

## Sanwa 29E31S Neck & control board

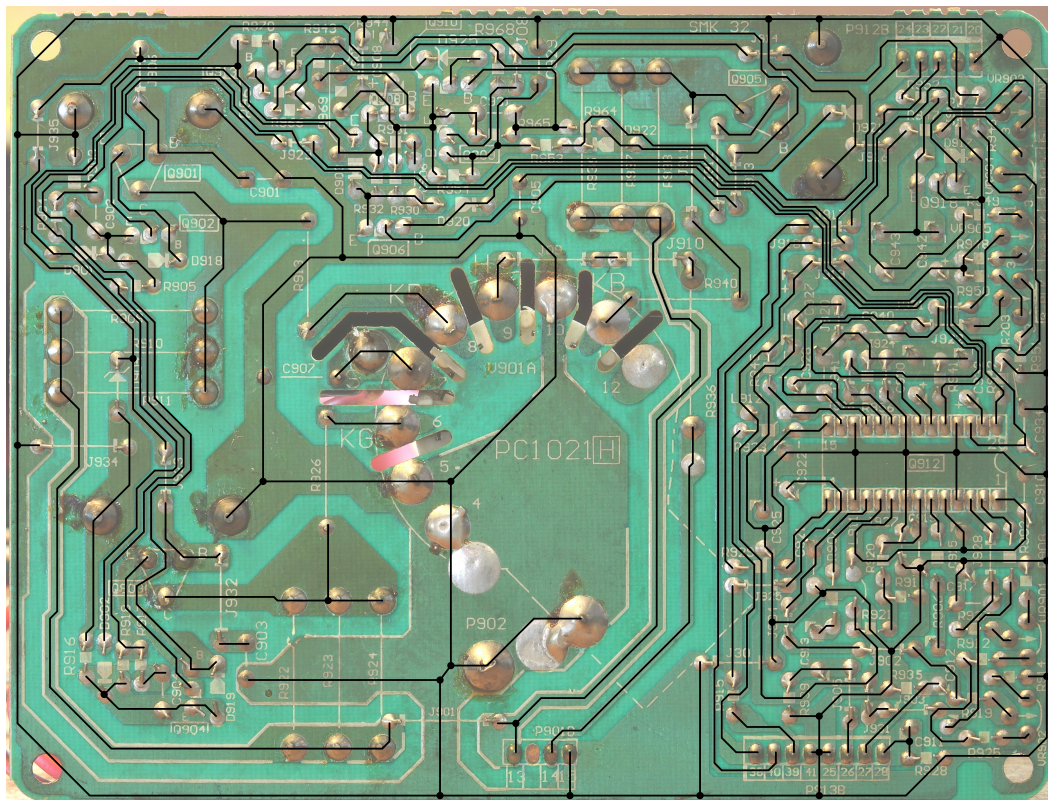
These photos were taken  
from the boards of 29E31SJ  
serial 000011.

# WARNING

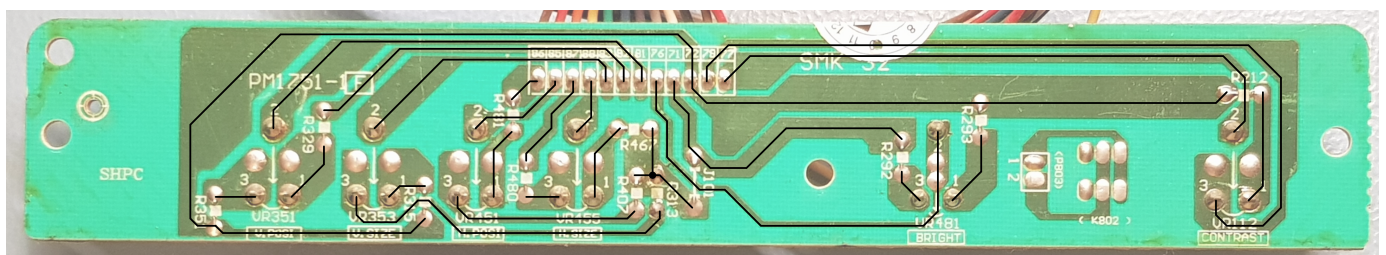
CRT circuitry operates on potentially lethal voltages! Do NOT work on monitors if you don't know what you're doing!

