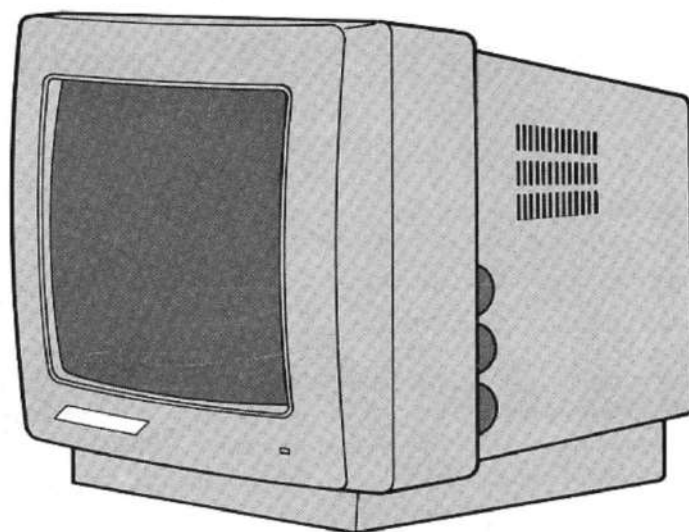


SC1224™

RGB COLOR MONITOR



Retrocomputing

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SAFETY PRECAUTIONS

DANGER

There are special components used in ATARI color monitor which are important for safety. These parts are shaded on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with the manufacture's specified parts to prevent X-RADIATION, shock, fire or other hazards. Do not modify the original design without obtaining written permission from ATARI or this will void the original parts and labor guarantee.

CAUTION: No modification of any circuit should be attempted. Service work should be performed only after you are thoroughly familiar with all of the following safety checks and servicing guidelines.

SAFETY CHECK

Care should be taken while servicing this color monitor because of the high voltage used in the deflection circuits. These voltages are exposed in such areas as the associated flyback and yoke circuits.

FIRE & SHOCK HAZARD

- An isolation transformer must be inserted between the color monitor and AC power line before servicing the chassis.
- In servicing, attention must be paid to the original lead dress especially in the high voltage circuit. If a short circuit is found, replace all parts which have been overheated as a result of the short circuit.
- All the protective devices must be reinstalled per original design.
- Soldering must be inspected for the cold solder joints, frayed leads, damaged insulation, solder splashes or the sharp points. Be sure to remove all foreign materials.

IMPLOSION PROTECTION

All used display tubes are equipped with an integral implosion protection system, but care should be taken to avoid damage and scratching during installation. Use only same type display tubes.

X-RADIATION

The only potential source of X-Radiation is the picture tube. However, when the high voltage circuitry is operating properly there is no possibility of an X-Radiation problem. The basic precaution which must be exercised is to keep the high voltage at the factory-recommended level: the nominal high voltage is 23.0KV and must not exceed 24.0KV at zero beam current at rated voltage. The following steps describe how to measure the high voltage and how to prevent X-radiation.

Note: It is important to use an accurate high voltage meter calibrated periodically.

- To measure the high voltage, use a high impedance high voltage meter, Connect (-) to chassis and (+) to the CRT anode button.
- Turn the brightness control fully counterclockwise.
- Measure the high Voltage. The high voltage meter should indicate at the factory-recommended level.
- If the upper meter indication exceeds the maximum level, immediate service is required to prevent the possibility of premature component failure.
- To prevent X-Radiation possibility, it is essential to use the specified picture tube.

GENERAL INFORMATION

- The SC1224 color monitor has the following features:
 - Uses 3 different, independent lines to drive the display—a RED, a GREEN, and an BLUE line.
- Has a bandwidth 18 MHz typical and medium-resolution CDT (Color Display Tube). So it has a great resolution and can display 80-column lines without blurring the characters.
- Uses the positive-level. Analog-compatibility at a frequency of 15.75 KHz.
- Displays 2000 characters using 8×8 dots format.
- Has its own power control and indicator using the SMPS (Switching Mode Power Supply). The SMPS in your color monitor automatically switches to match the applied power (AC 220V).
- Is compatible with ATARI ST Personal Computers.

SPECIFICATIONS

1. PICTURE TUBE

SIZE	: 12 inch
GUN	: In-line
DEFLECTION ANGLE	: 90°
NECK DIAMETER	: 29.1 mm
PHOSPHOR	: R.G.B

2. SIGNAL

INPUT SIGNAL	: R.G.B Analog Negative
H/V SYNC.	: TTL LEVEL
SIGNAL CONNECTOR	: 13 PIN "D" type
DISPLAY COLOR	: All colors

3. POWER

: AC 220V 50Hz 0.4A

4. SCAN FREQUENCY

: 15.75KHz (H), 60Hz (V)

5. DISPLAY CHARACTERS

: 25 rows \times 80 columns

6. CONTROLS

FRONT	: On/Volumn, Contrast, Brightness (See Fig. 1)
REAR	: V-Lin., V-Size V-Hold, H-Position, H-Hold (See Fig. 1)

7. ENVIRONMENT

OPERATING TEMPERATURE : 10-40°C Ambient

8. TUBE

: 1

9. IC

: 4

10. TRANSISTOR

: 30

11. DIMENSIONS

WIDTH	: 327 mm [12.87 inch]
DEPTH	: 367 mm [14.45 inch]
HEIGHT	: 290 mm [11.42 inch]

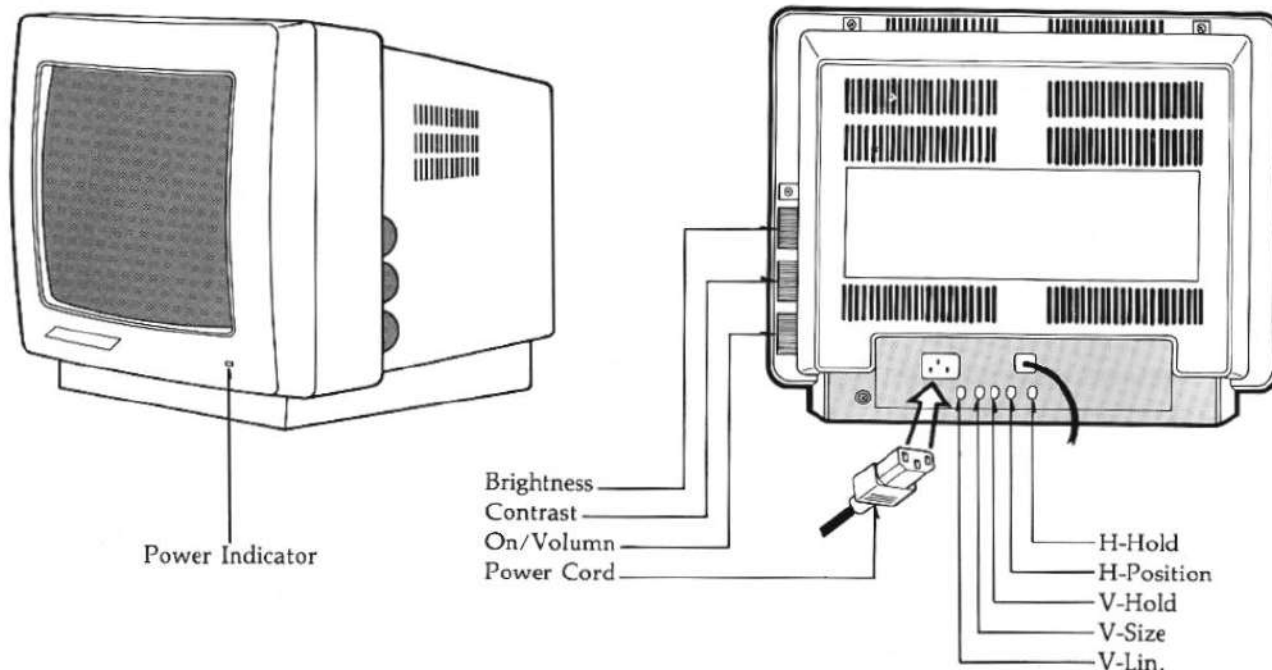
12. WEIGHT (SET)

: 10.7 Kg [23.54 lbs]

CONTROL OPERATION

• FRONT and SIDE VIEW

• REAR VIEW



[Figure 1] Monitor Controls

• ON/VOLUME

Turn on the monitor by turning this knob clockwise. The Power Indicator on the front of the monitor shows that the power is ON or OFF.

