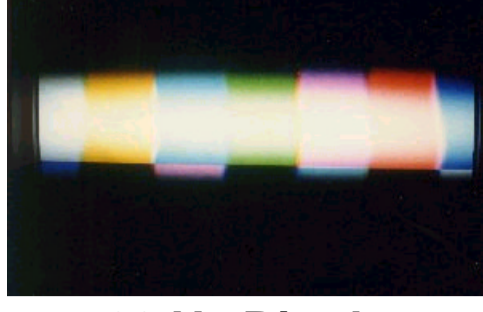


# Television Visual Symptoms

The following linked photos are of real symptoms that appeared on several televisions serviced by me. Some of the photos were shot by customers, technicians, and myself. They reflect some typical and not so typical symptoms that are seen throughout the service industry.

The purpose of this page is to share these symptoms as still pictures, and give a verbal description that can be universally understood by each technician. Some of these symptoms are very basic but the description is important in order to accurately communicate it to another technician or to Tech Support where the second party cannot see the television.

A few cures and explanations have been placed with each picture but no attempt was to make this a symptom-cure page.



## 60 Hz Ripple

A single horizontal line that usually travels up the screen slowly. Key is, there is only 1 line at a time on the screen.

This is typically caused by 60 cycle ripple from an A.C. line 1/2 wave power supply. Usually on a low voltage power supply used for a stand by source on an inexpensive or older television receiver, and in some models used as a band switching voltage on some vintage television receivers.

The offending ripple doesn't exactly match the phase of the 60 Hz vertical rate. This is the reason we see the horizontal bar or line up or sometimes down the screen.



## 120 Hz Ripple

A single horizontal line that usually travels up the screen slowly. Key is, here is there are 2 lines at a time on the screen.

This is typically caused by 120 cycle ripple from an A.C. line full wave power supply. This could be a low voltage power supply or the main power supply.

As with the 60 HZ scenario this offending ripple doesn't exactly match the phase of the 60 Hz vertical rate. We will see 2 horizontal bars or lines moving up or sometimes down the screen.

This symptom is not very common on most modern televisions because the main power supplies Chopper, or Switch mode power supplies. However the main filter capacitor for the raw DC source can cause 120 hz ripple in the picture but far more intense, but will have the double effect moving up the screen.

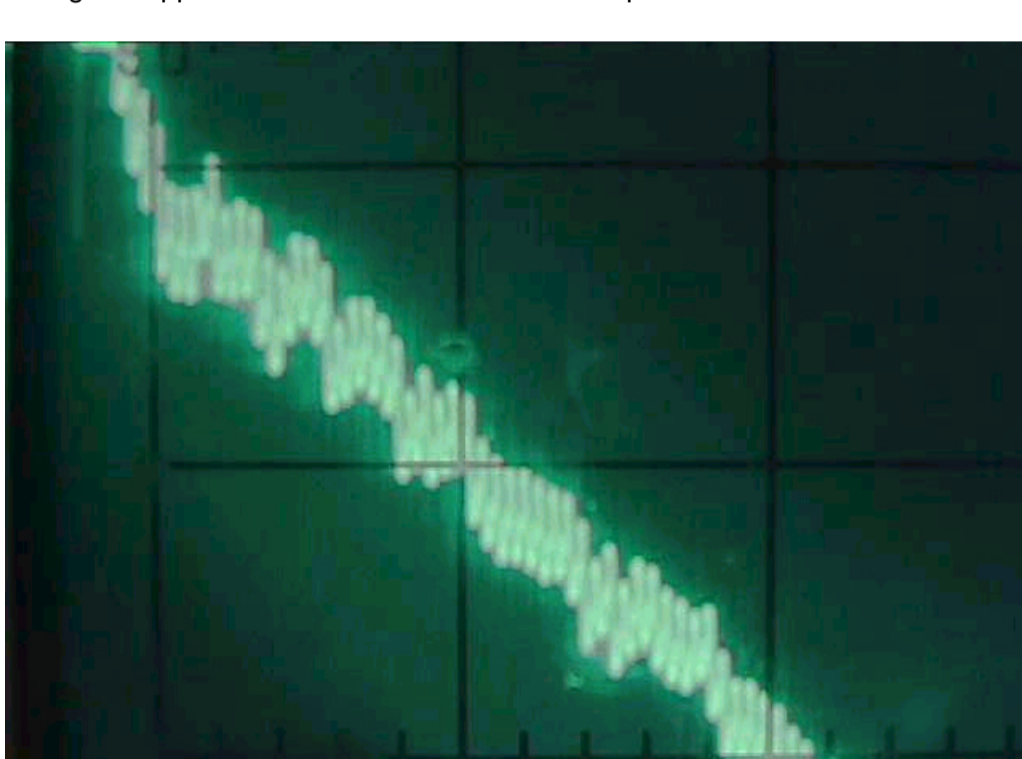


## Line Paring (vertical circuit)

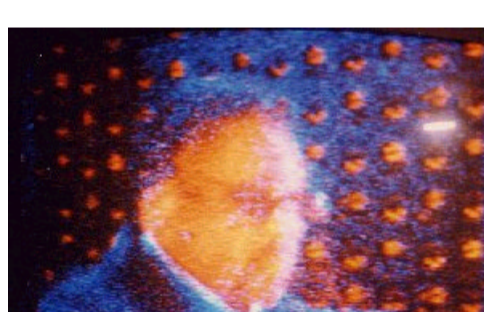
**Sony KP53XBR45 (RA1 chassis) Symptom:**

*The distortion can be seen on the high side input of vertical deflection yoke as high frequency ripple in the ramp portion of the signal.*

Criss-crossing bands of horizontal lines sometimes resembling a basket weave. The description was very hard to describe over the phone. Once looked at closely it was determined there was no video problem. It was a component in the vertical driver circuit for the Jungle IC on the "M" board. Below is a close up of the oscilloscope showing this ripple or oscillation on the vertical ramp.



