Technical Service Manual

COLOR TELEVISION RECEIVER

K-50H
CHASSIS MANUAL

Model No.: MTV-1410
MTV-2200

Semiahoo
Hall Monitors

SAFETY CAUTION:

Before servicing this chassis, it is important that the service technician read and follow the "Safety Precaution" and "Product Safety Notice" in this Service Manual.

* For continued X-radiation protection, replace picture tube with original type.

WARNING — SHOCK HAZARD — Use isolation transformer when servicing.

	Specifications	
	MTV-1410	**MTV-2200**
POWER CONSUMPTION	65 WATTS NOMINAL	77 WATTS NOMINAL
PICTURE TUBE	3720B22	51GGB91X
POWER REQUIREMENT	120V/60Hz	
VIDEO SIGNAL SYSTEM	N.T.S.C. COLOR TV SIGNAL	
TUNING RANGES	VHF CH 2-13, UHF CH 14-69	
RESOLUTION	MONOCHROME: MORE THAN 250 LINES	
ANTENNA INPUT IMPEDANCE	300 OHM BALANCED TYPE FOR UHF 75 OHM UNBALANCED TYPE FOR VHF	
INTERMEDIATE FREQUENCY	PICTURE 45.75MHz SOUND 41.25MHz	
X-RADIATION PROTECTOR	FAIL SAFE CIRCUIT	
RF AGC	REVERSE AGC	
AUDIO POWER OUTPUT RATING	0.8W AT 10% DISTORTION	
SPEAKER	IMPEDANCE: 8 OHM	

* Design and specifications are subject to change without notice.

CONTENTS

INSTRUCTION OF LA7520

1. VIDEO IF.

(1) Surface Acoustic Wave Filter

Since both the tuner and IC101 are high-gained circuits, an additional pre-amplifier for the surface acoustic wave filter Z101 is not required.
The output of the tuner IF is fed via the input circuit L101-R101 to the SAW-filter. Since the input impedance of IC101 is approximately 2K ohm, L103-R107-C104 are provided for the matching to high impedance.

(2) Internal Block Diagram of LA7625

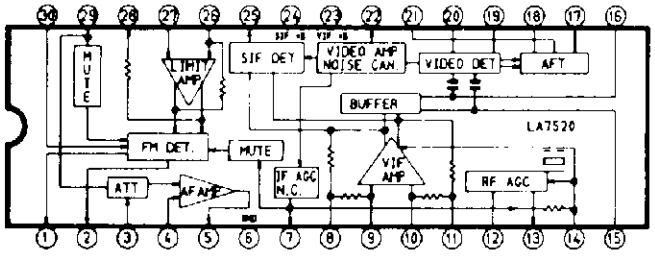


Figure 2. Internal Block Diagram of LA7625

(3) VIF Amplifier

The IF signal wave-shaped by Z101 is fed to pin 9 and pin 10. The input sensitivity of IC101 is 36 dB nominal. The output of the VIF amplifier is fed via the buffer stage and the sound trap at pin 15 and pin 16 to the low level detector. If the sound trap is not provided, the ratio of P/S must be compensated. Otherwise, 920KHz beat noise may appear on the picture and the S/N ratio of sound becomes worse.

(4) Video Detection

Differentially amplified, IF signal is then fed to the video detector.
C105 is for AC bias of DC negative feedback of the VIF amplifier.
L104 and R110 compose an LC tank circuit which is tuned in the video carrier frequency, so that the video signal with sync is detected.

(5) Video Amplifier

The video output via internal video amplifier and the noise canceller is provided at pin 22.
The output voltage at the pin 22 is normally 6.1V when no signal is inputted. The level of sync is 3.6V.
R117 is a bias resistor. The peaking level can be defined by the resistance of R118. L201 and Z201 are provided as a sound trap, and are tuned to 4.5MHz.

(6) A.G.C.

Peak detected signal by the internal AGC detector charges and discharges C108, and the voltage is fed back to the internal VIF amplifier for the gain control.
R102 and C151 are provided for the time constant, and are also designed for the high speed of responses.
The delay point of RF AGC is adjusted by VR101, and the output of RF AGC is provided at pin 13 of IC101.

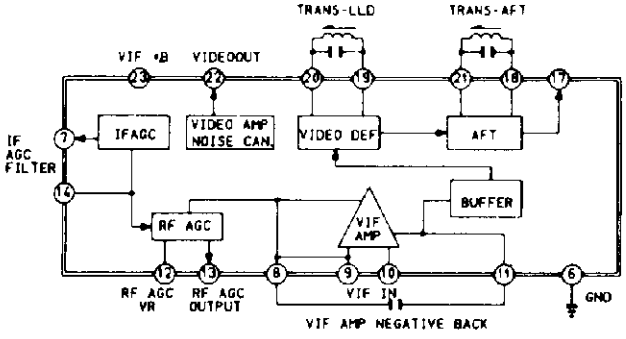


Figure 3. Internal Block Diagram of LA7625 PIF Part

The maximum voltage of RF AGC is 9V and the minimum is 0V.
R108 and R109 comprise a voltage divider.
C107 is provided to prevent any oscillation. Both of RF AGC and IF AGC are reversed AGC, so that the output voltage decreases when the input level increases.

(7) A.F.T.

AFT system in LA7520 is a Quadrature detection circuit. The LC tank L171 is connected to pin 18 and pin 21. AFT on-off switch may be customarily provided as shown in Figure 4. This feature is desirable for facilitating the tuning in of comparatively weak stations.
The AFT system should be turned off to tune in the weak station. Then turn the AFT system on to obtain capture. Thereafter, the AFT system will continue to lock in on the weak station.

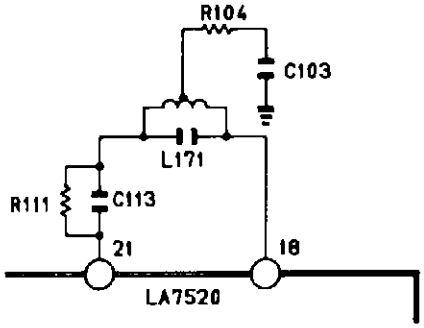


Figure 4.

The DC voltage between pin 18 and pin 21 is 4V. The AFT on-off switch reduces the voltage between pin 18 and pin 21 below 0.7V so that the signal from those pins can be cut off.
R111 and C113 are provided as a trap to prevent from a mis-operation.
The output of AFT from the current mirror circuit is provided at pin 17 and is supplied via R103 to the tuner as shown in Figure 5. The maximum voltage at pin 17 is 11.5V nominal and the minimum is 0.4V nominal.
The load resistors R114 and R113 divide the voltage so that the slope of AFT can be selected accordingly C114 is for decoupling and R103 is for AFT range setting.
A Varactor diode in the tuner controls the oscillation frequency in accordance with the voltage supplied.
When higher voltage is supplied, the capacitance reduces and the oscillation frequency increases.

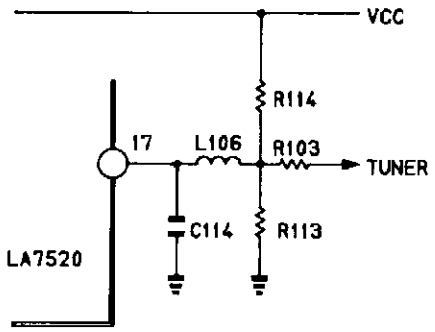


Figure 5.

2. SOUND

(1) SIF Detection

The output of the internal VIF amplifier is fed to the internal SIF detector, while the output of the internal VIF amplifier after buffer is fed via the sound trap at pin 15 and pin 16 to the low level detector.
The output of the first SIF detection is provided at pin 25 and is fed via the buzz canceller C601-L601 and 4.5MHz filter Z601 to the internal limiter.
R601 is a feed resistor.
C602 and C603 are bypass capacitors.

(2) FM Detection

The output of the limiter is fed to the FM detector. FM detector is Quadrature detection circuit so that the signal from pin 1 is 90 degree phaseshifted and is fed pin 30. Z602 is a part of the discriminator.
R606 and R607 are provided for the frequency band characteristic and the anti-distortion.
Since C604 controls the DC level for AC output, the level should be equal to DC output when no signal is applied.
The output of FM detection is provided at pin 2.

(3) AF Amplifier

The output of FM detector is fed via the De-emphasis circuit to the internal attenuator.
The range of the attenuation is maximum 30 dB.
R608 and C605 compose the De-emphasis.
The output of the attenuator is fed to the internal AF amplifier and pin 4 is provided for NFB from the sound output. The gain of the AF amplifier can be adjusted by R609 and the AC component must be cut and grounded by C654 and R609.
The maximum output voltage of the AF amplifier is 4Vrms nominal.
The AF signal is fed to the output transistors Q601 and Q602, which comprise a SEPP amplifier.

(5) Power Supply

The power for the VIF block is supplied to pin 23 and the power for the SIF block is supplied via the decoupling resistor R603.
C116 and C115 are for decoupling.
C651 and C152 are for voltage smoothing.

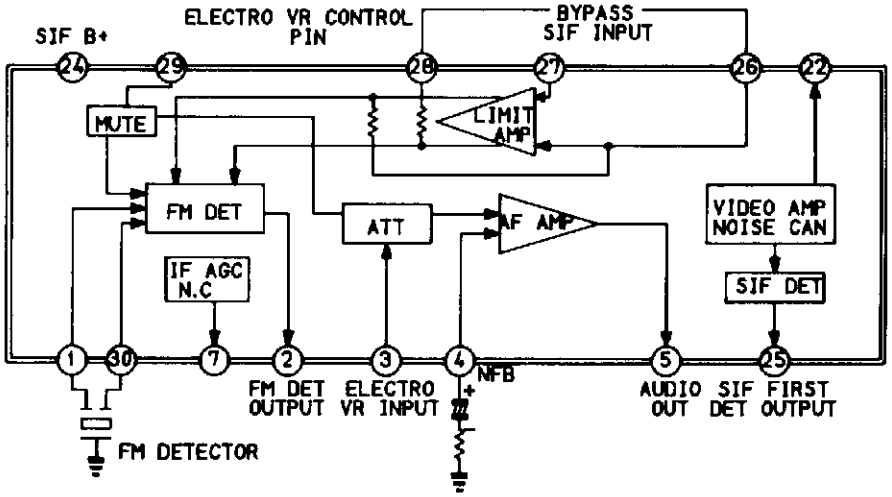


Figure 6. Internal Block Diagram of SIF Part

INSTRUCTION OF LA7625

(1) IC LA7625

IC LA7625 comprises a video circuit, a chroma circuit, a sync circuit, a vertical circuit and a horizontal circuit as shown in Figure 7.

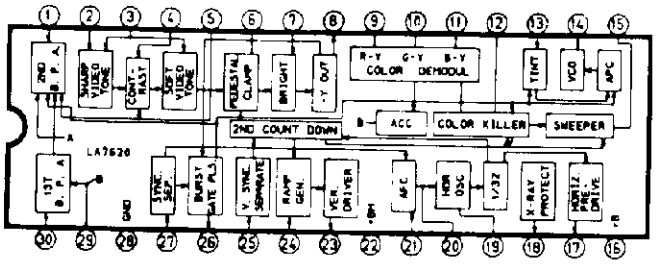


Figure 7. Internal Block Diagram of LA7625

1. VIDEO CIRCUIT

(2) Video Input

The internal block diagram only for the video is shown is Figure 8.

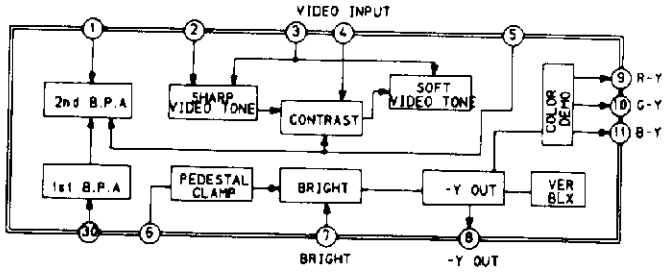


Figure 8. Internal Block Diagram of Video Part of LA7625

The video signal is fed to pin 4 of IC501 LA7625 and is amplified by the internal contrast amplifier. The gain of the amplifier is 15 dB in case 3Vp-p is required for – Y output, the level of the input signal is 3Vp-p/15dB (5.6) = 500mVp-p. Since the dynamic range of the amplifier is 5.8Vp-p, the maximum level of input signal is 5.8Vp-p/ 5.6 = 1.0Vp-p.

(3) Contrast

Pin 5 is provided for the contrast control. The range of the contrast control is from 5V to 12V so that a resistor is inserted between the contrast VR and the ground for the matching between the knob angle and the control range.

(4) Video Sharpness

The peak of the video tone is controled by the DC voltage which is applied to pin 3.
Due to the VIF characteristic and the delay line the phase deviation of – Y output may occur.
L202 and R203 are provided to prevent the – Y output from the phase deviation.
The resistance of R203 is selected to make the pre-shoot and the under-shoot are the same.
The inputted video signal is inverted by the differential circuit at pin 2 and the internal circuit of IC. The inverted signal is added by the video signal which is applied to pin 4, so that the video sharpness control can be performed.

(5) Current Limiter

The beam current limiter controls the maximum power dissipation of the receiver and protects the tube from developing purity errors associated with mask distortion due to excessive heating.
The flyback transformer voltage is sensed across C254 and is fed via the beam current network to the contrast control and the brightness control.
As the beam current increases, the voltage across C254 is decreased and hence the contrast and brightness control voltages via R209 and R210.

(6) Brightness

Pin 7 is provided for the brightness control. The range of the brightness control is from 3.5V to 8.5V. The relation between the input of the brightness control and the output of – Y is linear so that 1V increment of the input makes 1V increment of the output of – Y.
The feature of ABL is performed by the control of the voltage at pin 7. When the voltage is decreased, the brightness reduces.
The ABL circuit is shown in Figure 9.

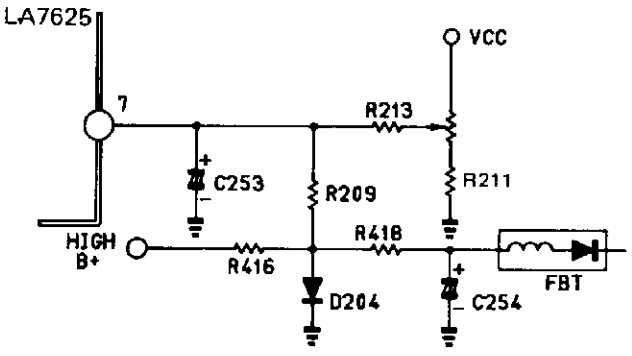


Figure 9. ABL Circuit

(7) Luminance Output

Pin 8 provides the output of – Y.
Since the horizontal flyback pulse is fed to pin 8 the internal AND gate provides the blanking signal for the luminance signal. The sensing level of the flyback pulse is internally set to 10.3V and the excessive pulse from the flyback transformer is to be absorbed by the circuit in the IC.

(8) Peak Clip

The level of the peak clip is set internally and the starting voltage of peak clip is 3.95V.
Assuming the level of the peak clip as 100%, 81% of the level is clipped and 19% of it is left as a soft tone as shown in Figure 10.

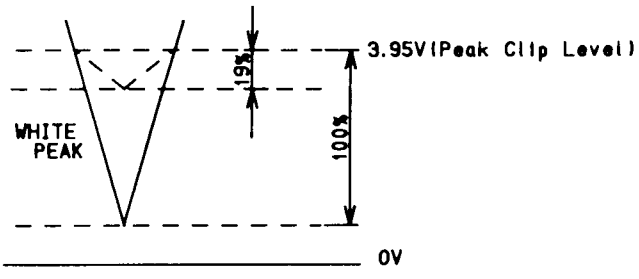


Figure 10. Peak Level

2. DEFLECTION CIRCUIT

(1) Sync Separation

The output of the video detection is fed via the sound trap L201-Z201 to Q201, Q201 is an emitter follower so that better frequency characteristic and low distortion can be performed.
R301 is for current limiting.
R302 and C351 are for the time constant, and are selected for the required DC voltage of sync tip and the peak voltage.
C301 is the high frequency filter especially for the weak signal reception.
The deflection block in LA7620 is shown in Figure 11.

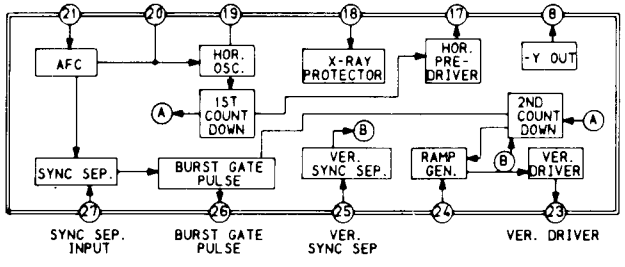


Figure 11. Block Diagram of SYNC Part of LA7620

(2) Burst-Gate Pulse and Vertical Trigger Pulse

C302-R303 at pin 26 are for the time constant of the burst gate pulse width.
R304 and C303 are for the time constant of the integrator circuit.
C304 is a coupling capacitor between the integrator circuit and pin 25.
The resistance of R305 is selected to make an optimum lead time of the vertical trigger pulse.
When the resistance of R305 is increased, the trigger pulse is shifted toward the last porch of the vertical sync pulse.

(3) Vertical Oscillation

Count-down method is applied to the vertical oscillator in LA7620 and the pull-in range is from 37.7Hz to 53.1Hz. When the trigger pulse is fed during the pull-in range, the count-down circuit is reset and the operating pulse which is synchronized with the trigger pulse is generated.

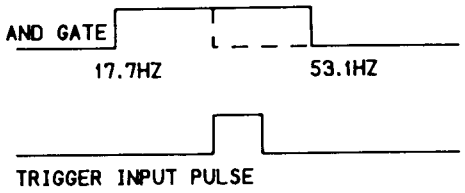


Figure 12. Vertical Oscillation

(4) Vertical Driver

The vertical driver in LA7620 generates the sawtooth wave. Pin 24 is provided for the feedback of AC and DC. The sawtooth wave is generated by charging and discharging of C356 in accordance with the on-off function of the internal transistor.
R317 is for the AC feedback.
R309 and C308 are provided to prevent the picture from bouncing especially when the channel is switched.
DC feedback of vertical center voltage is through R309 and R310.
The voltage divider R311-R310 affects the vertical center voltage and the stability of the circuit as well.
C357 and R316 are provided as a differential for circuit for the linearity of picture, so that hyperbola wave can be feedback to C356.
C353 is for DC blocking.

(5) AFC and Horizontal Oscillation

The reference sawtooth wave which is integrated from the Flyback pulse is fed to pin 21.
The phase detector inside of IC compares the phases of the sawtooth wave and the sync signal so that the difference can be fedback to the horizontal oscillator for the constant frequency.
The ceramic resonator X401 is provided at pin 19 for the horizontal oscillation.

(6) Horizontal Driver

The output of horizontal pre-driver at pin 17 is fed to the base of Q401, then the horizontal driver stage starts to work. When the high voltage is over than the specified voltage, the voltage at pin 17 falls to zero because of the

protection circuit inside of IC501. The horizontal circuit then stops operation.
Since the set is also off, the power switch must be turned on again for the restart of the operation.

