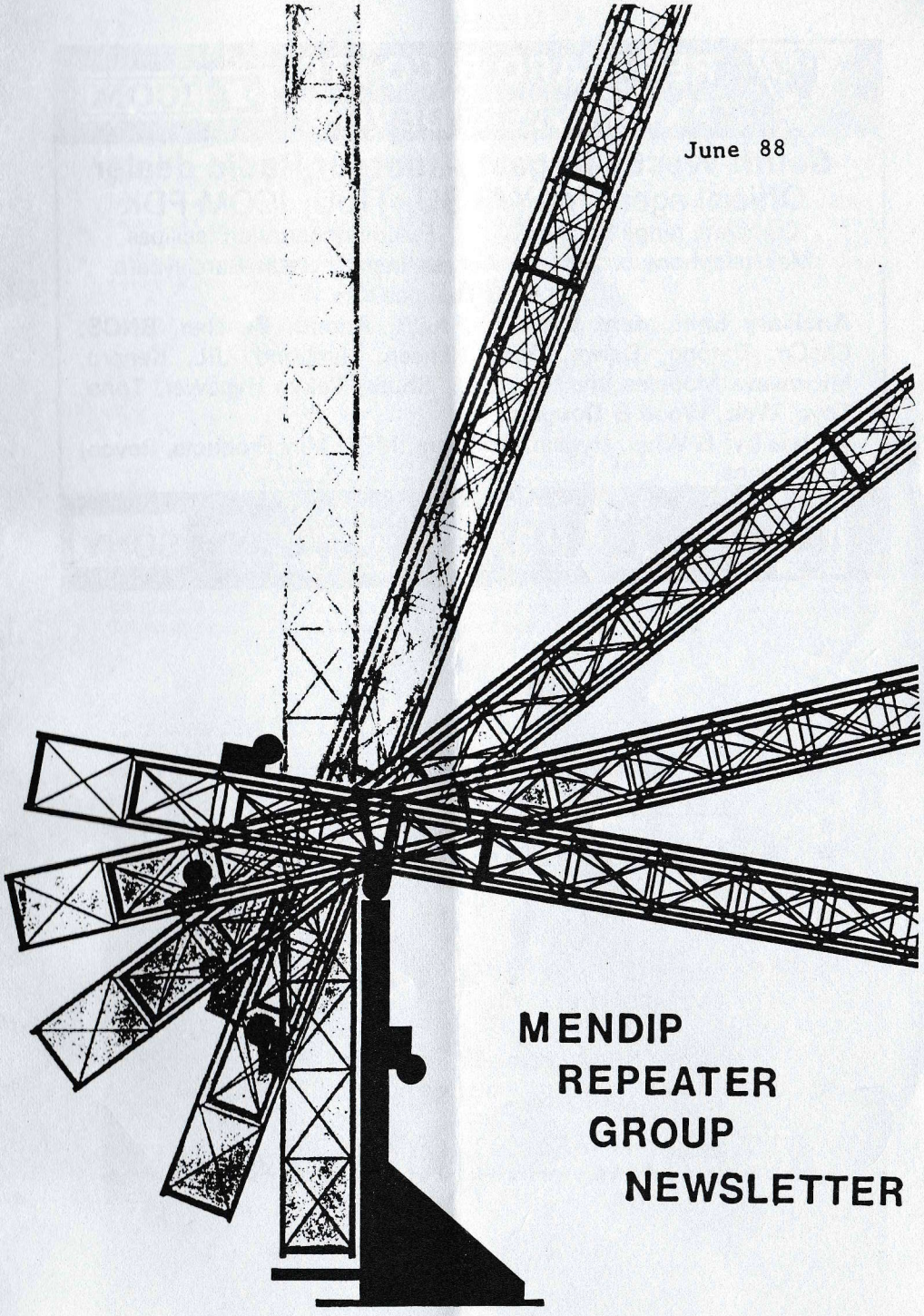
June 88



MENDIP REPEATER GROUP NEWSLETTER

GB3WR GB3UB GB3VS GB3UT

Editorial

Dear Member,

Welcome to the June 88 edition of the Mendip Repeater Groups Newsletter. Thankyou for your support over the past twelve months and we feel sure that continued support will remain, keeping our group of repeaters at the high standard we've become accustomed.
Technically our repeaters are superb and are the envy of other repeater groups especially for reliability and coverage. What is said on the repeater is another thing of course but please remember repeater operation gives you a large audience and you never know who may be listening.