Safety notes: most high voltage rails, including the picture tube anode, have bleed resistors. The 112V rail is an exception if the neckboard is not connected! It can be discharged by bridging either lead of R272 (between flyback and white jumper lead) to ground. The big heatsink in the power supply region is LIVE during operation; do not touch! All other heatsinks are grounded.

Neckboard



Control board

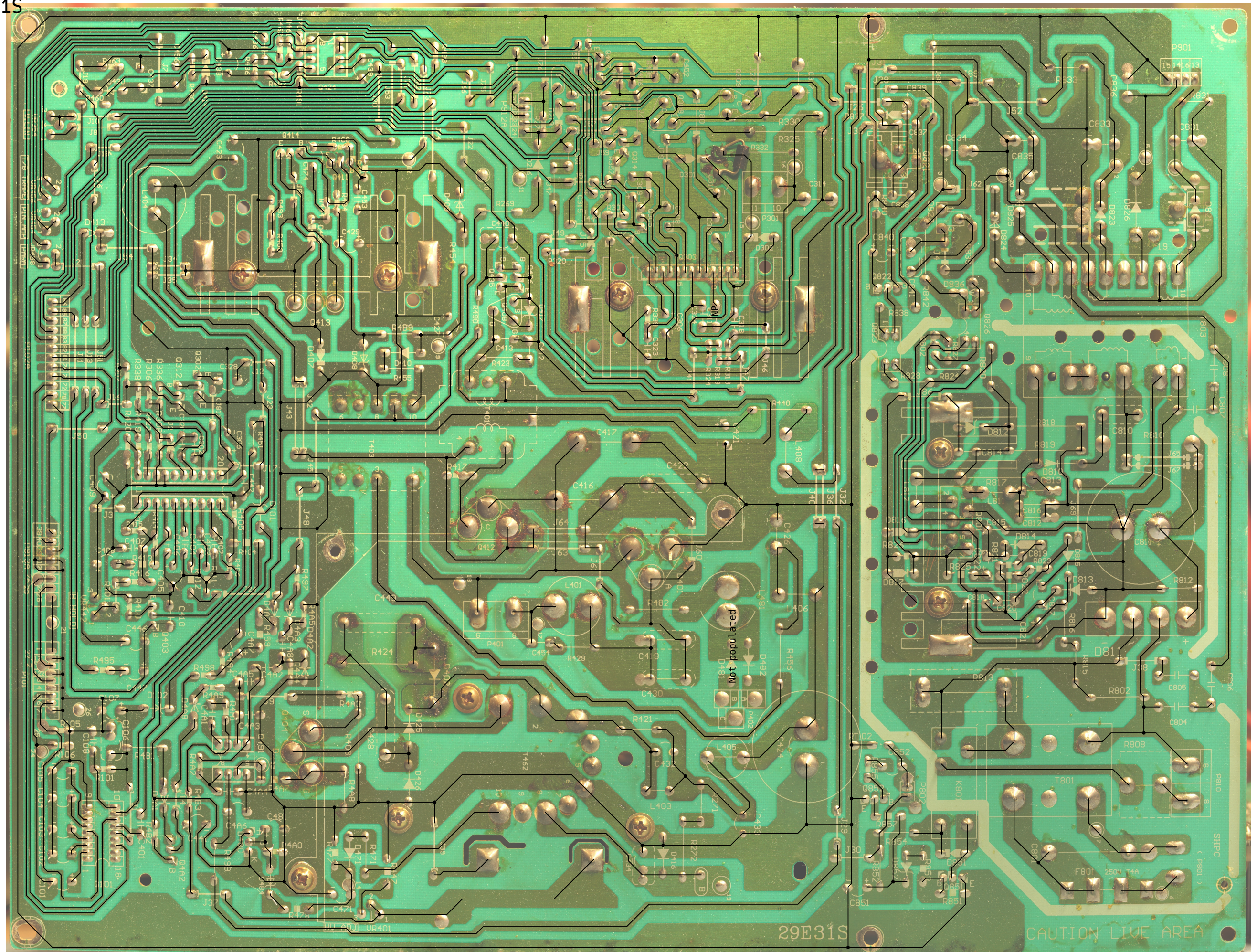