Always turn on the monitor before turning on the computer. To turn the power off, just turn this knob counterclockwise. This knob also controls the volume level. Your monitor is equipped with a small speaker located on the left side panel. As you turn the knob further clockwise, the volume level increases; as you turn it counterclockwise, the volume level decreases. Your computer is capable of sending audio signals to the monitor, and many programs and games will make use of the speaker.

• CONTRAST

Turn this knob clockwise to increase contrast.

• BRIGHTNESS

Turn this knob clockwise to increase brightness.

• V-LIN. (R635)

Turn this Potentiometer to conform the picture size vertically. i.e. this knob adjusts the vertical linearity.

• V-SIZE (R616)

Turn this Potentiometer to adjust the vertical size of the picture.

• V-HOLD (R603)

Turn this Potentiometer to stop vertical rolling of the picture.

• H-POSITION (R710)

Turn this Potentiometer to the right to move the center of the picture to the right. Turn it counterclockwise to move the center of the picture to the left.

• H-HOLD (R716)

Turn this Potentiometer to stop horizontal rolling of the picture.

• POWER SOCKET

Plug this socket into a power outlet before turning on the power switch.

THEORY OF OPERATION

POWER SUPPLY

The power supply is a SMPS (switching mode power supply) that consists of switching IC950 (STR41090), SMPS transformer (T950), and the associated components. The basic theory of the SMPS is the circuit of self oscillation. The primary winding of the SMPS transformer is applied the pulse by operating Q931. Therefore, rectified DC 115V and DC 12V, 14V is obtained by D960, D961, D962 in the secondary winding of SMPS transformer T950.

START UP CIRCUIT

An initial start-up circuit drives the horizontal output stage when the set is initially turned on.

This circuit consists of transistor Q701 and its associated components. It provides a drive pulse to the horizontal drive transistor Q702. Once the FBT-driven voltages operate, diode D706 is forward biased and diode D701 is reverse-biased, providing DC 24V to IC601 and Q702. Switching the voltage supply circuit in the above manner, result in saving power consumption.

HORIZONTAL AND VERTICAL DEFLECTION SYNCHRONIZATION

The IC701 performs the horizontal synchronization (oscillator). A horizontal rate output pulse is coupled from IC701 pin 12 to the horizontal driver Q702. The driver stage drives the horizontal output Q703.

The horizontal sync signal coupling IC701 pin 1 is derived from dividing between R708 and R709.

13 of IC701. A pulse from the FBT pin 2 is rectified by D705.

HORIZONTAL AFC AND OSCILLATION LIMITER

The AFC circuit consists of phase detection circuit of IC701 and the associated component. The oscillation limit circuit is necessary to prevent the pulse from excessive high voltage. This circuit is located in IC701 and controls the oscillator to maintain the control signal in its correct frequency and in phase with the horizontal sync signal.

X-RAY PROTECTION CIRCUIT

The X-ray protection circuit consists of D704, R725 (hold down), R724, R726 and the associated component that connected to pin 13 of IC701. A pulse from the FBT pin 2 is rectified by D705. Under normal operating conditions, the resultant voltage maintains the specified value.

If a malfunction cause excessive high voltage, the amplitude of the pulse from the FBT increases, causing a corresponding increase in D704 which results in a voltage increase at pin 13 of IC601. A voltage increase at IC701 pin 13 makes the X-ray protection circuit conduct, and the horizontal oscillation operation no longer functional.

The circuit latches as above, and it is necessary for the circuit to turn the power off for at least 30 seconds to function again.

VERTICAL OSCILLATION/DRIVE CIRCUIT

The time constant circuit that determines the vertical oscillation frequency consists of IC701, C602, R603 and C603 connected at IC701 pin 18. Vertical size control function is performed by R615, causing the negative feed back to change.

VERTICAL OUTPUT

Vertical out circuit consists of IC601 and associated component.

HORIZONTAL DRIVE CIRCUIT

To obtain horizontal drive pulses from IC701 pin 12, the horizontal oscillator must be working.

Horizontal drive pulses from IC701 pin 12 are applied to horizontal driver Q702. The B^+ for Q702 is supplied from the 50V line through D706. During initial receiver turn-on before the FBT (drive supply voltages are developed), an initial B^+ is supplied to Q702 from the regulated 115 volt line through R704.

HORIZONTAL OUTPUT

Horizontal drive pulses from Q702 are coupled through T701 to the base of horizontal output Q703. Transistor Q703 is biased on when the beam is at about mid-screen.

The charge stored on C732 and C733 causes current to flow through the horizontal yoke winding and Q703 to ground. When the beam reaches the right side of the screen, Q703 is turned off, and the current in the yoke is directed into C715 and C716. At the same time current flows into C715 and C716 from the regulated B^+ via the FBT primary winding.

Due to resonance, the current then reverses and flows back through the horizontal yoke winding into C732 and C733. This action deflects the electron beam back to the +115V regulated B^+ .

PINCUSHION CORRECTION

The pincushion correction circuit consists of T703, Q602 and its associated components.

The horizontal yoke current is increased or decreased in response to vertical parabola pulses.

POWER SUPPLY DESCRIPTIONS

This SMPS (switching mode power supply) using STR41090 obtains rectified DC115V, 12V, 14V from AC220V.

Power is supplied in the following procedure:

- 1) AC220V supplied from the AC socket is rectified by BD901.
- 2) Rectified voltage is supplied to the T950. As to STR41090, Voltage which is primarily rectified by D951, is supplied to pin 2 of IC951 through R952, R953, R954.
- 3) At this moment, a pulse is generated at pin 3 of the IC950, which switches Q3 by internal oscillation of IC951.
- 4) This oscillation causes IC950 to switch, and at the secondary terminal of T950, a voltage proportional to the turn ratio is generated.
- 5) The generated voltage supplies DC 115V, 12V, 14V to the output terminal after the rectified by D960, D961, D962 and filtered by C961, C963, C965 and L961.
- 6) Between Pins 5 and 6 of T950, a voltage is generated proportional to turn the ratio from voltage generated between Pins 11 and 12.
- 7) Detecting voltage (pin 1 of IC950) is obtained through D950 by generated voltage (pin 6 in T950) is 90V.
- 8) Over current protection circuit (Q950, R951) is existed in order to protect Q3 in IC950 from surge current which may be caused at power switch on or off and output short-circuit.

ADJUSTMENT AND MAINTENANCE

GENERAL INFORMATION

All adjustments are thoroughly checked and corrected when the monitor leaves the factory. Therefore the monitor should operate normally and produce proper color and pictures upon installation. However, several minor adjustments may be required depending on the particular location in which the monitor is to operate. This monitor is shipped completely in cardboard carton. Carefully draw out the monitor from the carton and remove all packing materials. Plug the power cord into a convenient 220 volts 50 Hz AC power outlet. Never connect to direct current or any other power outlet or frequency. Check and adjust all the customer controls such as BRIGHTNESS, and CONTRAST to obtain a normal picture.

AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing is normally unnecessary after moving the monitor. The monitor should be properly degaussed upon installation. The degaussing coil operates for about 1 second after the power to the monitor is switched ON. If the set is moved or faced in a different direction, the power switch must be switched off for at least 10 minutes in order that the automatic degaussing circuit operates properly.

Should the chassis or parts of the cabinet become magnetized to cause poor color purity, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube, the sides and front of the monitor, and slowly withdraw the coil to a distance of about 2 meters before disconnecting it from the AC source. If color shading still persists, perform the CONVERGENCE ADJUSTMENT procedures, as mentioned later.

HIGH VOLTAGE CHECK

WARNING: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. The +115 volt power supply must be properly adjusted to insure the correct high voltage.

1. Connect an accurate high voltage meter to the second anode of the display tube.
2. Turn on the monitor. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage will be measured below 24.0 KV.
4. Rotate the BRIGHTNESS control to both extremes to be sure that the high voltage does not exceed the limit of 24.5 KV under any conditions.

FS CIRCUIT CHECK (Hold Down)

The FS (fail safe) circuit check is indispensable for the final check. Checking should be done following steps:

1. Turn the power switch ON and adjust customer controls for normal operation.
2. Connect a VTVM between (the cathode of D704) and the chassis ground.
3. Adjust brightness, and contrast, for mechanical minimum.
4. Adjust the Hold-down VR (R725) on the main board for the voltage of (the cathode voltage of D704) in DC10.25V.
5. After adjusting the voltage, fix the hold down VR (R725) with EPOXY or same kind of bond.
6. Check the set in the hold down when the voltage of TP5 (the cathode voltage of D704) is 13.2V +0.5, -0V.
7. If this monitor is not the FS (fail safe), repeat steps 1 through 5.

