1. SPECIFICATIONS FOR 452V COLOR MONITOR

1. CRT
   35.5CM(14") 90 Deflection, 29mm Neck, 0.28mm Dot Pitch, Non-Glare Screen

2. Viewable image Size: 33.5CM (13.2") diagonal

3. Display Color: Unlimited Colors

4. External Controls:
   Power On/Off, UP/Down key, Function key: Contrast, Brightness, H-Size, H-center, V-Size, V-Center, Pincushion, Trapezoid, Rotation.

5. Input Video Signal

	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7
	RGB Analog	RGB Analog	RGB Analog	RGB Analog	RGB Analog	RGB Analog	RGB Analog
Horiz. Sync:	TTL Level	TTL Level	TTL Level	TTL Level	TTL Level	TTL Level	TTL Level
	Negative	Negative	Negative	Negative	Positive	Positive	Negative
Vert. Sync:	TTL Level	TTL Level	TTL Level	TTL Level	TTL Level	TTL Level	TTL Level
	Positive	Negative	Negative	Negative	Positive	Positive	Negative

6. Resolution

Horizontal:	720 (H)	640 (H)	640 (H)	640 (H)	800 (H)	800 (H)	1024 (H)
Vertical :	400 (V)	480 (V)	480 (V)	480(V)	600(V)	600 (V)	768 (V)
Fh (KHz):	31.5	31.5	37.5	43.3	46.8	53.7	48.4
Fv (Hz) :	70	60	75	85	75	85	60

7. Display Size
   Horizontal: 250 mm
   Vertical: 187 mm

8. Scanning Frequencies
   Horizontal: 30KHz ~ 54KHz
   Vertical: 50 Hz ~ 120 Hz

9. Factory Preset Timings: 7
   User Timings: 12

10. Misconvergence
    Center: 0.3 mm Max.
    Corner: 0.4 mm Max.

11. Video Dot Rate: 65 MHz

12. Power Source:
    Switching Mode Power Supply
    AC 100 ~240V, 50/60Hz Universal Type

13. Operating Temperature: 0°C to 40°C Ambient

14. Humidity:
    10% to 85% Relative, Non-Condensing

15. Weight: 11kg (Net), 12.8kg (Gross)

16. Dimensions Monitor:
    Carton: 438(W) x 394(H) x 460(D) mm
    Monitor: 350(W) x 352(H) x 370(D) mm

17. External Connection:
    15 Pin D-type Connector
    AC Power Cord

18. Regulations: UL, CSA, DHHS, FCC-B, TÜV/GS, CE , MPR II

4. ADJUSTMENT

4-1 ADJUSTMENT CONDITIONS AND PRECAUTIONS

1. Approximately 30 minutes should be allowed for warm up before proceeding.

2. Adjustments should be undertaken only on those necessary elements since most of them have been carefully preset at the factory.

4-2 MAIN ADJUSTMENTS

NO.	FUNCTION	LOCATION	DESIGNATION
1.	15V ADJ	PCB - MAIN	VR901
2.	B + ADJ	PCB - MAIN	VR902
3.	G1 ADJ	PCB - MAIN	VR702
4.	R.B. DRIVE	CRT - BOARD	VR801,802
5.	R.G.B. CUT-OFF	CRT - BOARD	VR803,804,805
6.	ABL ADJ	PCB - MAIN	VR701
7.	UP KEY	PCB - MAIN	SW101
8.	DOWN KEY	PCB - MAIN	SW102
9.	FUNCTION KEY	PCB - MAIN	SW103

4-3 ADJUSTMENT METHOD

1. 15V, B + & HV protection voltage adjustment:

   A. Chroma-2000 Signal generator or PC equivalent, set mode: 31.5kHz/60Hz ; cross pattern ; normal size.
   B. Connect a DC voltage meter between TP 901 and ground, then adjust VR901 to be 15VDC.
   C. Connect a DC voltage meter between TP 902 and ground, then adjust VR902 to be 88 VDC.
   D. Brightness set to max, connect a DC voltage meter between R895 and ground, then adjust VR702 to be –35.0±1V.

2. Factory preset timings adjustment:

   A. When you turn on the monitor, the function LEDS will light up simultaneously for a while, then extinguish.
   B. You can press the up/func two keys simultaneously, the most left four LEDS will light up for a while then extinguish.
   C. Then you can select one of the eight functions including Contrast, Brightness, H-SIZE, H-CENTER, V-SIZE, V-CENTER, Pincushion and Trapezoid Simply press the function key and the LED will be light up corresponding to the one selected, then press the up/down keys to get the factory presetting parameter value to your satisfaction.
   D. Then you will press the up/function two keys simultaneously again, the most right four LEDS will light up for a while then extinguish, the factory preset timings adjustment is finished.

3. White balance and luminance adjustment:

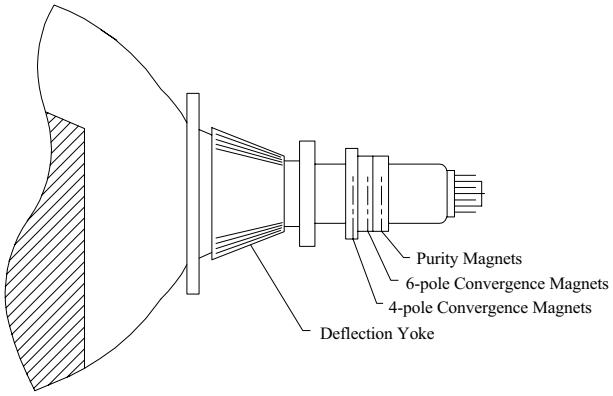
   A. Bias (low light) adjustment:
      (a) Set mode 5 (800 x 600 Fh: 46.8KHz) full white pattern.
      (b) Adjust VR801, 802, 803, 804, 805, to make VR in the center position.
      (c) Warm up more than 20 minute.
      (d) Brightness set to max. Contrast set to min. full white pattern, then adjust FBT screen VR to make Y= 1.0FL ± 0.2FL
      (e) Brightness set to raster just cutoff, contrast set to 4FL, then adjust CRT board VR805 (B-Bias) VR803 (R-Bias) to make Y= 4 ± 0.2 FL, x= 283 ± 10, y= 297 ± 10
   B. Gain (High light) adjustment:
      (a) Set mode 5 (800 x 600 Fh: 46.8KHz) full white pattern.
      (b) Brightness set to raster just cutoff and set the contrast to max.
      (c) Adjust VR801, 802 to make color code x=283 ± 10, y=297 ± 10.
   C. Re-check item A&B to make sure both of them in spec.

D. Full white luminance:
   (a) Set mode 5 (800 x 600 Fh: 46.8K) full white pattern.
   (b) Image size : H:250±4mm, V:187±4mm.
   (c) Brightness set to raster just cut off and set the contrast to max.
   (d) Adjust VR701 to make sure white luminance at 25 FL.

4. Focus adjustment:
   A. Set mode 2 (640 x 480 Fh: 31.5KHz) with character full page.
   B. Adjust external brightness to raster cutoff and external contrast to max. , then adjust focus VR to make the display be focused very well.

5. Purity adjustment
   A. Be sure that the display is not being exposed to any external magnetic fields.
   B. Ensure that the spacing between the Purity, Convergence, Magnet, (PCM), assembly and the CRT stem is 29㎜ .(See below diagram)
   C. Produce a complete, red pattern on the display. Adjust the purity magnet rings on the PCM assembly to obtain a complete field of the color red. This is done by moving the two tabs in such a manner that they advance in an opposite direction but at the same time to obtain the same angle between the two tabs, which should be approximately 180.
   D. Check the complete blue and complete green patterns to observe their respective color purity. make minor adjustments if needed.

RELATIVE PLACEMENT OF TYPICAL COMPONENTS



6. Convergence adjustment

   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 above diagrams)
   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 converged by varying the angle between the two tabs of the 6-pole magnets.
   G. Horizontal green and magenta lines are converged by varying the two tabs together, keeping the angle between them constant.

5. CIRCUIT DESCRIPTION

5-1 MICRO CIRCUIT

IC101 is CPU, This CPU has the following functions.

