

MORE quad mods

Following on from the first rebuild of a pair of Quad II tube amplifiers, there was a huge amount of feedback from readers interested in carrying out similar mods to their own amps; more particularly, in what might result if the rebuilds were carried out, at the same time upgrading the components to high quality ones, and also re-routing the internal wiring for improved results.

At the time of the II's conception, the effects of crosstalk and 'interference' from adjacent cables carrying variously HT, heater supply and signal voltages, were not as readily and widely understood as today. Combined with the strictures of manufacture, ease of assembly and internal neatness, the original design was, for its time, among the best. Today, however, when these – and other similar – effects can be 'designed out' at the drawing board stage, it is small wonder that the Quad, in its original form, is felt to fall some way behind its modern competitors. All is not lost, and for those for whom wielding a soldering iron holds no fears, and high voltages inspire respect, not awe, the following may be the start of a useful guide to bring a very competent design right up to date with a sound quality to at least match the best modern tube amps, if the esoteric high-end ones are out of reach.

One word of warning: if you

are not experienced in the black art of amplifiers, valves and voltages, DO NOT attempt this – one wire out of place, or one short circuit connection and your once precious valve amps could become a large repair bill. However, for a competent repairer this rebuild will be a fairly simple job, taking perhaps three hours from start to finish.

The original rebuild, you may remember [*HFN/RR* Sept '92], used easily available components from Tandy, and an average electrical repair shop would be able to provide components of a comparable quality for a similar outlay. However, by improving the quality of the components and the internal wiring, significant improvements in sound quality and other benefits can be achieved.

Two companies offer quality parts for amplifier rebuilds: Russ Andrews in Cumbria and Peter Qvortrup of Audio Note UK in Sussex. Each supplies very different components in pursuit of audio excellence, and take different routes to achieve it. They provided components for this review, and complete sets were built up using components from each. Similarly, there are two suppliers of valves – unless you happen to know where there are enough original MO or Mullard valves not to need modern ones – being Golden Dragon, and Groove Tubes. Again, both companies kindly supplied sets of valves for evaluation.

Starting with the internals, note all connections on a drawing so that on reassembly you can cut cable to length and solder it directly into place. Similarly with resistors, note their position and value, and with the capacitors, their location, connections and polarity (which way the + or – goes). Having done this and checked it, strip out all the internals including the three big octal valve bases. To keep reassembly simple, I have retained the resistor board, although with a bit of ingenuity this too can be discarded. Very carefully unsolder the resistors from their tags, noting carefully where the actual connections are, and how the resistors' leads are bent to the various tags. It's perhaps better to rebuild one of these boards leaving the one from the other amp untouched for reference just in case of any doubt.

Clean each tag carefully, removing as much of the old solder as possible – preferably all – before reassembly. The best electrical joints are strong, tight mechanical ones, but this is not always possible, so use the highest quality silver-based solder, and as solder is not the world's best conductor, as little of it as possible. I find that if the resistor's leads are 'hooked round' at their ends, they pass



Even if you have already done some modernising, 'stage two' mods bring further benefits from a pair of Quad IIs

through the holes on the tags and stay tightly in position on their own – which makes soldering easier, and also gives the joint some mechanical strength and integrity. Hold the lead with a pair of heat-conducting metal long-nosed or electrical pliers between the component and the soldered joint during soldering to prevent the heat from damaging the component itself.

One of the more important sets of connections on the resistor boards is that to the valve bases – which should be replaced with the highest quality ceramic type with gold plated contacts. Make sure these connections are good and tight.

A little metalwork is now required to give most returns with minimum work. If you have metalworking skills, at the mains transformer end of the chassis file or recut the square hole which took the voltage selector to accommodate a 3-pin IEC mains socket. You will also need to drill two small holes to take the fixing screws, and wire up the live – via the fuse – and the neutral directly to the transformer. You're unlikely to move out of the UK's 240V supply, so why bother sending the supply round the chassis and then through a voltage selector strip? If you're not so handy with the metalwork, an IEC socket will fit in the aperture which usually holds the 6-pin connector, but then you'll have to run a piece of cable the length of the chassis to the mains transformer as shown in the photo. If you leave the amp unearthed you may reduce the possibility of an earth hum loop. However, you can always 'earth' the amp later if necessary.