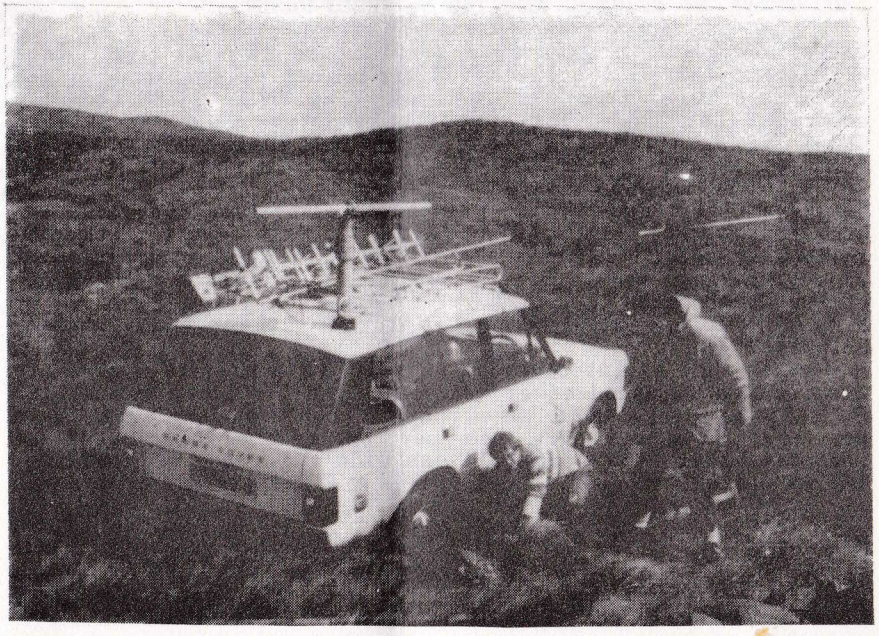
73 see you at Longleat !

MENDIP REPEATER GROUP COMMITTEE
****

Chairman	I. Rosevear		G3GKC
Vice Chairman	P. Beecham		G6PZ
Secretary	S. Gardner		G4PSP
Tech Manager	I. Parker		G8XZD
Computer Services	M. Stanbridge		G3RHU
Treasurer	L. Gardner.		

The Committee

I. Sparry	G8IWV	P. Price	G4SUH
A. Whatmore	G4UVZ	J. Trett	G6JTT
M. Webb	G1KVD	H.'O'Tani	G8OTA



CHAIRMANS NOTICE

Here is our 'new look' Newsletter and I hope the members will let the committee have comments. Hopefully we will not have to seek a hefty bank loan to cover the increased production costs. The AGM has produced some new committee members and the first committee meeting showed the advantage of 'fresh blood' with new ideas. Welcome to them and fresh ideas.
Our new technical manager Ian G8XZD has the urgent tasks in hand - stand by power for WR and with Adrians (G4UVZ) assistance GB3VS is now providing good service on 70cms to the SW of MRG catchment area.
Membership is healthy and you are asked to encourage the regular non-member users of our repeaters to join and contribute to the running costs. There are still several regular users of ' WR ' in particular who beleive it is a 'free service' funded by the RSGB/DTI/or someone.A little gentle persuasion please!
Longleat is on the horizon,see you there,

IVAN G3GKC

TECHNICAL MANAGERS REPORT

Since my last newsletter, I'm pleased to report that my technical sub-committee have been working hard maintaining our repeaters and commissioning GB7UX the groups packet radio repeater project.
Apologies in advance if I've missed out any names. Next time you use one of our repeaters spare a thought for all your repeater group back-up team that give so freely of their time.

GB3WR RO LOCATED Nr WELLS SOMERSET

GB3WR continues to give good service and is well used. Lets hope that when our site lease expires that we continue to get favourable terms from our Landlords (The BBC). G3VPF recently reported that the Stockland Hill repeater group which runs GB3SH (RBII) and GB3DB (144.65) have had their rent increased from 'nominal' to £100 per installation p.a. by the IBA as a result of a recent 'review of policy' .
We occasionally get on site interference which is unfortunately unavoidable.With the amount of RF generated on site the equipment seems to survive well despite the occassional hiccup.Maybe we should have a competition - guess the total erp of the Mendip mast or the number of aerials in use! (A prize of a bent slim jim on a seized rotator for the nearest correct entry!)
The other type of interference is still with us. Yes I know its been said a thousand times but IGNORE IT ! 9 times out of ten it will go away. What ever you do -don't acknowledge their presence, however angry you may be.If they hear you say something like "oh! sorry old man didn't get any of that-some !*#!** jammed you out", they'll have a field day and continue.

GB3UT 24cm TV REPEATER-BATH UNIVERSITY

Sterling work has been carried out on the 24cm television repeater by Mike G8CPF,Richard G1WRR and Henry G8OTA. The aerial is now some 3m higher which should improve coverage. Whilst the number of users is not high,the dedicated core maintain the spirit of true amateur radio with home construction and experimentation with equipment and aerials.