(7) X-Ray Protector (HV Shutdown Circuit)

The X-Ray protection circuit is consists of D402, Q403, and the switching circuit within IC501 against excessive high voltage. An overvoltage condition is monitored from Pin 2 of FBT through a rectifier circuit (D402, C455) that develops approximately 108V DC.
This voltage is divided by the voltage divider (R410, R411). Therefore, normally 6V DC is applied to the emitter of overvoltage sensing transistor (Q403).
The base of Q403 is biased at 6.2V DC by a zener Diode keeping it turned off under normal conditions.
With an overvoltage condition for certain reason, the charging voltage of C455 is increased (This circuit is designed to shutdown at approximately 118V DC.) and the emitter voltage of Q403 is also increased.
Q403 will be turn on as soon as the emitter voltage exceeds 6.8V DC, and (+) voltage is applied to the switching circuit of IC501 Pin 18.
This condition will turn off the horizontal drive output. The output of IC501 Pin 17 is switched to zero. So horizontal output will be stopped.
Consequently, the set is essentially dead.
R413 is added to check the shut down operation by shorting terminal X and terminal R.

(8) Vertical Output

The output of the vertical driver inside of IC501 is amplified by the internal amplifiers of IC301.
A pump-up circuit which can reduce the power consumption is applied to the vertical output stage.
During the first half of scanning, the deflection current flows through the following path.
24V rail – D301 – Pin 4 of IC301 – C353-DY.
During the second half of scanning, the deflection current flows through the following path.
C353 – Vertical output stage of IC – 317-Dy.
During the flyback, the vertical pulse is added to the voltage charged across C352, so that the VCC of IC301 increases up to 48V. This voltage 48V is rapidly discharged as an operating ener during the flyback period so that the power consumption can be reduced.
During the flyback, the current flows through the following path.
24V rail – C352 Pin 8 of IC301 – output stage of IC – C353-Dy.

(9) Horizontal Output

The pulse signal from the horizontal oscillator is fed to the base of Q401.
T401 is for AC coupling.
The loads of Q402 are the flyback transformer, the deflection coils and the built–in damper diode.
C407 and C408 are charged when Q402 conducts and are used as an energy source during the second half of the flyback interval.

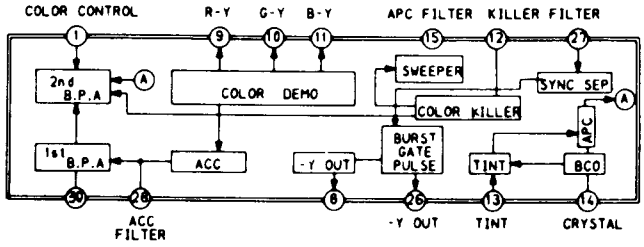


Figure 13. Internal Block Diagram of Chroma Part of LA7625

Q402 conducts for the right side of the picture while the damper diode conducts for the left side of the picture, so that the complete horizontal scanning can be performed.

3. CHROMA CIRCUIT

(1) Bandpass Amplifier

The chroma signal is fed via the chroma bandpass filter C501 and L501 to Pin 30.
C504 is to block DC contents.

(2) APC

The trimmer capacitor previously used in series with the crystal is not necessary, so that the APC alignment is not required. The pull-in range of APC is ±300Hz minimum.
Voltage controlled oscillator is appllen to the APC as shown in Figure 14.
The offset voltage of the APC filter is supplied by the internal sweeper.
Pin 15 is provided for the APC filter.
Assuming that the chroma sync is out of phase, the sweeper slowly pulls down the control voltage of VCO so that the frequency of VCO changes accordingly.
When the chroma sync is achieved, the killer circuit senses and stops the operation of the sweeper.
C552 and C553 are provided to cancel the ripple from the power voltage. If the capacitances of C552 and C553 are increased, the sync of the sweeper and the speed of color sync are delayed accordingly, so that the color appears late.

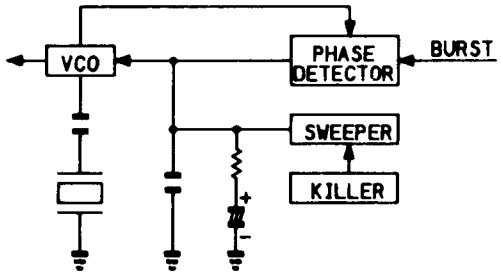


Figure 14. Block Diagram of APC Circuit

(3) ACC

Pin 29 is provided for the ACC filter and C554 is connected to the ground in order to eliminate the ripple.

(4) Color Killer

C551 and R508 at pin 12 are provided as a filter of the color killer circuit.
in case of B/W TV broadcasting or weak signal reception, the killer circuit decreases the gain of chroma amplifier to zero, so that the picture is forced to be only black and white.

(5) Color Difference Signal

The demodulated color difference signals R-Y, G-Y and B-Y are provided at pins 9, 10 and 11.
The level of the output is 6.5Vp-p nominal.
As a sub-carrier filter for each color difference signal, low pass filters are provided between IC501 and the video output transistors. R510 and C508 for R-Y, R511 and C509 for G-Y, R512 and C510 for B-Y. These filters can also be quite effective for the flashover protection.

(6) Video Output

The outputs of color difference signal R-Y, G-Y and B-Y are fed via the low pass filters to the bases of the respective output transistors.
Since -Y signal is applied to the emitters of the respective output transistors, Y signals are offset, and the -R, -G and -B signals are fed to the respective cathodes of the CRT.
The drive control VRs are trimmed for correct white-balance tracking in the highlights and the bias control VRs perform a similar function in the lowlights.
R540, R541 and R542 are for the flashover protection of the respective guns.

GENERAL ALIGNMENT INSTRUCTIONS

THIS RECEIVER IS TRANSISTORIZED AND SPECIAL CARE MUST BE TAKEN WHEN SERVICING. READ THE FOLLOWING NOTES BEFORE ATTEMPTING ALIGNMENT.

1. Alignment requires an exacting procedure and should be undertaken only when necessary.
2. The test equipment specified or its equivalent is required to perform the alignment properly. Use of equipment which does not meet these requirements may result in improper alignment.
3. Correct matching of the equipment is essential. Failure to use proper matching could result in responses which may result in improper operation of the receiver.
4. Use of excessive signal from a sweep generator can cause overloading of receiver circuit. Overloading should be avoided to obtain a true response curve. Insertion of markers from the marker generator should not cause distortion of the response.
5. The receiver should be connected to an AC power source with voltage and frequency as specified in the nameplate of the backcover.
6. Do not attempt to connect or disconnect any wire while the receiver is in operation. Make sure the power cord is disconnected, before replacing any parts in the receiver.
7. An isolation transformer must be used to prevent shock hazard.

INSTALLATION AND SERVICE ADJUSTMENT
(Refer to Figure 15)

GENERAL

In the majority of cases, a color television receiver will need only slight touch-up adjustment upon installation. Check the basic characteristics such as height, vertical sync., horizontal sync. and focus. Observe the picture for good black and white details without objectionable color shading. If color shading is evident, demagnetize the receiver. If color shading still persists, perform purity and convergence adjustments. This should be all that is necessary to achieve optimum receiver performance.

VERTICAL SIZE ADJUSTMENT

The V-SIZE controls (VR301) changes the size of the picture or pattern. Make final adjustment to overscan the mask about 10% vertically.

FOCUS ADJUSTMENT

Adjust the FOCUS control (T444) for well defined scanning lines on the picture screen.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis. The B^+ power supply (+125V) must be checked to insure the correct high voltage.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the AFT/AUTO COLOR switch to the OFF position. Set the BRIGHTNESS and CONTRAST controls to minimum (zero beam current).
3. High voltage must be about 27kV.
4. Rotate the BRIGHTNESS control to both extremes to be sure the high voltage does not exceed the 30kV limit under any conditions.

FAIL SAFE CIRCUIT CHECK (FS)

The FS circuit check is mandatory for the final check after servicing. Follow the steps below.

1. Turn the power switch on and adjust customer controls for normal operation.
2. Temporarily short point X and point R on Main Board with a jumper wire. Raster and sound will disappear.
3. The receiver must remain in this state even after removing the jumper wire. This shows that the FS circuit is functioning properly.
4. To obtain a picture again, temporarily turn the receiver off and allow the FS circuit more than 30 seconds to reset. Then turn the power switch on to produce a normal picture.

AGC ADJUSTMENT

1. Tune in the strongest station in your area.
2. Push "on" the AFT/AUTO COLOR switch SW101

located at the front of the receiver.

3. Turn the AGC DELAY control (VR101) fully counterclockwise, then turn it clockwise until snow noise just disappears from the screen.

SUB-BRIGHTNESS ADJUSTMENT

1. Tune in a color program.
2. Set the CONTRAST Control to minimum and the BRIGHTNESS Control to the maximum position.
3. Set the COLOR and TINT controls to center.
4. Set the SUB-BRIGHT control (VR203) to center and leave the receiver for five minutes in this state.
5. Connect VTVM between Pin Z and Pin Y, and then adjust the sub bright control (VR203) on Main Board for +0.4 volt reading.
6. Check for proper picture variation by roatating the CONTRAST and BRIGHTNESS controls to both extremes.
7. If the picture does not appear dark with the CONTRAST and BRIGHTNESS controls turned to minimum, or not bright enough with the controls turned to maximum, adjust the SUB-BRIGHT control for an acceptable picture.

AFT (AUTOMATIC FINE TUNING) FIELD ALIGNMENT

1. Place AFT/AUTO COLOR Switch in OFF position. Tune the set to an active channel and adjust fine tuning for best picture.
2. Place AFT Switch in ON position, and adjust Trans. (L171) on MAIN Board for best picture. Picture quality should be the same as that obtained in Step 1.
3. Check the AFT action by turning the fine tuning clockwise and counterclockwise.

AUTOMATIC DEGUASSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly deguassed upon installation. The degaussing coil operates for about 1 second after the power to the receiver is switched ON. If the set is moved or faced in a different direction, the power switch must be switched off 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 receiver and slowly withdraw the coil to a distance of about 6' (2 m) before disconnecting it from AC source. If color shading still persists, perform the COLOR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENT procedures, as mentioned later.

CRT GRAY SCALE ADJUSTMENT

1. Set the COLOR Control to minimum.
2. Adjust the BRIGHTNESS and CONTRAST Controls to obtain low light area.
3. Adjust RED, GREEN and BLUE BIAS Controls, (VR533, 534, 535) to obtain gray raster of low brightness.
4. Adjust the BRIGHTNESS and CONTRAST Controls to maximum.
5. Adjust the BLUE DRIVE (VR532) and RED DRIVE Controls (VR531) to obtain proper white-balanced picture in high light areas.
6. Repeat steps 2 through 5 for correct gray scale.

PARTS LOCATION DIAGRAM

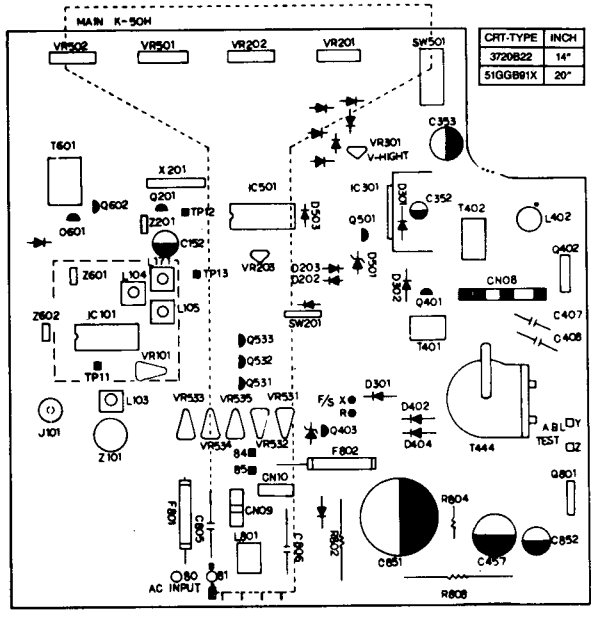


Figure 15.

COLOR PURITY ADJUSTMENT

1. Operate the receiver for 20 minute to warm up the CRT with Bright control maximum.
2. Degauss the receiver fully by using an external degaussing coil.
3. Roughly adjust convergence.
4. Receive a black and white signal.
5. Turn red and blue Low Light controls (VR533, VR535) fully counterclockwise to obtain a green field. Adjust Drive controls when green field is not obtained.
6. Loosen the deflection yoke clamp screw and move the deflection yoke as close to the purity magnet as possible.
7. Loosen purity, magnet clamp and adjust the purity magnet to set the vertical green raster precisely at the center of the screen. The tighten the clamp.
8. Slowly move the deflection yoke forward and adjust for best overall green screen.
9. Tighten the deflection yoke clamp screw.
10. Produce the blue and red raster by Low Light controls and observe that good purity is obtained on the respective field.

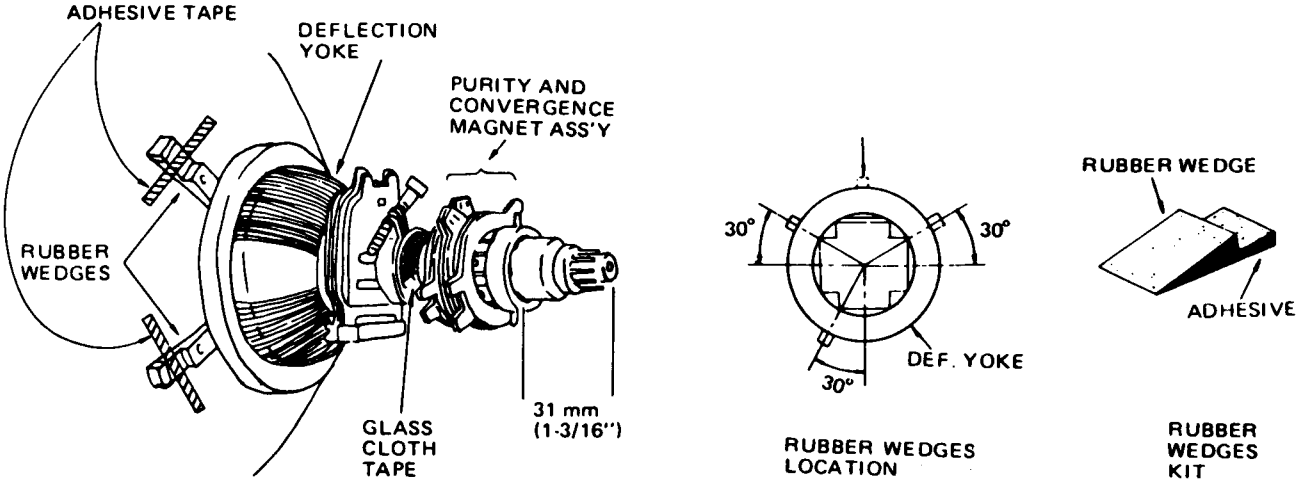


Figure 16. Tube Assembly

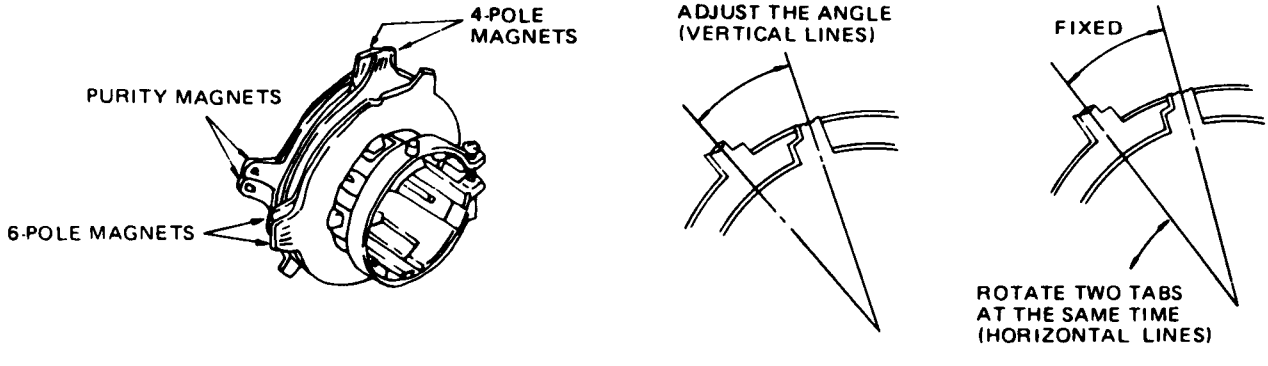


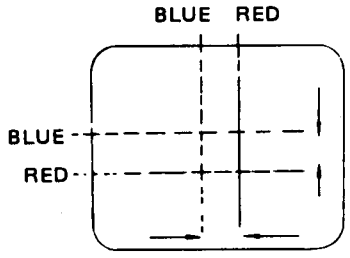
Figure 17. Purity and Convergence Magnets

CONVERGENCE ADJUSTMENTS

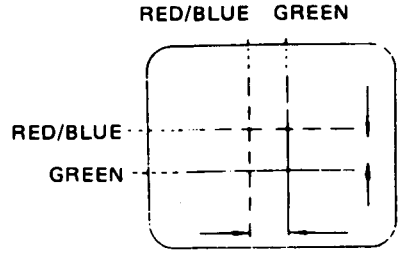
NOTE: Before attempting any convergence adjustments, the receiver should be operated for at least fifteen minutes.

CENTER CONVERGENCE ADJUSTMENTS

1. Receive crosshatch pattern with a color bar signal generator.
2. Adjust the BRIGHTNESS and CONTRAST Controls for well defined pattern.
3. Adjust the two tabs of the 4-Pole Magnets to change the angle between them and superimpose red and blue vertical lines in the center area of the picture screen.
4. Turn both tabs at the same time without changing position between them, to superimpose red and blue horizontal lines at the center of the screen.
5. Adjust two tabs of 6-Pole Magnets to superimpose red/blue line with green. Adjusting the angle affects the horizontal lines.
6. Repeat adjustments 3, 4, 5, observing red, green and blue movement, because 4-Pole Magnets and 6-Pole Magnets interact.



4-POLE MAGNETS MOVEMENT

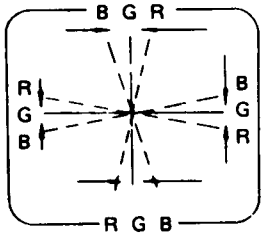


6-POLE MAGNETS MOVEMENT

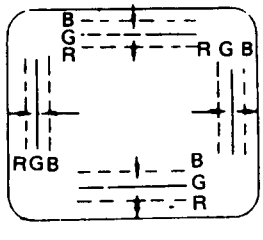
Figure 18. Center Convergence Adjustment

CIRCUMFERENCE CONVERGENCE ADJUSTMENT

1. Loosen the clamp screw of deflection yoke to allow the yoke to tilt.
2. Place a wedge temporarily. (Temporary Mounting). (do not remove cover paper on adhesive part of a new wedge).
3. Tilt front of the deflection yoke up or down to obtain better convergence in circumference. Push the mounted wedge into the space between picture tube and the yoke to hold the yoke temporarily in place.
4. Place other wedge at bottom and remove the cover paper to stick.
5. Tilt front of the yoke right or left to obtain better convergence in circumference.
6. Keep the yoke positioned and put another wedge in either upper space. Remove cover paper and stick the wedge on picture tube to secure the yoke.
7. Detach the temporarily mounted wedge and put it in another upper space. Stick it on picture tube to secure the yoke.
8. After inserting three wedges, recheck overall convergence.
   Tighten the screw firmly to hold the yoke tightly in place.
9. Place 3 adhesive tapes over wedges, as shown in Figure 16.



INCLINE THE YOKE UP (OR DOWN)



INCLINE THE YOKE RIGHT (OR LEFT)

Figure 19. Circumference Convergence Adjustment

TEST EQUIPMENT

Allow minimum of 10 minutes warm-up period for test equipment.

- Sweep/Marker Generator-Capable of furnishing markers at 41.25MHz, 42.75MHz, 45.75MHz.
- Oscilloscope-Wideband.
- External Bias-Battery or well regulated, isolated AC operated variable DC Bias supply (0-20V).
- Alignment Tool.

