

# FROM THE SERVICEMAN WHO TELLS

Only last month I had something to say about new tricks—on that occasion it was one for repairing wedge-type dial drives. Another new one intrigued me last week. It is not strictly radio servicing, but I found it interesting, nevertheless.

**A** FRIEND of mine has a car of popular American make, which quite suddenly began to give trouble. The motor ran smoothly under most circumstances, but faltered badly at certain critical speeds and would not accelerate evenly. The plugs and distributor points were checked and found OK and it seemed that the trouble had something to do with the fuel supply.

Because the job was due, anyway, my friend dismantled the carburettor, cleaned the jets, checked the petrol pump and cleared out the fuel lines. But the engine still faltered on occasions, and a more thorough check of the ignition system failed again to reveal trouble there.

My friend has a rudimentary knowledge of radio and thought that it might help solve his problem. So he borrowed a vibrator powered receiver, perched it on the back seat and connected it up to a separate accumulator. The aerial wire was led through and draped above the engine.

## TERRIFIC RACKET

When the engine was started up, there was naturally a terrific racket from the ignition system, but that was part of the scheme. The car was driven out on to the road and put through its paces. You've guessed it! Each time the motor faltered, there was a break in the continuity of noise from the receiver. The trouble was clearly in the ignition system.

Ultimately he traced it through to a wire in the distributor which was broken inside the insulation. The wire was flexed by each movement of the automatic spark advance mechanism, and it opened up completely at certain critical positions. It was a simple matter to replace the lead.

A rather cunning stunt by a non-radio man, and one of those things which can be tucked away in the mental files for future reference.

## CONDENSER BREAKDOWN

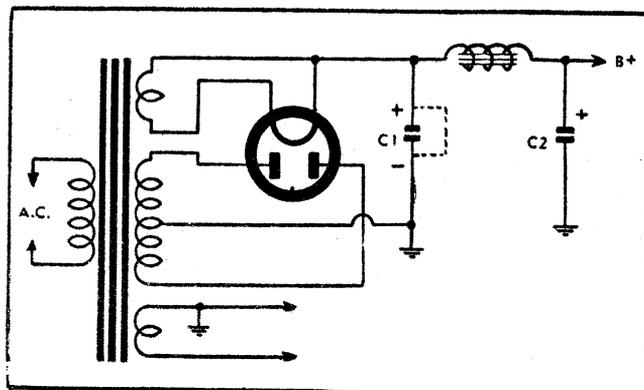
There are two causes for receiver breakdown which servicemen meet with the regularity of the sunrise. The ease with which the troubles are recognised and corrected contrast with another one I came across—one that had me puzzled for quite a while.

A breakdown in the first filter condenser is such a common fault that I can afford to generalise. Mrs. So-and-So rings to say that the receiver failed to come on in the morning and that working all the knobs produced no result. She tried it again a half hour later but the set was still dead.

Readers of these columns will be doing a public service if you acquaint your friends with the futility of leaving an inoperative receiver switched on for any length of time, or of expecting a breakdown to correct itself mysteriously during a half hour of idleness.

In one case out of a hundred that may happen. In the other ninety-nine cases damage to the receiver may be multiplied. A serviceman will almost certainly switch on a dead receiver as

Overheating in the plates of the rectifier, or flashing over, almost certainly denote a breakdown in the first filter condenser. Switch the set off immediately to save both rectifier and power transformer



his first operation, but he knows the danger signs and always has his hand ready on the switch while he watches the valves warm up.

If the first filter condenser is at all weak, it will generally break down when the receiver is first switched on. One can hardly blame it for doing so in many cases. If the receiver has no initial bleed across the high tension supply, the condenser receives practically the full peak voltage of the power transformer secondary. You can work it out for yourself at 545 volts for a 385 volt power transformer. Let the mains voltage be a little high and the figure looks alarming against the 525 volt peak voltage rating of the usual electrolytic condenser.

## DIRECT SHORT

So the condenser proceeds to break down and becomes a direct short across the output of the rectifier valve. Mrs. So-and-So has walked across the room to attend to the porridge, expecting presently to be greeted by the voice of her favorite early morning announcer. Or may be Mr. So-and-so may have switched the set on and forthwith busied himself with the utensils for his morning shave.

Presently the silence becomes apparent and one or other of the marital partners strolls over to the radio, twiddles the knobs and realises that something is amiss. According to the amount of genius or inspiration the

receiver is bumped, the aerial wire pulled about, the power switch flicked on and off a couple of times. Finally the set is switched off to the accompaniment of suitable comments.