1. Detect timing mode by sensing the horizontal frequency, vertical frequency, the polarity of Hor. Sync and Ver. Sync.
2. Keyboard scan control.
3. Geometry control internal D/A converters and I^2C bus control.
4. Cs capacitor switch control.
5. Power saving control.

When CPU detects timing, it takes data from E^2PROM (IC102), then output voltage to control the geometry and volume of this monitor.
If key is pressed, the CPU will do some job according to the key function. For example, if function key is pressed, it can change different value to control screen geometry (H-SIZE, V-SIZE...etc.)

5-2 DEFLECTION CIRCUIT

Hor. sync. and Ver. sync. come from PC, go into the CPU (IC101). The output goes to the Hor. oscillation and Ver. oscillation processor (IC401). The IC401 treats sync. Signal and output the drive signal to horizontal and vertical output circuit. IC401 also generates some functions for geometry use, like, horizontal center, vertical size, by I^2C bus control, the geometry can be controlled. IC601 is a vertical output IC to supply the vertical scan. Q404, Q405, Q406 and L405 are the horizontal size controls. Q403 is the horizontal deflection output, supply the horizontal scan of the monitor. Q707 and Q601 generate the Blanking signal output to G1 of CRT.
Q703 Q704 and Q705 are mute control, brightness control and G1 DC voltage output.

5-3 VIDEO CIRCUIT

IC801 is a video amplifier, clamping signal input from pin No. 11 to restore the DC voltage of video signal, the signal output from IC801 pass through IC802 Video package amplifier stage LM2438T, then go to the cut off DC restore stage, The video output signal is about 35Vpp.

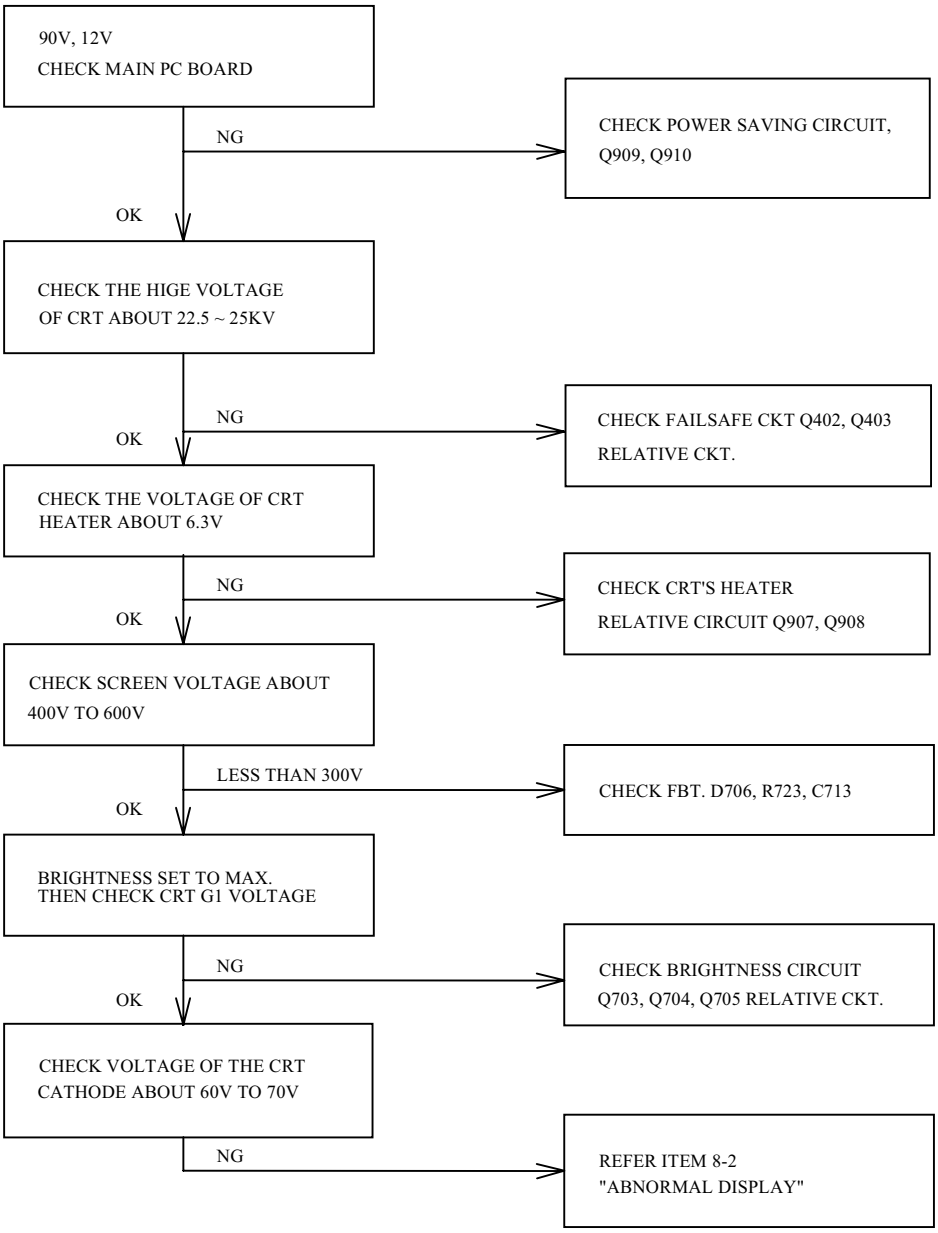
5-4 POWER SUPPLY

The design uses a discontinuous flyback topology operating in current-mode resulting in a multiple output switcher with stack well. Faster diodes are used. The fast transient response of the control loop maintains picture integrity. Very fast current limiting protects the switcher against short circuits.
UC3842AM (IC901) is the current mode controller selected. It offers feed forward compensation, feedback error amplifier, and low voltage lock out features. The 3842 draws very little current is start up mode. There is enough power from the line bleeder to slowly charge a capacitor to the 16 volts needed to start the switcher.
The FET starts a cycle by allowing current to flow into the primary of the power transformer. As current ramps up with time, the voltage across the current sense resistor (R929) also ramps to a point where the 3842 determines that enough power is stored and turns off the FET. As the voltage on the transformer reverses, power is dumped from the main power transformer through diodes into the different supplies. To keep RFI to a minimum and reduce transistor heating, a turn-off snubber network is placed across the FET. Current from the secondary windings are rectified and filtered to freate the desired voltages. Small high current capacitors quickly return charging current to the source. Filter inductors remove high frequency noise.

