

## Sony IK Circuit..... Explained by Dan Mundy, CET/CSM



I have posted this before as a troubleshooting aid. It should explain what is happening.

I don't have the manual in front of me so this may be a little generic. The IK circuit sends out a 100% white pulse during the vertical blanking interval. There is a pulse for red then green and lastly blue. Each pulse is on a different

scan line. The IK circuit then matrixes them together, amplifies the 3 pulses and send it back to the jungle IC.

Using a scope with delayed sweep or set at the vertical rate and expanded 10X you should be able to see the 3 pulses at the IK output from the CRT board and note that the amplitude will grow or shrink depending on the screen setting.

**If one color is missing** then you have an amp circuit problem for that color.

**If none of the pulses are there** and they go in from the jungle IC then look for a bad IK amp transistor.

**If the pulses are there but do not vary with changing screen voltage** the feed-

back to the jungle IC or the IC itself is bad. Some times the jungle IC has small Mylar caps off of it and if there they have been known to short. Sometimes the caps are built into the jungle IC and can still short.

Many times the IK circuit just goes out of tolerance meaning the current drawn by one crt is no longer within acceptable range and **the picture is blanked.**

**If this is the case then increasing the screen voltage will solve, for a while, the complaint.**

*Daniel Mundy, CET®/CSM*

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See The Next Three Pages  
To Bypass This Circuit  
For Test Purposes

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# Sony IK Circuit Bypass

By Joe Sopko, CET

Contributed By Jorge Miret And Luis Alberto Tamiet

Sony television sets of recent years (1994-95 & more) contain circuits which monitor the current of the CRT cathodes. The microprocessor in combination with the "jungle" chip and a series of transistors and other components in the circuits corresponding to the three cathodes, then automatically adjust the bias of each individual gun to compensate for Kinescope aging.

Unfortunately for the owner, they also will blank the picture when the Kine slumps too low. Some tech's have been able to "Rejuvenate" the Kine & restore performance, while others have wondered if there was a way to bypass that IK circuit. That answer has been always been "NO" --- Until now.

Jorge Miret, of J.C.Electronic Repairs in Puerto Rico has discovered a circuit modification which will allow a bypass of that circuit. It is found on a Spanish-Language website

**[www.comunidadelectronicos.com/articulos/IK.htm](http://www.comunidadelectronicos.com/articulos/IK.htm)**

which makes it a bit tough on us Gringo's, but "not to worry". Google, the ever helpful search engine is capable of translating, as you've learned in another article published within the pages of "The Speaker".

Following is a machine-translation of that webpage, aided by your reporter where necessary.

A diagram of the circuit modification is provided. It involves cutting a trace and the addition of 3 diodes.

Translation for Gringo's:

Following is a brief description of the Operation of the IK circuit. From each output of the Jungle Chip (R, G, B) exits a pulse, three pulses in all, one to cathode of the Kine. These pulses are at the horizontal sweep rate, so that it activates during the exploration of a line. These lines are not visible in the screen, since they are sent during the beginning of the "vertical sweeping", in the area of "blanking", but they can be seen in the

overscanned part of the screen if the vertical height (VSIZ) in the Menu is reduced slightly. This circuit, besides to verify the correct operation of the CRT, allows to make automatic adjustments within the IC jungle, to compensate the small differences of emission between the cathodes and to maintain the correct color of the image. The current of the cathodes is detected by 3 Detector circuits put in between the exciting amplifiers and each one of the cathodes. These circuits, send a signal, proportional to the current of each one of the cathodes, to a IK Buffer circuit, from where they are sent to the jungle chip. In many equipment these circuits are formed by discrete components (transistors, diodes, resistance, etc.) but in more recent models, all the exciting stage of the CRT and the components of IK circuit are included in a single integrated circuit like the TDA6108.

Almost from the moment at which the equipment is ignited, the "jungle" chip sends the respective pulses to each one of the output pins, while it maintains a "cut" or "muting" of video (black screen). As the cathodes reach the temperature necessary to emit electrons, the current of such, generates in the respective detector circuits, a pulse similar to the applied one and whose amplitude is proportional to the current of the cathode. To see the image on the screen, When the pulses in the IK circuit reach certain amplitude, the "cut" of video is deactivated and the image appears. The lack of video (black screen), in these TV Sony, sometimes causes confusion between the technicians, because when not having an output of signal from the jungle chip, tend to suppose that the problem is in the Jungle Chip.

