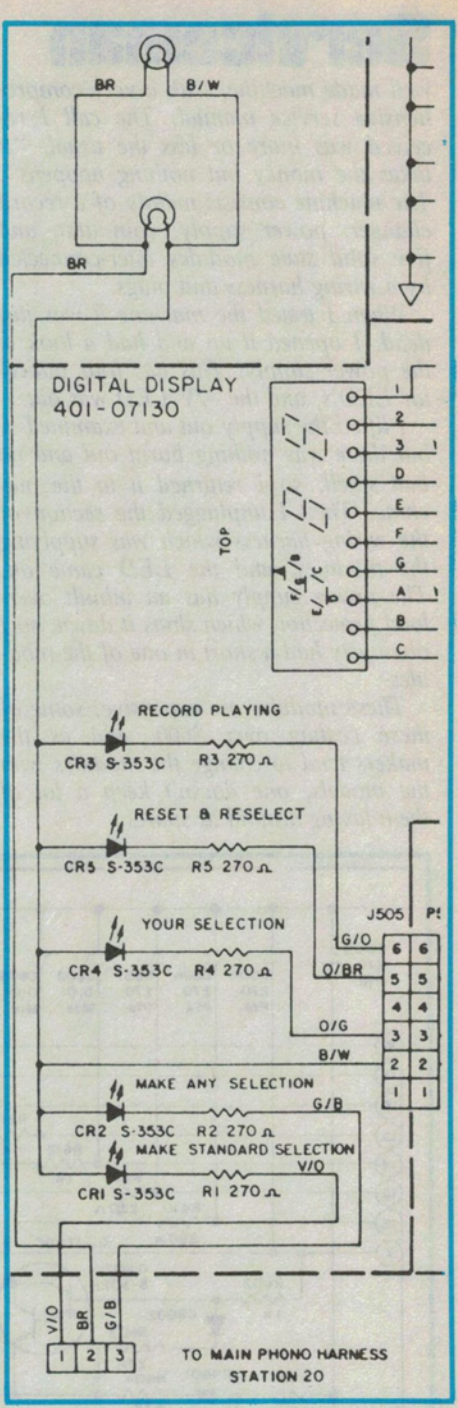


The console section of the circuit for the AMI R82 juke box — read it together with the circuit overleaf.

Anyhow, enough of my philosophising. Let's hear the story from the man himself:

Your article a few months ago, which made the point that sometimes a simple fault can cause a lot of work, has prompted me to write. I have had a case of this recently which is a bit off the beaten track, and I thought you'd find it interesting.

The machine involved was a juke box, an AMI R82. This is quite a large and

Serviceman

well made machine, with a very comprehensive service manual. The call I received was more or less the usual: "It takes the money but nothing happens". The machine consists mainly of a record changer, power supply, coin unit, and five solid state modules inter-connected by a wiring harness and plugs.

When I tested the machine it was just dead. I opened it up and had a look at the power supply. This has four indicator LED's, and the –7V LED was out.

I lifted the supply out and examined it, but there was nothing burnt out and no bad smell, so I returned it to the machine. Then I unplugged the section of the wiring harness which was supplying the modules, and the LED came on. The power supply has an inbuilt overload protection which shuts it down, so I obviously had a short in one of the modules.

These modules are expensive, some of these costing over $600, and as the makers tend to change the modules with the models, one doesn't keep a lot of them laying around as spares.

As the supply lines ducked in and out of the modules via the wiring harness, I decided to replace the machine and make it a workshop job. This is rather a big job, as records have to be brought up to date, the volume control changed, and a fair bit of fussing with extension speaker connections.

I had the machine in the workshop for a few days before I got around to it, and after about an hour or so of tracing wires and unplugging plugs I found that the last module supplied by the —7V brown wire was the "credit computer". At this stage I mentally kicked myself, because I had a spare one of these. I therefore plugged in the spare, switched on the machine, and stood back quite confident that it would work.

To my complete surprise the –7V LED still stayed off. This really set me back on my heels, as it didn't make sense.

