

The ultimate PLAYSTATION service Manual



SCPH 1002,5502,7002,7502,9002

A complete service manual for technicians
And electronics enthusiasts.
Repair techniques and diagnostics
Diagrams
Test points

Introduction

The first model introduced was the SCPH 1002 in to Europe and sales went through the roof. Could I find one for sale, just before Christmas “not likely” said the guy behind the counter.

Well I thought I'll wait and wait I did. I got one of these little grey boxes in February and guess what. It's a SCPH 1002. Like you I bet, I played for hours and hours and thought the graphic were UN believable. All my mates came around and I could not get rid of them. All those games I finished and then bought more and more. Magazines suddenly grew in to piles and, and I had sleepless nights... oh those were the days!

At the time of writing this manual, I am working for a large company who repair PSX machines, who `s got be nameless for legal reasons. I've now worked for them for over a year as an Electronic bench engineer. Working day in and day out changing CPU`s, GPU`s fuses, diodes and all those little fiddly bits.

I've worked on all the SCPH models of the Playstation and my personal favourite is the SCPH 7502 motherboard. As the years have passed the motherboards have grown smaller and I reckon that Sony are going to make it like a credit card size one day.

As the launch of the PSX 2 is just around the corner and the PSX 1 will be phased out. The inevitable will happen, it `s going to get cheaper. Car boot sales around the world are going to be brimming with thousands of little scratched broken, out of warranty PSX `s. So that's why I've written this service manual. We can bring back old memories playing favourite games.

Now for the serious bit. about disclaimers and all the nasty legal stuff. This manual must use for educational purposes only. Any loss of life, loss of limbs, divorce, loss of business, loss of profits, your dog leaves home, fire, you become mentally insane, that I cannot be held accountable. Original parts must replace all parts replaced. All fuses must be the correct ratings. The power supply must be replaced, only if there are serious damaged tracks on the board. This is because any modification of the PSU has to go through a standards test. If you have any doubt that you cannot repair this electrical apparatus, take it to a qualified electrician. This manual is a guide in repairing said apparatus; all pictures are taken from my Panasonic cam and edited. All diagrams were created form the three remaining brain cells left in my head and then edited.

I have not included any modifications in this release and I will not in further releases. If you chip your PSX you must have the original CD to play your backups. Chipping can cause failures to the machines chips. Bad or modified chipping will cause the machine irreparable damage and it does invoke the warranty. Many of the machines I repair are due to bad chipping.

Thanks for obtaining this ultimate Playstation service manual. This has taken a few months of my time to compile and I may have a revised manual in the offering. The next step for me is to write one on the Playstation two.

The tools that you are going to need!

Pace or Leister Hot air gun, with attachments. Most essential!!!

Assortment of screwdrivers

Liquid flux

Fine solder

Soldering iron

Oscilloscope 20mhz

Digital or analogue multi-meter

Tweezers of different sizes

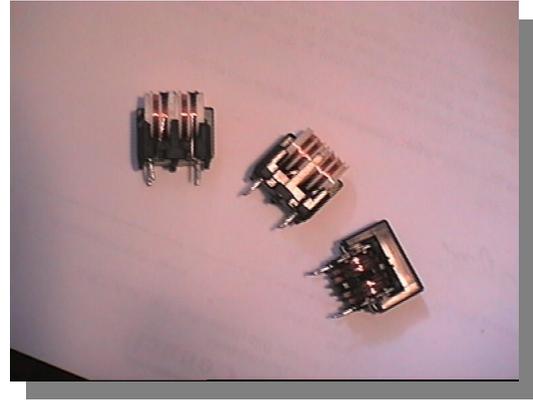
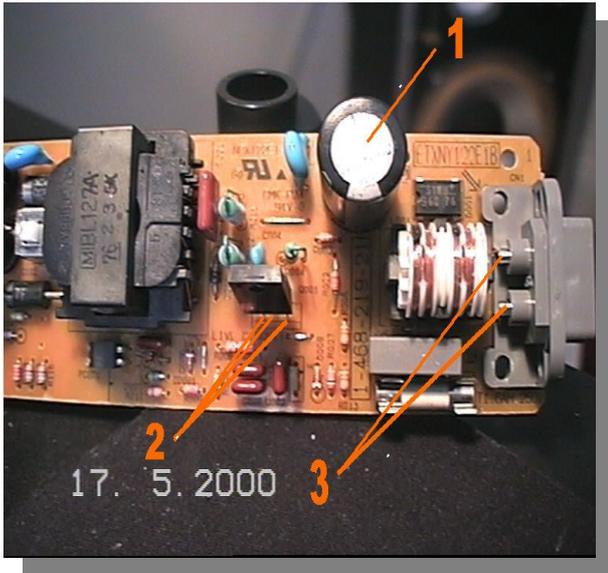
Sharp modelling knife

