



Harry Leeming's

in the shop

Harry Leeming G3LLL starts by mentioning his favourite Yaesu transceiver – the FT-990 – the 'sell and forget' rig.

Welcome – the G3LLL 'shop' is open again! And looking back I realise that we all have our favourites – and the Yaesu FT-990 h.f. rig is one of mine! Indeed, when we had the shop, it was a 'sell and forget rig' because I had so few problems with them.

There was however, one 'no fault' that arose a few times and it went something like the following story. It started when either 'Tom', 'Dick' or 'Harry' (Not me of course!) would decide to fit the optional c.w. filter, doing a neat job before he'd re-assemble the rig, only to find out that the FT-990 was dead on receive.

After this had happened with a few customers, it only needed a panic-style 'phone call or a visit, and I would know immediately what they had done! Next to the power **On/Off** button is a smaller button marked **RX ANT**, just exactly at the place where your fingers naturally fall as you turn the rig over, **Fig. 1**! If you press it the rig switches to a separate receive only antenna socket – which is great if you're using two antennas – but kills the receiver if you only have one!

Another 'No Fault'!

There was also another 'no fault' that I've experienced twice and the first

occurred about 15 years ago. 'Peter' was going on holiday, and as he wasn't happy with the idea of leaving his new FT-990 in a house that wasn't particularly secure, he asked 'George' to look after it for him, and said that if wanted he could operate it while Peter was away.

So, while Peter was away George was really enjoying himself on the air until the mode selector menu suddenly locked up in the FM mode. He appeared on my doorstep in somewhat of a panic, "What have I done Harry – what will it cost to repair?"

I took the rig round the back, popped it on my bench, and confirmed that it was still faulty. I then pulled the mains plug out, switched off the memory back-up battery, **Fig. 2**, and pushed the **On/Off** switch a few times with the power disconnected, to reset the microprocessor. I then held my breath, fired the rig up again and three cheers, it worked okay, and continued to do so when I switched the battery on again!

To say that George was happy and relieved would be an understatement, but at least it was nice to know that I could please some of the people some of the time. I was reminded of this story by a telephone call from 'Keith', who bought the

very last FT-990 from me before I retired from the shop.

Keith recently rang up to say that he was tuning across 3.5MHz (80m) on lower sideband (l.s.b.), when the rig suddenly selected the amplitude modulation (a.m.) mode, and refused to switch back to any other. I advised him to do a microprocessor reset, and he then phoned me back to say that all was well again.

Microprocessors are common in much electronic equipment and like computers they seem to occasionally 'crash' for no apparent reason and at no particular time interval. Even space probes have to be re-booted sometimes! Most electronic equipment, from video recorders and DVD players, to television sets and Sat-Navs, have details (often hidden away on the last page of the instruction books) as to how to do a re-set.

I can't help wondering as to how many million pounds worth of electronic equipment is dumped as not worth repair, when all that is required is for the user to read this, and to then switch off the back-up battery, or push a couple of buttons while reconnecting the power. When I fly overseas for a holiday I have also wondered, "Has the cockpit of a fly-by-wire airliner a red re-set button which the pilot can press?"



Fig. 1: The Sell-and-Forget FT-990, had a peculiar place for the RX ANT switch, just to the right of the main power switch (top left of the front panel). If you turned the rig over, it was easy to inadvertently press this on, switching antennas on receive.

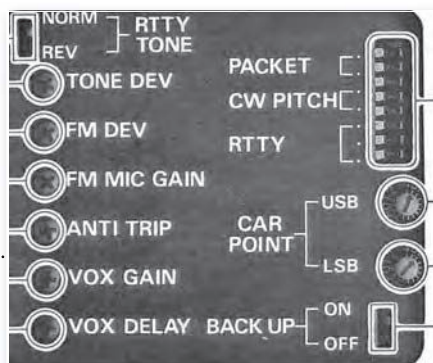


Fig. 2: If the c.p.u. 'locks' up on the FT-990, you'll need to switch off the back-up battery (switch on the lower right) to enable you to restart the c.p.u. 'cleanly'.

"Otherwise, what happens, if the control system's microprocessors decide to lock up in mid air?"

The FRG7 Speaker Switch

A recent E-mail correspondent asked me, "Why is there a switch and a wire wound resistor, hidden in the battery compartment of the Yaesu FRG7 general coverage receiver?"

The switch and resistor are not shown in the instruction booklet, or the service manual, but are there to reduce the power fed to the internal speaker. Straight out of the box the FRG7 is rather low on audio, but you just flick the hidden switch and the volume increases considerably. I was once told that by reducing the audio power this way Yaesu were able to rate them as a communications receiver and obtain a lower level of import duty in some European countries. It all sounds rather strange – but not really surprising!