HORIZONTAL OSCILLATOR ADJUSTMENT

If there is an indication of unstable horizontal sync., adjust the HORIZONTAL HOLD control (R716) until screen image is stable.

VERTICAL OSCILLATOR ADJUSTMENT

If the picture moves up or down on the screen, adjust the VERTICAL HOLD control (R603) at the back of the monitor until there is a single image without vertical movement.

VERTICAL SIZE ADJUSTMENT

The vertical size control (R616) on the main board changes the size of the picture or pattern, having an equal effect on the top and bottom. The final adjustment for the V-size of picture is 150 mm for 12".

FOCUS ADJUSTMENT

Adjust the FOCUS control on the focus pack for well defined scanning lines in the 1/4 and 3/4 points of the screen.

HORIZONTAL WIDTH ADJUSTMENT

Adjust the horizontal width control coil (L702) by turning it with a hexagonal adjusting tool so that the width of the picture (data display area) is 210 mm for 12".

H-POSITION ADJUSTMENT

Adjust the H-position control (R710), so that the center of picture is the same as the mechanical center of the screen.

V-LINEARITY ADJUSTMENT

1. Display the cross hatch with the character generator.
2. Adjust R635 (V-LIN.) to the best condition.
3. Non-Linearity should be within $\pm 7\%$.
4. If V-size is changed after adjusting R635 (V-LIN.), readjust R616 (V-SIZE). At the time, signal is reverse pattern.

SUB-BRIGHTNESS ADJUSTMENT

1. Supply white color with a computer to the video input terminal.
2. Turn the contrast to the maximum with the contrast volume (fully clockwise) and BRIGHTNESS to the minimum with the bright volume (fully counterclockwise).
3. Adjust the sub-bright volume (R742) to cut-off the picture slightly.

VERTICAL CENTER ADJUSTMENT

Adjust the V-center control (R626), so that the center of the picture is the same as the mechanical center of the screen.

SIDE PCC ADJUSTMENT

1. Display the reverse pattern with the character generator.
2. Adjust to minimum by rotating R621 (side PCC).
3. At this time, the pincushion or barrel distortion should be within 1.5% (max.)

WHITE BALANCE ADJUSTMENT

1. EQUIPMENT

- Video Signal generator: LVG-1600 (Analog input)
R: 1Vp-p G: 1Vp-p B: 1Vp-p
- Oscilloscope
- W/B meter
- Color analyzer

2. Adjustment 1

- Input the 16 step wave 4 Pattern to the set.
- Set the BRIGHTNESS, CONTRAST VOL to the maximum.
- Set the Video output level (R511 rear part) 45Vp-p with adjusting the G.DRIVE (R303).
- Set the Video output level (R510 rear part) 45Vp-p with adjusting the R.DRIVE (R323.)

- Adjust R.LEVEL (R369) in order to agree with R and G. output level when CONTRAST is minimum position.
- Adjust the R.DRIVE again in order to agree with R and G. output level when CONTRAST is maximum.
- When CONTRAST is maximum or minimum, As above (4) (5) (6) adjust the B.DRIVE (R343) in order to agree with B and G. OUTPUT Level.

3. Adjustment 2

- Set the SCREEN, CONTROL BRIGHTNESS, CONTRAST VOL.
- Set the SUB BRIGHT (R742) to the maximum.
- Set the R.CUT OFF (R317). G. CUT OFF (R337) B. CUT OFF (R357) to the center position.
- Input the reverse pattern.
- Set the reverse pattern 3FL in the COLOR ANALYZER with rotating the SCREEN CONTROL.
- In the case, adjust R.G.B CUT OFF (R317, R337, R357) As below X.Y with W/B METER.

$$X: 0.28 \pm 0.002 = 0.279-0.283$$

$$Y: 0.311 \pm 0.002 = 0.309-0.313$$

4. Adjustment 3

Set the CONTRAST AND BRIGHTNESS VOL to the maximum. Set the reverse pattern 28FL in the COLOR ANALYZER with rotating the SUB-BRIGHT (R742).

CONVERGENCE ADJUSTMENT

NOTE: Before attempting any convergence adjustments, the monitor should be operated for at least fifteen minutes.

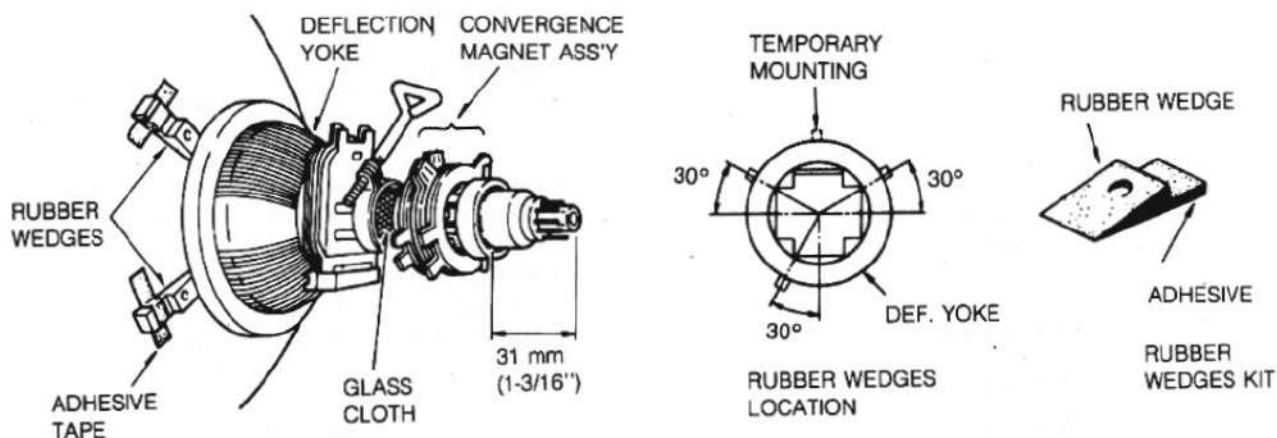
• Center Convergence Adjustment

1. Supply a crosshatch pattern with a color character generator. to the video input.
2. Adjust the brightness and contrast controls for a well defined pattern.

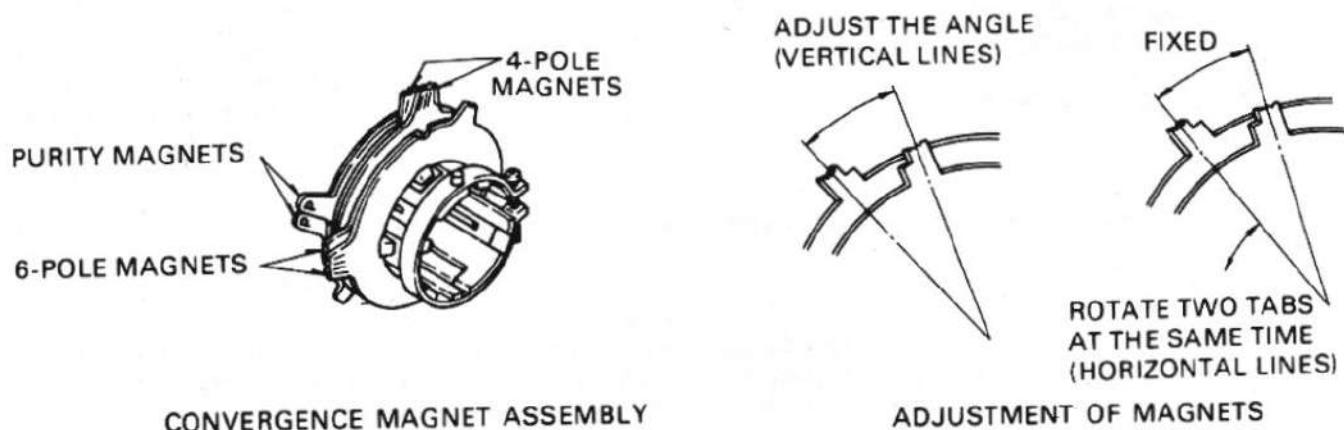
3. Adjust the two tabs of the 4-pole magnets to change the angle between them (See Figure 3) and superimpose red and blue vertical lines in the center area of the picture screen. (See Figure 4).
4. Turn both the tabs at the same keeping the angle constant to superimpose red and blue horizontal lines at the center of the screen. (See Figure 4)
5. Adjust the two tabs of the 6-pole magnets to superimpose red/blue line and a green one. Adjusting the angle affects the vertical lines, and rotating both magnets affects the horizontal lines.
6. Repeat adjustment steps 3,4,5 describing red, green and blue movements. The 4-pole magnets and the 6-pole magnets have mutual affection making dots movement complex.

