

# P 5

Newsletter of the Severnside Television Group  
 Edited by Shaun O'Sullivan G8VPG

## The Chairpersons Christmas message ...

May I take this opportunity to wish you and your family a merry Christmas and a Happy New Year.

A reminder that this years Christmas Social Evening will take place at the Pavillion, Elm Park, Filton on Sunday 10th December 1989 at 7.30 pm. Please remember to bring your family along, they are always welcome.

Hopefully by the new year, improvements to the repeater transmitter will be under trial. Also under way is a framestore, which will enable transmitting stations with no look through facility to see their own transmission for a short while after they drop out.

For the new year, the Group may well be building some 10 GHz TV equipment, to evaluate its use for links to other sites or locations.

Once again, a big thank you to one and all for the tremendous amount of work done on behalf of the Severnside Television Group. I wonder if this is why Brian GW6BWX went to America, for a rest ?.

See you all on 10th December, please attend because I can't eat all the mince pies !!

All the best from Viv G1IXE.

## NEW GROUP PRODUCT LAUNCHED AT LEICESTER

Once again, thanks to the good offices of the BATC, the Group were lucky to be represented at the Leicester Amateur Radio show on 28th October. There was much more floor space at the show this year, and much of the traditional Leicester crush was eliminated, and not before time says I !! The BATC stand was located in the new hall, which used to be the roller skating rink, and was quite well sited alongside many other RSGB affiliated groups.

Anyway, the big news is the launch of G4BVK's new 1.3 GHz TV Transmitter. Ken was burning the midnight oil for some weeks before the show, and the pre-production prototype was on the stand, and attracted a lot of attention and favourable comment.

Like the companion pre-amp ( see review in the last issue ), the TX is very much a state of the art item, and has not been compromised as far as performance is concerned. It is fully phase lock looped, and operates on two channels - 1249 and 1255 MHz are standard but others can be supplied to order, a simple reference crystal change in the 5 MHz region being all that is required. A power module PA conservatively rated at 3 W is used, and all the RF circuitry utilises surface mount chip components and is located in a seperate box within the main case.

A second pcb contains the 6 Mhz inter-carrier sound generator and a very effective video clamp, which eliminates the distortion which some other designs can produce. Two audio inputs are provided, one at line level and the other suitable for direct connection of a mic.. Front panel controls are provided for video and audio level, channel and audio input.

The whole unit is housed in a die cast aluminium box size approx. 200 mm x 125 mm x 50 mm. I hope that a full review with some pictures will appear in the next issue, but in the meantime a data sheet is available from Ken G4BVK, and orders are being taken. The cost is £220 plus £2.50 postage for a fully built and tested unit.

Needless to say, our usual aerials and pre-amps are both in stock and available to make nice Christmas presents - full details in the last

Construction detail of the 28 & 48 el Loop quad

KEN STEVENS G4BVK.

All loops were made of brass rod and then silver soldered onto the top of 4mm countersunk screws and then bolted to the boom.

The simplest way to go about making the loops is to form the rod around a mandrill which can be made of wood. The rod is soft and can be wound around the mandrill in one long length some 9 feet or so. This should give you a tightly wound spring. You can mark across the coils with a marker pen before you slacken the spring. By simply cutting with a pair of wire cutters across the marks this will give you a number of loops which are ready for soldering.

The diameter of the loops decreases as you go along the boom therefore the mandrill must also decrease. The mandrill I used was turned down on a lathe cut in steps from the largest size to the smallest loops. After the loops are soldered you then can reshape the loops by forming them with a hammer on the mandrill.

The driver is made up of three loops mounted on a phasing line. These loops are different sizes to cover the large bandwidth required. Building the driver unit: first bend the phasing line into a small trombone shape. Then solder the loops on one at a time starting with the largest loop first. The phasing line is then mounted onto the feeder bolt assembly. The feeder assembly is simply a brass bolt drilled out so the solid coax can feed through it. Then the bolt with the driver unit can be simply bolted through the boom. By threading the coax through the bolt and soldering it, this will secure the coax to the driver assembly.

