

## Newsletter of the Severnside Television Group

# 10 GHz TV REPEATER TRIALS

Work on our proposed 10 GHz ATV Repeater continues to progress. A major landmark on this path was passed on 29th November last year, when the first site trials were carried out. Ted G3JMY, Ivor G1IXF and Viv G1IXE assembled on the proposed site and set up a transmitter operating on 10.15 GHz, which is the expected output frequency. The aerial used was the slotted waveguide that the repeater will utilise. It was a typical cold November afternoon, but thankfully the rain that we had been having rather a lot of at that time had stopped.

### REPORTS RECEIVED

A number of people with 10 GHz receiving equipment were eagerly awaiting the switch on to see if the signals were watchable. For receive, everyone was using converted satellite TV LNB's, in conjunction with dish aerials of various sizes. The reports received were very encouraging, and suggest that we should obtain good coverage of the Bristol area. Roy G3FYX at home in Winterbourne sent in a P5, commenting that more deviation was needed. This was a comment that everyone made, and a suitable adjustment will be made to the transmitter in due course.

Phil G1HIA at home in Horfield reported a P4. John G3RFL at home in Portishead saw between a P0 to P3 with QSB, which I think surprised even him. Ken G4BVK at home in Hanham utilised his main steerable 1.2 m satellite dish, but still could not see anything. Later investigations showed that one of the stages in his LNB was u/s. Does anyone know what device is used in the last RF amplification stage of a Skyscan L1 LNB, and can they let us have a working spare device? Finally Steve G8KUW dashed around

/portable to various sites in the Filton area, but also drew a blank.

### COVERAGE MAP

The results from the days work will enable us to produce the necessary area coverage map and complete the licence application forms. However, we must first of all get formal permission to use the site. A written application has been made, and we are now awaiting a response - with our fingers crossed!. As some of you "in the know" are aware, it is a super site, and hence the reason why at this stage we are keeping it a little "under our hats". All will be revealed in due course!.

Finally, thanks go to Ted, Ivor and Viv for enduring the cold of the site all afternoon, and all of those stations above that gave us signal reports. •

## BSB SATELLITE SYSTEMS

Those of you that came to our Christmas Party last December cannot failed to have noticed the large stack of BSB Satellite TV systems that were on display in the corner. What you probably did not notice however was a few poor souls who spent the first hour of the Party on the cold and very dark roof of the building setting up the squarial dishes to receive pictures from the Marco Polo satellite!.

Once these were aligned, we were able to view very strong signals, with the signal strength display built into the receiver software assisting us greatly. Of course, by the time that you read this, the Marco Polo satellite will have been switched off. However, with an appropriate change of EPROM in the receiver to convert from DMAC to D2MAC, signals from the French

Telecom satellite may be seen at incredible strength.

### BARGAIN OFFER

The systems that we displayed were secondhand, having been received by dealers in exchange for ASTRA systems once the close down of the Marco Polo satellite was announced. Ivor G1IXF was able to negotiate a very favourable price for the Group, and we can supply the complete system comprising Receiver, remote control handset and either a Squarial aerial or the miniature offset dish. We will also throw in a D2MAC EPROM. The price is £20, but no guarantees at this price!. When you consider that a year or two ago, this lot retailed for about £400, this has to be the technology bargain of the year!

The receiver is very sensitive, and if the DMAC decoder is by-passed, it makes a very good receiver for GB3ZZ. I am also told that the Squarial aerial can be retuned quite simply, and then works very well on 10 GHz. There was a good article in the December 1992 issue of the "Shortwave Magazine" about how convert these receivers for other uses, and it is well worth while getting hold of a copy of this. •

## ECHOSTAR SR50

Many people were interested to read about the Echostar SR50-S satellite receiver reviewed in the last issue. This you may recall was the new "DX-ers" satellite receiver with manual tuning, variable bandwidth and many other features of great benefit to the enthusiast. We have used the IF unit from it in the new GB3ZZ receiver, and it works extremely well with Amateur FM TV signals.

We have supplied a number of these to members, at a cost of £139.00, brand new, boxed and guaranteed. Postage and insurance to UK destinations is £6.

