ft102 USER

GI4PCQ 58 William Alexander Park Belfast BT10 0LX N.Ireland

GREETINGS ALL 102 USERS !

Well, perhaps not ALL, but we have received a sizeable amount of mail since getting a mention in the Amateur Press and there are now 80 or so callsigns on our initial mailing list. An attempt was made to get the group off the ground earlier in the year through an announcement on GB2RS. That resulted in a dozen or so expressions of interest and a limited mailshot was done then. A 102 Net was set up on 80 meters (3.720 mHz, Tuesdays, 21.00 British LOCAL time). The magazine mentions have been much more productive, however and this bulletin is going out to all who wrote, with some of the comments that came in reproduced here. Some callsigns who were only contacted on the air have also been included, and complimentary copies will go to the magazines who gave us a mention.

OUR PURPOSE

It is hoped to provide a forum for the exchange of information about the 102 series of equipment i.e.

FT102 HF TRANSCEIVER
SP102 LOUDSPEAKER/FILTER
FC102 ANTENNA TUNER
FV102 DIGITAL VFO

and the range of accessories/add-ons which were/are available for this range.It has become obvious through contact with other users that a number of "standard" faults developed particularly in the FT102 TX/RX and it is hoped to share the experience of users who successfully cured these problems or who made modifications to prevent recurrence. The bandswitch,relays and output valves come immediately to mind as worthy of prominent mention..but there are others. Help has been sought from some of the major dealerships/service shops and their replies are awaited with interest. It is mutual self-help that we are really about though, so can I ask once again for contributions from yourselves, however small that might be useful to other users....I don't intend to write this newsheet...only to reproduce your contributions. So EVERYONE must have some unique 102 experience to share or just write and describe how you find the equipment, tell us about your shack, antenna farm etc. Photos are especially welcome.

THE NET

The 102 NET has been running for some months now and there is nearly always someone there on Tuesday at nine. In the early days a great stalwart was John G4USF,with EI7FE and others. G4FYY, Peter, has been very much to the fore lately, with G4PYB also. Please call in and give us your bit of chat any Tuesday. The frequency was chosen more or less at random (3.710.2 had also come to mind, geddit ?) but 720 has shown itself to be a very noisy bit of band and we may hve to pick another spot...any suggestion ? In the meantime you will probably find us a little up or down from there.

102 A USER

ALTHOUGH most of us would agree that Yaesu made a fine rig in the 102, there are a number of niggling problems that one hears mentioned again and again. This section will focus on these faults and suggestions for fixes/mods. May I claim the privelege of kicking off with the few discontents that I have had with my 102.

SHIFT/WIDTH CONTROL
After a few months, I learned how to use this to combat QRM but I would have thought that the NORMAL position to reset to would be 12 o'clock. However I get much more pleasing audio with the pointer set to say 2 o'clock on LSB and 10 o'clock on USB and CW. With the narrow filters in, the above settings are mandatory....is this a fault or just weird design ?

BANDSWITCH
I first encountered a problem here the very first time I tried to tune up on 80m and it wouldn't tune. Switching back and forth a few times cured it...until the next time. Eventually I was moved to have a look inside and noted that there is a lot of flexibility between the bandswitch segments. All the allen screws at the front sections were tight enough but the last section inside the PA was not quite keeping in step and on 80m was actually half way between two contacts, DEPENDING ON WHICH WAY I TURNED IT. I never cured this one but was able to negotiate it through knowing what was happening, and switching back and forth a few times until the rig would tune. It only happens on 80m (my favourite band).
G3YFO tells me that he got word from Yaesu "NEVER GO ANTI-CLOCKWISE" on the bandswitch..can you imagine going from 40 to 80 all the time the long way round ? Can they be serious?????? Anyway YFO's letter was so interesting that I have taken the liberty of reproducing parts of it elsewhere.

SPEECH PROCESSOR
Sometimes I wonder if there really is a processor in there, but I guess there is beacause if I wind up the compression pot almost full and increase the mic gain BEYOND the manufacturer's recommended setting, then I can see some increase in average power out on my external meter.. the real question is..is the processor any good? Many of you will have tried the on-air test and the other guy comes back to say that he couldn't detect any difference with the processor in or out...maybe the superb TX audio of the 102 disguises the fact the compression is being applied..but it should show on his S meter too..what do you think?

VOX ANTI-TRIP
The first time I tried to use VOX the rig wouldn't go on TX for me. When I looked at the anti-trip pre-set on the back it seemed to be almost fully off and I needed to be turned even more off befor the vox would work. There seems to be a design fault here...the pot should have much more range of adjustment..it affects break-in CW working too.Has antone else found this?

RELAYS
These must take the prize for MOST FREQUENTLY MENTIONED PROBLEM. Relay failure was the one and only reason for my rig visiting the repair shop..it went deaf and wouldn't TX either. Peter G3RZP has ideas to replace the relays and for lots of other mods too (see his letter).G3VMJ has the relay problem too...PA3CNY cured his deaf RX by changing relays. Les G4FKC sprayed his relays (presumably with switch cleaner) to cure same problem, but we hear that this is NOT to be recommended as it may attack the insulation...the relays should only be cleaned by inserting a piece of thin plain card between the contacts and moving gently up and down...that's official.Malcolm G4YMT has had his relays replaced and the set still doesn't go back on RX properly after TX (mine's just started this caper too). G3ZQS has had his relays changed THREE TIMES before a letter to Yaesu brought word of a relay-protecting mod....aparently a leaking capacitor can cause erosion of the contacts, and a resistor addition prevents this...can we have more details please George ?

More 102 Abuse

PA VALVES
Kevin, GOGBC writes about replacement valve sets...where can they be got in matched threes? **Harry G3LLL has kindly offerd to supply our group with sets (incl driver) at a special price for ONE MONTH ONLY (see his ad).** G3HVA and others have written to say that loss of these valves is the only fault they've ever had. Thermal runaway is often given as the symptom of dodgy PA tubes and it is said that the recommended make to fit is RCA. Sylvania types may NOT be suitable. The Radcom review of rigs published in March '87 brought out this point among others.

AM/FM UNIT
I've been through two of these. In both cases when fitted I noticed that the DISCRIMINATOR wasn't centre-ing on max received signal. It was possible to adjust this, but it was out by the same amount on both boards..is my IF not spot-on I wonder? GM4UYZ found his AM/FM unit wasn't TX-ing on the right frequency. The dealer fixed this as it was "A KNOWN FAULT"!?! The Technical Supplement gives a mod to protect the TC5081AP chip on this board (early units only).

RF AMP
GM4UYZ is one of a number of users who lost the FET in his RF amp during a thunderstorm. Remember it is static discharge in the atmosphere (lightning) that causes this failure and the strike doesn't have to be close by. ALWAYS switch out the RF when not using the rig and preferably disconnect the antenna from rig ANT socket and securely ground both as well...I do this by means of a switching arrangement in my homebru ATU, although an outdoor disconnect is probably to be preferred.

Incidentally you will no doubt have found, like me, that leaving out the RF amp on 40 and 80 greatly improves the QRM-handling capacity on RX, especially if you back off the RF gain control to about 10 o'clock also,just to the threshold of the receive AGC..try it. The S meter readings will be down a bit but you can compensate when giving reports or switch the amp in briefly to check.

FC102
Steve G4ZWY complains that his ATU won't tune 10 or 80m properly. He knows that the SWR on his tribander is fairly reasonable by checking with another meter but the FC102 shows it to be sky-high. The same applies to his 80m antenna..it's really only a matter of fine tuning the antenna system but the FC102 is playing up..any ideas ?

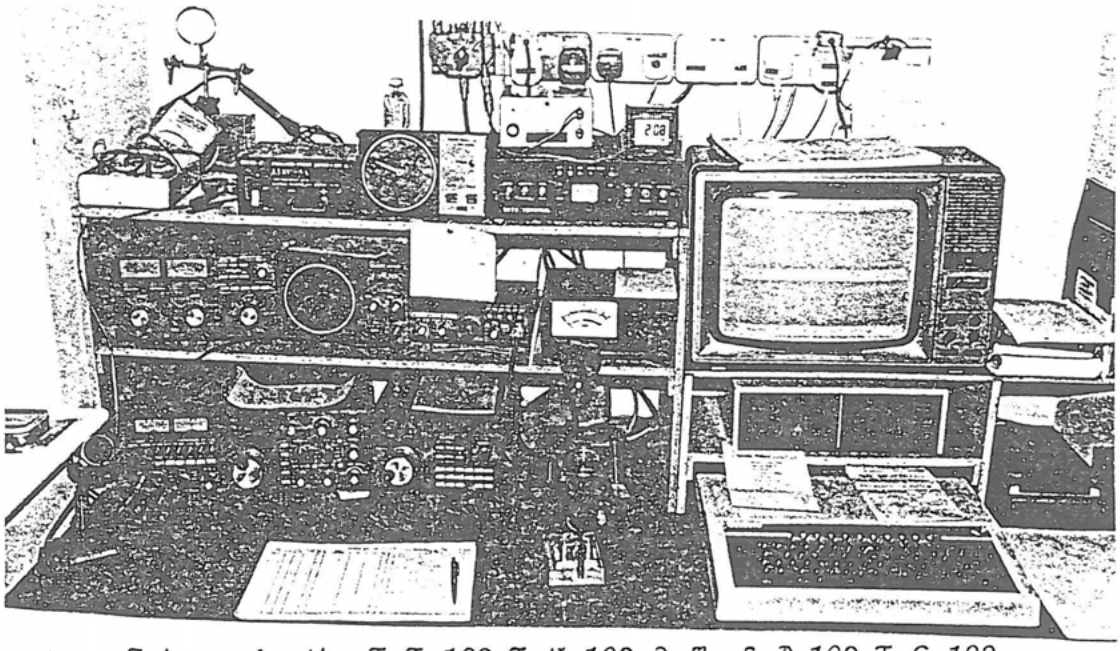
102 AMTOR
S.D. Williams (callsign?) wrote to ask about the mod for Amtor. I understand that the C/O relay timing is normally too slow for this mode. Fred GI4WXA has promised me details of the appropriate "fix" which should be in the next issue.

NO PROBLEMS?
Some users seem to have had an easy ride with their 102s. Colin G4UXH reports "years of good service" and Reg G3IRW has had "5 years of fairly trouble-free operation". Certainly many of my correspondents did not mention any particular problem, which is not the same as saying they hadn't any. It is interesting that the Radcom review of rigs put "un-reliability" as the overall impression of the 102, based on 29 replies..makes you think?

COMPILED GI4PCQ

102 Shack

Tell us about your 102 set-up and other equipment.....photos too!



The set-up I have is the F.T.102-F.U.102.D.M.-S.P.102-F.C.102. and the mike is the M.D.-1-B.8. scanning desk mike with the free engraved call sign plate from mother hen in Japan. I purchased the complete station new in September, 1983. just after the price was reduced to clear the stock to make way for the new model. The equipment has been in regular use since and I have only just experienced my first problems with the 102. The TX/RX relays were sticking, due I am told, to a build up of cigarette smoke deposit, so smokers beware! I hope I have now overcome that problem by fitting an extractor fan in the window of my rather small shack and the next step is to try and pack up smoking Hi.

Since last Christmas I work mostly on 20.M. in RTTY mode and have taken to it in a big way. I use the BBC-B micro, the ST5MC terminal unit with the HamTel GW4WRD software out to a homebrew 2 element tri-band quad atop a 60 ft Versatower. I am currently in hot persuit of the DXCC award in RTTY and my next country will be No. 77. I only hope all the cards come back in Hi. Out of a total of 270 cards sent out I have only received 20 cards back, half of which were sent direct, so I have now invested in the North American and International call books and send all new countries a card direct and to hell with the expense. I also hope to work all U.S. states at the same time and kill two birds with one stone and then it is on to the worked all zones award.

In October I am due to use my station for the benefit of scouts in a local village running a JOTA station for them again from their headquarters in the Village of Weobley, call sign GB4WCH (Weobley Cubs Hereford) and we propose to set up a RTTY station also just to see how it goes. The SSB H.F station will be the F.T.101.Z.D. (a poor second best you might say).

Bob.

R.G.(Bob) Canning. G0ARF.

102 MAIL

I've done a fair few mods on my 102, of which I can provide details if required. These include:-
1. Rearranging the filter switching. As it stands, switching to CW gives you the SSB bandwidth:switching CW Narrow cascades all the narrow filters you may have fitted. The very narrow filter is too narrow for general CW searching, so I've rearranged it such that on CW, you get the 800Hz filter, while on CW Narrow, you get the narrowest filter (200Hz?)
2. Lost the RF amp in a thunderstorm. J310 is a good replacemnet for the 2SK125.
3. Tendency to instability when feeding some loads on 3.5MHz. Althcugh the SWR was good, certain impedances outside the band could make it unstable. An R and C in series in the driver fixes that.
4. There's a receiver spurious which appears only on 3.5 and 7 MHz CW. Tune about 1 KHz in from the edge of the band, and you'll get br akthrough from a strong signal precisely on 3500 or 7000. Level is down about 40 db at 2 KHz off. 3.5 is worst:it's still there even on 14 MHz, though. By reducing the loop bandwidth in the synthesiser a bit, this can be improved. I've got to borrow the spectrum analyser from work to have a better go at that one.
5. New Front end. Intermodulation can be a problem on 7 and 14 MHz at times. A better RF front end would help, and my plans are to use a Plessey SI6440, with a 2N3866 RF Amp with noiseless feedback to push the third order input intercept up to about plus 20dBm with the RF amp in. To avoid crunching the second mixer, this will feed ~~xxx~~ an AM filter. Of course, the noise blanker won't perform so well under these conditions, so some switching will be required. And while I'm at it, those bloody relays can go!
6. I've brought info from the bandswitch out the back (and it needs a lot of filtering if RF isn't to get back in and cause distortion), and this feeds my remote antenna switching.
7. My tx doesn't perform above about 28.8MHz. Too much tank coil, I think, but I haven't bothered to do anything about it,'cos I've no interest in transmitting up there. But is it common?
8. Done the usual Yaesu key click mod on the RF board, as per service manual.

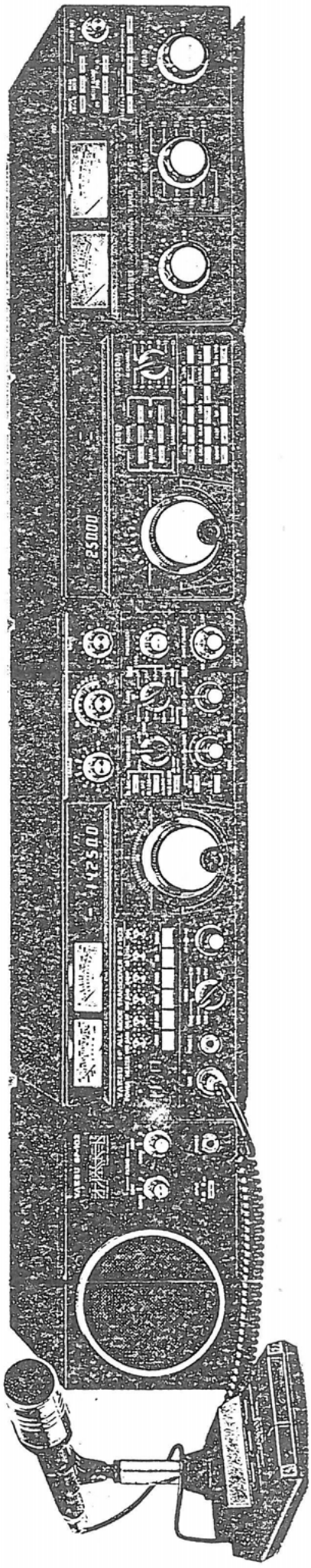
Occasionally get reports of slight chirp on CC CW. Can't say it sounds noticeable on the SC221, but I wonder if anyone else finds this?

Aren't the prices for spare dial lamps frightening? Still SMC do have the monopoly.

I hope that some of these items are of some interest, and I look forward to hearing from the group.

73, and GL

Peter Chadwick G3RZP



Firstly, we would like to thank you very much for trying to assist both present and past FT102 users to a further understanding and greater operating pleasure from what must be classed as 'the last of the line' valve transceiver from Yaesu.

We are able to provide the manuals and much of the information you require. There are both owners manuals and technical supplements available and are priced at £2.65 and £8.50 respectively. Unfortunately, these are subject to copyright which is owned by Yaesu, Japan and without their written permission no part or parts thereof can be reproduced.

We have still got available a number of items for the FT102 at substantially reduced prices but we're afraid stocks are limited. Please find details enclosed on separate sheet.

We also have a large comprehensive stock of spares ranging from transistors to complete PCB's available for the FT102. On the rare occasion that we are unable to supply spares from stock we can normally obtain them from Yaesu in approximately 4-6 weeks. If you have any queries regarding spares please do not hesitate to contact Mr Shaun Hey our Assistant Service Manager.

We hope this information proves useful to you and meanwhile we remain

Yours faithfully
SOUTH MIDLANDS COMMUNICATIONS LTD

Richard Swift

Richard Swift
Amateur Wholesale Manager

102 Mail (continued)

DX!

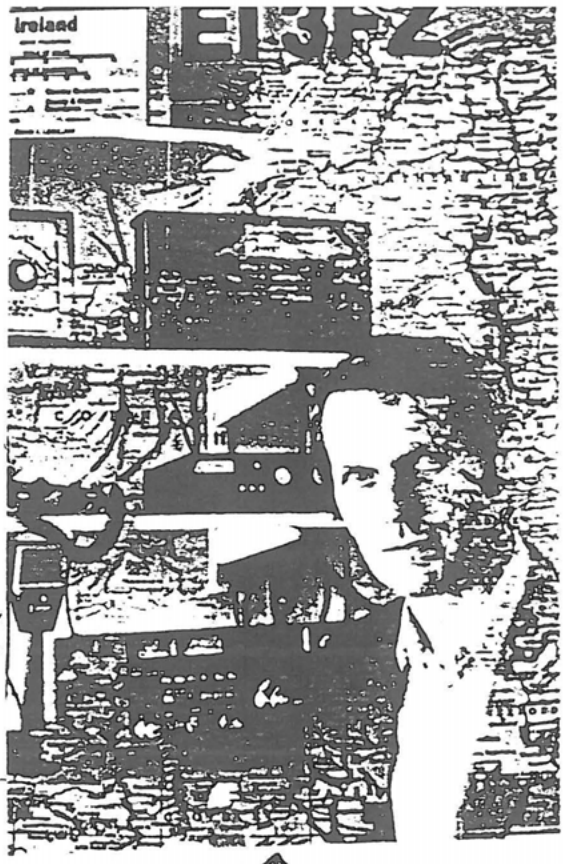
In response to your information in Raddcon for Sept. Please note that I would be interested in joining the FT102 users group — maybe your only dx member?!

My FT102 is quite "old", having passed its 5th birthday. I purchased it new on 23 July 1982. Serial No. is 2H 010857. Also have the digital VFO purchased 8th Oct. 82 Ser. No. 2F0102?1. and speaker SP102. The equipment has given trouble free performance except recently the dial lamp in the 'S' meter has burnt out (not yet got a replacement) and I had to remove the ant. change over relay and clean the contacts (a rather difficult job as it involved removing from the printed circuit board behind the ant. socket in the PA compartment. a then breaking open the sealed relay. I am still using the original valves which seem to give still the same output. I don't intend to part with the 102 in the foreseable future so would much appreciate being put on your mailing list. I imagine some small contribution would be required to cover your expences.

Look forward to hearing from you & perhaps work you on the air sometime but condx. into Europe from here are not good at present. I have a 2 element cubical Quad on a 60 ft. tower.

Vy 73's de John

VK4WLX



QSL card from Jamie in Killarney...

....and from the wilds of Buckinghamshire

GI4PCQ

YAESU themself Were Very helPfull and Provided Me with lots of Information, Mods, TrobleShootin9, and Production Faults,

Here are a Few-:

(1) Key Clicks Due to Missin9 CaPactor Value .01 on Jack Socket

(2) Intermittant LSB This is Due to the Lsb Crystal Base Ceramic Broken Where the leads come out of the Crystal.

(3) Band Chan9e Switch NEVER GO ANTICLOCKWISE (Quoat Yaesu)

(4) Band Chan9e Switch check CuPlers as they can 9o out of Sync for E9 if on 24 Mhz Chan9e to 28 Mhz PA Unit Stays on 24 Mhz this is Due to the alenkey screws not Ti9ht and score the shaft This Fault I have had myself.

(5) Ae Chan9over Relay Fault Due to the Flux When the Relays were soldered in it has Run Down the Leaf and by multi Use will dePosit on the contacts, the only cure is to clean with Thin card DO NOT Use Cleaner as most TyPes Attact the Inserlation.

(6) Noise Blanker Faults Due to Cracked Diodes on Mother Board (thease are broken in Production by the insertion unit and after lon9 use will 9o intermittant) this also is the case with the resistors.

(7) PA Valves Should have been Chan9ed by the A9ent for RCA 6146B (but 99% of the UK A9ents Would NOT do it Free of Char9e Even Though YAESU SuPPlied Them the New VALES Free of Char9e They still Wanted to RiP Us OFF By Char9in9)

(8) Meter Li9ht Faults The AGENTS Will only Sell You a NEW METER but the OLD Meter can be Taken aPPart and a New Film Li9ht Fitted.
However There is TWO Faults That I cannot Trace Down One is on My Own Ri9 and the other is on a mates Ri9.

(1) First fault-: Intermittant on RX When you Push Rf amP 8 out of 10 times Comes on OK but sometimes it will Reduce all incomin9 si9s by 80% have you had this Fault ???.

(2) On 10 meters Only some Whistles about every 3Kc/s (a bit like synth nois but after the ri9 has been on for Two Hours or so it disaPPears do you Know this fault ???.

102 USER is set on a BBC computer using WORDWISE wordprocessor and printed on a Micro-P CPA dot-matrix printer. Photocopying is on a U-Bix 550z. 102 USER is sent by private mail to a small group of Amateur Radio owner/enthusiasists and any contributions received are to cover expenses only. Publication and editorial address is 58 Willian Alexander Park, Belfast. No un-authorised reproduction of any part of this publication.....please.

More 102 Mail

Thank you for the very informative letter. My station comprises the FT-102 transceiver running barefoot and feeding a trap dipole antenna via a homebrew SPC Transmatch. The station is used mainly in the AMTOR and RTTY modes in association with two Dragon 32 computers and a Burroughs VDU (switched between the two computers). One computer is dedicated to the radio application and uses the GABMK software cartridge. Occasionally this computer is used for trial runs of lines during computer programming, and this does not require disturbance of the computer-transceiver interconnections.

The second computer is primarily for word-processing and the devising and running of utility programs, including distance, bearings and locator prograas which are often run in association with QSO's in progress - hence one reason for having two computers in use.

I looked for the Group net last Tuesday, but could find nothing of it. The QRM was intense around 3.720 MHz, and I would expect that it would be difficult to conduct a truly British Isles-wide net at that time of the day on any band. I find that 40 metres in the daytime, all year round gives the best such coverage, but the nearer stations would not be worked. I appreciate that daytime working except at week-ends would not be acceptable to most bread-winners, but OK for me who is an OAP and very ancient.

You ask for writing AT LENGTH about any problems.
What problems? Touch wood, the FT-102 here has been virtually problem-free. Oh, yes, there was one. There was persistent fuse-blowing which was caused by the rotor of the plate capacitor having sawn through the insulating sleeve on the adjacent connection to the neutralising capacitor. The remedy was to bend the wire clear of the plate capacitor rotor. Which hardly lends itself to being written-up at length.

I have modified the FT-102 for the faster T/R changeover required by the AMTOR mode. It was not at all difficult to do, but it is a mod that should only be undertaken after it has been decided exactly what is to be done and how. I will gladly supply details of the modificatrion to any member of the group needing it. It would be a tedious matter to restore the rig to the pre-mod condition, but as it does not detract from the performance of the rig it is best regarded as being irreversible, which, strictly, it is not.

For very many years I have used VOX and a boom microphone headset.and never a separate mike, on aaavoice QSO's. I have a strong dislike for the headset cord having a multi-pin plug and as well as a quarter-inch plug as such arrangement is often not particularly dependable. I have therefore modified the 8-pin mike socket so that it handles both TX and RX audio. As I have no use for the for the UP/DOWN push-button pins I used them for the mike connections. The mod also enabled the change from voice to data operating and visa versa to being a matter of one simple change at the mike socket in so far as system connections are concerned. This mod is readily and completely de-moddable, if required.

This user did not get a Technical supplement with the rig. He did get a more than usually comprehensive instruction manual and a Parts List. Would someone please tell me what I am missing by not having the Technical Suppliment?

73.

John.

AMATEUR RADIO STATION
GM 4DQD

PAYING FOR IT

This enterprise will need to cover its costs ONLY. I am therefore offering FREE adverts to users and trade sources as part of the information exchange.The costs to me are photocopying, stamps and stationery.I need to cover myself for these. I am sending this first issue to all 102 users who expressed interest. I f you would like to receive future issues (I can't guarantee how often) I would appreciate a contribution to funds, say £2 or 10 IRCs, to pay for this and the next few issues. When funds run out I will ask for more. Future issues will only be sent to those who support the effort.....I think that's fair. It's a hobby not a business...but if you think finances should be handled differently I'd like to hear from you. I'm a busy family man, but I'll give it all the time I can thanks to your encouragement. Till the next time.....
73 de GI4PCG

I dont expect to contribute much on the problem side unless incoming information leads me to look for things that up to now have not been apparent.at least to me.
I have run an ancient 101 for some 15 or 16 years,I changed the 6sj6s in the early years as pessimistic friends assured me that they wouldnt last five minutes but they have been going ever since! However with the advent of the new bands and the hope of getting a more up todate receive side and FM but avoiding the frills and price of something like the FT1 I settled in 1983 for the 102 having waited untill yaesu modified for the key thumps on the origional models.
The noise blanker did not operate on arrival but a prod around the board connectors and the problem vanished. Later on the pigtail of the S meter started earthing so I got a new one while current stocks were available but no doubt a more determined probe will put the origional to rights.
I did not buy the Fc102 despite sales pressure as I have a KW107 and an earlier HB EZY match built into a matching 101 fone patch cabinet with swr meter,dummy load and filter.
I have found there is I/C creep on Fm but the handbook does say watch this and it hardly amounts to thermal runaway.
The more update shift,width and notch are appreciated and also the three PA tubes when on RTTY.Peak on SSb would be usefull here but the first IF narrow filter does a good job.
I would have liked LEDs on the front panel bush buttons as say on the RIT as the old 101 does not even have an LED on Rit and this is sometimes left in by mistake.
I like the two meters as I am used on old AM rigs to watching an array swinging away.
I was a bit doubtfull on the lack of 12 volt operation so hung on to the 101 to cover this and also as a fallback should the 102 turn nasty on me!

I have of course heard a number of horror stories from non 102 users but also heard 102 users say they would have another one if they were available.
So,on the whole it looks as though I am going to wait with interest to other peoples troubles rather have much to add from this end.
I dont do a lot on eighty apart from RAOTA about once a week and the odd qso but will pass on your efforts if I hear a 102 user. So GL to your efforts and i look forward to hearing from you in due course.

Kind regards es 73 from

Frank

Frank C.Redfern GW3ICF

.....and from the Netherlands...

Read your helpline in September issue of Radcom.
Own a FT-102 since Dec 1982 as only hf set and still very pleased with it. As I intend to use my FT-102 for the years to come I like to join the user group.
My maintenance ~~experin~~ ~~experience~~ experience (← thank you Concise Oxford Dictionary) is limited to deaf rf preamp and that is solved by new relays and some work.
Come to think about maintenance: I had to change to the tiny lamps in the meters because one burned out and of course the right replacement was ~~unavail~~ unavailable; ~~and~~ further one of the tantalum condensors in the IF unit (C2175, C2176) changed into a diode, so ALC not working (at least meter not swinging).
Still: a very good set and I like to hear from you!

73 de
Hans

Hans Boer PA3CNY

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At present we have the following items in stock and at the prices shown. Other items are out of stock but we may not be able to obtain them from Yaesu.

			inc VAT	P&P
FAS-1-4R	4 way antenna switch		£ 80.00	£ 2.00
XF 82GA	6KHz Am filter		£ 14.50	£ 1.25
XF 82HC	600Hz CW filter		£ 14.50	£ 1.25
XF 82HCN	300Hz CW filter		£ 12.50	£ 1.25
XF 455C	500Hz CW filter	2nd IF	£ 39.00	£ 1.25
XF 455CN	270Hz CW filter	2nd IF	£ 39.00	£ 1.25

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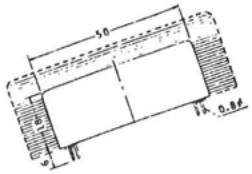

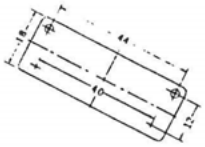

Products Info.

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YAESU

FT-101/E/EE

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FT-101ZD/107/301/707/901/902

117	8.9H2.1	2100	SSB	8987.5	1.6	$ 60.

FT-102/757

118	8.2H2.1	2100	SSB	8215.0	1.6	$ 60. 2)
119	8.2H250	250	CW	8215.9	2.8	60. 2)
120	8.2H500	500	CW	8215.9	2.0	60.

FT-980

117	8.9H2.1	2100	SSB	8987.5	1.6	$ 60.
187	455H2.1	2100	SSB	455.0	2.0	110.

FT-301

331	9.1H2.4	2400	SSB	9000.0	1.6	$ 60.

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12BY7A	*NEC. Original boxes as fitted late FT 101E, FT 901, FT 902, FT 101ZD, etc.	£12. 50
12BY7A	*SELECTED. Original boxes. These work O.K. most YAESU & TRIO rigs. Very old FT 101's may be unstable on 10M with this valve. Either fit valve screening can, or cover bottom 3rds of valve with metal foil & earth to chasis to completely stabilize.	£ 5. 75 *
6146B	*GENERAL ELECTRIC as fitted to most FT 901, FT 902, FT 101ZD, etc. Original boxes, matched pair.	£26. 00
6146B	Original boxes, matched three. (For FT 102)	£39. 00 *

POST AND HANDLING CHARGES £1.25 per order. *

*Due to difference in electrode capacity and the very high HT voltages used, other makes of valves are often not suitable. They can cause parasitic oscillation, low output, RX and TX peaking at difference points or even a cloud of smoke!! New valves may flash over; always check the correct fuse is fitted first.

VERY IMPORTANT.

Do not replace the P.A. Valves in old FT101's without first checking C13/C131. These go leaky and and will burn out the new Valves and the mains transformer

Please note that all the above valves are run in excess of their maker's ratings and hence the maker's guarantee is void the moment you switch on!

We will replace any valve that is received in faulty condition and returned within 14 days of receipt Hence test all valves immediately.

* Special Offer to 102 User Group
Three 6146B + driver
CASH or CHEQUE October '87 ONLY £40 P.P.

BUMPER XMAS ISSUE 10 PAGES !

ft102 USER

GI4PCQ 58 William Alexander Park Belfast BT10 0LX N.Ireland

ISSUE NO.2 DECEMBER 1987

The Net

continues to flourish on 80m, Tuesdays at 21.00 around 3.720 MHz (3.724 MHz actually in recent weeks). It is great to hear so much enthusuastic 102 chat....GI4PCQ has not been able to call in every week but things seem to be in very capable hands with either Pat G4YBP or Peter G3RZP keeping things in order. The first net after USER1 went out was really hairy with over 20 stations calling in ! Great to hear Ted G2FLT coming in from Brighton on an indoor Joystick antenna at 59 in Belfast and a lovely signal from Hans PA3CNY. Suggested time change to 20.00 GMT.....see NET LATEST inside.

Who Are We ?

The first 50 contributions received following the distribution of USER No. 1 included 24 G4s, 14 G2/G3 calls and 7 G0. Others were outside the UK and we have one G1 awaiting his morse test ! As varied a selection of Hams as you could wish for...if all those rigs could tell a story. I suspect that, for a lot of G4s like me the 102 was their first new rig...but some of you older callsigns must have interesting comparisons to make with your earlier rig(s). Care to drop us a line and tell ?

Who are we besides 102 users though? Judging from the mail we are enthusiasts.....we are generous and appreciative (the flow of contributions and copy hasn't stopped)....we are not all technical whizz kids but we are anxious to learn how to maintain our rigs as best we can. We think Ham Radio is great fun and we think we own rather a good piece of gear with just a few foibles..we'd like to keep it going as well as possible for as long as possible....to this end we want to share our experiences with the equipment and hear about the other fellow's experiences. That's us....the 102 Group !

Many Thanks

To all who wrote again after receiving the first USER, and for the contributions to costs. I have enough funds now to cover me for quite a few issues... the only worry is getting the copy ! To be fair, I have a good collection of items from the Mail, including hints and also requests for information....what we need is more contributions of article length, perhaps including circuit diagrams or drawings a la G3RZP and G3LLL.

So please keep the copy coming, including offerings for "102 SHACK" with photo....but most of all thanks for your support !

Who's Mailed ?

102 USER now goes out only to those who sent in a contribution to costs as explained in issue 1.Over 120 first-time enquirers got USER No.1 without obligation and over 60 of you have made a commitment to the group and will continue to receive FT102 USER at approx 2-monthly intervals until funds run out.The Net is open to all Users(see inside)

Peter's Pages

WHO IS THIS GUY?

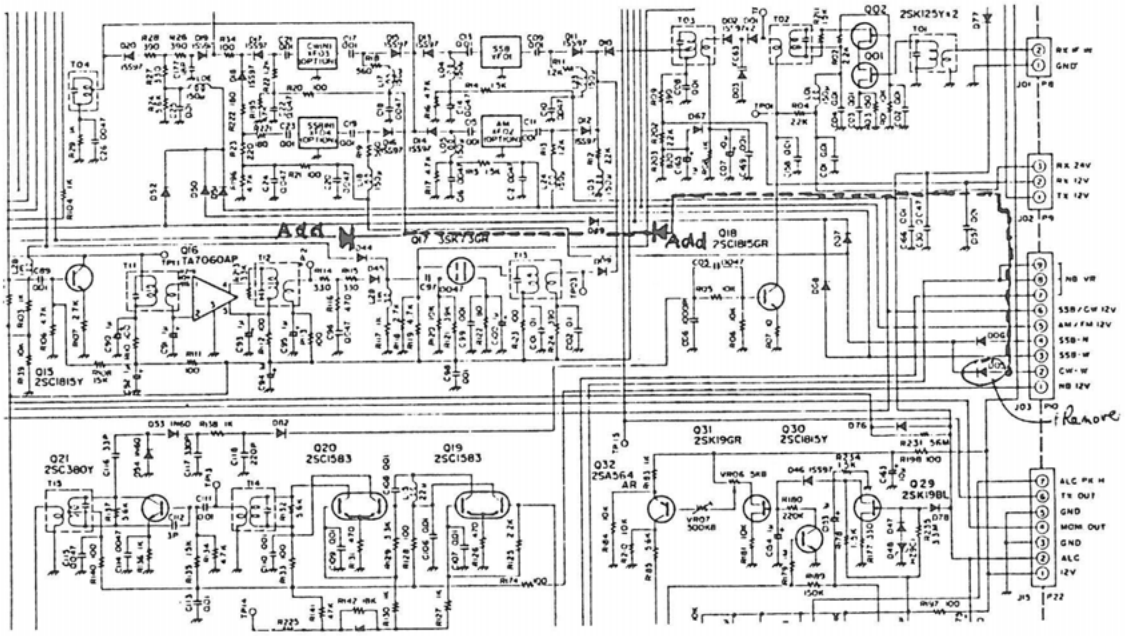
Anyone who has spoken to Peter on the 80m net will be aware of his extensive knowledge of RF electronics.Son of the late G8ON,he has worked with Marconi's, Labgear,Decca,KW, Racal and,since 1979,as Principal Applications Engineer at Plessey for RF and Professional Products !A most valued and early member of the 102 GROUP, Peter has addressed the IERE and IEEE,been a member of RSGB Technical and Publications Committee and published approx. ten articles in Amateur Magazines.