The dimensions for the boom are all taken from the reflector and I suggest when measuring the boom prior to drilling you measure it in the same way.

The difference between the 28 and the 48 element loop quad is merely their length and the diameter of the loops. The difference in gain would be around 2-2.5dbs. Gain of the 28el = 20dbi and 48el =22.5dbi.

Materials for building the loop quad

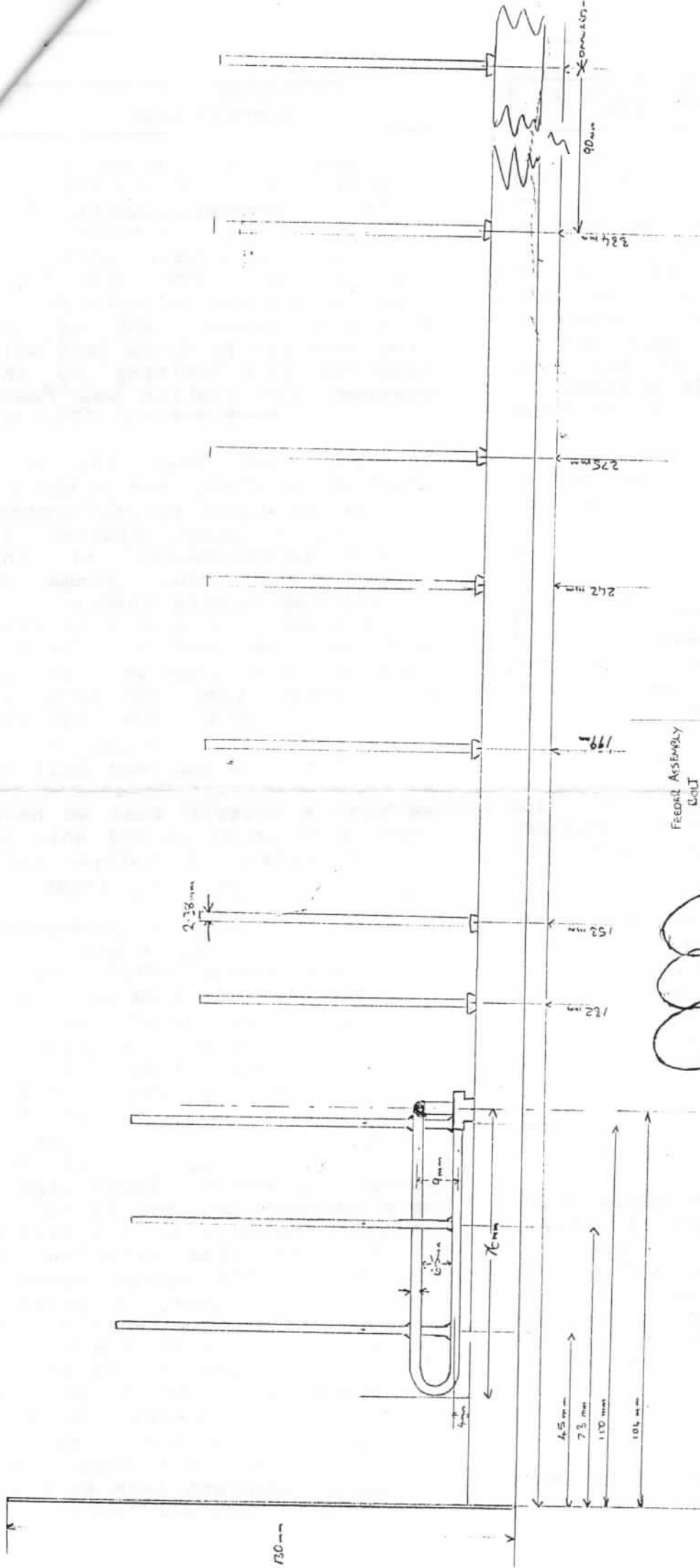
1) Brass rod (2.38mm). To build the 28 element version you will need approximately 6 meters of rod and around 12 meters for the 48 el.

2) Materials for the boom : For the 28 element beam I suggest using the 15x15mm aluminium with a small trombone support arm. Length of boom approximately 2.25 meters. The 48 element beam is almost twice the length, so needs a stronger boom, therefore I suggest 3/4x3/4 ins aluminium.