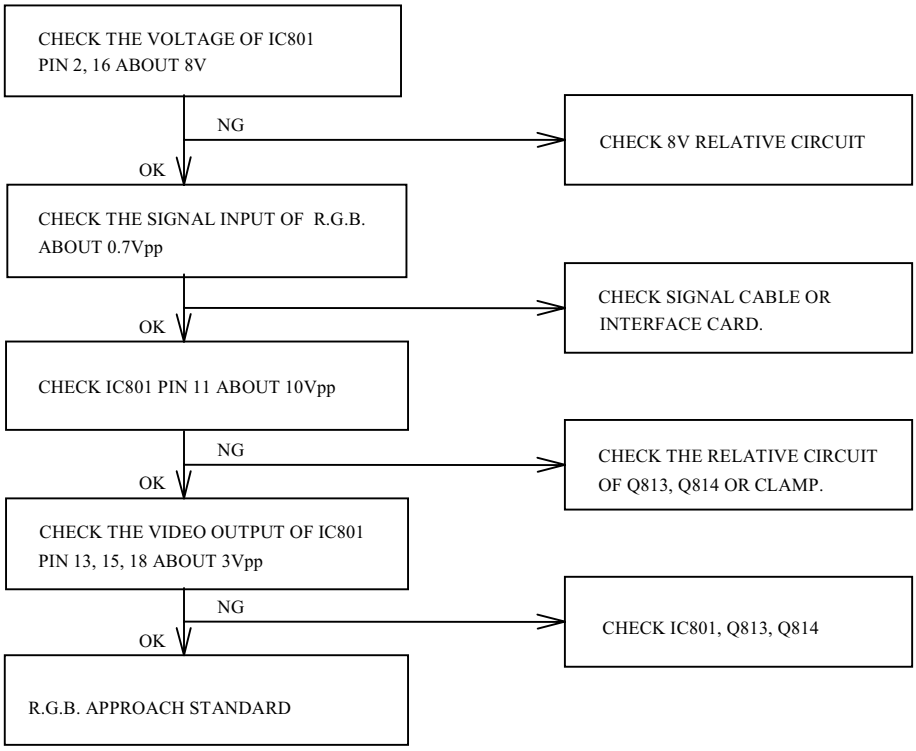
5-5 TRANSISTOR & DIODE CIRCUIT

LOCATION	CIRCUIT FUNCTION DESCRIPTION
D901 ~ D904	Bridge Rectifier for AC Source
D909	Half-Wave Rectifier for Start CKT
D910	Clamp Diode for Snubber CKT
D919	Rectifier for Output Voltage
D921	Rectifier for Output Voltage
D922	Rectifier for Output Voltage
D923	Rectifier for Output Voltage
D925	Rectifier for Output Voltage
D927	Forward Bias when Q403 Turn-off to Protect B+ Block CKT
D929	B+ Feed Back Rectifier from F.B.T Pulse
Q904	Start CKT Amplifier Transistor
Q907, Q908	Use for Off-Mode to Cut-off 6.3V Supply Voltage
Q909, Q910	Use for Stand-By or Suspend Mode to Cut-off 15V Supply Voltage
Q912, Q920	Push-Pull Topology to Drive Q911
Q401	Turn-on at Power ON/OFF and Change Mode to Protect Hor.Block
Q402	HOR. Driver Transistor
Q407, Q408	As a Switcher for H-Size Correction CKT
Q410	H-Size Correction Mosfet
Q404, Q405	As Differential Amp. to Drive Q406
Q406	Darlington Transistor for H-Size Control
Q703	As a Switcher to Mute Screen when Abnormal Qccurring
Q704, Q705	Unit Brightness Control CKT
Q601, Q707	Develop Blanking Signal
Q813, Q814	A Amplifier to Correction and Support Clamp Signal

