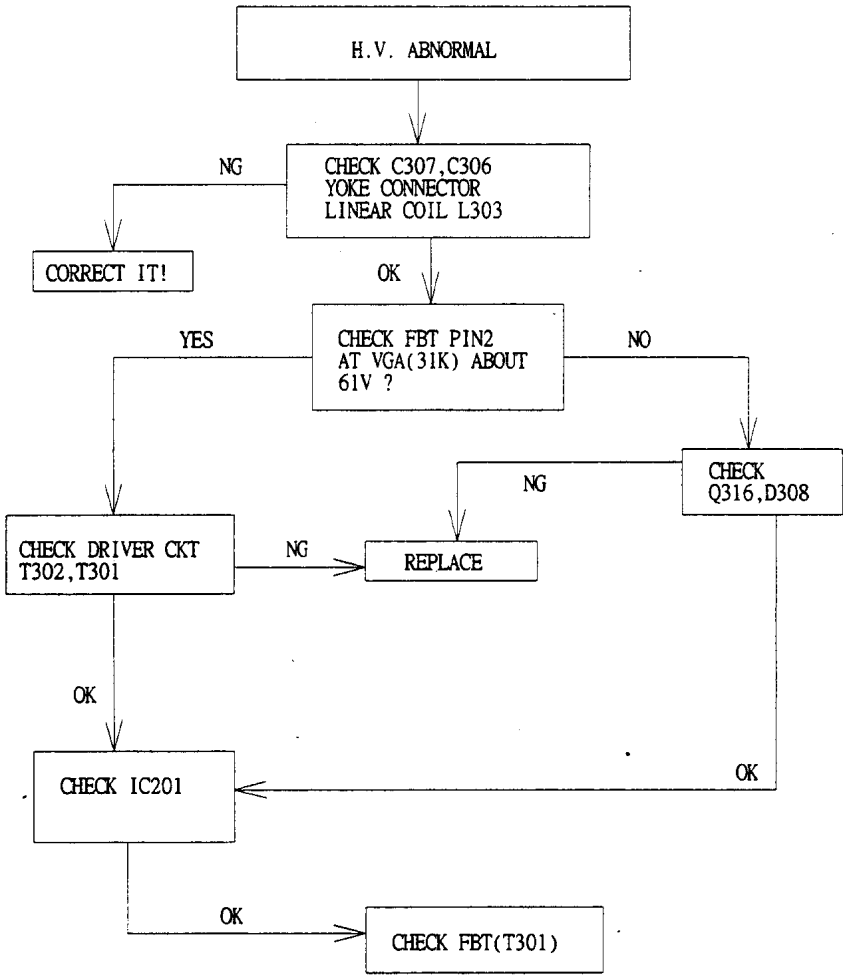
POWER NO OUTPUT



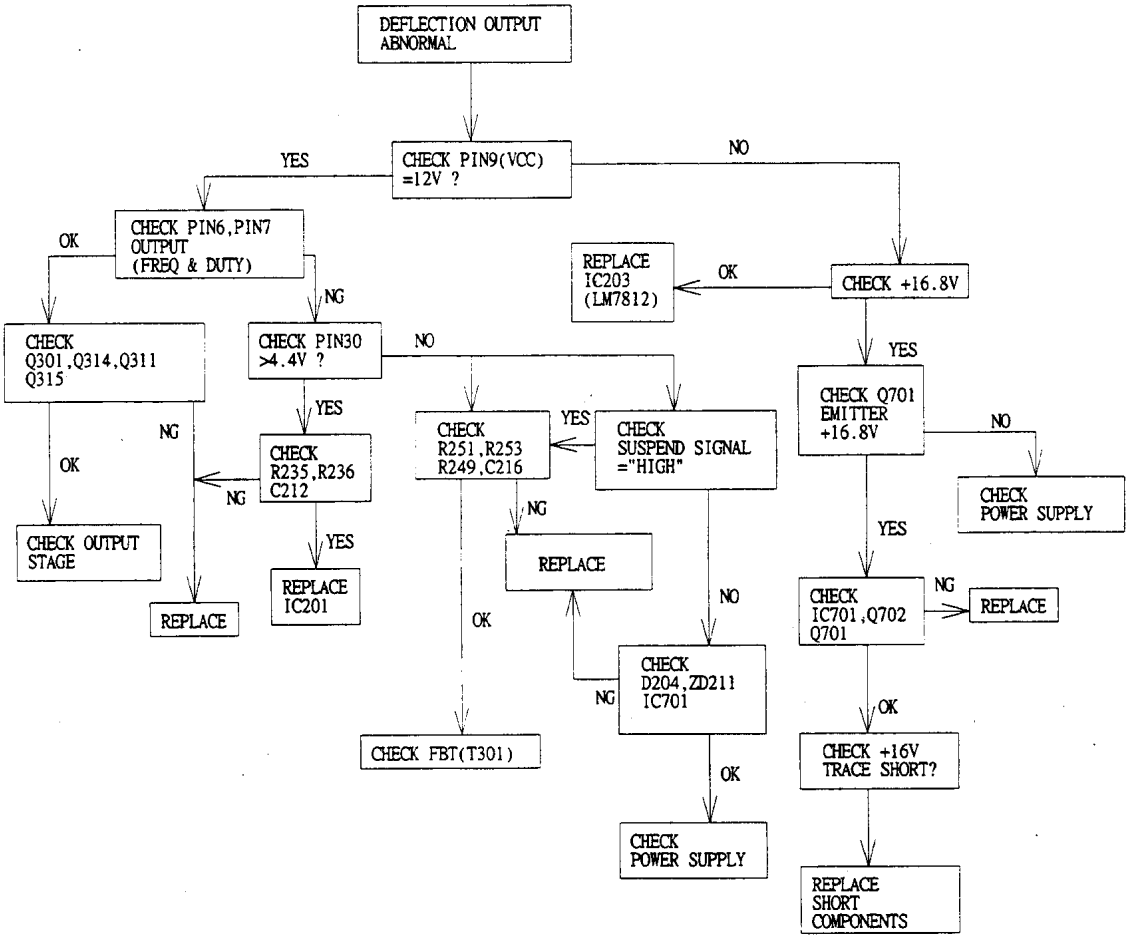
4.4 No Raster



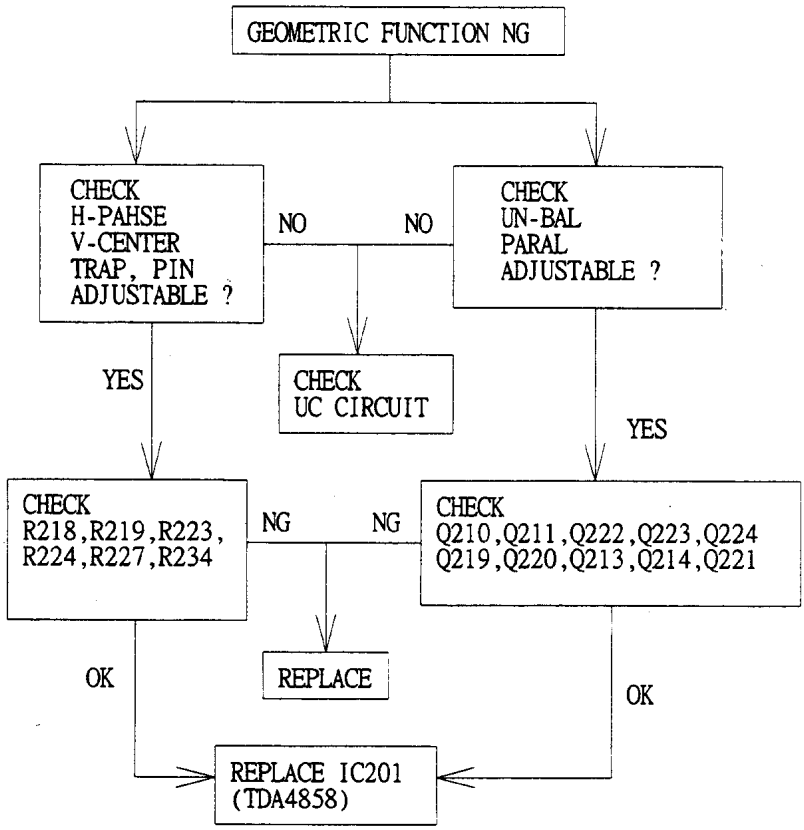
4.5 H. V. Abnormal



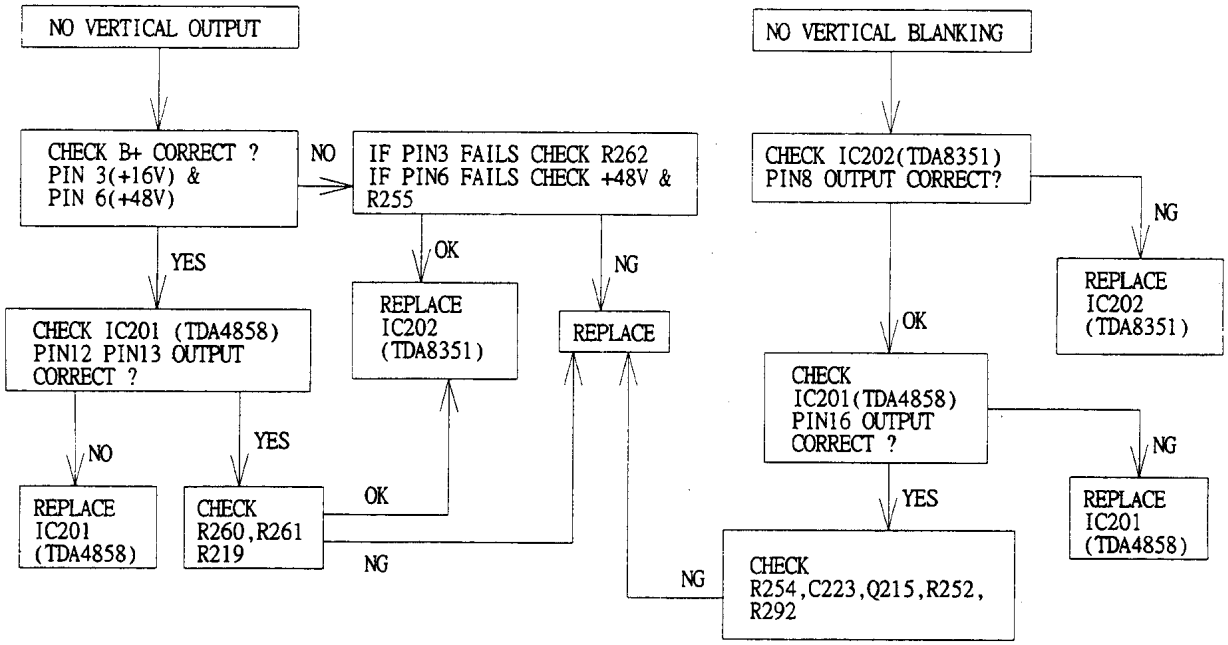
4.6 Check IC201



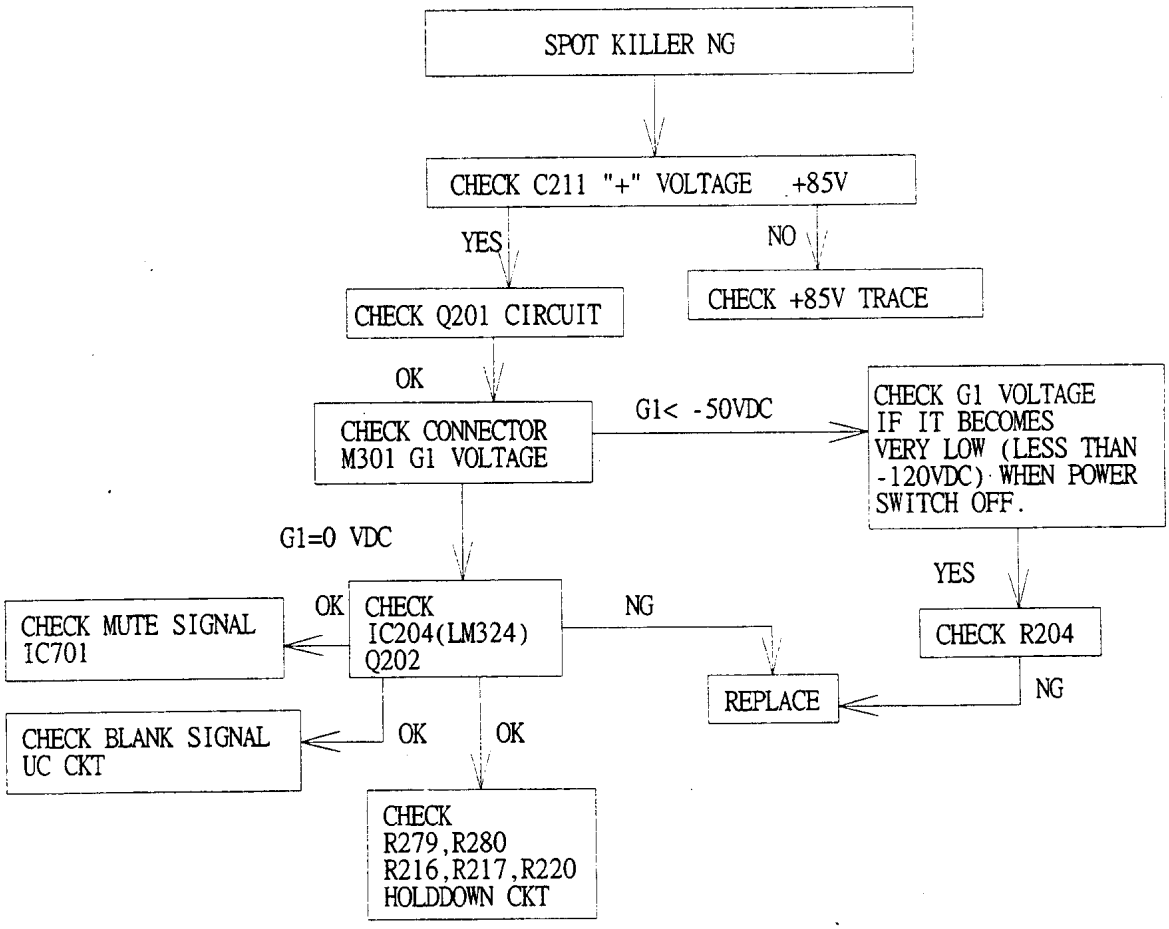
4.7 Geometric Function NG



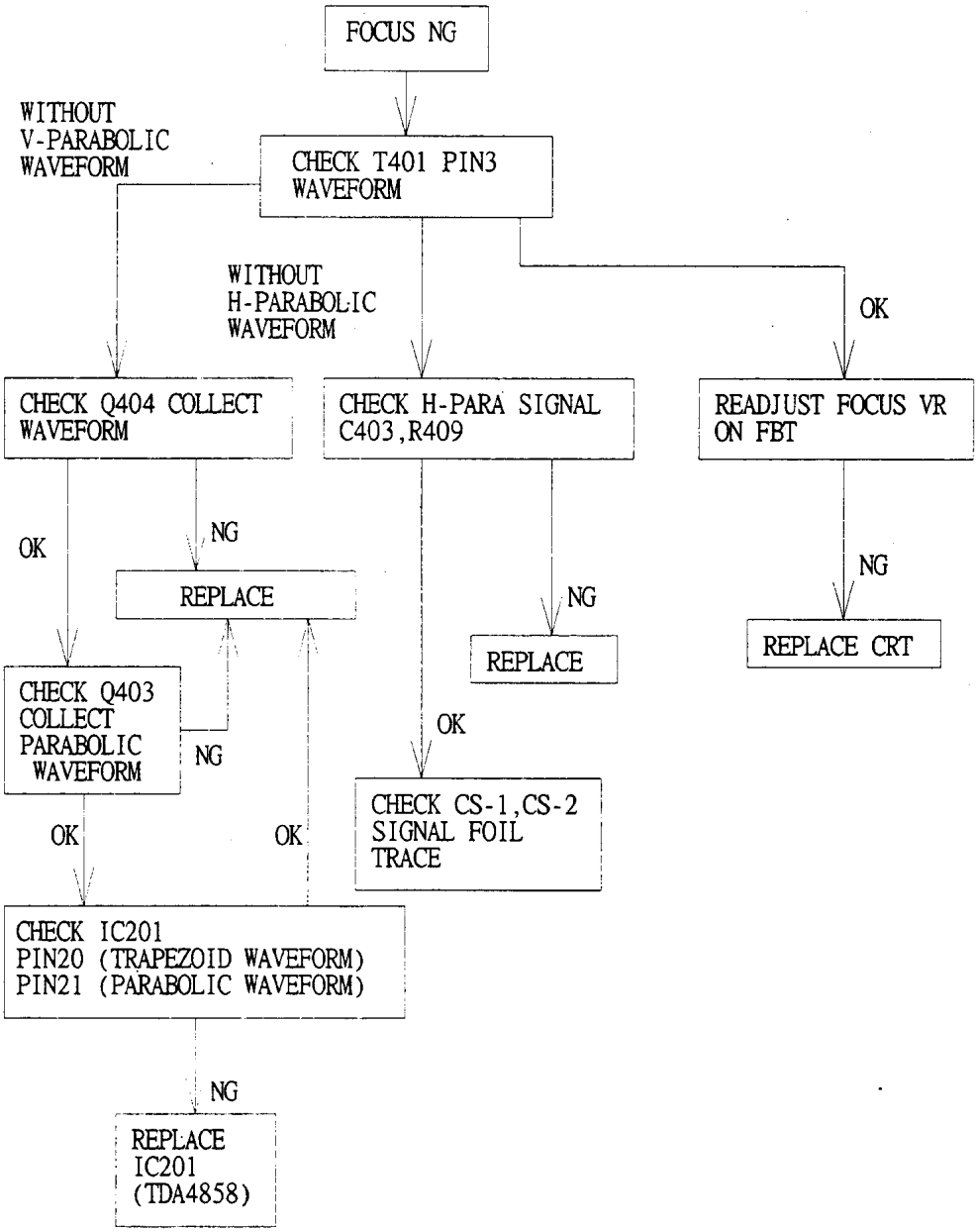
4.8 No Vertical Output & Retrace Line No Blanking