00 extra. One advertiser in the "Shortwave Magazine" is charging £186.82 including VAT and postage for the same receiver. At the time of writing, I have one in stock at the above price. The price may have to increase as a result of currency fluctuations, so let me know quickly if you want one. ●

## CLUB TALKS

For the first time in a long while, at the time of writing we have no bookings for club talks this year. As many of you know, the Group has always made a point of travelling around the local ( and some not so local ! ) clubs to wave the flag for ATV, and GB3ZZ in particular. If you belong to a club that would enjoy a presentation on the general subject of ATV, please get in touch with us. We can slant the subject in a variety of ways, such as a general view of the entire ATV hobby ( briefly covering 70 cm, 23 cm, DX-TV, video etc ), a beginners introduction to 23 cm FM TV ( supported by sales of our book "A Guide to 23 cm Television" ) or something a bit more technical concentrating on our repeater GB3ZZ. In support of the weather satellite facility on GB3ZZ, we also offer a beginners introduction to weather satellite reception. ●

## CHRISTMAS PARTY

It seems a long time ago now, but back in December we held our Christmas Party at the repeater site. I think that this must have been one of our best attended and most successful ones yet - the room was full of happy Group members and their families.

Viv, Ivor and Paul G8YMM spent a large part of the day preparing the room, which was transformed with Christmas decorations and soft, coloured lighting. A splendid buffet spread was laid on by members of the committee, and this was augmented by

by many members bringing along various goodies. As always, the bar was well stocked with members donations.

The draw for our annual raffle took place, and this was followed by our traditional auction sale. This was conducted with customary expertise by our founding Chairman, Roger G4ZQF, and a good sum was raised for Group funds. It seemed that in no time at all,

the evening was at an end.

Thanks must go to everyone who helped make the evening such a success : All those that prepared the room, food and drinks : Everyone that bought raffle tickets : All those that brought along donations for the auction and everyone that bought items : and finally of course, all those that came along and made it such a good evening. ●

## DX-TV NEWS

by Stephen Michie G7KXD

By the time that you are reading this issue of "P5", keen DX-TVers will be preparing themselves for the start of the main Sporadic E season. This usually starts in early May, and will then continue through till about September. Of course, it is possible to see signals at any time of the year, but they are much less frequent outside of the main season.

### AERIALS

As remarked upon many times previously, it is quite easy to receive Band I DX-TV signals via Sporadic E, since when the signals are present, they are often quite strong. Our regular correspondent Stephen Michie G7KXD has sent in some details of the equipment that he uses. For Band I, he uses half wave dipoles. He doesn't say so, but I expect that he has more than one, perhaps arranged to favour particular directions. I am also not sure whether they are mounted internally or outside, but I know from personal experience that even with internal ones, good results may be expected. For UHF, Stephen uses a stacked dipole grid array with about 13 dB gain ( often called a "bow-tie" array ). These aerials have the advantage of having good gain, enough bandwidth to cover all of Band IV/V and a beamwidth that is quite broad. Since DX-TV signals may come from a variety of directions, this can be a positive help when searching for signals.

### RECEIVERS

Stephen uses a couple of receivers. The first is a Barco multistandard set that will receive PAL or SECAM and the French system L. Similar multistandard sets are available from a number of specialist stockists that advertise in "CQ-TV" and "ShortWave Magazine". Alternatively, they can be bought over the counter from many of the retailers in Tottenham Court or Edgeware Road, London, since there is a large export trade in the capital. The second receiver used by Stephen is a D100 convertor, which is used to drive a standard monochrome portable set. This is a very useful device that converts Band I and III signals to UHF, so that they may be watched on a standard television set. The big advantage of the D100 is that it has several video IF bandwidths, down to 2 or 3 MHz. This is really useful for picking out the weak signals, particularly when a particular channel might be swamped by adjacent strong signals. Ken G4BVK has used the same technique in his 70 cm ATV contest receiver ( as used by G7ATV/P ). and I have seen how effective it can be on very many occasions.