PICTURE I-F SWEEP ALIGNMENT

Refer to figure 20 for alignment points and test equipment connections.

1. Connect output of sweep/marker generator to test point (TP) on the tuner. (See Fig. 20)
2. Connect the oscilloscope with direct probe to TP12 on the PWB Main Board through 100K ohm resistor.
3. Apply approximately +4.5V to TP-11 and +16.5V bias to the lower side of R225 on the PWB Main Board.

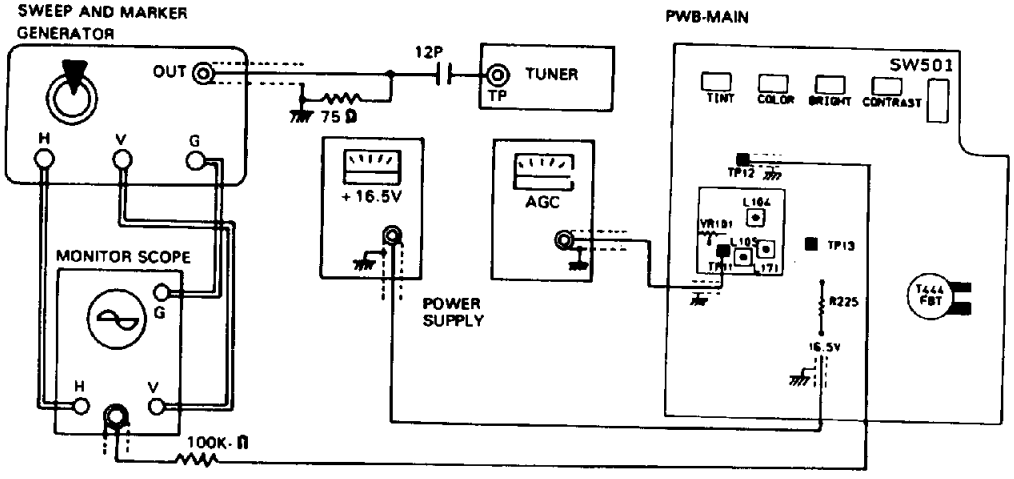


Figure 20. Picture I-F Sweep Alignment

I-F (45.75MHz) ADJUSTMENT

1. Adjust the attenuator on the Sweep/Marker Generator and I-F AGC Bias (TP11) to achieve 1Vp-p on oscilloscope.
2. Adjust L104 for maximum amplitude at 45.75MHz. (See Fig. 21)

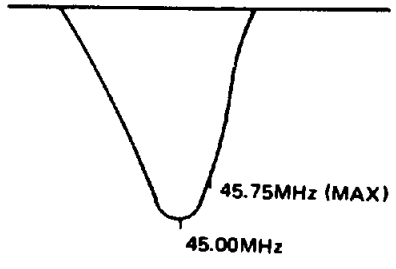


Figure 21. I-F (45.75MHz) Response Curve

I-F OVERALL ADJUSTMENT

1. Retain initial connections for I-F overall adjustment.
2. Ajust the core of tuner. (See Fig. 22)

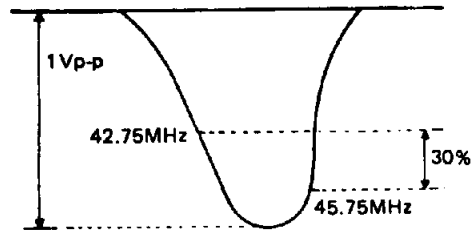


Figure 22. I-F Overall Response Curve

IF SOUND TRAP ADJUSTMENT

1. Retain initial connections for IF overall adjustment.
2. Push the button of the 41.25MHz keying pulse on the sweep generator.
3. Adjust L105 for minimum amplitude of the keying pulse. (41.25MHz) (See Fig. 23)

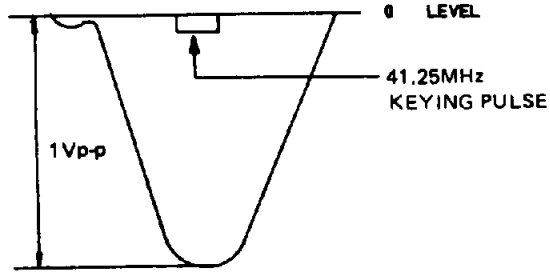


Figure 23. If Sound Trap Response Curve

AFT ADJUSTMENT

1. Remove detector probe from TP12.
2. Connect detector probe to pin 13 on the main board.
3. Adjust coil L171 for exact marker position.

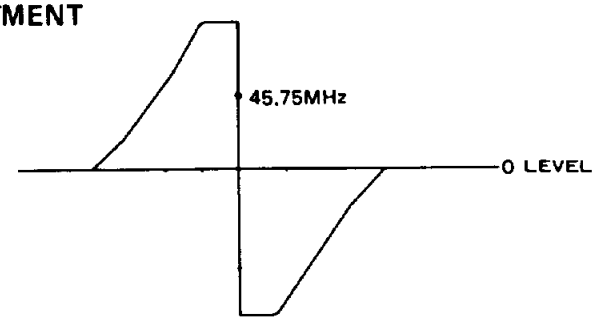


Figure 24. AFT Response Curve

TUNER TERMINAL VIEW

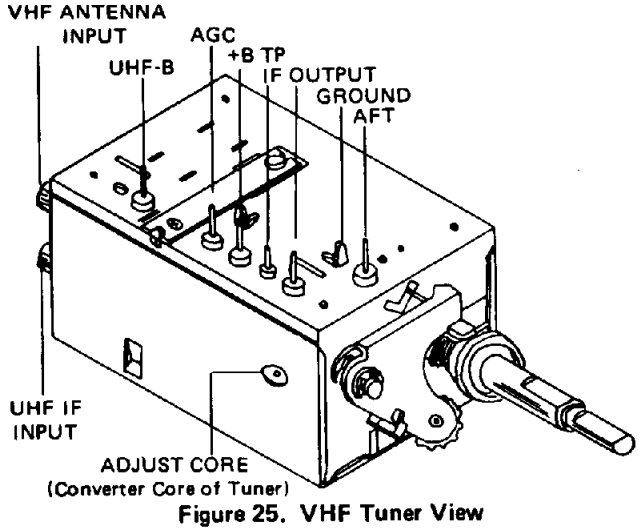


Figure 25. VHF Tuner View

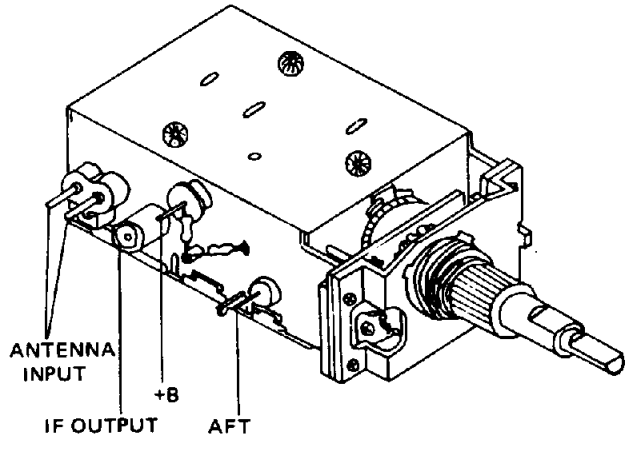


Figure 26. UHF Tuner View

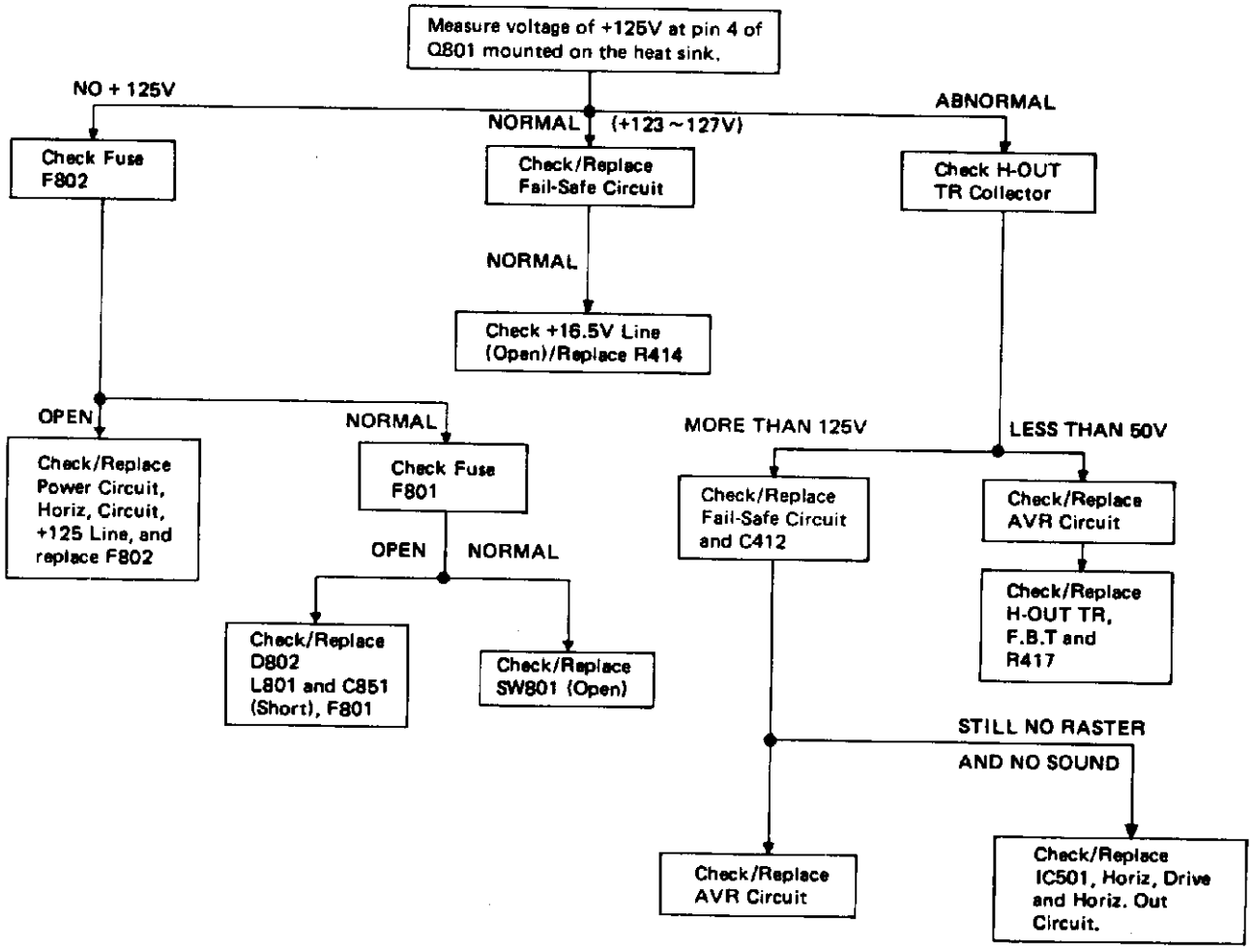
TROUBLESHOOTING CHARTS

The following charts are devoted to troubleshooting which, if followed carefully, will assist you in tracking down a fault to the correct stage.

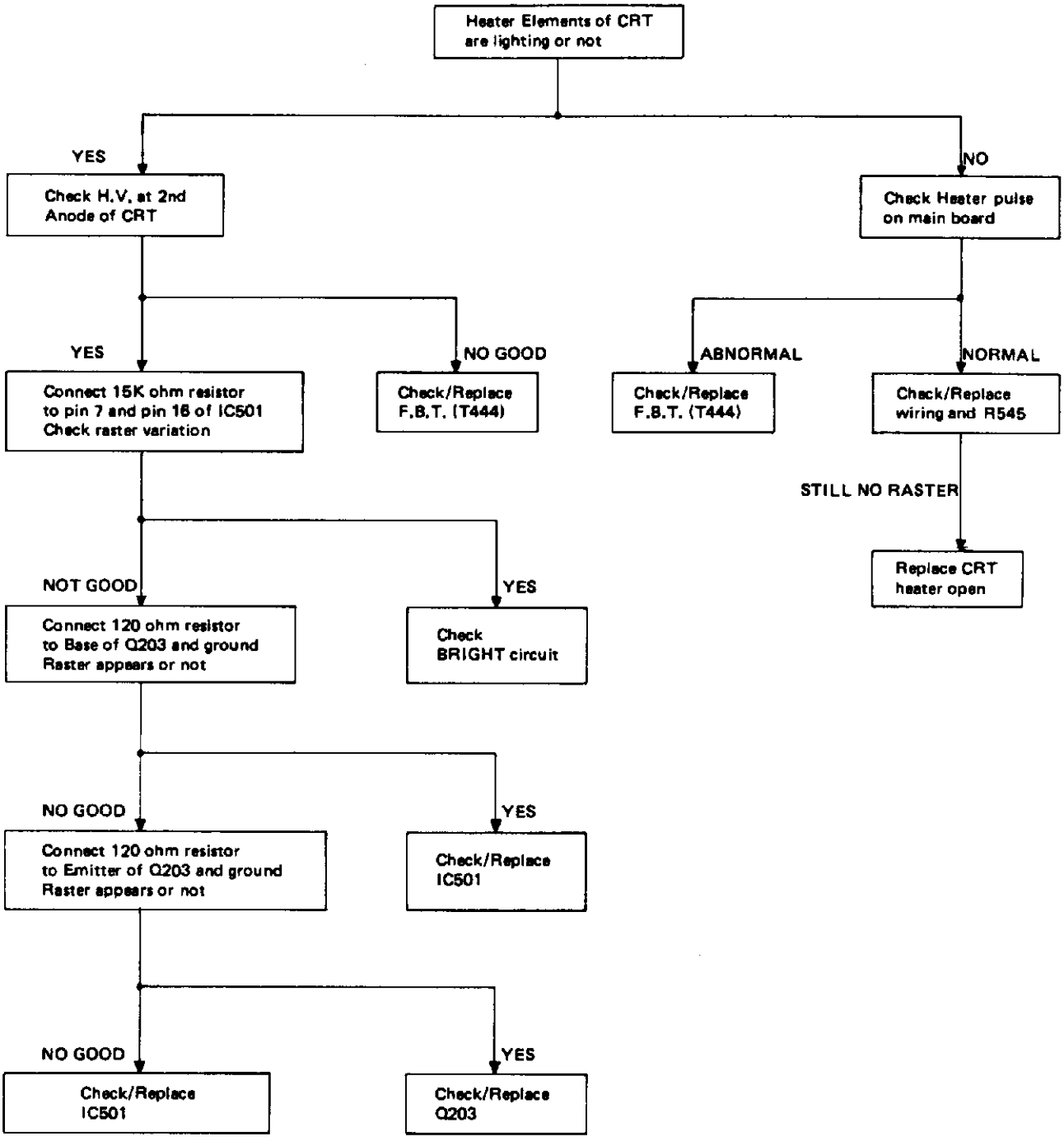
In order to utilize the charts (fault trees), first establish the complaint, i.e. – No Raster, No Sound.

Locate the chart applicable and then progress through the various alternatives until a final block indicates the offending components or stage.

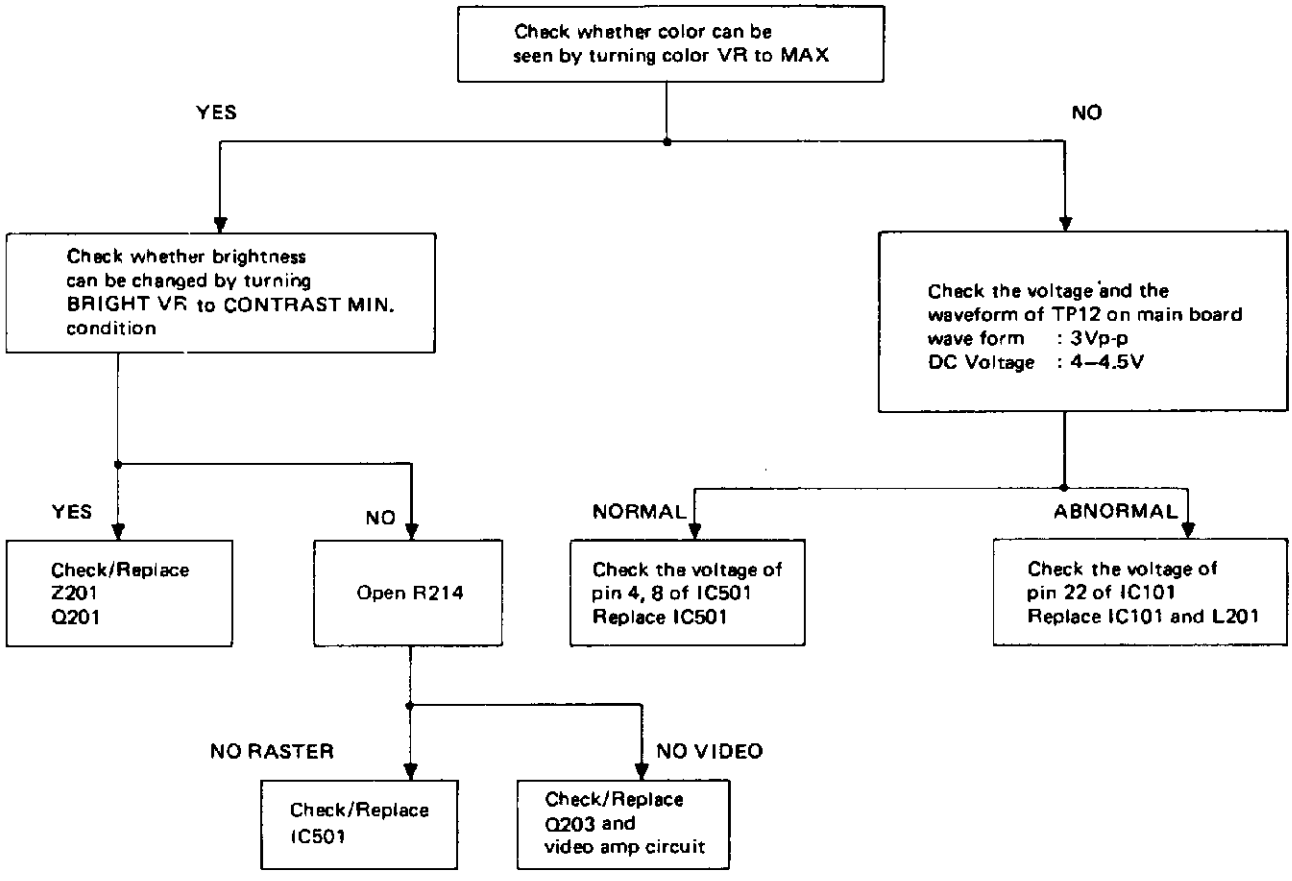
NO RASTER AND NO SOUND



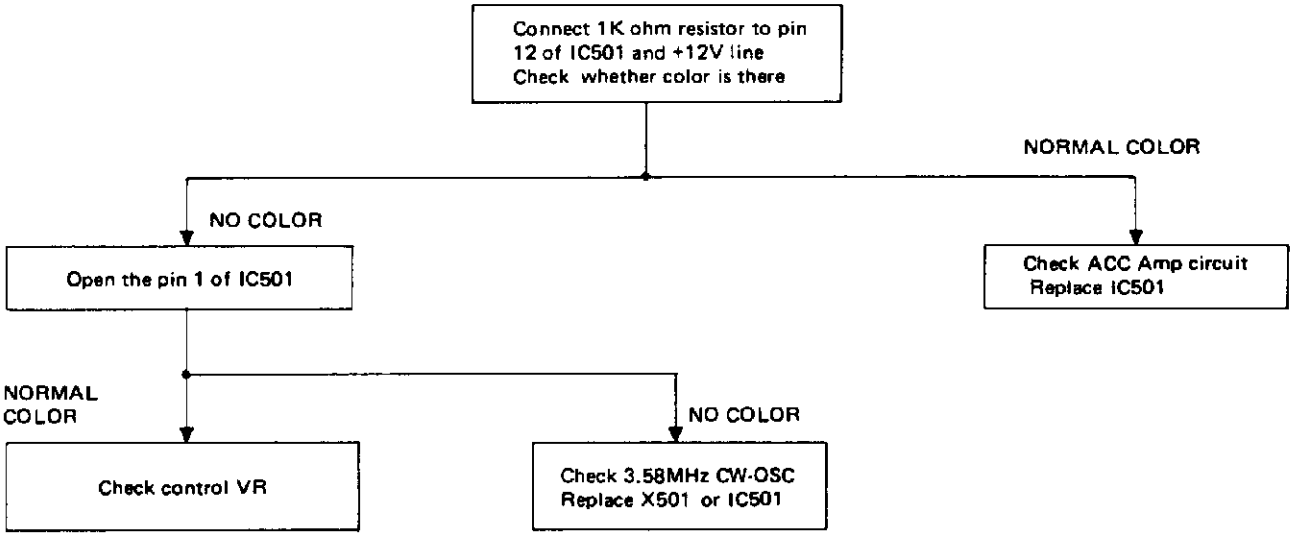
NO RASTER (SOUND OK)