He has worked on TXs from 750KW to 5W output,designed rigs for HF/VHF/UHF applications and currently runs his 102 with a home-bru linear and a 5-ele beam to chalk up 218 countries confirmed. Amateur radio is very much in the family:XYL is G4FNC (met at Cray Valley RS).Her father is G3ZCV and her brother G4MZM. The QTH is described as 'a radio station with living accomodation attached,chosen for ham radio.Only worthwhile gardening is plants with long steel stems,aluminium petals and fed with co-ax!'

Peter has sent in mods for the 102 to improve the IF filter arrangements,the CW keying,TX stability on 80m and a method of extracting band-change info to control a remote antenna switcher.
Some of these were described by Peter in a letter in our first issue....here are more details.

RE-ARRANGING THE FILTER SWITCHING

This mod gives you 800Hz filtering on CW wide with the narrowest possible filtering on CW Narrow position.Disconnect Diode 05 from Diode 06 on the IF board and connect it instead to the junction of C18/L17.Another Diode is inserted in the CW/N 12v feed to the same point.The original spec for these components is 1S1555.



IF UNIT

PB-2343A(No.2...)

MODIFIED CW FILTER

SWITCHING

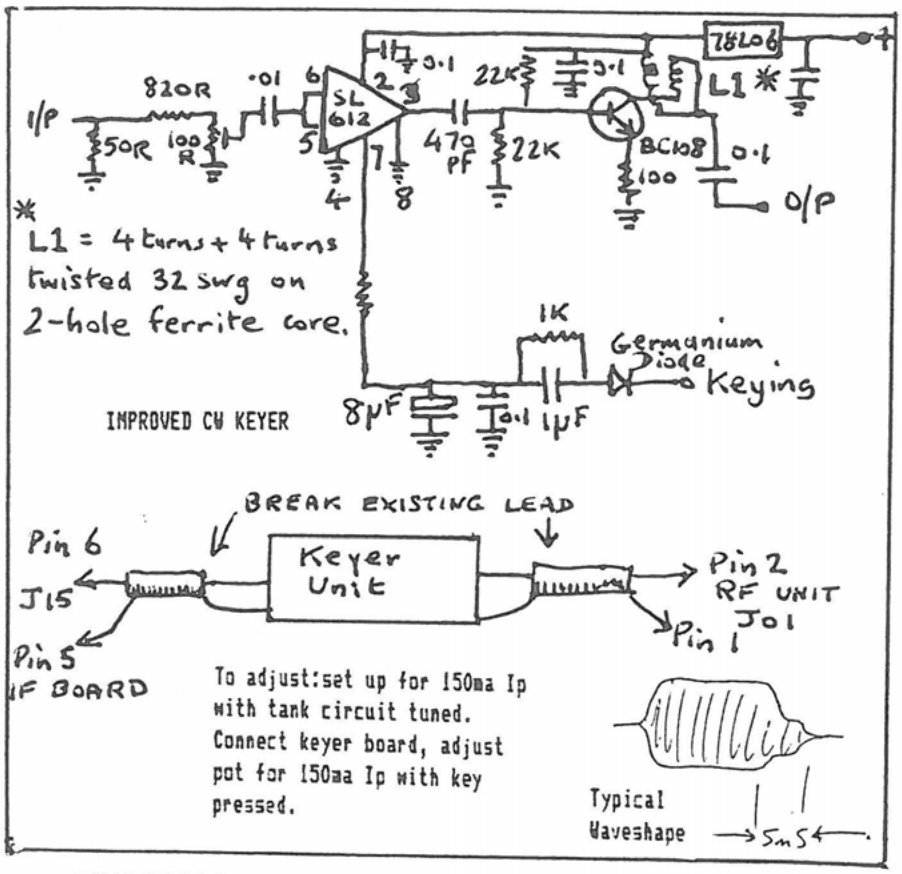
G3RZP continued

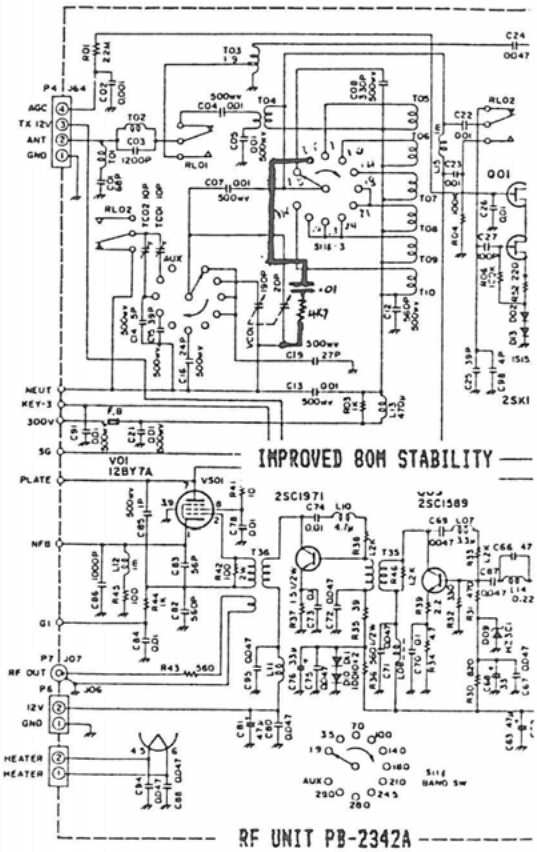
FT102 KEYER UNIT

This produces an improved keying waveform as indicated in the sketch.Circuit diagram and interconnect details are shown here. Pat G4YBP found that this mod didn't work with his rig so be warned !On the other hand, Peter has hinted that he may produce a PCB if there were enough interest.

80M IMPROVED STABILITY

G3RZP found that his 102 would go into violent oscillations on 80m.His cure is to fit an R/C network between the Driver and the Preselector variable capacitor.Find the tag on the rear of the 12BY7 plate section of the bandswitch that the rotor points to on 80m;connect the 47K/.01uF combination between this point and the frame of the Preselector Tuning Capacitor.Instability gone !





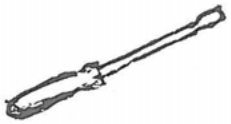
EXTERNAL PROGRAMMING INFO

Peter took the bandchange info from the counter board input on the Bandchange switch.He found that RF feedback on 80m could be a problem and installed an effective filter box externally to cure this..I have the details, if anyone wants to pursue this one. It is also worth mentioning the article on Auto Antenna Switching for the 102 by 5Z4DJ in Ham Radio Today, Nov/Dec 1983, which I also have...again if anyone is interested let me know.

WHAT NEXT?

G3RZP is working to cure Rx spurii on the 102 and has also promised to provide designs for a new front end and a mod for those PA bottles involving individual biasing so you don't need matched sets anymore! Peter recently did a complete re-alignment and advises that the chart at the top of p43 in the manual is incorrect. The 40m adjustment should be done at 7.0MHz and not 7.5 as shown (PLL VCV).However other sources suggest that the figure of 6V is also wrong.

MANY THANKS TO PETER G3RZP FOR HIS SUBSTANTIAL CONTRIBUTION THE GROUP BOTH ON AND OFF THE AIR.MORE MODS NEXT ISSUE.



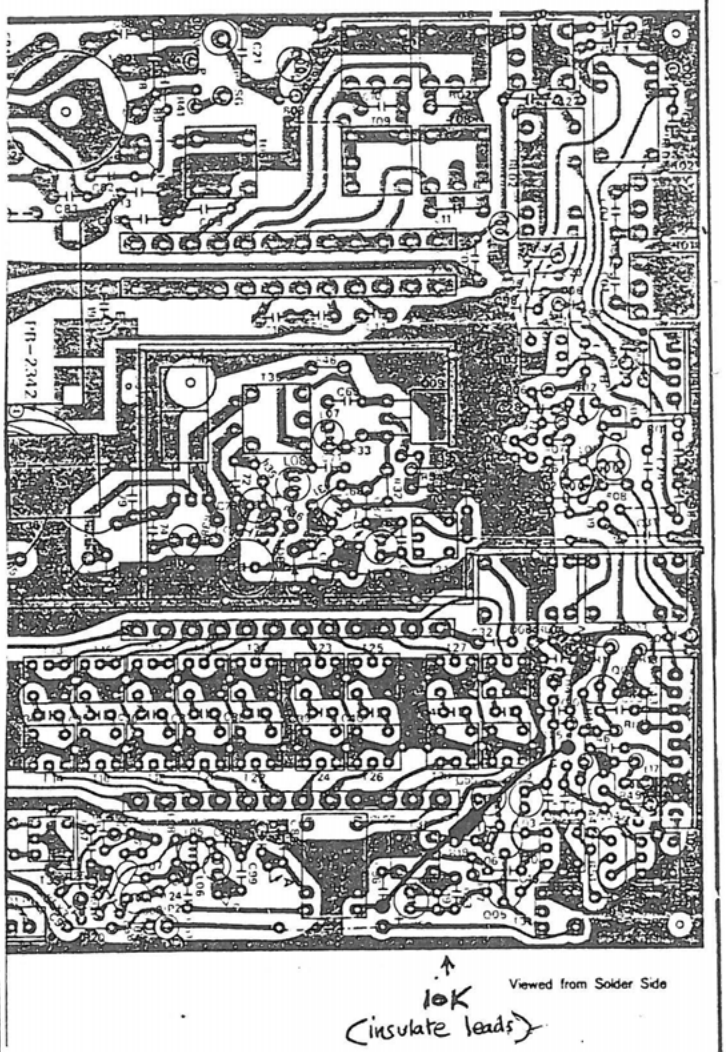
102 ABUSER

PETER G3RZP also wrote in reply to some points in the previous Abuser section: a Siliconix J310 is a close replacement for the 2SK125Y RF amp if you lose it in a thunderstorm. He thinks G4ZWY should check the diodes in the SWR bridge of his FC102 or the resistors around the detector. Running QRO can make these burn up giving erroneous readings. And the over-sensitive VOX ANTI-TRIP: wrong frequency response ! AND THOSE RELAYS...when no current is flowing the contacts can oxidise and have a high resistance....a few 1K resistors to put DC through them would break down the film.

IAN G4IUI says our first issue confirmed his worst fears about the relays.After he replaced his THIRD set he examined the contacts under magnification and found that the plating had corroded away - he blames poor quality components and 'penny pinching'. Replacing them is also quite a fiddle - the one under the Bandswitch extension rod is the worst. Impossible to fit as purchased...he had to shorten the leads with snips and slide it into place with the aid of Blu-Tak and a short blunt screwdriver.Lightly wedge it in place until soldered, otherwise the RF panel has to be removed with all the associated problems. Also CW reception using the (narrow?) SSB filter is, he feels, worse than without it - any answers? (see G3RZP page, Ian)

RF UNIT PARTS LAYOUT

G3LLL/YAESU RELAY CURE



HARRY G3LLL has joined our group and writes about the RELAYS also. He enclosed a letter from Ed Coan at Yaesu who commented that this fault does not happen in MOST FT102s!!!!!!!!! but suggested a remedy.The problem is apparently caused, not by dust or corrosion, but by EROSION of the contacts due to minute DC current charging capacitor C46 through the relay contacts when the rig switches from TX to RX. Adding a 10K resistor pulls the DC on C46 up to a continuous 24V, thus removing the damaging PD across the relay contacts. The new resistor is installed on the solder side of the RF board (see diag.) Harry says that this certainly helps prolong the life of the front-end relay but there can still be trouble.The contacts of some of the relays carry such minute signals on RX that the few microvolts is not enough to break down the slight tarnish that develops on the contacts and this is particularly true if the operator is a smoker!

Regarding the PA TUBES Harry says he never got any free ones from Yaesu as was alleged in USER1....the RCA ones were certainly the best but they are not made any more and the GE ones now on sale are not as good as the ones made a few years ago, being down about 10% on power.Modern amateur rigs run these valves to the limit, putting almost 1KV on them on RX. It may be desirable to tap down the mains transformer to reduce HT for the quality of valves that are likely to be available in the future. The same is true of the 12Y7BA drivers currently available...not a patch on the NEC ones but NEC valve plant closed down 6 years ago !!!

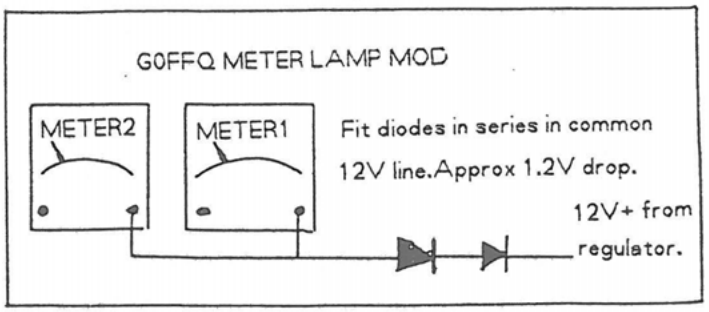
More 102 Abuse

REG,GJ3XZE, has experienced the same problems with the BANDSWITCH and the SHIFT/WIDTH control as reported in the first issue and also complains of intermittent operation of the meter lamps. His biggest problem arose when he accidentally left the key down on TX for a couple of hours (Into a dummy load we hope!) and burned out the mains transformer....the fuse never blew and there is no protection against overload. Apart from this he is very satisfied with the 102 !!!
(Early 102 folklore had the mains transformer as a weak point - but this is our first report of failure, any others?)

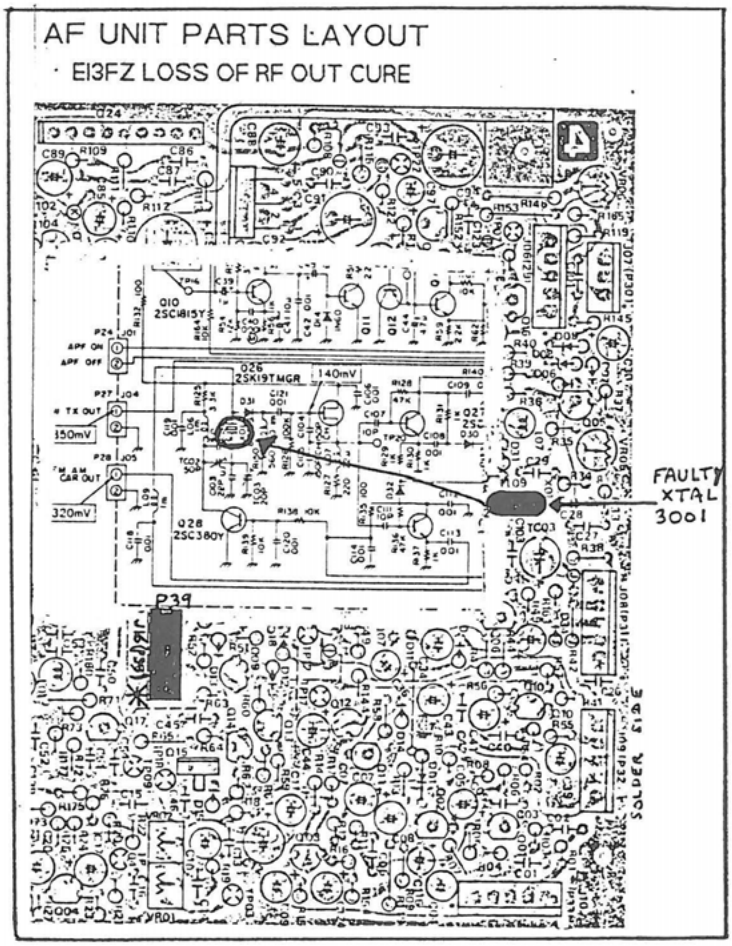
JAMIE EI3FZ recently lost RF out when the mode switch was in the TUNE,CW or AM position (Kerrymen still using am?). He discovered a novel method of tuning up using audio feedback from the MONITOR with the mike in front of the speaker....this kept him on the air until the fault was traced to a dead crystal - X3001 - on the AF board. In passing he discovered that the CW TX voltage (plug 39, pin 2) shown as 12V on the AF board diagram, page 54 of the Manual, should be 8V as indicated correctly on page 45 of the Technical Supplement.

TIM G0CWZ had the relays jam on TX, cured by replacement. Then he lost his driver (valve). He also reports the whistles on 10 metres (G3YFC previous issue) which DON'T go away on warm up. NOISE BLANKER not much good, SHIFT/WIDTH control too tricky (anyone like to write an article on that one ?) and disappointed with RF output on 10FM (aren't we all ?) Apart from that he cannot forsee parting with his 102 as it looks so nice alongside the 726!!!

ROY G0FFQ reports 'standard faults' including loose BANDSWITCH and blown mains fuse, the latter caused by rotor of TANK CAPACITOR arcing across to lead of NEUTRALISING CAPACITOR. This puzzled Roy, at first, because it only fused when tank reached resonance. To cure regular failure of METER LAMPS, Roy suggests fitting 2 Silicon Diodes in series and break the 12V common lead to the meter...lamps less bright but they last longer !(Incidentally new meter bulbs give off a vapour which clouds the glass each time the rig is switched on.Cure:gently COOK them in XYL's oven before installation) Roy is looking for an SP102 by the way.



JEAN-MICHEL F6AJA sends a 'cri de coeur' from Bouvignies: has anyone resloved the problem about the plate current increasing all the time during the transmission? Is this the dreaded THERMAL RUNAWAY ? Perhaps he has a set of un-matched SYLVANIA tubes? Any other ideas?



FREDDY G3HID is also looking for an SP102. He is disappointed in the sound of the fitted filters on AM (There is a special AM filter, though).Also disappointed with the NOTCH effectiveness...is there any internal adjustment? The concentric SHIFT/WIDTH control is a 'darned nuisance'.You need to have 'snake-like fingers to get the valves out of the PA box...or a special tool like a thin screwdriver, bent at an angle to lever each tube up off its base.But the FC102 is the 'BEST ATU SINCE SLICED BREAD' ! (A lot of hams who wish to use balanced twin feeder might not agree, Fred).

102 Mail

Thanks for the first issue of the newsheet,first class,hope you can continue. When I get a decent 80m antenna up I will join the Net, in the meantime I am a SWL, Hi !
I have the FT102,SP102,FT1012 and a FTV901R with 6m and 2m modules. I haven't had any problems with the FT102,just a scare - I noticed during long transmissions on 20m SSB that the standing current was 300ma. Sure stopped me making long overs ! A friend was caught out while we were doing some tests on 10m FM....he lost the 3 valves and had damage to some components in PA box.
I wish you every success and hope you can continue to keep things going. Thanks for taking the trouble to get a super idea off the ground.
73
Sandy GI4GPC

Ed:Similar report on High PA current to F6AJA (see ABUSER pages).Is this thermal runaway, and what brings it on?

First of all, thanks for the Newsletter which was extremely well done and it was amazing how informative it was.I checked my PA valves to discover that I had Sylvania fitted and guess who has had thermal runaway, mind only twice in four years? I replaced them from the ad in the newsletter, now I'll keep the fingers crossed.Would you believe now one of my meter lamps has gone, that means I have now had to replace both of them..my source of lamps is JAYCEE ELECTRONICS, Glenrothes (see ad in Radcom etc). Only took me 10 minutes to fit.
It was nice to have a word with you on the Net the other week, unfortunately Tuesday is not a good night for me so I will only be heard once in a while. By the way I am an avid circuit diagram collector, of CBs, TVs, Radios so if anyone is interested I could supply a list of what I have.
73
Bob GM4UYZ

Ed:Don't throw away the Sylvania tubes,Bob, you might be glad of them someday.It's possible this thermal runaway may be partly user-induced.Could you give us a brief run-down on replacing the lamps, Bob and perhaps send G2FLT an advance copy ?(see below)

Many thanks for the newsletter, which I appreciate very much. Does anyone know how to change a dial lamp ? I have spares but no idea how to get at the LH meter which has gone dark. I have had the 102 for just over a year but have not been able to test its DX capabilities as conditions have not been good. I am restricted to a Joystick tuned by a KW109 or a short thin wire antenna on my flat balcony, but I worked the world on my old KW2000, so I am looking forward to the propagation improvement in the coming years. Incidentally, I restarted Amateur Radio in Sept. 1980 when I retired. Had to take the RAE and CW test and got my 1938 callsign again.

Best Wishes
Ted G2FLT

Ed:Well,Ted,if you haven't replaced that lamp yet, you should have the info soon. The newsletter is a slow way of getting help though, and the Net is probably a better vehicle for urgent help. You have a good signal on 80m and just shows what can be done in restricted circumstances.Nice to work you OM and good DX.

Nice to meet you on the air and tnx fer first issue which arrived this am to my great delight and made a really swell beginning to what I hope will continue for many years to come. A few suggestions might however help with future editions: number and date each issue, leave a wider margin on odd numbered pages to facilitate binding, and I find the print on the last two sheets too small for me to read (eighty turns on the coil and navigation lights on the blink).
Here are some ideas for the Group which might be of help to you.

1.Publish membership list
2.Allocate each one a membership number
3.Numbers should be allotted in order of receipt of initial contribution
4.Declare the initial 100 to be founder members
5.Institute an awards scheme for contacts between 102 users using 102s
6.Devise a logo incorporating the Yaesu insignia and '102 User group'
7.Appoint an awards manager.

The only real trouble I have with my 102 is poor modulation on 40m.By adjusting the ATU for a 6:1 SWR I can get a perfect waveform on the scope.Any ideas of what's wrong ? It's obviously some form of RF feedback.
Thanks for starting a group that was badly needed.....long live the 102 User Group !

73 and GD DXing
Jesse G4GOF

Ed:That was an amalgam of several letters from Jesse. I have acted as far as poss. on the printing instructions.Reducing the size of type on the letters pages enables more letters to be fitted in...the change of typeface should help somewhat (I will type any handwritten letters in future), and I'll send Jesse an enlarged edition just to be sure(don't all ask for this!). I would welcome concise replies to his suggestions on group organisation,and on the technical query, I had exactly the same fault on 40m when I touched the metal case of my desk mic.The antenna feeder passed close to me where I had a switch on the leg of the bench...I've changed it now but could that have been RF feedback too ?

HANS PA3CNY, who mentions, in a fine long letter, that he feeds his inverted V with TWO co-ax cables (symmetrical feed - more details Hans?), shares my misgivings about the SHIFT/WIDTH control:switching from CW-WIDE to CW-NARROW makes his contact disappear unless this adjustment is spot on.When he changed his relays (three times) he took out the BANDSWITCH assembly necessitating re-aligning the sections each time.No problem with the switch though, regardless of direction of rotation !Beats the VOX ANTI-TRIP by wearing headphones, and finds it hard to keep the needle out of the red on TX when not using the processor (this usually means your mic output is too great, operating at the lower limit of the MIC GAIN control). Used Philips valves and G.E. without trouble.
Hans wants to know how the switching is done between the internal and external VFOs..does an RF signal 'ride' on a DC signal? Also how to get the KNOBS OFF?

102 Mail contd

I just received my first issue of the user group newsletter; thanks for getting it to me so fast. I am a new FT-102 user, and I find that the 102 is not very common here in the U.S. I am very glad to have found the user group, as there are not many sources of advice locally.

A few comments on your "102 AB-USER" notes:

I too find that the audio sounds better with the shift/width control at the 10 O'clock position (on USB). I guess that it is just a matter of personal taste, but the tone control on the 102 sure doesn't seem to do very much one way or the other.

Other stations say that they can hear a difference with the speech processor only if they are very close. DX stations say that they can't hear any difference. The noise blanker, on the other hand, works great, completely silencing an S9 woodpecker.

I have had no end of trouble with the VOX anti-trip. As you say, even a low setting prevents the VOX from working. I have had no luck at all getting the VOX to work with the SP-102P phone patch; the VOX trips at a rate of several times a second no matter where the anti-trip and null controls are set. If anyone figures out that one, please let me know.

After I bought my 102 (used, of course) I had to immediately have the relays on the RF board replaced to defeat the no-RX gremlin. The new relays did the trick.

So far, my PA tubes (sorry, valves) seem to be holding out ok. That is good, as they seem to be a bit expensive, if the advert in the newsletter is any indication. If I'm figuring this out correctly, the 40 pounds the dealer wants for a set of tubes comes to about 70 U.S. dollars. That's almost 10% of what I paid for the entire radio set, including the FV-102DM VFO!

I think that we can all agree, however, that the few problems the 102 has are small compared to the excellence of the radio. In my humble opinion, Yaesu reached an optimum mix of features, performance and quality in the 102 line. There is no radio available today that I would rather have. I am looking forward to corresponding with the user group to resolve the few problems the set has, and to comparing experiences using this fine radio.

Many thanks, Sean. Keep up the good work.

ED:Thanks for the kind comments,Mike, and welcome aboard.Please spread the word in USA.

73s from the U.S.

Mike White
N4PDY

I bought my 102 almost new from the estate of a silent key operator, complete with SP-102 and YD-148, for a very reasonable price. It has proved to be a very forgiving rig but, like most others, it has suffered from the odd problems - all intermittent faults.

On one occasion, the PA ran away - heaven knows what the plate current rose to before the fuse blew! New fuse fitted, and all O.K. On another occasion, I could not get more than 30 watts out, no matter what I did. I threatened to ditch it, so it stopped sulking immediately!

The latest intermittent fault - as yours I believe - was a change of use from pre-amp to 30 dB attenuator! Rapid mike keying stops that one.

There is version of the AMTOR mod in the latest edition of Datacom though I haven't modified mine. I'd rather keep it on the air! I have an AMT-1 for RTTY and MFJ 1274 packet TNC.

Would you send a copy of the newsletter to our other 102 user who is Reg Allenet, GJ3XZE, Les Sablons, Le Bourg, St. Clement.

CUAGN ES 73 DE

Peter C. Prosser
GJ4TVZ

Ed: Thanks for passing the word,Peter, Reg has joined us too !

I am a comparatively new owner, having passed the RAE, but I have not got my morse ticket yet, I find the going pretty hard. I don't intend to go on 2m...I'll stick it out until I can copy just over the magic 12 WPM. I have a separate speaker, a SEM tranzmatch and the 102 which is excellent on RX. The aerial is an end-fed 60ft LW, but I have a 4-trap dipole ready to erect and the centre mast is already up to support the 102ft top. I'll send you all the details when it's finished. Thanks for the newsletter, I think it's a great idea. Bernard

F.B.Greenall(SWL)
Ed:Thanks,Bernard,we need to hear from SWL users too..good luck with the morse and the antenna farm!

I seem to have avoided all the troubles with relays and switches. Tuning and frequency indication is spot-on. However the Noise Blanker does not blank anything and no matter how I adjust the Processor, the output drops from 100w to 30w when I switch it in ! Perhaps someone has the answer to this. I wonder does anyone find a desk mic an improvement over a fist mic ? I would also like to know if it is worth fitting the narrow SSB filter and where can they be obtained ?
The owner's manual has no test points or voltage readings, mains P.U. or fan wiring either.

N. Black G4RYS

Ed:Try increasing the mic gain a bit with the processor, and then bring uo the DRIVE control..average power out should increase. I reckon the SSB narrow filter is useful on occasions but it degrades the tone of received sigs a bit.Filters can be got from SMC,Fox-Tango Corp. and International Radio in Florida, and I prefer a fist mic for shouting at DX. Yaesu's owr MH1 hand mic is recommended for this rig..but MD1 desk mic sounds terrific on a good signal path !

More 102 Mail

EUREKA???

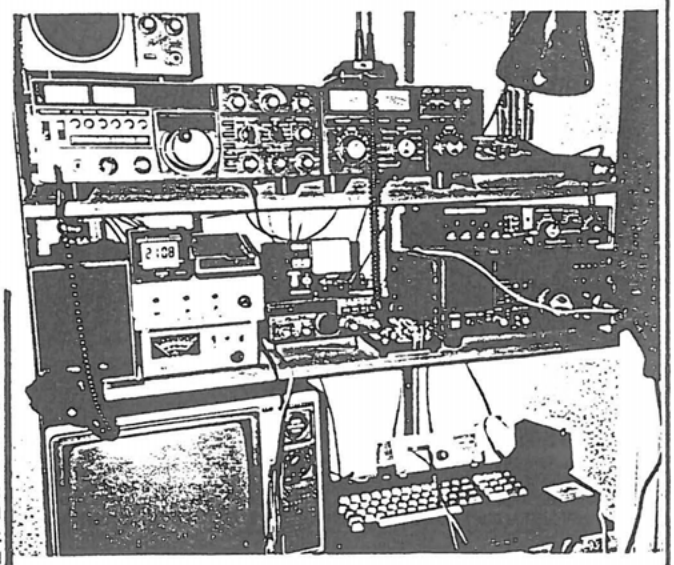
Well it certainly seems that we as a group have more than our fair share of problems! However, further to my first letter of 25.8.87 in which I told you I had had the relays in the rig replaced but still had an intermittent RX problem, well I think I have found the solution to my problem. Having fretted over whether it was the 102 relays yet again or the relays in the ATU (6 including the ones in the FAS-1-4R!) or if it could be the RF Amp or the FETS (etc, etc, worry, worry, cost, panic), I had a little (quite big for me) brainwave, caused mainly by faults appearing in some domestic equipment (one stereo cassette deck and one transistor radio). I hope my answer may come as a pleasant surprise to some of the group who are having the same problem, including yourself it seems!.

As we all know (I only just figured it out!) if a pot or a switch is left in the same position for years on end, an accumulation of smoke, dust and other airborne muck gets in and at best causes poor contact and at worst the switch or pot goes open circuit. Well which is the one switch on the 102 that virtually nobody ever touches and is held firmly in one position with a perspex plate? The one that forms a major link in the RX chain? Thats right, the one at the back marked SEP/NORM (S9) which switches the 102 receiver off!! Having removed the perspex plate, sprayed the switch with switch cleaner lubricant, and flicked it on and off a few dozen times I am pleased to say that my so called relay problem seems to have disappeared and stations are now still there when I drop the PTT! The 102 seems less deaf too.

I hope this may be of help to any user who might think they need new relays when in fact it is something far less expensive and can be done in two minutes! In fact may I suggest that members of the group carry out this procedure anyway in order to prevent the problem developing.

Malcolm

Malcolm Taylor G4YMT



THE SHACK AT G4YMT

Thank you for the newsletter which is excellent and very informative. My problem at the moment is that I removed the I.F. board and fitted a full compliment of filters and then when I re-installed the board the audio had dropped to near nil, so that an S9 signal on SSB or CW is just audible with the 'phones on. However the AM and FM receive is OK, so at present I am trying to find out the cause of this and then I might get on the 102 Net.

Archie

Archie GM4FGD

Ed:What have you done, Archie ? Did you snip the various leads under the board as instructed ? Maybe you disturbed some of the board connectors on re-assembly..just athought..check for solder bridges and finally gently rock the various components on the top side of the board adjacent to each filter, in case you disturbed what was a bad joint in the first place.Anybody else help with advice for this problem ?

I run my 102 by itself to a KW Trap Dipole for 80 and 40 meters. ATU and Directional Watt Meter are home brew.

I bought the rig in Sept. 1983 at a sale of smoke damaged equipment. It had the AM/FM board fitted but the driver transistor was known to have blown and the S-Meter was not working.The price was exactly half the going rate at the time so I decided to have a go at fixing it and off I went armed with a new driver transistor, circuit diagram and Instruction book all thrown in.

When we got down to it we found clear evidence that the driver transistor Q10 had been replaced at least once already so we did some careful checking and found that the cathode end of D10 had lifted out of the board thus making Q10 into a very fine fast fuse. Fixing D10 and replacing Q10 did the trick and the TX worked OK.

The reason for the dead S-Meter was eventually traced to the tag strip adjacent to the AF Board where a white wire had broken off the tag. This gets disturbed when the AF Board is removed to get access to the underside of the RF Board so care is requireda. The wire is part of the AGC switching network so repairing it fixed the AGC system and the S-Meter then worked OK.

The rig could now be used on the air but the receive sensitivity was erratic and a lot of time was spent looking for a dry joint on the RF Board. Eventually we were able to proove (you've guessed it) that the relays RL1,3,4,5 were the culprits. Well I won't go into all the details, sufficient to say I had the Rf Board out (never again) tested the relays using a good low resistance Ohmeter and decided that they should be replaced with better quality units. Here we were very fortunate for a good friend G3XTZ made me a present of ex-equipment high quality types sealed in TO5 cans. I fitted these using small pieces of Vero Board to help with the pinout. We've had no further bother in this area.

The next problem to occur was a loss of drive which was eventually traced to a dry joint inside the can of T06 which prevented D21 from switching. A time consuming job but we had plenty of drive when the job was done.

Next we had occasion to use TX RIT on CW only to have reports of slight frequency jumping. Investigation revealed that Relay RL01 on the Local Unit Board was responsible. However by dint of giving the relay plenty of work to do i.e. setting the VOX to come in on speaker noise with the TX heaters off this fault cleared up.

Recently we had the mains fuse blow twice when compression in use but thanks to Rad Comm review we have replaced one Sylvania with an RCA and now have all RCA in the PA.

By this time we had been using the rig for nine months and had been appreciating the excellent receiver performance. We fitted a 600Hz CW Filter and now consider that we have a jolly good piece of equipment. At the moment the only thing I'd like to improve on is the carrier suppression which is not as good as it should be, so I'm hoping that someone will have the answer to this and I shall see it printed in "102 USER".

Thank you Sean for a fine effort. Bob R.A.McCowatt G3WPK

102 Shack

Had the FT 102 for about two and a half years and also have the FC102, FV102 and the SP102.

In the photograph on the top row left is a 144 to 3.5Mhz transverter with 10 watts output and a low power A.T.U. on top, both were kits from C.M. HOWES. Next is the SP102 then the FT 726 with the 6M, 2M, and the 70cm moduls in, and runs the transverter, and next to that is a CWR670E Telereader, CW and RTTY decoder (receive only) and a Datong FL3 audio filter.