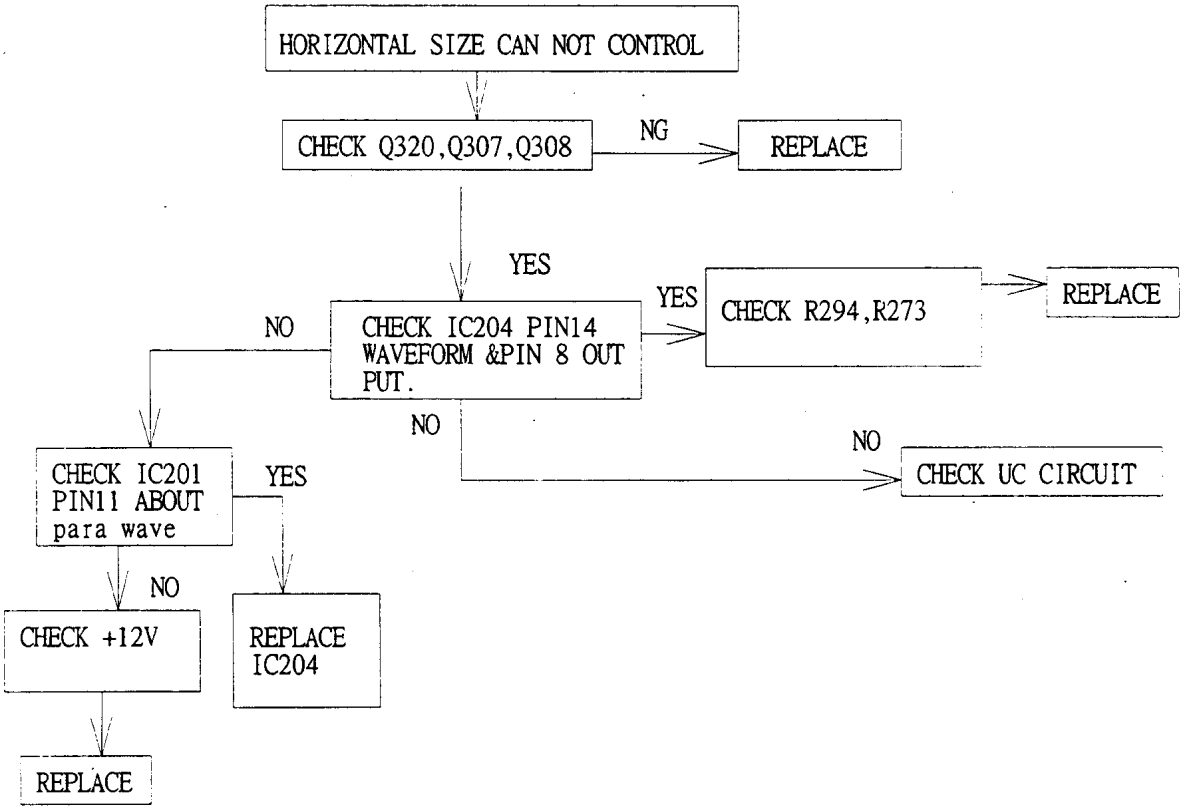
4.9 Spot Killer NG



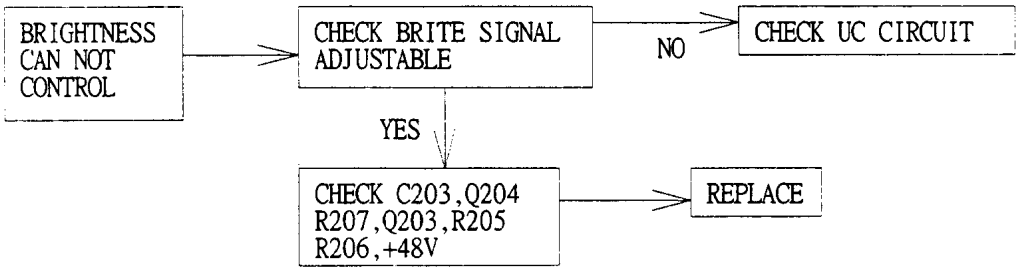
4.10 Focus NG



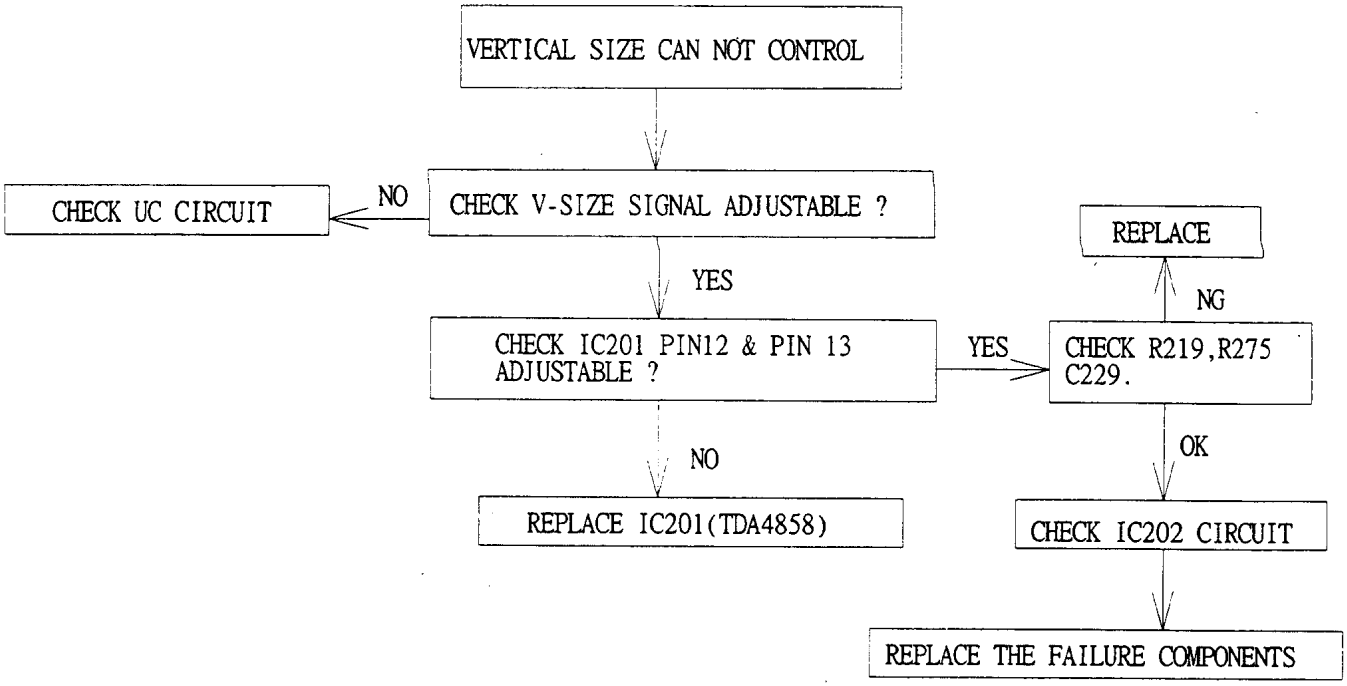
4.11 Horizontal Size Can Not Control



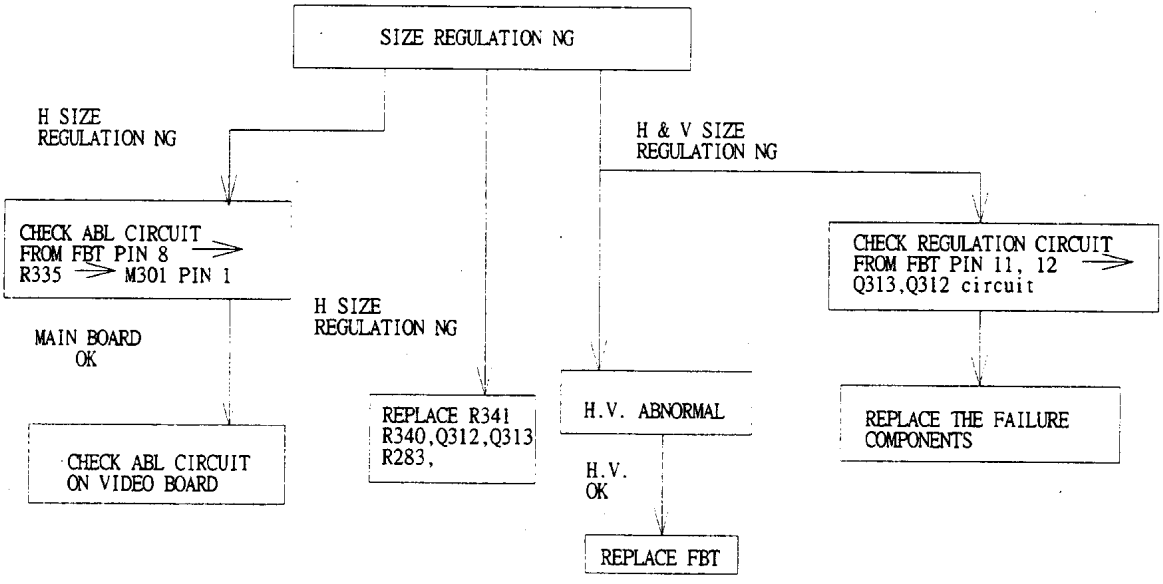
4.12 Brightness Can Not Control



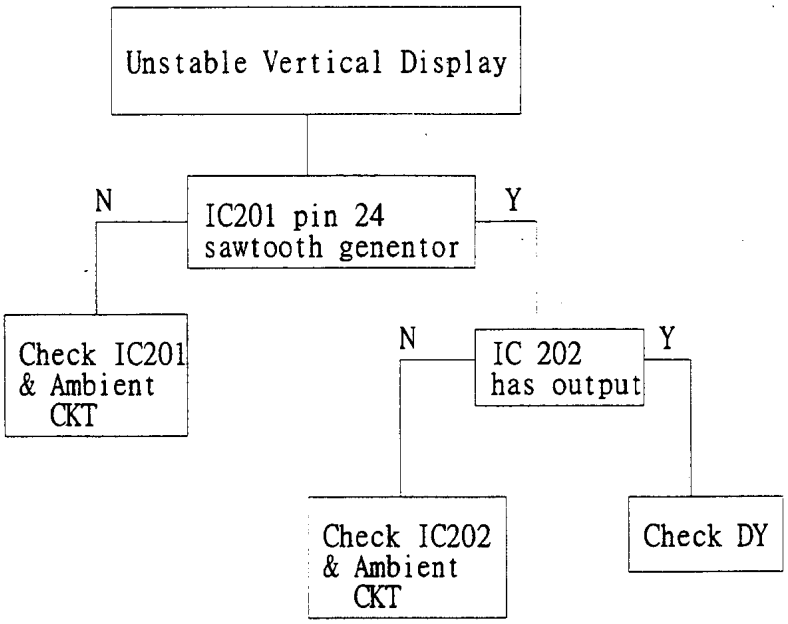
4.13 Vertical Size Can Not Control



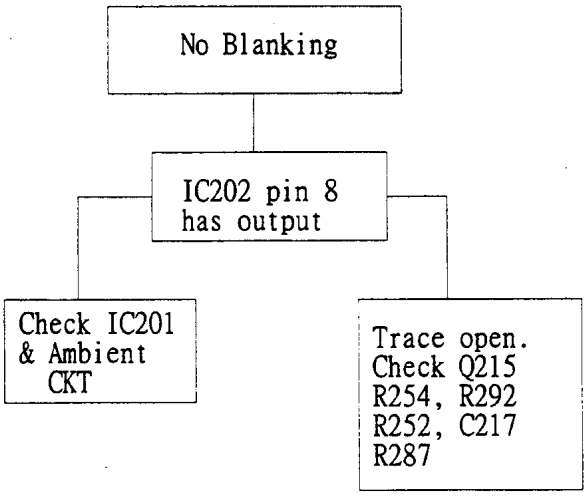
4.14 Size Regulation NG



4.15 Unstable Vertical Display



4.16 No Blanking



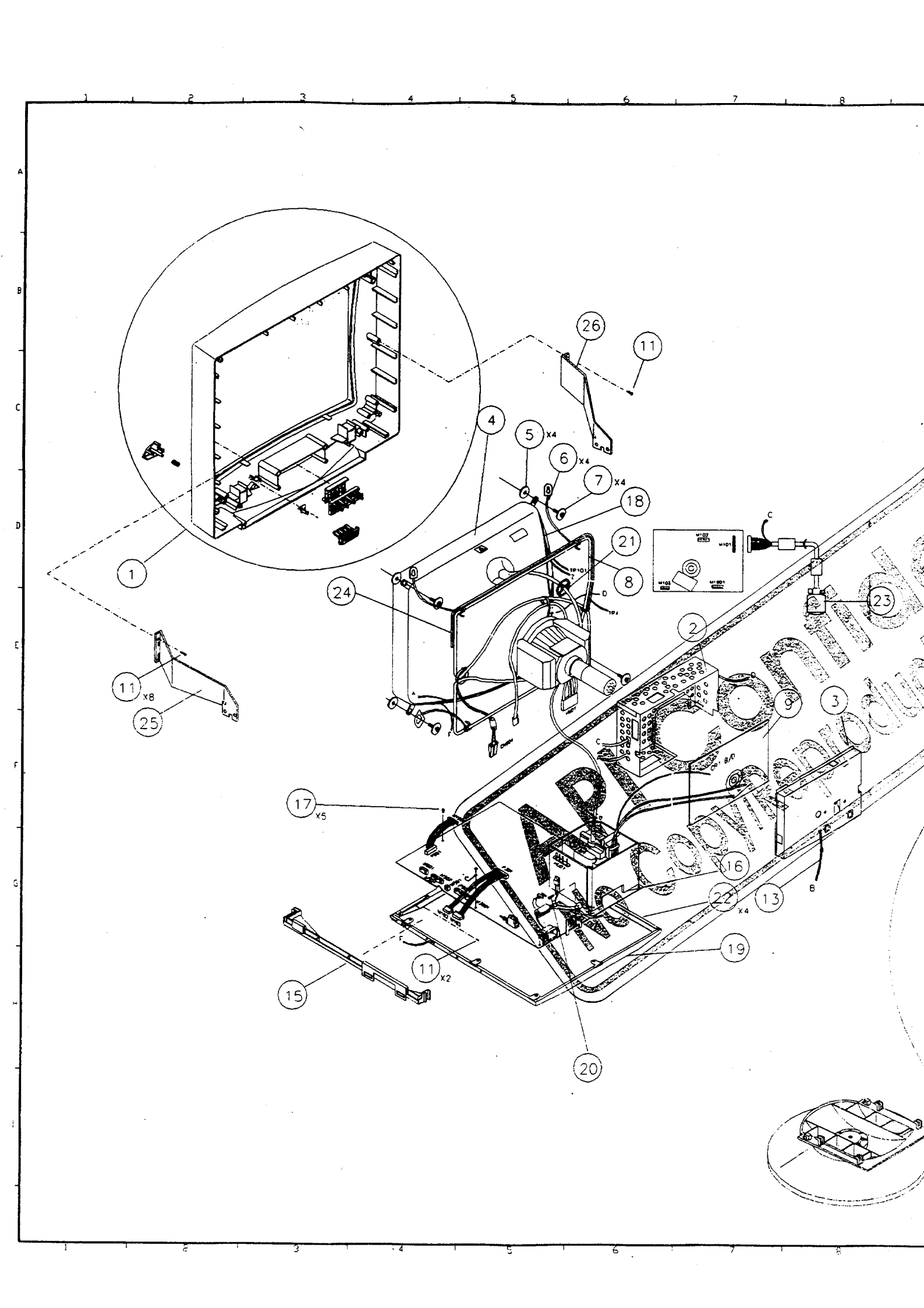
Appendix A

7276E Spare Parts List

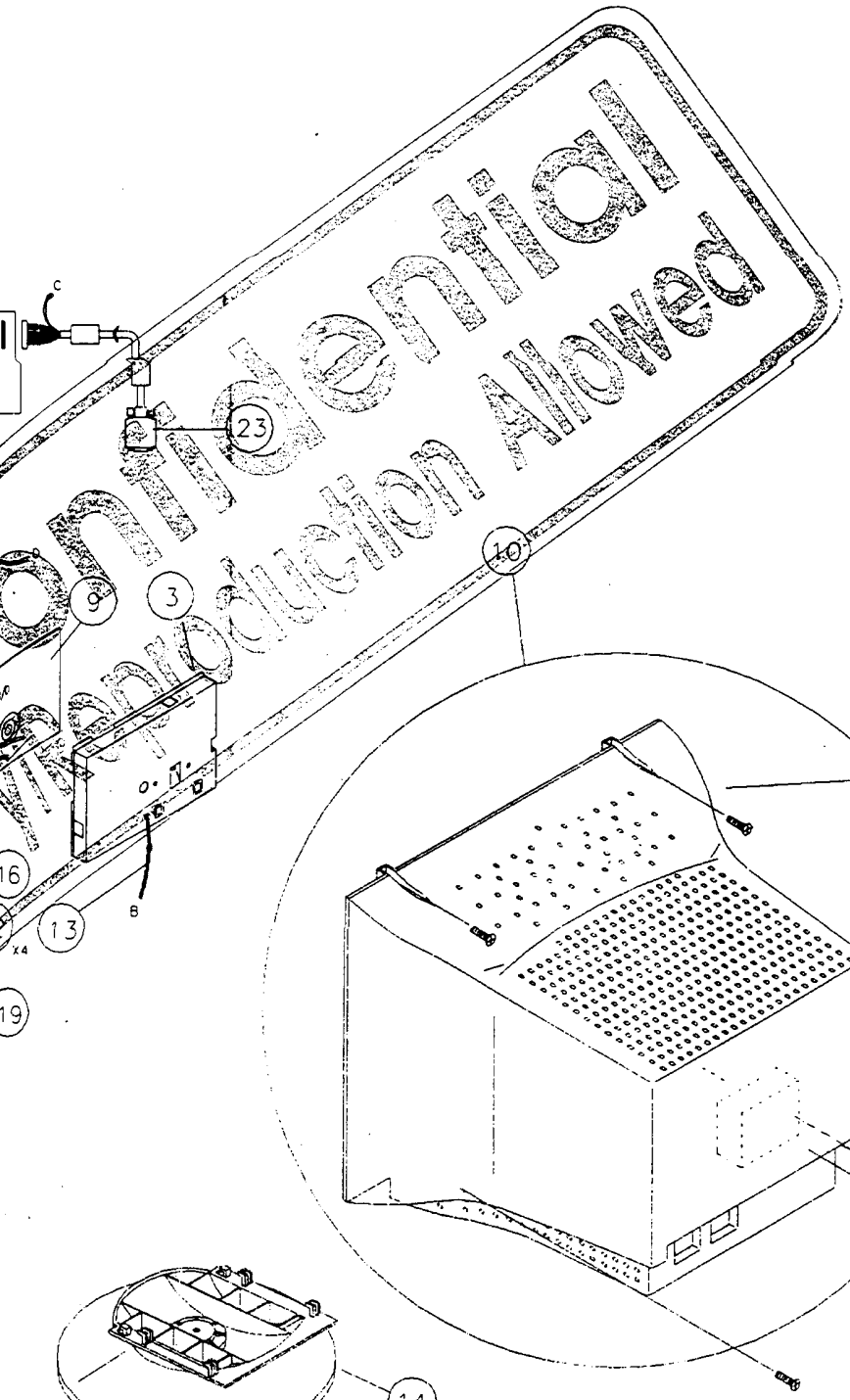
PART NUMBER	DESCRIPTION	LOCATION
55.72401.001	MAIN BD 7276E(MI)	
55.72402.001	VIDEO BD 7276(MI)	
55.72406.011	CTRL BD 7276E/MI ACER	
42.71509.002	BAG PE 302*201 7133D/ACER	
42.77504.001	BAG PE HDPE 900*900 7076I/AMR	
44.72401.001	CTN AB 545*516*490 7256E/ACER	
45.00005.201	LBL CTN ART B/W 152*101 ALL	
47.71801.001	CSN-L EPS WHI 7279T/ACER	
47.71802.001	CSN-R EPS WHI 7279T/ACER	
40.75404.001	LABEL BARCODE 50*20 7134T/NCR	
40.77902.001	LBL SPEC POLY TUV-E 7135c	
50.72401.001	S.A 13/15P 1840MM002 W/C SR DC	
56.05780.041	CRT 17" M41KXH100X02(X)TCO	
60.72406.001	ASSY BZL ABS 002 7276E/ACER	
60.72407.001	ASSY UP CASE 002 7276E/ACER	
60.78012.001	ASSY BASE ABS 94HB 002 7176IE	
01.03110.000	IC ASIC AP3110 OSD DIP 20P	IC1910
01.03107.000	IC ASIC AP3107 DIP 16P	IC701
01.03516.000	IC UCTRL(MYSON) AP3516 40P(79G)	IC801
02.02404.000	IC EEPROM 24C04 4K-BIT DIP 8P	IC802
04.00011.03A	IC V.R. PQ05RF11 DIP 4P	IC803
04.00324.010	IC OP LM324 DIP 14P	IC204
04.00358.010	IC OP LM358 DIP 8P	IC3901
04.00431.030	IC V.R. TL431C TO-92T 3P	IC702
04.01281.010	IC VIDEO AMP LM1281 DIP 28P	IC101
04.03842.040	IC V.R. UC3842 DIP 8P	IC601
04.04858.070	IC AUTO DEF CTRL TDA4858 DIP	IC201
04.06300.030	IC VOLT. SURV V6300 TO-92T	IC804
06.00031.01C	XTOR TIP31C TO-220 NPN P	Q318
06.00032.01C	XTOR TIP32C TO-220 PNP P	Q319
06.00089.010	XTOR BSS89 TO-92T	Q301
06.00630.020	FET MOS IRF630 NC TO-220	Q304,Q310
06.00857.010	XTOR 2SB857 B TO-220 PNP P	Q701
06.00956.020	FET MOS 2SK956 NC TO-3P	
06.01011.010	XTOR 2SB1011 TO-126B PNP P	Q404
06.02508.010	XTOR BU2508AF SOT199 NPN P	Q310
06.1R020.121	DIODE FAST RGP10D 200V 1A	D202,205,709,313,314,310,602
06.03788.010	XTOR 2SC3788 E TO-126 NPN P	Q703

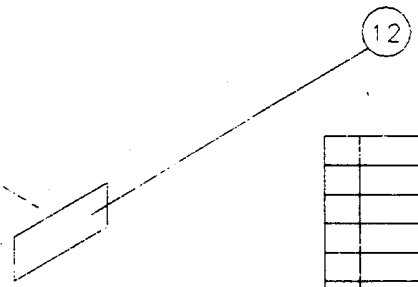
06.1R0A0.122	DIODE FAST UF4007 1KV 1A	D707,D608,D610
06.1R003.110	DIODE S.B. 1N5818 30V 1A DO-41	D302