The other piece of engineering which makes a huge sonic difference and improvement is either to drill a small hole in the other end of the chassis from the mains transformer to accommodate a 'gold' phono socket for the signal in connection or to open out one of the screw holes from the 6-pin socket for the same purpose. When rewiring the remainder, use the highest quality wire – silver if possible – and keep cable runs as short and direct as possible. In particular, keep the signal leads really short, and be sure to observe any directionality in the cable. Russ Andrews' Kimber cable is directional and, if used the wrong way round, will sound blurred compared with its recommended direction.

One surprise I found was in the heater supply wiring. For neatness I twisted the two wires together, but ensured on one pair of amps that they were connected identically at each valve. On another pair I was not so diligent, the polarity of the heaters on pairs of valves being reversed.

The second pair, on audition, sounded less detailed and veiled, so it will be worth ensuring common polarity for all heater connections.

Similarly with the capacitors across the KT66s: keep the length of the leads on each short, and equal if possible. The only lead which beat me was that from the mains smoothing cap to the KT66 – the shortest I could get it was 3½in; the longest lead in the rebuild!

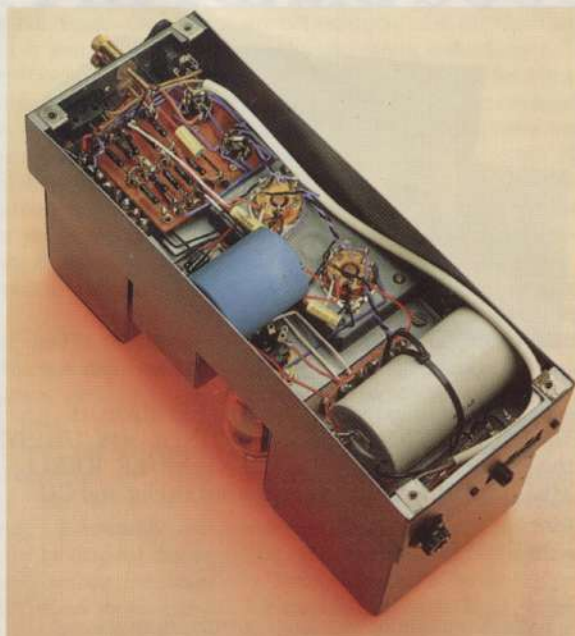
For output connections the Michell binding post connectors are very good – make sure you insulate the positive from the chassis and, if you can, make that connection a mechanical one first and foremost, using as little solder to hold it together as it will take [but take care to avoid dry joints – Ed].

Lastly, Russ Andrews advocates Ansar caps, and has a customised electrolytic pair in one can for the mains (though if you don't want its supplied screw fixing protruding through the side of the chassis you'll have to cut it off and use a pair of Zip ties to hold the can securely in position inside the chassis) and a nice, though large cap across the choke which improves the headroom, and which makes the sound more relaxed and effortless. Peter Qvortrup advocates paper-in-oil caps and high quality resistors in his parts list, which also give good results.

SOUND QUALITY

After the original rebuild, I was surprised at how good the amps sounded, particularly with regard to their dynamic capabilities and their open yet unfatiguing and detailed sound. This rebuild took that improvement another stage forward.

Peter Qvortrup's rebuild was auditioned first (with Golden Dragons), after a 24-hour period warm-up, running into a pair of the original Quad electrostatics. Immediately there was punch and subtlety to the sound. Hitherto deep soundstages sounded deeper, and detail was revealed which had been inaudible before. Comparing them directly with the original rebuild, there was 'more of everything', but interestingly they were still unattractive. Bass was deep; a little woolly when compared with a good high-end transistor amp, and a little less precise than a high-end valve amp, but considering the amp's pedigree, its performance belied its heritage. Here was a Quad which had none of the oft-mentioned 'Quad failings', yet which had the strengths that were so praised by everyone who loves them – their listenability, comfort, unattractive presentation, but now allied to startling dynamics, and an inky-black quiet to rival the very best.



Changing the valves to Groove Tubes made some interesting differences – not at all what was expected. The bass went deeper, apparently, than the Dragons, but seemed to have a little less weight. There was certainly more punch to pop and rock, but dynamics on classical and jazz didn't seem quite as sharply defined. The biggest surprise, though, was the soundstage. It changed shape. While there was no difference in the perceived height of an aural image, the GT soundstage grew less deep – not by much – but substantially wider. There was more space in the recording environment, and during listening the entire acoustic seemed much larger. The relaxed, laid-back presentation of the Quad stayed intact though.

Turning to the Russ Andrews (Golden Dragoned) rebuild, different results were again obtained. The

The amp felt as if it had left its 1950s' technological boundaries behind and was now totally unrestricted in its ability to make music

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