GB7UX-2 PROPOSED PACKET RADIO REPEATER

When I wrote to the RSGB on the 1st of August 1987, I was unofficially told that our licence application would be forwarded to the DTI as part of phase 2 of the packet radio experiment and that licencing would be a mere formality. Since the application went in ,(1/8/87) I have only received one communication from the RSGB which was a standard letter acknowledging the groups application. It is worth noting that our application was in with G8IMB (the packet co-ordinator) a good 2-3 weeks before phase 2 closed.
Nearly a year has passed now and we are still none the wiser. All enquiries either to the co-ordinator or the repeater management group seem to meet with non-committal answers. It seems strange that a hobby which is primarily concerned with communication that this situation should arise. The latest 'excuse' is that we are waiting for the new licence conditions to be drawn up. Having had my moan I'll get off the soap box and tell you a little more about the repeater.
A few weeks after the application went in a F494 base station was donated to the group by Philips Radio Communications Systems Ltd(ex Pye Telecom) of Cambridge. Thanks are due to Jon Bigwood,G8KNN, for this procurement. High spec crystals for the base station were donated by QSL Crystals Ltd.Our thanks to them.
For those unfermiliar with the F494 this sis a 25w base station which can be configured as a repeater (full duplex) or in our case,simplex operation. The F494 is current kit, and several examples of it are in use in the GB3WR repeater site by commercial users. Thanks are also due to Henry G8OTA for constructing a pin diode aerial changeover for this unit.Site tests were conducted from the repeater site on Feb 14th with many good links being established. Space doesn't permit the results to be published but I can assure you its a good site and should become an excellant repeater in keeping with the Mendip Repeater Group tradition.
It is hoped that the TNC will run level 3/4 Networking software and we are awaiting with interest the arrival of the 'ROSE' code from the states. Lets hope the licence arrives soon, in the mean time watch out for flying pigs!

GB3VS RB3 Nr. TAUNTON

Now settled down from its recent refurbishment by Adrian'G4UVZ'and his team.We are starting to see the benefit of the new site as the usage increases almost daily.
Recent improvements include increasing the spacing between tx and rx aerial thus improving the isolation, as a result the receive cavity has been taken out of circuit as desense is minimal.GB3VS is running the maximum output power of 25 watts erp providing recipocity with the higher powered mobile operators.

GB3UB RB4 BATH UNIVERSITY

Since US has been upgraded, the old US transmitter will be fitted into UB allowing the existing transmitter to be serviced without taking it off the air.
A new aerial, based on his 1.2 wave length full wave dipole(as used on WR) has been designed by Dave G3UUR. He reports initial tests to be favourable with a useful increase in gain over the G3VEH full wave dipole currently used. As soon as a second of these aerials can be manufactured, they will be installed on the mast at UB. This should help to improve the service area and iron out the odd scratchy spots.
Dave who originally built UB some 10 years ago has recently moved back into the area. We look forward to hearing him more often on the repeater.

SOME NOTES ON UHF OPERATION

In general remember;

1) That seasonal changes in foliage can affect received and transmitted signals by up to 10db.
2) That where the received signal is not line of sight the signal arriving at your aerial can come from several reflections. These reflections can cause partial (or total) cancellation of the received signal even though you might be Q5 through the box. If you experience this phenomena, then moving a few metres either way may cure it.
3) Mobile aerials not mounted in the centre of the car roof have lop sided polar diagrams. This can give the impression that the repeater is apparently stronger or weaker when travelling up and down the same stretch of road.
4) Joints in feeders are bad news. If avoidable, use the best possible connectors,N type or BNC. Avoid the PL259 series like the plague! Use good quality cable for patch leads CB cable is definately out!
5) That the rig is only as good as the aerial its connected to. Its ridiculous to connect a bent coat hanger to an expensive rig and expect it to perform well.
6) Aerials work far better when mounted outside.Expect a 10db increase in gain by taking the aerial out of the Loft and up onto the roof. At these frequencies its a lot cheaper to use decent aerials outside than to spend money on linears and pre amps!

INTERLINKING REPEATERS

There is some discussion locally and nationally concerning the linking up of amateur radio repeaters so that stations may communicate with each other using more than one repeater.

The system requirements are:-

* The opening of a repeater interlink should be under the deliberate control of a user, requiring a particular access or "thru-tone" to facilitate it.

* Such "thru-tones" should have a sufficient range of permutations to allow for every amateur phone interlink to have its own unique network identity ("NI"). The tone system should be compliant with one of the international standards such as CTCSS, CITT or DTMF.

* Compatibility. A station calling via two repeaters at the same time, MUST be able to hear any respondents on either repeater, whether or not they are equipped with the (new) tone signalling accessories.