• Circumference Convergence Adjustment

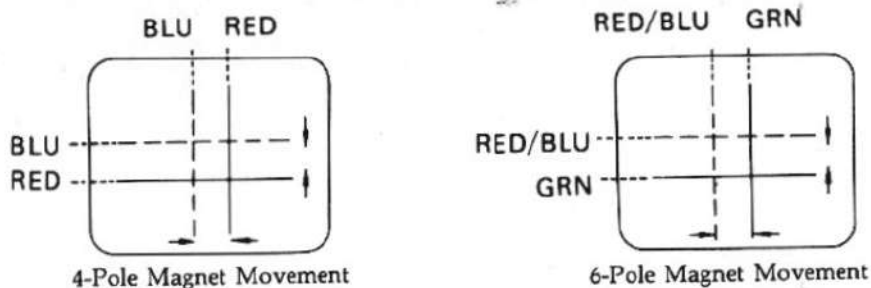
1. Loosen the clamping screw of deflection yoke to allow the yoke to tilt.
2. Put a wedge temporarily, as shown in Figure 2. (Do not remove the cover paper on the adhesive part of the wedge.)
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. (See Figure 2) push the mounted wedge into the space between display tube and the yoke to fix the yoke temporarily).
4. Put the other wedge into the bottom space and remove the cover paper.
5. Tilt the front of the yoke right or left to obtain better convergence in circumference. (See Figure 2).
6. Keep the yoke position and put another wedge in eighth upper space. Remove the cover paper and stick the wedge on the display tube to fix the yoke.
7. Detach the temporarily mounted wedge and put it in another upper space. Stick it on the display tube to fix the yoke.
8. After attaching three wedges, recheck overall convergence. Tighten the screw firmly to fix the yoke and check the yoke is firm.
9. Stick 3 adhesive tapes on the wedges as shown in Figure 2.



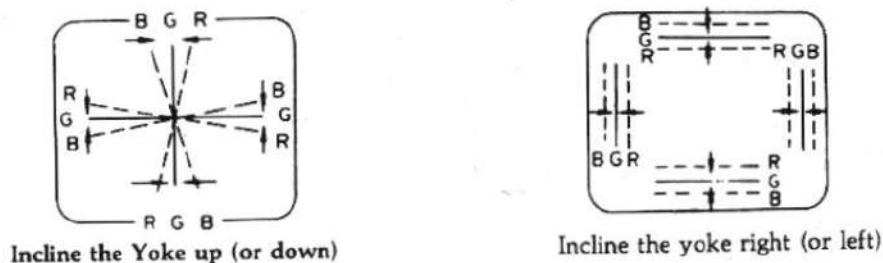
[Figure 2] Circumference Convergent Adjustment



[Figure 3] Center Convergent Adjustment



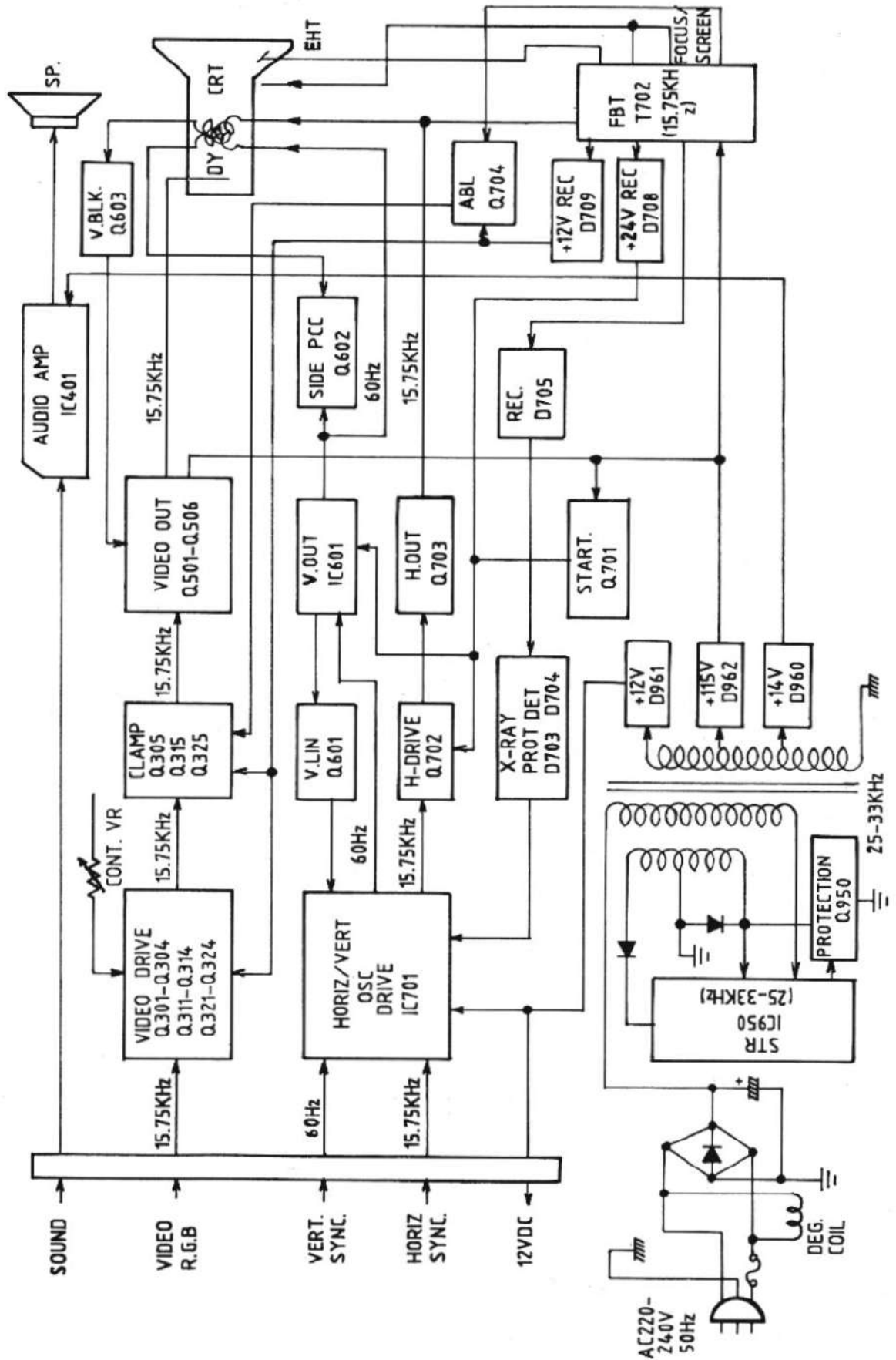
Center Convergence by Convergence Magnets