W.M.Stainless , Ltd  
Unit 6a  
Polygon  
Forth way  
Avonmouth BS11 8DP  
TEL 0272 821181

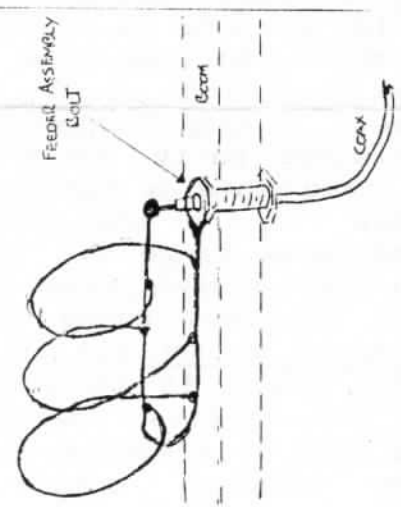
Supplier for brass rod and  
the 3/4x3/4 aluminium.

28 in - 20 dbi



INSIDE DIAMETER OF ELEMENTS

REFLECTOR	130 x 120 mm
DRIVER	(1) 78.5 mm 78.5 mm
"	(2) 73.5 mm 73.5 mm
"	(3) 71 mm
DIRECTORS	1 - 12 - 65.5 mm
"	13 - 20 - 63.5 mm
"	21 - 28 - 60.5 mm
"	29 - 45 - 58.5 mm



ALL WIRE ELEMENTS MADE WITH 2.38mm STAINLESS STEEL WIRE OR GUNS

## SATELLITE RECEIVERS

We still get a number of enquiries about the used satellite receivers which we used to be able to supply. Unfortunately, it is now a year since we have been able to get any from our supplier. We have tried a number of alternative sources, but it would appear that everyone is far too busy supplying new ASTRA systems to bother with a few second hand sales. Never the less, the Group has not given up hope, and we continue to search the market for good, used satellite receivers which are ideal for watching GB3ZZ. Keep reading "P5" and you will be first to know when supplies are resumed.

## SOCIAL EVENING

As you will have read in our Chairpersons column, the next social evening is on Sunday 10th December, at the usual venue of the Pavillion at the repeater site. Since this is the Christmas party, we are anxious to make this a "good do", and hence require the help of the members at large.

STG has always taken the view that precious funds should not be spent on socials if possible, since there is so much to buy for the repeater. Hence much of the food at previous socials has been donated, mostly by the officers and committee. However, this cannot continue indefinitely, and hence all members are requested to help in this direction.

If everyone brings along some food, such as packets of crisps, nuts, mince pies, cakes or savoury dishes, the load on the committee will be much reduced. Alternatively, a small donation of say £1.00 will go a long way to providing a splendid buffet. It might be a good idea to have a word with Viv beforehand, so that everyone does not turn up with dozens of mince pies !.

Your help is much appreciated.

## CONTEST NEWS

As usual, STG entered the International ATV Contest on 9/10th September, using Paul Greens callsign G7ATV/P. The event went very well, with very few problems. For the first time, we arrived on site on the Friday afternoon, and by the time darkness fell, we were well advanced with setting up the station. The station was ready to go by 3.00 pm on Saturday afternoon.

It was then that the wind started to blow, and with our further enlarged aerial system, the 23 cm beams started to rotate independently of the rotator and other beams !. Luckily, by turning them through 180 degrees, the wind blew them back and we had no further trouble. Conditions were not as good as last year, but we still did quite well. Our claimed scores are 7641 on 70 cm, with a best DX of 319 km, and 2521 on 23 cm with a best DX of 213 km. We hear a whisper that we have come first on 23 cm not only in the UK but also in Europe. Full details in the next issue of "P5" !.