### SIGNALS SEEN

What can you expect to see with a set up like this ? Stephens log for the end of the summer and autumn last year is packed with interesting signals from all over Europe. On 4th August, RUV Island from Iceland was seen. The following day, pictures were seen from Moldavia and Czechoslovakia. On the 14th, there were pictures from the CIS

# A Blot on the Landscape ?

I am sure that we have all met people who navigate by pubs. You know the sort of directions that they give you : left at the Crown until you reach the Masons Arms etc. I once worked with an Engineer who could navigate by the boilerhouse chimney stacks that he had worked

## DX-TV NEWS *Continued* ..

and on the 19th, Norway. The 25th featured a large opening that went on throughout the day. Signals viewed included MTV Hungary, TVP Poland, TVE1 & 2 Spain, RAI ONO Italy, SRG1 Switzerland, Canal+ France, HTV Croatia, CST Czechoslovakia, TVB Beograd Serbia and SVB Sweden.

## TROPOSPHERIC

September was a very poor month with very little seen, but in October there was some good tropospheric propagation on UHF. On the 7th, Stephen saw signals on a number of channels from Denmark and Germany. On the 8th, these were followed by signals from Luxembourg, Belgium and Germany. The 13th saw signals from the Netherlands. Finally a couple of late Band I Sporadic E openings on the 15th and 29th included signals from CST Czechoslovakia, Slovakia, Bratislava, MTV Hungary, HTV Croatia, RAI ONO Italy, Canal+ France, and TVE Spain.

## FURTHER READING

Hopefully, this will have wet your appetite for the forthcoming season. For further information, I can recommend the book "A TV-DXers Handbook" by Roger Bunney, published by Bernard Babani ( No. BP176, ISBN 0-85934-150-X ) priced at £5.95. This is packed full of all the information that you need to begin this interesting aspect of our hobby. Finally thanks go to Stephen Michie G7KXD for supplying all of the information that went into this column. We look forward to seeing how the 1993 season shapes up. ●

on. Radio Amateurs have another variation on this theme : they can navigate by prominent aerial systems that they have known !. None the less, however much we are in love with our beautiful aerial farms, we have to face the fact that to the uninitiated, they are at best tolerated and more often are actively disapproved of. So what can we do to make our essential installations more acceptable and what control can the local council / planning authority exercise over us ?.

## PREVENTION

Firstly, in a similar manner to my last article on TVI, there are some preventative measures that we can take. Planning and TVI matters are often inter-related in so far as neighbours will frequently tolerate an installation until it actively starts to cause them trouble.

This can take the form of interference, or perhaps it rattles noisily in the wind or is located on a shared chimney stack whose structural stability they are concerned about. The moment that they suspect that your aerial is causing them TVI, they will start to think of ways of stopping the problem, and this all too often takes the form of a telephone call to the Council. Therefore, try to make certain that you are not causing TVI and that your aerial is quiet when the wind blows.

Another important point is to try and make your system as unobtrusive as possible. A long multi-element beam that swings over your neighbours property will not endear you to him. Neither will a sixty foot tower that is clearly visible from over half a mile away. Therefore think carefully about what sort of aerial system that you need, and see if you can reach an acceptable compromise between performance and visual harmony.

## PERMISSION

What sort of aerial system needs

planning permission ?. This is a difficult question to answer, since it varies from place to place. If you live in a conservation area or in a listed building, any sort of external aerial might be unacceptable. Hopefully you will have checked this type of matter before you moved in, and also would have got your solicitor to check that there are no restrictive covenants on your property relating to aerials. If you read the planning laws literally, then almost anything can be construed to need planning permission. In practice, things are seldom this bad. I reckon that unless you are unlucky or have deliberately awkward neighbours, most people can get away with a small VHF type array on the chimney pot or on a light pole bolted to the side of the house, or a reasonable array of HF wire aerials.

## CONSULTATION

One thing that I would not recommend is to ask the council what is acceptable. Doing this draws you to their attention, and once you are logged into their system, they will pursue you to the bitter end. This is why it is important to try to avoid giving your neighbours any reason to complain to the Council, since they are obliged to follow up every complaint, however trivial or malicious. Having said this, I equally would not advise that you go ahead with a large and expensive installation, such as a tower, without planning consent. Such operations are so expensive and take so much effort to put up that most people would not risk the possibility of having to take them down.

