

VINTAGE RADIO

By JOHN HILL



Collecting & restoring horn speakers

One of the more collectable items as far as vintage radio treasures are concerned would have to be old loudspeakers. This month, we give advice on collecting and restoring these interesting relics.

Early radios had separate horn speakers which usually became lost from their respective receivers as time progressed. Occasionally, old radios and old speakers appear in antique shops as separate items but rarely do they stay together as a matched pair.

As a result, I have half a dozen horn speakers in my collection that have long since lost their original receivers. These speakers have been acquired through a number of sources over a period of time. Horn speakers are comparatively rare and generally speaking, they are now hard to come by.

Half of the speakers in my collection have come from antique dealers. Naturally, when buying from dealers, one has to pay top price, for most of these people work on a profit margin of 100% or more.

On the other hand, it takes a lot of time and travelling around to locate some of these scarce items and if that time and effort is taken into account, then perhaps dealer prices are not so bad after all. When all is said and done, antique dealers are entitled to make a reasonable profit on the goods that they sell.

Most antique dealers have a list

of prospective customers who are interested in a multitude of different things. When one collects rare items such as horn speakers and the like, it's a good idea to be on a dealer's list. The dealer is the one with all the contacts and can give his client a call if he finds something interesting. If the client doesn't like what's on offer he is under no obligation to buy.

In fact, when one takes everything into account, it must be cheaper to buy from a dealer than to spend countless hours looking for things yourself.

Burnt-out windings

Unfortunately, not many horn speakers work when you first come across them. They now average out at around 65 years of age and a lot of things can happen to a speaker in that period of time. The usual fault is that they burn out one of the pole piece windings and this must be re-wound if the speaker is to work again.

Most horn speakers were designed for use with the low-powered battery receivers of the mid-1920s era. When used as they were meant to be used, they gave very little trouble. But if they were used in other circumstances, such as with more powerful mains receivers, these ancient speakers simply could not take the strain and burnt out. Over the years, it would appear that a good many have been given this torture test and have failed miserably.

Making it work again

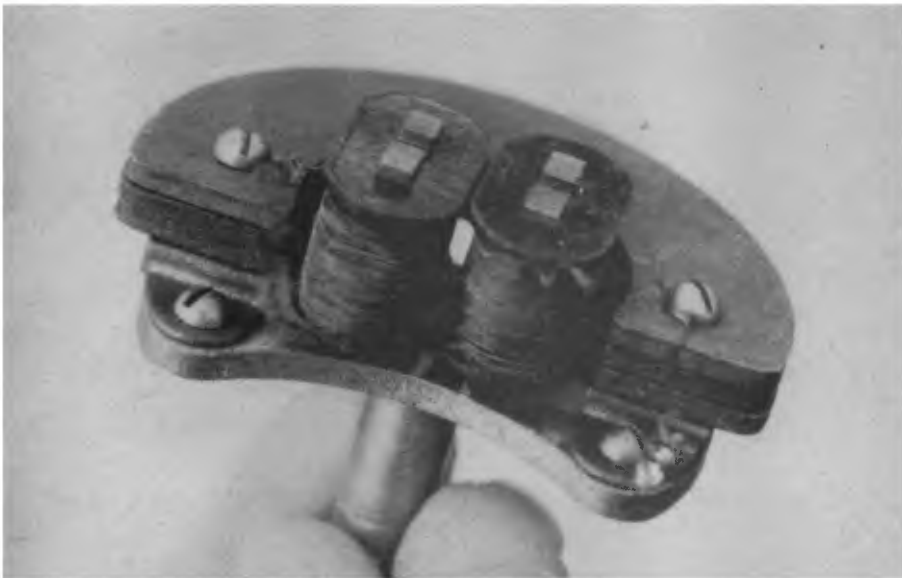
Now some collectors don't care much whether their collection is operative or not. In some cases, if it



Horn speakers have an adjustment which varies the spacing between the pole pieces and the diaphragm. This adjustment affects both the tone and the volume.



