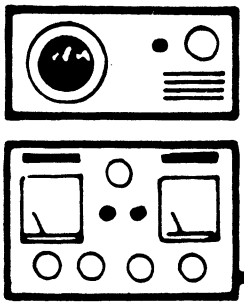

The Serviceman

Detecting intermittents needs time and patience

Taking things for granted is probably the most common single mistake of which we, as servicemen, are guilty. And, while it is easy to be wise after the event, it is one of the lessons which experience should teach us. My main story this month is a typical example.

The story concerns a valve type monochrome TV set, in which the main complaint was intermittent rolling, mainly on Channel 2, according to the customer. (I always treat such information with a certain amount of caution; in many cases the trouble appears to be worse on one channel simply because that is the customer's favourite channel!)

More important was the information that the set would sometimes go for days, or even weeks, without a sign of trouble. Then it would go all temperamental and slip a frame every few minutes for hours at a time — not a situation calculated to encourage relaxed and enjoyable viewing.

Naturally this was no job for the customer's lounge room. Intermittent faults need all the facilities which can be provided in the workshop, including time; time to let the set run and for the fault to show up.

On the bench the set decided it was not going to misbehave; a not uncommon situation with intermittents. So I simply set it up at one end of the bench and made a few routine measurements while it was working correctly. Such information can be vitally important when the fault does appear.

This set used one half of a 6Y9 twin pentode as the video amplifier, with the other half as the gated AGC stage. Signals from the plate of the video amplifier went to the cathode of the picture tube and to the sync separator stage, a 6CS6.

I concentrated on this latter stage, making voltage measurements and CRO pattern observations, and comparing these with the maker's circuit data. As far as I could see, everything was as it should be so I left the set running with the CRO connected to the sync separator input and a VTVM on the plate.

The set ran for several hours without missing a beat, while I busied myself with other jobs. Then it started to slip frames, and I dropped what I was doing and made a quick check on the CRO and meter.

The meter wasn't much help, but the CRO indicated that the sync pulses were varying in height quite significantly and, when they dropped low enough the picture would start to slip a frame, or even roll continuously.

Before I could do much more the fault vanished again, and nothing I could do would restore it. So I simply moved the VTVM to monitor the plate of the video amplifier stage, and went back to the other jobs.

Over the next couple of days the fault came and went in its own capricious manner, with yours truly taking every opportunity to narrow down the fault area. It didn't take me long to suspect the video amplifier. For one thing the CRO indicated that the sync pulses coming out of it were quite unreliable when the fault was present, though they remained constant at the grid. At the same time the voltages around this stage were kicking up and down in a quite unpredictable manner.

The first thing I did was to replace the valve, choosing a time when the fault was present. The fault vanished as the new valve warmed up, but I have been caught too many times to put much faith in such an occurrence. Sure enough, some time later the fault appeared again, ruling out that possibility.

Convinced that it was in the video stage I began a systematic examination of all associated components — screen resistor, cathode resistor, associated bypasses, and so on. None of this was to any avail; as far as I could test them all the components were above suspicion, yet I was convinced that the fault was in this stage.

Having reached such an impasse, I just sat and looked at the wiring, hoping for some inspiration. And that is just what I did get. This set was one of the relatively few designs, during the valve era, which used printed boards and the 6Y9 socket was an appropriate type mounted on the board.

I began to examine it closely and, when I came to the screen pin of the socket, I thought I detected a faint dark ring between the pin and the solder. A check with a jeweller's glass confirmed my suspicion; the pin was sitting in a little hollow of solder which barely touched it in one or two places, but had obviously never wetted it.

I confirmed the situation by exerting gentle pressure on the pin with an insulated prod and established that I could make the fault come and go at will. That was proof enough, and I knew that another intermittent was about to bite the dust.

In fact, I kept the set for another day, just to make sure, but there was never any real doubt in my mind. When it ran the whole day without even blinking, I returned it to the customer. A follow-up call a couple of weeks later confirmed that it was still behaving.

In some ways this fault was almost a routine one, as intermittents go, but there are a few points worth noting. One was the length of time that the set had been in the field, probably 10 years at least, during which time it performed without trouble until the last few months. This is not unusual with dry joints, in fact they almost invariably show up in old equipment and, I suspect, probably result in a significant number of such old units being written off as having reached the end of their useful life.

Another point is that we invariably get caught when we take too much for granted. How often do we trace a voltage up to a socket and take it for granted that, from there on, all is well. Most times it is, of course, but when all else fails don't forget that sockets, of all kinds, can fail.