## 4 YEAR RULE

There is one very important planning rule that can be of great assistance to us and it is one that the council will never tell you about. This is that if your installation has been in place for four years with no material change, then an enforcement order cannot be issued against it. This means that the council



cannot then make you take it down, and hence you have effectively got around the planning regulations. Hence I would advise you to keep all purchase receipts for your aerial installation, take regular dated photographs of your aerials and write a commentary on the back of them, and record in your log book tests on new aerials and a brief description of them. In this way, you will build up all the evidence necessary for the four year rule and be able to send the council away with their tails between their legs !.

### OBJECTIONS

So, if the dreaded letter from the council falls through your letter box one morning, what should you do ?. Firstly, if the four year rule above applies, you're home and dry. All that is needed is a meeting with the Planning Officer to show him the evidence. If you've done your homework properly, most will drop the case straight away.

As with the TVI problems discussed in the last issue, remember to stay polite and calm. Do not tell the planning officer what to do or where to go, and do not expect him to tell you who has brought the issue to his notice. What you must remember is that the planning officer has to follow a complex set of legal and bureaucratic procedures, and is subject to overseeing by the Chief Planning Officer, the elected members of the council, the local government ombudsman etc. He will therefore have to plod through his procedures, and it will not help matters if you give him a hard time. It might help you to read up the planning law, since you might be able to use these procedures to play for time.

### DE MINIMIS

You might also try to persuade him that your installation is "de minimis", ie too small to worry about. This does sometimes work with a small installation, but not with a tower !. Another well known dodge is the portable installation, such as a tower on a wheeled trailer. This can work, but the trailer must be demonstrably

mobile ( no jacked up wheels etc ) and it must not rely on guy lines or brackets to fixed structures for support.

### RSGB HELP

At the end of the day, you may just have to bite the bullet ( and pay the fee of £50 or so ! ) and apply for permission. This is where RSGB members have an advantage, since they can obtain a copy of the excellent RSGB booklet on planning permission. This contains a wealth of advice on how to go about applying, and I will not repeat it here. Whilst you should not of course attempt to mislead anyone, you should seek to minimise the impact of your installation in your application. If you are preparing drawings of your proposals, careful choice of line thickness ( thick for the house, thin for the aerial ) and including other higher objects on the drawings such as trees might help. If you are submitting photographs of an existing installation, use the old estate agent photographers trick of taking the photograph from the top of a pair of steps or other high vantage point : it helps to improve the perspective.

### RECORDS & FILES

You must keep a meticulous record of all your correspondence, filed neatly in date order. Anything to your advantage said verbally by the planning officer should be confirmed in writing. If you fail to obtain planning permission, then you must lodge an appeal. At this point, RSGB members will gain the assistance of an RSGB Planning Committee member to review their case and prepare the appeal - another good reason to join !.

### INTERFERENCE

Most planning officers are now aware of the official guidance that interference is not a material matter in planning cases. Thus a proposal cannot be turned down because it does or might cause interference. The council will usually write to your immediate neighbours

once you have submitted an application and give them an opportunity to comment. Hopefully they will not object, but if they do they must have a valid objection : simply saying that they don't like it or that they think you are an objectionable nuisance is of no use to them. Having said that, if this is what they believe and want to say, don't bother to stop them !.

### CONCLUSIONS

I hope that all of you reading this do not have any reason to put it into action. This has really been a very brief skim through the subject, and I do recommend that you read and take advice as widely as possible if you have a problem.

As always, lets end on a positive note. If you look around Bristol or most towns, and think about the people you know with large aerial installations, you will realise that with a little patience and diplomacy on your part, and perhaps a small compromise over what you really want, most people can get approval for an effective system. Don't forget that with regular watering, aerials can be made to grow by small increments over time : they seem to do better when its dark and the neighbours are away !. Strange isn't it ?.