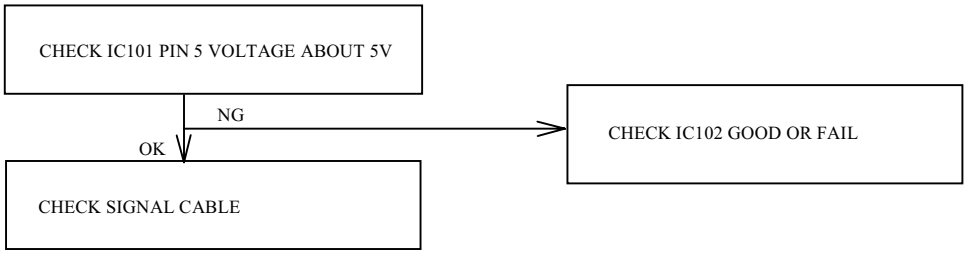
6.TROUBLE SHOOTING CHART
6-1 NO RASTER, CRT RELATIVE CIRCUIT PROBLEMS



2.ABNORMAL VIDEO LEVEL ON SCREEN

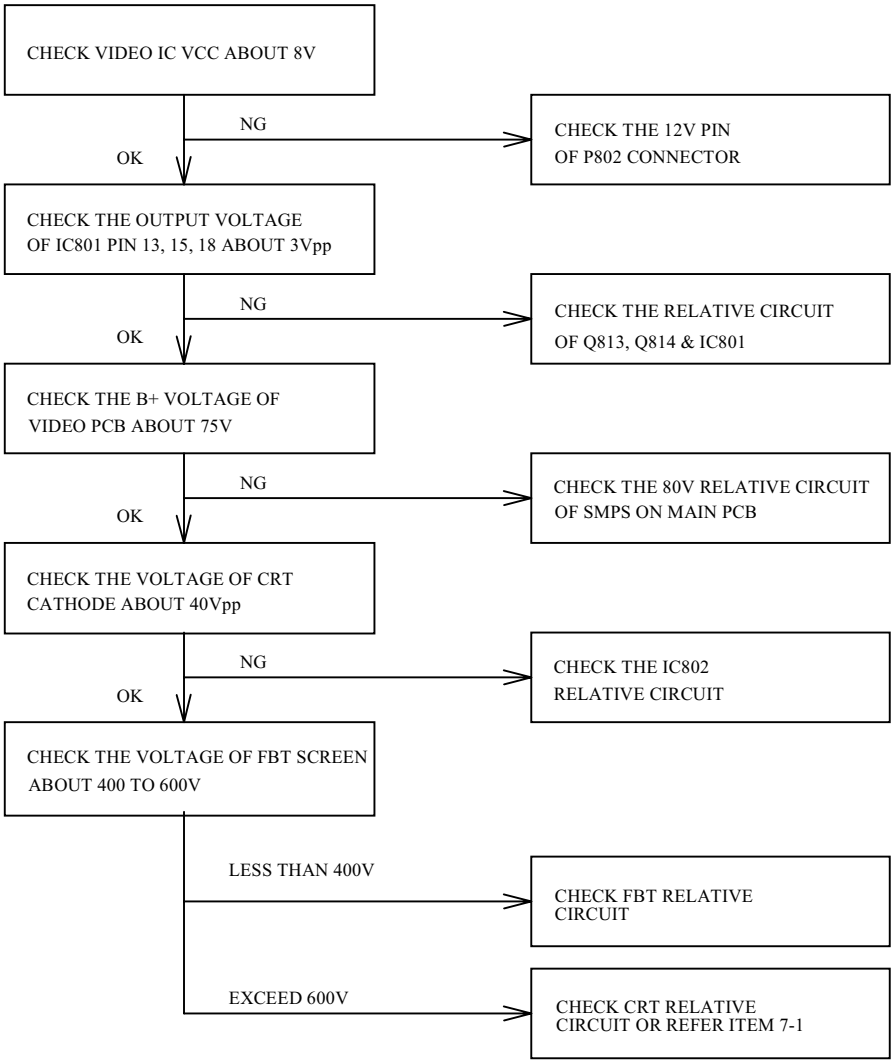


3. ABNORMAL DDC (PLUG & PLAY)

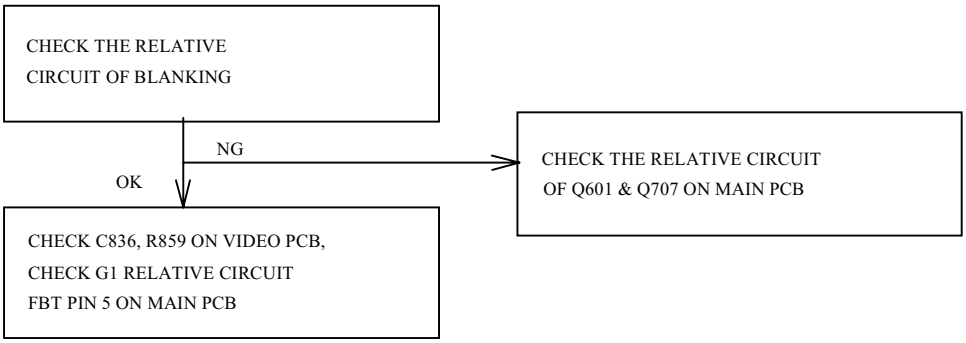


6-2 ABNORMAL DISPLAY

1.NO SIGNAL ON SCREEN

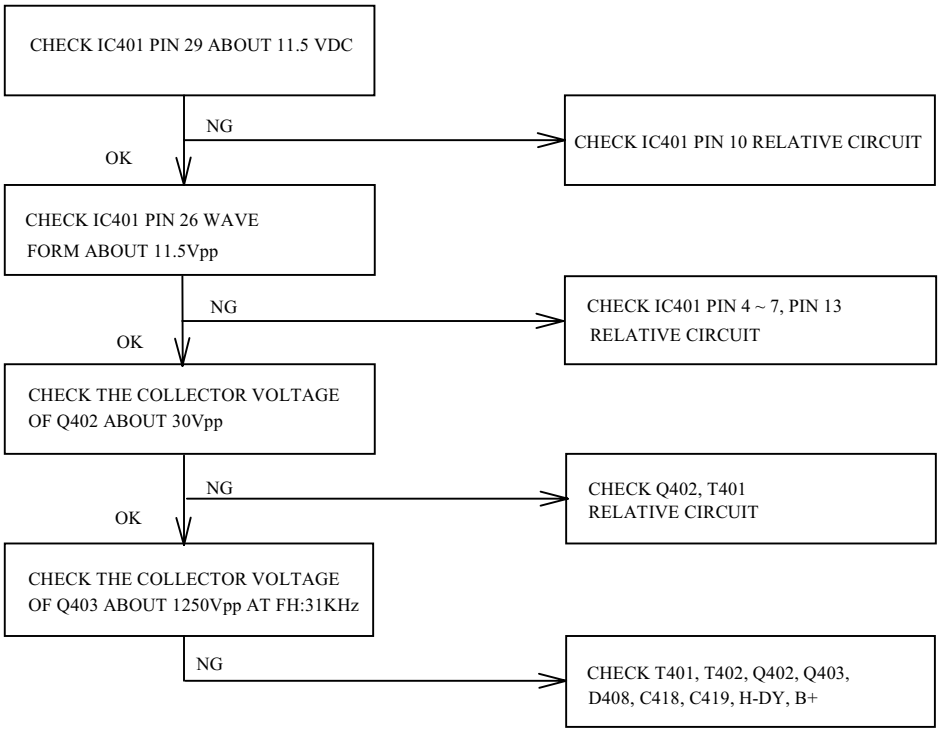


6-3 NO BLANKING



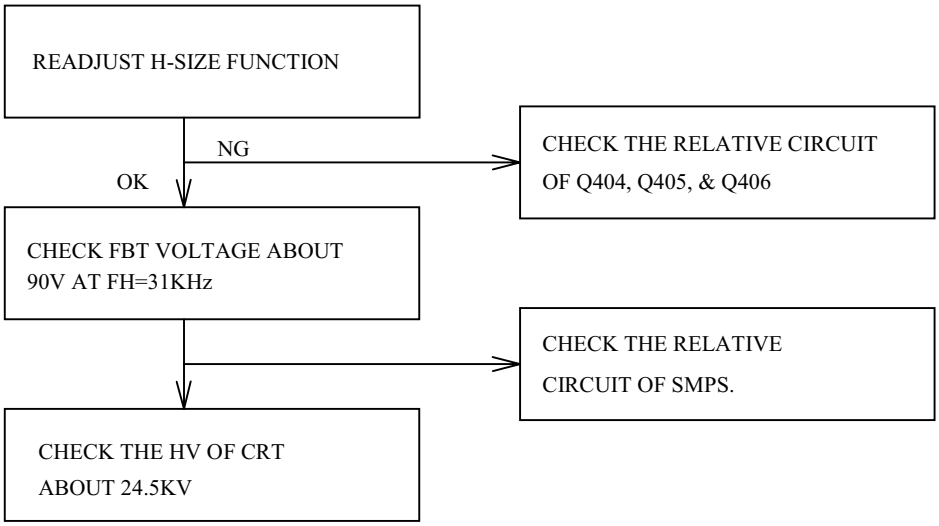
6-4 HOR./OSC/DEF/HV CIRCUIT FAULT

1. NO RASTER (DISCONNECT WITH SIGNAL CABLE)

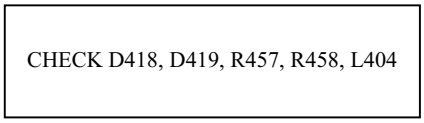