06.1R005.030	DIODE REC 1N4001 50V 1A DO-41	D616
06.1R010.120	DIODE FAST RGP10B 100V 1A	D330
06.1R020.122	DIODE FAST EGP10D 200V 1A	D311,604
06.1R040.120	DIODE FAST RGP10G 400V 1A	D312
06.1R060.120	DIODE FAST RGP10J 600V 1A	D315,305,306,319
06.12R03.070	DIODE ZEN 12V 1/2W DO-35 5%	ZD301
06.12R03.071	DIODE ZEN 12V 1W DO-41 5%	ZD601,604
06.20R03.070	DIODE ZEN 20V 1/2W DO-35 5%	ZD605
06.3R010.122	DIODE FAST EGP30B 100V 3A	D706
06.5R0F0.121	DIODE FAST FMPM-3FU 1.5KV 5A	D307
06.5R103.070	DIODE ZEN 5.1V 1/2W DO-35 5%	ZD203,204,205,210.650, 801
06.5R603.070	DIODE ZEN 5.6V 1/2W DO-35 5%	ZD701,603
06.5R503.070	DIODE ZEN 7.5V 1/2W DO-35 5%	ZD302
11.39437.12K	CAP PMH 0.39U 400V J RF22.5	C309
11.47337.064	CAP PMH 0.047U 400V J RF10	C403
11.5623B.05K	CAP PP 5600P 1.6KV J RF22.5	C307
11.56238.05E	CAP PP 5600P 630V J RF15	C306
13.10135.03H	RES MOF 100 J 2W AF20	R701
13.15135.074	RES MOFM 150 J 2W RF5 MINI	R365
13.2R236.074	RES MOFM 2.2 J 3W RF5 MINI	R262
13.39336.074	RES MOFM 39K J 3W RF5 MINI	R602,R603
13.4R736.074	RES MOFM 4.7 J 3W RF5 MINI	R347
13.47136.07H	RES MOFM 470 J 3W AF20 MINI	R303
13.47235.074	RES MOF 4.7K J 2W RF5 MINI	R702
13.56135.07E	RES MOFM 560 2W AF15 MINI	R709
13.68135.074	RES MOFM 680 J 2W RF5 MINI	R619
13.82336.074	RES MOFM 82K J 3W RF5 MINI	R604
17.40010.102	SVR 1K B6D 5*5 H	VR701
17.40010.103	SVR 10K B 6D 5*5 H	VR302
17.60021.8R0	THERM 8 NTC 11.5D	TR601
17.60030.00A	THERM 100/5 NTC 10% TAP TTC	R256,R274
17.60044.140	THERM 14 OHM 2P	TR602
19.20079.011	XFORM EI-19 56E/T302	T302
19.40067.001	LINE-FILTER 7.5MH EE28 7133D	L602
19.40091.001	CHOKE 180UH T68-26 7178I	L603,L604
19.40093.031	CHOKE 8MH DR10*16 L302 76IE	L302
19.46003.001	CHOK 10UH S-1085 S-1145	L703
19.50037.001	COIL-LINEAR 8UH 7276E/T303	T303
19.60038.041	XFORM PWR EE42*15 185UH 76E/T6	T601

19.60050.021	XFORM DRV EEL16 1.8MH(MIN)T602	T602
19.70041.001	TRANSFORMER FBT 7276E	T301
19.90035.021	COIL DEGAUSSING 7276E(W/TILT)	
22.10001.008	SKT IC DIP 8P D7.62MM	FOR IC802
22.10002.040	SKT IC DIP 40P D15.24MM	FOR IC801
22.40088.031	SW PWR PUSH RT ESB82137V	SW601
22.50013.011	RELAY OMIT-SS-124DM 24V SPST	RL601
23.30008.001	XTAL 12MHZ 32P 30PPM	Y801
23.30030.021	XTAL 32.768KHZ 12.5P 20PPM D3	Y701
26.13001.310	FUSE 3A 125V PICO F UL/CSA	F702,F701
26.14001.113	FUSE 4A 250V ST20 L/H SEM/U	F601
26.15001.310	FUSE 5A 125V PICO F UL/CSA	F703
27.81818.031	CORD SVT #18*3C 10A 125V US	
49.72401.101	MANU USER(5L) 7276E	