Warning: do not apply power to the chassis board without connecting the control board. The potentiometers and resistors on this board are an integral part of the chassis circuitry. Also do not apply power while testing without connecting the neck board, unless you first ground ACL (white jumper lead); D416 and C434 may be damaged otherwise.



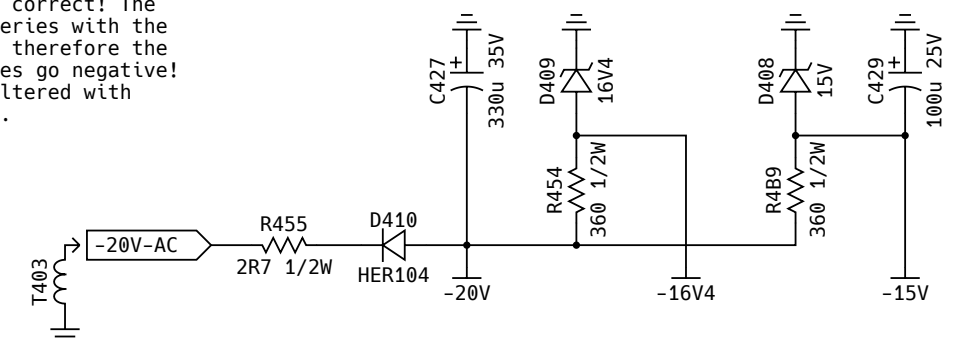
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These schematics were traced from the boards of 29E31SJ serial 000011. Component values were taken from the service manual and not manually verified.