6-5 ABNORMAL HORIZONTAL DEFLECTION

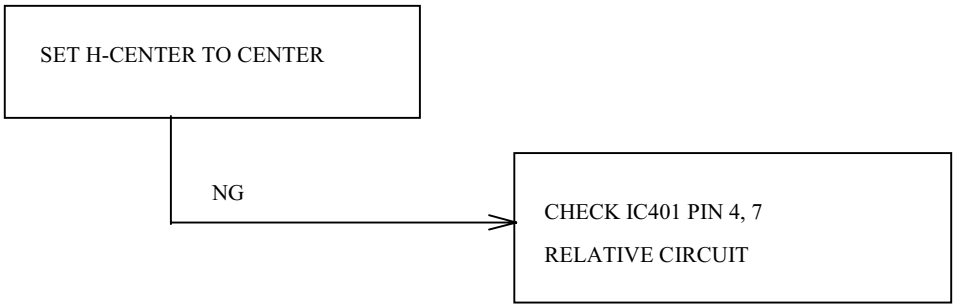
1. ABNORMAL HORIZONTAL SIZE



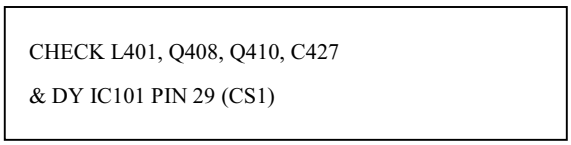
2. ABNORMAL HORIZONTAL RASTER CENTER



3. ABNORMAL HORIZONTAL VIDEO CENTER

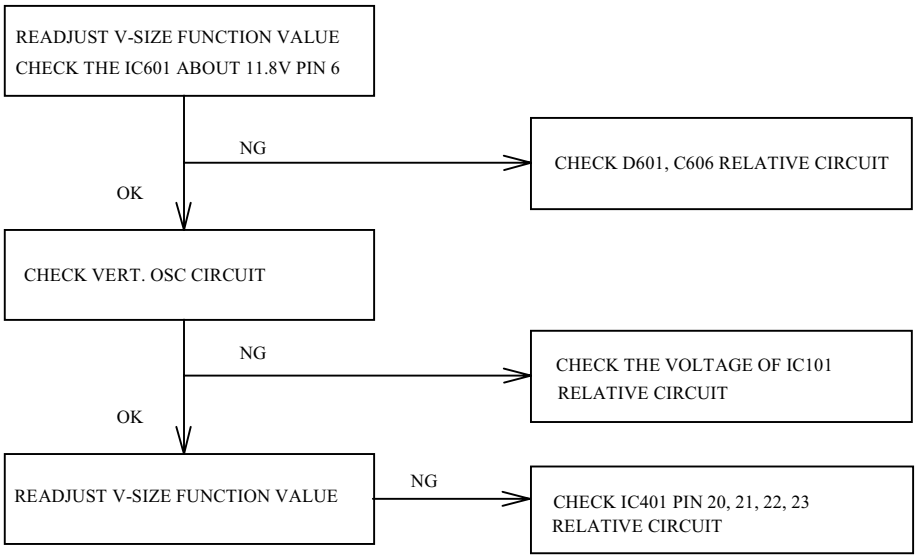


4. ABNORMAL HORIZONTAL LINEARITY

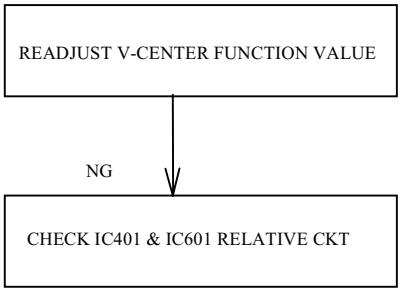


6-6 ABNORMAL VERTICAL SCANNING

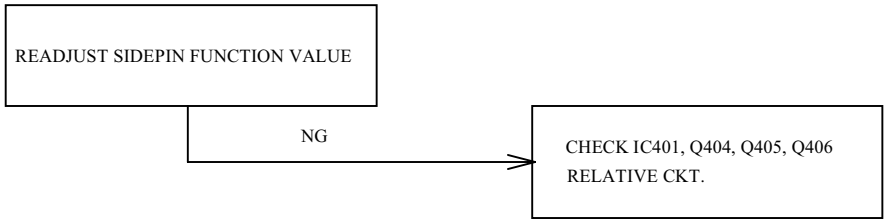
1. ABNORMAL VERTICAL SIZE



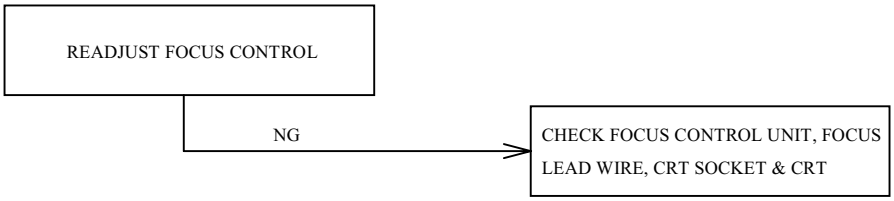
2. VERTICAL CENTER



6-7 SIDE-PIN CUSHION DISTORTION