Recently I just happened to ask at a demonstration of 'licence-free electric' bicycles about their top speed. I was told (confidentially). "They are limited by law but we can show you how to short out the governor!" It all sounds familiar doesn't it? Shades of 28MHz (10m) rigs that just happen to have links that can be cut to extend the range to cover illegal CB frequencies!

The Z-Match & 1.8MHz

I got quite a bit of feedback on the Z-match and 1.8MHz item (*PW* November 2009 issue), and **Eddie Marshall G4PPB**, from Wigan, sent me the photo shown, of the 1.8MHz coil fitted to an SEM Z match a.t.u. **Fig. 3.** Eddie found that with his installation a 16-turn coil wound on a 1.25 inch diameter piece of plastic waste pipe, tunes up both of his antenna systems nicely.

I also had a few responses to my request as to the origins of the Z-match. It seems to have been

developed from existing switch-less multi-band tank circuits. In fact, **Allen King W1CJL** produced his Z-match in 1954, and a d.i.y. article by him appeared in *QST* for May 1955. You can read all about this at www.cqham.ru/zm.htm – many thanks to all who responded, and particularly to **Mike Allenson** who let me have details of the National MB-40 SL multi-band tank assembly, which pre dates the Z-Match by a few years.

Good Low Loss Insulation? Not all plastics offer good low loss insulation, and when winding a coil for the 1.8MHz modification, the constructor obviously needs to know that the former is suitable. So, how do you tell?

Good Low Loss Insulation?

Here's a suitable test: Place a plate in a microwave oven, at one side of it a glass of water, and at the other a sample of the plastic. Fire up the microwave oven for 30 seconds, and the water should be hot and the plastic cold. If the plastic is warm, (or has melted – hence the plate!) it's not suitable.

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The FT-290 Again

Despite its age, the original Yaesu FT-290MK1 is still very popular and is the subject of many of the queries that I receive. The '290 was introduced in June 1981, and certainly as far as I was concerned, it was the best seller of all time.

At that time no other 144MHz (2m) rig offered frequency modulation (f.m.) and single sideband (s.s.b.), with the possibility of home, mobile, or portable operation for under £250 – and so it really took off. Being only a small retailer I used to order rigs such as the FT-101 in ones and twos. However, the '290 needed to be kept in stock and I ordered in 'tens and twenties' as they were so popular – I just couldn't get hold of enough of them!

The rig hit the market at the time when many CB operators were taking the Radio Amateurs Examination (RAE) and changing over to Amateur

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Radio. Once they had passed the exam they wanted to get on the air and try to work a little DX – without initially having to pass the Morse test. For them the FT-290 really fitted the bill.

Yaesu also made available a 15 watt linear amplifier, but this was not really competitive when compared with the 30 watt one made by Microwave Modules, which incorporated a switchable receive pre-amplifier, and so for many of my customers a '290 plus a 30 watt 'Mickey Mouse', became a standard installation. Because of its popularity, I still get quite a lot of E-mails about the FT-290, and so this is as good a time as any to answer some of them.

The FT-290 FAQs

The FT-290 Mark 1 'most Frequently asked questions (FAQs) include: "I've just bought an FT-290, and I can't get the tone burst button to work!"

Answer: One problem with the '290 was that as it was only small, it was difficult, and possibly dangerous, trying to hit the tone-burst button when operating mobile. I re-wired many of them so, that in the f.m. mode the tone burst was fed via the noise blanker's 6.8V supply. A diode, and a 470µF capacitor, making it operate continuously on receive. As soon as the push-to-talk (p.t.t.) was pressed the noise blanker supply voltage disappeared. The tone burst then continued to run for about two seconds on transmit until the voltage across the 470µF discharged – providing an automatic tone-burst.

After this modification has been carried out, the tone burst-button no longer works. So, for f.m. operation with a tone burst, the noise blanker must be switched on. This modification was published and widely copied. It's easy to tell over the air if a '290 has been modified in this way. Just listen to the tone burst, and if the end of the burst sounds like it's being 'strangled' as the capacitor discharges, you'll know that this mod' has been carried out!

FAQ: My Telescopic antenna has broken – does it matter?

Answer: The pull-up telescopic antenna is part of the power amplifier (a.m.) tuned circuit, and when it's pushed down, it forms a capacitor that ensures that the FT-290 is correctly tuned so as to deliver power to the PL259 socket on the rear. If the top of the telescopic antenna is broken, you must still ensure that the first 4 inches are left on, and telescoped down into the rig, before transmitting via the socket at the rear. If you try and operate – without at least the remains of the pull-up whip – you'll get reduced power and you may well also blow the p.a. transistor. If you can't obtain a good or a broken whip, it would probably be possible to fit a small capacitor to duplicate the loading of the whip and to then realign the p.a. stage – but I've never tried this. Unfortunately, I do not know of a source of supply for the whips, any suggestions readers?

FAQ: The Tuning is odd and intermittent, or the size of the steps is wrong.