Circumference by DEF Yoke

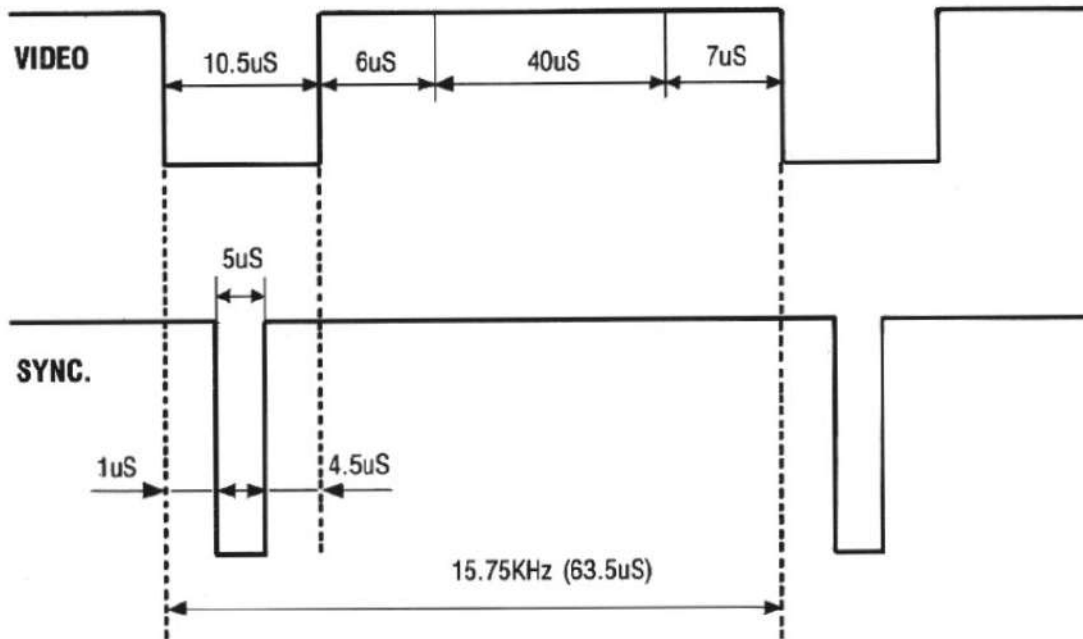
[Figure 4] Dot Movement Pattern

BLOCK DIAGRAM

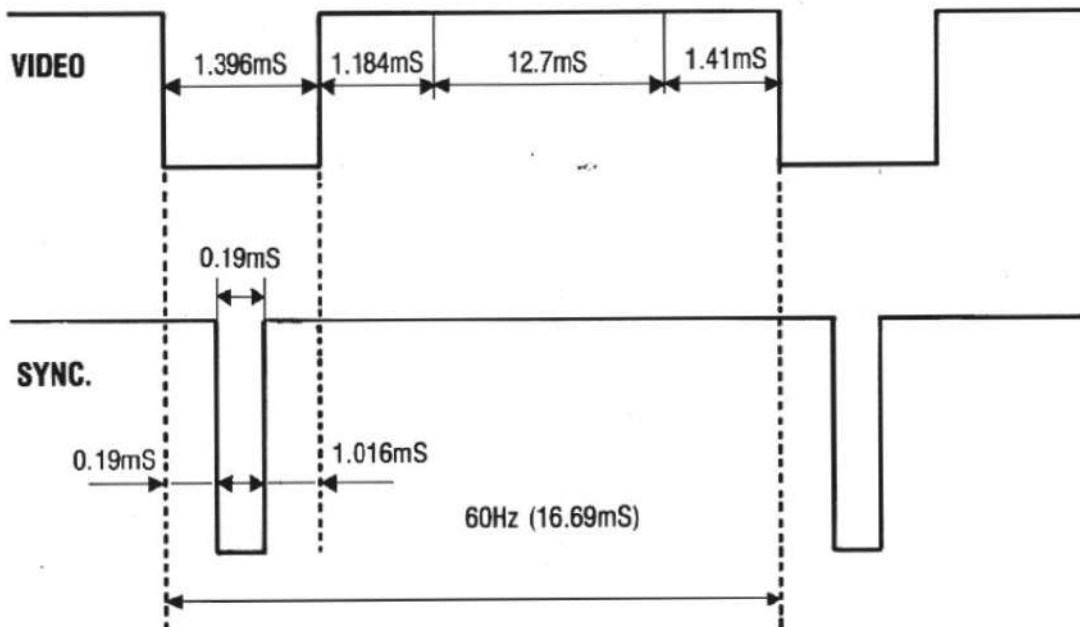


TIMING CHART

HORIZONTAL TIMING



VERTICAL TIMING

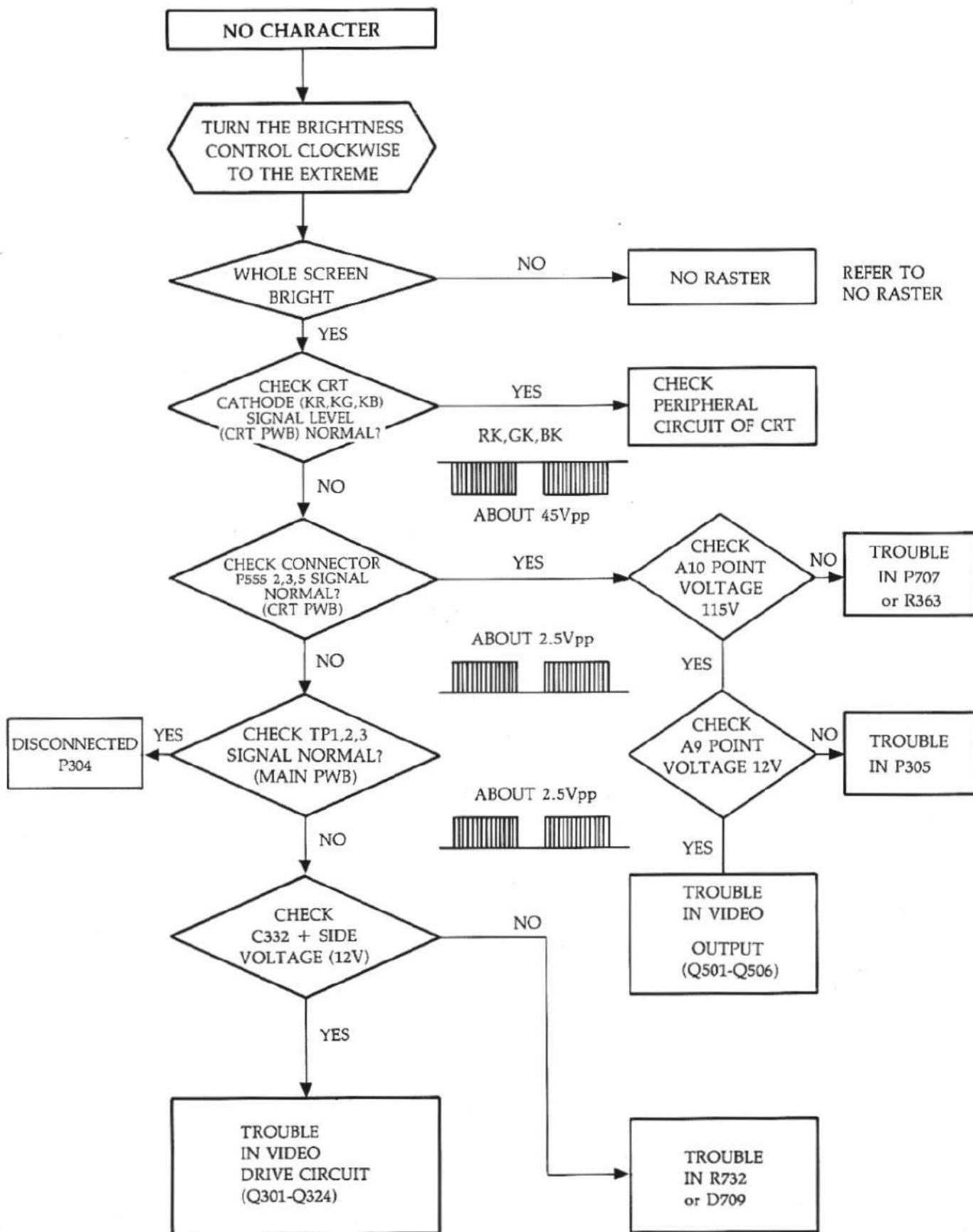


* NOTES

1. SIGNAL INPUT LEVEL: 1V_{p-p}
2. TIME TOLERANCE: $\pm 0.1\%$
3. THE MONITOR IS ADJUSTED ACCORDING TO THE ABOVE TIMINGS AND FREQUENCY.

