



Harry Leeming's

in the shop

Harry Leeming G3LLL looks back to his days running an Amateur Radio and Hi-Fi shop and adventures with customers!

Welcome to this month's *In The Shop* with the latest collection of memories from my days in business. 'Tom' sent me an E-mail. "I'm looking for a cheap h.f. base rig that I can also use mobile, and I have been offered an FT-747, do you know anything about it?"

My answer was, of course, "Yes!" The FT-747 was marketed as an economy rig and is a bit of an odd ball. An identical rig was also sold by the American kit manufacturer Heathkit, and as its appearance is different to other pieces of gear made by Yaesu, I wonder who actually made it?

An FT-747 in good working order can be quite a nice piece of kit, but there have been a few problems to watch out for. Mobile operation is normally okay – until you stop the car engine, and the battery voltage falls to around 12V. At this point, especially if you use the full length of 12V d.c. power cord, sometimes the voltage stabilisers don't have enough 'headroom' and single sideband (s.s.b.) transmissions become very distorted.

The tuning control may also cause problems. Some of these have become very unreliable, and so you

should check the operation of this before purchase.

Weird Fault

A few FT-747s I've come across, have developed a rather weird fault. When I have checked them out into a 50Ω dummy load, they've worked perfectly – but when the time has come to try to tune up into an antenna via an antenna tuning unit (a.t.u.), as the a.t.u. controls have been adjusted the standing wave ratio (s.w.r.) would suddenly shoot sky high! Some samples of FT-747 will function without this effect into one type of a.t.u., but have problems with others and even the length of connecting (patch) lead can effect them.

On checking the suspect rig with a receiver or a spectrum analyser, I've seen that when the s.w.r. goes high, the FT-747 is throwing out a wide spectrum of parasitics. Many cures have been suggested for this effect, but I found one to be effective.

My effective cure was to test a selection of output and driver transistors, pick the ones with the lowest gain, and then fit them. To do this I needed to be able to sort through a few hundred pounds worth of transistors and so it's not cost effective!

When I was in business at Blackburn the same FT-747 was passed round and brought to me with this fault by several different people. They were all rather upset when they learnt that the cost of repair to the rig they'd just bought would be more than it was worth!

On Commission?

While I was running the shop, "Harry, why did you always sell second hand goods on commission?" was a question I was often asked. In the 1970s VAT was introduced and we were told that it was to be a tax on the value we added to goods, fair enough. Unfortunately though, with second-hand goods purchased from private customers – it didn't work out like this though!

If I part exchanged or purchased goods from a private customer, the VAT office wanted their 20%, or whatever the VAT rate was, on the full selling price. Hence, if you allowed (let's say £400) for a rig, cleaned it up, gave it a guarantee and sold it for £480 – I made no profit, ran the risk of having to do a repair under guarantee and had to cough up £80 to the VAT office for the privilege! Obviously, this was a non-starter and various dealers got themselves into trouble trying



Fig. 1: Marketed as an economy rig, the FT-747 was and is a bit of an oddball from the Yaesu stables and had some interesting faults.

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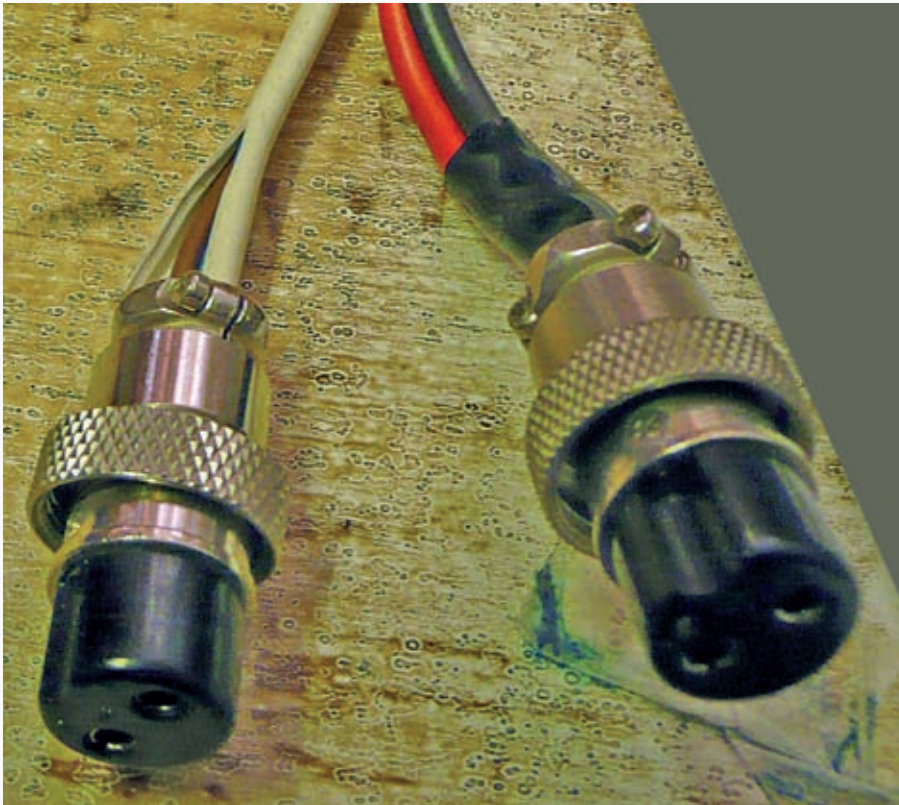


Fig. 2: These may look like they're the same, but the polarity is important too. Get it wrong by using the wrong lead and the rig could be irreparably damaged.

to get round it by doing 'under the counter' cash deals.