**Please**  
**Don't Forget**  
**SUBS**  
**are due**  
**NOW**

way of a change for "P5", there are a couple of cut-out features on this page for you to retain. Firstly, two photo-reduced copies of the complete list of GB3ZZ DTMF Codes that we published full size in the last issue. Hopefully, you will keep these by your tone pad in the shack. Secondly, for those members in the Bristol area, a copy of the RSGB Bristol Groups programme for 1993. STG members would be more than welcome to attend any of these meetings.

### GB3ZZ DTMF KEYPAD CODES

00	select beam antenna 0 (N)	50	reserved
01	select beam antenna 1 (NE)	51	reserved
02	select beam antenna 2 (SE)	52	reserved
03	select beam antenna 3 (S)	53	reserved
04	select beam antenna 4 (SW)	54	reserved
05	select beam antenna 5 (NW)	55	reserved
06	select Alford slot antenna	56	reserved
07	select Alford slot antenna	57	reserved
08	select Alford slot antenna	58	reserved
09	select Alford slot antenna	59	reserved
10	main text index page	60	display weather satellite image
11	STG description	61	switch to satellite channel 1
12	GB3ZZ special features	62	switch to satellite channel 2
13	DTMF instructions	63	reserved, duplicates page 60
14	DTMF valid tone sequences	64	reserved, duplicates page 60
15	GB3ZZ transmitter info	65	reserved, duplicates page 60
16	GB3ZZ receiver info	66	reserved, duplicates page 60
17	computer information	67	reserved, duplicates page 60
18	Antenna selection info	68	reserved, duplicates page 60
19	future developments	69	reserved, duplicates page 60
20	VCR functions index	70	VCR control STOP
21	VCR instructions STOP	71	VCR control PLAY
22	VCR instructions PLAY	72	VCR control REWIND
23	VCR instructions REWIND	73	VCR control FAST FORWARD
24	VCR instructions F FORWARD	74	reserved
25	VCR instructions RECORD	75	VCR control RECORD
26	VCR instructions PAUSE	76	reserved
27	VCR instructions STILL	77	VCR control PAUSE
28	VCR operation overview	78	reserved
29	VCR tips on how to use	79	VCR control STILL (freeze frame)
30	STG index	80	signal strength report
31	P5 newsletter	81	repeater status report
32	BATC information	82	identify repeater
33	Bristol RSGB Group info	83	callsign caption
34	ATV contest info	84	recall last caption
35	Obtaining DTMF keypads	85	signal diagnostics
36	GB3ZZ software notes	86	reserved
37	Weather satellite info	87	reserved
38	BBS information	88	reserved
39	map to reach GB3ZZ	89	reserved
40	contests and events index	90	cancel network link
41	updatable, event info	91	establish network link A
42	Guide to 23cm TV book	92	establish network link B
43	Plea for more to fill pages!	93	establish network link C
44	updatable, event info	94	establish network link D
45	updatable, event info	95	establish network link E
46	STG Committee news page	96	reserved
47	STG Committee members	97	reserved
48	Bristol RSGB Group page	98	reserved
49	SBARC events calendar	99	cancel special functions

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01	select beam antenna 1 (NE)	51	reserved
02	select beam antenna 2 (SE)	52	reserved
03	select beam antenna 3 (S)	53	reserved
04	select beam antenna 4 (SW)	54	reserved
05	select beam antenna 5 (NW)	55	reserved
06	select Alford slot antenna	56	reserved
07	select Alford slot antenna	57	reserved
08	select Alford slot antenna	58	reserved
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22	VCR instructions PLAY	72	VCR control REWIND
23	VCR instructions REWIND	73	VCR control FAST FORWARD
24	VCR instructions F FORWARD	74	reserved
25	VCR instructions RECORD	75	VCR control RECORD
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44	updatable, event info	94	establish network link D
45	updatable, event info	95	establish network link E
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## 1993 PROGRAMME

### RSGB BRISTOL GROUP

All meetings commence at 7.30 pm, and are held in the Small Lecture Theatre, Queens Building, University of Bristol, Clifton. Further information may be obtained from the Secretary, David Bailey G4NKT, telephone 0272 672 124.