TROUBLE SHOOTING CHART

A. NO CHARACTER



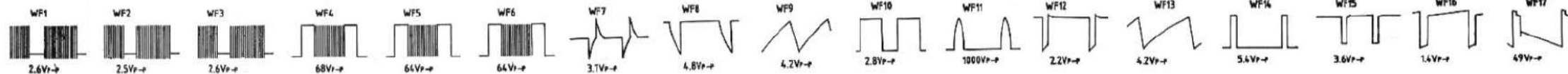
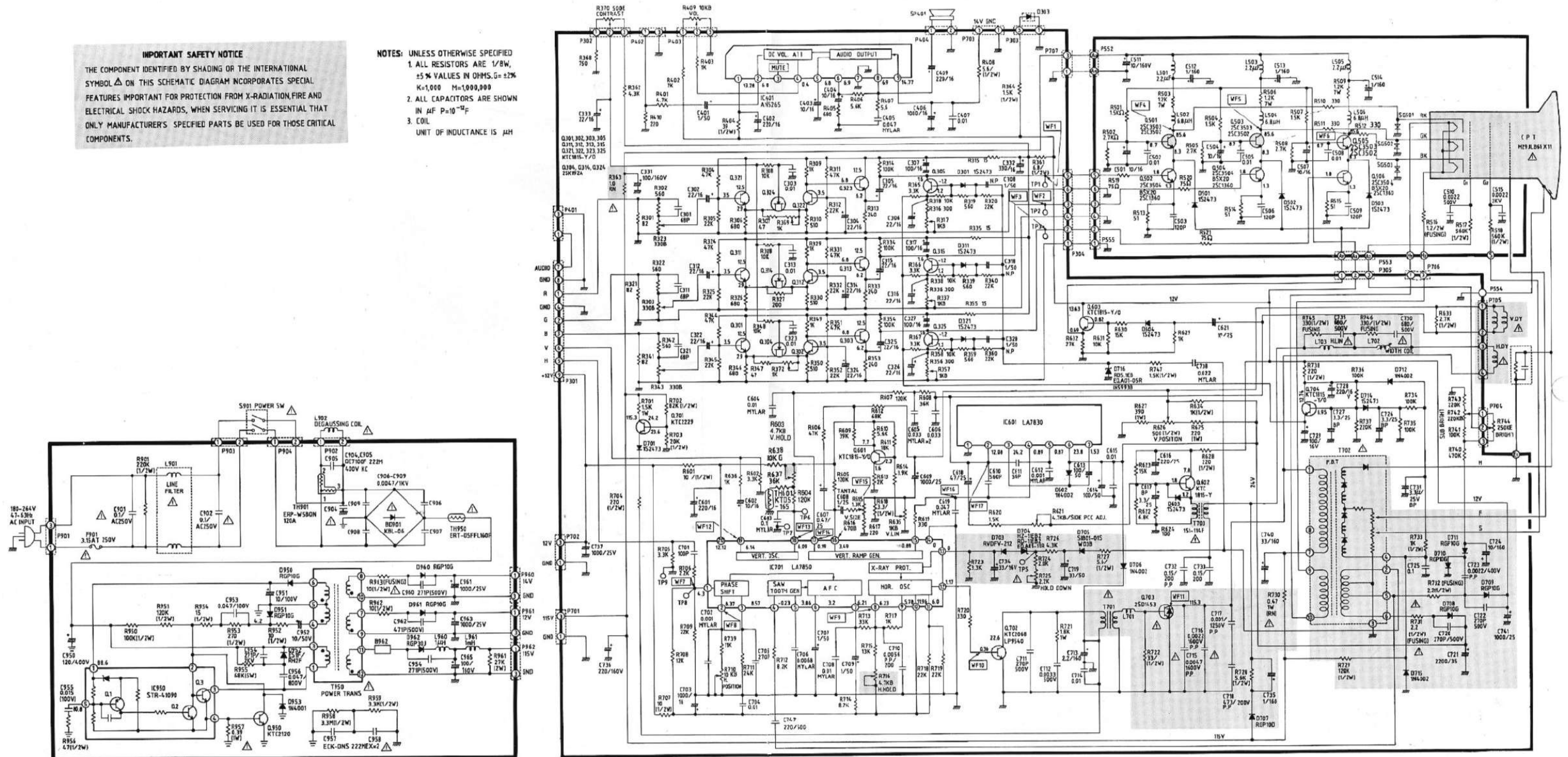
SCHEMATIC DIAGRAM

CA-3 CHASSIS SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE

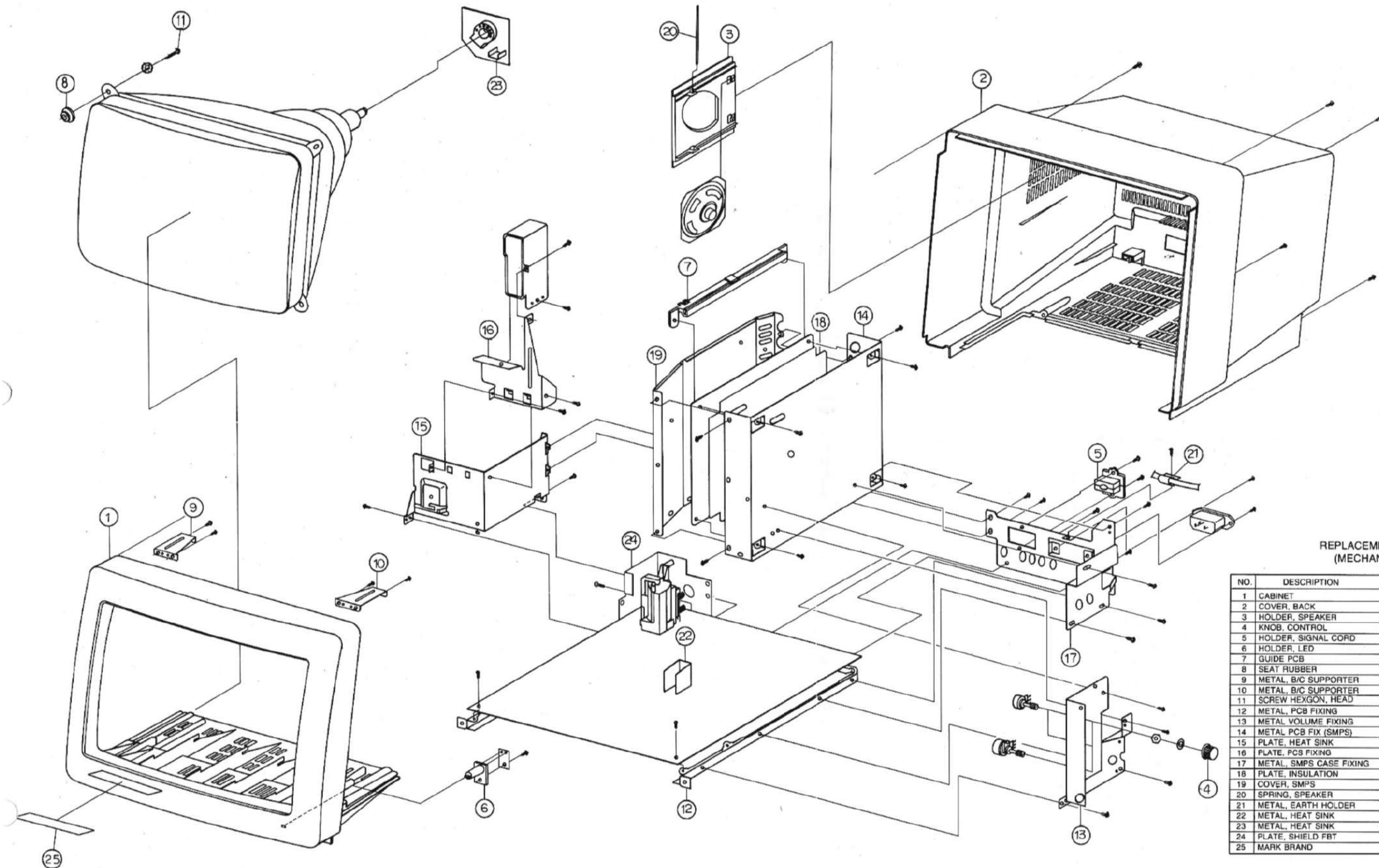
THE COMPONENT IDENTIFIED BY SHADING OR THE INTERNATIONAL SYMBOL Δ ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THOSE CRITICAL COMPONENTS.

- NOTES: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE 1/8W, $\pm 5\%$ VALUES IN OHMS, $\Omega = \pm 2\%$ K=1,000 M=1,000,000
 2. ALL CAPACITORS ARE SHOWN IN μF P=10⁻¹²F
 3. COIL UNIT OF INDUCTANCE IS μH



P/N 484-257A

EXPLODED VIEW DIAGRAM



REPLACEMENT PARTS LIST
(MECHANICAL PARTS)

NO.	DESCRIPTION	PART NO.	MATERIAL	Q'TY	REMARK
1	CABINET	301-186A	HIPS	1	
2	COVER, BACK	303-721A	HIPS	1	
3	HOLDER, SPEAKER	341-236A	HIPS	1	
4	KNOB, CONTROL	440-488D	HIPS	3	
5	HOLDER, SIGNAL CORD	341-068A	HIPS	1	
6	HOLDER, LED	341-238A	HIPS	1	
7	GUIDE PCB	348-026A	HIPS	1	
8	SEAT RUBBER	327-032A	NEOPRENE	4	
9	METAL, B/C SUPPORTER	430-502A		1	
10	METAL, B/C SUPPORTER	430-503A		1	
11	SCREW HEXAGON, HEAD			4	
12	METAL, PCB FIXING	430-498B		1	
13	METAL VOLUME FIXING	430-504B		1	
14	METAL PCB FIX (SMPS)	430-550B		1	
15	PLATE, HEAT SINK	407-390A		1	
16	PLATE, PCS FIXING	407-391A		1	
17	METAL, SMPS CASE FIXING	430-501C		1	
18	PLATE, INSULATION	407-142A		1	
19	COVER, SMPS	303-727A		1	
20	SPRING, SPEAKER	320-012B		1	
21	METAL, EARTH HOLDER	430-554A		1	
22	METAL, HEAT SINK	430-269A		1	
23	METAL, HEAT SINK	430-239A		3	
24	PLATE, SHIELD FBT	407-602A		1	
25	MARK BRAND	410-193B		1	