* Interlinking should "time-out" in the absence of re-enforcement.

The current solutions entail the use of duplex microwave links or expensive "trunking" using the public switched telephone network (PSTN). All of these require modifications to the existing repeater equipment and the introduction of additional equipment of complexity equal to or exceeding that already in use.

INTERMEDIATE REPEATERS

This proposal concerns the concept of "Intermediate Repeaters" which are systems designed to relay traffic BETWEEN existing repeaters.

It is felt that the main applications for this innovation would be in the linkage of little used "70 cms" repeaters which serve much smaller populations than their "2 metre" cousins.

The advantages of such systems are:-

* No changes need to be made to existing repeater equipment.

* The interlinked repeaters do not need to be directly connectable either through land-line or optical microwave links. A very long span is possible linking say, a West Country repeater with a Midlands repeater.

* Any convenient intermediate site will do.

* No additional frequency spectrum is required

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Equipment requirements:

At first sight, it would appear that two full-duplex units are required, each receiving the output from one repeater and re-transmitting it on the input frequency of the other.
It is however possible to make a system work by using a single full-duplex tranceiver and intelligently switching two (or more) sets of channels.

The system is depicted in Fig.1 interlinking two local 70 cms repeaters which are separated by the Mendips. It is assumed that the Intermediate Repeater is sited somewhere where both repeaters can be adequately worked using low power and simple antennas.

Full Duplex Transceiver:

The radio equipment will need to be of a similar quality as used in existing full duplex 70 cms systems. Being crystal controlled, such "talk-thru" base stations are available on the secondhand market for under £100.

Channel Switch:

This circuitry has to switch the two pairs of crystals alternately.
The transmitter must be electrically keyed down during each changeover.

Antennas:

For successful full-duplex operation it is best to use inherently simple matched antennas such as half-wave dipoles and quarter-wave ground-plane types.

However given a good set of filters and a low spurii commercial transceiver, high gain arrays, might be locked-off towards each of the two targets using a double antenna switching system.

"Thru-tone" detector:

The Intermediate Repeater's receiver will need to be able to detect its own unique "thru-tone". This can be a burst of CTCSS (sub-audible tone-squelch) or a pair of DTMF digits - these like the 1750 Hz tones currently in use will wake up the controller and initiate the interlink control system. CTCSS has the advantage of being passible throughout an initiating station's over. DTMF has the advantage of more permutations, simple encoders and convenience in "dialling" multiple hops.

"K" detector:

A few hundred milliseconds after a signal dissappears from the input of a repeater the control logic generates a "pip" or (formerly) a morse code letter "K". This will have fixed charateristics of deviation, frequency and duration.

The Intermediate Repeater must have a decoder tailored to recognise each of these two end of carrier signals ("EOCS"). The operation of the detector will need to be suspended for some seconds after changeover to pass the "EOCS" that precedes the start of any given "over".

THE FOLLOWING ARE MEMBERS OF THE GROUP (15th April 1988)