But during all that time a royal battle has been going on in the set between the power transformer and rectifier valve. With its output circuit shorted, the rectifier passes very high current which heats the plates to red heat. That is one of the danger signals a serviceman looks for when he peers behind the receiver after switching it on. Never let a set run if there is the slightest suggestion of flashing or overheating in the rectifier valve. Find the trouble and save your valve.

But back to the battlefield. The rectifier plates glow red, the filament becomes hotter than ever and the emitting surface of the cathode begins to disintegrate. A few moments of this treatment and the rectifier will for ever after show "Low emission" on the valve tester.

## STERNER STUFF!

In the normal way the filament gets so hot that it open-circuits and the battle is over. The serviceman finds a dead rectifier valve and a shorted filter condenser and, being in business for that very purpose, he is happy to replace both and charge accordingly. The delay in switching off the set costs the owner a rectifier valve and boosts the service charge by a corresponding amount.

But occasionally one strikes a rectifier made of sterner stuff. Though the plates are glowing red and the emission is steadily falling, it hangs on and continues to pass a few hundred extra milliamperes. The power transformer begins to get hot about it, the paper insulation and the varnish smoulders and exudes the incomparable and characteristic odor which excites any electrician.

Turns begin to short across in the transformer and within a few moments it is belching smoke like a chimney and the acrid fumes of burning varnish condense all over the chassis in a brown gluey mess. By the time Mrs.

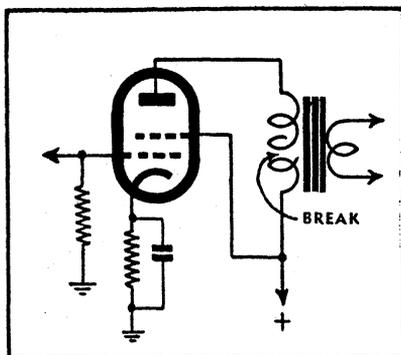
So-and-so smells something burning and opens the switch, a power transformer and its installation costs have to be added to the account—and to the serviceman's turnover.

Nor am I being morbid. The sticky fumes can penetrate coils, IF transformers and every odd corner of a chassis. And no Paris perfume can linger longer than the odor of burning power "tranny." I have seen more than one instance of a receiver having to be dismantled completely, the chassis resprayed, the components individually cleaned, and the whole job rewired from start to finish. Only when the inside of the cabinet has been cleaned and resprayed is the set fit to take its place again in the respectable lounge-room.

### FIRST FILTER RATING

Getting back to more technical ground, I always make a practice of replacing the first filter condenser with a 600 volt type, when available. The extra cost is very small when compared with the safety factor it affords. If there is any suggestion of high mains voltage, connection can be made to the 260 volt tapping on the power transformer, which will reduce the peak voltages without noticeably affecting the performance of the set.

Yet another course which will increase the safety factor is to use a 5V4-G or 83V indirectly heated rectifier and insert a 5-watt resistor of about 200 ohms between the cathode of the rectifier and the input to the



A broken down loudspeaker winding will result in excessive screen dissipation and probably a ruined valve.

filter system. The slower heating cathode gives the other valves a chance to draw current before full voltage is applied to the filter condensers.

Failure of the second filter condenser has hitherto been attended generally by no very serious complications. The resistance of the usual field-coil filter system is sufficient to limit the short-circuit current to more reasonable proportions. The rectifier, power transformer and field coil could become hot enough to do damage, but the process is usually slow enough not to reach these proportions before the set is switched off.

With low resistance choke filtering a breakdown in the second filter condenser would impose a heavier load on

the rectifier but, fortunately, the peak voltages with the now-popular 285 volt transformers are not likely to endanger even a 525 volt electrolytic.

### SPEAKER OPEN CIRCUIT

The second common fault I referred to is failure of the loudspeaker output transformer.

When this happens the pentode output valve is left with full voltage on the screen and none on the plate. The electrons, having nowhere else to go, are all collected by the screen, which proceeds to glow a bright cherry red. That is another danger sign a serviceman looks for during his first inspection of a set.

The results of this are generally not as drastic as trouble in the power supply, but they can still mean something in terms of £sd. Even a couple of minutes operation with the screen glowing red may not harm some output valves and, once the necessary repair is made, they operate again quite merrily.

But it sometimes happens that severe overheating of the screen and adjacent grids by this unnatural condition causes gas to be driven out from the metal wires and the valve begins to show the peculiarities of a gassy valve. Its demise, if not immediate, is at least hastened.

Milk, long regarded as good for teeth because of high calcium content, also helps prevent decay, it is now claimed.

# Here it is!

# THE CD-31