SPECIFICATIONS

1. CATHODE RAY TUBE

Type: Non-glare DARK
Size & Deflection angle: 12", 90°
Neck diameter: 20 mm
Phosphor: Paper White

2. INPUT

Input signal: TTL Signal
• Video : 1 Vp-p Positive
• Audio : 1 Vp-p
• Vertical Drive : 5 ± 1.5 Vp-p Negative
• Horizontal Drive : 5 ± 1.5 Vp-p Negative
Power Input : AC 220V 50Hz, 0.26A
Input Connector : 13 Pin Din Connector

3. SCANNING

Horizontal frequency : 35.7 KHz
Horizontal retrace time : 6.3 μ S
Vertical frequency: 71.2 Hz
Vertical retrace time : 420 μ S

4. VIDEO

- Display Area (HXV) : 210 mm \times 130 mm
- Amplifier Type : Linear
- Frequency band width : 32 MHz
- Horizontal resolution : 1100 lines at center
- Display character : 80 \times 50 characters

5. GEOMETRIC DISTORTION: 2.5% max.

6. LINEARITY

- Horizontal : 10% max.
- Vertical : 10% max.

7. EXTERNAL CONTROLS: BRIGHTNESS, CONTRAST, ON/VOLUME

ADJUSTMENT AND MAINTENANCE

CIRCUIT PROTECTION

Circuit protection is provided by one Mini fuse, on the power pc board. A 0.5 Ampere fuse (F901) is wired into one side of the AC line and provides primary protection to the entire chassis.

1. CENTERING ADJUSTMENT

CAUTION: The following adjustment points are close to the high voltage yoke terminal. If the raster is not centered in the raster opening, it may be centered by removing the cabinet back and adjusting the centering tabs on the neck of the tube, located at the rear of the deflection yoke. Turn the whole device clockwise or counter-clockwise. To increase the amount of raster shift, move the two tabs which project from the device, farther apart. If the raster is tilted on an angle, it may be straightened by loosening the deflection yoke locking clamp and rotating the deflection yoke.

2. FOCUS

Adjust the focus control (VR703) for best overall focus of the test pattern (marked with the symbol "%"). Usually the center and corners of the screen do not focus at the same setting and a compromise must be made.

3. BRIGHTNESS

Adjust subbrightness control (VR301) for visual cut off of the raster when external brightness is turned to maximum.

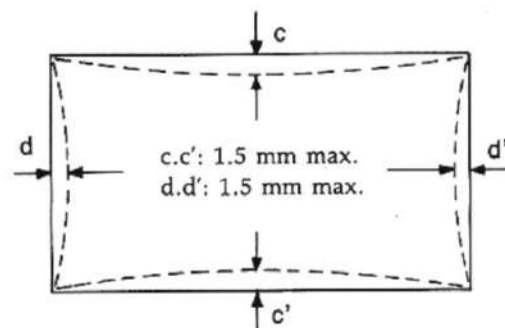
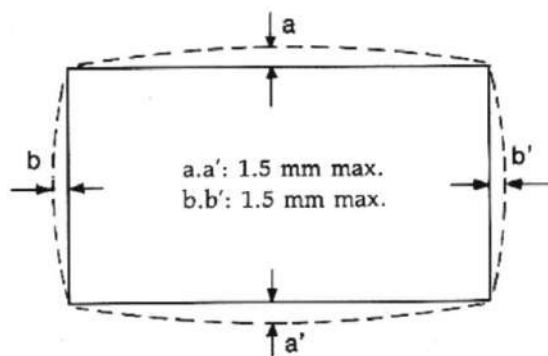
4. VERTICAL SIZE AND LINEARITY ADJUSTMENT

The vertical size control (VR602) should be adjusted for the picture to fill the screen vertically, the linearity control (VR603) should be adjusted for best overall vertical linearity. Adjustment of either control will not affect the adjustment of the other.

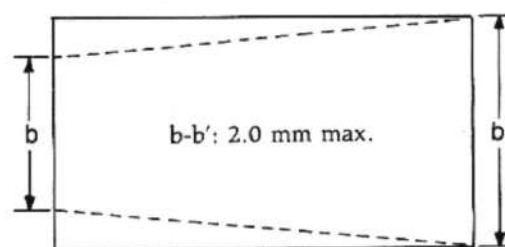
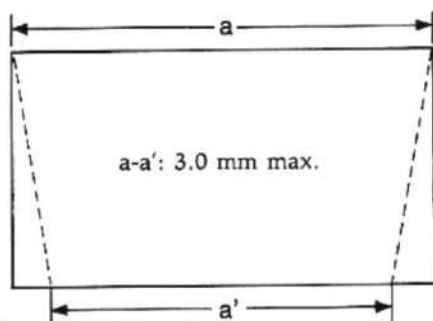
5. HORIZONTAL SIZE AND LINEARITY ADJUSTMENT

The horizontal size control (L702) is located on the main PCB, it should be adjusted for the picture to fill the screen horizontally, the linearity control (L703) should be adjusted for the best overall horizontal linearity adjustment so neither control will affect the adjustment of the other.

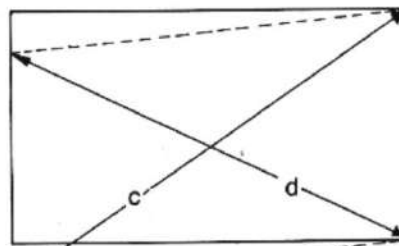
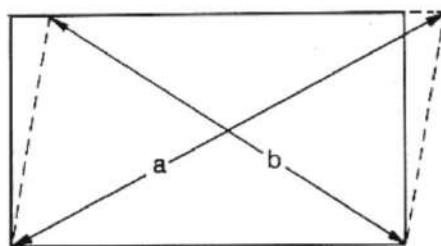
PINCUSHION AND BARRELLING