Answer: The simple cure – in most cases – is to switch off the back-up battery and do a re-set (exactly the same as for its much bigger sibling the FT-990, see earlier suggestions). However, on rare occasions it may be necessary to replace the rotary encoder. Please E-mail me at Leeming Towers (address at the end of the column) if you need one of these.

FAQ: There's a small extra p.c.b. inside and it seems to be wired to the antenna.

Answer: The UK company Mutek, made a special receive pre-amplifier for the FT-290. If you look carefully you'll find that it includes a pre-set potentiometer and by turning this you can adjust the gain. Incidentally, don't be tempted to set the gain too high, or strong signals may cause the rig to overload. This will then also create cross modulation and result

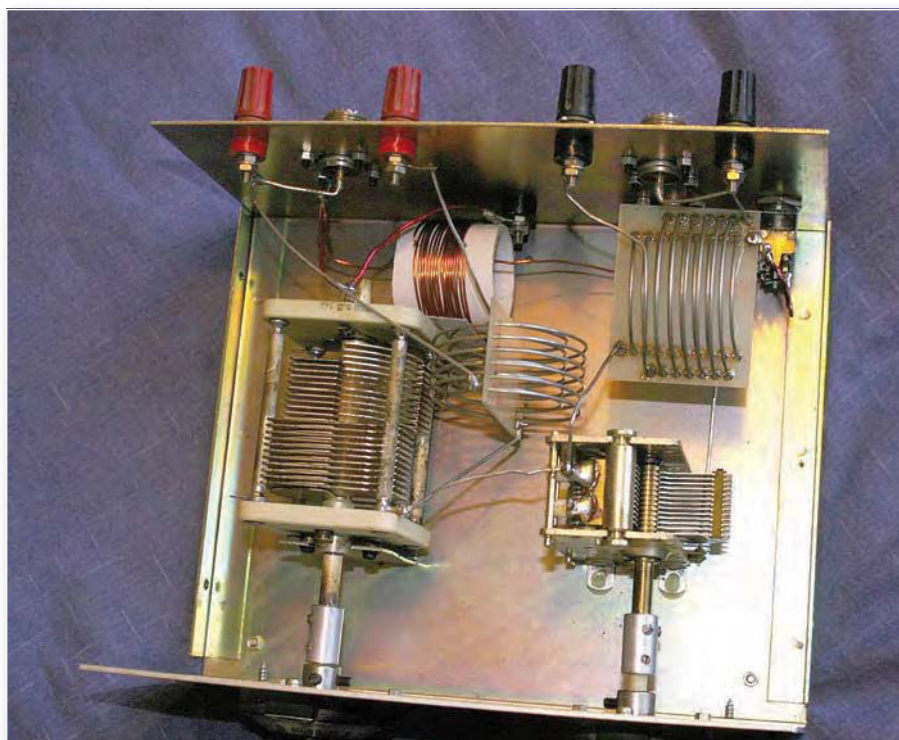


Fig 3: Eddie Marshall G4PPB, from Wigan, sent me the photo showing the 1.8MHz coil fitted to his SEM Z-match a.t.u.

in local stations spreading across the band. (More on the '290 next time).

Delivered Personally

Even when I was operating a full time business I much preferred repairs to be brought in personally, rather than sent via carriers. From the bitter experience of deliveries that went wrong – I developed two conclusions.

1: Many customers hadn't a clue as to how goods needed to be packed up if they were to be sent via carriers.

2: Many carriers hadn't a clue regarding how expensive electronic equipment needed to be handled.

I can't advise you any longer about the merits of the current batch of carriers, as it's nearly 12 years since I closed my shop but if you have to send an expensive rig away I would make two suggestions.

First telephone the repairer and ask their advice about transportation, they may well have a contract with someone reliable.

Next pack the goods in the original box and then place this in a larger box, with screwed up newspaper buffering the space between the two boxes.

Finally, hold the package head high over a concrete floor, and ask yourself the question, "Can I safely throw it onto the floor?" You can't! (You say this to yourself). If that's the answer – then start again as you've not packed it adequately.!

However, my suggestions **do not mean** that I approve of throwing delicate electronic equipment around! Instead, I'm just a realist and 100% in agreement with 'Joe', the operator of a CB/computer business, to who I was recently speaking.

Joe was walking to his shop when he passed a large lorry, from which he could hear thuds. He poked his head round the back and saw that the driver was busy throwing computers, along its full length. Just as he reached his shop the same lorry drew up, and the driver started to unload the batch of computers to his business. Joe refused delivery, advised the driver to take them back where they came from and made it quite clear that he would be complaining to the supplier! Ah well, it's closing time now – see you next month!

Harry & Your Radio Problems

I like to hear about problems with older equipment, particularly pre-1990 Yaesu rigs. Please E-mail 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).