Finally, you will be interested to learn that our night shift team were thrown into a major security alert at 3.00 am in the morning. Steve G6YRQ ventured outside to water the wurzels, and was confronted by a strange man, who ran away. Who can blame him you might ask, but shortly after, a large number of people were seen coming out of the woods. All the available lights were switched on, and it turned out that we were in the middle of a night time orienteering exercise by the nearby outward bound school. Everyone present was a little frightened for a while, and so it is planned to erect a flood lamp at the top of our tower next time, to provide better visibility and security at night. You readers tucked up in your beds don't know what trials our contest team have to go through to get our results !.

# MOD'S TO WOOD & DOUGLAS VID IF

KEN STEVENS G4BVK

Some months ago I had the opportunity to look into the problem we were having with the colour response of GB3ZZ. I had my suspicions of the response of the NE564 when I built a receiver for 23cm some years ago. It was found that the NE564 has a poor frequency response. To reproduce the full bandwidth of the modulation video signal it is important to have a flat response and the NE564 has not. It seems a bit pointless having Pre-emphasis and then De-emphasis networks to a precise law if the electronics being used have not.

It is possible modify the De-emphasis network to make up for some of the shortfalls of the NE564.

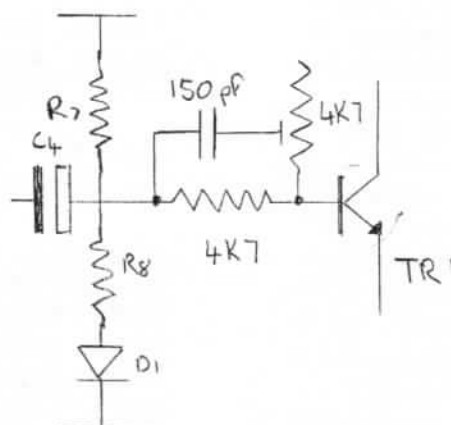
- 1) R1 Be changed from 300R to 120R
- 2) R4 Be changed from 18R to 15R

This will give an HF lift of 6dbs at around 5MHz. I also found the need for a small EQ peaking circuit on the base of TR1 to maintain its response.(fig 1) Additionally I also found that the VID IF has a poor ramping problem which is partly due to insufficient coupling.

- 3) Increasing C35 on VID IF board from 100uf to 470uf.
- 4) Increasing C4 De-emphasis board from 10uf to 47uf.
- 5) Increasing C5 De-emphasis board from 330uf to 470uf.

These mods are only my own observation on the problem we had with GB3ZZ. Colour through seems to be better and reports are good.

(fig 1)

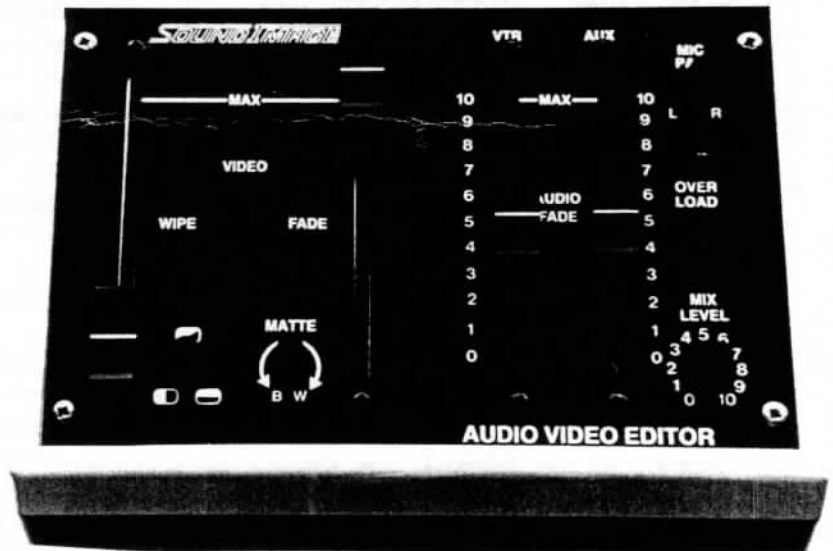


NB ; Fig 1 refers to the separate video de-emphasis board. I have tried these modifications, and there is a marked increase in the quality of colour signals. Ed.