#### JANUARY 25th

Potted Lectures by Group Members.

#### FEBRUARY 22nd

10 GHz Narrowband Operation by G3JMY & G3FYX.

#### MARCH 29th

Radio Servicing by G4AQU of Castle Electronics.

#### APRIL 26th

Home Winemaking with samples ! by G7GHB.

#### MAY 24th

Half Yearly General Meeting.

#### JUNE 21st tba.

#### JUNE 27th

Longleat Amateur Radio Rally.

#### JULY 26th tba

#### AUGUST 23rd tba

#### SEPTEMBER 27th tba

#### OCTOBER 25th

Annual General Meeting.

#### NOVEMBER 29th

Annual Home Construction Contest.

#### DECEMBER 20th

Christmas Party.

# ANNUAL GENERAL MEETING - 13th APRIL 1993

## NOTICE

Formal notice is hereby given of the Annual General Meeting of the Severnside Television Group. This will take place on Tuesday 13th April 1993 at 7.30 pm, at Elm Park Parish Pavilion, Elm Park, Filton, Bristol.

All members are asked to attend the meeting. Guests and non-members are welcome to attend, but only fully paid up members will be able to participate by speaking or voting.

## NOMINATIONS

Nominations are now invited for the following posts ; Chairman, Chief Engineer & Vice Chairman, Honorary Secretary, Honorary Treasurer and up to five committee members. All nominations must be deposited in writing with the Secretary ( who is currently S.P.O'Sullivan G8VPG, 15, Witney Close, Saltford, Bristol BS18 3DX ) no later than Tuesday 30th March 1993. Nominations must be proposed and seconded by two fully paid up members of the Group; and the nominee who must also be a fully paid up member of the Group, must indicate his agreement to serve in the capacity indicated if elected. You may nominate

someone for more than one post, the elections will take place in the order given above and the nominee must accept the first two posts to which he is elected. A member cannot hold more than two posts.

In the event of more than one nomination being received for any Officers post, or more than five nominations being received for committee members posts, a secret ballot will be held at the AGM.

A suitable nomination form is included in this issue of "P5", but the use of this is not obligatory.

Nominations will be sought at the AGM for the non-committee post of Honorary Auditor.

## RESOLUTIONS

Members wishing to propose Resolutions at the AGM must submit them in writing to the Secretary no later than Tuesday 30th March 1993. Each resolution must be proposed and seconded by two fully paid up members of the Group, who should be prepared to address the AGM when the resolution is discussed.

Members should note that whilst there will be an opportunity to discuss minor matters under "Any Other Business" at

the AGM, constitutional or major matters must be submitted in advance as a formal resolution.

## SUBSCRIPTIONS

Members are reminded that all annual subscriptions become due after the AGM. A suitable renewal form is included with this issue of "P5", and all members are asked to renew promptly. The rate will be set by the AGM.

## CURRENT COMMITTEE

For your information, the current committee is listed below ;

Chairperson, Mrs.Viv Green, G1IXE.

Chief Engineer & Vice Chairman, Steve Walsh G8KUW.

Honorary Secretary, Shaun O'Sullivan G8VPG.

Honorary Treasurer, Mrs.Jean Fletcher GoAWX.

Committee Members, Ivor Green G1IXF, Paul Stevenson G8YMM, John Hudson G3RFL, Ken Stevens G4BVK and Brian Kelly GW6BWX.

Honorary Auditor, Dr.Chris Newton GoFGZ.

## SEVERNSIDE TELEVISION GROUP NOMINATION FORM FOR OFFICERS & COMMITTEE 1993/94.

We wish to nominate ..... ( name ) ..... ( call )  
for the post of : Chairman  
Chief Engineer & Vice Chairman  
Honorary Secretary  
Honorary Treasurer  
Committee Member.

Proposer ..... ( signed ) ..... ( call )

Seconder ..... ( signed ) ..... ( call )

I agree to serve in the capacity indicated if elected,

..... ( nominees signature ) ..../../1993.

This form must be returned to the Secretary no later than 30th March 1993.