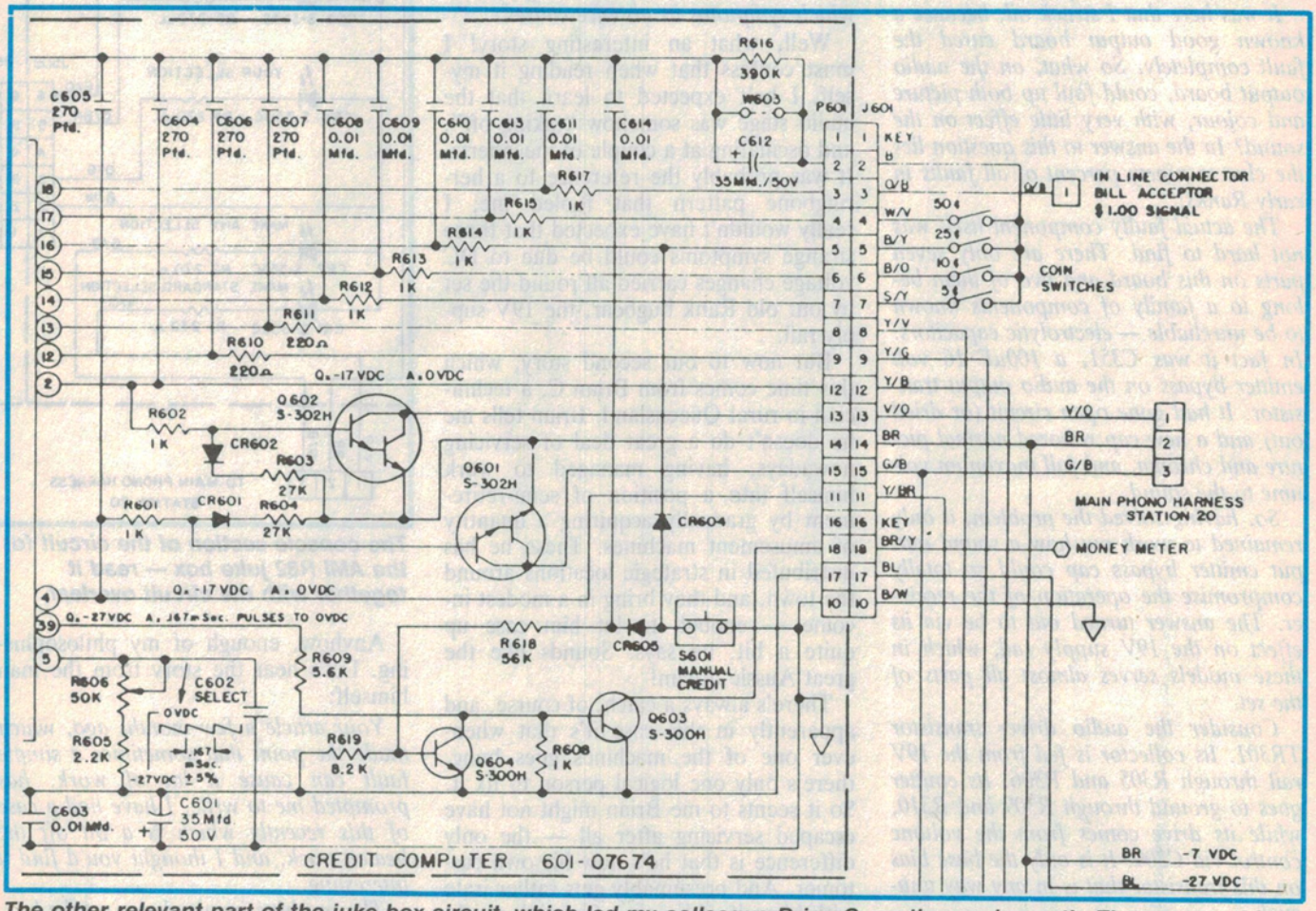
There is a three-pin plug coming from this module, which supplies two LED's indicating that credit has been established. Just because I was at my wit's end, and as an idle thought I unplugged this plug, switched the machine on, and it came to life. On closer examination I found that only two wires supplied the LED's, and the other was –7V to two general illumination bulbs (dial lamps) which lit up the ten pushbuttons.

Both bulbs were blown, so I dismissed them and started to check the wiring. The brown wire and black return passed under the midrange speaker housing, so I lifted this out expecting to see the housing had cut through the plastic insulation. But this was not the problem, either.

I had checked the brown wire with an ohmmeter, and it was definitely shorted to the black return. I had left the ohmmeter clipped to the plug, and on unscrewing the bulbs to test the sockets the short disappeared. In fact, one of the bulbs had shorted internally.

Like most such cases it's easy to explain things afterwards. Being driven from a DC supply, the bulb must have arced over and fused when the filament burnt out. This caused the power supply to shut down. At that stage the weld would cool down, and become permanent.

What made this simple fault so hard to



The other relevant part of the juke box circuit, which led my colleague Brian C. up the garden path. The strange things we servicemen have to find our way around — the hard way!

find was the fact that the circuit diagram showed the connection between the bulbs and the –7V power supply as being directly via the brown wire in the wiring harness. If this was the case, unplugging the credit computer module wouldn't have effected the fault; it would have stayed there.

But because the connection actually went via the credit computer module connectors, rather than direct, unplugging the module made the fault disappear. It was this that led me to believe that the fault was in the module, rather than where it had really occurred.

So to sum up, I had to spend a lot of time and work to fix a fault that should have been fixed in minutes. But then, who would expect a misleading error in the circuit diagram, whoever heard of dial lamps shorting internally, and whoever heard of driving the lamps for general illumination from a logic supply?

Thanks Brian, that was a lesson for all of us — not to assume that a manufacturer's circuit is gospel. I've never had to try and fix a juke box myself, but it sounds like they're subject to the same kinds of problems you find in more familiar equipment.

And that's all for this month. Hopefully by next time I'll have something interesting myself to tell you about, from my own workshop. This modern gear with its ICs is too reliable — in the good old days they really thought about the poor old serviceman, and built in all kinds of unreliability!

Still, when the new gear does go down, the faults can be even harder to track down than before — and more challenging to work out, when you have found them. So one way or another, there's generally still lots to learn and talk about. I hope you'll join me.