Earth strap

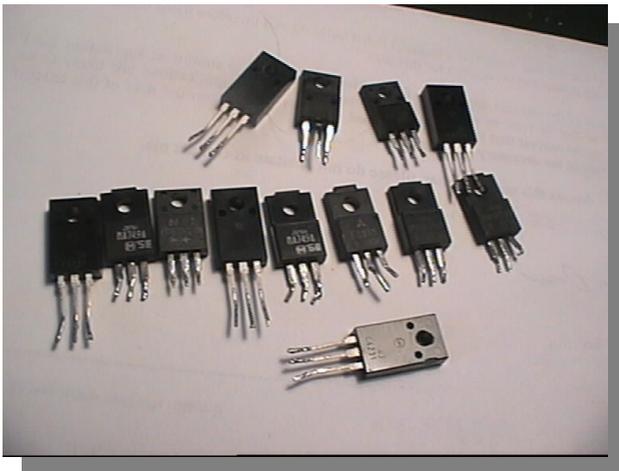
Good eye sight, steady hands and a lot of patience



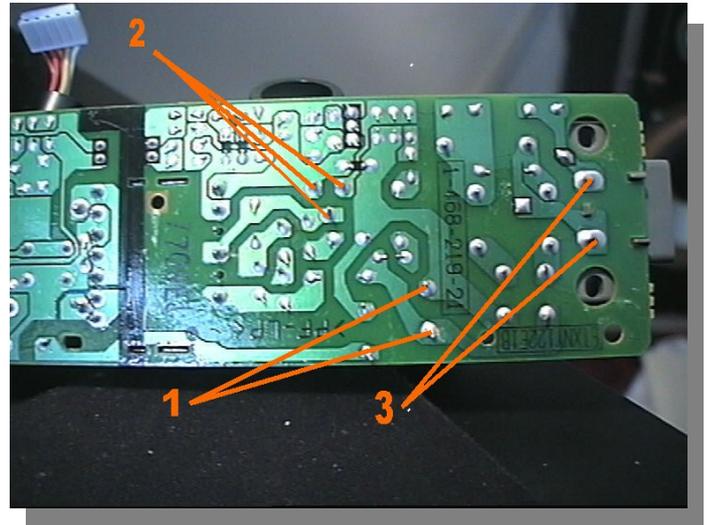
The PSU



L001`s



Q001`s



These PSU`s suffer from vibration over time, the solder around pins of the capacitor (1), and the pins of 240V input connector (3) get a bit crusty and loose joints form. Also the pins Of the FET (2) can get loose as well. When these pins go loose it usually blows the fuse (F001) and in some cases blows the FET (2). Check continuity across L001. This is the main isolation transformer. Replace all parts with originals.

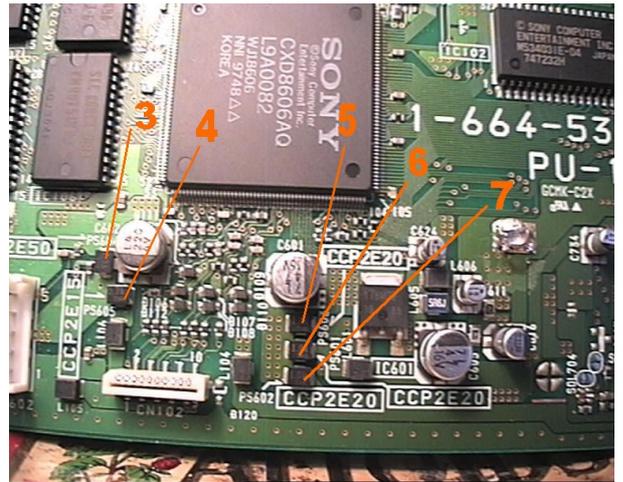
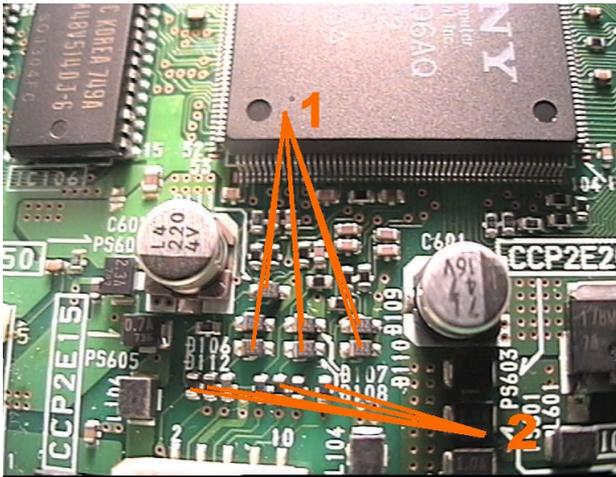
If the machine keeps resetting it self is it probably the PSU and a loud buzzing, the solder contacts around the capacitor pins have become dry joints.

