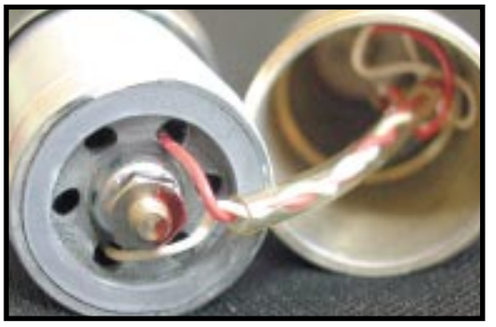
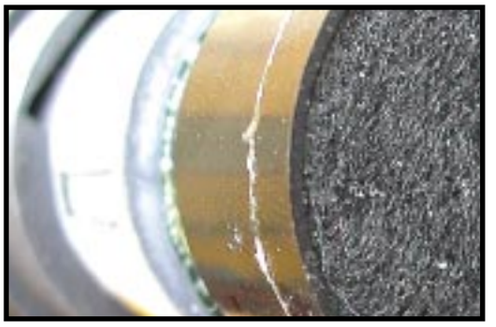
Maintenance – preserving what you have

We continue our look at studio equipment that is easy to look after: what you can do, what you shouldn't do, and when you should call for a grown up. KEITH SPENCER-ALLEN contemplates the microphone.





IT USED TO BE RECKONED THAT 60% of all studio problems were due to cable faults, even if that wasn't how they first showed up. The main source of these was mic cables and while you cannot prevent the occasional problem some form of inspection regime helps a lot. Studios with lots of cables might consider circulating them through the workshop on a continuous basis, perhaps even numbering them.

Poor connections to the XLR plug are the most likely fault. The prime cause is the loss of cable retaining screws or other damage to the XLR connector that allows movement of the cable within the connector. Much of this can be seen when winding up cables at the end of a session and that cable should be set aside for repair. A good cable testing box is also useful, where both ends of the cable are plugged in and LEDs indicate the integrity of the connections, and the polarity, while you waggle the cables. This is better than having to interrupt a musician in full flight to replace a faulty cable.

If you have a large collection of mics, there may be a few wired with a different pin standard and sometimes these are difficult to rewire internally. The easiest solution to that is to create a special cable for that mic with the correct wiring achieved in the XLR shell. However, there is always the chance that the cable might be used for another mic by mistake. To prevent this I make up very short XLR cables in red or yellow and colour the XLRs as well, to house the cross-wiring and then just use standard mic cables attached to it. This 'convertor' then lives with the mic and is less likely to be used in error.

Wiring XLRs does need some practice if you are to make good reliable connections. Some modern designs have helped a lot but it is a skill worth acquiring. You need to be quick and accurate with the solder but use a soldering iron that is small enough but still gets hot enough.

If you're dexterous, have a light touch and a big collection of tiny screwdrivers then the opportunity to care for microphones is also yours. More than with almost any other item of gear, it is really important to be certain where your limits lie and know what you should leave to the specialists. Venturing over this line can be expensive, or render the mic damaged beyond repair.

Most microphone problems are simple wiring faults and in theory are easy to correct. The most common are fractures in the wires that connect to the interior of the XLR, or at the other end, where stiff wires are used to connect to a capsule assembly that is in a rubber mount. Resoldering can be fiddly but not difficult but getting access to the interior of the mic may be harder. Most older microphones were designed with the knowledge that they would have to be disassembled at some time – the traditional large diaphragm Neumann mics are quite simple to open up once someone points out the way the bottom ring unscrews. Others are accessible but trickier, and some need to go back to the specialists for everything. Some of the newer manufacturers of mics are less clued-up on this aspect, particularly the lower cost brands. A combination of tiny soft-metal screws and wider manufacturing tolerance can make reassembly very tricky.

Without expertise, I wouldn't recommend touching any classic tube mic. Because of their age, and the deterioration of suspensions, valve bases, and components, problems can originate in the oddest of areas and are way beyond most users. Capsules are a frequent weak point and while it is tempting to clean decades of muck off a gold foil diaphragm by following the instructions and using distilled water with a very soft brush, the sinking feeling when the gold just falls away from its backing is just terrifying. Don't do it!

Specialists know the history of these old mics, what spares are available, and what might need to be adapted because certain valves or other parts just aren't available anymore. Some old mics have internal options that tailor the response for certain uses, for example. Without the handbook you won't know about these things but the specialists will.

Most of these old mics also have separate power supplies and these need checking periodically from a safety point of view because the expected standards of electrical compliance have changed. You also don't want to lose any clients.

With regard to general microphone care, the most obvious point is that they are delicate instruments and a hard knock has no beneficial effects. The second

point to consider is moisture, and there are two ways of looking at this.

Vocal mics are the recipients of a lot of hot moist air. This will cause moisture to settle on cooler surfaces, such as the microphone diaphragm. Older condenser microphones hated moisture and would start making frying sounds or they would stop working. It's a problem for modern versions too and most mics don't like the long-term effects of moisture, which can lead to corrosion of some diaphragm types.

Furthermore, a layer of condensation on a diaphragm acts as a magnet to airborne particles that can remain adhered to the diaphragm after the moisture has gone.

Some recommend packing delicate mics away with drying agents (silica gel) after use to dry out the mic fully, and this may be useful for those more precious oldies. However, unless that store is a similar temperature to the studio, condensation will form on the mic as soon as it enters the warmer studio.

The counter argument is that mics should be left out in the area they are used in, provided that it is not perpetually humid, and left to dry naturally. My experience tends to favour this latter approach because I've found that tube mics create their own warmth, which dries the capsule area, so I'd leave the mic powered up after the end of a session to dry it, and then maybe pack it away. I'd bring it out and power it up a couple of hours before it is needed again.