On the bottem row left is the FRG 7700 general coverage receiver, then comes the FC102 A.T.U., FT 102 and the FV102 V.F.O., I use a MD1B8 desk mike. Also have FT 208 and the FT 708 handhelds and various other odd bits and pieces.

The FT 102 has the SSB filter and a 600hz CW filter in. The audio reports I get from people, not asked for, are always very good.

My main bands are 80M and Top Band. I use the transverter on 80M and find it very rewarding to work around Europe with something I built and only 10 watts PEP. The FT 102 is usually left loaded up on or near 1.930khz, don't normaly venture higher than 80M, but now have a converted C B for 10M F M.

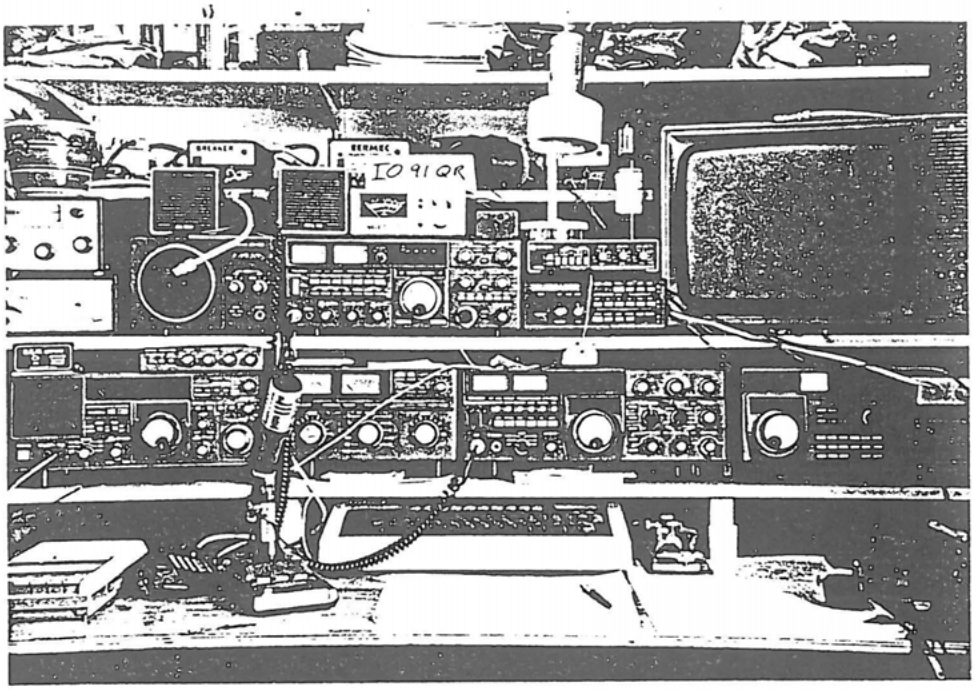
Aerials are a trapped dipole for 80M and 160M, fed with 50 ohm coax and a balun in the centre, it is about 28 feet above the ground at the highest point and gets lower from then on, and not in a straight line, the Top Band part is then folded under it, and it works very well. I also have a half size G5RV for the other bands.

I am very pleased with my FT 102 and do not think I will sell it for a long time. It is my first H F radio, I don't think I could afford another one, that why I only normally use it on Top Band were we have to keep the power low, and use the transverter on 80M. The receiver is used to listen around and the FT 102 is only put on when I want to have a QSO.

73s and best wishes

David Cook GOABZ

PICTURE OF SHACK AT GOABZ



SOME MORE MAIL

I am particulary interested in methods of reducing power on SSB to a nominal 5 - 10 watts. Please let us know if you come across any information on this.

J. Tomlinson G3MGX

Ed: It's not just a matter of reducing mic gain, is it ? How do the top-band users do it ? It's easy on CW..just reduce drive but how to reduce power on SSB....answers please ?

I have had the 102 since Aug. 1982 with no really difficult problems. I did have a CW switching problem, which concerned diode D09 on the AF board. This had to be replaced, several times. The other fault I had was that the main tuning drive had to be replaced about 12 months ago. Apart from replacing dial lamps I had no other bother and overall I am very satisfied with the gear. I tried to contact the Net but the noise here on 80m is overwhelming, and my hearing is not so good, being 71 years old (and an ex-flying boat operator who used to fly out of Lough Erne in WW2). However I wish the Net the very best of luck in the meantime.

73 to all

Geo. W. Hunt G4PJM

Ed: Replacing the main tuning drive is more than most of us want to do George. Hope to hear you on the Net if conditions improve. You may be interested to know that your old base is now a country forest park and holiday centre with boating, fishing, caravanning and camping, but the old flying boat jetties are still there.

Bits and Pieces

THE TECHNICAL SUPPLEMENT

SMC sent me a few sections of it when I wrote to tell them I was starting the group....they also said that the contents were copyright so I couldn't publish them ! They will sell you the whole thing for £8.50. I got in touch with Liam EI7FE who had bought one and compared notes....there are chunks of it that one doesn't really need... so here is what you might be interested in.....

Errata in the User Manual (Early Editions)
Keyclick Suppression
FM Unit Protection
24.5MHz ALC Reduction
Receiver RF Amplifier Protection
Receiver Spurious reduction
Counter Noise reduction
Transverter Modifications for use with the FT102:
FTV901R,FTV107,FTV707

Nearly all the mods mentioned were implemented on all rigs after LOT 4, so if you have a late model you don't need the Technical Supplement. If you want more detail on any particular item drop me a line...I have written direct to Yaesu asking for permission to reproduce parts of the Supplement in our mag.

NET LATEST

As we get deeper into Winter, night-time conditions for inter-UK working on 80m have somewhat deteriorated, making it difficult for some of the 102 Net people to hear each other. In a bid to combat the problem, the NET time has been MOVED FORWARD TO 20.00 GMT since mid November. Those of you unable to call in this early may still find some Users on frequency at 21.00, and we will keep the Net running as late as conditions allow.Frequency now 3.724 Mhz usually.

HOW OLD IS YOUR 102?

A number of different LOTS of 102s were produced.You can identify your LOT No. from the Serial No....the digit after the letter gives the clue.Say the Serial is 2M071018 (mine)..that shows LOT No.7, a late model. The Technical Supplement gives a lot of mods which were incorporated into all rigs after LOT 4...so if you've got a late rig you really don't need to worry. What I'm not sure of is if there were really SEVEN different lots made as the numbers suggest...if you have a LOT 2,3,5 or 6 rig you know the answer.

102 USER is set on a BBC micro using 'Wordwise', 'Printwise' 'Typesetter', and 'Signwriter' software.Master copy is produced on a Micro-P CP80 dot-matrix printer and main-run printing is on a U-Bix 550z copier with 40-bin sorter.

ISSUE NO.3 SPRING 1988

Ft102 USER

GI4PCQ 58 William Alexander Park Belfast BT10 0LX N.Ireland

SORRY WE'RE LATE !

Apologies for the delay in producing this third issue of 102 USER, due to a combination of heavy commitments at the work and domestic QTHs since the beginning of the year, plus an upsurge in new enquiries as a result of recent publicity for our group in RADCOM and PW. USER No.1 had to be reprinted several times at 10-20 copies each time, and the follow-up requests for User No.2 meant that had to re-printed too as new members made their financial commitment, and of course the associated mailng exercise also takes time.Not much time left for actually USING the old black box you will agree !

TAKING STOCK

Although we didn't promise to bring out USER on a particularly regular basis there was enough initial interest to encourage that objective. Funds rose rapidly initially, but making "free" reprints to send to new first-time enquirers and the cost of postage and stationery has eaten into the kitty quite a bit. To try and get things under control I propose to answer future enquiries with a brief note indicating the existence of the NET and inviting a contribution on receipt of which they will receive the most recent USER with a membership list. If new members wish to obtain earlier issues they might contact a nearby founder member, but I can't see me producing 1 & 2 over and over.

FOX-TANGO MODS AND OTHER ARTICLES

Dave G3TJP has taken the trouble to lend me a bundle of F-T newsletters which contain 102 mods. I have recently got permission to reproduce same. Also received just recently, from Geoff G3ZDO,is some copies of ARP - Amateur Radio Profiles, another American newsheet which contains reports on various rigs...it did a rave review of the 102 in 1982 and I am seeking permission to reproduce that too.

I also have the reviews of our rig published in Radcom, Ham Radio Today,the Australian radio mag 'Radio Action' and QST, courtesy of Richard G4PRI and Sean EI2CR....do any of you wish to see these in the USER ? If so please let me know and I will try to get permission to reproduce same.

On the subject of articles, mods etc, I received enormous help recently from Bob GM4UYZ who has a stockpile of technical articles, service sheets etc. Bob is compliling a print-out of all his stuff and we look forward to hearing more from him. In the meantime he has provided us with our own 'Technical Supplement' for this issue...the LAMP-CHANGE SHEET. FB BOB !

WANTED - MORE TECHNICAL CONTRIBUTIONS

Any of you who has personally replaced 102 RELAYS, worked on the BANDSWITCH, or otherwise GONE INSIDE, please write a how-to-do-it for the others, with simple drawings as Bob did....this is what we should really be about.

THE NET ON 80M

I have been able to keep the sked only irregularly of late and letters received suggest that conditions for reception have been poor in many parts of the country. Quite a few USERS are probably still looking for us at 2100 and as that time suited me better anyway, I propose we return to it from beginning of May i.e. 2100(LOCAL) Tuesdays, between 3.720 and 3.725 MHz. I was pleased to contact G3RZP,G4GOF,G3HID and quite a few others recently with good signals. Freddy sold his Linear from the ad in USER 2 but still has the Bencher key and Peter was just back from stateside including a visit to the Miami Hamfest.....he gave the Yaesu mob a flea in their ear for killing off the 102 ! I know a lot of American hams feel the same.Nice to hear some of the old stalwarts still to the fore on the NET as well as some newer members like G3AJV,GW4VIB,G3YJE and G3EFS, a confirmed CW man making a very rare foray on to SSB!

A NET ON 40M ?

Strong inter-G signals heard mid-morning in recent weeks encourage me to suggest a SUNDAY MORNING NET on 40m commencing at 1100 LOCAL around 7.065 MHz. This may be better for those who couldn't make Tuesdays and for all of us who couldn't hear each other on 80m anyway...let's try it and see !Starting in May also.

NEW GROUP ORGANISER WANTED

I will continue to produce USER until existing funds are exhausted (probably one more issue !) and then I would like to hand over to someone else....anyone with a bit of time and access to a typewriter or computer and a photocopier could do it.....please let me know if anyone would like to take it on. I can pass over all the names etc, correspondence and the increasing bundle of technical articles that is accumulating.My job situation is changing and it will not be easy to carry on.....please?

LETTER FROM JAPAN

Made contact finally with Mr.Ed Coan of Yaesu (see his letter inside). The big treat is their permission to reproduce extracts of manual/tech. supp. and also the interesting snippets about the history of the rig. Thanks Ed.

Sean GI4PCQ

G3RZP

MATCHED VALVES

Let's start with the business of matched or otherwise PA valves. I've measured the standing current for 12 valves with the same bias, and get a minimum of 9mA and a maximum of 34mA. The average is 21mA, and the standard deviation is 7.1mA. This means that some 60 odd percent will be plus/minus 7.1 mA on the 21 mA, and means that unless you fit a separate bias pot for each valve, you need a matched set of valves. If you fit a separate bias pot, then you don't. I haven't got round to that yet, though.

THERMAL RUNAWAY

Run away PA current. After my comments on the net about wanting a set that ran away, my 102 started doing it! By stabilising the screen and bias supplies, it can be minimised. On the PA PCB, there's a relay which is unused, but has the capability of reducing the PA screen grid volts to 160 on 28 MHz if the wiring's complete. We can use this as follows:

1. Cut the brown wire on the pad on the PA PCB adjacent to the pad marking '28 M'.
2. Cut the Blue/White striped wire connected to the pad marked'160 v', and tape it back out of the way.
3. Short diode D02 on the PA PCB.
4. Connect the '160v' pad to earth - the end of C17 is convenient.
5. Connect a lead from the '28M' pad to the '15v' tag on the Rect B board. This tag is adjacent to the fat vertical capacitor: it provides 15 volts in receive, thus energising the relay and grounding the screen grids of the PA valves.
6. Connect a 220 ohm, 1 watt resistor from the '210v' pad to the blank pad adjacent to it.
7. Connect the Orange/White striped lead that ran to the '220v' pad to the free end of this resistor.
8. Connect a lead from the two relay contacts that are joined on the PA PCB to the end of a 190 volt, 10 watt zener (or two zeners in series, or an amplified zener - see fig*2)
9. On the Rect A board, connect a 10Kohm, ½watt resistor across R9.
10. Connect a 75 volt 2 watt zener from the end R9 nearest the bias pot to the top of R10.
11. Reset the PA bias.

This mod provides a stabilised, low impedance screen supply, and a stabilised, lower impedance bias supply. Results are good - standing current would rise from 75 to 175 mA during an over. Now, having set for 75mA, after 5 mins full carrier output at 100 watts on 28 MHz, the standing current has only crept up to 100 mA with the same valves - which are 4 years old - and which havebeen hammered (won 20m section BERU two years running, Area award Bermuda Contest, second in G in CQ WW CW on 20m single bander, 4 top band contests, 3 ROPOCO contests - all of which are hard on a rig).

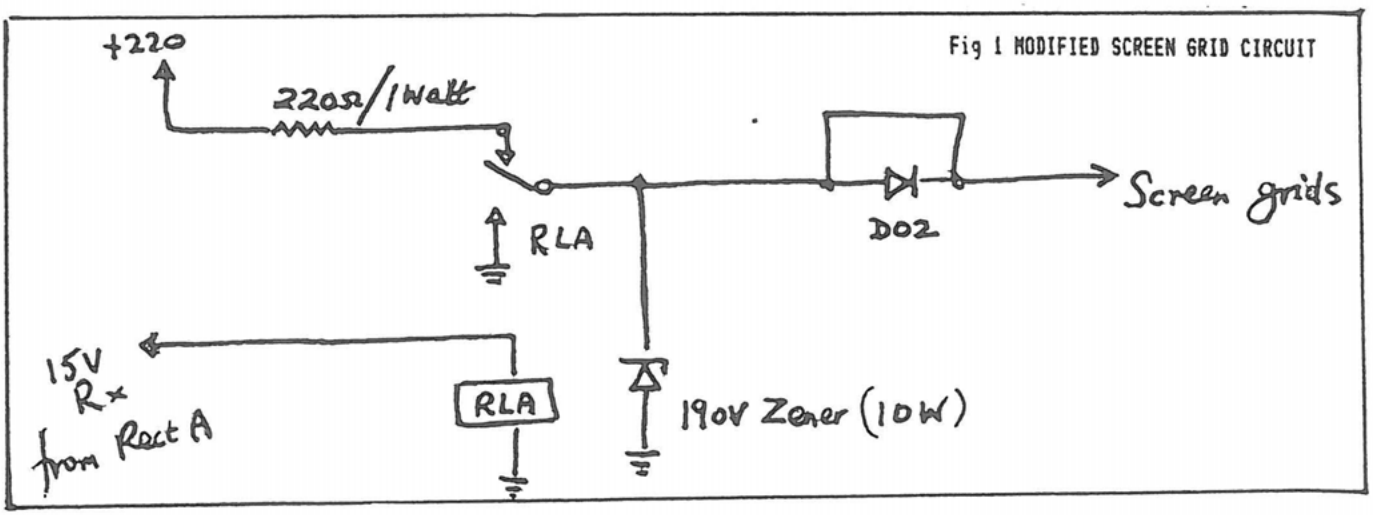


Fig 1 MODIFIED SCREEN GRID CIRCUIT

The reason for stabilising screen and bias is that tetrodes and pentodes are insensitive to variation in plate volts, but are to variations in screen and bias. If you stabilise the screen and not the bias, there are major variations in standing current with changes in mains voltage. Stabilising neither gives some compensation, so if you stabilise one, you really need to do both.

If there's enough demand, I'll do another PCB to allow these additions. Don't forget that the 200 volt zeners need a fair bit of heatsinking. Drill a hole in the back panel above the power transformer.

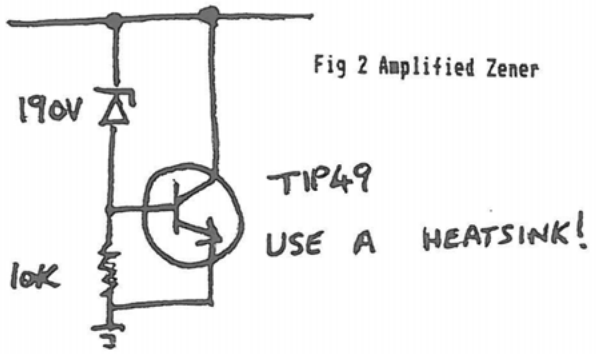


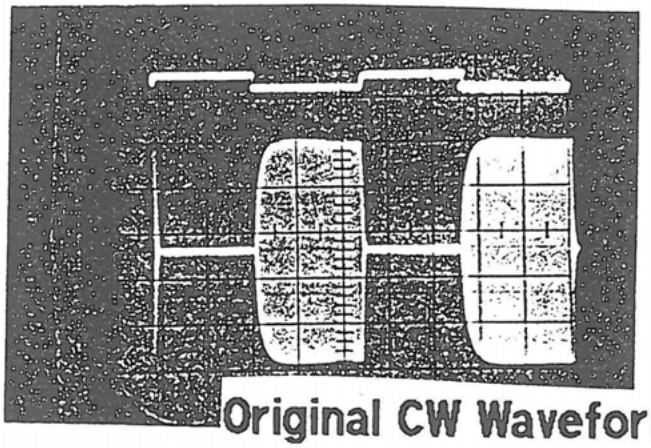
Fig 2 Amplified Zener

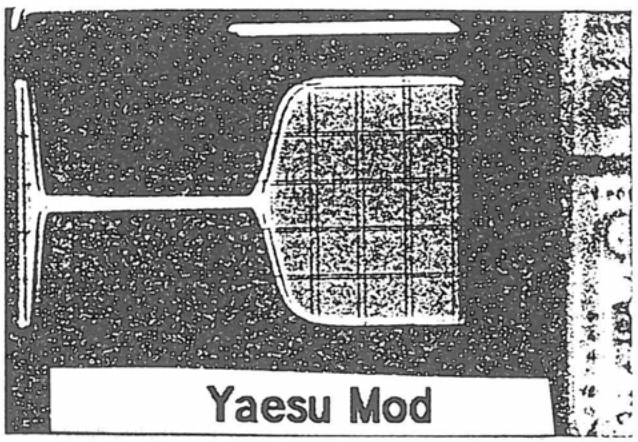
The next mod is for clearing up the key clicks. Although my previous one seemed OK here, it was very much aimed at the low level output for driving a transverter. This one is simple - do the Yaesu mod, and then add 47 ohms in series witha 10 microfarad capacitor from 'Key 3' line to ground. This is conveniently done with one end on the drive pot (on the front panel) and the other picking up the Key3 line on the RF unit PCB. If you can't find the white wire referred to in the Yaesu mod, don't worry. Just fit the capacitor. (positive end live - negative end to earth)

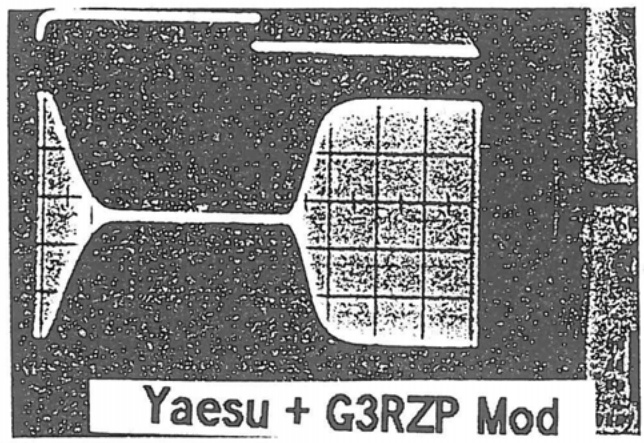
I hope the enclosed photos come out. The first is 10 millisecs / cm, and is the 102 waveform at 100 watts with no mods.

The second is the Yaesu mod, and the third is the Yaesu mod an the 10 microF and 47 ohm detailed earlier. The upper trace is the 'Key3' line waveform. Both are at 5 mS/cm., and 100 watts o/p.

KEY CLICK CURE







The final mod is the recieve spurious. For those of you not familiar with this, I'll describe it again. It manifests itself as follows.

Tune to the bottom end of 80. Find a strong signal on 3500 KHz, and tune away-even better, feed in a signal from a sig gen, and tune away. You'll hear the strong signal causing a constant ffequency heterodyne as you tune way up the band. It's not so bad on 40, but still there. On 80, it's only about 30 dB down - enough to lose DX. The cure requires a degree of confidence and some bravery, but it works!

Remove the Local Unit PCB from the chassis. Turn it over, and take out the following :-

R 100/101/102/103/104/105/106. C136/137/141 Q 30.

In the area left clear, fit an SL6440 acording to the attached circuit. (see Fig 3

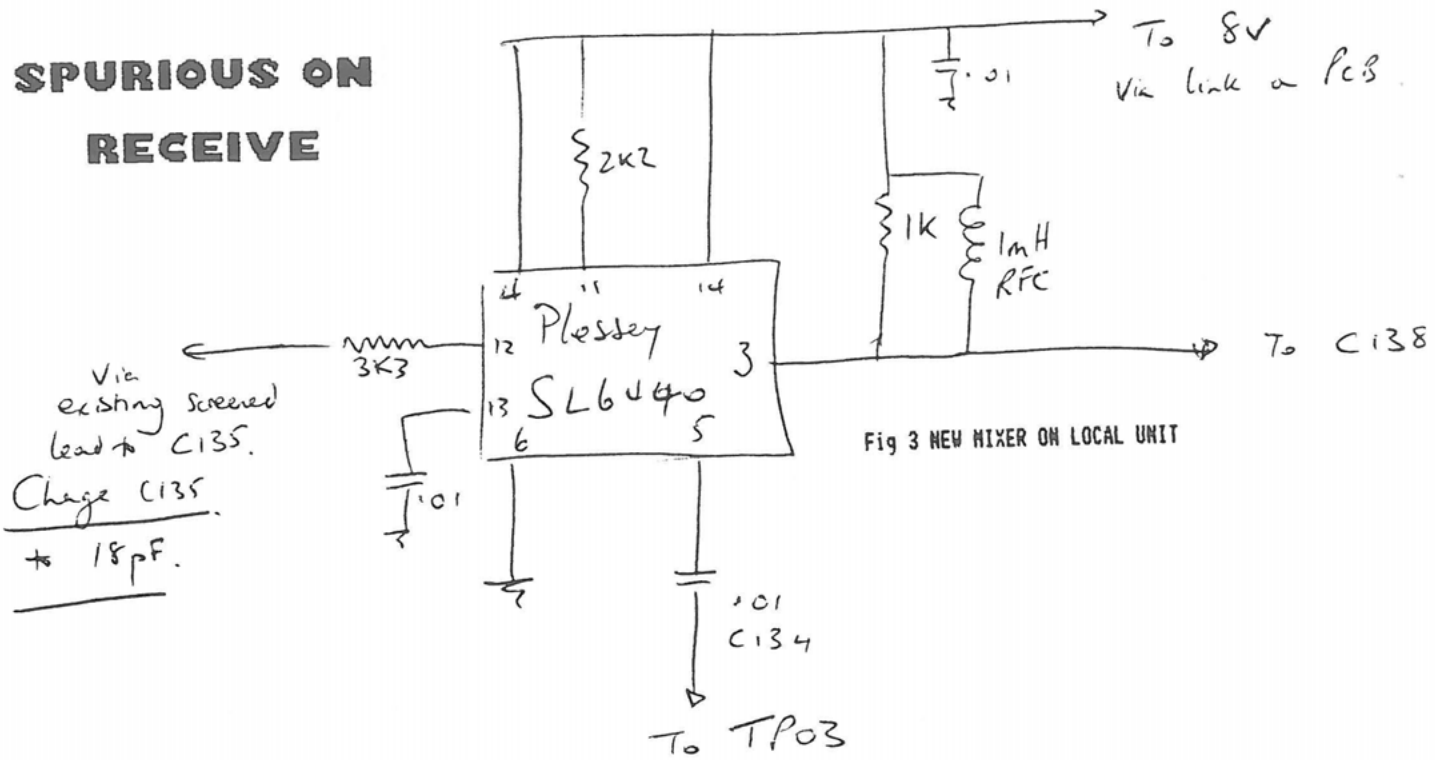


Fig 3 NEW MIXER ON LOCAL UNIT

The spur is caused by the 6 MHz on gate 2 of Q30 leaking over to gate 1, and thence down the lineto pin 11 of Q24. It's interesting to note that the RSGB RC14 direct conversion receiver abandoned the use of dual gate MOSFETS as the mixer because of the local oscillator radiation caused by this sort of coupling. Now the spur is still there, but it is at about the same level as the reciprocal mixing noise. In case this sounds too easy, I fixed by borrowing about £50,000 worth of kit from work. I started on Saturday AM at 1000, and got this problem cured by 1930, with only 30 minutes off! It took some finding. I know this spur is a problem -it's there on the local club's 102. My previous mods aren't as as much good as I'd hoped - amazing what unpalatable truths a spectrum analyser can tell!

In the alignment instructions in the manual, it tells you (page43) to connect a DC voltmeter to TP4009, and adjust the PLL VCO coils for the given voltage at the given frequency. The 40 metre adjustment is given as 7.5MHz and 6.0 volts (plus/minus 0.1v) This should read 7.0 MHz.

For those that wonder about the PA PCB mod and the shorting of D02, the reason is that I don't know why D02 is there! In the Eimac book on 'care and feeding of power grid tubes', it does recommend a low impedance screen supply as screen grids in modern high perveance valves can get coated with cathode material and start acting as cathodes, especially when they get older. Some valves, such as 4CX250's and that family are very good at this - it's also tied up with the intercept of the electron stream by the screen grid, and the amount of anode swing, and the formation of virtual cathodes between anode and screen. Obviously, if the screen grid sources current with D02 in circuit, the reverse impedance is high, so the screen grid volts rises, making the runaway worse. I've seen references to a 'screen grid diode mod for Yaesu to avoid flashover'. This may be the reason for the diode, but if so, I'd say it's very bad practice.

Setting up the S meter the Yaesu way means in my case that it can't go above about S9 plus 25. If you reset it for a strong signal as full scale, then everyone is S9. This will be looked into, although it is low priority - S meters aren't that important, and lie like personnel managers anyway!

If anyone wants actual physical help with these mods, it could possibly be arranged - I'm QTHR from 1987 CB onwards, and Autumn 86 RSGB CB. Tel: 0666 860423.

73 all

Peter G3RZP

This modification is provided to eliminate or remedy keyclick trouble with FT-102s having serial numbers XX030001 — XX069999.

1) On the component side of the RF Unit, install a 1 uF, 50 WV electrolytic capacitor, as shown in Figures 1 and 2. The positive lead of the capacitor is soldered to the lead of R1045, and the negative lead to the TEST PIN (G1).
2. Referring to Figures 3 and 4, cut the white wire connected to J4017 on the LOCAL Unit, and wrap the end of the white wire with insulating tape to prevent it from shorting to other parts.

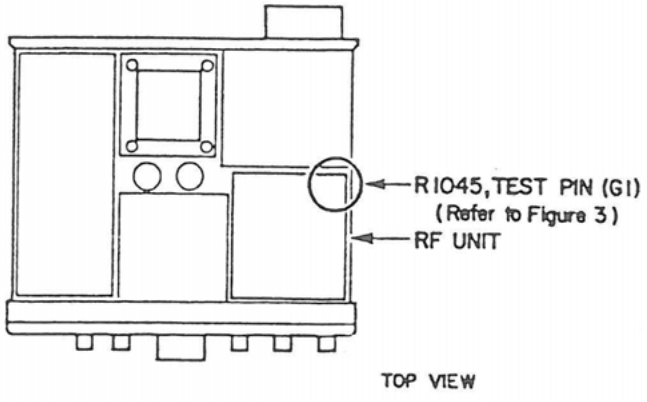


Figure 1

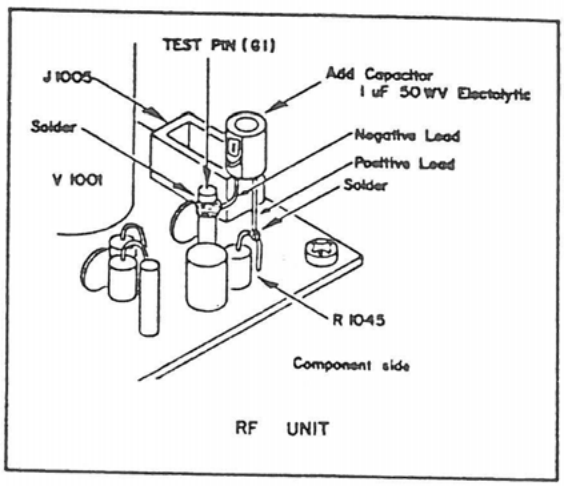


Figure 2

TECHNICAL BULLETIN

NO. 56

FT-102 (YAESU)

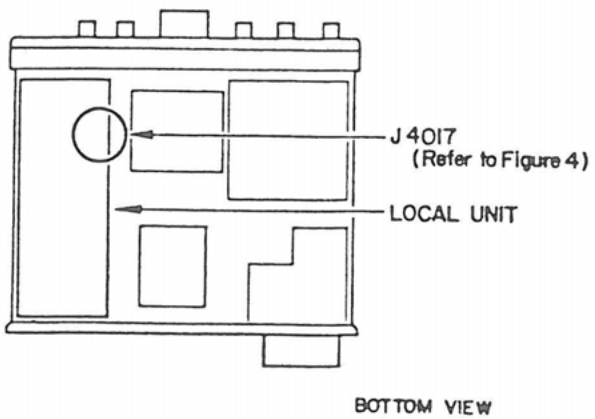


Figure 3

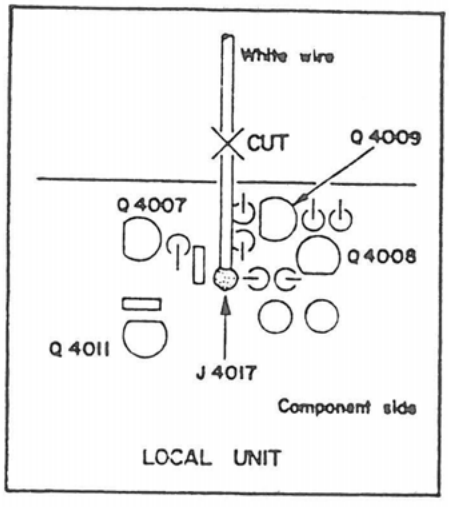


Figure 4

LETTER FROM G3BLE

I see that several members of the group are suffering, what they term as thermal runaway of the PA Valves; this is caused by what is known as CONTROL GRID EMISSION. It's action is to produce a POSITIVE Voltage, which reduces the NEGITVE BIAS, resulting in increased ANODE current.

It can be brought on by the action of one or more of the following:-

1. Excessive RF drive, generating heat in the valve grid structure.

2. General PA compartment heat,

3. Excessive DC resistance between the GRID/s and CATHODE/s.

Items 1 & 2 can be cured, by reducing the drive and or the use of a FAN to give cooling to the PA compartment.

Item 3, This is a serious design problem, please refer to the circuit diagram of RECT "A" PB-2349A (No.80..), where it will be seen that between R12 and Chassis that there is a total DC resistance of 148K Ω.

A look at the 6146 Data sheet, tells us that the MAXIMUM grid resistance is 30,000 Ω,!!, unless Cathode bias is in use; in the case of the FT102 this is not so, the only resistance in the cathode circuit is a Meter SHUNT.

This effect can be reduced, by fitting a Diode between the centre arm of VR 01 and chassis, make sure that the Diode CATHODE is connected to the centre arm of the Pot.

There is one other item I could mention; this concerns the FC102 ATU, this is a fine ATU when used correctly, but the 4 x SO 239's sockets mounting at the rear are very poorly designed, as the constant removal of the PL 259's will break away the solder connection between the centre pin and the PC Board.

Should this happen, the RF voltage suddenly increases, due to the LOAD going open circuit whilst under RF Power.
This can result in the FC 102 SWR Diodes burning out and the FT 102 PA circuit catching fire, burning out C 08 on the RELAY UNIT PB-2354.

I trust the above information will be of use to your group.

G3RZP REPLIES

Our correspondent is only partially correct.Dealing with his points....

1.Excessive RF drive: 6146s ARE rated for Class C operation - up to 3.5mA of grid current. Thus a grid dissipation capability of some 200mW exists. In the FT102, ALC action starts at 70uA of total grid current i.e. about 23 to 25 uA per valve,representing some 1.25mW. I think the safety factor is adequate ! Rough calculations suggest something about 140-200uA of grid current with the ALC meter at half-scale.

2.The FAN is provided for the Air.

3.There is NOT 148K from R12 to chassis ! But G3BLE is partiallly correct....for three tubes you shouldn't go above 10K. Still, fitting a zener as per my previous suggestion ensures that the bias stays fairly stiff. (He missed the following: R11 on the Rect A board is shunted by D7,D8 and the switching of Q3, and D11,D12 & D17 in TX. The source impedance of the supply through the bias rectifier is around 20K.)

(continued over)

Fitting the diode as suggested still means that it does nothing until the slider of the pot goes positive with respect to ground. This means some 5 - 10mA of positive grid current - so there'll be 50 - 100V across R12 and the grid will be +50V to +100V w.r.t. cathode. Sorry, G3BLE.....

Experience has shown that the removal of the series screen grid diode and fitting a solid shunt regulator (zeners) together with reduction of the bias impedance with a zener (and I suspect shorting out R12 on Rect A) DOES work.

Matched tubes are a MUST - unmatched ones will run away 'cos one will do most of the work. Fitting separate bias pots isn't so easy. I think the problem isn't only grid emission, but screen grid emission. Thus the series diode (sometimes called an "ANTI-FLASHOVER DIODE") gives problems, as screen emission just takes the screen grid volts higher, leading to more current through the valve, more electrons hitting the screen grid, raising the temperature etc. This effect is worst under RF drive, because the screen grid current rises as the anode swings in potential towards the screen grid. This is why clamping the screen grid with a shunt regulator is so effective.

Peter G3RZP

102 MAIL

de GI4GPC - RECEIVE WOBBLE
Still haven't got on 80m yet so don't know if you still having any input. My new problem with my 102 is a slight wobble in RX frequency, about 100/200Hz, just sounds as if the transmitting station has hit his old 1940 rig with his fist now and then, not too bad on SSB, but with narrow filters in CW position vy disconcerting as it wobbles out of the passband of the 270MHz filter. My friend W3BYI is an old timer and has a love/hate relationship with his 102. His main problem is relays...he cut the side out of the cover beside the difficult one so he can easily clean the contacts ! Sounds a bit drastic !

