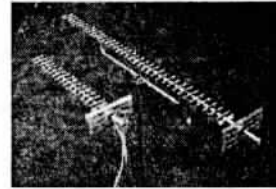




P5



Newsletter of the Severnside Amateur Television Group

Winter 1999

Annual bash

Don't forget to come along to the Group's annual Christmas Social on **Saturday 11th December**. This will be held beneath the GB3ZZ aerials at Filton, from 7:30pm, and will feature the usual attractions, including the Grand Auction and the Raffle. Please come along, and bring some items for the Auction and plenty cash! (*I hear that there is a lot of surplus video gear on offer*)

GB3ZZ refurbishment

The new antenna stack, described in the last P5, was installed at the GB3ZZ site on October 9th.



Thanks to Ivor, Ken and Ian for all their hard work on that drizzly Saturday. As well as installing the new aerials, we replaced all the original (*12-year-old*) rusted fittings with new stainless-steel ones. Sadly, the new aerials did not give a noticeable improvement over the old ones, and there was a problem with breakthrough in the new preamp, so more work on the roof was required. Further details of the work done on ZZ are given later in this newsletter.

It is now possible to view the 3cm output of GB3XG, as seen at the GB3ZZ site, by accessing 'ZZ, and keying in the DTMF sequence *86#. Similarly, the 'ZZ output may be viewed through 'XG, by keying DTMF 3. This is deactivated by keying 2, or by dropping out of XG.

Annual Table

Following a successful summer of portable operations, I have compiled the following informal table:

Station	band	power	distance
G0WJR/P	3cm	10mW	66km
G0WJR/P	13cm	800mW	24km
G4BVK/P	3cm	220mW	71km
G4BVK/P	23cm	18W	66km
GW3PYX/P	3cm	600mW	67km
GW3PYX/P	23cm	12W	66km
G7FEQ/P	3cm	10mW	67km
GW4NOS/P	3cm	50mW	71km

We have certainly enjoyed ourselves and had some fine weather this year, and as a result are planning more portable trips in the New Year. The Group will be running a small competition next year (see the details on page 2), and a trophy will be awarded to the leading portable station of the year, so better dust off your portable kit for 2000!

First Irish repeater

I've just heard that the *Cork Amateur Television Group* has been granted the first ATV repeater licence in the Republic of Ireland. This project was set up by a blind operator (*sic*), Aedan o'Meara, EI3EG, who only became interested in ATV last year!

The repeater's callsign is *EI2TVR*, and it has input on 1250MHz. The output is on **1293MHz**, and uses a *West Sussex ATV Group* design. The repeater is presently sited the RTE transmitter site at Spur Hill in Cork, also co-sited with the Cork 70cm repeater (*sounds like a good site!*).

I'm not sure if this is on air yet, but it's worth having a look for next time we get a good tropo opening.

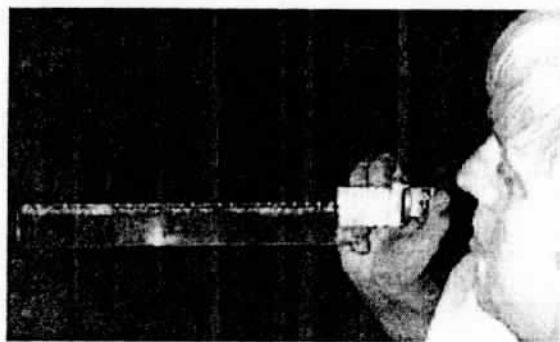
A parasitic array for 10GHz?

"You must be loopy to even consider it!"

Those of you who have balked at the thought of having a high-gain dish antenna for 3cm swaying about on the top of your mast may find the following of interest.

Ken G4BVK has recently been developing a loop-quad-type beam antenna for 10GHz. The design goal was to produce a compact beam antenna with low wind-loading which could achieve a gain of 20dBi. Although this is significantly lower than the gain of a dish, the beam would be compact enough to be installed right at the top of a mast, and maybe obtain a line-of-sight path which a dish mounted much lower could not attain. Also, this antenna will have a wider much beamwidth than the dish, and be less susceptible to "wind-modulation".