Tube mics have a few oddities that those of us brought up with solid state mics and phantom power don't even think about. A tube mic and its power supply should be powered up only when fully connected. If the power supply is turned on without the mic connected, turn it off and wait a few minutes because it takes a while to return to a 'neutral setting'. Equally, when a tube mic has been finished with, leave it to 'relax' with the power off before moving it. The mics are more delicate when powered up, and when powered off but still warm.

Regularly used vocal mics will need to be checked at intervals for deterioration due to build-up of deposits on the diaphragm. I suspect that regular users will hear a less bright response from the mic before any serious deficiencies occur but it may need cleaning every few years.

Windscreens and windshields also need cleaning quite frequently for reasons of hygiene using whatever the manufacturer recommends.

Should a mic have to returned for specialist repair, you may be without it for some weeks and if this is scheduled maintenance, you may want to arrange this for quieter times. If you use ribbon mics a lot, you will need to adjust the number you have according to the fact that unless you are very lucky, due to their fragility at least one will be off for repair at any one time. They sound great but everyday wear and tear takes a toll. If you use them as stereo pairs, mics should be returned in pairs with a note to that effect to help match them.

And a word of caution for those who want to use some of those old RCA mics. While they do create a very stylised sound, they also have any amazingly strong magnetic field surrounding them and should be kept metres away from any magnetic media. ■

Racks

Your 19-inch racks need to be inspected periodically, particularly those that sit in the control room. Ideally nothing should change but there are possible problems that can occur.

- **If the equipment in the rack changes, such as a lot more digital products being added, increased heat and dust from fans can build up.**
- **You need to check that the rear panel connectors are fully located and pushed home. Removing or replacing one unit from the rack can partially loosen the rear connectors on the units above and below it, particularly if the rear wiring is arranged in looms. Particular attention needs to be paid to jacks, IEC mains plugs and non-latching XLR-type plugs. They need to be checked manually because the most likely problem is a poor connection rather no connection.**
- **Check that all cable looms are still fully supported. While an excellent job may have been done on first installation, changes made in a hurry can weaken the reliability of the fixing leading to pressure on individual connections. I had a plastic cable restraint fracture that led to weeks of intermittent failures on a patchbay at the top of a 19-inch rack until the real cause was located.**
- **Visually check the mechanical security of any very heavy items, such as power supplies or large power amplifiers. While such items would normally have front and rear rack support, make sure it's there and working because most standard racks will buckle, sooner or later, under heavy loads.**

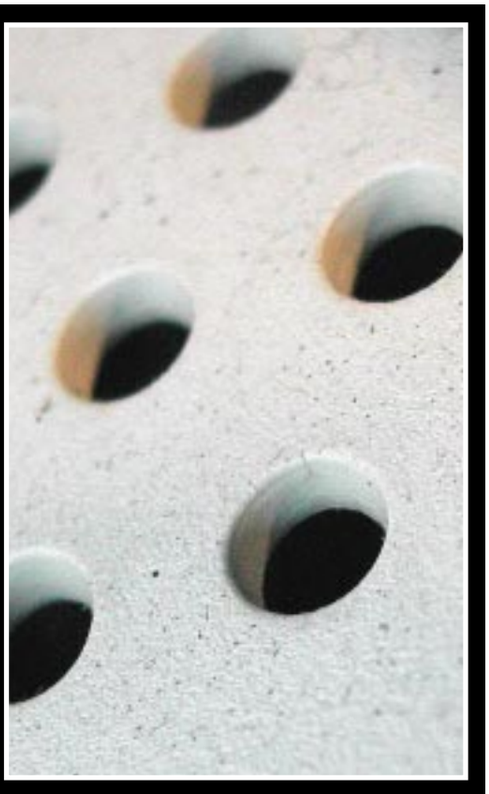
Dust

Dust, that special mixture of fibres, dead skin, building residues and airborne impurities, appears to be a growing problem for studio equipment. Dust has always been with us but equipment is now being used in more open situations, such as homes and offices, that don't have the more controlled air environment of regular studios with their conditioning and filtering. And the problem can be very local. A few years ago a specialist air-con company, familiar with central London, showed me a map of the area coloured to indicate which areas would require what level of air filtering for a studio installation. Even adjacent streets could be significantly different.

That was for large installations but the problems remain at whatever level you operate at. For most, general cleanliness may be sufficient – the use of those mini-vacuum cleaners to remove dust from equipment before it has the time to ingress into switches, disk drives, consoles. Even using any supplied dust covers does seem to have a long-term effect in prolonging equipment life.

However, there are hot spots that need extra attention – fans. Because a fan 'pushes or pulls' air through a piece of equipment to cool it, a far higher amount of dusty air passes through it. The rotating fan also extracts/attracts material from the passing air and once one bit is there it just builds up and up. The performance of the fan blades is gradually reduced as the fine dust changes their profile. Dust around it increases turbulence in the air reducing efficiency and increasing noise. Eventually the fan will be doing very little more than making noise and at the very worst it will come to a complete standstill with possible serious consequences.

Regular cleaning of any equipment with internal fans works wonders. Computers are worth checking and cleaning because most don't have a direct path for the airflow and dust can build up anywhere. This is due to them having fans to extract air from the casing, plus a smaller fan mounted inside the casing to cool the larger processors. Some brands use cheap internal fans that gradually become noisier. Better replacements are easy to source from most component suppliers.



...a rare opportunity to acquire this classic. Only used to help roll a Leslie once, includes free duct tape (not shown). Boxed, as new. Serious offers only...