Dear Friends,

Yes, we've been at it again on the Severnside Repeater, we chose 3rd January 1993 to indulge in our Fancy Dress evening on the air. The old stalwarts were still around with several new "odd characters" that turned up on the night.

The fun began at 7pm. with Phil G1HIA as "Mr. T" the TV detective, with apples disguised as huge muscles under black boot polish (I wonder if his wife has to scrub him later??) Next came our Chief Engineer, Steve G8KUW who gave us a superb sketch of "Captain Jeanluc Pickard of the USS Enterprise", with authentic background and dressed as the great Captain himself. Number three was Ken G4BVK, this was ingenious, he was "A Christmas Parcel", he mentioned he had difficulty in finding a cardboard box large enough to cover with Christmas wrapping paper and tinsel. (I think I should mention that our Ken is not exactly tiny!!) Fred G7LPP (one of those newcomers) joined in wholeheartedly with a very convincing study of a "Geisha Girl" (rather large!) and later with "BoPeep", with various other disguises popping up throughout the evening, it was very funny. One of the stalwarts, our very own Terry G4YTH brought back "Four old faces revisited"... "The Swagman", "Phantom of the Opera", "The Artist", and "Micro Man". All wonderfully acted on video in previous years but given a new slant for the newcomers this year. Terry really is our artist, we all would dearly love to emulate him. Another of our newcomers braved his first night, David G6ZKC looking very authentic as an "Arab", we hope to see him again next year. For a fleeting moment we saw an "Upside Chinaman", we had difficulty in recognising Alan G7DRU, as his effort was quickly removed from the screen but we "caught on" eventually, jolly good Alan. The next scene was a "Nookey Bear" who crept around the base of monitor screen to talk to us in his own inimitable way, it took some time before we worked out it was Paul G8YMM, he made it very realistic.

You will all know I keep our Chairman and Husband to the end and this year Viv G1IXE became a "Purple Witch" with the most horrible face, hair tangled down to her waist, a red tongue, poked out at the screen (she wanted to do that to us for ages!), with the typical witches garment to add to the effect. I would not dare to repeat the remarks that were bandied around the airways! Not to be outdone, Ivor G1IXF followed his Wife with "Rabbit, from Alice in the Looking Glass", the costumes in each of these cases were excellent, and very daunting to wear, congrats. to you both. This year we departed from our usual evening and we organised a "Teddy Bears Picnic" to complete the fun. Everyone had to produce a Teddy Bear or cuddly toy! All obliged,--that says something about the members of GB3ZZ!!

One more year of fun for STVG but most of all the initiative and work that went into the costumes so that others might have a good time is very rewarding. The Group wants to take this opportunity to thank everyone who made the evening such a success.

Warm wishes for a healthy New Year to all ATVers.

Jean G0AWX.

*Jean G0AWX*

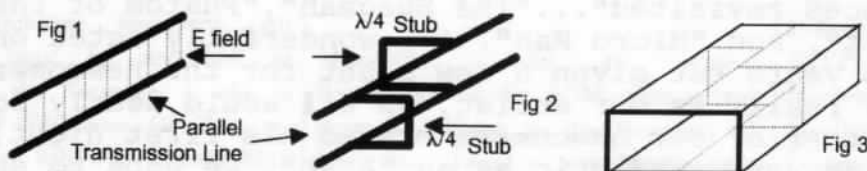
# 10 GHz Fundamentals

## Part 1: Waveguides

The imminent arrival of a 10GHz repeater for the Bristol area has spurred a good deal of interest in 10 GHz operation. In a previous article for P5, we outlined some ways of obtaining a 3 cm carrier for possible use as a TV transmitter using Gunn diodes and DRO pucks. This article explains how some of the more basic parts of the "plumbing" associated with operating at 10 GHz work ... waveguide.

The function of waveguide is to conduct RF energy from one part of the transmitter or receiver to another. Waveguide is preferred to coax for ease of use and low losses, coax is a form of waveguide since it "guides" waves but we usually refer to a hollow tube as waveguide. It is possible to use coax at frequencies as high as 50 GHz, but it is difficult to make coax accurately enough to prevent useful RF energy being lost, or to stop "moding". Moding is where the dielectric space between the conductors form a cavity that can resonate, absorbing yet more power.