1
2
3
4
5 X4
6 X4
7 X4
8
9
11
11 X8
11 X2
13
15
16
17 X5
18
19
20
21
22 X4
23
24
25
26

ITEM NO.	PART NO	DESCRIPTION	QTY
1	60.72406.XXX	ASSY BZL	1
2	31.72402.00X	PLATE SHLD COVER	1
3	31.72401.00X	PLATE SHLD REAR	1
4	56.05728.0XX	CRT 17"	1
5	47.73101.00X	CRT SPACER	4
6	34.75605.02X	CLIP CABLE	4
7	86.00031.280	SCRW HEX W/WSHR M5*26L C-ZN CRT*4	4
8	19.90037.00X	COIL DEGAUSSING 7276E	1
9	55.72402.00X	VIDEO BD	1
10	60.72407.XXX	ASSY CASE U	1
11	86.PA526.160	SCRW TAP PAN M4*16L U/CASE TO BZ	8
12	40.77902.001	SPEC LBL	1
13	50.60311.01X	W.A 1P(GND) BD 115MM	1
14	60.78012.XXX	ASSY BASE ABS	1
15	42.72406.00X	LINK POWER	1
16	55.72401.00X	MAIN BD 7276j	1
17	86.WD424.8R0	SCRW TC CAP EXT/TOOTH M3*8L CZ	7
18	50.72804.00X	W.A 1P*6 BD 780MM	1
19	33.72403.00X	BKT M/B	1
20	86.00010.161	SCRW TAP TRS W/EXT M4*8L GND WIRE*1	1
21	42.73105.00X	CLIP FBT	1
22	40.72401.00X	PLT-INSULATION	4
23	50.72401.0XX	S.A. 13/15P 184DMM002 W/C	1
24	50.72803.00X	W.A. 1P 1015#22 1300MM	1
25	33.72404.00X	BKT-LEFT	1
26	33.72405.00X	BKT-RIGHT	1
27	42.75804.001	CABLE CLIP	1
28	42.72801.001	WIRE CLIP	3





REV	DESCRIPTION	SIGN	DATE

UNITS OR ASSEMBLY	7276e/ACER	NAME	ASSY DRAWING
DRN	S.P.LIAO 1-17-97	MATERIAL	
DSN		FINISH	
CKD			
APPD		明基電腦 Acer Peripherals, Inc.	

SCALE: X | DIM IN: M M

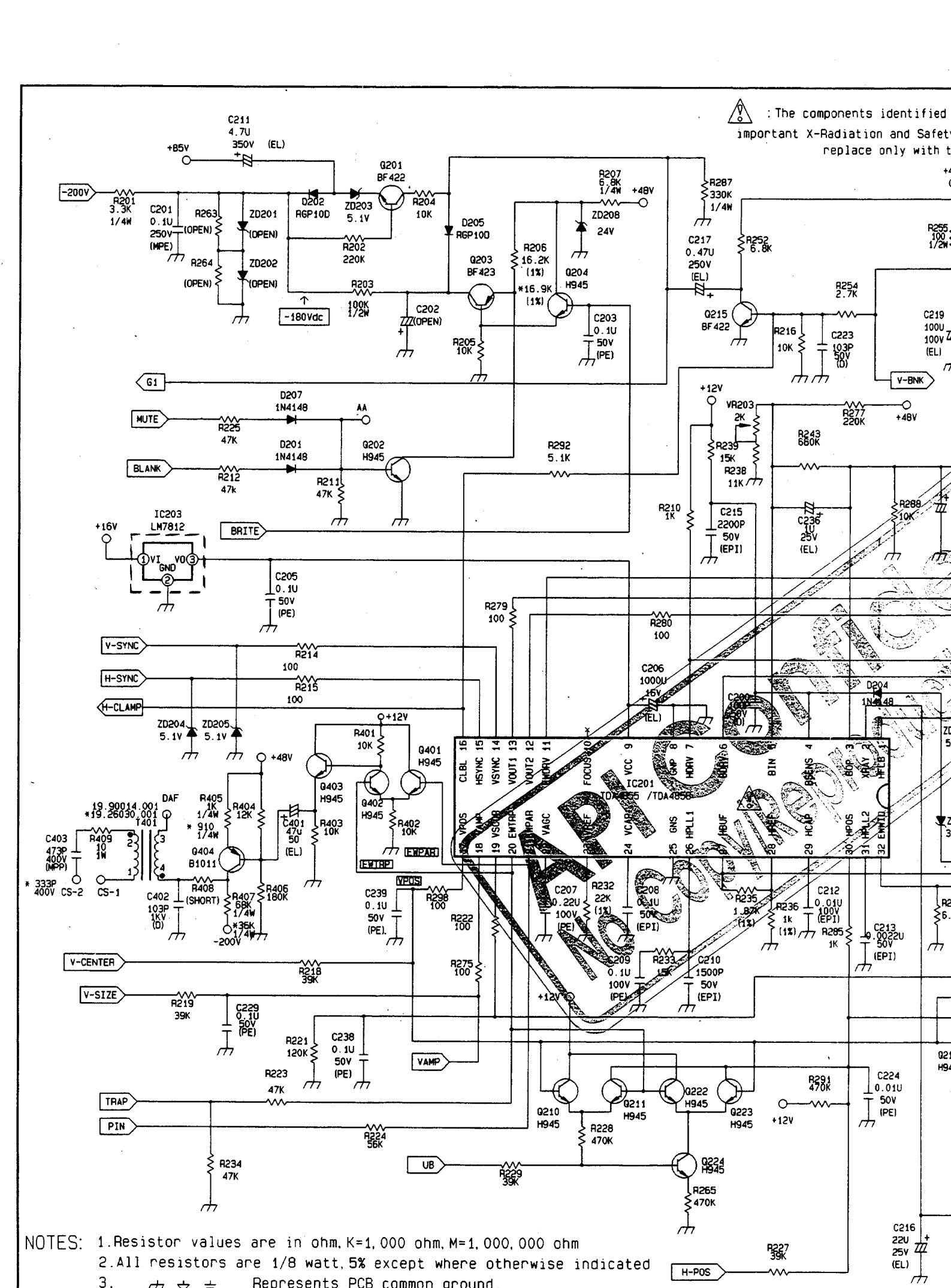
LIMITS UNLESS OTHERWISE NOTED

1-6	±0.1	200-1000	±0.5
6-30	±0.2	1000-2000	±1.0
30-100	±0.3	2000-	±2.0
100-300	±0.5	ANG	±1°-2'

MOLD NO.

SHEET 1 OF 1

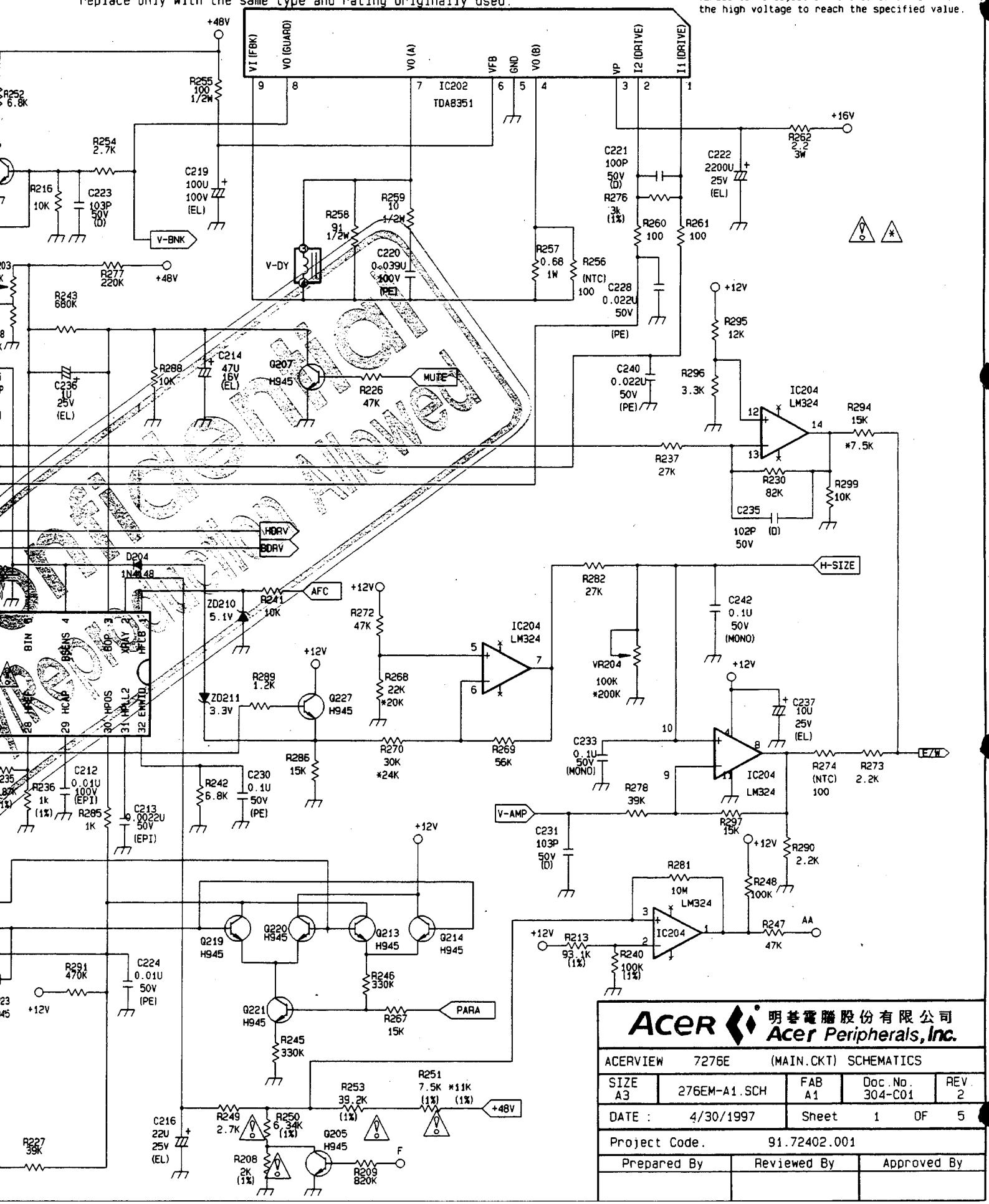
DRAWING NO. 57.72402.001



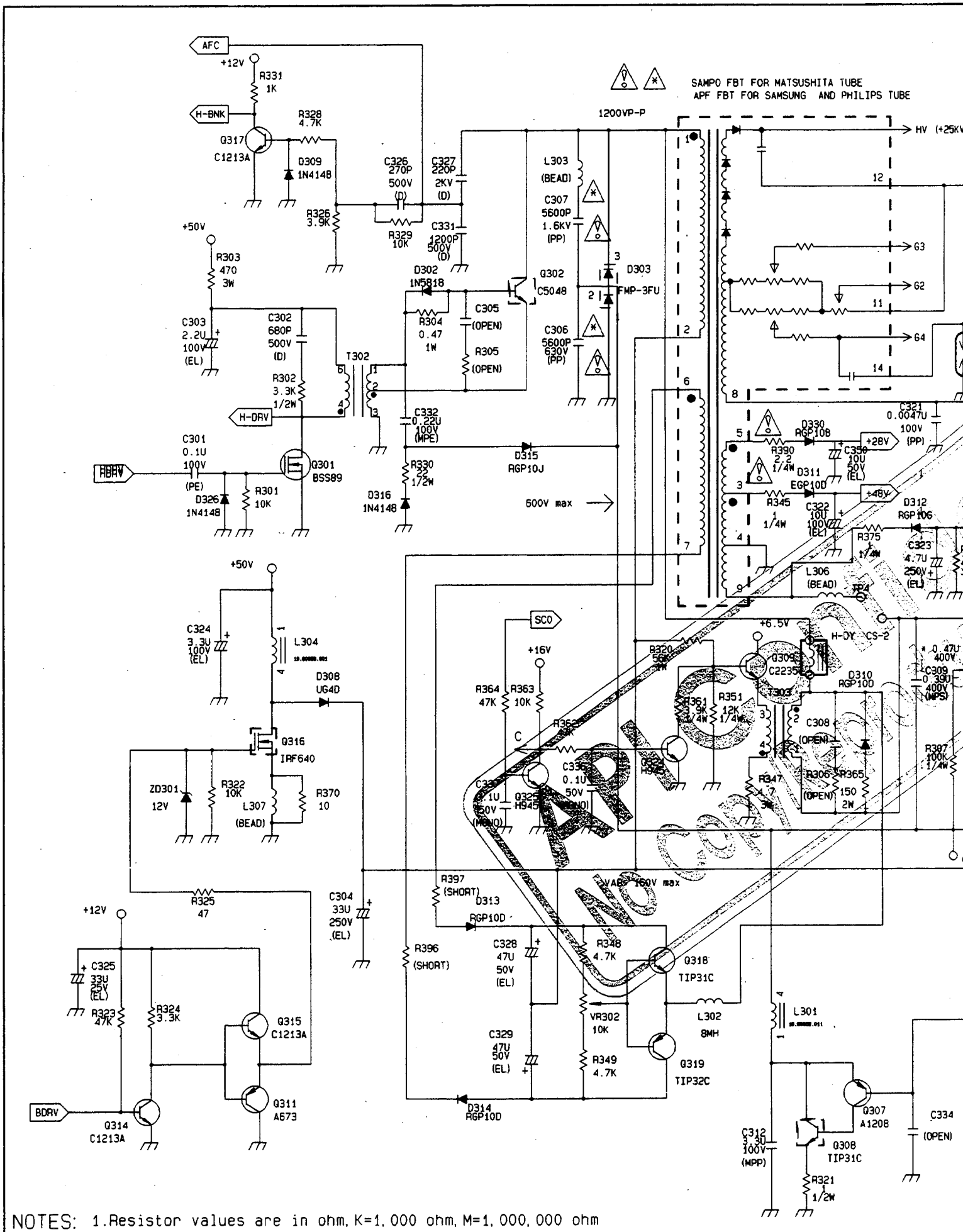
NOTES: 1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2. All resistors are 1/8 watt, 5% except where otherwise indicated
3. ⏚ ⏚ ⏚ Represents PCB common ground.

⚠ : The components identified by the mark of ⚠ in the schematic are important X-Radiation and Safety Parts. Should replacement is required, replace only with the same type and rating originally used.

⚠*: The components identified by the mark of ⚠* in the schematic are important safety parts. If replacement is required, refer to service manual to re-adjust or re-checked the B+ and the high voltage to reach the specified value.