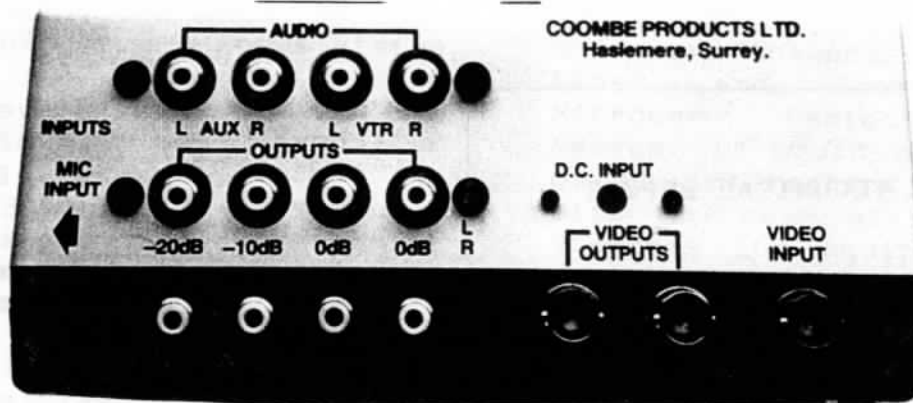
Part I of this article looked at some of the very clever edit decks which are now available on the video market. Doubtless, there are now new or additional models out, such is the pace of change in this area. In this final part of the article, I am going to look at some less expensive gadgets which enable the home video buff to get some quite professional looking results.

At this years BATC Convention in Coventry, a British company, Coombe Products were displaying their range of "Sound Image" equipment for the home video enthusiast, or maybe the small scale commercial user. Amongst these is a very good looking video processor which I would love to get my hands upon!. The cost was a not unreasonable £199. Also available was a video mixing unit at the same price, which gave very comprehensive mixing/wiping facilities between two sources of composite video signals. The snag is that both sources must be gen-locked, that is they must derive their syncs from a common generator. This facility is the norm on commercial video decks, but I am not aware of any domestic decks to offer this facility. I wonder who will be the first on the market to do this?. With the increasing popularity of home video and video edit decks, I am sure that there would be a demand in the specialist market. Also available is a small Audio Video Editor, which costs a reasonable £89. This is housed in a smart sloping front plastic verobox, with a black front panel containing white lettering. Lets look at the video side first of all. There is a single BNC input socket, but two buffered outputs so that an edit monitor can be driven. If only one output is used, a 75 Ohm BNC termination is supplied. The unit features two front panel slider controls marked



The front panel of the Audio Video Editor. The video controls are on the lefthand side, whilst those for the audio mixer are on the right. The slider controls work well, but the small rotary ones are a little fiddly, especially for larger fingers.

fade and wipe. Fade enables the input signal to be faded down to a matte level which can be set any where between white to black. Wipe enables the input signal to be wiped to the previously set matte level. The wipe direction can be continuously varied from horizontal through diagonal to vertical. However, the direction is set and cannot be changed, which seems a pity since an invert should not have been too difficult to achieve.



The rear panel of the Audio Video Editor, showing a comprehensive variety of facilities. 4 stereo audio outputs are provided at varying levels.

On the audio side, the unit features a two input stereo mixer. The levels for each channel are varied by front panel slider controls which match the video fade and wipe sliders. There is no adjustment for stereo balance. There is a third mono mic input for dubbing on commentary. The level of this can be varied and it can be panned across the stereo outputs from left to right, or any where inbetween. No less than four stereo outputs are provided, at varying levels to suit any deck.

There is no indication of audio levels apart from a front panel LED, which flashes when the levels are excessive.

DC power is supplied by an external mains unit, which is included in the price. This is a doctored Maplin battery eliminator. A brief look inside reveals a well made glass fibre pcb, with all the IC's etc socketed, and a general good level of construction. The instruction manual is adequate, but does not contain a circuit diagram, which is a grave omission for anything sold onto the Amateur Radio market. One criticism which I have is the 7812 voltage regulator chip, which is not heat sunk as supplied. The temperatures which

this reached were quite frightening, and I have added a heat sink to mine which dissipates the heat over a much larger area.