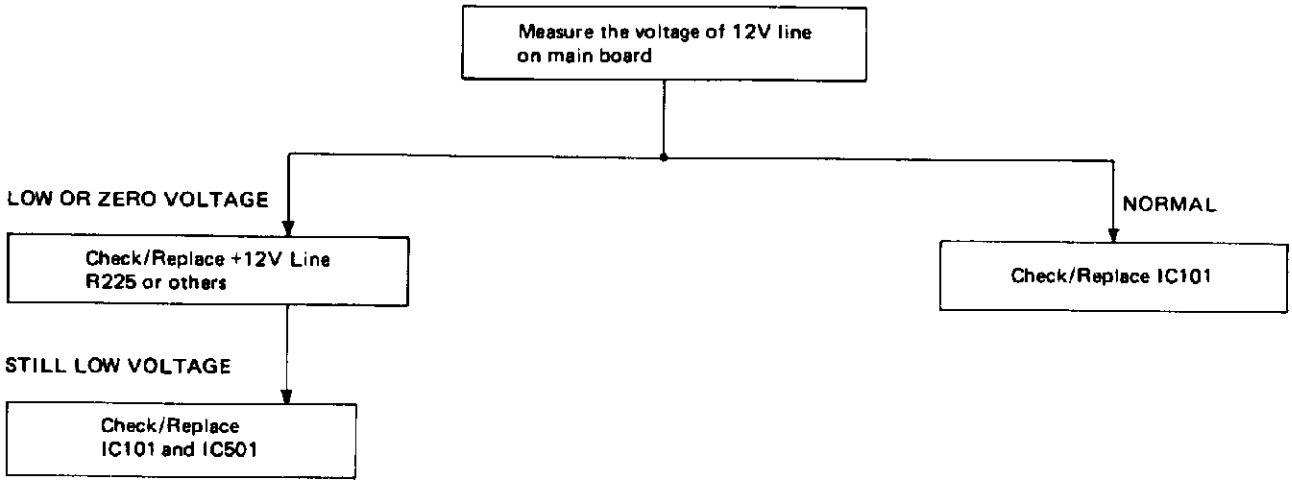
NO PICTURE (RASTER AND SOUND OK)



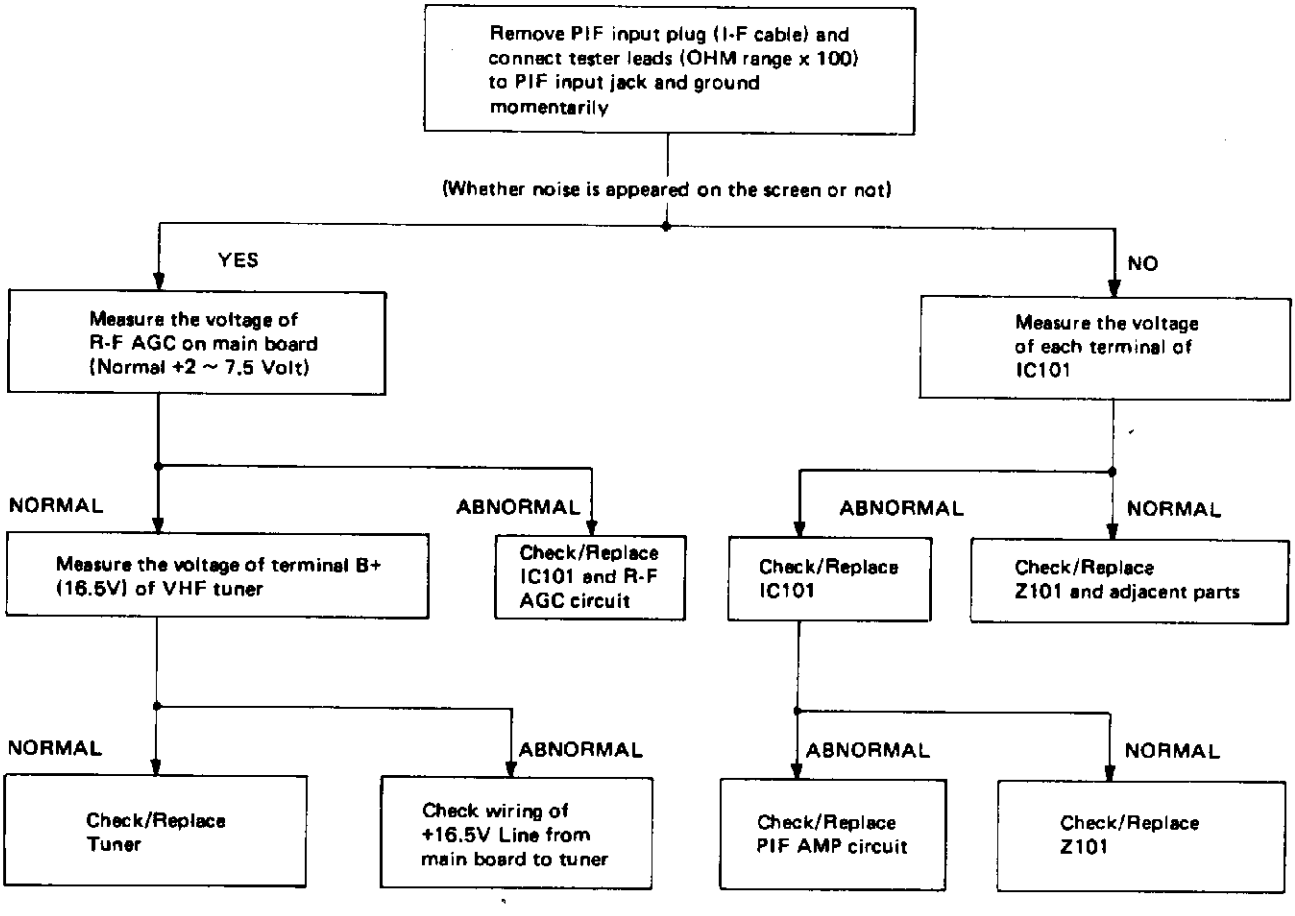
NO COLOR



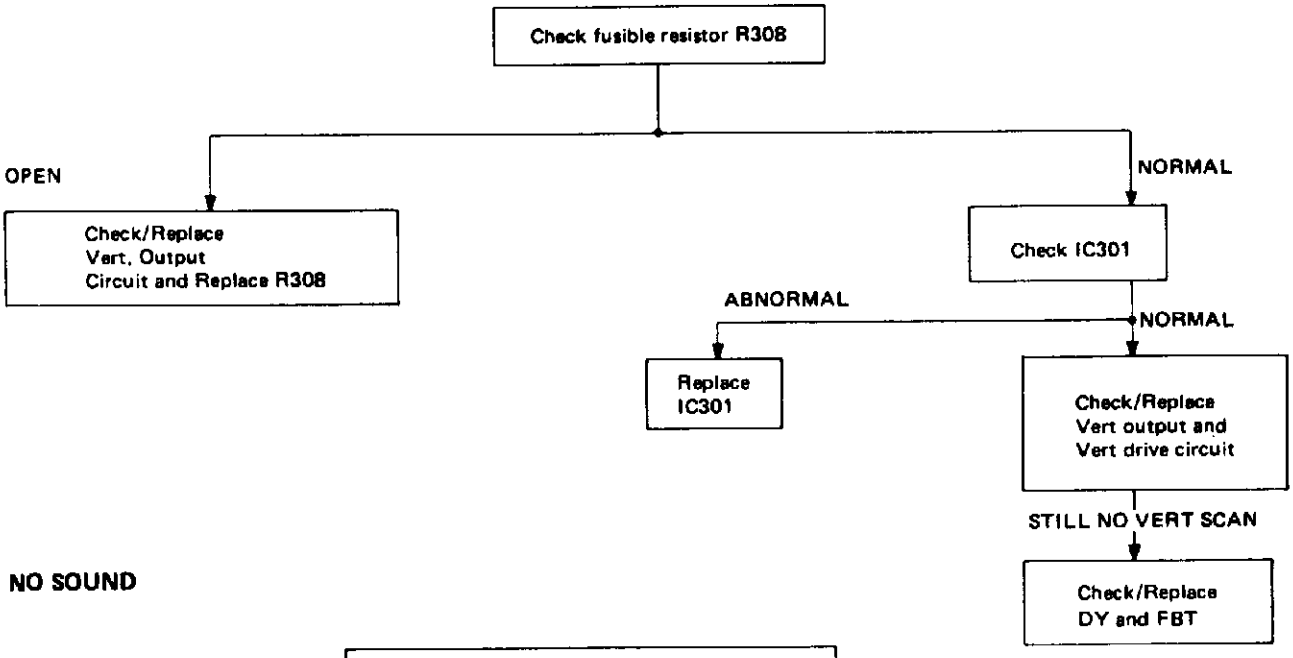
NO RASTER (SOUND NOISE OR WEAK SOUND)



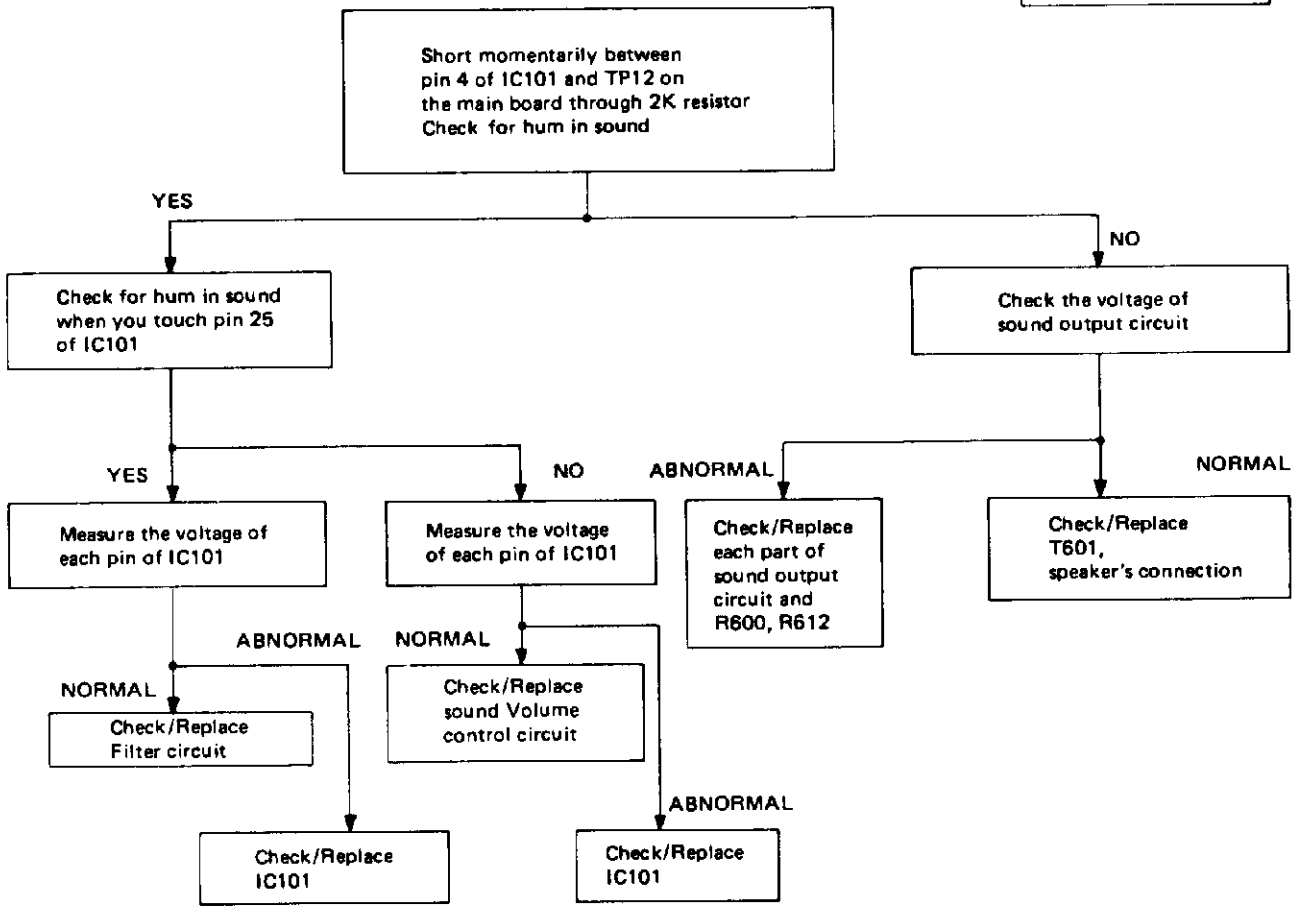
NO PICTURE (RASTER ON) AND NO SOUND



VERT SCAN (ONE HORIZONTAL LINE RASTER)



NO SOUND



HYBRID IC SPECIFICATION

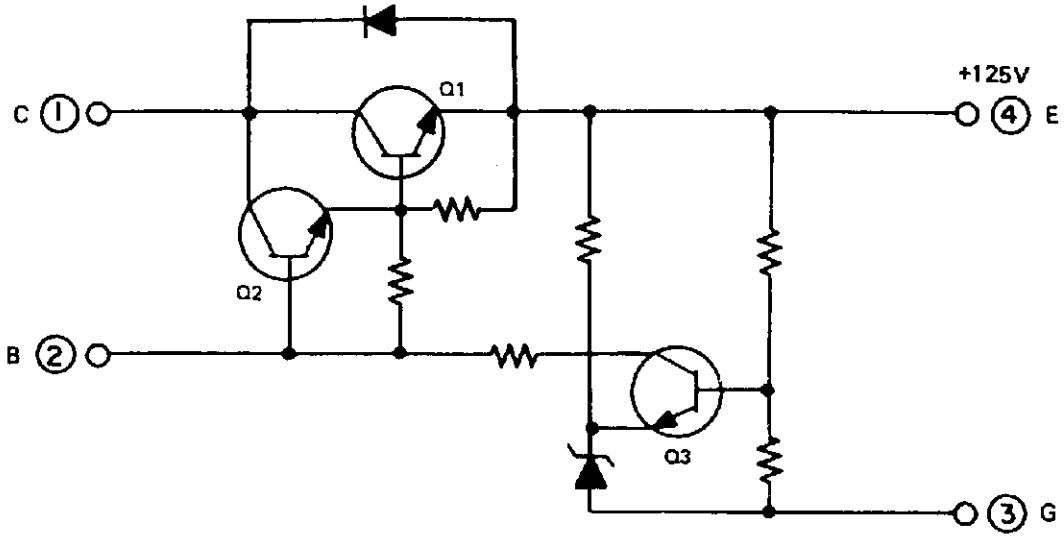
STR 30125

1. STRUCTURE & APPLICATION

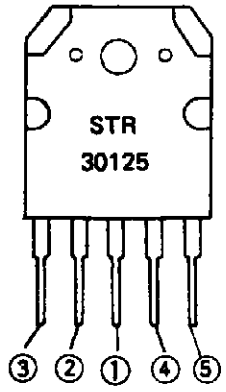
- Hybrid type voltage regulator by darlington transistor.
- Plastic Package
- For line operate TV.
- Output voltage fixed.

2. EQUIVALENT CIRCUIT

Figure 27.