Acer 明碁電腦股份有限公司 Acer Peripherals, Inc.				
ACERVIEW 7276E (MAIN.CKT) SCHEMATICS				
SIZE A3	276EM-A1.SCH	FAB A1	Doc. No. 304-C01	REV 2
DATE : 4/30/1997		Sheet 1 OF 5		
Project Code. 91.72402.001				
Prepared By	Reviewed By	Approved By		



NOTES: 1.Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
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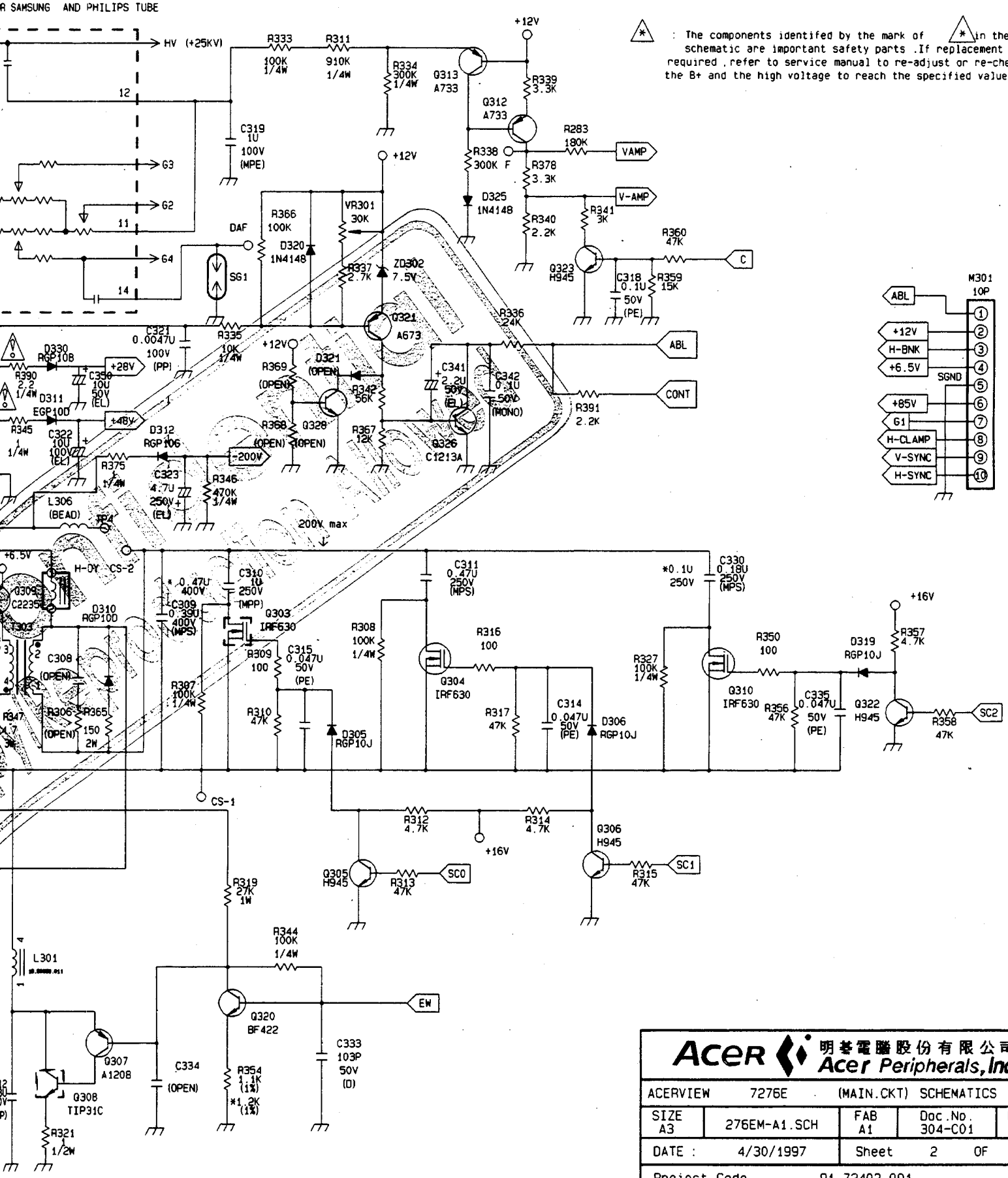
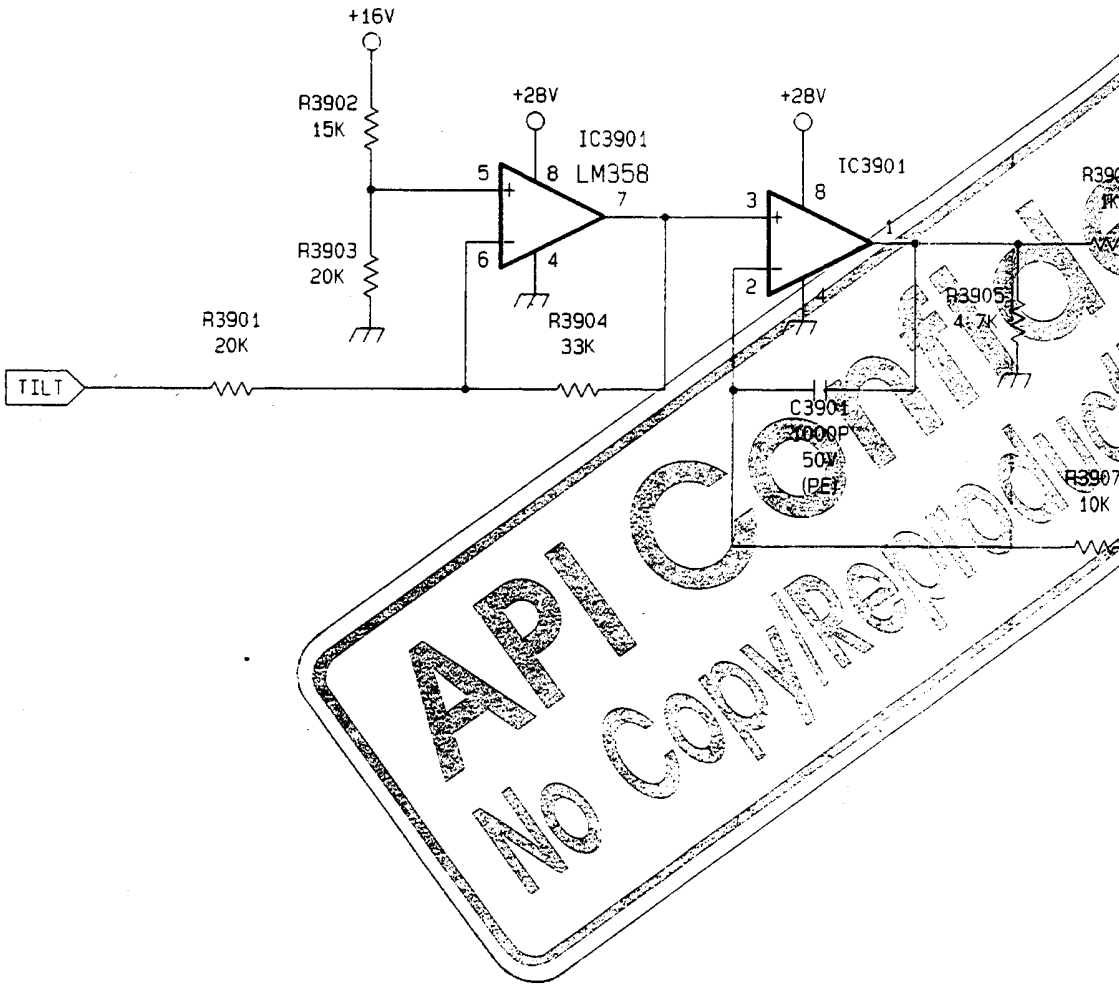
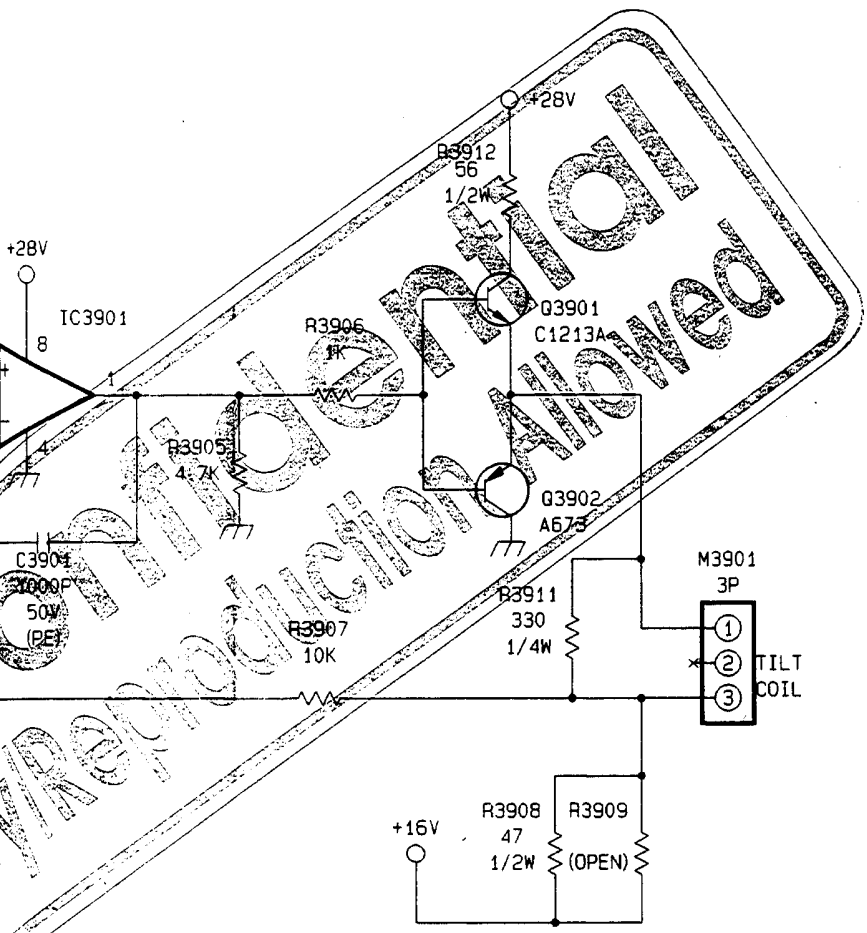
FOR MATSUSHITA TUBE
R SAMSUNG AND PHILIPS TUBE



Acer 明碁電腦股份有限公司 Acer Peripherals, Inc.				
ACERVIEW 7276E (MAIN.CKT) SCHEMATICS				
SIZE A3	276EM-A1.SCH	FAB A1	Doc.No. 304-C01	REV. 2
DATE : 4/30/1997		Sheet 2 OF 5		
Project Code. 91.72402.001				
Prepared By	Reviewed By	Approved By		



NOTES: 1. Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2. All resistors are 1/8 watt, 5% except where otherwise indicated
3. Represents PCB common ground.



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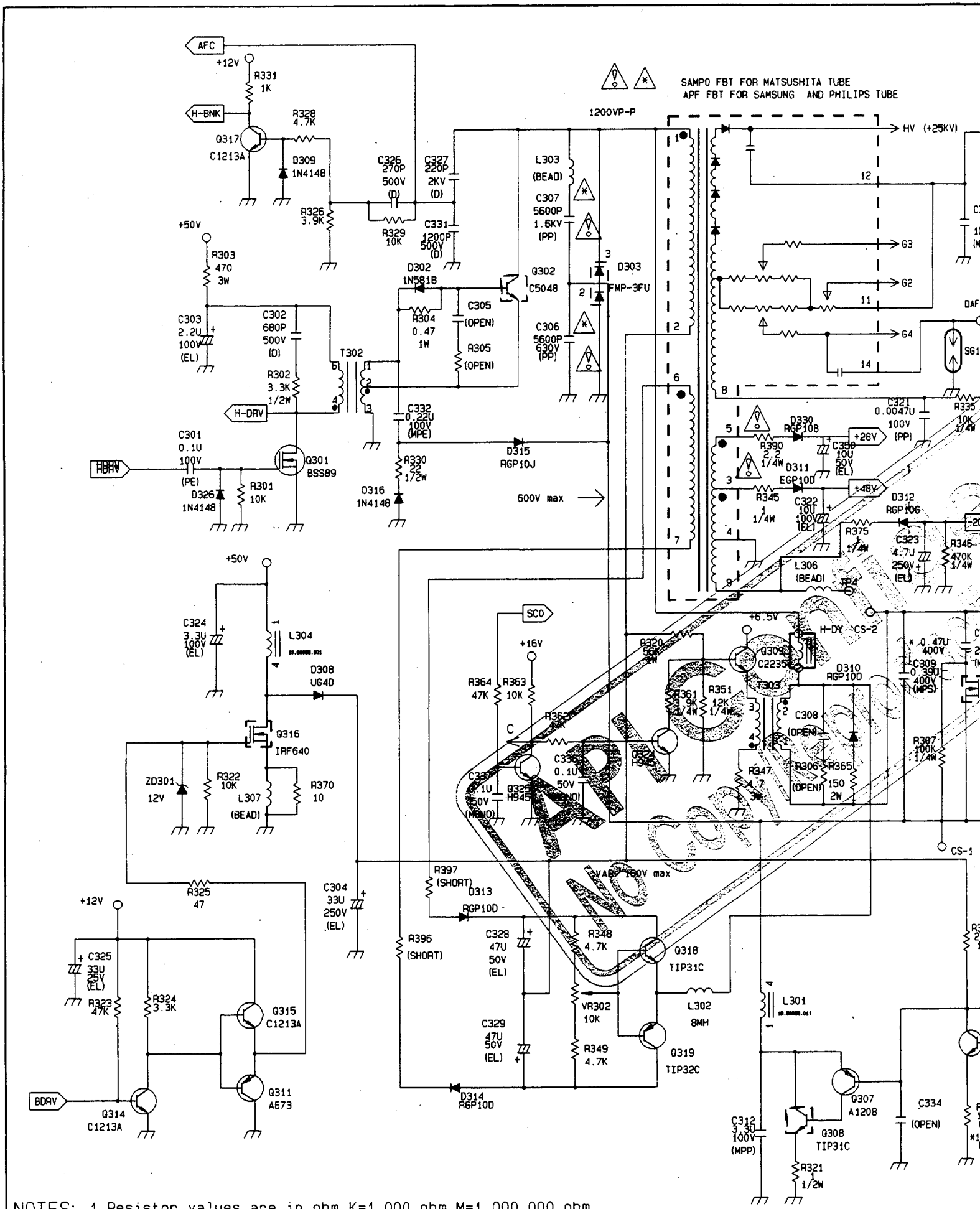
Acer 明碁電腦股份有限公司 Acer Peripherals, Inc				
ACERVIEW 7276E (ROTATION) SCHEMATICS				
SIZE A4	276EM-A1.SCH	FAB A1	Doc.No. 304-C01	REV 3
DATE : 4/30/1997		Sheet 3 OF 5		
Project Code. 91.72402.001				
Prepared By	Reviewed By	Approved By		