The G4BVK design uses a waveguide-section launcher, and then an array of loop-shaped parasitic elements to direct the travelling wave. The loops are formed from tinned copper wire, joined with solder, and stuck through a graduated plastic "boom" (available from all good stationery stores, priced around 15p!).



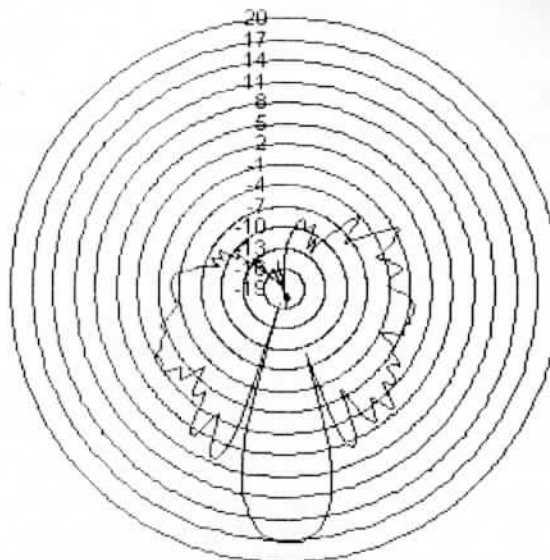
The size and spacing of the loops has been the subject of a fair amount of experimental iteration during the development of this aerial, involving polar pattern measurements in an anechoic chamber. With all the experience gained with soldering little loops together, I think that Ken could now go into the jewelry business!

The gains of the prototype aeriels were measured by comparison with a reference 10dBi horn antenna. The latest Mk 6 prototype has a forward gain of **17dBi**, a sidelobe level of -10dB, and a horizontal half-power beamwidth of 20 degrees.

An initial attempt to improve the gain by doubling the boomlength proved unsuccessful: there was only a modest increase in gain, and the main lobe split into three. However, Ken has not given up,

and is now doing some further research on element scaling factors. We hope to be able to report further developments in the next issue.

G4BVK mk6 loop yagi at 10.3 GHz



G4BVK & G0WJR, October 1999

More 13cm equipment

More low-cost FM-TV equipment for the 2.4GHz ISM band is beginning to appear. In an earlier edition of *P5*, G6TVJ gave a detailed review of the *Picotronic* units, and now I see that in the latest *Farnell* catalogue, page 1301 (*Farnell's* website is www.farnell.com, but it's rather slow!), a tx/rx pair can be bought for £84 +VAT. Although more expensive than the *Picotronic* units, these are complete with video and audio outputs (rather than baseband) and only need a 12v supply. If the design is the same as the *Picotronic* units, then a change of the reference crystals is all that's required to bring them into the Amateur band.

Mouse eats repeater!

A brief unscheduled interruption in service of GB3XG took place on Friday 19th November.

An investigation of the fault by Ivor and Nigel the following day found one of the wires in the logic unit severed, and mouse droppings were spotted nearby! Repairs were quickly effected, and the repeater was soon back on air.

Does anyone have a source of armoured (or even poison-coated) wires?

STG Millennium Contest

In order to promote ATV (especially low-powered portable operation) in the year 2000, we have decided to run a little competition within the Group.

In contrast to previous BATC and IARU single-session events, this is a *cumulative* contest, where scores may be accumulated in up to ten sessions. These sessions are not even on fixed days: it is up to each entrant to select their best ten sessions within the scoring period. Given the time taken to set up distant contacts, especially with low power and very narrow beamwidth antennas, it would probably be better to devote each session to skeds with a small number of stations, rather than trying to work dozens of stations in a single day. A new scoring algorithm has been devised, which takes account of the transmit power used, and thus encourages QRP operation.

The **rules** are as follows:

1. There are two categories for entries, Portable and Fixed.
2. **Pictures** must be transmitted, not just number captions (*see note 1*). For the contact to be valid, the picture must be correctly identified on talkback by the receiving station *at the time of sending*. A different picture must be used for each contact in a given session.
3. **Points** are awarded for each FM-ATV contact in the Amateur bands above 1GHz, according to the following equation: (*see note 2*).

$$\frac{\text{distance in km} \times \text{frequency in MHz}}{\text{transmit power in dBm}}$$

4. Only one contact per band per day per site with any particular station may be claimed.
5. Contacts through repeaters shall **not** count for points.
6. The scoring period is any ten days (chosen retrospectively by the entrant) from 1st January to 30th November 2000.
7. Final claims must be received by the adjudicators by 5th December. The results will be announced at the Christmas Social, and fabulous (!) prizes will be awarded to the winners.
8. Entries will only be accepted from paid-up STG members.