When faced the repair of a recent TV that presents absence of Video (black screen), we must make the following steps: To increase G2 screen voltage. If the screen is illuminated with "raster" (swept) normal, we can discard the possible problems in the circuits of sweeping. (a defect in the Vertical circuit, can cause the same symptom) This also allows us to quickly verify the necessary voltages for the operation of the CRT (filament, anode, G2). If these voltages are correct, is very possible that the problem is in the Kine

drive amplifiers, in the CRT, or in the IK circuit.

The next step, is to verify the state of the CRT. If it has low emission in some of the cathodes, or if it has some internal short it can cause that IK circuit to stay in "cut". For this it is advisable to use a Kine Checker. If it is not had one, the following verification can be made: With the TV operating, momentarily place a 15 or 20K 2W resistor, between ground and each one of the cathodes (KR, KG and KB), one at a time. This will result in the corresponding color illuminating brightly. The intensity must be similar when doing the test in the three cathodes. If some of the colors does not appear or it does in tenuous form, it indicated an exhausted or defective CRT. (This is not a very precise test. It is better to use a Kine Checker, but nevertheless, this test could aid to determine if some of the guns, is defective or with very low emission).

To deactivate or "to deceive" the IK circuit sometimes can be useful. The circuit modification below will "deceive" the IK circuit into deactivating the video blockade that it causes. This can be done by disconnecting the line of the IK buffer and placing three diodes of the type 1N4148 between the pins of the integrated jungle, as it is shown in the figure. With this modification, the pulses from the output of the jungle chip are re-introduced into the IK line of the chip which then deactivates the video blockade, allowing the image to appear on the screen. If the image does NOT appear, and having made the verifications given earlier, is possible that the integrated jungle (or some component associate) is defective.

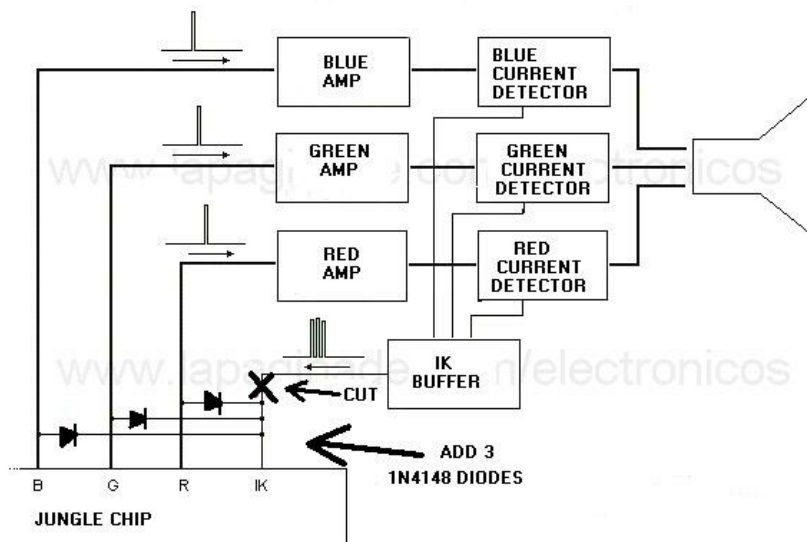
Granted, The translation leaves a bit to be desired (you should have tried reading it before I "Helped" it along). I make no claim to be a linguist— My parents never even spoke Hungarian around me, but I believe that this is more information than we've ever seen about this IK circuit before.

( *Cont. Next Page* )

The article that you've just read was contributed By Jorge Miret and appears to be written by Luis Alberto Tamiet on the website listed in the first paragraph. As the entire site is in Spanish, I am not sure of the actual author.

The Speaker would like to thank Both of these Techs for adding to our store of knowledge. Take the information for what it's worth, I've not tried it, and neither has the contributor so we can't speak of it's efficacy from personal experience. It is presented as another diagnostic tool to determine whether the blanking is caused by the jungle chip or the kine.

*Of course, no tech would ever leave the bypass circuit in as a permanent measure, nor would "The Speaker" ever recommend a modification not authorized by the manufacturer. If you try this, we'd like to hear of your experience and opinion as to it's value.*



See follow-up article next page.