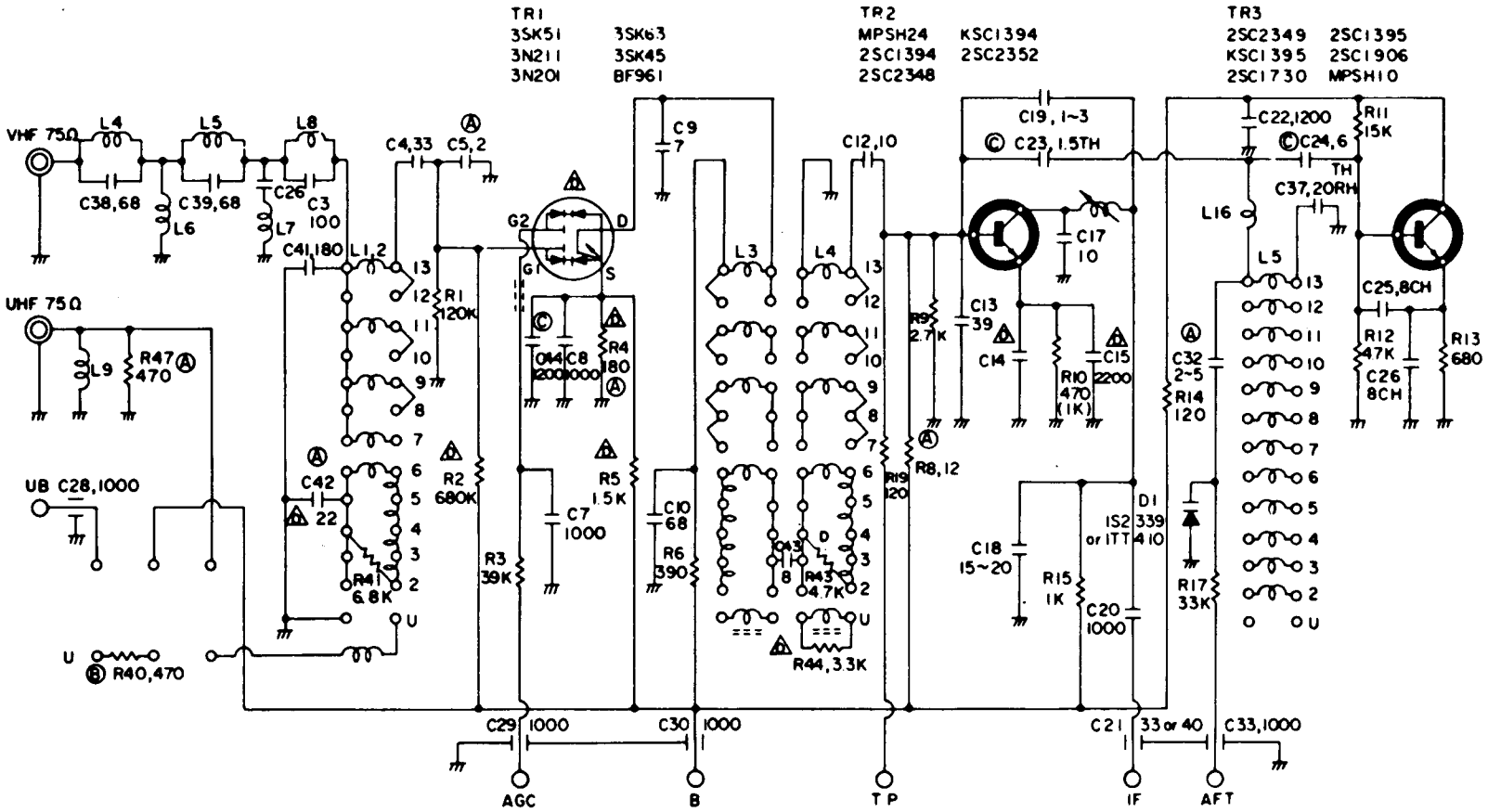


3. PIN ASSIGNMENT. (BOTTOM VIEW)



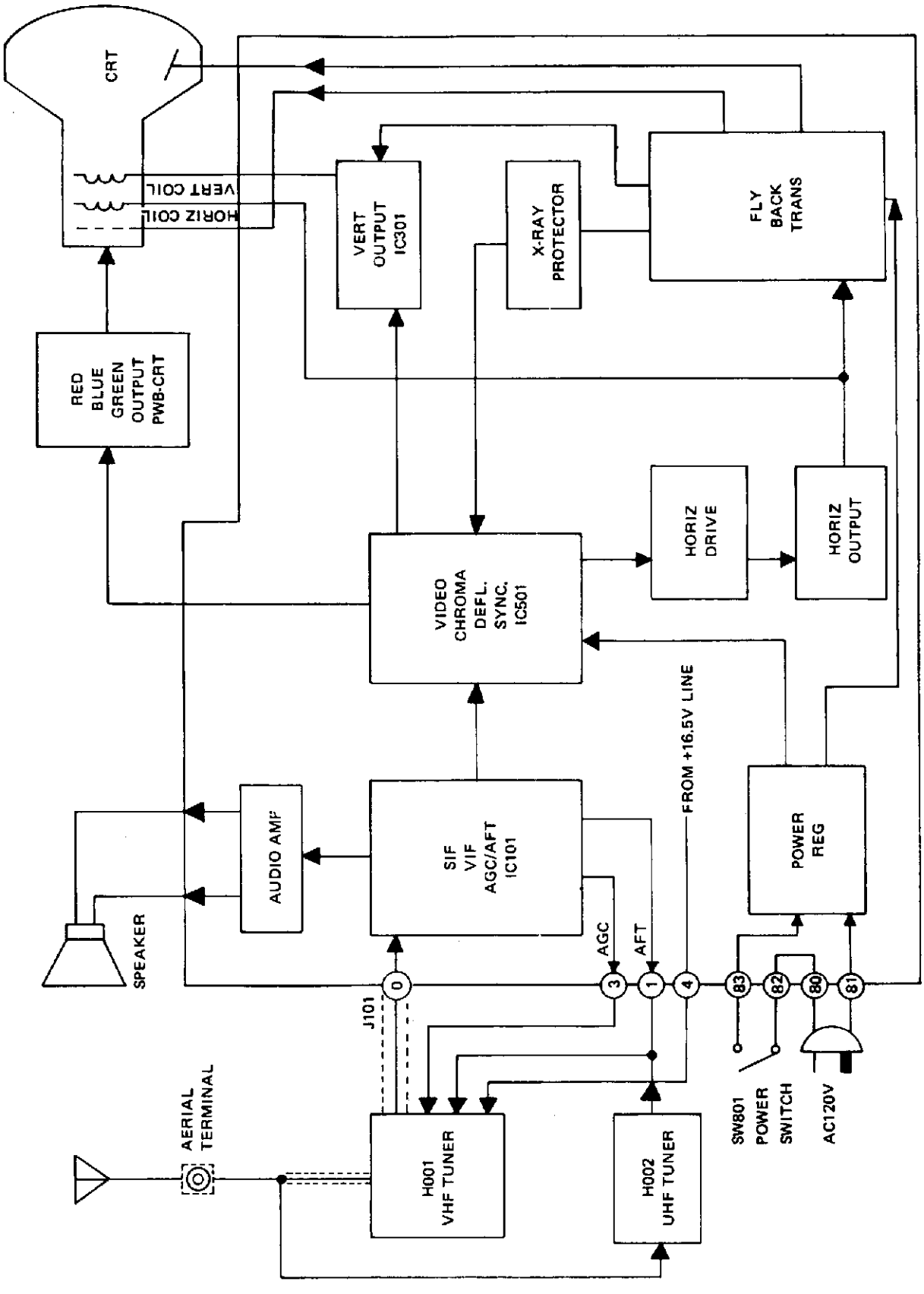
STR30125

PIN NO.	FUNCTION
1	INPUT
2	BASE
3	COMMON (–)
4	OUTPUT
5	BLANK



VHF TUNER
VCP 1880AL

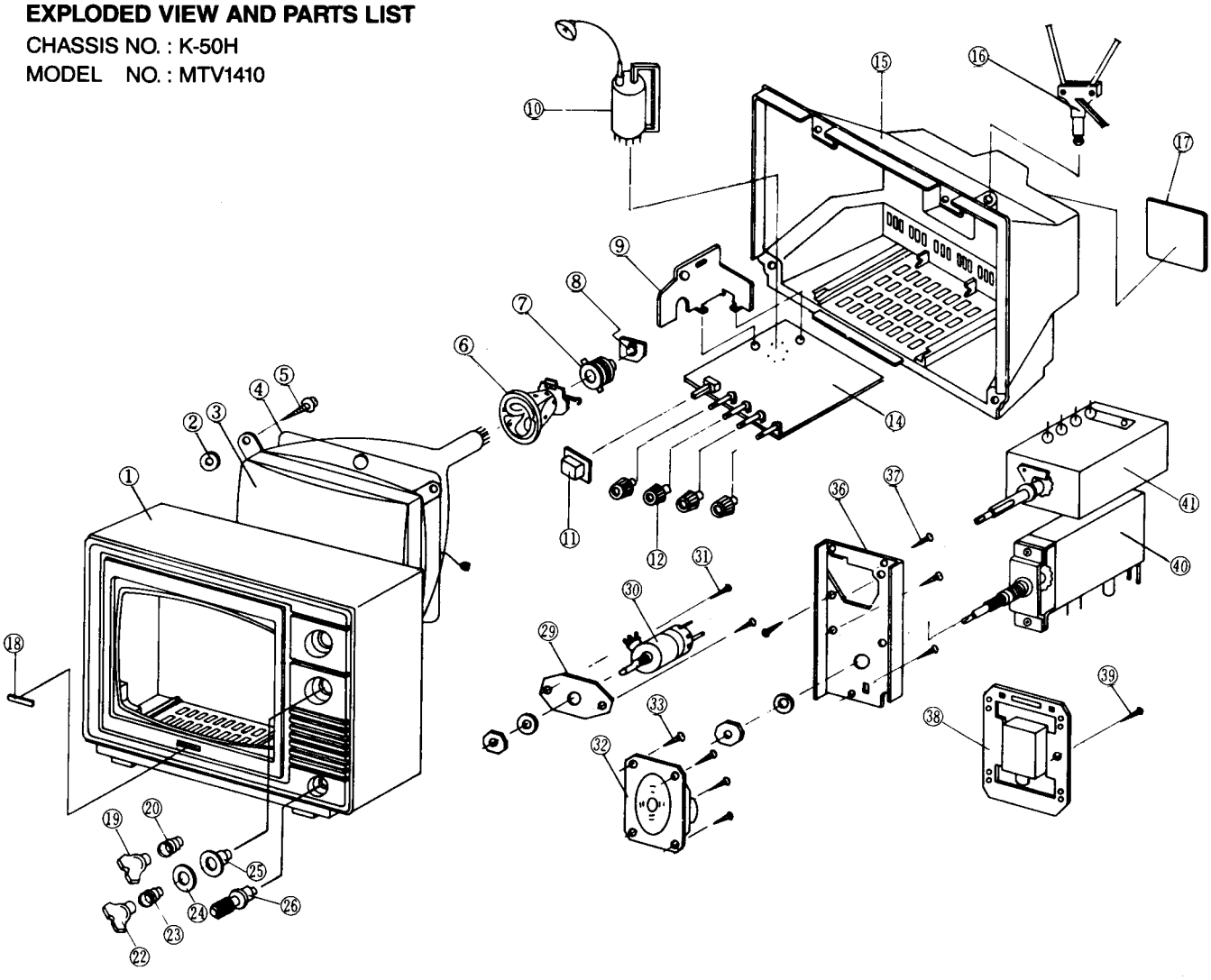
K-50H CHASSIS BLOCK DIAGRAM



EXPLODED VIEW AND PARTS LIST

CHASSIS NO. : K-50H

MODEL NO. : MTV1410

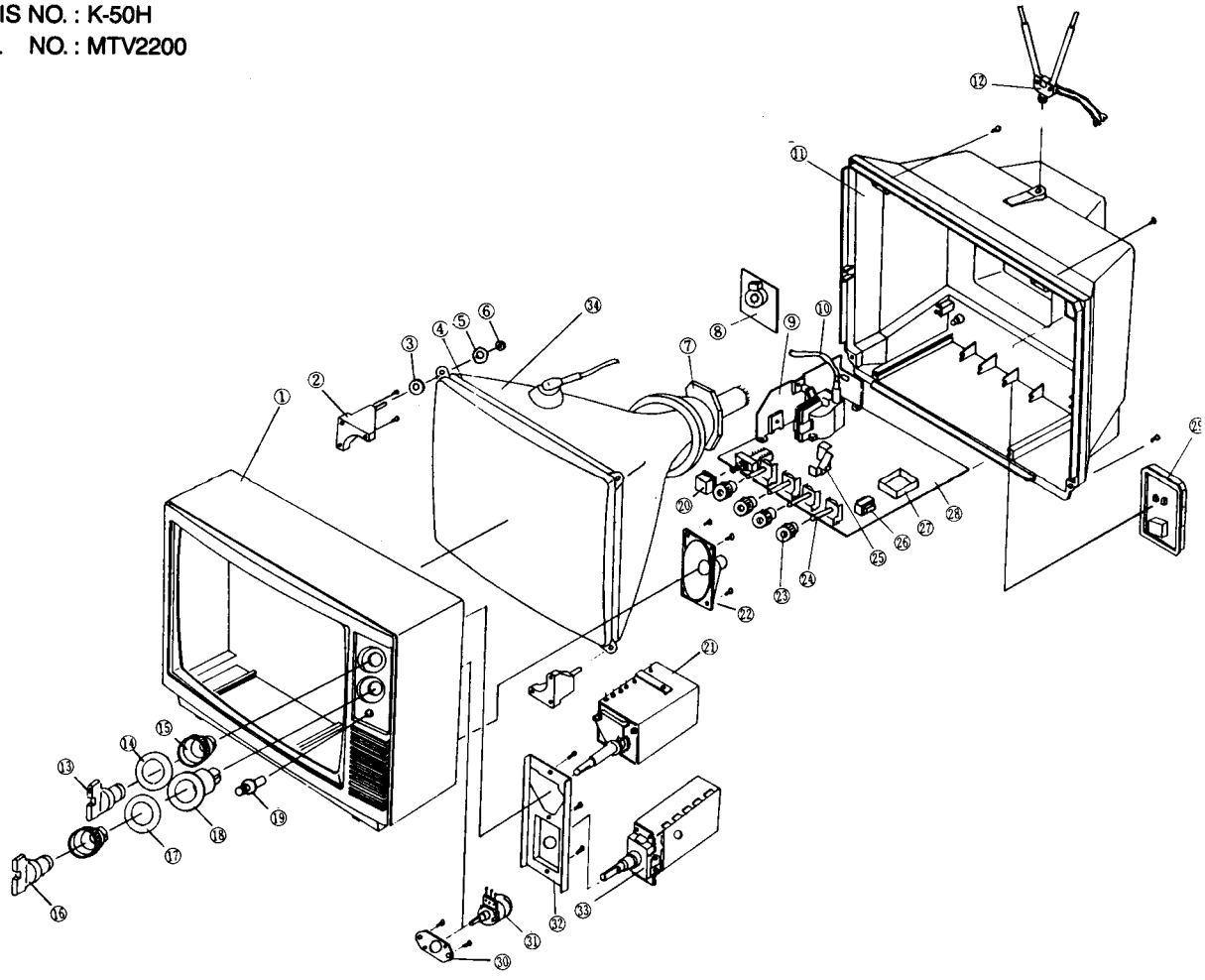


NOTE: Items marked " * " are not stocked since they are seldom required forroutine service. There may be some anticipated delay. When you order these items.
*** S.N.A. = service not available. ***

NO.	CODE NO.	DESCRIPTION	Q'TY	NO.	CODE NO.	DESCRIPTION	Q'TY
1	36001-358-090	CABINET-FRONT	1	20	37624-133-110	KNOB FINE, VHF	1
2	36834-110-110	WASHER-GUM, CRT.	4	22	37624-149-013	KNOB-UHF	1
3	32019-233-013	COLOR-CRT: 3720B22	1	23	37624-133-110	KNOB-FINE, UHF	1
4	32479-027-710	COIL DEGAUSSING	1	24	37714-191-740	INLAY TUNER, UHF	1
5	37124-100-010	SCREW-CRT	2	25	37624-147-110	DIAL-BASE, UHF	1
6	32439-109-010	DEFL YOKE: DIE-1492HL	1	26	37624-162-610	KNOB-POWER	1
7	34099-023-010	MAGNET-CONVERGENCE	1	29	36614-203-211	BRACKET-S/W	1
8	33359-050-010	CRT-SOCKET	1	30	31251-104-001	VR-W/SW	1
9	35683-112-113	HEAT-SINK, MAIN	1	31	37148-530-101	SCREW-TAP, RH	2
10	32859-151-810	TRANS-FLYBACK	1	32	34209-169-140	SPEAKER-GENERAL	1
11	37624-152-730	KNOB-PUSH	1	33	37148-530-101	SCREW-TAP, RH	4
12	37624-137-210	KNOB-BOTTOM	4	36	36613-155-710	BRACKET-TUNER, BASE	1
14	33004-150-840	PWB-MAIN (S.N.A)	1	37	37148-540-121	SCREW-TAP, RH	3
15	36001-359-010	CABINET-BACK	1	38	3A60-14170-000	*ASSY-ANT, TERMINAL	1
16	34509-223-013	ANTENNA-ROD	1	39	37148-540-152	SCREW-TAP, RH	1
17	38113-131-400	LABEL RATING	1	40	34519-960-080	TUNER-UHF: UCD-1400EL(S)	1
18	38024-169-130	BADGE-BRAND	1	41	34519-118-030	TUNER-VHF: VCP1880AL	1
19	37624-147-213	KNOB-VHF	1				

EXPLODED VIEW AND PARTS LIST

CHASSIS NO. : K-50H
MODEL NO. : MTV2200



NOTE: Items marked " * " are not stocked since they are seldom required forroutine service. There may be some anticipated delay. When you order these items.
*** S.N.A. = service not available. ***

NO.	CODE NO.	DESCRIPTION	Q'TY	NO.	CODE NO.	DESCRIPTION	Q'TY
1	36001-371-120	CABINET-FRONT	1	18	37623-116-130	DIAL-BASE, U	1
2	36604-134-812	HOLDER CRT	4	19	37624-145-210	KNOB-POWER	1
3	36834-112-910	WASHER-GUM, CRT	4	20	37624-152-730	KNOB-PUSH	1
4	32479-028-510	COIL-DEGAUSSING	1	21	34519-118-030	TUNER-VHF (VCR-1880AL)	1
5	37334-105-530	WASHER SPRING	4	22	34209-169-140	SPEAKER-GENERAL (5902BR 3W)	1
6	37208-115-001	NUT HEX	4	23	37624-137-210	KNOB-BOTTOM	4
7	32439-090-010	DEFL-YOKE (DIE-1992GL)	1	24	31201-115-002	VR-ROUND	2
8	33359-050-010	SOCKET-CRT	1	25	35684-115-711	HEAT SINK-VERT	1
9	35683-112-113	HEAT SINK	1	26	32789-550-010	TRANS-OUTPUT, SND	1
10	32859-136-010	TRANS-FLYBACK (FCM 2015AL)	1	27	34544-128-110	SHIELD-CASE	1
11	36001-361-010	CABINET BACK	1	28	33004-150-840	PWB-MAIN (S.N.A)	1
12	34509-223-013	ANTENNA-ROD	1	29	*3A60-19170-000	ASSY-ANT, TERMINAL	1
13	37624-128-363	KNOB-VHF, ASS'Y	1	30	36614-203-211	BRKT-SWITCH	1
14	38014-122-910	DIAL VHF	1	31	31251-104-001	R-W/SW	1
15	37624-128-430	KNOB-FINE	2	32	36613-155-810	BRKT-TUNER	1
16	37624-128-373	KNOB-UHF, ASS'Y		33	34519-960-080	TUNER-UHF (UCD-1400EL(S)	1
17	38014-119-740	DIAL UHF	1	34	32019-400-015	CRT-COLOR (51GGB91X)	1

REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by shaded area have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.