The fuses and Diodes

These fuses control different voltage parts of the motherboard.

- (3) 2.3 amps marked 50. 3.5 volts
- (4) 0.7 amps marked 15. 3.5 volts
- (5), (6), (7) 1.0 amps, marked 20. 8.0 volts
- (1) Zener Diodes D106 – D112
- (2) FB ferrite chokes

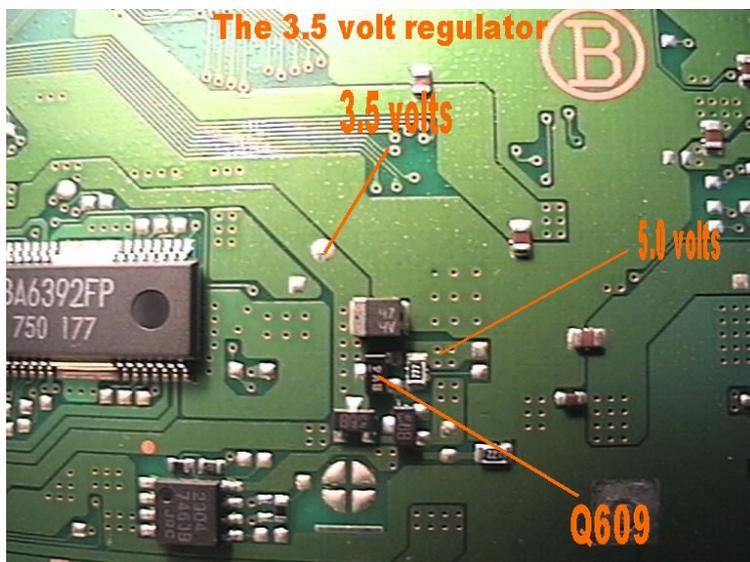
- (3) Is the main supply fuse at 3.5 volts this supplies many chips and related systems?
- (4) This supply's the ports with 3.5 volts. The game pad gets its voltage here. If you get no response from the game pad then it is likely that this fuse can be the cause.
- (5) 8 volts. Supply's the regulator, CD driver, and some of the chips.



The diodes shown here (1) are related to the game pads and ports. If any of these go down for any reason the memory cards will not operate correctly. Check with multi-meter for correct measurement. If you find closed circuit on any of these then replace. Cursor will not show up can be caused by the fuse (4) as well. Also the Ferrite beads can go open circuit causing no controls. Check for closed circuit for correct operation.

CN102 has a tendency to have dry joints causing game pad related problems. Have a close inspection for the pins. Usually a reflux can solve this problem.

The 5volt regulator pictured to the right of the 1.0 amp fuses (IC601) has an 8-volt input. The output goes to some of the chips and to the 3.5-volt regulator (5502) rear.



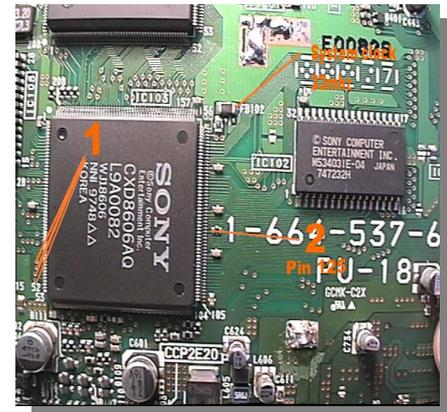
This regulator can cause quite a few problems with all sorts of systems of the Playstation. The noticeable ones are no laser spot and slow boot, no spinning of the disc and so on. Check for the correct output. Q609 has to be replaced if found faulty. Some times marked BV4, BV5, and BV3 transistor surface mounted.

Test Points (all models)

These test points are intended for diagnostics purposes and you will need some test instruments. A good frequency counter and a DMM (multi-meter) will be useful for measuring outputs on these semiconductors.