73 Sandy

Cleaning the CLARIFIER RELAY contacts has been known to clear RX instability.Thanks for sponsoring W3BYI for membership....we don't recommend his relay mod though! Spoils the re-sale value (would anyone part with his 102?).

de G0CGV - REPLY TO USER 1
My compliments on the content of 102 USER, all very interesting and some several of the reported problems also experienced here.
I find the SHIFT/WIDTH control setting the same as you but I think it is quite normal and logical for tuning USB and LSB to move it either side of centre.For CW I leave it at 12 o'clock. It is a big help for tuning out QRM on CW in conjunction with the 300Hz filter and a very valuable feature of the rig as is the APF.
The SPEECH PROCESSOR, I am also doubtful about. I use the Adonis AM503G compressor mic as a fantastic pile-up cracker.No need for the internal processor with this.
VOX ANTI-TRIP - no prolems here. Neither with the RELAYS, but I'm a non-smoker, must help. RF amp still works but always leave it in as it helps to give a compatible sig report, without amp S-meter seems very lazy. Of course who heeds needles anyway ? Sure boosts weak CW RST though !
BANDSWITCH - started to go deaf on 80m RX last winter so treated appropriate segment with switch cleaner, since no problem !As for 'never go anti-clock', who are they kidding ? Can find no reason or need for this statement...please explain !!
SP102 I find the second input useful for my Trio R1000 and the filters are quite useful although for broadcast bands they must be set at the widest position.
I think the 102 is truly superb rig, a real workhorse which looks every bit a classic and a legend in its own lifetime. Thanks for all your efforts and ideas..I look forward to future issues.
73 Jim

de G5CP - ENJOYS NET
I enjoyed my QSO with the NET tonight and spoke to Jamie, Pat, Peter and Mike. I bought my 102 from G3YIU in October 1986 and would like to join your 'society'. Hope to meet you on the air one Tuesday soon.
73 Ron

de G0ENO - SMASHING RIG
Many thanks for the newsletter, it is an excellent service for which you are to be congratulated. Already, I have taken up the offer of the valves from G3LLL. Some of the problems are interesting, and one could think that the 102 is a bit of a nightmare, but I think it is a smashing TXR and much more easy to operate than some of the 'compact' boxes (e.g.TS430). I'm busy putting up a tiltover mast and Jaybeam minibeam at the moment.
Regards, Kevin

de EI2CR - MIC DRIVE TOO HIGH
Thanks for the Newsheet.I am sending reviews of the 102 from QST and Amateur Radio Action (Australia). My shack consists of FT102,FV102DM,SP102 and a KW107 with open wire feeder to the centre of a 35ft horizontal wire. I also have a FT101B/FV101B as standby transceiver.
The mic gain on my 102 seems to operate in a very non-linear manner. It is almost impossible to keep the ALC within the recommended limit unless the Speech Processor is used. Any comments ?
73 de Sean (ex-VK2DJU)

You must be using a desk mic with fairly high output or a hand mic and speaking close. Even with the recommended YAESU MH1, the Mic gain has to be practically off to keep that needle out of the red...and you may well get reports of garbled audio if you go over the limit..I did. It's funny, though, you can cheerfully bring the mic gain well up when using the Processor, in fact the Processor won't make any noticeable difference unless you do. Try checking the COMPRESSION meter while processing with different levels of mic gain...you won't get much more than 5db of compression without advancing the mic gain well beyond recommended setting.
The MD1 seems to be the best Mic for the 102; using a desk mic like this and speaking well back should avoid the problem you raise, Sean.

de G4ZSB - LOSS OF DRIVE ON SSB

I've had my 102 for three years now...some trouble with the RF relay but I only have to flick the button and it rights itself, so I've no intentions of messing about with it. On two occasions I have lost modulation on SSB, and the fault, not easy to find at first, proved to be the connector plug to the main PB2343 board and a slight push rectified the fault.

The 'T' match I use now is made from the tank end of a T1154 RAF TX and it works very well, but I would like to see a circuit of the FC102 ATU (even just the tuner bit).
73 Lawrie

That connector fault causing loss of TX has been known on 101ZDs also, I've read.Can anyone help with the FC102 circuit ? We've no literature on it or the FV102DM in the Group file.

de G3TJP - COMPARISON OF AMTOR MODS

I'm now QRV on Packet,Amtor,RTTY,ASCII and WeFAX due to splashout on Kantronics TNC...now the only thing missing is the urge to talk to other folk !
Here is a coarse analysis of Amtor mods for the 102 based on info from G4WSQ (regarded as an Amtor mod specialist), Amateur Electronics UK and SMC.Capacitors to be removed as indicated.)

AF: C38(SMC/WSQ) C44(WSQ) C46(WSQ) C62(WSQ) C96(WSQ) Cut pin 1,J15, connect to pin 4,J16(WSQ/AE)

RF:C92(WSQ/AE)

IF: C58(WSQ/AE) C83(WSQ) C59-change to 1uF(WSQ),2.2uF(AE)

LOC: C153(WSQ/AE/SMC)

RLY: C04(WSQ/AE)

MAIN: C139(WSQ) C8(WSQ)-disables zobel network.

I got the WSQ mods via Peter G3PLX.I've listened for the Net a few times on Tuesdays but nothing heard...has it folded?
73's Dave

Thanks for all the trouble Dave.The Net still struggles on intermittently..perhaps conditions will be better with the lighter evenings.We printed the WSQ Amtor mods last issue,courtesy of GI4WXA. Avoid any mods which advise removal of C89 or C97.This is not possible and they should not be removed in any circumstances. Thanks to Bob G0ARF for also sending in the WSQ mods.

de G4BZV - ALC METER DOESN'T MOVE

Thanks for the 102 User - it is very interesting reading and I'm sure it has great potential. It is good to know that there are people like you prepared to put themselves out for the benefit of others.One of the most pleasing aspects of this hobby of ours is that it abounds with goodwill.
I am recently retired from the Coal mining industry at 55 years old,enjoying a level of leisure time I never experienced before.I have the FT102,FV102 working through a Capco ATU to a trapped dipole and 3 ele tribander at 35ft on a homebru mast. The rig has been satisfactory except that the level of ALC does not now register on the meter.
Best 73s, Norman

It's important to get that ALC indication going..it is your main TX condition indicator to transmit nice audio and avoid interference.It is absolutely vital to have the PRESLECTOR TUNING SPOT-ON for it also controls the drive to the PA...if that's not set right the ALC will not deflect correctly (and you won't get out too well either).Remember, the first step in Tuning up is to adjust that knob for Max deflection..and IT MAY NEED RESET IF YOU QSY VERY FAR AWAY FROM THE TUNE-UP FREQUENCY.Any other ideas anyone???

de G3ZQS - NEW CW CLUB

Can I draw you attention to the FISTS CW CLUB which aims
(a)To further the use of CW on the bands
(b) to encourage the newcomer to the mode
(c)To engender friendships within the membership

It is hoped to have a healthy sprinkiling of 'veterans' as well as novice operators, and to bring out a newsletter at least six times a year.A love of CW and a concern for its continuation are the prime requisites for membership. We have our own Club call-sign, G0IPX, and subs are £4, renewable on the anniversary.
73 George

More details and application form from G3ZQS at 119 Cemetery Rd, Darwen, Lancs,BB3 2LZ.

de G4UXH - NO NOTCH

Two small faults have occurred with my FT102..firstly poor receive when first switching on,traced to the relay under the Band-change switch,front of the board, a real sod to get at. A spray with switch cleaner has done the trick (touch wood).The second problem was the notch filter inoperative. A look at the manual,some friendly advice from another User,thank you, and I proceeded to check the alignment of this filter with the aid of frequency marker.

I started with inductor L2012 (page45, manual-alignment procedure) and the filter burst into life ! Looking at the metal can of L2012,it was leaning like that famous tower! Lifted the board out and applied Iron,it sprang back to a vertical position and worked happily ever since.

Apart from above my 102 has given very good service...I am very pleased with it. The FC102 disappointed me when I found that it had no output for balanced feeder.Perhaps someone has modified it with an internal balun.

73s Colin

Anyone with a spare FC102 for sale, there are several members looking for same ! The idea of a balun inside an ATU seems theoretically wrong...baluns only work properly at low SWR don't they ? In which situation an ATU isn't needed..anyone like to argue this one ?

de G3IRW - VFO FREQUENCY JUMP

I have the FT102 and the FC102 and neither have given any major problems.Just the usual meter lamps and key clicks. Birketts of Lincoln had a stock of wire-ended 12V lamps at 15p each but I'm not sure if there are any left. I did run into a problem with FREQUENCY JUMP and traced it to the VFO. The cure necessitated removing the VFO complete and re-adjusting the bearings. Unfortunately there is no way of doing this with the unit in situ (no problem since).

Good luck with the venture and thanks for your initiative.

73 Reg

de VK4WLX (Oct '87) - NO CW DRIVE

After 5 years of relatively trouble-free operation a nasty problem has now arisen..the CW mode is out of operation i.e. no RF when key down ! Checks show that the normal signal of correct frequency is available at the low-level phono socket on the rear panel, so everything is OK up to the input to the driver tube. From this point on nothing happens except side-tone and relays clicking. According to my manual the key activates the side-tone(which is OK) on the AF board and also controls switches Q8001,2SA733Q and Q8002,2SC1815Y an Q8003, 2SA639Q to turn the bias to the tubes on and off.Q8002 also keys post TX mixer amp Q1007 on RF board. Also Q8001 also controls 12V CW TX line to CW carrier oscillator. Presummably latter is OK or I wouldnt have correct RF at low-level socket. Incidentaly, I cannot find a 2SA639Q in the circuit diagram in my Manual or in the Technical Supplement.I have left the problem for the moment so as not to disable the rig from its main use which is SSB. Can anyone help ?

Replacement dial lamps are available here from Dick Smith Electronics (Spare Parts Dept),PO Box 321, North Ryde 2113 NSW, price is 90c (=40p). I wanted a spare changeover relay but had to order the complete board at $32.14 as it was not available separately (!!!). I already cleaned the contacts with a piece of card soaked in switch cleaner..not poured on! I have RCA tubes in the PA and no problems there.I get muted whistles ever 100Kcs on RX.I generally agree with your remarks on the speech processor (User1) but add that I use it most of the time as it gives better control of drive to the linear that the mic gain...I keep the mic and compression pots set at half-way and adjust the drive to suit. I also find the VOX ANTI-TRIP very critical.

I'm really very happy with my 102, particularly the RX performance and the TX audio reports received.Photo of shack shows also HB linear amp,PSU, ATUs and Yaesu FR101/FL101.

Best 73 and success to your efforts on behalf of all of us, John(ex-G3WLX)

Thanks to you too, John...your CW problem sounds familiar. You don't say if you have the TUNE facility still...EI3FZ reported loss of RF out on CW and TUNE in User2 and the cause was faulty crystal X3001 on the AF unit.Any other Users help ? Regarding bulbs, RS Components in the UK have a range of wire-ended lamps including Stock Nos 587-686(12V,sub-min) @ 40p and 587-074 (14V) @ 21p. Would any of these do the 102 ?

de VK4WLX (April '88) - THE CURE

I have solved the CW problem. I had to remove (literally cut out of the harness) the RectA board PB2349A. I checked all the components out-of-circuit, and all seemed to be OK. On refitting the board, the problem was gone !

My only other problem concerns the FV102....according to the manual I should be able to store the main rig's frequency onto the FV by simply pressing the memory key, but it doesn't work...all the digits change to 00000 on the digital VFO. I can insert the freq. by means of the keypad or I

can store the FV's own freq. but not the FT102's....anyone help ?
I would be interested in working other users on 20m or 15m...I can regularly get into Europe with or without the linear using my 2el quad. I will be in the UK in Oct and hope to visit the Leicester exhibition.
Yours Sincerely,John

Glad the CW problem is fixed John, but the remedy was pretty severe, and we still don't know what the cause was.Why did you suspect that board anyway? Anyone who can help John re the FV102DM please correspond direct to him and/or arrange a sked as he requests.

de G4PRI - WOT NO PROBLEMS ?
Enclosing some documents for the 102 Users' Hon Sec to hold on file. There is only one problem with having a User Group and that is , if you have so far been relatively free of trouble, as I have (touching wood in large quantities), then you start looking for imaginary problems !!! Not good for the nerves.
73 and many thanks for you trouble, Richard

In addition to the reviews already mentioned upfront,Richard sent info on the Antenna Switching project printed in HRT Nov/Dec 1983. All held on file for any member to consult on request.

de G4FKC - LAZY 'S' METER
Beside the common relay problem I have another fault concerning the S-meter on RX..it doesn't come on when the set first switches on. However after a warm-up period of up to 45 mins, it comes on. I've tried adjusting the sensitivity as per the manual but without sig gen and appropriate equipment I got it reading too high. Just wondered if any other users had met and cured this one.
Otherwise congratulations on a useful facility, I hope the problems (with solutions from the whizz kids) come rolling in, and look forward to the next issue.73.
Yours Sincerely,Les

The 'S' meter on the 102 is a trifle mean..I have tweaked mine a fraction higher...but the RF relay fault can give the same effect...i.e.deaf at first upon switch-on which would also affect the meter.

de G3ZDO - FLYING BOATS?
Thanks for the very interesting newsletter.One letter concerning Flying Boats from G4PJM brought back memories of these marvellous old aircraft!
From 1940 throughout the War I was a radar mechanic on Sunderland F.B. squadrons:mainly based at Pembroke Dock,West Wales with various movements to Sullom Voe, Iceland, Bathurst and Jui, West Africa with 204 Sqdn, but never managed to get to Lough Erne !(Was it Castle Archdale ?) My RAFARS no. is 852: doubtless there are others in the group.
Best Wishes & 73, Geoff

I saw what appeared to be Flying Boat jetties at Castle Archdale a few years ago, so I presumed that was the base (hence my comment in Issue 2). What was the relationship of that to the nearby ST.ANGELO airstrip which is still in use today, I wonder ?

de DK1MM - UNWANTED MONITOR
After 5 years of trouble-free operation here, I have a small problem. It only happens on 14MHz USB and it is a 'monitor effect' but WITHOUT THE MONITOR KEY DEPRESSED. This monitoring of my own speech is not so loud as with 'MONI' key depressed, but I can hear it with speaker and with headphone. What can I do ?
I have the FT102 & FV102DM, plus manuals and Technical Supplement, which I could copy if anyone is interested. I'm looking for SERVICE MANUALS and other literature.
My antenna is a GPA tuned with a TCS80 variometer system from 7MHz to 30MHz.

Sincerely Yours,
Martin(ex-G5BXV,F0XT)

Martin,thanks for the photos of your station etc. This breakthrough of transmitted audio has been encountered here at GI4PCQ, but on 10M when trying to TX into a 40M dipole! I suspect it is caused by 'RF in the Shack'....the signal getting into the external speaker or headphone leads and somehow being demodulated. Winding the speaker leads on a ferrite ring may help, but why has this started recently? Did you change anything at the antenna ? I suspect RF leakage from Co-ax running a high SWR i.e. coming back into the rig from the antenna system..which is itself unusual (see photos)...anyone else got a better idea ?
As far as we know, there are no SERVICE MANUALS. The USER MANUALS are believed to contain all necessary service info...but there is no PA circuit diag, and no disassembly instructions. The mods featured in the FOX-TANGO newletter are the other major source of info...and the most important of these will be reproduced here.(See below)

de N4ML - FOX TANGO MODS
OK to copy the mods from the F-T Newsletter as long as you give the credit to the source of information.

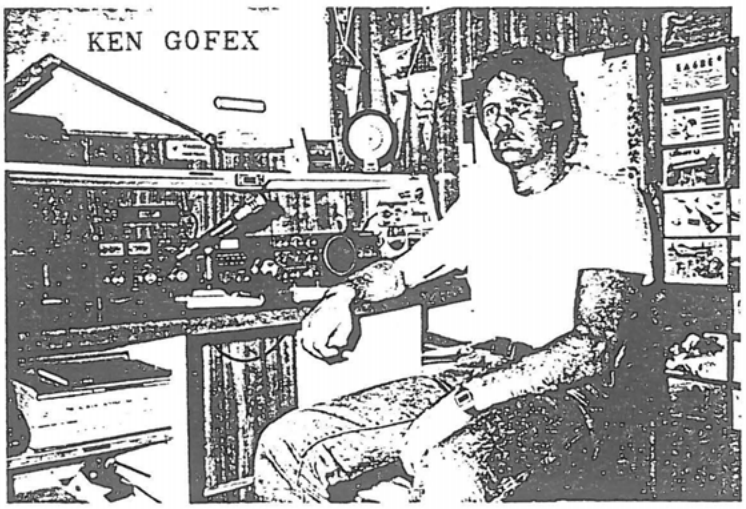
de N4ML (contd) If you wish, you could bulk order our CRYSTAL FILTERS and supply them individually to your members, saving them the bother of international orders.Good Luck, 73
Milt

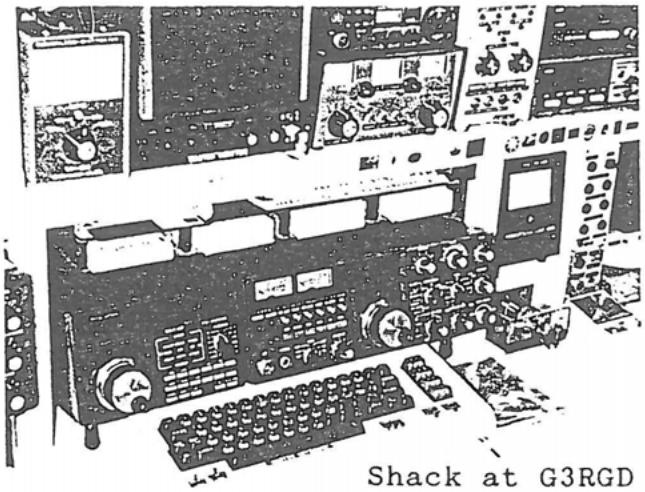
Any members interested in Fox-Tango filters let me know which ones you want and I will work out the economics and come back to you.Details on back page.

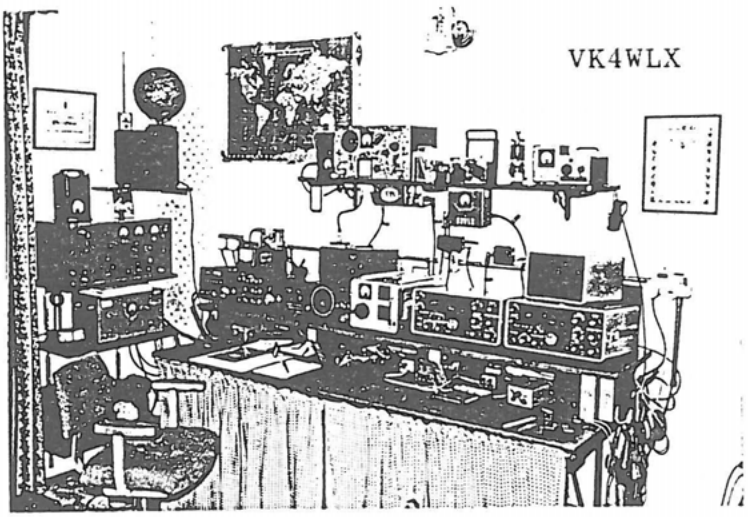
de G3IZM - FREQUENCY INSTABILITY
More on the 'Unreliable Relay Saga' on the FT102 : frequency instability on RX (and TX) WHEN THE CLARIFIER IS SWITCHED IN can be traced to dirty contacts on relay RL4001 on the LOCAL UNIT board. It is possible to clean the contacts with the relay in situ by prising off the transparent cover and burnishing the contacts with a strip of card in the manner outlined in Issue 1 of 102 User.
73 John

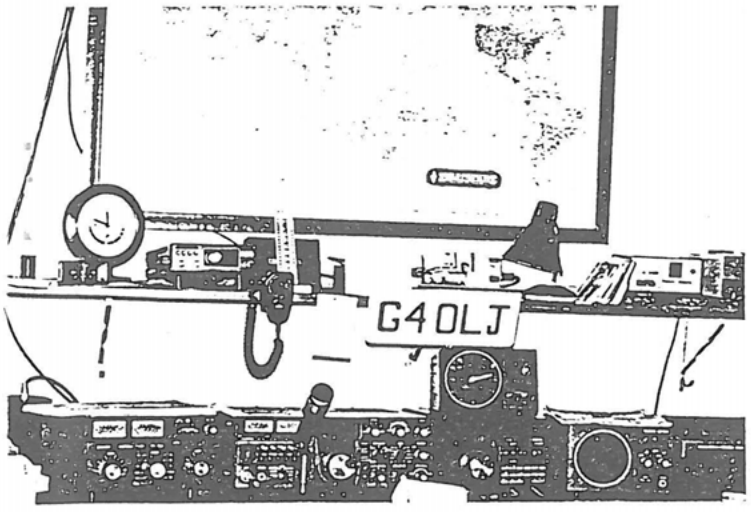
de GW4UJT - SOURCE FOR BULBS
Replacemnt bulbs for the 102 dials can be made from ordinary pea bulbs with a screw thread. two pieces of insulated wire being soldered to the bulb and then the meter contacts. The stiffness of the wire will support the bulb. I had been using this method for somw time when I discoverd a source of supply for the correct bulbs...the branch of SMC operated by Howarth at SMC(TMP) Buckley, Clwyd. The price is 99p plus Vat and postage. He also had a small stock of filters etc,which, when gone will not be replaced.

Keep up the good work, 73
Roger

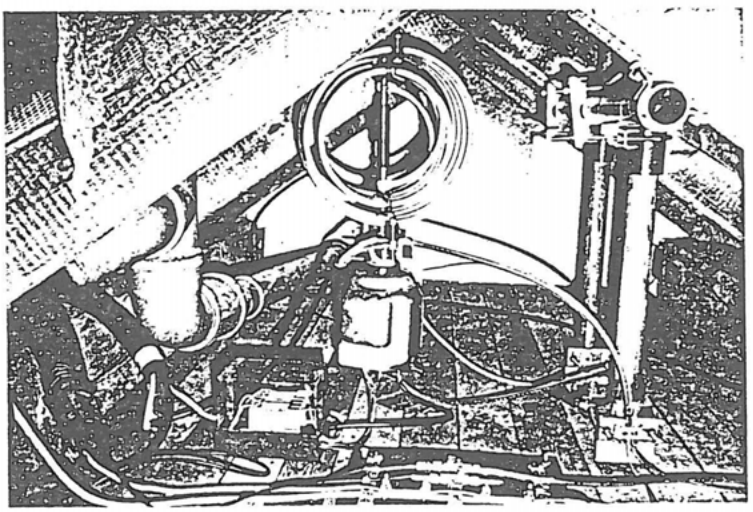

KEN G0FEX


Shack at G3RGD

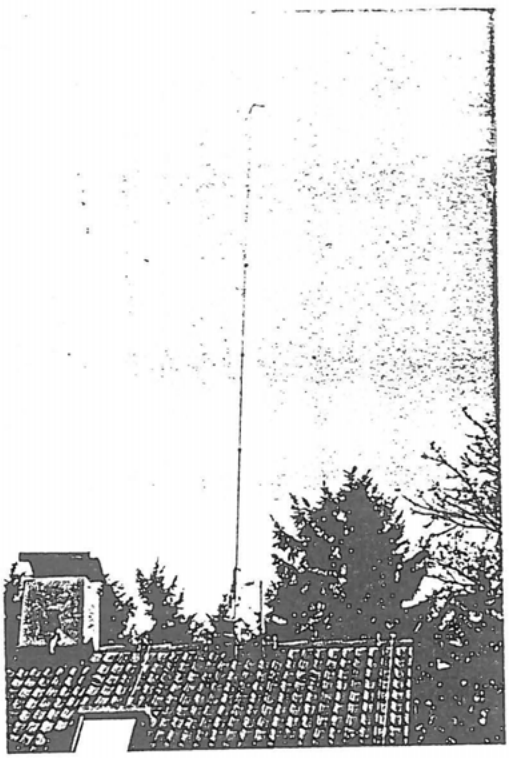

VK4WLX

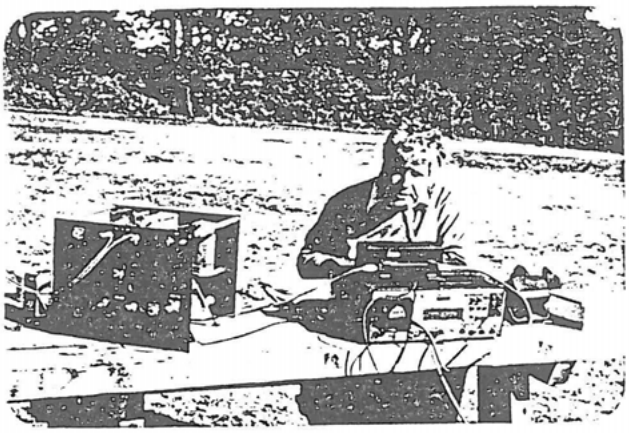


Variometer in Roof at DK1MM →



VERTICAL ANTENNA & SHACK AT DK1MM



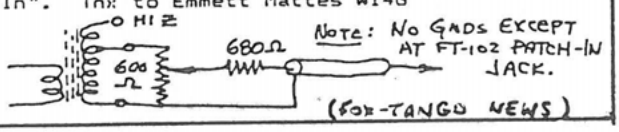


← PETER GW4UZL Field Tests 1987

PATCH PROBLEM WITH FT-102

I have a small problem in my new FT-102. It seems that the factory grounded the "Speaker Out" jack to the rear deck but lifted the shell of the RCA "Phone Patch In" jack above ground. They then supplied ground by way of the shield braid from the "AF" board. This lead is better than 0.5 ohm. As a result, any connection between the shells of these two jacks, or any grounding of the Patch jack, will cause an internal ground loop and considerable hum.

I am using a Heathkit patch and the easy way out was to rewire it to a balanced output and go balanced-to-unbalanced, using a shelded lead grounded only at the transceiver. Note the "Patch In" and the "Mike In" are paralleled with no limiting resistors. I put one in series with the patch to prevent loading down the "Mike In". Tnx to Emmett Mattes WI4G



(FOX-TANGO NEWS)

SSB FILTER

Alan G4YYD has a spare Fox-Tango SSB Filter. Offers to 24 Greymount Rd. Bury BL86PN

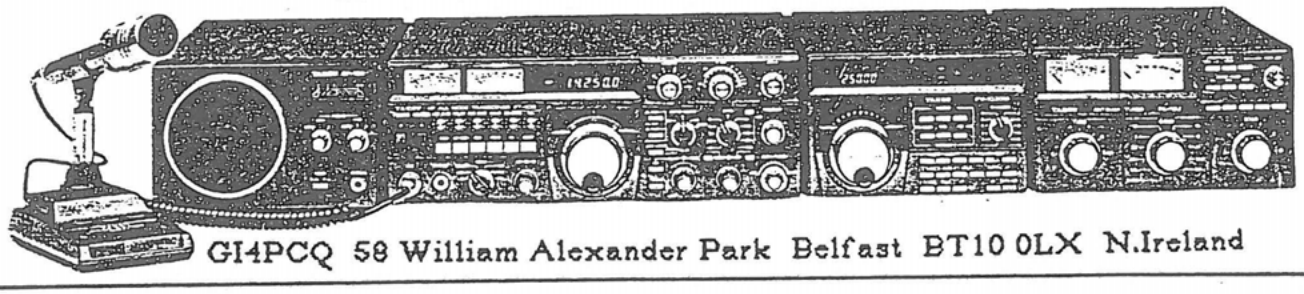
VALVES

G3LSD has Triple Matched 6146Bs for £27.50, 12BY7As for £3.75. Also 572Bs for your Linear at £107.50 per matched pair. All including post.(This is not an advert - say you saw it MENTIONED in 102 USER).
Orders to Lt.Cdr. Ellis Diggle, Netherton Cottage,The Elms, Stoke Damerel, Plymouth PL3 4BR. (On holidays Mid-May to Mid-June)

ISSUE NO.4

Ft102 USER

SUMMER 1988



GI4PCQ 58 William Alexander Park Belfast BT10 0LX N.Ireland

HELLO AGAIN

The main purpose in getting out this issue so soon on the heels of the last one was to make way for the "Summer Holidays" and also to try to fulfil a notional commitment to producing at least four issues within 12 months. I had asked in the last issue for someone to take over the Newsletter from here on as I am going on "study leave" from my College and won't have the easy access to printing facilities as before. The funds you sent me won't rise to another issue either....but please don't send ME any more money. If someone contacts me with an offer to take over I will pass the membership list and other documentation over to him and let him mail you all to arrange for future funding. I have enjoyed putting the newsletter together and have learned a lot about Desktop Publishing (and Radio Technology) in the process. I have moved on from the humble BBC Micro to its big brother the Acorn Archimedes and am currently using Clares' "Graphic Writer" as my Word Processor-cum-Page Editor....all new to me still.

I hope to continue to meet some of you through the proposed NETS on 80m, Tuesdays, 21.00 British LOCAL time, and 40m, Sundays, 11.00 local. What we need now is a DX net, and perhaps some of our members might like to propose same. I hope to be heard more often on the NETS during the next few months, especially from the /A station I am developing at our weekend cottage on the North coast of GI. I hope to put up my first HF beam and would be glad to hear from any of our DX members who would like a sked.

I have managed to include the letter from Ed. Coan which I forgot to put in last time and am sending Yaesu all of our issues for their archives. The major feature in this issue is the FOX TANGO Mods courtesy of MILT N4ML who used to run the F-T Newsletter for all Yaesu equipment. Milt still sells the Fox Tango crystal filters, but publication of the Yaesu newsletter has been taken over by International Radio of 751 SW Macedo Blvd, Port St Lucie ,Florida 34983. The Fox Tango mods are really readers' letters sent in to N4ML offering suggestions for improvements or repairs to Yaesu rigs. From 1982 to 1985 there were a number of such letters about the FT102 and I am reproducing them all together here. There is some more of our members' correspondence, but I must apologise to those whose letters did not get into print yet, and to thank you all for your friendly, encouraging correspondence over the past year. Here's hoping that our 102s keep giving good service for many years to come.....may the existence of the 102 User Group help achieve that.

Best 73, Sean GI4PCQ .-.-. ...-.- ...-.-

BIGGEST EVER - 16 PAGES !!!

YAESU MUSEN CO., LTD.

C.P.O. BOX 1500, TOKYO, JAPAN
Head Office: 7-7, 1-Chome, Yaesu, Chuo-ku,
Tokyo, Japan

Dear Mr. Quinn,

Thank you for your letter of December 22nd regarding the FT-102 User Group, which we have also read about in "Radio Communications".

Unfortunately, the information that we retain on discontinued equipment consists primarily of engineering notes in Japanese, which are largely confidential, but of little intelligibility outside of the Company anyway, and of negligible historical interest.

I have, however, reviewed these notes for items of possible interest to your club, and can offer the following:

FT-102 production began in September or October, 1981. Production ceased in early 1984 with serial no. 090999, indicating approximately 8,000 to 10,000 sets were produced (the exact number is not available, since production lot quantities varied).

From the beginning of production until the present there were 240 modifications developed by the engineers. Note, however, that these consist largely of changes to production methods and component suppliers, which do not affect transceiver operation or performance.

The unique PLL design of the FT-102 was granted a patent by the US Patent Office.

Production was forced to cease due to the discontinuation of IC Q7001, a custom-designed VFO chip which was not available from any alternate source.

The most common service complaint of a serious nature has been intermittent loss of sensitivity and power output due to pitting or fouling of relay contacts on the RF Unit, requiring replacement of the relays. This problem can be best avoided by replacing the relays with low-current reed relays (not available from Yaesu). Another solution, after replacing the relays, has been to install a 10-kilohm resistor on the solder side of the RF Unit from the junction of C56/RL05 to the junction of R14 and the anode of D15, biasing the relay contacts at 24VDC to remove DC potential difference when switching.

The manuals are the only published information available for the FT-102 from Yaesu, and we do hereby grant permission for you to reprint excerpts of these manuals in your newsletter if credit is given to Yaesu Musen Company. We would also appreciate your providing us with copies of your newsletter.

With the exception of the VFO IC above-mentioned, and certain mechanical parts (such as panels and covers), we maintain a large stock of parts for the FT-102, and expect to continue making all such parts available through our representatives for at least the next several years. All of these parts which are prone to failure are maintained in stock by our large importers, such as:

SOUTH MIDLANDS COMMUNICATIONS LTD.
S.M. House, School Close
Chandlers Ford International Estate
Eastleigh, Hampshire, SO5 3BY
ENGLAND
Tel: 04215 55111

YAESU U.S.A.
17210 Edwards Rd.
Cerritos, CA 90701
U.S.A.
Tel: 213-404-2700

Unfortunately, due to the necessity of keeping costs down, we do not maintain a specific department to handle parts sales to individual customers, so we must refer individual requests to our importers. Therefore, for fastest service, we encourage customers to place their orders directly with the parts departments of our importers.

We hope this information proves helpful, and trust that the "102 News" will be of great help to FT-102 users worldwide.

Very truly yours,

Edward J. Coan

YAESU MUSEN CO., LTD.
Edward J. Coan, Manager
Public Relations Department

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The International Fox-Tango Club

NEWSLETTER

THE FOX-TANGO 102 MODS

FT-102 FILTERS

Yaesu fooled us by bringing out the FT-102 so quickly. In the light of the long delay with the FT-ONE, we mistakenly thought we had plenty of time but we did not, and our filters (with one important exception) are not yet ready. But if you are not in a hurry, we should have Fox-tango filters worth waiting for.

As for the "exception", from our study of the FT-102 Instruction Manual we were struck by the presence of CF-2001. This a 3-pole, 455KHZ, ceramic unit. It reminded us of a similar unit in the Kenwood R820, TS830/930---and the spectacular improvement which resulted when our premium quality 2.1 KHz bandwidth 8-pole 455KHz discrete crystal filter was substituted for it. Indeed, the VBT (variable bandwidth tuning) was so improved that the need for CW filters was eliminated except for the most serious CW operators! Incidentally, W6TOG reports that he has compared the performance of this filter in his Collins 75S-3C with that of 5 competitive units made in Arizona and said our unit was the "best by far". So there is little reason to believe it would not be an effective substitute for CF2001 in the FT-102.

Trouble is, we don't have an FT-102 to try it in. So here's an opportunity for someone who has the rig to try it on a no risk basis, and and buy it at an attractive price if he choses. Installation is easy: the filter (our 2809.2) is naturally much larger than the ceramic unit is replaces. Thus it must be "patched" into the circuit by using short lengths of coax between the filter pins and the circuit board holes left empty when CF2001 was removed. There is a large space reserved for optional CW filter XF2005 immediately adjacent to CF2001. The new filter can be mounted there with double-stick tape, or if the CW filter is in place, the new unit can be mounted in the same way, but on top of it.