C30AKA	G0APK	G0AWX	G0AZE	G0BKU	G0BQD	G0CAM	G0CCA	G0CCB
G0CCO	G0CFM	G0CNA	G0COM	G0CPG	G0CYD	G0DBK	G0DUU	G0DZA
G0EGC	G0ENF	G0EZU	G0FAA	G0FFY	G0FGF	G0FGN	G0FGR	G0FHD
G0FZT	G0GJB	G0GWF	G0GZW	G0HAD	G0HBE	G0HFX	G0HKB	G0HPS
G0HVA	G0IFI	G1AAH	G1ABT	G1AJC	G1ARZ	G1AVB	G1BKL	G1BVG
G1BYE	G1DBF	G1DCG	G1DCZ	G1DFK	G1DNG	G1DYG	G1FGK	G1FON
G1HFJ	G1HFY	G1HSF	G1IHL	G1IHT	G1IIM	G1IVM	G1JKO	G1JMK
G1JOR	G1JPK	G1JRM	G1KEU	G1KFC	G1KTJ	G1KVD	G1MDC	G1MIV
G1MMS	G1MSI	G1MWM	G1NGQ	G1NKB	G1NMW	G1NTK	G1NUA	G1NZJ
G1OKC	G1OKD	G1OKU	G1OOB	G1OPW	G1ORL	G1ORN	G1PBX	G1PVU
G1PLM	G1PNF	G1PVB	G1PWU	G1RLC	G1RSF	G1RWT	G1SGK	G1SMD
G1TAL	G1UAA	G1UEL	G1UKB	G1ULZ	G1UQE	G1UQH	G1USW	G1VJK
G1VQA	G1VQG	G1VSX	G1VSZ	G1VZO	G1WCH	G1WPX	G1WQR	G1WQV
G1WRR	G1WVI	G1XGX	G1XOZ	G1XWZ	G1XXC	G1XXE	G1XYX	G1YKC
G1YLT	G1YNZ	G1YZV	G1ZBM	G2BAR	G2BQY	G2BRR	G3AGT	G3BPM
G3CQE	G3ESO	G3EWF	G3GKA	G3GKC	G3IBK	G3IJU	G3IUV	G3JAR
G3JEP	G3JYS	G3KSK	G3LJD	G3LNW	G3MIZ	G3MVA	G3NET	G3NOF
G3NXU	G3OSH	G3PYF	G3RHU	G3RRK	G3RYC	G3SJI	G3SPU	G3SXY
G3TFM	G3TKF	G3UGR	G3UPV	G3UTO	G3UUR	G3VEH	G3VJJ	G3WBA
G3XBW	G3XGY	G3XIT	G3XWK	G3YBY	G3YDC	G3YHV	G3YNI	G3YPL
G3ZKI	G3ZNV	G3ZUQ	G3ZWL	G4ATP	G4AUN	G4AVJ	G4AYB	G4AYD
G4BSF	G4BYJ	G4CBS	G4CJZ	G4DGU	G4DIE	G4DKS	G4ETN	G4EVI
G4EXQ	G4FSL	G4GBN	G4GBX	G4GGA	G4GTD	G4GUG	G4GVM	G4HHL
G4HWD	G4JBG	G4JBW	G4JQD	G4JQP	G4JSN	G4KNE	G4KPT	G4LAF
G4LAW	G4LJZ	G4LYG	G4LYP	G4MYR	G4NBD	G4NFO	G4NQQ	G4NXG
G4NYN	G4OFH	G4OJA	G4OJH	G4OTJ	G4OWH	G4OXR	G4OXY	G4OYY
G4OZH	G4PDG	G4PLY	G4PSP	G4RLK	G4RSH	G4RZY	G4SCD	G4SFS
G4SJJ	G4SUH	G4SZB	G4SZS	G4TAH	G4TBO	G4TIX	G4TJB	G4TLL
G4TLP	G4TRN	G4TXW	G4UEO	G4UGO	G4UGT	G4UHN	G4UIU	G4UKF
G4ULV	G4UNU	G4UOA	G4UPS	G4USO	G4UVZ	G4VBO	G4VEH	G4VGV
G4VVS	G4WJY	G4WKM	G4WLB	G4WMV	G4WPY	G4WPZ	G4WRW	G4WTA
G4WXD	G4XKK	G4XLY	G4XUR	G4XWE	G4XWY	G4XYZ	G4YJH	G4YOC
G4YQG	G4YQR	G4YTH	G4YTP	G4YZR	G4ZBQ	G4ZDR	G4ZEU	G4ZLF
G4ZNK	G4ZOG	G4ZQF	G4ZXE	G5RQ	G6ACO	G6AEC	G6AFL	G6ANI
G6ASI	G6ASO	G6ASP	G6AWT	G6BMF	G6EIY	G6EMB	G6ENM	G6ETL
G6FBR	G6FXH	G6GBH	G6GNG	G6GVH	G6HIQ	G6HKD	G6HMV	G6HOR
G6HTZ	G6HUO	G6HYU	G6IAV	G6IUQ	G6IVU	G6IZE	G6JGR	G6JNB
G6JTT	G6KPD	G6KTW	G6LRQ	G6MBJ	G6MJG	G6MRJ	G6MXL	G6OWL
G6PEN	G6PJT	G6PPU	G6PZ	G6RAZ	G6RKO	G6RQB	G6RUP	G6SIM
G6TAH	G6TAL	G6TKR	G6UAC	G6VSE	G6WIM	G6WLG	G6WLX	G6WOV
G6WZA	G6WZS	G6XFC	G6YCG	G6ZIM	G6ZOD	G6ZPG	G6ZPY	G7AHE
G7AYL	G8ARH	G8BIR	G8BMR	G8CPF	G8DBP	G8DJW	G8DKC	G8DRK
G8FAS	G8FC	G8FKC	G8GFZ	G8HNM	G8HVY	G8IKR	G8IOJ	G8IWV
G8IZZ	G8KBQ	G8KKA	G8KNN	G8LGC	G8LRB	G8MPH	G8MYN	G8NMU
G8NNU	G8NQO	G8OEU	G8OQG	G8OTA	G8OTH	G8OUG	G8PVI	G8SPC
G8SRH	G8SUW	G8TOF	G8UVM	G8VDF	G8VGI	G8VOE	G8VPG	G8WKK
G8WKL	G8WLV	G8WRC	G8XYS	G8XZD	G8YML	G8YMM	G8YPV	G8YWQ
G8ZOE	G8ZSP	G8ZVK	G8ZYD	GU1WDT	GU3EJL	GW0HKL	GW1EPR	GW1LOR
GW1LWC	GW1NYO	GW1OPT	GW1RGO	GW1VGS	GW2FWD	GW3LAD	GW4HA	GW4ISF
GW4KYM	GW4NLE	GW4POA	GW4TUL	GW4UXK	GW4WQC	GW4XKE	GW6ADM	GW6CUR
GW6JBP	GW6MOB	GW6MWN	GW6NQU	GW6UXK	GW6VLA	GW6YNV	GW6ZHM	GW8DGM
GW8ERA	GW8PTS	GW8REV						