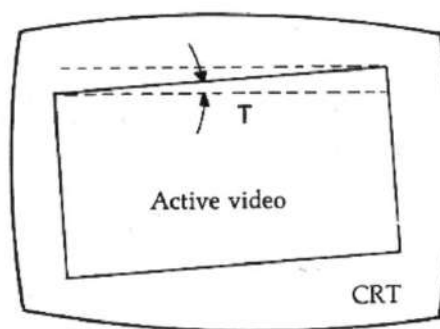
TRAPEZOID



PARALLELOGRAM



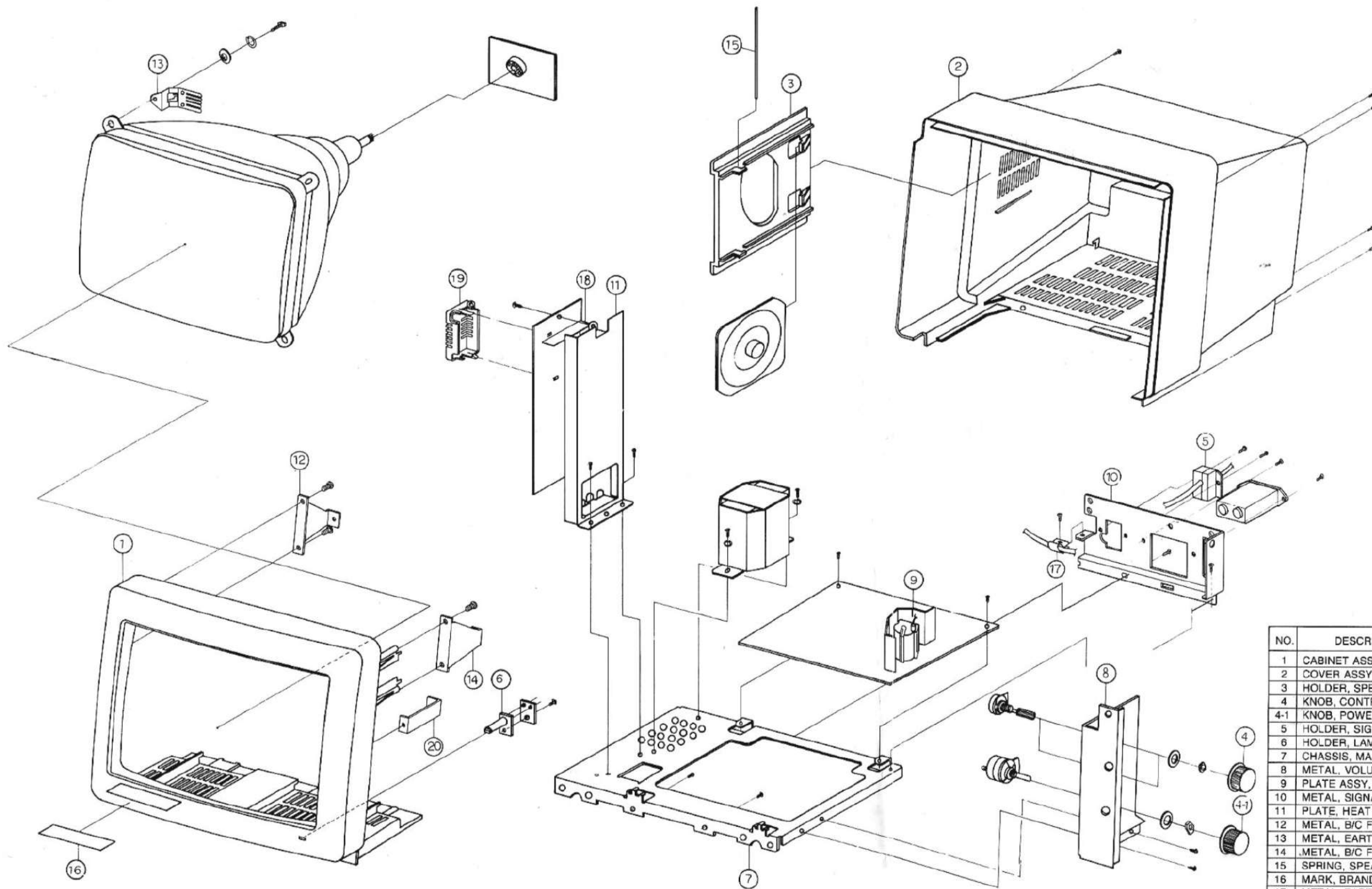
YORK TILT



$$T = 1^\circ \text{ max.}$$

Fig. 2, Geometry Measurements

EXPLODED VIEW

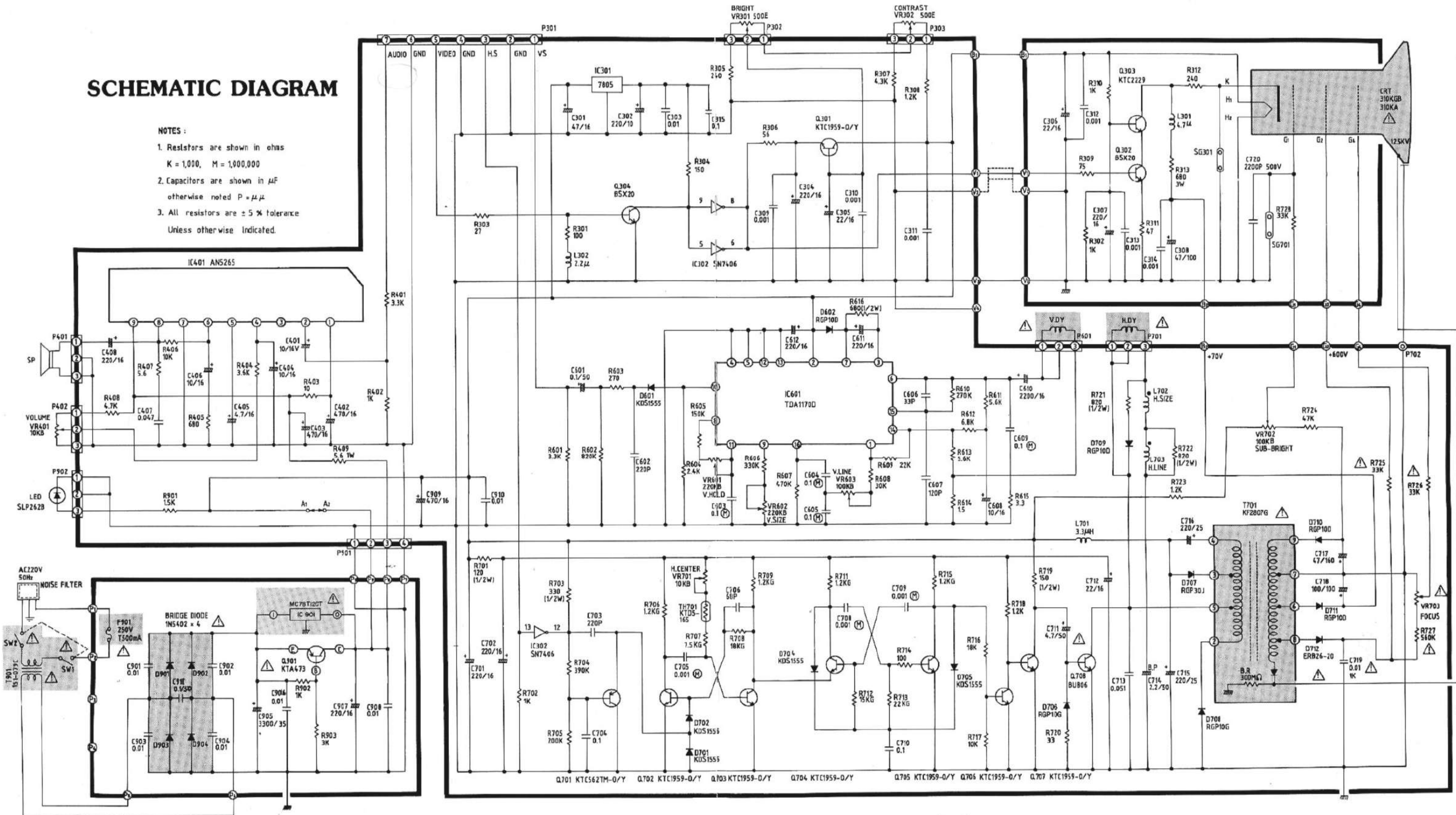


MECHANICAL PARTS

NO.	DESCRIPTION	PART NO.	MATERIAL	Q'TY	REMARK
1	CABINET ASSY	300-105D	HAN NAM HIPS 425TV	1	
2	COVER ASSY, BACK	303-614D	HAN NAM HIPS 425TV	1	
3	HOLDER, SPEAKER	341-236D	HAN NAM HIPS 425TV	1	
4	KNOB, CONTROL	440-488D	LUCKY ABS AF-303	2	
4-1	KNOB, POWER	440-207A	LUCKY ABS AF-303	1	
5	HOLDER, SIGNAL CORD	341-068A	LUCKY ABS AF-303	1	
6	HOLDER, LAMP	341-238A	LUCKY ABS AF-303	1	
7	CHASSIS, MAIN	311-486A		1	
8	METAL, VOLUME FIXING	430-273A		1	
9	PLATE ASSY, HEAT SINK	407-385A		1	
10	METAL, SIGNAL POWER	430-268C		1	
11	PLATE, HEAT SINK	407-384B		1	
12	METAL, B/C FIX (R)	430-420A		1	
13	METAL, EARTY	430-552A		1	
14	METAL, B/C FIX (L)	430-421A		1	
15	SPRING, SPEAKER	320-012B		1	
16	MARK, BRAND	410-193A		1	
17	METAL, EARTH HOLDER	430-554A		1	
18	PLATE, INSULATION	407-448A	SUMILITED	1	
19	COVER, FUSE	303-791A	LUCKY ABS AF-303	1	
20	METAL, VOLUME SUPPORTER	430-553A		1	

SCHEMATIC DIAGRAM

- NOTES :
1. Resistors are shown in ohms
K = 1,000, M = 1,000,000
 2. Capacitors are shown in μF
otherwise noted P = μF
 3. All resistors are $\pm 5\%$ tolerance
Unless otherwise indicated.



⚠ : REPLACE ALL COMPONENTS
MARKED WITH SAFETY
SYMBOL WITH IDENTICAL TYPE

IMPORTANT SAFETY NOTICE

THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

IMPORTANT AVIS SUR LA SÉCURITÉ

LA PARTIE OMBRÉE DE CE DIAGRAMÉ SCHEMATIQUE COMPREND D'IMPORTANTES CARACTÉRISTIQUES SPÉCIALES CONÇUES POUR PROTÉGER DES RAYONS X, ET DES DANGERS D'INCENDIE ET DE SECOURS ÉLECTRIQUES. EN CAS DE BESOIN SI DES PIÈCES DE CETTE PARTIE OMBRÉE DOIVENT ÊTRE REMPLACÉES N'UTILISEZ QUE DES PIÈCES SPÉCIFIÉES PAR LE MANUFACTURIER.