FT-102 USER REPORT

by Wilbur Reed

I thought I'd let the Club know how I'm making out with the FT-102 which I got a few months ago. So far I find it to be very good. I studied the Manual first and learned that what is stated is true---it takes less than a minute to set it up. I've had nothing but good reports on my audio using SSB. I also bought the optional AM/FM module and started working 10M FM---I've made about 20 contacts including Japan, Virgin Islands, England, and Alaska. All FB. Recently I answered a CQ from W6PXS out in California and the quality of his audio was the best I had ever heard on the ham bands---turned out he was using a FT-102 also. When I told him mine was the same rig and he became quite excited by my audio quality. All in all we were both delighted and you really have to hear it to believe it. I have had QSOs with hams using the FT-1, Icom 740, KWM380, Azden 2800 but then again these all used solid state finals and I liked my '102 quality more. The only set with tube-type finals I contacted were FT-101ZD MK 3's but they didn't compare, perhaps because they only use two 6146's in the final unlike the 3 in the '102 with negative feedback.

So far as the RX is concerned, it is the best I have ever used. I find it quite amazing how you can kill the QRM. I have used the rig on practically all the bands and the only thing I find desirable to watch out for is on 10 meters. I find that if I tune up on say 29520 at 200mA and I then go to 29.6 that my current has gone up to 220mA so to play it safe, I tune up on the higher frequency and then the current goes down when I switch lower. I usually operate the RX with the RF stage Off except in the FM mode. I don't like to use the speech processor because I am proud of my audio and don't want to take a chance on degrading it. I would say that ARP (Amateur Radio Profiles) magazine did a good job on testing out the FT-102 and reporting enthusiastically about it. I wonder what surprises Yaesu has in stoe for us in the promised FT-980? Seems to me that Collins, Icom, Kenwood, and the rest will have to burn a lot of midnight oil to out-do Yaesu!

PANEL PAINT TOUCH-UPS

Here's a tip that might help others. In making improvements on my FT-901DM [and probably others with similar panel colors] I have run into the inevitable problem of nicks in the front panel. Most of them are too small or too thin (as with light scratches) to touch up with paint even if I could find the exact shade. Instead, I fix them up by taking a "Flair" marking pen (common dime-store variety) and dabbing the nick or drawing a line along the scratch. Next I use my finger to dab the area until the excess is wiped away and the color has lightened to a shade matching that of the front panel. The marks seem to disappear and so far none of the ink has ever rubbed off. But even if it does in the future, it's very easy to retouch the area

ELIMINATING KEY CLICKS IN THE FT-102

The following modification is recommended by Yaesu according to Dal Wulf W9FID. Turn the unit over, bottom up, with the front panel facing you. Remove the bottom cover. To the right is the "Local Unit" PB2345. On the left side of this board, about 1 1/2" from the front panel, locate transistor Q4009 (numbered 09 on the board). Adjacent to this transistor is resistor R23 (10K). Connected to the top of this resistor is a White wire, coming out of the cable. Clip this white wire from the resistor and lay it back in the clear. This will cure the key clix problem. The unit to which this mod applies was run "03"; it may or may not apply to other runs but if you have the problem its worth a try; it is certainly simple enough!

[To determine the "Run" of any Yaesu rig, check the serial number; the RUN is indicated by the first two digits after the letter in the serial number. For example, 3C031234 means a rig was part of manufacturing run No. 3. The first digit (3) means it was made during 1983, in March (third month, third letter of the alphabet. The actual serial number of the rig is really 1234.N4ML]

USER REPORT - FT FILTERS IN THE FT-102

by F.X. Rudenauer KA1RL

I was interested in KE6QP's report on adding filters to his FT-102 [See page 8407]. I made the same installation of the FT #2809.2 filter as he did. [This is the 2.1KHz 455 second IF unit very popular with Kenwood TS830/930 users. N4ML] I did not have a CW filter installed so I placed my filter on a little bracket in the CW space of the PC board and pulled the ceramic filter. I left the jumpers in so that the crystal filter takes over whether in the CW or SSB mode. The performance with the new filter has been most satisfactory. Now I would like to replace my stock first IF filter with your 1209.1.

FOX TANGO FILTERS AND THE FT-102

by Joe Orzechowski, KE6QP

Here is my report on the installation and performance of the Fox Tango sideband filters I purchased for my FT-102.

To begin with, as I had already installed Yaesu's optional narrow filter I decided to replace the standard Yaesu first IF 2.7KHz bandwidth filter with the 2.1KHz FT filter, Stock #1209.1. As you know, both filters are the same size and have the same pin-out so this was a simple drop-in replacement.

I then installed the FT 2.1KHz second IF (455kHz) Stock #2809.2. Since I had already installed the Yaesu narrow CW filter (XF-2005), I mounted the Fox Tango filter on top of it with double-sided tape. Upon removing the very modest Yaesu ceramic filter (CF-2001), I was able to patch the new filter into its vacated holes in the IF board using short lengths of coax. Incidentally, the IF board in the '102 can be removed for filter installation rather easily.

Upon completing the installation I found it unnecessary to readjust the IF transformers; everytthing seemed to be "right on". I did, however, make adjustments to the carrier oscillators. This was done by the "seat-of-the-pants" method, using the '102's monitor circuit to listen to my audio and adjusting upper and lower sideband responses to my taste.

My first opportunity to test the rig after the modifications came during Sweeps takes weekend, perhaps the ultimate test of a receiver's selectivity. I must report that I am extremely satisfied with the results. The Fox Tango filters transformed the FT--102's receiver from very good to excellent. It now has the selectivity needed for today's crowded bands. I have also received very good reports on my own audio.

While I've always enjoyed my '102, I do so even more now. I've found the Fox Tango filters to be "as advertised" and I am very pleased with them.

[For those who do not have the Yaesu narrow CW filter installed, the FT #2809.2 mounts easily in its spot, "dead-bug fashion" (pins up) and patching in to replace CF-2001 is easy. This filter is the same one which has long been used to replace a ceramic filter similar to CF-2001 used in the Kenwood TS830 and TS930 with excellent (and widely publicized) results. Its price is $110 and that of the FT 2.1 first IF filter (#2109.1) is $60. Both include all necessary coax, tape, etc. For a limited time, this two-filter package will be available to paid-up Club members at a 10% discount ($153) plus shipping ($3 US; add $1 for airmail, $1 for COD; $4 Canada and Mexico; $10 overseas airmail). It is not necessary to replace two filters as Joe did but the improvement will not be as marked since two 2.1's "in cascade" are necessarily better than a 2.7 and 2.1. Preliminary experiments indicate that the modification should improve the FT-980 also. N4ML]

FT-102 MAINTENANCE SUGGESTIONS

by Dan Sullivan WD8IDZ

[The following reminds me of the report of serious gear wear reported by Terry Stuadt W0WUZ on page 8217. Dan is a dealer. N4ML]

Gear Lubrication. None of the FT-102's I have inspected show any trace of lubrication on their gear trains. I feel these gears actually need lubrication not only to reduce wear but to smooth out the tuning knob "feel". The best lubricant I have found for such an application is Garcia "Silicote", a fishing reel lubricant available at many Sporting Goods stores including K-Mart. This material is unaffected by temperature extremes and will not "gum up". It comes in 3/8 ounce tubes and retails for $2. FT-102 owners should remove the bottom cover of their rigs and apply the Silicote to the gear teeth with a toothpick.

Screws. I have found most of the PC board screws in the 102's in need of tigghtening; some were very loose. [Since boards are often depend upon these screws for grounding, it is essential that they be tight. N4ML]

FT102 TECH SUPPLEMENT - MISSING DATA

KA1RL writes: "If you check page 15 of the FT-102 Technical Supplement under Receiver Spurious Reduction, you will see that Yaesu refers the reader to paragraphs A2 and A3 on page 20. This is part of the section on 11M Installation Procedures which has been removed from my book. If you could copy just the two pertinent paragraphs which apparently are disassembly instructions, it would be a great help since I have a spurious beat note every 100kHz on all bands and would like to try the modification....."

The reason KA1RL asks me is that I stated over the Net that I had received my copy of the Manual directly from Tokyo and no pages had been removed. So for the benefit of those not so "lucky", here are the missing paragraphs:

2. Referring to Figure 2, carefully bend the two chassis clips (marked A) slightly inwards about 5mm so that the two gray shielded cables can be removed from the clips. It is not necessary to disconnect these cables from the pc-board.

3. Remove the seven screws affixing the Local Unit (PB-2345) and carefully lift the outer edge of the board, folding it towards the middle of the transceiver so that the solder side is exposed.

That's it. My possession of the entire missing chapter has already posed several moral dilemmas for me. I have been beseiged with calls from those anxious to obtain the information in full. However, the pages were removed for fairly obvious reasons. To make them available would be contrary to the Club policy which is to do nothing to facilitate illegal operation. It would also be a breach of Yaesu's confidence in sending the information to me, to say nothing of possible involvement with the FCC. N4ML

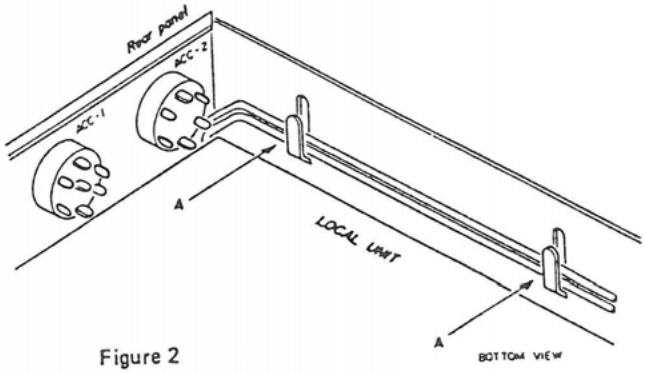


Figure 2

REPORT ON FT-102 MODS

by Rudy Rudenauer KA2RL

The following is a summary of remarks I made recently on the FT Net concerning modifications which Yaesu suggested be made to early-run FT-102's.

I have made the keyclick, FM Unit protection, RX spurious reduction, and counter noise reduction as presented in the Technical Supplement for my FT-102 S/N 2I 030779 without a hitch. The major requirement is a steady hand and a small-tipped low-wattage soldering iron. [Like the Antex G---See Green Sheet. N4ML]

I have two comments with respect to these mods. I found the 1uF 50WV electrolytic capacitor for the keyclick mod already installed in my set, and J4017 is the top end of resistor R23 which is mounted vertically on the local board. The white wire and a green wire are tacked on to the top of R23. I lifted both wires and safetied them down.

The RX spurious reduction mod slightly reduced a 100kHz beat note I was getting at every 100kHz point on the tuning dial on all bands. In checking the local board further, I found the factory had also put in additional jumpers for low impedance ground paths to various points on the board. I found the jumper they put in from the ground side of J16 to the edge of the board to have a cold soldered connection. Resoldering the connection cleaned up the 100kHz beat note problem completely. The small coax lead from J16 carries a 100KHz reference signal from the local board to the accessory sockets on the back of the set for remote VFO operation.

FT-102 USER REPORT

by Harvey Columbine W2MLO

Here are some random thoughts on my FT-102.

First, I have heard from some local hams that Yaesu is supposed to be phasing out the FT-102. If so, it sure is strange because it has such a nice TX and its RX is very good too. Plus the fact that the '102 is the sharpest-looking Amateur transceiver I have ever seen! To me it is far better looking than the highly touted FT-ONE which seems overpriced for what it offers. It seems especially strange (that the '102 would have such a brief life) when there are so many of the old FT-101's still around and very popular. I wonder if Kenwood had any influence on the decision?

[I've heard a variety of opinions including the one that tube finals are no longer popular, that they are not broadbanded and require tuning, etc. On the other hand, some hams still like to "participate in the operation" at least to the extent of doing more than throwing the power switch. Speaking to a very large Yaesu dealer about the matter, he reported that the '102's were indeed "gone" insofar as the US market was concerned although they might still be available in Japan. Asked why he thought they had been discontinued, he said they just "did not sell well" and Yaesu "cleared the decks" for the introduction of the FT-757GX. It is not good marketing, he said, to have too many models from the same manufacturer competing with one another. As to reasons for "poor sales", in addition to lack of popularity of tube finals, the set just did not work well on CW. The concept of the 3-tube final amplifier with negative feedback, etc. was sound but the execution just didn't work out. This is quite different from the enthusiastic reports from many members who report complete satisfaction. N4ML]

[W2ML0 continues] I think the best part of the '102 is its super Digital External VFO (which I have). It is expensive ($300) but is well-engineered and nicely made. Built-in VFO's like those in the Kenwood TS930 do not compare with the superior design and capabilities of the '102 unit. However, I consider the memory feature a waste of time and money; it really is not needed. The FT-102 External VFO can hold up to 14 frequencies. I have had it for 8 months now and just haven't used it, not even once! It simply takes too long to program a frequency into it. Then after you get through with the programming, you need to remember the frequency or write down on scrap paper which of the 14

positions it is on and then you must press readout buttons to get it back. It all sounds so nice in the ads, but in practice it could drive you crazy as it loses time in a contest situation. If it were used to store two or three important frequencies it might be OK at certain times but I have my doubts about its utility in fast DX-contest use. The secret of success in such a situation is constantly to keep moving to run up your score as high as possible. Diversions such as programing and excessive frequency switching really slow you down. Memory banks for frequencies is one of those sucker-bait "bells and whistles" which one manufacturer introduces to gain an "edge" over his competitors, and pretty soon they all have it, not because of any inherent value, but just to keep up with the "crowd". I even fail to see how computer operation would be an asset in contesting other than to maybe help find "dupes" more quickly. Otherwise, its just another expensive diversion from the real task at hand, which is communication.

Finally, I'd like to see a comparison between the Shure MC11J cartridge the Club offers and the slightly less expensive but similar-sized unit from the Heil Company. [I'll try to arrange the comparison unless someone has already made one---if so please let me know. N4ML]

IMPROVING FT-102 SPEECH PROCESSING

The FT-102 comes with a "Speech Processor" as standard equipment but it uses the principle of peak limiting rather than true RF envelope clipping of the classic type such as is used in high grade units like the G3LLL RF Clipper which was so effective in the old FT-101 series and probably served as a protype of Yaesu's later and somewhat inferior design. In the G3LLL unit, the i-f signal is passed through an adjustable stage of amplification to compensate for the losses introduced by a new crystal filter which follows it. More amplification is followed by two stages of progressive clipping. Such clipping results in removal of the tops of sine waveforms, or flat tops. As is well known, such forms resemble square waves which generate a large number of high frequency harmonics which cause severe distortion if not corrected. However, if the clipped signal is made to pass through a second crystal filter, the harmonics will be mostly removed and the signal largely restored to its undistorted sinusoidal form; albeit its average amplitude (and the resulting average power output) or "audio punch" will be significantly increased without serious loss of audio quality. In the case of the G3LLL unit, the "new filter" must be of a quality comparable to that of the "stock" filter which is used to "clean up" the clipped i-f signal. Since the retail price of such filters is now about $60, it is easy to see why the entire unit sold, when available, for about $100. There was no way to get around the need (and expense) of that extra crystal filter---there was only one in the old single-coversion FT-101 series.

But the FT-102 is different---it has two i-f filters built in. Thus, true RF envelope clipping is possible with a filter before and after clipping, without the cost of an additional filter. This drops the price and complexity dramatically. W7OAK has designed and manufactures a compact, easily installed high-quality double-sided processor board for the '102. He markets it under the name of MAGICOM. If you check the FT-102 block diagram you will see the basic idea. A DSB signal is generated at 455kHz, passed through a ceramic filter for SSB selection, processed (or not processed), mixed up to 8.2MHz, then passed through the 8.2MHz crystal filter, and then on through the i-f amplifier. The MAGICOM design uses all of the existing elements of the FT-102 RF processor string except that clipping is accomplished on the Magicom board and Q16 is used as an amplifier instead of its original use as a peak limiter.

Since I have read several favorable reports about the effectiveness of the MAGICOM unit (it is claimed to increase average signal power by 6dB) and its relatively easy installation (the instructions are good), I have decided to depart from the usual Club practice of not offering a device to our members until it has been evaluated by one or more members, preferably on our technical advisory committee. Instead, since I believe the design is sound and the device well-made, I have decided to offer it on a no obligation or money back if not satisfied basis. The only qualification is that you agree to write a brief report on its performance and installation (good or bad) and, if possible, demonstrate its performance on the Fox Tango net so others can judge for themselves.

FT-102 "MAGICOM" SPEECH PROCESSOR REPORT

On NL page 8440, we offered club members a two-month opportunity to try out the Magicom Speech Processor board for the FT-102 at a reduced price and on a money-back, no obligation basis if not satisfied in any way with its performance. The purpose was to obtain an impartial test before listing the unit on the Club's Green Sheet, provided it was found to be satisfactory.

*

Although about 20 were sold during the trial period, not one was returned. Several purchasers wrote saying they liked its performance. And three demonstrated its effectiveness during successive sessions of the Fox Tango Net. In each case the consensus was that "audio punch" was significantly increased, in some cases S-meter readings were reported to have gained as much as two S units, and that no significant degradation of audio quality was noted.

** MILT N4ML advises that (despite users' initial enthusiasm) he was forced to discontinue it due to too many complaints. He is not sure if anyone else still sells it...do any of you know ?*

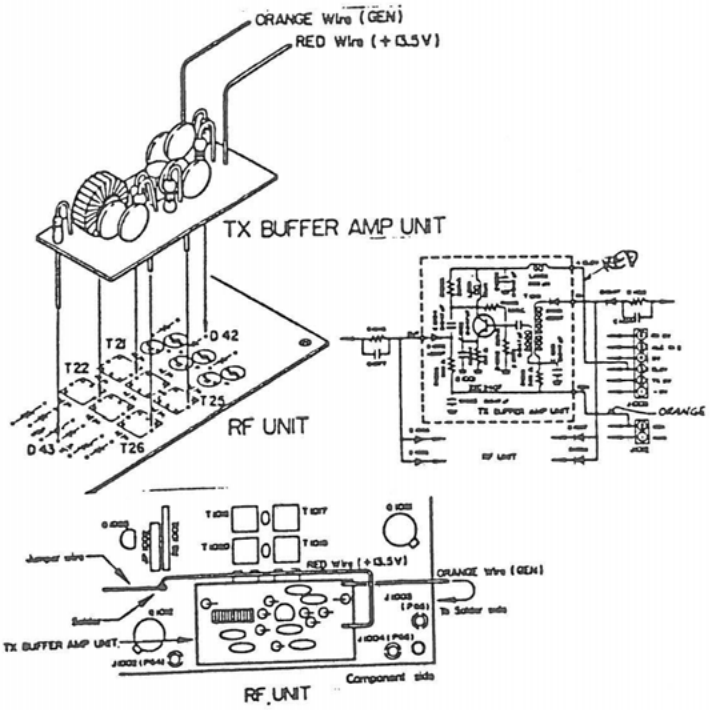
SIMPLE FT-102 IMPROVEMENTS

by P MacDougall VE8YQ

The following ideas are so simple that I have not bothered to give specific circuit references. Just check the schematic.

1. The first thing I noticed after receiving my FT-102 was that the filament switch shut off the fan. I always like to let my final tubes cool off before killing all the power. To permit this, I transferred the return lead from the fan to the ON side of the main power switch.

2. When phone patching, if RX audio was fed to the patch from the speaker jack on the rear panel and I wanted to use the phones for monitoring, this would cut off



the audio to the patch. The simple solution was to run a single wire from the hot side of the phone jack to the unused "AUX" jack on the rear panel and connect that to the patch input.

Finally I'd like to say I cannot imagine why Yaesu discontinued the FT-102. There are lots of locations where the advantages of having tube finals, especially 6146's, far outweighs any argument in favor of transistors, and mine is one of them. Indeed it is the main reason I chose the FT-102 in the first place!

FT-102 SUGGESTIONS

by Rich Armstrong NE7T (ex W7CDM)

I received my new FT-102 recently and it is the best yet. Absolutely super! Workmanship on the inside is excellent.

As noted in the May 1984 NL, some of my board screws were also loose. Use a large enough screwdriver to do the job. I thought the dial system was great as received but after a day or two found it worthwhile to use the silicote treatment.

I heard that a couple of hams had lost their RX RF amps and didn't replace them since their use is optional and they didn't feel they needed them. However, I use them a lot for weak signal DX so when they failed I started looking for replacements. To start, I could find no 2SK125's or any cross-reference replacement for the two used in the RF amplifier. Several more are used in other spots in the rig. Call the Yaesu Parts Dept. The Tech Dept seems to be the same as its always been: I wrote to them to send me 2 2SK125's and after three weeks and a phone call they sent me a form letter saying how much they cost and, yes, they would ship them if I wanted them to! I got back on the phone and spoke to Ed in the Paramount Parts Dept and he had them going via UPS the same day. Thanks Ed.

To check your RF amplifier, turn volume all the way down and push the RF Amp button IN: If you can hear the Relay then its pretty obvious that the two transisitors are bad.

To replace them, take both covers off the rig and turn it upside down. Find the AF Unit PB-2344B. Remove the screws from this board using a "part picker". Fold the board back on its cable harness out of your way. Then remove the metal plate now exposed and set it aside. You are now looking at the solder side of PB-2342. Turn the rig up on its side, locate Q01 and Q02; you will see a 4-pin cable plug close by with a resistor and capacitor near it. On the solder side of the board this makes it look like a 5-pin plug. Use this as a reference, noting the direction the transistor legs take. Unsolder them using a small iron and solder wick; if done correctly the units practically fall out. Replace with new units using needle nose pliers and lots of light. Time: 30 minutes and well worth the effort.

FT-102 INTERMITTENT RX - CAUSE & CURE

This problem, reported on the FT Net, involved an intermittent RX when going from TX to RX. Sometimes all would be well, at other times the RX would be very weak. Pushing the PTT a few times usually cleared the problem, but not always. Troubles of this kind usually point suspicion at the T/R relay and this indeed was the problem. However the cause of the relay failure was unusual---one of the 6146B finals!

Seems that the plate cap (cemented to the top of the tube) became loose and then unsoldered from the pin that extended out from the glass envelope. This caused arcing inside the metal cap producing an abnormal amount of heat. Indeed the radiated heat was so great that the plastic case of the nearby T/R relay melted causing its operation to become erratic. The cure was obvious. Both the relay and the 6146B were replaced and the trouble disappeared. As insurance against possible future high heat levels, the new relay was insulated with an asbestos wrapping. Tnx to Richard Bovee.

FT-102 ITEM CLARIFICATION

NE7T advises that the item he wrote on the FT-102 Pre-amp [see page 8444] was ambiguous. He suggests the following:

The paragraph starting with "To check your RF amplifier..." should read: If your RF amplifier is inoperative, turn the volume all the way down...etc, etc.---the rest is correct.

Explanation: With the volume turned down you can hear the RF Amp Relay thus checking the Relay and control circuit. If the relay shuts, you can bet Q01 and Q02 are bad. Hope this clears it up. NE7T

FT-102/SB-221 PROBLEM

Q.
I have the following problem with my FT-102. I use it primarily on 80 meters using an inverted V antenna. When operating barefoot the rig operates extremely well. However when I use it as an exciter for by Heath SB221 linear amplifier my signal is reported to be of very poor audio quality. The increased power output is evident but so is audio distortion, according to reports. I have modified the SB221 in accordance with Heath instructions when using a Kenwood as a driver. However, although the TS130S-SSB221 combination works very well, the problem remains when using the FT-102.

I have tuned the FT-102 into a 50-ohm dummy load and put it on the line---again it was beautiful alone but as soon as the amplifier was turned on the distorition was back and I was told I was "overdriving" although all indications were well within limits. I have tried operating the '102 without the ALC lead connected to the SB221 with the same results: signal reports of distortion or something that sounds like overdriving. Now the strange part is that all this trouble seems to occur only within the local state area. When contacting more distant states such as the mid-west or east coast, the signal is reported to be okay with the amplifier in the system!!! I feel the SB221 is okay since it works so well with the Kenwood exciter. So---what can be wrong with the FT-102??? Don WD0BSZ.

A.
It sounds very much as if your problem is caused by RF getting back into the audio system of your FT-102. It is commonly called RF Feedback. High power creates a strong RF field near your equipment, especially if your VSWR is poor or your feedline is mismatched. But if this is so why, you may ask, does it not affect the TS130S which is working under the same conditions? Well, perhaps the '102 does not have as good defenses against the feedback as the much smaller '130. The usual ways for RF to get back inside any rig is through external leads which act like antennas, such as those for an external speaker, phone patches, microphones, etc. Manufacturers usually provide some kind of filtering inside the chassis where such leads enter. Filters may be as simple as a .01uF caramic capacitor connected between the entering lead and ground to by-pass the unwanted RF, or a little pi network in which the legs of the pi are .01 caps and the horizontal part is a little RF choke (250uH or so). The free ends of the caps are connected to the chassis while the RFC is in series with the entering lead. Naturally the pi is more effective than a simple cap. Yaesu has used both.

Another possibility is a ceramic bead strung on the lead inside the chassis where it enters. Of course before adding such filtering check the effects of removing external units like speakers, etc. so as to tell where the filtering is needed. Try a different mike; vary the cord length by varying the stretch if it is a coiled type. Check the braid to plug attachment of your RF cables, especially the antenna leads from the linear. Make sure the plugs are tight and wrap aluminum foil around them to prevent RF leakage. And, of course, make sure that all equipment (including the linear) is well grounded.

Finally, your statement that the poor audio is reported only by nearby stations is a mystery. If the audio is poor it should not be improved if the signal travels further. It might be weaker but this is not necessarily so as you know from the effects of skip. Maybe some of our readers will find an explanation---I can't. Good luck. N4ML

FT-102 PROBLEMS

by Charles Baker W2KTF

Problem 1: Very erratic condition when Loading Control is varied, especially below setting of 2 on panel marking. Varies smoothly when top of final amplifier compartment is removed. Trouble returns when it is replaced.

Cause and Cure: The loading capacitor frame touches the top cover of compartment. Insulate it; gummed cellophane (Scotch) tape is adequate. Apparently the frame (and rotor of the variable capacitor) must be grounded onlythrough the grounding braid used during manufacture. It will be seen that the frame itself is mounted on inulating bushings but in my set, projections on the capacitor frame were contacting the compartment cover.

Problem 2: On CW TX the frequency shifts about 100Hz at the start of a transmission. However, after a few seconds the rig settles down and becomes very stable.

Solution, anyone? This may resemble the chirp problem described in paragraph 5 on NL page 8405. However, C4153 (3.3pF), the cause of that problem, was found to have been deleted at the factory.

AVOIDING THE FT-102 PANIC BUTTON

by Elmer Frantz W3FQS

As a satisfied FT-101 owner of 12 years, I recently upgraded to a new FT-102. The latter's greatly improved receiver section with its associated 16 knobs and buttons proved to be a big plus. I continually marvel at the FT-102's VFO and RIT stability with virtually zero drift. The digital readout's high degree of reliable accuracy on all bands is truly an amazing advance over its FT-101 forbear. For sensitivity and selectivity, I am confident that few competitive models, as standardly configured, will equal or surpass it.

As so ably advocated by NL Editor N4ML, an analysis of the problem's symptoms was first addressed. It was quickly observed that the fuse did not blow in the RX mode and, since all receiver functions were normal, this obviously narrowed the trouble down to transmitter-only circuitry, which included four old-fashioned devices known as vacuum tubes. Since their fallibility was common knowledge, initial trouble shooting efforts were centered on them.

First all tubes were removed from their sockets and the PTT or MOX switch activated. Since the F1 fuse did not blow under these conditions, we had fair proof that one of the tubes was the culprit. An ohmmeter test of all tube elements for internal shorts proved negative. So next, starting with the 12BY7 driver, one tube at a time was inserted into its socket and, after warm-up, plate voltage was applied. The second 6146B (a GE) so energized caused F1 to blow and simultaneously an internal arc between the tube elements was readily seen. Apparently the insulation the tube elements was breaking down under the stress of high voltage when applied. An "offshore" brand replacement of the faulty tube solved the problem once and for all. [Not sure what kind of tube was used, but it is best to use the same brand as the others when all operate in parallel. N4ML]

In retrospect, a simpler procedure would have been to first remove the cabinet top cover and the final tube compartment lid. Then, if room illumination was dimmed, arcing within the faulty tube would have been readily visibile when the high voltage was applied. This simplified and modest victory thanks to the use of dynamic analysis once again restored my faith in logical procedure, my own capabilities, and in the soundness of the basic design of the FT-102.

[Elmer's method of using his head before his hands is the basis of sound trouble shooting technique and so applies to the solution of similar problems in other rigs. It should be obvious, but it will bear repeating, that tubes operate at voltages which can be lethal so be sure no high voltage is present before touching anything in the final amplifier compartment. This means not only seeing that the AC power is off (preferably by pulling the power plug), but also using an insulated screw driver to short the plate caps to the grounded frame of the final amplifier compartment. The DC filter capacitors can hold their charge a surprisingly long time, especially if the tube heaters have been turned off. Don't take any chances on unexpected and unpleasant surprises. BETTER SAFE THAN SORRY! N4ML]

WHO WILL FIGURE IT OUT?

Hip [N2FTJ] has been trying to inspire FT-102 owners via the FT Net to come up with designs to achieve the following:

1. How can the last digit in the Display unit be activated to give a 10Hz frequency indication?

2. How can solid state relays be used to permit QSK operation?

3. Is there a simple way to electronically "disconnect" the main tuning knob so that, in effect, the desired operating frequency is "locked" when desired?

AN FT102 "SPUR" PROBLEM AND A FIX"

by Tony Berg W10T

The Problem

At certain frequencies, when a strong (over S9) signal is rreceived, a spurious replica is generated. This occurs near the low end of 80, 40, 20, 15, and 10 meters, as well as on 160. The problem is worse on 80, and the frequency of the spur is halfway between 3.5MHz and the real signal, plus 0.4kHz. However, since the level of the spur increases as the real signal approaches 3.5MHz, it is then more noticeable. For example (with my FT102) when an S9 + 10dB signal is on 3502, an S5 spur is produced on 3501.4. In this case, the two beat notes can be heard simultaneously. On 160 meters, there is a different frequency relationship wherein W1AW at S9+ on about 1818kHz can be heard weakly on about 1801kHz.

[Preliminary: The problem, which probably always existed, was only discovered after the warranty had expired. I have called and written to Yaesu about it and was promised an answer months ago. But so far, nothing! So I have tried to solve the problem myself. I substituted the output from a Hewlett Packard 606 signal generator for the 1st LO output of the local oscillator unit and the spurious responses disappeared, but I have not been able to postulate a mixer spur, component failure, or misalignment that would cause the spurs. Also I have verified that the Local Unit in my FT-102 has the RX spurious reduction mods described in the FT-102 Technical Supplement.]

The Investigation

It was noted that the spur tuned twice as fast as a real signal; that is, tuning 500Hz from the spur produced a 1000Hz beat note. This led to a suspicion that the effect was produced by insufficient suppression of the VFO's second harmonic. Examination of the components of the VFO's low pass filter in the Local Unit (near left rear corner, viewing the upside-down FT-102 from the front) showed some discrepancies among the parts as installed, shown in the schematic, and given in the parts list. L25, L26, and L27 are 6.8uH on the schematic but were actually 10, 18, and 18uH respectively in the unit. On the parts list, L25 is not listed, and L26 and L27 are listed twice, once as 6.8uH and once as 18uH. [!]

A Fix

Choosing to believe the schematic, I installed three 6.8uH chokes each made up of 48 turns of #30 enameled wire to fill an Amidon T-37-6 core. These toroids are excellent in this application. They are cheap, small, have high Q;, minimal mutual coupling, and good termperature stability. This change resulted in no great improveement, but I found that a 5-60pF

trimmer capacitor (Radio Shack 272-1340), in parallel with L25 could be tuned to reduce the level of the spur. Further, this in combination with adjusting VR101 (associated with Q24, near the aforementioned components) nulls the previously S5 spurious signal to inaudibility. To produce the spur, the antenna input of an external receiver was connected to the FT-102's "EXT RCVR" input, and the frequency of the external receiver's 100kHz calibrator was readjusted to prroduce a signal at about 3503kHz.

Notes

The parallel resonant frequency of the trap formed by the 5-60pF trimcap, on-board 20pF capacitor, and L25 is around 7MHz (not the VFO's second harmonic of about 11MHz). The above is called a Fix rather than the Fix because more investigation into the source of the spur probably should be made, and a more elegant solution found. In this "fix", L25 functions as part of a trap, rather than as part of aa low pass filter. Also the fix does nothing for the spur on 160 meters. However I tried out other fixes prior to the above, and don't want to wear out the Local Unit PCB and its connecting cables.

Three Questions

1. Do you have the problem in your FT-102? Answers will establish if the trouble is general or peculiar to Tony's rig.

2. What is your theory as to the cause of the problem?
3. Can you find THE Fix?

FT-102 CW FILTER SWITCHING MOD

by Tony Berg W1OT

The purpose of this modification is to route IF Unit signals through 2nd IF filter XF05 rather than CF01 in the CW-wide mode, to provide improved performance in the CW-W mode. Without this modification, some available combinations of bandwidths (with optional Yaesu filters) are given in Cases 1 - 3 below. The modification enables Case 4 for Yaesu filters, Case 5 for Fox-Tango filters, and Case 6 for a mix.

	Case #					
Mode	1	2	3	4	5	6
CW-W	1800/2900	1800/2900	600/2900	600/500	500/400	600/500
CW-N	600/ 500	300/ 270	300/ 270	300/500	250/400	250/500
	Pre-Mod			Post-Mod		

In the above table, 6-dB bandwidths in Hz are listed for the 1st and 2nd IF filters, respectively. Filter locations are as follows:

	Pre-Mod		Post-Mod
Mode	1st IF	2nd IF	2nd IF
CW-W	XF04	CF01	XF05
CW-N	XF03	XF05	XF05
SSB-W	XF01	CF01	CF01
SSB-N	XF04	CF01	CF01

In the above cases, #1 provides a useful SSB-N bandwidth, but both CW-W and CW-N are rather wide compared to their names. In Case 2, CW-W is the same, and too drastic a bandwidth change is obtained when switching from CW-W to CW-N. Case 3 for CW-W suffers from two problems. First, wideband noise generated in the receiver after the 600 Hz filter and filtered by the 2900 Hz filter can be heard in the receiver output as well as the 600 Hz-wide noise. This is annoying and degrades receiver noise figure/sensitivity. Second, overall skirt selectivity is not as good as when two filters of more comparable bandwidths are used in tandem. Cases 4, 5, and 6 are intended to be better compromises, optimized for CW, to overcome the above objections to Cases 1, 2, and 3.