Sanwa 29E31S  
Sync & deflection processing

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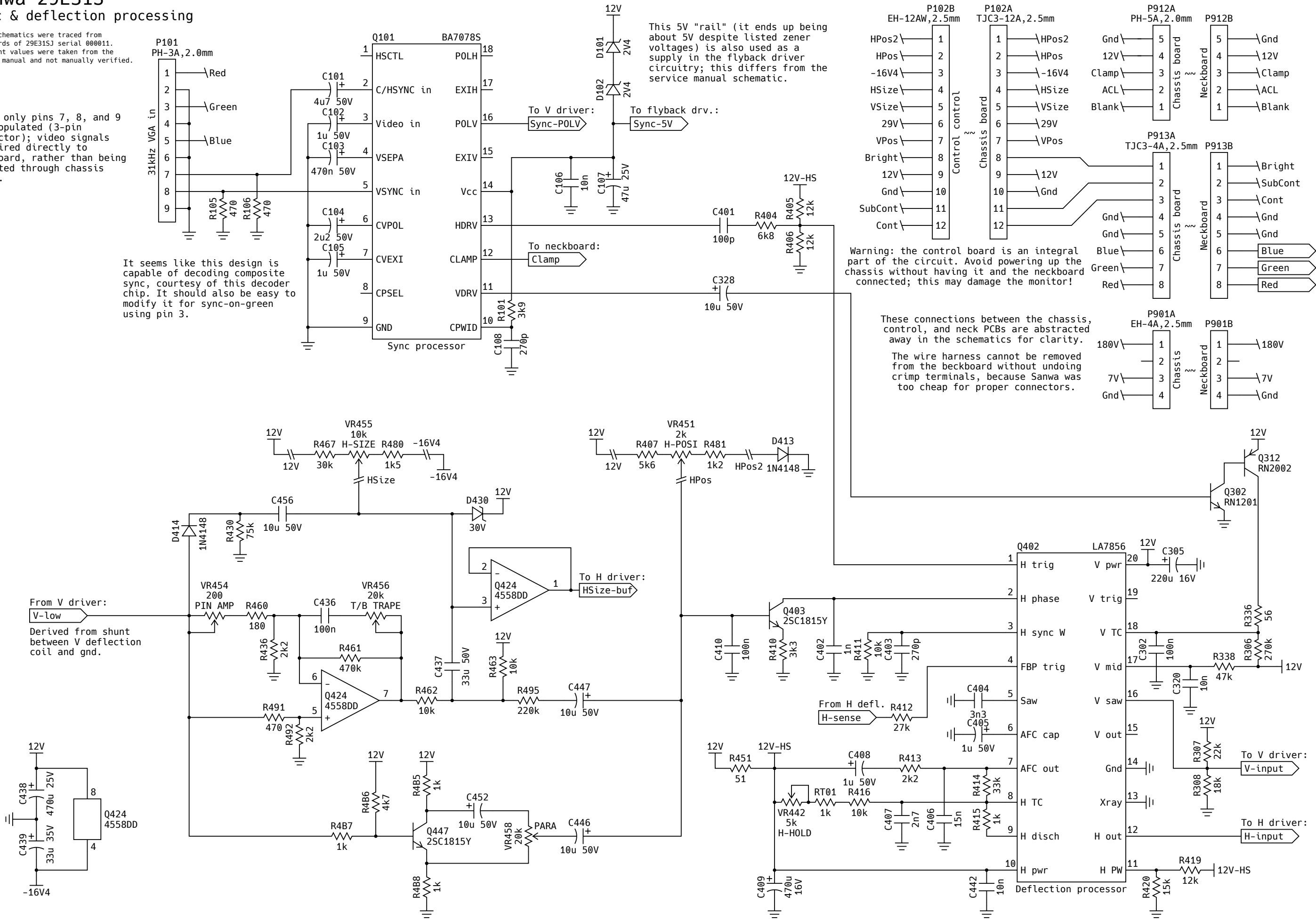
Note: only pins 7, 8, and 9 are populated (3-pin connector); video signals are wired directly to neckboard, rather than being directed through chassis board.

It seems like this design is capable of decoding composite sync, courtesy of this decoder chip. It should also be easy to modify it for sync-on-green using pin 3.

This 5V "rail" (it ends up being about 5V despite listed zener voltages) is also used as a supply in the flyback driver circuitry; this differs from the service manual schematic.

Warning: the control board is an integral part of the circuit. Avoid powering up the chassis without having it and the neckboard connected; this may damage the monitor!

These connections between the chassis, control, and neck PCBs are abstracted away in the schematics for clarity. The wire harness cannot be removed from the beckboard without undoing crimp terminals, because Sanwa was too cheap for proper connectors.