Note 1. Still pictures and computer-generated images are permitted.

Note 2. Power in dBm = power in dBW + 30. Powers below 1.25mW shall count as "1".

If the above scoring system is clear as mud, here is a worked example:

G0WJR/P, July 11th 1999				
<i>QSO with</i>	<i>distance</i>	<i>frequency</i>	<i>power</i>	<i>points</i>
GW3PYX/P	66km	1249MHz	18W (45dBm)	1831
GW3PYX/P	66km	10315MHz	10mW (10dBm)	68079
GW4NOS/P	71km	10315MHz	220mW (23dBm)	31842
G1HIA	24km	2330MHz	800mW (29 dBm)	1928
Total				103680

If you fancy having a go, but don't have the gear, the Group is building up a set of portable equipment available for loan to any member who is not already suitably equipped.

We may also be operating a multi-band station from the Group's contest site on the Mendips for one or more weekends during the summer.

Ross G0WJR & Ken G4BVK

P5 Review: an excellent video editing system?

Mike G7GTN reviews the Matrox Rainbow Runner add-on board

Having just purchased the *Rainbow Runner* add-on card for the *Matrox Mystique*, I thought that others may be interested to read a report of the functions available. First, this card is priced at a very reasonable £130 inclusive from most suppliers, so this is currently one of the cheaper options available for editing video at home. "Ah", I hear you say cheapest is not always best, and you may be partly right in this case.

The software is the first hurdle to be overcome once you have installed the piggy-back style card onto your *Matrox Mystique*. You cannot use this board in conjunction with any memory up-grades that you may have installed, so you will need to have a 2MB or 4MB *Mystique 220* to be able to use this system; these types of cards seem to be finding their way into more and more new base-level Pentium computer systems.

The video inputs and outputs are taken from the 15-pin "D" connector which is part of the normal *Mystique* card: quite a neat solution which does not tie up any of your backplate expansion slots.

A few more words on the supplied CD-ROM which contains the operating software to tell the system that the daughter board has been installed: well, quite simply a complete nightmare from start to finish! I ended up installing it three times before concluding that there must be a bug fix available. On the last attempt, everything went as expected and as described in the comprehensive user's manual which accompanies the unit. It's at times like these that you almost decide to spend the £600+ for a well-known system, only stopping to realise that these too can be just as troublesome.

When you first install the software you can run a supplied program called *connect wizard*, this is used to make sure that you can get video into and out of the computer. If there are any problems, the program will suggest ways to try to resolve these issues.

To get the video into the computer you may use the supplied PC-TV remote control program, this is as simple as connecting your composite or S-Video source to the sockets and playing in the scenes you require. You can also use this card to provide a TV-output, so you can for example play your favourite games on the large screen. I have made no mention of sound input or output here, as this is all handled by whatever type of sound card you have installed in your computer. I had no problems with a *SoundBlaster* for both capturing and playing back sound to my *Panasonic* VCR. More expensive cards such as *Fast's AV Master* also rely on the computer's existing sound card.

Rainbow Runner comes with a set of plug-ins for use with *Adobe Premiere*, which allow you to use exact pre-sets for your editing work. I used both the pseudo S-VHS-quality as well as the VHS-quality with no problems.

The card is supplied with *ULEAD MediaStudio 2.5* video edition for your editing work; I decided to use *Adobe premiere 4.2*, which I find to be easier and quicker to use, there are also far more transitions.

As soon as you start to use a computer for video editing, you realise that your current machine is never fast enough, in terms of the amount of hard disk space and also in the processing speed. The processing speed pays a major part in how long it will take to render your scenes, that is create the final product for output to videotape. The price of Ultrawide SCSI drives has started to fall now so you can for example purchase a 4.3GB IBM unit for just over £198, which compares extremely well with just over four years ago when a well-known brand name 1GB unit would have cost you £1000 plus.