For the modification, three 1N914/4148 diodes are required (Radio Shack #276-1122, 10 for 99¢), as well as sleeving for their leads. Refer to FT-102 Instruction Manual, Page 50, for access to the solder side of the IF Unit board. Connect the anode of the first diode to J13 pin 5 (near XF05) and the cathode to the pad at the end of R55 which is connected to L19 and C47. Referring to Figure 4 on Manual page 51, identify the track which this first diode is connected to either end of. Cut the track where the stem of the circled "7" on Fig. 4 crosses it. Connect the cathode of a second diode to the same point as the cathode of the first diode. Extend the anode lead of the second diode with a piece of hook-up wire and solder it to the pad at the anode of D05 (near J03). This part of the modification steers CW-W, in addition to CW-N, to XF05. Because of where the cut is made in the track, CW-N is still routed to XF03.

Remove diode D07 (near D05) and install a replacement D07 as follows: Cathode to same location as before; anode to same pad as D06 anode. The impact of this change is to steer CW-W and SSB-N to XF04 via D05 and D06, respectively, and steer SSB-N and SSB-W to CF01 via D07 and D08, respectively. Thus, CW-W is no longer steered to CF01.

FT-102 - TROUBLE AND CORRECTION

by William Hoertel KA0RDQ

The trouble happened suddenly: I found I could not tune my FT-102 on the 30-meter band. Plate current was excessive and I could not reduce it. Strangely, all the other bands worked fine! [The FT-102 has tube finals which, unlike many solid-state finals, must be tuned to resonance with plate, output, and preseletor controls. N4ML)

Then, without warning, the 20-meter band started acting up the same way. At a loss as to what to do, I let the set rest overnight and---as you probbably guessed---the trouble was still there the next day but this time the 40-meter band wouldn't tune! Well, I fooled around with it, got various kinds of information and advice, and decided to change the final tubes one at a time. Nothing I tried did any good, except that occasionally the rig would work normally.

A real problem and nowhere to look!

Finally since the problem involved various bands, I started to wonder if something might be wrong with the bandswitch. I examined it carefully while turning the knob (with power off, of course)---and I found the trouble! An allen-head set-screw which locked one of the bandswitch wafers to the shaft was loose! It was the wafer outside the final stage compartment. I had to remove the two "outside" final tubes to get access to the wafer but once I did I got it into sync with the others. Then I tightened the set-screw securely on the shaft (which is non-metallic) and now I'm back in business!

Lucky I thought about the bandswitch.

FT-102 PLATE RESONANCE FAILURE

by Elmer Frantz W3FQS

The FT-102 problem and symptoms by Bill Hoertel KA0RDQ outlined on page 8537 of the Newsletter were immediately recognized as applicable to my year-old FT-102.

Without warning, manipulation of the "PLATE" control no longer produced resonance and therefore RF output was nil along with abnormally high IC current indications. Simultaneously, normal functioning of the ALC, PRESELECT, and

HINTS AND KINKS FOR THE FT-102

by Dave Lankshear G3TJP

1. Noisy Fan. The 12VDC Hall effect fan is sometimes noiser than its AC couterpart. A reduction in noise may be effected by inserting a resistor of a few ohms (cut and try) in series with the fan supply.

2. VFO Removal/Replacement. After removing the digital display board, tuning knob and four retaining screws, remove the 5 pin connector plug by first depressing the locking tongue and then withdrawing the connector. The VFO is then free to move but its removal/replacement is made much easier by loosening the self-tapping screws holding the two large electrolytic capacitors C5 and C6 on the main chassis and tilting them away from the VFO. It can then be withdrawn easily through the top of the set.

3. AM/FM PCB Chip Failure. The TC5081 chip can sometimes latch due to spikes on the Vcc line. Yaesu has devised a modification (Tech. Bulletin 56) for this. It consists of replacing L6002 (pin 5/Q6003) and L6004 (pin 5/Q6005) with 56 ohm 1/4 watt resistors and adding a 470 ohm 1/4 watt resistor in series with pin 5 of Q6013 (TC 5081P). This is decoupled to ground on the pin 5 side of the resistor by a .047uF ceramic capacitor. See diagrams from T.B. 56.

4. Key Clicks. (For Serial Nos. xx030001 - xx069999). On CW the rise time of each CW element may be exremely short (measured 7 to 20uS) giving rise to serious clicks. The addition of a 1uF 50V electrolytic capacitor between test poin G1 located adjacent to J1005 on the RF Unit, and the long lead of R1045 (+ve to R1045), and the cutting of the white wire leading from pin J4018 located between Q4007 and Q4009 on the PLL board should ameliorate the problem.

5. CW Chirp. This may be present and dependent upon the setting of the IF Shift/Width controls. As the controls are moved from their centralized position, increasing chirp may be noted on the first CW element of each changeover from RX to TX. Removal of C4153 (3.3uF electrolytic located between X4002 and T4014) on the PLL board effects a complete cure.

6. Owners' Manual Errors (confirmed by the Factory).

a. Page 41. 19MHz reference oscillator, step 1. Voltage at TP4003, delete 100mV RMS and insert 350mV +/-100mV RMS.

b. Page 41. 10.5MHz SSB carrier oscillator, step 4. Delete 0 volts and insert 100mV. Note: The setting of the IF Shift/Width control affects this voltage. Be sure that the controls are centered. Measure voltage across VR4004 between long lead of R4115 (adjacent to D4075) - scrape paint from lead - and J4005 pin 5, yellow lead.

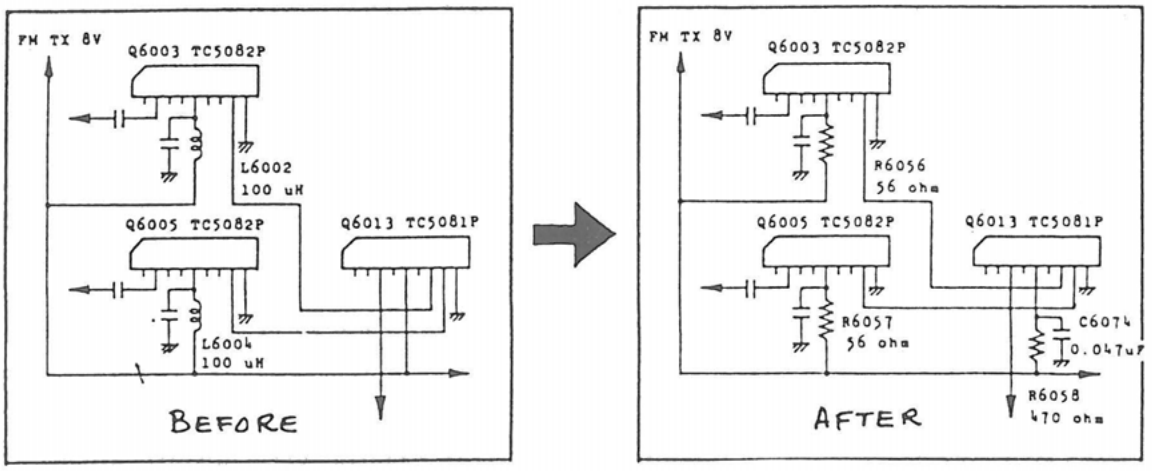
c. Page 43. PLL VCV step 1. Table of frequencies and voltages. For 7.5MHz adjust L4006 for 2V; not 6V as stated, The symptom of a wildly incorrect VCV voltage setting on any band is the unlocking of the PLL somewhere within the band, indicated by a blanked display.

d. Page 47. AF Unit alignment, CW carrier frequency, step 2. TC3003 should be adjusted for 8.2159MHz at J3004 pin 1.

e. Page 54. AF unit circuit diagram, X01 frequency should be 8.2159MHz.

NOTE: The crystal frequency is finally adjusted to converge the true CW TX frequency with that of the display in a later alignment procedure.

Tnx to Yaesu Musen Co., South Midlands Communications, and G8ILP without whose counsel, assistance and cooperation, my FT-102 could easily have become a wreck.
73 de Dave G3TJP



DRIVE circuits indicated that the fault lay within the final tubes' compartment. Curiously these symptoms occurred on some bands but not on others. Moreover, the trouble, which appeared intermittently, could be eliminated by repetitive flicking of the BAND switch. I therefore first concluded that the fault was merely caused by dirty contacts on those bandswitch wafers housed within the final amplifier compartment.

However, after reading KA0RDQ's experience I carefully inspected the highly miniaturized hex-head set screws which locked the wafers to the bandswitch shaft. Sure enough, a loose set-screw was readily apparent on the shaft coupler located adjacent to the 12BY7A driver tube. This was causing partial slippage of the shaft extension driving the switch wafers mounted inside the final amplifier compartment.

Removing the 12BY7A driver tube facilitated access to and tightening of the loose set-screw with a 1/16" Hex Key (Allen) wrench. This solved my problem completely. The common experience of KA0RDQ and myself suggests that loosening of the bandswitch wafer set-screws is likely to be encountered by other FT-102 users. Recent vintage FT models that use the same or similar type of bandswitch could eventually develop the same problem so if you get the symptoms, check for loose "grub screws" (UK for set screws) first. We are all indebted to KA0RDQ for discovering the cause and cure of the problem and passing it along via the Newsletter.

FT-102 POOR AUDIO WHEN USING LINEAR

by Jack Vandermosten N2JV

With reference to WD0BSZ's problem (NL page 8502) of poor audio complaints when using a linear amplifier with his FT-102 on 80 meters, I had a similar problem with my '102 on 160m and a friend had the same problem on 80m when using a SB-220 linear. In both cases the difficulty was traced to RF entering the '102 through a Heath HD-15 phone patch.

Since I never use my patch, I took it off line and the problem was eliminated. At the time this seemed much easier than dealing with 300 feet of 12-conductor telephone cable running through the house to provide phone jacks in each room.

[Reports like this seem to be accelerating the demise of phone patching which has been on the wane anyway since late-hour and weekend costs of "reaching out to touch someone" have come down substantially. The few reequests I have received for patching have come mostly from hams who want to give their retired grandparents in Florida the thrill of hearing from them via ham radio rather then to save money. So it would be nice if transceiver manufacturers would provide more effective filtering to prevent the entrance of RF through accessories such as the patch input. N4ML]

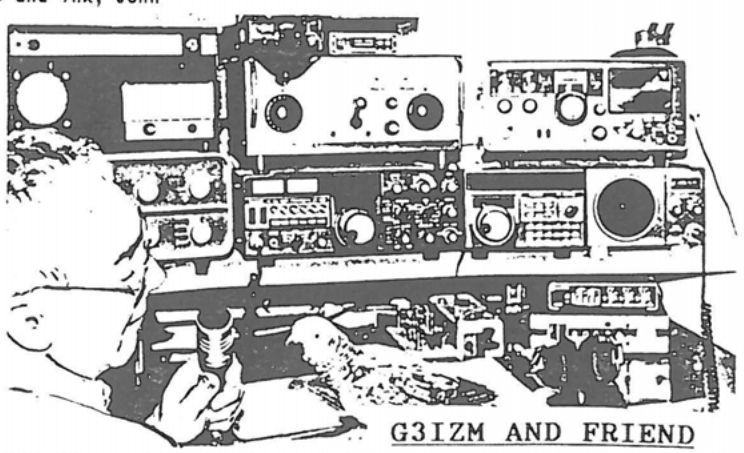
Fox-Tango FT102 references.

Filter improvements	1982	p.53
Special filters	1983	p.10
User report	1983	p.12
Using aux. pos'n on b'switch.	1983	p.39
Phonepatch problem	1983	p.46
Key click mod	1983	p.47
Hints & tips	1984	p.5
Filters	1984	p7
Filters (user report)	1984	p.20
Missing data from tech manual	1984	p.21
Maintenance suggestions	1984	p.25
Report on mods	1984	p.30
User report	1984	p.39
Improving speech proc	1984	p.40
Simple improvements	1984	p.42
User suggestions	1984	p.44
Receiver problem	1984	p.50
Intermittent rx	1984	p.51
Problem linking to SB221	1985	p.2
Clarification on 1984/p44 item	1985	p.3
Magicom speech proc.	1985	p.8
Problems & solutions	1985	p.11
PA problems	1985	p.12
Problem puzzle	1985	p.19
Filters	1985	p.20
Killing sprogs	1985	p.21
Filter switching mod	1985	p.34
30m problem	1985	p.37
PA resonance fail	1985	p.49
Poor audio with linear	1985	p.49

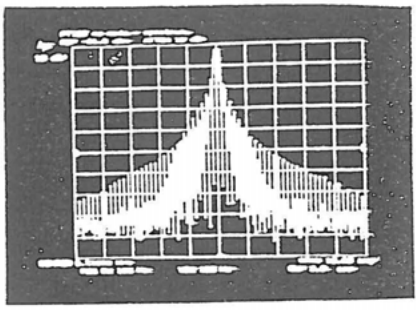
de G3IZM

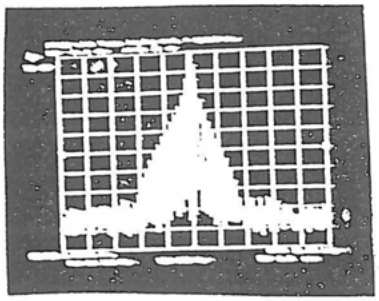
In the first few months I went through 3 FM boards until they fitted one of the modified versions. The original Sylvania finals were replaced with GE tubes after I forgot to switch off the PA while transverting...quite a lot of smoke ! After losing the front end transistoe in a thunderstorm, I too now have a 'ground' position on the ATU ! I am not happy with the noise blanker as it is not effective aginst ignition and electric motor noise. I agree with you that the Speech Processor doesn't seem to work at all but as a CW man that doesn't worry me too much. I have a full range of filters including the 270 Hz CW option. The signal appears to shift frequency and attenuate slightly when switching back to wide ?? Despite all this I am very happy with the rig...the RX performance is the best I have used for CW and the FV102 has nice bandspread tuning and is also useful for giant hops from one end of band to other. Photo shows me, the gear and 2nd Op:my parrot "Ratbag".

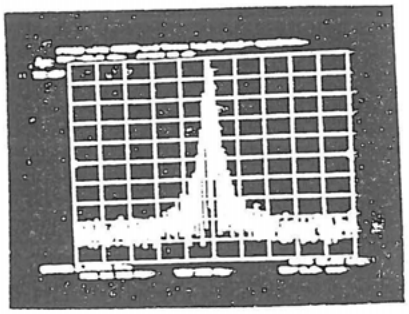
73 and Tnx, John



G3IZM AND FRIEND

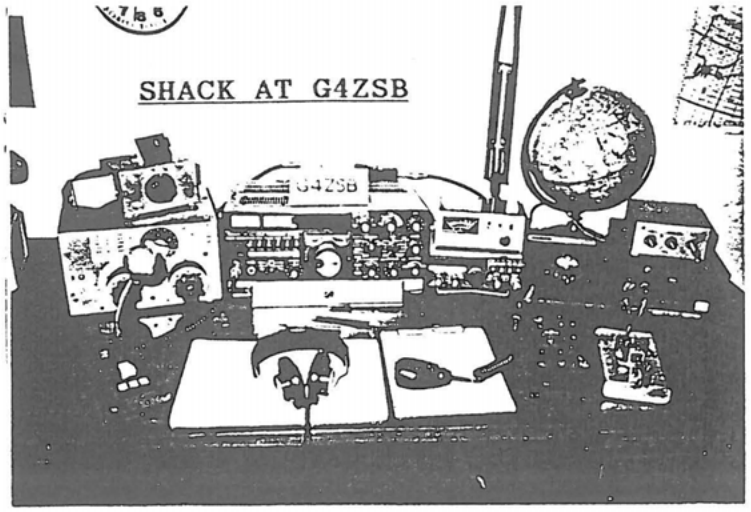






Spectrum analyser photos from G3RZP show the relative effects of the keyer mods described in detail in the previous issue. Top - original rig; middle - Yaesu recommended key-click mod; bottom - Yaesu mod plus G3RZP additions. Thanks for this extra info Peter and nice to hear you on the Net again !

SHACK AT G4ZSB



THE SHACK OF GM4UYZ

Due to the normal limited space within the normal semi-detached house these days my shack lies at the rear of my garage.I have made use of the last six feet of the garage by having it blocked off,fibre glassed all round to make it,one could say nice and cosy.

I have been licenced since October 1983 obtaining a full 'A' licence on the first attempt.I purchased the FT102 in August 83 and wouldn't change it at all.

The shack consists of the FT102,FT102 Speaker,FC902 ATU as the main HF gear.For VHF I have the FT290R with a Microwave Module 30W Linear.Also shown in the photograph is an old PYE AM radio which has been converted to use FM and is set up to receive all the local repeaters,a CM Howes set of kits built up for 20M.These consist of the VFO,Receiver and Transmitter with sidetone.Not shown in the photograph are a WKS 1001 AM/SSB,DNT M40FM (both ex CB) converted to the 10M bands,100W Linear,MAXCOM 4E CB all fitted along my workbench on the left hand side as you look at the FT102. I have also an ORIC ATMOS what I can use for RTTY but I dont use that very much at all.

The shack is set up aerial wise as follows.Main HF aerial is a G4MH minibeam for 10,15,20M ,G5RV and an ex CB 'Silver Rod' vertical for 10M working.All the HF radios can have access to all three aerials via aerial switches.For VHF the aerials are a 4 element Quad and a vertical Colinear.

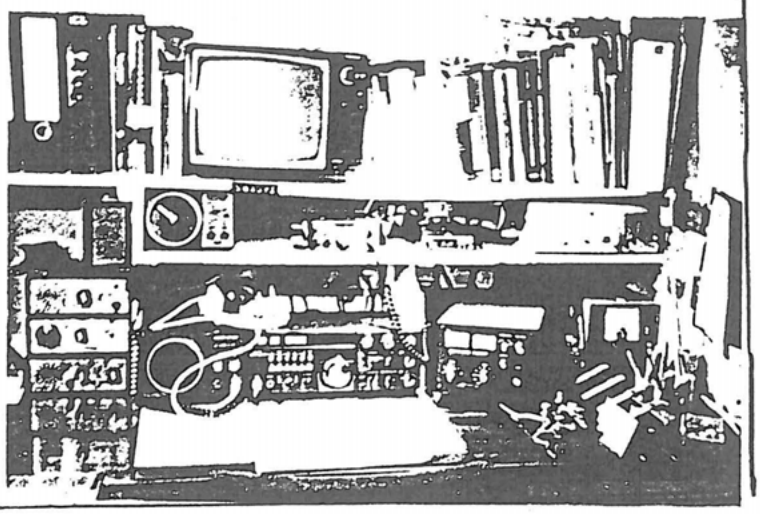
The main bands used are 20M or 15M with 10M working if I hear the band open.My main enjoyment in amateur radio apart from normal operating is working on radios.I am an avid circuit diagram collector and always willing to help any amateur looking for circuit diagrams if I have the same in my possession.Most of the work I do on radios is with either CB's or recently on Marine Radios which always give a great deal of satisfaction when I have repaired them no matter what the fault was.

I look forward to meeting you all on the Bands some day.

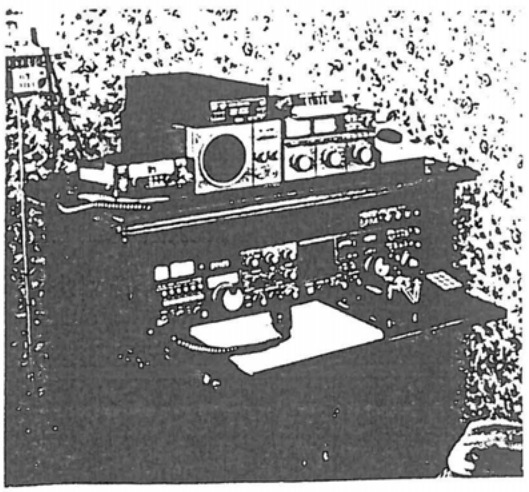
73's,

R E Glasgow

BOB GLASGOW,GM4UYZ



SHACK AT EI7FE



de G4ZSB
I felt I must write to you abt the mention in User 3 about my interest in the FC102 ATU (tuner circuit). I received a reply from Cecil G6MZB the vy next morning after the newsletter came. That really is good, of course I wrote back to Cecil straight away, but I think that Yaesu have made a complication of a very simple circuit. Anyway, enclose a photo of my shack, hoping that it may be of interest.
Yours, Lawrie

Nice to Know the USER is working as it should. For anyone else interested in the Tuner circuit it is reproduced in this issue courtesy of Yaesu (Manual lent by Liam EI7FE)

de PA3BXM
I heard about the User Group from some people on 7 MHz. I have the 102 line and am very happy with it really. There have been some problems (as usual the relays) and I have to give more carrier if I go into the NAR mode and that is a strange thing that nobody till now has given me an answer to.
Thanks, Peter

The NAR position/low drive phenomenon sounds like misalignment in the IF. The carrier must be slightly outside the passband of the Narrow filter but OK on WIDE.....but are the filters actually IN LINE on TX ? They are only needed on RX ? Help anyone ?

de G4GOF
Would like to see reprints of the various reviews of the 102. NB the Civil Service net is on 3.720 Tuesdays 8 pm (clock time). 102 Users should find our group slightly higher from 9 pm. Suggest the next membership list should be in Callsign order to help find people on the net. Sorry you have to hand the Newsletter over to someone else after all the effort you have put in.
73 Jess

Jess has been one of our most regular Netters. The Civil Service group have tended to go on beyond 9 pm and also to move up onto our old slot at 3.724, but we'll be around there somewhere. The membership list accompanying this issue is in both number and callsign order as suggested. Jess has just turned 80 and is hoping for an eye op in Sept as he is nearly blind..I am sure we all wish him all the best.

de G3AJV
Now and then, when tuning up on 80m the meter goes over the 400 mA before the ALC meter registers, and power is down a little. Flicking the DRIVE control will sometimes cure it, and often when coming back on a day or two later everything is back to normal. Another time I lost output on CW..key up Volts was 1.8V and keydown current 25 mA, quite different from the book. After a lot of checking I discoverd that just increasing the VOX control brought everything back !
Cheers es 73s, Stan

That quirk with the lazy ALC is what happens if your PRESELECTOR is slightly off tune..it also tunes the drive on TX you see so power would be down as well. ALWAYS tune the PRESELECTOR first item on your tune-up procedure and RETUNE it if you QSY much from the original frequency. Why the VOX sensitivity should change is anybody's guess.

de G3XEW
I must agree with other Users that this rig was one of the best produced, combining the advantages of solid state technology with the tolerance and size of a good-sized valve PA. I have had some problems tuning up on 15m & 10m, even into a dummy load the PA would suddenly go out of tune with a massive increase in PA current, sometimes the sound of sparking and once a pillar of smoke appeared !
I stripped down the PA and there was no sign of overheated components but a lot of hard flux around the major component joints. I cleaned this up, resoldered some doubtful joints and bent out slightly the TX IN pins of the aerial changeover relay which might have sparked over under adverse loading conditions. I also cleaned the contacts of the two plug-in relays under the counter board, but the thought of having to tackle the other ones on thr RF board fills me with horror !
Whatever the problem was, my attentions seem to have cured it and loading up on 15m is now reliable albeit with a low value of LOAD capacity i.e. position 1. I now wallow in the pleasure that this 'black box' has brought into my hobby; reassured with the knowledge that there is a wealth of experience available through the User Group.
73s Gordon

de G3KDD
I have recently purchased my 102 and have only two queries as it seems to performing generally OK. First, when switching on, the speaker nearly turns itself inside out. I have to turn the VOL off before switching on. Second, when adjusting the MIC gain, the ALC reading is nil until the knob reaches 1/3 and the the needle jumps into the red. Listening to the MONITOR the audio seems to increase correctly but not the meter. Any Ideas ?
All the best, Barry

1. Perhaps best to leave the audio low or off to avoid that thump on switch on...I think it is normal, capacitors charging up in the power supply or audio output stage etc. 2. Sounds like the PRESELECTOR again, needing careful tuning but maybe not. One wonders if your microphone is properly matched to the rig....1/3 on the audio gain, that's 10 o'clock, is fairly far advanced. Many users of standard Yaesu mics get away with settings of between 8 and 9 o'clock.Try a different mic ?

de G0IUX
I find the plate and load control settings differ from those shown in the manual. Also the relation of power out and Plate current are not exactly as specified. My REAL problem is the XYL's Conn Trinidad organ which is is the same room as the rig. It is alleged that the RF is taking out the IC's in the organ even though it is not switched on when I am transmitting . HELP !!!
73 Yours Sincerely, Bob

The discrepancies you quote are often due to the peculiarities of your individual antenna system, capacitative and inductive reactances etc...don't worry..provide you can get 300 mA on the Plate at resonance and the ALC to react as required you are in business ! As described elsewhere in your letter, you have a high voltage point of your inverted V antenna (i.e. one end of it) only 8ft from the 'shack' (and the organ). This could be the source of your problem, but as it only happened to date when the organ was not in use, we would need to hear the XYL actually playing it as you transmit to be sure! Try moving organ and antenna or both.....best of luck.

de G4VBH
My only real trouble was the 80m not loading on Tx. This was eventually traced to a capacitor (100 mF) being switched in on 80m. It was located on the switch inside the PA housing, and fixed by SMC. No way was I going to start messing about in there !
73 Albert

I wonder what that capacitor was for and where it was really supposed to be connected to ?

de G3HID
Thanks for the ads (User 2). Sold the KW600 linear but not the Bencher paddle...will part now for £45. Got this tip from Ted G8PO who has two 102 rigs and is an authority on this model: If no signal from the RF amplifier Button when switched out, the cure is to switch METER SWITCH between IC and HV.. this, he tells me, will bring matters into line again.
Best 73, Freddy

de GM4DQD
In reply to G3MGX, the power output of the 102 can most easily be controlled by the DRIVE CONTROL with the PROCESSOR switched in. If compression is not required, the COMPRESSION control can turned fully anti-clockwise. I would say to Norman G4RYS that I have not found a desk microphone to be any advantage over a fist mic. If you want hands-free operation a boom mic is the best way of achieving this. For those who do not wish to use headphones, there is a Shure boom mic without phones.

24.5 MHz ALC Reduction

This modification increases the drive level during transmission on the 24.5 MHz band in those transceivers having serial numbers under XX-080001. Later sets have this modification already incorporated.

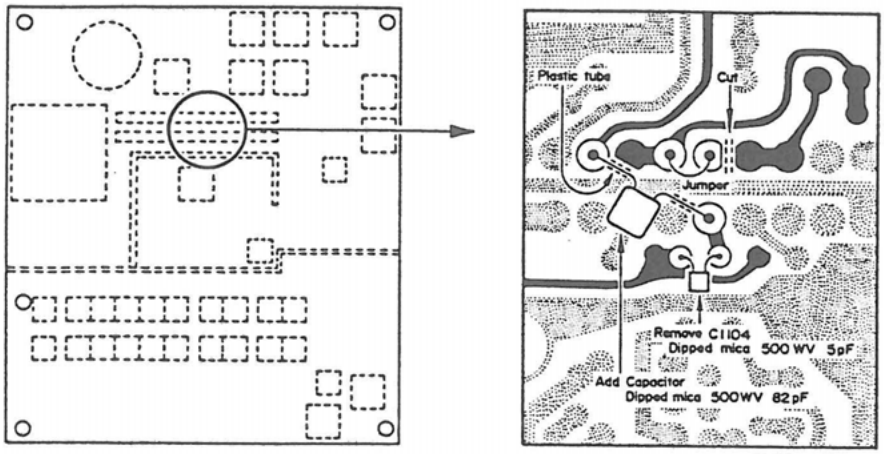
1. Referring to the diagrams below, locate the places on the solder side of the RF Unit where the terminals from the stationary contacts of bandswitch wafers S11b-3 and S11b-4 are soldered to the RF Unit. Carefully cut the foil pattern to isolate the 24.5 MHz pad of wafer S11b-3 as shown. Make sure it is the right place before cutting.

2. Install a small jumper between the 24.5 MHz pad isolated in the previous step and the 21 MHz pad on the opposite side from the cut.

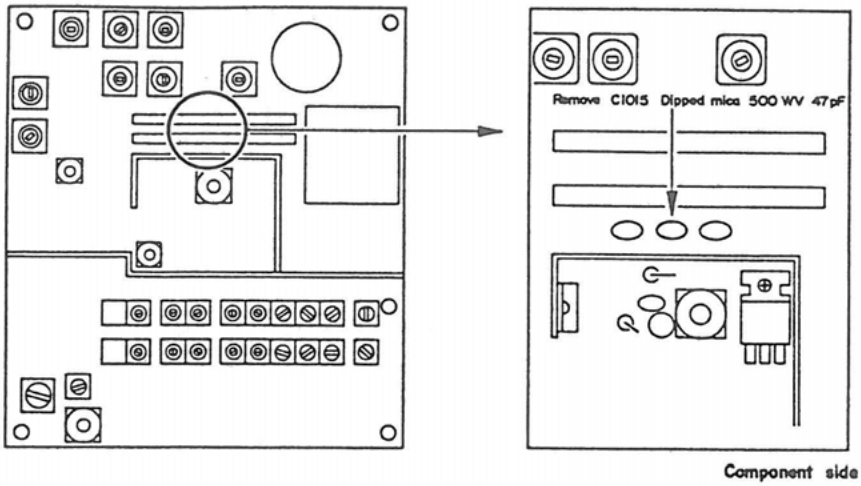
3. Now locate C1015 on the component side of the board, and C1104 on the solder side (connected in parallel to the same pads). Remove both of these capacitors to isolate the 24.5 MHz pad of wafer S11b-4.

4. Install plastic insulating sleeves over both leads of an 82 pF, 500 WV dipped mica capacitor, and connect from the 14 MHz pad of S11b-3 to the 24.5 MHz pad of S11b-4 on the solder side of the RF Unit, as shown in the diagram. This new capacitor is designated C1108.

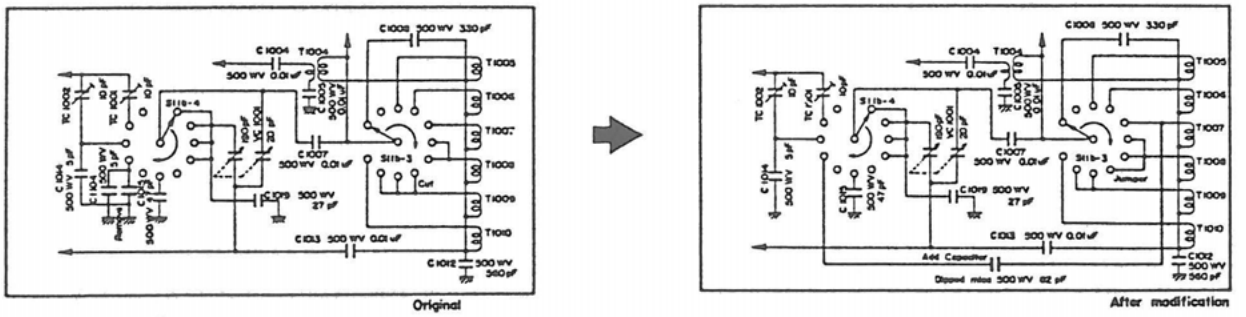
This completes the modification.

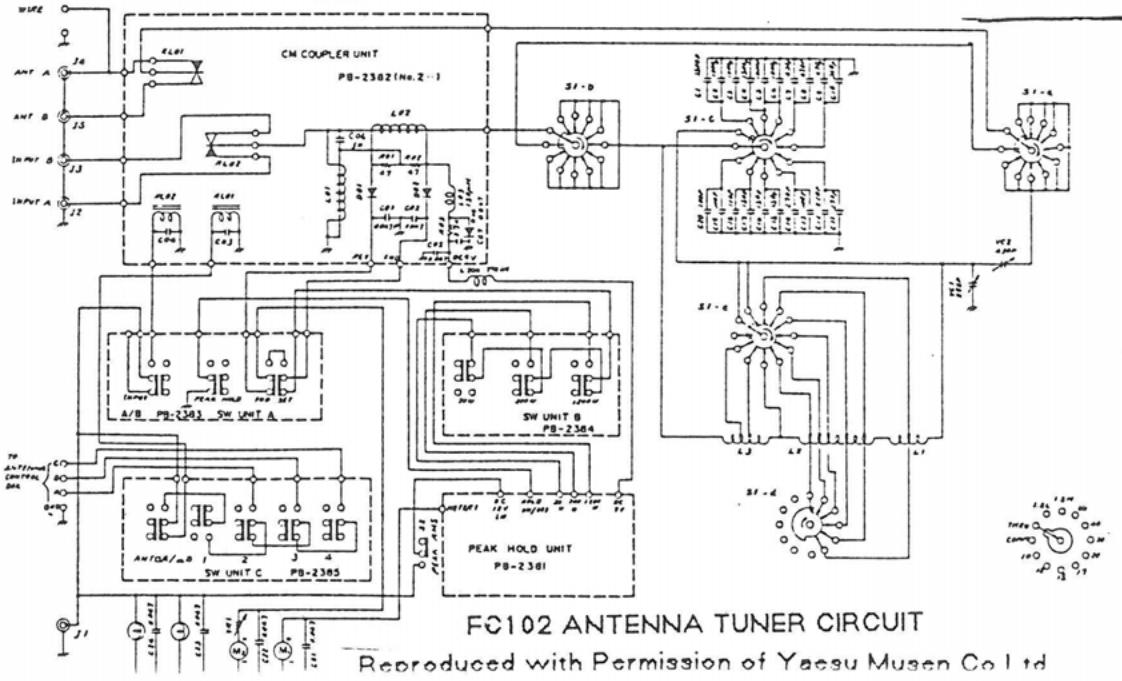


RF UNIT



RF UNIT





FC102 ANTENNA TUNER CIRCUIT

de GM4UYZ
Can I get a mention in the User for SMJ Electronics, Slateford Road, Edinburgh, Tel:031-337-6950. He supplies the cheapest IC's, Transistors around and supplies to people like Watford Electronics, Mutek etc.
73, Bob

Bob supplied the lamp-change guide with User 3, and also features in '102 Shack' this time.

de GW4GNY
A slight problem: when tuning up on 24 Mhz, the ALC meter does not rise as it should. I can 'dip the PA current and raise it to 300 mA but the ALC meter does not "follow it". The TX seems to funtion OK otherwise and I wonder if I may be doing any harm operating under these conditions? The problem is the same on my G5RV and my 160m loop, so its not an antenna fault.

Best 73 Martin

Your problem is covered by a Mod from the Yaesu FT102 Technical Supplement, Martin, and it is reproduced in this issue for you. with their permission.

de ZS5NZ
My problem is the audio is weak when I first switch on - then it surges - and eventually remains strong. Sometimes a touch on the PTT switch brings on the audio. After ten minutes or so there is no more trouble, until the next time I switch on.