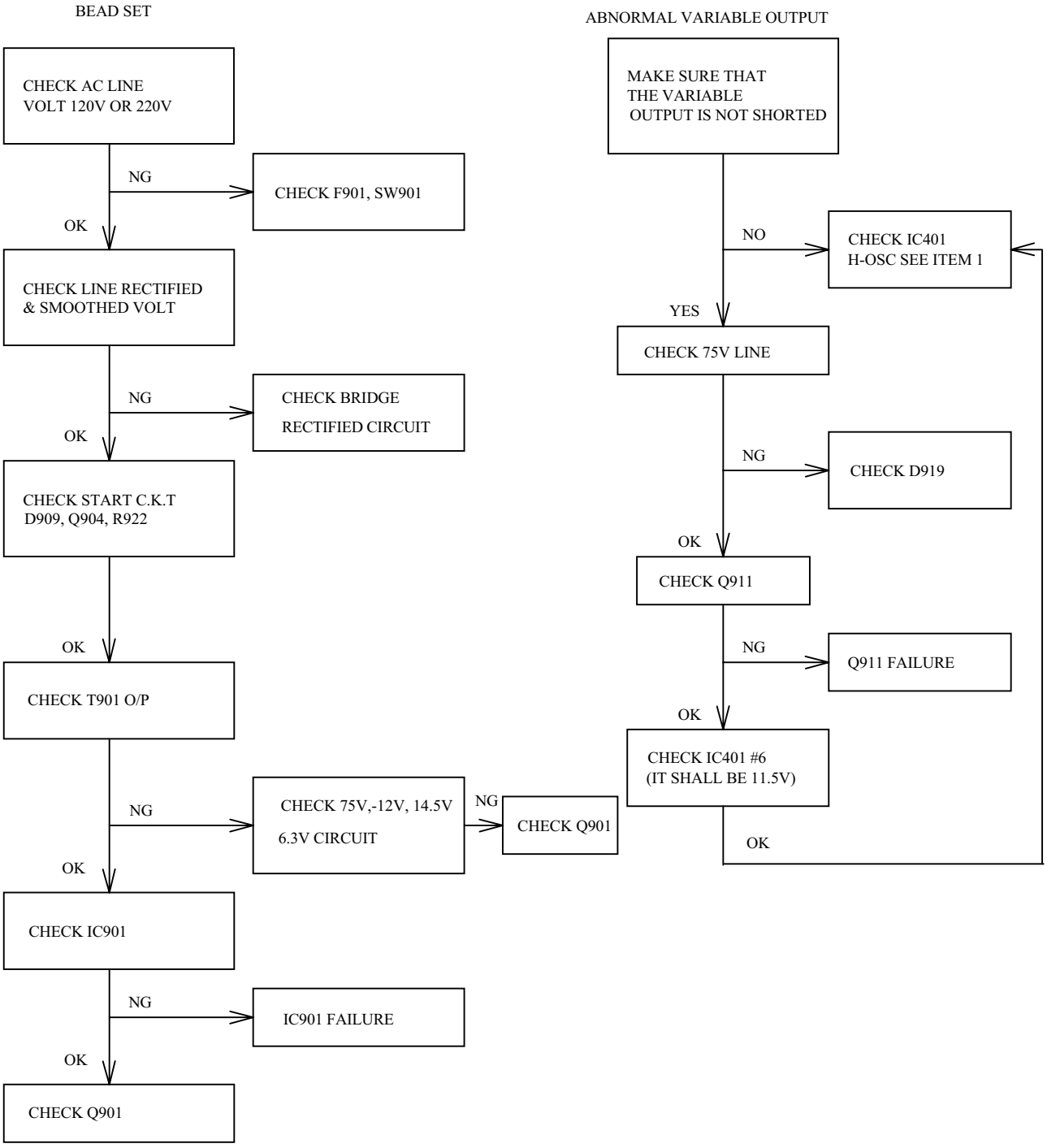


6-8 POOR FOCUS

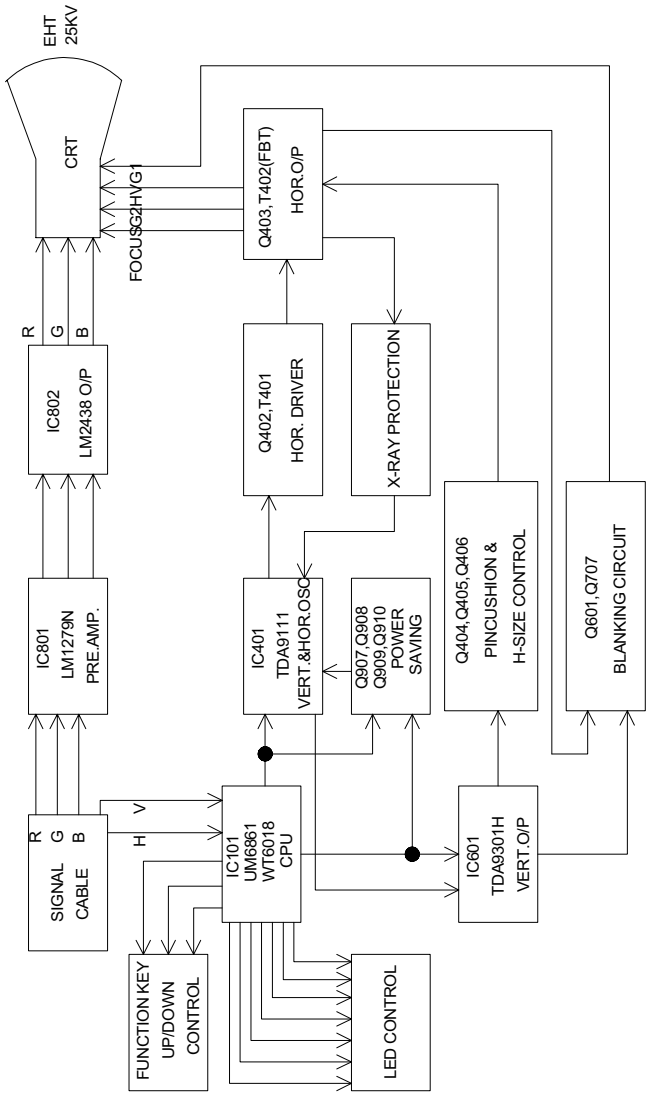


6-9 POWER SUPPLY TROUBLE SHOOTING CHART

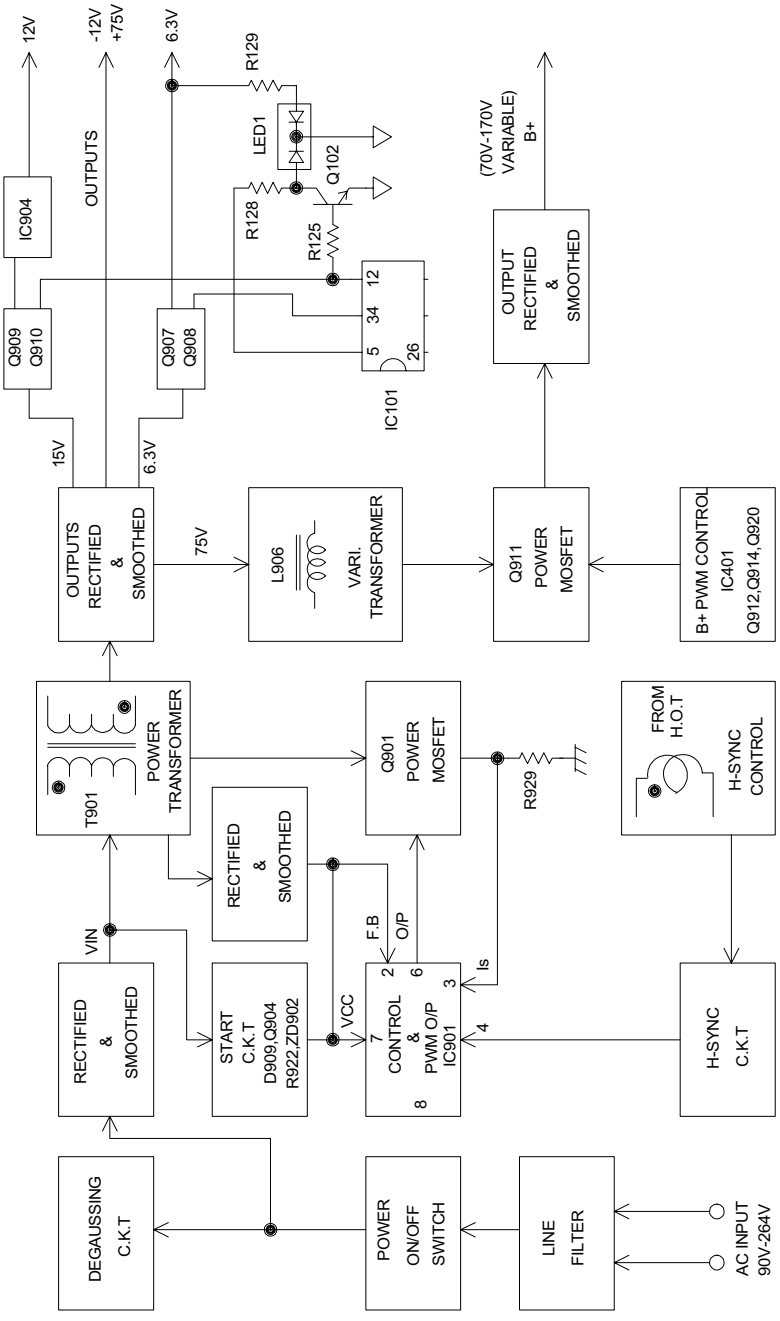
BEFORE CHECK SW.REG. PLEASE REFER TO THE POWER SUPPLY BLOCK DIAGRAM
POWER SUPPLY OUTPUT: (A) VARIABLE OUTPUT : 80V - 160V
(DEPENDING UPON H.SYNC FREQUENCY)
(B) CONSTANT OUTPUT : 6.3V, 14.5V, -12V, 82.5V



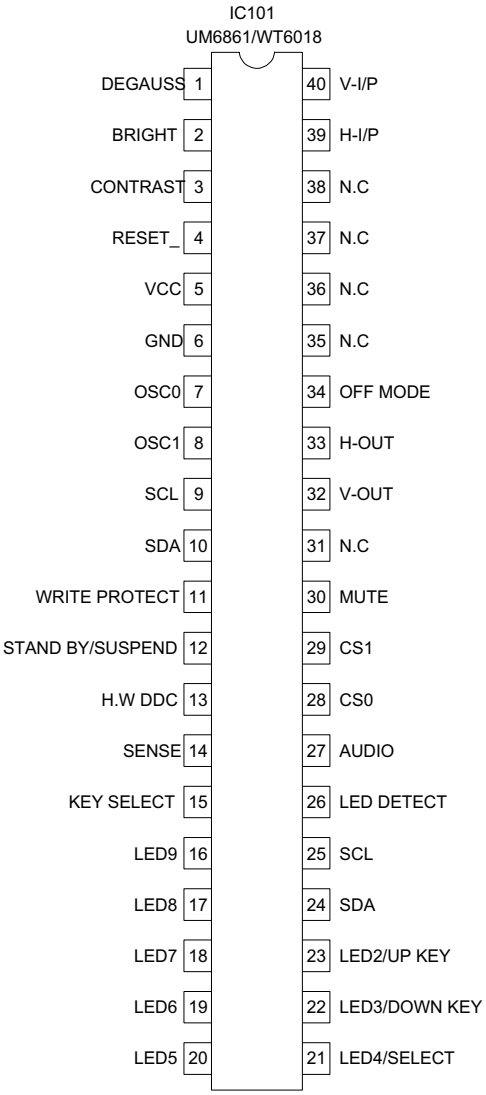
9. BLOCK DIAGRAM (DEFLECTION)

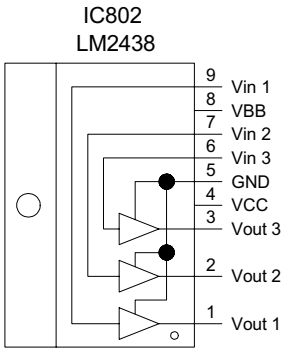


9-1. BLOCK DIAGRAM (SMPS)

