

Repair notes on Toshiba projection TVs

John Coombes provides fault-finding guidance on sets fitted with the C5SS, C8SS and COOP projection chassis

Our company has sold and serviced many Toshiba projection TV sets in recent years. The following notes summarise our servicing experience with them.

Model 43PJ93B (C8SS chassis)

There are two power supply circuits, a standby supply that provides a regulated 5V output (+5V-1) and the main chopper power supply. The standby supply is fed from a small mains transformer and, amongst other things, provides the DC feed to the relay (SR80) that controls the input to the chopper circuit. Fig. 1 shows the arrangement. A second relay (SR81) shorts out the surge-limiting resistors after an initial delay – this reduces unnecessary dissipation during normal operation. The standby circuit is immobilised when the X-ray protection plate interlock is disconnected. A short across the standby 5V supply will result in a dead set with no red LED display. The usual cause of this is failure of the 6.2V zener diode D7709 on the convergence PCB – check it by replacement.

The main power supply is based on an STR-Z4267 chopper IC (Q801). There are four windings on the isolated side of the chopper transformer, with each one feeding a bridge rectifier. Fig. 2 shows the

HT rectifier circuit. There is also a half-wave voltage-doubler circuit that generates a 36V supply for the convergence board. A hybrid IC (Z801, type HIC1019) on the secondary side of the chopper circuit is used for excess current (sensed across R853) and over-voltage protection and for regulation error sensing. Regulation feedback is applied to Q801 via optocoupler Q862 (type TLN621).

If, when the set is switched on, it trips to standby followed by four clicks from the relays there is no mains input to the chopper circuit. This usually means that there is an overload. The first check is to isolate the deflection panel by disconnecting BB21 and BB22. The voltage across the HT smoothing capacitor C886 (47 μ F, 160V) should then be 125V, with or without a 60W lamp as a dummy load. If the HT voltage is correct there is probably a fault in the line output stage. Note that the 2SD2253FA line output transistor Q404 incorporates a parallel diode. The feed to the line output stage is via R444 (0.39 Ω , 1W). Note also that in projection models there are three sets of scanning coils: the field scan coils are in series and the line scan coils in parallel.

If there is no HT at C886, check whether the 2A circuit protector Z856 is open-circuit. If it is, check the HT bridge rectifier D860 (type D4SBL40) for shorts and the HT reservoir capacitor C876 (330 μ F, 160V).

If the HT rectifier circuit is OK, check for shorts across the other rectifiers on the secondary side of the chopper circuit then, if necessary, turn to the primary side. The mains bridge rectifier is D802 (type LN65860) while C810 (560 μ F, 400V) is its reservoir capacitor. If there is 300V across C810, check the chopper chip Q801 (STR-Z4267) by replacement.

There are quite a lot of useful check points. If tripping is cured by disconnecting fuse F870 (4AT) there's a fault in the convergence circuitry – F870 is in series with the voltage-doubler circuit

that produces the 36V supply. The connections to the deflection PCB are sockets BP21 and BP22: 125V should be present at pins 6, 7 and 8 of BP21.

If there is a problem in the field output stage, check its 35V supply at test point P415. This supply is derived from the line output transformer via R327 (3.3 Ω , 1W fusible), D302 (type EU2A) and the current sensing resistor R370 (1.5 Ω , 0.5W), with C310 (2,200 μ F, 50V) as the reservoir capacitor and C320 (100 μ F, 50V) for smoothing. If the voltage is low or missing, suspect the field output IC Q301 (LA7833S). Usually if Q301 is faulty the relay will click on and off, shutting down the power supply.

The field output stage can be isolated by disconnecting R327. Field collapse won't show, as CRT blanking comes into operation. If the tripping stops and the receiver doesn't go into standby, sound will be present and the cause of the fault will be in the field output stage. To avoid CRT damage, don't run the receiver for long with R327 disconnected.

The heater supply for the CRTs is derived from the line output stage. It's rectified for protection purposes (X-ray protection). You can check for correct operation at test point P416, where the voltage should be about 22V. This voltage is fed back for protection purposes to pin 13 of the HIC Z801.

If the red LED at the front is lit, the standby power supply is providing its 5V output (+5V-1).

There is another protection system that's built into the DPC E/W PCB and is related to the HT supply to the RGB output stages. The RGB HT supply is derived from the line output transformer and should be 200V across C446 (33 μ F, 250V). Note that the set will trip to standby if operated without the DPC PCB being in position, because there is no EW control and the voltages in the line output stage will rise above the trip level. The protection-trip latch is within the HIC