MR R.WARE
MRS L.GARDNER

MR J.GOODWAY
MR A.STEVENS

CHEAP PRESCALER FOR 23CM

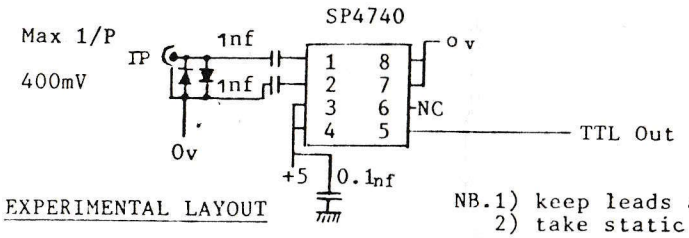
****

I was looking to extend the range of my frequency counter up to 23cm but couldn't justify spending in excess of £40 for a 1.39Hz devided by 100 prescaler. Looking through some data books I came across a Plessey devided by 256 chip, these are intended for synthsized tv tuners. Sensitivity was quoted as 5mV between 50MHz and 1.39Hz,it also produced a TTL output.Of course putting a devide 256 on the input to your counter is going to mean the displayed frequency will be devided by 256. At first I thought you could further devide the output-this would make the display correct but impair the resolution (the counter would be counting far less pulses per unit time so full 8 digit accuracy wouldn't be acheived). Further inspection of the above meant that the second devider would have to devide by 1000 over 256 which isn't an integer so would not be possible anyway! Anyway, not to be put off I considered the other option - devide the clock frequency to the counter chip by 256 (or 25.6 or 2.56). This would make the reading correct and also increase the gate time by 256 (25.6 x or 2.56 x) so the resolution would be maintained. To stop the display from overflowing I decided on deviding 2.56 Problem non intege division- however it suddenly twigged that I could cheat and alter the crystal frequency and solve the problems. So I threw away the 10MHz crystal and got a new one made. Since I was deviding the input by 256 I devided 10 MHz by 2.56 giving a new crystal frequency of 3.90625MHz. This was ordered and duly installed. Now the reading was correct but reading 10x higher ie.433.1MHz read 4331.0MHz. Anyway just shift the decimal pointone place to the left. The gate times are now 0.256 sec 2.56s or 25.6s. I find the 2.56s gate gives the best comprimise between accuracy and count update time. Do remember the accuracy of the counter is only as good as the crystal reference so make sure its a high stability one.

RESULTS - The counter triggered happily off a 70cm 1W handheld at 1M-ditto for 2M handheld(1W). I was most surprised that it triggerd off a cordless telephone at 10cm! (thats 1mW output!).

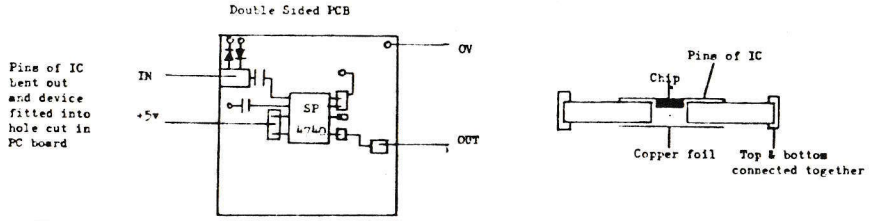
Although its lower quoted frequency is 50MHz it seemed to work ok at 5MHz, I've only had it operating for a week but it appears to work well- the only problem seems to be it oscillates in the absence of a signal but I'm sure I can get around this o.k, and the cost £1.95! Not bad.

Circuit (CRIBBED FROM DATA SHEET)



EXPERIMENTAL LAYOUT

NB.1) keep leads as short as possible.
2) take static precautions.



Modulation detector:

The Intermediate Repeater requires a means of detecting plain modulation through a repeater - a simple VOX circuit will be suitable.

Carrier detection:

The Intermediate Repeater requires a means of detecting whether or not a particular repeater is transmitting or not. This can be derived from the receiver's squelch circuit. Pye 461s for example have a squelch relay circuit already fitted.

Access tone generator:

This is the standard 1750 Hz tone generator for accessing a repeater from "cold".