These parts are all from a dismantled Amplion driver. The body appears to be made of moulded ebonite (hard rubber). Note the pole pieces at left.



Here is a close-up view of the pole pieces. Pole piece rewinding is a very tedious job because the poles require thousands of turns of very fine wire.

looks the part then that's all that matters.

I'm not like that and everything in my collection is in working order. Mind you, some items work better than others but everything on display is a goer. Therefore, if I buy myself a burnt-out horn speaker, my first job is to get it working again.

Dismantling a horn speaker will soon show that it is nothing more than a large headphone with a trumpet attached. All the units that I have seen are based on early headphone technology and consist of two 1000-ohm pole pieces which

are bolted to a permanent magnet. The pole pieces are in close proximity to a thin metal diaphragm which vibrates in accordance with the signals that pass through the coils.

When inspecting the innards of a burnt out horn speaker, you'll invariably find that everything looks to be in good order. There are usually no obvious signs of damage and the only thing wrong is that the fine wire in one of the windings will have a break in it. It's worth noting that in every speaker I have repaired, only one of the windings was open. Checking for open cir-



This English-made Amplion horn speaker is the best performer in the author's collection. Notice the two connecting terminals on the base.

cuits with an ohmmeter will soon locate the faulty winding.

The reason only one winding burns out is that the break will occur at the weakest point of the windings when an overload is placed on the speaker. This weak spot acts as a fuse and protects the other winding before it has a chance to burn out. It is most unlikely that both windings would blow.

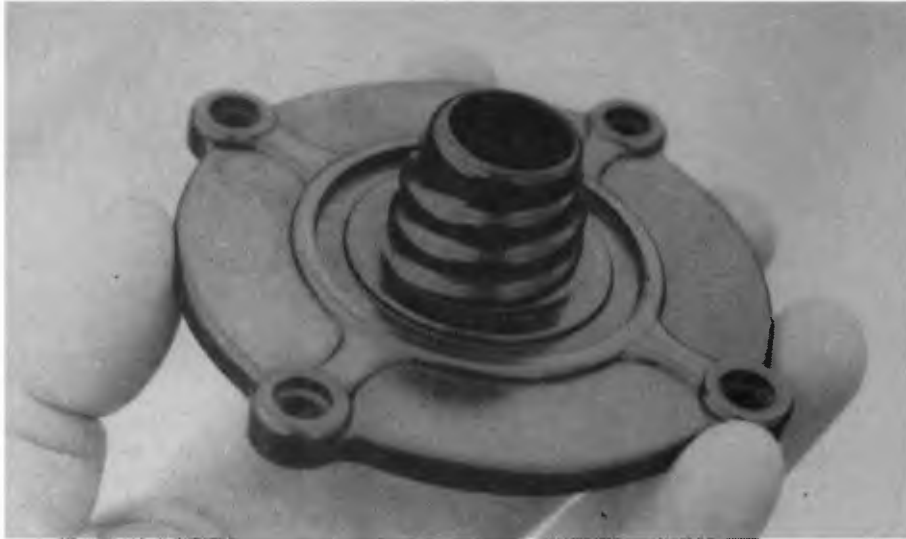
To repair the damage, the faulty pole piece coil must be removed and rewound with a similar gauge of wire and in the same direction as the original winding.

While the advice in the previous paragraph sounds simple enough, it is quite difficult to wind thousands of turns of fine wire without breaking the wire at some stage of the operation. Such a tedious rewinding job really requires the use of a winding machine of some sort, even if it is a makeshift one using a vice-held hand drill to spin the coil former.

But no matter how you go about it, it is a delicate operation and far from easy.

My first rewind

The first horn speaker pole piece coil I rewound was an absolute



Amplion horns simply screwed onto the driver. Note the two-start thread — not bad for 1925!

disgrace to say the least. I used a slightly heavier gauge of wire than in the original and I simply wound it on by hand. As a result, I ended up with at least three joins in the wire because of breakages and a total resistance of about 200 ohms instead of the 1000 ohms of the original winding.