The only legal way out of the difficulty was to make sure that no secondhand items became your own property and hence that's why many dealers started to offer to sell goods on behalf of customers, in other words a 'commission sale'.

Fortunately for today's dealers there are now ways around this stupid arrangement, (if you can cope with the paperwork!). But as happens so often in the UK, the powers that be do seem to try hard to discourage anyone who wants to run a business!

Secondhand HF Linears

Customers were sometimes rather taken aback when I refused to sell second hand h.f. linear amplifiers. The difficulty was that the extremely expensive valves in these were very easily damaged, especially if the user was not conversant with tuning up such high power beasts!

I could think of quite a few customers who I certainly wouldn't

have liked to let loose with a second-hand linear. But how could I politely say, "Sorry mate you're too stupid to buy one of these, you'll either blow it up or kill yourself?"

I often wonder at times, what twisted, evil genius has managed to apply his influence, to ensure that there is always some trap door through which users of equipment can fall? I think the Irish call it 'Murphy's Law'!

Thinking of problems, it sounds obvious of course, but you should always ensure that the correct fuse is fitted to whatever equipment is in use. However, to give us the **maximum possible chance of fitting the wrong one** – most manufacturers supply a few spares. Unfortunately users do not always check the value of these and many times I've examined a burnt-out hulk, only to find that the spare 20A d.c. fuse, or the 6A fuse intended for 115V operation has been fitted in place of a 3A 230V mains fuse.

To really put us on the wrong foot, some rigs have the fuse value

stamped on the chassis next to the fuse holder. As most rigs are sold in 115V areas however, the value was sometime correct for these counties but almost twice the size of that needed for safe operation in Europe!

Next, there are d.c. leads and polarity to consider. And here, it may seem hard to credit, but there's no standard for polarity on power leads, **Fig. 2!** Grab the lead for your KDK 144MHz mobile, plug it into your Yaesu rig and the polarity will be reversed. At the best the fuse will pop – at the worst the fuse will be too big and your rig might then not be worth the cost of repair!

If you really want to run up a repair bill, try plugging the a.c. lead for a Yaesu FT-101E, into a Trio/Kenwood TS-520, or the other way round. The plug is the same but the connections are entirely different, resulting in the mains supply being applied to all the wrong places.

Now, I think it's just about understandable that two different manufacturers should use the same plug and wire it different ways. But if all the equipment in a particular shack is from the same maker, then the operator will know they're safe – but are they?

The Yaesu FC-700 a.t.u. power lead uses exactly the same 12V d.c. coaxial plug as the FT-290. However, the '290 has the positive connection on the outside, while the a.t.u. has the positive (+) terminal on the inside. Please don't swap them over!

Fortunately, the manufacturers have at last seen sense, and the d.c. lead for most h.f. rigs is now the same. These leads use a multiway plug, some of the pins not being connected in circuit. Safe at last?

Safe at last? Well – no! All is

fine until you try to use an Icom power supply with a Yaesu rig. The Yaesu p.s.u. has an **On/Off** switch incorporated on the front panel – but the Icom p.s.u. is wired so that the rig's On/Off switch also kills the power supply. The spare pins on the DC plug are used by Icom to carry the mains switching, but Yaesu use the same pins inside some of their rigs as an anchor point for various components in the power amplifier stage. This results in a big bang if you (**unthinkingly**) try to run a Yaesu rig from the d.c. output lead of an Icom p.s.u.

The Self-destruct Socket

Now, I've got time to go back to the FT-747! 'Fred' turned up with an FT-747 and the rig was completely dead except that it lit up and the S-meter went hard over as soon as it was switched on. Checking around with a test meter soon located that several voltage rails had disappeared and the fault was eventually traced to a strip of printed circuit that had completely fused.

So, why had the fault occurred? To answer the question, this particular strip of circuit, as well as passing 12V around various parts in the set, also feeds the 12V output socket on the rear of the FT-747, **which isn't fused**.

If you own an FT-747, try connecting your speech processor, or a.t.u. lamps to this point, and you leave the lead dangling so that it touches something, or incorrectly insert it in the socket and wham, you'll have over 20A passing through your rig's printed circuit!