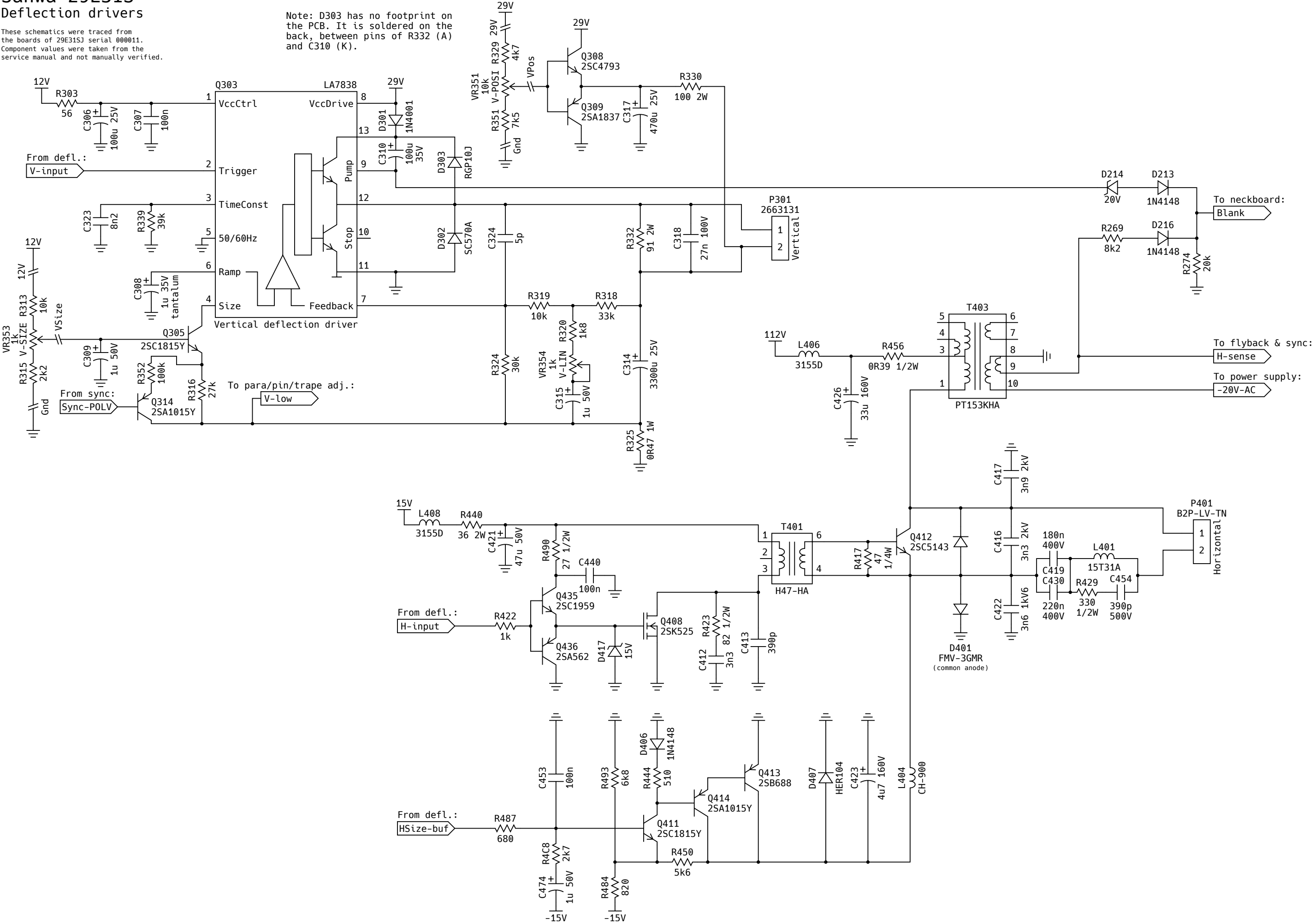


# Sanwa 29E31S

## Deflection drivers

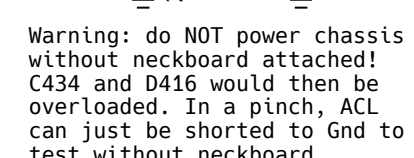
These schematics were traced from the boards of 29E31SJ serial 000011. Component values were taken from the service manual and not manually verified.

Note: D303 has no footprint on the PCB. It is soldered on the back, between pins of R332 (A) and C310 (K).