Whatever video editing software you decide to use, you should save your projects every couple of minutes, as you may find as I did that you have frequent and inexplicable system crashes.

The *Rainbow Runner* add-on does not seem to perform any worse than any other card currently available in the domestic market, but does highlight as well as any other system the fact that you need a very stable computer system to do digital non-linear video editing work.

For the price, there is not much else that even comes close, although *Hauppauge* have just bought out a new system grandly entitled *Video Wizard*, which is supposed to handle full S-VHS quality at 785x586.

If you already have a *Mystique* graphics card installed in your system, then this is probably a good route to follow, as you can be sure that both will operate together with few major compatibility issues.

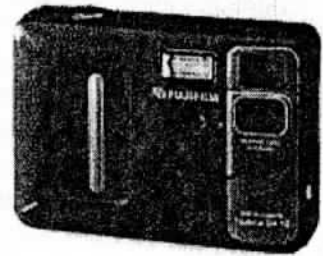
It is the whole concept of editing on your P.C with very reasonably-priced equipment like this that will help to kick-start the video revolution on the personal computer for the masses. In short, we can expect the next year or so to bring a lot more goodies for all our home movies and editing work.

Mike G7GTN, June 1999

P5 Review: digital (stills) camera

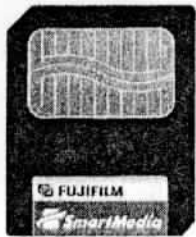
Here's something to ask Father Christmas for?

FujiFilm DX-8 digital camera



When operating on ATV, especially portable, I've often had the need for a compact battery-powered PAL video source of still or moving pictures. Back in January, I purchased the Fuji DX-8 digital camera, and have found it almost ideal for this application, and also very useful in its own right.

Most important for a power-thirsty portable piece of electronics, it runs off four standard AA batteries: with my rechargeable Nickel-metal-hydride cells, I find that I get around an hour's almost continuous operation, or a couple of weeks' occasional photography. The unit has a tiny LCD screen on the back, which is not really bright enough for outdoor viewing, but the alternative PAL video output (on a 3.5mm socket on the side) is absolutely ideal for driving an ATV transmitter. In "viewfinder" mode, it provides continuous moving pictures, or it can of course continuously play one of the still pictures stored in memory.



The memory is a wafer-thin *SmartMedia* card (see left) inserted in the side of the camera. The supplied card has 2Mb capacity, and can hold around 30 pictures, and I've since purchased an additional 16Mb high-capacity card, which can hold up to 250 images. I keep the 2Mb card with useful ATV images on it, and use the other for general photography. The picture resolution is 640x480 pixels, with two JPEG compression modes (x11 *normal* or x8 *fine*). More compression means more pictures can be stored, but at lower quality. For ATV transmission of the full-frame picture, *normal* mode is good enough, but if you want to expand a portion of the image, *fine* mode is better.

As well as a built-in flash unit, the camera offers macro focus, down to a couple of inches, which is perfect for photographing diagrams in documents for transmission on-air.

Some amusing picture effects are also possible: sepia toning for that olde-worlde look, plus concave, convex, wide and slim image-stretching.

The camera comes with a serial-link cable and software to take the pictures to and from a PC COM port. Note that the *Fuji* programs only run in *Windows 95* or *98* operating systems, not *3.11* or *NT*, but *MGI PhotoSuite* will run on those platforms, and do the same job. I've also purchased a *FlashPath* disk adapter, which allows the *SmartMedia* card to be read on a 3.5" PC diskette drive (a 3.5" diskette with 16Mb storage is sometimes useful in its own right, too!). Once on the PC, the images may be used for SSTV, emailed or may even be edited and sent back to the camera: this is very useful for test cards, captions, etc.

The only disadvantages I've found with the system are a built in power time-out, which shuts the camera down after two minutes in one mode (awkward for continuous portable transmission) and the low-light handling is nowhere near the performance of camcorder CCDs (but you can always use flash and store a still picture). No more need to play a torch across the caption card when operating portable at night, Jim!