In fact, I've had quite a few different models of Yaesu rigs in for repair with fused printed circuits, and melted wiring harnesses, as a result of a short on these 12V output sockets. Frankly, whoever decided to fit un-fused 12V output sockets on the rear of Yaesu rigs should be eliminated using the traditional Japanese method! (Perhaps they could then get a better head?). In fact, I always told my customers to either fit a 1A fuse to any lead, or better still not to use these all too convenient outlets at all.

Datong Equipment

Many readers will remember Datong equipment and that this company made available a mains adaptor for use with their really excellent audio filters, speech processors and other add on units – and if you use it you'll have no problems. If however, you decide to connect one of their units to your normal 12V supply – take care! The d.c. connection is made by a 3.5mm jack plug and so – with the plug halfway out of its socket – the live tip will touch the chassis.

Push the plug in, or pull it out of your speech processor (for example), while the p.s.u. is switched on, and you'll have a short to chassis – via the microphone socket of your rig. If the lead isn't fused the full current of your p.s.u. will then pass via your rig's internal microphone wiring. Some of the thinner ribbon cables may well melt and this is a particularly effective way of putting some Icom rigs out of action. Oh well, someone had to keep my service department going!

Assorted Hints & Tips

Many of the following hints and tips are dead obvious, but they're still well worth repeating. If you have any more that you'd like to pass on to readers, please drop me an E-mail.

Before you can attempt to repair a piece of electronic equipment, or even replace its supply lead, you have to dismantle it. Some manufacturers seem to take a sadistic pleasure in making this as difficult as possible by hiding the screws and the same people seem to design motor vehicles too! But, before you give up and reach for the hammer, do check

that the pretty label giving the maker's details, or warning you about the dangers of electricity is not covering the screws you need to remove.

Undoing the screws can be difficult! I weigh under 10 stone and I'm by no means a 'Pocket Hercules', but I seemed to be able to loosen screws that other people at twice my size had great difficulty with. There are two secrets, I first got a screwdriver that fits the screw correctly.

However, 30 years ago a 144MHz rig arrived that no driver I had would fit correctly! So, instead of damaging the screw heads I took the rig into a tool shop, where I tried a section of screwdrivers, and paid a few pounds for a good quality one that fitted properly and I'm still using it!

The second secret is not to slowly force a reluctant screw but to press down on the head as hard as possible, and then to suddenly jerk it. It's amazing as how 'catching the screw unawares' and apparently 'surprising it' with a jerk, does the trick. Just like the 'snatch' power tools they use changing wheels at the local garage.

When on your own, you often need something to hold an item in place while you work on it, or something to act as a heat sink. You can of course purchase many devices made for just these purposes, but for free go into the street, collect a few of the postman's discarded Royal Mail rubber bands, **Fig. 3** and use these on the handles of a pair of pliers.

See you next month! ●

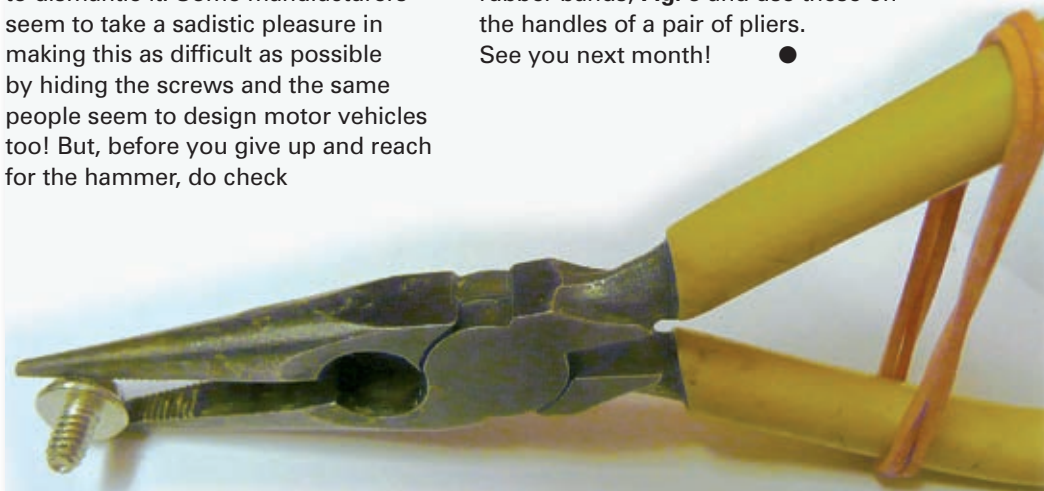


Fig. 3: *Dropped and lost in their thousands by your local postman, the red rubber-bands can be put to good use keeping a grip on an item, held in the jaws of a set of pliers.*

Problems. I like to hear about problems with older equipment, particularly pre 1990 Yaesu rigs. Please email me, (add some radio related term in the subject heading, to differentiate against spam), or write and enclose a stamped addressed envelope. Remember that electricity is dangerous, if you are not familiar with safety precautions you must never work on your equipment whilst it is plugged into the mains. (Switching off at the wall socket does not necessarily make equipment safe).