How does a square pipe propagate microwave energy? It is easier to visualise a parallel transmission line, think of the pink twin core aerial wire that used to be popular on FM stereo receivers, that is a 300Ω balanced transmission line. A transmission line has an electric field between the conductors that will remain contained between the conductors as long as the conductors remain balanced. See figure 1. Containing the electric field ensures that most of it arrives at the other end. A quarter wave ( $\lambda/4$ ) shorted stub presents an open circuit at the appropriate frequency even though it is a dead short at DC.



In Figure 2 we can see that placing any amount of shorted  $\lambda/4$  stubs either side of the transmission line will have little effect on the RF power transmission. Placing an infinite amount of  $\lambda/4$  stubs on either side of the line will form a tube (figure 3), what we call a waveguide. We may also surmise that the  $\lambda/4$  stubs need not be a squared off U shape, if the  $\lambda/4$  stub was hemispherical, then the waveguide would be circular, we could use circular waveguide, but it will not keep its polarity along any but a short length of guide. This is a phenomena satellite dish owners know as "skew". In microwave ATV we need to retain the polarity to ensure that the transmitting station and the receiving station see each other. The polarity we quote to each other always refers to the electric field generated by the radiating device, in figure 3 the electric field is between the broad faces of the waveguide. Therefore a signal radiated by the waveguide in figure 3 is said to be vertical.

Recall that the  $\lambda/4$  stubs are only  $\lambda/4$  stubs at a particular frequency, this is the main reason for waveguide being frequency critical. At 10 GHz, we would use WG16 type waveguide, the WG16 dimensions are roughly 23mm x 10mm and has a frequency range of about 8 to 12 GHz. The relationship between frequency and choice of waveguide is also affected by the possible modes of propagation in waveguide. The electric field is the most meaningful to us as described above, but with every electric field there is a perpendicular magnetic field. We refer to these as Transverse Electric and Transverse Magnetic or TE & TM modes of propagation, there is also a TEM mode but this mode is not possible in waveguide. The main mode in rectangular waveguide is known as  $TE_{10}$  (pronounced T, E, one, zero). The "one" is the amount of minima's / maximas in the electric field over the broad face and "zero" is the amount in the narrow face.

We get energy in and out of the waveguide by using "probes" and "feeds". A "probe" is sometimes called a monopole, it usually couples a coax feed into a waveguide as a small vertical antenna set into one of the broad faces. The electric field at the probe aligns directly to the electric field in the waveguide. A "feed" will usually couple the 10 waveguide into free space, these will be covered in the next article on horns, feeds and dishes.

The mechanics of using waveguide are made simple by the vast range of WG16 parts available to the TV amateur. The circular flange fitting used to be the most widely used, but today the more elegant rectangular flange is very common. It is critical that the mating of the flange be as accurate as possible in order to minimise leaks. Some flanges have an RF choke built in to the flange so that should a leak occur into the gap when two flanges are mated the RF is reflected back into the cavity. Angles, twists, attenuators and filters are all widely available on the surplus market, but may be fabricated as needed from brass plate provided that care is taken to ensure that the inner surfaces are smooth and of the correct dimensions.



SEVERNSIDE TELEVISION GROUP

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NAME ..... CALL .....

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- 1 ) Can you receive GB3ZZ ? YES / NO
- 2 ) If YES, what picture grade do you get ? P5 / 4 / 3 / 2 / 1
- 3 ) What additional facility would you like to see on GB3ZZ ?

.....  
 4 ) What subject(s) can you suggest for future articles in "P5".

.....  
 5 ) Would you be prepared to actively help the Group ?. Some of the areas where help is needed are : Organising Club talks/demonstrations : Writing an article for "P5" : Helping with our Contest station : Manning our stand at a Rally : Technical design/construction work for the repeater and new Group products : Visiting beginners to assess repeater signal strength and give advice on setting up a station : Advice/visits to resolve EMC/TVI problems. Please underline where you can help or suggest other areas over the page.

Please add further comments over the page - thank you for your time.