In summary, this camera does not approach the image quality of the latest *MegaPixel* units, but has many features ideal for ATV operations. In January 1999 the camera cost just under £200, and I guess they are available second-hand for a lot less now. There is also a new model, the **DX-10** (pictured above), on the market now at under £200.

Ross GOWJR, October 1999

I'm hoping to publish further contributions on this subject in the next newsletter, so if you can write any comments on your experiences with this technology, please forward them to me.

Latest developments at GB3ZZ

For some time, it has been a goal of the Group to renew the antennas at GB3ZZ, which have been in place since 1987.

The first stage of this task was effected by a working party one fine Friday evening at the end of June. After some "gentle persuasion", of the rusted old fixing hardware, the original antennas were lowered and removed from the mast. This allowed us to inspect the Heliac feeders, and measure their losses, to confirm that they were still OK: happily they were.



Ken, Ivor and Matthew on the roof at Filton, working on the old 'ZZ antenna stack

In order to retain some service from the repeater, a temporary pair of antennas, loaned by Ivor, were raised into position. The temporary receive antenna was a high-gain beam, pointed to the NE, so only stations in that direction (*or very close locals*) were able to access the repeater.

As reported in the last *P5*, over the summer Ian put together a new antenna stack, incorporating brand-new antennas and preamp. This was erected one wet Saturday morning at the start of October, when we also renewed all the metal fittings with stainless-steel hardware.

Tests soon revealed a problem with the new omni-receive antenna: there was some breakthrough of BBC2 TV into the sound channel when the repeater was relaying weak signals. This was deemed most likely due to a parasitic oscillation around 2GHz in the preamp.

Furthermore, although the temporary transmit antenna had yielded improvements over the original, the new antenna was reported as giving a weaker signal to the North than its predecessor.

Tests of one of the original Alford slot antennas soon revealed a likely reason: the polar pattern is not very omnidirectional, so the orientation of the antenna can result in a 3dB variation of coverage in a particular direction. With an FM signal close to

the onset of limiting, 3dB can represent a significant change in signal-to-noise, (*and hence picture quality*).

At the same time, the "Jewson radome" was tested for its transparency to RF: happily no significant losses were measured.

Full details of the tests on the Alford slot antenna are given later in this newsletter.

Another site visit was made in mid-November by Ivor, Ken, Ian and myself. Lowering the mast again proved much easier, thanks to the new stainless hardware. The transmit antenna was rotated to improve coverage to the NE, and the receive antenna and preamp assembly was exchanged for a replacement set, which is now powered up the feeder, via a bias-tee. This removed the problem with BBC2TV breakthrough, and has improved sensitivity.

We were quite happy with this situation, until the very next day, when it was discovered that no-one was able to gain access. There were worries that the mast had come down, or the GaAsFET in the new preamp had failed, but it turned out to be a problem at the bottom end: the mechanical strain of the thick Heliac cable had broken the new bias-tee. A replacement heavy-duty version was speedily built and fitted the next day.

To help stations to the North-East of 'ZZ, a high-gain loop-yagi receive antenna has been added, and connected to port 0 of the antenna switch. To select this, key in the DTMF sequence ***00#**.

A complete list of valid DTMF sequences will be included in the next issue.

Meanwhile, the original VCR used by the repeater has been repaired by Brian GW6BWX, and the faults with the Meteosat weather satellite receiver have been traced and repaired by Jim GW3PYX. Both these units should be re-installed in the repeater before the end of the year.

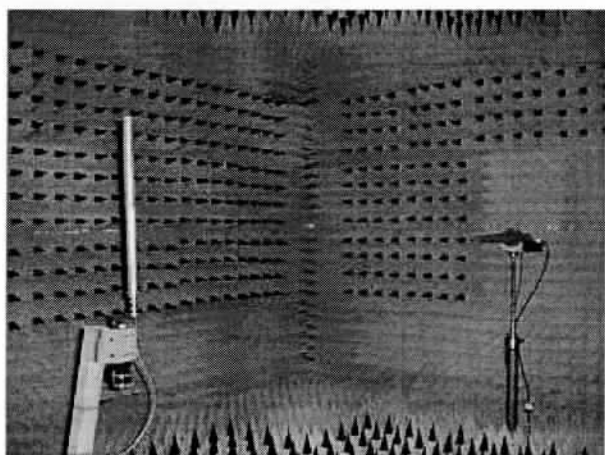
Recent tests on the new slot antenna removed from the site have revealed that an apparent manufacturing defect has resulted in its radiation pattern being tilted upwards from the horizon, and it is suspected that the current transmit aerial may have the same fault. Another morning on the roof is therefore planned, to replace this aerial.