ABBREVIATIONS:

CC	C-CERAMIC	RC	R-COMPOSITION
CE	C-ELECTROLYTIC	RD	R-CARBON
CFS	C-M.POLYESTER	RF	R-FUSIBLE
CK	C-CERAMIC,HK	RM	R-METAL,FILM
CQ	C-POLYPROPYLENE,POLYESTER	RP	R-CEMENT WIRE
CS	C-TANTALIUM,SOLID	RS	R-METAL,OXIDE

NOTE: The items with "*" are usually out of stock since they are seldom required for the routine service. There may be some anticipated delay when you order these items.
*** S.N.A.=Service Not Available.***

Loc No	Supplier Part No.	Description
	1 . P W B - M A I N	
PWB	33004-150-840	245X245X1.6T (S.N.A)
	R E S I S T O R S	
R101	31018-177-102	RD 1/8T 1K-J
R102	31018-177-152	RD 1/8T 1.5K-J
R103	31018-177-103	RD 1/8T 10K-J
R107	31018-177-152	RD 1/8T 1.5K-J
R108	31018-177-102	RD 1/8T 1K-J
R109	31018-177-333	RD 1/8T 33K-J
R110	31018-177-222	RD 1/8T 2.2K-J
R111	31018-177-102	RD 1/8T 1K-J
R113	31018-177-563	RD 1/8T 56K-J
R114	31018-177-473	RD 1/8T 47K-J
R115	31018-277-472	RD 1/4T 4.7K-J
R117	31018-177-272	RD 1/8T 2.7K-J
R118	31018-177-271	RD 1/8T 270-J
R119	31018-277-331	RD 1/4T 330-J
R120	31018-377-220	RD 1/2T 22-J
R201	31018-177-162	RD 1/8T 1.6K-J
R202	31018-177-162	RD 1/8T 1.6K-J
R203	31018-177-132	RD 1/8T 1.3K-J
R206	31018-177-821	RD 1/8T 820-J
R207	31018-277-123	RD 1/4T 12K-J
R209	31018-177-563	RD 1/8T 56K-J
R210	31018-177-473	RD 1/8T 47K-J
R211	31018-277-562	RD 1/4T 5.6K-J
R212	31018-277-392	RD 1/4T 3.9K-J
R213	31018-277-223	RD 1/4T 22K-J
R214	31018-277-391	RD 1/4T 390-J
R215	31018-377-471	RD 1/2T 470-J
R218	31018-177-512	RD 1/8T 5.1K-J
R219	31018-177-682	RD 1/8T 6.8K-J
R225	31046-467-470	RS 1T 47-J (AUTO)
R301	31018-177-331	RD 1/8T 330-J
R302	31018-177-224	RD 1/8T 220K-J
R303	31018-177-472	RD 1/8T 4.7K-J
R304	31018-177-393	RD 1/8T 39K-J
R305	31018-177-684	RD 1/8T 680K-J
R307	31018-177-331	RD 1/8T 330-J
R308	31059-002-010	RF 1/2P 1-J
R311	31018-177-124	RD 1/8T 120K-J
R312	31046-467-102	RS 1T 1K-J (AUTO)
R313	31046-467-511	RS 1T 510-J (AUTO)
R314	31018-177-393	RD 1/8T 39K-J
R317	31018-377-399	RD 1/2T 3.9-J
R320	31018-177-333	RD 1/8T 33K-J
R401	31046-567-123	RS 2T 12K-J(AUTO)
R402	31018-177-152	RD 1/8T 1.5K-J
R403	31018-177-332	RD 1/8T 3.3K-J
R404	31018-177-331	RD 1/8T 330-J
R405	31018-177-681	RD 1/8T 680-J
R406	31018-277-432	RD 1/4T 4.3K-J

Loc No	Supplier Part No.	Description
R407	31046-567-472	RS 2T 4.7K-J(AUTO)
R408	31018-277-392	RD 1/4T 3.9K-J
R409	31018-177-333	RD 1/8T 33K-J
R410	31049-974-680	RM 1/4T 6.8K-F
R411	31018-376-124	RD 1/2T 120K-G
R412	31018-177-104	RD 1/8T 100K-J
R413	31018-177-474	RD 1/8T 470K-J
R414	31059-002-010	RF 1/2P 1-J
R415	31046-467-102	RS 1T 1K-J (AUTO)
R417	31059-002-010	RF 1/2P 1-J
R418	31018-277-102	RD 1/4T 1K-J
R419	31046-567-472	RS 2T 4.7K-J(AUTO)
R420	31046-467-151	RS 1T 150-J (AUTO)
R421	31018-377-103	RD 1/2T 10K-J
R501	31018-277-622	RD 1/4T 6.2K-J
R502	31018-177-101	RD 1/8T 100-J
R503	31018-277-333	RD 1/4T 33K-J
R504	31018-277-183	RD 1/4T 18K-J
R505	31018-277-623	RD 1/4T 62K-J
R507	31018-277-103	RD 1/4T 10K-J
R508	31018-177-334	RD 1/8T 330K-J
R509	31018-177-395	RD 1/8T 3.9M-J
R510	31018-177-561	RD 1/8T 560-J
R511	31018-177-561	RD 1/8T 560-J
R512	31018-177-561	RD 1/8T 560-J
R513	31018-277-822	RD 1/4T 8.2K-J
R514	31018-277-822	RD 1/4T 8.2K-J
R515	31018-277-163	RD 1/4T 16K-J
R517	31018-177-222	RD 1/8T 2.2K-J
R518	31018-177-272	RD 1/8T 2.7K-J
R530	31018-277-151	RD 1/4T 150-J
R531	31018-277-151	RD 1/4T 150-J
R532	31018-277-101	RD 1/4T 100-J
R533	31018-277-151	RD 1/4T 150-J
R534	31018-277-102	RD 1/4T 1K-J
R535	31018-277-102	RD 1/4T 1K-J
R536	31018-277-102	RD 1/4T 1K-J
R537	31046-467-153	RS 1T 15K-J (AUTO)
R538	31046-467-153	RS 1T 15K-J (AUTO)
R539	31046-467-153	RS 1T 15K-J (AUTO)
R540	31028-328-472	RC 1/2T 4.7K-K
R541	31028-328-472	RC 1/2T 4.7K-K
R542	31028-328-472	RC 1/2T 4.7K-K
R543	31018-277-471	RD 1/4T 470-J
R545	31059-003-100	RF 1P 1-K
R600	31059-002-820	RF 1/2P 820-J
R601	31018-177-471	RD 1/8T 470-J
R602	31018-177-102	RD 1/8T 1K-J
R603	31018-277-560	RD 1/4T 56-J
R604	31018-177-821	RD 1/8T 820-J
R605	31018-177-103	RD 1/8T 10K-J
R606	31018-177-222	RD 1/8T 2.2K-J
R607	31018-177-391	RD 1/8T 390-J
R608	31018-177-562	RD 1/8T 5.6K-J
R609	31018-177-561	RD 1/8T 560-J
R610	31018-177-331	RD 1/8T 330-J
R611	31018-177-272	RD 1/8T 2.7K-J
R613	31046-467-123	RS 1T 12K-J(AUTO)
R614	31018-177-102	RD 1/8T 1K-J
R615	31018-177-683	RD 1/8T 68K-J
R616	31018-177-154	RD 1/8T 150K-J
R803	31018-277-154	RD 1/4T 150K-J
R804	31039-901-020	RW 3J 1.2-K
R805	31046-567-103	RS 2T 10K-J(AUTO)
R806	31018-277-470	RD 1/4T 47-J
R807	31018-277-224	RD 1/4T 220K-J
		VARIABLE RESISTORS
VR101	31249-123-015	CET-92A B10K/CER8-92
VR201	31201-115-001	181RV 23F B1K
VR202	31201-115-001	181RV 23F B1K
VR203	31249-126-001	CET-117A B100K/CER8-119
VR301	31249-125-009	CET-117A B200/CER8-119
VR501	31201-115-002	181RV 23F B10K
VR502	31201-115-002	181RV 23F B10K
VR531	31249-123-016	CET-92A B200/CER8-92
VR532	31249-123-016	CET-92A B200/CER8-92
VR533	31249-123-003	CET-92A B5K/CE98-92
VR534	31249-123-003	CET-92A B5K/CE98-92
VR535	31249-123-003	CET-92A B5K/CE98-92
		CAPACITORS
C102	31417-109-140	CK45 TAPG F 50V 103-Z
C104	31417-109-100	CK45 TAPG F 50V 102-Z
C105	31417-109-100	CK45 TAPG F 50V 102-Z
C107	31507-127-007	ECQB1H153J-F3
C108	31507-121-570	CQ921M TAPG 100V 0.068-K
C110	31407-101-860	CC45 TAPG SL 50V 050-C
C113	31407-105-180	CC45 TAPG CH 50V 220-J
C114	31417-104-070	CK45 TAPG B 50V 271-K
C116	31417-109-140	CK45 TAPG F 50V 103-Z
C117	31417-109-140	CK45 TAPG F 50V 103-Z
C151	31607-402-200	CE04W TAPG 50V 0.47M
C152	31609-401-510	CE04W 16V 1000M VENT SNA

Loc No	Supplier Part No.	Description
C201	31407-105-260	CC45 TAPG CH 50V 470-J
C202	31407-105-280	CC45 TAPG CH 50V 560-J
C203	31417-109-140	CK45 TAPG F 50V 103-Z
C251	31607-401-430	CE04W TAPG 25V 10M
C252	31607-401-430	CE04W TAPG 25V 10M
C253	31607-402-200	CE04W TAPG 50V 0.47M
C254	31607-402-250	CE04W TAPG 50V 10M
C256	31607-401-450	CE04W TAPG 16V 33M
C301	31507-127-011	ECQB1H683J-F3
C303	31507-121-430	CQ921M TAPG 100V 0.0047-
C304	31507-121-220	CQ921M TAPG 100V 0.047M-
C309	31507-127-006	ECQB1H103J-F3
C311	31417-468-681	CK45 TAPG B500V 681-K
C320	31507-127-011	ECQB1H683J-F3
C351	31607-902-250	CE04W TAPG 50V 0.22M
C352	31607-402-100	CE04W TAPG 35V 100M-M-VE
C353	31609-401-510	CE04W 16V 1000M VENT SNA
C354	31607-402-250	CE04W TAPG 50V 10M
C355	31609-402-130	CE04W 35V 470M VENT SNAP
C356	31607-402-570	CE04W TAPG 50V 1M(+10 -1
C357	31627-201-350	CS TAPG 35V 1.0M-K
C358	31607-401-460	CE04W TAPG 16V 47M
C359	31607-402-510	CE04W TAPG 50V 36M VENT
C401	31507-127-010	ECQB1H473J-F3
C402	31507-121-220	CQ921M TAPG 100V 0.047M-
C403	31507-127-005	ECQB1H822J-F3
C404	31417-109-100	CK45 TAPG F 50V 102-Z
C405	31417-468-331	CK45 TAPG B500V 331-K
C406	31417-106-090	CK45 TAPG B 500V 471-K
C408	31609-381-110	CQ922M 1600V 0.0047-J
C411	31417-109-140	CK45 TAPG F 50V 103-Z
C412	31507-121-340	CQ921M TAPG 100V 0.001M-
C413	31509-335-130	CQ922M 200V 0.36-J
C414	31417-106-090	CK45 TAPG B 500V 471-K
C417	31417-318-222	CK45 TAPG B50V 222-K
C451	31607-401-460	CE04W TAPG 16V 47M
C452	31607-402-210	CE04W TAPG 50V 1M
C454	31607-401-450	CE04W TAPG 16V 33M
C455	31609-403-560	CE04W 315V 2.2M VENT SNA
C456	31607-401-710	CED4W TAPG 25V 470M-M
C457	31609-403-230	CE04W 160V 33M
C458	31607-403-060	CE04W TAPG 100V 10U
C501	31407-106-630	CC45 TAPG RH 50V 470-K
C502	31407-106-760	CC45 TAPG RH 50V 151-J
C504	31417-109-140	CK45 TAPG F 50V 103-Z
C505	31417-109-140	CK45 TAPG F 50V 103-Z
C506	31407-105-180	CC45 TAPG CH 50V 220-J
C507	31507-127-007	ECQB1H153J-F3
C508	31417-104-070	CK45 TAPG B 50V 271-K
C509	31417-104-070	CK45 TAPG B 50V 271-K
C510	31417-104-070	CK45 TAPG B 50V 271-K
C531	31417-104-560	CK45 TAPG B 50V 561-K
C532	31417-104-070	CK45 TAPG B 50V 271-K
C533	31417-104-560	CK45 TAPG B 50V 561-K
C534	31418-767-102	CK45 B 2KV 102-K
C551	31607-402-170	CE04W TAPG 50V 0.1U-L,L
C552	31607-402-210	CE04W TAPG 50V 1M
C553	31607-402-230	CE04W TAPG 50V 3.3M
C554	31607-402-220	CE04W TAPG 50V 2.2M
C555	31607-401-430	CE04W TAPG 25V 10M
C556	31607-402-210	CE04W TAPG 50V 1M
C601	31407-048-270	CC45 TAPG RH50V 270-K
C602	31417-109-140	CK45 TAPG F 50V 103-Z
C603	31417-109-140	CK45 TAPG F 50V 103-Z
C604	31417-109-100	CK45 TAPG F 50V 102-Z
C605	31507-127-008	ECQB1H223J-F3
C608	31407-105-260	CC45 TAPG CH 50V 470-J
C651	31607-401-480	CE04W TAPG 16V 220M-M-VE
C653	31607-401-430	CE04W TAPG 25V 10M
C654	31607-401-430	CE04W TAPG 25V 10M
C655	31607-403-200	CE04W TAPG 160V 4.7M-M(G
C656	31607-402-200	CE04W TAPG 50V 0.47M
C657	31607-403-190	CE04W TAPG 160V 3.3U
C802	31469-102-010	CK 45P E250V 222-M(T2.5K
C805	31569-204-110	CPS922M 125V 0.22M-M LP
C806	31569-204-110	CPS922M 125V 0.22M-M LP
C851	31619-007-040	200V 470M
C852	31609-403-220	CE04W 160V 22M
CS57	31607-402-220	CE04W TAPG 50V 2.2M

SEMICONDUCTORS

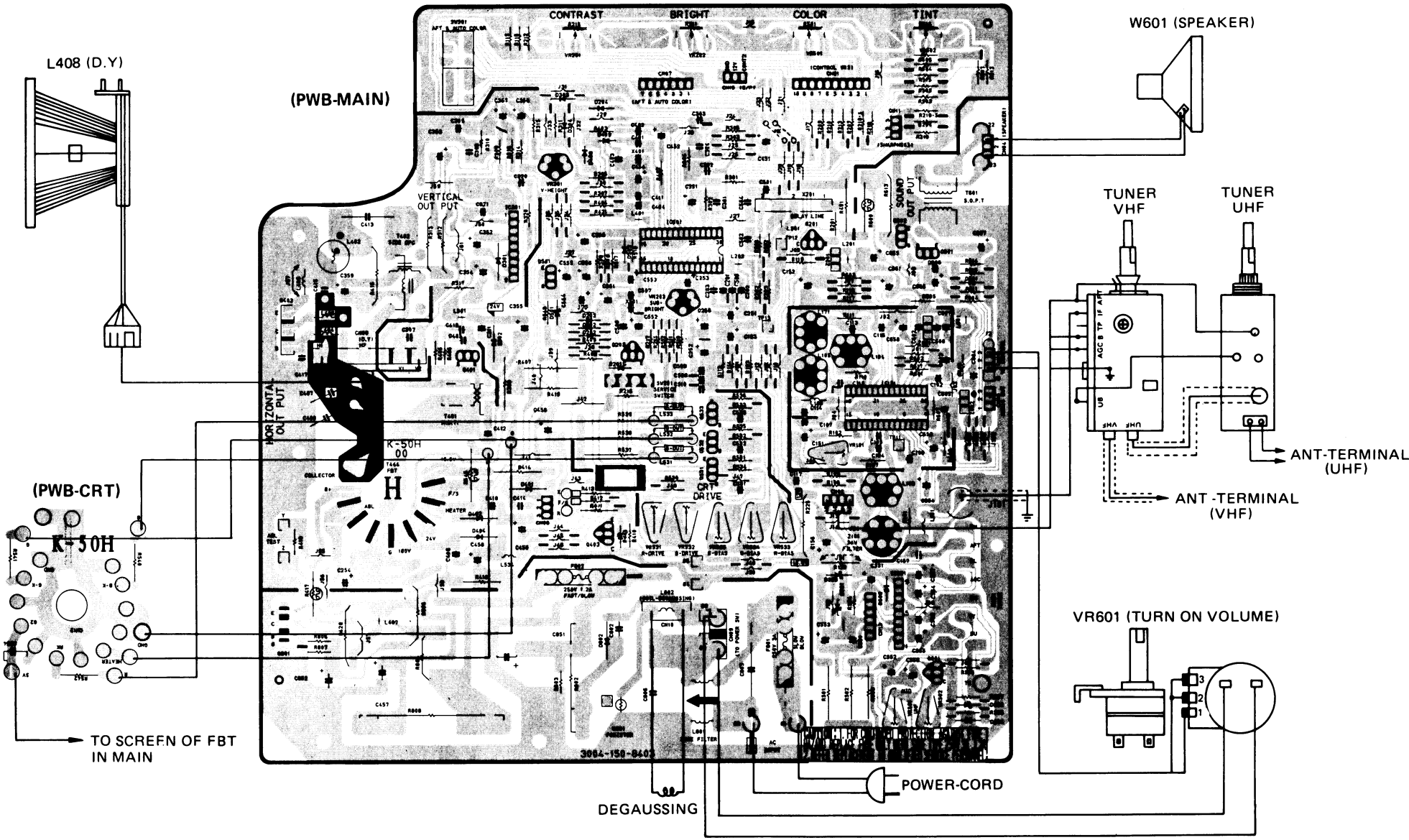
Loc No	Supplier Part No.	Description
D201	32167-406-480	1N4148TAPG
D202	32167-406-480	1N4148TAPG
D203	32167-406-480	1N4148TAPG
D204	32167-406-480	1N4148TAPG
D301	32167-208-580	ERB 12-06 TAPG
D302	32167-201-160	TVR06G(TAPG)
D303	32167-406-480	1N4148TAPG
D304	32167-406-480	1N4148TAPG
D305	32167-406-480	1N4148TAPG
D307	32167-406-480	1N4148TAPG
D401	32167-201-160	TVR06G(TAPG)
D402	32167-201-160	TVR06G(TAPG)
D403	32167-408-090	RD8.2-06D/MTZ8.2B(TAPG)
D404	32167-201-160	TVR06G(TAPG)
D408	32167-406-480	1N4148TAPG

Loc No	Supplier Part No.	Description
D409	32167-406-480	1N4148TAPG
D501	32167-408-060	RQA02-12B/MTZ13B(TAPG)
D502	32167-406-480	1N4148TAPG
D503	32167-406-480	1N4148TAPG
D601	32167-406-480	1N4148TAPG
D802	32169-208-530	ERC 04-04F
IC101	32119-102-090	KA2919
IC301	32119-102-300	KA 2131
IC501	32119-102-020	LA7625
Q201	32157-301-170	KSC 815D-0(TAPG)
Q203	32137-103-430	KSA 642-0(TAPG)
Q401	32137-301-540	KSC 2330-Y(TAPG)
Q403	32137-401-530	KSA 539-Y(TAPG)
Q501	32137-301-560	KSC 2331-Y(TAPG)
Q531	32137-301-540	KSC 2330-Y(TAPG)
Q532	32137-301-540	KSC 2330-Y(TAPG)
Q533	32137-301-540	KSC 2330-Y(TAPG)
Q601	32137-301-540	KSC 2330-Y(TAPG)
Q602	32137-301-540	KSC 2330-Y(TAPG)
Q801	32119-901-020	STR30125
R801	32189-605-030	PTH 631D 01 BF7ROM140
		C O I L S
L101	32429-035-020	0.85UH-K
L103	32739-138-020	TRF1225
L104	32719-050-010	45.75MHZ,AFT-BAL
L105	32729-501-910	41.25MHZ
L171	32719-050-010	45.75MHZ,AFT-BAL
L201	32427-822-010	15UH-J TAPG
L202	32429-903-820	180UH-K
L534	32429-823-010	330UH-K
L601	32427-816-010	24UH-K TAPG
L801	32429-903-610	6MH
X201	32469-010-910	162401(DL401T)
		T R A N S
		M I S C E L L A N E O U S
F801	34709-067-140	T/L 250V 3A 20MM(U/C)
F802	34709-088-050	NM 250V 1.2A 20MM(U/C)
L106	34047-019-060	3.5X6X1.0
L406	34047-019-060	3.5X6X1.0
SW201	33549-007-010	JRS1301/KLR1301
SW501	33529-130-310	PB41S-A(S)/KPB141SSBF
V999A	33359-050-010	B12-262 BASE
X401	34359-070-610	CSB503F5/KBR503.5AKTS15
X501	34539-013-010	HC-18/U(3.579545MHZ)
Z101	34529-428-010	TSF 1202C
Z201	34527-460-001	TPS4.5MCTF21/EFCT4R5MW3
Z601	34527-460-000	SFE4.5MBTF21/EFCT4R5MS4
Z602	34527-460-002	CDA4.5MC24BFF21/EFCT4R5M
CN04	33347-108-310	67094-003(AUTO)