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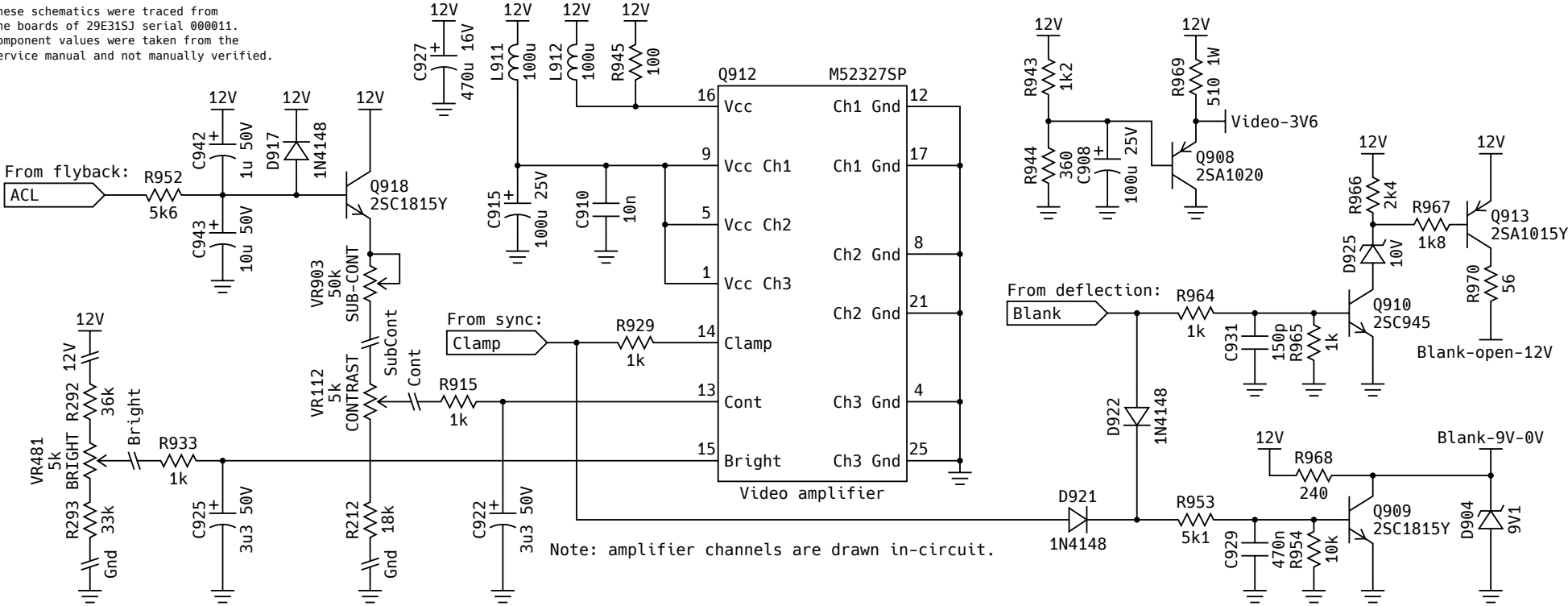




# Sanwa 29E31S

## Video & picture tube

These schematics were traced from the boards of 29E31SJ serial 000011. Component values were taken from the service manual and not manually verified.



Warning: lots of designators are printed incorrectly on the back of the neckboard.  
When in doubt, verify with the top side; it seems to be more accurate.

Red, green, and blue drivers are identical, except that the green channel lacks a gain potentiometer, and the blue channel has a slightly different compensation circuit (R931 is 6R8 instead of 10R).

For whatever reason, blanking is done via three independent systems, based on two information sources. Firstly, the video amplifier clamps the signals based on the clamp signal derived by the sync processor. Secondly, the reference voltage for the power transistors (Blank-9V-0V) is pulled to ground during retrace, derived from the V driver charge pump output for vertical retrace and the T401 series transformer for horizontal retrace. Finally, the base-emitter junction of the voltage-to-current transistors is completely reversed by Blank-open-12V when either of those sources give a blanking signal.