Many thanks to all the Group members who have supported our work on 'ZZ this year. I hope that these and further improvements will bring a worthwhile increase in activity in the coming year.

Tests on GB3ZZ Alford Slot antenna

After installing our new Alford Slot antennas at the GB3ZZ repeater site, we did not obtain the expected coverage, with signals being down to the NE. It seemed that the antenna pattern was far from ideal, so we decided to investigate further.

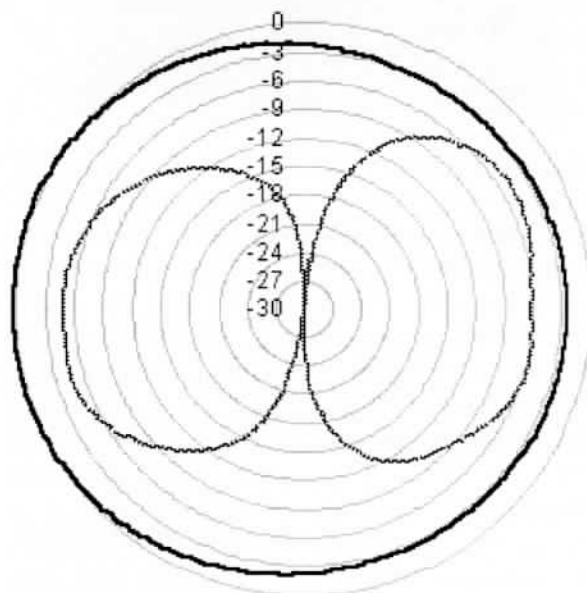
By chance, I was at this time involved in setting up new aerial measurement facilities at the University, and so was able to use one of the old Alford Slots from the 'ZZ stack as a test antenna while the new system was under development.



Automatic antenna test range in use at 1.3GHz

The polar radiation measurement did show an asymmetrical pattern, with some 3dB of gain variation. The maximum radiation was from the slotted side of the antenna; here the gain was about 5dB higher than a reference dipole.

Polar plots at 1315MHz

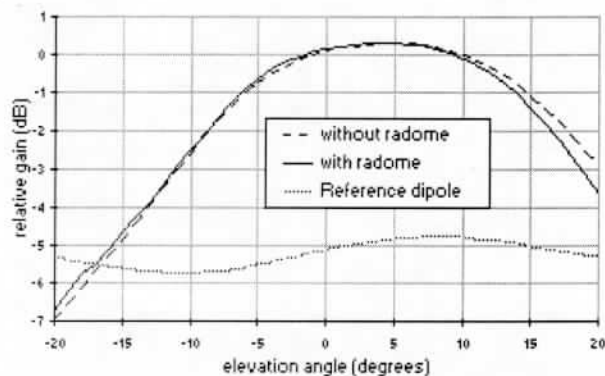


Approx. gain of slot
5.2dBd = 7.3dBi

— Alford slot with radome
..... Reference dipole

In the elevation plane, a slight up-tilt of the radiation was measured, but this could be due to the measurement setup: the centre of rotation was at the end of the antenna, rather than its centre. In this case, the range would be slightly shorter as the antenna was tilted forward (*elevation > 0 degrees*).

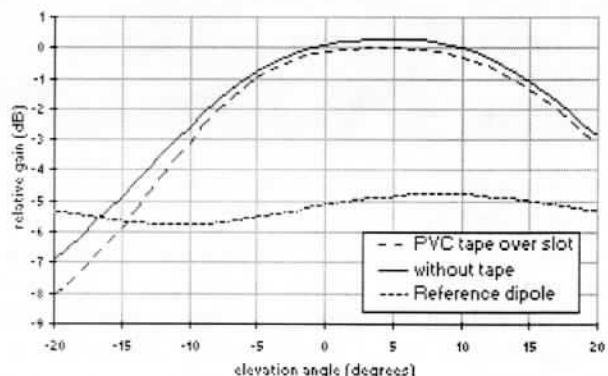
Elevation plots of Alford slot at 1315MHz



A much more important result is the fact that the plastic radome tube has no significant effect on the antenna's radiation.