DIFFERENT PARTS LIST

LOC NO	MTV-1410		MTV-2200	
	PART NO	DESCRIPTION	PART NO	DESCRIPTION
R216	31018-277-391	RD 1/4T 390-J	31018-277-471	RD 1/4T 470-J
R309	31018-277-273	RD 1/4T 27K-J	31018-277-223	RD 1/4T 22K-J
R310	31018-277-334	RD 1/4T 330K-J	31018-277-394	RD 1/4T 390K-J
R316	31018-277-432	RD 1/4T 4.3K-J	31018-277-562	RD 1/4T 5.6K-J
R324	31018-277-822	RD 1/4T 8.2K-J	31018-277-562	RD 1/4T 5.6K-J
R416	31049-275-274	RM 1/4T 270K-F	31049-375-194	RM 1/2T 190K-F
R506	31018-277-123	RD 1/4T 12K-J	31018-277-822	RD 1/4T 8.2K-J
R802	31039-907-170	RW 7J 2.4-J	31039-906-180	RW 10J 2.4-J
R808	31039-737-301	RW 10J 300-J	31039-947-211	RW 20J 210-J
C302	31507-121-350	CQ921M 100V 0.0012M-K	31507-121-340	CQ921M 100V 0.001M-K
C307	31507-121-200	CQ921M 100V 0.033M-J	31507-121-180	CQ921M 100V 0.022M-J
C308	31607-402-200	CE04W 50V 0.47M	31607-402-210	CE04W 50V 1M
C321	31507-121-260	CQ921M 100V 0.1U-J	31507-121-570	CQ921M 100V 0.068-K
C407	31509-391-020	CQ922M 1600V 0.0033-J	31509-391-010	CQ922M 1600V 0.033-J
C415	31419-901-180	CK45 B 2KV 271-K	31419-901-180	CK45 B 2KV 271-K
T444	32859-151-810	FCK-1415AL	32859-136-010	FCM-2015AL(M)
T601	32789-550-020	1.5K:8R 24MM	32789-550-010	1.1K:8R
L802	32479-027-710	4.0RT30L940	32479-028-510	4.0RT35L1280
Q404	32149-401-040	2SD1650	32149-401-050	2SD1651

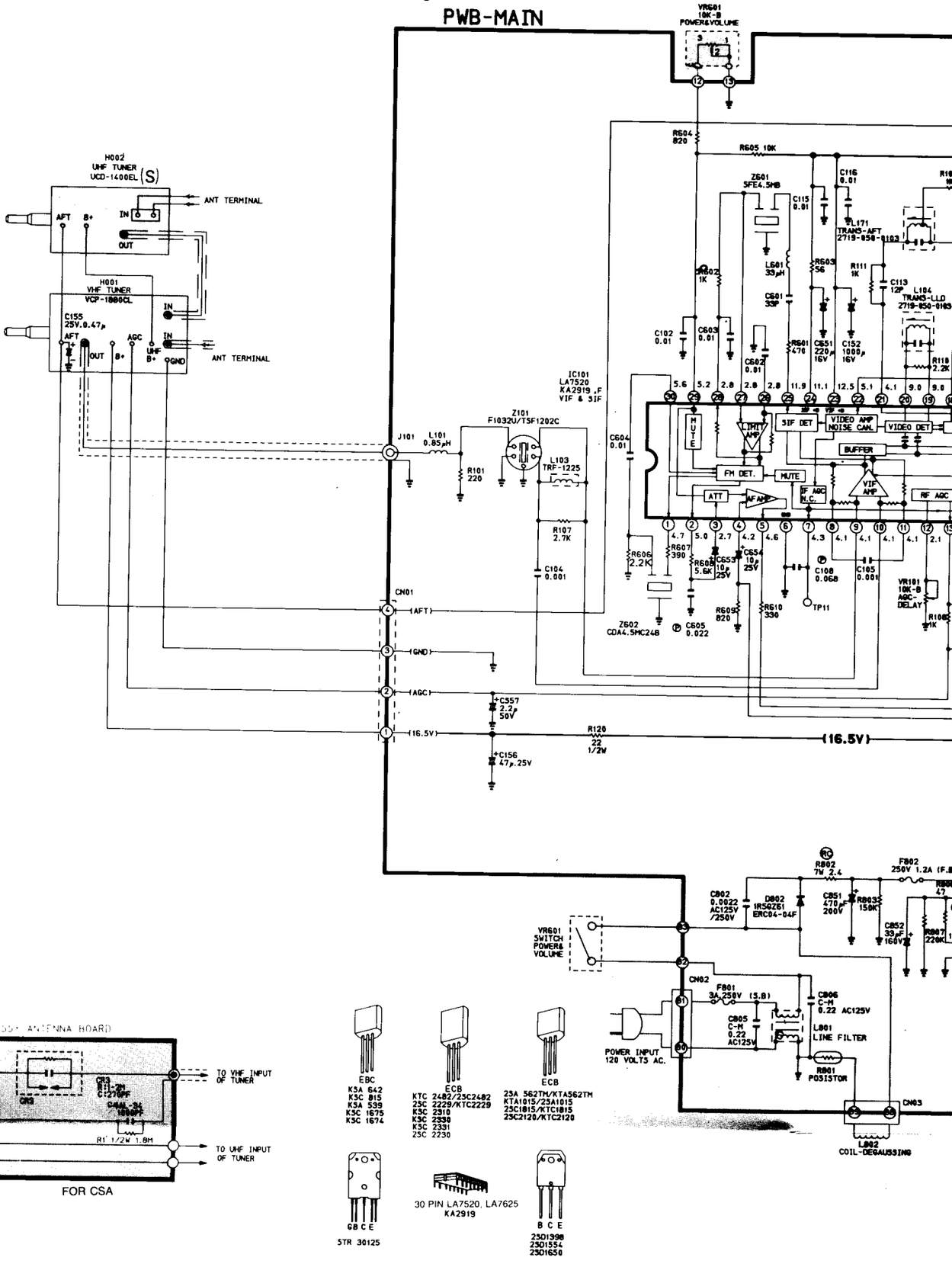
PRINTED CIRCUIT BOARD WIRING DIAGRAM
K-50H CHASSIS, BOTTOM (FOIL) SIDE



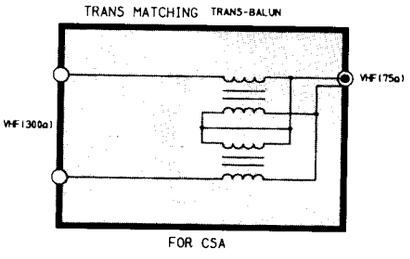
SCHEMATIC DIAGRAM

CHASSIS NO. K-50H

MODEL NO: MTV-1410 C



FOR CSA



FOR CSA

WARNING : BEFORE SERVICING THIS CHASSIS READ THE "X-RAY RADIATION PRECAUTION" "SAFETY PRECAUTION" AND PRODUCT SAFETY NOTICE" IN MANUAL.

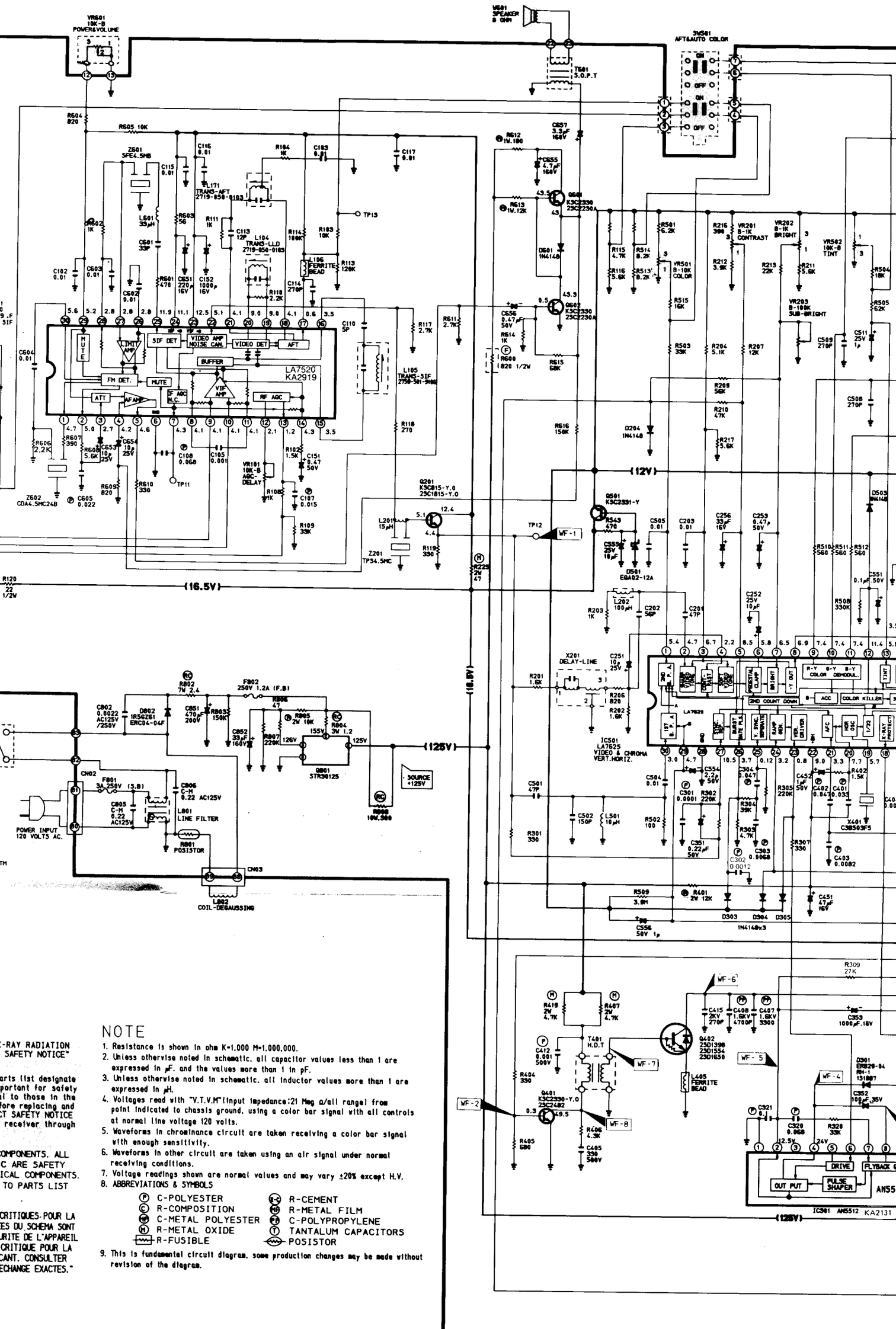
CAUTION : The shaded area in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types indentical to those in the original circuit or specified in the parts list. Before replacing and of these components, read carefully the PRODUCT SAFETY NOTICE in this manual. Do not degrade the safety of the receiver through improper servicing.

WARNING : "THIS RECEIVER CONTAINS SAFETY CRITICAL COMPONENTS. ALL PARTS SHOWN IN THE SHADED AREAS OF THE SCHEMATIC ARE SAFETY CRITICAL FOR CONTINUED SAFETY.REPLACE SAFETY CRITICAL COMPONENTS. ONLY WITH MANUFACTURER'S RECOMMENDED PARTS. REFER TO PARTS LIST FOR EXACT REPLACEMENTS".

AVERTISSEMENT : "CE RECEPTEUR EST EQUIPE DE COMPOSANTS CRITIQUES POUR LA SECURITE. TOUTES LES PIECES INDIQUEES DANS LES ZONES OMBREES DU SCHEMA SONT CRITIQUES POUR LA SECURITE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT. CONSULTER LA NOMENCLATURE DES PIECES POUR TROUVER LES PIECES DE RECHANGE EXACTES."

NOTE

1. Resistance is shown in ohm K=1,000 M=1,000,0
2. Unless otherwise noted in schematic, all capa expressed in μF, and the values more than 1
3. Unless otherwise noted in schematic, all in expressed in μH.
4. Voltages read with "V.T.V.M"(input impedance point indicated to chassis ground, using a co at normal line voltage 120 volts.
5. Waveforms in chrominance circuit are taken with enough sensitivity.
6. Waveforms in other circuit are taken using receiving conditions.
7. Voltage readings shown are normal values a
8. ABBREVIATIONS & SYMBOLS
   - (P) C-POLYESTER
   - (C) R-COMPOSITION
   - (MP) C-METAL POLYESTER
   - (M) R-METAL OXIDE
   - R-FUSIBLE
   - (PP)
   - (MO)
   - (T)
9. This is fundamental circuit diagram, some prod revision of the diagram.

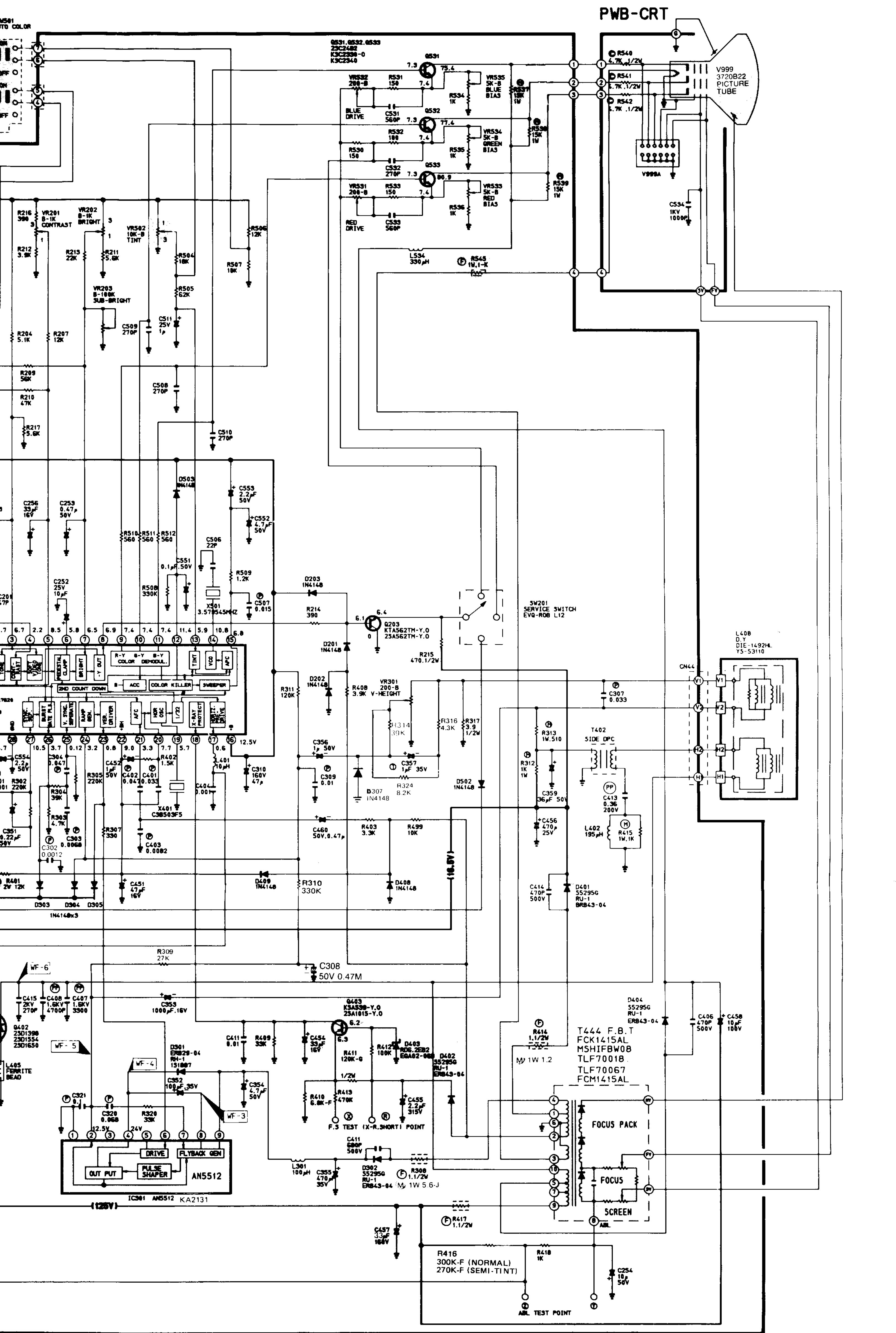


NOTE

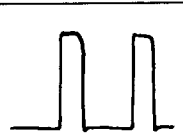
1. Resistance is shown in ohm K=1,000 M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF, and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH.
4. Voltages read with "V.T.V.M"(input impedance:21 Meg Ω/all rangel from point indicated to chassis ground, using a color bar signal with all controls at normal line voltage 120 volts.
5. Waveforms in chrominance circuit are taken receiving a color bar signal with enough sensitivity.
6. Waveforms in other circuit are taken using an air signal under normal receiving conditions.
7. Voltage readings shown are normal values and may vary ±20% except H.V.
8. ABBREVIATIONS & SYMBOLS

(P) C-POLYESTER	(R-C) R-CEMENT
(C) R-COMPOSITION	(MF) R-METAL FILM
(MP) C-METAL POLYESTER	(PP) C-POLYPROPYLENE
(M) R-METAL OXIDE	(T) TANTALUM CAPACITORS
R-FUSIBLE	POSISTOR

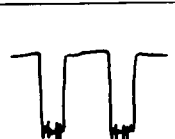
9. This is fundamental circuit diagram, some production changes may be made without revision of the diagram.