In use the unit works very well. The quality of the sound channels is to hifi standards, and the video wipe/fade controls enable a picture to be reduced to a matte level, where the video signal can be imperceptively changed with an edit deck, and then faded or wiped back up to signal level. Of course, the unit could also be used to provide a professional touch to your signals via GB3ZZ.

I would recomend the unit as being good value for money, at £89 plus £2.50 postage. The company advertise regularly in CQ-TV and most of the video magazines. This concludes this short series on Home Video Editing - unless of course you, the readers have some items which might interest others. Perhaps you have some equipment which you can write about, or maybe give some practical tips about how to go about the editing process. Please let me know if you can help, and don't forget to send all your impeccably edited programmes out on GB3ZZ !.

## GB3ZZ TECHNICAL REPORT

Regular viewers of GB3ZZ will know that just as the last edition of "P5" was published, the repeater underwent a number of significant enhancements.

First of all, the new Version 2.70 logic software was installed. For the first time, this allows users to control aspects of the repeaters operation remotely from their shacks. This is carried out by sending telephone type DTMF tones on the inter-carrier sound of the input signal. A very sensitive decoder in the repeater recognises these, and carries out the desired command. Most of these are concerned with selecting pages of "infotext", which is teletext style pages of information and news about GB3ZZ and STG in general. A menu page gets you started, and there are then over 40 pages to go through. Not all of these are fully programmed yet, but some of them are specially designed to allow quick and easy updating for late news etc. There is also a status page, which gives full details on the repeaters operating condition, and for those that can make head or tail of it, a read out of the machine code location currently being processed.

At this point, we must give credit to our software author Brian GW6BWX, who despite many other demands on his time, spent many long hours developing and debugging this very extensive and complex new programme. Brian is now working in America for a year, after which he will be returning to work in Swindon. He is hoping to buy a house on a hill top facing Bristol, so that he can still work GB3ZZ.

Of course, Brian worked in

tandem with Steve G8KUW, who constructed most of the repeater logic hardware. Between them, they have made GB3ZZ the most advanced ATV repeater in the UK, and that surely makes it the most advanced amateur radio repeater full stop ?.

The introduction of the new logic made possible our new user selectable input aerial system. In addition to the Alford slot omnidirectional aerial, there are now six small 5 element yagis, located below the transmit aerial. They are equally spaced, and have a 3 dB beamwidth of about 60 degrees. The sensitivity of the aerials is not much greater than the Alford slot, but selecting one does eliminate much of the ghosting and distortion which the slots can introduce on some signals.

The aerials were beautifully constructed by Ken G4BVK, with Ted G3JMY carrying out most of the heavy metalwork. Six individual feeder cables of Westflex 103 feed a motor driven co-axial switch, which is controlled by the all powerful logic computer.

In the next issue, it is planned to have a full account of how the logic works.

Of course it must not be forgotten that running a repeater is not just a matter of adding more high tech items to the unit. Ivor G1IXF, our long suffering Site Engineer, has been busy replacing guy lines, clamps and other items to ensure that the aerial system stays up safely. It is also planned to lay a new mains electrical supply to the repeater, direct from the building intake. The shack was also recently given a new coat of paint.

Finally, a glimpse of our plans for 1990. As Viv mentioned on page 1, we hope to improve the transmitter, thus giving an even better signal to stations in outlying districts. Secondly, Steve G8KUW is working on



or 525 lines ), a 4 input vision switcher, an electronic vision selector, fade to black, superimposing character generator, a reprint of the Chropredy testcard project, a 525 line video display generator for USA use, a teletext pattern generator, a dual standard PAL/NTSC colour coder and finally a video distribution amplifier. Obviously, BATC must be courting the American market with some of the 525 line/NTSC circuits.

The digital section includes a framestore, universal sync generator and a spectrum E-PROM programmer. Are people still using spectrums, I thought it all had to be PC compatible these days ?.

Finally, the RF section includes a re-run of the Elektor 24 cm ATV down convertor, a German originated 24 cm transmitter and a very interesting 3 cm transceiver. Now that 23 cm is so well established, perhaps it is time to think about the next band. Will 3 cm be the future boom band for ATV ?. G8OZP has been doing most of the pioneering work for ATV on this band, so it would be nice if there was more activity during 1990.