Author Joe Sopko  
Tried This Procedure

# Sony IK bypass, IT WORKS !!

By: Joe Sopko CET

Recently, The Speaker printed an article describing a procedure to bypass the Sony IK circuit. The procedure came from a Latin American site, and at the time of printing we didn't know of anyone who had actually tried it or if it was actually effective...Heck, it took us long enough just to translate the thing!

Subsequent to that time, a Sony KV20S20 came into Consumer Service in South Euclid Ohio with a Black Screen (has sound). Turning up the Screen Grid restored the picture, so it looked as though this was a candidate to determine the efficacy of that Bypass Mod. Seized by the curiosity that marks all technicians, I installed the components mentioned in that article from The Speaker.

As you can see in Figure 1, there are 3 diodes riding like an outrigger on the

Jungle Chip (CXA1870). Those 3 diodes and a cut of a foil trace on the PCB are all that the mod involves. Real Easy, Takes only a couple of minutes. Figure 2 shows how the diodes are connected schematically.

Be aware that there are different jungle chips involved in different sony chassis. Some use the CXA1465, and some use the CXA1870 (and I have no doubt that there are others, too). I have put the affected pin numbers for these 2 chips in figure 2 for your information. Also be aware that a particular chassis may use "either" of 2 chips. The chassis that I was working with had the PCB roadmapped for a 48 pin chip, but actually had a 42 pin chip installed. Needless to say, the pin markings on the PCB's surface were incorrect. (Tech's are nothing if not adaptable)

I'm glad to report that the modification performs as promised. BEFORE the Mod, the picture would blank at the low end of the screen control, would reappear at mid to high range, and then blank again at very high position of the control. AFTER the Mod, The picture was present throughout the entire rotation of the screen control. I assume that Sony's intent was to prevent a poor picture from being seen as the kine aged beyond limits. With this modification, you can watch a crappy picture throughout the entire range of the control if you so desire.

*Naturally, this procedure is presented only as a Test procedure to determine if the IK Blanking Circuit is indeed keeping the picture from appearing. No technician would ever leave the mod in as a permanent fix and The Speaker would never recommend any procedure contrary to the manufacturer's approved practices.*

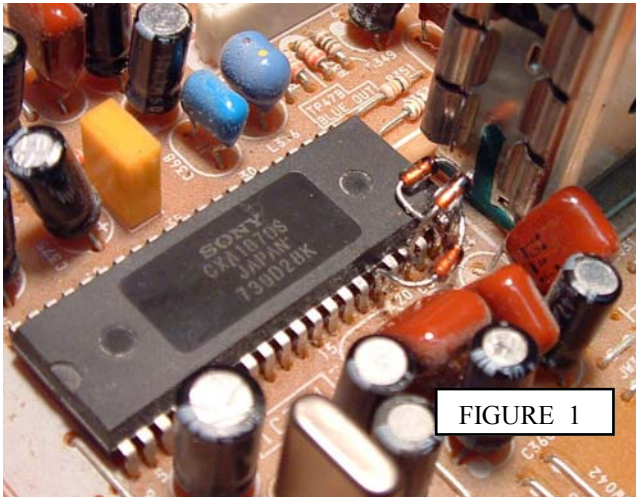


FIGURE 1

Photo by Flash Sopko with the new NesdaOhio Digital Camera

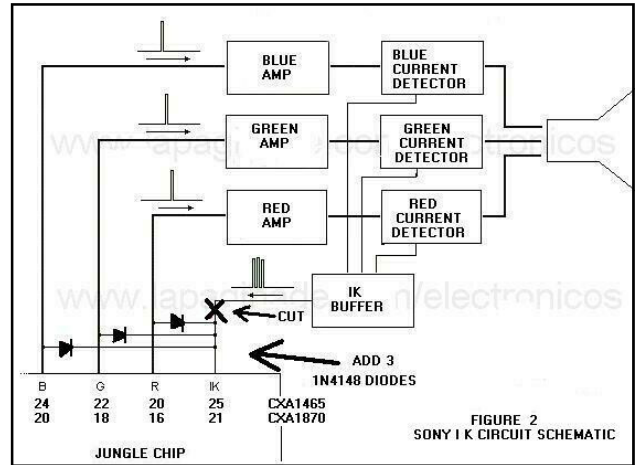


FIGURE 2  
SONY I K CIRCUIT SCHEMATIC