NOTES: 1.Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2.All resistors are 1/8 watt, 5% except where otherwise indicated
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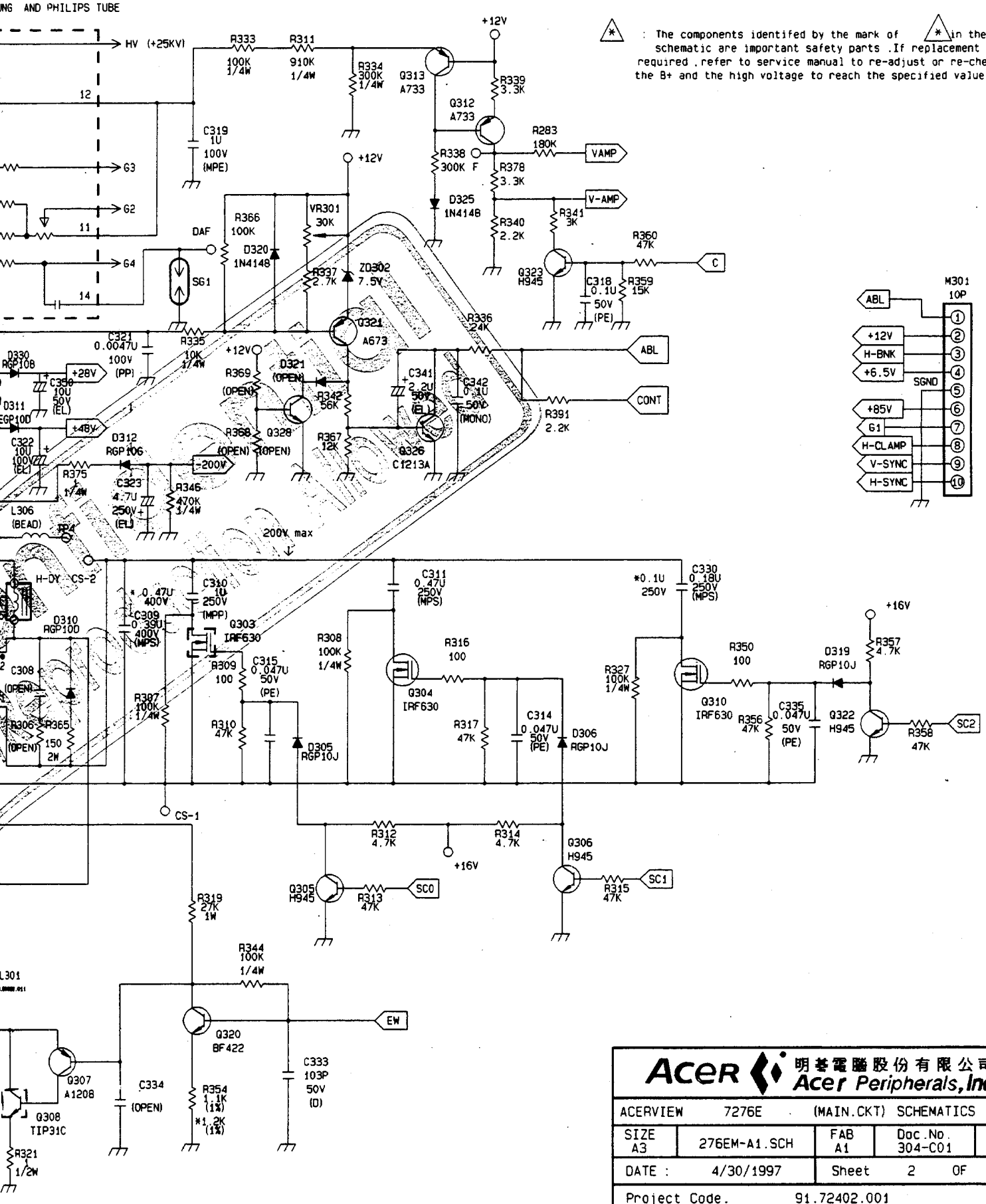
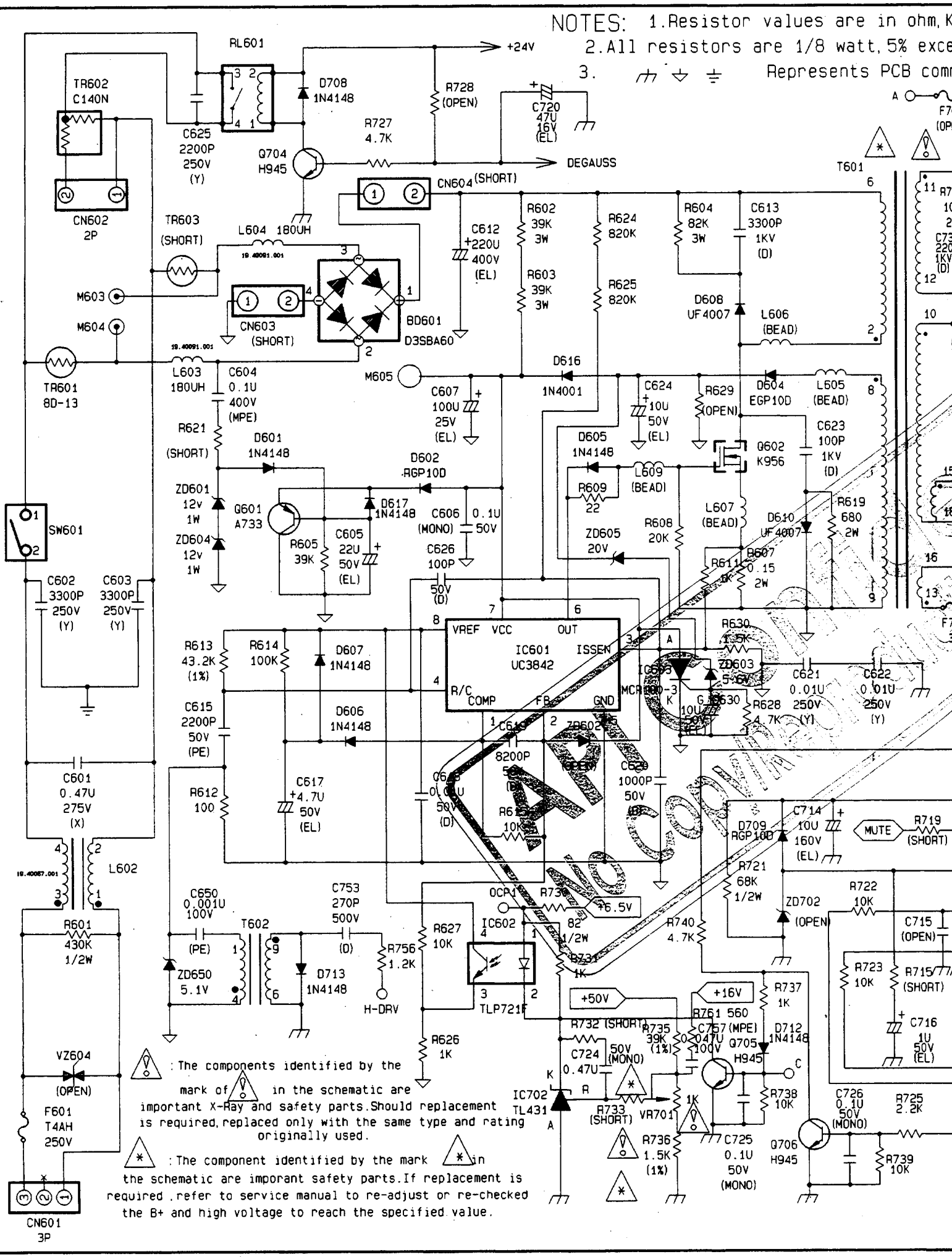
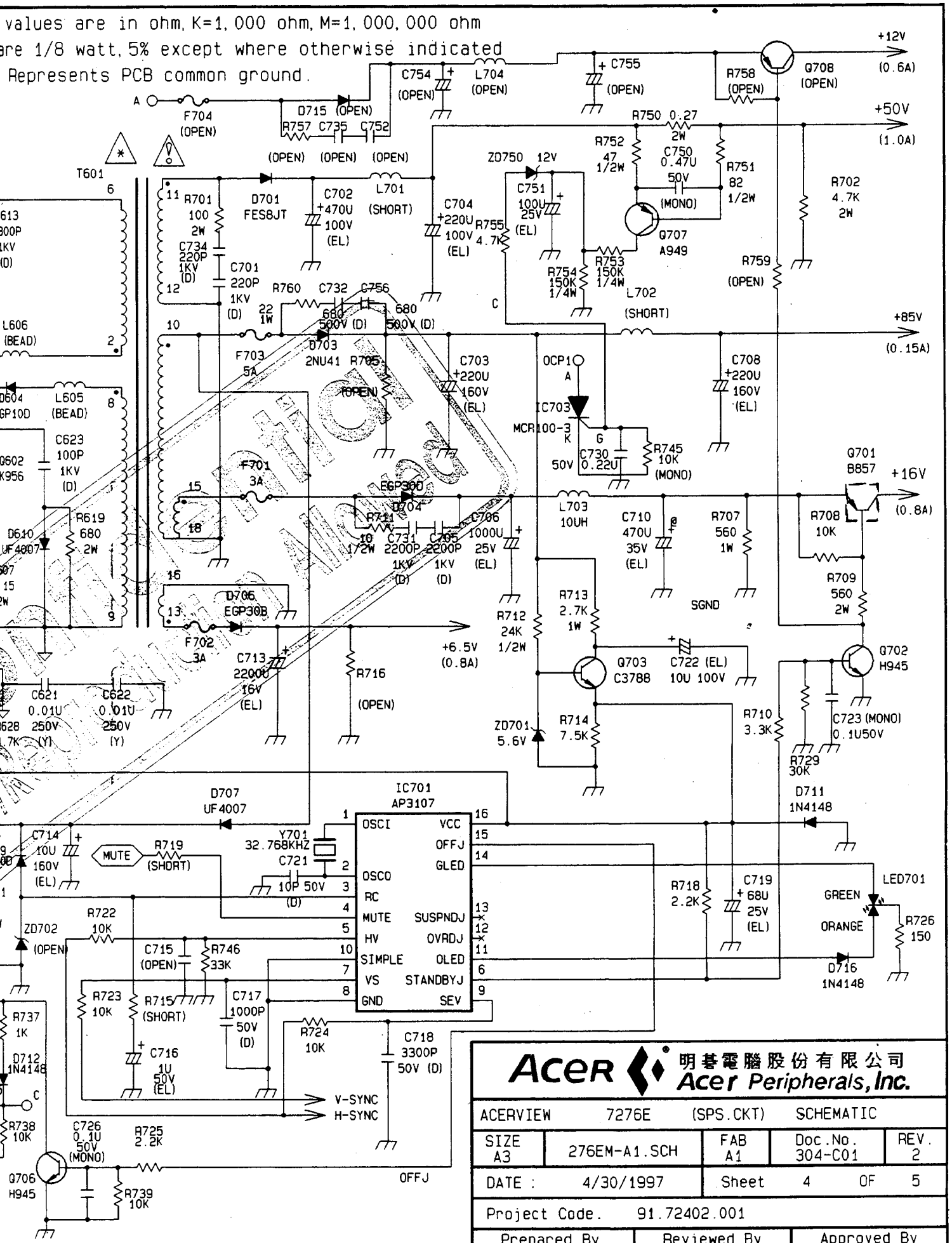
SUSHITA TUBE
NG AND PHILIPS TUBE



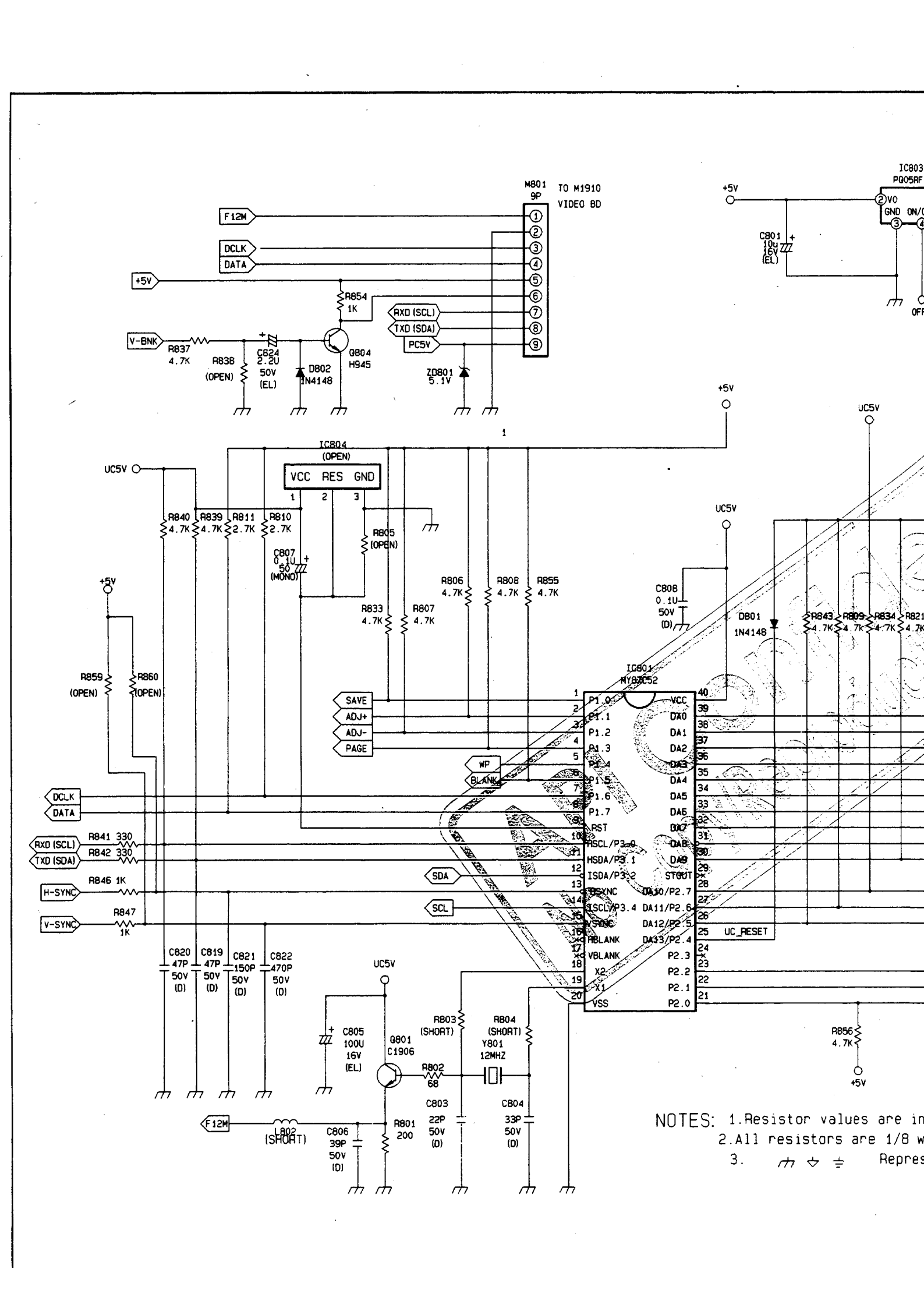
Acer 明基電腦股份有限公司 Acer Peripherals, Inc.				
ACERVIEW 7276E (MAIN.CKT) SCHEMATICS				
SIZE A3	276EM-A1.SCH	FAB A1	Doc.No. 304-C01	REV. 2
DATE : 4/30/1997		Sheet 2 OF 5		
Project Code. 91.72402.001				
Prepared By	Reviewed By	Approved By		