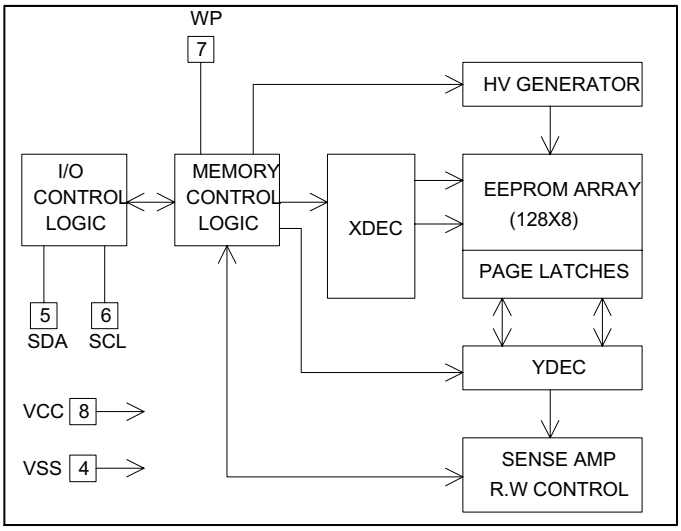


10. IC BLOCK DIAGRAMS

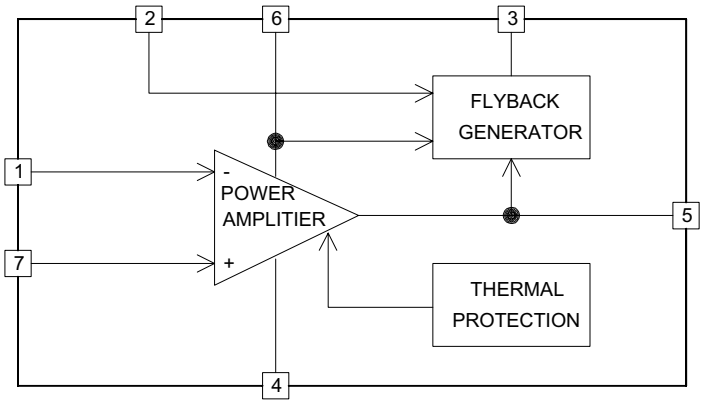




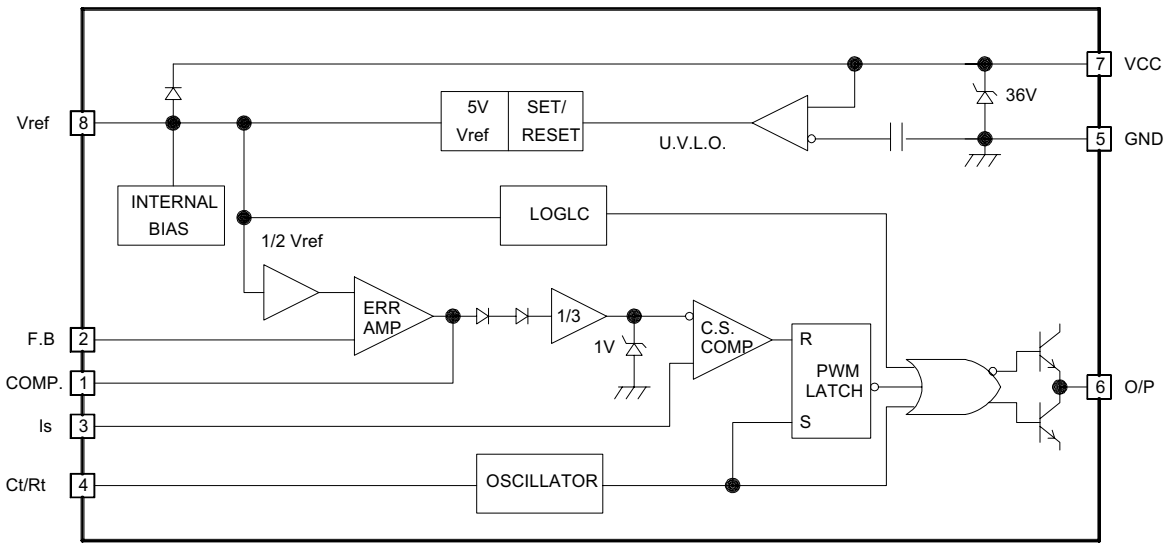
IC102 24C04

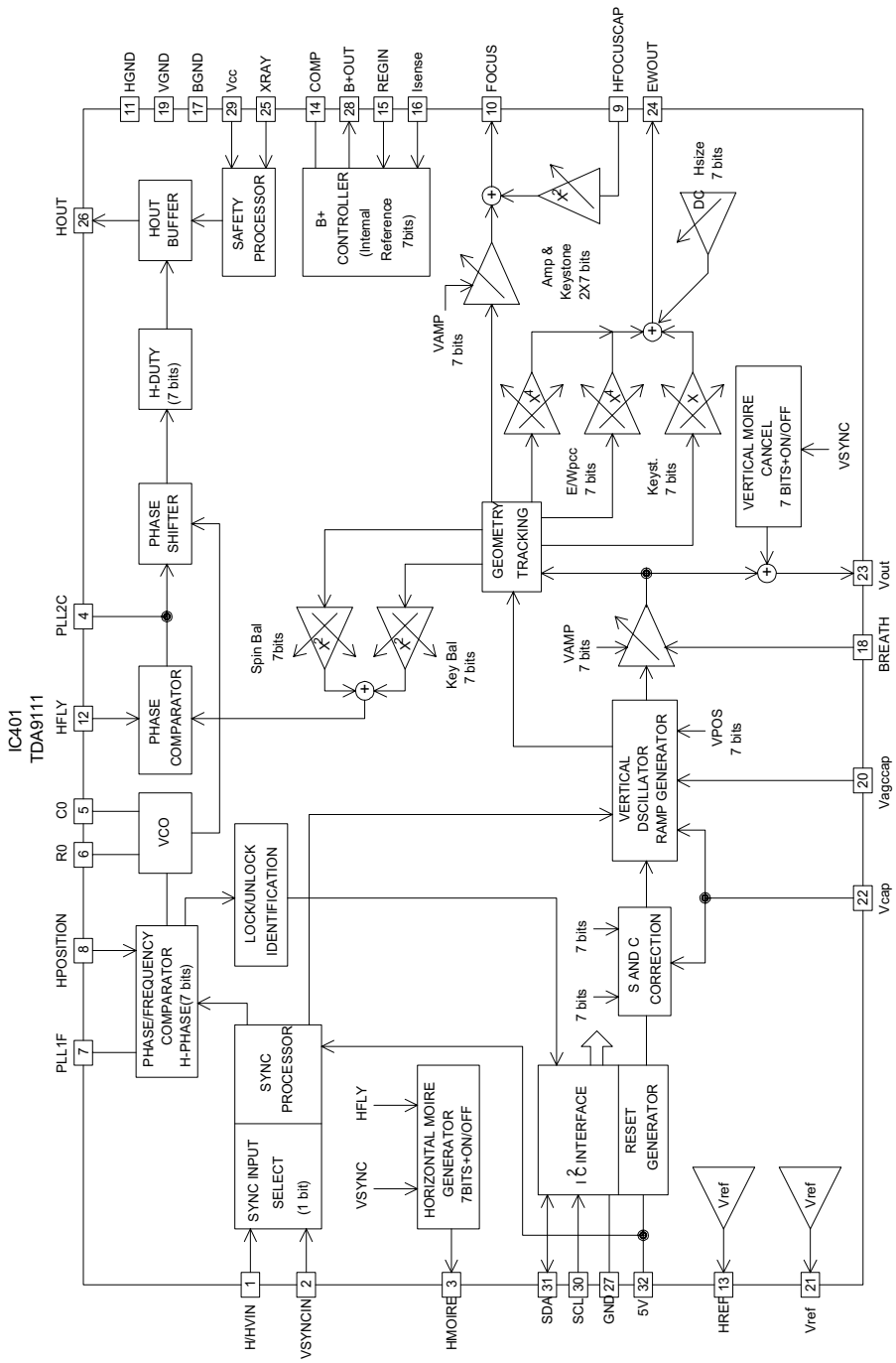


IC601 TDA9302H

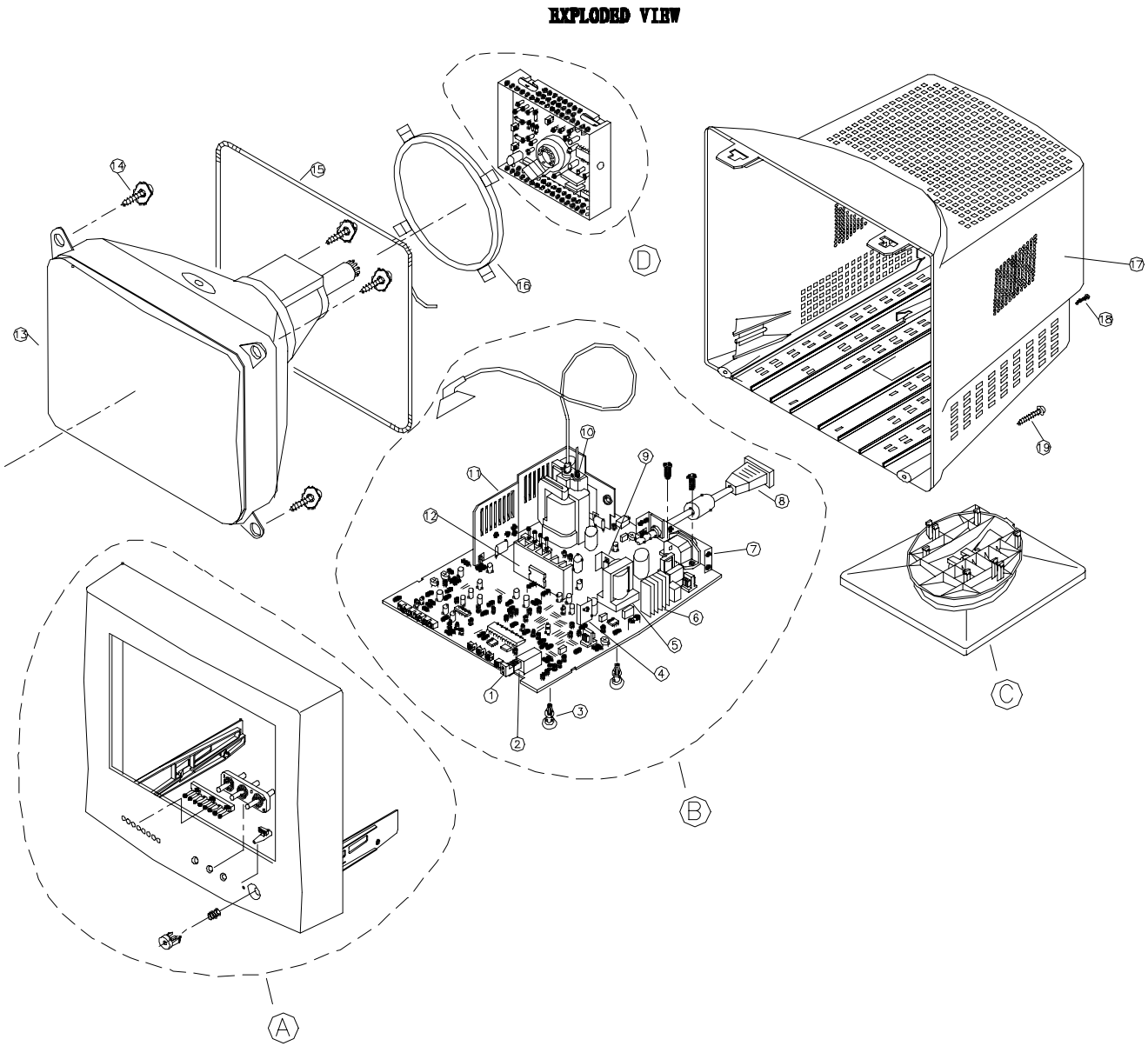


IC901 3842

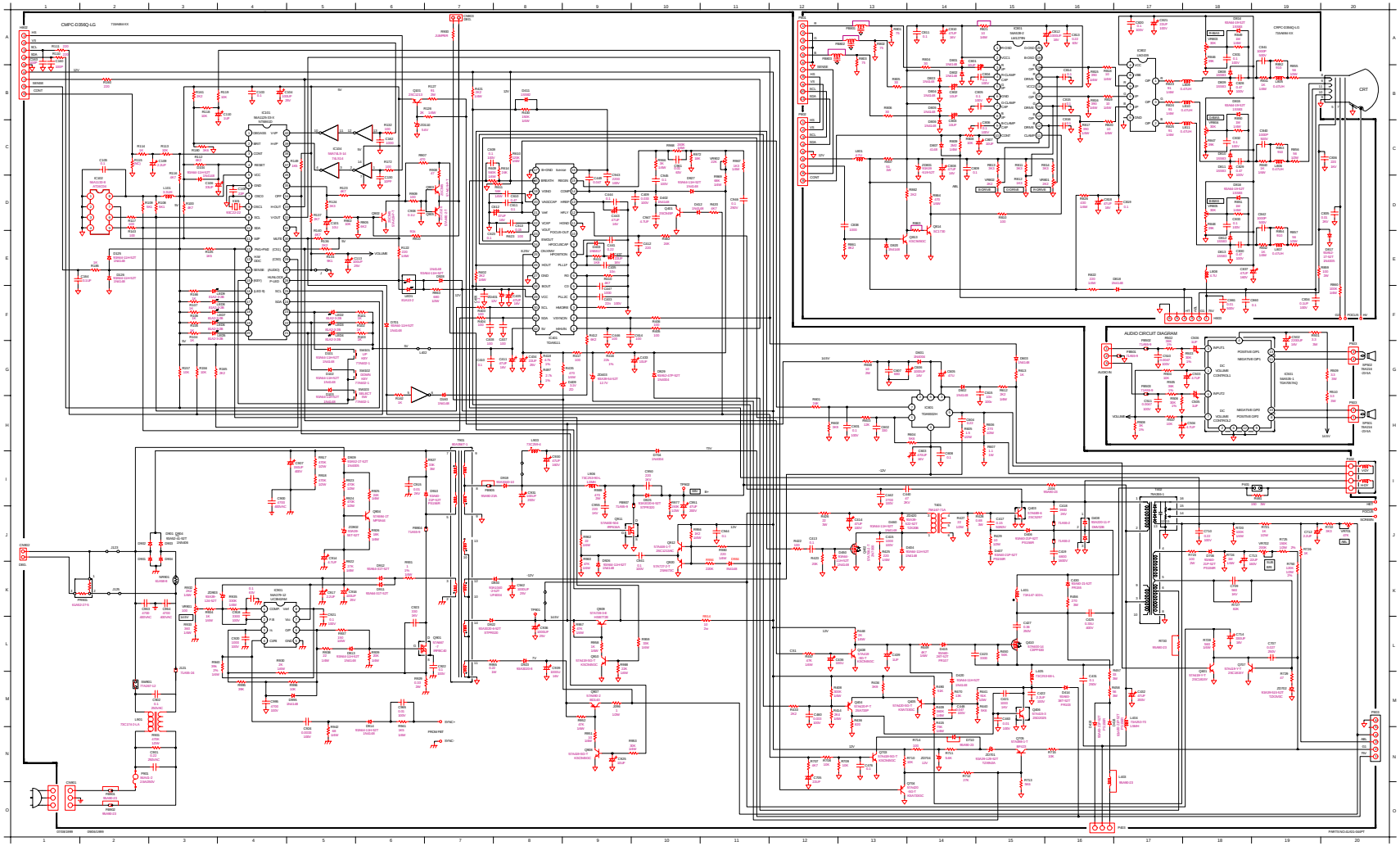



IC401
TDA9111
HGND
VGND
BGND
Vcc
XRAY
COMP
B+OUT
REGIN
Isense
FOCUS
HFOCUSCAP
EWOUT
HOUT
HOUT BUFFER
SAFETY PROCESSOR
B+ CONTROLLER (Internal Reference 7bits)
Amp & Keystone 2X7 bits
Hsize 7 bits
DC
VAMP 7 bits
H-DUTY (7 bits)
PHASE SHIFTER
PLL2C
HFLY
PHASE COMPARATOR
C0
R0
VCO
HPOSITION
PLL1F
PHASE/FREQUENCY COMPARATOR H-PHASE(7 bits)
LOCK/UNLOCK IDENTIFICATION
SYNC PROCESSOR
SYNC INPUT SELECT (1 bit)
HORIZONTAL MOIRE GENERATOR 7BITS+ON/OFF
I²C INTERFACE
RESET GENERATOR
S AND C CORRECTION
7 bits
GEOMETRY TRACKING
E/Wpcc 7 bits
Keyst. 7 bits
VERTICAL MOIRE CANCEL 7 BITS+ON/OFF
VSYNC
Spin Bal 7bits
Key Bal 7 bits
VAMP 7 bits
VERTICAL DSCILLATOR RAMP GENERATOR
VPOS 7 bits
Vout
BREATH
Vagccap
Vcap
Vref
H/HVIN