73 Milne

This sounds like the RF changeover relays again....there is exactly the same fault at GI4PCQ. Cleaning the contacts is a temporary cure. See issue No. 2 for the recommended permanent solution.

de G4YBP
Has anyone a mod for an attenuator for use on 80m ? I don't like the RF gain (backed off). I put an attenuator in the antenna line for receive and it was better than using the RF gain. Sorry for not being on the NET for a while, but have been working away from home 5 days a week...pass on my regards to all the group.

Yours Pat

Backing off the RF gain and switching out the RF amp had been found useful in working 80m at night in the UK when there is heavy QRM from non-amateur traffic.The 102 NET frequency was often very difficult in this respect.

de VK4WLX
I am hopefully awaiting some comment on my problem with the FV102 (Spring Issue). I noted EI2CR's problem with the non-linear Mic control. I had this problem and solved it by simply using the Drive control with the processor in circuit but turned to a low level. You can leave the Mic control at 9 - 10 o'clock....works fine ! This also answers the query from G3MGX to achieve QRP operation. Another solution to Mic overdirve is a 680 ohm resistor from TP03 to ground on audio board PB2344A. This should not affect VOX oparation.

Best 73s John

de G5MN
I cannot make any sense of the Speech processor and use a Datong RF clipper plugged in at the back which gives all the processing anyone could want. My other grumble is the Noise Blanker which is virtually useless. apart from this I enjoy using my 102 which over the past five-and-a-half years has proved very reliable and given me much pleasure.
I blew the fuse on one occasion but that was due to pushing it too hard on 10m. There did seem to be signs of thermal runaway on one occasion after a long transmission, so I gave the appropriate pot a tweak to reduce standing current.

Yours Sincerely,
Chas.(Age 80, licenced 1935)

The speech processor seems to be one of the 102s weak points. The Fox-Tango people produced an alternative called the MAGICOM, but after initial acclaim it was withdrawn.(See elsewhere this issue).

de VK3DWZ
The thing that endeared me to the 102 was the LOVELY VALVES in the final. I was "educated" in the solid state but have never lost my love of valves. My present Communications receiver is a R-390A with 26 of them !
I have had problems on receive with a strong local spreading about 50Kc on 20m. My only other problem was both dial lights burning out but I found some local replacements, which although not perfect, do the trick. I wrote to Yaesu about the Plate current rising during a lengthy over (particularly on RTTY) but their reply was of no help. So I have to keep an eye on the IC and reset the mic gain as necessary.

Cheers from the city (Melbourne) where the sun shines nearly all the time !
Terry

Cheers to you Terry from the city (Belfast) where it RAINS nearly all the time !

de G0BNJ
After a year on HF with a KW2000E, the 102 was a great step forward. It does not as yet suffer from any of the problems found by other users...however the PA does not like continuous long transmissions on 10FM over 10 watts. Mills creep up , but told this is normal. I have replaced the PA and driver valves as the original (?) GE valves were down 20% on power. Obtained replacements from G3LSD, very reasonable. To sum up, the rig does all I require without any frills. Thanks again for the Newsheet, very , very interesting.
73 Bernard

Glad you like the rig, Bernard, it has a FEW frills though surely, and USEFUL ones too ? IF shift ? APF ? AGC hold ? Monitor ? Some of us think that in the FT102, Yaesu got the mix just about right ! Thanks for putting us in touch with G3LSD....a very nice gent and a very useful source for those matched triples.

de G3FCT
I had always coveted the 102 since its inception, and was eventually able to afford one on sale secondhand at a local rally. Imagine my disappointment when it did not operate...a phone call to the vendor (a London dealer) brought the advice " You gotta wire loose there mate ! Take the top orf anava poke arahn ." Investigation showed that the VFO was not working ....when the assembly was removed it was found that one end of the VFO coil had never been soldered to the variable capacitor. This done the rig worked well with only the following small details:

1. A faint heterodyne on all bands at all settings of the VFO.

2. The Noise Limiter doesn't work (I have used a 101ZD and a TS820 and a couple of Icom rigs and the NL didn't work on them either. I assumed this was normal for the 102.

The rig worked well for some time and then suddenly developed another fault: A Zener dide and transistor went down on Rect B board. I must give credit to SMC..I had replacements the next day and the rig working an hour after that.

Since then another fault has developed...random drift - several Kcs in as many seconds,can be high or low..it is drift, not a jump and only occurs occasionally...any answers to this?

I purchased the XF8.2HC CW filter, but when I fitted this there was absolutely no output from the Receiver WITH THE FILTER SWITCHED IN. I have checked the voltages on the switching diodes and they seem to be working correctly. I had to reconnect the shorting links as the indication is that the filter is U.S. Another disappointment....any help would be appreciated.

Lots of luck and 73,
Stan

Reckon you got a wire loose inside that filter, Stan. Why not " take the can orf anava poke arahn" , or better still, send for a Fox-Tango filter from N4ML? His U.S. filters really work !

de G6MZB
do not use the FT102 on the HF bands yet, only for transverting to 2 metres. I have an RF relay problem....it does attenuate the incoming signal quite a bit, press the RF amp button a few times and the fault disappears. I have cleaned the relays and it cleared but is beginning to return. If anyone has any info on changing the relays and type I will be pleased to hear from them.

Best 73,Cecil

Me too Cecil, We have heard more moans about those 102 relays but we never received from ANYONE a blow by blow account of how to change them. Somebody out there must have done it ! Please tell.

de G4CVZ
I've had the 102 line-up (FT,FC,FV) since 1983 and ONLY problem was the relays. I'm still using the original bottles and I tend to operate in 24-hour contests!
Our local Club has a 102 also since 1983 and its only 'problem' was a change of valves once.
Thanks for your efforts, Al

de G4TAW
I find "User" most interesting and informative. I hope to run my 102 on Amtor as I also have BBC micro, though I have moved on from Wordwise to Interword for wordprocessing.

Best 73s, Nick

Hope to try Interword on the Archimedes shortly, Nick. For all those who queried the G4WSQ mods for Amtor here they are again:

AF UNIT (PB2344A) remove C38,C44,C46,C62,C96
RF UNIT (PB2342A) remove C92
IF UNIT (PB2343A) remove C58,C83. Change C59 to 1uF
LOCAL UNIT(PB2345)remove C153
RELAY UNIT(PB23450remove C4
MAIN CHASSIS remove C139 (on PTT line),C8 (behind Mic Socket). Cut wire at Pin 1 (J15) to Pin 4 (J16).
NOTE: ON AF board C44 is removed if only Amtor is to be used. If other modes are to be used, make C44=2.2uF.
Final changeover times : TX to RX =12 ms ; RX to TX = 14 ms.

de G4FLK
Blew two loading capacitors through not using an ATU on 1.8 and 3.5 MHz. High SWR..RF feedback..self-inflicted..Hi ! Noise blanker not very effective and find the RX generally noisy compared to my old HRO, AR88 etc. IF shift good for eliminating QRM (almost). In expert and experienced hands, a good workhorse ! Still using original PA bottles and no sign of deterioration yet.

Yours, Bert (Age 82, ex-M/M, ex-RAF 1923 - 1965)

de N4ML
Have gotten some great reports re new "MESH DIODES". Effects on FT980 are mentioned as especially good. Chas KY0DA says Mesh Diodes offer vast improvement in most rigs....the conversion is ideal for any receivers that use 1N60 diodes in the mixers (Finding the mixers is the 'roughest part of this conversion').Bill VY1CW replaced the four original diodes in his FT101 with the new "passivated" Schottky diodes from Hewlett-Packard with results that he described as "amazing to say the least".N4ML suggests that although the "passivated" diodes are a great improvement over the point-contact ones normally found in equipment, the new "mesh" type are notably superior again. The type to look for are H-P 5082-2900, not readily available but can be got from the Fox-Tango Corp @ $4 each plus $5 DX ($3 US) postage per consignment.

More details available from GI4PCQ if required.

Volume 2
March
1989

FT 102
User Group
UK & DX

Issue 1
Bristol

G4VBU 10 Brinmead Walk, Withywood, Bristol BS13 8SF England

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*** HELLO FROM G4VBU ***

As you all are aware Sean's commitments are now such that he had asked for someone to take over this newsletter. So it gives me great pleasure in thanking Sean for all his hard and dedicated work in the production of past newsletters. I hope that my new roll as Editor will keep the ball rolling in the right direction ! It is my intention to provide 6 issue's per year. At this time of writting, however, we do not have the funds to cover the cost of production, so if you would like this news letter to continue then please send in your contributions. We have set our rate of membership fees for 1989 as follows:-

U.K. & Eire £3.50 : G, GW, GM, GD, GJ, GU, GI and EI

D.X. & Europe £4.50 :

*** 7.065 SUNDAY NET ***

Don't stay in bed lads ! ... the net needs you ! ... so give us a call for the very latest info on Mods, Faults, Reports, (and only if to find out that G4VBU's out of bed) ! ... On 7.065 MHz up or down a bit (QRM) ! Time at 1100 Gmt ! ... On a radio near you ! (FT102)

*** A.G.C or G3EWF IQ TEST ***

One evening not so long ago the phone rang ! ... Hello Jim its Andy G3EWF, got bit of a problem with the rig old boy ! ... well I turned the rig on early this morning, the sound was very distorted, also I can't turn down the volume, he explained. O.K Andy I said, will be round your QTH in about half an hour. I jumped into my Plastic Pig (Reliant Robin) and off I jolly well went. I always like poping over to Andy's QTH because ... Hi Jim, like a coffee old boy ? have a cigar said Andy (Andy is a bit of a diplomat when the Rig Doctor calls) ! ... Andy switched on the 102 ... Yes the sound was distorted, I turned down the Volume, funny still got sound ! ... I looked hard at the rig ! ... Ah um er ! ... I think, better switch the A.G.C. back on ... Andy muttered *** Pillock *** quietly !

*** HELP LINE ***

For technical information you can telephone Jim at Bristol (0272) 781265. The best time to phone will be between 2130 - 2230 (Week-Days) or 0930 - 1130 (Saturdays).

*** BRAIN DAMAGE *** From Don G3JIE

Having suffered the problems of runaway P.A. current on my FT102 and subsequently replacing all 3 P.A. Finals, I looked at various publications and decided that secondary grid emission must be a prime suspect. R.C.A. also state that the screen and control grid supplies should be of a low impedance. Schematics for the FT102 seemed to indicate that these supplies were not particulary of a low impedance.

Being a good practical amateur able to build, adapt or use parts of published circuits to my own advantage is all very well and good, but this problem needed some design ability. This put me pritty well down in the class !

At this stage I had to rest and try to regain my confidence which was sagging due to my inability to get around the design impass. But like most good bed time stories this had what I thought was to be a good ending. It came in the form of FT102 User Issue 3 1988, page 2, Modification details to cure thermal runaway by Peter G3RZP. This looked to be well within my capabilities.

As allways when attempting to do any mods, I take all covers off to see exactly what is involved and also what size components can be accomadated, because the junk box will be the first port of call for parts.

My feeling of well being and thought of one evenings work being sufficient to complete the task soon came to an abrupt end !

Item 1 in the said article "cut Brown wire on P.A. P.C.B. ", this I took to be board PB 2355. Problem was PB 2355 had no Brown wire going to it, also no pads marked "28M".

Item 2 says "cut Blue/White striped wire going to pad marked 160 V". Problem was PB 2355 had no Blue/White wire going to it and again no pads marked 160 V.

Item 3 says "short diode D02 on P.A. P.C.B." !!! Yes you guessed it, no prizes given. Big mug of tea called for, leave shack for 24 hours so head can clear.

(Next Page O.M.) >>>

Questions ...

(a) Was Issue 3 printed on April 1st ? : Did'nt think so !

(b) Is the editor a sadist ? : Don't think so, he seem so nice on the nets !

(c) Had Peter got it all wrong ? : Very unlikely !

(d) Had I misunderstood ?

Number 1 Son read it and said that he understood the article the same way as me (his call G1KYV). Many mugs of tea later, I had collected my self together (a Man of many parts !) and decided to go back to basics, like checking photos in the FT102 manual.

Page 38 shows a bottom view of the FT102 and clearly indicates PB 2355 (P.A. Board). Two differences between my rig and the photo were noted:-

(1) Wires coming into bottom L.H. section of board in the photo in fact on my rig come to the top centre of the board.

(2) Two large holes in the chassis just visible below top R.H. side of PB 2355 on photo, were totaly obscured by the board on my rig.

Checking closely I found that my final board is numbered PB 2355 and also I have an additional board bolted along the top edge of my PB 2355, (this is the board which covers the 2 large holes on photo). This extra board is marked PB 2356A. I had not previously looked for any other numbers, assuming that PB 2355 was for all the P.A. boards.

A very close check of the manual and all schematics failed to reveal any mention of PB 2356A, also I could not find diode D02 any where in the screen circuit of the P.A. on my schematic. Likewise no 160 V available from any power supply according to my schematics.

At this point a just perceptable change in my luck took place, parts list showed a Relay Unit 2 with PB 2356A as the P.C.B. It also listed the elusive D02 as D9902 a 10D10 diode. So at last I know where the Relay, diode ect. that Peter mentions are situated, but still do not have a schematic for them, neither are any pads marked.

(Next Page O.M.) >>>

My next step is to trace out all the wiring for the additional board, make my own diagram, then try and relate to the information that Peter provided. That should put me back to square one i.e. looking at the FT102 to weigh up exactly what needs doing. My one evening of estimated time has up to now become 2 plus a 4 hour Saturday afternoon and still no mod done.

73's Don (G3JIE)

Answers ...

On page 55 of the Instruction Manual (Ref: RECT A PB 2349A) the AC 190 V. via D02/D03 provide the screen voltage of 210 V. and 180 V. which is then fed to the P.A. screen Relay on PB 2355. Note that it has been marked up on the P.C.B. as 160 V and 210 V when it is in fact 180 V. On the main diagram RECT A Unit is marked up as PB 2352 and the 210 V is fed to the 6146B's via L01 as screen volts. Also the main diagram shows that the 180 V is fed directly to the 12BY7A screen grid. .... Ye Gods !!! Whats that Bleeding Relay doing !!!

Will Jim fix it ? Is there life after Yaesu ? Did it rain last year ? ... Next Issue all will be revealed.

73's Jim (G4VBU)

*** K'NOBS ***

Most of us have at some time or another, had the problem of a loose Mode switch. The nut under the knob works loose (sounds fun). So how do I get the knobs off... good point !

(1) Pull the rig forward, so that it's edge is level with the front of your work bench.

(2) Take a large flat bladed screw-driver, turn Mode switch to the Tune position, fit blade of screw-driver (flat end !!) under the plastic bottom part of the knob, hold the rig with one hand and push blunt end of screw-driver against work bench.

(3) The Meter Select, Band switch, AF/RF, Clar/Tone, Notch/APF, Shift/Width and Drive pull off. Do not try to pull off the Loading, Plate or the Preselect knobs as the plastic couplers will snap ! To get off you must undo the grub screws inside the rig and pull out each shaft with the knob still attached.

(Next Page O.M.) >>>

(4) The Tuning Knob can be removed by firstly pulling off the rubber jacket and the insertion of an allen key into the slot revealed, undoing the grub screw.

*** FILTER TIPS (Cough!) ***

Having got your grubby mitts on one of those all singing and dancing SSB/CW Filters, you fit it and your not very well pleased with the results. When our Mr. Yaesu made that nice FT102 for you it was given the very best I.F. alignment possible with very sophisticated test equipment. To compete with his many competitors, he provides an option for the installation of narrow CW and SSB Filters. To fit them as a standard part at the manufactory stage, would put up the cost of each rig he makes by many £££'s. (Yen: Dong: Ding: Dollops ect.)

The installation of an 8-pole crystal filter is in it self an art, that requires the correct impedance and alignment to it's own centre frequency. In most instances the centre frequency is not the same as the standard filter fitted. That is why after installation of a narrow filter, realignment of the I.F. stage must be made.

Alignment can be made very easily because that very nice Mr. Yaesu has given you a very good signal generator the frequency marker. The I.F. alignment procedure is as follows:-

(1) Turn on rig and let it warm up for about 40 minutes. Take off top case, fit speaker, fit dummy load to rig or A.T.U., turn on marker switch (back of rig), set band switch to 14 Mhz and tune dial for 14.250 MHz.

(2) Set Shift and width to centre, A.P.F. and Notch out (off), A.G.C. on, A.G.C out (fast), N.B. out (off) and NAR out (off).

(3a) Standard filter : Turn Mode switch to Tune, turn main dial for a reading of about S5 on signal meter, turn back R.F. gain just to the point where the S meter just starts to rise and adjust for Max reading on S meter T1030, T1029 on R.F. Unit (Page 44), T2001, T2002, T2003 on I.F. board (Page 45) and T2008 also on I.F. board.

(3b) SSB narrow filter XF8.2.HSN : Turn Mode switch to USB, Press on Narrow switch e.g NAR in (on), turn main dial for the point where the S meter reading is about S5 and R.F. gain as in (3a) and adjust for Max reading on S meter T2004, T2005, T2018 and T2006 on I.F. board (Page 45) then turn Mode switch to LSB and adjust T2003 for Max S meter reading.

(Next Page O.M.) >>>

(3c) CW (600 Hz) filter XF8.2HC : As for (3b) but turn Mode to CW only.

(3d) CW (300 Hz) filter XF8.2HCN : As for (3b) but turn Mode to CW only.

(3e) CW (500 or 270 Hz) filters XF455C or XF455CN : Turn Mode switch to CW NAR, set S meter and R.F gain as in (3a) and adjust T2008, T2006 for Max S meter reading. (Page 45)

NOTE Page 44/45 is in the FT102 Instruction Manual : Trimming tools for ALL I.F. Transformers MUST be with a phosphor bronze blade at each end designed to fit 4mm and 6mm cores (e.g. Maplin part BR51F).

NOTE I work about 50% of my time on CW and 50% on SSB. I have found that although I have narrow CW and narrow SSB filters fitted to my rig, I have aligned it as for (3a),(3b) and (3e) because I have on more than one occasion, particularly on 40 Mtr Nets wanted that extra sharp filtering that the narrow SSB gives. (3c) and (3d) are a MUST for the 100% CW boys, but it's up to you ...

Jim G4VBU

*** T.V.I and R.F.I ***

Each issue, I will be giving info on T.V.I, so lets kick off with this one. B.T. New Type Telephones (Short Wave Radio Receivers) a better name for them . In Bristol don't phone B.T. as the only thing B.T. Bristol will do for you is Bill you for your phone call !!!

Take a 2 inch ferrite ring, unplug B.T. Telephone, at about 1 FT. from Unit (the bit with the buttons on ! not the Handset) and form a coil by winding the lead (close wound) 3/4 ways round the ring.

*** FAULTS ***

It is my intention to start a catalogue of faults and cures on the FT102, FC102, FV102 and SP102 using an index system. Each fault will be given a reference code. The first letter will be T (FT102), C (FC102), V (FV102) and S (SP102). The first number is the Volume number, the second number will be the Issue number of the news-letter where info is contained.

Example:- T21001

FT102 fault : Look at Volume 2 in Issue 1 (T21)

(Next Page O.M.) >>>

IDENT:	FAULT:	REMEDY:
T21001	RX drift when clarifier fuction is on.	Change Relay RL01 on Local Unit: Fit Maplin Part YX94C 12 Volt.
T21002	ALC reading on meter is intermittent mainly on 10 Mtrs.	Check and tighten up fixing screws on RF board.
T21003	Intemittent Bias Current reading (SSB no Mod)	Clean VR01 (Bias Pot) on RECT A Board with switch cleaner and then reset bias (75 mA).
T21004	No Tune up Volts and no Bias current reading on meter (No TX).	Check HT Volts on P.A. (850 V - 900 V) and if No Volts Change HT fuse. If P.A. Volts ok then Check Screen Volts on 6146B's (aprox 210 V) Goto T21005
T21005	No tune up Volts, no Bias current reading on meter (No TX) and no Screen Volts 6146B's	Check R04 on RECT A board for open circuit 470 R 2 watt: Fit Maplin 3 watt wirewound resistor Part W470R WW.
C21001	Can't get A.T.U to Tune down (G5RV type aerials) on 10 Mtrs.	Inside A.T.U. look for the large self supporting coil (back part of A.T.U.) and stretch out or squeeze in coil (not during key up !) to get S.W.R in range on that Band.

*** NEXT ISSUE ***

R.F. Relay Faults: I can not recommend that any Relay in the FT 102 is cleaned with switch cleaner. The only cure is to change the 5 Relays on the R.F. Board. The only one's that I can recommend are obtained via Maplin a fully enclosed type of relay. The 12 volt Part Number is YX94C (2 required), the 24 Volt Part Number is FM92A (again 2 are required) and the 12 Volt DPDT Part YX95D (1 required). In the next issue I will be giving a run down on fitting these types of Relays.

(Last Page O.M.) >>>

73's Jim G4VBU

Referring to T21005 : Over the last 2 years I have had a number of FT 102's in for repair with no TX faults. In every case when the fault has been no screen volts the P.A. valves have been Sylvania types fitted and R04 on RECT A board has been found to be open circuit.

Recently I fitted 3 Sylvania 6146B's (Yes Sylvania ECG) in my FT102. As a precauction I checked my R04 on the RECT A Board and yes the resistor was hot ! The 2 watt rating should be fine for the screen current required so I thought, was it parasitic oscillation ? Putting the wave meter by R04 on TX yes lots of LF oscillations . Fitting the R.C.A. valves back in and much better ! Changing R04 to a 3 watt WW type and fitting Silvania valves back in, the LF oscillations were very much reduced. I have set up the bias for 75 mA and adjusted the Final Amplifier Neutralization. Tuning up on 10 Mtrs for 300 mA. for aprox 150 Watts P.E.P. and TXing at 230 mA SSB with nice 20 minute overs, no sign of that dreaded thermal runaway.

73's Jim G4VBU

*** WANTED ***

FV102DM in good condition: Trevor G0CEM (0272) 642867

*** ADVERTS ***

6146B's GE match set of 3's £33.00 + £1.25 pp : 12BY7A £4.00 + £1.00 pp
A special price to FT 102 User's members from G3LSD (Lt. Cd. E. Diggle), Netherton Cottage, The Elms, Stoke Damerel, Plymouth, PL3 4BR.

Will swap FT102 MK6 for one exactly the same: POINTLESS SWAPS Ltd. Bristol.

Volume 2
July
1989

FT 102
User Group
UK & DX

Issue 2
Bristol

G4VBU 10 Brinmead Walk, Withywood, Bristol BS13 8SF England

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*** HELLO FROM G4VBU ***

I hope that you all enjoyed our Issue 1 and my thanks to all for your many comments. The quality of the photo-copying was not as good as I had wanted as about 20% of the copy was of a very poor standard.

My thanks to Andy (G3EWF) and to Don (G3JIE) for their input to the mag. Keep sending in the letters lads ...

*** SUNDAY NET ***

Our Sunday Nets on 7.065 MHz are getting a better response from our members now with very good input. The Net frequency of 7.065 MHz however is possibly about the worse choice that we could of made.

We are going to change the frequency from 9th July 1989 to 7.082 MHz ± QRM .

*** FINANCE ***

Some members outside the U.K. have sent in their membership fees in their National Currency. The problem is that the Bank will make a charge of £1 to exchange for Sterling. So for example if you were to send me $10 Australian I will get £3.52 in Sterling for it and a £5 Eira will give £3.07. Please send Bank Drafts in Sterling.

The cost of photo-copying the news-letter worked out at 48 pence per copy. I am at present looking for a better price.

Listed below is an example of cost for 4 Issues:-

	U.K.		OUTSIDE U.K.	
News-letter	4 x 48p	= £ 1.92	4 x 48p	= £ 1.92
Envelopes	4 x 13.5p	= £ 0.54	4 x 13.5p	= £ 0.54
Postage	4 x 19p	= £ 0.76	4 x 26p	= £ 1.04
W.P. costs	1 x 35p	= £ 0.35	1 x 35p	= £ 0.35
Total		£ 3.57		£ 3.85

Unless I can find a better price for photo-copying then there is no way that I can produce 6 Issues per year. Any suggestions ?

*** HELP LINE ***

For technical information you can telephone Jim at Bristol (0272) 781265. The best time to phone will be between 2130 - 2230 (Week-Days) or 0930 - 1130 (Saturdays).

*** NEW TYPE RELAYS ***

One of the main problems with the FT 102 is intermittent receive, due to faulty relays on the R.F. Board. There has been many suggestions of treatment such as 'sell it quick !' or 'hit it with a sledge hammer'.

The symptoms are when working that nice D.X. station, his 5/9 + signal drops down to a 4/0 and blipping the 'Mox' button his signal jumps back up to 5/9+. Some times pressing the 'R.F. Amp' button will recover it. Some users will keep pressing the 'Mox' button in and out many times before they QSO this will some times help.

Cleaning the relays with switch cleaner at best will provide a short term solution, but most likely will do more damage to the relays.

Fitting the 'official S.M.C. Relays' will provide a short term cure of about 1 or 2 years. I know that some users are on their 3rd set of relays. So what is the problem with these relays ?

1. The plastic cover on the relay is not an air-tight seal, so dust can get onto the contacts.

2. The mechanical construction is of a very poor quality, the leaf spring is very flimsy and the contacts are not silver coated.

3. The under seal on some relays have small gaps around the pins, so when soldered in, flux runs up the pin onto the contacts.

All in all it is not surprising that we have trouble with them. The only solution is to fit a better type. I recommend that all 5 relays on the R.F. Board are replaced with the 'Maplins type' for price details please refer to 'ADS back page'. Of the five replacements, 3 will fit in with no problems, one will require a wire link to be fitted and one (12 V D.P.D.T.) will require some small P.C.B. work.

This work requires the removal of the R.F. Board and a competent engineer to carry out the surgery, 3 hours of uninterrupted time, many cups of tea and a swear box !

Parts: (From Maplins)

12 V. YX94C 2 required

12 V. YX95D 1 required

24 V. FM92A 2 required

(Next Page O.M.) >>>

*** PRE-OP ***

Disconnect mains supply and any other leads to your Rig. If Rig has been powered up over last hour or so, do not take off covers for at least 1 hour (H.T. Caps. will be charged up to 900 V. d.c) !

1. Take off the top and bottom covers of Rig. Unplug 12BY7A.

1.1 Set Band Switch to '10 MHz' position.

1.2 Turn 'Load' fully anticlockwise, unscrew grub screws and pull off knob with shaft attached.

1.3 Turn 'Plate' to 9 O'Clock position, unscrew grub screws and pull out shaft and take off cupplers.

1.4 Turn 'Pre-select' fully anticlockwise, unscrew grub screws and pull off knob with shaft attached.

1.5 Unplug all plugs on R.F. P.C.B., * CUT & MARK * white wire at front R.H. side of P.C.B.

1.6 * CUT & MARK * White wire and Brown wire at R.H. end of P.A. (2 pins out of P.A. case).

1.7 * CUT & MARK * Orange wire, Red/White wire and Yellow wire at back part of R.F. Board. Cut Orange wire off at top of resistor end. (Pins are on P.C.B.)

1.8 The Band Switch shaft is connected from the front selector, through the R.F. Wafers to the Band Change Switch in the P.A. box. It is very important that the Band Switch is set in the '10 MHz' position. On the outside of the P.A. box, you will see the P.A. Switch shaft Nut that retains the P.A. Switch. This Nut must be unscrewed (not all the way !) as to enable you to push in the P.A. Switch slightly for clearence. Then holding the Band Switch Knob unscrew the grub screws on the front shaft cuppler and then the back cuppler.

1.9 Turn the Rig on its side and unscrew A.F. Board and its screen plate (to get to solder side of R.F. Board). On the solder side of the P.A. end (R.F. Board) *CUT & MARK White wire and unsolder Earth brade. Turn Rig back so that it is in its normal position and unsolder Earth brade on Switch screen plate, unscrew Black screen wire (P.A. end) and unscrew R.F. Board fixing screws.

* The term 'CUT & MARK' is to cut wire about 1/8th inch away from the pin so as to leave a small amount of the coloured wire still in connection with the pin. This technique will enable you to easily identify your reconnections later.

(Next Page O.M.) >>>

1.10 Now the hard bit ! lift the R.F. Board up slightly and with care push Board towards the P.A. Band Switch and release back shaft cuppler and then release the front cuppler. Lift out R.F. Board and wipe sweat off forehead, pay swear box and have cup of tea !

1.11 If you did not unscrew the nut on the P.A. Band Switch, now is the time to order your new P.A. Band switch ! and pay swear box !

*** SURGERY ***

2.0 Lay your R.F. Board on clean work-bench, unscrew the 2 cross point screws at front section of wafer to release bakelite strip and release circlip on shaft. Locate RL05 24 V. Relay, unsolder and fit new part (FM92A). Locate RL04 24 V. Relay, unsolder and fit (FM92A). Locate RL03 12 V. Relay, unsolder and fit (FM94C).

2.1 Locate RL01, unsolder and fit new part (FM94C) and note new type Relay has not got dummy pin in same position so will require a wire link jumper to be fitted.

2.2 Locate RL02 and unsolder. Note the new (YX95D) Relay is not of the same pinning. Refer to Notes a to c and Figure 1 below and make the following mods to the P.C.B.

a) The Relay coil pins are located in a different position so drill two 1.5 mill holes into the P.C.B. at positons x on diagram (Figure 1).

b) The N.C. contacts on the old relay are the N.O. contacts on the new Relay and so you will have to cut P.C.B. tracks and make links as shown on diagram (Figure 1) and then fit new Relay.

c) Check all connections to diagram (Figure 1).

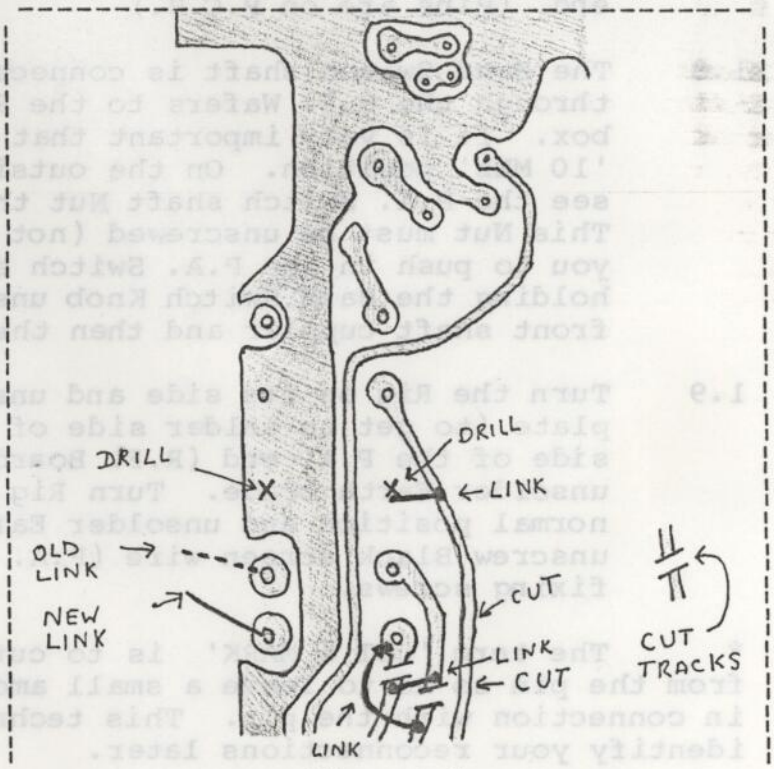

Figure 1

(Next Page O.M.) >>>

*** RECOVERY ***

3.0 Refit bakelite strip and circlip. Check P.C.B. for any dry solder joints or shorts.

3.1 Refit Band Switch cupplers to shaft and slide on black plastic fittings (hold in place with tape). Do not yet screw up grub screw on back cuppler to P.A. Switch or change position of Band Switch Knob.

3.2 Reloate R.F. board and slot in cupplers (not easy !).

3.3 Refit P.C.B. Screws, Plugs, Earth Staps, White wire and Brown wire on P.A. case, White wire at front of P.C.B. and Yellow wire, Red/White and Orange to tags P.C.B. and tighten up P.A. Switch nut. Refit White and Screen lead to underside of R.F. board and refit Screening plate and A.F. board.

3.4 Take off P.A. cover and P.A. side cover and take out 6146B by the P.A. Band switch.

3.5 Looking at the back of the P.A. Band Switch you will see a support plate running from the top of the last wafer to the bottom. On the L.H. side of the plate are 6 connections from the P.A. wafer to the P.A. Tank coil. From top left (11 O'Clock) to bottom L.H. side (7 O'Clock) the Band positions are 10, 14, 18, 21, 24.5 and 28 MHz. With the Band Change switch in the 10 MHz position check that the P.A. Tank coil wafer wiper is located at (11 O'Clock) and if ok then screw up P.A. cuppler grub screw.

3.6 With all the Band Switch grub screws tight, turn band Switch Knob from 10 MHz to 28 MHz and check that the P.A. Band Switch wiper is locating in each position corectly. If not so the unscrew P.A. cuppler grub screw and apply light force to the left or the right side of Band Change Switch Knob, tighten up P.A. cuppler grub screw and recheck.

3.7 Refit 6146B, P.A. side cover and refit 12BY7A.

3.8 Refit 'Load' Knob, shaft and shaft cuppler to load cap. shaft.

3.9 Refit 'Plate' shaft and cuppler's to plate cap. shaft.

3.10 Refit 'Pre-select' shaft and Knob.

3.11 Refit P.A. cover, top and bottom covers.

The swear box will now contain many coins of you local currency sufficient for several pints of beer.

(Next Page O.M.) >>>

FROM GI4PCQ

Hi Jim and all the 102 Users.
Congrats on Vol 2, issue 1. It is great that so many of our original members have re-registered for volume 2 of the newsletter. I have retained all the original membership numbers as well as adding new ones for brand new members, so we have upwards of 170 users listed, of which over 100 are taking vol.2.

THE NET
40 meters on Sunday mornings has been quite busy (11.00 British local time around 7.065). There have been the usual problems with QRM and a move up the band is under consideration. Nice to hear Hans PA3CNY again when skip permitted - Hans was one of our early members (38). Speaking of early members, Jamie EI3FZ (No.2) has gone solid-state with a Kenwood 440 line-up and his good friend, ex-Kerryman Mike G0JVX (155) threatens to do the same !

ATU OVERHAUL
I recently had the experience of losing a segment of the bandswitch on my FC102. There was a small crackle during TX and then the switch wouldn't rotate properly afterwards. Inspection showed some of the contacts on the rearmost wafer had melted - this was with 100 watts !

It is not possible to get a wafer on its own and in the end a complete new switch had to be obtained from Japan. At almost £50 I felt slightly ripped off! Putting it in was also not much fun. I had hoped to just replace the faulty ceramic wafer but the old one shattered when I tried to prise it off, so I didn't want to try that on the new one. I began the painstaking job of de-soldering all the contacts on the old switch and removing it...practically all the innards had to come out of the ATU to achieve this. I made drawings of all the connections beforehand to be safe. It is interesting how Yaesu achieved the (supposedly) high power rating of this unit by twinning together the contacts on the back and front of each wafer.