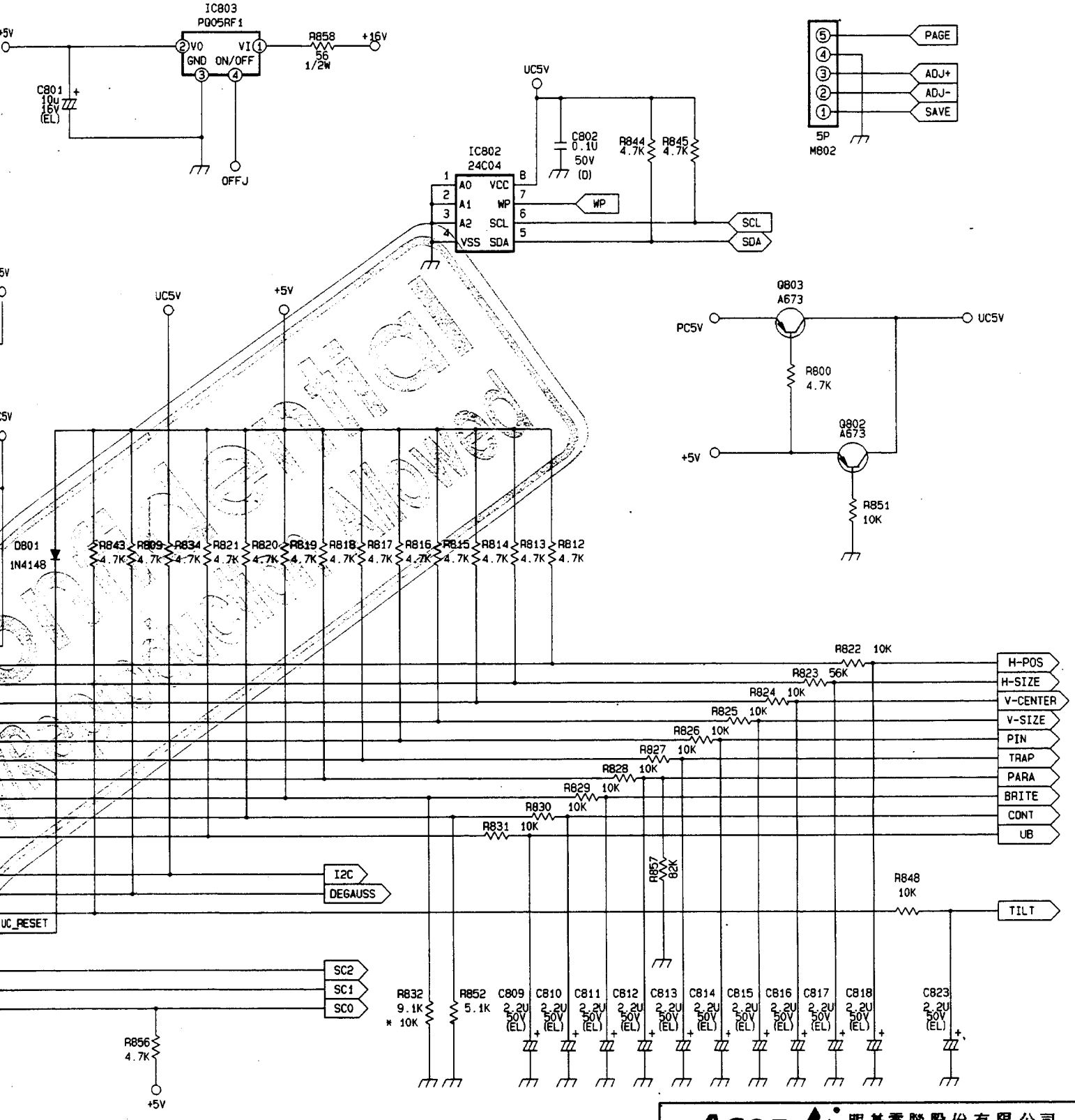

NOTES: 1.Resistor values are in ohm, K
2.All resistors are 1/8 watt, 5% exce
3. Represents PCB comm
RL601
TR602
C140N
C625
2200P
250V
(Y)
D708
1N4148
R728
(OPEN)
+24V
C720
47U
16V
(EL)
R727
4.7K
Q704
H945
DEGAUSS
CN602
2P
CN604 (SHORT)
TR603
(SHORT)
L604 180UH
C612
+220U
400V
(EL)
R602
39K
3W
R603
39K
3W
R624
820K
R625
820K
R604
82K
3W
C613
3300P
1KV
(D)
D608
UF4007
L606
(BEAD)
M603
M604
CN603
(SHORT)
BD601
D3SBA60
TR601
8D-13
L603
180UH
C604
0.1U
400V
(MPE)
M605
D616
1N4001
C607
100U
25V
(EL)
C624
10U
50V
(EL)
R629
(OPEN)
D604
EGP10D
L605
(BEAD)
R621
(SHORT)
D601
1N4148
D602
RGP10D
D605
1N4148
L609
(BEAD)
Q602
K956
C623
100P
1KV
(D)
ZD601
12v
1W
ZD604
12v
1W
Q601
A733
D617
1N4148
C606
(MONO)
0.1U
50V
R605
39K
C605
22U
50V
(EL)
C626
100P
50V
(D)
R609
22
ZD605
20V
R608
20K
L607
(BEAD)
D610
UF4007
R619
680
2W
R611
0.15
2W
SW601
C602
3300P
250V
(Y)
C603
3300P
250V
(Y)
R613
43.2K
(1%)
R614
100K
D607
1N4148
IC601
UC3842
VREF
VCC
OUT
ISSEN
R/C
COMP
FB
GND
R630
1.5K
ZD603
5.6V
C621
0.01U
250V
(Y)
C622
0.01U
250V
(Y)
R628
4.7K
C615
2200P
50V
(PE)
D606
1N4148
C619
8200P
C620
1000P
50V
C601
0.47U
275V
(X)
R612
100
C617
+4.7U
50V
(EL)
R631
10K
D709
RGP10D
C714
10U
160V
(EL)
MUTE
R719
(SHORT)
L602
R721
68K
1/2W
R722
10K
ZD702
(OPEN)
C715
(OPEN)
C650
0.001U
100V
C753
270P
500V
T602
OCP1
R739
82
1/2W
+6.5V
IC602
TLP721F
R740
4.7K
R723
10K
R715
(SHORT)
C716
1U
50V
(EL)
R601
430K
1/2W
ZD650
5.1V
D713
1N4148
R756
1.2K
H-DRV
R627
10K
R731
1K
+50V
+16V
R737
1K
R761 560
C757 (MPE)
0.047U
100V
D712
1N4148
Q705
H945
R732 (SHORT)
R735
39K
(1%)
C724
0.47U
50V
(MONO)
R738
10K
VZ604
(OPEN)
F601
T4AH
250V
R626
1K
IC702
TL431
R733
(SHORT)
VR701
1K
R736
1.5K
(1%)
C725
0.1U
50V
(MONO)
C726
0.1U
50V
(MONO)
R725
2.2K
Q706
H945
R739
10K
CN601
3P
: The components identified by the mark of in the schematic are important X-Ray and safety parts. Should replacement is required, replaced only with the same type and rating originally used.
: The component identified by the mark in the schematic are imporant safety parts. If replacement is required, refer to service manual to re-adjust or re-checked the B+ and high voltage to reach the specified value.

values are in ohm, K=1,000 ohm, M=1,000,000 ohm
are 1/8 watt, 5% except where otherwise indicated
Represents PCB common ground.



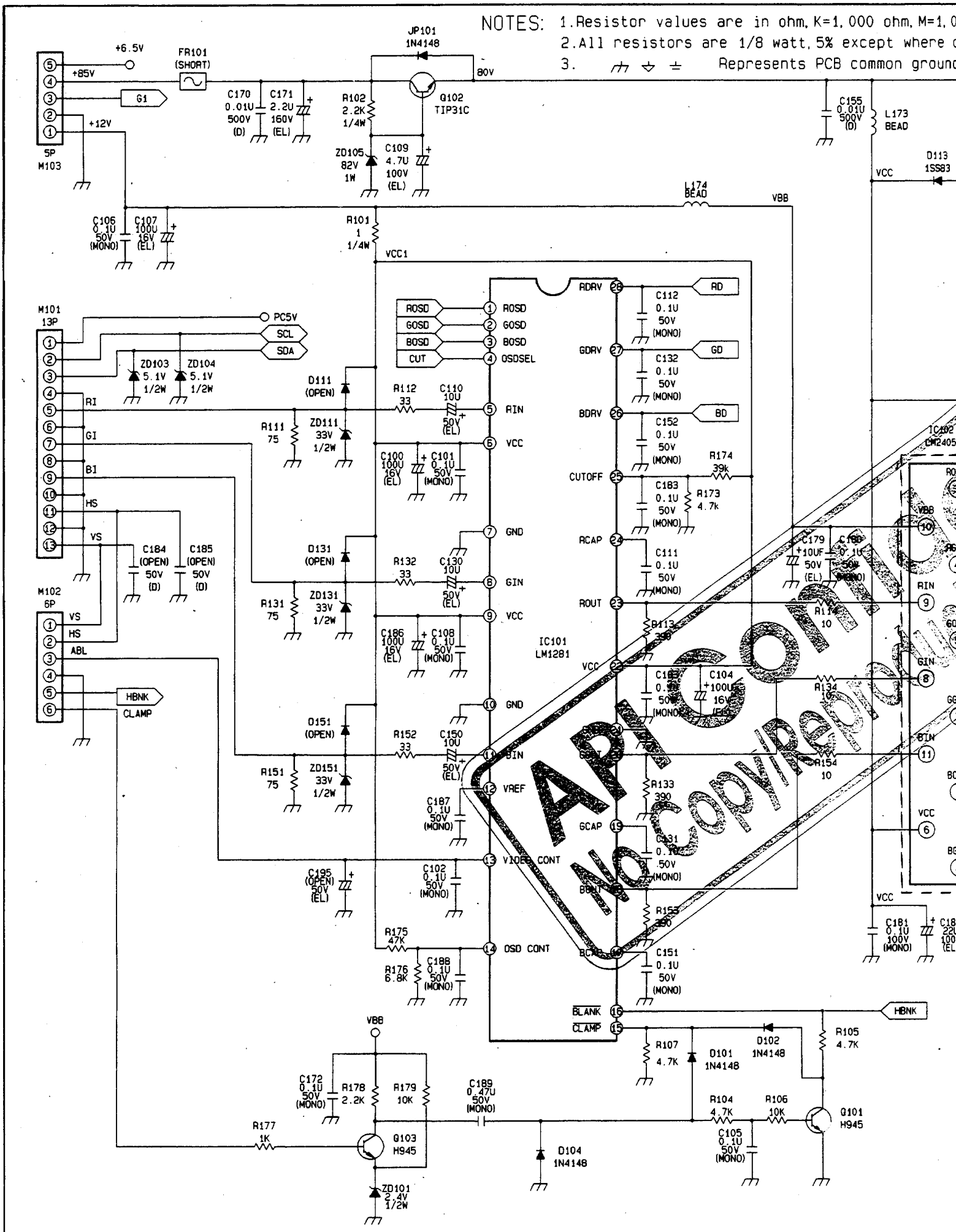
Acer 明碁電腦股份有限公司 Acer Peripherals, Inc.				
ACERVIEW	7276E	(SPS.CKT)	SCHEMATIC	
SIZE A3	276EM-A1.SCH	FAB A1	Doc.No. 304-C01	REV. 2
DATE : 4/30/1997		Sheet 4	OF 5	
Project Code. 91.72402.001				
Prepared By	Reviewed By	Approved By		


M801
9P
TO M1910
VIDEO BD
F12M
DCLK
DATA
+5V
R854
1K
RXD (SCL)
TXD (SDA)
PC5V
V-BNK
R837
4.7K
R838
(OPEN)
C824
2.2U
50V
(EL)
D802
1N4148
Q804
H945
ZD801
5.1V
IC803
PQ05RF
VO
GND
C801
10u
16V
(EL)
IC804
(OPEN)
VCC RES GND
UC5V
R840
4.7K
R839
4.7K
R811
2.7K
R810
2.7K
R805
(OPEN)
C807
0.1U
50
(MONO)
R806
4.7K
R808
4.7K
R855
4.7K
R833
4.7K
R807
4.7K
C808
0.1U
50V
(D)
D801
1N4148
R843
4.7K
R809
4.7K
R834
4.7K
R821
4.7K
R859
(OPEN)
R860
(OPEN)
IC801
MY82C52
SAVE
ADJ+
ADJ-
PAGE
WP
BLANK
SDA
SCL
P1.0
P1.1
P1.2
P1.3
P1.4
P1.5
P1.6
P1.7
RST
RXD (SCL)
TXD (SDA)
HSDA/P3.1
ISDA/P3.2
SSYNC
SCL/P3.4
VSYNC
HBLANK
VBLANK
X2
X1
VSS
VCC
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
DA8
DA9
STOUT
DA10/P2.7
DA11/P2.6
DA12/P2.5
DA13/P2.4
P2.3
P2.2
P2.1
P2.0
UC_RESET
R841 330
R842 330
R846 1K
R847
1K
H-SYNC
V-SYNC
C820
47P
50V
(D)
C819
47P
50V
(D)
C821
150P
50V
(D)
C822
470P
50V
(D)
C805
100U
16V
(EL)
Q801
C1906
R803
(SHORT)
R804
(SHORT)
Y801
12MHZ
R802
68
C803
22P
50V
(D)
C804
33P
50V
(D)
F12M
L802
(SHORT)
C806
39P
50V
(D)
R801
200
R856
4.7K
NOTES: 1.Resistor values are in
2.All resistors are 1/8 w
3. Repres



1.Resistor values are in ohm, K=1,000 ohm, M=1,000,000 ohm
2.All resistors are 1/8 watt, 5% except where otherwise indicated
3. ⏚ ⏚ ⏚ Represents PCB common ground.