VSYNCIN
HMOIRE
SDA
SCL
GND
5V
HREF
Vref

EXPLODED VIEW



No.	Part No.	description	Q'ty	Remark
1	33A35981	ABS PLASTIC	1	
2	77A267-12	POWER SWITCH	1	
3	11A121-500	PCB SUPPORT	2	
4	90A315 HEAT SINK	IC904	1	
5	80A356T1	T901	1	
6	90A339-2-A	HEAT SINK (Q901)	1	
7	15A5643501	REAR BRACKET	1	
8	89A173E5DA	SIGNAL CABLE	4	
9	90A315-1	HEAT SINK Q911	1	
10	79A355-4-A	FBT(T402)(T402)	1	
11	90A354-509	HEAT SINK(Q402/D406/Q411)	1	
12	90A348-501	HEAT SINK(IC601)	1	
13	X0A5640***	CRT	1	REFER TO TABLE 2
14	1A503-1-47	SCREW	4	
15	X0A1697-1GD	DEGAGSSING COIL	1	
16	X0A1697503	ROTATION COIL	1	
17	0A452V-B1	BACK COVER ASS'Y	1	
18	B1A103510	SCREW	1	
19	Q1A340-16	SCREW ø4*16	2	
A	0A452V-F1	FRONT ASS'Y	1	
B	CM452****	MAIN BOARD ASS'Y	1	REFER TO TABLE 1
C	0A452V-S1	BASE ASS'Y	1	
D	CR4521	CRT BOARD ASS'Y	1	



NOTE: This schematic, we can't guarantee the accuracy of this information; after the data of publication and disclaims liability for changes, errors or omissions.

MODE	D356Q FOR LG	DRAWING	M.Y.GU
VERSION	A	CHECKED	
DATE	JUL-11-00	APPROVED	
P/N			