The CPU

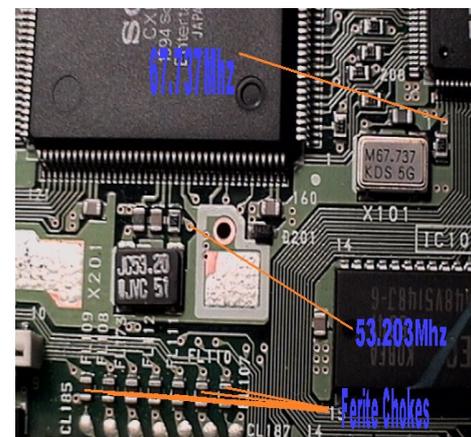
Ok the first thing to remember that a PSX CPU is like most CPU's, it has memory read, writes to and fro memory. An external oscillator running at 67.737 Mhz. Which outputs a system clock of exactly half of the external clock (33.868Mhz). as in the picture (right). This is supplied to other chips. IC102 is the system Boot ROM and this is where the PSX boots up. Data held in this chip like the main boot up pictures, memory card and Audio CD data. When you power up the data is read from this chip and then processed. You can see the data moving to the CPU pin 125(2). It's a good starting point to find out why the PSX doesn't boot up. Like if you have a black screen. Of course



you will need an oscilloscope to see the data. The data being processed is held in the 2 Meg of memory (IC106 to 109). The data lines are addressable RAS and CAS (row address strobe), (column address strobe) and can be seen on a scope. Pins (46 to 49 (CPU) (1). If you have a PSX with a blank black screen and no sound, these test points are very good indicators for diagnosing faults for CPU, memory or Boot ROM.

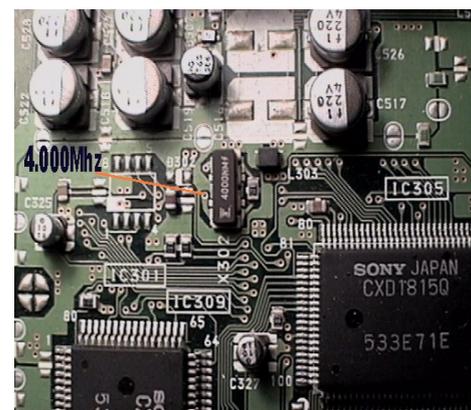
The next thing to check is the GPU (Graphics Processor Unit).

Make sure that you have an output of 53.203Mhz at the test point (above). The oscillator (X201) supplies the GPU. If the oscillator slightly wanders off frequency it will cause the GPU to fail to start up. In some cases I have seen a display of black and white due to this.



This has a memory read and write (CAS) and (RAS) like the CPU has. The memory (IC201), which has 512Kb addressable memory. The SCPH 1002 has a 4Mhz oscillator (below right) supplying the Sub Processor it is good practice to check this one. The symptoms are usually to do with the CD side of things.

It is OK to notice differences of test point placements as it slightly differs to model to model. Once you are familiar with the board you can work around them quite easily.

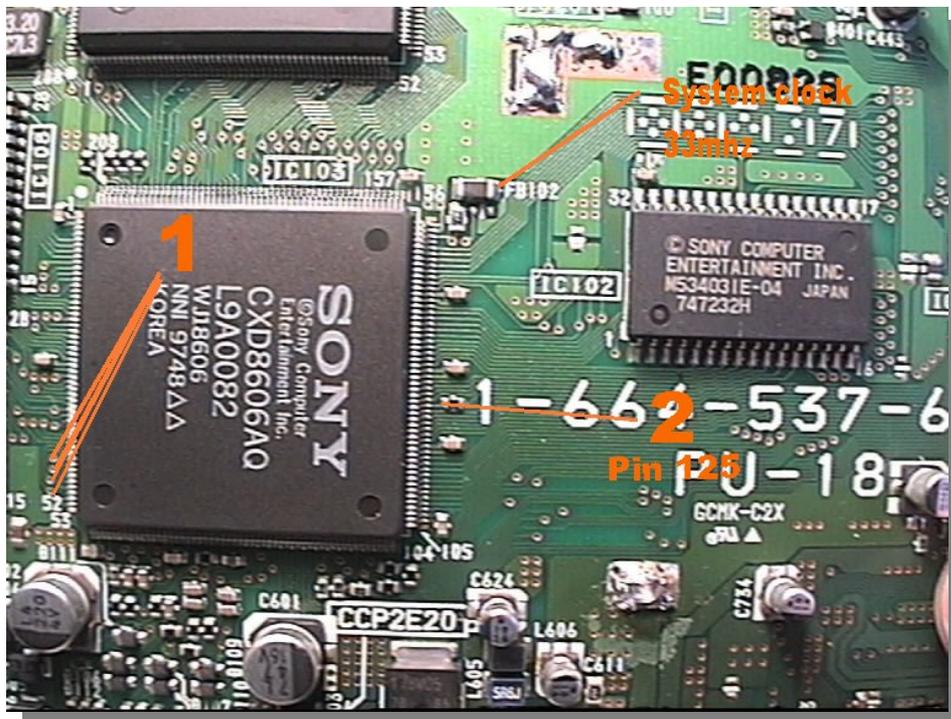


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GPU

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