"Busy" tone generator:

This can be a brief (4 cycle) burst of the familiar telephone "engaged" signal.

OPERATION

Fig.2 is a simple flowchart indicating the type of control requirements for an Intermediate Repeater ("IR")

Initiation:

The "IR" receiver scans between the two monitored repeater's outputs. The "IR" transmitter ALWAYS transmits on the input of the repeater it is NOT listening to.

We start the description with a user appearing at his/her local repeater's input and sending a brief "Thru-tone".

Decoders usually generate an initial "flag" when an incoming tone is first detected. This stops the scanning while the more specific decoding takes place. Should the decoded signal be accepted the system briefly changes channel and checks the distant repeater for "carrier present".

If busy, the repeater changes channel and waits for the calling station to drop carrier after which it sends the busy signal (indicating nothing has been retransmitted) and switches through to the normal talk-thru mode. In this case starting with the distant traffic being re-transmitted through the caller's local repeater.

Talk-thru:

Should the distant repeater be "down", within a few milliseconds of this being established, the "IR" changes channel to receive the local repeater and keys its transmitter and standard 1750 Hz tone burst to bring up and relay through the distant machine.

In the talk-thru mode, the direction of transmission is maintained until detection of a "EOCS pip tone", one or two seconds of silence or a "thru-tone terminating" is detected at which the Intermediate Repeater changes direction. This latter facility (of detecting a termination) enables a calling station to restore an interrupted distant QSO by "blipping the distant repeater in". As for example when a weak mobile signal is dropping in and out producing a succession of spurious "pips".

The Intermediate Repeater interlinking "times out" after say either 8 seconds of silence on both machines or say 6 minutes without a "thru-tone" having been detected at either end.

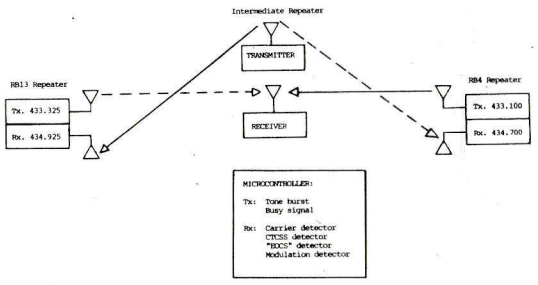
ROUTINE PROCEDURES

The audio quality is likely to be much degraded, passing through THREE repeaters rather than one. A crisp "communications quality" speech will no doubt fare the best.

In "talkthru" it will be normal to hear TWO pips between overs. The first as YOU drop carrier will come from your local repeater and the second will be the relayed "EOCS pip tone" of your transmission tail via the distant repeater. Likewise the distant operators will generate a local "EOCS" and you will both hear a second one as the "IR" drops out of your local unit.

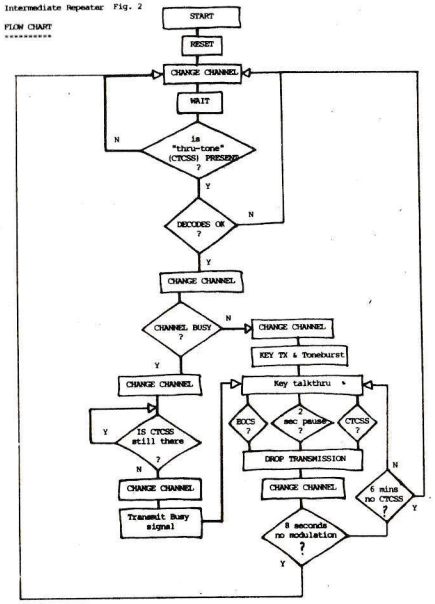
To reply to someone via your own repeater, and be heard via the distant repeater will entail either "jumping in before the pip" or waiting for three!

Intermediate Repeater System Fig. 1



Intermediate Repeater Fig. 2

FLOW CHART



MATERIAL COSTS

The repeater should be obtainable for under £100 (the author has two serviceable 70cms repeaters purchased for around £60 each).