In contrast, removing a piece of green PVC insulating tape which originally covered the slot did result in a measurable improvement of about 0.5dB. Happily this tape will not be required when the tube is used to protect the antenna from the weather, but there's an important lesson: be careful how you weatherproof your microwave aerials!

Elevation plots of Alford slot at 1315MHz



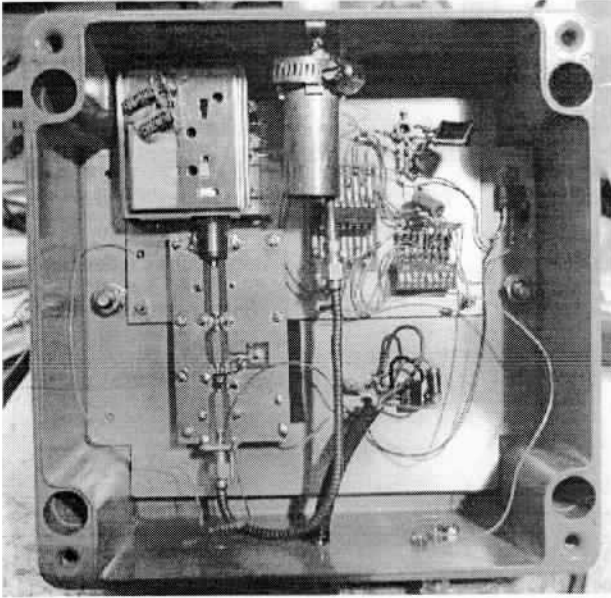
Recently, measurements of one of the new slot antennas have revealed problems with the elevation pattern: more details of these in the next issue!

Many thanks to the Centre for Communications Research, University of Bristol for use of their antenna measurement test range.

GOWJR, October 1999

13cm beacon

Following his excellent article in the March *P5*, Ian G6TVJ has built a low-power 13cm ATV beacon transmitter based on the *Picotronic* module.



He has recently tested this from "an elevated site in central Bristol".



During tests in October, Ian G8XZD was able to receive this from his QTH in "downtown LA" (*Long Ashton*) using only a simple bowtie antenna. Ian can activate his beacon on request, so if any of you want an on-air signal on 13cm, do give G6TVJ a call.

Our previous *P5* article on 13cm equipment referred to a 1 watt PA kit from Philipp Prinz DL2AM. Philipp now has a website which gives details of this and his other excellent kits, at:

<http://home.t-online.de/home/prinz.dl2am/>

Winter activity sessions

Now that both our repeaters are back in action, the long dark winter nights offer an ideal opportunity to do some ATV operating from the comfort of your homes (*except if you're in the G3KAC shack with the temperature at 9°C!*).

As we've seen recently, two-way full-duplex sound and picture QSOs using GB3ZZ and GB3XG are certainly an enjoyable way of "video-conferencing" on the amateur bands.

As well as the usual highbrow technical discussions (!) and live shack pictures, we hope to see plenty of recorded programmes, maybe featuring film of the solar eclipse or other events of note from 1999.

Season's greetings

As this is the last newsletter of the year (*or of the Millennium, in the opinion of some!*) I'd like to take this opportunity to wish all our members and their families a very happy New Year. I hope to see many of you on ATV in the coming year, and would be even more delighted to receive some input to *P5* from you!

Contacts

NEW Severnside TV Group WebSite:
<http://www.qsl.net/stg>

P5 Newsletter & STG matters:

Ross Wilkinson G0WJR
13 George Court, Hampton Park, Redland,
Bristol, BS6 6LL.
Tel. 0117 973 8794
email: g0wjr@qsl.net

Membership:

Paul Stevenson G8YMM
14 Camelford Road, Greenbank,
Bristol BS5 6HW.

Aerial sales:

Mike Stevens G7GTN
The Beeches, 13 Downs Road,
Westbury-on-Trym,
Bristol BS9 3TX.

Edited by G0WJR, November 1999