In conclusion, this book\* is excellent value, with a generally very good level of print quality. If there is only one project of interest to you, it has to be worth £3.50 doesn't it ?.

**"Microwave Handbook Volume I",** edited by M.W.Dixon G3PFR, Pub. RSGB, £19.80 members price inc. postage from RSGB booksales.

The long awaited RSGB Microwave Handbook has at last made its debut. However, it is only a partial debut, since there are to be two further volumes following on at an as yet unspecified date.

This volume contains sections on Operating Techniques, System Analysis and Propagation,

Microwave Antennas, Transmission Lines and Components, and Microwave Semiconductors and Valves. It would seem that many of the interesting and practical bits like actual circuit diagrams for equipment will be mostly in future volumes.

Never the less, this is a thorough and complete book as far as it goes. A feature throughout is a lot of BASIC computer programme listings ( in too small typeface ) for many tasks like QTH locator bearings and aerial gain calculations. There is a good guide to erecting aerial masts, which our contest team would have benefitted from reading in our early days !. G3JVL wrote the chapter on aerials, and it is very good, covering in detail the loop quad and wide band feed much beloved by ATVers, and also the Alford slot.

However, those familiar with Radcom and the RSGB VHF/UHF Handbook will recognise some familiar old chestnuts. The bit on parabolic dish aerials is lifted in its entirety.

Never the less, this is a good book for anyone interested in operation over 1 GHz, and when the set is complete, it will form the "Bible" for amateur microwave enthusiasts. It is not cheap, but apart from BATC books, what books are these days ?. The RSGB needs the money, and anyway, I expect that several of the local clubs will be adding a copy to their libraries for you to borrow.

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developing a digital framestore, which will enable you to see a frozen picture of your through video after you have dropped out. This project will also facilitate further experiments in digital video signal processing and enhancement. We're not resting on our laurels in 1990 !!.

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#### LETTERS FROM OUR READERS ...

Dear Shaun,  
Thanks for the useful notes in "P5" about the Worthing TX. I am now having a go at another one and offer the following ( with some diffidence ! ).

On digging into the plastic bag for C33, it struck me that it was somewhat skimpy looking for the specified 5-60 pF. One would expect the beefier size with more plates than the device I was looking at. Anyway, insofar as testing with a digital capacitance meter can be reliable, the supplied item proved to be massively under-size compared with a known 65 pF trimcap, by a factor of about 6 I should say.

If I am right, it is yet another instance of someone being misled by the colour coding. Both items are yellow but they seem to be vastly different in maximum capacitance.

Yours aye !  
Pat Janes GW1SXU.

*Thanks for your letter Pat, the first I have published from a reader. I wonder whether anyone else has had this problem, I know that a few of the fixed caps were wrong in my kit. Ed.*

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#### YOUR NEWSLETTER

Once again, I have been able to produce a 10 page newsletter, with a reasonable variety of articles in it. This time it is largely thanks to Ken G4BVK, who found the time to write about some the work which he has been doing. I am sure that readers will appreciate his efforts.

I have a very interesting article on the new logic by Brian GW6BW for the next issue, but after that the cupboard is looking somewhat bare. With the long, dark winter nights approaching, now is the time to sit down, and put pen to paper for your newsletter.

I am afraid that my desktop publishing programme is becoming a long running saga. No, it is still not running well enough to do much on it, but I have introduced some word processor innovations for this issue. Much of the letter pitch has been decreased from 12 characters per inch to 10, which should make it a little easier to read for our older members. I have also split many of the pages into two columns. Please let me know if you like the changes, since it is quite easy to reformat things once it is on disk.

#### BOOK REVIEWS

\* "The ATV Compendium" by Mike Wooding G6IQM. Pub. BATC. 104 pages. £3.50 inc. postage from BATC booksales.

Once again, BATC lead the way with excellent value practical books for the ATV enthusiast. The latest edition of the famous ATV Compendium is packed with projects for the ATVer, many of which are new and not previously published. The first section on video circuits includes a dual standard pattern generator ( 625