However, I decided to see what would happen if this hideous looking hand-wound coil was put into service, so I replaced the coil in the speaker with a one-watt resistor to make up the difference in resistance. The result was a working

horn speaker that was every bit as good as other units with two good windings.

My next attempt was a much better effort. This time, I used the correct gauge of wire and ended up with a coil resistance of about 900 ohms. The restored speaker has now given hours of trouble-free service.

I tried something different with the last horn speaker I repaired. Reflecting on my first miserable rewinding attempt, I suddenly had a great idea! What would happen if the burnt-out coil was simply bridg-

ed with a 1k Ω 1W resistor? At the very least, it was worth a try. Just how well the speaker would work on a single pole piece was the question about to be answered.

After implementing the simple repair, the old horn burst into life and worked quite well — so well in fact that I don't think I'll ever bother to rewind the offending coil.

No doubt such a cheapskate repair will cause many readers to throw up their hands in horror. But before you rap me over the knuckles for suggesting such a dreadful thing, first consider this.

Horn speakers are so lacking in tonal quality that there is little pleasure involved in listening to one. They sound harsh and metallic and their frequency range is very limited indeed. Bass is totally non-existent and 10 minutes of listening is about enough for anyone. They really are awful things to listen to.

What I'm getting around to is this: very few collectors would spend much time listening to their horn speakers. They are great for display purposes and it's an added bonus if they work. But no matter what you do to them they will still sound dreadful. If bypassing a burnt-out coil with a resistor gets an old horn speaker working again without additional expense, then such a simple trick must be worthy of consideration.



Although unrestored, this little Brown horn loudspeaker works quite well. A repaint job will restore the speaker to as-new condition.



Not all horn speakers look like horn speakers. This particular unit is of German manufacture and is housed in a decorative diecast cabinet.



Amplions with a timber flare would be the ultimate collectors' items as far as horn speakers are concerned. (Photo courtesy Orpheus Radio Museum, Ballarat).

Horn speaker guises

As a matter of interest, not all horn speakers look like horn speakers. Many are disguised in various ways and some are specially shaped to fit into decorative cabinets and boxes. This particular type of horn speaker is referred to as an "internal horn speaker".

But no matter how dressed up these internal horns may be, one only has to listen to know that it's a horn speaker in disguise. These ancient speakers have a characteristic harsh sound that cannot be mistaken for something else.

I have also done other sneaky things to horn speakers, apart from the resistor bypass trick mentioned earlier. One of the speakers in my collection is a mismatch of two different types although not many would be aware of this fact. Only a collector who was fairly familiar with horns would pick it up.


This mismatch is a combination of a Brown driver and a very fancy flare of unknown make. Collectively, the two odd parts work as well as any other horn speaker in my collection and it looks particularly good even though it is a hybrid.

A lot of antiques are in fairly poor condition and most horn

speakers are knocked about and in a rather sad state. I have only one, an Amplion, that was in good original condition. Usually, a 60-70 year old horn speaker has a dented flare, up to 50% of its paintwork is chipped off, and it is burnt out.

Inevitably, these battle-scarred old speakers will look better after a panel beat and repaint job. Unfortunately, repainting will often cover up the maker's original name transfer. Brown and Sterling speakers, in particular, fit into this category but often the name has faded so badly it is hardly worth retaining and repainting doesn't cover up anything worthwhile.

When repainting an old horn speaker, a semi-gloss surface seems a more appropriate way of finishing them. They lose some of their appeal if they are too bright and shiny.

Whether horns or early cone speakers, these curios are excellent collector material and are much sort after. They make interesting displays and attract a lot of attention. However, their sound reproduction is another matter and just a few minutes of listening is enough to make one aware of how much loudspeakers have improved during the past 60 years. 



This Sterling "Baby" horn speaker is one of the few in my collection that didn't require rewinding.