Acer 明碁電腦股份有限公司 Acer Peripherals, Inc.				
ACERVIEW	7276E	(MICRO.CKT)	SCHEMATIC	
SIZE A3	276EM-A1.SCH	FAB A1	Doc.No. 304-C01	REV. 2
DATE : 4/30/1997		Sheet 5 OF 5		
Project Code. 91.72402.001				
Prepared By	Reviewed By	Approved By		


NOTES: 1.Resistor values are in ohm, K=1,000 ohm, M=1,0
2.All resistors are 1/8 watt, 5% except where
3. Represents PCB common ground
+6.5V
FR101 (SHORT)
+85V
G1
+12V
5P M103
JP101 1N4148
80V
Q102 TIP31C
R102 2.2K 1/4W
ZD105 82V 1W
C109 4.7U 100V (EL)
C170 0.01U 500V (D)
C171 2.2U 160V (EL)
C155 0.01U 500V (D)
L173 BEAD
L174 BEAD
VBB
VCC
D113 1SS83
C106 0.1U 50V (MONO)
C107 100U 16V (EL)
R101 1 1/4W
VCC1
M101 13P
PC5V
SCL
SDA
ZD103 5.1V 1/2W
ZD104 5.1V 1/2W
RI
GI
BI
HS
VS
C184 (OPEN) 50V (D)
C185 (OPEN) 50V (D)
M102 6P
ABL
HBNK
CLAMP
ROSD
GOSD
BOSD
CUT
OSDSEL
D111 (OPEN)
R112 33
C110 10U 50V (EL)
R111 75
ZD111 33V 1/2W
C100 100U 16V (EL)
C101 0.1U 50V (MONO)
D131 (OPEN)
R132 33
C130 10U 50V (EL)
R131 75
ZD131 33V 1/2W
C186 100U 16V (EL)
C108 0.1U 50V (MONO)
D151 (OPEN)
R152 33
C150 10U 50V (EL)
R151 75
ZD151 33V 1/2W
C187 0.1U 50V (MONO)
C195 (OPEN) 50V (EL)
C102 0.1U 50V (MONO)
R175 47K
R176 6.8K
C188 0.1U 50V (MONO)
IC101 LM1281
RIN
VCC
GND
GIN
VREF
VIDEO CONT
OSD CONT
ADRV
GDRV
BDRV
CUTOFF
RCAP
ROUT
GCAP
BCAP
BLANK
CLAMP
RD
GD
BD
C112 0.1U 50V (MONO)
C132 0.1U 50V (MONO)
C152 0.1U 50V (MONO)
R174 39k
C183 0.1U 50V (MONO)
R173 4.7k
C111 0.1U 50V (MONO)
R113 390
C104 100U 16V (EL)
R133 390
C131 0.1U 50V (MONO)
R153 390
C151 0.1U 50V (MONO)
C179 10UF 50V (EL)
R114 10
R134 10
R154 10
C181 0.1U 100V (MONO)
HBNK
R107 4.7K
D101 1N4148
D102 1N4148
R105 4.7K
R104 4.7K
R106 10K
C105 0.1U 50V (MONO)
Q101 H945
C172 0.1U 50V (MONO)
R178 2.2K
R179 10K
C189 0.47U 50V (MONO)
R177 1K
Q103 H945
D104 1N4148
ZD101 2.4V 1/2W
APEX COPY
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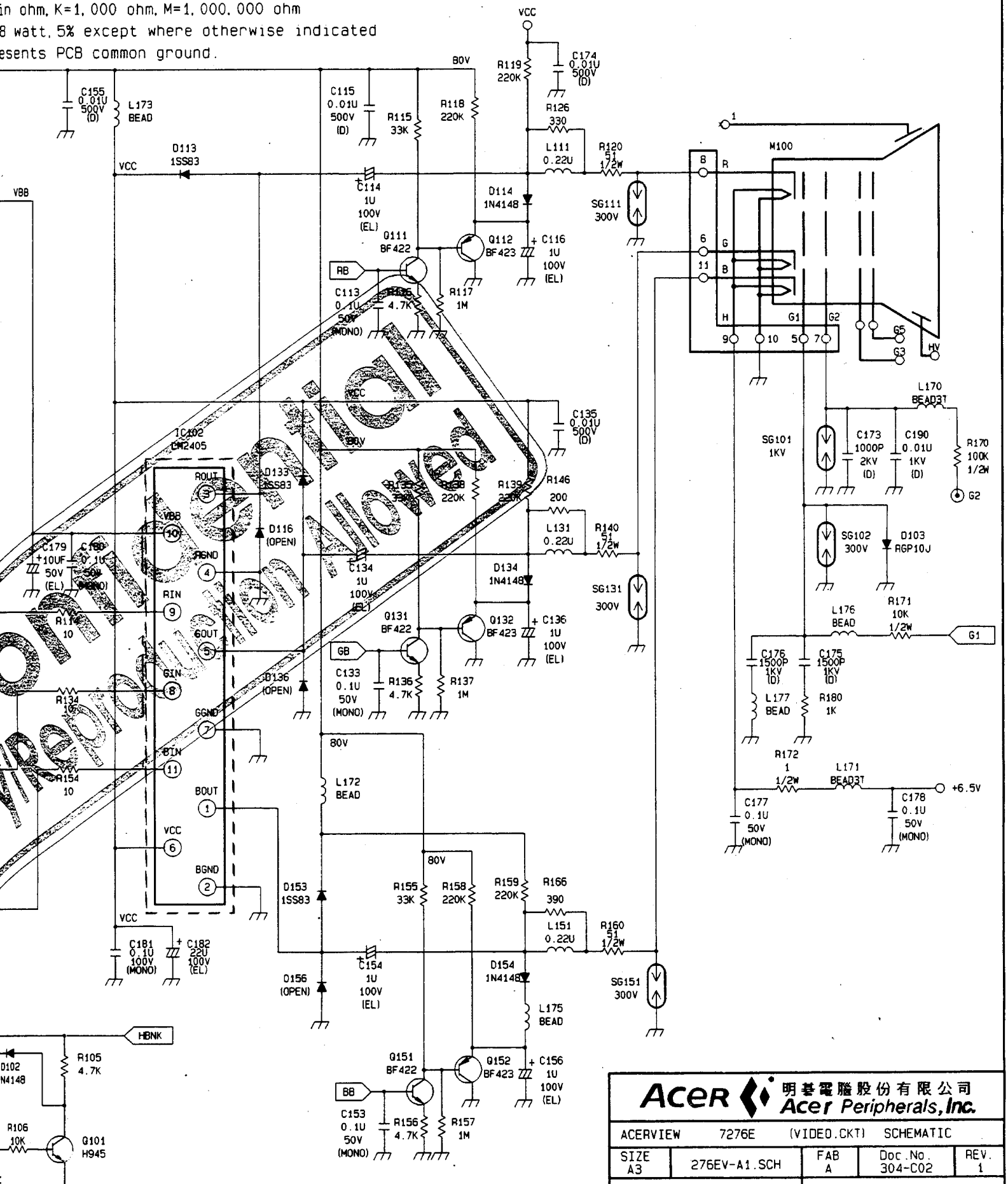
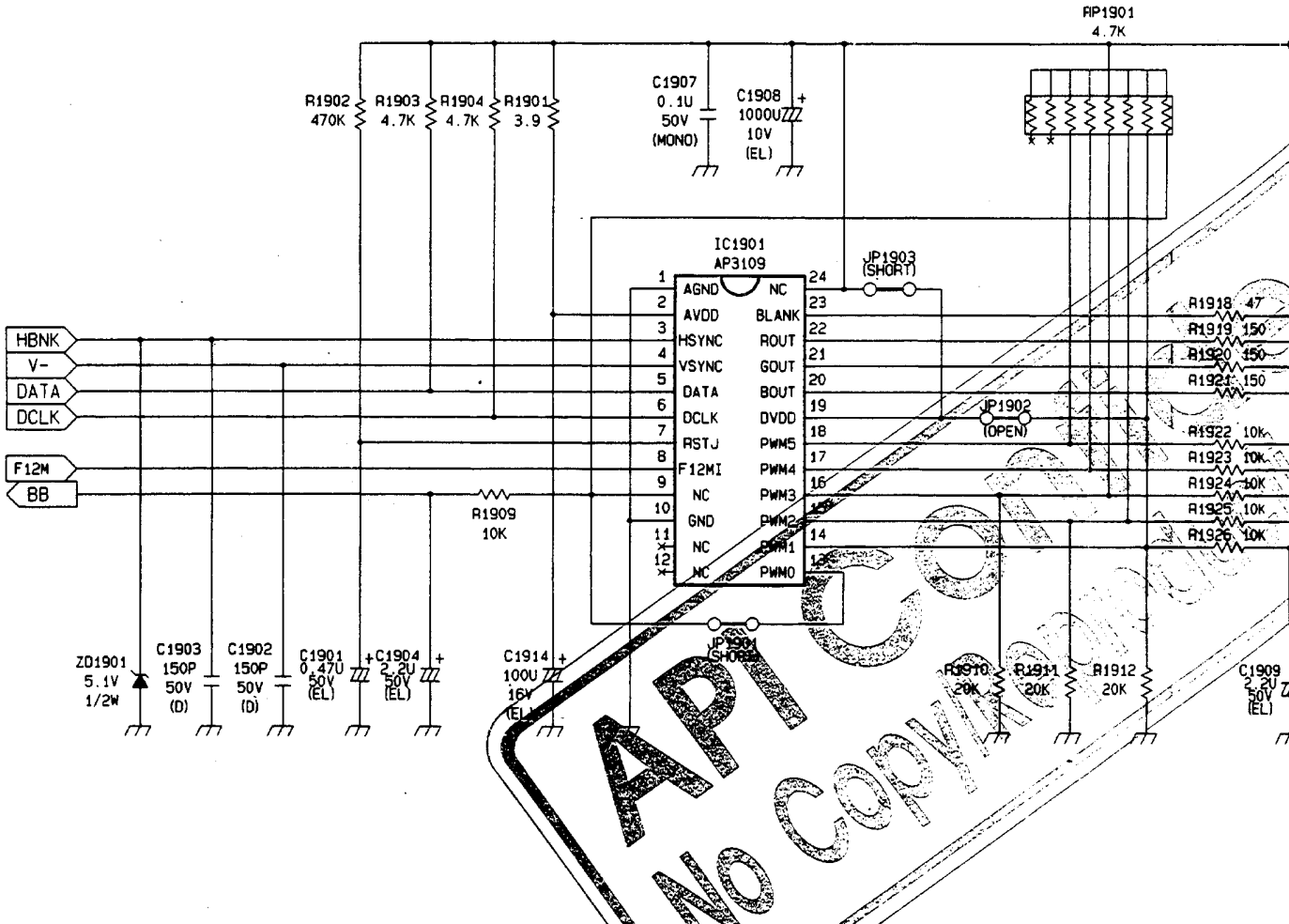
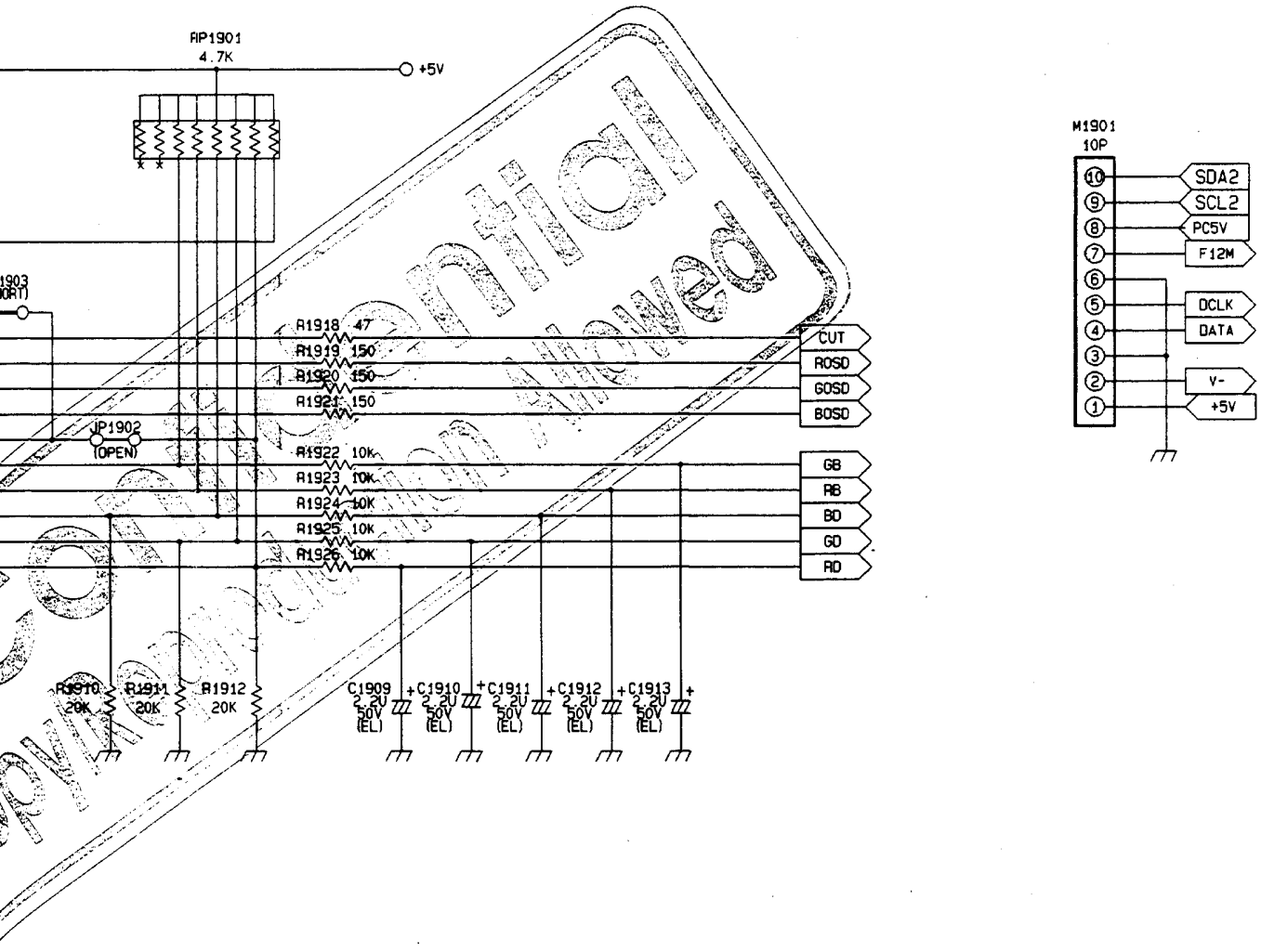
in ohm, K=1,000 ohm, M=1,000,000 ohm
8 watt, 5% except where otherwise indicated
esents PCB common ground.



ACER 明碁電腦股份有限公司 Acer Peripherals, Inc.				
ACERVIEW 7276E (VIDEO.CKT) SCHEMATIC				
SIZE A3	276EV-A1.SCH	FAB A	Doc.No. 304-C02	REV. 1
DATE : 2/24/1997		Sheet 1 OF 2		
Project Code. 91.72402.001				
Prepared By	Reviewed By	Approved By		

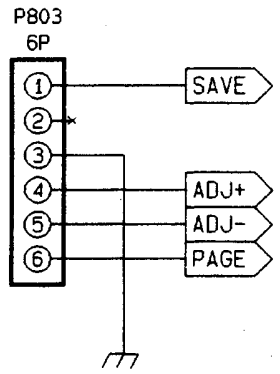


NOTES: 1. Resistor values are in ohm, K=1,000 ohm, M=1,000
2. All resistors are 1/8 watt, 5% except where oth
3. ⏚ ⏚ ⏚ Represents PCB common ground.



are in ohm, K=1,000 ohm, M=1,000,000 ohm
re 1/8 watt, 5% except where otherwise indicated
Represents PCB common ground.

Acer 明碁電腦股份有限公司 Acer Peripherals, Inc			
ACERVIEW 7276E (OSD.CKT) SCHEMATIC			
SIZE A3	276EV-A1.SCH	FAB A	Doc.No. 304-C02
DATE : 2/24/1997		Sheet 2	OF
Project Code. 91.72402.001			
Prepared By	Reviewed By	Approved	



ohm, K=1,000 ohm, M=1,000,000 ohm
att, 5% except where otherwise indicated
nts PCB common ground.

Ac	
ACERV	
SIZE A4	
DATE	
Proj	
Prep	