PWB-CRT
V999 3720B22 PICTURE TUBE
SW201 SERVICE SWITCH EVQ-R08 L12
T444 F.B.T FCK1415AL MSHIFBW08 TLF70018 TLF70067 FCM1415AL
FOCUS PACK
FOCUS
SCREEN
AN5512
ABL TEST POINT
R416 300K-F (NORMAL) 270K-F (SEMI-TINT)

0.35Vp-p (H)
IC501 #4



6.8Vp-p (H)
IC501 #8

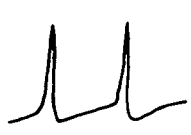


3.2Vp-p (H)
IC501 #9

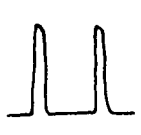
1.2Vp-p (H)
IC501 #10

2.7Vp-p (H)
IC501 #11

3Vp-p (V)
IC501 #21



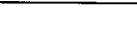
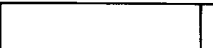
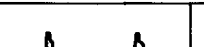
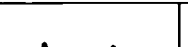
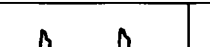
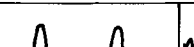
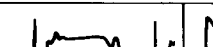
1.2Vp-p (V)
IC501 #25



5.5Vp-p (V)
IC501 #26

0.8Vp-p (H)
IC501 #27

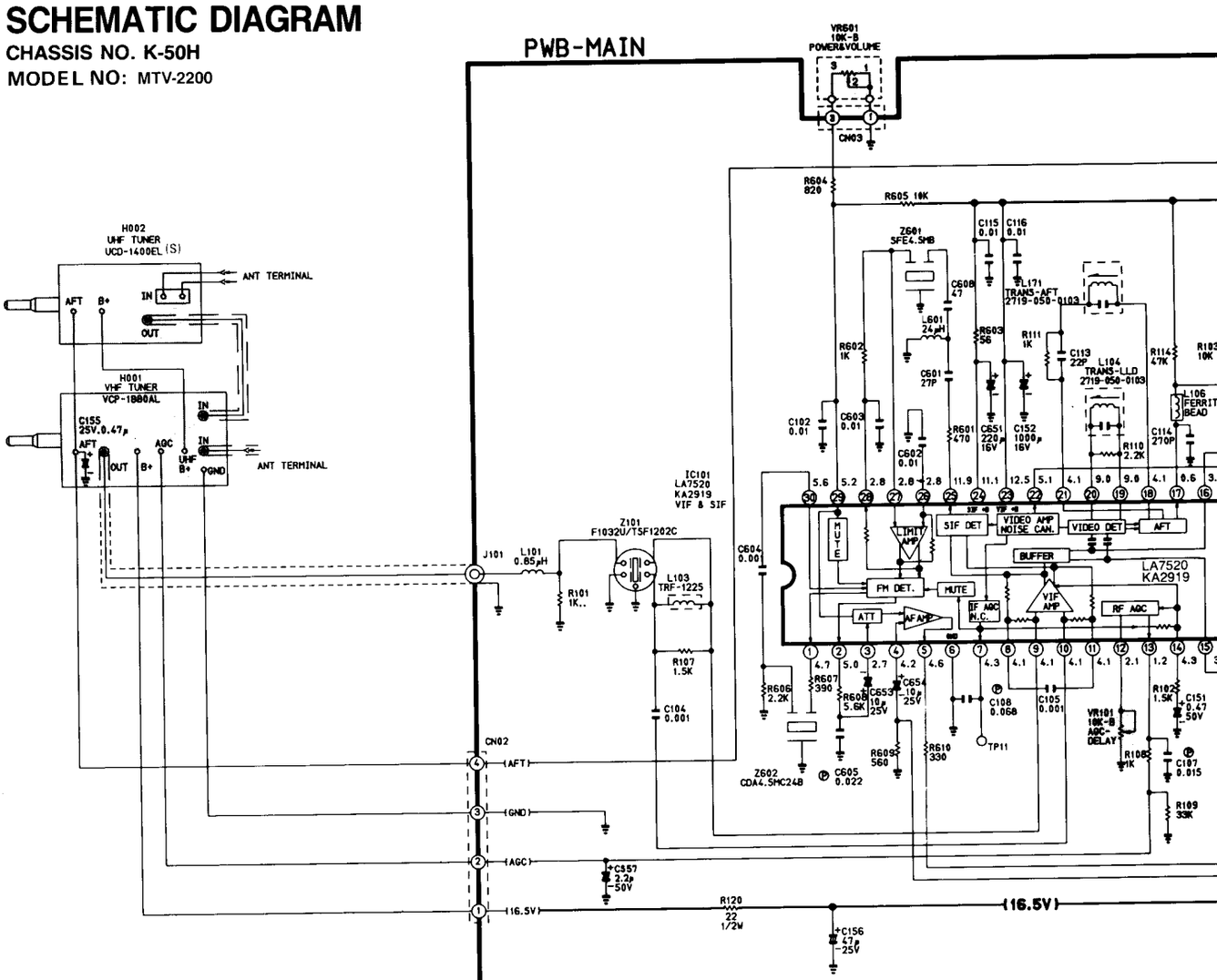
0.1Vp-p (H)
IC501 #30

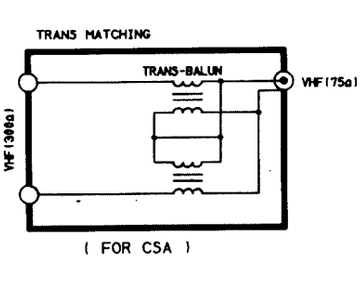
										
5.5Vp-p (V) IC501 #26	0.8Vp-p (H) IC501 #27	0.1Vp-p (H) IC501 #30	1.3Vp-p (H) WF-1	0.7Vp-p (H) WF-2	2.5Vp-p (V) WF-3	25Vp-p (V) WF-4	48Vp-p (V) WF-5	920Vp-p (H) WF-6	25Vp-p (H) WF-7	170Vp-p (H) WF-8

SCHEMATIC DIAGRAM

CHASSIS NO. K-50H

MODEL NO: MTV-2200





WARNING : BEFORE SERVICING THIS CHASSIS READ THE "X-RAY RADIATION PRECAUTION" "SAFETY PRECAUTION" AND PRODUCT SAFETY NOTICE" IN MANUAL.

CAUTION : The shaded area in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types indentical to those in the original circuit or specified in the parts list. Before replacing and of these components, read carefully the PRODUCT SAFETY NOTICE in this manual. Do not degrade the safety of the receiver through improper servicing.

WARNING : "THIS RECEIVER CONTAINS SAFETY CRITICAL COMPONENTS. ALL PARTS SHOWN IN THE SHADED AREAS OF THE SCHEMATIC ARE SAFETY CRITICAL FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS. REFER TO PARTS LIST FOR EXACT REPLACEMENTS".

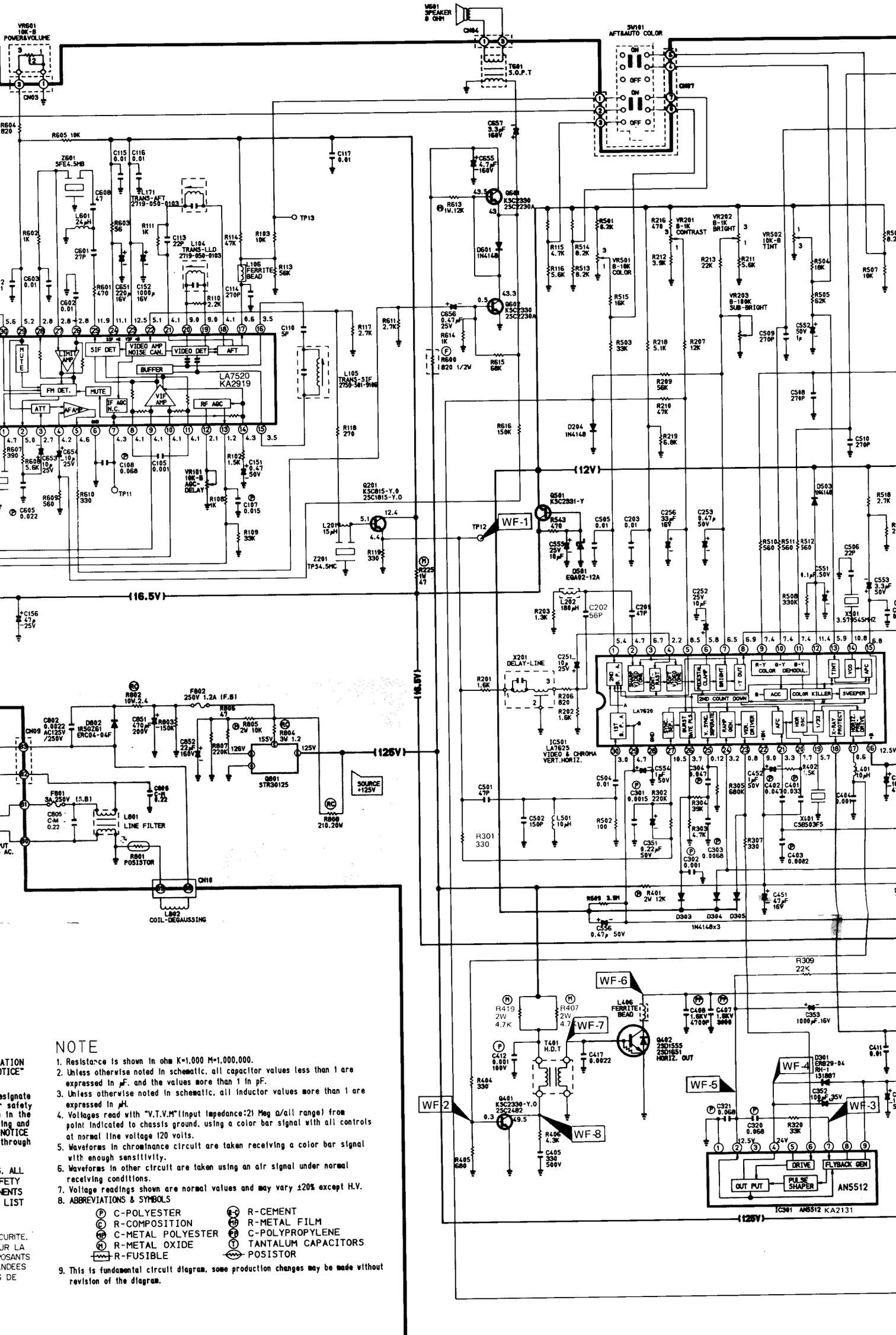
AVERTISSEMENT :"CE RECEPTEUR EST EQUIPE DE COMPOSANTS CRITIQUES POUR LA SECURITE. TOUTES LES PIECES INDIQUEES DANS LES ZONES OMBREES DU SCHEMA SONT CRITIQUES POUR LA SECURITE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT. CONSULTER LA NOMENCLATURE DES PIECES POUR TROUVER LES PIECES DE RECHANGE EXACTES"

NOTE

1. Resistance is shown in ohm K=1,000 M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor v
   expressed in μF, and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor
   expressed in μH.
4. Voltages read with "V.T.V.M"(input impedance:21 Meg
   point indicated to chassis ground, using a color ba
   at normal line voltage 120 volts.
5. Waveforms in chrominance circuit are taken recei
   with enough sensitivity.
6. Waveforms in other circuit are taken using an air
   receiving conditions.
7. Voltage readings shown are normal values and ma
8. ABBREVIATIONS & SYMBOLS

(P)	C-POLYESTER	(RC)	R-C
(C)	R-COMPOSITION	(RD)	R-M
(MP)	C-METAL POLYESTER	(PR)	C-P
(M)	R-METAL OXIDE	(T)	TAN
	R-FUSIBLE		POS

9. This is fundamental circuit diagram, some productio
   revision of the diagram.

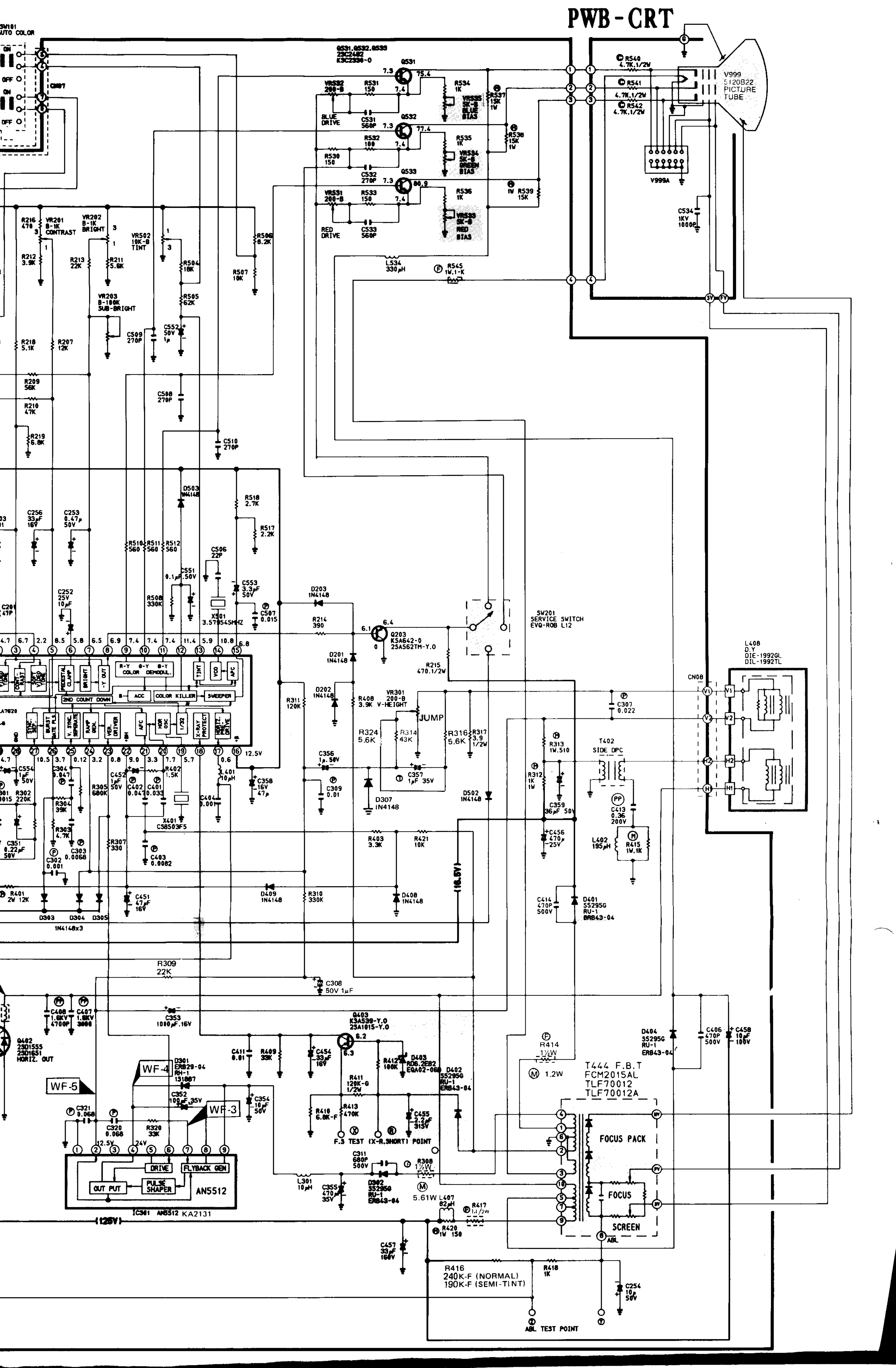


NOTE

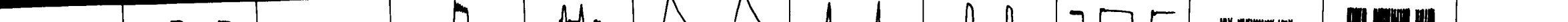
1. Resistance is shown in ohm K=1,000 M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF. and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH.
4. Voltages read with "V.T.V.M" (input impedance:21 Meg Ω/all range) from point indicated to chassis ground, using a color bar signal with all controls at normal line voltage 120 volts.
5. Waveforms in chrominance circuit are taken receiving a color bar signal with enough sensitivity.
6. Waveforms in other circuit are taken using an air signal under normal receiving conditions.
7. Voltage readings shown are normal values and may vary ±20% except H.V.
8. ABBREVIATIONS & SYMBOLS

(P) C-POLYESTER	(C-C) R-CEMENT
(C) R-COMPOSITION	(MF) R-METAL FILM
(MP) C-METAL POLYESTER	(PP) C-POLYPROPYLENE
(M) R-METAL OXIDE	(T) TANTALUM CAPACITORS
R-FUSIBLE	POSISTOR

9. This is fundamental circuit diagram, some production changes may be made without revision of the diagram.



PWB - CRT
SW101 AUTO COLOR
ON
OFF
CN07
Q531, Q532, Q533 2SC2482 KSC2330-O
Q531
Q532
Q533
VR532 200-B
R531 150
BLUE DRIVE
C531 560P
R532 100
R530 150
C532 270P
VR531 200-B
R533 150
RED DRIVE
C533 560P
R534 1K
VR535 5K-B BLUE BIAS
R537 15K 1W
R535 1K
VR534 5K-B GREEN BIAS
R538 15K 1W
R536 1K
VR533 5K-B RED BIAS
R539 15K
L534 330μH
R545 1W.1-K
R540 4.7K.1/2W
R541 4.7K.1/2W
R542 4.7K.1/2W
V999 510B22 PICTURE TUBE
V999A
C534 1KV 1000P
R216 470
VR201 B-1K CONTRAST
VR202 B-1K BRIGHT
VR502 10K-B TINT
R506 8.2K
R212 3.9K
R213 22K
R211 5.6K
R504 10K
R507 10K
VR203 B-100K SUB-BRIGHT
R505 62K
C509 270P
C552 50V 1μ
R218 5.1K
R207 12K
R209 56K
R210 47K
C508 270P
R219 6.8K
C510 270P
D503 1N4148
R518 2.7K
R517 2.2K
C256 33μF 16V
C253 0.47μ 50V
R510 560
R511 560
R512 560
C506 22P
C551 0.1μF 50V
C553 3.3μF 50V
C252 25V 10μF
R508 330K
X501 3.579545MHZ
C507 0.015
D203 1N4148
R214 390
Q203 KSA642-O 2SA562TM-Y.O
SW201 SERVICE SWITCH EVQ-ROB L12
D201 1N4148
R215 470.1/2W
R-Y COLOR
B-Y DEMODUL.
TINT
VCO
APC
2ND COUNT DOWN
ACC
COLOR KILLER
SWEEPER
PEDESTAL CLAMP
BRIGHT
-Y OUT
SYNC. SEP.
BURST GATE PLS.
V. SYNC. SEPERATE
RAMP GEN.
VER. DRIVER
AFC
HOR OSC
1/32
X-RAY PROTECT
HORIZ. PRE DRIVE
LA7620
R311 120K
D202 1N4148
R408 3.9K
VR301 200-B V-HEIGHT
JUMP
R324 5.6K
R314 43K
R316 5.6K
R317 3.9 1/2W
C357 1μF 35V
D307 1N4148
C356 1μ 50V
C309 0.01
D502 1N4148
L408 D.Y DIE-1992GL DIL-1992TL
CN08
C307 0.022
R313 1W.510
R312 1K 1W
T402 SIDE DPC
C359 36μF 50V
C413 0.36 200V
C456 470μ 25V
L402 195μH
R415 1W.1K
C554 1μF 50V
C304 0.047
R305 680K
C452 1μF 50V
C402 0.047
C401 0.033
R402 1.5K
L401 10μH
C358 16V 47μ
C404 0.001
X401 CSB503F5
R301
R302 220K
R304 39K
R303 4.7K
C303 0.0068
R307 330
C403 0.0082
C351 0.22μF 50V
C302 0.001
R403 3.3K
R421 10K
(16.5V)
R401 2W 12K
D303 D304 D305 1N4148x3
C451 47μF 16V
D409 1N4148
R310 330K
D408 1N4148
C414 470P 500V
D401 S5295G RU-1 ERB43-04
R309 22K
C308 50V 1μF
C408 1.6KV 4700P
C407 1.6KV 3000
C353 1000μF.16V
Q402 2SD1555 2SD1651 HORIZ. OUT
Q403 KSA539-Y.O 2SA1015-Y.O
C411 0.01
R409 33K
C454 33μF 16V
R412 100K
D403 RD6.2EB2 EQA02-06B
D402 S5295G RU-1 ERB43-04
WF-4
WF-5
WF-3
D301 ERB29-04 RH-1 1S1887
C352 100μF 35V
C354 10μF 50V
R411 120K-G 1/2W
R410 6.8K-F
R413 470K
C455 2.2μF 315V
F.S TEST (X-R.SHORT) POINT
C321 0.068
C320 0.068
R320 33K
12.5V
24V
DRIVE
FLYBACK GEN
OUT PUT
PULSE SHAPER
AN5512
IC301 AN5512 KA2131
(125V)
L301 10μH
C355 470μ 35V
C311 680P 500V
D302 S5295G RU-1 ERB43-04
R308 1/2W
5.61W
L407 82μH
R417 1/2W
R420 1W 150
C457 33μF 160V
R414 1/4W
1.2W
T444 F.B.T FCM2015AL TLF70012 TLF70012A
FOCUS PACK
FOCUS
SCREEN
ABL
D404 S5295G RU-1 ERB43-04
C406 470P 500V
C458 10μF 100V
R416 240K-F (NORMAL) 190K-F (SEMI-TINT)
R418 1K
C254 10μ 50V
ABL TEST POINT



0.35Vp-p (H) IC501 #4	6.8Vp-p (H) IC501 #8	3.2Vp-p (H) IC501 #9	1.2Vp-p (H) IC501 #10	2.7Vp-p (H) IC501 #11	3Vp-p (V) IC501 #2	1.2Vp-p (V) IC501 #25	5.5Vp-p (V) IC501 #26	0.8Vp-p (H) IC501 #27	0.1Vp-p (H) IC501 #30	1.3Vp-p (H) WF-1	0.7Vp-p (H) WF-2

1.2Vp-p (V) IC501 #25	5.5Vp-p (V) IC501 #26	0.8Vp-p (H) IC501 #27	0.1Vp-p (H) IC501 #30	1.3Vp-p (H) WF-1	0.7Vp-p (H) WF-2	2.5Vp-p (V) WF-3	25Vp-p (V) WF-4	48Vp-p (V) WF-5	920Vp-p (H) WF-6	25Vp-p (H) WF-7	170Vp-p (H) WF-8