We are connected to the high side of vertical deflection yoke. The high frequency ripple is in the ramp portion of the signal. The anomaly in this picture resembles about 2~3 volts Peak to Peak. It is riding on a 60 volt peak to peak overall signal. I have expanded the vertical gain enough to see the ripple and measure its amplitude. This wave form should be a clean, linear ramp.

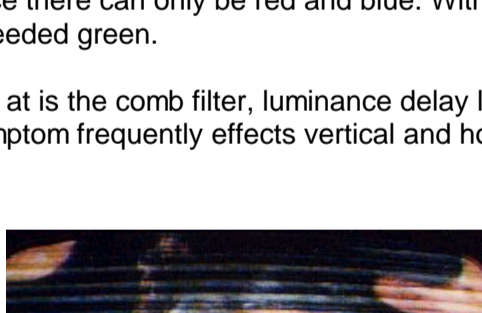


## No Luminance (No "y")

A complete loss of the brightness portion of the video signal. The only thing that is seen is pure chroma. Some technicians & customers may call this a negative picture.

The fact is its not a negative picture at all. It is the strong presence of reds and blues. Chroma is only R-y & B-y information. Without luminance there can only be red and blue. Without the luminance portion, the RGB Matrix circuit cannot create the needed green.

The area that needs to be looked at is the comb filter, luminance delay line, or any "y" path not limited to and including the comb filter. This symptom frequently effects vertical and horizontal sync integrity.



## Random Horizontal White Lines

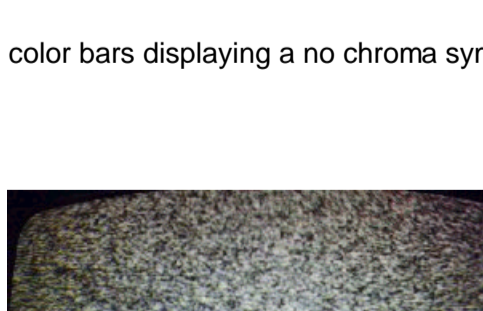
This symptom was caused by an open by-pass electrolytic capacitor which filtered the AGC voltage to the tuner.

## Terms/Descriptions



## No Chroma

NTSC color bars displaying a no chroma symptom.



## All Snow or White Noise

*NOT "NO PICTURE"!*



## No Reception

Horizontal bands of snow accompanied by a low pitch whine in the audio.

*This is a MGA V10 chassis. The problem was the PLL in the tuner falls out of phase lock. Replaced the tuner.*





### Crisscross lines

Note: These lines are not causing any vertical scan effects like the symptom of Line Paring. The was caused by a defective IC in the black expansion circuit of a MGA V10.



### Doming

The discoloration in this picture shows a woman in a white shirt. In a previous picture the television was tuned to a Closed Circuit video source where a security camera was trained on a lobby in a security apartment complex. On the left side of the picture was a tall window that allowed daylight to enter the room and the iris of the camera. This intense light caused by the iron shadow mask to expand in areas of high brightness. The expansion caused a blistering or warping of the Mask material. In turn the electron beam hits the wrong phosphor. Once the video source was changed the discoloration disappeared after 10 minutes.

Conventional iron shadow masks have been known for this problem because of the demand for higher brightness. A solution is a Invar shadow mask. It is a Nickel / Iron alloy that has very good thermal conductivity. The doming effect or blistering that occurs when the shadow mask heats up causes the mask to expand effecting the "Q" distance. (Q distance is the distance between the tiny aperture opening of the shadow mask to the phosphor dot on the face of the CRT.) This distance is critical to insure correct beam alignment and hit the right phosphor dot.

Unfortunately the Invar tubes are not available for all televisions. They are still quite expensive and in limited supply. This phenomena cannot be corrected by changing the CRT. It can usually be controlled by reducing bean current by reducing brightness, color, or contrast.



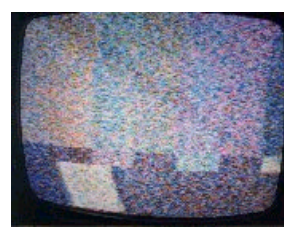
### White screen with Retrace Lines

NOT NO PICTURE! Disregard the white diagonal line. It's from the camera shutter. I'll do better next time.



### No Raster. (No light being produced on the CRT face plate)

Probable causes could be no filaments, No high voltage, No G2 voltage...



### Weak signal



### No Red/Green & Blue OK



### No Blue/Green & Red OK



### No Green/Red & Blue OK



### No Vertical Sweep

**THIS IS NOT A VERTICAL LINE! It is a horizontal line.**



### Cyan Discoloration Thomson PS27108 Chassis CTC187 BF2.

*This is a odd symptom to describe. It is a CTC187 RCA television. Caused by tuner misalignment. It can effect 1 or two channels. Never shows up in the video input mode.*

This symptom only affected two channels while using the tuner mode. Using the video input from a VCR receiving the same channel. Customer was using an external television antenna with strong signal strength. The symptom only affected the flesh tone part of the picture as long as it was well illuminated.

The cure was to realign the tuner. At one point someone had replaced the EEPROM and never bothered to realign the tuner. By realigning the tuner using the Thomson TAG-001, the trouble was corrected.