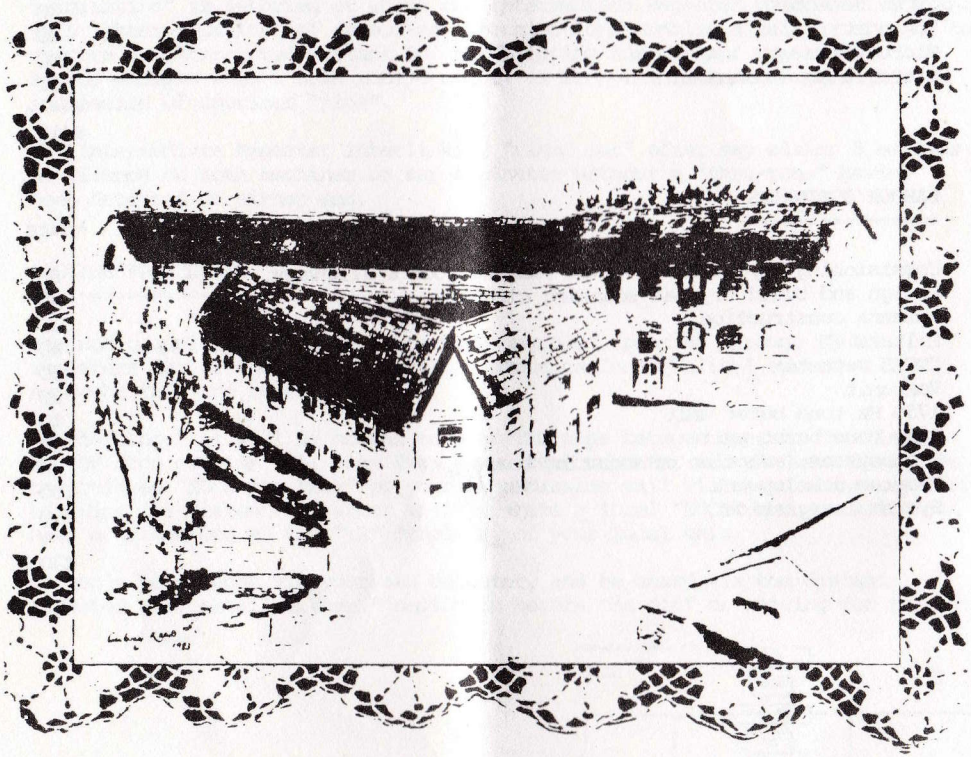
The repeater will require two pairs of crystals	£100
Antennas	30
Filters	30
CTCSS detector	20
VOX unit	30
Microsystem	20
Miscellaneous components	100
	80
	£410

LABOUR ESTIMATES

	hours
Commisioning repeater on 70cms: making good & alignment	80
Design and build crystal scanning circuits	40
Antenna construction	20
Filters	40
CTCSS detector	20
Vox unit	20
1750 Hz tone burst unit	10
Busy tone burst unit	40
Microsystem (adaption of existing board)	40
Program development	100
System integration	60
	470

Fine Crystals from the Old Lace Mill

Appearances can be deceptive. Deep in the centre of Somerset amongst the bountious cider orchards, sits an old Lace Mill founded by members of the Huguenot family, nearly three centuries ago. The Huguenots who were renowned for fine craftsmanship and prodigious output have endowed the area with a strong tradition of marketing innovation and high quality workmanship.



Today Webster Electronics continue the tradition, as they have since 1974, by manufacturing and supplying high quality crystal components in the purpose converted building.

The range now available has increased greatly to cover, in addition to precision crystals, a wide range of antennae, oscillators, filters, resistors, thermistors, coils and coil parts.

The Huguenot legacy is continued by Webster Electronics by insisting on quality and reliability.

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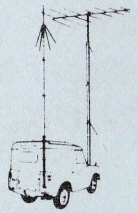

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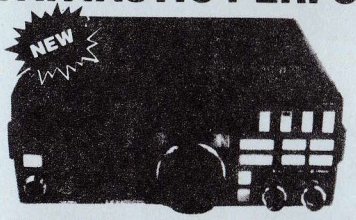

The FT-747GX is a compact SSB/CW/AM and (optionally) FM transceiver providing 100 watts of PEP output on all hf amateur bands and general coverage reception continuously from 100 kHz to 30 MHz.
A front panel mounted loudspeaker and clear, unobstructed display and control layout makes this set a real joy to use.
Convenient features include operator selectable coarse and fine tuning stems optimized for each mode. Dual (A/B) vfos, along with twenty memory channels which store mode and skip-scan status for auto resume scanning of selectable memories. Eighteen of the memories can also store independent transmit and receive frequencies for easy recall of split-frequency operation. Wideband (6kHz) AM and narrowband (500 Hz) CW IF filters are included as standard, along with a clarifier, switchable 20 dB receiver attenuator and noise blanker.
User programming for more advanced control by an external computer is possible through the CAT (Computer Aided Transceiver) System.
The transmitter power amplifier is enclosed in its own diecast aluminium heat-sink chamber inside the transceiver, with forced-air cooling by an internal fan allowing full power FM and packet, RTTY, SSTV and AMTOR operation when used with a heavy duty power supply.

FM UNIT.....£39.99
MMB38.....£22.00
TCXO-747.....£28.95

FT747GX R.R.P. **£659.00 inc VAT**

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FT712RH.....£375.00
DVS 1, voice memory unit.....£79.00
FTS12, CTCSS unit.....£60.38

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