I had to replace a bulb in the SWR meter at the same time and this proved straightforward...the meter assembly comes away easily with a few screws and the glass is actually held on to the meter with a layer of black tape. The bulb (obtained from SMC) was easy to solder in position.

After unscrewing the Antenna sockets at the rear a few times I managed to break the PCB connection to the SWR sensor/relay board..watch this: the antenna sockets are soldered straight in to the board - it is easy to unseat them.

ATU POWER READINGS
My ATU's power meter, on the PEP setting, shows upwards of 200 watts on 40M and 150ish on 20m and 15m..I am suspicious of this, can any other user confirm such readings ?

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ALC READINGS

A recent stateside contact, W3BYI (he had TWO 102s) complained that one of his rigs wouldn't move the ALC meter on TX, but only on 20m SSB! It starts off OK but drops away after 30 mins use (driver tube failing?). It is otherwise perfect on all other bands...is the ALC circuitry bandswitched? I don't think so. The driver is, isn't it? I reminded him that if you QSY far away from the original tune-up frequency, the PRESELECTOR needs to be re-peaked, otherwise you'll certainly lose some drive and ALC won't move. Anyway I promised to get help....experts please contact W3BYI, Mr G. Thompson, at 4012 Walrad St. Baltimore, Md. 21229 USA, or else advise me via the NET or via Packet @ GB7TED-2.

CORRECTING CW CHIRP

I found a report (in an old QST mag) from Carl AA4MI, of a cure for CW chirp when using the VOX semi-break-in facility on the FT102. As the VOX circuit keys the rig, a rising tone chirp is heard. This fault was apparently common on early models and the suggested cure is to remove C153, a 3.3uF capacitor which charges when the VOX circuit is keyed. The location is the LOCAL board 2345, accessible from the bottom cover ...simply cut one lead...it is a tubular capacitor standing on end. In newer rigs the component has been left out.

FAULTY GE VALVES

Harry Leeming G3LLL of Holdings Electronics, Blackburn has been a useful source of matched triple 6146B final tubes for our group. Until recently these were always American GE brand, which worked well in the 102. Harry now advises that his last batch of GE 6146 valves were down on power out and he had to send them all back. He tested pairs in a 101ZD against alternatives and found that the heater volts had to be increased up to 7.5V to get even 70 Watts out from the new valves!

6-year-old used GEs and 3-year-old unused National 6146Bs gave this with normal 6.3V heater supply. A pair of 10-year-old unused RCA tubes gave 80 Watts under normal conditions. The results from the new batch were very variable (full test data forwarded to Jim). The best pair gave 55W at 6.3V, so be warned !

Harry is now offering SYLVANIA as alternatives, but they are more expensive...please see his ads. There was some concern in the past about the SYLVANIAs in the 102 causing thermal runaway. Please let us know if you have tried these with success.

PROTECTING YOUR RF AMP

A recent bout of electrical storms has reminded me how easy it is to lose the FET in the RF amp of your receiver's front-end as a result of transients arising from nearby strikes. In the past we have suggested switching the RF amp out when the rig is not in use. However it now occurs that, because it is relay-switched, it may come back in when power is removed from the rig...or does it? Perhaps the RF amp is normally out and only comes in when the rig is powered up. Can anyone

(Next Page O.M.) >>>

confirm which? (Relays only switched in with power on Rig ! Ed.) Anyway the safest bet is to disconnect the antenna from the rig and ground it and the antenna socket if storms are about..a heavy duty coaxial switch can be used for this. That should protect your pre-amp against everything except a direct hit, in which case you won't be needing it anyway!

10 METER POWER LEVELS

Some confusion has arisen (judging from NET discussion) regarding the level of Plate current to run on 10 meters. The manual doesn't say that you CAN'T TUNE UP for the usual 300 mA Ic, but it definitely advises limiting drive on FM and CW to 200 mA during TX - this will give you only about 40W. Some of us have found that SSB working at higher drive levels can cause the standing current to creep up alarmingly...especially if you are long-winded like me!

I have written to Yaesu for their comments. G4VBU has suggested (last issue) that R04 may be the answer to all our thermal runaway worries. We shall see...meanwhile watch that Ic on 10M....it's going to be an interesting band for the new few years!

That's all for now,
Best 73s , Sean GI4PCQ (102 User Group Co-Ordinator)

*** NEXT ISSUE ***

In our next issue we will continue with the faults list and T.V.I. info. Our feature item will be on improvements to the product detector and I.F. stages. Some items were held over this time as Sean's letter was included in this issue. I am sure that you all agree that it is very informative so many thanks Sean from all users.

*** BITS & BOBS ***

One of the problems with me working in a Hospital is that my work hours can change from week to week. For the most part however I work from 1PM to 9PM Mondays to Fridays and on (week 1) a Saturday from 1PM to 9PM and on (week 2) a Sunday from 9AM to 9PM. So for most times I will be on the Net every other Sunday. I will hold a mid-week Net on our Net frequency at 1000 GMT Wednesday and a Saturday Net at 1000 GMT. Dx stations will find me (G4VBU) most nights at 2030 GMT. working on 21.380 MHz with Trevor (G0CEM) beaming U.S.A.

Our Spanish Users would like this news letter published in Spanish that is not possible but is there anyone who can speak the lingo? We are looking for someone to translate our news letter on cassette tape, any offers please?

Best 73s , Jim G4VBU (102 User Group Editor)

(Last Page O.M.) >>>

FT102

VOLUME 2
ISSUE 3
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FT102
USER GROUP
UK & DX
BRISTOL

USER

G4VBU 10 Brinmead Walk Withywood Bristol BS13 8SF England

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HELLO FROM G4VBU

Hello again and yes, your Newsletter has arrived at last ! Well what happened ? Over the last couple of months I have been slaving away on verious sick FT102s in for surgery. The good thing though is that our faults and cure list has many new additions. Back in late September Jim's Plastic Pig Tours was in action again running Jerry 'W1IDP' all over the U.K. I clocked up 1765 miles during Jerry's visit and even Jerry managed to pick up a very sick FT102 for me to fix when he was staying in good old Cornwall. The Plastic Pig (Reliant Robin) performed marvellously but I never want to see Manchester ever again. At 0130 the M66, M67, M6, M5 and M102 was the best maze I have ever driven on. I saw Liverpool 3 times that night. I must learn Brummy Yono wotimeean Arrie !

NEW MEMBERS

We are still getting new members to our user group, I am sorry for the delay in sending out back issues. If any member has not yet received volume 2 issue 1 and/or issue 2 then please telephone me on Bristol (0272) 781265 between 2130 and 2230.isted below are new members since our last issue:-

G0CEM	Trevor	(Bristol)
G0EOU	Brian	(Bristol)
G0JZF	Nick	(Bristol)
G3HDD	Gordon	(Dorset)
G3BEQ	Derek	(Norbury)
G6STX	Stan	(Marlow)
G0JSO	Rob	(Warrington)
W3BYI	George	(USA)
KB9MZ	Art	(USA)
VK3VF	Bruce	(Australia)
VK1AU	Col	(Australia)
VE3FXX/3	Ron	(Canada)

MODS and CONS

.....And it came to pass that in the land of Briftol there was much gnashing of teeth. Ye olde FT102 was finding it hard going on a very noisy 14 Mhz QSO with O'LORs aboveth and beloweth ! ..... The FT102 is, in my opinion, one of the best transceivers that Yaesu have ever produced. However there is one section of the design that has been badly neglected over the years. While mixer design has improved with the advent of hot carrier diodes, the receiver product detector is still using 25 year old technology (gemanium diodes). The product detector in any receiver is one of the most important sections of signal processing. In the FT102 like most modern transcevers the product detector's function is to remove the audio content from the I.F. (455 KHz input) mixed with just the right amount of carrier (455 KHz) so as to decode SSB or CW signals without distortion.

Some time ago Sean GI4PCQ sent me an article that was in QST, that looked at the reason why Drake equipment, that was used in a contest, when compared with a Yaesu FT980, was able to pull in signals that the Yaesu could not separate between strong signals. Having read the article over and over again I decided to investigate the product detector in my FT102. Looking on page 54 (FT102 Manual) on the A.F. Unit circuit diagram you will see the product detector diodes D21, D22, D23 and D24 (1N60 x 4 gemanium diodes), T3002 (4:1 transformer), VR3004 (balance 470R preset pot), and low pass filter C74, R94, R93, C73, note Q18 (2SC1815Y) feeds VR3004 with the 455 Khz carrier and the audio is fed to Q19 (MC14066B) via C72. The MC14066B is a Hex switch and it is used in this circuit to select the audio pass filters for SSB Q22/Q23 and in the CW mode using Q20, Q21 and Q24 (AN6551 APF opamp).

With the exception of the first section of low pass filtering (C74, R94, R93 and C73) Yaesu have made an excellent job in the audio filtering stages. The first section however can be improved by some small changes to component values.

As I am the local FT102 Rig Doctor, I see many Rigs at my QTH and as such I get the chance to compare different makes. The TS430, TS830, and TS930 have all been compared against my FT102 and although I like the extra VFOs on the Kenwoods, my FT102 had the edge on them for pulling in the weak signals with the exception of the 28 Mhz band. I did also notice that when I compared my FT102 against Trevor's (G0CEM), that the back- ground noise on Trevor's Rig was much lower. It was when I later changed my diodes that I found out why that was !

CASE NOTES

The diference between the choice of diodes in the product detector stage are as follows :- (a) Silicon (1N4148 type) : Low priced : Easy to get : Strong signal handling : can't handle low signals .7 volt turn on : Noisy will distort on weak signals.

(b) Gemanium (1N60 type) : Low priced : Easy to get : Good Low signal handling .2 volt turn on : Strong signal handling not so good and not easy to match in bridge configuration : Leaky can let through carrier which can remix giving distortion : Bit noisy.

(c) Passivated Schottky (BAR28 or HP5082 - 2835) : Med priced : BAR28 is easy to get (Maplins) : Good Low Signal handling .3 volt turn on : Good Strong Signal handling : Low 1/f noise : Low distortion : Not easy to match : Very fast switching upto U.H.F.

(d) Unpassivated Schottky (Mesh diode HP5802 - 2900) : Expensive : Very hard to get : These diodes have extremely Low 1/f noise and are ideal for low noise mixing : Very easy to match : Very low distortion. : Can only get them in U.S.A. : Can get them in a bridge package : Very fast switching upto U.H.F.

NOTES: For most of us in the U.K. I can recommend the BAR28 at 48p each but you will need to get at least 6 diodes to match the 4 required. When matching any Schottky diode it is very important that you do not apply the meter tests leads directly to the diode. Always used a 4K7 resistor in series with the positive meter lead and use the OHMS x 1000 range.

For the purist get the HP5802 - 2900 Mesh diodes I would recommend the bridge package. Each single Mesh diode will cost you $5 each. I am still waiting for mine to arrive ! I do not have any knowledge of the price of the bridge package yet, but I am working on it ! I do have the data sheets for all the Hewlett Packard diodes thanks to KB9MZ Art.

SURGERY

1. Disconect all leads to rig, turn rig upside down and unscrew bottom cover. Locate A.F. unit (PB-2344), remove all plugs and unscrew the P.C.B. Refer to page 54 of your Instruction Manual for the circuit diagram.

1.1 Locate and unsolder D21, D22, D23 and D24 and replace with your own choice of schottky diodes. It was at this point of time that I noticed that on my board one of the original diodes had been *fitted the wrong way around* ! The 'K' cathode is marked on each diode with a band as is the P.C.B.

1.2 Locate and unsolder R94 (470R) and replace with a 2K2 resistor.

1.3 Locate and unsolder R93 (5K6) and

replace with a 10K resistor. 1.4 Locate and unsolder C73 (10n) and replace it with a 4n7 capacitor.

1.5 Locate and unsolder C72 (10uF) and replace it with a 4.7uF tantalum capacitor. NOTE the + to TP14 !

1.6 Check your soldering and then replace P.C.B. and refit all plugs. 1.7 Take off top cover of rig and keep speaker leads connected, turn rig onto its side, insert mains lead and Ant and switch on rig, set band to 21MHz and allow to warm up.

1.8 Set mode to SSB, Shift/Width to centre, A.G.C. to fast, Switch on marker and tune in dial for max S meter reading. (Note this reading)

1.9 Looking at the S meter reading now adjust Balance pot (VR3004 on A.F. unit) for the best dip on the S meter.

2.0 Turn off marker and tune into a weak SSB station and locate T2008 on I.F. board and turn it anti-clockwise for a reduction in back-ground noise but making sure that the station signal is not reduced.

2.1 Switch on marker and turn dial for max S meter reading. Adjust VR2003 for the S meter reading noted in 1.8 of this page.

2.2 Refit top and bottom covers. You should now be able to make the following observations :-

(a) Turn volume to 9 O' clock unplug antenna and note how much less back-ground noise you have. Plug in antenna and yes the noise is there but thats Sky noise not internal rig noise !

(b) Tune in to good 20 over 9 SSB signals and go up and down and note that they don't seem to splatter so much now ! (except Italy) (c) The received audio seems much better (except for Italy or U.S.S.R. or G0EOU*) this mod will not get rid of 'OLARS' or Bad modulation. (d) Switch over to 28Mhz and yes your receiver is much more sensitive now. Schottky diodes don't attenuate at higher frequencies !

* Sorry Brian .... I could not resist that one ! (Ed.)

HELPLINE

For technical information you can telephone Jim at Bristol (0272) 781265. The best time to phone will be between 2130 - 2230 (Week-Days) or 0930 - 1130 (Saturdays).

T.V.I and R.F.I

One of the most common problems with T.V.I. is faults within the T.V. receiving equipment. The FT102 is an exceptional transceiver with regard to not putting out unwanted sprogs due to the fact that its P.A. stage is well filtered. It was pleasing to look at the output of my FT102 using a spectrum analyser. I did however note that if you plan to use a transverter connected to the R.F. out socket (P7) then you must use a low pass filter as the output comes from T36 (R.F. board) without any low pass filtering. This low level output is full of harmonics and sprogs and on a spectrum analysor shows that if you were to drive any transverter from this, Boy you would have problems ! So be warned ! With regard to any T.V.I. complaint I would recommend the following procedure:

1. You can hardly expect your neighbour to understand that their T.V. or video equipment is faulty. So telling them that their equipment is 'Crap' will not go down too well!

Use diplomatics, tell them how you had to study hard to get you licence. Take your time to explain about keeping your Log, that your station is open to inspection by the D.T.I. (F.C.C. in the U.S.A).

2. You must put yourself over as some one who will sort it out. Get as much information from them as possible. Take your log book in with you as this will help you to see what band or bands are giving them interference.

3. One of the first things to check is their T.V. coax feeder. Take off the coax plug and look at the screen for any signs of corrosion (copper brade green or black) and if this is the case then water has got into the coax. It will have formed a diode junction down the feeder. Most people neglect this, you often find that the coax feed has been up for many years. Tell them that this is the problem and offer to replace it. At a cost of about `3.50 in the U.K. it is best that you pay for it ! don't expect them to pay it's your hobby that will suffer if you don't sort it out !

4. If the coax looks ok then the next stage is to fit a high pass filter to their T.V. and get an Amateur friend or your wife to look at the T.V. while you make a test transmission. If after fitting the filter the interferance is worse then this usually indecates that the T.V. antenna is at fault. If the dipole of the antenna is one-ended then its feed impedance will be wrong. Your filter will have an input line impedance of 75R any mismatch at the coax will show up as an increase of interference.

5. Until you sort out this problem keep off any band that is giving your neighbour interference. Remember that if you can't be bothered to sort it out, that neighbour may be the one who objects to the planning permission for your 60ft tower !

BURN IN

It is that time again to put in a new set'BOTTLES' (tubes) in your FT102. So what ! it's easy init ! ... is it ? read on O.M.

In the good old days of 'BOTTLES' when you ordered a new set of valves for you transmitter the manufacturer would 'Burn in the valves' in sets before sending them out with a cirtificate listing the 'spec'. Sadly like the Cats whisker 'Burn in' is a thing of the past. So What was the advantage then ?

Well lets say that we have a new car, if when we picked it up from the dealer we drove it like a bat out of hell, how far would we get before it seized up ? ... Get the picture ! We run it in not run it out ! So don't put in 3 x 6146Bs in your FT102 then and run at full power but 'Burn them in'.

PROCEDURE

1. Fit new 6146Bs, switch on rig, switch on heaters, leave rig on 7MHz receive for about 10 minutes, then Tune up for 50 Watts, take dip and turn down drive to 25 Watts. Leave mode switch in 'TUNE' position and leave 'MOX' switch on, let rig transmit a carrier for 3 minutes.

2. Switch off 'MOX' and switch in 'LSB' position and adjust bias pot on Rect A Unit for 75 mA. Switch in 'TUNE' position, 'MOX' switch on, then Tune up for 75 Watts, take dip and turn down drive to 50 Watts. Leave mode switch in 'TUNE' position, leave 'MOX' switch on and let rig tranmit a carrier for 2 minutes.

3. Switch off 'MOX' and switch in 'USB' position and readjust bias pot on Rect A Unit for 75 mA. Leave rig on receive for 10 minutes. Turn band switch on to 29MHz, tune up for 150 mA IC meter reading and adjust P.A Neutralization as for (2) on page 40 (Instruction Manual).

4. For the next 8 hours of Transmissions keep tune up IC down to 250 mA (3.5MHz to 24.5MHz SSB) and 175 mA (28MHz SSB). After about 8 hours of transmissions then you can tune up for 350 mA (3.5MHz to 24.5) and 300 mA on 28MHz (SSB) YES 350 mA ! Tune up and during SSB transmissions IC will peek at 220 mA for 180 Watt P.E.P. output (3.5MHz to 24.5MHz).

5. When running CW on (3.5 to 24.5) keep max IC below 300 mA. On 29MHz FM Tune up to 200 mA and keep F.M. carrier below 195 mA. On 28MHz SSB you can tune up for 300 mA and run at 125 Watt P.E.P. with no problems.

NOTES:No matter what power you wish to run at, it is best always to tune up for max safe I.C. at 350 mA (3.5MHz to 24.5MHz) or 300 mA (28MHz SSB) or 200 mA (29MHz FM). The 'Tune up procedure' is not always fully recognized by the user. The purpose of this procedure is to adjust the transmitter output impedance to the correct input impedance of your antenna (Load).

Don't assume that your antenna impedance is 50 ohms, as it will be more likly to be between (40 to 85 ohms) regardless of a good S.W.R. reading. The 'Dip' at max power will indicate that your output impedance is equal to your input (Load impedance) and taking a final 'Dip' at a lower power level will not give the correct output impedance. If you want to run QRP then use the processor and adjust your output power with the drive control. It's very easy to run at 1 Watt SSB this way.

Letter From Japan

After some discussion on the UK 40m Net about recommended levels of Ic to run on various Bands, a query was sent to Yaesu, which brought the following reply (GI4PCQ)

We recommend restricting plate current to around 200 mA during RTTY, FM or long transmissions in any mode. Power output at this level will vary with tube condition and band, being lower on 10m. Operating with higher plate current will of course provide more output, but at the expense of reduced tube life. Therefore the best way to handle this might be to make a short call with high power (if necessary), and then to drop back to 200 mA or less when connection is established.

Very truly yours,

YAESU MUSEN CO., LTD.

YAESU MUSEN CO., LTD.

Edward J. Coan, Manager
Public Relations Department

FAULTS

IDENT:	FAULT:	REMEDY:
T23001	No TX and Max tune up current at 75 mA. Also RF. preamp not working.	Check Pin 7 of 12BY7A on R.F. board for plate volts and if missing then change L15 (1mH R.F.C.)
T23002	Very poor sigs when R.F. preamp switched on.	Change Q01 and Q02 (2SK125Y) on R.F. board.
T23003	Can't get any HV or FM discriminator or Compression reading on Meter 1.	Change the 10n capacitor that is fitted across Meter 1.
T23004	When using R.F. preamp the preselect control needs to be in diferent position to its transmit position.	Change L15 (1 mH R.F.C.) on R.F. board. If the R.F.C looks cooked then also fit new 12BY7A.
T23005	Noise blanker not working.	Check D53, D54, D55 and D56 on I.F. board for dry joints.
T23006	Intermittant or no Frequency display.	Check J05 (P58) on counter board for dry joints.
T23007	H.F. whistling noise as main tuning dial is turned every 25 KHz or so.	Unsolder C18 on counter board cut legs shorter and resolder flat on underside of board.
T23008	After nice long over on SSB bias reading creeps up and fuse blows.	Thermal Runaway Old Boy ! fit new set of 'Bottles' and refer to 'BURN IN' procedures.
T23009	Very poor FM receive.	Change Q08 (MC3359)
T23010	No CW sidetone.	Check all components around Q05 (2SC1815Y) phase shift oscillator on AF board for dry joints.

ADVERTS

SP102 at £45, FV102DM at £150 and 3 matched GEC 6146Bs plus 1 12BY7A at £30 from Les West 5 Fairview Drive, Colkirk, Norfolk.

Millons of People every day ... Pick up a tin of Beans and say ... Where's the damn Tin-opener !

I do hope that all our members had a very happy Christmas and very nice start to 1990. It looks like being a very good year for DX with cycle 22 still climbing. 73s de Jim G4VBU.

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User Group
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*** HELLO FROM G4VBU ***

I am very sorry that there has been a very long gap between our Issue 3 and this Issue 4. My work situation at the Hospital went from bad to worse with having to work very long hours. Also with what little time I had to spare things here were getting bogged down.

When we get new people wishing to join the User Group because I do not now have a stock of back Issues at hand, I have to print out each one on the Daisy Printer from my WP files. Each News Letter will take about 30 minutes to print this way. Again if any of you know of any one who has not had all their Issues (1,2,3 and 4) then please let me know and if possible, by telephone. Some people when asking to join our group are not giving me all of their details or their address is scrawled and not easy to read on their letter.

I am please to say that I have now changed my job and so now have more time to spare. Sean and I been discussing how to continue the User Group. We will not for the time being produce any more News Letters, but instead we will concentrate on the Sunday Nets and I will be available here to answer any technical queries that you have. So please for the time being do not send in any funds. If you have any problems then do telephone me. I will be very happy to send info to you all if required, but please send a S.A.E.

There are some of you that sent in more than the £3-50 U.K or £4-50 D.X. The cost of the News Letters (Issue 1,2,3 and 4) of volume 2 worked out with post and package at £3-56 U.K. and £4-42 D.X.

If there is any one that has over subscribed then please send me a S.A.E. and I will make a refund.

*** USER GROUP NETS ***

On Sundays at 1000 Gmt (1100 U.K. time) on 7.082 ± QRM.
Weekdays at 1930 Gmt on 21.383 ± QRM. (for DX Members)

*** HELP LINE ***

For technical information you can telephone Jim at Bristol (0272) 781265. The best time to phone will be between 1630 - 1930 (Week-Days) or 1230 - 1430 (Saturdays and Sundays).

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*** REMOTE ANTENNA UNIT ***

The FC102 Antenna Tuner Unit was built with an option of fitting the remote antenna switching unit (FAS-1-4R). This unit can be installed at the back of the FTC102 or as a remote unit installed at the antenna to enable you to select up to 5 separate antennas from the A.T.U. switchbank (Push Buttons 1,2,3,4 and ANT A).

The FAS-1-4R is not now readily obtainable and if you are lucky to find one advertised you can expect to part with about £70 - £100 for it.

You can with very little effort make this unit at a cost of about £10 - £15. Looking at the back of the A.T.U., you will see that there is a steel plate fitted by 2 screws.

*** STRATEGY ***

1. Refering to the FC102 Instruction Man'whell (Manual) page 12 and 13 remove the subpanel on the rear of the FC102 as shown in Figure 1. Read page 12 and page 13 to get a good understanding of this unit.

2. Use this steel subpanel as a template and mark out and cut a new plate of 12 S.W.G aluminium (alloominem U.S.A.) to size.
Unless you have lots of drills and lots of time don't try to drill the steel subpanel !

3. On your new subpanel mark out a line about 1.25 inch down from the top and make 4 equal marks across that line for the fitting of 4 off SO259 antenna chassis sockets (Maplins part FE98G) in a straight line across the panel. Drill out the 4 holes to size.

4. On your new subpanel mark out a line about 1.25 inch up from the bottom across the panel and at the centre of that line drill a hole for 1 off SO259 chassis Input socket to size.

5. Fit all 5 SO259 sockets onto the new subpanel making sure that each earth tag is fitted and that each socket is tight. Run a line of tinned copper wire through each of the 4 earth tags to form a buss bar and solder each tag.

6. Taking each of the 4 12V Relays (Maplins part JM67X) apply an epoxy adhesive (Araldite Rapid) to the top of the Relay cases and glue each Relay to the inside of the new subpanel so that pin 1 (centre pin common) points towards the centre pin of its SO259 socket.

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7. After the epoxy adhesive has set hard, run a short thick wire from each pin 1 (centre pin common) of each Relay to its appropriate SO259 socket centre pin. Refering to the circuit diagram on page 13 of the FC102 Manual (RL Unit PB-2415A) apart from plug J01 (not now used) the subpanel should be wired as is shown. (Not Yet!)

8. Looking at the back of your FC102 A.T.U. you will see a tag strip that is marked "A B C GND" we will be using the tags to feed a +12V that is switched by the 4 Push Buttons (1,2,3 and 4) at the front of your FC102. When Push Button 1 is selected there is no +12V on tags A,B and C. When Push Button 2 is selected there is a +12V on tag A only. When Push Button 3 is selected there is a +12V on tag B only and when Push Button 4 is selected there is a +12V on tag C.

*** WIRING ***

1. Take off the top cover of your FC102 and fit on the new subpanel, top right (looking from inside A.T.U.) will be ANT 1 . ANT 4 will be top left. Refering to the circuit diagram (page 13 Manual) the black contact of the Relay is the N.C. (normaly closed when no voltage is fed to the Relay coil) and the white contact of the Relay is the N.O. (normaly open) this will close to make with the common when the +12V is fed to the Relay coil.

2. Run a thick wire from the Input SO259 sockit centre pin to the N.C. contact of Relay 1 and solder. Continue that wire from the N.C. contact (Relay 1) to the N.O. contacts of Relays 2,3 and 4 and solder as shown in the diagram page 13 (Manual). Next solder a wire from the N.O. contact of Relay 1 to the earth buss bar, solder a wire from the N.C. contacts of Relays 2,3 and 4.

3. Run a wire from each Relays L.H. coil contact to the buss bar, solder a diode (1N4148) and a .1uF 35V cap. from the L.H coil contact to the R.H. coil contact of each Relay. (note as in the diagram the diode must have its band + wired to the Right Hand contact of the Relays coil)

4. Run a wire from the tag strip "A B C GND" Terminal C to the R.H. coil contact of Relay 4 and solder. Run a wire from Terminal B to the R.H. coil contact of Relay 3 and solder. Run a wire from Terminal A to the R.H. coil contact of Relay 2 and solder. Solder 3 diodes (1N4002) + bands to Relay 1 R.H. coil contact and solder a wire from each diode 1 to Terminal A, 2 to Terminal B and 3 to Terminal C.

5. Use Input B of A.T.U. for FT102, make a short Patch Cable to go from ANT B of A.T.U. to Input SO259 sockit of subpanel. On A.T.U. ANT A can be used as Antenna 5 or to select your Dummy Load.

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Parts required

5 off SO259 sockits eg. Maplins part No. FE98G 38p each

2 off PL259 Plugs (for Patch Cable)

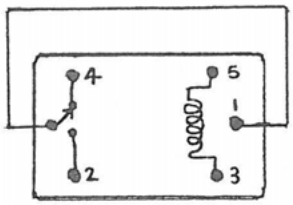
4 off 1N4148 or 1S44 Diodes

3 off 1N4002 or any 1 Amp 200V Diodes

4 off .1uF Capacitors 35V or over

4 off 12 Volt (10 Amp contact) Relays Maplins JM67X £1-48 each

1 Tube of Elbow Grease



Relay view from below

*** HINTS AND TIPS ***

A common fault on FT102s is that the bridge Rectifier D1 (S4V10) on the main chassis that delivers 15 Volts to Rectifier B Unit has a very nasty habbit of going short circuit. Not so very long ago I had it blow on my rig. I found that the 12V power lead from the FT102 to the FC102 had pulled out very slightly at the A.T.U. end. So take care and check the state of that power lead and never unplug it with the rig switched on.

On the Issue 1 and some of Issue 2 FT102s they never seem to get problems with thermal runaway. I know of many Users with Issue 1 and 2 that have the Sylvania 6146Bs in the P.A. and don't get any problems. On the R.F. board circuit diagram, I have found that the diagram is only correct as far as Issue 1 and some of Issue 2.

I have found that from some of Issue 2 onwards Yaesu made some very major changes to the ALC circuits, just try and trace out the caps that are switched at the last wafer, Relay 02 and the 12BY7A Neutralization circuit. These changes would appear to be undocumented. I will be writing to Yaesu for more information.

(Next Page O.M.) >>>

For a long time I had been having some problems with my FT102 an Issue 4. The problem started one day when I switched on the rig, turned on the heater switch and after about 3 minutes started to tune up on 21 Mhz. As I turned up the drive to dip the plate I found that the IC meter stuck on 75 mA and would not move. Looking at the power meter it was clear that there was no sign of any R.F. I did all the usual things like swear at it, kick it, I jumped up an down and took two Anadins but no luck ! After several cups of tea later I tried again and yes all worked fine. Many moons later the same thing happend again and again and .... It seemed to be a thermal fault, fort I, (Pun !) as I had found with the passing of time, or wind, (can't recall which), after the rig had been on for about 10 minutes it would work fine. I got me a can of freezer spray and soon had all the rigs ICs, Transistors, Voltage Regulators, FETs and diodes white with snow, but no luck. I prayed to my Fairy Liquid God Mother and ... "POKE THE RELAYS" said a far away voice, so I pressed the Mox switch and prodded away .... and as I tapped Relay 02 ... the IC and the Power meter moved ! The very next day I changed all the Relays on the R.F. board and that was that!

A similar fault to the one that happend to me above, is that after some time, say during a QSO mostly on CW, you will lose all output with the IC meter at 5 mA (75 mA SSB) and after about 10 to 15 minutes all will again be O.K. This is caused by an intermittent crystal (8.2159 Mhz) on the AF Board.

This next tip will I hope help you to find the reason why, if your FT102 stops transmitting R.F.

1. Always check IC meter 1 , select USB and press 'MOX' do you have any Bias current (75 mA) YES/NO ?

2. Switch Meter Select to HV and press 'MOX', meter 1 should read HT Voltage (800V to 900V) YES/NO ?

3. Take off bottom cover and Check at Pins of each 6146B that you have Screen Voltage (between 160V and 220V) YES/NO ?

4. Check on pins of 12BY7A for Screen Voltage and Anode Voltage Screen (180V to 220V), Anode (200V to 320V) YES/NO ?

5. Take off top cover and look to see if each 6146B and 12BY7As heaters are O.K. (Red Glow !) YES/NO ?

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After making all of the above checks and all answers are YES, then the problem is no R.F. drive. The 12BY7A is not likely to be at fault, so first of all take a good look a REC B Board and look for any signs of burn up around Q03 and Q04. (This is a very common fault !)

NO SCREEN VOLTS (6146B)

The 6146Bs get their Screen Voltage from REC A Board, so check R04 (470R) for open circuit. (Again this is a very common fault !)

On the P.A. Board, there is a 12V Relay that is used to switch 2 levels of Screen Volts to the 6146Bs and this Relay can pack up and yes can give no Screen Volts.

NO SCREEN VOLTS (12BY7A)

The 12BY7A gets its Screen Voltage from REC A Board (180V) from R05 (3K3), check for open circuit and if then, it is probably C78 on the R.F. Board, short circuit or the 12BY7A is faulty.

NO ANODE VOLTS (12BY7A)

Check that you have 300V on REC A Board and if not then check R01 for open circuit and if so then check C05 and C04 for short circuit.

If 300V on REC A Board O.K. then check L13 (470uH) and L15 (1mH) for open circuit and if so replace and change 12BY7A.

NO BIAS CURRENT

On REC A Board check R21 (10K) and R12 (10K) for open circuit and if so replace. You have a Grid short in one of the 6146Bs. Take out all 6146Bs and plug one in at a time, switch on rig and heater switch, select SSB and press 'MOX' if Bias now over 250mA thats the faulty valve.

You can run the FT102 on two 6146Bs providing that you reset Bias current for 50mA and tune up for 220mA Max. (just like a 101). You can use the rig until the new bottles arrive.

FUSE BLOWING

There are 3 things to look for (1) Bridge Rectifier (S4V10) short circuit. (2) HT Rectifiers D01, D02, D03 and D04 on REC B Board short circuit. (3) 6146B has screen grid short or thermal runaway.

(Next Page O.M.) >>>

I have tryed to give you the most common list of faults that I have found on FT102s. It would take a long time to list more but if at the end of the day you still have a problem, then try our Help Line !

I have had a look to see if there is any way that we can use that last digit on the frequency counter board and at the present time it looks like it can be made to work. I hope to make a small subpanel to fit onto that board soon.

I recently telephoned S.M.C. and enquired about the price of 6146Bs for the FT102, S.M.C. stock GEs & *Sylvania Tubes and for the GEs they quoted me just under £20 each for them !

Is there any-one out there that can let the User Group know if they Know of any other supply of GEs or NECs or RCAs at a Realistic price ?

* The Sylvania 6146Bs are only O.K. if used in the FT101s or FT102 MK 1 (Issue 1). We do not recommend them in FT102 MK 2s (Issue 2s and above)

Well I must say that I have enjoyed producing this news letter and I hope that I can produce some more soon. Over the next few months I will be taking a break. You will find me on Sundays on the Net and on 21Mhz having a natter on this trusty old FT102. All are very welcome !

I will soon be sending out the volume 2 masters to G4TMK Peter who will provide back issues for any new members.

(Last Page O.M.) >>>

73's Jim G4VBU

*** ADVERTS ***

FV102		Excellent Condition	Bristol
SP102		Good Condition	
Telephone	G0CEM	Trevor (0272) 642867	QTHR

*****

FT102 + MH1		Good Condition	Bristol
Telephone	G0EOU	Brian (0272) 325324	QTHR

*****

FT102 + SSB/CW Filters		Good Condition	Tipperary
FV102		:	
FC102 + FAS-1-4 Remote		:	
SP102		:	
MD1B8 Desk Microphone		:	
Telephone	EI7FE	Leam 010 (U.K) 353 5222493	

*****

FT102		Good Condition	Glasgow
FC102		:	
SP102		:	
Contact	GM3ZTA	(QTHR) or Arrow Electronics (Glasgow)	

*****

FT102 + Mic		Good Condition	Belfast
SP102		:	
ATU (Amcomm)		:	
Telephone	Gerard Devenney	(0232) 240908	

*****