



# The Serviceman

## *You're never too old to learn — even about valves*

To say that some faults — and their solutions — are unbelievable may sound like an exaggeration, but this was literally true of one job recently. Among other things it emphasises that it doesn't matter how long you have been in the game; there's always a curly one sitting on the shelf waiting to throw you.

It is bad enough when either the symptoms, or the cure, are hard to believe, but when both occur in the one set it really makes you wonder. So take note of this one, it could happen to you.

The set was a portable, monochrome, valve TV set, AWA model P4. The customer's complaint seemed simple enough; the picture had progressively shrunk over the preceding months, until it was now only about half its normal size.

I tipped that it was most likely the 6CM5 line output valve, a common enough cause of these symptoms, so I promptly took a new one from stock and substituted it. This seemed to be the answer because the set came good immediately with a full size picture.

However, the picture appeared to be running at full brightness and contrast, presumably due to the weak, as well as small, picture which had resulted from the sick valve. No doubt this had prompted the customer to turn both controls full up.

So what? All I had to do was turn these controls down. Except that that was where the trouble started. As soon as I retarded either control, the picture was cut to pieces horizontally. And I use that "cut to pieces" phrase deliberately; it wasn't the more conventional loss of horizontal sync, where the picture simply tips over and may even remain faintly recognisable.

Rather, the whole horizontal system seemed to go mad, as though it was being forced to work at some completely foreign frequency. Even the faint sound from the EHT transformer seemed wrong somehow.

At this point I had a horrible feeling that what had started out as a routine "this-one-will-only-take-a-few-minutes" job had suddenly become a monster. Quite frankly, I hadn't the faintest idea what would be the cause. Granted, it would be easy enough to

name half a dozen likely causes of lost sync, but not one that was dependent on the setting of the brightness or contrast controls.

The first thing I did was to put the old valve back in the set. It behaved exactly as before, but seemed to be quite immune to the setting of either control. At any setting where I could still see the picture, it remained rock steady. But the new valve was hopeless.

I fished out the circuit of the set and began looking for some part which might provide unwanted coupling, in the event that a decoupling component had failed. This provided little inspiration and I found myself going round in mental circles.

I decided to make a few voltage measurements around the offending controls to see whether that would provide a clue. In fact, I didn't get very far with this exercise, because just then the phone rang. It turned out to be a colleague who was trying to track down a hard-to-get component, and wanted to know if I could help.

I could, as it happened, and having done him a favour I was not above asking one in return. I nominated the set, described the symptoms, and asked him if he had ever experienced anything like it.

He laughed. "I'll bet," he said, "that you've fitted a Mullard or a Philips valve".

I glanced over to the workbench where the empty carton lay.

"It's a Mullard," I replied, "but what's that got to do with the price of fish?"

"Try an AWV brand."

"Eh? Aw, don't be uncle Willie."

My colleague snorted. "I am not, as you rather rudely put it being 'uncle Willie'. I am trying to help you. Have you got an AWV 6CM5?"

"Yes, I think so."

"Well try it. I'll bet you any money you like it'll fix it. I'll even wait on while

you try it."

It was obvious that the poor fellow had blown a fuse in his main computer. After all, everyone knows that a 6CM5 is a 6CM5 — regardless of the brand. In fact there was a time when they all came out of the same factory.

Best to humour him. All I had to do was fit the AWV valve, confirm that it behaved the same, then gently suggest that he take a holiday — and perhaps see a doctor at the same time.

I found a couple of AWV 6CM5s, fitted one to the set, and switched it on. The set came on at full brightness and contrast (as I had left the controls) and fully locked as before. Now came the moment of truth. I turned down the brightness. The picture stayed locked. I turned down the contrast. It still stayed locked. I tried every combination setting of the controls I could think of, and the picture remained rock steady.

I went back to the phone. My colleague heard me pick up the handset and didn't wait for me to speak.

"Well, are you convinced now?"

It's moments like this that I wish I was one of those blokes with a rapier wit who, with all the odds against him, can come up with a devastating reply which makes the other fellow feel about half size. Unfortunately I'm not and, even if I was, I doubt whether I could have coped with this situation. As it was, all I could manage was "You seem to have been lucky this time".

The tone of my colleague's reply was suddenly rather more serious.

"It wasn't really luck you know. The same set caught me, and I found out the hard way. I don't know why it is, but those sets won't work with Philips or Mullard brand valves. Check it with the rest of your stock if you like, but I'm sure the results will be the same."

Which rather put an end to any argument I may have felt inclined to offer. But it didn't answer the obvious question: exactly what was the nature of the malfunction and why was it caused by valves of a particular brand?

(I did, in fact, check my stocks later, and confirmed that what he said was true.)

We both agreed that it was almost certainly a case of the valve going into some form of spurious oscillation — hence the “cut to pieces” effect I had noted — but what really puzzled us was why it seemed to be tied in with the brightness and contrast control settings.

We finally evolved a theory which, for the want of something better, will have to do for the moment. When the picture tube is running at full brightness it is drawing maximum current from the EHT supply and, therefore, would be producing the maximum damping effect on this supply. In these circumstances, the valve was probably too heavily loaded to enable it to take off. But once the brightness was turned down . . .

But why did the valve take off anyway? There seems little doubt that the two brands are not identical, but which one is “wrong” — if that is a correct term — is another matter. Also, it is inevitable that the AWA TV set was designed around AWV valves with whatever minor differences they contained, relative to the Philips or Mullard versions.

Unfortunately, whatever these differences were, they were sufficient to tip the scale between stable and unstable operation. Which seems to suggest, in turn, that the set did not have a very great safety margin of stability, even though it may have appeared adequate in the original design.

All of which involves a fair amount of speculation, but that is probably as close as we shall ever get to the real story. In any case, with the valve scene rapidly running down, the precise details become largely academic.

On the other hand, from a practical point of view, servicemen will have to try to keep these sets going as long as they can, using what valves they can get, from rapidly dwindling sources. Hopefully, my experience will at least alert others to the nature of the fault. After that, you're on your own.